Department of the Navy SBIR/STTR Transition Program

Topic # N201-X01
ADAPT - Advanced, Agile Manufacturing of Limited-Production Swarming Unmanned Systems (UxS) to Support Humanitarian Assistance and Disaster Relief (HADR) Operations
Hydronalix, Inc

WHO

SYSCOM: ONR

Sponsoring Program: ONR

Transition Target: A novel, low-cost, disposable, American-made, micro unmanned aircraft system (UAS)

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Image courtesy of Hydronalix, Inc.

Other Transition Opportunities: Hydronalix has worked closely with the Littoral Explosive Ordnance Neutralization (LEON) group to understand their requirements and provide preliminary training and experimentation. The UAS were demonstrated for the Marines and a representative from Ausgar during Technology Concept Experiment (TCE) 21.1 in San Diego. The Hydronalix ADAPT UAS were also included in the Baltops50 exercise as part of testing and demonstration. Hydronalix ADAPT drones have been purchased by the John Hopkins Applied Physics Laboratory to serve as a platform for a custom quadcopter payload they are developing. The Robotic Autonomy Integration Lead and Technical Specialist from NSWC Crane has expressed interest in partnering with Hydronalix through a CRADA to use our UAVs to support the Artificial Intelligence for Small Unit Maneuver (AISUM) prize challenge.

Notes: An ADAPT UAV with a two-500mL bottle payload.

WHAT

Operational Need and Improvement: There is a need for low-cost disposable micro UAS Drone platform to support humanitarian field operations of USMC Explosive Ordnance Disposal (EOD) Littoral Explosive Ordnance Neutralization (LEON) program. It is anticipated there will be initial value in a cheap, easily mass-produced UAS system with domestically sourced components. We also plan to perform initial operational testing with ongoing projects with U.S. Border Patrol and U.S. Coast Guard.

Specifications Required: - Capable of transporting a 2 pound payload 2 kilometers
- Autonomous operation
- Rapidly manufacturable (1000 units in 16 days)

Technology Developed: - Integration of American-made flight control hardware
- Integration of non-Chinese IoT WiFi communications
- non-Chinese battery solution
- printed circuit board to integrate power, WiFi, and flight control hardware
- Waterproof capable chassis design
- Rapid manufacturing process

Warfighter Value: The ADAPT UAS system is more accessible to a broader range of warfighters and humanitarian response operators due to its accessibility, low cost, and disposable, no-recovery-necessary design. By using low-power WiFi communications, the operator can manage multiple vehicles from one control device, and the vehicles themselves have a small spectrum footprint.

WHEN

Contract Number: N68335-22-C-0199 **Ending on:** Jan 31, 2024

Milestone	Risk Level	Measure of Success	Ending TRL	Date
100 drone 2km flight	High	100 drones reach their individual destinations	7	3rd QTR FY21
John Hopkins technology integration	Low	Demonstration of operation	8	4th QTR FY21
300 drone 2km flight	Medium	100 drones reach their individual destinations	8	3rd QTR FY22
Swarming technology integration	Low	Demonstration of operation	8	4th QTR FY22

HOW

Projected Business Model: The first anticipated applications are Navy humanitarian missions by Fleet Operations. The second early adopter will most likely be US Marine Corps Mine Counter Mine Very Shallow Water (MCM VSW) type of missions. The Navy EOD MCM missions will also use ADAPT UAS to replace the previous Chinese drones.

Company Objectives: To become a competitive manufacturer of American-made UAS systems.

Potential Commercial Applications: Any organization that Hydronalix has worked with in the past (fire departments, search and rescue personal, first responders as well as disaster relief organizations) are potential customer for this new product. This is in addition to the DoD agencies including DON. A conservative estimate of the current market would be at least $4 million/year, assuming a selling price of approximately $1000 per Quadaptor, and 4000 units per year.

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