Topic: N092-097

Thermal Wave Imaging, Inc.

Automated, Rapid Non-Destructive Inspection (NDI) of Large Scale Composite Structures
Current Nondestructive Inspection (NDI) of large composite aircraft is labor intensive, providing results that require subjective interpretation by the operator. Our solution, Large Standoff Large Area Thermography (LASLAT), performs automated, non-contact NDI using proprietary signal processing algorithms and excitation hardware. Founded in 1992, Thermal Wave Imaging is the industry leader in the development and commercialization of thermographic NDI systems. LASLAT is unique in its ability to operate at a large distance from the aircraft, and to retrieve signal information that is lost using conventional thermography. Demonstrations on NAVAIR V-22 aircraft confirmed the ability to perform rapid, automated inspection, and to successfully detect subsurface flaws. The company seeks relationships with manufacturers, application contractors and defense maintenance personnel to bring this inspection technology to the Navy market.

Technology Category Alignment:

None
None
None

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SYSCOM: NAVAIR
Contract: N68335-14-C-0310

Department of the Navy SBIR/STTR Transition Program

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

WHO

SYSCOM: NAVAIR

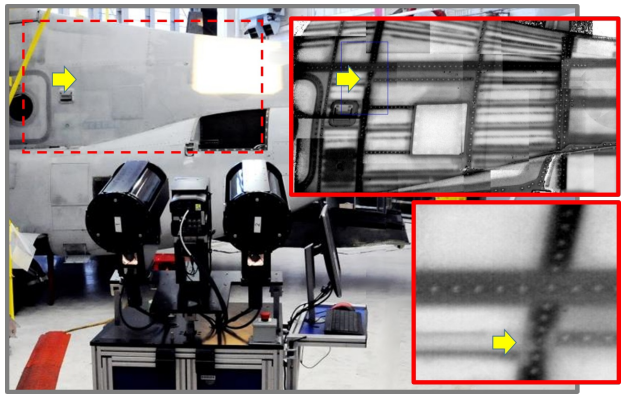
Sponsoring Program: Fleet Readiness Center East

Transition Target: V-22

TPOC:
(252)464-5339

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

Notes:



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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