A SATELLITE LAUNCH FOR TELECOMMUNICATIONS IN THE MIDDLE EAST, NORTH AFRICA, CENTRAL ASIA AND INDIA

Arianespace will orbit two telecommunications satellites on its fourth Ariane 5 launch of the year: EUTELSAT 25B/Es'hail 1 for the Qatari and European operators, Es'hailSat and Eutelsat, and GSAT-7 for the Indian Space Research Organization (ISRO).

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 EUTELSAT 25B/Es'hail 1 satellite is a joint program by Eutelsat and Es'hailSat to operate a high-performance satellite at 25.5 degrees East, an orbital position that has been used for many years. This new satellite will serve booming markets in the Middle East, North Africa and Central Asia. It will bolster the organization's power and coverage from this orbital position, gradually taking over for EUTELSAT 25C. EUTELSAT 25B/Es'hail 1 was built by the American company Space Systems/Loral and will weigh over 6,000 kg at launch. In addition to ensuring Ku-band service continuity for Eutelsat and providing additional Ku-band capacity for Es'hailSat, the satellite will offer the two partners their initial Ka-band capacity, paving the way for new business development opportunities.

Arianespace and Eutelsat have established a long-standing, fruitful relationship reaching back more than 30 years. Two-thirds of Eutelsat's satellite fleet has been orbited by the European company, and EUTELSAT 25B/Es'hail 1 is the 27th Eutelsat satellite launched by Arianespace.

GSAT-7 will be the 17th ISRO satellite to use the European launcher. Starting with the launch of the Apple experimental satellite on flight L03 in 1981, Arianespace has orbited 16 Indian satellites to date.

Arianespace has also launched two other satellites designed by India, for the operators Eutelsat and Avanti Communications.

The collaboration between Arianespace and the Indian Space Research Organisation (ISRO) has been extended to include technological development aid for launcher operation.

Designed, developed and integrated by ISRO in Bangalore, southern India, the GSAT-7 multi-band telecommunications satellite will weigh about 2,650 kg at launch. It offers a design life exceeding seven years. GSAT-7 carries Ku, C, S and UHF band transponders. Positioned at 74 degrees East, its coverage zone encompasses the entire Indian subcontinent.

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

1. Mission profile

The 215th Ariane mission will boost two telecommunications satellites into geostationary transfer orbit: EUTELSAT 25B/Es'hail 1 for the operators Es'hailSat and Eutelsat, and GSAT-7 for the Indian Space Research Organization (ISRO).

This will be the 71st Ariane 5 launch.

The launcher will be carrying a total payload of 9,790 kg, including 8,960 kg for the EUTELSAT 25B/ ES'hail 1 and GSAT-7 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	***249 km***
Apogee altitude	***35,929 km***
Inclination	***3.5 degrees***

The lift-off is scheduled on the night of August 29 to 30, 2013 as soon as possible within the following launch window:

Launch opportunity

	Universal time (GMT)	*Paris time*	*Kourou time*	*Washington time*	*Doha time*	*Bangalore time*
Between	*8:30 pm*	*10:30 pm*	*5:30 pm*	*4:30 pm*	*11:30 pm*	*2:00 am*
and	*9:20 pm*	*11:20 pm*	*6:20 pm*	*5:20 pm*	*00:20 am*	*2:50 am*
on	*August 29, 2013*	*August 29, 2013*	*August 29, 2013*	*August 29, 2013*	*August 29 to 30, 2013*	*August 30, 2013*

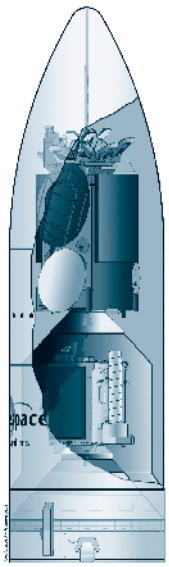
Payload configuration

The EUTELSAT 25B/Es'hail 1 satellite was built by Space Systems/Loral in Palo Alto, California, for the operators Es'hailSat and Eutelsat.

Orbital position: 25.5° East

The GSAT-7 satellite was built by the Indian Space Research Organization (ISRO) in Bangalore, India. ISRO will also operate the satellite.

Orbital position: 74° East



2. Range operations campaign: ARIANE 5 - EUTELSAT 25B/Es'hail 1 & GSAT-7

Satellites and launch vehicle campaign calendar

Ariane activities	*Dates*	*Satellites activities*
Campaign start review	*July 1st, 2013*	
EPC Erection	*July 1st, 2013*	
EAP transfer and positioning	*July 2, 2013*	
Integration EPC/EAP	*July 2, 2013*	
ESC-A and VEB Erection	*July 5, 2013*	
	July 11, 2013	*Arrival in Kourou of GSAT-7 and beginning of preparation campaign in building S5C*
	July 27, 2013	*Arrival in Kourou of EUTELSAT 25B/Es'hail 1 and beginning of preparation campaign in building S1B*
Roll-out from BIL to BAF	*August 9, 2013*	
	August 3-7, 2013	*GSAT-7 filling operations*
	August 9-13, 2013	*EUTELSAT 25B/Es'hail 1 filling operations*

Satellites and launch vehicle campaign final calendar

J-10	*Wednesday August 14, 2013*	*GSAT-7 integration on launcher. EUTELSAT 25B/Es'hail 1 integration on adaptor (PAS) and transfer to Final Assembly Building (BAF)*
J-9	*Friday August 16, 2013*	*Integration on Syld*
J-8	*Monday August 19, 2013*	*Fairing integration on Sylda*
J-7	*Tuesday August 20, 2013*	*Launcher inspection*
J-6	*Wednesday August 21, 2013*	*Upper composite integration with EUTELSAT 25B/Es'hail 1 on launcher*
J-5	*Thursday August 22, 2013*	*ESC-A final preparations*
J-4	*Friday August 23, 2013*	*ESC-A final preparations and Launch rehearsal*
J-3	*Monday August 26, 2013*	*Arming of launch vehicle*
J-2	*Tuesday August 27, 2013*	*Arming of launch vehicle* *Launch readiness review (RAL) and final preparation of launcher*
J-1	*Wednesday August 28, 2013*	*Roll-out from BAF to Launch Area (ZL), launch vehicle connections and filling of the EPC liquid helium sphere*
J-0	*Thursday August 29, 2013*	*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*
+ 12.7 s	*End of vertical climb and beginning of pitch rotation (10 seconds duration)*	*0.1*	*37.5*
+ 17 .1s	*Beginning of roll manoeuvre*	*0.3*	*74.1*
+ 2 mn 23 s	*Jettisoning of solid boosters*	*67.7*	*2014*
+ 3 mn 13 s	*Jettisoning of fairing*	*106.9*	*2284*
+ 7 mn 59 s	*Acquisition by Natal tracking station*	*163.7*	*5750*
+ 8 mn 46 s	*Shut-down of main cryogenic stage*	*161.2*	*6929*
+ 8 mn 52 s	*Separation of main cryogenic stage*	*161*	*6956*
+ 8 mn 54 s	*Ignition of upper cryogenic stage (ESC-A)*	*161*	*6958*
+ 13 mn 40 s	*Acquisition by Ascension tracking station*	*142.2*	*7651*
+ 18 mn 20 s	*Acquisition by Libreville tracking station*	*178.2*	*8375*
+ 23 mn 00 s	*Acquisition by Malindi tracking station*	*426.8*	*9089*
+ 24 mn 53 s	*Injection*	*627.9*	*9374*
+ 27 mn 45 s	*Separation of **EUTELSAT 25B/Es'hail 1** satellite*	*1060.2*	*9035*
+ 29 mn 10 s	*Separation of Sylda 5*	*1319.7*	*8844*
+ 34 mn 26 s	*Separation of **GSAT-7** satellite*	*2459.1*	*8099*
+ 41 mn 49 s	*End of Arianespace Flight mission*	*4296.6*	*7142*

4. Flight trajectory of EUTELSAT 25B/Es'hail 1 & GSAT-7

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

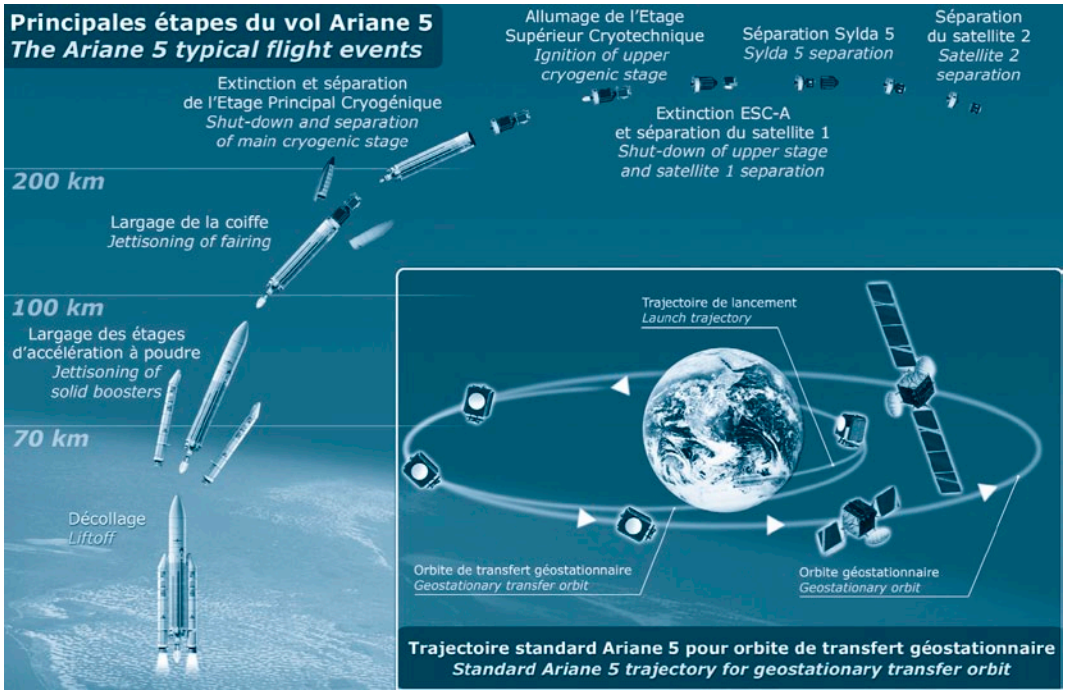
7.05 seconds after ignition of the main stage cryogenic engine at T-0, the two solid-propellant boosters are ignited, enabling liftoff. The launcher first climbs vertically for 6 seconds, then rotates towards the East. It maintains an attitude that ensures the axis of the launcher remains parallel to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

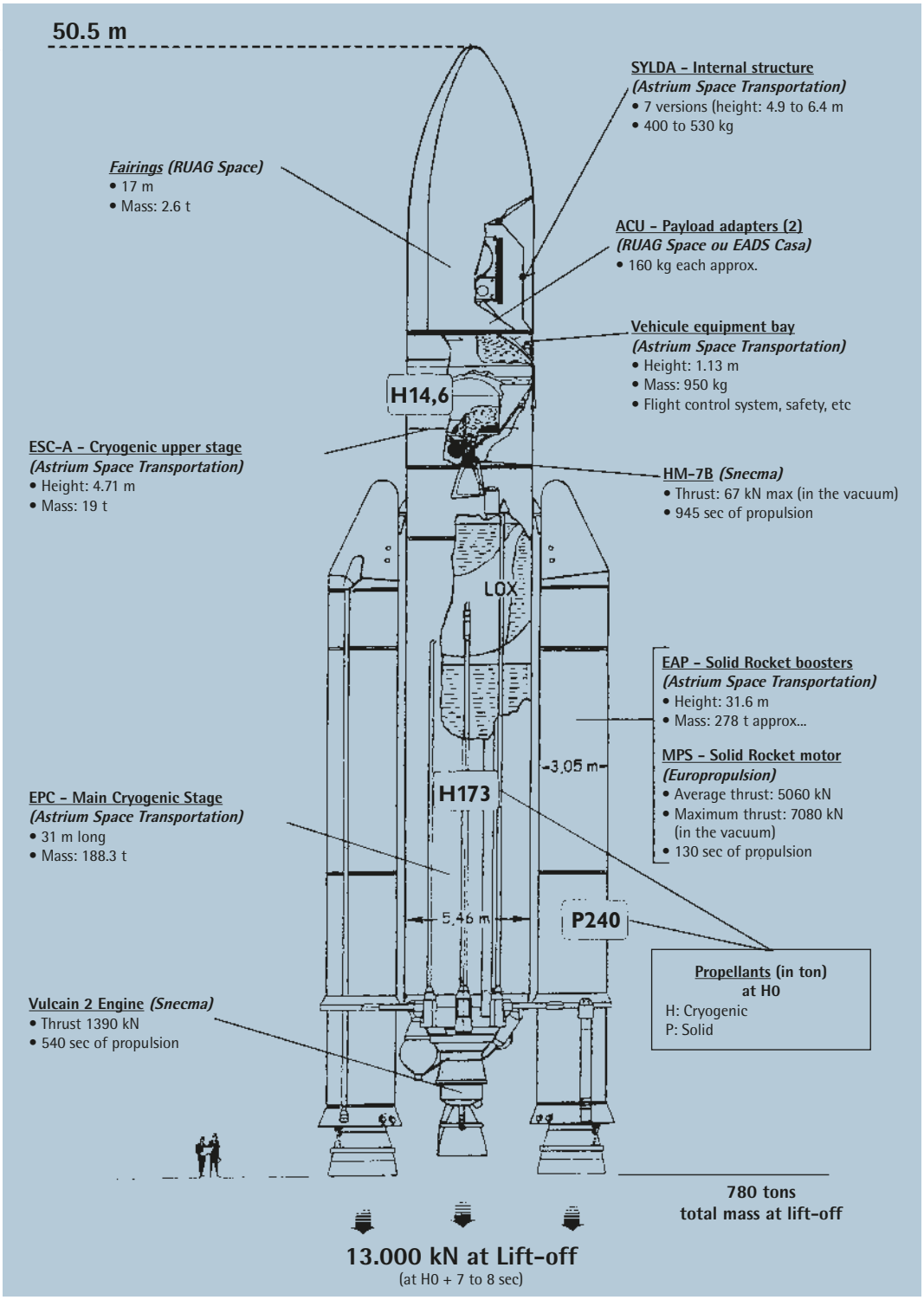
On orbital injection, the launcher will have attained a velocity of approximately 9,374meters/second, and will be at an altitude of about 627.9 kilometers.

The fairing protecting the EUTELSAT 25B/Es'hail 1 and GSAT-7 spacecraft is jettisoned shortly after the boosters are jettisoned at about T+193 seconds.

Standard Ariane 5 trajectory for geostationary transfer orbit



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



6. The EUTELSAT 25B/Es'hail 1 satellite

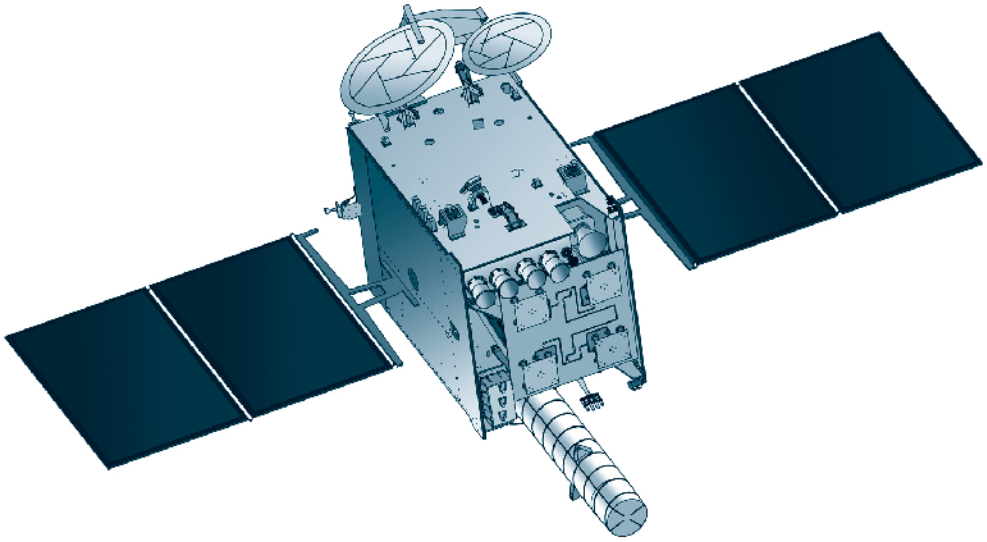
Customer	*Es'hailSat / Eutelsat*
Prime contractor	*Space Systems Loral*
Mission	*Video services, telecommunications and government services*
Mass	*Total mass at lift-off approx. 6,300 kg*
Stabilization	*3 axis stabilized*
Dimensions *Span in orbit*	*7.2 x 2.2 x 2.3 m* *25.5 m*
Platform	*SSL 1300 Bus*
Payload	*46 Ku and Ka band transponders*
On-board power	*12 kW (early life)*
Life time	*15 years*
Orbital position	*25.5° East*
Coverage area	*Middle East, North Africa and Central Asia*

Press Contact

Es'hailSat
Melanie Dickie
T: +974 44993527
M: +974 66272350
mdickie@eshailsat.qa

Eutelsat
Marie-Sophie Ecuer
T: +33 1 53 98 32 45
M: +33 6 89 62 17 74
mecuer@eutelsat.fr

7. The GSAT-7 satellite



Customer	*ISRO*	
Prime contractor	*ISRO / ISAC*	
Mission	*Telecommunications*	
Mass	*Total mass at lift-off*	*2,650 kg*
Stabilization	*3 axis stabilized*	
Dimensions	*3.1 m x 1.7 m x 2.0 m*	
Platform	*1-2.5Kbus*	
Payload	*KU, C and UHF band transponders*	
On-board power	*3,000 W (end of life)*	
Life time	*7 years*	
Orbital position	*74° East*	
Coverage area	*India land mass*	

Press Contact

Deviprasad Karnik
Director, P and PR
ISRO Headquarters
New BEL Road, Bangalore 560 095
Tel: (91 80) 23415275
Fax: (91 80) 23412253

Appendix 1. Arianespace - EUTELSAT 25B/Es'hail 1 & GSAT-7 launch key personnel

In charge of the launch campaign			
Mission Director	*(CM)*	*Didier SAÏD*	*ARIANESPACE*
In charge of the launch service contract			
Program Director EUTELSAT 25B/Es'hail 1	*(CP)*	*Beatriz ROMERO*	*ARIANESPACE*
Program Director GSAT-7	*(CP)*	*Christophe BARDOU*	*ARIANESPACE*
In charge of EUTELSAT 25B/Es'hail 1 satellite			
Satellite Mission Director	*(DMS)*	*Raphaël MUSSALIAN*	*EUTELSAT*
Satellite Program Manager	*(CPS)*	*Arlen KASSIGHIAN*	*EUTELSAT*
Satellite Preparation Manager	*(RPS)*	*Doug EASTMAN*	*SS/L*
In charge of GSAT-7 satellite			
Satellite Mission Director	*(DMS)*	*G. SHIVANNA*	*ISAC / ISRO*
Satellite Program Manager	*(CPS)*	*M. MANI*	*ISAC / ISRO*
Satellite Preparation Manager	*(RPS)*	*V.P. PRAMOD*	*ISAC / ISRO*
In charge of the launch vehicle			
Launch Site Operations Manager	*(COEL)*	*Raphaël BREDA*	*ARIANESPACE*
Ariane Production Project Manager	*(CPAP)*	*Frédéric DAUGERON*	*ARIANESPACE*
Launcher Production Quality Manager	*(RQLP)*	*Delphine SOTINEL*	*ARIANESPACE*
Launch Campaign Quality Manager	*(COCL)*	*Franciska DEMBINSKA*	*ARIANESPACE*
In charge of the Guiana Space Center (CSG)			
Range Operations Manager	*(DDO)*	*Antoine-Pépin GUILLAUME*	*CNES/CSG*
Range Operations Deputy	*(DDO/A)*	*Laura APPOLLONI*	*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 1329 million euros in 2012.

At January 1, 2013, Arianespace had 320 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.