A DUAL LAUNCH FOR COMMUNICATIONS AND BROADCASTING SERVICES

Arianespace will orbit two communications and broadcast satellites on its fifth launch of the year: Arabsat 5C for the operator Arabsat and SES-2 for the operator SES.

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 its proven reliability and availability, 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 and handling a complete range of missions, from launches of commercial satellites into geostationary orbit to dedicated launches into special orbits.

Over the last 26 years, since the launch of Arabsat 1A in 1985, Arianespace and Arabsat have developed a very close relationship. Arabsat 5C is the eighth satellite for this operator to be orbited by the European launcher

Arabsat 5C was built by Astrium and Thales Alenia Space for satcom operator Arabsat, based in Riyadh, Saudi Arabia. Astrium supplied the Eurostar E3000 platform and handled satellite integration, while Thales Alenia Space supplied the payload. Fitted with 26 active channels in C-band and wide band transponders over 10 spots in Ka-band, Arabsat 5C will deliver supply communications services, as well as providing TV broadcast services for the Middle East and North Africa. Positioned at 20 degrees East, it offers a design life exceeding 15 years.

Arianespace and SES have developed an exceptional relationship over the last 20 years. SES-2 is the 35th satellite from the SES group (Euronext Paris and Luxembourg Bourse: SESG) to be lofted by an Ariane rocket.

SES-2 was built by Orbital Sciences Corporation using the Star 2.4 platform. It is fitted with 24 C-band and 24 Ku-band transponders, and offers a design life of 15 years.

Positioned at 87 degrees West, SES-2 will broadcast programming for the world's leading TV stations through one of the largest distribution networks in the market. It will also provide VSAT services for professional customers and government agencies in North America and the Caribbean.

The SES-2 satellite will also carry the Commercially Hosted Infrared Payload, or CHIRP, purpose-designed to meet the U.S. government's experimental requirements.

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 ARABSAT 5C satellite
7 - The SES-2 satellite

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

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

1. Mission profile

The 204th Ariane mission will orbit two communications and broadcast satellites: Arabsat 5C for the operator Arabsat and SES-2 for the operator SES.

This will be the 60th Ariane 5 launch.

The launcher will be carrying a total payload of 8,974 kg, including 7,830 kg for the Arabsat 5C and SES-2 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

Perigee altitude	***249.6 km***
Apogee altitude	***35,957 km at injection***
Inclination	***2° degrees***

The lift-off is scheduled on the night of September 17 to 18, 2011 as soon as possible within the following launch window:

Launch opportunity

	Universal time (GMT)	*Paris time*	*Kourou time*	*Washington time*	*Riyadh time*
Between	*9:39 pm*	*11:39 pm*	*6:39 pm*	*5:39 pm*	*12:39 am*
and	*11:02 pm*	*01:02 am*	*8:02 pm*	*7:02 pm*	*02:02 am*
on	*September 17, 2011*	*September 17-18 2010*	*September 17, 2011*	*September 17, 2011*	*September 18, 2011*

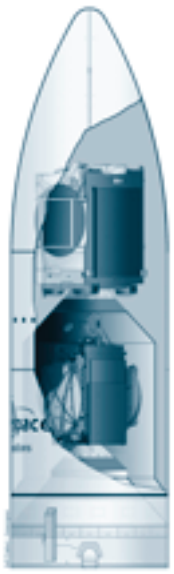
Configuration of Ariane payload

The Arabsat 5C satellite was built by Astrium and Thales Alenia Space on behalf of the operator Arabsat.

Orbital position: 20° East

The SES-2 satellite was built by Orbital Sciences Corporation in Newtown, Pennsylvania for the operator SES.

Orbital position: 87° *West*



2. Range operations campaign: ARIANE 5 - ARABSAT 5C & SES-2

Satellites and launch vehicle campaign calendar

Ariane activities	*Dates*	*Satellites activities*
Campaign start review	*June 23, 2011*	
EPC Erection	*June 23, 2011*	
EAP transfer and positioning	*June 24-25, 2011*	
Integration EPC/EAP	*June 27, 2011*	
ESC-A and VEB Erection	*June 29, 2011*	
	August 3, 2011	*Arrival in Kourou of SES-2 and beginning of preparation campaign in building S5 C*
	August 8, 2011	*Arrival in Kourou of ARABSAT 5C and beginning of preparation campaign in building S5 C*
	August 16-18, 2011	*SES-2 filling operations*
	August 19-24, 2011	*ARABSAT 5C filling operations*
Roll-out from BIL to BAF	*August 23, 2011*	

Satellites and launch vehicle campaign final calendar

J-11	*Friday, August 26*	*ARABSAT 5C integration on adaptor (ACU)*
J-10	*Saturday, August 27*	*ARABSAT 5C transfer to Final Assembly Building (BAF) SES-2 integration on adaptor*
J-9	*Monday, August 29*	*Arming of SES-2 - ARABSAT 5C integration on Sylda*
J-8	*Tuesday, August 30*	*Fairing integration on Sylda - SES-2 transfer to Final Assembly Building (BAF)*
J-7	*Wednesday, August 31*	*SES-2 integration on launcher*
J-6	*Thursday, September 1st*	*ESC-A final preparations and payloads control Upper composite integration with ARABSAT 5C on launcher*
	September 2-8	*Supplementary checks on launch vehicle*
J-6 bis	*Friday, September 9*	*Resume functional control*
J-5	*Monday, September 12*	*Satellite functional tests on launcher*
J-4	*Tuesday, September 13*	*Launch rehearsal*
J-3	*Wednesday, September 14*	*Arming of launch vehicle*
J-2	*Thursday, September 15*	*Launch readiness review (RAL) and final preparation of launcher*
J-1	*Friday, September 16*	*Roll-out from BAF to Launch Area (ZL), launch vehicle connections and filling of the EPC liquid helium sphere*
J-0	*Saturday, September 17*	*Launch countdown including EPC and ESC-A filling with liquid oxygen and liquid hydrogen*

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*

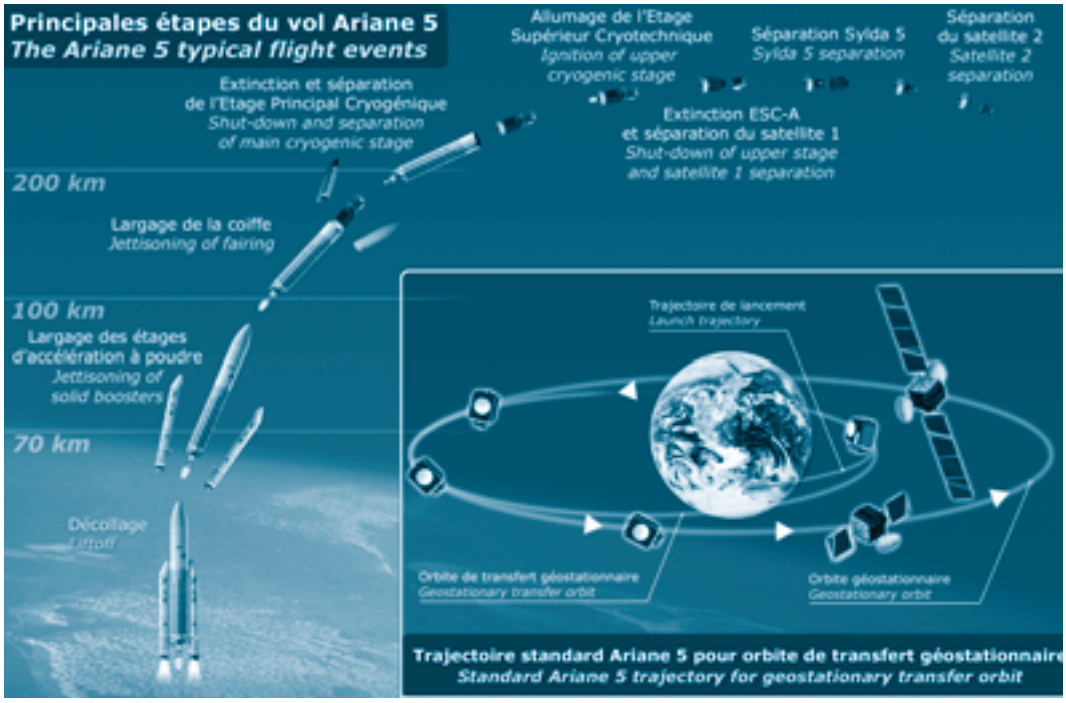
HO	*Ignition of the cryogenic main stage engine (EPC)*		*ALT (km)*	*V. rel. (m/s)*
	+ 7,05 s	*Ignition of solid boosters*	*0*	*0*
	+ 7,3 s	*Liftoff*	*0*	*0*
	+ 12,5 s	*End of vertical climb and beginning of pitch rotation (10 seconds duration)*	*0.092*	*37.5*
	+ 17,1 s	*Beginning of roll manoeuvre*	*0.34*	*75.5*
+ 2 mn	*21 s*	*Jettisoning of solid boosters*	*69*	*1995*
+ 3 mn	*08 s*	*Jettisoning of fairing*	*106.9*	*2190*
+ 7 mn	*39 s*	*Acquisition by Natal tracking station*	*188.8*	*5118*
+ 8 mn	*59 s*	*Shut-down of main cryogenic stage*	*186.7*	*6890*
+ 8 mn	*05 s*	*Separation of main cryogenic stage*	*186.6*	*6917*
+ 9 mn	*09 s*	*Ignition of upper cryogenic stage (ESC-A)*	*186.6*	*6919*
+ 13 mn	*29 s*	*Acquisition by Ascension tracking station*	*167.0*	*7526*
+ 18 mn	*28 s*	*Acquisition by Libreville tracking station*	*193.5*	*8319*
+ 23 mn	*14 s*	*Acquisition by Malindi tracking station*	*434.6*	*9068*
+ 25 mn	*04 s*	*Injection*	*637.5*	*9368*
+ 27 mn	*21 s*	*Separation of ARABSAT 5C satellite*	*973.4*	*9087*
+ 34 mn	*38 s*	*Separation of Sylda 5*	*2477*	*8016*
+ 35 mn	*53 s*	*Separation of SES-2 satellite*	*2777*	*7832*
+ 47 mn	*58 s*	*End of Arianespace Flight mission*	*5845*	*6309*

4. Flight trajectory of ARABSAT 5C & SES-2

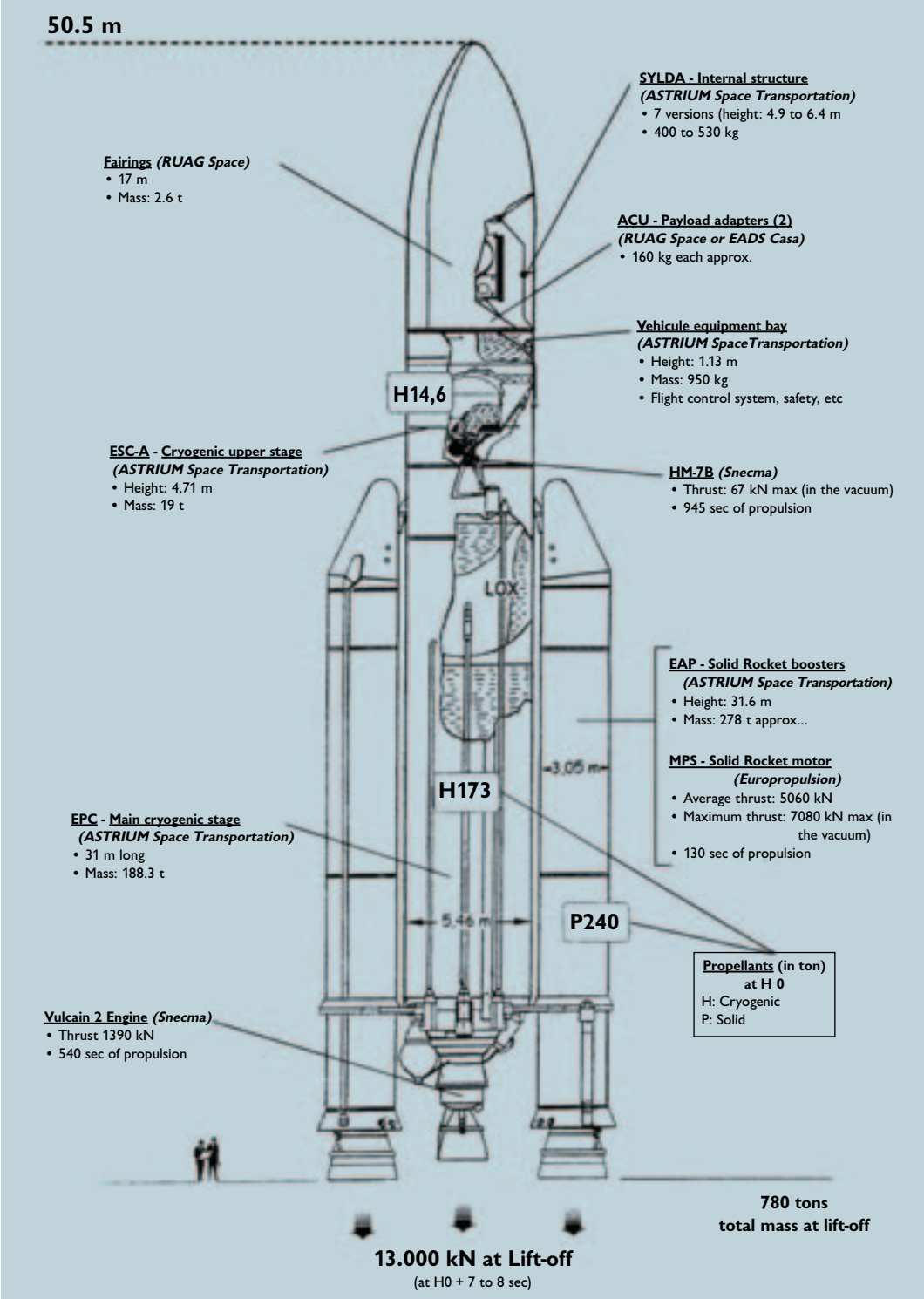
The launcher's attitude and trajectory are totally controlled by the two onboard computers, located in the Ariane 5 vehicle equipment bay (VEB).
7.05 seconds after ignition of the main stage cryogenic engine at T-0, the two solid-propellant boosters are ignited, enabling liftoff. The launcher first climbs 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 9368 meters/second, and will be at an altitude of about 637.5 kilometers.
The fairing protecting the ARABSAT 5C and SES-2 spacecraft is jettisoned shortly after the boosters are jettisoned at about T+188 seconds.

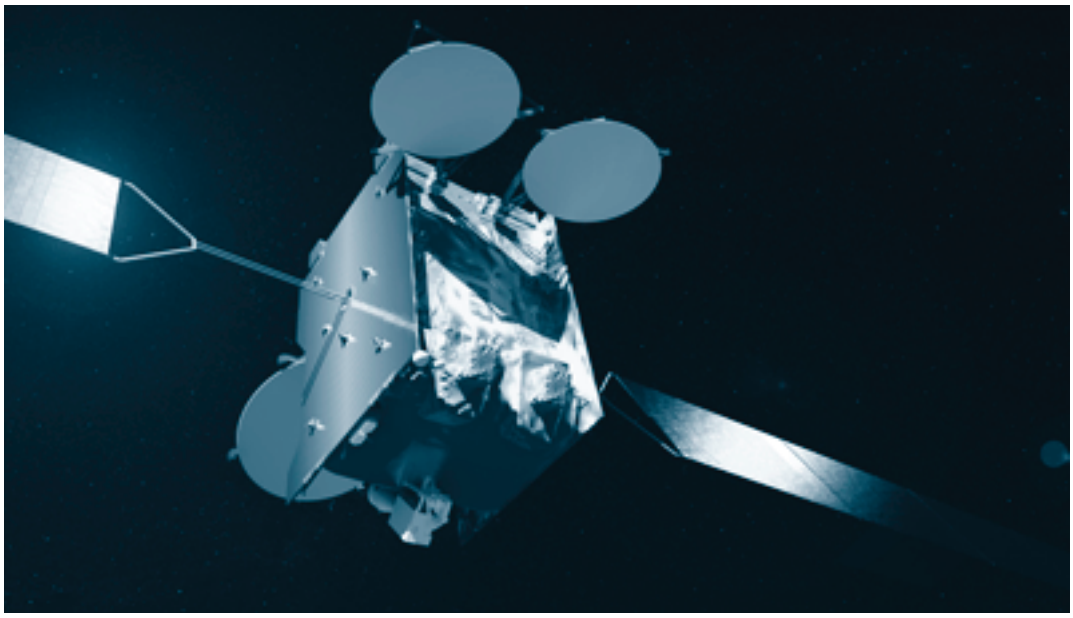
Standard Ariane 5 trajectory for geostationary transfer orbit



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



6. The ARABSAT 5C satellite



Customer	**ASTRIUM, THALES ALENIA SPACE & ARABSAT**
Prime contractor	*Astrium & Thales Alenia Space*
Mission	*Communications satellite*
Mass	*Total mass at lift-off 4 630 kg*
Stabilization	*3 axis stabilized*
Dimensions	*2.1 x 2.35 x 4.09 m*
Span in orbit	*30.75 m*
Platform	*EUROSTAR E3000*
Payload	*26 active channels in C-band and wide band transponders over 10 spots in Ka-band*
On-board power	*12 kW (end of life)*
Life time	*15 years*
Orbital position	*20° East*
Coverage area	*The Middle East and Africa*

Press Contact

Sandrine BIELECKI
Thales Alenia Space
Media Relations
Tel : + 33 (0) 4 92 92 70 94
E-Mail : Sandrine.Bielecki@thalesaleniaspace.com

Gregory GAVROY
Astrium
Media Manager
Tel : + 33 (0) 1 77 75 80 32
E-Mail : gregory.gavroy@astrium.eads.net

7. The SES-2 satellite

Customer	***SES***
Prime contractor	*ORBITAL SCIENCES CORPORATION*
Mission	*Telecommunications*
Mass	*Total mass at lift-off 3 200 kg*
Stabilization	*3 axis stabilized*
Dimensions	*4.9 x 3.3 x 2.30 m*
Span in orbit	*23.6 m*
Platform	*STAR 2.4*
Payload	*24 Ku-band transponders and 24 C-band transponders*
On-board power	*6 KW (end of life)*
Life time	*15 years*
Orbital position	*82° East*
Coverage area	*The Caribbean islands and North America*

Contact Presse
Leslie Gadsby
Industry Events Manager
SES
Phone : 609 987 4082 - Mobile : 609 273 3889
E-mail : leslie.gadsby@ses.com

Appendix 1. Arianespace ARABSAT 5C & SES-2 launch key personnel

In charge of the launch campaign			
Mission Director	*(CM)*	*Didier SAÏD*	*ARIANESPACE*
In charge of the launch service contract			
Program Director ARABSAT 5C	*(CP)*	*Thomas PANOZZO*	*ARIANESPACE*
Program Director SES-2	*(CP)*	*Alex MADEMBA-SY*	*ARIANESPACE*
In charge of ARABSAT 5C satellite			
Satellite Mission Director	*(DMS)*	*Ahmad AL SHRAIDEH*	*ARABSAT*
Satellite Program Manager	*(CPS)*	*Philippe LE BOUAR*	*ASTRIUM*
Satellite Preparation Manager	*(RPS)*	*Pascal LAFFAYE*	*ASTRIUM*
In charge of SES-2 satellite			
Satellite Mission Director	*(DMS)*	*Rick STARKOVS*	*OSC*
Satellite Program Manager	*(CPS)*	*Jeremy NOVOSAD*	*OSC*
Satellite Preparation Manager	*(RPS)*	*Mickael KOENIG*	*OSC*
In charge of the launch vehicle			
Launch Site Operations Manager	*(COEL)*	*Raphael BREDA*	*ARIANESPACE*
Ariane Production Project Manager	*(CPAP)*	*Didier AUBIN*	*ARIANESPACE*
Launcher Production Quality Manager	*(RQLP)*	*Sebastien GASPARINI*	*ARIANESPACE*
Launch Campaign Quality Manager	*(CQCL)*	*Maryléne MATHONNET*	*ARIANESPACE*
In charge of the Guiana Space Center (CSG)			
Range Operations Manager	*(DDO)*	*Aimée CIPPE*	*CNES/CSG*
Range Operations Deputy	*(DDO/A)*	*Thierry VALLEE*	*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 300 launch contracts and launched 296 satellites. More than two-thirds of the commercial satellites now in service worldwide were launched by Arianespace.
The company posted sales exceeding 900 million euros in 2010.
As of January 1, 2011, Arianespace had 331 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.

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 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 Astrium, 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 construction of the Soyuz launch complex (ELS) and of the Vega launch complex (SLV) have now been completed.
Europe's commitment to independent access to space is based on actions by three key players: the European Space Agency (ESA), the 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 infrastructure 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 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.