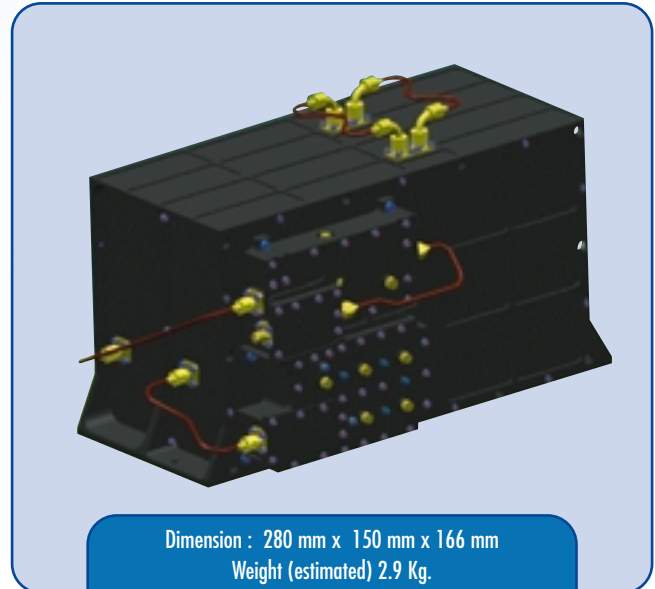


Dual Mode TT&C Transponder

This unit performs the following functions both in standard and spread spectrum mode:

- Up-link telecommand demodulation
- Down-link telemetry transmission
- Coherent frequency turn-around
- Ranging turn-around function



Dimension : 280 mm x 150 mm x 166 mm
Weight (estimated) 2.9 Kg.

The selection of the mode is performed via command.
The standard mode is used in LEOP operation or in emergency mode .
The spread spectrum mode is used during nominal mission phase (routine operation)



Main Features:

- On-board PN code flexibility (with selection of different codes via command)
- On-board Frequency flexibility (with selection of different S-band RX/TX channels via command)
- Convolutional encoding on down-link data stream
- Telemetry Subcarrier modulation with down-link data stream in STD mode
- Ranging in Standard mode: according ESA standard and compatible 100 KHz tone ranging system
- Internal TCXO or external USO capability (selectable via command)
- 5 Watt TX Power
- Internal Diplexer

Development History:

After preliminary Galileo system study with definition of strong requirements at transponder level, ESA recognized the importance to include the Dual Mode TT&C Transponder in the Galileo predevelopment program, with the objective of achieving demonstration of feasibility of critical technologies before to start the Phase-C.

The transponder predevelopment will concentrate on the design of a flexible, modular and reconfigurable unit with optimized mass and power consumption.

The developing was started in 2001 with

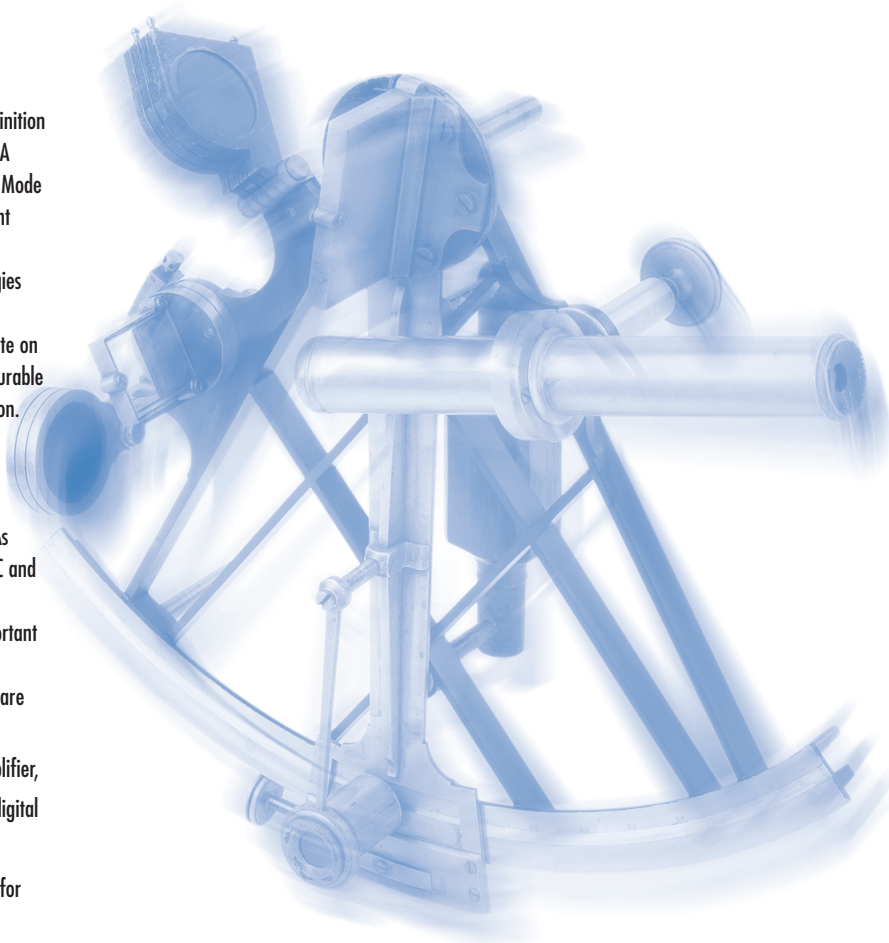
Alcatel Espacio.

The state of art technology has been selected assuming for the RF side the application of GaAs MMIC and for the digital section the use of ASIC and advanced Digital Signal Processing.

The PDR was successfully passed and next important milestone is the BDR.

Several companies, apart from Alcatel Espacio, are involved in this activity. Among them we have:

- **MIER**, responsible for the High Power Amplifier,
- **Universidad de Cataluña**, responsible for digital algorithms.
- **Alcatel Space Industry (ASPI)**, responsible for system aspects



Coming soon:

June-03:
BDR:

Mid 2004:
delivery of the EM

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