

IAF SPACE TRANSPORTATION SOLUTIONS AND INNOVATIONS SYMPOSIUM (D2)  
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DEVELOPMENT OF AN ON-DEMAND, SMALL PAYLOAD RETURN CAPABILITY FROM LEO

**Abstract**

SpaceWorks has been developing and flight testing an entry capsule that can provide for the on-demand return of payloads from Earth orbit. Novel space-based manufacturing, biomedicine, and pharmaceutical advancements obtained in microgravity are leading to rapid LEO market growth and a versatile, low cost delivery platform is needed to support its associated products. A commercially-focused reentry device targeted at small payloads represents a critical need for this industry.

The capsule-shaped device is capable of withstanding the high temperatures associated with reentry and accommodates customizable payload masses, payload configurations, and environmental control requirements. The system's size and form factor permit it to be integrated on smaller, dedicated launch systems or as a rideshare on a larger launch vehicle. Using a guided parafoil for precision landing, the fully-autonomous system supports returning up to 50-kg of payload from space with recovery in under 24 hours.

This paper will report on the program status, including results of low-altitude drop testing, development of the prototype unit, and recent suborbital flight testing from a high-altitude balloon funded through NASA's SpaceTech-REDDI-2020 Flight Opportunities Program.