# Department of the Navy SBIR/STTR Transition Program

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NAVAIR 2016-736

Topic # N092-097
Automated, Rapid Non-Destructive Inspection (NDI) of Large Scale Composite Structures
Thermal Wave Imaging, Inc.

## WHO

**SYSCOM:** NAVAIR

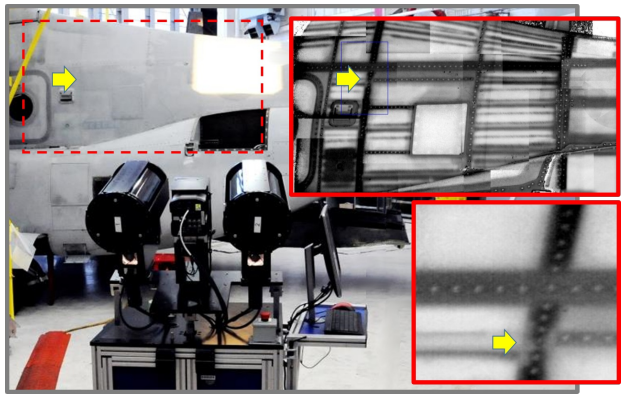
**Sponsoring Program:** Fleet Readiness Center East

**Transition Target:** V-22

**TPOC:**
(252)464-5339

**Other transition opportunities:** H-53K, F-35

**Notes:**



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LASLAT automated NDI of an 8' x 10' V-22 fuselage section is completed in 9 minutes. The highlighted feature indicates a skin to frame disbond.

## WHAT

**Operational Need and Improvement:** Aggressive Nondestructive Inspection (NDI) of aircraft is essential to fleet readiness. However, current inspection methods are labor intensive, and not well-suited to large composite structures used in modern aircraft. There is a need to develop an automated Nondestructive Inspection NDI capability for the rapid and accurate inspection of large composite aircraft structure during depot maintenance. Such a development should enhance the readiness of Naval aircraft by minimizing the time a vehicle spends in the depot and by reducing the possibility that the aircraft will suffer an unexpected failure during operation by ensuring the structural integrity of critical components.

**Specifications Required:** Develop an automated NDI capability for the rapid and accurate inspection of the composite structures of aircraft, such as trailing edges, flight control surfaces, and fuselage, during depot maintenance. An automated NDI system with the capability to rapidly inspect large areas of composite structures and automatically identify relatively small defects. The NDI system will need to find voids, delaminations, and disbonds of 0.25 square inches and/or 1.0 inch length 90 per cent of the time with a 95 per cent probability.

**Technology Developed:** Large Standoff/Large Area thermography (LASLAT) automated non destructive inspection system and intelligent defect identification tool to pinpoint the exact location and nature of defects found.

**Warfighter Value:** Will result in decreased maintenance downtime, increased throughput, cost savings, and increased structural integrity of aircraft

## WHEN

**Contract Number:** N68335-14-C-0310 **Ending on:** October 1, 2019

| Milestone | Risk Level | Measure of Success | Ending TRL | Date |
|---|---|---|---|---|
| Concept demonstration at 45' working distance. | High | Detection of embedded targets in a composite test sample with comparable performance to COTS close proximity system | 4 | October 2009 |
| Develop projection heat source | High | Detection of embedded targets in a composite test sample with comparable performance to COTS close proximity system | 5 | October 2011 |
| Automated large area acquisition | Med | Detection of embedded targets place over 100 sq. ft. at 12' working distance | 6 | October 2014 |
| On-aircraft demonstration of wide area inspection | Med | Inspection time for 8 x 10' fuselage area < 10 min | 7 | July 2016 |

## HOW

**Projected Business Model:** Sell LASLAT NDI systems directly to maintenance depots, manufacturing primes, and tier one suppliers.

**Company Objectives:** Develop partnerships, licensing and direct sales relationships with government and private aerospace manufacturers and service providers.

**Potential Commercial Applications:** Aircraft maintenance and manufacturing, detection of Foreign Object Debris (FOD), wind turbine inspection and remote inspection in hazardous environments.

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