

Topic Number:
AF06-270

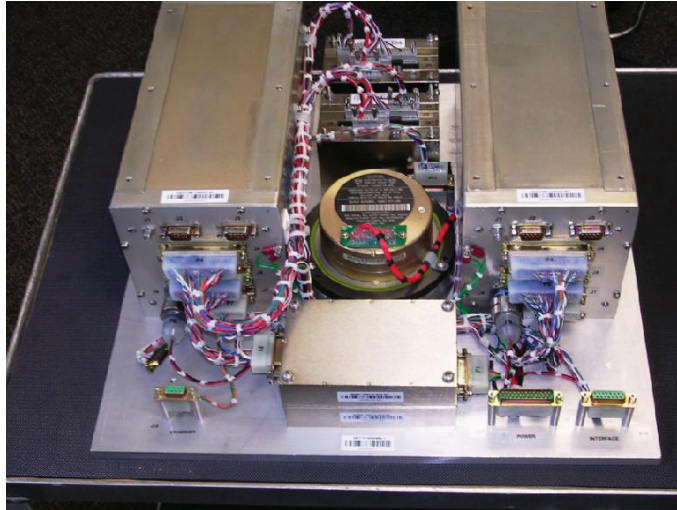
Title:
Autonomous Flight Termination & Satellite Based Telemetry System for Launch Vehicles

Contract Number:
FA9453-07-C-0049

Company Name:
ASRC Research and Technology Solutions, LLC, Greenbelt, MD

Technical Project Office:
AFRL Space Vehicles Directorate, Kirtland AFB, NM

This Air Force SBIR/STTR Innovation Story is an example of Air Force supported SBIR/STTR technology that met topic requirements and has outstanding potential for Air Force and DoD.



SAFTTS Flight Hardware

Space-based Autonomous Flight Termination and Telemetry System

- With current technology, the risk to public safety from hazards associated with flights of Expendable Launch Vehicles (ELVs) and Unmanned Aerial Vehicles (UAVs) is mitigated by the use of ground-commanded flight termination systems
- ASRC Research and Technology Solutions, LLC, developed and tested a flight-ready Space-based Autonomous Flight Termination and Telemetry System (SAFTTS) prototype
- SAFTTS uses the Global Positioning System (GPS) and Inertial Navigation System (INS) for tracking, along with onboard, configurable intelligent software for autonomous flight termination capabilities
- The SAFTTS technology will improve Air Force launch operations by reducing the need for tracking and communications sites, thereby decreasing nonrecurring and recurring costs, supporting Responsive Space (RS) activities by reducing turnaround times and supporting simultaneous launches, and making it easier to expand the number of geographic locations suitable for space launches

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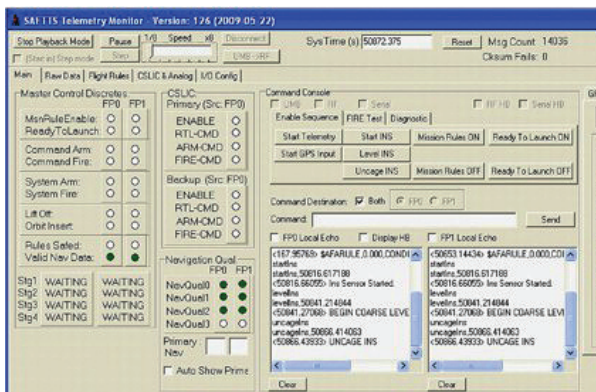
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Air Force Requirement

With current technology, the risk to public safety from hazards associated with flights of Expendable Launch Vehicles (ELVs) and Unmanned Aerial Vehicles (UAVs) is mitigated by the use of ground-commanded flight termination systems. Current launch operations require extensive networks of remote, ground-based radar tracking and communications sites to provide range support, and are available only at limited geographic launch areas. Existing ranges require long turnaround times and are costly to use because of aging equipment costs and fixed staffing costs. The Air Force desires improved technology solutions that enable more responsive and lower cost launch operations

SBIR Technology

ASRC Research and Technology Solutions, LLC (ARTS) developed and tested a flight-ready Space-based Autonomous Flight Termination and Telemetry System (SAFTTS) prototype. SAFTTS uses the Global Positioning System (GPS) and Inertial Navigation System (INS) for tracking, along with onboard, configurable intelligent software for autonomous flight termination capabilities. At the same time, the onboard tracking data is sent to the control center over a high link margin telemetry link.



SAFTTS Telemetry Display

The control center can send up encrypted "Terminate" or "Inhibit Autonomous Terminate" commands directly to the vehicle. For safety, if uplink communications are lost or out of range, SAFTTS will have default termination responsibility.

Potential Air Force Application

The SAFTTS technology will improve Air Force launch operations in the following ways:

- By reducing the need for tracking and communications sites, it will decrease the high nonrecurring and recurring costs of launch operations resulting from aging equipment, fixed staffing, and remote locations.
- It will support Responsive Space (RS) activities by reducing turnaround times that are currently required in configuring range and communication equipment.
- It will support simultaneous launches replacing limited fixed ground range equipment with equipment located onboard each vehicle.
- It will make it easier to expand the number of geographic locations suitable for space launches by eliminating fixed range equipment.

Future ranges can enhance their responsiveness to their customer's needs which include lower operational costs, simpler operations, expanded geographical locations, and faster turnaround times.

Company Impact

"Although ARTS has not received any corporate sales from a product development standpoint, I believe that the SAFTTS development activities have played a role in demonstrating ARTS' significant technical skills and capabilities to various customers, whether it is to federal agencies, or to large businesses that are looking for a suitable small business for teaming on procurement opportunities. As a technical services organization that survives solely based on performance, the success of this and other SBIR projects are key to our continued growth."

Gregg Einfalt
President
ASRC Research and Technology Solutions, LLC



SBIR/STTR

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