EGNOS FACT SHEET

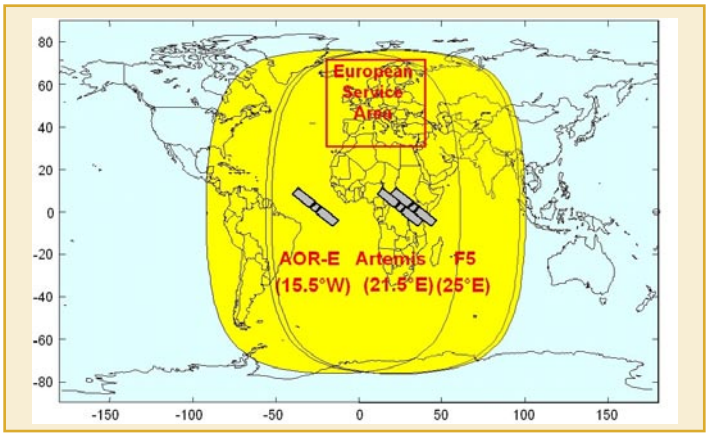
1: EGNOS EXPLAINED

The European Geostationary Navigation Overlay Service - EGNOS - is being developed to provide regional satellite-based augmentation services to aviation, maritime and land users in Europe.
The European Space Agency, together with both the European Commission and Eurocontrol, is currently implementing EGNOS - the European contribution to the first phase of the Global Navigation Satellite System (GNSS-1). EGNOS augments GPS and GLONASS, providing and guaranteeing the availability of navigation signals for aeronautical, maritime and land mobile trans-European network applications. It will become operational at the start of 2004.

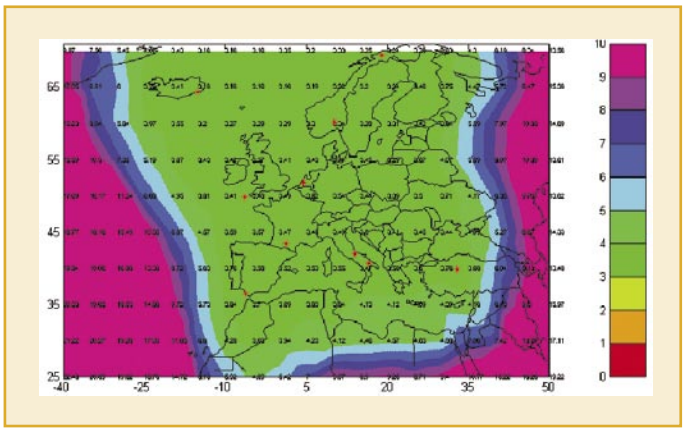
EGNOS users will benefit from improved performance, removing the need for local-area differential and commercial services in many cases.
EGNOS has been designed to meet the demanding performance requirements for landing aircraft:

- Accuracy is improved to between 1 and 2 meters horizontally and between 2 and 4 meters vertically
- The EGNOS Core Coverage and the ESTB 95 % Horizontal accuracy pictures shall be replaced by new ones provided . Since The ESTB accuracy will be replaced by an EGNOS accuracy plot, please correct the possible text mentioning the figure
- Availability is improved by broadcasting GPS look-alike signals from three geostationary satellites preparing for the EGNOS operations from 2005.

EGNOS provides a European-wide, standardised and quality-assured positioning system suitable for a diverse range of applications. It is highly compatible with GPS, so a single antenna and receiver can process both the GPS and EGNOS signals eliminating the need for a separate radio to receive differential corrections. This will allow many users to dispense with their current local-area differential or commercial services.



EGNOS Core Coverage Area



ESTB 95% Horizontal Accuracy

The EGNOS architecture is highly redundant, generating wide-area differential corrections and alerting users within six seconds if something goes wrong.
Thirty-four Reference and Integrity Monitoring Stations (RIMS) are deployed to monitor the satellite constellation satellites. Each satellite has to be monitored by multiple RIMS before correction and integrity messages are generated. Four Mission Control Centres (MCC) process data from these RIMS to generate the WAD corrections and integrity messages for each satellite. Only one of these MCCs is active and operational, the other MCCs are hot spares that can be activated if a problem occurs. Navigation Land Earth Stations (NLES) upload the corrections and integrity messages to the satellites, for onward broadcast to the users. The system will deploy two NLESs (one primary and one backup) for each of the three geostationary satellites, and a further NLES for test and validation purposes.
The EGNOS space segment is composed of three geostationary satellites with global earth coverage. The EGNOS operational system is based on the use of two INMARSAT-3 satellites (AOR-E and IOR), as well as the ESA ARTEMIS satellite.
EGNOS users should be able to track at least two geostationary satellites. It takes less than six seconds to notify users about a problem with one of the satellite

ESA Navigation Web Page:
www.esa.int/navigation

ESA EGNOS Web Page:
www.esa.int/EGNOS/

ESA EGNOS for Professionals Web Page:
www.esa.int/navigation/egnos-pro

ESA ESTB Web Page:
www.esa.int/ESTB

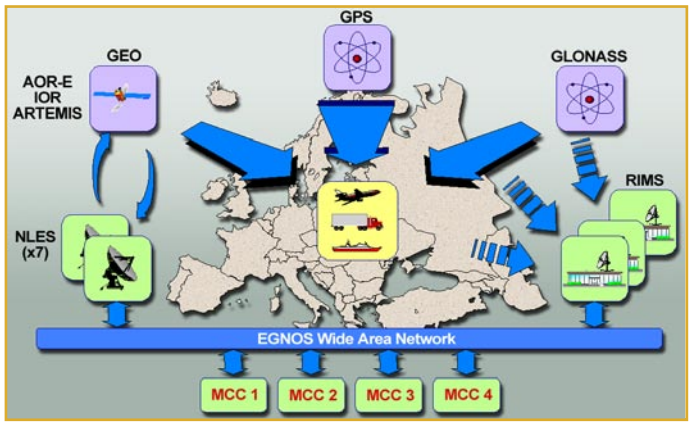
ESA EGNOS Help Desk:
EGNOS@esa.int

ESA Galileo Web Page:
www.esa.int/Galileo

EC Galileo Web Page:
http://europa.eu.int/comm/dgs/energy_transport/galileo/

FAA GPS Product Team:
http://gps.faa.gov/

Galileo Joint Undertaking:
www.galileoju.com



The Architecture of EGNOS

constellations once it has been monitored by the RIMS network.

Different levels of service are available as a result of the high degree of redundancy required to meet the safety requirements.
EGNOS provides different levels of service at different parts of the area covered by the geostationary satellites. Optimum performance is obtained within the core coverage area (as shown in diagram). There is degraded performance outside the core area, although there is some potential for improvement through interoperability with the Japanese, American and Canadian systems.

A pre-operational service has been available from the EGNOS System Test-Bed since February 2000. It is already helping companies to develop products, and users to trial applications.
A pre-operational service has been available from the EGNOS System Test-Bed (ESTB) since February 2000. The ESTB serves a European service area similar to that of EGNOS, using a much smaller number of RIMS and only two geostationary satellites (see previous diagram). Accuracies of around 3 metres horizontal (95%) are being obtained.
This provides a unique opportunity for validating and demonstrating new service and application developments in a realistic environment, not only preparing for the EGNOS operations from 2004 onwards but also in getting ready for the initiation of the Galileo system later this decade.

Receiver and integrated product manufacturers are already using the ESTB signal to test new products as part of their development processes.
Users have been working with ESA to assess the use of EGNOS in their environments. This has included high-profile aviation trials at the Farnborough and Paris air shows, maritime trials in Genoa and Greece, and land-mobile trials in Turin.
European Commission funding supports the development and operation of the EGNOS System Test Bed.

EGNOS is the European solution for the European environment, but interoperability with other SBAS systems creates a global standard with access to global markets.
Four interoperable satellite-based augmentation systems (SBAS) are being developed: EGNOS in Europe; WAAS in the US; CWAAS in Canada; and MSAS in Japan. Each of these will transmit GPS look-alike signals in a standard format. Furthermore, EGNOS has a built-in expansion capability to extend its services to regions covered by the its geostationary satellites, such as Africa, Eastern Europe and Russia.

Users will benefit from standardisation in terms of global seamless navigation. A significant global market should also promote competition among receiver manufacturers