Project Work

on

Indian Space Research Organisation

(ISRO)

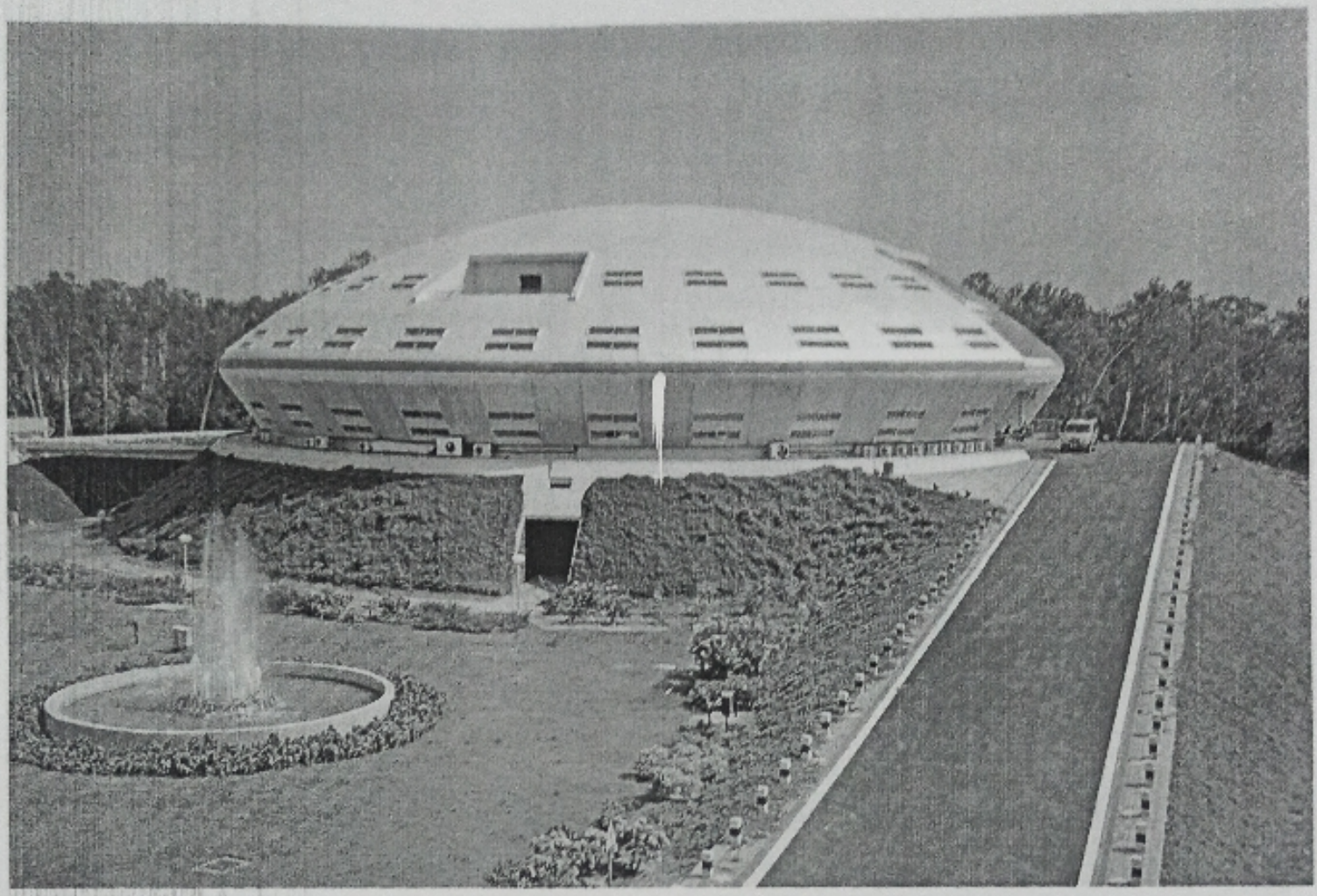
and

ROCKET

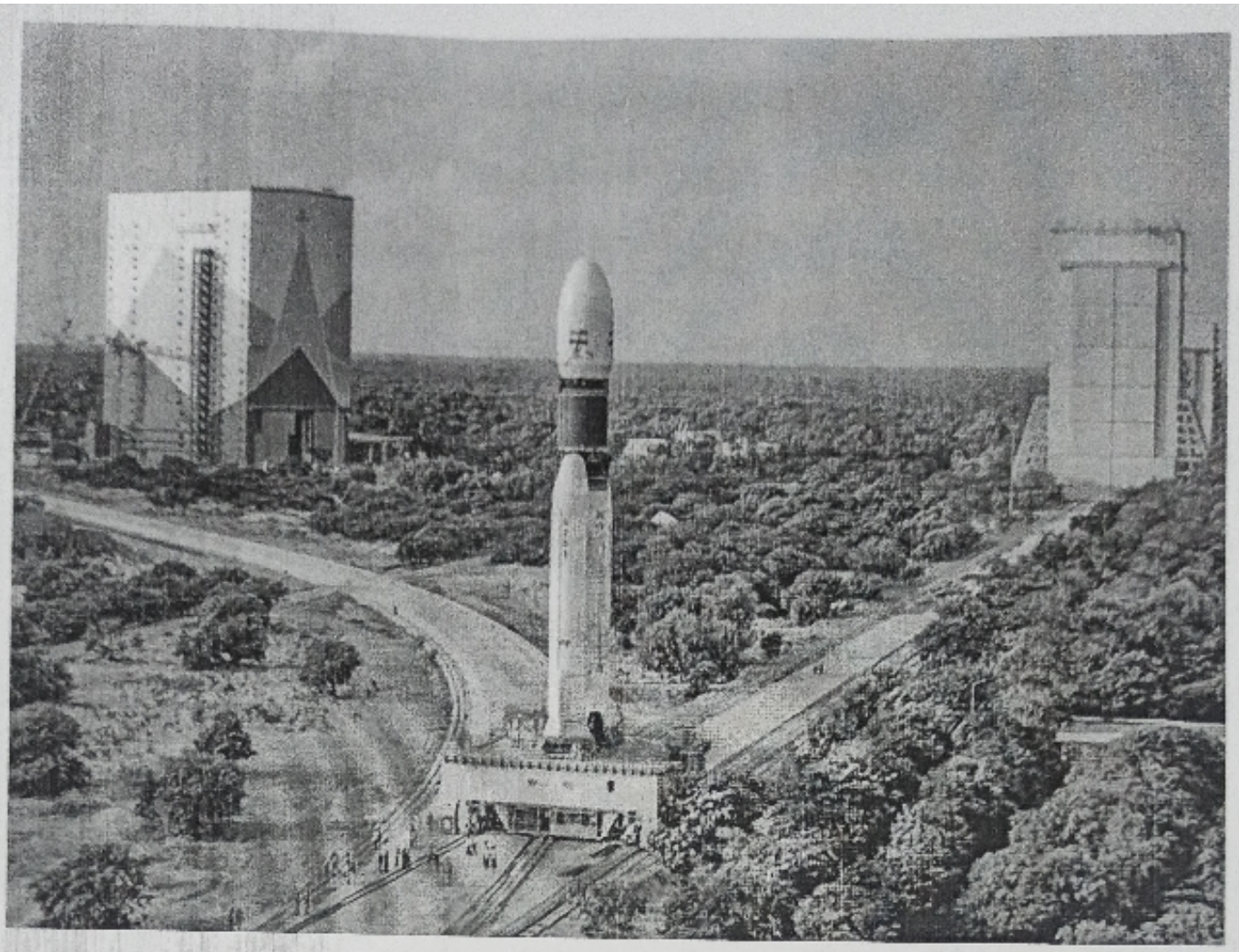
B.Sc. I yr I sem

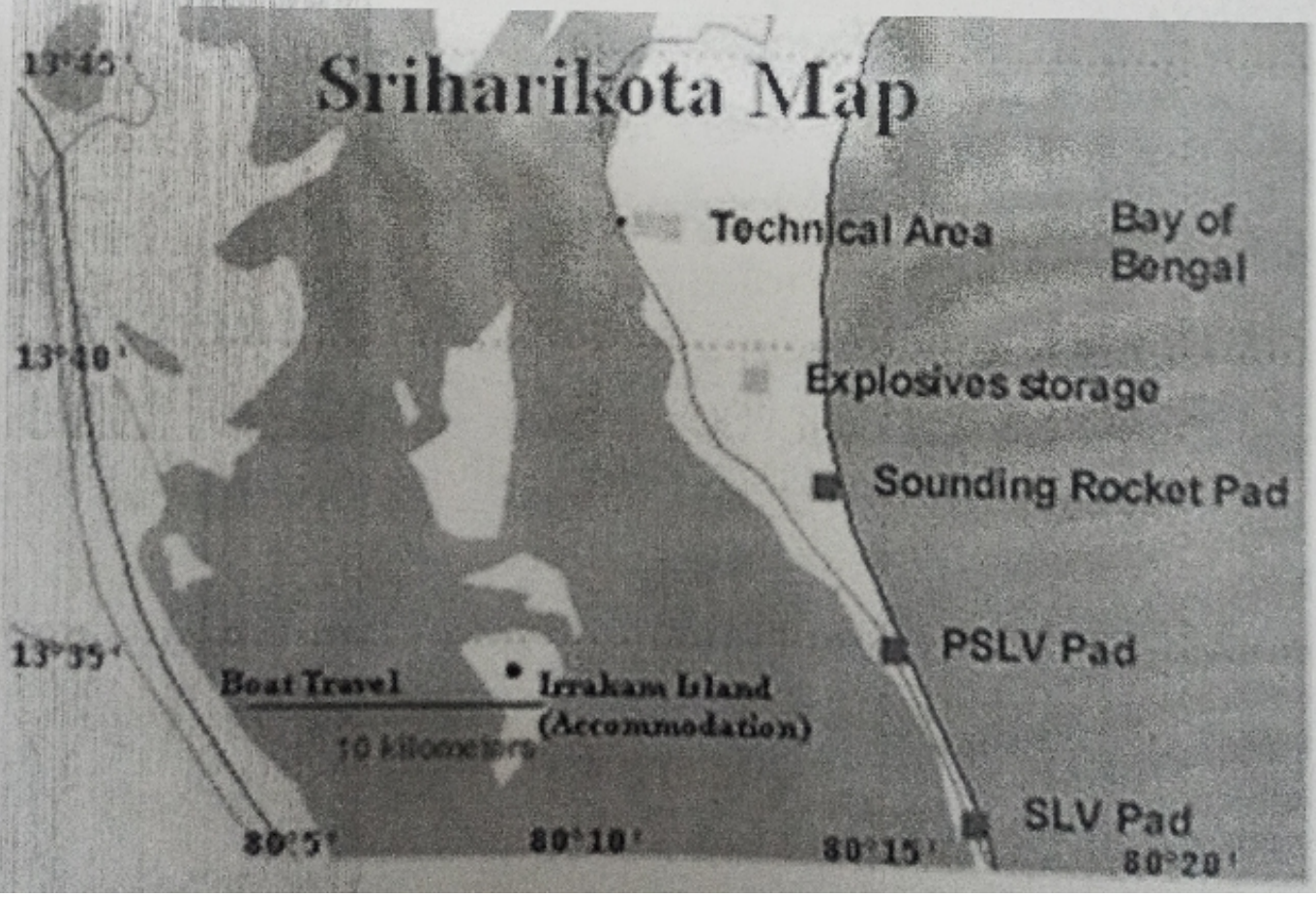
by P. Archana
T. Aparna
S. Rama Devi
Shailaja
Srikanth

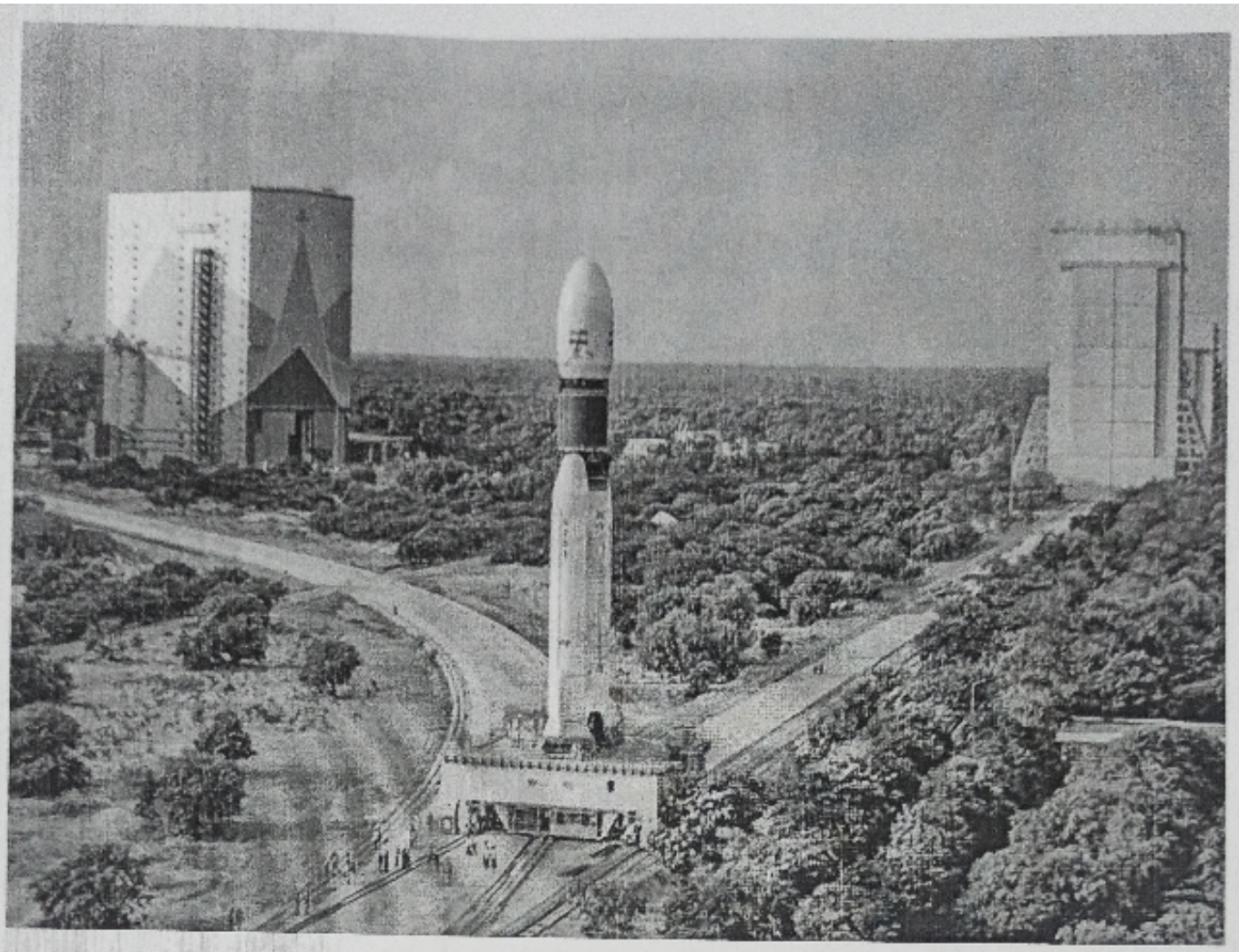
Signature of faculty

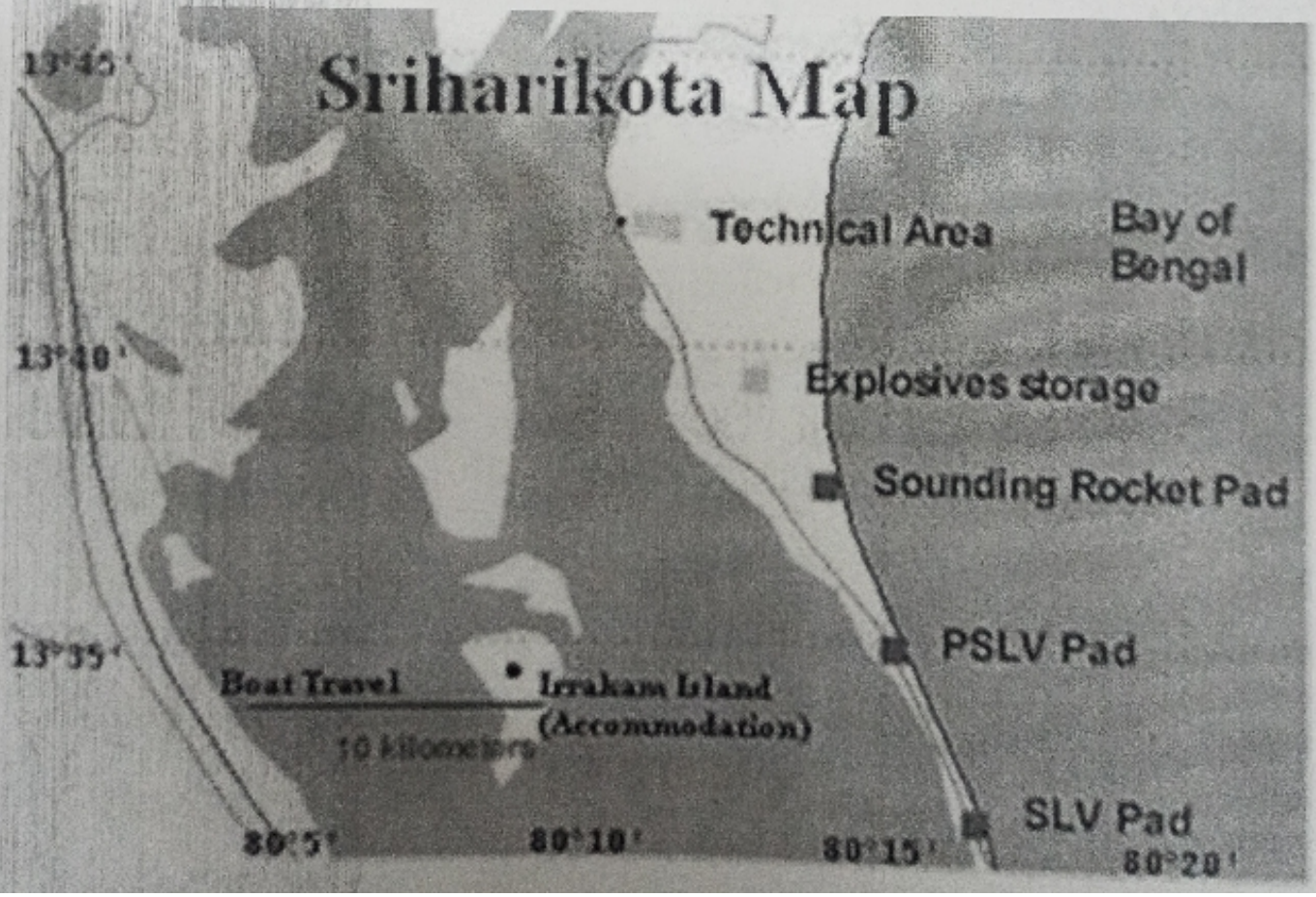


Satish Dhawan Space Centre (SDSC) SHAR




Sriharikota Map
13°45'
13°40'
13°35'
Technical Area
Bay of Bengal
Explosives storage
Sounding Rocket Pad
PSLV Pad
Boat Travel
Irrakam Island (Accommodation)
10 Kilometers
SLV Pad
80°5'
80°10'
80°15'
80°20'

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The famed PSLV went on to become a favoured carrier for satellites of various countries due to its reliability and cost efficiency, promoting unprecedented international collaboration. The Geosynchronous Satellite Launch vehicle (GSLV) was developed keeping in mind the heavier and more demanding Geosynchronous Communication Satellites.

Apart from technological capability, ISRO has also contributed to science and science education in the country. Various dedicated research centres and autonomous institutions for remote sensing, astronomy and astrophysics, atmospheric sciences and space sciences in general function under the aegis of Department of Space. ISRO's own Lunar and Interplanetary missions along with other scientific projects encourage and promote science education, apart from providing valuable data to the scientific community which in turn enriches science.

Future readiness is the key to maintaining an edge in technology and ISRO endeavours to optimise and enhance its technologies as the needs and ambitions

of the country evolve. Thus, ISRO is moving forward with the development of heavy lift launchers, human spaceflight projects, reusable launch vehicles, semi-cryogenic engines, single and two stage to orbit (SSTO and TSTO) vechiels, development and use of composite materials for space applications etc.

Dr. Sarabhai was convinced that the resources in space have the potential to address the real problems of man and society. As director, physical Reasearch Laboratory (PRL) located in Ahmedabad, Dr. Sarabhai problems convened an army of able and brilliant scientists, anthropologists, communicators and social scientists from all corners of the country to spearhead the indian space programme.

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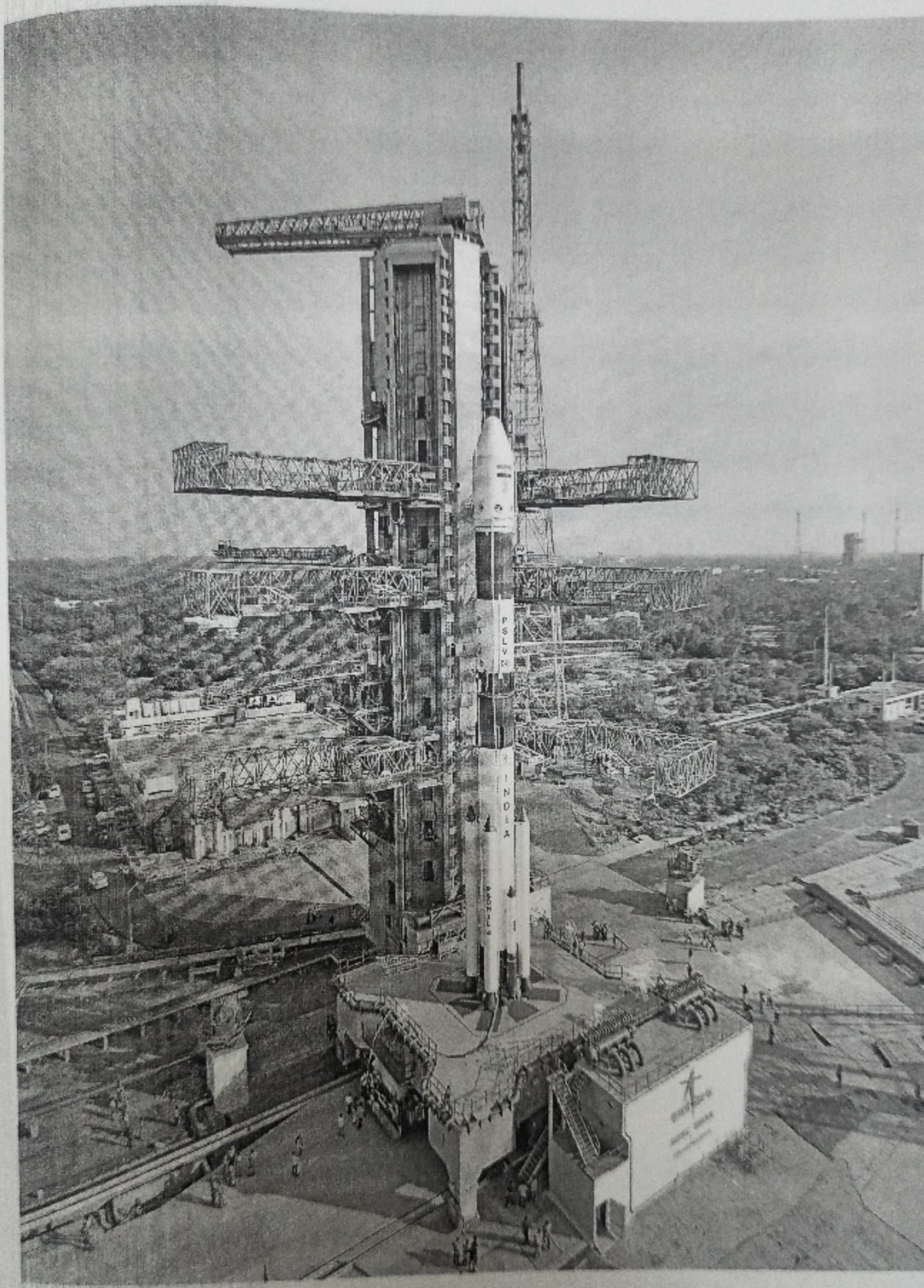
PSLV
INDIA

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Ap

International scientists and engineers.

To establish that a satellite system can contribute to the national development, ISRO was clear that it need not wait for its own satellites to begin application development. While foreign satellites could be used in the initial stages. However, before trying out a full-fledged satellite system, some controlled experiment to prove the efficacy of television medium for national development was found necessary. Accordingly, a TV programme on agricultural information to farmers 'Krishi Darshan' was started, which received good response.

The next logical step was the Satellite Instructional Television Experiment (SITE), hailed as 'the largest sociological experiment in the world' during 1975-76. This experiment benefited around 200,000 people, covering 2400 villages of six states and transmitted development oriented programmes using the American Technology satellite (ATS-6). The credit of training 50,000 science teachers primary schools in one year goes to SITE.

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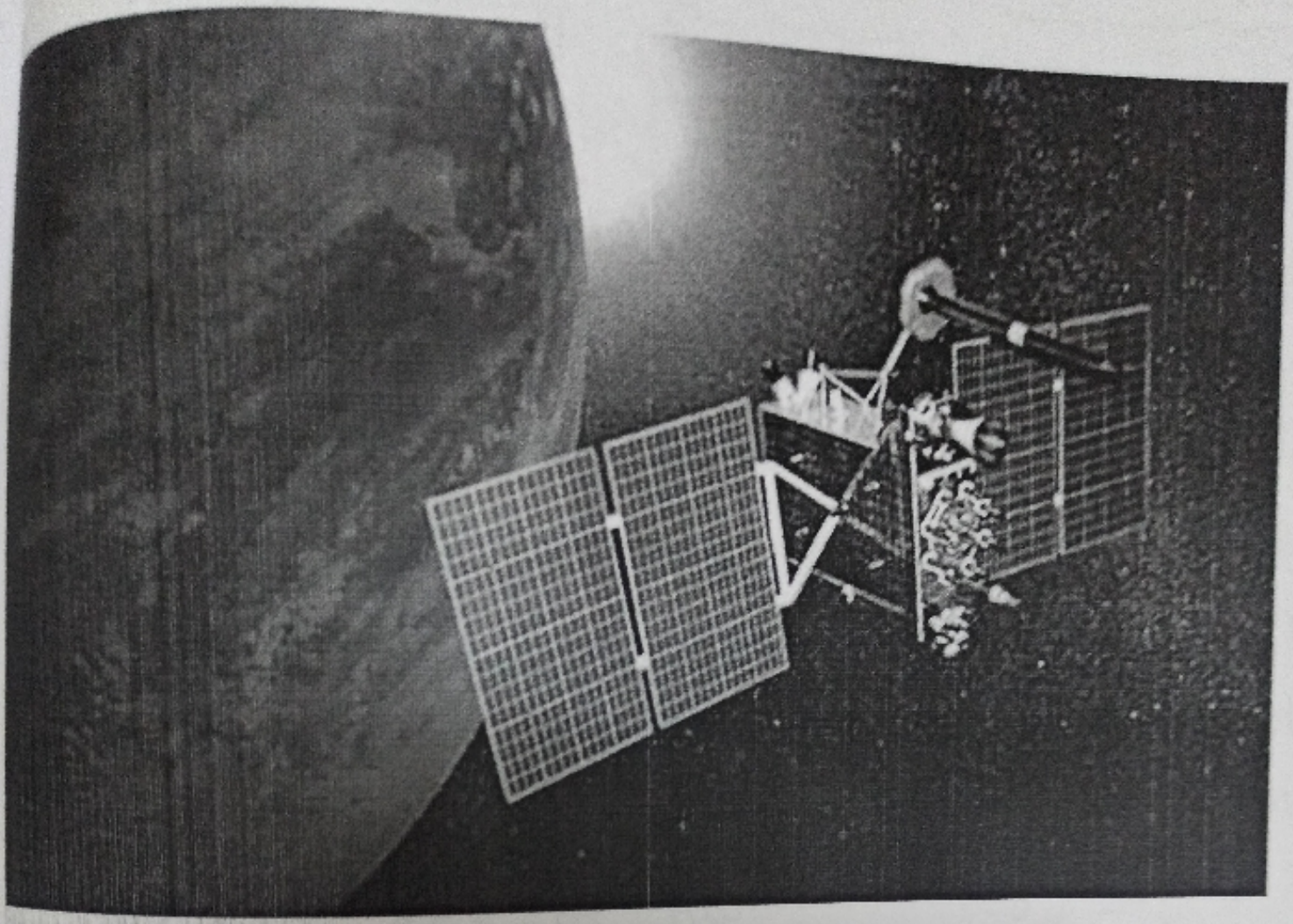

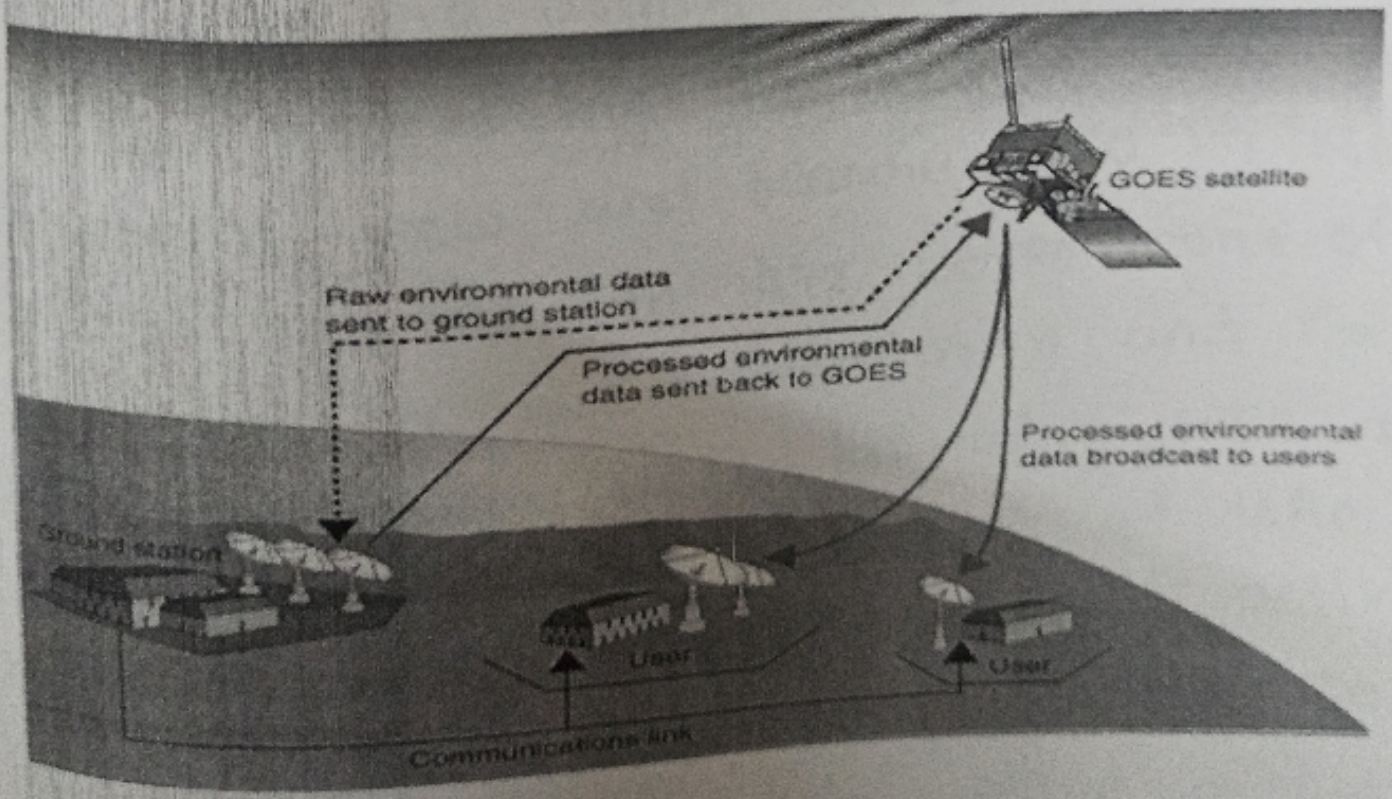
GOES satellite
Raw environmental data sent to ground station
Processed environmental data sent back to GOES
Processed environmental data broadcast to users
Ground station
User
User
Communications link

ROCKET

A rocket is a missile, spacecraft, aircraft or other vehicle that obtains thrust from a rocket engine. Rocke engine exhaust is formed entirely from propellant carried within the rocket. Rocket engines work by action and reaction and push rockets forward simply by expelling their exhaust in the opposite direction at high speed, and can therefore work in the vacuum of space.

In fact, rockets work more efficiently in space that in an atmosphere. Multistage rockets are capable of attainin escape velocity from earth and therefore can achieve unlimited maximum altitude. Compared with airbreathing engines, rockets are lightweight and powerful and capable of generating large accelerations. To control their flight, rockets rely on momentum, airfoils, auxiliary reaction engines, gimballed thrust, momentum wheels, deflection of the exhaust stream, Propellant flow, spin or gravity.

Rockets for military and recreational uses date back to at least 13th-century china. Significant scientific, interplanetary and industrial use did not occur untill

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the 20th century, when rocketry was the enabling technology for the space Age, including setting foot on the Earth's moon. Rockets are now used for fireworks weaponry, ejection seats, launch vehicles for artificial satellites, human spaceflight, and space exploration. Chemical rockets are the most common type of high work rocket, typically creating a high exhaust by the combination of fuel with an oxidizer. The stored propellant can be simple pressurized gas or a single liquid fuel that disassociates of fuel with an oxidizer. The stored propellant can be a simple pressurized gas or a single liquid fuel that disassociates of fuel with an oxidizer. The stored propellent can be simple pressurized gas or a single liquid fuel that, two liquids that must be ignited to react, a solid combination of fuel with oxidizer, or solid fuel with liquid oxidizer. Chemical rockets store a large amount of energy in an easily released form, and can be very dangerous. However, careful, testing, construction and

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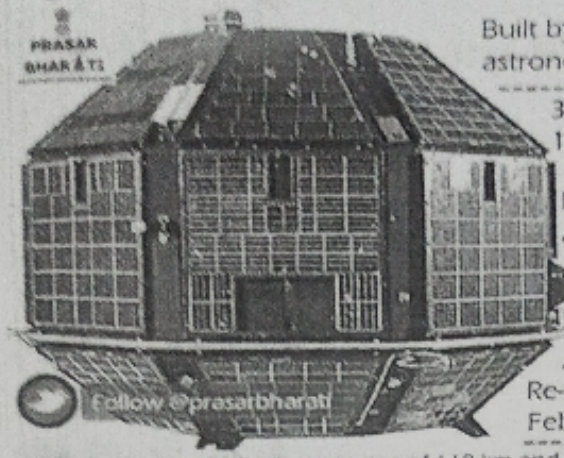
India's first satellite, named after a ancient Indian mathematician Aryabhatta

FIRST SATELLITE OF INDIA



Built by ISRO to conduct experiments in X-ray astronomy, aeronomics, and solar physics

360 Kg spacecraft was a 26-sided polyhedron 1.4 metres (4.6 ft) in diameter

Launched by Soviet Intercosmos rocket on 19 April 1975 from Kapustin Yar.

A power failure halted experiments after 4 days in orbit & signals from the spacecraft were lost after 5 days of operation.

Re-entered the Earth's atmosphere on 11 Feb1992.

96.3 minute orbit had an apogee of 619 km and a perigee of 563 km, at an inclination of 50.7 degrees

List of Earth Observation Satellites

Earth Observation Satellites	Launch Date
BHASKARA-I	07.06.1979
RS-D1	31.05.1981
BHASKARA-II	20.11.1981
RS-D2	17.04.1983
IRS-1A	17.03.1988
SROSS-2	13.07.1988
IRS-1 B	29.08.1991
IRS-1 E	20.09.1993
IRS-P2	15.10.1994
IRS-1C	28.12.1995
IRS-P3	21.03.1996
IRS-1 D	29.09.1997
IRS-P4/0CEANSAT	26.05.1999
TES	26.05.1999
IRS-P6/RESOURCESAT-1	17.10.2003
CARTOSAT-1	05.05.2005
CARTOSAT-2	10.01.2007
CARTOSAT-2A	28.04.2008
IMS-1	28.04.2008
RISAT-2	20.04.2009
OCEANSAT-2	23.09.2009
CARTOSAT-2S	12.07.2010
Megha-Tropiques	October 2011
[illegible]	December 2016

List of Geo-stationary Satellites

Geo-stationary Satellites	Launch date
INSAT-1A	10.04.1982
INSAT-1B	30.08.1983
INSAT-1C	21.07.1988
INSAT-1D	12.06.1990
I NSAT-2A	10.07.1992
I NSAT-2B	23.07.1993
I NSAT-2DT	Jan 1998
I NSAT-2E	03.04.1999
I NSAT-3B	22.03.2000
GSAT-1	18.04.2001
I NSAT-3C	24.01.2002
KALPANA-1	12.09.2002
I NSAT-3A	10.04.2003
GSAT-2	08.05.2003
I NSAT-3E	28.09.2003
EDUSAT (GSAT-3)	20.09.2004
HAMSAT	05.05.2005
I NSAT-4A	22.12.2005
I NSAT-4C	10.07.2006
I NSAT-4B	12.03.2007
INSAT-4CR	02.09.2007
GSAT-4	15.04.2010
GSAT-14	05.01.2014
GSAT-16	06.12.2014

Indian National satellite system

The Indian National satellite system or INSAT, is a series of multipurpose geostationary sate-llites launched by ISRO to satisfy the tele communications, broad casting, meteorology, and search and rescue operations. commi-ssioned in 1983, INSAT is the largest domestic communication system in the Indo-pacific Region. It is a joint venture the Department of space, Department of tele communications, India meteorological Depart-ment, All India Radio and Doordarshan. The overall coordination, and management of INSAT system rests with the secretray-level INSAT coordination committe.

INSAT satellites provide transponders in various bands (C, S extended C and KU) to serve the television and communication needs of India. Some of satellite have the very high Resolution Radiometer (VHRR), CCD for meteoro-logical imaging.

The satellites also incorporate transponder (s) for receiving distress alert signals for Search and rescue missions in the South Asia and Indian ocean Region,

as ISRO is a member of the Cospas-Sarsat program.

NSAT SYSTEM

INSAT-1B satellite :- Broadcasting sector in India is highly dependent on INSAT system

The Indian National satellite (INSAT) system was commissioned with the launch of INSAT-1B in August 1983 (INSAT-1A, the first satellite was launched in April 1982 but could not fulfil the mission). INSAT system ushered in a revolution in India's television and radio broadcasting, telecommunications and meteorological sectors. It enabled the rapid expansion of TV and modern telecommunication facilities to even the remote areas and off-shore islands. Together, the system provides transponders in C, Extended C and Ku bands for a variety of communication services. Some of the INSATS also carry instruments for meteorological observation and data relay for providing meteorological services. KALPANA-1 is an exclusive meteorological satellite. The satellites are monitored and controlled by master control facilities that exist in

Satellites in service

Satellites in service of the 24 satellites launched in the course of the INSAT program, 11 are still in operation

INSAT - 2E

It is the last of the six five satellites in INSAT-2 series (protect). It carries seventeen c-band and lower c-band transponders providing zonal and global coverage with an effective Iso-tropic power (EIRP) of 36 dBW. It also carries a vew High Resolution Radiometer (VHRR) with imaging capacity in the visible (0.55-0.75 um), thermal infrared (10.5-12.5 um) and water vapour (5.7-7.1 um) channels and provides 2x2 km, 8x8 km ground resolution respectively. In addition to the above two pay loads it has with it a charge coupled Device (CCD) camera providing 1x1 km ground resolution in the visible (0.63-0.69 um) Near infrared (0.77-0.86 um) and shortwave infrared (1.55-1.70 um) bands.