

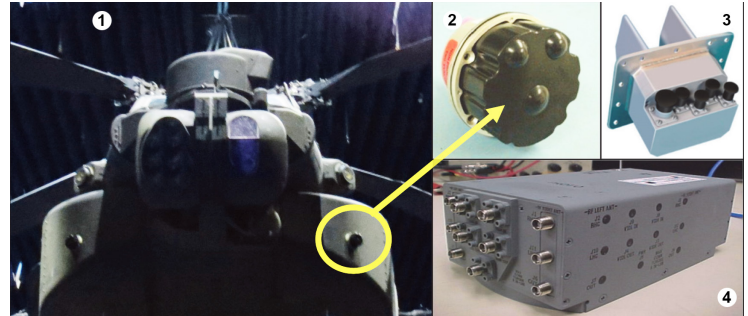
## AN/APR-39D(V)2 Radar Signal Detection Set (RSDS)

### Executive Summary

- Preliminary results indicate that the AN/APR-39D(V)2 Radar Signal Detection Set (RSDS) has resolved the legacy deficiencies of the AN/APR-39 family (A(V)2, A(V)4, B(V)2, and C(V)2) of Radar Warning Receivers (RWRs).
- Preliminary results indicate an integration problem between the AH 64E platform and AN/APR 39D(V)2 audio warnings. Lack of audio warnings from the AN/APR 39D(V)2, as experienced in developmental test period 2 (DT2), could reduce an aircrew's situational awareness in contested environments.
- Preliminary results indicate the system has a low Mean Time Between Operational Mission Failure (MTBOMF) as tested on the Army's AH 64E platform.

### System

- The AN/APR-39D(V)2 is a digital upgrade to the AN/APR-39 family of analog RWRs used by nearly all DOD rotorcraft.
- The AN/APR-39D(V)2 RSDS consists of the following:
  - Four new dual-polarized E through M band (high band) antennas, and a C through D band (low band) direction of arrival antenna.
  - New quadrant receivers (two to four per aircraft). Each receiver has two channels that can accept signals from two E through M band antennas.
  - A new radar data processor with two wideband digital receivers.
  - A crystal video receiver processor and a Quad Core i7 based processor.



1 - AH-64 Antenna Installation  
2 - High Band Quadrant Antenna  
3 - Low Band Directional Antenna  
4 - Quadrant Receiver

- The system uses either a separate display unit or integrates with the onboard aircraft displays to visually and aurally alert the pilots to active threat radars.
- For Navy aircraft, the system also acts as the electronic warfare bus controller.

### Mission

Commanders employ units equipped with the AN/APR-39D(V)2 RSDS to improve the mission survivability of Navy and Army aircraft by identifying radio frequency signals from threat surface-to-air missiles, airborne interceptors, and anti-aircraft artillery through cockpit alerts.

### Major Contractor

Northrop Grumman – Rolling Meadows, Illinois

### Activity

- This is a Navy-led program, but the Army has assumed the test lead due to Navy test aircraft availability problems.
- The Army completed Developmental Test period 1 (DT1) with the AH-64E at the Electronic Combat Range in China Lake, California, in April 2016.
- The Army completed anechoic chamber integrated developmental/operational testing with the AH-64E at the Joint Preflight Integration of Munitions and Electronic Systems facility at Eglin AFB, Florida, in July 2016.
- The Army completed DT2 with the AH 64E at the Electronic Combat Range in October 2016.
- The Army conducted all testing in accordance with the DOT&E-approved test plans.
- The Army completed an operational assessment with the AH-64D and AH-64E at the Electronic Combat Range in November 2016.

### Assessment

- Preliminary results indicate that the AN/APR-39D(V)2 RSDS has resolved most of the legacy deficiencies of the AN/APR-39 family of RWRs (A(V)2, A(V)4, B(V)2, and C(V)2).
- Preliminary results indicate an integration problem between the AH-64E platform and AN/APR 39D(V)2 audio warnings. Lack of audio warning from the AN/APR 39D(V)2, as experienced in DT2, could reduce an aircrew's situational awareness in contested environments.
- Preliminary results from laboratory testing indicate that a small number of radar modes could not be detected by the AN/APR-39D(V)2 system. The Navy and Army have requested modifying those symbols to mitigate this limitation.
- Excessive system resets and system degrades occurred during DT1. A reduced number of system resets and system degrades occurred during DT2 as compared with DT1.

## FY16 NAVY PROGRAMS

- Preliminary results indicate the system has a low MTBOMF. Testing on the Army's AH-64E platform demonstrated an MTBOMF of 6.7 hours, well below the mission-based derived requirement of 102 hours for the AH-64E and 81 hours for the MV-22B. The Navy intends to fly a KC-130T as a surrogate to accumulate flight hours for system reliability assessment, but available flight hours will not allow demonstration of reliability requirements by the end of FOT&E.
- The system passed all electro-magnetic interference requirements except conductive susceptibility. The system experienced some anomalies for conductive susceptibility during electro-magnetic interference requalification.
- FY16 Recommendations. The Navy and Army should:
  1. Investigate and correct the integration problem related to the lack of AN/APR 39D(V)2 audio warning messages before the Army's AH-64E OT&E in 3QFY17.
  2. Investigate and correct the causes of all system software resets and system degrades.
  3. Incorporate all software and hardware corrections prior to the Navy's anechoic chamber testing with the MV-22 in 2QFY17.
  4. Plan and fly additional KC-130T flights to accumulate more operational flight hours for system reliability assessment.

### **Recommendations**

- Status of Previous Recommendations. The Navy accomplished all previous recommendations.