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SBIR INVESTMENT: \$2,399,715

PHASE III FUNDING: \$78,726,195

DEPARTMENT OF THE NAVY

NAVY SBIR/STTR SUCCESS



ADVANCE TECHNIQUES FOR DIGITAL RADIO FREQUENCY MEMORY (DRFM)

State-of-the-art threat electronic attack techniques and target generation capabilities utilizing an innovative DRFM architecture containing flexibility, programmability and other enhancements.

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THE TECHNOLOGY

Most all modern weapon systems employ the use of Radar and Electronic Attack (EA) systems. During engagements, the Radar system is employed to find and lock onto the intended target in an attempt to successfully launch the first missile shot. A Threat Electronic Attack System is employed by the adversary in an attempt to defeat the Radar system thus denying information in one or all three dimensions sought by the Radar system: Range, Velocity and/or Angle. A DRFM Threat Electronic Attack System captures, modifies and replays a target's radar signal to execute deception jamming in range and velocity.

"PMA-208 SPONSORED THE CONTINUED DEVELOPMENT OF THE ADVANCED DRFM AS A CRITICAL ITEM IN BEING ABLE TO PROVIDE REALISTIC ELECTRONIC THREATS FOR NAVY AND MARINE CORPS TEST, EVALUATION AND TRAINING. THE PROGRAM HAS BEEN HIGHLY SUCCESSFUL IN DEVELOPING AND PRODUCING A DRFM FOR THREAT EMULATION WITH A FLEXIBLE ARCHITECTURE THAT CAN EVOLVE TO KEEP PACE WITH EMERGING THREATS. THE TARGET THREAT SIMULATION PROGRAM (TTSP) TEAM WITHIN PMA-208, WORKING BESIDE MERCURY DEFENSE SYSTEMS, HAS BEEN INSTRUMENTAL IN THE PROGRESS AND SUCCESS OF THIS TECHNOLOGY."

Captain Molly Boron, Program Manager, PMA-208

THE CHALLENGE

An adversary with Threat Electronic Attack capabilities such as that provided by an advanced DRFM could create a very serious situational awareness problem for US Naval Radar systems and aircrew, resulting in decreased weapons effectiveness. The development of advanced DRFM units for laboratory and field testing allow for the simulation of current and next generation multi-channel DRFM's with threat libraries.

THE TRANSITION

In FY11, the project transitioned to Program of Record funding from the Aerial Target and Decoy Systems Program Office (PMA-208) for continued development, procurement, and operation & maintenance of advanced concept DRFM hardware units in direct support of weapons evaluation programs by the AIR 5.3 Airborne Threat Simulation Organization (ATSO). Low rate initial production is complete and full rate production commenced in early FY16 with the procurement of 127 units across both Air Force and Navy weapon programs as of 2018. Weapon testing includes Hardware in the Loop (HIL) laboratory testing, captive carry missile Test and Evaluation (T&E) flights, and live fire missile T&E flights using both full-scale and sub-scale aerial target drones. This advanced concept DRFM is the latest iteration in the successful line of PMA-208 "Filthy" series DRFMs and is now known throughout the acquisition and test communities as Filthy Buzzard.

THE NAVAL BENEFIT

The efforts of this SBIR are to make the Advanced DRFM capabilities available to aircrew in controlled T&E and training environments prior to flying combat sorties. Without the Advanced DRFM, the first time the aircrew flies against these advanced Electronic Attack capabilities could possibly be in combat. The advancement in the capability of the Advanced DRFM has been phenomenal. Modern DRFM technology has allowed for growth from a simplistic single threat processing system to a simultaneous multiple threat processing system. In this case, the Advanced DRFM provides a scalable RF architecture that handles time coincident threat inputs, a threat library that allows individual technique assignment for each threat and is able to respond against wide RF bandwidths found in modern Active Electronically Scanned Arrays (AESA) radar. The Advanced DRFM serves as the much needed modern threat simulation device to test and train against.

THE FUTURE

To keep pace with emerging threats, we will continue to execute spiral upgrades to the DRFM thus providing advanced concept DRFM hardware units with improved capabilities in direct support of US Navy and Air Force weapons evaluation programs.