

What is UNIGIS? UNIGIS is a network of universities co-operating to supply post-graduate Certificate, Diploma and Masters courses on GIS by distance learning as well as short workshops on current developments in GIS. It was founded in 1990 and currently includes sites in eleven countries on three continents. About 900 students have taken the UNIGIS Diploma Course world-wide. For more information: <http://www.unigis.net>.

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Friends of UNIGIS Organisations which work closely together with the UNIGIS International Network are ESRI and Intergraph. These Friends of UNIGIS make available their products for UNIGIS students for a low price and support students in MSc-projects. Currently UNIGIS is in negotiation with other potential 'Friends'. For more information on the Friends of UNIGIS Programme contact: Henk Scholten, henk@geodan.nl.

Galileo Test Bed

GNSS are based on the premise of celestial instead of terrestrial positioning. This will not change with the upcoming European Galileo system. But, Galileo's full operational constellation is currently not foreseen until 2011, with a first validation set of operational satellites for testing several years away as well.

By Josef Strobl



The Galileo test bed in Berchtesgaden, close to the city of Salzburg, Germany.

Transmitters

This is where the Galileo test bed comes into play. The transmitters emulate signals from the future Galileo system, including the simulation of time/distance delays and atmospheric effects. In a small area of 65 square kilometres in and around Berchtesgaden Galileo will be in operation from early 2007. The main rationale for this test bed infrastructure is to give receiver and applications developers an early opportunity to evaluate prototypes and to verify the features Galileo will be offering.

Bridging the Gap

The implementation of the Berchtesgaden area test bed with its full name of Galileo Test and Development Environment (GATE) has been contracted to IFEN GmbH by the

German Aerospace Center (DLR). It aims at bridging the gap between electronics lab technology development and deployment in orbit. GATE transmitters will support all Galileo frequencies plus flexible signal generation based on atomic clocks to simulate behaviour under varying conditions.

Shifting Code Phase

While the different modes will require use of a custom-built receiver terminal ('GATE User Terminal' – GUT) supplied by the GATE operators, in Virtual Satellite Mode (VSM) a generic GNSS receiver is assumed. The GATE transmitter infrastructure now fully mimics satellites by shifting code phase, Doppler shift and signal power levels of carrier and code forth and back in a way that the signal is perceived as coming from orbit. VSM will

primarily support the development of systems and receivers, including combined GPS and Galileo devices.

The GATE infrastructure will undergo a turn-of-the-year beta testing period and from approximately mid-2007 move to a fee-based business model. GATE users will then be able to conduct their own experiments with confidential results, assisting with the development of innovative technologies and services based on Galileo.

And yes, the idea of innovation is very much at the heart of Galileo. While of course the creation of an independent civilian GNSS is a core motivation and business opportunities for European enterprises are hoped for, Galileo capabilities go beyond what we experience from current GNSS. This starts with guaranteed signal availability and quality, includes new signal characteristics while maintaining GPS compatibility to reap the benefits of a higher number of satellites in simultaneous view from receivers, and the introduction of a two-way emergency beacon facility.

Promises of Benefits

The promises of benefits in the prime target application domains The UNIGIS International Association offers distance education to GIS professionals worldwide. Acquisition of spatial data through GNSS as well as real-time positioning as a foundation of Location Based Systems (LBS) are key technologies for geoinformation practitioners. UNIGIS is therefore looking forward to allow students a 'glimpse into the future' of GNSS by including Galileo into its curricula and to offer some hands-on previews through the Galileo test bed.

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