ESOC Station Network Status and Progress

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Abstract

ESA/ESOC continues to maintain and improve a worldwide network of GNSS stations. This poster will cover the changes and the upcoming upgrades. The ESOC station network has completed the upgrade to full GNSS receivers and antennas over the last year, providing 15-min, hourly, and daily Rinex 2.11 and Rinex 3, as well as NBS (Nav Riv) to Eunetnet to support LEO satellite occultation processing. In an effort to continue to be a reliable provider of GNSS data for all the constellations. In addition, ESA/ESOC has advanced negotiations with several third parties in order to enhance its global coverage in the coming year.

ESOC Station Network Upgrade 2013-2014

ESOC is committed to provide worldwide data for all GNSS constellations during the year as a result of having completed the upgrade of the equipment at all the current installations over the last year as well as focusing on the establishment of collaborations with third parties in order to install new stations at various new locations. If agreements can be reached with the corresponding organizations.

The following acquisition of a large number of Septentrio PolarRx4 receivers and Septentrio Chokeking MC antennas plus 4 Leica AR52 revA antennas in 2011-2012, the entire ESA GNSS network now operates these Septentrio receiver/antenna combinations, with the exception of MGUE, MAL2, MAS1 and FAATx where the Leica antennas are used. The completion of the upgrades consisted of installing the Leica AR52 antenna at MAL2 in the 1st half of 2013 followed by installation of Septentrio receivers at MAL2, MGUE and REDU in the 2nd half of 2013, complemented by a Septentrio antenna for the latter. Finally, in February 2014 the network was completed with the new station SNTM, which will remain for internal use for the foreseeable future.

The Polar Rx4 Septentrio receivers installed provide all the expected measurements for the GNSS constellations as available: GPS, GLONASS, Galileo, QZSS, BOLD and SBAS. As of mid-2013, ESOC has been contributing with daily, hourly and high rate multi-GNSS Rinex 3 data to the MGEX effort. Also, since the beginning of 2013, ESOC has been providing NBS (Nav Riv) data from this same set of stations to Eunetnet to support LEO satellite occultation processing.

For the 2nd half of 2014 worldwide coverage is planned to be enhanced considerably with negotiations with third parties in Tsukuba (Japan), Awaras (New Zealand), Doha (UAE) and Banding (Malaysia) in an advanced stage. The maps below show the current global data coverage for all the GNSS constellations.

New ESA/ESOC station Santa Maria - SNTM

The Santa Maria S-band station, also known as Montes de Flower “Hill of Flowers”, is located 5 km from the town of Vila do Porto on the Portuguese island of Santa Maria. Following the general strategy of complementing each ESA/ESOC station with the installation of a multi-GNSS Septentrio PolarRx4 receiver and Septentrio Chokeking MC antenna in the antenna room, starting early 2014, the station SNTM was fully operational on Feb 1st 2014, pending only the installation of a lightning rod and an upgrade of the communication lines. In order to allow for a data throughput containing all the GNSS constellations, the network was completed.

The monument was installed near – but superior in height to – the main station building to reduce cable length and optimize the open sky view in all directions around the antenna.

Conclusions

ESA/ESOC is fully engaged in supporting the modernization of GNSS data formats and data transfers through our involvement in the MGEX Working Group and the IGS Infrastructure Group. Further, ESOC remains involved in providing the Rinex 3 data format to and from the new Multi-Signal Message RTCM receiver code. In mind of the upgraded GNSS constellations, we look forward to provide the upgraded data formats as part of the MGEX and the Real-Time pilot project.

The ESA/ESOC Navigation Support Office is also committed to providing the highest quality GNSS data by maintaining, improving and expanding the existing station network with modern Septentrio receivers and antennas, providing measurements for all GNSS constellations.