

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Space-Based Navigation Systems and Services (3)

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GALILEO FOC – DESIGN, ON-ORBIT OPERATIONS & PERFORMANCE

Abstract

The European Commission has tasked OHB System with the design, production, and verification of the Galileo FOC ("Full Operational Capability") satellites. The Galileo project is a programme of and funded by the European Union with the goal to develop and deploy an independent European satellite navigation system. The European Space Agency serves as the procurement agency on behalf of the European Commission. Project kick-off for Galileo FOC space segment contract was in January 2010 for Work Order 1 (14 satellites) and January 2012 for Work Order 2 (8 satellites).

This paper will outline the design and production approach of the FOC satellites; it also focuses on the operations and on-orbit performance following the first launch on Soyuz on August 22nd 2014.

- The design is based on a high degree of modularity, allowing high levels of parallelization of activities in early stages of assembly. The manufacturing, assembly, integration, and testing approach is based on a production island philosophy, which allows for a production cadence of one satellite every six weeks through series production.
- During the launch of the first two FOC satellites, a failure during the upper stage's injection burn led to an erroneous circularization, resulting in a highly elliptical rather than circular deployment orbit. ESA tasked OHB to aid in developing concepts that still allow for mission success despite this injection error. These concepts will be outlined. The paper will also report on the execution of the different mitigation activities.
- Despite the erroneous orbit, the satellites are fully operational and in perfect health. Further launches with pairs of satellites aboard Soyuz are planned for March and September 2015. The initial payload results show good agreement with the test results obtained during the verification on-ground in thermal vacuum. Selected payload performance results from the in-orbit test campaign are presented.

Note: The views expressed in this paper can in no way be taken to reflect the official opinion of the European Union and/or ESA.