

SPACE COMMUNICATIONS AND NAVIGATION SYMPOSIUM (B2)
Mobile Communications and Satellite Navigation Systems (3)

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ESA IRIS PROGRAMME: SATELLITE COMMUNICATIONS FOR THE EUROPEAN AIR TRAFFIC
MANAGEMENT SYSTEM

Abstract

The future European Air Traffic Management (ATM) System is currently being defined by the Single European Sky ATM Research (SESAR) programme. Iris is the ESA programme to develop a new Air-Ground communication system for ATM as the satellite-based communication solution for the SESAR programme. Iris is funded by the ESA Member States as Element 10 of the ARTES Programme, and is managed by ESA in close liaison with the SESAR Joint Undertaking. It is designing a new system for safety communications to be operational in Europe by 2020. This system will allow aviation to use low-cost satcom services and guarantee seamless transition between high-density continental airspace and remote and oceanic areas.

The Iris Programme Phase 1, initiated in 2007, has been recently completed: it included four industrial Phase A studies and complementary activities to assess feasibility. The ICOS and Phoenix studies determined which features of the communication protocols are required for a new communication standard suitable for continental airspace. The AVISAT and Samara studies proposed options for a satellite system architecture providing the service in European airspace and neighbouring oceanic areas.

The Programme Phase 2 has been approved at the ESA Council of Ministers in November 2008. It revolves around the design and development of the new satellite communication standard, its associated user terminals, the ground segment, and the end-to-end satellite system design. Adaptation of existing systems is also considered, while satellite operators and service providers undertake complementary studies of operations and service provision. The Iris Programme itself can be regarded as a specific project within the Work Package 15 (Communication Navigation Surveillance) of the SESAR Development Phase.

So far Iris Phase 1 feasibility studies allowed ESA to define the process by which, from the user requirements defined by aviation, one can deduce the requirements for the user terminals, the characteristics required of the communication protocols, the link budget and, consequently, determine the requirements for the space segment and the ground segment. Depending on the interpretation of user requirements, a range of design options has been proposed for the communication protocols and air interface, with the aim to submit it to the International Civil Aviation Organisation for standardisation. Several options have been considered for the satellite system architecture. The present paper provides results of these studies completed in February 2009, focusing on the design of the communication standard.