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THE IXV GROUND SEGMENT – ARCHITECTURAL AND OPERATIONAL DEVELOPMENT

Abstract

The Intermediate eXperimental Vehicle (IXV) is a re-entry demonstrator aimed to perform in-flight experimentation with atmospheric re-entry. The project objectives are the design, development, manufacturing and on-ground and in-flight verification of an autonomous European lifting and aerodynamically controlled re-entry system.

The key elements of the IXV mission are: the use of Vega as launcher, a lift-off from Kourou (French Guyana), a quasi-Equatorial trajectory followed by a re-entry and splash-down in the Pacific Ocean. The IXV main flight phases are essentially four: Ballistic Phase, Re-entry Phase, Descent Phase and Splash down.

ALTEC role in the program is the development and management of the IXV Ground Segment that will provide all required capabilities for the IXV mission support. The IXV Ground Segment is composed by the following major elements: the IXV Mission Control Center (hosted at ALTEC premises), the IXV Ground Stations Network (including two transportable antennas, one of which is embarked on recovery ship) and the IXV Communication Network.

The Mission Control Center (MCC) provides infrastructure, systems, tools and applications to be used during the IXV mission for Telemetry (TM) monitoring, storage, processing, displaying as well as detailed trajectory prediction and coordination of the Ground Stations operations. The Ground Stations Network grant the IXV space to ground communications, i.e. tracking the Spacecraft, receive and locally record TM and send selected data, in real-time, to the Mission Control Center. The Communication Network provides the necessary infrastructure to allow reliable communications between the IXV Mission Control Centre and the IXV Ground Stations, the AIT site (hosted in Turin - IT) and the launch site (located at VEGA launch premises, in Kourou, Guyana Space Center CSG)

The purpose of this paper is to detail the IXV Ground Segment architecture and to present the most updated status of its design, development and implementation.

The paper was not submitted to previous meetings. The presence of the authors at the IAC in Naples to present the paper is assured.