



What Happened to Galileo

No, not that Galileo, the renowned astronomer and father of modern science. We know that after being shown the instruments of torture he recanted and avowed that the Catholic Church knew more about heliocentricity than he did. Nice people, the Inquisition.

The Galileo I'm referring to and about which we haven't heard much since 2007 is Europe's challenge to the US-owned Global Positioning System (GPS).

On paper there are currently three global navigation satellite systems: America's GPS, the Russian Global Navigation Satellite System (GLONASS) and the European Galileo system. GPS, as we all know, is operational and Galileo is scheduled to be working by 2013.

GPS was developed in the 1970s by the United States' Department of Defense and Ronny Raygun made the decision to widen GPS use in 1983, after a Korean airliner strayed into Soviet airspace and was shot down.

Although available for civilian use, GPS access was always 'selective' at the whim of the USDD, until selective availability was disabled by Bill Clinton. Nonetheless, Europe has always been edgy about US ownership of a global navigation system on which virtually everyone relies these days – hence Galileo.

A private-sector group of eight companies called European Satellite Navigation Industries took on the Galileo project in 2003 and the first test satellite was launched in 2005. Not much happened after that and ESNi abandoned Galileo in early 2007.

Since May 2007, the European Union's European Space Agency took direct control of the Galileo project and there should be three satellites, out of a stage-one target of 22, in place by April 2011.

The original Galileo plan was for an eventual 30 satellites, but this was cut back last year to 28.

What Can Galileo Do For Us

Satellite navigation relies on a number of satellites to provide accurate location on Earth by 'triangulation'. A GPS unit measures the time taken for signals from several satellites to reach it. Computer programming converts the time differences and the angles between the satellites into a focussed point that's expressed as Earth latitude and longitude.

GPS and Galileo rely on this same principle, but there are differences.

Like GPS, basic Galileo access will be free to everyone, but, also like GPS, high-accuracy capabilities will be restricted to military use and paying commercial users, who will have access to ground-station referencing as well as satellite location. The first Galileo ground station was built last year in French Guiana.

Galileo, when fully functional, will use 28 satellites, compared with the GPS system's average of 24, but the biggest difference is ownership. The US military retains control over GPS, but Galileo has been developed primarily as a civilian system; at least that's what the EEC says.

Galileo is intended to provide more precise measurements than those available through GPS or GLONASS and should be accurate within a few metres at its most basic level. It's also expected to be more accurate than GPS at high altitudes and latitudes.

Behind the technical differences is a political aim to provide European nations with a location system if Russia or the USA deny access to their systems. American military agencies have voiced concern over Galileo as an unrestricted system that could be used by enemies and at one stage there were threats that the Yanks would blast Galileo satellites if they were aiding a US enemy!

Because of its civilian bias Galileo is open to more development than GPS and German researchers are already planning interaction with terminal locations, so that a Galileo-compatible mobile phone can give voice direction instructions automatically.

The 2010 European Satellite Navigation Competition is aiming to kick-start commercial exploitation of the Galileo system with a contest featuring \$900,000 in prizes. Companies that come up with a new Galileo application can win individual amounts of around \$20,000, plus aid in developing their proposals into a European patent. Winners from each country participating in the contest will also be entered for the Galileo Masters Prize, which promises an additional \$40,000 to the business with the best idea.

Galileo and GPS compatibility seems assured and all the prototype Galileo navigation devices developed to date work with both systems. They use signals from all available satellites, but can work exclusively on one or the other.

By combining GPS and Galileo these new-generation navigation units may be marketed under yet another acronym: Global Navigation Satellite System (GNSS).