

Common Communications Technology

There are several forms of communications technology used in the [SARPIverse](#). There are some technologies however that are similar enough to consider common or generic.

History and Background

Communications technologies are the backbone of both civilian and military settings in the [SARPIverse](#). These systems are hugely important to the operations of all [factions](#) in that they connect people to people, and in some cases keep entire groups of people in contact. Some [factions](#), like the [Yamatai Star Empire](#), the [Democratic Imperium of Nepleslia](#), and the [New Dusk Conclave](#) have highly sophisticated quantum communications which are real-time and theoretically unlimited in range, while other fledgling civilizations are not yet that advanced.

Types of Communications Systems

These are a list of commonly found communications systems in the [SARPIverse](#). The exact deployment of these technologies may differ from source to source, but this will serve as a general reference.

Quantum Communications

A system that utilizes the principle of quantum entanglement to bond pairs of particles for the purposes of instantaneous communication. In order to function the location of the receiver must first be specified in order to establish a connection; from that point onward the two communications devices remain connected on a quantum level so that when particles in one device are manipulated to convey information the particles in its counterpart are instantaneously changed in the same manner, regardless of the distance between the two devices.

No signal or emissions exist to be intercepted or jammed, but the data transfer rate is relatively limited. Unfortunately, distortion shielding can interfere with the particle entanglement between two devices - severing the connection - making the system of little use during combat when shields must remain active.

Commonly coupled with [volumetric imaging](#) for real-time projection of the parties involved.

Examples:

- [Star Army Quantum Communications](#)
- [NDC Quantum Communications](#)

Hyperspace Communications

The hyperspace communication system (Also sometimes called subspace communications) is the preferred method for long-distance communication; this system propagates modulated gravity waves through hyperspace, allowing high-bandwidth communications at extremely long ranges. Hyperspace messages are fast, omnidirectional, and can be encrypted, but like subspace comms, they are easily detected and vulnerable to jamming.

Examples:

- [Star Army Hyperspace Communications](#).
- [NDI Hyperspace Communications](#).
- [Nepleslian Hyperspace Communications](#).

Subspace Communications

The subspace communications transceiver can detect or propagates old-style radio signals through the universe's subspace spatial membrane. This essentially accelerates a normal radio message to extreme superluminal velocities and allows for long-distance communication between distant star systems. Such messages are extremely fast, omnidirectional, can be encrypted, but are also easily detected by any subspace transceiver within range and are vulnerable to jamming.

Due to the dependence on radio-waves – which spread out and become less coherent over distance – the maximum range and data transmission rate for this technology is comparably low; for long-distance communications hyperspace-based communications tech is usually preferred despite the lower transmission speed. Normally, subspace communications are only used when time is of the essence and brief transmissions are acceptable.

Examples:

- [Star Army Subspace Communications](#)

Radio Communications

The radio communication system – as its name suggests – is designed to broadcast and receive data using radio waves. The system incorporates spread-spectrum technology with which communications clarity and reliability can be significantly improved by distributing the signal over a range of frequencies. Also through the use of frequency hopping the location of the transmitter can be made intentionally harder to detect and locate. Radio wave transmissions are relatively easy to encrypt, but are extremely vulnerable to jamming – many pre-FTL civilizations possess this capability.

The listed “effective” range can be extended by lowering the signals data transfer rate – if the data of a signal is repeated so that the transmission time is quadrupled that would approximately double the range; if the transmission time is multiplied by one hundred then the range is increased by roughly a

factor of 10. This is a technique that is commonly used by pre-FTL civilizations for deep-space transmissions.

Examples:

- [Star Army Radio Communications](#).
- [Nepleslian Radio Communications](#).

Laser Communications

Laser communications antennae utilize modulated multi-frequency laser beams to transmit directional signals to a specific receiver. Due to the narrow beam and line-of-sight nature of this system, lasers are difficult – though not impossible – to detect, jam, or eavesdrop upon. In order to intercept a laser beam, one must lie in its path. This is an old-style communication system and is commonly left unused in favor of more modern neutrino beam comms tech – which has both similar capabilities and superior performance – but has been included in the ship comms suite should the need arise.

Performance of laser communications can also be drastically impaired when forced to pass through certain environments; nebulae clouds for instance – depending on their composition – can easily reduce communications range to a hundredth the normal distance.

The laser beam frequencies utilized are usually invisible to the eye, though in order to function at great distances they are necessarily tightly focused and are powerful enough to cause light damage if used at full power and at close range (under ~300,000km).

Examples:

- [Star Army Laser Communications](#)
- [Nepleslian Laser Communications](#)

Gravity Pulse Communications

For omnidirectional light-speed transmissions, gravity pulse communications are the next technological tier above radio comms. Gravity waves – similar to radio and the rest of the electromagnetic spectrum – propagate through normal space at the speed of light, however, the amount of information able to be transmitted through the use of gravity pulses is many times greater than that of radio waves and the effective broadcast range is considerably greater.

Additionally, encryption is easy and gravity pulses are practically impossible to jam or obscure – doing so requires an immense source of gravity equivalent to a star or quantum singularity. Unfortunately, the system is not particularly covert and can be easily traced with the right type of sensor.

As with radio communications tech, the listed “effective” range can be extended by lowering the signal's data transfer rate.

Examples:

- [Star Army Gravity Pulse Communications](#).

Neutrino Beam Communications

For directional light-speed transmissions, neutrino beam arrays are the next technological tier above laser comms antennae. The Neutrino arrays utilize modulated neutrino particle beams to transmit a directional signal to a specific receiver. These neutrino beam transmissions are virtually impossible to block or jam as the particles can pass through miles of rock with relative ease; it is only through the use of specialized sensor systems with extremely sensitive energy fields that react to neutrinos that such beams are detected at all.

Performance-wise, neutrino beam comms have roughly double the range of laser communications and roughly an equal data transfer rate. Typically, neutrino comms are used in favor of their laser equivalents for covert in-system communications or uninterrupted fire control for missiles and drones.

Examples:

- [Star Army Neutrino Beam Communications](#)

Tachyon Communications

Tachyon pulse communicators – like the radar systems based on the same technology – utilize omnidirectional bursts of exotic massless particles that travel at superluminal velocities. Because these particles are inherently unstable tachyon comms systems have an inferior range to other FTL communicators based on subspace and hyperspace technology – though with larger and more powerful transmitters the tachyon stability can be increased and particle transmission range extended.

As with neutrino beam transmissions, a burst of tachyon particles is virtually impossible to jam. However, with the right kind of sensors tachyons are relatively easy to detect and trace to their source.

Examples:

- [Star Army Tachyon Communications](#)

Psion Communications

A system derived from the study of telepathic communication and as an outgrowth of older psionic signaller technology, the communications system generates omnidirectional superluminal telepathic messages that can be broadcasted to sentient organic minds or otherwise compatible receivers as sub-vocalized thoughts, sounds, sensations, feelings, and imagery.

The technology uses exotic 'thought' particles known as psions to convey information and though any sufficiently advanced organic brain is usually a compatible receiver, that does not necessarily mean that the content of the message can always be understood. As an example; a sentence broadcasted in

Yamataian would still be unintelligible to its recipient if they do not know that language, but feelings, sensations, and images might possibly be comprehended. A species with brain chemistry incapable of expressing a particular emotion however may not correctly interpret broadcasted emotions by this technology.

Transmissions with this technology can be manipulated and blocked through the use of specialized devices, such as psionic signal controllers.

Examples:

- [Star Army Psion Communications](#)

Communications Range

The Range of these systems, in general, varies between [factions](#). Different technology development levels produce inferior and superior systems.

A General Guide However, based on the [Star Army Standard Communications Array^{1\)}](#):

Communications Range			
Type of Communications System	Estimated Range	Transmission Speed	Estimated Data Transfer Rate
Quantum Communications	Theoretically Infinite	Instantaneous	~0.1 GB/min
Hyperspace Communications	~875 LY	~1.12 LY/min	~1 GB/min (~17.89 MB/sec)
Subspace Communications	~150 LY	~2.65 LY/min	~1.7 MB/sec
Radio Communications	~80 million km (~50 million mi. or 0.53 AU)	299,792.454 km/sec (186,282.395 mi/sec, or 1 c)	~1.7 MB/sec
Laser Communications	~200 million km	299,792.454 km/sec (186,282.395 mi/sec, or 1 c)	~1 TB/min (~18,325 MB/sec)
Gravity Pulse Communications System	~1.3 billion km (~800 million mi. or 8.69 AU)	299,792.454 km/sec (186,282.395 mi/sec, or 1 c)	~1 GB/min
Neutrino Beam Communications System	~400 million km (~250 million mi. or 2.67 AU)	299,792.454 km/sec (186,282.395 mi/sec, or 1 c)	~1 TB/min
Tachyon Communications System	~250 AU	5.7 AU/sec (~2,844 c)	~1 GB/min
Psion Communications System	~100 AU	Instantaneous	~0.1 GB/min

How to Link Off This Page

To link to one of these systems descriptions in your articles please do as follows:

Example using radio communications:

====Systems====

Systems on the Whatever this is.

====Radio Communications====

<Insert Name of Ship> uses a standard

[[technology:common_communications_technology#radio_communications|Radio Communications System]].

OOC Notes

[Andrew](#) created this article on 2022/11/22 01:46. Most of the work is attributed to [Khasidel](#) and [Wes](#).

- The purpose of this page is to provide a factionless technology article for communications technologies. So that those who don't have their own "Standard Communications Systems" Article, can link to this page.
- Systems Descriptions borrowed from [Khasidel](#) articles.²⁾ They were great descriptions, some of the best found on the wiki.

This was approved by [Wes](#) on 2022/11/26.³⁾

¹⁾

A Highly developed technology level system

²⁾

https://stararmy.com/wiki/doku.php?id=wip:stararmy:starships:naginata-class_battlecruiser#communication_systems

³⁾

<https://stararmy.com/roleplay-forum/threads/common-communications-technology.69650/#post-431916>

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