PSLV-C6 / CARTOSAT-1 & HAMSAT Mission

05 May, 2005

THE MISSION

PSLV-C6 carrying on-board the CARTOSAT-1 & HAMSAT Satellites lifted-off from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota at 10:15 AM (IST) on May 05, 2005. In its 9th flight, ISRO's Polar Satellite Launch Vehicle, PSLV-C6 successfully placed both the satellites in polar Sun-synchronous Orbit (SSO) at an altitude of 632 x 621 km with an inclination of 97.8^0 with respect to the Equator. The solar panels of CARTOSAT-1 were deployed soon after its injection into orbit. For the first time, the state-of-the-art Second Launch Pad at Satish Dhawan Space Centre (SDSC) SHAR was used for a launch.

PSLV-C6

THE LAUNCH VEHICLE

PSLV-C6 is the 9th flight of India's Polar Satellite Launch Vehicle (PSLV). PSLV-C6 is the first flight to be launched from the Second Launch Pad (SLP) at Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota, which is India's spaceport. Located on the East Coast of India, SDSC SHAR is about 80 km to the north of Chennai (Lat 13.6^0 Long 80.2^0). It provides the necessary infrastructure for launching satellites.

In its present configuration, the 44.4 m tall, 295 tonne PSLV has four stages using solid and liquid propulsion systems alternately. The 3.2 m diameter metallic bulbous heat shield protects the satellites and it is discarded after the vehicle has cleared the dense atmosphere. PSLV employs a large number of auxiliary systems for stage separation, heat-shield separation and so on. The vehicle performance is monitored through telemetry and tracking.

SPECIFICATIONS

Height	44.4 m
Lift-Off Mass	295 t
No of Stages	4
Payloads	• CARTOSAT-1 • HAMSAT
Orbit Height	632 x 621 km
Inclination (deg)	97.8^0
Launch Pad	Second Launch Pad (SDSC, SHAR)

CARTOSAT-1

THE SATELLITE

CARTOSAT-1 is the 11th satellite in the IRS series. It is the first IRS satellite capable of providing in-orbit stereo images, used for cartographic applications meeting the global requirements.

CARTOSAT- 1 carried two state-of-the-art PAN (Panchromatic Cameras) viz PAN-F (Panchromatic Forward Pointing Camera) & PAN-A (Panchromatic Aft Pointing Camera) that take black and white stereoscopic pictures of the Earth in the visible region of the electromagnetic spectrum. Each camera provides a spectral range of 0.5-0.85 μm, a spatial resolution of 2.5 m a swath width of 30 km and data quantization of 10 bits. The cameras are mounted [with a tilt of $+26^0$ (fore) and -5^0 (Aft) from yaw axis in yaw roll plane] on the satellite in such a way that near simultaneous imaging of the same area from two different angles is possible. The images taken by CARTOSAT-1 cameras are compressed, encrypted, formatted and transmitted to the ground stations. The images are reconstructed from the data received at the ground stations. It also carries a Solid State Recorder with a capacity of 120 Gigabits to store the images taken by its cameras.

SPECIFICATIONS

Weight	1560 kg
Power	Solar Array: 1020 W Batteries: Ni-Cd 24 Ah
Stabilization	3-axis body stabillised using Reaction Wheels, Magnetic Torquers and Hydrazine Thrusters
Type of Satellite	Earth Observation
Payloads	• PAN-FORE • PAN-AFT
Mission Life	5 Years

HAMSAT

THE SATELLITE

HAMSAT is a Microsatellite for providing satellite based Amateur Radio Services to the national as well as the international community of Amateur Radio Operators (HAM). It consists of two transponders, one indigenously developed by Indian Amateurs with the expertise of ISRO and the experience of HAMSAT-INDIA. The second transponder has been developed by a Dutch Amateur Radio Operator and Graduate Engineering student at Higher Technical Institute, Venlo, The Netherlands.

HAMSAT is India's contribution to the international community of Amateur Radio Operators. This effort is also meant to bring ISRO's satellite services within the reach of the common man and popularise Space Technology among the masses. This satellite will play a valuable role in the national and international scenario by providing a low cost readily accessible reliable means of communication during emergencies and calamities like flood, earthquakes, etc. Besides, it will stimulate technical interest and awareness among the younger generation by providing them with an opportunity to develop their technological projects including offering a platform for testing new technologies. Some of the new technologies being incorporated in the HAMSAT include Integrated Processor based Electronic Bus Management Unit, Lithium Ion Battery and Gallium Arsenide based Solar Panels.

SPECIFICATIONS

Weight	42.5 kg
Power	Body mounted Gallium Arsenide Solar Panels Lithium Ion Battery
Stabilization	4±0.5 RPM Spin-stabilised
Type of Satellite	Communication
Payloads	2 Transponders
Mission Life	Nominal 6 Years (Operation continues in 2012)