

ALR-69A Radar Warning Receiver (RWR)

Executive Summary

- DOT&E concurred with the Air Force Operational Test and Evaluation Center (AFOTEC) FY07 Operational Assessment (OA-1) that the ALR-69A did not demonstrate potential for operational effectiveness and suitability. However, an Acquisition Decision Memorandum (ADM) dated June 20, 2007, established the second OA-2 entry gates and allowed the ALR-69A program to enter the first phase of low-rate initial production (LRIP) (10 units).
- The Air Force, in coordination with DOT&E, added a series of additional tests in FY08 to augment the original operational assessment and provide more credible information on ALR-69A maturity prior to the second LRIP decision currently scheduled for 1QFY09.
- Since OA-1, the Air Force incorporated several key re-designs to ALR-69A software, hardware, and aircraft integration efforts.
- FY08 OA-2 testing is in progress and is demonstrating improved performance over OA-1.

System

- The ALR-69 is a Radar Warning Receiver (RWR) that detects, identifies, and locates threat electronic signals.
- The Core ALR-69A RWR design improves performance over the Air Force's primary RWR system, the ALR-69, by enhancing:
 - Detection range and time
 - Accuracy of threat identification
 - Location of threat emitter systems
 - Performance in a dense signal environment
 - Reliability and maintainability
- The system integrates with transport and fighter aircraft. The lead platform is the C-130H, with other platforms to be added at a later date.
- Core ALR-69A RWR components include:
 - Radar Receivers (previously the digital quadrant receivers)
 - Countermeasures Signal Processor (previously the countermeasures computer)
 - Control indicator
 - Azimuth indicator
- The Air Force incorporated spiral developments, which are incremental improvements to the core system, to provide the most significant new ALR-69A capabilities. These ALR-69A



spiral designs improve the Core ALR-69A's threat locating capabilities, which enable the following:

- Spiral 1: Accurate threat-locating capability by single aircraft
- Spiral 2: Location of threat emitters through a multi-aircraft network, accurate enough for destruction with GPS-guided munitions
- Spiral 3: Specific Emitter Identification — currently RWRs classify threats as general threat systems, but the Specific Emitter Identification is designed to “fingerprint” a specific threat
- Spiral 1 is temporarily unfunded and development is on hold. Spiral 2 is part of the program of record, is being assessed as an advanced concept technology demonstration effort, and should complete in September 2008. Spiral 3 is unfunded.

Mission

- Combatant commanders will use ALR-69A to enhance the survivability of transport, fighter, and special operations aircraft on missions that penetrate hostile areas.
- Commanders use the ALR-69A to provide aircraft self protection by warning pilots of radar threats, supporting threat avoidance, or permitting timely use of defensive countermeasures.

Prime Contractor

- Raytheon

Activity

- The Air Force entered the first phase (10 units) of ALR-69A LRIP in FY07.
- System improvements continued through FY08 during both laboratory and flight testing.

- AFOTEC, the Air Force's Operational Test Agency, completed the first Operational Assessment-1 of the ALR-69A in FY07 in support of the first LRIP decision.

AIR FORCE PROGRAMS

- The Air Force continued to incorporate several key re-designs to ALR-69A software, hardware, and aircraft integration design throughout FY07 and FY08.
- The Air Force, in coordination with DOT&E, added a series of additional tests in FY07/08 to augment OA-1 results and provide sufficient data for assessing ALR-69A maturity prior to a FY09 LRIP decision. These additional ALR-69A tests included C-130 flight tests at Eglin AFB and Duke Field, Florida.
- The Air Force designated Air Mobility Command's C-130H as the lead aircraft for ALR-69A integration.
- FY08 testing included both government and contractor testing which utilized the Electronic Warfare Avionics Integrated Support Facility, Warner Robins AFB, Georgia; the Benefield Anechoic Chamber, Edwards AFB, California; and the Multi-Spectral Test and Training Environment, Eglin AFB, Florida.
- FY08 ALR-69A testing was conducted in accordance with the DOT&E-approved Test and Evaluation Master Plan (TEMP).

Assessment

- The ALR-69A continues to show improved operation in dense and dynamic (flight test) environments; however, system maturity is less than expected at this point in the program.
- In FY08, government flights have shown the radar warning display is partially usable for crew members. The display clutter is still a problem including threat symbol split tracks, miss identifications, non-correlated threat emitters, unusable threat identification emitter audio, and incorrect age-out times.

Recommendations

- Status of Previous Recommendations. The Air Force has taken effective actions on the previous recommendation.
- FY08 Recommendation.
 1. The Air Force should ensure that ALR-69A maturity and ground testing meet the Milestone Decision Authority's entry gates for follow-on LRIPs as detailed and documented in the Acquisition Decision Memorandum and TEMP.