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EUROCOPTER AND FUNKWERK PERFORM GALILEO TEST FLIGHT

Eurocopter and Funkwerk Avionics have successfully completed a helicopter test flight with an EC145 in the Galileo test bed GATE in Berchtesgaden, Southern Germany. The test flight was observed by IFEN GmbH, the operator of the GATE test bed. The test marked the first time that signals from the future European satellite navigation system Galileo were used for navigation in a helicopter. In the "Galileo Test and Development Environment" (GATE), transmission antennas on six mountain peaks simulate the Galileo signals. In recent months, these so-called "pseudolites" had been upgraded to the current Galileo signal definition.

The test flight was one of three demonstration campaigns as part of the European research project MAGES. MAGES stands for Mature Applications of Galileo for Emergency Services and is a project funded by the Galileo Supervisory Authority (GSA), which aims to demonstrate the benefits of EGNOS and Galileo for emergency services.

For helicopter air rescue services Galileo could one day lead to a paradigm shift, as there would then be an additional satellite navigation system, independent of (although compatible with) the American Navstar GPS available, which would also, as part of the Safety Of Life Service, provide information on the reliability of the signal. This could, in combination with highly reliable terrain data and obstacle detection system as well as up-to-the-minute traffic data allow for the development of new flight procedures, which would permit rescue helicopters to achieve field landings nearby the accident site, even in bad weather conditions. At present, such landings at not previously identified sites are only possible under visual meteorological conditions.

During the test flight in Berchtesgaden the test pilot in the cockpit of the EC145 experimental helicopter used a synthetic vision system developed by Eurocopter, on which the terrain below and around the helicopter is shown in perspective. The positioning of the synthetic terrain displayed is based on the data from the Galileo satellite navigation system. As an additional navigational aid, the pilot was also provided with a special "tunnel-in-the-sky" symbology for the planned flight path, which led him safely through the mountainous terrain to its landing site.

As part of the test flight an "integrity alarm", on which one of the simulated Galileo satellites was marked as having failed, was also demonstrated. In future, this "integrity information" would make it possible for a suitable navigation system to warn the pilot that continuing the flight may be unsafe if the navigation provided by Galileo can no longer be guaranteed to be reliable.

During the test flight it was also possible to demonstrate other innovative solutions to existing problems. For example, the helicopter crew was able to fly straight to an "injured" fireman and "rescue" him thanks to a transponder, powered with rechargeable batteries, which allowed his position to be displayed on the navigation system's screen in the helicopter. The system demonstrated is based on transponder technology developed by Funkwerk Avionics.

The ADS-B transponder used by the system determines its current position via GPS and transmits this information continuously ("ADS-B out"). The receiver located on board the helicopter receives these signals ("ADS-B in") and sends them to the helicopter's navigation system, where the position is displayed on the basis of the data received.

In the next stage of this process, these signals could then also be transmitted to a ground station, but this was not demonstrated during this flight. The great advantage of this system is that it operates without the need for any ground infrastructure, such as a GSM network, as such infrastructure is not available everywhere, on the one hand (for example, when fighting forest fires in remote locations), or may be destroyed by the event itself. The ADS-B system was originally developed for use in air space surveillance, but has also proven its worth in various applications such as for monitoring ground vehicle movements (for example, at airports).