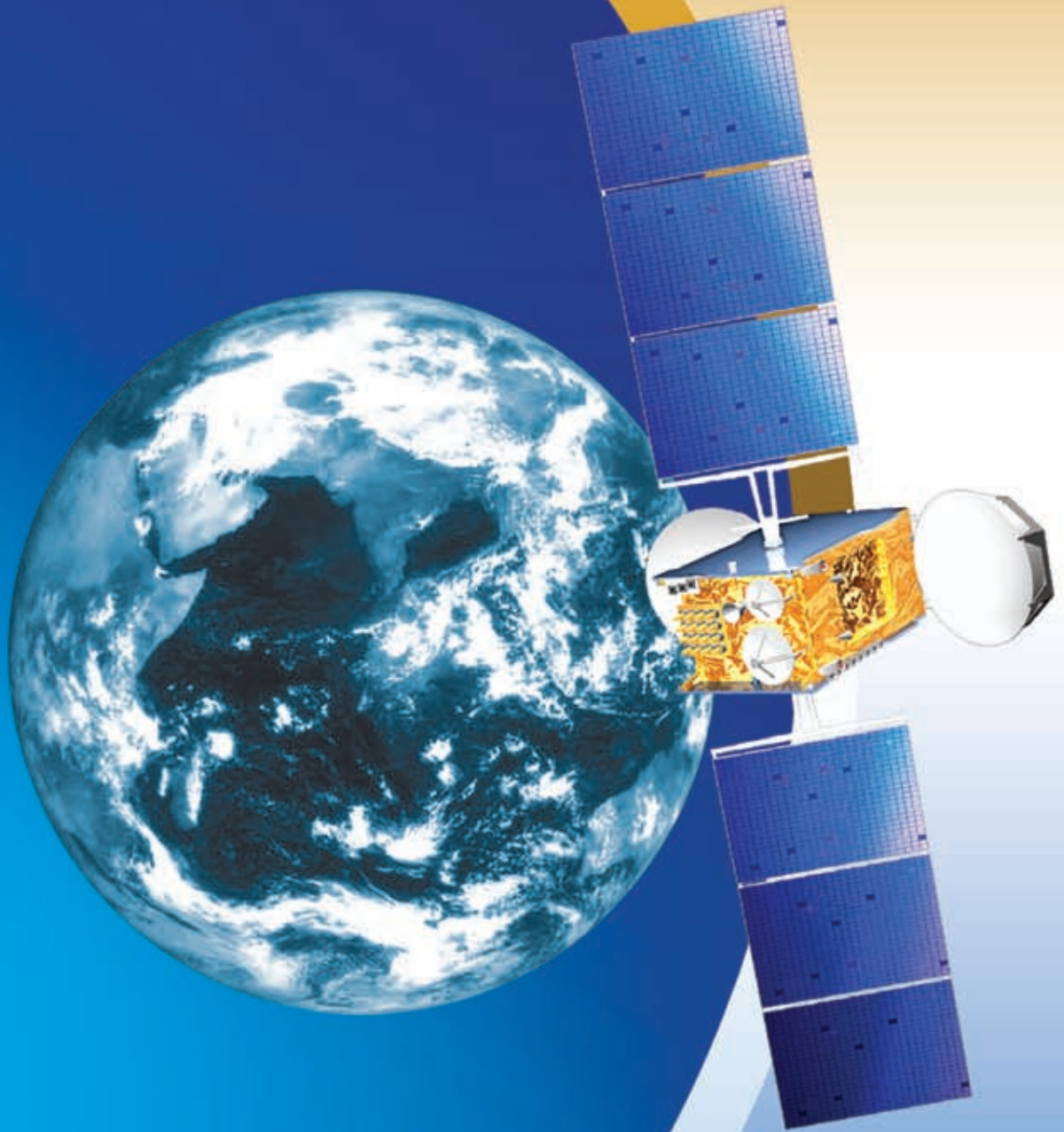
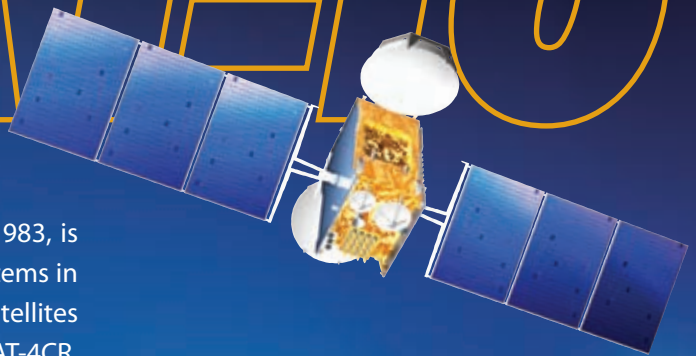


# GSAT-10

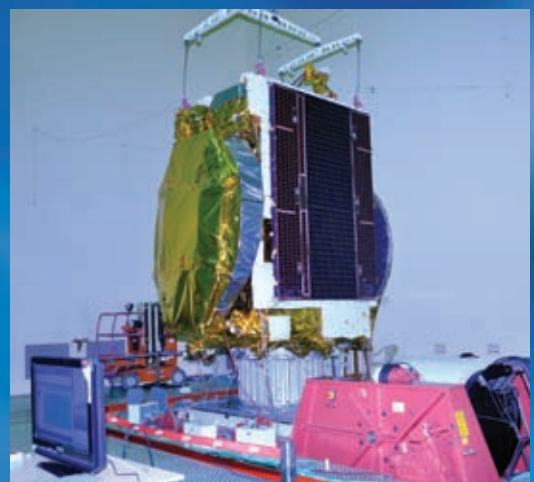


# GSAT-10

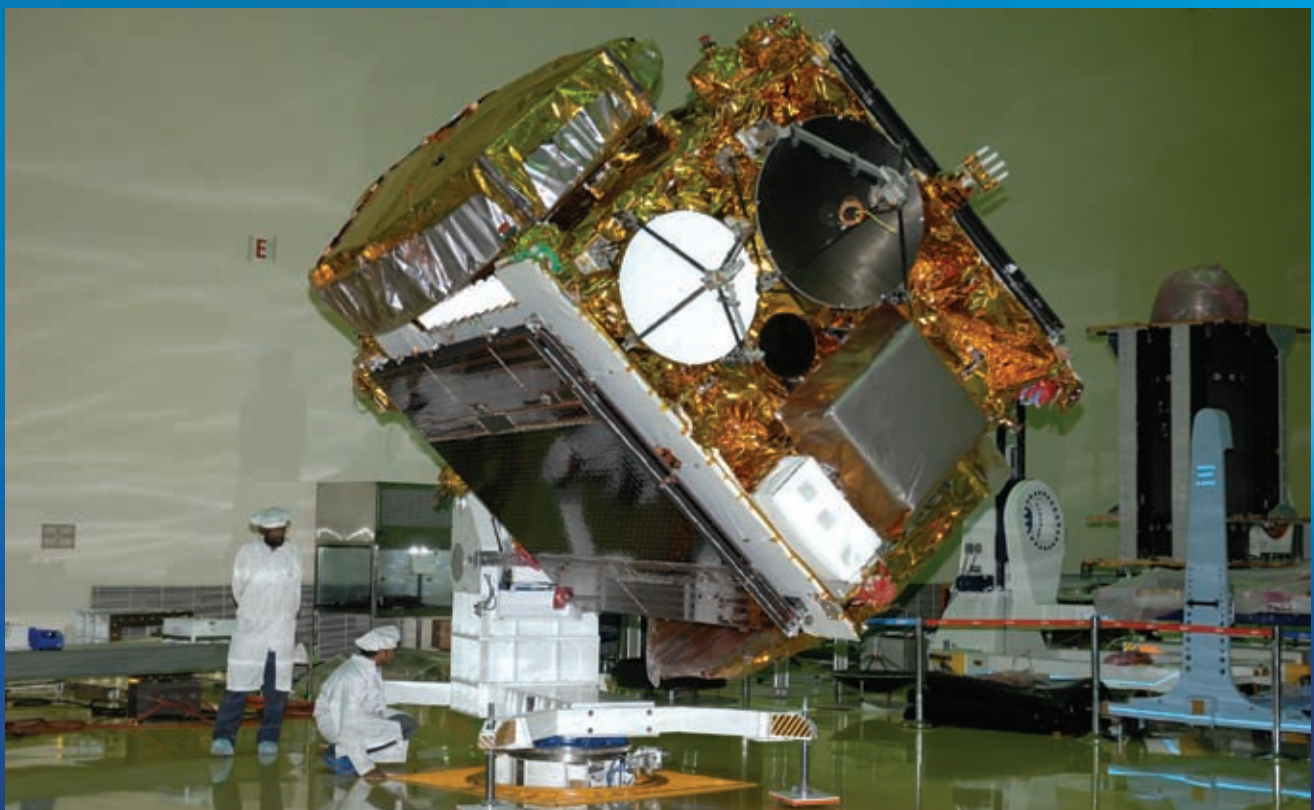


Indian National Satellite (INSAT) system, established in 1983, is one of the largest domestic communication satellite systems in the Asia Pacific Region. It presently comprises of eight satellites – INSAT-3A, INSAT-3C, INSAT-3E, INSAT-4A, INSAT-4B, INSAT-4CR, GSAT-8 and GSAT-12 – providing 168 transponders in S, C, Ext-C and Ku-bands.

GSAT-10, India's advanced communication satellite, is a high power satellite being inducted into the INSAT system. Weighing 3400 kg at lift-off, GSAT-10 is configured to carry a total of 30 communication transponders in normal C-band, lower extended C-band and Ku-band as well as a GPS Aided GEO Augmented Navigation (GAGAN) payload operating in L1 and L5 bands. GSAT-10 is the second satellite to carry GAGAN payload after GSAT-8, which is already providing navigation services from orbit. GSAT-10 carries a Ku-band beacon as well to help in accurately pointing ground antennas towards the satellite.



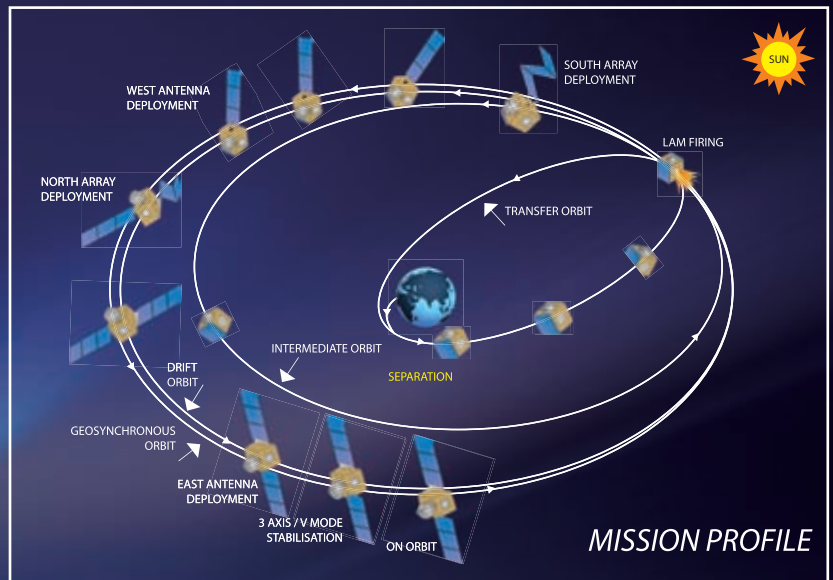
*GSAT-10 undergoing vibration test*



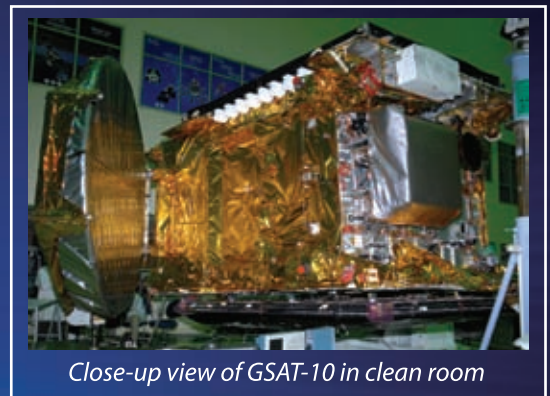
*The fully integrated GSAT-10 at clean room*



GSAT-10 is launched into a Geosynchronous Transfer Orbit (GTO) by Ariane-5 VA-209 launch vehicle from Kourou, French Guiana. After its injection into GTO, ISRO's Master Control Facility (MCF) at Hassan takes control of the satellite and performs the initial orbit raising manoeuvres using the Liquid Apogee Motor (LAM) on-board the satellite, placing it in the circular Geostationary Orbit. After this, the deployment of appendages such as the solar panels, antennas and three axis stabilisation of the satellite will be performed. GSAT-10 will be positioned at 83 deg East longitude and co-located with INSAT-4A and GSAT-12 satellites. The designed in-orbit operational life of GSAT-10 is 15 years.



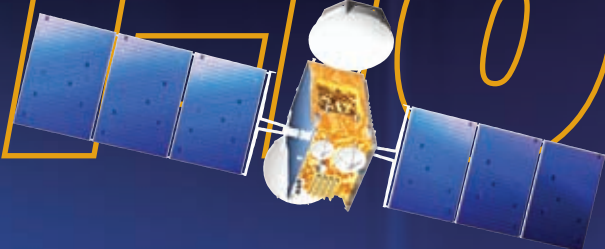
The 30 communication transponders onboard GSAT-10 will further augment the capacity in the INSAT system. The GAGAN payload provides the Satellite Based Augmentation System (SBAS), through which the accuracy of the positioning information obtained from the GPS satellites is improved by a network of ground based receivers and made available to the users in the country through geostationary satellites.



## SALIENT FEATURES

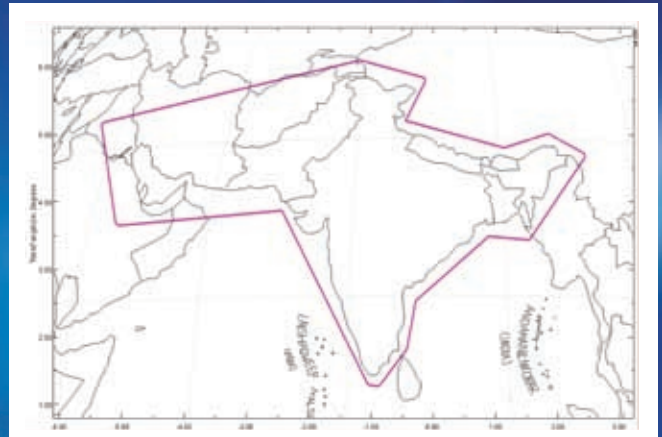
Orbit	: Geostationary (83 deg East longitude), co-located with INSAT-4A and GSAT-12
Lift-off Mass	: 3400 kg
Dry Mass	: 1498 kg
Physical Dimensions	: 2.0 m x 1.77 m x 3.1 m cuboid
Propulsion	: 440 Newton Liquid Apogee Motor (LAM) with Mono Methyl Hydrazine (MMH) as fuel and Mixed Oxides of Nitrogen (MON-3) as oxidiser for orbit raising
Stabilisation	: 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 6474 Watts (at Equinox) and two 128 AH Lithium Ion batteries
Antennas	: East : 2.2 m dia circular deployable Dual Gridded Reflector (DGR) West : 2.2 m x 2.4 m elliptical deployable DGR Earth Viewing Face (Top) : 0.7 m parabolic, 0.9 m parabolic and 0.8 m x 0.8 m sixteen element helical antenna for GAGAN
Operational Life	: 15 years

# GSAT-10



## PAYLOADS OF GSAT-10 COMMUNICATION PAYLOADS

- 12 Ku-band transponders each with 36 MHz usable bandwidth employing 140 W Travelling Wave Tube Amplifier (TWTA) with footprint covering Indian mainland with an Edge of Coverage Effective Isotropic Radiated Power (EIRP) of 51.5 dBW and Andaman & Nicobar islands with an EIRP of 49.5 dBW
- 12 C-band transponders each with 36 MHz usable bandwidth employing 32 W TWTA with footprint covering Indian mainland and West Asia with an Edge of Coverage EIRP of 40 dBW
- 6 Lower Extended C-band transponders each with 36 MHz usable bandwidth employing 32 W TWTA with footprint covering Indian mainland and island territories with an Edge of Coverage EIRP of 38 dBW and 37 dBW respectively



Normal C-Band Coverage

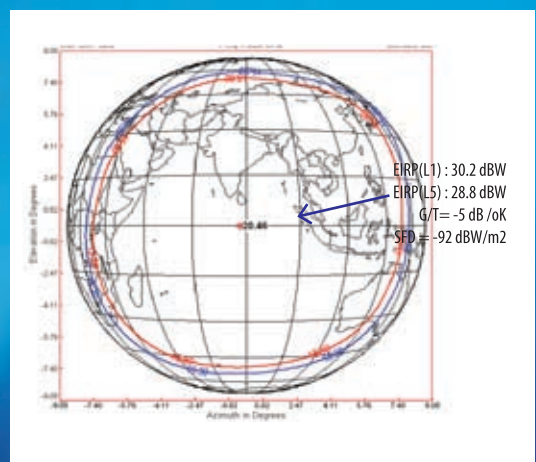


Ext-C Band Coverage

Ku Band Coverage

## NAVIGATION PAYLOAD

Two-channel GAGAN payload operating in L1 and L5 bands provides Satellite-based Navigation services with accuracy and integrity required for civil aviation applications over Indian Air Space.



GAGAN Coverage



## Indian Space Research Organisation

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