# TacSat-4 participates in Navy fleet experiment Trident Warrior

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MCTSSA Marines are shown-on-the-move in a HMMWV during Trident Warrior testing of TacSat-4.communication and demand assigned multiple access communication. Credit: (U.S. Naval Research Laboratory)

U.S. Naval Research Laboratory's Tactical Satellite-4 successfully completes three weeks of intense testing, June 28, as part of the Navy's annual Trident Warrior Experiment 2012 (TW12). TacSat-4 is a Navy-led Joint mission that provides Ultra High Frequency (UHF) satellite communications (SATCOM).

Sponsored by Navy Warfare Development Command, Trident Warrior is an annual fleet experiment focused on gaining valuable insights to improve future capability investments. This year's agenda included at-sea experimentation of critical maritime initiatives, and developing or

improving tactics, techniques and procedures to aid maritime forces.

Kicking off the three-week experiment, NRL personnel conducted TacSat-4 SATCOM testing and training aboard the U.S. Navy amphibious assault ship, USS Essex (LHD 2) and at Marine Corps Tactical Systems Support Activity (MCTSSA), Camp Pendleton, Calif.

Training and testing was successfully completed for multiple UHF SATCOM operations between Essex and Marines ashore using the Enhanced Manpack UHF Tactical (EMUT) Conical Logarithmic Spiral Mobile (CLSM) Antenna, an antenna typically used by Marines aboard in the Landing Forces Operations Center (LFOC) to communicate with forces ashore. Marines ashore were afoot and in a High Mobility Multipurpose Wheeled Vehicle (HMMWV) equipped with 'eggbeater' omni-antenna using standard PRC-117F, PRC-117G radios.

MCTSSA based operations with fielded Marines in HMMWV using vehicle mounted PRC-117F radio and dismounted Marines using PRC-117G, PRC-152 and PRC-148 radios, performed multiple voice and data SATCOM operations through TacSat-4. This included SATCOM to a simulated Forward Operating Base (FOB) or headquarters network for Voice over Internet Protocol (VoIP), chat and file data transfers.

A fielded TacSat-4 Portable Ground Terminal (PGT) enabled this SATCOM to network interface. The PGT uses the same components as the deployed Joint Base Station. MCTSSA personnel also trained on the NRL Virtual Mission Operations Center (VMOC) and successfully submitted satellite tasking via the VMOC mission-planning tool.

Week two testing evaluated the military utility of TacSat-4 for multiple types of UHF SATCOM equipment aboard Essex while sailing from San Diego, Calif., to Pearl Harbor, Hawaii. SATCOM voice communications

were successful between Essex and MCTSSA using two separate systems—a portable PRC-117F radio in the LFOC connected to a CLSM EMUT Antenna and a WSC-3 radio/MD-1324 modem connected to an OE-82 antenna.

During the final week, NRL personnel conducted TacSat-4 SATCOM operations between U.S. Navy submarine USS Olympia (SSN 717) and the submarine Broadcast Control Authority-Pacific (BCA-PAC). Voice testing was successfully performed at all power levels. Data testing used the submarine's standard data mode for UHF SATCOM communication.

Aboard Essex, TacSat-4 SATCOM voice testing continued with the Marines as the ship approached O'ahu, Hawaii. The 3rd Battalion, 3rd Marine Regiment located at Kaneohe Bay on Marine Corps Base Hawaii (MCBH), participated in this testing. Collectively, operators onboard Essex and ashore at MCBH again demonstrated voice SATCOM using both the ship's SATCOM system—the WSC-3 and OE-82 antenna—as well as using the Marines' on-ship PRC-117F radio in the LFOC attached to the ship's CLSM EMUT antenna.

Trident Warrior 2012 is a key component for the TacSat-4 Military Utility Assessment (MUA). Demonstrating ship-to-shore SATCOM with Marines, including On-the-Move Marines, and sub-to-BCA SATCOM was integral in showcasing the potential that TacSat-4 has for joint operators.

TacSat-4 was designed to augment current geosynchronous satellite communications using its highly elliptical orbit to by provide coverage in the high latitudes as well as to selectable theaters throughout the world. TacSat-4 is a single prototype satellite so coverage is not continuous.

The Office of Naval Research (ONR) sponsored the development of the payload, the first year of operations and experimentation in Trident

Warrior for Navy's MUA. The Operationally Responsive Space (ORS) Office funded the launch and Joint MUA.

Provided by Naval Research Laboratory