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A dual launch for Brazil and Vietnam

Arianespace will boost two communications satellites into orbit on its second launch of the year: STAR ONE C2 for Brazilian operator Star One, as part of a turnkey contract with Thales Alenia Space, and VINASAT-1, built by Lockheed Martin Commercial Space Systems (LMCSS) for operator Vietnam Post and Telecommunications Corporation (VNPT).

Arianespace's selection by major satcom manufacturers and operators reflects broad international recognition of the company's top-quality launch Service & Solutions.

Ariane 5 is the only commercial launcher in service today capable of simultaneously launching two payloads.

STAR ONE C2 will be the eighth Brazilian satellite to use the European launcher. Star One is the largest regional satellite service operator in Latin America.

The STAR ONE C2 satellite was built by Thales Alenia Space using a Spacebus 3000 B3 platform. Weighing about 4,100 kg at launch, it will be positioned in geostationary orbit at 70 degrees West. STAR ONE C2 is fitted with 28 C-band, 16 Ku-band and one X-band transponder, and will provide communications, multimedia and broadband Internet services for South America

Arianespace is particularly proud of being selected to launch VINASAT-1, Vietnam's first communications satellite. Through VINASAT-1, the Vietnam Post and Telecommunications Corporation (VNPT) will be able to offer a wide range of telecommunications services across the country.

Weighing about 2,600 kg at launch, VINASAT-1 was built by LMCSS in Newton, Pennsylvania, using an A2100A platform. It will be positioned in geostationary orbit at 132 degrees East, and offers a design life exceeding 15 years. Fitted with 12 Ku-band and 8 C-band transponders, VINASAT-1 is designed to provide radio, television and telephone transmission services throughout Vietnam.

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

1. Mission profile

The 182nd Ariane launch will orbit two communications satellites: STAR ONE C2 for Brazilian operator Star One, within the scope of a turnkey contract with Thales Alenia Space, and VINASAT-1, built by Lockheed Martin Commercial Space Systems (LMCSS) for operator Vietnam Post and Telecommunications Corporation (VNPT).

This will be the 38th Ariane 5 launch.

The launcher will be carrying a total payload of 7,762 kg, including 6,737kg for the two satellites, which will be released separately into their targeted orbits.

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

Injection orbit

Perigee altitude	***250 km***
Apogee altitude	***35 928 km at injection***
Inclination	***2° degrees***

The lift-off is scheduled on the night of April 18 to 19, 2008 as soon as possible within the following launch window:

Launch opportunity

	Universal time (GMT)	*Paris time*	*Hanoï time*	*Kourou time*	*Rio de Janeiro time*
Between	*10:16 pm*	*00:16 am*	*5:16 am*	*7:16 pm*	*8:16 pm*
and	*11:23 pm*	*1:23 am*	*6:23 am*	*8:23 pm*	*9:23 pm*
on	*April 18, 2008*	*April 19, 2008*	*April 19, 2008*	*April 18, 2008*	*April 18, 2008*

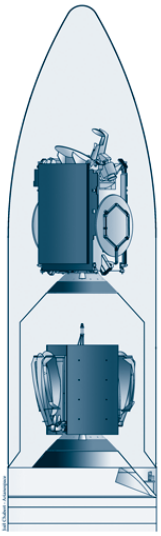
Configuration of Ariane payload

The STAR ONE C2 satellite was built by Thales Alenia Space in Cannes, France, for Brazilian operator Star One.

Orbital position: 70° West

VINASAT-1 was built by Lockheed Martin Commercial Space Systems (LMCSS) in Newton, Pennsylvania for the operator Vietnam Post and Telecommunications Corporation (VNPT).

Orbital position: 132° East.



2. Range operations campaign: ARIANE 5 - STAR ONE C2/VINASAT-1

Satellites and launch vehicle campaign calendar

Ariane activities	*Dates*	*Satellites activities*
Campaign start review	*February 18, 2008*	
EPC Erection	*February 18, 2008*	
EAP transfer and positionning	*February 19, 2008*	
Integration EPC/EAP	*February 20, 2008*	
	February 25, 2008	*Arrival in Kourou and begining of STAR ONE C2 preparation campaign in building S1B*
ESC-A Erection	*February 25, 2008*	
	March 7, 2008	*Arrival in Kourou and begining of VINASAT-1 preparation campaign in building S5C*
Roll-out from BIL to BAF	*April 1, 2008*	
	March 31- April 2, 2008	*VINASAT-1 filling operations in S5B building*
	April 1-3, 2008	*STAR ONE C2 filling operations in S5A building*

Satellites and launch vehicle campaign final calendar

J-11	*Saturday, April 5*	*STAR ONE C2 integration on adaptor (ACU)*
J-10	*Monday, April 7*	*STAR ONE C2 transfer to Final Assembly Building (BAF)*
J-9	*Tuesday, April 8*	*STAR ONE C2 integration on Sylda and VINASAT-1 integration on adaptor*
J-8	*Wednesday, April 9*	*Fairing integration on Sylda and VINASAT-1 transfer to Final Assembly Building (BAF)*
J-7	*Thursday, April 10*	*VINASAT-1 integration on launcher*
J-6	*Friday, April 11*	*Upper composite integration with STAR ONE C2 on launcher*
J-5	*Saturday, April 12*	*ESC-A final preparations and payloads control*
J-4	*Monday, April 14*	*Launch rehearsal*
J-3	*Tuesday, April 15*	*Arming of launch vehicle*
J-2	*Wednesday, April 16*	*Launch readiness review (RAL) and final preparation of launcher*
J-1	*Thursday, April 17*	*Roll-out from BAF to Launch Area (ZL), launch vehicle connections and filling of the EPC liquid Helium sphere*
J-0	*Friday, April 18*	*Launch countdown including EPC and ESC-A filling with liquid oxygen and liquid hydrogen*

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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.

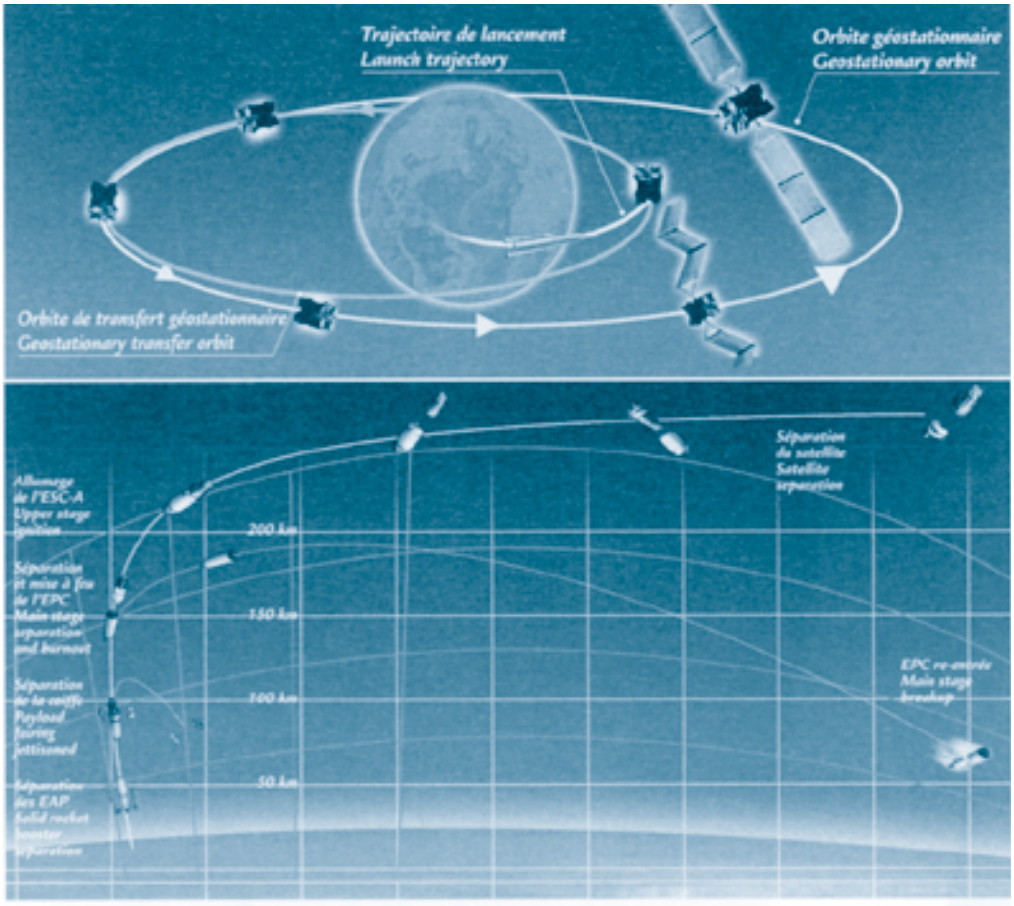
Time		*Events*
– 11 h	*30 mn*	*Start of final countdown*
– 7 h	*30 mn*	*Check of electrical systems*
– 4 h	*50 mn*	*Start of filling of main cryogenic stage with liquid oxygen and hydrogen*
– 3 h	*20 mn*	*Chilldown of Vulcain main stage engine*
– 1 h	*10 mn*	*Check of connections between launcher and 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)*
	+ 7,0 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)*	*0.091*	*37*
	+ 17 s	*Beginning of roll manoeuvre*	*0.332*	*74*
+ 2 mn	*20 s*	*Jettisoning of solid boosters*	*66.7*	*1970*
+ 3 mn	*09 s*	*Jettisoning of fairing*	*104.8*	*2139*
+ 7 mn	*19 s*	*Acquisition by Natal tracking station*	*200.4*	*4581*
+ 8 mn	*55 s*	*Shut-down of main cryogenic stage*	*208.3*	*6714*
+ 9 mn	*01 s*	*Separation of main cryogenic stage*	*208.8*	*6741*
+ 9 mn	*05 s*	*Ignition of upper cryogenic stage (ESC-A)*	*209.1*	*6743*
+ 13 mn	*14 s*	*Acquisition by Ascension tracking station*	*209.5*	*7360*
+ 18 mn	*19 s*	*Acquisition by Libreville tracking station*	*228.1*	*8229*
+ 23 mn	*35 s*	*Acquisition by Malindi tracking station*	*470.7*	*9206*
+ 24 mn	*46 s*	*Shut-down of ESC-A / Injection*	*597.4*	*9402*
+ 26 mn	*09 s*	*Separation of STAR ONE C2 satellite*	*783.9*	*9243*
+ 28 mn	*48 s*	*Separation of Sylda 5*	*1225.7*	*8887*
+ 31 mn	*00 s*	*Separation of VINASAT-1 satellite*	*1660.9*	*8564*
+ 41 mn	*55 s*	*End of Arianespace Flight mission*	*4285.7*	*7011*

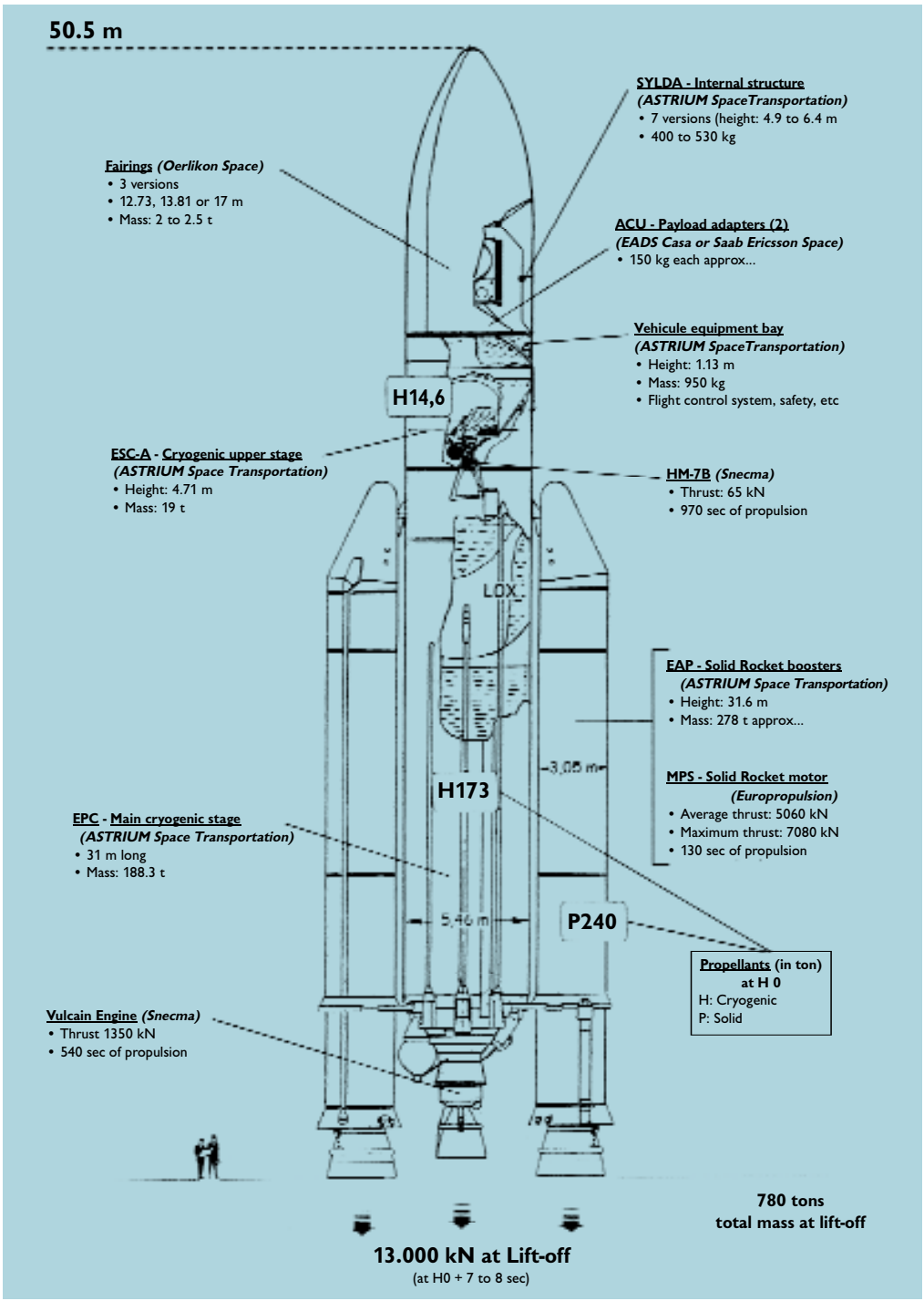
4. Flight trajectory of STAR ONE C2/VINASAT-1

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 9402 meters/second, and will be at an altitude of about 597 kilometers.
The fairing protecting the STAR ONE C2/VINASAT-1 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 SpaceTransportation)



6. The STAR ONE C2 satellite

Customer	**Thales Alenia Space for Star One**	
Prime contractor	*Thales Alenia Space*	
Mission	*Telecommunications, multimedia and Internet*	
Mass	*Total mass at lift-off*	*4 100 kg*
	Dry mass	*1 750 kg*
Stabilization	*3 axis stabilized*	
Dimensions	*4.0 x 3.2 x 2.4 m*	
Span in orbit	*22.4 m*	
Platform	*Spacebus 3000 B3*	
Payload	*28 C band transponders, 16 Ku band transponders, 1 X band transponder*	
On-board power	*10 500 W (beginning of life)*	
Life time	*15 years*	
Orbital position	*70° West*	
Coverage area	*South America*	

Press Contact

Sandrine Bielecki
Thales Alenia Space
Tél. : +33 4 92 92 70 94
Fax. : +33 4 92 92 13 10
E-mail : sandrine.bielecki@thalesaleniaspace.com

Luiz Freitas
Embratel
Tél. : +55 21 2121 6291
Mob. : +55 21 9329 4296
E-mail : luizaf@embratel.com.br

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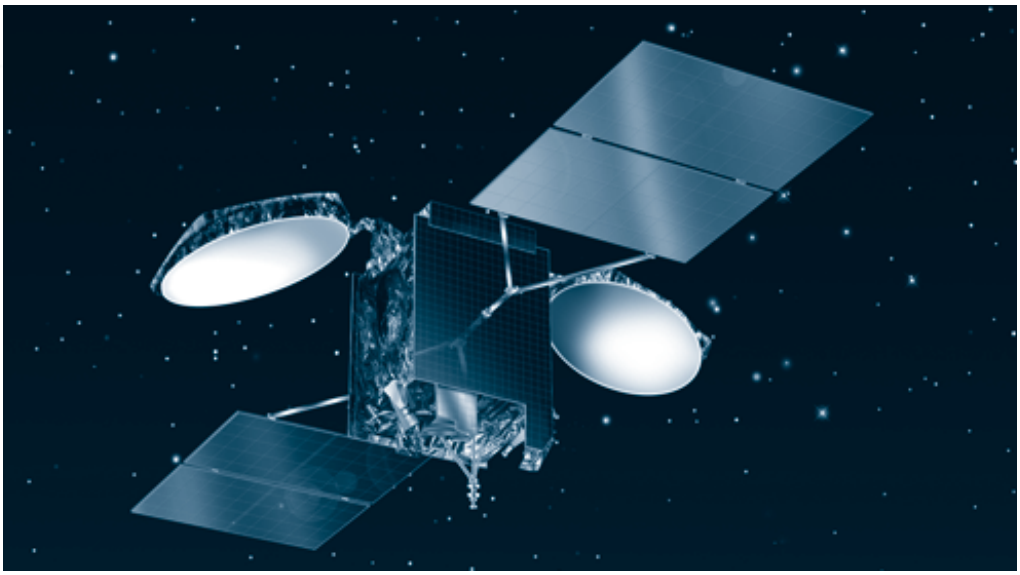
7. The VINASAT-1 satellite



Customer	Lockheed Martin Commercial Space Systems (USA) for Vietnam Post and Telecommunications Corporation (VNPT)
Prime contractor	*LMCSS*
Mission	*Telecommunications*
Mass	*Total mass at lift-off 2 637 kg*
Stabilization	*3 axis stabilized*
Dimensions	*3.8 x 1.9 x 1.9 m*
Span in orbit	*14.65 m*
Platform	*A2100 A*
Payload	*12 Ku-band and 8 C-band transponders*
On-board power	*> 2000 W (It debut of life)*
Life time	*15 years*
Orbital position	*132° Est*
Coverage area	*Vietnam*

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

Appendix 1. Arianespace STAR ONE C2 & VINASAT-1 launch key personnel

In charge of the launch campaign			
Mission Director	*(CM)*	*Daniel MURE*	*ARIANESPACE*
In charge of the launch service contract			
Ariane Payload Manager	*(RCUA)*	*Caroline ARNOUX*	*ARIANESPACE*
Ariane Deputy Mission Manager	*(RCUA/A)*	*Alexandre MADEMBA-SY*	*ARIANESPACE*
In charge of STAR ONE C2 satellite			
Satellite Mission Director	*(DMS)*	*Jean POURRAT*	*THALES ALENIA SPACE*
Satellite Program Manager	*(CPS)*	*Marcello LAVRADO*	*STAR ONE*
Satellite Preparation Manager	*(RPS)*	*Pierre GABILLET*	*THALES ALENIA SPACE*
In charge of VINASAT-1 satellite			
VINASAT Program Director	*(DPS)*	*Hoang MINH THONG*	*VNPT*
Satellite Mission Director	*(DMS)*	*Joseph PULKOWSKI*	*LMCSS*
Satellite Program Director	*(CPS)*	*Jim BUCKLEY*	*LMCSS*
Satellite Preparation Manager	*(RPS)*	*Roy WELLER*	*LMCSS*
In charge of the launch vehicle			
Launch Site Operations Manager	*(COEL)*	*Jean-Pierre BARLET*	*ARIANESPACE*
Ariane Production Project Manager	*(CPAP)*	*Bernard DONAT*	*ARIANESPACE*
In charge of the Guiana Space Center (CSG)			
Range Operations Manager	*(DDO)*	*Jacques SCHRIVE*	*CNES/CSG*
Range Operations Deputy	*(DDO/A)*	*Emmanuel SANCHEZ*	*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 beforre 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 reduntant 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.

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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 23 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 290 launch contracts and launched 254 satellites. More than two-thirds of the commercial satellites now in service worldwide were launched by Arianespace.
The company posted sales of more than 900 million euros in 2007, and stayed in the black for the fifth year in a row.
At January 1, 2008, Arianespace had 292 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 2009.
- The Vega light launcher, to be launched from the Guiana Space Center starting in 2009.

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 bas operation, 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 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.