

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)  
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DEVELOPING THE FUTURE GALILEO SPACE SEGMENT

**Abstract**

Galileo is a constellation of satellites currently being deployed in Medium Earth Orbit, with 12 satellites launched so far. Further launches are planned throughout the next years, so that the initial constellation (FOC) will be completed by 2020. However at this time, the first satellites will already be close to the end of their design lifetime and need replacement. To prepare the industrial production of these replenishment satellites and to introduce new and improved services for the future the European Space Agency (ESA), on behalf of the European Commission, initiated the industrial definition phase to define the satellite design of Galileo 2nd Generation, the future constellation.

Now, two years later, the definition study is complete and two consolidated satellite designs have been produced. In collaboration with ESA, new features have been implemented in order to investigate the impact on the space segment of several improvements to the Galileo System also being investigated for the future. These new features include:

- higher payload navigation signal power to further improve the access and take up of the Open Service
- new advanced payload services
- the use of electric propulsion in order to maintain stable or even reduced launch costs
- the implementation of an Intersatellite Link (ISL) to perform ranging and communication between the satellites, enabling a reduction of the worldwide and complex Galileo ground network, as well as reducing the reliance on leased communications infrastructure

The two satellite designs are compliant to two possible future system design points, one maximising the number of satellites on the launch vehicle and the other with the maximum level of new advanced features.

The results of this definition study are being used directly by ESA and the European Commission to finalise the mission and system requirements for the future of Galileo. In fact, an extension phase is being planned throughout 2016 in order to support the Galileo System PDR.

Parallel to the above activities, support is also being provided for the next immediate stages of the Galileo space segment procurements.

In addition, in other activities, a regional segment for Galileo is being investigated in order to provide further improved services specifically for Europe. Such a satellite could operate from an Inclined Geostationary Orbit (IGSO).