

Ariane-5 Completes Flawless Third Test Flight

A launch-readiness review conducted on Friday 16 and Monday 19 October had given the go-ahead for the final countdown for a launch just two days later within a 90-minute launch window between 13:00 to 14:30 Kourou time. The launcher's roll-out from the Final Assembly Building to the Launch Zone was therefore scheduled for Tuesday 20 October at 09:30 Kourou time.

On 21 October, Europe reconfirmed its lead in providing space transportation systems for the 21st Century. Ariane-5, on its third qualification flight, left no doubts as to its ability to deliver payloads reliably and accurately to Geostationary Transfer Orbit (GTO). The new heavy-lift launcher lifted off in glorious sunshine from the Guiana Space Centre, Europe's spaceport in Kourou, French Guiana, at 13:37:21 local time (16:37:21 UT).

This third Ariane-5 test flight was intended primarily to qualify Europe's new launcher for satellite injection into GTO, but also carried the Atmospheric Reentry Demonstrator (ARD) capsule, packed with the most advanced equipment to test and qualify new European technologies and flight-control capabilities for atmospheric reentry and landing. Flight 503 was the final qualification flight carried out under ESA responsibility prior to the launcher entering commercial service with Arianespace.

The launch, delayed twice from 13:00 by minor problems, was flawless. The solid-propellant boosters separated as planned at an altitude of about 62 km, 2 min 16 sec into the flight. The fairing was jettisoned after 3 min 6 sec, followed by separation of the cryogenic main stage after 9 min 52 sec at an altitude of 168 km. The Atmospheric Reentry Demonstrator was released approximately 2 min later, at an altitude of 216 km, and 3 min 14 sec thereafter the storable-propellant upper stage began to propel the stage assembly and Maqsat-3, built by Kayser-Threde, Germany, as a representative mock-up of a commercial satellite, towards its injection point. Almost exactly 33 min after lift-off, the upper-stage

engine shut down and Maqsat-3 was successfully injected into GTO. The orbital parameters at that point were:

Perigee: 1027 km, compared with the 1028 ± 3 km predicted

Apogee: 35 863 km, compared with the 35 898 ± 200 km predicted

Inclination: 6.999 deg, compared with the 6.998 ± 0.05 deg predicted.

Speaking in Kourou immediately after the flight, Fredrik Engström, ESA's Director of Launchers and the Ariane-503 Flight Director, confirmed that: *"The third Ariane-5 flight has been a complete success. It qualifies Europe's new heavy-lift launcher and vindicates the technological options chosen by the European Space Agency."*

ESA's Director General, Antonio Rodotà, speaking at the European Press Centre at Evry near Paris, drew the media's attention to the fact that: *"The European Space Agency is already working to meet the challenges of the 21st Century with increasingly powerful and versatile launchers designed to handle the widest possible range of space missions."*

This sentiment was echoed by Alain Bensoussan, Chairman of CNES (to which ESA has delegated prime contractor responsibility for the new launcher), who commented that: *"France is proud to have helped make this ambitious European programme a success. The Ariane programme, consolidating as it does Europe's standing in the world space community, is an outstanding illustration of Europe's capacity to pool its best scientific and industrial teams in pursuit of a common goal."*

With the highly successful release, reentry and subsequent recovery of the automatic Atmospheric Reentry Demonstrator capsule (built for ESA by the French company Aérospatiale), Europe has moved a step closer to flying its own complete space missions. Engineers analysing real-time telemetry data

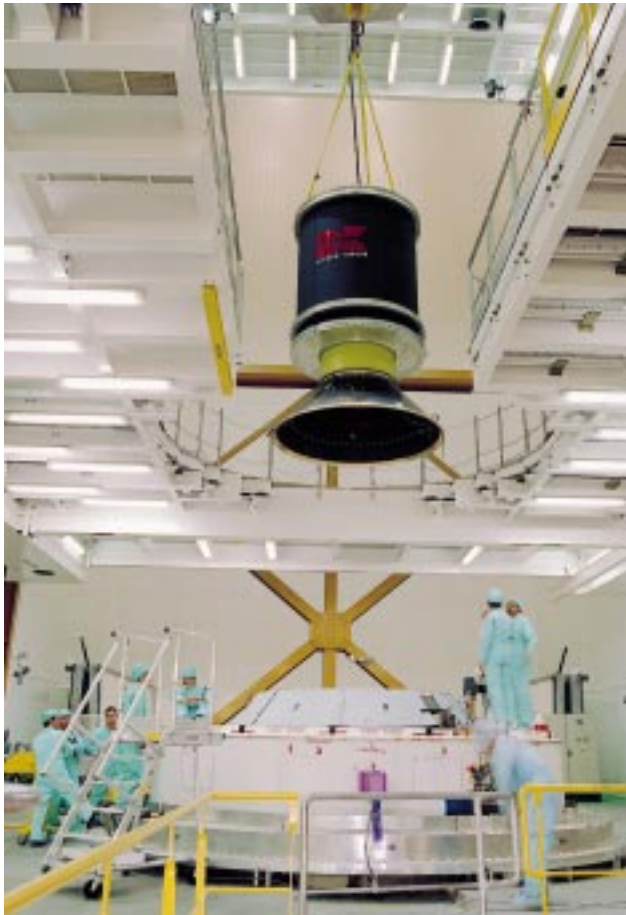
from its suborbital flight reported that all of the capsule's systems had performed well and according to expectations. The ARD's telemetry systems and reception stations all functioned well, with more than 200 critical parameters for analysis of the flight and the behaviour of onboard equipment being recorded and transmitted to ground during the flight. The onboard GPS receiver also worked satisfactorily throughout the flight, except (as was expected) during the black-out period during reentry.

The ARD reached an altitude of 830 km before splashing down within 4.9 km of its target point in the Pacific Ocean between the Marqueses and Hawaii, after 1 hour and 41 minutes. Having been recovered from the ocean just a few hours later, the capsule is now undergoing detailed technical analysis back in Europe. During the reentry, the ARD's heat-shield temperature reached 900°C, but the cone and thermal protection were found to be in perfect condition after retrieval, with the capsule having remained perfectly airtight throughout the mission.

Although not strictly a prototype of a possible future European Crew Transport Vehicle, which could fly to and from the International Space Station, the ARD represents a major step towards providing greater confidence in Europe's capabilities in reentry technologies for use not only in the framework of crew and equipment transport to and from space, but also for future reusable launchers. 



Transfer of the Ariane-503 lower composite from the Launcher Integration Building to the Final Assembly Building on 3 October



Mating of the lower payload, Maqsat-3, with its flight adaptor, in the Final Assembly Building



Mating of the upper payload, the Atmospheric Reentry Demonstrator (ARD), and its flight adaptor, in the Final Assembly Building



Installation of the fairing, in the Final Assembly Building





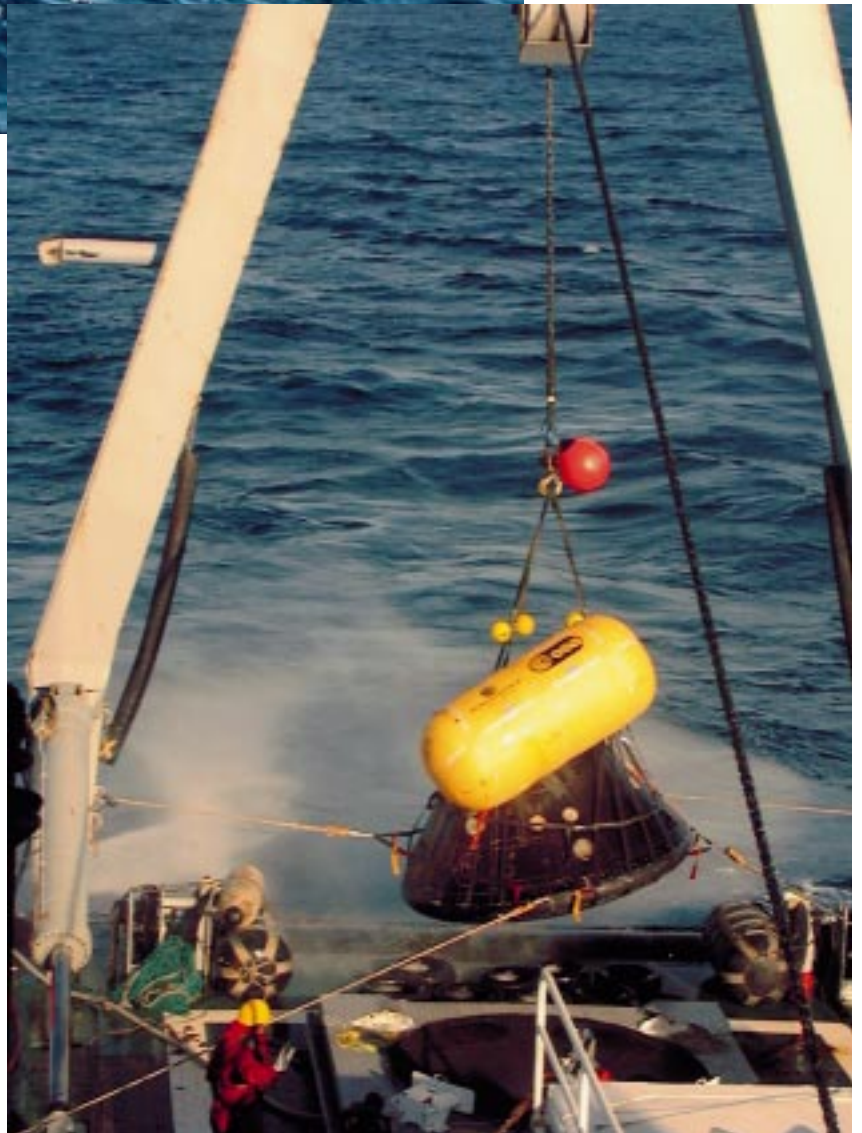
Transfer of the launcher from the Final Assembly Building to the Launch Zone on 20 October

Lift-off of Ariane-503 on 21 October









Recovery of the Atmospheric Reentry Demonstrator (ARD) capsule from the Pacific Ocean