**MidStar™ Satellite Platform**

*A fully redundant, flight-qualified MedLite-class spacecraft bus capable of supporting large, complex, high power payloads.*

### DESIGN

As the pathfinder for NASA’s Mid-Class Explorer program (MIDEX), the Far Ultraviolet Spectroscopic Explorer (FUSE) mission required a reliable spacecraft capable of precision pointing and of being produced on a challenging schedule. The MidStar bus is the result. Compatible with the Delta launch vehicle but adaptable to other Med-Lite vehicles, the compact spacecraft supports large payloads through a thermally isolated three-point stable interface mount and provides clear fields of view for instruments.

### PAYLOAD SUPPORT

The simple electrical interface provides standard 28V power and a standard MIL-STD-1553 bus with CCSDS protocols. The baseline attitude control system employs redundant Star Trackers, but can accept a fine error signal from the payload for more precise pointing.

### HERITAGE

The MidStar subsystems have all been adapted from previous spacecraft programs and feature extensive heritage from other successful Explorer-class spacecraft such as EUVE and XTE. No technology development was required for any component, and no mission-unique qualification effort was necessary, thereby minimizing risk and cost.

### VERSATILITY

Originally developed for space observation missions, the MidStar bus can be readily adapted for many mission types requiring high data handling capabilities with the addition of a large capacity SSR and an x-band downlink system. The structure can be adapted to the payload and the launch vehicle, and the power system sized to support the mission requirements.

### REDUNDANCY

For high reliability, MidStar features a fully redundant architecture achieving 0.93 reliability at 3 years. If desired, redundancy can be reduced to meet lower cost and weight requirements.

### DATA SERVICES

Customers can purchase the MidStar 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, based on other Orbital-built satellites, the company provided end-to-end services, producing the satellite bus, integrating the payload and launching the satellite on a Pegasus. Orbital currently conducts mission operations from its own ground station, delivering data to principal investigators via direct downlink and the Internet.
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**Technical Specifications**

**Core Bus Features**
- Bus Dry Mass: 580 kg
- Payload Mass: ≤ 780 kg
- Reliability: 0.93 @ 3 years
- Orbit: 768 km, 25°
- Launch Vehicle: Delta
- Typical Mission Life: 3-5 years
- Delivery: 27 Months ARO

**Structure**
- Bus Dimensions: 2.0m x 2.0m x 1.0m
- Available Payload Volume: 2.2m diam x 4.5m (Delta)
- Construction: Al Honeycomb
- Shape: Rectangular

**Power Subsystem**
- Payload Power: 323 W (orbit average)
- Bus Voltage: 22-35 V
- Solar Arrays: 2 GaAs
- Batteries: 2x40 A*hr NiCd

**Attitude Control Subsystem**
- Stability Mode: Three axis, zero momentum inertially pointed
- Pointing Control: < 0.5 arcsec (with fine payload-provided error sensor, FES)
- Pointing Knowledge: < 0.3 arcsec (with FES)
- Position Knowledge: Derived from ground tracking data

**Command & Data Handling**
- Flight Processor: 80386 with 80387 coprocessor
- Radiation Tolerance: 7.5 K rad
- Data Storage Capacity: 2 Gbits
- Interface: MIL-STD 1553

**Communication Subsystem**
- S-Band Rx/Tx Rates: 2kbps/1Mbps
- Interface: DSN compatible, CCSDS

**OPTIONS**
- GPS receivers provide onboard position knowledge to within 100m
- Enhanced structure to carry up to a 3,000 kg payload
- X-Band downlink increases downlink data rate from 1 Mbps to 150 Mbps and increased data storage provides up to 128 Gbits
- Add a propulsion system which provides 234 kg of propellant
- Mission operations

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