

Test Confirms EGNOS + Galileo = Safer Skies



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Europe's two satellite navigation systems could combine in the future for heightened performance, an airborne test has confirmed. A helicopter flight took place above an alpine valley in Germany, the one place on Earth where Galileo services are already routinely available.

Results of the flight test, conducted in September 2012, show that adding Galileo signals to the European Geostationary Navigation Overlay Service (EGNOS) should boost its accuracy significantly. EGNOS, which augments the accuracy and reliability of GPS signals over Europe, renders satnav usable for safety-critical applications such as aircraft guidance, as well as more general precision uses.



The test receiver. The helicopter flew a variety of maneuvers, from fast loops to mid-air hovering, to see how satnav signals were received in practice.

Operational horizontal and vertical distance "protection levels" for safety were cut by half by combining use of GPS and Galileo within EGNOS. In addition, new integrity algorithms installed within the user receiver turned out to reliably detect and exclude reflected or otherwise faulty signals.



The Galileo Test and Development Environment – GATE – is a giant outdoor laboratory where prototype Galileo receivers can be used freely without any modifications.

The first test of real Galileo navigation fixes is scheduled for later this year from the four satellites already in orbit, with more satellites set to join them by the end of the year.

As the constellation takes shape, satnav researchers and industrial developers can already try out Galileo services with prototype receivers at the German Galileo Test and Development Environment, or GATE, a giant outdoor laboratory. GATE, in and around the town of Berchtesgaden in the Bavarian Alps, is Europe's go-to place for Galileo testing: transmitters atop eight neighbouring mountains cover 65 square kilometers of territory with simulated Galileo signals.

ESA's Global Navigation Satellite System Evolution program carried out helicopter-based testing here on September 24–26. The results will help to guide the development of next-generation satnav systems.

The helicopter flew a variety of maneuvers, from fast loops to mid-air hovering, to see how satnav signals were received in practice. The test relied on ESA's SPEED platform — Support Platform for EGNOS Evolutions & Demonstrations, co-funded by French space agency CNES and operated by Thales Alenia Space France — which enabled the receiver to receive simultaneous realtime augmentation for both GPS and Galileo.

Europe's next-generation EGNOS, planned for around 2020, is envisaged to operate in the same way, with augmentation of both constellations and dual-frequencies at the same time making the system much more robust.



A helicopter flies over the Galileo Test and Development Environment – GATE – in Berchtesgaden, Germany, gathering data on how EGNOS and Galileo will work together. The promising results from the testing are now being analyzed.