

GSLV-D2 / GSAT-2 Mission

08 May, 2003

THE MISSION

GSLV-D2 carrying on-board the GSAT-2 Satellite lifted-off from the Satish Dhawan Space Centre (SDSC) SHAR, Sriharikota on May 08, 2003. In this flight, GSLV placed a heavier satellite GSAT-2 into Geosynchronous Transfer Orbit of 180 km perigee (nearest point to Earth) and 36,000 km apogee (farthest point to Earth).

G S L V - D 2

THE LAUNCH VEHICLE

GSLV-D2 is the second developmental test flight of the GSLV launch vehicle. GSLV-D2 is a three stage vehicle. The first stage (GS1) consists of a solid core stage (S139) and 4 liquid stages (L40 H) strapped to the core. The second stage (GS2) is a liquid stage and third (GS3) is a cryogenic stage. The configuration of GSLV is denoted as S139 & 4L40H + L37.5H + C12.5.

The higher payload capability has been achieved by incorporating:

- Enhanced propellant loading in core solid motor.
- High pressure engine in liquid propellant strap-ons and second stage.
- Optimisation of structural elements.

SPECIFICATIONS

Height	49 m
Lift-Off Mass	414 t
No of Stages	3
Payloads	GSAT-2
Inclination (deg)	104°
Apogee	36,000 km
Perigee	180 km



STAGE CHARACTERISTICS

Parameters	First Stage, GS1		GS2 Second Stage	GS3 Third Stage
	S139 Booster	L40H Strap-on		
Length (m)	20.13	19.7	11.6	8.7
Diameter (m)	2.8	2.1	2.8	2.9
Total Mass (t)	161.33	47.44	44.1	15.18
Useful Propellant Mass (t)	138.15	42.25	39.3	12.64
Case / Tank Material	M 250 Steel	Aluminium Alloy	Aluminium Alloy	Aluminium Alloy
Propellant	HTPB & Aluminium Perchlorate	UH25 & N ₂ O ₄	UH25 & N ₂ O ₄	LH ₂ & LOX
Burn Time (s)	106.5	149	135	707
Thrust (kN in Vacuum)	4736 (pk)	765	804	Up-rated Phase: 81.6 Nominal Phase: 73.6
Control System	Engine gimbaling in one plane		Engine gimbaling for Pitch & Yaw control; Reaction thrusters for Roll control	Vernier engine gimbaling for Pitch, Yaw & Roll control; Reaction thrusters for coast phase
Separation System	Flexible Linear Shaped Cord (FLSC)		Pyro actuated collet release mechanism	Merman band and spring thrusters



GSAT-2

THE SATELLITE

GSAT-2 is the 2000 kg class Experimental Communication Satellite. The satellite carried four C-band transponders, two Ku-band transponders and a Mobile Satellite Service (MSS) payload operating in S-band and C-band for forward link and return link respectively.

GSAT-2 also carried four scientific experimental payloads:

- Total Radiation Dose Monitor (TRDM)
- Surface Charge Monitor (SCM)
- Solar X-ray Spectrometer (SOXS)
- Coherent Radio Beacon Experiment (CRABEX)

SPECIFICATIONS

Weight	1800 kg
Power	Solar Array: 1380 W Batteries: Ni-Cd 24 Ah
Stabilization	3-axis body stabilized in orbit using Momentum / Reaction Wheels, Magnetic Torquers, Sensors and Bipropellant Thrusters Besides Normal Sensors, fine Sun Sensor used for pointing SOXS payload towards the Sun
Type of Satellite	Communication
Payloads	<ul style="list-style-type: none">• 4 C-band Transponders• 2 Ku-band Transponders• MSS Payload (S-band forward, C-band return)• TRDM• SCM• SOXS• CRABEX
Mission Life	8 Years

