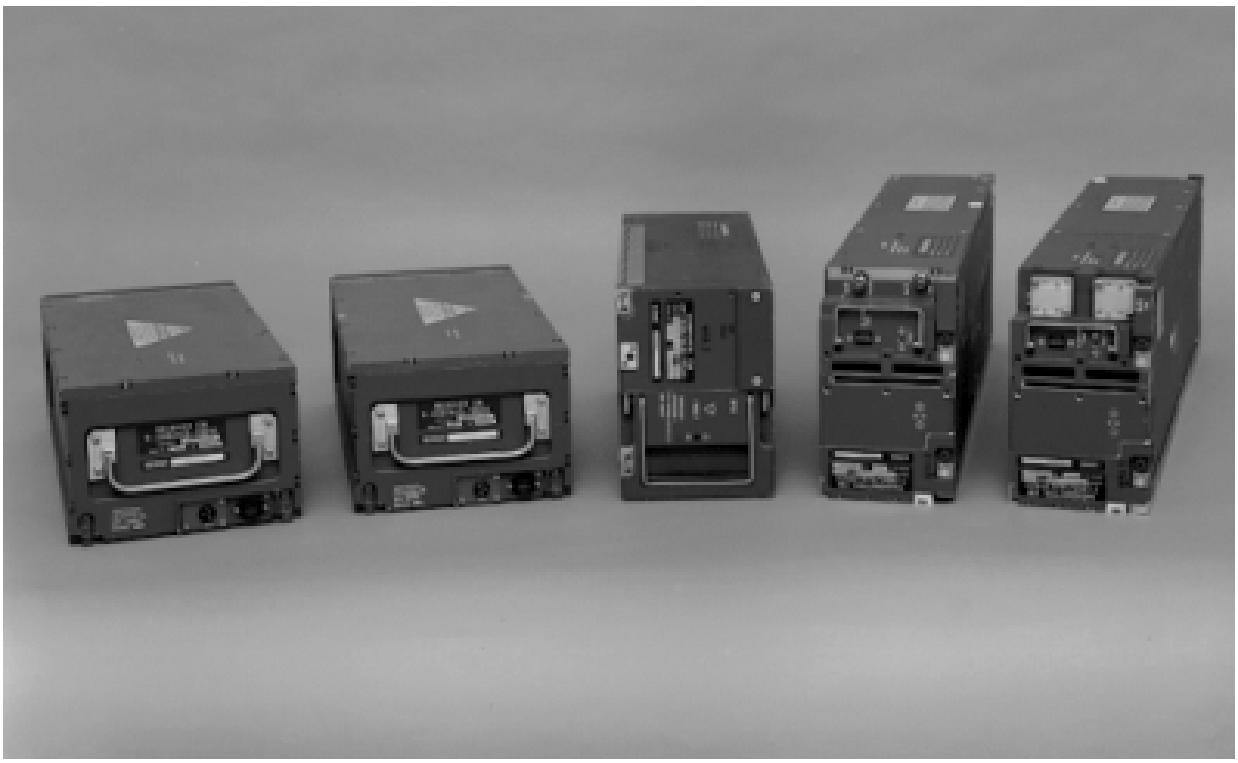
AN/ALQ-165 AIRBORNE SELF-PROTECTION JAMMER (ASPJ)



Navy ACAT III Program

Total Number of Systems:	123 (36 systems procured with FY97 Congressional Plus-up)
Total Program Cost (TY$):	$47.45M
Average Unit Cost (TY$):	$1.27M

Prime Contractor

ITT/Northrop Grumman (Joint Venture)

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2010

The Airborne Self Protection Jammer (ASPJ) contributes to the ***Joint Vision 2010*** concept of ***full-dimensional protection*** by improving individual aircraft probability of survival.

The AN/ALQ-165 ASPJ is an automated modular reprogrammable active radar frequency (RF) deception jammer designed to contribute to the electronic self-protection of the host tactical aircraft from a variety of air-to-air and surface-to-air RF threats. ASPJ was designed to accomplish threat sorting, threat identification, and jamming management in a dense signal environment to counter multiple threats. The modular architecture supports internal integration with other avionics/weapons systems in a variety of aircraft. The basic system consists of five weapons replaceable assemblies/line replaceable units (WRAs/LRUs) that include two receivers, two transmitters, and one processor. Each WRA is interchangeable among different tactical aircraft. Additional transmitters can be installed on aircraft with larger radar cross sections to increase the effective radiated power. Key to this architecture is the WRA installation racks which are of necessity unique for the particular type of aircraft in which the system is

installed. These racks include a multitude of multi-pin connectors providing the interfaces between ASPJ WRAs and between ASPJ and the host aircraft/other systems.

BACKGROUND INFORMATION

ASPJ entered full-scale development in 1979 and LRIP in 1989. Five OT&E phases were conducted with ASPJ FSD systems in 1988 and 1989. Flight testing on DoD electronic warfare ranges occurred in the F/A-18A and F-16A. Key performance criteria for effectiveness and suitability were not met and the FSD systems were not considered production representative. In 1990, the DAB agreed to revised ASPJ effectiveness measures. The Joint Requirements Oversight Council validated these measures in August 1991, and USD (Acquisition) approved the Acquisition Program Baseline incorporating them in December 1991.

Subsequent phases of DT and OT, including Hardware-in-the-Loop and open-air range tests, were conducted with production representative systems and the F/A-18C. OPEVAL (OT-IID) was completed in May 1992, with DOT&E assessing ASPJ as not operationally effective because it did not meet the requirement threshold value for increasing the survivability of an ASPJ equipped F/A-18 strike force over that of a non-ASPJ baseline F/A-18 strike force. DOT&E also assessed ASPJ as not operationally suitable because it did not meet required criteria for mission reliability or built-in-test (BIT) effectiveness. BIT false alarm inadequacies were a significant factor in failing to meet mission reliability requirements.

The ASPJ program was cancelled and production was terminated. Sufficient ASPJs (about 100 systems) had already been delivered to equip the entire planned F-14D (ground attack upgrade) fleet. F-14D was specifically equipped to carry ASPJ and it was not considered economically feasible to modify the aircraft to carry another self-protection jammer. In 2QFY93, the Navy obtained permission to field the existing ASPJ systems in F-14D, contingent upon satisfactory performance during FOT&E in F-14D. Since there would not be a production decision involved and no other feasible self-protection alternative was available, limited operational effectiveness criteria for ASPJ was articulated in an F-14D survivability critical operational issue as, “Is the F-14D more survivable with ASPJ than without it?”

In late FY95, a SAM shot down an Air Force F-16 over Bosnia. The operational commander urgently requested deployment of a developmental self-protection system to improve survivability of F-16s and F/A-18C/Ds in the Bosnian theater of operations. Although successfully integrated on the F-16 and immediately available in limited numbers, the requested system was not compatible with F/A-18C/D. The only system rapidly available to improve F/A-18C/D survivability against the threat of interest was ASPJ. Contingency F/A-18C/D deployments continued as F-14D deployments began, resulting in potentially competing demands in the near term for available ASPJ systems. ASPJ was approved for export after the earlier Navy program cancellation, and the production line has remained open filling foreign military orders. The FY97 Defense appropriation provided $48.4 million, with direction that the Navy procure an additional 36 ASPJ systems with spares and support. The Navy intends to use these systems as a rotatable pool to equip three squadrons of USN/USMC F/A-18C/D aircraft, forward deployed for contingency operations, thereby not impacting ASPJ availability for F-14D.

Limited testing by the Navy and COMOPTEVFOR in late FY95 and early FY96, monitored by DOT&E, supported the Secretary of Defense decision to deploy available ASPJ systems from storage to F/A-18C/Ds conducting contingency operations. The Navy was responsive to DOT&E suggestions concerning the scope of these tests. These tests focused on confirming aircraft integration (since the aircraft baseline had changed after FY92 OPEVAL), and on confirming that operational effectiveness

remained consistent with FY92 OPEVAL results against threats of interest in Bosnia. In addition, with on-site monitoring by COMOPTEVFOR and DOT&E, a USMC F/A-18 squadron in Aviano, Italy collected data during 4QFY95 to support an assessment of ASPJ suitability.

In 3QFY96, an early operational assessment by COMOPTEVFOR supported deployment of ASPJ in F-14D. ASPJ testing, monitored by DOT&E, was conducted by COMOPTEVFOR during F-14D FOT&E (OT-IIIA) primarily in 1Q-2QFY96. F-14D OT-IIIA ASPJ flight testing was completed in late 4QFY96.

After cancellation of the ASPJ program, the Navy conducted analyses that generated the requirement for tactical aircraft self-protection capability against RF and IR surface-to-air and air-to-air threats. The Integrated Defensive Electronic CounterMeasures system (an ACAT II program) began development in FY96 and was intended to be part of the OPEVAL configuration of F/A-18 E/F. IDECM was planned as on off-board RF jammer only (using a Fiber Optic Towed Decoy (FOTD)), with a complimentary on-board RF jammer capability as a possible upgrade (when and if needed). Technical challenges and EMD delays with the IDECM program led to two program restructurings and non-availability of IDECM for operational testing during F/A-18 E/F OPEVAL.

In March 1999, IDECM technical challenges and schedule constraints led to a Navy decision to develop an on-board RF jammer to ensure that F/A-18 E/F initial deployments were made with a self-protection suite. F/A-18 E/F was specifically designed and equipped to carry IDECM, with IDECM systems architecture backwards compatible with ASPJ configuration. It is not considered economically feasible to modify the aircraft to carry another self-protection jammer. A three-phase program to incrementally develop an on-board and off-board RF jammer system for F/A-18 E/F was begun, with the first phase (IDECM Block I) an upgraded variant of ASPJ.

The first phase, IDECM Block I, is an interim F/A-18 E/F self-protection jamming suite consisting of ALQ-165 (Advanced Self-Protection Jammer) and the ALE-50 Advanced Expendable Decoy. IDECM Block I OT-IIIA is scheduled to begin 3QFY00, and will be an extensive operational test of an improved variant of the ALQ-165. IDECM Block II, a second interim configuration, will be comprised of the ALQ-214 Radio Frequency CounterMeasures (RFCM), including the on-board transmitter capability and ALE-50 towed decoy. Transition to this configuration is dependent upon RFCM successfully completing a RFCM OA (to support a RFCM LRIP) and OPEVAL (4QFY01, coincident with F/A-18E/F FOT&E). IDECM Block III will be the final configuration, and will be comprised of ALQ-214 RFCM and ALE-55 FOTD. IDECM Block III OPEVAL is scheduled for 4QFY01, with Milestone III scheduled for 3QFY02.

IDECM Block I is comprised of the five basic ASPJ WRAs (two receivers, two transmitters, and one processor), all upgraded through either Navy sustainment efforts and/or Foreign Military Sales (FMS) derived upgrades. The upgrades include FMS preamps (to improve receiver performance), a RF tunable filter (to improve ASPJ interoperability with the AI radar), and a new threat parametric User Data File. The Block I configuration also includes the requirement to interface with the ALE-50 Advanced Airborne Expendable Decoy.

Development and deployment of the IDECM Block I system is meant only as an interim capability until IDECM Radio Frequency CounterMeasures and ALE-55 FOTD successfully conclude their developmental and operational testing requirements. The IDECM Block I configuration (ASPJ/ALE-50) is only planned to be used for initial F/A-18 E/F deployments, but could be used longer if RFCM and FOTD development continue to experience technical difficulties. It is the Navy's intention to replace ASPJ with the IDECM RFCM techniques generator as soon as possible, with the IDECM

RFCM on-board RF jammer utilizing IDECM Block I transmitters and receivers. Since no production decision will be involved in fielding an interim ASPJ capability, and no other self-protection alternative is available, the operational effectiveness criteria for IDECM Block I is that it provides a measurable reduction in lethality for the Block I equipped F/A-18 E/F as compared to an ALQ-126B equipped F/A-18 C/D.

TEST & EVALUATION ACTIVITY

No formal OT&E was conducted during FY99. DT-IIA was conducted from April-October 1999, with ASPJ installation and interoperability with the F/A-18 E/F electronic protection suite being evaluated at the Electronic Combat Systems Evaluation Laboratory at Pt. Mugu. Limited airborne testing was also done in the F/A-18D Aircraft Test Bed at the Electronic Combat Range and the Western Test Range. DT-IIB (which includes a COMOPTEVFOR DT assist) commenced in September 1999 and will assess ASPJ effectiveness and suitability measures. Development of an IDECM Block I TEMP has been closely coordinated with DOT&E, with TEMP submission expected in 2QFY00. IDECM Block I OPEVAL (OT-IIIA) is scheduled to commence in May 2000.

TEST & EVALUATION ASSESSMENT

The Navy's effort to develop, integrate, and test an interim F/A-18 E/F ASPJ on-board RF jammer suite has been thorough and aggressive. Development of a TEMP has been closely coordinated, with sufficient test resources allocated to ensure comprehensive OPEVAL (OT-IIIA). Initial DT results show that an interim ASPJ suite is achievable, with efforts to integrate ASPJ with the ALR-67 (V)3, ALE-47, and the ALE-50 posing the highest risk to successful completion of OT. Numerous upgrades to correct longstanding ASPJ deficiencies will be assessed in IDECM Block I testing and will provide Navy decision makers with other RF self-protection suite options if development of IDECM RFCM/FOTD continues to experience technical problems and further delay.