MUGS – MARSIS UTILISATION GROUND SEGMENT

Mars Express is the first flexible mission of the revised long-term ESA Science Programme Horizons 2000. The mission is dedicated to the orbital and in-situ study of the interior, subsurface, surface and atmosphere of the planet. MARSIS is one of the seven instruments aboard ESA’s Mars Express mission. MARSIS is a low-frequency nadir looking, pulse limited radar sounder and altimeter with ground penetration capabilities, which uses synthetic aperture techniques and a secondary receiving antenna to isolate subsurface reflections. MARSIS Primary Science Objective is to map the distribution of HI50 (solid and/or liquid) in the upper porion of the crust of Mars. Secondary objectives are: sub-surface geology profiling, surface characterization, atmosphere sounding. The MARSIS instrument can operate as Subsurface Sounder at an altitude below 200km and as a Ionosphere sounder at an altitude below 200km. The MARSIS Utilisation Ground Segment designates the set of facilities that supports the Principal Investigator (PI) experiment teams.

- Providing PI inputs (instrument timelines) to the Master Science Plan (MSP) and creating a consolidated MSP from ESA’s Science Operations Center
- Planning and generating Payload Operations Requests (PORs), and forwarding them to Payload Operations Support
- Requesting and receiving instrument and S/C raw telemetry and S/C auxiliary data from ESA/ESOC Mission Operations Centre
- Processing housekeeping telemetry in order to assess the status and health of the instrument
- Processing science data to generate different levels of data products
- Managing data archiving in coordination with ASI’s ASDC

**MARSIS Utilisation GS architecture**

**MARSIS Utilisation GS NW/SW Configuration**

**PIEWS**

- **SW**
  - W3 IBM INTELLIGENT Z-PRO XEON (2)
  - S/Server IBM - X SERIES X345 (2)
  - Planner (4)
  - Router
  - LAN Switch
- **HW**
  - Linux Red Hat 9.
  - Linux Red Hat 9.
  - Oracle 11
  - S钦. 3 Enterprise
  - Windows XP
  - Office XP
  - Java Zone

**Application SW Tools**

- **Simulation**
  - Linux timeline sequence of MARSIS operative modes to be simulated
- **Commanding**
  - permits to accomplish all MARSIS commanding needs
  - performs data retrieval and verifies instrument health status
  - De-formatting & Level 1b
  - performs level 1b data processing and generates L1b data products in EPS labelled format
  - Level 2
  - performs level 2 data processing and generates L2 data products in EPS labelled format
- **Quick Look**
  - verifies instrument performances
- **Geographic Visualisation**
  - performs visualisation of geographic data, Mars surface attributes, target topography, ground tracks analysis, level 2 data display
- **Archive Management**
  - performs search and visualisation of Local Archive Server files, files exporting in human readable format, copy file in a local environment, archive structure management