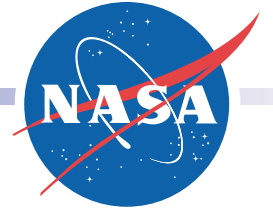


PicoStar™ Satellite Platform



An inexpensive, flight-proven spacecraft bus suitable for small payloads and designed for “piggyback” or multiple spacecraft launches on Pegasus, NASA's Space Shuttle and other launch vehicles.

DESIGN

Designed to be launched as a secondary payload on a range of launch vehicles, Orbital's low-cost PicoStar satellite platform supports payloads of up to 10 kg (mounted internally) or 60 kg (mounted externally) and provides a nominal one year mission lifetime. The baseline bus is a simple, octagonal plate and stringer construction used by Orbital on many previous missions.

PAYLOAD SUPPORT

The PicoStar configuration is applicable for a variety of missions, from technology demonstrations to space science programs. Its low mass and small size make it an excellent choice for focused experiments conducted by universities.



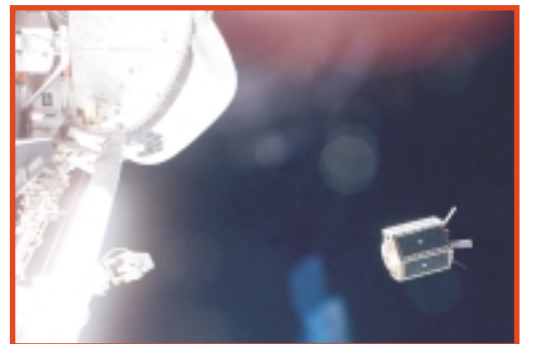
MicroSat Satellites mated to Pegasus

HERITAGE

PicoStar originated in the 1991 DARPA MicroSat program in which a constellation of seven PicoStar class spacecraft launched from a single Pegasus successfully validated a LEO communications architecture. Since the MicroSat program, subsystem designs have evolved to enhance reliability and reduce cost. All of the PicoStar bus subsystems have either flown previously or are derivatives of flight-proven Orbital designs. For example, the heritage of the structure comes from the MicroSat, REX, REX II, GEMstar and RADCAL programs, while the electrical systems and software are derived from the Air Force STEP missions.

COMMERCIAL PRODUCTION APPROACH

Orbital is able to deliver PicoStar satellites in 24 months using a low-risk manufacturing approach based on semi-custom designs with proven components. Delivery on similar schedules has been successfully demonstrated on the GEMstar, REXII and RADCAL programs. With the exception of a few components such as the transponder, all PicoStar mechanical and electronic assemblies are manufactured in house, permitting tight control of cost and schedule while at the same time allowing rapid accommodation of customer requirements.



MightySat 1 satellite being deployed from the Shuttle

SHARED LAUNCH OPPORTUNITIES

PicoStar has been designed for the requirements of the Space Shuttle. Other launch vehicles, such as Taurus, the Delta (Med-Lite) Secondary Payload Service, and the Ariane 4 and 5 secondary payload services, can be accommodated through straightforward structural modifications.

DATA SERVICES

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

PicoStar™ Satellite Platform

Technical Specifications

Core Bus Features

Bus Dry Mass.....	52.7 kg
Payload Mass Capability.....	20 kg
Redundancy.....	Single string
Orbit.....	248-900 km LEO orbits All inclinations
Typical Mission Lifetime.....	1 year
Delivery.....	24 months ARO

Structure

Bus Dimensions (D x H).....	41.5 cm x 50.0 cm.
Payload Accommodation Dimensions (D x H).....	Internal mount: 35 cm x 19 cm x 18 cm
Construction.....	Plate and stringer Al honeycomb
Shape.....	Hexagonal

Power Subsystem

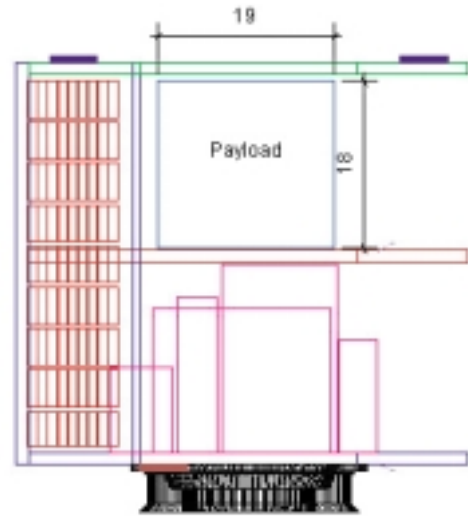
Payload Power.....	10 W orbit average bus
Voltage.....	28 VDC
Solar Arrays.....	GaAs body mounted
Batteries.....	4 A*hr, NiCd

Attitude Control Subsystem

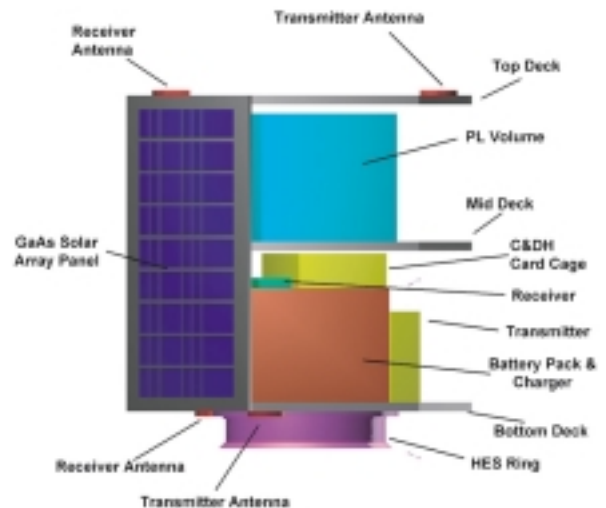
Stability Mode.....	Spin stabilized @ 3 rpm with precession control
Pointing Capabilities Control.....	$\pm 1^\circ$ at 3 RPM
Knowledge.....	$\pm 1^\circ$

Command & Data Handling

Flight Processor.....	80C186
Rad Tolerant.....	Yes – Selective shielding and EDAC
Data Storage Capacity.....	3.9 MB
Interface Architecture.....	RS-422
S-band Uplink/Downlink Rates.....	2 kbps/100 kbps, STDN, DSN & CCSDS compatible



PicoStar Payload Accommodations



PicoStar with Panels Removed

OPTIONS

- ELV launch option
- Data to desktop option–mission operations

For more information contact:
Rapid Spacecraft Development Office
NASA Goddard Space Flight Center
Mail Code 456
Greenbelt, MD 20771 USA

Phone: 301/286-1289
Web: <http://rsdo.gsfc.nasa.gov>