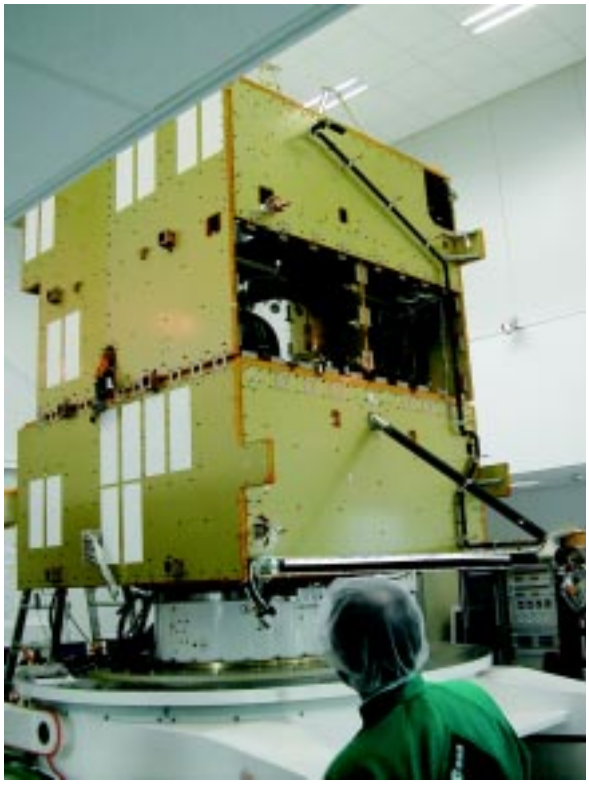
Finnish industries deliver the main structure

The Finnish company, Patria Finavicomp Oy, supplies the main structure of the satellite. The company is responsible for the structural design, manufacture, assembly, integration and static testing. The order was an important milestone for the Finnish company, as it was the first time the company was responsible for the design and manufacture of the whole structure of a spacecraft.



The engineering model placed in ESOC. One can catch a glimpse of the central tube, and the structure at right is the hold for the main antenna.
Photo: Nordic Space Activities

The structure consists of two main modules. Bus Support Module (BSM) is the main load carrying the structure of the spacecraft carrying for example the propellant tank, solar arrays and the high gain antenna. The spacecraft is attached to the Ariane 5 launcher vehicle via LVA ring at the bottom of the BSM Central Tube. The central tube is 1.2 metres in diameter and is 2.5 m high and contains among others the two propellant tanks that contain 1600 kg of propellant, as well as the surface science module to be sent to the comet, i.e. the Lander attached to the Bus Support Module. The Payload Support Module (PSM) containing parts of the equipment and the scientific instruments forms a box like structure around the BSM and is attached to the BSM.

BSM and PSM together form the entire structure sub-system of the spacecraft. The total structure only weighs 200 kg, which makes it a very mass efficient structure for the three tons' spacecraft. The structure is of an aluminium sandwich structure, typically with 0.3-0.5 mm facecheets. The most challenging task in the design is to achieve the tight mass limit with the high g-loads of the launch, especially when taking into account the heavy propellant tanks and the Lander needed for the mission.

The StM (Structural Model), which is also acting as the Flight Spare, was delivered back in June 1999. The tight schedule for the design and manufacturing creates an additional challenge on top of the technical requirements. Patria Finavicomp, however, has a good track record from its numerous previous aircraft and space projects to deliver on time and within the specification. The previous major space delivery from Patria Finavicomp was the huge Telescope Tube structure for ESA's XMM satellite.

Power Distribution Units

Another Member in the Patria Group, Patria Finavictec is responsible for the Power Distribution Units in the spacecraft. The order has included design and manufacturing of two units including thermal control functions.

The two units weigh 22 kg each. The units are going to:

- Distribute main power to all spacecraft instruments and subsystems, including thermal heating to keep the spacecraft functional.
- Protect the main power source by electronic fuses.
- Release power & deploy systems (pyrotechnic, thermal knife)
- Communicate with the Space Telemetry & Telecommand functions.

Patria Finavitec Oy and Patria Finavicomp OY are both part of the Patria Group. Patria operates internationally as a technology group whose core business includes products and services within aviation and space as well as the defence and the telecommunications industries.

