LAUNCH KIT

June 2020

VV16

SSMS PoC Flight

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FLIGHT VV16: FOR THE FIRST VEGA MISSION OF 2020, ARIANESPACE WILL PERFORM THE SMALL SPACECRAFT MISSION SERVICE PROOF OF CONCEPT FLIGHT

For its fifth mission in 2020 and the first Vega flight of the year, Arianespace will orbit 53 satellites on the Small Spacecraft Mission Service (SSMS) Proof of Concept (PoC) Flight, performed on behalf of 21 customers.

With this mission, designated Flight VV16, Arianespace underscores its comprehensive range of innovative and very competitive services to address the nano- and micro-satellite market sub-segment, serving both institutional and commercial needs. The creation of such a new service using the company's light-lift Vega led to the SSMS project.

The European Space Agency (ESA) funded the SSMS hardware development, and also contributed with the European Union to the funding of this "Proof of Concept" (PoC) flight.

The combined European efforts will enhance Arianespace's response to the rideshare demand with solutions that are perfectly suited to the flourishing small satellite market.

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The first SSMS mission

VV16's mission, with 21 customers from 13 countries on board, will serve different types of applications: earth observation, telecommunications, sciences, technology/education, etc.

By choosing Arianespace, all customers are entitled to the same level of quality and reliability. New customers such as laboratories, universities and start-ups are guaranteed the optimum conditions for the launch of their space projects.

For the European partners involved, the SSMS' purpose is to perfectly address the bourgeoning microsatellite market for institutional and commercial needs by offering a new rideshare concept on the Vega light-lift launcher.

The SSMS rideshare concept is now integrated into Arianespace commercial offer, as a new service to address the small satellite market.

This Arianespace's concept – with multiple small satellites from 1 kg. to 500 kg. being flown together on Vega with the objective of sharing the launch cost – has been developed with the support of ESA and Avio. The satellite dispenser is an ESA product developed by Avio under ESA leadership and it is produced by the Czech company, SAB Aerospace s.r.o. Satellite integration has been performed for the first time in Europe (Czech Republic).
The European Union contributed to the financing of this PoC flight.

The SSMS dispenser is composed of different modular components, which can be put together as needed in a building-block style:

- An upper portion, with a central column, tower or hexagon; a supporting platform; adjustable rods and dividers.
- A lower portion, also using a hexagon-shaped module (Hexamodule) to accommodate several deployers for CubeSats.

For Flight VV16, the launcher will carry seven microsatellites (from 15 kg. to 150 kg.) on the upper portion, along with 46 smaller CubeSats on the lower portion's Hexamodule.

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The satellite industry's sizing of CubeSats is based on standard unit dimensions (designated as: "U") of 10 cm. x 10 cm. x 10 cm., and the 46 CubeSat passengers on Flight VV16 range in size from 1/4 Unit up to 6 Units. Their sizing distribution is as follows: 26 satellites of 3 U; 12 satellites at 1/4 U; six satellites of 6 U; one satellite at 2 U; and one satellite at 1 U.

The SSMS dispenser has been designed to be as market-responsive as possible, able to accommodate any combination of customers. Regular follow-on SSMS flights are planned once the more powerful Vega-C launcher begins operations. This will offer an extra 700 kg of capacity and enlarged volume within a wider launcher fairing – at the same Vega launch cost as before – so Arianespace will be able to fly even more passengers per individual SSMS rideshare launch at significant lower cost per kilo.

The constellations and small satellites [0-500kg] market remains dynamic. This trend must continue: according the market projections, 200-300 nano satellites per year to be launched during the next decade, knowing that most (more than 80%) will be provided by constellations projects.

Arianespace will be able to respond to this demand thanks to the dual strategy of shared launches on the dual strategy of shared launches on Vega / Vega C and Ariane 6.

MISSION DESCRIPTION

The 16th Vega launch from the Guiana Space Center (CSG) will place its satellite passengers into Sun-Synchronous orbits (SSO).

The launcher will be carrying a total payload of approximately 1,310 kg.

The launch will be performed from the Vega Launch Complex (SLV) in Kourou, French Guiana.

DATE AND TIME

Liftoff is scheduled for **Thursday, June 18, 2020**, at exactly:

- **9:51:10 p.m.**, Washington, D.C. time,
- **10:51:10 p.m.**, Kourou, French Guiana time,
- **01:51:10**, Universal Time (UTC), on June 19,
- **03:51:10 a.m.**, Paris and Rome time, on June 19.

MISSION DURATION

The nominal mission duration (from liftoff to separation of the 53 satellites) is:

1 hour, 44 minutes and 56 seconds.

TARGETED ORBIT FOR THE SEVEN MICROSATELLITES

Orbit	Altitude at separation (approximative)	Inclination
SSO	515 km.	97,45 degrees

TARGETED ORBIT FOR THE 46 NANOSATELLITES

Orbit	Altitude at separation (approximative)	Inclination
SSO	530 km.	97,51 degrees

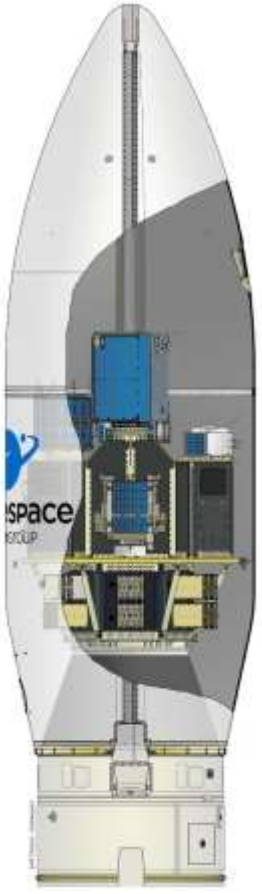
THE LAUNCH AT A GLANCE

Following liftoff from the Guiana Space Center, the powered phase of Vega's first three stages will last six minutes and 30 seconds. After this first phase, the launcher's third stage will separate from the upper composite, which includes the AVUM upper stage, the SSMS and its 53 passengers. The lower three stages will fall back into the sea.

The AVUM upper stage will ignite its engine for the first time, operating for about eight minutes, followed by a ballistic phase lasting approximately approximately 23 minutes, 37 seconds. The AVUM stage will then reignite its engine for about one minute, 21 seconds, prior to releasing the seven microsatellites. A third and a fourth AVUM ignition phase will have a duration of respectively seven seconds and four seconds, prior to releasing the 46 nanosatellites (CubeSats), which are to be deployed at one hour, 44 minutes and 56 seconds after liftoff.

VEGA PAYLOAD CONFIGURATION

- **Payload: 53 small satellites**
- **Weight at liftoff: 756 kg.** (for the satellites only)
- **SSMS structure**
- **Vega Payload Adaptor (PLA)**



THE SEVEN MICROSATELLITES

ARIANESPACE TO ORBIT ONE SATELLITE FOR SPACEFLIGHT INC.
(THE SATELLITE NAME IS UNDISCLOSED)

The satellite is a small experimental communication spacecraft including a communication system and a bus supporting module.

Main characteristics
Customer: Spaceflight Inc.
Final customer: Undisclosed
Manufacturer: Maxar
Platform: Specific
Mission: Telecommunications
Mass at launch: 138 kg.
Batteries: Lithium-ion

ARIANESPACE SERVES AIR QUALITY BY LAUNCHING GHGSAT-C1 SATELLITE

GHGSat-C1 is the first commercial microsatellite in a planned constellation being built for GHGSat Inc. of Montreal. GHGSat-C1 will monitor greenhouse gases emitted from sources on the ground. To detect and measure point emissions, such as area fugitive sources and stacks, it will require fine ground target tracking capability. This involves an onboard sensor pointing precisely at a target on the ground while the satellite slews in orbit to remain fixed on the spot for a certain period.
Each GHGSat satellite provides periodic, high-precision measurements of emissions from thousands of such sites.

Main characteristics
Customer: SFL
Final customer: GHGSat Inc.
Manufacturer: SFL
Platform: NEMO
Mission: Earth observation
Mass at launch: 15.4 kg.
Batteries: Lithium-ion
Coverage area: Global
Lifetime: 3 years (5 years goal)

ARIANESPACE TO LAUNCH NEMO-HD, THE FIRST SATELLITE FOR SLOVENIA

NEMO-HD is the first Slovenian microsatellite. It will explore a new Earth observation concept by combining interactive real-time video streaming and multispectral imaging. The main applications will be aimed at monitoring smart cities and river basins with special attention to forests, agriculture, droughts, floods and invasive plants.

With NEMO-HD in orbit, the Slovenian Centre of Excellence for Space Sciences and Technologies (SPACE-SI) will achieve a very innovative and cost-effective remote sensing system.

Main characteristics
Customer: SPACE-SI
Final customer: SPACE-SI
Manufacturer: SFL with SPACE-SI
Platform: NAUTILUS
Mission: Earth observation
Mass at launch: 65 kg.
Batteries: 7S2P Lithium-ion
Coverage area: Global
Lifetime: 3 years

ARIANESPACE AT THE SERVICE OF EDUCATION WITH UPMSAT-2 SATELLITE

The UPMSat-2 is an educational, scientific and in-orbit technological demonstration microsatellite project led by the research institute of Universidad Politécnica Madrid (IRD/UPM). Its objective is to give students the competences for designing, analyzing, building, integrating, testing, and operating the platform. The satellite includes two payloads: IN-ORBIT DEMONSTRATION and RESEARCH-EDUCATIONAL. The launch service for UPMSat-2 is funded by the European Union under the Horizon 2020 IOD/IOV Programme.

Main characteristics
Customer: UPM
Final customer: UPM
Manufacturer: IRD/UPM
Platform: New development
Mission: Technology / education
Mass at launch: 45 kg
Batteries: Li-ion battery
Coverage area: Global
Lifetime: 2 years

ARIANESPACE IN COOPERATION WITH ESA FOR THE ESAIL SATELLITE

ESAIL is the first commercial microsatellite developed under ESA's SAT-AIS program for tracking ships. ESAIL is part of ESA's Partnership Projects, involving exactEarth as a mission operator and LuxSpace Sarl as the prime contractor. ESAIL's mission is to enhance the next generation of space-based services for the maritime sector.

Main characteristics
Customer: ExactEarth
Final customer: ExactEarth
Manufacturer: LuxSpace
Platform: LuxSpace Triton-2
Mission: Earth observation
Mass at launch: 112 kg
Batteries: SAFT 8s3p MPS
Coverage area: Global
Lifetime: 4 years

ARIANESPACE TO ORBIT THE ION SCV LUCAS SATELLITE

The ION Satellite Carrier is a spacecraft able to transport a batch of CubeSats to space and deploy them individually into precise orbital slots. This mission will pave the way for the definition of a new standard of space logistics, in line with the company's vision of enabling profitable business and human expansion in a sustainable space.

Main characteristics
Customer: D-Orbit SpA
Final customer: Planet Labs Inc.
Manufacturer: D-Orbit SpA
Platform: ION mk01 platform
Mission: Technology
Mass at launch: 150 kg.
Propulsion: PM200 bi-propellant system
Payloads: 12 CubeSats from Planet Labs
Coverage area: Global
Lifetime: 4 years

ARIANESPACE WILL DELIVER NEWSAT

NewSat is a commercial high-resolution imaging satellite that operates in the visible and NIR spectrum.

Main characteristics
Customer: Spaceflight Inc.
Final customer: Satellogic
Manufacturer: Satellogic
Platform: Newsat-6
Mission: Earth observation
Mass at launch: 43.5 kg
Propulsion: Butane
Batteries: Lithium Polymer
Coverage area: Global
Lifetime: 3-4 years

THE 46 NANOSATELLITES

NUMBER OF SATELLITES	CUSTOMER	DEPLOYEUR	CUBESAT	CUBESAT CUSTOMER	CUBESAT MANUFACTURER
26	SpaceFlight Inc.	ISL QuadPack	SpaceBEE Flock 4V (1-14)	Swarm Technology PLANET	Swarm Technology PLANET
8	SPIRE	ASTROFEIN (12 PSLP-4W)	LEMUR-2	SPIRE	SPIRE
2	D-Orbit / Tyvak	Tyvak	3Cat-5/A 3Cat-5/B	Universitat Politècnica de Catalunya & ESA Universitat Politècnica de Catalunya & ESA	Deimos / Tyvak Deimos / Tyvak
6	SAB-Launch Services	ISL QuadPack XL ISISPOD 1U (ISL) ISISPOD 2U (ISL)	1. DIDO-3 3U 2. PICASSO-BE 3U 3. SIMBA 3U 4. 3U TRISAT 3U TTU-100 1U AMICal SAT 2U	1. SpacePharma 2. ESA 3. ESA 4. University of Maribor (Sloveny) Tallin University of Technology CSUG-MSU (Moscow State University)	1. SpacePharma 2. Royal Belgian Institute - Space Aeronomy 3. Royal Meteorological Institute Belgium 4. SkyLabs Tallin University of Technology CSUG and SatRevolution
2	ISIS / ISL	ISL QuadPack	NAPA-1 6U TARS 6U	Royal Thai Air Force KEPLER	ISL ISL
2	Tyvak	Tyvak	Tyvak-0171 OSM-1 Cicero	(Undisclosed) Orbital Solutions Monaco	Tyvak Tyvak

THE VEGA LAUNCH VEHICLE

Avio, the production prime contractor, delivers the Vega launcher to Arianespace.

Payload fairing
(RUAG Space)

Payload adaptor
(Airbus Spain)

Integration & testing
(Avio)
AVUM

Production, integration & testing
(Avio)
ZEFIRO-9

Production, integration & testing
(Avio)
ZEFIRO-23

Integration & testing
(Avio)
P80

AVUM structure
(Airbus)

AVUM engine
(KB Yuzhnoye)

Interstage - 2/3
(Rheinmetall)

Interstage - 1/2
(Airbus Netherlands)

P80 engine
(Europropulsion)

Interstage - 0/1
(S.A.B.C.A)

P80 nozzle
(ArianeGroup)

Thrust vector control system
(P80, Zefiro 9, Zefiro-23 & AVUM)
S.A.B.C.A

Igniters (P80, Zefiro-9 & Zefiro-23)
APP

Avionics
Thales, IN-SNEC, Selex Avionica, CRISA, RUAG Space, SAFT

VEGA – THE SMALL SPACECRAFT MISSION SERVICE

The SSMS rideshare concept is part of Arianespace commercial offer, as a new service to address the small satellite market.
This Vega mission service is specifically conceived to provide a regular, flexible and affordable access to space to all European and worldwide small satellite customers.

SSMS is based on simplified contractual clauses and a lean integration chain, with cubesat integration and flight readiness performed for the first time in Europe (Czech Republic).

The service is leveraging on the extreme flexibility of a modular dispenser concept, which provides an interface to all kinds of small satellites ranging from 1 kg. to 500 kg. in several configurations based on the same structural elements.

Two main type of missions can be supported by the SSMS dispenser:

- Piggy back mission with a dispenser configuration based on one or two hexagonal modules below the main payload interface
- Rideshare mission, based on a dispenser configuration using one or two hexagonal modules and a main deck, equipped with or without spacers, a central column, and multiple tower modules.

For Flight VV16's PoC (Proof of Concept) mission, the SSMS dispenser is in the Flexi-3 configuration, with microsatellites on its upper portion and CubeSats on its hexagonal lower module.

The Vega Proof of Concept flight using SSMS hardware has been firstly conceived in the context of ESA's LLL (Light satellite, Low-cost, Launch opportunity) Initiative.

The flight has been then organized by Arianespace with ESA and European Union support.

ESA contribution to the PoC flight has been approved by European ministers at the CM-16 ESA Ministerial Council meeting in Lucerne (2016), with the aim at demonstrating European capability to aggregate, prepare, launch and deliver into orbit a set of lightweight satellites; enabling timely, standardized and guaranteed access to space for lightweight satellites of the institutional and commercial users communities by means of a dedicated and optimized European launch service.
The European Union support for this first flight has been provided in the frame of the Horizon 2020 programme, In-Orbit Demonstration/Validation Programme (IOD/IOV).

The revenues of the PoC flight are half commercial and half institutional, whereas a specific "institutional pricing policy" has been applied based on ESA and EU request to a set of institutional payloads embarked on this PoC flight.

The SSMS hardware, as well as the specific mission preparation process were developed under ESA leadership by Avio, which also is the Vega launcher's industrial prime contractor.
The dispenser design authority is SAB Aerospace s.r.o. (CZ), while SAB-Launch Services is the entity selected by Arianespace to carry out payload integration activities in Europe and support the introduction of this new European small satellite service.

LAUNCH CAMPAIGN: VEGA – SSMS

SATELLITE AND LAUNCH VEHICLE CAMPAIGN TIMETABLE

DATE	SATELLITE ACTIVITIES	LAUNCH VEHICLE ACTIVITIES
February 10, 2020		Campaign start review Transfer of P80 stage
February 10, 2020		Interstage 1/2 integration
February 13 to 22, 2020	Arrival in French Guiana of the **seven microsatellites** at Felix Eboué Airport (Cayenne)	
February 15, 2020		Z23 integration
February 19, 2020	Arrival in French Guiana at Felix Eboué Airport (Cayenne) of the Hexamodule, with 41 CubeSats installed and five other CubeSats, which are to be integrated on the structure at the Guiana Space Center (CSG) launch site	
February 20, 2020		Z9 integration
February 22, 2020	Pre-POC combined operations for the **seven microsatellites**	
February 24, 2020		AVUM integration
February 25 to March 16, 2020	Integration of the **seven microsatellites** on the SSMS structure	
February 27, 2020		Start of preliminary inspections
March 4, 2020		Synthesis control test
March 13 to 17, 2020		Filling of the AVUM
March 16 to May 27, 2020	*Lockdown of the CSG launch site due to the COVID-19 pandemic* *All satellites are put in the stand-by mode*	*All operations are suspended* *The VV16 launch vehicle is placed in the stand-by mode*
May 27, 2020	Resumption of the launch campaign	
June 4, 2020	Mating of the SSMS structure with the 53 satellites on the payload adaptor (PLA)	
June 8, 2020	Final inspection of the SSMS with the integrated 53 satellites prior to encapsulation	
June 9, 2020	Encapsulation of the upper composite in Vega's payload fairing	

SATELLITE AND LAUNCH VEHICLE CAMPAIGN FINAL TIMETABLE

DATE	SATELLITE ACTIVITIES	LAUNCH VEHICLE ACTIVITIES
Friday, June 12, 2020	Transfer of upper composite from the payload preparation facility to SLV (Vega Launch Site)	Fueling operations for AVUM and RACS (Roll and Attitude Control Subsystem)
Monday, June 15, 2020	Upper composite integration on the launcher	Additional checks Arming of Z23/Z9, AVUM and fairing
Tuesday, June 16, 2020		Arming of P80 General dress rehearsal
Wednesday, June 17, 2020		Launch readiness review (RAL) Final preparation of launcher and final inspections of the fairing
Thursday, June 18, 2020		Final launch countdown

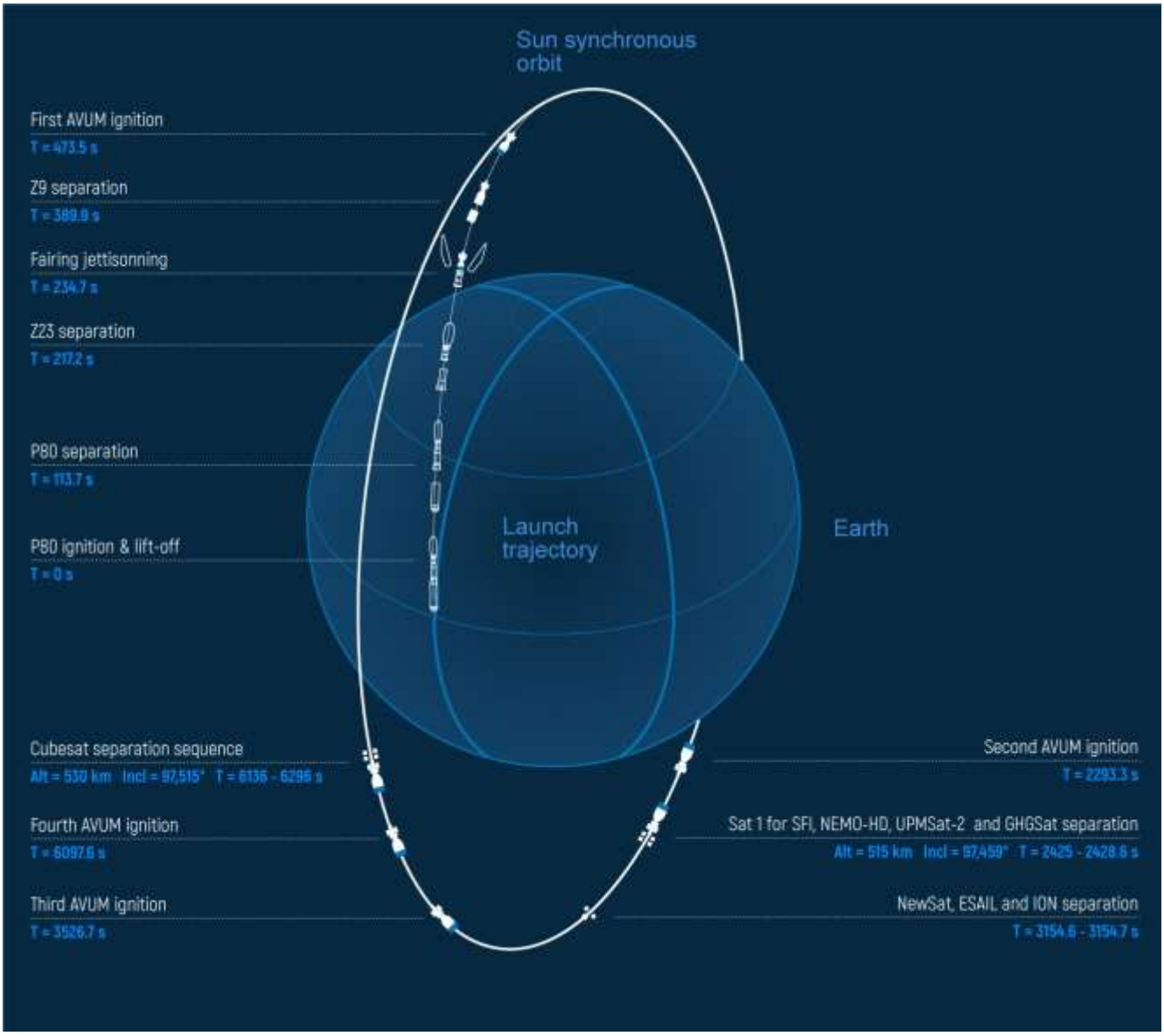
COUNTDOWN AND FLIGHT SEQUENCE

The countdown comprises all final preparation steps for the launcher, the satellites and the launch site, including the steps leading up to authorization of the P80 first-stage ignition.

TIME	EVENT
- 09 h 10 min	Start of final countdown
- 06 h 00 min	Activation of Multi-Functional Unit (MFU)
- 05 h 40 min	Activation of Inertial Reference System (IRS)
- 05 h 40 min	Activation of telemetry
- 05 h 10 min	Activation of Safeguard Master Unit (SMU)
- 04 h 50 min	Removal of safety devices
- 04 h 40 min	Activation of onboard computer and loading of flight program
- 04 h 30 min	IRS alignment and checks
- 03 h 15 min	Mobile gantry withdrawal (45 min.)
- 02 h 25 min	IRS alignment and checks after withdrawal gantry
- 01 h 15 min	Activation of the telemetry transmitter after withdrawal gantry
- 01 h 15 min	Activation of transponders and receptors
- 00 h 50 min	Launcher system ready
- 00 h 10 min	Final weather report prior to launch
- 00 h 04 min	Start of synchronized sequence

H-0	EVENT
+ 00 h 01 min 54 s	1st stage (P80) separation
+ 00 h 01 min 55 s	2nd stage (Zefiro-23) ignition
+ 00 h 03 min 37 s	2nd stage (Zefiro-23) separation
+ 00 h 03 min 50 s	3rd stage (Zefiro-9) ignition
+ 00 h 03 min 55 s	Fairing separation
+ 00 h 06 min 30 s	3rd stage (Zefiro-9) separation
+ 00 h 07 min 54 s	1st ignition of AVUM
+ 00 h 15 min 16 s	1st cut-off of AVUM
+ 00 h 38 min 13 s	2nd ignition of AVUM
+ 00 h 39 min 34s	2nd cut-off of AVUM
+ 00 h 40 min 25 s	**SAT 1 for SFI satellite separation**
+ 00 h 40 min 27 s	**Separation of the NEMO-HD and UPMSAT-2 satellites**
+ 00 h 40 min 29 s	**GHGSAT satellite separation**
+ 00 h 52 min 35 s	**Separation of the ESAIL & NEWSAT satellites**
+ 00 h 52 min 35 s	**ION SCV LUCAS satellite separation**
+ 00 h 58 min 46 s	3rd ignition of AVUM
+ 00 h 58 min 53 s	3rd cut-off of AVUM
+ 01 h 41 min 37 s	4th ignition of AVUM
+ 01 h 41 min 41 s	4th cut-off of AVUM
+ 01 h 42 min 16 s	**1st CubeSat separation**
+ 01 h 44 min 56 s	**Final CubeSat separation**
+ 02 h 04 min 26 s	End of the Vega mission

MISSION PROFILE



ARIANESPACE AND THE GUIANA SPACE CENTER

ARIANESPACE, A LEADING GLOBAL LAUNCH SERVICES COMPANY

Arianespace was founded in 1980 as the world's first launch Services & Solutions company. Arianespace is a subsidiary of ArianeGroup, which holds 74% of its share capital; the balance is held by 15 other shareholders from the European launcher industry.

Since the outset, Arianespace has signed over 600 launch contracts and launched more than 650 satellites. More than half of the commercial satellites now in service around the globe were launched by Arianespace.

The company's activities are worldwide, with the headquarters in Evry, France (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 services to satellite operators from around the world, including private companies and government agencies. These services call on three launch vehicles:

> The Ariane 5 heavy-lift launcher, operated from the Guiana Space Center in French Guiana.

> The Soyuz medium-lift launcher, currently in operation at the Guiana Space Center, the Baikonur Cosmodrome in Kazakhstan and shortly the Vostochny Cosmodrome in Russia.

> The Vega light-lift launcher, also operated from the Guiana Space Center.

Building on its complete family of launchers, Arianespace has won over half of the GEO commercial launch contracts up for bid worldwide in the past two years. Arianespace now has a backlog of more than 750 satellites to be launched.

THE GUIANA SPACE CENTER: EUROPE'S SPACEPORT

For more than 50 years, the Guiana Space Center (CSG), Europe's Spaceport in French Guiana, has offered a complete array of facilities for rocket launches. It comprises primarily the following:

> The CNES/CSG technical center, including various resources and facilities that are critical to launch base operations, such as radars, the 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 Spatial Guyane and ArianeGroup – all participating in the production of Ariane 5 and Vega components. A total of 40 European manufacturers and local companies are involved in launcher operations.

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 (Centre National d'Etudes Spatiales) and Arianespace. ESA is responsible for the Ariane, Soyuz and Vega development programs. Once these launch systems are qualified, ESA transfers responsibility to Arianespace as the operator. 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 France's space program, the Guiana Space Center has evolved into 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 the CNES/CSG fixed expenses, and also helps finance the fixed costs for the Ariane and Vega launch complexes.

CNES has several main responsibilities at the Guiana 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 launchers for missions. Whether during tests or actual launches, CNES is also responsible for overall coordination of operations and 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.

ARIANESPACE IN FRENCH GUIANA

In French Guiana, Arianespace is the contracting authority in charge of operating the family of three launchers: Ariane, Soyuz and Vega.

For Vega, Arianespace supervises the integration and inspection of the launcher constructed by Avio, the production prime contractor. At the same time, Arianespace coordinates the preparation of satellites in the payload preparation facility (EPCU) operated by CNES/CSG, handles the integration of satellites and preparation of the payload composite up to its transfer on the launcher to the Vega launch zone (ZLV), and also works with Avio teams in charge of the launcher to conduct the final countdown and launch from Launch Control Center No. 3 (CDL3).

Arianespace deploys a top-flight team and technical facilities to get launchers and satellites ready for launch. Building on this unrivalled expertise and outstanding facilities in French Guiana, Arianespace is the undisputed benchmark in the global launch services market.

VV16'S DEDICATED FAIRING LOGO