Ekinox Test Results

TEST CONDITIONS

TESTED PRODUCT
Ekinox-N Inertial Navigation System with embedded GNSS receiver.

TESTED PERFORMANCE
Real-time and Post-processed Roll, Pitch, and Altitude

PLACE
Magdeburg, Germany

CONDITIONS
Survey-type flight under mixed weather conditions with some turbulence.

A higher grade inertial device is used as reference unit. This FOG-based AHRS integrates very high accuracy gyroscopes (0.005°/√h), so the Ekinox roll and pitch, real-time, and post-processed data can be compared to the reference unit’s real time data. Inertial Explorer® software was used for Ekinox data post-processing.

As the reference does not provide navigation information, no position data was available for comparison. The GPS antenna of the aircraft was connected to the Ekinox through a splitter.

MOUNTING
For precise comparison, the Ekinox was installed on the same stabilized mount as the reference inertial device. As the Ekinox was not in a strapdown configuration (the GPS antenna lever arm was changing over time), performance had been slightly decreased.

FULL REPORT: Send an email to sales@sbg-systems.com to receive the complete version of this test.

Special thanks to SOMAG AG Jena and GeoFly GmbH for their cooperation and for making these tests possible.
The flight pattern is typical of survey applications, with parallel straight lines of about 8.5km. Altitude was 600 m and cruise speed was about 200 km/h.

On the flight at 600 m altitude, we observe some spikes on GPS raw data (in red). This is common with GPS systems when the reception is not perfect. These inaccuracies are compensated by the Ekinox which shows the actual flight path of the plane. Indeed, once the GPS gets back to its full accuracy, we see that the enhanced altitude of the Ekinox is in line with GPS. When a lower grade INS would have drifted, the Ekinox fills the gap while GPS is not fully available.

Real time accuracy remains below 0.05° RMS for roll and pitch, according to Ekinox specifications. The post-processed output has a lower RMS error and a better stability over the whole flight. This technique allows a better estimation and compensation of sensors internal errors, hence a better behavior.

Only one GPS antenna was used in this test with Ekinox-N model. Nevertheless, heading reaches an estimated accuracy of 0.06° in post-processing. The Ekinox-D model provides a more accurate heading thanks to its integrated dual antenna GNSS receiver.