

## GSAT-14 Communication Satellite

GSAT-14 is the twenty third geostationary communication satellite of India built by ISRO. Four of GSAT-14's predecessors were launched by GSLV during 2001, 2003, 2004 and 2007 respectively. After its commissioning, GSAT-14 joined the group of India's nine operational geostationary satellites.

GSLV-D5 launched 1982 Kg GSAT-14 communication satellite, into Geosynchronous Transfer Orbit (GTO). After reaching GTO, GSAT-14 used its own propulsion system to reach its geostationary orbital home and will be stationed at 74° East longitude. GSAT-14 will help provide many satellite based communication services to the country including tele-education and telemedicine.

The main objectives of GSAT-14 mission are:

- To augment the in-orbit capacity of Extended C and Ku-band transponders.
- To provide a platform for new experiments.

Some of the new experiments being flown on GSAT-14 are; Fiber Optic Gyro, Active Pixel Sun Sensor Ka band beacon propagation studies and Thermal control coating experiments

After its injection into Geosynchronous Transfer Orbit (GTO) by GSLV-D5, ISRO's Master Control Facility (MCF) at Hassan took control of GSAT-14 and performed the initial orbit raising manoeuvres in three steps, firing the satellite's Liquid Apogee Motor (LAM), finally placing it in the circular Geostationary Orbit. Following this, the deployment of the antennae and three axis stabilisation of the satellite will be performed. GSAT-14 will be positioned at 74 deg East longitude and co-located with INSAT-3C, INSAT-4CR and KALPANA-1 satellites. The 12 communication transponders onboard GSAT-14 will further augment the capacity in the INSAT/GSAT system.

The GSAT Mission Profile; Six extended C-band transponders for Indian mainland and island coverage with 36 dBW edge of Coverage-Effective Isotropic Radiated Power (EOC-EIRP), Six Ku-band transponders covering the mainland India with 51.5 dBW EOC-EIRP, Two Ka-band Beacons operating at 20.2 GHz and 30.5 GHz to carry out attenuation studies.

The Indian Space Research Organisation added feather after feather to its cap. It was an unequivocal demonstration of the space agency's mastery of cryogenic technology, a key element in building more powerful launch vehicles. While its older sibling, the Polar Satellite Launch Vehicle (PSLV), can accommodate communication satellites weighing about 1,200 kg, the GSLV will be able to carry spacecraft that are heavier by around 1,000 kg.

GSLV-D5 is the eighth flight of India's Geosynchronous Satellite Launch Vehicle (GSLV). It is also the fourth developmental flight of GSLV. During this flight, the indigenously developed Cryogenic Upper Stage (CUS) was flight tested for the second time.

GSLV-D5/GSAT-14 was launched from the Second Launch Pad at Satish Dhawan Space Centre SHAR (SDSC SHAR), Sriharikota. The flight duration of GSLV-D5 was 17 min 8 sec. GSLV is a three-stage launch vehicle with solid, liquid and cryogenic stages. It is designed to inject 2 Ton class of communication satellites to Geosynchronous Transfer Orbit (GTO). The four liquid L40 strap-ons as well as the second stage of GSLV use storable liquid propellants. GSLV-D5 vehicle is configured with its first and second stages similar to the ones flown during earlier GSLV missions. The third stage is the indigenous cryogenic stage. The metallic payload fairing with a diameter of 3.4 metre is adopted for GSLV-D5.

(input; various agencies)