

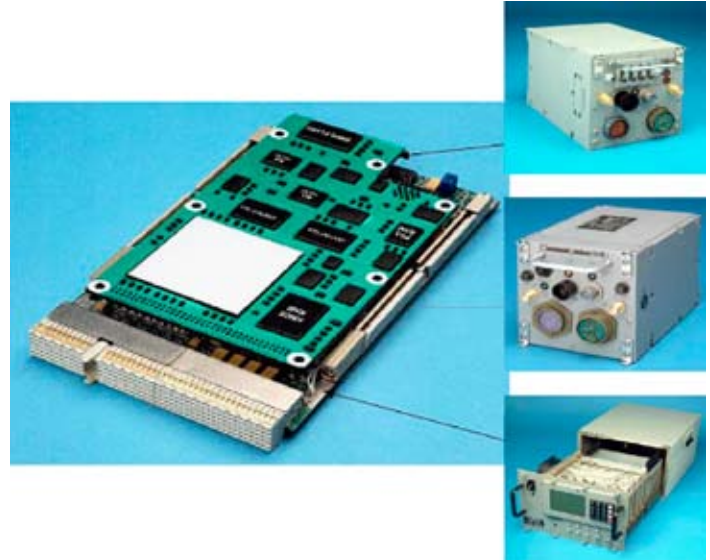
Mark XIIA Identification Friend or Foe (IFF) Mode 5

Executive Summary

- There is no coherent acquisition or test strategy for Mode 5 in the Department of Defense.
- Each Service has initiated one or more programs to independently develop and field Mode 5 transponders and/or interrogators.
- The Navy approved a low-rate initial production decision based on an under-resourced operational assessment and without a DOT&E-approved Test and Evaluation Master Plan (TEMP).
- With multiple programs and multiple vendors, there is significant risk that the Mode 5 equipment integrated into some combat systems may not be interoperable and may be ineffective in preventing fratricide.

System

- The Mark XIIA Identification Friend or Foe (IFF) Mode 5 is an identification system that uses interrogators and transponders located on host platforms to send, receive, and process friendly identification data.
- Mode 5 is a military-only identification mode, which will replace Mode 4 and allows secure encryption of interrogations and replies. Primary features include:
 - A lethal interrogation format, which is a final “wake-up” interrogation sent just prior to weapons release and intended to reduce fratricide
 - A random-reply-delay, which prevents distorted replies from closely spaced platforms
- Mode 5 offers more modern signal processing, compatibility with legacy Mode 4 IFF systems and civilian air traffic control, and data exchange through the new waveform.



Mission

- The combatant commander employs the Mode 5 to provide positive, secure, line-of-sight identification of friendly platforms equipped with an IFF transponder.
- Mode 5 serves as a component of a combat identification process used on ground- and sea-based systems such as PATRIOT, Aegis-equipped ships, and all military aircraft to include the E-3 Airborne Warning and Control System.
- This system’s information will be combined with other cooperative and non-cooperative combat identification techniques in order to provide identification of all platforms – enemy, neutral, and friendly.

Activity

- In August 2005 and February 2006, DOT&E asked the Services to update the test strategy status for their separate Mode 5 programs. None of the Services had an adequate strategy to test any of their Mode 5 systems. DOT&E asked the Navy to submit an updated TEMP prior to the low-rate initial production decision scheduled for June 2006. DOT&E also asked the Services to update their requirements documents and work together on a concept of operations for the capability.
 - There was no effort to update the requirements for the capability
 - The Navy declined to update their TEMP and received a waiver to update requirements prior to their low-rate initial production decision
- Joint Forces Command has an effort in progress to create a concept of operations for the capability
- The Service test communities are coordinating informally to find test opportunities
- In March 2006, DOT&E asked the Defense Acquisition Executive to define an overarching governance process for Mode 5. DOT&E also asked the Chairman of the Joint Requirements Oversight Council to define the requirements for the capability to further synchronize the Services’ efforts.
- The Navy’s Commander, Operational Test and Evaluation Force conducted an operational assessment on the Navy’s Mode 5 developmental hardware using the test plan approved by DOT&E in support of a low-rate initial production decision.

NAVY PROGRAMS

- Lacking an approved TEMP, joint governance, or updated requirements the Navy approved low-rate initial production for Mode 5.
- The Navy low-rate initial production decision included acquisition of nearly one-third of Army Aviation's total Mode 5 purchase. Currently no Mode 5 TEMP exists for Army Aviation.
- The Air Force Operational Test and Evaluation Command suspended all work on any Mode 5 testing because the Air Force lacks an acquisition strategy. Currently, no Mode 5 TEMP exists for any Air Force Mode 5 system.

Assessment

- The Navy does not have an adequate strategy to conduct an IOT&E of the Mode 5 capability, but is proceeding with low-rate initial production.
- The Navy's operational assessment conducted for their low-rate initial production decision was under-resourced due to funding cuts. Although Mode 5 demonstrated potential to be a significant upgrade to Mode 4, the test was inadequate to provide a full assessment.
- The Navy's operational assessment was not adequate to support purchase of hardware for Army Aviation systems.
- The Mode 5 equipment used in the Navy operational assessment does not meet NATO or U.S. standards, significantly increasing the risk that the Navy's equipment may not be interoperable with other Service or Allied equipment.
- The Navy's operational assessment showed significant risk areas with the integration of the Mode 5 interrogation equipment into Aegis combat systems. This highlights the integration challenges to other programs.
- The Air Force intends to make fielding decisions associated with the integration of Mode 5 on aircraft without any adequate operational testing.

- Lacking any synchronization among the Services in fielding this capability and without a coordinated strategy to provide an adequate operational test of the system, there is great risk that Mode 5 may be ineffective in preventing fratricide.

Recommendations

- Status of Previous Recommendations. The recommendations from FY05 have not been resolved and require further effort.
FY05 #1: The Services' Program Managers must integrate their test schedules and look for opportunities to test in a joint environment. This will ensure interoperability between all interrogators, transponders, and dual interrogator transponders.
FY05 #2: Service Program Managers must ensure that all systems being developed interoperate properly as follows:
 - Coordinate testing between each of the Services' operational test agencies
 - Develop a capstone TEMP between all of the Services for Mark XIIA IFF
- FY06 Recommendations. DoD should:
 1. Create a coherent strategy to synchronize and fund Mode 5 to include:
 - An Acquisition Decision Memorandum to guide the efforts and provide a mandate for the synchronization and interoperability of the capability across the Services
 - A validated requirement for the capability to include a timeline for Initial and Full Operational Capability and an emphasis on interrogators as well as transponders to bring the independent efforts into alignment
 2. Identify a lead Service to:
 - Coordinate testing between each of the Services' operational test agencies
 - Develop a capstone TEMP between all of the Services for Mode 5