EA-6B Upgrades

The EA-6B is a four-person, carrier capable, twin turbojet tactical aircraft. Its primary mission is the interception, analysis, identification, and jamming of radio frequency transmissions of enemy weapons control and communications. The crew includes one pilot and three electronic countermeasures officers. The EA-6B carries the ALQ-99 Tactical Jamming System, which includes a receiver, processor, and various mission-configured jammer pods carried as external stores. The EA-6B has the USQ-113 Communications Jammer, and may also be armed with the high-speed anti-radiation missile (HARM) for enemy surface-to-air radar destruction and suppression. The EA-6B is a key contributor to the Suppression of Enemy Air Defenses Electronic Attack mission.

Operational since 1972, the EA-6B underwent a number of upgrades: Expanded Capability, Improved Capability (ICAP), ICAP II, and Block 89A. The Navy cancelled another significant upgrade - Advanced Capability - for financial reasons after it reached full-scale development in FY93. The Operational Test and Evaluation Force (OPTEVFOR) conducted IOT&E of Advanced Capability in FY94 which provided the technical basis for much of the current upgrade program. The program scheduled the Initial Operational Capability (IOC) around June 2005.

Improvements to the ALQ-99 jamming pod capability include the Universal Exciter Upgrade (full-rate production in FY96), Band 9/10 transmitter (IOC in FY00), a prototype Band 7/8 jamming capability, and the development phase for a low-band transmitter (LBT) upgrade.

ICAP III, which will be the most significant upgrade, includes a new receiver intended to provide a reactive jamming capability. ICAP III systems integrate many of the above warfighting enhancements with the addition of new controls and displays. It includes provisions for Link 16 connectivity, via the Multi-Functional Information Distribution System. ICAP III builds upon the Block 89A improvements to achieve a reactive jamming/targeting and geolocation capability for active emitters. The Navy's procurement plan is to transition all EA-6B aircraft to the ICAP III configuration by 2010. Addition of the Multi-Mission Advanced Tactical Terminal and the Improved Data Modem capability improves battlefield situational awareness for the crew. The program is also integrating aircrew night vision devices to enhance night capabilities. DOT&E approved the Test and Evaluation Master Plan in January 2003.

TEST AND EVALUATION ACTIVITY

The Navy has been conducting ground and flight system testing on the ICAP III new receiver (the AN/ALQ-218) since February 2002. DOT&E approved the test plan for a two month operational assessment (OA) involving 29 open-air range flight sorties. The test was completed on March 20, 2003. During the first half of 2004, there will be an additional period of ground and flight testing for correction of deficiencies in preparation for full-system operational evaluation (OPEVAL). Specific performance interests prior to fleet deployment are jammer and HARM launch reactive response times, hostile emitter geolocation accuracy, suitability of built-in test, reliability, and aircrew display and control capabilities.

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The Navy is implementing a re-baselined LBT jammer pod program in two phases. The first phase concentrates on completing in-plant tests of the LBT transmitter/amplifier module integrated with a new, vertically polarized antenna and another configuration incorporating an existing horizontally polarized antenna that is currently in fleet use. The second phase will continue the more difficult development and integration of three (or possibly fewer) remaining horizontally polarized antenna types with the transmitter/amplifier module. The Navy projects OA

field-testing of the LBT to begin around March 2004, subject to completion of developmental testing. A prototype Band 7/8 jammer pod based on the Band 9/10 architecture is in its early design/fabrication phases.

There was no formal USQ-113 communications jammer test and evaluation activity in FY03. Upgrades and correction of deficiencies are underway in preparation for additional flight testing by OPTEVFOR in early 2004.

TEST AND EVALUATION ASSESSMENT

The ICAP III receiver upgrade program risk centers on its ability to provide accurate emitter geolocation in full azimuth coverage for HARM targeting and the reactive jamming of selected hostile emitters. Twenty-nine OA sorties indicate that with some exceptions, the system is potentially effective and potentially suitable in this role. Prior to entering OPEVAL, deficiencies observed during OA in target emitter display rates, alphanumeric keyboard dysfunction, and mission planner must be corrected. Additionally, the OA revealed a number of operator display and control inefficiencies. Needed correction of deficiencies, almost all by software changes, is predicted to delay the start of OPEVAL from December 2003 to around April 2004. The Navy has scheduled IOC for June 2005. Even after OPEVAL and IOC, there will be a period of tactical concept development and further software refinements to make the best use of the ICAP III selective reactive jamming capability.

The LBT program continues in the development phase. The program office is closely monitoring problems in successful completion of in-plant testing. The Naval Air Warfare Center, Point Mugu, California, has completed aircraft integration testing with one engineering development model. In-plant vibration qualification regression tests resulted in unacceptable damage to a newly designed support bracket. The LBT Reliability Development/Growth Test effort continues to fall behind schedule in both demonstrated mean time between failure measures (71.4 hours vice 277 hours required), and accumulated test time (1,499 hours vice 4,345 hours previously scheduled for this point in the program). The Navy's developmental test began in October 2003.

There were five major deficiencies observed during the January to June 2001 follow-on operational test and evaluation (FOT&E) of the AN/USQ-113(V)3 Radio Countermeasures Set. One was a safety concern and two involved human factor considerations. The FOT&E revealed signal classification and interoperability problems. During the past two years of fleet operation, the Navy initiated an effort to correct selected deficiencies. Two deficiencies are being addressed in a Verification of Correction of Deficiencies that is scheduled to end flight test in December 2003. Testing at required frequencies is denied because of the impact on civilian sector usage of certain frequency bands. Those same frequency bands are the ones that the enemy will plan to use because of readily available, cheap, and effective equipment. This inability to test at all required frequencies in other-than-remote test locations complicates adequate testing. Testing at remote locations is being explored, but such an approach will require transportable, real, or simulated target/victim equipment and associated diagnostic instrumentation. Some of these same testing challenges apply to the LBT.