



TOPIC NUMBER: N131-039

SBIR INVESTMENT: \$2,650,000

PHASE III FUNDING: \$4,230,000

DEPARTMENT OF THE NAVY NAVY SBIR/STTR SUCCESS



UNMANNED MULTI-ROTOR AERIAL RELAY (UMAR)

A tethered Unmanned Aerial System (UAS) that provides high bandwidth over the horizon (OTH) communications for increased situational awareness.

Dragonfly Pictures, Inc. (DPI UAV Systems)

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THE TECHNOLOGY

The UMAR, a modern-day “Crow’s Nest”, is a tethered UAS that provides OTH communications range extension for off-board assets (Mine Hunting Unit (MHU) Unmanned Surface Vehicles, Unmanned Underwater Vehicles, and other assets). Lifting the antenna to 500 ft. provides 360-degree coverage, and a high bandwidth solution at two to three times the current operational range. The UMAR’s tether provides power, allowing it to fly for long periods of time, and, secure communications over its fiber optic cable. It operates with minimal operator input. The UMAR is a simple, cost-effective solution, enhancing communication and situational awareness capabilities across multiple Department of Defense platforms.

“THE NAVY SBIR PROGRAM OFFICES CONTINUES TO PROVIDE LEADERSHIP AND GUIDANCE FROM CONCEPTUAL DESIGN THROUGH TRANSITION TO THE FLEET. THEY HAVE PROVIDED US WITH THE SUPPORT (PROGRAMMATIC, TECHNICAL, AND RISK REDUCTION) REQUIRED FOR TRANSITION TO THE SAILOR.”

Joseph S. Pawelczyk, VP Operations, DPI

THE CHALLENGE

The Navy needs to project situational awareness and communicate at greater distances beyond the horizon where the earth’s curvature limits persistent and reliable communications. The Navy also desires greater standoff operational range, and increased host ship maneuverability when involved in unmanned surface vehicle mine sweeping efforts.

THE TRANSITION

The UMAR technology, initially developed under a Navy SBIR, has been miniaturized as a tethered UAV and delivered to the Army and Marine Corps. The Army is currently using the technology for signal intelligence tethered to the Multi-Utility Tactical Transport System (MUTT). The USMC, in conjunction with SPAWAR, purchased 2 UMAR systems to assist with physical security.

THE NAVAL BENEFIT

The UMAR allows ships to extend their influence through a high bandwidth OTH datalink that integrates with the current system architecture. This expands the operational range of current MHU unmanned surface vessels by two to three times, and increases the sweep area by an order of magnitude. The UMAR does not require significant training or maintenance. It automatically tracks and follows the host ship/platform (operator commands are confined to takeoff, landing and altitude changes). It also offers payload adaptability -- allowing other sensors, such as cameras or signals intelligence payloads, to be integrated for persistent over watch.

THE FUTURE

The UMAR has been designed as a modular portable installation for ships, and can be easily adapted to various ship types and missions, providing OTH communications and increased situational awareness -- while carrying a variety of payloads to an altitude of 500 feet. Dragonfly Pictures is actively working with General Dynamics to integrate with their MUTT.