

STATUS OF THE ENVISAT MISSION

CGMS is informed of the status of the European Space Agency
ENVISAT mission

STATUS OF THE ENVISAT MISSION

1.- INTRODUCTION

The continuity of the ERS (ESA Remote- sensing Satellites), launched successively in 1991 and 1995, will be taken over by ENVISAT, being the most sophisticated and complex polar orbiter ever planned by ESA.

2.- MISSION OBJECTIVES

The main objective of the ENVISAT mission is to contribute to the monitoring of the Earth's environment including its atmosphere and the oceans. This means: provide observations for coastal zones, sea and Earth processes, improve oceanographic observations, contribute to the understanding and monitoring of atmospheric chemistry and obtain data about the climate system.

Emphasis is being put on the continuation and extension of the services provided by the ERS series. The mission nominal duration is of 5 years, including six months of commissioning.

The global mission includes operation of all instrument modes whenever observation conditions permit, with on-board data recording and dump once per orbit. The regional mission implies either real time data acquisition or on-board recording and deferred dump.

3.- THE SATELLITE AND ITS PAYLOAD

ENVISAT (dimensions: 26 m x 10 m x 5 m) will fly at 800 km nominal altitude in a polar helio-synchronous polar orbit with a 35 day cycle repeat. The descending node crossing time will be 10 am mean local solar time. With a mass of 8 Tm, it will be launched by Ariane V in a single launch from Kourou (French Guyane).

The instruments on board ENVISAT are either ERS improved:

- **ASAR** Advanced Synthetic Aperture Radar (C-Band SAR),
- **RA2** Advanced Altimeter (a dual frequency nadir-pointing pulsed Radar),
- **LRR** Laser Retro Reflector (passive optical Reflector) supporting the RA2,
- **MWR** Advanced Microwave Radiometer (two-channel nadir view radiometer) supporting the RA2, and
- **AATSR** a replica of the Along Track Scanning Radiometer flown on ERS,

or completely innovative:

- **MIPAS** Michelson Interferometer for Passive Atmospheric Sounding (Limb viewing IR interferometer)
- **GOMOS** Global Ozone Monitoring through Occultation of Stars (UV and optical spectrometer),
- **MERIS** Medium Resolution Imaging Spectrometer (visible and near IR 15 channels spectrometer),
- **DORIS** Doppler Orbitography and Radio positioning Integrated by Satellite (RF orbitography),
- **SCHIAMACHY** Scanning Imaging Absorption spectrometer for Atmospheric Cartography (multi-channel nadir and limb view UV/VIS/IR spectrometer).

AATSR, DORIS and SCHIAMACHY are provided by European partners, as ENVISAT Announcement of Opportunity experiments.

The on board storage is carried by a combination of tape recorders and solid state recorders. They allow recording of the instruments operated around the orbit (global mission) as well as recording of ASAR high rate data and MERIS full resolution mode (300 m), as needed (regional mission). The payload data will be recovered either by direct X-band links to stations or relayed via the European Data Relay Satellite ARTEMIS.

4.- GROUND SEGMENT FACILITIES

The ENVISAT ground segment will consist of :

- A Flight operations control center **FOCC** in ESOC (Darmstadt, Germany),
- A Payload Data Segment **PDS** composed of:
 - ◆ a payload data control center at ESRIN (Italy),
 - ◆ the main payload data handling stations **PDHS** in Kiruna (Sweden), ESRIN (Frascati, Italy, including DRS data reception)
 - ◆ payload data acquisition station at Fucino (Italy) with data processing at ESRIN
- The low rate reference archive center **LRRA** in Kiruna and
- Processing and Archiving centers (**PAC**) in France, Italy, United Kingdom, Germany, Spain and Sweden for:
 - ◆ Archiving of ASAR and MERIS High Rate data acquired by the ESA stations
 - ◆ Production of ASAR and MERIS High rate regional off-line products
 - ◆ Production and archiving of geophysical products derived from the global mission instruments
 - ◆ Archiving of Near Real Time NRT products.

The services offered by the PDS will include on-line access to catalogue, browse and ordering services. The ESA products available will range from raw reformatted data to geophysical products and images (from browse to high resolution).

The regional mission products are associated to the ASAR image modes and MERIS full resolution mode. The data will be acquired in direct visibility or in deferred time using the on board recording capabilities. ESA will offer Near Real Time NRT services (within 3 hours of sensing) at PDHS and off-line services at PACs. National and Foreign stations may also offer NRT services.

The global mission products are associated to the low rate data instruments, recorded on-board and acquired at PDHS stations. The NRT services will be provided by the PDHS, and off-line services by the PACs.

5.- PROGRAM STATUS

The ENVISAT program, which was approved end 1993, is well advanced.

The ENVISAT Satellite Engineering Model EM program was completed in mid April 1999, with all objectives met.

The ENVISAT Flight Model FM (satellite platform and instruments) is integrated at ESTEC (Noordwijk, The Netherlands), where it will remain for final satellite environmental and integrated system tests until its transport to Kourou (French Guyanne) for its launch campaign. The Thermal Balance/Thermal Vacuum (TB/TV) tests of the satellite have been completed over the summer 1999. Some retrofits are being performed on the payload to integrate final and complete FM versions of the instruments.

The ENVISAT satellite Qualification Review was performed from mid May to end June 1999. The Review Board concluded that the review objectives have been met, and that, the status of the Program was sound.

The Payload Data Segment PDS integration has progressed well: the Payload data handling stations acceptance testing is taking place at the ESRIN station in Frascati (I) and deployment is on-going at Kiruna Salmijarvi (S).

The Flight Operations Segment Implementation Review has been successfully concluded.

The organization of the post launch Cal/val activities is in progress.

The current launch target date is November 2000.

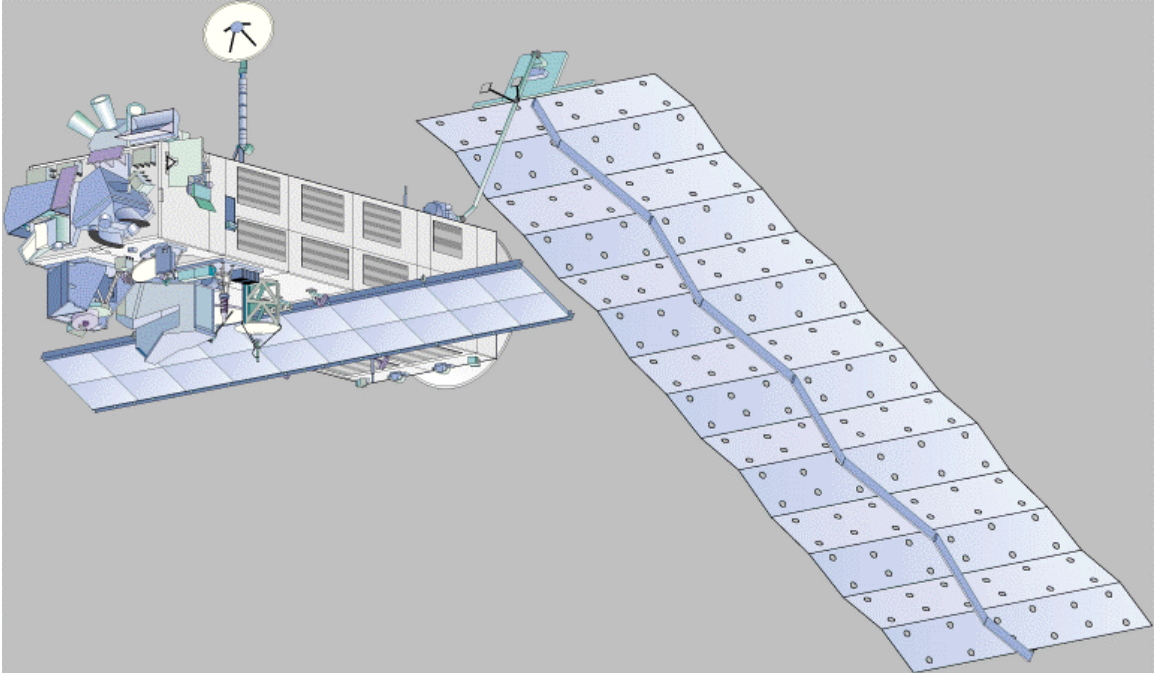
6.- REFERENCES

Further information about the ENVISAT mission can be found on the following WWW address which offers the possibility to download many supporting relevant documentation:

<http://envisat.estec.esa.nl/>

FIGURES

ENVISAT artist view



ENVISAT structural model under test at ESTEC facilities

