Flight Testing of a UAT ADS-B Transmitter Prototype for Commercial Space Transportation Using Reusable Launch Vehicles

Problem Statement

- ADS-B technology such as the MITRE UBR-TX have great potential for tracking assets in commercial space transportation.
- The UBR-ERAU is a prototype based upon the UBR-TX that utilizes an unrestricted GPS to support operations in excess of current ITAR/COCOM velocity and altitude limits.
- This proposal seeks flight opportunities to test and refine this prototype.

Technology Development Team

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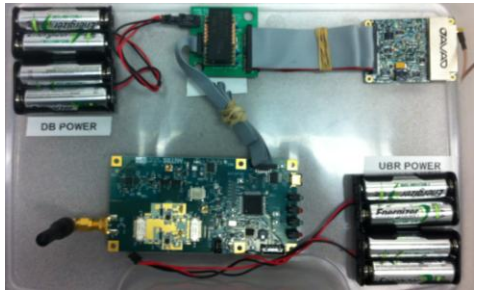
- Partner organizations:
  - FAA
  - MITRE

Experiment Readiness:

- The payload will be tested under an approved NASA FO onboard the Near Space Corporation (NSC) Nano Balloon System.
- The UBR-ERAU will be ready for flight in October 2012.

Test Vehicles:

- This proposal requests operation on three vehicles: NSC's High Altitude Shuttle System (HASS), Masten Xaero (or Xombi), Up Aerospace Spaceloft XL (or STIG).



Test Environment:

- The UBR-TX, the basis for this prototype, has flown on a number of rocket flights.
- The UBR-ERAU will have flown onboard a high altitude balloon by October 2012.
- Requested flights will include:
  - Extended duration balloon flight;
  - Reusable launch vehicle; and
  - Sounding rocket.

Technology Maturation

- Flight opportunity will provide the transition from TRL 5 to TRL 6 or 7.
- HASS flight will provide validation for achieving TRL 5.
- Xaero flight will provide validation of non-brassboard prototype at TRL 6.
- Spaceloft XL flight will validate further maturity via flight data onboard a flight with conditions close to the planned "worst-case" for the prototype.

Objective of Proposed Experiment

- The objective of the three proposed flight opportunities is to create a path through empirical analysis to mature the UBR-ERAU prototype toward a design that can be utilized by NASA, FAA, and commercial space transportation providers such as Virgin Galactic to support asset tracking and better airspace integration.

This effort addresses Technology Area 13-26: "Tracking, Surveillance, and Flight Safety Technologies"