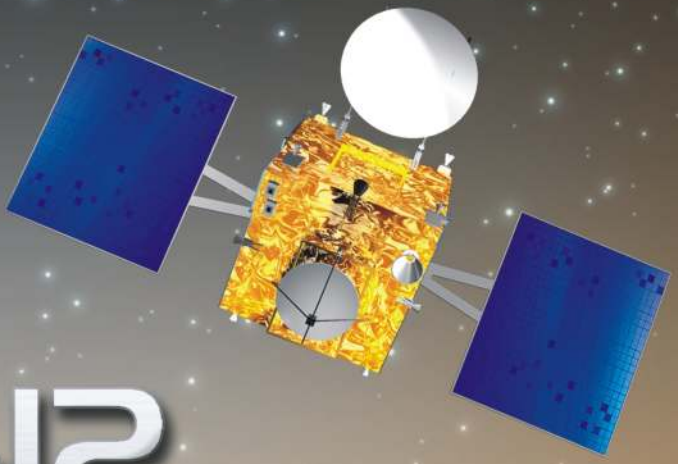
इसरो isro



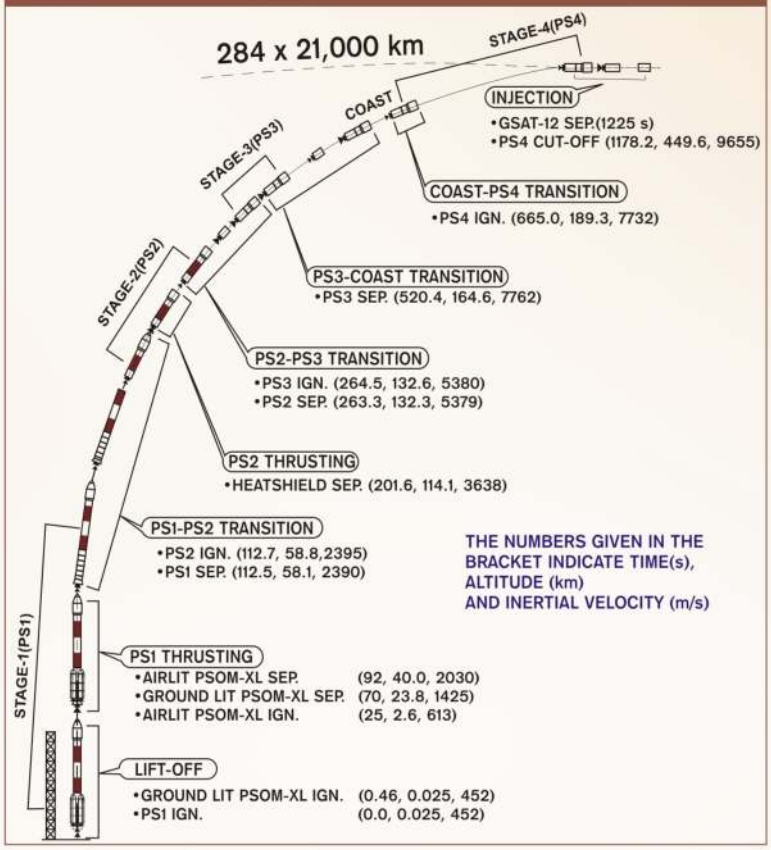
GSAT-12

PSLV-C17

Polar Satellite Launch Vehicle, in its nineteenth flight (PSLV-C17), will launch India's communication satellite GSAT-12 from the Second Launch Pad of Satish Dhawan Space Centre, (SDSC) SHAR. PSLV-C17 will use PSLV-XL version. In PSLV-XL, six extended solid strap-on motors are used wherein each strap-on will carry 12 tonnes of solid propellant. This is the second time such a configuration is being flown, earlier one being the PSLV-C11/Chandrayaan-1 mission.

PSLV at Second Launch Pad

PSLV-C17 Typical Flight Profile



PSLV-C17

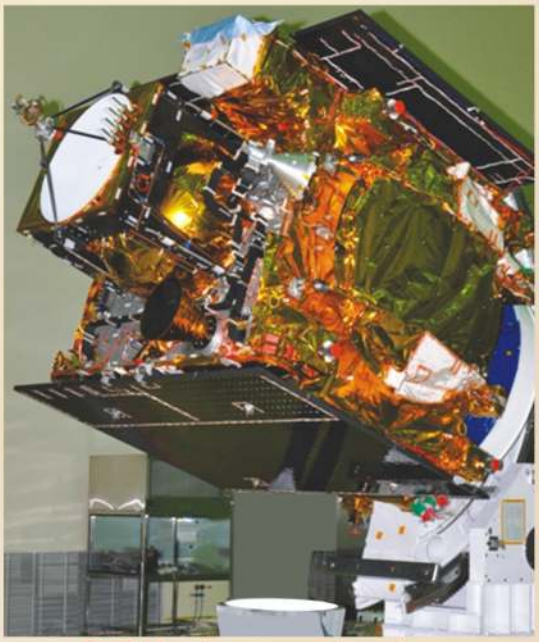
PSLV- C17 stages at a glance

	STAGE-1	STAGE-2	STAGE-3	STAGE-4
Nomenclature	Core Stage (PS1) + 6 Strap-on Motors	PS2	PS3	PS4
Propellant	Solid (HTPB Based)	Liquid (UH25 + N_2O_4)	Solid (HTPB Based)	Liquid (MMH+MON-3)
Mass (tonne)	138.0 (Core) + 6 x 12.0 (Strap-on)	41.0	7.6	2.5
Max Thrust (kN)	4703 (Core) + 6 x 670 (Strap-on)	804	244	7.3X2
Burn Time (sec)	107 (Core) 55 (Strap-on)	151	116	510
Stage Dia (m)	2.8 (Core) 1.0 (Strap-on)	2.8	2.0	2.8
Stage Length (m)	20 (Core) 14.7 (Strap-on)	12.8	3.6	2.6

GSAT-12

GSAT-12, the latest communication satellite built by ISRO, weighs about 1410 kg at lift-off. GSAT-12 is configured to carry 12 Extended C-band transponders to meet the country's growing demand for transponders in a short turnaround time.

Indian National Satellite (INSAT) system, established in 1983, is one of the largest domestic communication satellite systems in the Asia Pacific region. It presently comprises of eight satellites – INSAT-2E, INSAT-3A, INSAT-3C, INSAT-3E, INSAT-4A, INSAT-4B, INSAT-4CR and GSAT-8 providing 175 transponders in S, C, Ext-C and Ku-bands.



GSAT-12 undergoing pre-launch tests at ISRO Satellite Centre

GSAT-12 is launched into a sub Geosynchronous Transfer Orbit (sub GTO) with a 284 km perigee (nearest point to Earth) and 21,000 km apogee (farthest point from the Earth) with an inclination of 17.9 deg with respect to the equatorial plane.

GSAT-12 undergoing pre-launch checks at SDSC SHAR

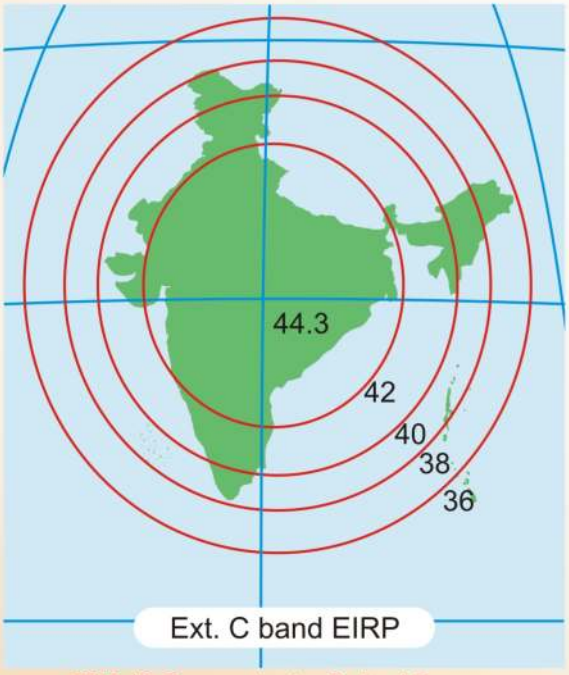
After injection into this preliminary orbit, solar panels of GSAT-12 satellite are automatically deployed and the Master Control Facility (MCF) at Hassan takes control of the satellite and performs the initial orbit raising manoeuvres using the Liquid Apogee Motor (LAM) onboard the satellite, finally placing it in the circular Geostationary Orbit. After this, the deployment of the antenna and the three axis stabilisation of the satellite will be performed. GSAT-12 will be positioned at 83 deg. E longitude and co-located with INSAT-2E and INSAT-4A satellites.

The 12 Extended C-band transponders of GSAT-12 will augment the capacity in the INSAT system for various communication services like Tele-education, Telemedicine and for Village Resource Centres (VRC).

GSAT-12 Salient Features	
Orbit	Geostationary (83 deg. longitude) co-located with INSAT-2E and 4A
Lift-off Mass	1410 kg
Dry Mass	559 kg
Physical Dimensions	1.485 x 1.480 x 1.446 m cuboid
Propulsion (for orbit raising)	440 Newton Liquid Apogee Motor (LAM) with Mono Methyl Hydrazine (MMH) as fuel and Mixed Oxides of Nitrogen (MON-3) as oxidiser
Attitude & Orbit Control	3-axis body stabilised in orbit using Earth Sensors, Sun Sensors, Momentum and Reaction Wheels, Magnetic Torquers and eight 10 Newton and eight 22 Newton bipropellant thrusters
Power	Solar array providing 1430 Watts and one 64 Ah Li-Ion battery
Antennae	One 0.7 m diameter body mounted parabolic receive antenna and one 1.2 m diameter polarisation sensitive deployable antenna
Mission Life	About 8 years

COMMUNICATION PAYLOAD

GSAT-12 carries12 Extended C-band band transponders each with 36 MHz usable bandwidth with footprint covering Indian mainland with an Edge Of Coverage EIRP of 37 dBW and islands with an Edge Of Coverage EIRP of 33 dBW.



GSAT-12 Communication Payload Coverage

इसरो isro INDIAN SPACE RESEARCH ORGANISATION
Publications and Public Relations, ISRO Headquarters, Antariksh Bhavan, New BEL Road, Bangalore-560 231, India
Designed by Imagic Creatives Pvt. Ltd. Printed at Brilliant Printers Pvt. Ltd., Bangalore
www.isro.gov.in
JULY 2011