Quantum Mirror

History and Function

Starships feature a vast array of equipment on board, all of which is purposed to some use or another. The variety of energy signatures generated by sources both natural and artificial requires a large number of sensor systems, each of a different size and power requirement, in order for a bridge crew to be offered a full and complete picture of what is happening around the ship.

As more and more forms of energy and particles were discovered, the size and complexity became too much to handle for even the largest ships were having entire fifty-meter sections of their bulk dedicated to sensor suites which filled every available space and drained massive amounts of power from the engines, essential energies that would be put to better use elsewhere.

The solution came from the private sector, naturally, who stood to profit greatly from outfitting every starship that could fly with the new equipment. Quantum detectors perform the same duties as a dozen of the most complex sensors available, with a fraction of the power required by even one of them.

A detector operates by experiencing a shift in its quantum state when it encounters an emission such as solar radiation or the effusion from a ship entering an FTL mode; this shift is recorded by a computer which interprets the change according to what caused it. The detectors, being physical objects, can and will decay, especially without regular maintenance and cleaning, as although sold as a single piece they are in fact several elements tied together.

Composition and Maintenance

The breakdown of the elements that are found in the detector is as follows:

- 12% argon
- 8% neodymium
- 20% quartz
- 30% aluminum
- 30% titanium

The argon is held pressurized between the neodymium and the quartz, which are formed into flat disc shapes and held together by an aluminum ring. The whole package is cased in a titanium wrapper of sorts, thin but durable with holes in the appropriate places for valves and flanges and contact leads, etc., needed to maintain gas pressure and also to allow the computer to monitor changes in the quantum state. Since argon is an inert gas they use it as a buffer between the electrically active quartz and the magnetic neodymium.

The titanium casing is essential to the detector's operation because although it is not a reactive metal in the context of the mirror's design it slows down the shifts experienced enough that they can be measured; even though the shift occurs on nanosecond scale timeframes even the slightest delay can amount to a massive difference that has an even greater effect on the quartz quantum state. As the state shifts it also alters the weak field between the quartz and the neodymium, resulting in an alteration that is read by the computer attached to the mirror.

Maintaining the device is a simple process. First the contacts are removed from their sockets and set aside; then the hot lead is disconnected from the quartz and neodymium discs. Next the mirror is taken from the mounting and laid on a rack; a technician checks the pressure of the argon inside the mirror while wiping down the titanium casing with a clean and oil-free cloth. The titanium is then polished and wiped down again to remove any residue; if the gas pressure has changed towards the negative more argon is added instead of it simply being compressed. Should the gas pressure be below a certain point it is changed entirely. The last thing that is done is that all seams are checked for leaks and ensuring that the discs have not slipped from their slots and allowed gas to escape. Once all the steps have been completed the detector is replaced in its mounting and all connections are restored.

The entire process takes about fifteen minutes for a set of four; average size for each device is about 40 centimeters in diameter.