

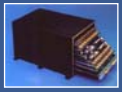
# Gravity Probe B Space Vehicle

LOCKHEED MARTIN

## Reliable Science Operations

- 100% redundancy
- Multiple failure tolerance in critical systems
- Largest cryogenic helium dewar flown in space
- Long on-orbit life and precise temperature control

### Reliable data transmission using TDRSS and NASA ground station communications



Solid State Recorder (SEAKR)



Command & Data Handling Unit (Goodrich)



NASA Standard Transponder (Motorola)



Antenna (Lockheed Martin)

### Robust flight software based on Hubble Space Telescope



Flight Computer (BAE)

Autonomous on-orbit operations  
Safemode Protection

### Low-shock non-pyrotechnic mechanisms



4 Solar Array Release mechanisms (Lockheed Martin)



4 Deployment Mechanisms (Lockheed Martin)



7 Mass Trim Mechanisms (Lockheed Martin and Litton Poly-Scientific)

## Lockheed Martin Space Systems Company

- Space vehicle design
- Systems engineering
- Integration and test
- Launch base operations
- On-orbit operations support

### World's first 6-axis stabilized satellite 3-axis pointing 3 axis translation control (drag-free)



16 Helium Microthrusters (Lockheed Martin)



16 Thruster Isolation Valves (Lockheed Martin)



3 Magnetic Torque Rods (Ittaco)



Attitude Control Electronics (Spectrum Astro)



2 Star Trackers (Goodrich)



2 Control Gyros (Kearfott)



Magnetometers (MEDA)

### Flawless electrical power performance Four double-sided solar arrays Low-ripple bus voltage



Standard Power Regulation Unit (Engineered Magnetics)



2 Batteries (Eagle Picher)



Power Distribution Unit (Spectrum Astro)