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

**Design**

Designed to be launched as primary mission on a Pegasus or Taurus launch vehicle, PegaStar is optimized for versatile payload interfaces. The payload is housed in a separate module located on top of the bus, an arrangement which provides the payload with unrestricted fields of view and a simple interface which streamlines integration and test.

**Payload Support**

PegaStar supports standard payload electrical and digital interfaces, including MIL-STD-1553, RS 422, RS-485, and digital protocols such as CCSDS. The PegaStar bus meets a wide range of payload volume and mass requirements, and available power can be upgraded with several growth options.

**Heritage**

The PegaStar platform was originally developed to support the APEX mission, launched in August 1994 (see top photo for launch configuration and bottom photo for flight configuration). APEX exceeded its 12 month mission requirement and performed for 28 months in a harsh radiation environment. PegaStar was later adapted to host the SeaWiFS/Orbview-2 mission. Launched in August 1997, the spacecraft is performing very well on orbit.

**Versatility**

PegaStar attitude control can be reconfigured to support inertial sun-pointed (like APEX), nadir ground track (like Orbview-2) or target tracking missions. Orbital’s integration facilities have the capabilities and handling experience needed to support optical, communications and other technology demonstration missions.

**Shared Launch Opportunities**

By utilizing the three point interface option a secondary satellite can be manifested underneath a PegaStar bus. While PegaStar is optimized for Orbital’s Pegasus and Taurus launch vehicles, it can be adapted to other vehicles as well.

**Data Services**

Customers can purchase the PegaStar spacecraft itself, or the spacecraft, launch, operations and data delivery as a turn-key service. For the Orbview-1 and OrbView-2 programs, Orbital provided end-to-end services and is paid for the delivery of data. The company produced the satellite bus, integrated the payload, and launched 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.
# Technical Specifications

## Core Bus Features
- **Bus Dry Mass**: 135.4 kg
- **Payload Mass**: 570 kg
- **Reliability @ 1 year**: 0.89
- **Orbit**: 400-2500 km
- **Launch Vehicles**: Pegasus, Taurus
- **Typical Mission Life**: 3-5 years
- **Delivery**: 36 Months ARO

## Structure
- **Bus Dimensions**: 97cm dia x 101cm
- **Available Payload volume**
  - Pegasus: 117cm dia x 122cm
  - Taurus: 137cm dia x 231cm
- **Construction**: Al Honeycomb
- **Shape**: Hexagonal

## Power Subsystem
- **Payload Power**: 60 Watts (BOL, orbit average)
- **Bus Voltage**: 28+/-6 V
- **Solar Arrays**: 6 Silicon
- **Batteries**: 2 x 10 A*hr NiH2 CPVs

## Attitude Control Subsystem
- **Stability Mode**: Momentum Biased Sun Pointed
- **Pointing Control**: 0.59∞
- **Pointing Knowledge**: 0.56∞
- **Position Knowledge**: 100 m

## Command & Data Handling Subsystem
- **Flight Processor**: 68302
- **Radiation Tolerance**: Yes
- **Data Storage Capacity**: 256 MBytes
- **Interface**: MIL-STD 1553, RS-422/RS-485, CCSDS

## Communication Subsystem
- **S-Band Rx/Tx Rates**: 2kbps/2Mbps
- **Interface**: STDN or SGLS

## Options
- **Full Redundancy** increases Ps above 80% at 3 Years
- **Increased Power** provides >70 W orbit average by adding more powerful arrays and batteries
- **Articulated Arrays** enable bus to support nadir oriented missions in all orbit inclinations
- **Zero Momentum Attitude Control** supports pointing and slewing with 0.3∞pointing
- **Enhanced IMU** improves attitude control and knowledge and increases reliability
- **Enhanced Attitude Sensor** provides 0.01∞pointing knowledge by adding star tracker
- **Increased Data Storage** replaces 256 Mbyte Data Recorder with 16 Gbits
- **X-Band Downlink** supports science data rates from 2 to 150 Mbps
- **UHF Downlink** provides downlink telemetry to low-cost ground station at user site
- **Propulsion** adds 68 kg of hydrazine with average specific impulse of 220 sec
- **Three Point Launch Vehicle Interface** enables shared launch with Orbital MicroStar spacecraft

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