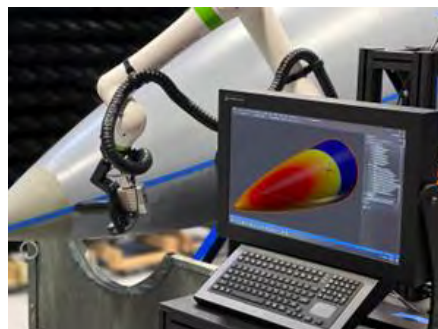


# Advanced Microwave Mapping Probe for Naval Aircraft



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**Topic Number:** AF121C-123

**SYSCOM:** Naval Air Systems Command  
(NAVAIR) [www.navair.navy.mil](http://www.navair.navy.mil)

**Program Sponsor:** FRC-SW

**Other Potential Programs:** All  
aircraft platforms

**Current TRL:** 8

**Projected TRL:** 9 / Q1 2025

**Keywords:** Microwave, Radome,  
Specialty Coatings, Thickness,  
Nondestructive Inspection,  
Transparencies

## THE CHALLENGE

Whether in manufacturing or at a repair depot, quality assurance inspection is required to ensure components meet specifications. There are limited methods for testing electromagnetic materials such as aircraft transparencies, radomes, or specialty coatings. This effort started as a way to verify microwave performance of conductive coatings on transparencies for the F-35 aircraft. The success of that effort led to application in performance and thickness monitoring of specialty coatings on other advanced aircraft. Most recently, it has fulfilled a need for diagnosing defects and performance in aircraft radomes, including the F-15 nosecone. In all these applications, the challenge was accurate and timely measurement of microwave performance in a high-tempo manufacturing or depot environment.

## THE INNOVATION

The core innovation centers around a new wideband microwave sensor called the Advanced Microwave Mapping Probe (AMMP). This probe is more compact and rugged, and has wider frequency bandwidth than conventional probe antennas. Further, this probe combined with advanced data processing algorithms and robotic automation creates measurement solutions that give accurate and relevant information to manufacturing technicians or aircraft maintainers. AMMP technology is in active use by the F-35 transparency manufacturer, all large aircraft OEMs for coating and absorber characterization, and by Robins AFB for radome diagnostics.

## THE NAVY BENEFIT

The Navy flies and maintains advanced aircraft that require diagnostics for efficient repair and performance of transparencies, radomes, and specialty coatings. Timely diagnostic data will provide Navy aircraft maintainers with information to efficiently maintain aircraft while minimizing unnecessary rework. This technology also promises to enhance corrosion detection, a prevalent concern in Navy aircraft applications.

## THE FUTURE

With the introduction of AMMP to FRC-SW, next steps will integrate measurement systems and procedures as part of the regular maintenance work flow. Beyond that, all Navy aircraft programs can benefit from AMMP. So, the future includes introducing it to other programs for improving diagnostic information and enhancing overall aircraft maintenance effectiveness while reducing cost.

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