Department of the Navy SBIR/STTR Transition Program

Statement A: Approved for public release, distribution is unlimited. (17 December 2015)

Topic # N122-148
Deployable Multi-Band Radio Base Station
W5 Technologies, Inc.

WHO

SYSCOM: SPAWAR

Sponsoring Program: Navy Communications Satellite Program Office (PMW 146)

Transition Target: Mobile User Objective System (MUOS)

TPOC:
843-218-4808

Other transition opportunities: The Mighty 'Mobile User Objective Orientation System' (MUOOS) and Mighty 'MUOS Expander' (MUOSe) are valuable to all branches of the military. The MUOOS provides off system training and pre-mission rehearsal to all sailors, airmen, and soldiers. The MUOSe will provide much needed Beyond Line-of-Sight (BLOS) communications in terrain and areas beyond the coverage of geosynchronous satellites to all users carrying MUOS terminals.

"Mighty MUOOS"
Satellite Simulator

"Mighty MUOSe"
Deployable MUOS Ground System

WHAT

Operational Need and Improvement: The Navy could benefit from a a Multi-band MUOS base station capable of rapid deployment on ground and aerial platforms enabling extended MUOS coverage around barriers such as slot canyons and to the northern latitudes, and increased spot beam capacity anywhere in the world.

Specifications Required: The high-level requirements for this effort are:
- Interoperate with MUOS terminals
- Support alternate platforms such as terrestrial antennas, Unmanned Aerial Vehicles (UAV), High Altitude Platforms (HAP), and Molniya orbit satellites
- Support multiple bands to ensure communications in all scenarios.
- Future capability to provide reach-back to existing MUOS RAF.

Technology Developed: The Mighty MUOSe is small and easy to deploy on the ground, in a vehicle, or on a UAV. The Mighty MUOSe contains Radio Base Station (RBS), Radio Network Controller (RNC), and Core Network (CN) functionality. It is capable of processing MUOS calls and supports the MUOS Common Air Interface. It has a frequency range of 250 MHz to 3 GHz allowing it to talk directly to MUOS terminals on the UHF band, or to a Wide-band Code-Division Multiple Access (WCDMA) repeater payload over L or S band. When paired with a MUOS Extension Gateway (MeG), users under the extension beam can communicate seamlessly with users on the main MUOS network.

Warfighter Value: The Mighty MUOSe provides the warfighter MUOS coverage anywhere in the world to any MUOS user in the world. Even without a backhaul connection, the Mighty MUOSe can provide BLOS MUOS service when deployed as a UAV payload or when paired with a WCDMA repeater payload. Increased MUOS terminal battery life will be seen due to the close proximity between the terminal and ground station.

WHEN

Contract Number: N66001-14-C-5217 **Ending on:** March 29, 2017

Milestone	Risk Level	Measure of Success	Ending TRL	Date
MUOOS first deployment in SPAWAR lab to support MUOS Waveform porting and testing	Low	Able to support MUOS waveform porting and integration	6	January 2016
MUOOS deployed in SPAWAR lab to support MUOS Terminal Certification	Low	Able to support MILSTD 188-17 off-nominal testing	6	January 2017
MUOSe first aerial demonstration	Low	Ability to make voice and data calls	6	December 2016
MUOSe first operational scenario test	Med	Ability to make voice and data calls	7	December 2017

HOW

Projected Business Model: W5 has commercialized the technology into the Mighty MUOOS for sale to the MUOS satellite simulator market. Proceeds from those sales will be used to self fund the development of the Mighty MUOSe.

Company Objectives: W5 intends to produce and sell the Mighty MUOOS to government agencies for the uses listed below. We are interested in strategic partnerships to help with the sales and support services. We plan to produce and sell Mighty MUOSe units to defense primes for integration into their communication systems.

Potential Commercial Applications: The Mighty MUOOS is an off-satellite MUOS system emulator capable of supporting MUOS terminal development, certification, regression, inter-operability testing, and application development. Next, as a training device enabling soldiers to be trained on the operation of MUOS terminals in a classroom environment. Finally, deployed to allow pre-mission rehearsal and on flight lines to perform system checks.

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