

PEARL

PICO-SATELLITE EXO-ATMOSPHERIC RESEARCH LABORATORY

The **PEARL** spacecraft platform has been designed from the ground up to provide high capability in a CubeSat form factor. The initial 3U version of the platform is a highly capable spacecraft bus. Increased processing and pointing control provide the utility necessary for relevant scientific or military missions.

The PEARL platform is a set of standard and customizable components that can be assembled into mission-specific configurations while minimizing non-recurring engineering costs and development schedules.

At 109 by 109 by 341 mm, the 3U version of PEARL is one of the smallest spacecraft to provide such capabilities as a Vx Works operating system, 3-axis attitude control with a high order Kalman Filter, and floating point operations for navigation and mission data processing.

Additional options available for PEARL are 1U and 1.5 U options. Spin stabilized spacecraft configurations are available with deployable booms. An optional deployable solar array is under development for missions requiring greater power generation.



PEARL PROGRAM :

- 1-3U options
- Current focus is 3U design
- 12-18 month development program

3U PEARL SPECIFICATIONS :

- ~16W EOL standard with deployed array
- Up to 42W EOL, optional deployed array
- LEON III based radiation tolerant single board computer
- 11-66 MIPS (configurable)
- PCI-104 bus
- 256 Mbytes on board memory
- Vx Works or LINUX OS
- Floating point processing
- High order Kalman filter
- Reaction wheels and torque coils
- GPS and 3-axis stability <math><1^\circ</math>
- UHF or S-band downlink available, various rates up to Mbps, encryption optional

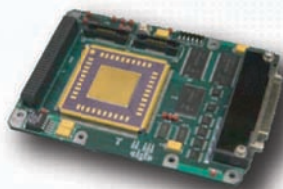
PAYLOAD ACCOMMODATIONS :

- 1U payload bay
- 2W minimum (orbit average) standard
- up to 20W (orbit average) with array options
- PCI-104 PCI card slot for payload interface
- Additional RS-422 asynchronous interface



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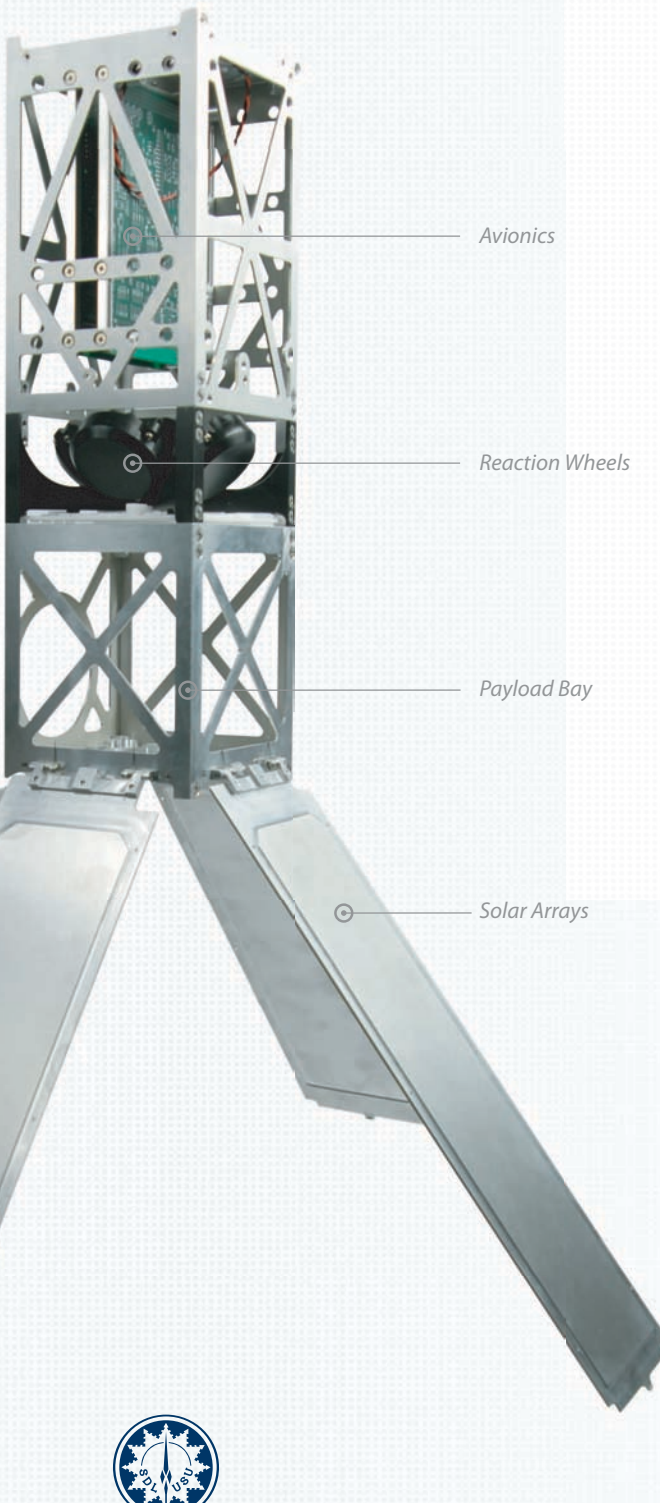
PEARL



Single Board Computer



Reaction Wheel Prototype



3U PEARL Mockup



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