

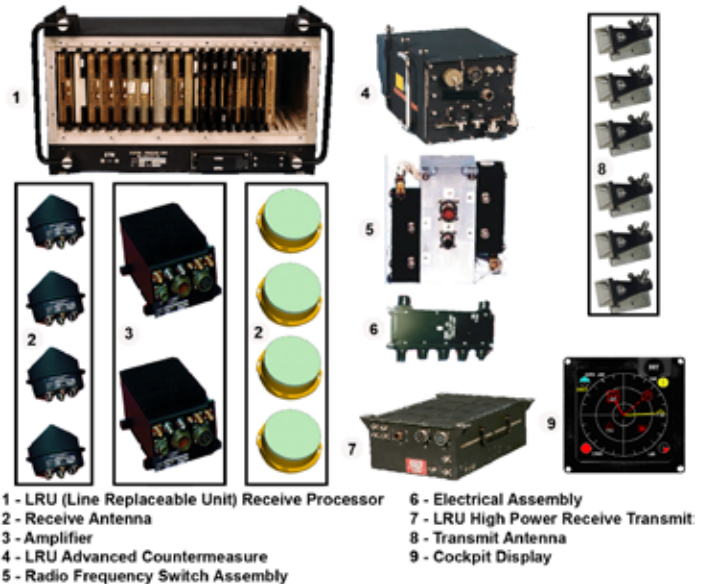
Suite of Integrated Radio Frequency Countermeasures (SIRFC) (AN/ALQ-211)

Executive Summary

- Emerging results from the FY07 Suite of Integrated Radio Frequency Countermeasures (SIRFC) IOT&E indicate that the SIRFC:
 - Radar Warning Receiver (RWR) provides significant improvement to effectiveness and situational awareness for special operations helicopter pilots in operationally representative mission environments
 - Electronic Countermeasures Suite has effectiveness and reliability limitations, but provides effective radar jamming against some threats, while enhancing helicopter survivability against most threats when combined with tactics and expendables
 - Electronic Countermeasures suite continues to demonstrate reliability problems that limits the availability of self-protection jamming during IOT&E
- The U.S. Army's Special Operations Command (USASOC) completed IOT&E of SIRFC for the MH-47G in late FY07 supporting a 1QFY08 SIRFC full-rate production decision.
- The Navy and Air Force Special Operations Command (AFSOC) will operationally test integration of SIRFC on the CV-22 aircraft during the FY08 CV-22 IOT&E.

System

- SIRFC is an advanced radio frequency self-protection system designed for installation on aircraft.
- Major SIRFC subsystems are:
 - Advanced threat RWRs (Numbers 1, 2, 3, 6 and 9 in picture)
 - Advanced threat radar jammer/Electronic Countermeasures (Numbers 4, 5, 7 and 8 in picture)
- SIRFC is being developed for use on Army Special Operations MH-47 and MH-60 helicopters and Air Force Special Operations CV-22 tilt rotor aircraft.



Mission

Special Operations Forces will use SIRFC to enhance the survivability of aircraft on missions that penetrate hostile areas. SIRFC-equipped units should be able to provide self-protection against threat radar-guided weapons systems by:

- Improving aircrew situational awareness and threat warning
- Employment of active electronic jamming countermeasures
- Expending countermeasures (i.e., chaff)

Activity

U.S. Army Special Operations Command

- USASOC completed the IOT&E of SIRFC on MH-47G and MH-60K+ helicopters in 4QFY07. This supports USASOC's 1QFY08 full-rate production decision for SIRFC.
- The SIRFC IOT&E included more than 20 two-ship missions, accumulating over 40 hours of dedicated mission representative flight data in a six week time period. Missions were conducted at the Naval Air Warfare Center, China Lake, California, and the Air Force's Nevada Test and Training Range.

- The U.S. Army Communications-Electronic Research, Development, and Engineering Center (CERDEC), USASOC's designated operational test agency for SIRFC, will also use applicable data products from extensive SIRFC development ground and flight testing in FY07, in addition to IOT&E data products to report on SIRFC.
- DOT&E approved USASOC's SIRFC IOT&E test plan in FY07.

- FY07 testing was conducted in accordance with the DOT&E-approved SIRFC Test and Evaluation Master Plan (TEMP).

Air Force and Navy

- The Navy, in coordination with AFSOC and the Air Force Operational Test and Evaluation Command (AFOTEC), the Air Force's Operational Test Agency, led extensive CV-22 SIRFC development testing in FY07. The Air Force conducted this testing in preparation for the IOT&E commencing in 1QFY08.
- The FY07 testing included reliability testing of a re-designed SIRFC jamming technique generator component.
- The Air Force conducted CV-22 SIRFC testing in FY07 at the Naval Air Warfare Center, China Lake, California, and the Air Force's Nevada Test and Training Range.
- The Navy submitted a revised V-22 TEMP in FY07, which includes a focus on CV-22 defensive system testing.
- FY07 Navy and Air Force testing was conducted in accordance with the DOT&E-approved V-22 TEMP.

Assessment

Although SIRFC development and testing is being conducted under two separate TEMPS, inter-program communication is good allowing the CV-22 program to benefit from the USASOC SIRFC lessons-learned.

U.S. Army Special Operations Command

- DOT&E's assessment of emerging results from the FY07 SIRFC IOT&E, augmented with applicable development test data, is that:
 - The RWR provides a significant improvement to effectiveness and situational awareness to special operations helicopter pilots in operationally representative mission environments.
 - The Electronic Countermeasures Suite provides effective radar jamming against some of the threats, while enhancing

helicopter survivability against most threats when combined with tactics and expendables. However, stand-alone jamming effectiveness is significantly limited when employed against a small number of specific operational threats.

- The Electronic Countermeasures suite continues to demonstrate reliability problems that limited the availability of self-protection jamming during IOT&E.

Air Force and Navy

- The Navy and Air Force's extensive testing of CV-22 defensive systems in FY07 demonstrated that the SIRFC RWR and Electronic Countermeasures Suite when integrated on the CV-22 are ready for the platform's upcoming IOT&E.
- MV-22 icing flight testing conducted in FY05 revealed that the design and integration of the forward SIRFC antennas significantly contribute to icing build-up. The Navy and AFSOC are considering configuration changes to mitigate these, but must ensure any new configurations are tested prior to operational use.

Recommendations

- Status of Previous Recommendations. One of the five previous DOT&E recommendations is not being adequately addressed and remains unresolved. The Services should employ more realistic short-range radar-guided missile threats, which will support adequate testing of self-protection systems against radio frequency guided threats (FY06).
- FY07 Recommendations.
 1. USASOC: None.
 2. The Navy and AFSOC should ensure that applicable SIRFC component design changes or integration changes on the CV-22 are adequately characterized prior to fielding those configuration changes on CV-22.