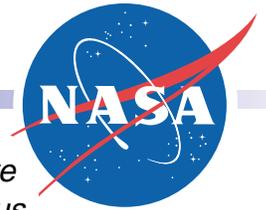


# LEOStar™ Satellite Platform



*An affordable, versatile, flight-proven Taurus-class spacecraft bus suitable for more demanding payloads and compatible with smaller launch vehicles such as Pegasus.*

## DESIGN

Designed to be launched on a Taurus launch vehicle or in multiple or "piggyback" units on SELVS-II or smaller launch vehicles, Orbital's innovative LEOStar satellite platform supports payloads up to 360 kg and provides a three-to five-year mission life. The 12-sided bus is comprised of four decks: the deployment deck, payload deck, core deck and propulsion deck. The decks are connected together vertically by strong but light stringers, with shear plates attached to the 12 sides. The bottom and mid-decks house all primary spacecraft systems with the payload deck reserved for payload mounting.

## PAYLOAD SUPPORT

Designed for flexibility, the LEOStar bus has been adapted to a variety of space science, remote sensing and technology validation missions. It features a large payload volume to handle multiple instruments and a pointing capability of up to 0.35° with pointing knowledge of up to 0.24°, which can be dramatically enhanced by the addition of a star tracker.

## HERITAGE

Originally designed as a common bus for the U.S. Air Force's Standard Technology Experiment Program (STEP) series of space technology missions, the LEOStar bus has supported five flight STEP missions and is currently in production for the TSX-5, OrbView-3 and VCL programs.

## COMMERCIAL PRODUCTION APPROACH

To date, Orbital has built six LEOStar buses and has three more in production. The LEOStar bus was designed for low rate production line assembly and testing, which provides cost and schedule advantages through the uses of mature designs, familiar manufacturing and test equipment, dedicated and experienced personnel, and established vendor sources.

## SHARED LAUNCH OPPORTUNITIES

LEOStar's unique design offers frequent, cost-effective, launch-sharing opportunities. Depending on the payload height and complexity, for example, two LEOStar satellites readily fit within the Taurus, Athena, Delta II and SELVS-I and II launch vehicles.

## DATA SERVICES

Customers can purchase the LEOStar spacecraft alone, or as part of a turn-key service that includes launch, operations and data delivery as well. For the OrbView-1 and OrbView-2 programs, based on other Orbital-built satellites, the company provided end-to-end services and is paid for delivery of data. Orbital produced the satellite bus, integrated two payloads and launched the satellite on a Pegasus, and is currently conducting mission operations from its own ground station, delivering data to principal investigators via direct downlink and the Internet.



Step-0 launch configuration



TSX-5 during integration and test

# LEOStar™ Satellite Platform

## Technical Specifications

### Core Bus Features

Bus Dry Mass .....	263 kg
Payload Mass Capability .....	≤101 kg
Redundancy .....	Selected
Orbit: Altitude .....	450 - 1000 km
Inclination .....	28° - 110°
Launch Vehicle Compatibility .....	Taurus, Pegasus, SELVS-II
Typical Mission Lifetime .....	3 years with Ps ≥ 0.9
Delivery .....	29 months ARO

### Structure

Bus Dimensions (D x H) .....	95.2 cm x 160 cm
Payload Support Dimensions.....	46 cm x L/V shroud (see diagram)
Construction .....	Al Honeycomb and FaceSheets
Shape .....	12-sided

### Power Subsystem

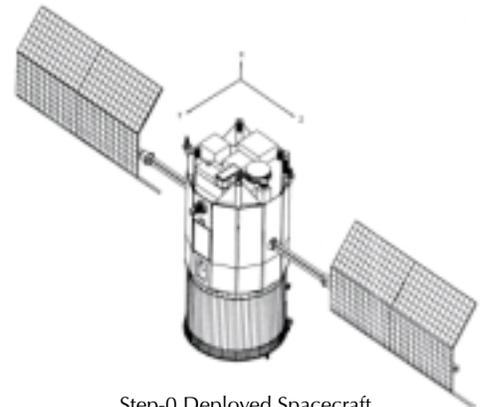
Payload Power .....	110 watts (orbit average) EOL
Bus Voltage .....	28 ±4 VDC
Solar Arrays .....	2 Silicon
Batteries .....	32 A*hr NiCd

### Attitude Control Subsystem

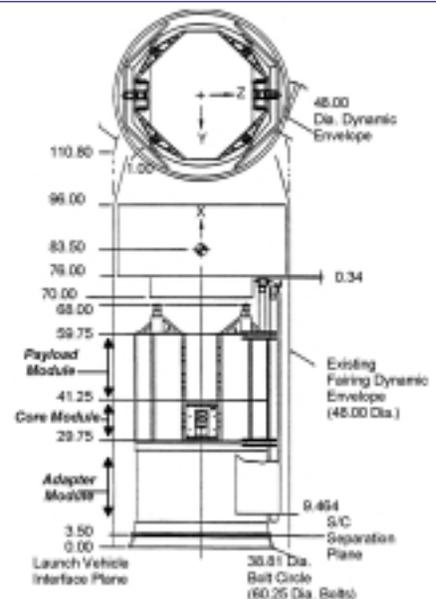
Stability Mode.....	3 Axis zero momentum nadir pointed
Pointing Capabilities:	
Control .....	±0.35°
Knowledge.....	≤0.24°
Rate/Stability .....	≤ 0.001°/sec
	Slew Rate – Pitch 6°/sec; Roll 3°/sec

### Command & Data Handling

Flight Processor .....	80C186
Rad Tolerant .....	15 K rad
Data Storage Capacity .....	28 MB
Interface Architecture .....	MIL-STD 1553B/RS-422, CCSDS
S-Band Uplink/Downlink Rates.....	2 kbps/1 Mbps



Step-0 Deployed Spacecraft



Note: Measurements in Inches.  
Step-0 Spacecraft in Taurus Fairing

## OPTIONS

- Addition of star tracker provides improved pointing accuracy
- GPS receiver provides onboard orbit knowledge with 30 m accuracy
- Reconfiguration of solar array for Pegasus launch compatibility
- Removal of propulsion system allows Pegasus launch
- Mission operations

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