

*An affordable, versatile, Pegasus XL-class spacecraft bus suitable for SMEX, MIDEX, ESSP and Discovery class missions and compatible with larger launch vehicles such as Taurus and Delta.*

## DESIGN

Designed to be launched on a Pegasus XL launch vehicle, or in multiple or "piggyback" units on SELVS-II or smaller launch vehicles, Orbital's innovative, flexible LEOStar-2 satellite platform supports payloads up to 210 kg. The LEOStar-2 structure is a simple, but robust modular design consisting of a hexagonal bus with a dedicated payload interface module. The hexagonal bus enhances its stiff structure, which is suited for payloads requiring rapid slew rates and short settling times.



*GALEX during integration and test*

## PAYLOAD SUPPORT

Designed for flexibility, the LEOStar-2 bus has been adapted to a variety of space science, remote sensing and technology validation missions. It features a large separate payload compartment with volume to handle multiple instruments and a pointing capability of up to 150 arcseconds per axis with pointing knowledge of up to 108 arcseconds per axis, which can be dramatically enhanced by redundant or high-performance ACS components.



*ORBVIEW-4 during integration and test*

## SHARED LAUNCH OPPORTUNITIES

LEOStar-2's unique design offers frequent, cost-effective, launch-sharing opportunities. Depending on the payload height and complexity, for example, multiple LEOStar-2 satellites readily fit within the Taurus, Athena, Delta II and SELVS-I and II launch vehicles.

## DATA SERVICES

Customers can purchase the LEOStar-2 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.



*SORCE during integration and test*

## COMMERCIAL PRODUCTION APPROACH

To date, Orbital has launched one LEOStar-2 bus and has two more in production. The LEOStar-2 bus was designed for 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.

## HERITAGE

First developed for ORBIMAGE's OrbView-4 high resolution imagery mission, the LEOStar-2 bus is currently in production for the GALEX and SORCE programs.

## ADDITIONAL FEATURES

**Modular Design** - Flexibility in assembly, testing and integration of instruments with previously qualified systems.

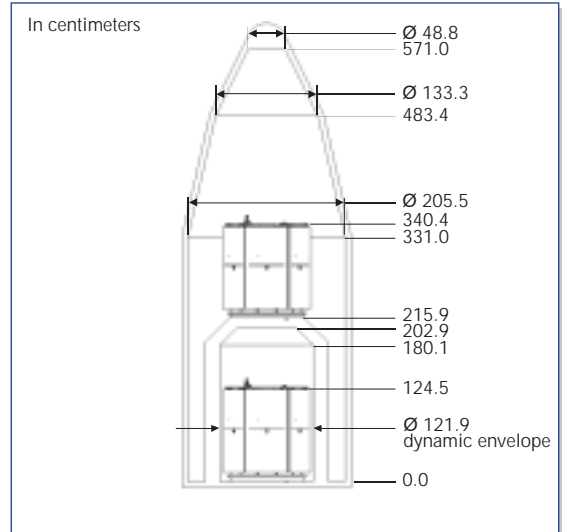
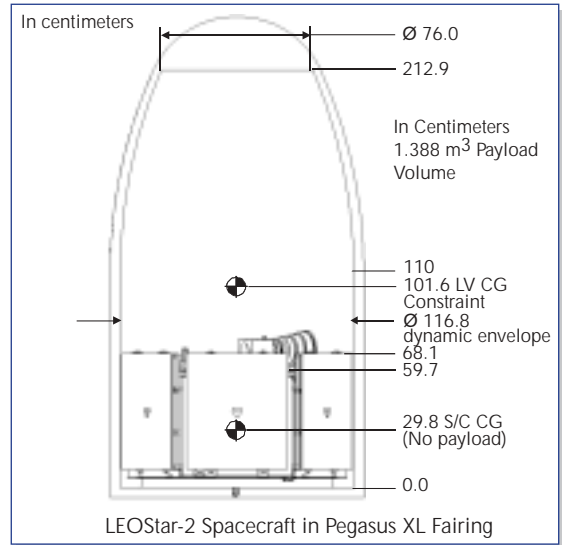
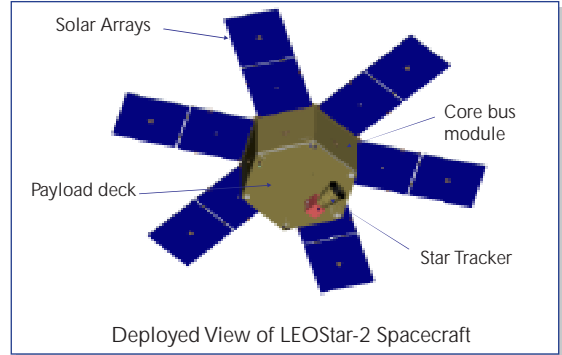
**Customer Focused Design** - Straightforward interface facilitates instrument bus accommodation.

**Low Cost, High Experience** - World-leading developer and manufacturer of affordable multiple spacecraft for commercial, government, and military programs.

# LEOStar-2™ Satellite Platform

## LEOStar-2 Mission Suitability

Item	LEOStar-2 Performance
Launch Vehicles . . . . .	Pegasus XL, Taurus, Athena, Delta-II
Design Life . . . . .	6 years with redundant architecture
Orbit Options . . . . .	450 to 1,000 km altitude, 28° to 110° inclination
Operations . . . . .	Simultaneous data acquisition by payload(s) and data transmission capability
Onboard Data . . . . .	Scalable to 32 Gb in data recorder and 128 Mbit in flight computer
Storage Capability	ADCS Approach . . . . .
	3-axis zero net momentum, stellar inertial or nadir referenced
Pointing Accuracy . . . . .	<46 arcsec/axis (3 $\sigma$ ) with Option 1 <150 arcsec/axis (3 $\sigma$ ), baseline
Pointing Knowledge . . . . .	<32 arcsec/axis (3 $\sigma$ ) with Option 1 <108 arcsec/axis (3 $\sigma$ ), baseline
Orbit Knowledge . . . . .	35 m (1 $\sigma$ ) available with Option 1
Pointing Stability . . . . .	<1 arcsec per second
Agility . . . . .	Slew rate >1.25°/sec per axis, with Option 1 Slew rate > 1.0°/sec per axis (Standard)
<b>Communications</b>	
Payload Data Downlink . . . . .	Up to 150 Mbps X-band (Option 3) Up to 2 Mbps S-band (standard)
Command Uplink . . . . .	Up to 2 Kbps S-band
Propulsion . . . . .	(Option 2) Blowdown monopropellant hydrazine; up to 43.7 kg propellant and 265 m/s total impulse (with 155 kg payload)
Spacecraft Mass . . . . .	376 kg with maximum payload mass
Maximum Payload . . . . .	210 kg (structural limit)
Maximum Payload Power . . . . .	118 W orbit average with 690 km circular orbit and 29° inclin. (optional 286W EOL)
<b>Maximum Payload Volume</b>	
External . . . . .	Up to 1.388 m <sup>3</sup> in Pegasus XL
Internal . . . . .	6 cm x 21 cm x 5 cm high
Delivery Time . . . . .	30 months after receipt of order



LEOStar-2 Spacecraft with Propulsion Modules Can Fit as Primary or Secondary Payload Within a Taurus 2210 With 92" Fairing Using a 63" Dual Payload Attach Fitting.

## OPTIONS

1. Addition of redundant components improve performance, mission life, and reliability
2. Addition of propulsion system
3. SSR and X-band downlink for increased payload data storage and high rate data transfer
4. Mission operations



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