Department of the Navy SBIR/STTR Transition Program

Statement A: Approved for Release. Distribution is unlimited.

Topic # N131-039

Aerostat Communications Relay from Unmanned Surface Vehicle

Dragonfly Pictures, Inc.

WHO

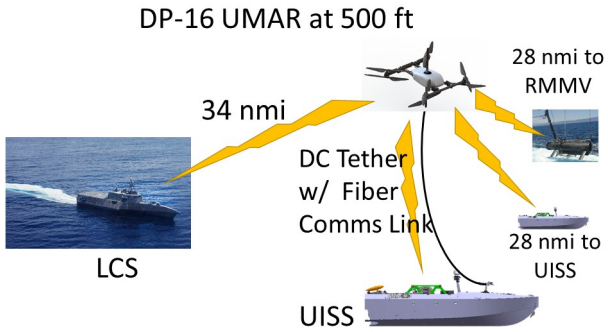
SYSCOM: NAVSEA

Sponsoring Program: Program Office for the Littoral Combat Ship (LCS) Mission Modules (PMS 420)

Transition Target: Program Office for Unmanned Maritime Systems (PMS 406) - Unmanned Influence Sweep System (UISS)

TPOC:
(850) 235-5883

Other transition opportunities:
Mine Sweeping and Patrol Craft Operations with PEO Ships
Search and Rescue with the Coast Guard
US Army for Intelligence, Surveillance and Reconnaissance (ISR) applications
Commercial/Civil Applications: Fire Fighting, Law Enforcement, News Agencies, etc.



WHAT

Operational Need and Improvement: The Unmanned Influence Sweep System (UISS) will be launched from the LCS to conduct mine countermeasure missions. The current LCS Multi-Vehicle Communication System (MVCS) would be limited to about 14 nautical miles (NM) due to the radar horizon. Dragonfly Pictures Inc. (DPI) is developing a power tethered Unmanned Multirotor Aerial Relay (UMAR) that can easily be flown and recovered and operates for up to 16 days. The UMAR will lift a pair of RT-1944/U high power amplifiers and antenna to 500 ft. to improve the radar horizon and extend the communications range potentially to over 34 NM for the UISS and other MVCS-enabled vessels.

Specifications Required: The UMAR must deploy to 500 feet in under five minutes, carry LCS Multi-Vehicle Communication System (MVCS) communications relay equipment and have the low size, weight, and power characteristics as well as cost (SWaP-C) desired by the Navy. It must be able to deploy/recover multiple times from an unmanned surface vessel. It must have a threshold mean time between maintenance (MTBM) of 100+ hours and be able to extend communications to 28 NM. Flight time is 24+ hours with an objective MTBM of 400+ hrs (16+ days). Expensive radio is kept on deck.

Technology Developed: This is an eight propeller multirotor that can carry a modular payload of up to 15 lbs. It operates on a 500 foot power-tether and communicates by fiber. The payload has two additional fiber members in the tether for RF over Fiber communication between two high power amplifiers and two RT-1944/U radios that have a higher throughput (18 mbps). It can be loaded on unmanned/manned vessels, stationary, or ground platforms.

Warfighter Value: Launching the UMAR from the UISS extends the communications range from 14 to 34 nmi (240% improvement). The 3 easy buttons of "Takeoff," "Land," "Change Altitude" reduce the learning curve without adding staff/burden or complex training requirements. It requires minimal maintenance and logistics with only 8 moving parts.

WHEN

Contract Number: N00024-15-C-4010 **Ending on:** October 31, 2016

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Surrogate system from Coast Guard Vessel	Low	Successful Takeoff/Flight/Following/Landing	5	October 2015
UMAR Stationary Demonstration	Low	Successful Takeoff/Hovering/Landing	5	November 2015
UMAR from moving ground platform	Med	Successful Takeoff/Flight/Following/Landing	5	January 2016
UMAR from moving vessel	Med	Successful Takeoff/Flight/Following/Landing with Comms Relay	6	April 2016

HOW

Projected Business Model: DPI would produce the systems using key subcontractors that are ISO 9001 certified and currently build to military standard (MIL STD) specifications, while DPI would handle the final assembly, software upload and final test prior to delivery. The subcontractor network is already set up and DPI has the ability to begin Low Rate Initial Production in 8 weeks with full production in 6 months. DPI would sell to either the prime contractor on the UISS common unmanned surface vehicle (CUSV) program, which is Textron AAI, or directly to the US Navy for this application. DPI would maintain a direct sales model for other primes and government agencies.

Company Objectives: DPI is looking to utilize the UMAR for several different payloads and expand further into the tethered multirotor marketplace. DPI wants to make a product flexible enough for other sensor packages, such as WiFi, electro-optical infrared (EO/IR) sensors or small synthetic aperture radars (SAR). DPI is looking to talk with industry partners, prime contractors as well as government agencies.

Potential Commercial Applications: Commercially, DPI is looking to sell tethered multirotor systems to a broad range of commercial and civil users. These include police, fire, first responders, television news agencies and film producers. This system allows for transportable, easily operated, quickly launched asset that can fly up to 500 ft, cost significantly less than a manned helicopter. The extended flight times of the UMAR can operate significantly longer than current battery powered multirotors.

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