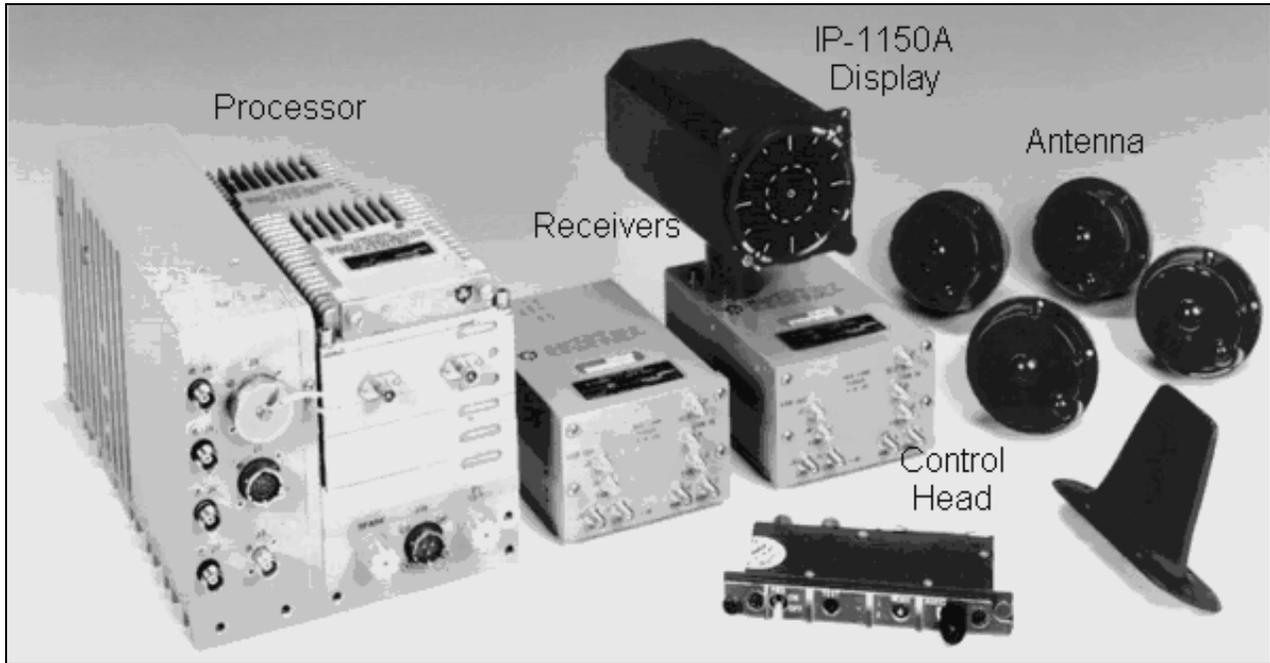


## RADAR WARNING RECEIVER (RWR) AN/APR-39A (V)2



### Navy ACAT IIIC Program

Total Number of Systems:	700
Total Program Cost (TY\$):	\$234M
Average Unit Cost (TY\$):	\$150K
Full-rate production:	3QFY96

### Prime Contractor

Litton Advanced Systems Division

### SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2020

The AN/APR-39A (V)2 Radar Warning Receiver (RWR) contributes to the *Joint Vision 2020* concept of **full-dimensional protection** by improving individual aircraft probability of survival through improved aircrew situational awareness of the electromagnetic threat environment. The AN/APR-39A (V)2 is a multi-Service (Navy/USMC, and Special Operations Force) next generation RWR upgrade to the existing AN/APR-39 (V1). The upgraded system is intended for helicopters and other non-high performance aircraft. It is capable of detecting and providing alerts to the aircrew of SAM and antiaircraft artillery associated pulse, pulse Doppler, and continuous wave radar activities identified from a software programmable threat library. In addition to the cockpit video display, the APR-39A (V)2 provides the aircrew with synthetic speech audio threat warnings, facilitating a "hands on/heads up" aircrew posture. The system also integrates the Aircraft Survivability Equipment Suite, and provides a single controller for power and Built-In Test, as well as a single display for threat information. The system can integrate and display data from an on-board missile warning system, laser warning system, and expendable countermeasures dispenser. The system retains the former AN/APR-39A (V)1 low band vertically polarized blade antenna. The new, more sensitive, circularly polarized spiral antennas are a form and fit replacement for the previous equipment, as is the new night vision compatible cockpit video

display and the cockpit control unit. An assessment of integrated system effectiveness and suitability of upgrades will be evaluated during host platform Follow-on Operational Test and Evaluation (FOT&E).

## **BACKGROUND INFORMATION**

Early Navy OT in the USMC AH-1W helicopter, from 1QFY91-2QFY92, found the system not operationally effective and potentially operationally suitable. Fleet introduction was not recommended until a subsequent OPEVAL could demonstrate satisfactory resolution of OT-IIA deficiencies.

OT-IIB in a USMC UH-1N helicopter (in accordance with a DOT&E-approved TEMP and test plan) was completed by COMOPTEVFOR in May 1995, with a finding of operationally effective and suitable and a recommendation for fleet introduction into UH-1N. Involvement by the Operational Test community in the DT leading to this phase of OT facilitated meaningful use of DT test results and allowed some streamlining of OT-IIB. DOT&E staff and support analysts observed major portions of OT-IIB testing and data collection.

Since the AN/APR-39A (V)2 RWR is not a major defense acquisition program, no B-LRIP report was produced. The system is covered by language in the National Defense Authorization Act for Fiscal Year 1989, Conference Report (H.R. 4481, page 345) which "directed that all future operational test results for RWR update programs be reviewed and approved by the Director of Operational Test & Evaluation, prior to obligation of production funds."

The Navy Milestone III was approved in 1QFY96. AN/APR -39A (V)2 systems are intended as the standard RWR for the UH-1N, AH-1, V-22, VH-60, HH-60, SH-60, CH-53, MH-53, KC-130, and the VH-3 aircraft. Follow-on Operational Test and Evaluations of selected host platform integration efforts are planned for FY01.

## **TEST & EVALUATION ACTIVITY**

Several contractor and government developmental tests aimed at evaluating the APR-39A(V)2 system performance occurred throughout FY99 and FY00. Litton has completed contractor first article testing, verification of basic operating software functionality and interface testing on the upgraded hardware and software. Successful Line Replaceable Unit-level tests have enabled the program to proceed into system-level testing at both the contractor and government facilities. AH-1W, HH-60, CH-53E, and MV-22 host platforms are scheduled to perform FOT&E of integrated APR-39A(V)2 systems in FY01.

The first production units marked for testing were delivered in 3QFY99 and installed on AH-1W, the lead FOT&E platform. The AH-1W APR-39A(V)2 Electronic Warfare suite and associated operating software were delivered to the government for independent validation and verification testing as part of host platform integration test efforts. Developmental flight testing on AH-1W started in July 1999 at the Rotary Wing Test Directorate at Naval Air Station Patuxent River, MD. Developmental testing has been completed and an independent FOT&E period on AH-1W is scheduled to start in November 2000 upon issuance of readiness certification by the developing activity. HH-60 FOT&E is also scheduled for completion in November 2000. HH-60 has undergone platform unique validation and verification testing as part of their developmental test programs.

The APR-39A(V)2, as integrated on the MV-22, was delivered to the government as Contractor Furnished Equipment. The Electronic Warfare suite, as installed and integrated, was tested as part of the MV-22 complete airframe IOT&E in July 2000. Data from these tests are currently being evaluated and the results of that evaluation will be reported in the MV-22 BLRIP Report due 1QFY01. Plans to conduct FOT&E of the APR-39A(V)2 in the HH-53 and KC-130 are now uncertain due to funding shortfalls.

The AN/APR-39A TEMP Update was approved by OSD 15 August 2000. The AH-1 and HH-60 Follow-on Operational Test Plans were approved by DOT&E on 3 October 2000 and 30 October 2000 respectively.

### **TEST & EVALUATION ASSESSMENT**

The APR-39A(V)2 is undergoing a multi-platform test and evaluation program, which encompasses several platforms undergoing unique phases of their acquisition life cycle. Contractor qualification testing and government independent validation and verification testing have proceeded relatively well considering the complexity and integration challenges of these systems. Management of diverse platform mission and integration requirements has gone well. Issues involving the Test and Evaluation Master Plan have been resolved, and detailed planning for the FOT&E is proceeding. An extensive amount of APR-39A(V)2 operational testing will occur in FY01. Data collected and reported in these results will help to determine if the systems should be deployed and serve the Program Manager in executing follow-on contract award options for additional units.

### **CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNED**

The APR-39A(V)2 program is proceeding as planned. The Program Manager needs to pay particular attention to follow-on platform integration efforts that plan on utilizing existing lead platform (AH-1W) test and evaluation data to support fielding recommendations. In the past, there has been a tendency to rely too heavily upon existing lead platform data and to overly minimize unique platform-specific test requirements. It will become very important for platforms to adequately develop and implement robust test objectives that address unique aircraft platform integration and system-level performance. Each follow-on platform should plan on testing the integrated system's operational effectiveness and suitability, and perform an assessment of upgraded performance against what is currently fielded. Integrated platform performance should be assessed as operationally effective and suitable prior to the system receiving recommendation for fielding.

