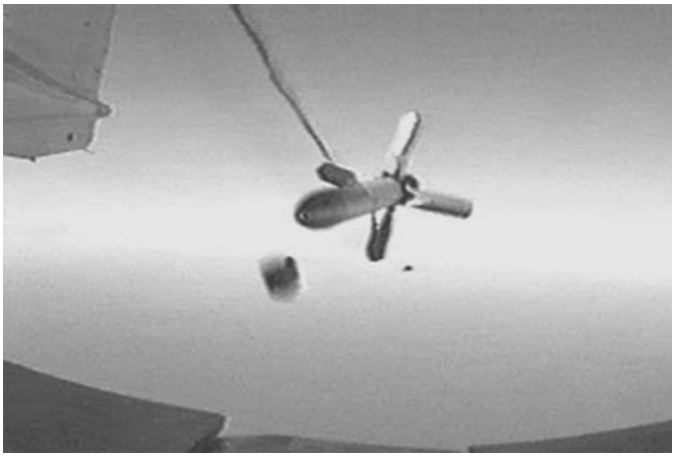
Integrated Defensive Electronic Countermeasures (IDECM)

The Integrated Defensive Electronic Countermeasures (IDECM) is intended to provide increased self-protection and survivability for tactical aircraft, against radio frequency and infrared surface-to-air and air-to-air threats. The major hardware components being developed are the radio frequency countermeasures (RFCM) system and the ALE-55 Fiber Optic Towed Decoy (FOTD). The FOTD is trailed behind the aircraft to optimize RFCM techniques against threat missiles and tracking/targeting systems. The RFCM consists of an on-board receiver/processor/techniques generator that stimulates either the FOTD via fiber optic cable or the on-board transmitters. The FOTD is intended to be deployed from the same controller currently used with the ALE-50 towed decoy. The IDECM lead aircraft (F/A-18E/F) will integrate the radar warning receiver, a missile warning system, the chaff/flare dispenser, and an off-board decoy launch controller/dispenser. With the onboard jammer, even if the limited number of FOTDs carried is depleted, the aircraft will still have some self-protection capability.

IDECM Block I is currently deployed, and is an interim system consisting of the ALQ-165 Advanced Self-Protection Jammer (ASPJ) and the ALE-50 towed decoy. The Navy plans to use the Block I for the first three F/A-18 E/F carrier deployments; the first one is currently underway. IDECM Block II, a second interim configuration, will replace the ASPJ with the ALQ-214 (V)2, providing onboard jamming capability, planned for deployment in 2003. This configuration is planned for the fourth and fifth F/A-18 E/F carrier deployments. IDECM Block III will be the final configuration and will consist of the ALQ-214 V2 RFCM and an upgrade to the ALE-55 FOTD.

United States Air Force (USAF) requirements for a common FOTD and techniques generator were included in the IDECM RFCM engineering and manufacturing contract. USAF selected components of IDECM RFCM for the B-1B Defensive System Upgrade Program and intends to add them to the F-15 electronic warfare suite. In 1998, IDECM was re-baselined to fund an 87 percent development cost overrun. In 1999, technical difficulties and cost overruns resulted in a second restructuring.

IDECM Block I Developmental Testing (DT), a combined DT/Operational Test, and an independent Operational Test were completed successfully in 2000 on the F-18 E/F. The operational effectiveness criterion was a measurable reduction in the lethality of the attacking missile when compared to an F/A-18 C/D equipped with its standard ALQ-126B, and when compared to no jammer. Block 1 was found to be effective and suitable.



The Integrated Defensive Electronic Countermeasures is intended to provide increased self-protection and survivability for tactical aircraft against radio frequency and infrared surface-to-air and air-to-air threats. Current efforts are focused on radio frequency threats.

Block II completed a limited Operational Assessment (OA) in March 2000, in which it was assessed to be potentially operationally effective and potentially suitable. The OA consisted of hardware-in-the-loop and flight tests at China Lake. By design, the flight test was limited to a non-production representative installation on a test bed aircraft using a non-operationally representative reel-out, reel-in external pod to conserve decoys.

Late in FY01, due to poor test aircraft availability, continued difficulties with fast deployment of the FOTD decoys, and unplanned software iterations, the Navy decided to focus testing primarily on the Block II, restructuring the FY02 DT/Operational Test and subsequent Operational Evaluation (OPEVAL). The majority of Block III operational testing will be conducted in FY04 and FY05. Block II and III testing were originally planned to happen concurrently.

TEST & EVALUATION ACTIVITY

Block II/III performance in test and evaluation during FY02 was beset by continued technical difficulties with the FOTD and FOTD launcher assembly, the receiver signal tracking capability, and with system integration. DT revealed that deploying and towing the FOTD over the entire desired flight envelope, and IDECM component interoperability issues were more difficult than expected. System integration (particularly with the ALR-67 (V)3 radar warning receiver), optimization of the receiver signal detection and response, and operator interface led to multiple delays in the DT/ Operational Test and OPEVAL, including a six-month re-baselining in March 2002. Fast deploy (a rapid ejection and reel out to a specific distance behind the aircraft) testing was carried out on the F/A-18 E/F and B-1B. Multiple iterations of the canister and towline were evaluated.

A multi-service tiger team was formed to address some of the fundamental issues related to towed decoy deployment and towing. The initial report from this group indicated that the decoy and canister were still high risk and needed further development and testing. The most recent flight tests on both the F/A-18 E/F and the B-1B have demonstrated an increased ability to deploy and successfully tow the decoy more consistently and over a larger part of the flight envelope. Developmental flight-testing continued through the end of the fiscal year. The re-baselining effort mid-way through the year appears to have provided the necessary time to resolve the most severe integration issues. The development and testing of Block III will be covered in a subsequent Annex update to the Test and Evaluation Master Plan.

TEST & EVALUATION ASSESSMENT

The three Block development strategy and test planning have successfully mitigated some of the risk incurred over the last four years of IDECM evolution. Block I will be deployed on the first three F-18E/F deployments, the first of which was aboard the USS *Abraham Lincoln* in 2002. The IDECM Block I system, by virtue of being an interim solution, has limited logistic supportability for the fleet. Follow-on IDECM Blocks II or III need to produce an effective and suitable replacement to the Block I suite before its available logistics support expires. Block II performance results in DT look promising, but operational tests are not complete. Suitability performance results in DT are promising; however, a number of repeated system Built in Test (BIT) failure indications have been removed from scoring because corrective actions are underway to solve them. BIT failures and aircraft integration issues are still considered moderate risk and will be are being examined in the ongoing Block II OPEVAL. For Block III, the deployment of the FOTD and the durability of the towline are still high risk. In the lab environment, the Block III RFCM and FOTD have proven to be highly effective and close to predicted performance.

Several test range limitations have hampered all blocks of IDECM testing. Some threat simulators intended for use during IDECM flight-testing were not operationally realistic. Limitations of the threat simulators and flyout models have made analysis of the results difficult and less useful.