

GOES L

PROJECT HIGHLIGHTS

Announcement of Opportunity	N/A
NASA Headquarters Office	Earth Science (Code Y)
Enterprise	Earth Science
Project	Geostationary Operational Environmental Satellites (I through M)
Project Lead Center	GSFC
Management Approach	Out-of-House
Mission Life (months)*	60 (minimum) 72 (predicted)
Additional Data Analysis (months)	N/A
Launch Data	15 May 1999

*On orbit life

MISSION OBJECTIVES

GOES L is one of the five satellites within the third series of geostationary satellites designed to meet the National Oceanic and Atmosphere Administration (NOAA) regional meteorological requirements. Mission objectives are as follows:

- Maintaining reliable operational, environmental and storm warning systems to protect life and property
- Monitoring the Earth's surface and space environmental conditions
- Introducing improved atmospheric and oceanic observations and data dissemination capabilities
- Developing and providing new and improved applications and products for a wide range of federal agencies, state and local governments and private users.

FOREIGN PARTICIPATION

None

SPACECRAFT DESCRIPTION

The GOES L spacecraft is a three-axis, body-stabilized design capable of continuously pointing the optical line of sight of the imaging and sounding radiometers to the Earth. The spacecraft body contains all of the propulsion and electronic equipment and provides the stable platform on which the payload instruments are mounted. A single-wing, two-panel solar array on the south-facing side continuously rotates about the spacecraft pitch axis to track the sun during orbital motion. The use of a single-wing solar array mounted on the south-facing side of the spacecraft allows the passive north-facing radiation coolers of the Imager and Sounder to view cold space.

PAYLOAD DESCRIPTION

The payload instruments consist of a multichannel imaging radiometer for acquisition of high-resolution visible and infrared radiometry data, an atmospheric sounder for obtaining data used to determine or infer temperature and moisture profiles of the atmosphere and a space environment monitor subsystem for measurement of energetic particle flux, magnetic field intensity and solar X-ray radiation. The payload also includes a data collection subsystem for obtaining and transmitting data to data collection platforms and a search and rescue subsystem.

INSTRUMENT DESCRIPTIONS AND SCIENCE LEADERS

The GOES L Imager, DPN 857, is a five channel imaging instrument designed to sense radiant and solar energy reflected from sampled areas of the Earth. The instrument is capable of providing full-Earth disc images, sector images that contain the edges of the Earth and various sizes of area scans completely enclosed within the Earth scene. Area scan selection permits rapid continuous viewing of local areas for monitoring of mesoscale phenomena and accurate wind determination.

The GOES L Sounder, DPN 858, is designed to provide data from which atmospheric temperature and moisture profiles, surface and cloudtop temperature and ozone distribution can be deduced by mathematical analysis. The Sounder's multi-element detector array assemblies simultaneously sample four separate fields or atmospheric columns. The infrared channel spectral definition is provided by a rotating filter wheel, which brings selected filters into the optical path of the detector array. Spectral separation of the Infrared channels is provided in each of three bands consisting of the longwave (12 to 14.7 μm , midwave (6.5 to 11 μm) and shortwave (3.7 to 4.6 μm).

The GOES L Space Environment Monitor (SEM), DPN 859, consists of a set of instruments designed to provide real-time measurement of solar activity, charged particle environment and the Earth's magnetic field at synchronous orbit. The SEM Instrument complement includes a three-axis vector magnetometer, an energetic particle sensor and associated high energy proton and alpha detector and an X-ray sensor.

GROUND SYSTEM DESCRIPTION

The above ground system diagram illustrates active elements during satellite on-orbit operations. Two GOES satellites, one at 135 degrees west longitude (GOES West) and one at 75 degrees west longitude (GOES East) provide coverage of the contiguous 48 states and major portions of the central and eastern Pacific Ocean and the central and western Atlantic Ocean areas. The Command and Data Acquisition (CDA) Station is in line-of-sight of both satellites allowing simultaneous uplink of commands and downlink of data from both satellites. Raw Imager and Sounder data received at the CDA Station are processed with other data to provide highly accurate, Earthlocated, calibrated imagery and sounding data in near real-time for retransmission via GOES satellites to the primary end users, the seven National Weather Service Satellite Field Service Stations (SFSS) located throughout the United States and to other users, such as the NOAA Environmental Research Laboratory and data collection platforms. Sectorization of the GOES image data is performed at the NOAA Central Data, and Distribution Facility (CDFF) and sectors of interest are provided to weather forecasters through the SFSS. Operational management and planning are performed at the NOAA Satellite Operations Control Center (SOCC).

NASA provides support at launch and during spacecraft checkout and evaluation from the GSFC Flight Dynamics Facility, NASCOM and various ground stations. The Wallops/NASA ground station and the Goldstone DSN station continue to provide backup support for on-orbit operations. Air Force facilities provide support during launch operations.

CONTRACT AND SUBCONTRACT HISTORY

<u>Contractor/Sub contractor</u>	<u>Project Element</u>
SS/L	GOES satellite
Loral Aerosystems	Telemetry and command system
ITT-AOD	Imager and Sounder
Panametrics	EPS and HEPAD
Schoenstedt	Magnetometer
General Dynamics	ELV launch services
McDonnell Douglas	Project technical support

LAUNCH AND MISSION ORBIT DATA

Launch Vehicle/Upper Stage	Atlas I	Inclination (deg)	0
Launch Site	Eastern Test Range	Period (min)	TED
Mission Orbit Type	Geosynchronous	Apogee (km)	35.7917
		Perigee (km)	35.790