ARIANESPACE LAUNCHES SATELLITES FOR TWO MAJOR EUROPEAN OPERATORS

On its second Ariane 5 launch of the year, Arianespace will orbit two telecommunications satellites: ASTRA 5B for the Luxembourg-based operator SES, and Amazonas 4A for the Spanish operator Hispasat.

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.

Arianespace and SES have developed an exceptional relationship over the last two decades. ASTRA 5B will be the 39th satellite from the SES group (Euronext Paris and Luxembourg Bourse: SESG) to use Europe's launcher. SES operates the leading direct-to-home (DTH) satellite broadcast system in Europe, based on its ASTRA family of satellites, serving more than 135 million households via cable and DTH networks.

Built by Airbus Defence and Space using a Eurostar 3000 L platform, ASTRA 5B will weigh about 5,755 kg at launch. It is fitted with 40 active Ku and 6 Ka-band transponders, and will be positioned at 31.5 degrees East. The ASTRA 5B satellite will provide DTH television broadcast, cable distribution and digital terrestrial television (DTTV) network services in Europe. It also hosts an L-band payload for the European navigation overlay system, EGNOS. ASTRA 5B offers a design life of about 15 years.

ASTRA 5B is the 107th satellite built by Airbus Defence and Space to be launched by Arianespace.

Amazonas 4A will be the 8th Spanish satellite launched by Arianespace. The launch services company first orbited the Hispasat 1A and 1B satellites in 1992 and 1993. In 2005 and 2006, Hispasat and its subsidiary Hisdesat chose Arianespace to launch the XTAR-Eur and Spainsat satellites, with Amazonas 2 and Hispasat 1E following in 2009 and 2010, respectively. Arianespace also launched Amazonas 3 in February 2013.

Amazonas 4A was built by Orbital Sciences Corporation using a GEOStar-2.4 platform, and will weigh about 3,000 kg at launch. It is equipped with 24 active Ku-band transponders. This high-power satellite will provide a broad range of telecommunications services across all of South America, and has a design life of 15 years.

Amazonas 4A is the 25th satellite built by Orbital Sciences Corporation to be launched by Arianespace.

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

1. Mission profile

The 217th Ariane mission will boost two telecommunications satellites into geostationary transfer orbit: ASTRA 5B for the Luxembourg-based operator SES, and Amazonas 4A for the Spanish operator Hispasat.

This will be the 73rd Ariane 5 launch.

The launcher will be carrying a total payload of 9,579 kg, including 8,755 kg for the ASTRA 5B and Amazonas 4A 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	***250 km***
Apogee altitude	***35,736 km***
Inclination	***3 degrees***

The lift-off is scheduled on the night of March 21 to 22, 2014 as soon as possible within the following launch window:

Launch opportunity

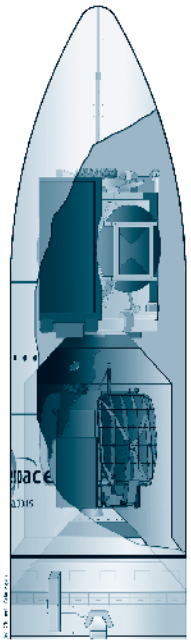
Universal time (GMT)	*Paris time*	*Kourou time*	*Washington time*
Between 10:05 pm	*11:05 pm*	*7:05 pm*	*6:05 pm*
and 11:02 pm	*12:02 am*	*8:02 pm*	*7:02 pm*
on March 21, 2014	*March 21-22, 2014*	*March 21, 2014*	*March 21, 2014*

Payload configuration

The ASTRA 5B satellite was built by Airbus Defence and Space in Toulouse, France, for the Luxembourg-based operator SES.

Orbital position: 31.5° East

The Amazonas 4A satellite was built by Orbital Sciences Corporation in Dulles, Virginia (United States) for Spanish operator Hispasat.



2. Range operations campaign: ARIANE 5 - ASTRA 5B & Amazonas 4A

Satellites and launch vehicle campaign calendar

Ariane activities	*Dates*	*Satellites activities*
Campaign start review	*September 25, 2013*	
EPC Erection	*September 25, 2013*	
EAP transfer and positioning	*September 26, 2013*	
Integration EPC/EAP	*September 257 2013*	
ESC-A and VEB Erection	*October 1st, 2013*	
	November 5, 2013	*Arrival in Kourou of ASTRA 5B and beginning of preparation campaign in building S1B*
	February 4, 2014	*Arrival in Kourou of Amazonas 4A and beginning of preparation campaign in building S1B*
	February 11, 2014	*ASTRA 5B transfer to S5B*
Roll-out from BIL to BAF	*February 17, 2014*	
	Feb 28, - March 7, 2014	*ASTRA 5B filling operations*
	March 7, 2014	*Amazonas 4A transfer to S5A*
	March 10-12, 2014	*Amazonas 4A filling operations*

Satellites and launch vehicle campaign final calendar

J-12	*Saturday March 8, 2014*	*ASTRA 5B integration on adaptor (PAS)*
J-11	*Monday March 10, 2014*	*ASTRA 5B Functional tests*
J-10	*Tuesday March 11, 2014*	*ASTRA 5B transfer to Final Assembly Building (BAF)*
J-9	*Wednesday March 12, 2014*	*ASTRA 5B integration on Sylda and Amazonas 4A integration on adaptor (PAS)*
J-8	*Thursday March 13, 2014*	*Amazonas 4A transfer to Final Assembly Building (BAF) and Fairing integration on Sylda*
J-7	*Friday March 14, 2014*	*Amazonas 4A integration on launcher*
J-6	*Saturday March 15, 2014*	*Composite integration with ASTRA 5B on launcher*
J-5	*Sunday March 16, 2014*	*Completion of composite integration on launcher*
J-4	*Monday March 17, 2014*	*ESC-A final preparations and Launch rehearsal*
J-3	*Tuesday March 18, 2014*	*Arming of launch vehicle*
J-2	*Wednesday March 19, 2014*	*Arming of launch vehicle Launch readiness review (RAL) and final preparation of launcher*
J-1	*Thursday March 20, 2014*	*Roll-out from BAF to Launch Area (ZL), launch vehicle connections and filling of the EPC liquid helium sphere*
J0	*Friday March 21, 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*	*36*
+ 17,0 s	*Beginning of roll manoeuvre*	*0,3*	*72*
+ 2 mn 24 s	*Jettisoning of solid boosters*	*68,4*	*2033*
+ 3 mn 23 s	*Jettisoning of fairing*	*111,1*	*2315*
+ 8 mn 43 s	*Acquisition by Natal tracking station*	*180,1*	*5368*
+ 8 mn 47 s	*Shut-down of main cryogenic stage*	*178,6*	*6891*
+ 8 mn 53 s	*Separation of main cryogenic stage*	*178,5*	*6918*
+ 8 mn 57 s	*Ignition of upper cryogenic stage (ESC-A)*	*178,4*	*6920*
+ 13 mn 33 s	*Acquisition by Ascension tracking station*	*154,9*	*7582*
+ 18 mn 24 s	*Acquisition by Libreville tracking station*	*181,4*	*8356*
+ 23 mn 07 s	*Acquisition by Malindi tracking station*	*425,1*	*9093*
+ 24 mn 59 s	*Injection*	*624,4*	*9379*
+ 27 mn 03 s	*Separation of **ASTRA 5B** satellite*	*922,4*	*9129*
+ 33 mn 06 s	*Separation of Sylda 5*	*2018,7*	*8248*
+ 34 mn 37 s	*Separation of **Amazonas 4A** satellite*	*2470,1*	*8021*
+ 47 mn 39 s	*End of Arianespace Flight mission*	*5750,5*	*6348*

4. Flight trajectory of ASTRA 5B & Amazonas 4A

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

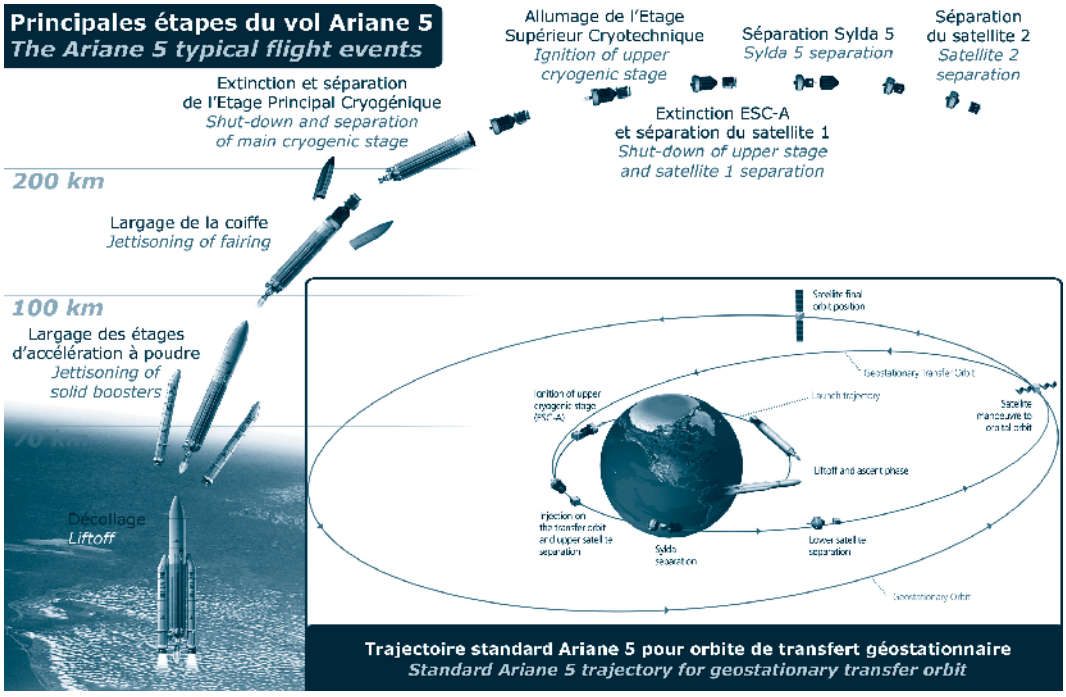
7.05 seconds after ignition of the main stage cryogenic engine at T-0, the two solid-propellant boosters are ignited, enabling liftoff. The launcher first climbs vertically for 6 seconds, then rotates towards the East. It maintains an attitude that ensures the axis of the launcher remains parallel to 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).

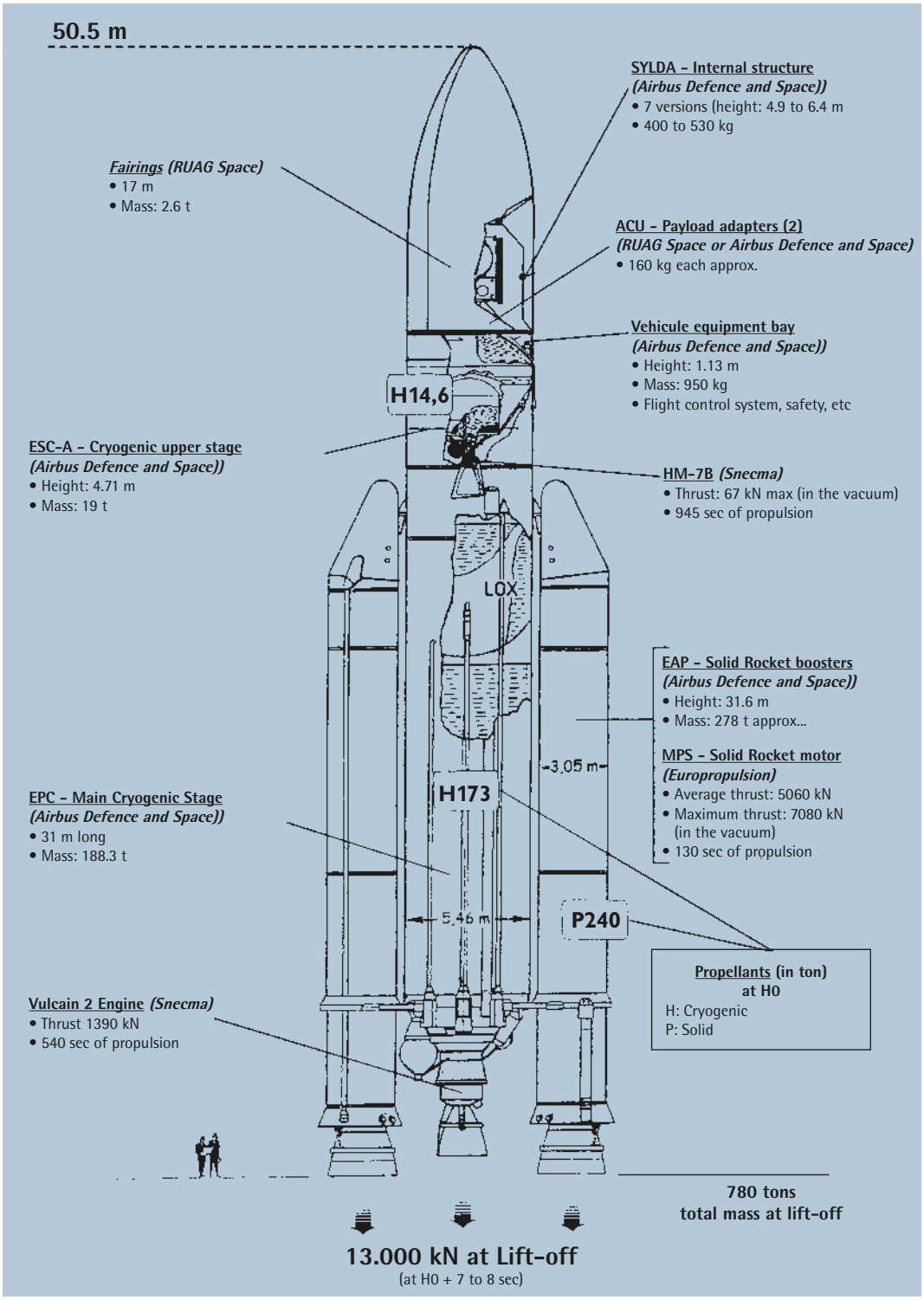
On orbital injection, the launcher will have attained a velocity of approximately 9,379 meters/second, and will be at an altitude of about 624.4 kilometers.

The fairing protecting the ASTRA 5B and Amazonas 4A spacecraft is jettisoned shortly after the boosters are jettisoned at about T+203 seconds.

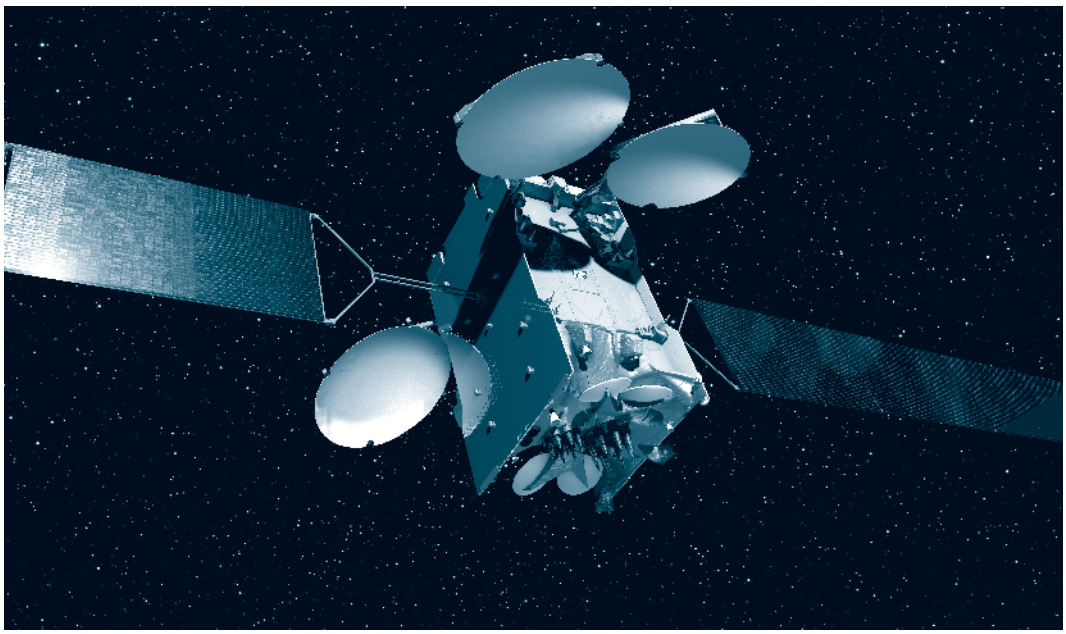
Standard Ariane 5 trajectory for geostationary transfer orbit



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



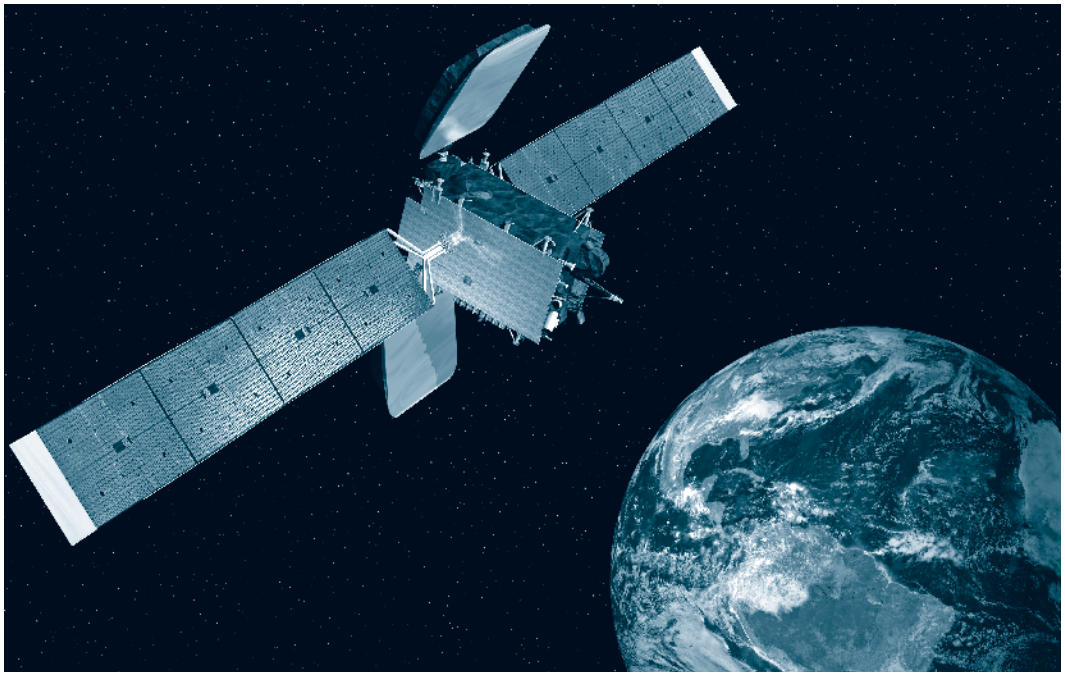
6. The ASTRA 5B satellite



Customer	*SES*
Prime contractor	*Airbus Defence and Space*
Mission	*Video services, telecommunications and government services*
Mass	*Total mass at lift-off approx. 5,755 kg*
Stabilization	*3 axis*
Dimensions *Span in orbit*	*Body height 5 m* *40 m*
Platform	*Eurostar 3000 L*
Payload	*40 Ku and 6 Ka band transponders*
On-board power	*13.5 kW (end of life)*
Life time	*15 years*
Orbital position	*31.5° East*
Coverage area	*Europe*

Press Contact
Yves Feltes
SES
VP Corporate media relations
Tel +352 710 725 311
Email: yves.feltes@ses.com

7. The Amazonas 4A satellite



Customer	*Hispasat*	
Prime contractor	*Orbital Sciences Corporation*	
Mission	*Telecommunications*	
Mass	*Total mass at lift-off*	*< 3,000 kg*
Stabilization	*3 axis*	
Dimensions *Span in orbit*	*4.7 m x 2.5 m x 3.2 m* *23 m*	
Platform	*GEOStar-2.4*	
Payload	*24 Ku band transponders*	
On-board power	*7 kW (end of life)*	
Life time	*15 years*	
Coverage area	*South America*	

Press Contact
Cristina Perez Cantó
Directora de comunicación - HISPASAT
Castellana, 39 - 28046 Madrid
Tel : 91 708 08 53
E-mail : cpcanto@hispasat.es

Appendix 1. Arianespace - ASTRA 5B & Amazonas 4A launch key personnel

In charge of the launch campaign			
Mission Director	*(CM)*	*Jean-Marc DURAND*	*ARIANESPACE*
In charge of the launch service contract			
Program Director ASTRA 5B	*(CP)*	*Christophe BARDOU*	*ARIANESPACE*
Program Director Amazonas 4A	*(CP)*	*Alina SENTENAI*	*ARIANESPACE*
In charge of ASTRA 5B satellite			
Satellite Mission Director	*(DMS)*	*Rick STARKOVS*	*SES*
Satellite Program Manager	*(CPS)*	*Eric PERROT*	*AIRBUS*
Satellite Preparation Manager	*(RPS)*	*Christophe LE BLAY*	*AIRBUS*
In charge of Amazonas 4A satellite			
Satellite Mission Director	*(DMS)*	*Antonio ABAD*	*Hispasat*
Satellite Program Manager	*(CPS)*	*Zachary SCHULTZ*	*OSC*
Satellite Preparation Manager	*(RPS)*	*Jim JONES*	*OSC*
In charge of the launch vehicle			
Launch Site Operations Manager	*(COEL)*	*Frédéric FACCHIN*	*ARIANESPACE*
Ariane Production Project Manager	*(CPAP)*	*Laurent JOURDAINE*	*ARIANESPACE*
Launcher Production Quality Manager	*(RQLP)*	*Isabelle LECLERE*	*ARIANESPACE*
Launch Campaign Quality Manager	*(COCL)*	*Bernard DECOTIGNIE*	*ARIANESPACE*
In charge of the Guiana Space Center (CSG)			
Range Operations Manager	*(DDO)*	*Laura APPOLLONI*	*CNES/CSG*
Range Operations Deputy	*(DDO/A)*	*Damien SIMON*	*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 318 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.