

CARTOSAT-2B



CARTOSAT-2B is an advanced Remote Sensing Satellite built by ISRO. This is the latest in the Indian Remote Sensing Satellite Series and the seventeenth Remote Sensing Satellite of India. CARTOSAT-2B is mainly intended to enhance the remote sensing data services to the users of multiple spot scene imagery with better than 1 metre spatial resolution and 10 km swath in the panchromatic band. Cartosat-2 and 2A, two Indian Remote Sensing satellites in orbit, are currently providing such services. The 694 kg CARTOSAT-2B will be launched into a 637 km high polar Sun Synchronous Orbit (SSO) by the seventeenth flight of India's Polar Satellite Launch Vehicle (PSLV-C15).

CARTOSAT-2B carries a Panchromatic camera (PAN) similar to that of its two predecessors CARTOSAT-2 and 2A. It is capable of imaging a swath (geographical strip of land) of 9.6 km with a resolution of better than 1 metre. The highly agile CARTOSAT-2B is steerable up to ± 26 deg along as well as across track to obtain stereoscopic imagery and achieve a four day revisit capability. The satellite also carries a Solid State Recorder with a capacity of 60 Giga Bits to store the images taken by its camera which can be read out later to the ground stations.

The multiple spot scene imagery sent by CARTOSAT-2B's PAN will be useful for village level/cadastral level resource assessment and mapping, detailed urban and infrastructure planning and development, transportation system planning, preparation of large-scale cartographic maps, preparation of micro watershed development plans and monitoring of developmental works at village/cadastral level. Besides, CARTOSAT-2B's imagery can be used for the preparation of detailed forest type maps, tree volume estimation, village/cadastral level crop inventory, town/village settlement mapping and planning for comprehensive development, canal alignment, rural connectivity assessment, planning new rural roads and monitoring their construction, coastal landform/land use and coral/mangrove mapping and monitoring of mining activities.

SALIENT FEATURES

Orbit	: Circular Polar Sun Synchronous
Orbit height	: 630 km
Orbit inclination	: 97.91 deg
Orbit period	: 97.44 min
Number of Orbits per day	: 14
Local Time of Equator crossing	: 09.30 AM
Revisit	: 4 days
Lift-off Mass	: 694 kg
Attitude and Orbit Control	: 3-axis body stabilised based on inputs from star sensors and gyros by using Reaction wheels, Magnetic Torquers and Hydrazine Thrusters
Power	: Solar Array generating 850 W, Two 18 AH Ni-Cd batteries
Mission Life	: 5 years



PAYLOAD: Panchromatic Camera (PAN)

Spatial Resolution: Better than 1 metre
Swath: 9.6 km
Spectral Band: 0.5-0.75



CARTOSAT-2B SATELLITE IN CLEAN ROOM WITH ITS PANELS DEPLOYED

AUXILIARY PAYLOADS OF PSLV-C15

Besides its main payload CARTOSAT-2B weighing 694 kg, PSLV-C15 will also carry four small satellites as auxiliary payloads. Of these, the 116 kg ALSAT-2A of Algeria is a small remote sensing satellite, whereas two Nanosats – NLS-6.1 AISSAT-1 weighing 6.5 kg and built by Space Flight Laboratory of the University of Toronto, Canada and NLS-6.2 TISAT-1 weighing 1 kg and built by University of Applied Sciences of Switzerland – are for testing various satellite technologies. The fourth auxiliary payload STUDSAT is a Picosatellite weighing less than 1 kg built jointly by students from a consortium of seven engineering colleges from Karnataka and Andhra Pradesh.

PSLV-C15



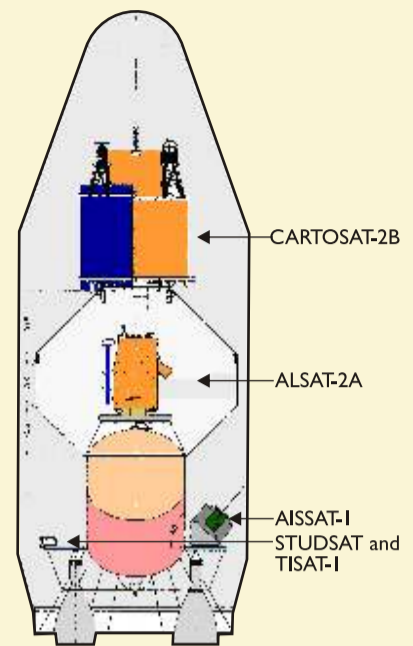
PSLV-C15 is the seventeenth flight of ISRO's versatile Polar Satellite Launch Vehicle, PSLV. In this flight, PSLV will place the 694 kg CARTOSAT-2B in a 637 km polar Sun Synchronous Orbit (SSO). PSLV was initially designed for launching 900 kg Indian Remote Sensing Satellites into a 900 km polar SSO.

Since its first launch in 1993, the PSLV has been successively improved to attain its present capability of launching 1750 kg into a 630 km polar SSO. The major changes made in PSLV since its first launch include the increase in the propellant loading of the first stage solid propellant motor as well as the strap-ons and in the second and fourth liquid propellant stages, improvement in the performance of the third stage motor by optimising motor case and enhanced propellant loading and employing a carbon composite payload adopter.

PSLV has also been made a more versatile vehicle for launching multiple satellites in polar SSOs as well as for launching satellites into Geosynchronous Transfer Orbit (GTO) and Low Earth Orbit (LEO). With fifteen consecutively successful launches, PSLV has emerged as a workhorse launch vehicle of ISRO and is offered for launching satellites of other space agencies also.

Besides launching 17 Indian satellites, PSLV has launched 22 foreign satellites as well during 1994-2009 period into polar Sun Synchronous, Geosynchronous Transfer, Highly Elliptical and Low Earth Orbits and has repeatedly proved its reliability and versatility.

For PSLV-C15 mission, the 'core alone' version of PSLV has been chosen based on the weight of the payloads and the orbit to which they are to be placed. The 44 metre tall 'core alone' version of PSLV weighs 230 tons at lift-off. Six solid 'strap-on motors', clustered around the first stage of PSLV 'standard version' to enhance its thrust, are absent in 'core alone' version. PSLV-C15 is the sixth flight of the 'core alone' version of PSLV.



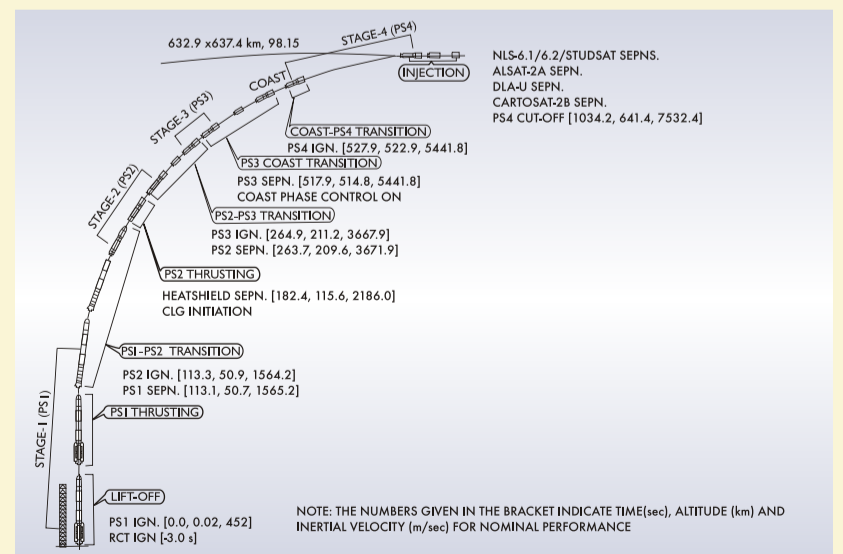
CARTOSAT-2B in PSLV-C15 envelope

PSLV-C15 Stages at a Glance

	STAGE-1	STAGE-2	STAGE-3	STAGE-4
Nomenclature	Core (PS1)	PS2	PS3	PS4
Propellant	Solid HTPB Based	Liquid UH ₂ + N ₂ O ₄	Solid HTPB Based	Liquid MMH+MON-3
Mass (Tonne)	138.0	41.0	7.6	2.5
Max Thrust (kN)	4817	799	238	7.3x2
Burn Time (Sec)	101	147	112	497
Stage Dia (m)	2.8	2.8	2.0	2.8
Stage Length (m)	20	12.8	3.6	2.6
Control	SITVC for Pitch & Yaw, Reaction Control Thrusters for Roll Control	Engine Gimbal for Pitch & Yaw, Hot Gas Reaction Control Motor for Roll Control	Flex Nozzle for Pitch & Yaw, PS 4 RCS for Roll Control	Engine Gimbal for Pitch, Yaw & Roll, on-off RCS for Coast Phase Control

SALIENT FEATURES

- Height : 44.4 metre
- Weight : 230 Tonne
- Payload Fairing : 3.2 metre diameter



PSLV-15 Mission Profile

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Designed by Imagic Creatives, Bangalore. Printed at Brilliant Printers, Bangalore

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