ESA redefines Hermes spaceplane

by Tim Furniss

ESA has agreed to a further re-design of the proposed Hermes spaceplane. Safety concerns over maintaining the mass of the vehicle at re-entry to about 16 tonnes, compared with its maximum 23-tonne launch weight, have prompted the transfer of much of the spaceplane's payload into the Ariane 5 adapter section, which will now remain attached to Hermes throughout its space mission and will then be discarded.

The adapter, called Module de Resources Hermes (MRH), will house the docking adapter for attachment to the Columbus module of the US Freedom International Space Station and the ESA man-tended free-flier (MTFF). It will also include a transfer tunnel leading from the pressurised, enclosed Hermes payload bay, and an independent airlock to allow EVAs when Hermes is attached to either Columbus or the MTFF. There will also be an unpressurised equipment bay in the MRH.

The 15m-long Hermes is designed to carry a 3-tonne payload into a 460km, 28.5° Freedom orbit and to return with just 580 kg payload.

Concern remains over the final design of the proposed three-crew, ejectable launch escape pod, which is adding more weight to the original design. This has been criticised as being not efficient enough to ensure an instantaneous and safe separation in the event of an inflight explosion.

The definitive design also includes more subtle changes—the wings, for example, now begin their upward sweep almost from the nose—and will be formally submitted to ESA in April. By the middle of the year the design will have been ratified, and towards the year’s end all contractors will be chosen, so that a final estimated budget can be established. This could be more than double the latest estimate of around $5 billion, which itself is double the original 1984 estimate.

The first launch of Hermes is scheduled for April 1997 and will be unmanned. It will be followed by the first manned flight in April 1998. Many observers believe, however, that the first launch will not take place until early next century.

The original Hermes spaceplane was to have been a six-crew vehicle, 17m long, weighing 17 tonnes and capable of carrying 5 tonnes to orbit inside an open payload bay. It could fly independent missions lasting 30 days, among its many roles.

NASA has selected four candidate payload mission specialists for the Shuttle/Spacelab International Microgravity Laboratory mission in April 1991. They include ESA astronaut, and Spacelab 1 veteran, Dr Ulf Merbold, NASA’s Dr Roger Crouch, and Canada’s Dr Roberta Bondar and Dr Kenneth Money. Two payload specialists will fly on the mission.

**SPACEFLIGHT**

- Delta II improved
  McDonnell Douglas plans to introduce improved versions of its Delta II satellite launcher starting in 1991. The Delta II 7930 with larger fairing and cryogenic second stage with RL-10 engine could place 5-8 tonnes in geosynchronous transfer orbit (GTO); a widebody Delta with 4m-diameter fairing and RL-10 second stage could place 5-5 tonnes into GTO; a two-stage Delta with two Delta II 7925 first stages, stretched second stage, and Pam D third stage could place 6 tonnes in GTO—8 tonnes if the RL-10 second stage is used.

- Scout goes commercial
  LTV has signed an agreement with NASA enabling the company to market its Scout launch vehicle for commercial launches.

- GD builds Atlas IIs
  General Dynamics says that six of the 18 Atlas commercial launch vehicles it is building will be Atlas II boosters derived from that being built for the US Air Force, which has ordered 11.

The adapter includes a transfer tunnel leading from Hermes to the man-tended free-flier