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DEPARTMENT OF THE NAVY

# NAVY SBIR/STTR SUCCESS STORY



## DEPLOYABLE MULTI-BAND RADIO BASE STATION

*W5 developed the world's first and only Mobile User Objective System (MUOS) Simulator for when mobile communication is mission critical*

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## THE CHALLENGE

Diverse communications paths, versus a single link, are required to ensure war fighters can communicate in a variety of austere scenarios. The Navy is interested in technologies that enable links via multiple (ground, air, and/or space) communications layers. There are a multitude of aerial vehicles employing a variety of communications links. The interface to the radio base station must be capable of operating in multiple bands to ensure communications in all scenarios. Wideband Code Division Multiple Access (WCDMA) repeater payloads have been in development for balloons or unmanned aerial vehicles (UAVs) use to provide enhanced cellular coverage in a variety of scenarios.

## THE TECHNOLOGY

W5 developed the Mobile User Objective Orientation System (MUOS) simulator where Phase I determined the feasibility of a deployable MUOS ground station to support alternate platforms (other than geosynchronous satellites) resulting in functional requirements, initial system design, and performance predictions. Phase II demonstrated a prototype deployable MUOS ground station in a laboratory environment resulting in design documentation and software (S/W) source code.

## THE TRANSITION

MUOS transitioned after its participation in the Navy SBIR/STTR Program (STP) via two Phase IIIs awarded by NAVAIR's PMA-209, Air Combat Electronics Program Office, and NAVWAR's PEO Space and with W5 investments. The primary objectives of the Phase IIIs were to provide two (2) MUOS Single Satellite Beam Carrier Base Unit Model #1900-1, 1 week of user training on the Model #1900-1 and 2 years of H/W and S/W maintenance and support. The procurement and support of the MUOS satellite simulator (SATSIM) are critical to the success of multiple Navy Aviation platform missions.

## THE NAVAL BENEFIT

MUOS trains users and planners and provides a local and portable solution offering realistic and configurable training without using satellite channels. When combined with an appropriate communications link to a deployed radio base station, a WCDMA payload provides alternate or supplementary cellular communications using existing phones or radios. MUOS supports the Navy's desire to transition from legacy UHF SATCOM to MUOS WCDMA communications. MUOS enables increased reliability and performance of Naval aircraft satellite communications. The warfighter benefits from this innovation by enhanced (e.g., polar region) coverage from the additional WCDMA payloads. In many regions, he will then be served by a choice of WCDMA beams, eliminating the single point of failure of a single beam.

## THE FUTURE

Now a commercially available product, Mighty MUOOSTM is the world's first and only MUOS Simulator! W5's ultimate goal is to integrate and transition this technology into government and prime contractor systems for facilitating condition-based maintenance and the satellite simulator market. The Mighty MUOOSTM is an off-satellite MUOS system emulator capable of supporting MUOS terminal development, certification, regression, inter-operability testing, and application development. As a training device, it enables operators to be trained on the operation of MUOS terminals in a classroom environment. Mighty MUOOSTM can also be deployed to allow pre-mission rehearsal and on flight lines to perform system checks. Areas of temporary congestion, such as stadiums and parks could be augmented with additional coverage at low cost. MUOOS could provide emergency communications in the event of natural disasters where ground-based cell towers are damaged.