



T0095-SB Test of Satellite Communications Systems on-board Suborbital Platforms to provide low-cost data communications for Research Payloads, Payload Operators, and Space Vehicle Operators

Problem Statement

NASA and commercial developers of orbital and suborbital spacecraft have a constant need to lower the cost of 2-way air-to-ground data transmission. Solstar Communication's technology directly addresses this issue. Customers for this technology improvement include NASA, DoD, as well as commercial crew and spacecraft developers/operators.

Potential users of the matured technology: NASA; FAA; Suborbital Reusable Launch Vehicles (sRLV) operators; sRLV payload specialists; Science payload developers and operators.

Team

- M. Brian Barnett, Solstar barnett@satwest.com (PI)
- Funding POC: Solstar Satwest, M. Brian Barnett.
- Letters of support: Virgin Galactic, Iridium, Armadillo Aerospace.

Proposed Flight Experiment

Experiment Readiness:

- The experiment will be ready for flight April 2013

Test Vehicles:

- sRLV; High Altitude Balloon; sounding rockets

Test Environment:

- Parts of the experiment hardware have previously flown on an UP Aero sounding rocket (May 2011). The best test environment through FOP is on board horizontal take off and landing sRLV & non-spin stabilized vertical sRLV.
- Preferred launch site: Spaceport America
- **Test Apparatus Description:**
- Various satellite communications transceivers and antennas



Technology Maturation

Solstar's proposed satellite network and hardware is at TRL 9 for ground and aircraft applications. However, the system has not been tested above 70,000 feet or at spacecraft velocities. Spaceflights will demonstrate the efficacy of the technology at spacecraft velocities and 100km altitude.

To mature the technology and the associated timeline, Solstar proposes to fly the equipment on multiple occasions, on multiple platforms during the next 12-24 months. The test results will provide information of additional hardware/software, if any, should be further developed to reach TRL 6 for spaceflight applications

Objective of Experiment

To test that the commercial satellite networks and equipment can provide data communications for research payloads and spacecraft tracking during suborbital flights & high altitude balloon flights

The expected flight data will be tracking data, text messaging uplink, and text messaging, internet and voice with crewed missions).