

ARCHIVED REPORT

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MITA

Outlook

- Platform was funded by ASI for science missions
- No new production of the MITA platform expected
- This report will be archived in 2013

Orientation

Description. Microsatellite Italiano a Tecnologia Avanzata (MITA) is a low-Earth-orbiting scientific microsatellite.

Sponsor. The Italian Space Agency (ASI) sponsored the MITA mission.

Status. The first MITA launched in July 2000 on board a Russian Cosmos rocket from Plesetsk Cosmodrome in Russia; it re-entered the atmosphere in August 2001. Agile was launched on an Indian Polar Satellite Launch Vehicle (PSLV) in May 2007.

Total Produced. Two

Application. MITA is a standard, low-cost, and multipurpose satellite platform used for small missions, primarily in low-Earth orbit. The MITA platform was developed under an Italian Space Agency program and is used for ASI missions.

Price Range. The cost to design and produce each MITA platform varies depending on the payload. The baseline MITA price is approximately \$10 million, whereas the Agile costs more than \$30 million.

Contractors

Prime

CGS SpA	http://www.cgspace.it , via Gallarate 150, Milan, 20151 Italy, Tel: + 39 02 380481, Fax: + 39 02 308 6458, Email: cgs@cgspace.it , Prime
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Subcontractor

Italian Institute for Nuclear Physics, INFN	http://www.infn.it , 70 Piazza dei Caprettari, Rome, 00186 Italy, Tel: + 39 06 684 0031, Fax: + 39 06 683 07924, Email: presidenza@presid.infn.it (MITA Payload)
MIPOT SpA	http://www.mipot.com/ , Via Corona 5, Cormons, 34071 Gorizia, Italy, Tel: + 39 0481 630 200, Fax: + 39 0481 623 87 (Agile Silicon Tracker)
Thales Alenia Space - Milano	http://www.thalesgroup.com , SS Padana Superiore 290, Vimodrome, Milan, 20090 Italy,

MITA

	Tel: + 39 022 507 51, Fax: + 39 022 505 515 (Mini-Calorimeter)
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Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 22 Commerce Road, Newtown, CT 06470, USA; rich.pettibone@forecast1.com

Technical Data

Design Features. MITA is a cube-shaped spacecraft small enough to be a secondary payload. The three-axis-stabilized and nadir-pointing spacecraft has two onboard computers. The Onboard Data Handler is linked to all spacecraft systems, while the Payload Computer reads out all data from the NINA-2 detector. On board, MITA hosts two payloads: NINA-2 and the MicroTechSensor for Attitude and Orbit Measurement System (MTS-AOMS).

NINA-2 is a silicon detector cosmic ray telescope built by the Italian Institute for Nuclear Physics. Its predecessor, NINA-1, flew on Russia's Resurs-01 satellite in 1998. NINA-2 is identical to NINA-1, but takes advantage of MITA's computer and telemetry

capabilities to improve data acquisition time. The payload studied cosmic ray flux during the solar maximum from 2000 to 2003.

The MTS-AOMS contains three sensors: the CMOS active pixel sensor, the magnetic field sensor, and the angular rate sensor. The CMOS active pixel sensor is part of a camera that determines the satellite's position and attitude. The magnetic field sensor measures Earth's magnetic field in two axes and the angular rate sensor measures the angular rate around one axis.

The MITA spacecraft was designed with the ability to host and easily integrate Earth-observation, communications, scientific, and technological payloads of up to 50 kilograms.

	<u>Metric</u>	<u>U.S.</u>
Dimensions		
Satellite bus	1,400 x 1,800 x 650 mm	4.592 x 5.904 x 2.132 ft
MTS-AOMS	172 x 78 x 90 mm	.564 x .255 x .295 ft
Weights		
Satellite bus	100 kg	220.5 lb
MTS-AOMS	1,200 g	42 oz
Agile payload	~80 kg	~176 lb
Agile spacecraft mass	120-130 kg	265-287 lb
Performance		
<i>MITA</i>		
Altitude	450 km	279 mi
Orbit	Circular	
Design life	3 years	
Inclination	87.3°	
<i>Agile</i>		
Altitude	550 km	341.6 mi
Orbit	Equatorial	
Design life	3 years	
Pointing accuracy	0.5° - 1°	
Pointing reconstruction	1 arcmin	
Payload required power	~65 W	
Downlink telemetry rate	~500 kbit/sec	
Mass memory	500 Mbit	
Positioning	GPS, ~50 m (1-s)	
Satellite time	GPS, 1µs	

Variants/Upgrades

MITA-1. Mission to validate platform and advanced technologies in orbit. Launched in 2000 and re-entered August 2001. The first MITA mission studied cosmic particles and the composition of solar flares. The spacecraft also observed the interaction between the Sun and Earth's magnetosphere.

Agile. Gamma-ray detector aimed to survey the celestial sphere and identify gamma-ray bursts. Launched in May 2007.

Hypseo. The mission was planned to validate an Italian hyperspectral payload. Launch was originally scheduled for 2004, but the program was canceled in 2002.

DesertSat. Italian-Egyptian joint remote sensing program. Phase-A production was implemented in fall 2001. Launch was originally slated for 2006, but no new information has been publicized regarding the mission since it began.

Future Missions. ASI released an Announcement of Opportunity in 2000 for its third MITA-based Earth

observation mission. Six missions have been selected for preliminary studies: FOURIER, a mission to detect global warming; BISSAT, the Bistatic Synthetic Aperture Radar for Earth Observation; IGPM, the Italian contribution to the Global Precipitation Mission; REFIR, the Radiation Explorer in the Far Infrared; VISIR; and ESPERIA. Nothing has been announced regarding these missions.



Agile Spacecraft in a Calibration Facility

Source: Carlo Gavazzi

Program Review

MITA

Background. In the mid-1990s, ASI lacked proper organization, and the Italian government formed an investigative team to find the reason for ASI's budget mismanagement. After a reorganization of the Italian Space Agency, the administration also revamped its entire space program. ASI renegotiated debts and was determined to take part in international programs such as the International Space Station. ASI also wanted to budget for future programs in Earth observation and scientific missions.

Low-Cost Satellites for Italy

The purpose of the MITA program was to design and manufacture a low-cost satellite for use on future Italian missions. Once the satellite is flight-proven, ASI expects the Italian space industry to fund parts of future missions.

Contributing to the development and launch of the MITA program was ESA. The MTS-AOMS was part of ESA's Technology Flight Opportunity trial program. This trial program was conducted under ESA's General Studies Program. The objective of the trial program was to ensure quick and low-cost access to space for European products needing flight-proven qualification.

MITA was launched in July 2000 on board a Cosmos rocket from Plesetsk Cosmodrome in Russia. It was a secondary payload launched with CHAMP (primary) and BIRD-Rubin, a German experimental satellite.

Agile. Agile is an international effort led by French and Italian industry to identify and study active galactic nuclei, gamma-ray bursts, pulsars, supernova remnants, galaxies, and solar flares using the onboard Gamma-Ray Imaging Detector (GRID) and SuperAgile instruments.

Originally slated to launch in 2003, the Agile finally launched in 2007. The Agile cost about EUR30 million. The 180- to 200-kilogram spacecraft was three-axis stabilized and operated in a 550-kilometer equatorial orbit, where it was to remain for at least three years.

Egypt and Italy Together for DesertSat

In 2001, Egypt and Italy signed an agreement to launch the DesertSat remote sensing scientific satellite using the MITA payload. The Italian Space Agency and

Egypt's National Authority for Remote Sensing and Space Sciences are jointly developing and launching DesertSat. The satellite will monitor coastal erosion, desertification, and agricultural and water resources. The project will be conducted in four stages: training of Egyptian engineers and technicians; design; satellite production; and launch. The program may also include the construction of a land station for receiving and processing satellite images.

DesertSat will be launched into a 620-kilometer, circular, Sun-synchronous orbit, with a lifetime of three years. It will weigh 120 kilograms and feature two gallium-arsenide deployable solar arrays and 80 watts of power. In addition, DesertSat will be three-axis stabilized and operate in both the S-band and X-band frequencies. A launch date for the DesertSat spacecraft has not been finalized.

Funding

Most of the funding for the initial MITA launch was provided by the Italian Space Agency (ASI). The MITA was part of ESA's Technology Flight Opportunity program, which covered the integration, launch, and operation costs.

Timetable

<u>Month</u>	<u>Year</u>	<u>Major Development</u>
Jul	2000	Successful launch of MITA from Plesetsk Cosmodrome in Russia
May	2007	Agile launched on PSLV

Forecast Rationale

MITA served a niche market for Italy's small and medium (150- to 300-kilogram) satellite payloads. At one time, Carlo Gavazzi Space officials foresaw demand of about one satellite every two years. However, information regarding the satellite has not been published since the launch of the Agile. Therefore, no new production is expected.

There have been no new orders for the MITA or launch announcements since the 2007 launch of the Agile. Barring any new developments, this report will be archived in 2013.

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