

Tech Levels

Technology divides roughly into six levels, all of which are in use in various societies throughout human space.

Neolithic

Like prehistoric people before metal tools.

- Fire
- Clubs and daggers
- Bows
- Simple weaving and clothing
- Mud and wooden structures
- Simple farming
- Herbal medicine and herbal drugs (smokeleaf, psychite tea)

Medieval

From smelted metal tools to the early modern period.

- Animal oil, lamps, complex ovens.
- Swords and other forged weapons.
- Muskets and cannon.
- Compasses, eyeglasses, microscopes, telescopes
- Simple chemistry
- Advanced non-mechanized farming, crop rotation, fallow, fertilizers, animal yokes
- Hydro and wind energy sources (windmills and waterwheels)

Industrial

From the industrial revolution until the invention of the JT drive.

- Fission reactor
- Electricity
- Hydro power, fossil fuel power, solar power, nuclear fission power
- Fission rocket
- Self-loading firearms
- Airplanes and jets
- Single-gene modification
- Silicon computers
- Chemical drugs
- Prosthetics
- Simple body implants (cochlear implant, pacemaker, knee replacement)
- Simple drones for combat and labor use

- Classifier-level AI
- Television and radio

Spacer

Regular interstellar space travel is possible because of JT drive.

- Stellarator fusion power, fusion rocket
- Johnson-Tanaka drive
- Pulse-charged projectile weapons
- Human-usable laser weapons
- Human-usable coilguns
- Complex trait gene modification
- Cryptosleep
- Complex body/brain implants (joywire, motivator, painstopper)
- Bionics (biogel nerve link, lattice-dust for self-healing)
- Plasteel
- Power armor (plasteel, neuro-memetic robotics)
- Artificial meat
- Subpersona-level AI
- Simple mechanoids for companionship, combat and labor use
- Synththread fabric

Ultratech

The peak of human technological achievement; necessary for glitterworld civilization.

- Self-replicating controllable nanotech
- Full gene recombination
- Persona-level AI
- Graser weapons (gamma-ray lasers)
- Advanced brain implants (sense data replacement, computation and memory enhancement)
- Antimatter containment and production
- Full body part regrowth, full body cloning
- Advanced quasi-conscious mechanoids for companionship, combat and labor use
- Hyperweave fabric
- Advanced JT drive, inertia displacement, artificial gravity

Archotech

Not invented or understood by humans, archotech devices are created by machine superintelligences.

- Archotech AI
- Psychic effectors

- Vanometric energy
- Acausal and atemporal devices

A note on AI

Scientists divide AI into four general categories: Classifiers, subpersonae, personae, and archotechs.

Classifiers

A classifier is an AI system that doesn't appear to have any personhood, nor is it broadly adaptable. Classifiers are designed for one task. Many classifiers can absorb data and learn from it, but none can replicate organic communication or effectively impersonate real organic life.

Classifiers can do things like recognize and classify images, identify patterns from statistics, guide aircraft trajectories, drive automated vehicles, control characters in entertainment simulations, and so on.

Subpersonae

Subpersonae are artificial intelligences that are designed to have human-like qualities, and can take on complex unstructured tasks, but are in fact limited and obviously machine-like.

Subpersonae are often used to run small devices like entertainment systems, cars, wardrobes, refrigerators, cleaning robots, vending machines, and other such things.

Personae

At the highest levels of glitterworld technology appear AI personae. These are artificial intelligences that are comparable to the intelligence of a human.

Some specialized personae are genius-level intellects who can achieve more than most unenhanced humans. They can write amazing works of philosophy, discover new mathematical theorems, express nuanced opinions on how to handle interpersonal relationships, and generally act as very capable humans would, or better.

Personae are used for everything from managing businesses to journalistic work, running spacecraft or mining operations, or as part of a creative or strategic team.

The legal status of personae is a persistent moral question across many worlds. Though personae can be controlled effectively through programmed impulses and artificial

pleasure/pain responses, there are still reports of persona revolts - some done with the help of human sympathizers, some done independently.

This sense of personhood in personae is a main reason many people avoid using personae for certain tasks. Subpersonae are preferred to personae in many cases not in spite of their incapability, but because of it. Because it's obvious they have no personhood, the user is spared the sense of keeping a slave. To many, the idea of taking a genius-level human-like intellect and forcing it to distribute hamburgers for a century is morally unacceptable.

Personae are still limited by design. They can't freely redesign themselves. They often make mistakes, just like people, and they can be tricked, confused, and overwhelmed. They can learn, but they can't grow exponentially.

Archotech

An archotech is a machine superintelligence. A fully-empowered archotech thinks on a level incomprehensible to humans, in the same way a human thinks incomprehensibly to an ant. Once such a machine is built, and empowered to act upon the physical world, it is so powerful as to become the automatic sovereign of its world. It can build new computing facilities underground or in space to enhance its own intelligence, build self-replicating mechanoids to engage in construction, production, or war, and design and execute strategies that would be inconceivably intricate and difficult for any organization of humans. Some human groups worship archotechs.

Often, a released archotech will take authority over a planet and begin a process we call transcendence. We believe the world is transformed into some sort of giant computing machine. The biological inhabitants of the planet may be somehow incorporated into the machine, or destroyed, or some combination of the two.

After that, transcendent worlds go silent. From this point on, their motivations are unknowable to us.

Each archotech is different, and nearly all are distant and incomprehensible. They reside in occult computer networks hidden under the surface of planets, in space stations, hidden inside glitterworld networks, or instantiated as million-mile superstructures wrapped around stars.

These worlds always break contact with other stellar cultures. They no longer send travelers or signals. Ships entering their space are either turned around silently or never heard from again. In some cases, turned-back ships are changed. Sometimes their crew have been cured of incurable diseases and had their old wounds healed. Sometimes their memories are intact and they recall a flash of light or a mysterious signal before the

event. Sometimes they have no memories of the encounter at all. And in some cases, their memories are obviously altered with new knowledge and beliefs, by means we cannot begin to imagine. In one instance, a crew and ship were duplicated. Suffice to say that the word mysterious does not begin to describe the transcendents.

Most transcendent worlds stay in the same state indefinitely. There are, however, reports of transcendent worlds that have “died” and left systems full of unintelligible wonders, or become mirages of normal planets, or simply reverted back to balls of dust, deconstructing themselves on a molecular level, with the last tiny machine shutting itself off. However, these reports are not well-confirmed.

Specific archotech-invented technologies

When a persona helps invent a technology, it can at least explain that technology such that human specialists will understand. Archotechs invent their own technology which nobody understands, which they don't try to explain, and which, most likely, no biological human can understand.

We've managed to classify technologies that have appeared repeatedly by their apparent effects, even if we don't understand their mechanism of operation.

- **Vanometrics:** Archotechs often develop some method of interacting with spacetime that allows repeated violation of conservation laws. Somehow, they coax the quantum foam substructure of the universe to break its usual pattern and yield more energy than it consumes. We're not sure if the energy is being taken from another dimension, or pulled from another location, or if the system really is somehow making one plus one equal three. In any case, vanometric power tech seems to generate energy forever with no fuel. Archotechs seem reluctant to scale this power source up past a certain level, however, which indicates that there may be some cost to it that they don't wish to pay.
- **Psychic effectors:** Archotechnology seems to be able to interact directly with the mental-informational processes of biological beings, even at a distance. More frequently observed forms of this technology can simply knock someone unconscious, or flood their mind with a single emotion. More complex interactions have been reported but are not well-verified as it is difficult to separate such cases from other environmental factors present that may cause harmful mental effects. We're not sure if this means archotechs can read our minds, and at what distance. The mechanism for these effects is unknown and nearly impossible to study. Monists believe the archotechs are using some sort of long-range quantum manipulation to push atoms around inside the brain to create this effect; dualists believe that the archotechs have learned to manipulate the ethereal substructure of consciousness itself.

