

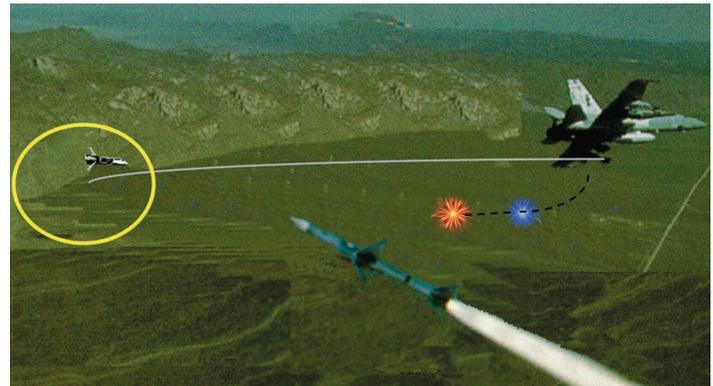
Integrated Defensive Electronic Countermeasure (IDECM)

Executive Summary

- In FY05, the Navy focused on increasing the maturity of Integrated Defensive Electronic Countermeasure (IDECM) Block III's Fiber Optic Towed Decoy (FOTD) and integrating it with the ALQ-214 onboard jammer in preparation for the FY06 Integrated Test and Evaluation (IT&E).
- Although software development challenges delayed the start of FY05 tests, the IB-3 software is near final configuration and is expected to be ready to support the January 2006 IT&E.
- The Navy should ensure that IDECM's required flight envelope supports tactical employment of the system, and that adequate analysis of jamming performance in the development test portion of IT&E also supports the dedicated operational evaluation portion of IT&E.

System

- The IDECM system is a radio frequency, self-protection electronic countermeasure suite on F/A-18 E/F aircraft. The system is comprised of onboard components that receive and jam radar signals, and off-board electronic jammers.
- Legacy components
 - ALQ-165: Onboard radio frequency receiver and jammer
 - ALE-50: Off-board towed decoy with basic jamming capability
- New components
 - ALQ-214: Onboard radio frequency receiver and jammer
 - ALE-55: Off-board FOTD
- The three IDECM variants are as follows:
 - IB-1 uses the legacy ALQ-165 and legacy ALE-50 (fielded in FY02).
 - IB-2 uses the new ALQ-214 and the legacy ALE-50 (fielded FY04).
 - IB-3 uses the new ALQ-214 and the new ALE-55 (in test).



Mission

- Combatant commanders will use IDECM to improve the survivability of Navy F/A-18 E/F strike aircraft against radio frequency guided threats while on air-to-air and air-to-ground missions. Each block upgrade of IDECM is designed to offer the warfighters more survivability.
- IB-3 adds:
 - ALE-55 FOTD is designed to provide better integration with the onboard receiver/jammer and a complex jamming capability, to enhance survivability.
 - Designed to increase survivability for the warfighter against modern radar-guided threats when supporting the combatant commanders.

Activity

- In FY05, the Navy focused developmental testing on maturing the performance of IDECM Block III's (IB-3) FOTD, while integrating it with the ALQ-214 onboard jammer. This testing supported preparation for the 2QFY06 IT&E that is expected to support a Milestone III full-rate production decision in 2QFY07. Additionally, FY05 testing included extensive software development, as well as hardware assessment.
- Risk reduction testing to prepare for IB-3 IT&E in FY05 included:
 - Contractor testing of the IB-3 stand alone system and F/A-18 E/F platform integration in System Integration

- Laboratories and hardware-in-the-loop facilities to assess the ability of IDECM to detect, identify, and track all programmed threat modes
- Government development flight tests conducted at Naval Air Weapons Station, China Lake, California, Electronic Combat Range, and the Nevada Test and Training Range to assess IB-3's ability to detect, identify, track, and assign the correct jamming technique against threat radar-guided systems
- The Navy conducted 15 developmental flight tests to finalize the hardware configuration of the tow line and the

FOTD. This testing at the Naval Air Station, Patuxent River, Maryland, also assessed IB-3 across its required flight envelope.

- A Joint test resource development verification and validation effort by the Navy and Air Force focused on the creation of a modern radar threat using a complex guidance system for IDECM testing. Since this resource will not be available for IT&E in early FY06, the Navy plans to use a science and technology system called the Airborne Seeker Test Bed.
- The Navy prepared a revised Test and Evaluation Master Plan, planned for approval in early FY06, to support the IB-3 final development testing and operational evaluation that make up the IT&E.

Assessment

- The IB-3 hardware configuration is mature and near its final configuration for the FY06 IT&E.
- The software is approaching a final configuration demonstrated by a significant reduction in the number of new software problems identified.
- The FY05 government flight tests to date indicate that IB-3 is progressing towards clearance for the entire required flight envelope.
- Although only 53 percent of key threats are available for high quality testing due to test resource availability on open air ranges and in hardware-in-the-loop, the four main categories of threats are all adequately represented.
- The primary test resource limitation is the lack of a modern threat using a complex guidance system. This is needed to

support full quantitative assessment of the primary IB-3 key performance parameter. The Navy's alternate resource plan, utilizing the Airborne Seeker Test Bed, is adequate to assess if the IB-3 works against this modern system, but how well it works will need to be assessed qualitatively. Test resources for threats using more traditional guidance systems are available and will be utilized in the IT&E.

- The draft Test and Evaluation Master Plan includes a critical operational test readiness review prior to the start of IT&E, required joint interoperability testing, and is adequate to support IB-3 operational testing and evaluation.

Recommendations

1. The Navy should provide adequate analysis of the system's jamming performance during the development test portion of the IT&E to support the dedicated operational evaluation portion.
2. The Navy should ensure joint interoperability testing supports assessment of the IB-3 reaction to and impact on friendly radar-guided surface-to-air and air-to-air systems, as well as command and control systems.
3. The Services should continue to improve the level of threat system fidelity needed to quantitatively assess the end-to-end (i.e. detect to jam) effectiveness of self-protection suites against all radar threat system categories.