

Department of the Navy SBIR/STTR Transition Program

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NAVAIR Public Release 2021-954

Topic # AF141-253

LIFTS and ISR for Maritime Operations
Technology Service Corporation

WHO

SYSCOM: NAVAIR

Sponsoring Program: PEO U&W

Transition Target: MQ-8 Firescout

TPOC:

(301)757-2035

Other transition opportunities: MH-60R/S, V-22, TRUAS

Notes: LIFTS Precision Approach and Landing CONOP

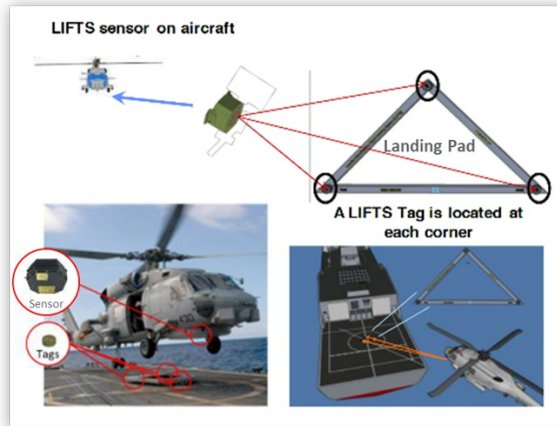


Image Courtesy of TSC 2021

WHAT

Operational Need and Improvement: Autonomous landing of rotary wing UAS and helicopters in all weather conditions in A2AD environments.

Specifications Required: Enable autonomous and safe landing of rotary wing UAS and helicopters in all weather conditions in A2AD environments (including GPS denied and total EMCON) from at least 10 NM from landing zone.

Technology Developed: TSC developed LIFTS to provide a RF sensor solution for the Navy Air Warfare Center - Aircraft Division (NAWCAD) 4.3.2 Sea-Based Automated Landing and Recovery System (SALRS).

Cooperative radar interferometer and communications sensor system for Positioning, Navigation, and Timing (PNT) provides precision range and bearing measurements and establishes a datalink for communication. LIFTS uses frequency agnostic architecture and support for LPI/LPD waveforms and meets low-size, weight, and power (SWaP) software defined radio implementations.

Warfighter Value: LIFTS is a small SWaP sensor that can be mounted onto a manned or unmanned systems that communicates with small SWaP tags that can be placed on vessels or the ground. LIFTS uses RF and maintains performance in all environments including difficult maritime conditions, uses LPI/LPD waveforms with encryption to minimize EMCON and authenticate and protect the positioning information and requires no a priori knowledge of its location to correctly generate precision location information. This enables precision landing in a GPS denied and total EMCON environment, day night up to sea state 5. LIFTS development has been focused on aircraft, but is easily applicable to surface vessels

WHEN

Contract Number: N68335-20-C-0334 **Ending on:** July 14, 2021

Milestone	Risk Level	Measure of Success	Ending TRL	Date
Completed Prototype Hardware for Sensor and Tags	Low	Successfully demonstrated capability and measurement accuracy in a lab	4	September 2017
Completed Final Form Factor Prototype Demonstration	Low	Successfully performed outdoor testing and validated measurement accuracy	5	November 2017
Completed Successful Demonstration on small UAS	Med	Flight test with position data validation	5	May 2021
Integration and Demonstration on large UAS or Manned Platform	Med	Flight test with position data validation	5	February 2022
Integration and Demonstration with UAS Autopilot	Med	Demonstration of autonomous landing	6	June 2022

HOW

Projected Business Model: TSC intends to offer LIFTS as a payload product that would be applicable to multiple platforms. The intent is to avoid custom or platform specific versions allowing flexible integration among many platforms.

RDTE and NRE requires to transition to production but when done so the target price is <\$100k for interrogator and <\$10k for tags. TSC has similar products in productions for these price ranges

Company Objectives: Provide payload products to support integration onto any UAS either directly to the government or through a system integrator.

Potential Commercial Applications: None.

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