

Framework for the ESA Alphasat Programme

The primary objective of ESA under the Alphasat Programme is to facilitate an early first flight, and in-orbit validation of the Alphabus platform, currently under development with European industry. Following an extensive evaluation process, ESA has selected Inmarsat Global Ltd geomobile mission for this first flight opportunity.

Both ESA and Inmarsat will bring substantial funding to accomplish the mission.

In addition to the operational payload, ESA is also providing four Technology Demonstration Payloads (TDPs) for embarkation on Alphasat. These will constitute approximately 15% of the total payload mass. The contract with Inmarsat Global was signed in November 2007. The Alphasat launch is scheduled in 2012 with Ariane 5.

Inmarsat "Geomobile" Mission

Following the successful implementation of the Inmarsat IV satellite series, Inmarsat is currently deploying the new BGAN (Broadband Global Area Network) family of services which provides a wide range of high data rate applications to mobile user terminals for aeronautical, land and maritime markets.

With the Alphasat mission Inmarsat will extend the capabilities of this geomobile satellite infrastructure, both in terms of performances and capacity, resulting in an enhancement in the current services and additional capacity for new services.

The Alphasat mission definition is based around two main service types

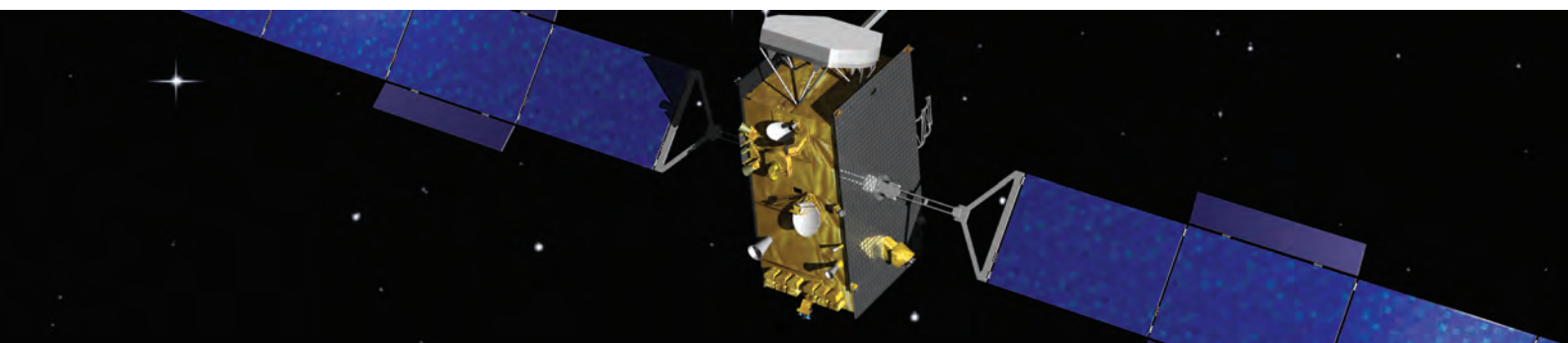
BGAN directional (as currently provided by Inmarsat IV)

BGAN Omni-directional (including handheld services)

Alphasat will be capable of accessing the additional 2x7 MHz of L-band spectrum allocated at the WRC-03, which were not available to the Inmarsat IV satellites, when originally specified. It will be positioned at 25 degrees East, covering Europe, Middle East, Africa and parts of Asia.

Implementation of this geomobile application necessitates the adaptation of the nominal Alphabus platform design to allow a 90 degree rotation of the satellite flight orientation to accommodate the large antenna configuration.

Both these adaptations are offered as options in the future Alphabus portfolio, demonstrating the flexibility of this platform.



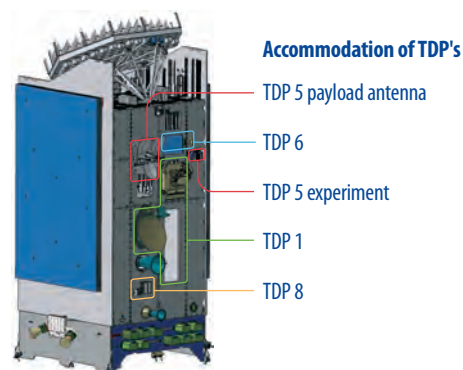
Key Features

- Alphasat Service Module in geomobile configuration, compatible with Ariane 5 and Proton 4 m fairing
- Repeater Module split in 2 halves, for ease of payload accommodation
- Implementation of payload integrated processors providing payload flexibility through coverage and power reconfiguration capabilities
- 11 m diameter deployable reflector
- **Total launch mass:** more than 6 tons
- **Total electrical power:** 12 kW

Technology Demonstration Payloads

Following several technology studies and preliminary accommodation activities four TDPs have been selected for flight on the Alphasat; these comprise:

- An advanced laser communication terminal to demonstrate GEO to LEO communication links at 1064 nm (TDP 1)
- A Q/V -Band communications experiment to assess the feasibility of these bands for future commercial applications (TDP 5)
- An advanced star tracker with active pixel sensor (TDP 6)
- An environment effects facility to monitor the GEO radiation environment and its effects on electronic components and sensors (TDP 8)



User Segment and Applications

In the frame of the Alphasat programme, ESA also supports in partnership with Inmarsat and Industry the development of the user segment associated with the advanced mobile payload embarked on-board the Alphasat satellite. The user segment and application programme is aimed at developing new services with enhanced performances and will allow for the provision of value added applications to mobile institutional and public users on a pan-European scale.

Benefits of the Alphasat & Alphasat programmes

- In orbit-validation of the Alphasat product line, on a commercial mission
- Completion of the environmental qualification testing of the Alphasat product line
- Opportunity for demonstration of new European technologies