

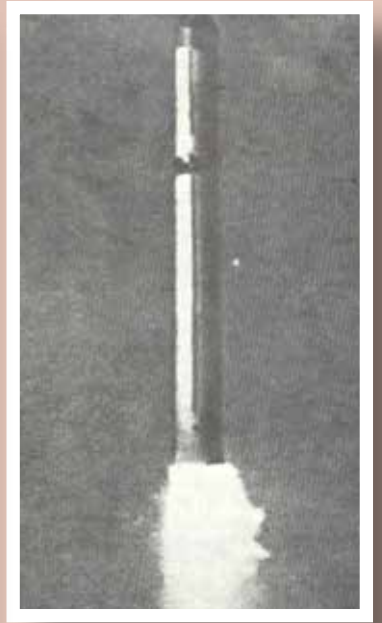
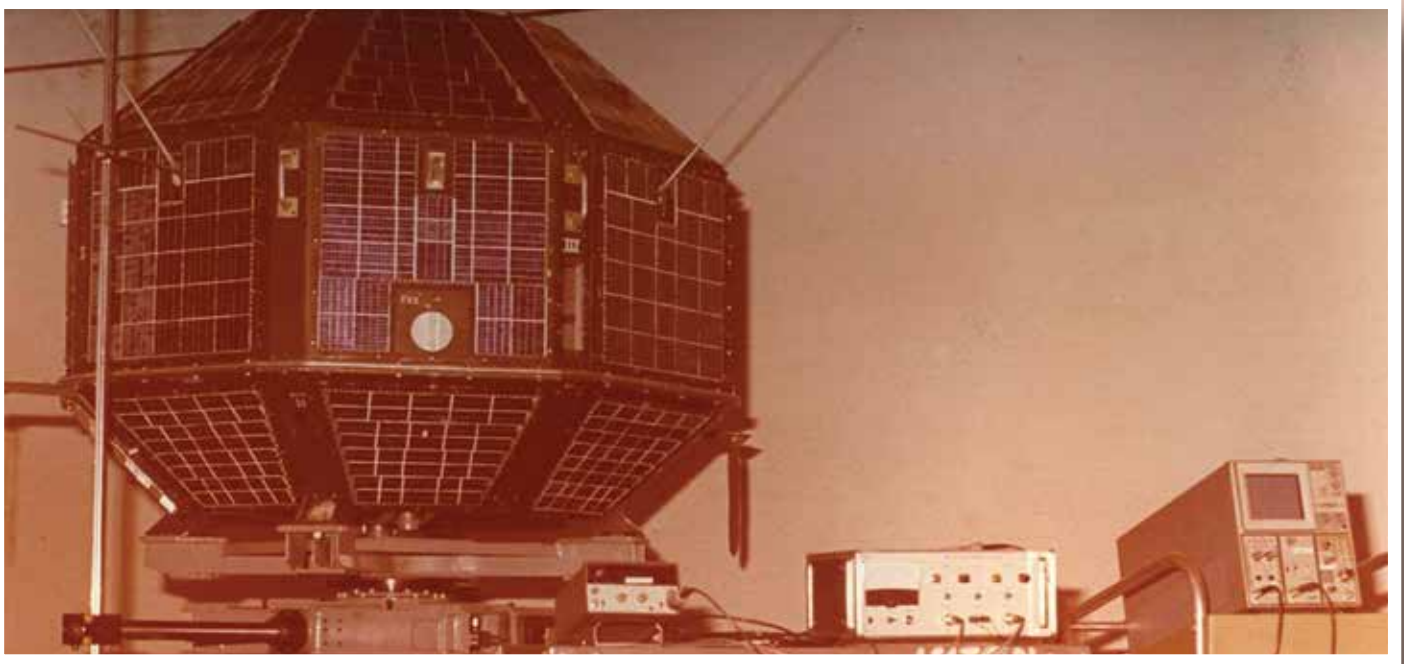
ARYABHATA

India's First Satellite Mission

19 April, 1975

THE MISSION

India's first satellite Aryabhata on-board the Soviet Kosmos-3M lifted-off from Kapustin Yar on April 19, 1975. It was designed and built by the Indian Space Research Organisation. The satellite was named after Aryabhata, the famous astronomer and the earliest mathematician of the 5th century. The satellite carried three experiments for the measurement of Cosmic X-rays, Solar Neutrons, and Gamma Rays, together with a sensor for the study of the Ionosphere.



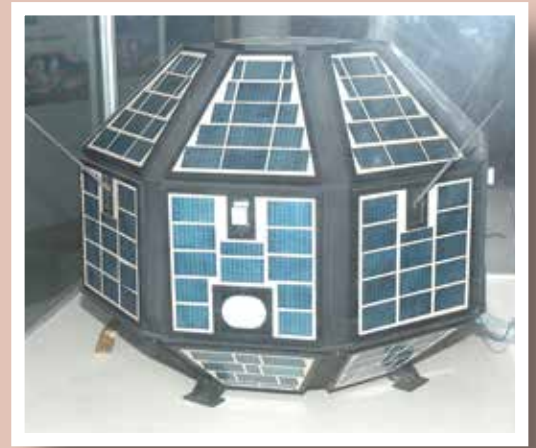
Soviet Kosmos-3M

ARYABHATA

THE SATELLITE

The satellite was quasispherical in shape containing 26 sides. The satellite used solar panels on 24 sides to provide 46 watts of power, used a passive thermal control system, carried Ni-Cd batteries, and a spin up gas jet system to provide a spin rate of not more than 90 rpm. There was a set of altitude sensors comprising of a tri-axial magnetometer, a digital elevation solar sensor and four azimuth solar sensors. The data system included a tape recorder at 256 bits per second with playback at 10 times that rate. The PCM-FM-PM telemetry system operated at 137.44 MHz.

The spin up system started its operations, 6 months after the launch. Only one payload could be operated for the first few orbits, due to a problem developed in the power distribution system. The full main frame of the satellite worked well and the satellite was tracked for 17 years before the orbital life ended. This satellite was one of the earliest ones to use CMOS devices on a large scale. The checkout system used Indian made TDC-12 computer with punched tape input/output devices. Experiments were conducted on satellite ranging which demonstrated the tele-medicine concept in the elementary form by transmitting ECG signals from SHAR to Bangalore. During the development phase, the satellite model roughly half in size of the final version was tested out on a balloon flown at about 25 km altitude on May 5, 1973 from Hyderabad. Similarly, the engineering model was carried aloft by a helicopter over Sriharikota during January 1975. Four models of the satellite were developed during a three year period by a young team which had no previous experience of making any space hardware.



SPECIFICATIONS

Weight	360 kg
Power	46 W
Stabilization	Spin-stabilized
Type of Satellite	Experimental
Payloads	<ul style="list-style-type: none">• X-ray Astronomy• Aeronomy• Solar Physics
Mission Life	6 months (nominal), (Spacecraft mainframe active till March 1981)

