

AIM-9X Air-to-Air Missile Upgrade

Executive Summary

- The AIM-9X program continues operational test and evaluation of a software upgrade to the fielded missile. The upgrade addressed a previous deficiency in performance against aircraft employing countermeasures against heat-seeking missiles, and added new interim capabilities to the baseline missile to reduce future developmental risk.
- Analysis and evaluation is ongoing. Modeling and simulation analysis indicates that the new software provides measurable increases in acquisition and track ranges, and greater capability against aircraft employing countermeasures. Initial feedback from the captive flights indicates slightly better performance than the currently fielded missile.

System

- AIM-9X is the latest generation short-range, heat-seeking, air-to-air missile that reduces the gap in short-range combat capability between U.S. aircraft and primary enemy threat aircraft. The currently fielded version of the missile software is 8.019.
- AIM-9X is highly maneuverable, day/night capable, and includes the warhead, fuse, and rocket motor from the previous AIM-9M missile.
- AIM-9X added a new imaging infrared seeker, vector controlled thrust, digital processor, and autopilot. F-15C/D, F/A-18 C/D, and F/A-18 E/F aircraft can carry the AIM-9X, and the missile includes a container for storage and maintenance.
- 8.2XX (the latest software version) includes a rudimentary air-to-ground attack mode; limited lock-on-after-launch; full envelope high off-boresight capability without a helmet-mounted cueing system; and increased flare rejection performance.



Mission

Air combat units use the AIM-9X to:

- Conduct short-range offensive and defensive air-to-air combat
- Engage multiple enemy aircraft types using passive infrared guidance in the missile seeker, using external cues (other than the missile seeker itself) from multiple aircraft systems, including radar and the Joint Helmet-Mounted Cueing System
- Seek and attack enemy aircraft at large angles away from the launch aircraft

Prime Contractor

- Raytheon

Activity

- The AIM-9X program continued operational test and evaluation of a software upgrade (8.2XX) to the fielded missile. The upgrade addressed a previous deficiency in performance against aircraft employing countermeasures against heat-seeking missiles, and added new interim capabilities to the baseline missile to reduce future development risk.
- The program executed the operational test for 8.2XX from May through October 2007, using a DOT&E-approved test plan. The test program consisted of 105 captive carriage flights using F-15, F-16, and F/A-18 aircraft, and three live shots against target drones evaluating end-to-end system performance in varying scenarios.
- The AIM-9X program had to extend 8.2XX operational testing due to technical problems found late in the test. The latest version of 8.2XX, version 8.212, began operational test in September 2008. Eight captive carry and two live fire tests are planned. Pending successful completion of testing, the scheduled software release is planned for early 2009.
- The Program Office began developmental testing of version 9.2XX in September 2008. Version 9.2XX consists of hardware upgrades as a result of parts obsolescence.
- The Program Office recently divided software enhancements to the new missile hardware (Block II) into two versions, 9.3XX and 9.4XX. Air Force and Navy approval for this division of capabilities is pending.

Assessment

- Analysis and evaluation is ongoing. Modeling and simulation analysis indicates the new software provides measurable increases in acquisition and track ranges, and greater capability versus aircraft employing countermeasures. Initial feedback from the captive flights varies indicating slightly better performance than the currently fielded missile. There may be insufficient information in the limited test program to date to fully characterize performance or confirm new capability.
- The three version 8.2 shots to-date were marginally successful. Of the three shots, one successfully killed the target drone. The other two were failures, one due to the pilot shooting beyond intended range, and the other failing to track. In all cases, the missile appeared to function nominally, but did not achieve the expected performance increase over the current software.
- The increase in performance of the 8.2XX variants is not readily discernable when applying comparative analysis.

DOT&E believes, in these cases, side-by-side testing is warranted.

Recommendations

- Status of Previous Recommendations. All of the FY06 and FY07 recommendations remain valid.
- FY08 Recommendations.
 1. The Navy and Air Force requirements offices should establish the requirements for versions 9.3XX and 9.4XX and approve as soon as possible allowing adequate test planning for those increments. Testing should have sufficient captive carry and live shots to demonstrate the new capabilities.
 2. Testing of future versions of the AIM-9X should ensure side-by-side testing against the prior version to validate performance improvements when an increase in performance is not discernable via comparative analysis.