AEROSPACE

DISKSAT: A NEW ARCHITECTURE FOR SMALL SATELLITES

DiskSat takes a radically different approach to small satellite design. This plate-shaped satellite is roughly the size and shape of a large pizza—1 meter in diameter and just 2.5 cm thick. The unconventional geometry provides roughly 13 times more surface area than traditional box-shaped satellites of similar volume. That translates directly into capability—DiskSat generates several times more solar power than conventional small satellites while maintaining a lightweight carbon-fiber structure.

The concept originated at The Aerospace Corporation during a constellation study. Engineers recognized missions needed more power and larger antennas than traditional designs could provide and rethought the shape entirely. The result provides substantial volume inside while delivering performance previously difficult to achieve with satellites of this size.

Why the Form Factor Matters

DiskSat's high power-to-weight ratio enables significant maneuvering capability using electric propulsion—far more than typical satellites in this class. The flat design allows for larger antennas and instruments, creating opportunities for communications, Earth observation, and distributed satellite networks. When flying edge-on, DiskSat cuts through the atmosphere with minimal drag. Combined with electric propulsion, this allows operations at very low altitudes, providing sharper images and better data for missions that traditional satellites can't sustain.

The design streamlines launch. Multiple DiskSats stack vertically with alternating orientations that allow components to nest within gaps, fitting efficiently within standard rockets and making them ideal for rideshare missions. The dispenser releases each satellite individually for safe deployment. The flat layout simplifies design, assembly, integration, and testing.

Demonstration Mission

NASA's Small Spacecraft Technology program and U.S. Space Force Space Systems Command sponsored the DiskSat demonstration mission through the Space Test Program. In December 2025, four spacecraft launched aboard Rocket Lab's Electron rocket and are currently operating in low Earth orbit. The mission validates baseline performance, including power generation, electric propulsion and maneuvering, attitude control, communications, coordinated operations between spacecraft, and very-low-altitude flight. All four DiskSats were successfully able to communicate, generate substantial power, and successfully control their orientation. Operations included thruster demonstrations, formation flying tests, and low-altitude capability exploration, providing valuable engineering data, including refinements to thermal management and optical

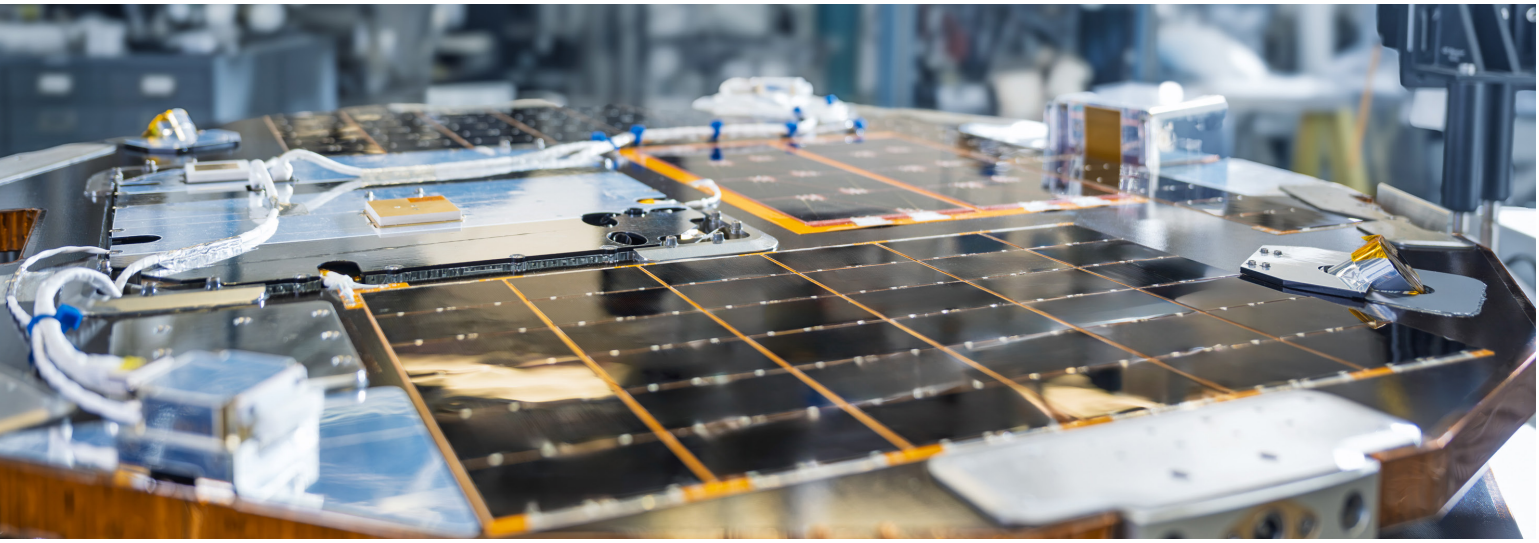
DiskSat Facts

- **Dimensions:** 1 meter diameter × 2.5 cm thick
- **Mass:** Approximately 13.5 kg
- **Power:** Generates more than 100 watts
- **Volume:** Equivalent of a 20 U CubeSat
- **Propulsion:** Electric propulsion with >200 m/s delta-V
- **Structure:** Carbon-fiber composite sandwich
- **Launch:** Four spacecraft stack within 1-meter envelope
- **Altitude:** Can operate in LEO environment, pending demonstration for operation below 350 km in Spring 2026

DiskSat Inquiries

Contact: DiskSat@aero.org

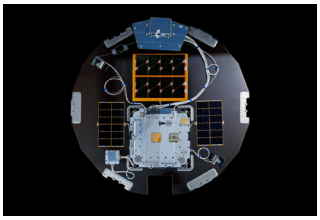
Scan the QR code to learn more.



sensors—real-world insights that inform future spacecraft versions and validate the platform for broader use.

Applications and Mission Potential

DiskSat enables mission concepts previously difficult to achieve with small satellites. Large antennas support enhanced communications. Increased power enables advanced sensors combined with low-altitude operations for improved Earth observation. High maneuverability supports distributed satellite networks for space monitoring. Efficient stacking enables rapid constellation deployment. High power supports edge computing and advanced onboard processing. Beyond low Earth orbit, DiskSat has potential for lunar communications, resource mapping, and defense applications.



DiskSat is a plate-shaped satellite (1 meter in diameter, 2.5 centimeters thick) that could provide the required power and aperture needed for future missions.

Technology Transfer and Partnerships

The Aerospace Corporation designed DiskSat as a flexible platform that companies can adopt and build upon—not as a one-time government spacecraft. Aerospace is making DiskSat available for licensing and providing documentation that allows partners to design spacecraft, payloads, and missions based on the architecture. Partnerships are intentionally non-exclusive, encouraging a broad ecosystem.

Organizations are exploring opportunities in spacecraft manufacturing, payload development optimized for the disk shape, mission operations and ground systems, constellation architectures, and supporting services including launch integration and mission planning. Multiple partners are already engaged, with additional collaborations expected as the mission continues and technology matures. This open model accelerates innovation by allowing diverse players to experiment and build on the platform.

Get Involved

Organizations interested in building on the DiskSat platform are encouraged to contact Aerospace to explore partnership opportunities. Success will be measured not just by spacecraft currently in orbit, but by how widely the platform is adopted and how many new missions it enables across the space industry.

The Aerospace Corporation

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