ARIANESPACE LAUNCHES TWO TELECOM SATELLITES

On the first Ariane 5 launch of the year, Arianespace will orbit two telecommunications satellites: ABS-2 for the Bermuda-based operator ABS and Athena Fidus for French and Italian Space Agencies, whose launch service is managed by Telespazio.

Arianespace's selection by the world's leading satellite operators and manufacturers is clear international recognition of the company's excellence in launch services. Because of its proven reliability and availability, Arianespace continues to set the global standard in launch systems for all players, including national and international agencies, private and government operators.

The ABS-2 satellite was built by Space Systems Loral (SS/L) using an FS-1300 platform. It will weigh more than 6,330 kg at launch, and will be positioned in geostationary orbit at 75 degrees East. Fitted with C, Ku and Ka-band transponders, it will provide optimized telecommunications, direct-to-home (DTH) broadcasting, multimedia, and data transmission services for Africa, Asia Pacific, Europe, the Middle East, Russia and the Commonwealth of Independent States (CIS).

ABS is a young, dynamic and fast growing global satellite operator, with an entrepreneurial and creative business approach. ABS operates a fleet of five satellites with ABS-2 satellite launching shortly. ABS has also procured two new satellites scheduled for the next 24 months.
ABS is the 35th company to choose Arianespace for its first launch, and ABS-2 is the 43rd payload built by Space Systems Loral to be launched by Arianespace.
Arianespace has launched nearly 2/3 of the commercial geostationary satellites for the Asia-Pacific region.

Athena Fidus (Access on THeatres for European Nations Allied forces - French Italian Dual Use Satellite) is a French-Italian telecommunications satellites using state-of-the-art technologies to provide broadband Internet. Funded jointly by French space agency CNES and the Italian space agency ASI, it will provide telecommunications services to both armed forces and homeland security units in France and Italy, to complement the capacity offered by the Syracuse 3 and Sicral satellites.

Athena Fidus was built by Thales Alenia Space using a Spacebus 4000 platform. Weighing 3,080 kg at launch, it offers a design life exceeding 15 years.

Follow the launch live on internet broadband
at www.arianespace.com
(starting 20 minutes before lift-off)

1. Mission profile

The 216th Ariane mission will boost two payload into geostationary transfer orbit: ABS-2 telecommunications satellite for the operator ABS, and Athena Fidus government telecommunications satellite for French and Italian Space Agencies, whose launch service is managed by Telespazio.

This will be the 72nd Ariane 5 launch.

The launcher will be carrying a total payload of 10,214 kg, including 9,410 kg for the ABS-2 and Athena Fidus satellites, which will be released into their targeted orbits.

The launch will be from Ariane Launch Complex No. 3 (ELA 3) in Kourou, French Guiana.

Targeted orbit

Perigee altitude	***246 km***
Apogee altitude	***35,937 km***
Inclination	***6 degrees***

The lift-off is scheduled on the night of February 6 to 7, 2014 as soon as possible within the following launch window:

Launch opportunity

	Universal time (GMT)	*Paris time*	*Kourou time*	*Washington time*	*Hong Kong time*
Between	*8:30 pm*	*9:30 pm*	*5:30 pm*	*3:30 pm*	*4:30 am*
and	*10:35 pm*	*11:35 pm*	*7:35 pm*	*5:35 pm*	*6:35 am*
on	*February 6, 2014*	*February 6, 2014*	*February 6, 2014*	*February 6, 2014*	*February 7, 2014*

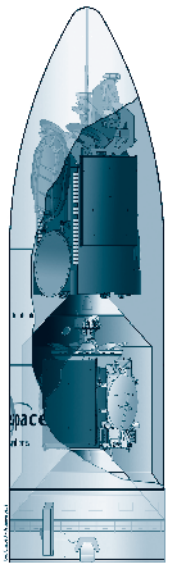
Payload configuration

The ABS-2 satellite was built by Space Systems Loral (SS/L) in Palo Alto, California, for the operator ABS.

Orbital position: 75° East

The Athena Fidus satellite was built by Thales Alenia Space in Cannes, France for French and Italian Space Agencies, whose launch service is managed by Telespazio.

Orbital position: 38° East



2. Range operations campaign: ARIANE 5 - ABS-2 & Athena Fidus

Satellites and launch vehicle campaign calendar

Ariane activities	*Dates*	*Satellites activities*
Campaign start review	*November 5, 2013*	
EPC Erection	*November 6, 2013*	
EAP transfer and positioning	*November 7, 2013*	
Integration EPC/EAP	*November 8, 2013*	
ESC-A and VEB Erection	*November 13, 2013*	
	December 6, 2013	*Arrival in Kourou of ABS-2 and beginning of preparation campaign in building S1B*
	December 10, 2013	*Arrival in Kourou of Athena Fidus and beginning of preparation campaign in building S1A*
	December 16, 2013	*Athena Fidus transfer to S5A*
Roll-out from BIL to BAF	*December 17, 2013*	*ABS-2 transfer to S5B*
	December 18, 2013	*ABS-2 standby in S5B*
	December 19, 2013	*Athena Fidus standby in S5A*
	January 15, 2014	*ABS-2 filling operations*
	January 20, 2014	*Athena Fidus filling operations*

Satellites and launch vehicle campaign final calendar

J-11	*Tuesday January 21, 2014*	*ABS-2 integration on adaptor (PAS)*
J-10	*Thursday January 23, 2014*	*ABS-2 transfer to Final Assembly Building (BAF)*
J-9	*Friday January 24, 2014*	*ABS-2 integration on Sylda and Athena Fidus integration on adaptor (PAS)*
J-8.1	*Saturday January 25, 2014*	*Fairing integration on Sylda*
J-8.2	*Monday January 27, 2014*	*Athena Fidus transfer to Final Assembly Building (BAF)*
J-7	*Tuesday January 28, 2014*	*Composite integration with Athena Fidus on launcher*
J-6	*Wednesday January 29, 2014*	*Upper composite integration with ABS-2 on launcher*
J-5	*Thursday January 30, 2014*	*ESC-A final preparations*
J-4	*Friday January 31, 2014*	*ESC-A final preparations and Launch rehearsal*
J-3	*Monday February 3, 2014*	*Arming of launch vehicle*
J-2	*Tuesday February 4, 2014*	*Arming of launch vehicle* *Launch readiness review (RAL) and final preparation of launcher*
J-1	*Wednesday February 5, 2014*	*Roll-out from BAF to Launch Area (ZL), launch vehicle connections and filling of the EPC liquid helium sphere*
J0	*Thursday February 6, 2014*	*Launch countdown including EPC and ESC-A filling with liquid*

3. Launch countdown and flight events

The countdown comprises all final preparation steps for the launcher, the satellites and the launch site. If it proceeds as planned, the countdown leads to the ignition of the main stage engine, then the two boosters, for a liftoff at the targeted time, as early as possible in the satellites launch window.
The countdown culminates in a synchronized sequence (see appendix 3), which is managed by the control station and onboard computers starting at T-7 minutes.
If an interruption in the countdown means that T-0 falls outside the launch window, then the launch will be delayed by one, two or more days, depending on the problem involved, and the solution developed.

Time	*Events*
- 11 h 30 mn	*Start of final countdown*
- 7 h 30 mn	*Check of electrical systems*
- 4 h 50 mn	*Start of filling of main cryogenic stage with liquid oxygen and hydrogen*
- 3 h 20 mn	*Chilldown of Vulcain main stage engine*
- 1 h 10 mn	*Check of connections between launcher and telemetry, tracking and command systems*
- 7 mn 00 s	*"All systems go" report, allowing start of synchronized sequence*
- 4 mn 00 s	*Tanks pressurized for flight*
- 1 mn 00 s	*Switch to onboard power mode*
- 05,5 s	*Command issued for opening of cryogenic arms*
- 04 s	*Onboard systems take over*
- 03 s	*Unlocking of guidance systems to flight mode*

HO	*Ignition of the cryogenic main stage engine (EPC)*	*ALT (km)*	*V. rel. (m/s)*
+ 7,05 s	*Ignition of solid boosters*	*0*	*0*
+ 7,3 s	*Liftoff*	*0*	*0*
+ 12,6 s	*End of vertical climb and beginning of pitch rotation (10 seconds duration)*	*0,1*	*35,7*
+ 17 ,1 s	*Beginning of roll manoeuvre*	*0,3*	*73,4*
+ 2 mn 22 s	*Jettisoning of solid boosters*	*65,9*	*2019*
+ 3 mn 20 s	*Jettisoning of fairing*	*108,9*	*2301*
+ 8 mn 10 s	*Acquisition by Natal tracking station*	*160,1*	*5919*
+ 8 mn 49 s	*Shut-down of main cryogenic stage*	*158,5*	*6908*
+ 8 mn 55 s	*Separation of main cryogenic stage*	*158,5*	*6934*
+ 8 mn 59 s	*Ignition of upper cryogenic stage (ESC-A)*	*158,5*	*6936*
+ 13 mn 49 s	*Acquisition by Ascension tracking station*	*142,5*	*7637*
+ 18 mn 24 s	*Acquisition by Libreville tracking station*	*175,9*	*8366*
+ 23 mn 05 s	*Acquisition by Malindi tracking station*	*419,4*	*9083*
+ 25 mn 05 s	*Injection*	*634,4*	*9373*
+ 27 mn 19 s	*Separation of **ABS-2** satellite*	*961,9*	*9099*
+ 30 mn 15 s	*Separation of Sylda 5*	*1504,5*	*8680*
+ 32 mn 28 s	*Separation of **Athena Fidus** satellite*	*1976,5*	*8347*
+ 43 mn 04 s	*End of Arianespace Flight mission*	*4575,5*	*6877*

4. Flight trajectory of ABS-2 & Athena Fidus

The launcher's attitude and trajectory are totally controlled by the two onboard computers, located in the Ariane 5 vehicle equipment bay (VEB).

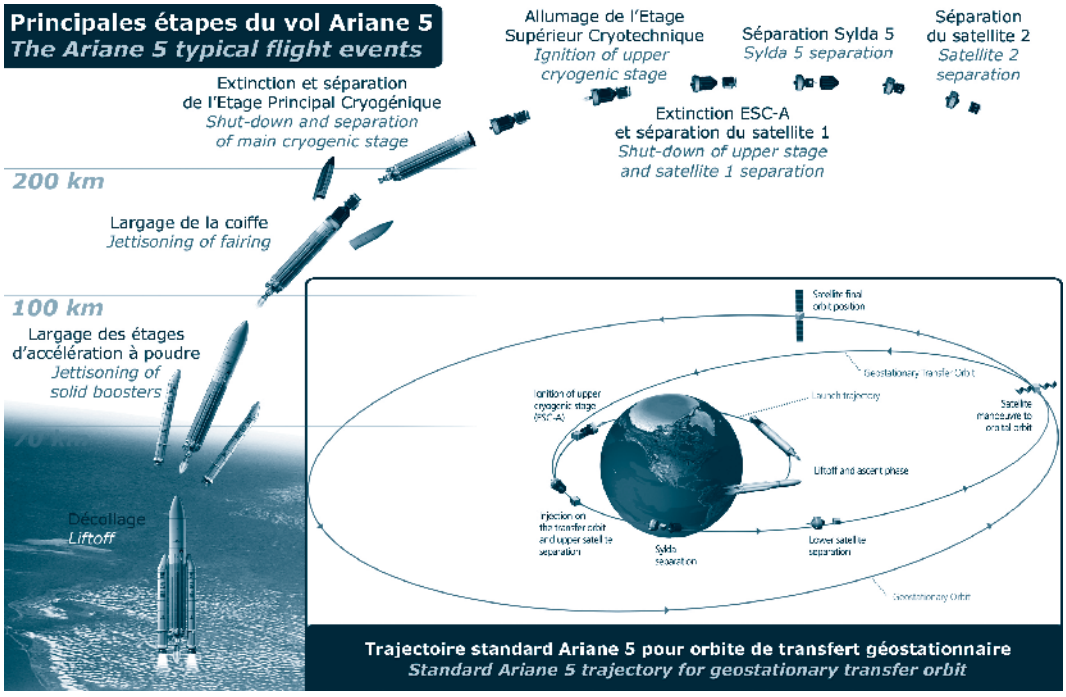
7.05 seconds after ignition of the main stage cryogenic engine at T-0, the two solid-propellant boosters are ignited, enabling liftoff. The launcher first climbs vertically for 6 seconds, then rotates towards the East. It maintains an attitude that ensures the axis of the launcher remains parallel to its velocity vector, in order to minimize aerodynamic loads throughout the entire atmospheric phase, until the solid boosters are jettisoned.

Once this first part of the flight is completed, the onboard computers optimize the trajectory in real time, minimizing propellant consumption to bring the launcher first to the intermediate orbit targeted at the end of the main stage propulsion phase, and then the final orbit at the end of the flight of the cryogenic upper stage. The main stage falls back off the coast of Africa in the Atlantic Ocean (in the Gulf of Guinea).

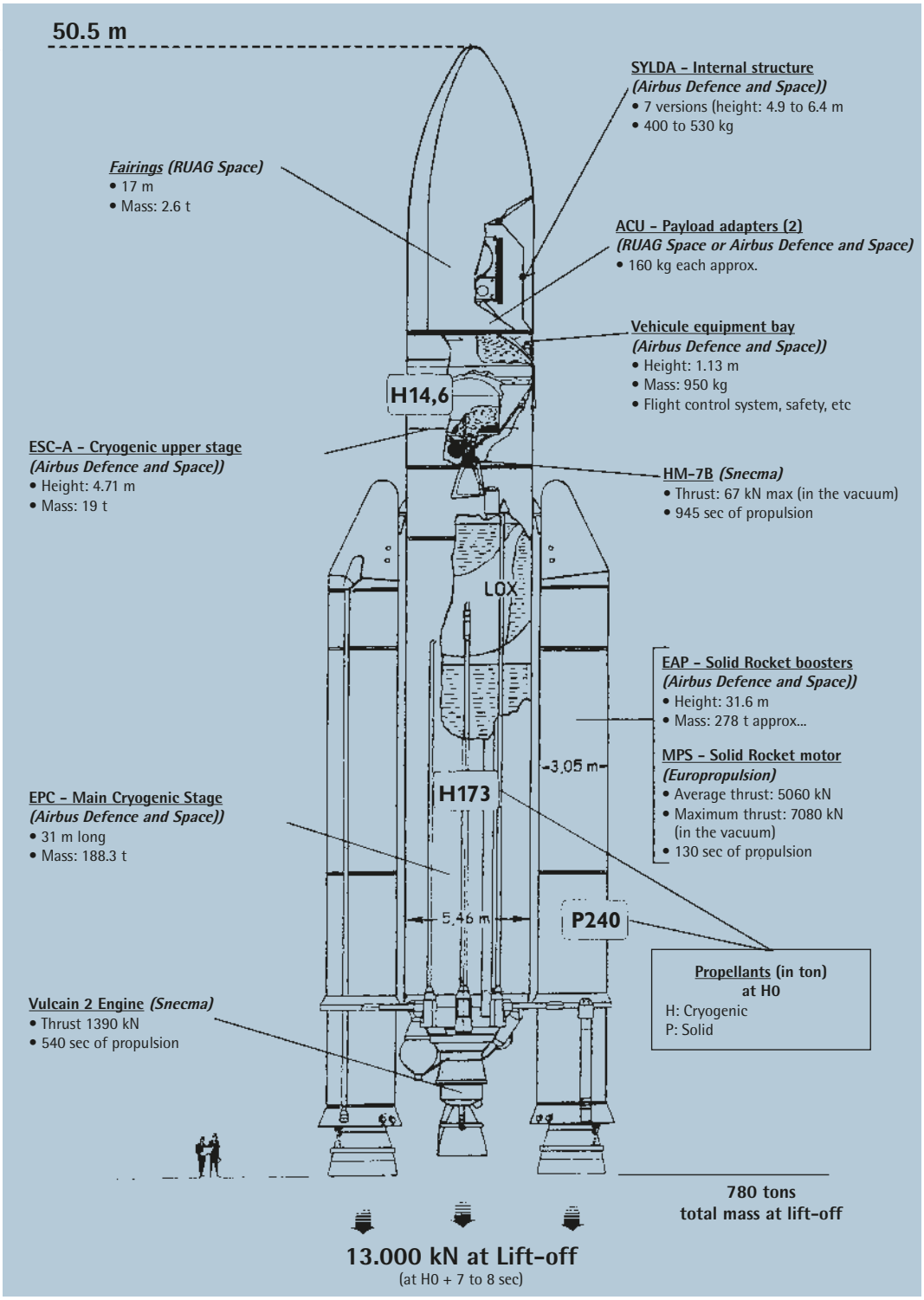
On orbital injection, the launcher will have attained a velocity of approximately 9,373 meters/second, and will be at an altitude of about 634.4 kilometers.

The fairing protecting the ABS-2 and Athena Fidus spacecraft is jettisoned shortly after the boosters are jettisoned at about T+200 seconds.

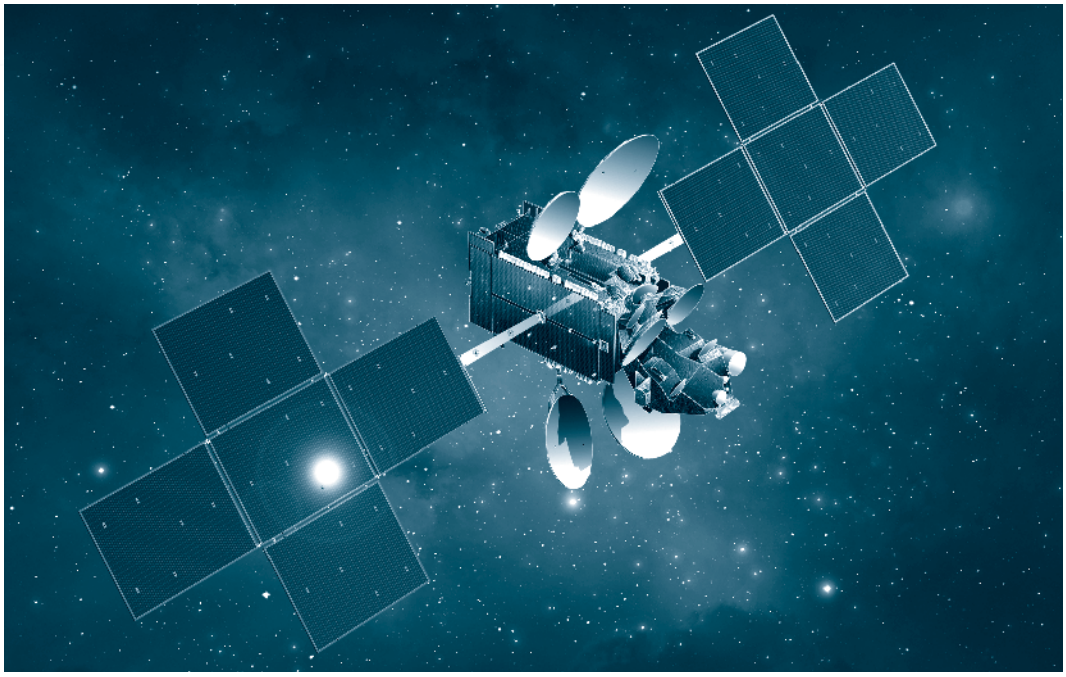
Standard Ariane 5 trajectory for geostationary transfer orbit



5. The Ariane 5-ECA (Industrial prime contractor: Airbus Defence and Space))



6. The ABS-2 satellite



Customer	*ABS*
Prime contractor	*Space Systems Loral (SS/L)*
Mission	*Video services, telecommunications and VSAT services*
Mass	*Total mass at lift-off approx. 6,330 kg*
Stabilization	*3 axis*
Dimensions *Span in orbit*	*8.3 x 3.5 x 3.5 m* *26 m*
Platform	*FS 1300*
Payload	*51 Ku, 6 Ka and 32C band transponders,*
On-board power	*16.7 kW (end of life)*
Life time	*15 years*
Orbital position	*75° East*
Coverage area	*Middle East, North Africa, Europe, India, Russia and Asia. Western and Eastern hemispheres.*

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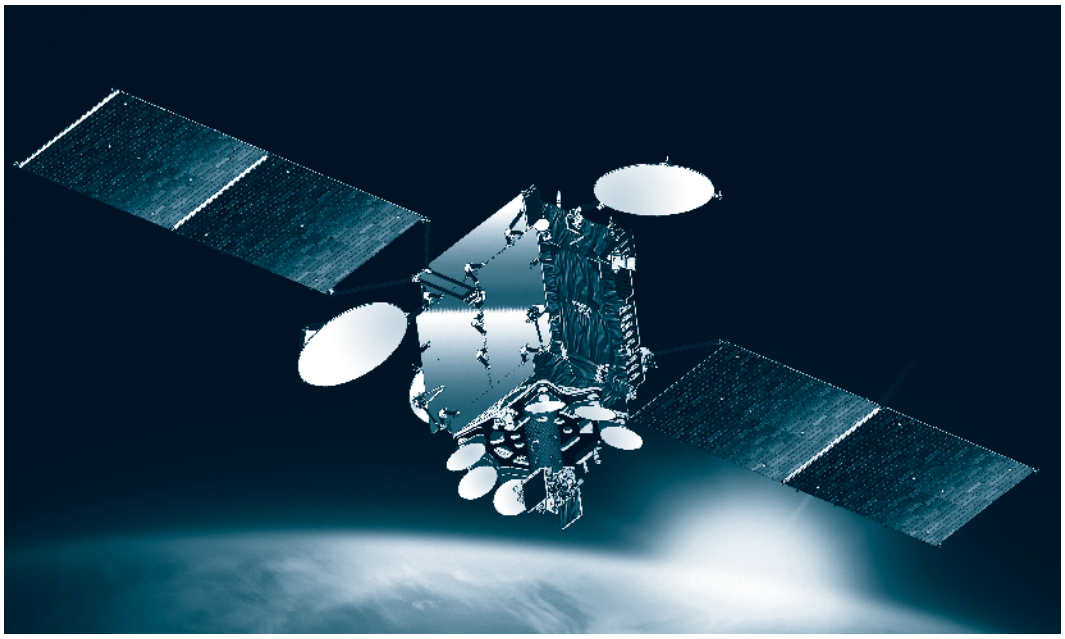
7. The Athena Fidus satellite



Customer	*Telespazio*
Prime contractor	*Thales Alenia Space*
Mission	*Telecommunications and government services*
Mass	*Total mass at lift-off* *3,080 kg*
Stabilization	*3 axis*
Dimensions	*2,86 m x 1.8 m x 2.95 m*
Platform	*Spacebus 4000*
Payload	*23 Ka band transponders*
On-board power	*5.85 kW (end of life)*
Life time	*>15 years*
Orbital position	*38° East*
Coverage area	*France - Italy - Global Cover*

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Appendix 1. Arianespace - ABS-2 & Athena Fidus launch key personnel

In charge of the launch campaign			
Mission Director	*(CM)*	*Jean-Christophe DELAUNAY*	*ARIANESPACE*
In charge of the launch service contract			
Program Director ABS-2	*(CP)*	*Franck DESNOUES*	*ARIANESPACE*
Program Director Athena Fidus	*(CP)*	*Luca CHIECCHO*	*ARIANESPACE*
In charge of ABS-2 satellite			
Satellite Mission Director	*(DMS)*	*Edward KIM*	*ABS*
Satellite Program Manager	*(CPS)*	*Sandor NEMETHY*	*SS/L*
Satellite Preparation Manager	*(RPS)*	*Pamela MURRAY*	*SS/L*
In charge of Athena Fidus satellite			
Satellite Mission Director	*(DMS)*	*Alberto DORI*	*Telespazio*
Satellite Program Manager	*(CPS)*	*Philippe BRETON*	*TAS*
Satellite Preparation Manager	*(RPS)*	*Gilles OBADIA*	*TAS*
In charge of the launch vehicle			
Launch Site Operations Manager	*(COEL)*	*Christian LARDOT*	*ARIANESPACE*
Ariane Production Project Manager	*(CPAP)*	*Pierre-Yves TISSIER*	*ARIANESPACE*
Launcher Production Quality Manager	*(RQLP)*	*Sebastien GASPARINI*	*ARIANESPACE*
Launch Campaign Quality Manager	*(COCL)*	*Denis CORLAY*	*ARIANESPACE*
In charge of the Guiana Space Center (CSG)			
Range Operations Manager	*(DDO)*	*Damien SIMON*	*CNES/CSG*
Range Operations Deputy	*(DDO/A)*	*Raymond BOYCE*	*CNES/CSG*

Appendix 2. Launch environment conditions

Acceptable wind speed limits at lift-off range from between 7.5 m/s to 9.5 m/s according to the wind direction. The most critical is a northerly wind. For safety reasons, the wind's speed on the ground (Kourou), and at a high altitude (between 10,000 and 20,000 m) is also taken into account.

Appendix 3. The synchronized sequence

The synchronized sequence starts 7 mn before ignition (T-0), it is primarily designed to perform the final operations on the launcher prior to launch, along with the ultimate checks needed following switchover to flight configuration. As its name indicates, it is fully automatic, and is performed concurrently by the onboard computer and by two redundant computers at the ELA 3 launch complex until T-4 seconds.
The computers command the final electrical operations (startup of the flight program, servocontrols, switching from ground power supply to onboard batteries, etc.) and associated checks. They also place the propellant and fluid systems in flight configuration and perform associated checks. In addition, they handle the final ground system configurations, namely:

- Startup of water injection in the flame trenches and jet guide (T-30 sec).
- Hydrogen aspiration for chilldown of the Vulcain engine in the jet guide (T-18 sec).
- Burnoff of hydrogen used for chilldown (T-5.5 sec).

At T-4 seconds, the onboard computer takes over control of final engine startup and lift-off operations:

- It starts the ignition sequence for the Vulcain main stage engine (T-0).
- It checks engine operation (from T+4.5 to T+7.3 sec).
- It commands ignition of the solid boosters for immediate lift-off at T+7.3 seconds.

Any shutdown of the synchronized sequence after T-7 mn automatically places the launcher back in its T-7 min configuration.

Appendix 4. Arianespace and the Guiana Space Center

Arianespace was founded in 1980 as the world's first launch Service & Solutions company. Today, Arianespace has 21 shareholders from ten European countries (including French space agency CNES with 34%, Astrium with 30%, and all European companies participating in the construction of Ariane launchers).
Since the outset, Arianespace has signed more than 350 launch contracts and launched 316 satellites. More than two-thirds of the commercial satellites now in service worldwide were launched by Arianespace. The company posted sales of about 975 million euros in 2013.

At January 1, 2014, Arianespace had 330 employees, working at the company's headquarters in Evry (near Paris), the Guiana Space Center in French Guiana, where the Ariane, Soyuz and Vega launch pads are located, and offices in Washington, D.C., Tokyo and Singapore.
Arianespace offers launch Service & Solutions to satellite operators from around the world, including private companies and government agencies. These Service & Solutions call on three launch vehicles:
- The Ariane 5 heavy launcher, operated from the Guiana Space Center in Kourou, French Guiana.
- The Soyuz medium launcher, currently in operation at the Baikonur Cosmodrome in Kazakhstan and the Guiana Space Center.
- The Vega light launcher, launched also from the Guiana Space Center.

With its family of launchers, Arianespace won over half of the commercial launch contracts up for bid worldwide in the last two years. Arianespace now has a backlog of more than 40 satellites to be launched.

The Guiana Space Center: Europe's Spaceport

For over 30 years, the Guiana Space Center (CSG), Europe's Spaceport in French Guiana, has offered a complete array of facilities for rocket launches.
It mainly comprises the following:
- CNES/CSG technical center, including various resources and facilities that are critical to launch base operations, such as radars, telecom network, weather station, receiving sites for launcher telemetry, etc.
- Payload processing facilities (ECPU), in particular the S5 facility.
- Ariane, Soyuz and Vega launch complexes, comprising the launch zones and launcher integration buildings.
- Various industrial facilities, including those operated by Regulus, Europropulsion, Air Liquide Spacial Guyane and Astrium, which contribute to the production of Ariane 5 elements. A total of 40 European manufacturers and local companies are involved in operations.

Europe's commitment to independent access to space is based on actions by three key players: the European Space Agency (ESA), French space agency CNES and Arianespace.

ESA is responsible for the development of the Ariane, Soyuz and Vega programs at the Guiana Space Center. Once these launch systems are qualified, ESA will transfer responsibility to the operator Arianespace. ESA has helped change the role of the Guiana Space Center, in particular by funding the construction of the launch complexes, payload processing buildings and associated facilities. Initially used for the French space program, the Guiana Space Center has gradually become Europe's own spaceport, according to the terms of an agreement between ESA and the French government.
To ensure that the Spaceport is available for its programs, ESA takes charge of the lion's share of CNES/CSG fixed expenses, and also helps finance the fixed costs for the ELA launch complexes.

French space agency CNES plays several roles at the Space Center.
- It designs all infrastructures and, on behalf of the French government, is responsible for safety and security.
- It provides the resources needed to prepare the satellites and launcher for missions.

Whether during tests or actual launches, CNES is also responsible for overall coordination of operations. It collects and processes all data transmitted from the launcher via a network of receiving stations, to track Ariane, Soyuz and Vega rockets throughout their trajectories.
In French Guiana, Arianespace is the contracting authority in charge of operating the family of three launchers, Ariane, Soyuz and Vega.

Arianespace supervises the integration and functional checks of the Ariane launcher, built by Astrium as production prime contractor, in the Launcher Integration Building (BIL). It then carries out acceptance tests of the launcher at the same time as satellite preparations in the Payload Preparation Complex (EPCU), operated by the Guiana Space Center (CSG). Arianespace next oversees final assembly of the launcher and integration of satellites in the Final Assembly Building (BAF), followed by transfer of the launcher to Launch Zone No. 3 (ZL3), and then final countdown and liftoff from Launch Complex No. 3 (CDL3). Arianespace has created a top-flight team and array of technical resources to get launchers and satellites ready for their missions. Building on this unrivalled expertise and outstanding local facilities, Arianespace is now the undisputed benchmark in the global launch services market.