

# ESA Launched Super Rocket

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ESA successfully launched the Ariane 5 rocket from Europe's Space Port in French Guiana with three payloads onboard. The new version of Ariane 5 rocket, with upgraded twin solid boosters, is designed to lift payloads of up to 10 tonnes to geostationary orbit. Today, 3600-kg commercial X-band communication satellite, the SlosSat-FLEVO minisatellite and the Maqsat B2 instrumented model were injected into the predicted transfer orbit.

This success paves the way for the commercial introduction of this "Ariane 5 ECA" version, which is due to replace the current Ariane 5G "Generic" configuration and is designed to maintain the competitiveness of European launch systems on the world launch services market. Starting from the second flight scheduled for mid-year, Ariane 5 ECA will become the new European workhorse for lifting heavy payloads to geostationary orbit and beyond.

Ariane 5 ECA features upgraded twin solid boosters, each loaded with an extra 2.43 tonnes of propellant, increasing their combined thrust on lift-off by a total of 60 tonnes compared to the Generic configuration. The cryogenic main stage has also been upgraded to carry 15 tonnes of additional propellant. It is powered by the new Vulcain 2 engine, derived from Vulcain 1, which provides 20% more thrust. The Ariane 5 ECA introduces the new high-performance "ESC-A" cryogenic upper stage, powered by the same HM-7B engine as on the Ariane 4 third stage.

Ariane 5 ECA has enough lift capacity to take most combinations of commercial satellites to geostationary transfer orbit and will enable

Arianespace to reinstate the systematic dual-launch policy that spelled the success of previous generations of Ariane launchers.

### **Commercial and technology payloads**

On this flight, the Ariane 5 ECA launcher carried three payloads. The first released 26 minutes into flight, was XTAR-EUR, a 3600-kg commercial X-band communication satellite flown on behalf of XTAR LLC. This will subsequently use its onboard propulsion system to achieve circular orbit. The Spanish Ministry of Defense (SMOD) is XTAR's first customer, leasing 238 MHz of X-band capacity on XTAR-EUR until its primary satellite, SPAINSAT, enters service. Weighing four tons at launch, XTAR-EUR is based on SS/L's space-proven 1300 platform and carries twelve wideband and high-power X-band transponders. XTAR-EUR, which has a specified service life of 15 years, maintains station-keeping and orbital stability by using bipropellant propulsion and momentum-bias systems. In all, SS/L satellites have amassed more than 1,100 years of on-orbit service.

The other two satellites onboard, the SlosSat-FLEVO minisatellite and the Maqsat B2 instrumented model, stored inside the Sylde dual launch adapter, were flown on behalf of ESA.

Next released, 31 minutes after lift-off, the SlosSat Facility for Liquid Experimentation and Verification in Orbit is a 129-kg satellite developed for ESA by the Dutch National Aerospace Laboratory (NRL). It will investigate fluid physics in microgravity, to understand how propellant-tank sloshing affects spacecraft control. Its mission is planned to last ten days.

In order to limit the proliferation of space debris, the third passenger Maqsat B2 will remain attached to the launcher's upper stage. This 3500-kg instrumented model was designed to simulate the dynamic behaviour of a commercial satellite inside the Ariane 5 payload fairing.

An autonomous telemetry system transmitted data on the payload environment during all the flight phases, from lift-off to in-orbit injection. Fitted with a set of cameras, Maqsat B2 also provided dramatic onboard views of several key flight phases, including separation of the solid boosters and jettisoning of the Sylva upper-half payload.

“Less than one month after the descent of Huygens on Titan, this launch marks another great achievement for Europe in space and a further demonstration of European skills in this highly demanding technological field” said Jean-Jacques Dordain, Director General of ESA, after the flight. “Today’s success is also just reward for all the people, in industry and at agencies all over Europe, who have been working so hard to bring this launcher back into operational use. Guaranteed access to space is a pre-requisite for our success in all space activities and so it is our duty to maintain this capacity to the full.”

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