

AIM-120 AMRAAM



Air Force ACAT IC Program

Total Number of Systems:	10,917 (U.S. only)
Total Program Cost (TY\$):	\$10,917M
Average Unit Cost (TY\$):	\$949K
Full-rate production:	3QFY94
SEP Production	3QFY92

Prime Contractor

Raytheon

SYSTEM DESCRIPTION & CONTRIBUTION TO JOINT VISION 2010

AIM-120 is an all weather, radar guided, air-to-air missile with launch-and-leave capability in both the beyond-visual-range and within-visual-range arenas, enabling a single aircraft to simultaneously engage multiple targets with multiple missiles. The U.S. Air Force and Navy, as well as several foreign military forces use AIM-120. Currently employed by the F-15C, F-15E, F-16, and F/A-18C/D, AIM-120 will also be employed by the F/A-18E/F and F-22.

The AIM-120B missile resulted from the Advanced Medium Range Air-to-Air Missile (AMRAAM) Producibility Enhancement Program. Major improvements in the missile included a new digital processor, erasable programmable read only memory, and five electronic unit hardware chassis upgrades. AIM-120B is in production for foreign military sales only.

AIM-120C was modified by clipping its wings to reduce its box size from 17.4 to 12.5 inches to allow internal carriage in the F-22. Block change lethality improvements are being incorporated into the missile from Lot 8 and beyond, culminating in a new warhead and lengthened rocket motor in Lot 12. All current U.S. deliveries are of AIM-120C configuration.

AIM-120 contributes to *Joint Vision 2010* by providing the warfighter with a *precision engagement* weapon.

BACKGROUND INFORMATION

The AMRAAM program entered FSD in September 1982. The DAB approved LRIP in June 1987; authorized continued LRIP in May 1991; and entered full-rate production (Milestone III) in April 1992. The Air Force declared AMRAAM IOC with the F-15 in September 1991, and with the F-16 in January 1992. The Navy declared AMRAAM IOC in October 1993.

FOT&E(1) was completed in May 1993. AIM-120 FOT&E(2) was completed and documented in the FY96 Annual Report. Begun in May 1993, this phase of testing included the launch of 40 missiles from 12 shot profiles under various test conditions and continued the captive-carry reliability program (CCRP) testing on the F-16. Missiles from production Lots 4 through 8, including AIM-120A and AIM-120B missiles, were tested on F-15 and F-16 aircraft. Twenty-four of the live launches were missiles from CCRP inventory. The live shots were designed to evaluate missile end game performance against advanced ECM threats and warhead lethality in more challenging end game scenarios. The final FOT&E(2) live launch test event occurred in December 1995.

An updated TEMP and Test Plan to define FOT&E(3) activities was approved in 1996. This TEMP included Live Fire Test characterization of the new contact fuze and testing of the new warhead against bomber components, as requested by DOT&E. The TEMP approval letter also stated that DOT&E would submit a LFT&E report to Congress at completion of FOT&E(3). FOT&E(3) will emphasize testing of lethality improvements incorporated in missiles from Lot 8 and higher, culminating with the new warhead in Lot 12.

TEST & EVALUATION ACTIVITY

The FOT&E(3) is an ongoing joint Air Force and Navy evaluation divided into specific phases. The first phase specific flight test objectives include evaluation of Lots 8 through 10 hardware and software tapes 5 and 7. This test phase was completed in December 1999 and included 26 live launches and multiple AMRAAM Captive Equipment missions, along with a 3712-hour CCRP. The Navy Operational Test-IIID operational test phase will begin in early 2000 to verify integration of AIM-120C with F/A-18C/D aircraft equipped with APG-73 radar.

Air Force progress towards meeting their FOT&E(3) test objectives were hampered by drone unavailability during most of FY98 due to: (1) a lack of QF-4 drones capable of carrying ALQ-167 jamming pods that prevented ECM testing; (2) higher-priority programs utilizing available drones; and (3) drone throttle problems with QF-4s. This problem was solved in FY99 and 15 live fires were completed against QF-4 drones. In addition, there was one launch against an AQM-37 drone and ten against QF-106 drones.

LFT&E activity focused on the planning and execution of arena tests for AMRAAM P3I warhead against a suite of gray and threat targets. DOT&E participated and provided oversight for the first arena test against a cruise missile and a bomber section on April 7, 1998. Pre-test predictions were provided to DOT&E after the test was executed. The second arena test, against two foreign fighter targets, was completed in October 1998. A third arena test against the same foreign fighter targets was conducted in April 1999. DOT&E is awaiting receipt of final test reports, as well as simulation analyses results to conduct an independent evaluation.

TEST & EVALUATION ASSESSMENT

FOT&E(2) testing demonstrated fulfillment of the weapons effectiveness requirements in both countermeasure and non-countermeasure environments. Missile reliability, previously evaluated as unsatisfactory during IOT&E and FOT&E(1) was demonstrated to exceed user requirements by a wide margin during FOT&E(2). Rigorous FOT&E(2) testing of the "All Aspect Launch and Track" requirement called for 28 percent of the shots traversing the target's beam aspect. Another area of FOT&E(2) emphasis was missile effectiveness in the presence of targets employing self-screening chaff; 21 percent of launches were against such targets. Although significant improvements from IOT&E performance were noted, concerns were not completely alleviated regarding missile capabilities in these two challenging environments. These operating environments will continue to be emphasized in continuing FOT&E(3) tests scheduled to be completed in November 2000. This will evaluate AIM-120C-5 missiles configured with improved warhead, guidance, and ECM improvements as well as the lengthened rocket motor.

Emerging LFT&E results indicate that the P3I warhead works as planned. Final test results for the three LFT&E tests conducted in FY99 have not been forwarded to DOT&E. These reports and results of simulation analyses are expected to be published in early 2000. LFT&E will be conducted on the basis of that information and previously published data.

Emphasis during FY00 will be on the improved missile being developed under the P3I Phase III program. This missile will incorporate new seeker and guidance sections as well as OFP software written in a new language. A P3I Phase III Total System Performance Responsibility contract (that does not contain funding for OT&E launches) was signed with Raytheon Systems Company this fiscal year. Raytheon plans only eight launches (for which they will define the test scenarios), and no captive carry reliability program to demonstrate the significantly modified AIM-120C missiles capabilities. This small number of test launches, under the prime contractors' control is considered inadequate for demonstrating operational effectiveness for this 1,300 missile production contract. Adding 6 to 11 missiles specifically for OT&E purposes has been proposed, but funding issues have not been resolved and the TEMP defining P3I Phase III testing has not been approved.

