

SATELLITE LAUNCHES FOR EUROPE AND JAPAN

For its fourth launch of the year, Arianespace will orbit two communications satellites: W3B for the European operator Eutelsat, and BSAT-3b for the American manufacturer Lockheed Martin Commercial Space Systems, as part of a turnkey contract with Japanese operator Broadcasting Satellite System Corporation (B-SAT).

The choice of Arianespace by leading space communications operators and manufacturers is clear international recognition of the company's excellence in launch services. Based on the proven reliability and availability of its launch services, Arianespace continues to confirm its position as the world's benchmark launch system.

Ariane 5 is the only commercial satellite launcher now on the market capable of simultaneously launching two payloads.

Arianespace and Eutelsat have built a strong and uninterrupted relationship for more than 25 years, with the European launcher orbiting over half of Eutelsat's fleet. W3B will be the 25th Eutelsat satellite launched by Arianespace.

The W3B satellite was built by Thales Alenia Space as prime contractor, using a Spacebus 4000 C3 platform. It will weigh 5,370 kg at launch. W3B is equipped with 53 active Ku-band transponders and three Ka-band transponders. Offering a design life of 15 years, it will be located at 16 degrees East to serve broadcasting markets in Central Europe and Indian Ocean islands. It will also initiate a new mission over Africa for data, telecom and broadband services.

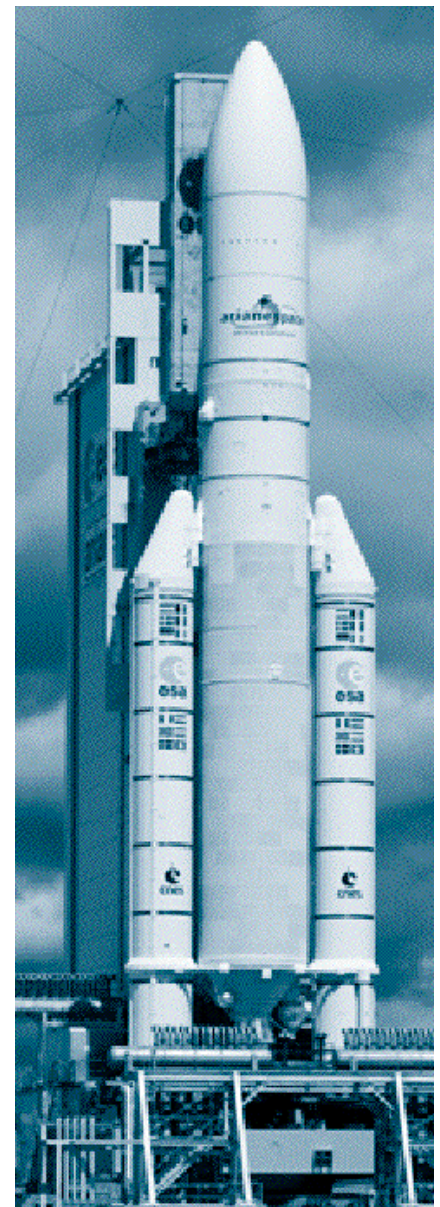
BSAT-3b is the seventh satellite for which B-SAT Corp. has chosen Ariane, and the 40th Lockheed Martin-built platform to be launched by Arianespace.

BSAT-3b was built by Lockheed Martin Commercial Space Systems at its plant in Newtown, Pennsylvania, using an A2100 A platform. Weighing about 2,060 kg at launch, it will be positioned at 110 degrees East longitude in geostationary orbit, and offers a design life exceeding 15 years. BSAT-3b is fitted with eight 130 Watt Ku-band transponders, and is primarily designed to provide direct TV broadcast links for all of Japan.

- 1 - The ARIANESPACE mission
- 2 - Range operations campaign: ARIANE 5
- 3 - Launch countdown and flight events
- 4 - Flight Trajectory
- 5 - The ARIANE 5 launch vehicle
- 6 - The W3B satellite
- 7 - The BSAT-3b satellite

Appendix

1. Flight Key personnel
2. Launch environment conditions
3. Synchronized sequence
4. ARIANESPACE, its relations with ESA and CNES



1. Mission profile

The 197th Ariane mission will place into geostationary transfer orbit two communications satellites: W3B for the European operator Eutelsat, and BSAT-3b for the American manufacturer Lockheed Martin Commercial Satellite Systems, as part of a turnkey contract with Japanese operator Broadcasting Satellite System Corporation (B-SAT).

This will be the 53rd Ariane 5 launch

The launcher will be carrying a total payload of 8,263 kg, including 7,460 kg for the W3B and BSAT-3b 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.

Injection orbit

<i>Perigee altitude</i>	250 km
<i>Apogee altitude</i>	35,913 km at injection
<i>Inclination</i>	2° degrees

The lift-off is scheduled on the night of October 28 to 29, 2010 as soon as possible within the following launch window:

Launch opportunity

	<i>Universal time (GMT)</i>	<i>Paris time</i>	<i>Kourou time</i>	<i>Washington time</i>	<i>Tokyo time</i>
<i>Between</i>	9:51 pm	11:51 pm	6:51 pm	5:51 pm	6:51 am
<i>and</i>	11:01 pm	1:01 am	8:01 pm	7:01 pm	8:01 am
<i>on</i>	October 28, 2010	October 28-29, 2010	October 28, 2010	October 28, 2010	October 29, 2010

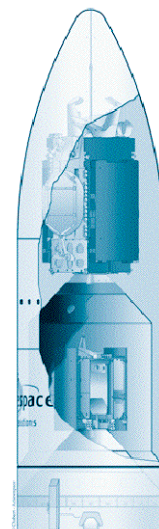
Configuration of Ariane payload

The W3B satellite was built by Thales Alenia Space, in Cannes, France, for the operator Eutelsat.

Orbital position: 16° East

The BSAT-3b satellite was built by Lockheed Martin Commercial Space Systems (LMCSS) at its plant in Newtown, Pennsylvania, for the Japanese operator Broadcasting Satellite System Corporation (B-SAT).

Orbital position: 110° East



2. Range operations campaign: ARIANE 5 - W3B & BSAT-3b

Satellites and launch vehicle campaign calendar

<i>Ariane activities</i>	<i>Dates</i>	<i>Satellites activities</i>
<i>Campaign start review</i>	<i>July 26, 2010</i>	
<i>EPC Erection</i>	<i>July 26, 2010</i>	
<i>EAP transfer and positioning</i>	<i>July 27, 2010</i>	
<i>Integration EPC/EAP</i>	<i>July 28, 2010</i>	
<i>ESC-A and VEB Erection</i>	<i>August 2, 2010</i>	
	<i>August 17, 2010</i>	<i>Arrival in Kourou of BSAT-3b and beginning of preparation campaign in building S1 B</i>
<i>Roll-out from BIL to BAF</i>	<i>September 9, 2010</i>	
	<i>September 30, 2010</i>	<i>Arrival in Kourou of W3B and beginning of preparation campaign in building S1 B</i>
	<i>October 11-14, 2010</i>	<i>W3B filling operations</i>
	<i>October 12-14, 2010</i>	<i>BSAT-3b filling operations</i>
	<i>October 15, 2010</i>	<i>W3B integration on adaptor (ACU)</i>

Satellites and launch vehicle campaign final calendar

<i>J-10</i>	<i>Saturday, October 16</i>	<i>W3B transfer to Final Assembly Building (BAF)</i>
<i>J-9</i>	<i>Monday, October 18</i>	<i>BSAT-3b integration on adaptor and W3B integration on Sylda</i>
<i>J-8</i>	<i>Tuesday, October 19</i>	<i>Fairing integration on Sylda - BSAT-3b transfer to Final Assembly Building (BAF)</i>
<i>J-7</i>	<i>Wednesday, October 20</i>	<i>BSAT-3b integration on launcher</i>
<i>J-6</i>	<i>Thursday, October 21</i>	<i>Upper composite integration with W3B on launcher</i>
<i>J-5</i>	<i>Friday, October 22</i>	<i>ESC-A final preparations and payloads control</i>
<i>J-4</i>	<i>Saturday, October 23</i>	<i>Launch rehearsal</i>
<i>J-3</i>	<i>Monday, October 25</i>	<i>Arming of launch vehicle</i>
<i>J-2</i>	<i>Tuesday, October 26</i>	<i>Arming of launch vehicle</i> <i>Launch readiness review (RAL) and final preparation of launcher</i>
<i>J-1</i>	<i>Wednesday, October 27</i>	<i>Roll-out from BAF to Launch Area (ZL), launch vehicle connections and filling of the EPC liquid Helium sphere</i>
<i>J-0</i>	<i>Thursday, October 28</i>	<i>Launch countdown including EPC and ESC-A filling with liquid oxygen and liquid hydrogen</i>

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.

<i>Time</i>	<i>Events</i>
- 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

<i>HO</i>	<i>Ignition of the cryogenic main stage engine (EPC)</i>	<i>ALT (km)</i>	<i>V. rel. (m/s)</i>
+ 7,05 s	Ignition of solid boosters	0	0
+ 7,3 s	Liftoff	0	0
+ 12,5 s	End of vertical climb and beginning of pitch rotation (10 seconds duration)	0.090	37.7
+ 17 s	Beginning of roll manoeuvre	0.347	77.1
+ 2 mn 22 s	Jettisoning of solid boosters	69.1	2004
+ 3 mn 9 s	Jettisoning of fairing	107.7	2188
+ 7 mn 31 s	Acquisition by Natal tracking station	211	4959
+ 8 mn 50 s	Shut-down of main cryogenic stage	213.2	6813.2
+ 8 mn 56 s	Separation of main cryogenic stage	213.0	6840.7
+ 9 mn 00 s	Ignition of upper cryogenic stage (ESC-A)	212.9	6843.1
+ 13 mn 22 s	Acquisition by Ascension tracking station	187	7521
+ 18 mn 22 s	Acquisition by Libreville tracking station	213	8325
+ 23 mn 9 s	Acquisition by Malindi tracking station	469	9083
+ 24 mn 47 s	Shut-down of ESC-A / Injection	645.9	9357.8
+ 28 mn 11 s	Separation of W3B satellite	1186.7	8918.2
+ 36 mn 32 s	Separation of Sylva 5	3030.3	7682.2
+ 37 mn 50 s	Separation of BSAT-3b satellite	3354.4	7498.3
+ 49 mn 50 s	End of Arianespace Flight mission	6422.9	6077.4

4. Flight trajectory of W3B & BSAT-3b

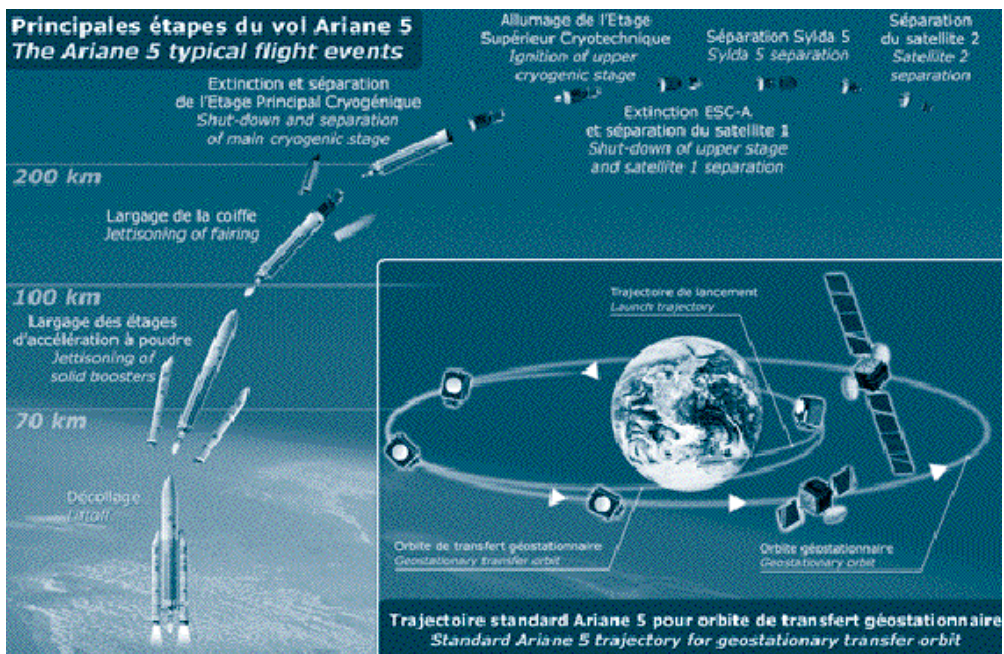
The launcher's attitude and trajectory are totally controlled by the two onboard computers, located in the Ariane 5 vehicle equipment bay (VEB).

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).

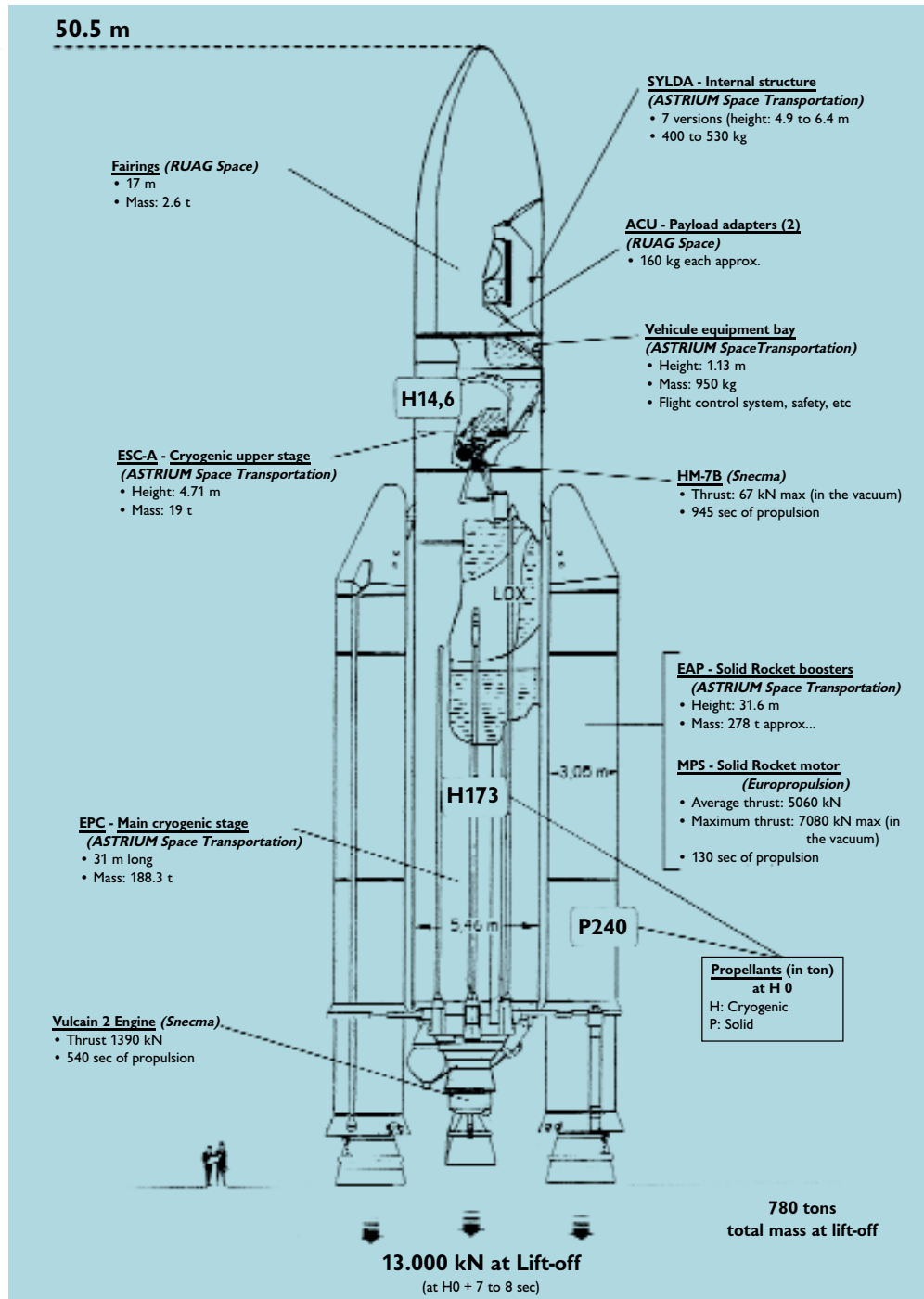
On orbital injection, the launcher will have attained a velocity of approximately 9358 meters/second, and will be at an altitude of about 646 kilometers.

The fairing protecting the W3B et BSAT-3b spacecraft is jettisoned shortly after the boosters are jettisoned at about T+189 seconds.

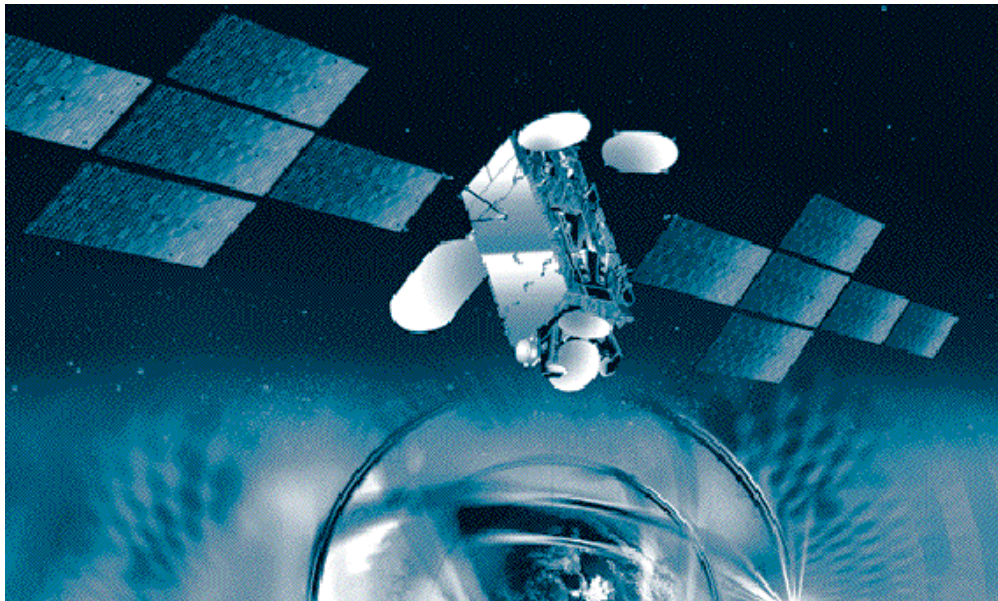
Standard Ariane 5 trajectory for geostationary transfer orbit



5. The Ariane 5-ECA (Industrial prime contractor: ASTRIUM Space Transportation)



6. The W3B satellite



Customer	EUTELSAT
<i>Prime contractor</i>	<i>Thales Alenia Space</i>
<i>Mission</i>	<i>Satellite for Direct Television (DTH) broadcasting, telecom, data and broadband services</i>
<i>Mass</i>	<i>Total mass at lift-off 5 370 kg</i>
<i>Stabilization</i>	<i>3 axis stabilized</i>
<i>Dimensions</i>	<i>5.8 x 2.0 x 2.2 m</i>
<i>Span in orbit</i>	<i>34 m</i>
<i>Platform</i>	<i>SPACEBUS 4000 C3</i>
<i>Payload</i>	<i>53 Ku-band transponders and 3 Ka-band transponders</i>
<i>On-board power</i>	<i>12 kW (end of life)</i>
<i>Life time</i>	<i>15 years</i>
<i>Orbital position</i>	<i>16° East</i>
<i>Coverage area</i>	<i>Europe, Africa, Middle East, Central Asia</i>

Press Contact

Frédérique GAUTIER
Eutelsat
Media Relations
Tel : + 33 (1) 53 98 46 21 - Fax : + 33 (1) 53 98 37 88
E-Mail : fgautier@eutelsat.fr

7. The BSAT-3b satellite



Customer *LOCKHEED MARTIN COMMERCIAL SPACE SYSTEMS (USA)
for B-SAT Corporation (JAPAN)*

<i>Prime contractor</i>	<i>LMCSS</i>	
<i>Mission</i>	<i>Direct to Home television satellite</i>	
<i>Mass</i>	<i>Total mass at lift-off</i>	<i>2 060 kg</i>
	<i>Dry mass</i>	<i>975 kg</i>
<i>Stabilization</i>	<i>3 axis stabilized</i>	
<i>Dimensions</i>	<i>3.8 x 1.9 x 1.9 m</i>	
<i>Span in orbit</i>	<i>14.65 m</i>	
<i>Platform</i>	<i>A2100 A</i>	
<i>Payload</i>	<i>12 130-watt Ku band channels, 8 operating at one time</i>	
<i>On-board power</i>	<i>3 KW (end of life)</i>	
<i>Life time</i>	<i>15 years</i>	
<i>Orbital position</i>	<i>110° East</i>	
<i>Coverage area</i>	<i>Japan</i>	

Contact Presse

Dee Valleras
Manager, Communications & Public Affairs
Lockheed Martin Commercial Space Systems
Phone : (215) 497 4185 - Fax : (215) 497 4017
E-mail : dee.valleras@lmco.com

Appendix 1. Arianespace W3B & BSAT-3b launch key personnel

In charge of the launch campaign

Mission Director	(CM)	Philippe ROLLAND	ARIANESPACE
------------------	------	------------------	-------------

In charge of the launch service contract

Program Director W3B	(CP1)	Pierre-Yves BERTIN	ARIANESPACE
----------------------	-------	--------------------	-------------

Program Director BSAT-3b	(CP2)	Luca CHIECCHO	ARIANESPACE
--------------------------	-------	---------------	-------------

In charge of W3B satellite

Satellite Mission Director	(DMS)	Raphaël MUSSALIAN	EUTELSAT
----------------------------	-------	-------------------	----------

Satellite Program Manager	(CPS)	Philippe MATHON	EUTELSAT
---------------------------	-------	-----------------	----------

Satellite Preparation Manager	(RPS)	Michel ROUSSY	THALES ALENIA SPACE
-------------------------------	-------	---------------	---------------------

In charge of BSAT-3b satellite

Satellite Mission Director	(DMS)	Luis TERRAZAS	LMCSS
----------------------------	-------	---------------	-------

Satellite Program Manager	(CPS)	Howard FLOYD	LMCSS
---------------------------	-------	--------------	-------

Satellite Preparation Manager	(RPS)	Roy WELLER	LMCSS
-------------------------------	-------	------------	-------

In charge of the launch vehicle

Launch Site Operations Manager	(COEL)	Patrick LUCET	ARIANESPACE
--------------------------------	--------	---------------	-------------

Ariane Production Project Manager	(CPAP)	Marc ROY	ARIANESPACE
-----------------------------------	--------	----------	-------------

Launcher Production Quality Manager	(RQLP)	Maël MATTOX	ARIANESPACE
-------------------------------------	--------	-------------	-------------

Launch Campaign Quality Manager	(CQCL)	Marylène MATHONNET	ARIANESPACE
---------------------------------	--------	--------------------	-------------

In charge of the Guiana Space Center (CSG)

Range Operations Manager	(DDO)	Antoine GUILLAUME	CNES/CSG
--------------------------	-------	-------------------	----------

Range Operations Deputy	(DDO/A)	Bruno GILLES	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, it handles 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 24 shareholders from ten European countries (including French space agency CNES with 34%, EADS with 30%, and all European companies participating in the construction of Ariane launchers).

Since the outset, Arianespace has signed more than 300 launch contracts and launched 283 satellites. More than two-thirds of the commercial satellites now in service worldwide were launched by Arianespace.

The company posted sales of 1046 million euros in 2009.

At January 1, 2010, Arianespace had 323 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 under the responsibility of Starsem, a Euro-Russian subsidiary of Arianespace, it will be launched from the Guiana Space Center starting in 2011.
- The Vega light launcher, to be launched from the Guiana Space Center starting in 2011.

Arianespace has also signed a mutual backup agreement with Boeing Launch Services and Mitsubishi Heavy Industries, through an entity called the Launch Services Alliance. This arrangement guarantees that customers' payloads will be launched in case the chosen launcher is unavailable for technical reasons.

With its family of launchers and this backup agreement, 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 (EPCU), in particular the S5 facility.
- Ariane launch complexes (ELA), comprising the launch zone and launcher integration buildings.
- Various industrial facilities, including those operated by Regulus, Europropulsion, Air Liquide Spacial Guyane and EADS, which contribute to the production of Ariane 5 elements. A total of 40 European manufacturers and local companies are involved in operations.

The Guiana Space Center is preparing to welcome two new launch vehicles, Soyuz and Vega. The Soyuz launch complex (ELS) and the Vega launch complex (SLV) are now under construction.

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 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 rockets throughout their trajectory.

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 EADS 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.