

An example of Air Force supported SBIR/STTR technology that has been transitioned into an Air Force or other DoD system or subsystem or used by Air Force test ranges and facilities or maintenance depots.

SBIR Topic Number:

AF02-072

SBIR Title:

Integrated Satellite Operations Training and Rehearsal for Multiple Satellite System Ground Control

Contract Number:

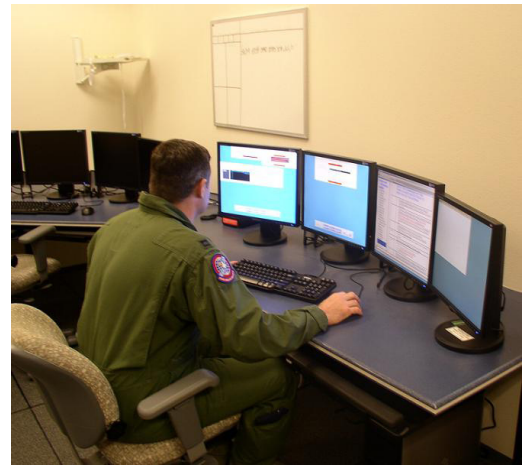
F33615-03-C-6322

SBIR Company Name:

Sonalysts, Inc.
Waterford, CT

Technical Project Office:

AFRL Human Effectiveness Directorate, Warfighter Readiness Research Division, Mesa, AZ



Standard Space Trainer (SST) Offers Expanded Simulation Features

- The Air Force has a need for the development of an integrated simulation-based operator training and rehearsal capability for satellite system ground control
- Advantages of using the SST include flexible instructor control features, increased instructor and student productivity, quick setup, and lower training costs
- Sonalysts, Inc., developed a Standard Space Trainer (SST) for use as a satellite operator proof-of-concept instructional simulation that supports multiple systems
- Due to the success of the prototype, the planned Air Force Phase III acquisition deliverables include the SST hardware and software architecture, two satellite training software applications, and the sustainment of these products

Commercialization Pilot Program Series

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Air Force Requirement

The Air Force has a significant need for the development of an integrated simulation-based operator training and rehearsal capability for satellite system ground control. Satellite systems have traditionally consisted of a master control system for one primary satellite constellation performing a specific mission. However, future generations of military satellites should logically use a common ground system which will operate several disparate satellite constellations within a mission area.

SBIR Technology

In this SBIR project, Sonalysts, Inc., developed a satellite operator proof-of-concept instructional simulation that supports multiple systems. The simulation was developed for the Air Force Research Laboratory (AFRL), Warfighter Readiness Research Division, Mesa, Arizona, and was subsequently evaluated by the 533rd Training Squadron, Vandenberg AFB, California.

The results of the SBIR effort – a proof-of-concept Standard Space Trainer (SST) – provided instructional simulation support for a subset of the Architectural Evolution Plan (AEP) and Defense Satellite Communications System (DSCS) satellite systems using advanced modeling, simulation, and visualization technologies. The proof-of-concept SST was designed to: (1) evaluate the potential of using a personal computer (PC)-based microsimulation environment for satellite Command and Control (C2) training in Initial Skills Training (IST) and Unit Qualification Training (UQT), and (2) to serve as a stepping stone for the development of a production SST system.

Transition Impact

The goal of the SBIR project was to explore and demonstrate a closed loop adaptive training capability for satellite operations. To that end, there was considerable leveraging of Sonalysts' adaptive training technologies to support a seamless blend of complex knowledge and skill training to improve training effectiveness and ultimately performance in the operational environment. The work was informed by instructional, cognitive, and modeling and simulation science and practice on how best to structure complex performance events from the perspective of how humans learn and how they instantiate knowledge to improve performance. The foundation of the SST comes from these domains. The SST effort represents the successful development, demonstration, and extension of the research and applications from these three domains to the development of an adaptive instructional capability that promotes learning and performance for complex environments.

The proof-of-concept SST was successful in using a single-system architecture that provided training for two different satellite C2 systems. Due to the success of this application, the Air Force is pursuing the development of a production SST system using Sonalysts' technologies and methodologies. In May 2008, the Air Force determined that the Phase III deliverables will include the SST hardware and software architecture, two satellite training software applications, and the sustainment of these products.

The SST can be used to support independent qualification training, unit qualification training, and crew training. Training programs can support the fundamentals of behavior of common military satellites, sub-systems common to all satellites, space flight, orbital mechanics, and satellite operations. An instructor can monitor up to six students, provide targeted instruction to any student, and change values or insert faults/dynamic events during a scenario. Moreover, SST training applications can be set up and shut down quickly.

There are hardware/software cost savings since the SST vision will result from the application of commercial-off-the-shelf (COTS) PC-based hardware and the modeling of only the user's experience – not the operational hardware/software. The experience of the 533rd Training Squadron is that required instructor manpower has been reduced significantly, while student evaluation productivity has increased dramatically.

Company Impact

This Phase III initiative provides a mechanism to transition the training technology conceived under the Phase I and Phase II efforts to the field. This allows Sonalysts an opportunity to provide cost-effective training technology to the Air Force in a streamlined process. Hence, this is a true "win-win" situation.

Headquartered in Waterford, Connecticut, Sonalysts is an employee-owned company known for its first-class technical capabilities which are aligned with communication expertise, creativity, and an understanding of the business aspects of both government and commercial projects.



U.S. AIR FORCE

SBIR/STTR

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