

# Sentinel A4 Radar



The Sentinel A4 Program Office is unable to provide the funding and test resources necessary to execute the IOT&E described in its DOT&E-approved TEMP. In addition, production delays and system immaturity have adversely affected the program's test timelines in support of a 4QFY25 full-rate production (FRP) decision. The Army has therefore not yet finalized its planning for the March 2025 IOT&E.

The AN/MPQ-64A4 Sentinel Radar, or Sentinel A4 Radar, is a three-dimensional, X-band phased array radar system, equipped to support beyond-visual-range air defense engagements. It provides detection, classification, and reporting capabilities against rocket, artillery, and mortar (RAM) threats. Sentinel A4 also has capabilities against cruise missile (CM), unmanned aircraft system (UAS), and fixed-wing (FW) and rotary-wing (RW) aircraft threats. The system consists of a trailer, truck, and other equipment and software required for the two-person crew to move and operate the Sentinel A4 Radar and communicate with the air defense command and control system. The primary radar components and subsystems are mounted on a modified M1095 Medium Tactical Vehicle trailer. The generator and communication equipment are integrated into a M1083 Family of Medium Tactical Vehicles cargo truck.

To continue to meet its mission requirements and address counter-RAM requirements, the Army plans to replace its legacy Sentinel A3 radars with Sentinel A4 radars, which use advanced Active Electronically Scanned Array sensor technologies to improve performance. The Sentinel A4 is a multi-function radar which simultaneously provides search and track against FW and RW aircraft, UAS, CM, and RAM threats.

## MISSION

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The Army intends to use the Sentinel A4 Radar as a major component of the Army Integrated Air and Missile Defense (AIAMD) system-of-systems architecture. It provides a 360-degree hemispherical surveillance and fire control capability against low to mid-altitude threats, to include CM, UAS, FW and RW aircraft, and RAM threats. The Army also intends for the Sentinel A4 radar to be used in the Defense of Guam architecture.

## PROGRAM

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Sentinel A4 Radar is an Acquisition Category II program that DOT&E placed on oversight in February 2023. The Milestone Decision Authority approved the program's Milestone C decision in July 2023. The baseline acquisition objective is 240 radars, including the radars being procured for the Defense of Guam mission.

The program office submitted a TEMP in September 2023 for DOT&E's approval, but DOT&E requested the Army address several items and resubmit the document. The updated TEMP was approved in March 2024. The Army plans to conduct IOT&E in 2Q – 3QFY25. DOT&E will publish a classified report following the conclusion of the IOT&E to inform the FRP decision in 4QFY25.

### » MAJOR CONTRACTOR

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- Lockheed Martin Corporation – Syracuse, New York

## TEST ADEQUACY

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In 2QFY24, the Sentinel Program Office began delta-developmental testing, which is intended to resolve system deficiencies and complete functional testing that was either deferred or failed during initial developmental testing. Due to delays in delivery of the User Operational Evaluation System test articles, the program office expects delta-developmental testing to conclude in 2Q FY25, which overlaps with the start of IOT&E.

The program office is unable to provide the IOT&E funding outlined in the TEMP DOT&E approved in March 2024. Production delays and system immaturity have also impacted the program office's ability to deliver the resources necessary to conduct the IOT&E described in the DOT&E-approved TEMP. The Army Test and Evaluation Command has developed a descoped plan that fits within the time and budgetary constraints, but the new plan does not reflect the testing in the DOT&E-approved TEMP and will not assess all the Sentinel A4's intended capabilities in an operational environment. DOT&E is working with the Army to determine if the descoped plan will be adequate to evaluate the radar's effectiveness, suitability, and survivability.

The Army plans for the Sentinel A4 to participate in future Integrated Fires Test Campaign operational test events, integrating with AIAMD and other air and missile defense sensors and shooters.

These events rely on modeling and simulation (M&S) tools to execute simulated air battle scenarios that cannot be replicated with real aircraft and threats. The Sentinel A4 program must complete verification, validation, and accreditation of the M&S tools that will support a credible assessment of operational effectiveness in a realistic threat environment.

## PERFORMANCE

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### » EFFECTIVENESS, SUITABILITY, AND SURVIVABILITY

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DOT&E will provide an assessment of Sentinel A4 Radar operational effectiveness, suitability, and survivability following the completion of an adequate IOT&E.

## RECOMMENDATIONS

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The Army should:

1. Provide the resources necessary to execute IOT&E in accordance with the DOT&E-approved TEMP.
2. Develop M&S tools and a verification, validation, and accreditation strategy that supports use of those M&S tools in future Sentinel A4 operational testing, including as part of the Integrated Fires Test Campaign.