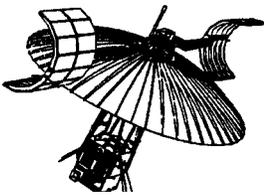


ATS 6

Applications Technology Satellite 6

Spacecraft Sketch	Mission Objective
	<p>The primary objectives of the Applications Technology Satellite (ATS 6) mission are to: 1) deploy a 30-foot diameter parabolic antenna in space that is capable of providing a good quality TV signal to a ground-based receiver, 2) provide a satellite with fine pointing, stowing, and tracking capability, 3) provide an oriented, stable platform at synchronous altitude for advanced experiments including those designed to study the spacecraft environment, 4) demonstrate new in-space communications technology, and 5) evaluate the feasibility of new concepts in meteorological and weather data collection.</p>

TYPE OF MISSION	PROGRAM OFFICE	PROJECT LEAD CENTER	MANAGEMENT APPROACH	S/C CONTRACTOR	I&T CONTRACTOR
COMMUNICATIONS	SPACE SCIENCE & APPLITICATIONS	GSFC	AUGMENTED HYBRID	FAIRLAND	FAIRLAND

Payload Description
<p>The ATS 6 payload includes a wide variety of experiments mainly concerned with the direct broadcasting of television programs to small, simple ground receiving units in remote regions over large geographical areas; aeronautical and maritime communications; and spacecraft tracking and data relay. In addition, the ATS 6 payload includes a high-resolution radiometer for meteorology, sensors to analyze the space environment at synchronous altitude, and general technology experiments that include an Environmental Measurements Experiment (EME) package. The ATS 6 spacecraft is configured somewhat like an open parasol and consists of four major assemblies: 1) a large dish antenna; 2) two high-power solar cell paddles mounted at right angles to each other on opposite sides of an upper equipment module (UEM); 3) an earth-viewing equipment module (EVM); and 4) an attitude control and stabilization system. The UEM provides a mounting platform for the space-viewing experiments. The EVM houses the earth-viewing experiments and provides support for the remaining spacecraft subsystem components.</p>

INSTRUMENT NAME	ACRONYM	PI AFFILIATION	PRINCIPAL INVESTIGATOR	I&T CONTRACTOR
ACCELEROMETERS	NONE	GSFC	TBD	TBD
AURORAL PARTICLES	NONE	UCSD	C. E. McILWAIN	UCSD
LOW-ENERGY PROTON	NONE	NOAA	T. FRITZ	GSFC
LOW-ENERGY PROTON-ELECTRON	NONE	UNIV NH	R. L. ARNOLDY	UNIV NH
MAGNETOMETER	MAG	UCLA	P. J. COLEMAN	UCLA
OMNIDIRECTIONAL SPECTROMETER	NONE	AEROSPACE	G. PAULIKAS	AEROSPACE
PARTICLE ACCELERATION MEASUREMENT	NONE	UNI MINNESOTA	J. R. WINCKLER	UNIV MINNESOTA
RF INTERFEROMETER SUBSYSTEM	RFI	GSFC	A. KAMPINSKY	IBM
SOLAR COSMIC RAY	NONE	MDAC	A.MASLEY	MDAC
VERY HIGH RESOLUTION RADIOMETER	VHRR	GSFC	W. SCHENK	ITT-AOD

Instrument Descriptions
<p>The ATS 6 Accelerometers experiment provides data for use in updating the analytic model of the ATS 6 spacecraft as well as for detecting and diagnosing anomalies during the powered flight. It is used further as an aid in the design of future spacecraft to be launched by the Titan III-C launch vehicle. Three vibration accelerometers are mounted on the spacecraft to sense spacecraft movement in lateral and vertical directions. An additional accelerometer is mounted on the Titan 111-0 third stage for vertical movement sensing. The accelerometers data is telemetered to ground stations and delivered to GSFC for analysis.</p>
<p>The ATS 6 Auroral Particles, Data Point 13, is developed at the University of California at San Diego to measure low energy electrons and protons. This instrument displays nominal complexity; however, it measures the energy in 62 discrete ranges which requires a large amount of data handling and associated equipment.</p>
<p>The ATS 6 Low-Energy Proton experiment measures protons, alpha, light ions, medium ions and heavy ions to determine: 1) where in local time protons are injected into the magnetosphere; and 2) how closely in time the injection of protons is associated with auroral substorms. The energy ranges covered are: 1) Protons from 20 Kev to 2.1 Mev; 2) Alpha from 0.6 Mev to 4.0 Mev; 3) Light Ions from 2.1 Mev to 12.2 Mev; 4) Medium Ions from 9.5 Mev to 22.7 Mev; and 5) Heavy Ions equal or greater than 20 Mev.han 20 Mev.</p>
<p>The ATS 6 Low Energy Proton-Electron Experiment, Data Point 14, includes four detector assemblies and associated electronics. Each of the detector assemblies consists of two Bendix Channeltron electron multipliers located behind a set of curved (90 degree) electrostatic deflection electrodes and are called double electrostatic analyzers (DESA). The inner channel detects protons and the outer channel detects electrons.</p>
<p>The ATS 6 Magnetometer (MAG), Data Point 12, is designed and built by UCLA to study the earth's magnetic field at synchronous distances along the three orthogonal axes relative to the spacecraft. The accuracy is 1/8 gamma with a range of 1024 gamma. The telemetry rate is 450 bps.</p>
<p>The ATS 6 Omnidirectional Spectrometer experiment measures omnidirectional fluxes and spectra of electrons and protons. The four detectors count protons from 2 MeV to 60 MeV and also count, respectively, electrons with energies greater than 150 KeV, 700 KeV, 1.4 MeV, and greater than 3 MeV.</p>
<p>The ATS 6 Particle Acceleration Measurements, Data Point 15, is designed and built by the University of Minnesota to measure electrons and protons in the Van Allen belt. The instrument consists of a magnetic deflection separation system and a solid state particle counter system with directional capabilities so that particle pitch angles can be determined.</p>
<p>The ATS 6 RF Interferometer (RFI) Subsystem, Data Point 342, is used as a precision, wide field-of-view attitude sensor for the ATS-6 spacecraft attitude control subsystem. It is an all electronic C-Band receiver, which measures the phase difference of continuous wave ground station signals received at paired antenna elements and converts this information into digital data. The instrument is designed and manufactured by IBM.</p>
<p>The ATS 6 Solar Cosmic Ray experiment: 1) conducts a study of solar cosmic rays, their entry and propagation within the magnetosphere, and 2) measures parameters of trapped electrons, both as functions of local time in orbit. Each measurement is performed at two different pitch angles with sufficient detail, energy resolution, dynamic intensity range, and time resolution to allow several studies during the period following maximum solar cosmic ray activity. The energy ranges are: 1) alpha particles from 2 Mev to 250 Mev; 2) protons from 0. 2 Mev to 230 Mev; and 3) electrons from 50 kev to 1 Mev.</p>
<p>The ATS 6 Very High Resolution Radiometer (VHRR), Data Point 11, is designed to observe cloud cover and motion over a large portion of the earth both day and night and to measure cloud top or earth surface temperature. The instrument uses a two-axis scan mirror to image from geosynchronous orbit. The fast line scan is achieved by tilting the scan mirror in steps covering a 20-degree field of view. The ATS-6 radiometer evolves from a series of seven similar predecessor instruments.</p>

Launch
5/30/74