The On-board Data Handling System of Lunarsat

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This paper describes the design of the LunarSat On Board Data Handling (OBDH) System. The aim of the OBDH system is to:

- Maneuver the LunarSat spacecraft autonomously into an elliptical lunar orbit with its perigee above the south pole region
- Gather, format and downlink all the telemetry
- Monitor housekeeping data
- Receive, decode, and distribute commands
- Provide attitude and time information to the payloads

The heart of the OBDH system is the Data Control Unit (DCU) which inhabits all vital hardware. For telemetry and telecommand functions LunarSat will use ESA's TM/TC chipset. This hardware solution enables the DCU to execute commands and to collect and transmit spacecraft information without having to depend on the On Board Computer (OBC), thus increasing the reliability of the system.

The core of the OBC will be the new ERC32 one-chip-processor. No mass memory is required since each payload has its own. The operating system and all its application software will be stored in EEPROM which can be reprogrammed by the ERC32. Any relevant data will be stored in SRAM chips. Analog and digital signals are sampled by the Analog Data Acquisition Unit (ADAU).