

15th launch for Eutelsat

Arianespace's seventh launch of the year will orbit the ATLANTIC BIRD™ 2 communications satellite for international operator Eutelsat. This launch reflects the confidence of one of the world's leading satcom operators in Arianespace. ATLANTIC BIRD™ 2 is a key to Eutelsat's international expansion strategy.

ATLANTIC BIRD™ 2 will be the 15th Eutelsat satellite launched to date by Ariane.

Built by Alcatel Space in Cannes, southern France, it will be positioned at 8 degrees West, and provide a wide range of high-speed communications services for North America, South America, Europe, North Africa and the Middle East.

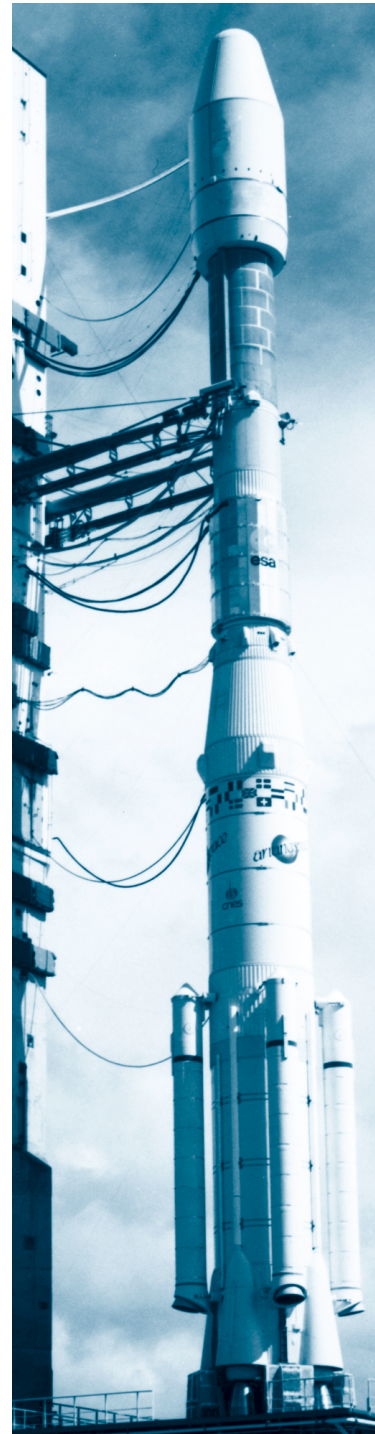
ATLANTIC BIRD™ 2 will help meet demand from regional and transatlantic markets for TV and radio broadcasting, Internet access, interactive IP and other networks, and MPEG 4 streaming video services.

For Flight 144, Arianespace will use an Ariane 44P, the version fitted with four solid-propellant strap-on boosters.

- 1 - ARIANESPACE Flight 144 mission.
- 2 - Range operations :
ARIANE 44P – ATLANTIC BIRD™ 2.
- 3 - Countdown and Flight events.
- 4 - Flight 144 trajectory.
- 5 - The ARIANE 44P launch vehicle.
- 6 - The ATLANTIC BIRD™ 2 satellite.

Annexes

- 1 - Flight 144 key personnel.
- 2 - Launch environment conditions.
- 3 - Synchronized sequence.
- 4 - ARIANESPACE orderbook.
- 5 - ARIANESPACE, ESA and CNES.



1 - Arianespace Flight 144 mission

The 144th Ariane launch (Flight 144) is scheduled to place the ATLANTIC BIRDTM 2 satellite into a geostationary transfer orbit using an ARIANE 44P launch vehicle equipped with four solid strap-on boosters (PAP). This will be the 106th Ariane 4 launch and the 15th in the ARIANE 44P configuration.

It will be launched from the Ariane launch complex n°2 (ELA2), in Kourou, French Guiana. The launch vehicle performance requirement is 3 195 kg (7 029 lb) of which 3 150 kg (6 930 lb) represent the mass of the spacecraft to be separated on the injection orbit.

Injection orbit

Perigee	300 km
Altitude Apogee	35 786 km at injection
Inclination	7° degrees

The ARIANE 44P launcher lift-off for Flight 144 is scheduled on the night of September 25 to 26, 2001 as early as possible within the following launch window :

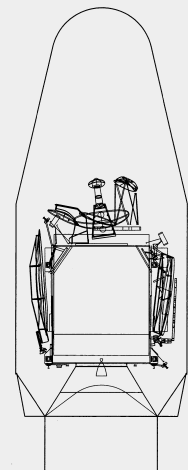
Launch opportunity

GMT	Paris time	Washington time	Kourou time
From 10:32 pm	00:32 am	06:32 pm	07:32 pm
to 11:29 pm	01:29 am	07:29 pm	08:29 pm
on September 25, 2001	September 26, 2001	September 25, 2001	September 25, 2001

Ariane payload configuration

The ATLANTIC BIRDTM 2 satellite was built by Alcatel Space Industries in Cannes (France), for the operator EUTELSAT.

Orbital position: 8° West, over the Atlantic Ocean.



ATLANTIC BIRDTM 2

2. Range operations campaign: ARIANE 44P – ATLANTIC BIRD™ 2

The actual work for satellite range operations lasts 16 working days for ATLANTIC BIRD™ 2 from its arrival in Kourou (before encapsulation).
The ARIANE 44P preparation campaign lasts 24 working days.

Satellite and launch vehicle campaign calendar

<i>Ariane activities</i>	<i>Dates</i>	<i>Satellite activities</i>
<i>Campaign start review</i>	<i>August 22, 2001</i>	
<i>First stage erection</i>	<i>August 22, 2001</i>	
<i>Second stage erection</i>	<i>August 24, 2001</i>	
	<i>August 27, 2001</i>	<i>ATLANTIC BIRD™ 2 arrival in Kourou and beginning of its preparation in S1B building.</i>
<i>Third stage erection</i>	<i>August 30, 2001</i>	
	<i>September 6, 2001</i>	<i>ATLANTIC BIRD™ 2 transfer from S1B to S3B building.</i>
<i>Roll-out to launch pad</i>	<i>September 10, 2001</i>	
	<i>September 10, 2001</i>	<i>Beginning of ATLANTIC BIRD™ 2 filling operations.</i>
<i>Solid strap-on boosters erection</i>	<i>September 12-13, 2001</i>	
<i>D-7</i>	<i>Friday, Sept. 14, 2001</i>	<i>Start of combined operations</i>
<i>D-6</i>	<i>Monday, Sept. 17</i>	<i>Satellite encapsulation operations.</i>
<i>D-5</i>	<i>Tuesday, Sept. 18</i>	<i>Satellite composite transfer to the launch pad.</i>
<i>D-4</i>	<i>Wednesday, Sept. 19</i>	<i>Satellite composite mating onto launcher and overall checks.</i>
<i>D-3</i>	<i>Thursday, Sept. 20</i>	<i>Launch Rehearsal</i>
<i>D-2</i>	<i>Friday, Sept. 21</i>	<i>Launch Readiness Review (RAL) and launcher arming.</i>
<i>D-1</i>	<i>Monday, Sept. 24</i>	<i>Filling of 1st stage and 2nd stage with UH 25 and N2O4.</i>
<i>D-0</i>	<i>Tuesday, Sept. 25</i>	<i>Launch Countdown including 3rd stage filling with liquid oxygen and liquid hydrogen.</i>

3. Launch countdown and flight events

The final launch countdown runs through all the final launcher and satellite related operations. It configures the vehicle and its payload for ignition of the first stage and PAL engines at the selected launch time, as soon as possible within the launch window authorized by the spacecraft.

A synchronized sequence (see Appendix 3), controlled by the Ariane ground check-out computers, starts at H0 - 6mn and concludes the countdown.

Should a hold in the countdown delay the H0 time beyond the launch window, the launch is postponed to (in days) : D + 1 or D + 2 (or later) depending on the source of the problem and the time to resolve it.

Time	Events
- 12h 30 mn 00 s	Start of final countdown.
- 5 h 35 mn 00 s	Start of gantry withdrawal.
- 3 h 35 mn 00 s	Start of the 3rd stage filling operations with liquid hydrogen and liquid oxygen.
- 1 h 5 mn 00 s	Activation of launcher telemetry, radar transponders, telecommand.
- 6 mn 00 s	"Green status for all systems" to authorize : start of synchronized launch sequence
- 3 mn 40 s	Spacecraft switched to on-board power (latest time).
- 1 mn 00 s	Launcher equipment switched to on-board batteries.
- 09 s	Inertial platform released.
- 05 s	Release command to cryogenic arms retraction system.
H0	Ignition of first stage engines
+ 4,2 s	Ignition of solid strap-on boosters.
+ 4,4 s	Lift-off.
+ 11 s	End of vertical ascent phase of pitch motion (10 s duration).
+ 1 mn 12 s	Solid strap-on boosters jettison.
+ 3 mn 31 s	First stage separation.
+ 3 mn 34 s	Second stage ignition.
+ 4 mn 30 s	Fairing jettison.
+ 5 mn 42 s	Second stage separation.
+ 5 mn 47 s	Third stage ignition.
+ 6 mn 50 s	Launcher acquired by Natal station.
+ 12 mn 50 s	Launcher acquired by Ascension Island station.
+ 18 mn 00 s	Launcher acquired by Libreville station.
+ 18 mn 46 s	Third stage shutdown sequence.
+ 19 mn 45 s	ATLANTIC BIRD™ 2 separation.
+ 19 mn 55 s	Start of the third stage avoidance maneuver.
+ 23 mn 04 s	End of Arianespace Flight 144 mission.

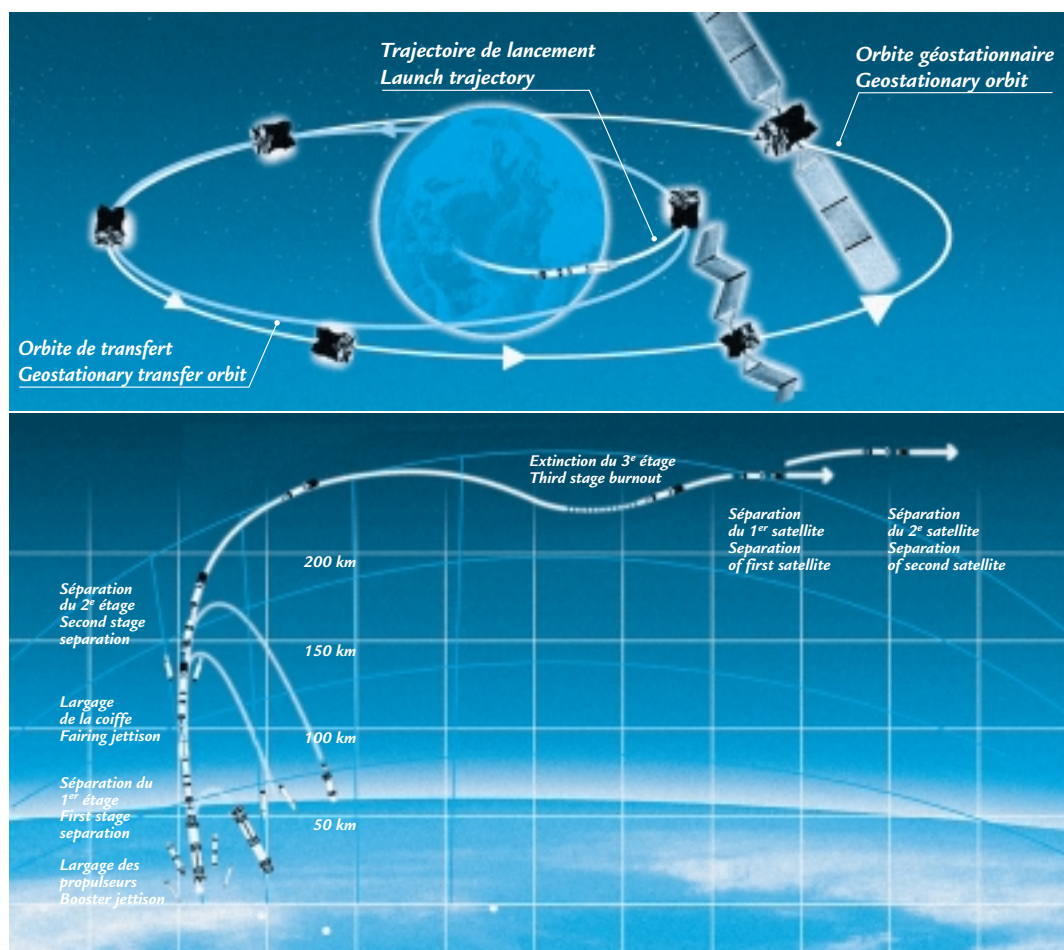
4. Flight 144 Trajectory

The launcher ascends vertically from lift-off to H0+16 sec. During a period of 10 sec. after this vertical ascent, the launch vehicle tilts in the pitch plane defined by the trajectory and pre-calculated by the on-board computer.

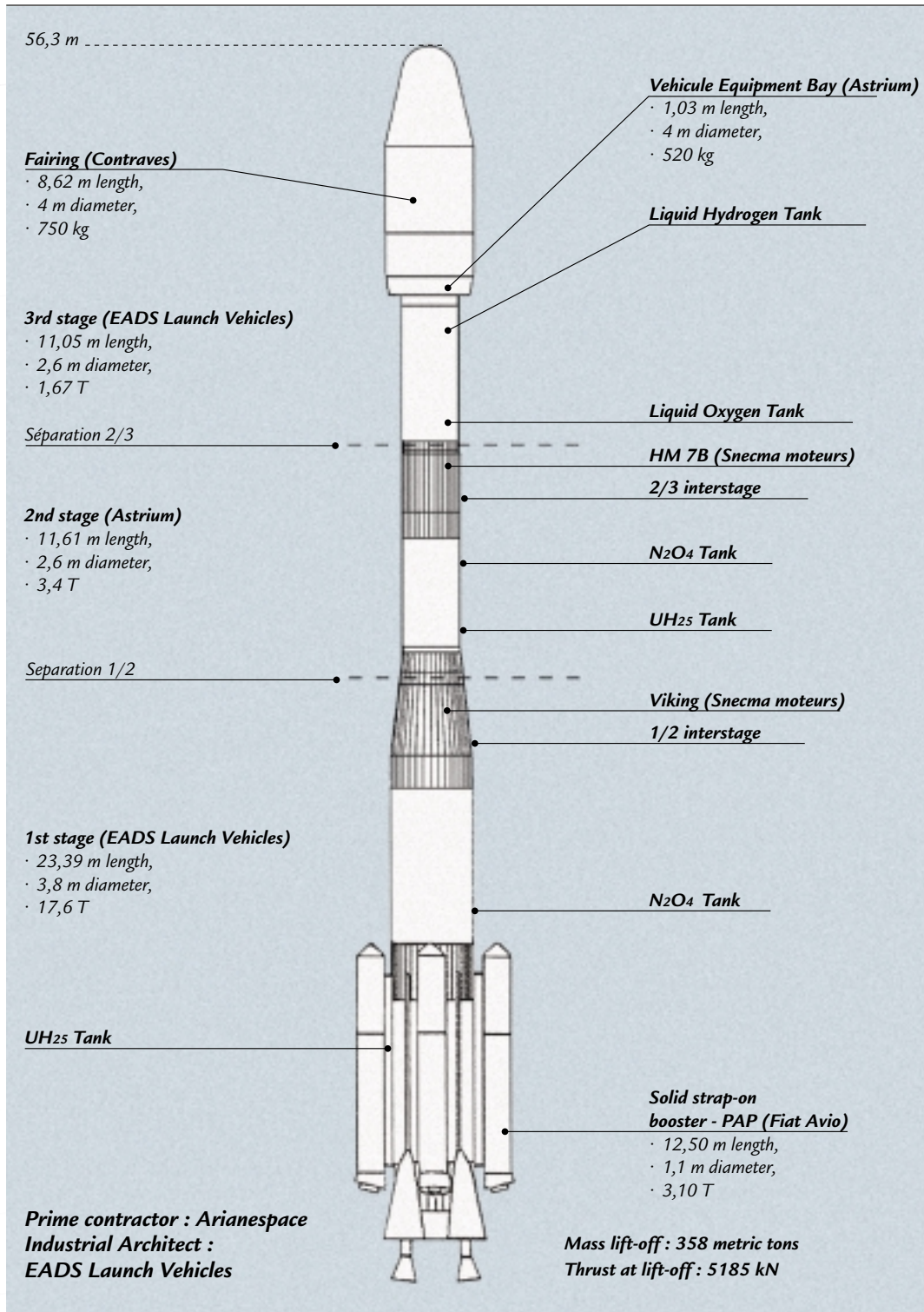
The vehicle's attitude is commanded by a predetermined law. The guidance phase is initiated 10 sec. after ignition of the 2nd stage. The attitude law in the pitch-and-yaw plane is optimized in order to minimize the 3rd stage propulsion time necessary to reach the target orbit with a performance margin of about 155 kg (341 lb). This ensures reaching this orbit with a probability of about 99% before the exhaustion of third stage propellant.

The roll law is applied so as to improve the launcher/ground station radio link budget.

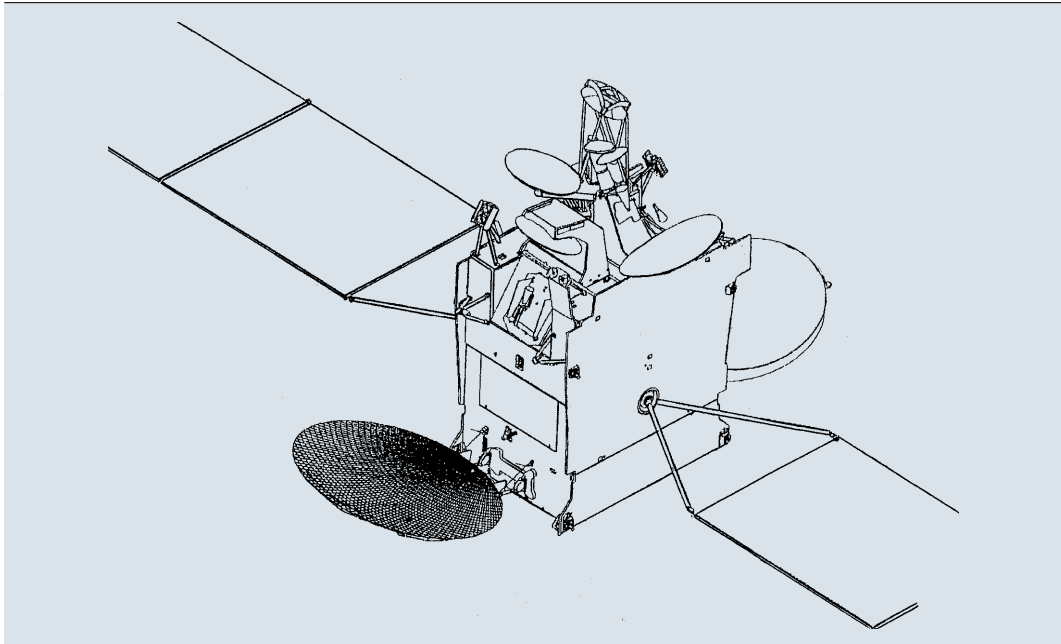
Typical trajectory for standard geostationary transfer orbit and ground station visibility



5. The 44P launch vehicle



6. The ATLANTIC BIRD™ 2 satellite



Customer	EUTELSAT	
Prime contractor	Alcatel Space Industries in Cannes (France)	
Mission	TV and radio broadcasting, Internet access, interactive IP and other networks	
Mass	Total mass (at lift-off)	3 150 kg (6 930 lb)
Dry mass		1 368 kg (3 010 lb)
Stabilization	3 axis	
Dimensions		2.90 m x 3.44 m x 4.71 m
Span in orbit	29 m	
Platform	Spacebus 3000 B2	
Payload	26 Ku Band transponders	(107 W each)
Downlink frequencies	10.95 - 11.70 GHz / 12.50 - 12.75 GHz	
Transponder bandwidth	72 MHz, 54 MHz, 36 MHz	
On-board power	6.5 kW (end of life)	
Life time	15 years	
Orbital location	8° West, above the Atlantic Ocean	
Coverage area	North and South America, Europe, North Africa and Middle-East.	

Press Contact

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Annex 1 - Arianespace Flight 144 key personnel

In charge of the launch campaign

<i>Mission Director</i>	(CM)	Rémi KOCHER	ARIANESPACE
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In charge of the launch service contracts

<i>ARIANE Payload Manager</i>	(RCUA)	Baard EILERTSEN	ARIANESPACE
<i>ATLANTIC BIRD™ 2 Mission Manager</i>		Véronique SEGUIN	ARIANESPACE
<i>Deputy Mission Manager</i>	(RCUA/A)	Michael CALLARI	ARIANESPACE

In charge of ATLANTIC BIRD™ 2 satellite

<i>Satellite Mission Director</i>	(DMS)	Jean-Jacques DUMESNIL	EUTELSAT
<i>Satellite Project Manager</i>	(CPS)	Raffi MUSSALIAN	EUTELSAT
<i>Satellite Preparation Manager</i>	(RPS)	Pierre-Jean MONICAT	ALCATEL

In charge of the launch vehicle

<i>Launch Site Operations Manager</i>	(COEL)	Jean-Louis LEBLANC	ARIANESPACE
<i>Ariane Production Project Manager</i>	(CPAP)	Marc ROY	ARIANESPACE

In charge of the Guiana Space Center (CSG)

<i>Range Operations Manager</i>	(DDO)	Pierre RIBARDIERE	CNES/CSG
<i>Flight Safety Officer</i>	(RSV)	Dominique POULAIN	CNES/CSG

Annex 2 - Launch environment conditions

The allowable weather conditions for gantry withdrawal depend on the Ariane stage pressurization values. Wind speed has to be below 17 m/s. Acceptable wind speed limits at liftoff range from between 9 m/s to 14 m/s according to the wind direction. The most critical is a northerly wind. For safety reasons, the wind speed on the ground (at Kourou) and at a high altitude (between 10,000 and 20,000 m) also is taken into account.

Annex 3 - Synchronized sequence

The synchronized sequence starts at H0 - 6 min. This sequence is used for final preparation of the launcher, and for checkout operations related to switchover to flight configuration. The sequence is fully automatic, and is controlled in parallel, up to H0-5 sec., by two computers in the Ariane Launch Center (CDL). All resources used for launch are synchronized on a common countdown sequence.

One computer configures fluids and propellants for flight and performs associated checks. The other computer executes final preparation of the electrical systems (initiation of flight program, start-up of servomotors, switchover from ground power to flight batteries, etc.) and corresponding checkout operations.

After H0 - 5 s. and retraction of the cryogenic arms retraction from the launcher, a majority logic sequencer delivers the main timing pulses for :

- first stage engine ignition (H0) ;
- engine parameter checkout (conducted in parallel by the two computers, starting at H0 + 2.8 s.) ;
- solid boosters ignition (H0 + 4.2 s.) ;
- opening of the launch table clamps (releasing the launch vehicle between H0 + 4. 4s. and H0 + 4.6 s.) as soon as engine parameters are judged as nominal by one of the computers.

Any hold in the synchronized sequence before H0 - 5 s. automatically resets the launcher to the H0 - 6 min. configuration

Annex 4 - Arianespace order book

To date 190 satellites and 38 auxiliary payloads have been launched by Arianespace. Out of the 242 launch services contracted since 1981 by Arianespace and before Flight 144, 42 satellites and 9 ATV missions remain to be launched (2 confidential contracts at the request of customers).

Europe 13 satellites

Astra 1K, X, 3A

Atlantic Bird™ 2

e-Bird

Envisat-1/PPF

Hot Bird 6

MSG-1 & 2

Rosetta

Spot 5

Stentor

Syracuse III

+ 9 ATV launches

International organizations 9 satellites

Ameristar (Worldspace)

Inmarsat 4

Intelsat 904, 905, 906, 907

New Skies Satellites 6 & 7

Stellat

Middle-East and Africa 1 satellite

Amos 2

Americas 9 satellites

Anik F2 (Canada)

Directv-4S (USA)

Galaxy 12 (USA)

Galaxy VR & IRR (USA)

GE TBD (USA)

Loralsat 3 (USA)

Wild Blue 1 & 2 (USA)

Asia 8 satellites

Insat 3C, 3A & 3E (India)

JCSat 8 (Japan)

L-Star A & B
(Thailand/Laos)

N-Star C (Japan)

Optus C1 (Australia)

International

- Inmarsat
- Intelsat
- New Skies
- Stellat
- Worldspace

Europe

- ESA
- Eumetsat
- Eutelsat
- France
- Luxembourg

Asia

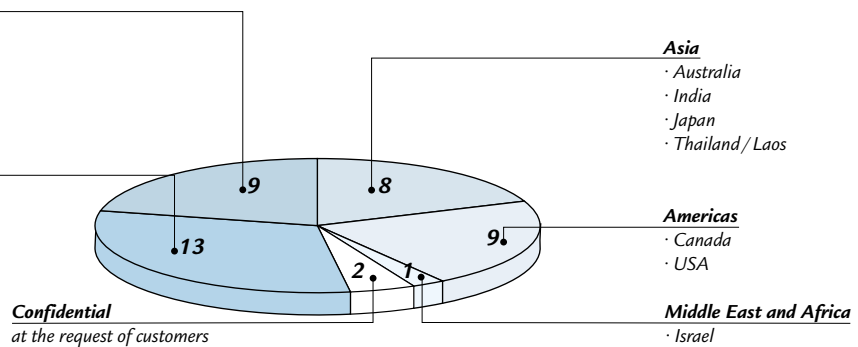
- Australia
- India
- Japan
- Thailand/Laos

Americas

- Canada
- USA

Middle East and Africa

- Israel



Appendix 5 - Arianespace, its relations with ESA et CNES

FROM A PRODUCTION BASE IN EUROPE, ARIANESPACE, A PRIVATE COMPANY, SERVES CUSTOMERS ALL OVER THE WORLD. Arianespace is the world's first commercial space transportation company, created in 1980 by 36 leading European aerospace and electronics corporations, 13 major banks and the French space agency CNES (Centre National d'Etudes Spatiales).

Arianespace is a European venture--, the direct result of the participating nation's commitment to bringing the Ariane family of launch vehicles from the drawing board to the launch pad. To do so, they turned to the European Space Agency (ESA) and mobilized the scientific and technological expertise of CNES.

The shareholder partners in Arianespace represent the scientific, technical, financial and political capabilities of 12 countries : Belgium, Denmark, Germany, France, Great Britain, Ireland, Italy, Netherlands, Norway, Spain, Switzerland and Sweden.

In order to meet the market needs, Arianespace is present throughout the world : in Europe, with its head office located near Paris, France at Evry, in North America with its subsidiary in Washington D.C. and in the Pacific Region, with its representative offices in Tokyo, Japan, and in Singapore.

Arianespace employs a staff of 380. Share capital totals 317 M€.

As a space transportation company, Arianespace :

- m markets launch services to customers throughout the world ;
- m finances and supervises the construction of Ariane expendable launch vehicles ;
- m conducts launches from Europe's Spaceport in Kourou in French Guiana ;
- m insures customers for launch risks.

Personalized reliable service forms an integral part of Arianespace's launch package. It includes the assignment of a permanent team of experts to each mission for the full launch campaign. Our customers appreciate the time and cost savings made possible by our efficiency and flexibility.

Most of the world's commercial satellite operators have contracted to launch at least one payload with Arianespace. This record is the result of our company's realistic cost-effective approach to getting satellites into orbit.

Relations between ESA, CNES and Arianespace

Development of the Ariane launcher was undertaken by the European Space Agency in 1973. ESA assumed overall direction of the ARIANE 1 development program, delegating the technical direction and financial management to CNES. The ARIANE 1 launcher was declared qualified and operational in January 1982. At the end of the development phase which included four launchers, ESA started the production of five further ARIANE 1 launchers. This program, known as the "promotion series", was carried out with a management arrangement similar to that for the ARIANE 1 development program

In January 1980 ESA decided to entrust the commercialization, production and launch of operational launchers to a private-law industrial structure, in the form of ARIANESPACE, placing at its disposal the facilities, equipment and tooling needed to build and launch the ARIANE vehicles.

Ariane follow-on development programs have been undertaken by ESA since 1980. They include a program for developing updated versions of the launcher : Ariane 2 and Ariane 3 (qualified in August 1984); the program for building a second ARIANE launch site (ELA 2) (validated in August 1985); the Ariane 4 launcher development program (qualified on June 15th, 1988); and the preparatory and development program of the Ariane 5 launcher (qualified in October 21st 1998) and its new ELA 3 launch facility. All these programs are run under the overall direction of ESA, which has appointed CNES as prime contractor.

In general, as soon as an updated version of the launcher has been qualified, ESA makes the results of the development program together with the corresponding production and launch facilities available to ARIANESPACE.

ESA is responsible (as design authority) for development work on the Ariane launchers. The Agency owns all the assets produced under these development programs. It entrusts technical direction and financial management of the development work to CNES, which writes the program specifications and places the industrial contracts on its behalf. The Agency retains the role of monitoring the work and reporting to the participating States.

Since Flight 9 Arianespace has been responsible for building and launching the operational Ariane launchers (as production authority), and for industrial production management, for placing the launcher manufacturing contracts, initiating procurements, marketing and providing Ariane launch services, and directing launch operations.

Use of the Guiana Space Center

The "Centre Spatial Guyanais" (CSG), CNES's launch base near Kourou, has all the equipment needed for launching spacecraft : radar tracking stations, telemetry receiving stations, a meteorology station, a telecommand station, safety facilities, etc...

It became operational in 1968 for the purpose of the French National Space Program.

ESA built its own launch facilities, the ELA 1 and ELA 2 complexes (for Ariane 4) and ELA 3 (for Ariane 5) and the EPCU payload preparation complex. These facilities comprise Europe's Spaceport. The use of these facilities requires, CSG's technical and operational resources, especially during launch operations. The French Government has granted ESA the right to use the CSG for its space programs. In return, ESA shares in the costs of operating the CSG.

Arianespace directly covers the costs of use, maintenance and upgrading of the Ariane launch sites and the payload preparation complex.