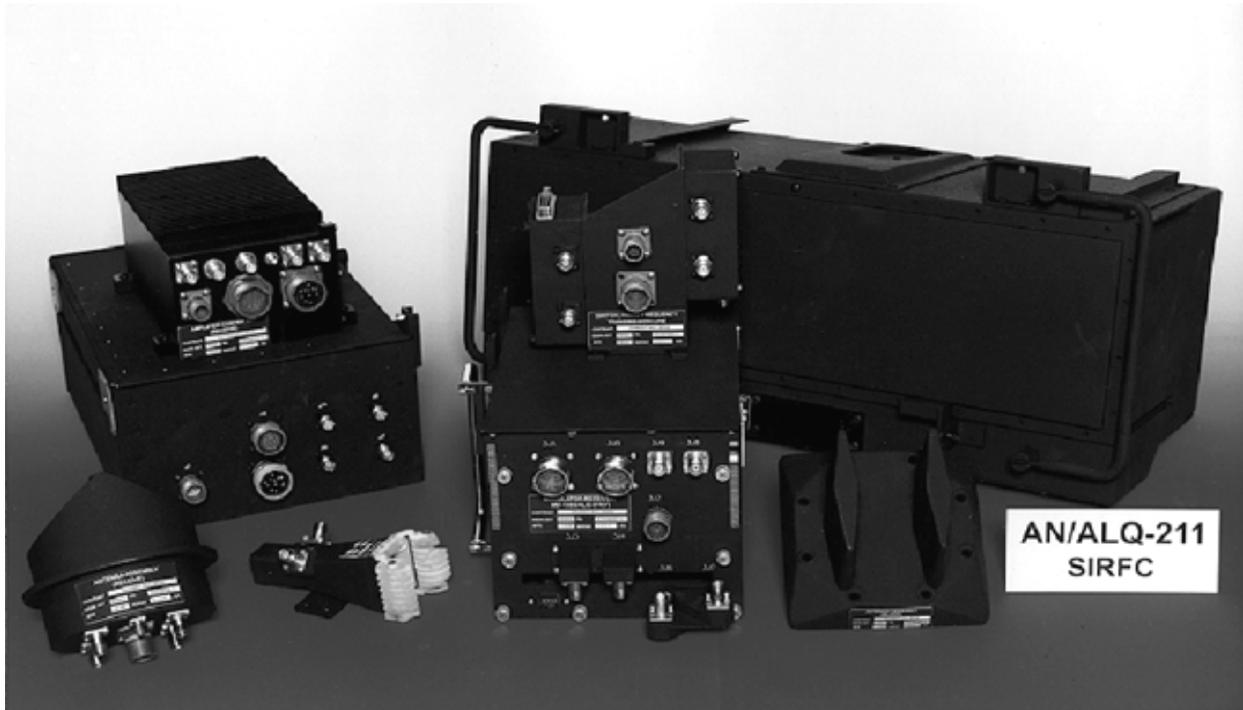


SUITE OF INTEGRATED RADIO FREQUENCY COUNTERMEASURES (SIRFC) AN/ALQ-211 (V)



Army ACAT III Program

Total Number of Systems:	465
Total Program Cost (TY\$):	\$1,035M
Average Unit Cost (TY\$):	\$1,500K
Full-rate production:	2QFY02

Prime Contractor

ITT Avionics Division-Clifton, NJ

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2010

The Suite of Integrated Radio Frequency Countermeasures (SIRFC) contributes to the *Joint Vision 2010* concept of *full-dimensional protection* by improving the individual aircraft's probability of survival. In addition, the improved aircrew situational awareness offered by the synergistic effect of SIRFC with other attack aircraft sensors has the potential to contribute tactically to *precision engagement*, and could also contribute tactically to *dominant maneuver*. SIRFC is intended to be an integrated aircraft survivability system that provides defensive, offensive, active, and passive countermeasures to ensure optimum protection for the host aircraft. There are plans for this system to be integrated on the AH-64D, MH-60K, and MH-47E helicopters, and the CV-22 and U-2 fixed-wing platforms. The lead aircraft for SIRFC integration and test and evaluation has transitioned from the AH-64D Longbow Apache to the CV-22. Subsequent host aircraft platforms desiring SIRFC will undergo FOT&E to assess unique platform integration effectiveness and suitability issues. SIRFC consists of two required subsystems: the Advanced Threat Radar Jammer (ATRJ), and the Advanced Threat Radar Warning Receiver (ATRWR). The Advanced Airborne Radio Frequency Expendables package and the Escort Stand-Off variant are two system optional components that are currently unfunded. The basic

system will be capable of operating in either an automatic or manual (command) mode. It provides warning (situational awareness), active jamming (self-protection), and when necessary expendable countermeasures to defeat threat radar guided weapon systems. Radar guided air defense artillery threat systems include surface to air missiles and anti-aircraft artillery. A Southwest Asia theater of operations set in 2006 is the basis for threat selection for the EMD program. Threat systems are not only those originating from within the Former Soviet Union, but also systems made and proliferated by the United States, our allies, and other weapons producers. Future integration of SIRFC with the Suite of Integrated Infrared Counter Measures on aircraft, which may be equipped with both systems, is a program objective that optimizes multi-spectral threat countermeasures.

BACKGROUND INFORMATION

From this point on, when the name SIRFC is used, it will refer specifically to ATRJ and ATRWR, which are major sub-systems under this program's development. SIRFC entered Milestone I in FY90, and two prototype systems were delivered in FY93. In addition to Hardware-in-the-Loop (bench) testing, DEM/VAL testing was conducted at Eglin AFB in an EH-60 aircraft beginning in FY93. SIRFC entered Milestone II in 1QFY95, with an EMD contract to produce five test articles supporting T&E through IOT&E. The initial lead aircraft for SIRFC integration and testing was the AH-64D Longbow/Apache. The Army reduced the priority of the Apache requirement for SIRFC, eliminating SIRFC production funding from the Apache budget and, more recently, transitioning lead test platform responsibilities over to CV-22. The program is currently undergoing an acquisition plan restructure to better accommodate program milestones and execution of allocated program funding.

TEST & EVALUATION ACTIVITY

The first EMD test articles were delivered in 3QFY99 and installed on the AH-64D Longbow Apache for integration testing. Some of the initial "box-level" tests conducted prior to platform integration included: safety of flight qualification, electromagnetic compatibility, initial software validation, maintenance logistic demonstrations, environmental qualification, bench performance, direction finding accuracy, modulator-receiver characterization, antenna pattern, and pole testing. Upon SIRFC installation on the AH-64D Apache, the test team encountered several integration performance problems with the operational flight program (OFP) software. The most recent of these problems surfaced during 1QFY00 developmental testing at the Bennefield Anechoic Facility (BAF) at Edwards AFB in California. The purpose of BAF testing was to evaluate SIRFC's integrated system performance as installed on the test platform. Aircraft platform testing at BAF included threat identification and prioritization, evaluation of deployment of jamming techniques, performance against both single and multiple emitters (system loading), and measurement of Angle of Arrival Accuracy. During this testing the SIRFC system revealed significant performance problems handling threat emitters in a dense signal environment. These problems have lead the Program Manager to stop current test efforts on the AH-64D until integrated performance issues have been resolved. The Program Manager has proposed inserting an additional year to the EMD Phase. This should allow time in the EMD schedule to sufficiently analyze discovered deficiencies, develop and implement corrections, and properly evaluate OFP software performance. It will also allow the developmental test team to incorporate more stress testing throughout the validation and verification of the software.

The Program's early test schedules revealed very limited time for the "Test-Analyze-Fix-Retest" process to occur during Developmental Testing. The proposed additional one-year that would be inserted into the restructured EMD phase should allow adequate time to evaluate development of the maturing

software and hardware design. It will also allow for more effective utilization of test resources, which were a challenge in earlier EMD schedules.

TEST & EVALUATION ASSESSMENT

The SIRFC Program Manager has concluded that the previously promulgated test and evaluation schedule did not allow for adequate time to resolve unknown technical problems commonly encountered during the development of electronic warfare programs. The recent integration problems encountered during performance testing at BAF provided the necessary data to support the Program Managers' actions to restructure the EMD phase of the program to include more effective developmental testing. This restructuring shall allow adequate verification of system performance through a robust developmental test program and provide for sufficient time to address technical deficiencies.

Initial SIRFC program schedules relied too heavily on the results of contractor testing prior to delivery to the government for independent validation and verification. Early reliance and confidence in contractor testing prompted the program management team to reduce the size and scope of independent government testing. Although "box-level" performance in the contractor's test facility was adequate in assessing performance in a controlled laboratory environment, it did not sufficiently evaluate system performance in a dynamic, multiple emitter environment that heavily tasks and stresses OFP software.

DOT&E will continue to remain engaged in the formulation and execution of the restructured EMD phase of the program.

