

AN/APR-39E(V)2 Modernized Radar Warning Receiver (MRWR)



The Army continues to develop the AN/APR-39E(V)2 Modernized Radar Warning Receiver (MRWR) to enhance aircrew situational awareness and aircraft survivability during current and emerging electromagnetic spectrum operations (EMSO). In FY23, developmental testing, monitored by DOT&E, included laboratory and flight test events. In FY24, the Army conducted operational cyber testing on MRWR in accordance with DOT&E-approved test plans. An FOT&E test period is planned for 1QFY25 to inform the Army's fielding and full-rate production (FRP) decisions.

SYSTEM DESCRIPTION

The AN/APR-39E(V)2 MRWR was developed to replace the more than 30-year-old AN/APR-39A(V)1/4

and AN/APR-39C(V)1/4 systems on Army rotary-wing and selected fixed-wing aircraft. New electronics and improved antennas provide a fully digital threat discrimination capability against current and emerging threats that operate over

extended frequency ranges with highly agile waveforms. Cockpit display of the threat's location and operating mode, combined with auditory warnings, enhance the aircrew's situational awareness and the aircraft's survivability.

The MRWR includes an open-systems approach and a growth path for integrating an electronic attack capability.

MISSION

Commanders will employ units equipped with the AN/APR-39E(V)2 to improve the mission survivability of Army aircraft by identifying radio-frequency signals from hostile surface-to-air missiles, airborne interceptors, and anti-aircraft artillery. The combination of improved situational awareness, tactics, techniques, and procedures will allow aircrew to deny, degrade, deceive, disrupt, and defeat attacking threats.

PROGRAM

The APR-39E(V)2 is an Acquisition Category II program developed as an engineering change proposal to the Navy's APR-39D(V)2. The Army conducted FOT&E of the D(V)2, in accordance with a DOT&E-approved test plan in 2017, and fielded a limited number as an interim solution to an operational need. MRWR development started in 2019 and the Army's TES, approved by the Program Executive Officer for Intelligence, Electronic Warfare & Sensors, was accepted by DOT&E when the program was placed on DOT&E oversight in December 2022. The Army began low-rate initial production in December 2023. An FOT&E period is planned for November 2024 to inform the Army's fielding and FRP decisions in 1QFY26.

» MAJOR CONTRACTOR

- Northrop Grumman – Rolling Meadows, Illinois

TEST ADEQUACY

The Army conducted three developmental tests in 2023. The first was an installed system evaluation in March 2023 of the APR-39E(V)2 onboard an AH-64E, which occurred in the Joint Preflight Integration of Munitions and Electronic Systems (JPRIMES) anechoic chamber at Eglin AFB, Florida. The aircraft was illuminated with threat signals of interest and background signals to assess the E(V)2's performance and integration with the aircraft's controls and displays. DOT&E participated in JPRIMES testing and observed that the system performance was stable and predictable. The second DT event conducted by the Army was a built-in test demonstration in March 2023. A total of 194 test cases were executed in a laboratory environment, demonstrating that the E(V)2 meets the Army's requirements for fault detection and fault isolation.

For the third DT event in June 2023, JPRIMES testing was followed by open-air-range flight testing of a single AH-64E on the Electronic Combat Range, at the Naval Air Weapons Station in China Lake, California. Flights were conducted against the range's surface threats, along with a "trolling" flight through the Los Angeles area to assess performance in a

dense and diverse electromagnetic background environment. After test completion, DOT&E received copies of the Army reports for all three tests and is analyzing them in preparation for the upcoming FOT&E.

The Army conducted a cooperative vulnerability and penetration assessment in December 2023 and an adversarial assessment (AA) in March 2024, in accordance with DOT&E-approved test plans and observed by DOT&E. Both assessments were performed on an AH-64E Apache at the Redstone Test Center in Redstone Arsenal, Alabama. Final system performance and mission accomplishment, while under cyber-attack, will be characterized as part of a second AA during the FOT&E.

PERFORMANCE

» EFFECTIVENESS

Results from developmental laboratory anechoic chamber testing and flight test events of the APR-39E(V)2, along with prior D(V)2 FOT&E effectiveness results, are being analyzed. DOT&E's final assessment of E(V)2 operational effectiveness is pending FOT&E completion, scheduled for November 2024.

» SUITABILITY

Results from developmental laboratory anechoic chamber testing, flight test events of the APR-39E(V)2, along with prior D(V)2 FOT&E suitability results,

are being analyzed. DOT&E's final assessment of E(V)2 operational suitability is pending FOT&E completion, scheduled for November 2024.

» **SURVIVABILITY**

Assessment of E(V)2 cyber survivability is pending completion of the second AA during the FOT&E, scheduled for November 2024.

RECOMMENDATIONS

The Army should:

1. Execute the planned FOT&E to inform their fielding and FRP decisions.
2. Continue to develop and refine the APR-39D/E(V)2 software, libraries, and techniques as threats continue to evolve.