

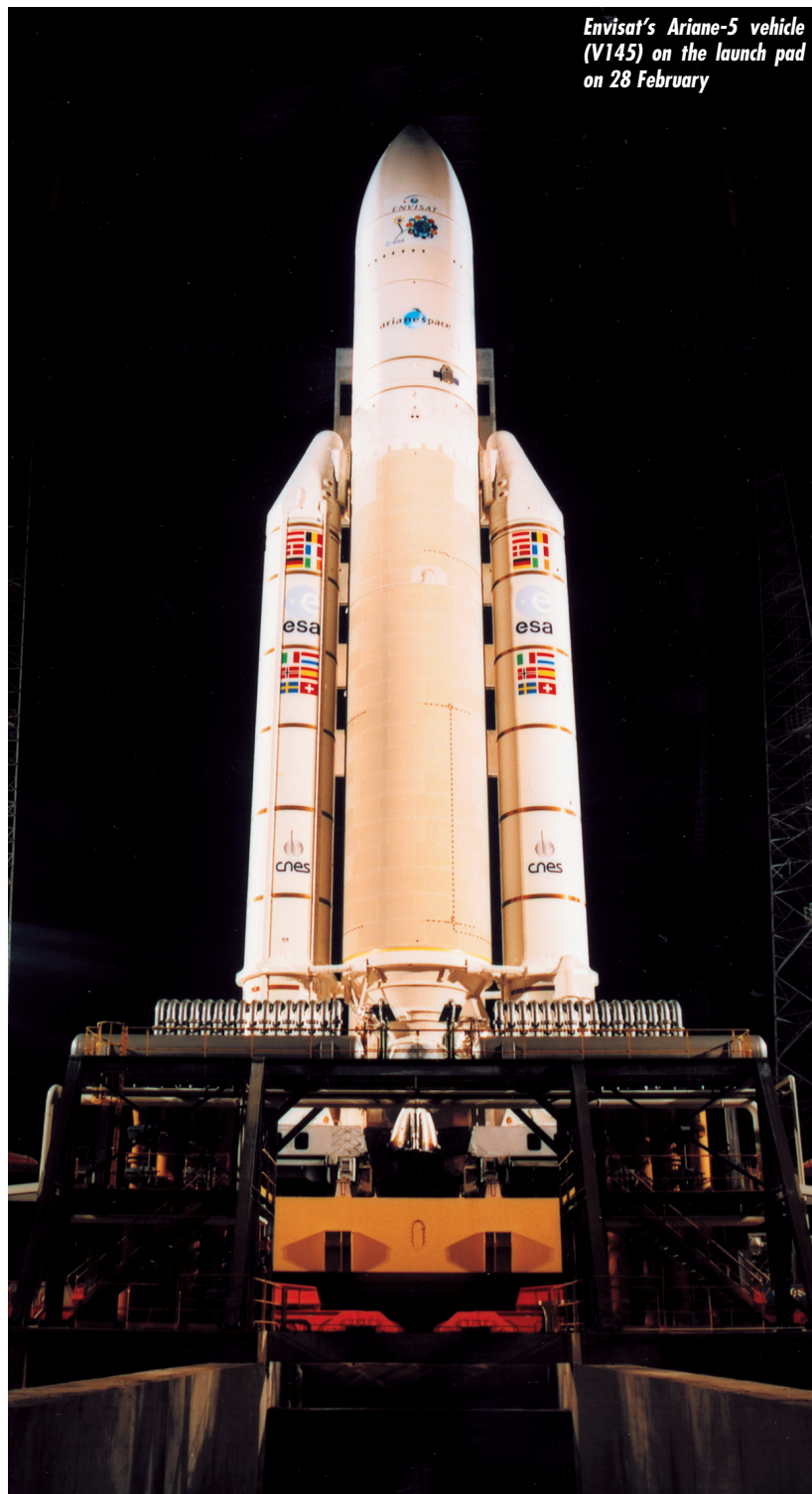
Space Transportation

During the first half of the year, the Agency consulted widely with the main stakeholders in the European launcher sector – Governments, the European Commission, Industry and Arianespace – as it was requested to do by the ESA Ministerial Council in November 2001. At the same time, the worldwide commercial launch-service market was facing a brutal down-turn in volume, coupled with a severe drop in market prices. The Director General presented his overall assessment to the ESA Council in June 2002 and made a proposal for a detailed action plan and re-organisation to secure the long-term future of the European launcher sector.

The Council, alarmed by the excessive dependence of the European launcher sector on the commercial market, set the objectives of guaranteeing Europe's independent access to space and putting industry on a level playing field with its competitors in the commercial marketplace. For this purpose, it decided to set up a dedicated working group to prepare for the decisions to be taken by the end of the year regarding the organisation of the production phases for ESA-developed launchers.

At the same meeting in June, the Council authorised the opening of the Guiana Space Centre for the exploitation of the Soyuz launcher by Arianespace, as part of a long-term cooperation and partnership arrangement with Russia that also encompasses cooperation on future launcher technologies.

During the second half of the year, the working group developed the concept of a 'European Guaranteed Access to Space' programme, with two main objectives: (a) to cover a significant part of the launcher production fixed costs, necessary for guaranteeing access to space for European institutions, and (b) to structure the European institutional launch-service market by granting those institutions favourable conditions.



Envisat's Ariane-5 vehicle (V145) on the launch pad on 28 February



The Ariane-4 vehicle (V151) carrying Spot-5 on the launch pad on 3 May

Following the go-ahead given by Ministers in November 2001, those Member States intending to participate in the Future Launcher Preparatory Programme (FLPP) progressively shaped the programme during the year. They accepted to cover within this programme the preparatory activities for the Next Generation Launcher (NGL) to be operational around 2020, as well as those for the evolution of current expendable launch vehicles developed by ESA. For the NGL's preparation, they also converged on the choice of reference missions, on the launch-service cost targets and on the focus for technology activities within the first three-year period for reusable-launch-vehicle technologies. As far as international cooperation within FLPP is concerned, the general principles of cooperation, as well as the three specific



The launch of MSG-1 by Ariane-5 (V155) on 28 August

Flight No.	Launch Date (Kourou)	Mission	Outcome	Launcher	Payload
V 147	23-01-02	GTO	Success	AR42L	Insat-3C
V 148	23-02-02	GTO	Success	AR44L	Intelsat-904
V 145	28-02-02	SSO	Success	AR5G	Envisat
V 149	28-03-02	GTO	Success	AR44L	JCSat-8 Astra-3A
V 150	16-04-02	GTO	Success	AR44L	NSS-7
V 151	03-05-02	SSO	Success	AR42P	Spot-5
V 152	05-06-02	GTO	Success	AR44L	Intelsat-905
V 153	05-07-02	GTO	Success	AR5G	Stellat-5 Nstar-C
V 155	28-08-02	GTO	Success	AR5G	Atlantic Bird 1 MSG-1
V 154	06-09-02	GTO	Success	AR44L	Intelsat 906
V 157	11-12-02	GTO	Failure	AR5 ECA	HotBird-7 Stentor
V 156	17-12-02	GTO	Success	AR44L	NSS-6

themes of cooperation with Russia – reusable engines, reusable stages and experimental vehicles – were endorsed.

On 11 December, the maiden flight of the new ECA version of Ariane-5 failed due to a malfunction in the new Vulcain-2 engine. Just thirteen months after the Ministerial Council's meeting in Edinburgh, the whole Ariane sector was sailing in rough waters: on-going developments would have to be refocused on the in-flight qualification of the ECA version and the production entities would face costly delays in introducing this new '10 tonne' Ariane-5 onto the market.

One week later, some relief was provided by Ariane-4, which closed the year with its 73rd successful flight and was readied for its last flight early in 2003.

Ariane Operational Launches

Ariane-4 both opened and closed the year successfully for the launcher family. It lifted-off seven times in 2002, making a total of 73 consecutive successful launches.

Its successor, the Ariane-5 Generic version successfully lifted-off three times in 2002, twice serving the European Earth Observation

community by launching the first Meteosat Second Generation (MSG-1) satellite and Envisat, the largest European remote-sensing satellite to date. Unfortunately, as reported above, the maiden flight of the new 50% more powerful Ariane-5 ECA version failed on 11 December.

Ariane-5 Development Programmes

Activities focused on completion of the Vulcain-2 and ESC-A stage developments necessary for the introduction of the new Ariane-5 ECA version onto the market. The new Vulcain-2 main-stage cryogenic engine is being developed within the framework of the Ariane-5 Evolution programme, which was committed to in 1995, and the new ESC-A stage powered by the flight-proven Ariane-4 HM7 cryogenic upper-stage engine is being developed within the framework of the Ariane-5 Plus programme, decided upon in 1998.

Following successful completion of the campaign aimed at validating the upper-stage tank-filling procedures at the end of July, the Flight-Readiness Review was completed on 9 September. The launch campaign began on 22 August and a first countdown occurred on 28 November, during which the onboard

control system did not trigger the Vulcain-2 engine's ignition sequence, and the launch vehicle, the satellites and the launch system went into safe mode. The cryogenic upper stage was drained via the launch-vehicle purge lines, and the launch vehicle was moved back to the Final Assembly Building (BAF). As reported above, lift-off subsequently took place on 11 December.

Ariane Research and Technology Accompaniment (ARTA) Programme

The primary objective of the Ariane-5 complementary programme ARTA-5 is to maintain the launcher qualification standards throughout the production phase, which includes engine test campaigns. All three cryogenic engines therefore underwent such campaigns during 2002: the upper stage cryogenic engine HM-7 (used on Ariane-4 and Ariane-5 ECA) in May, the first Vulcain-2 (used on Ariane-5 ECA) in October, and the presumed last Vulcain-1 (used on Ariane-5 Generic) at the end of the year.

Guiana Space Centre (CSG)

The contract renewal with the Guiana Space Centre (CSG) for the period 2002-2006 was signed on 2 May in Kourou, French Guiana.

The Vega Programme

The development of a small launcher forms part of Europe's strategy of developing a family of launchers in order to enlarge the range of launch services offered, particularly for institutional needs. It will reinforce the European capabilities for ensuring independent access to space, making it more flexible and more affordable.

Several milestones were achieved in 2002 in the development programmes of the Vega small launcher and its first stage (P80). The System Preliminary Design Review actions were closed-out, the subsystem preliminary design was completed, and the overall technical baseline was finalised. A major improvement in the Vega baseline was achieved with the definition of a modified Attitude and Vernier Upper Module (AVUM), the propellant mass of which has been increased to 550 kg to cope with the third-



Artist's impression of the Vega small launcher

stage direct re-entry strategy agreed in July. Also important was the definition of the technical and programmatic requirements needed to ensure coherence between Vega, P80 and the ground segment.

On the contractual side, a Preliminary Authorisation to Proceed was issued at the end of July to the prime contractor ELV SpA, and negotiation of the full development contract was almost completed by year's end.

For the P80's development, a Preliminary Design Review in April identified no major technical issues and by the end of the year negotiation of the contract with FiatAvio was in its final stages.

For the Vega Ground Segment, there was a System Design Key Point in February, and a successful Ground-Segment Preliminary Design Review took place during June and July. The procurement proposals for the ground segment were subsequently issued.