



T0142-S Affordable Vehicle Avionics

Problem Statement

- SOA Avionics cost more than Nano-Launcher and low-cost payloads. Need affordable, responsive, modular common avionics system for Nano-Launchers
- The AVA test flight will validate AVA procedures and assess AVA performance.
- NASA, DoD and private launch vehicle developers will benefit from the low-cost AVA technology.

Technology Development Team

- Jim Cockrell, NASA ARC, AVA PM james.j.cockrell@nasa.gov.
- Wade May, LaRC, PEM, GCDP
- MSFC nanolauncher project, and a number of private launch vehicle operators are potential customers of AVA technology..

Proposed Flight Experiment

Experiment Readiness:

- AVA will be read to ship on May 15, 2015.

Test Vehicles:

- AVA proposes to fly on UP Aerospace SLXL to 115 km altitude.

Test Environment:

- AVA has been environmentally tested in the lab environment to flight qualification levels of GEVS.

Test Apparatus Description:

- AVA payload is self-contained; it includes batteries with sufficient life for pre-flight and flight.
- Data is stored in non-volatile SD card on board.
- A launch vehicle-provided GPS antenna and connecting cable are required.
- Pre-flight "aliveness test" is conducted through a "T-0" serial cable to be attached at a launch vehicle bulkhead until ready for launch.



Technology Maturation

- AVA is tested in the lab environment to TRL 5.
- A suborbital flight in "open loop" mode will raise AVA TRL 6
- The AVA goal is to achieve TRL 6 by FY15 end.

Objective of Proposed Experiment

AVA test flight enables comparison of AVA navigation data with actual "truth" data and validate AVA'S performance. It provides confidence that AVA is viable and matures technology beyond TRL 5.

Goals:

- Validate AVA survives shipping and flight environments
- Validate pre-flight procedures
- Determine if the AVA GPS receiver works during ascent
- Determine AVA accurately computes flight data
- Validate the post-flight recovery /data processing