AH-64D Longbow Apache

SUMMARY

- In recent combat deployments, the Longbow Apache helicopter confirmed the 1995 Initial Operational Test and Evaluation (IOT&E) assessment that the AH-64D helicopter provides effective air-to-ground combat power and, when engaged by small arms, the aircraft survives and provides protection for the crew.
- The Airworthiness and Flight Characteristics testing of Block I aircraft confirmed that the published performance charts for the AH-64D are in need of refinement.
- The Army completed a Preliminary Airworthiness Evaluation of Block II aircraft during FY04. The Army is planning for additional development and testing of Block II software and hardware.
- Army testing has found that Block II adds significant interoperability capabilities, but pilot workload inside the cockpit has increased.

As of August 2004, Boeing has delivered 367 AH-64D Longbow Apaches and scheduled 77 other airframes for conversion.

SYSTEM DESCRIPTION AND MISSION

The Army is remanufacturing and upgrading the AH-64A Apache helicopter into the AH-64D Longbow helicopter. The primary modifications to the Apache are the addition of a millimeter-wave Fire Control Radar (FCR) target acquisition system, the fire-and-forget Longbow Hellfire air-to-ground missile, upgraded T700-GE-701C engines, and a fully-integrated cockpit. In addition, the aircraft has improved survivability, communications, and navigation capabilities.

The Army is fielding the AH-64D in two configurations. The full-up AH-64D includes all of the improvements listed above. The other version of the AH-64D does not have the FCR, Radar Frequency Interferometer, or the improved engines. The AH-64D without FCR is more affordable, yet remains capable of employing Longbow Hellfire missiles autonomously or in cooperation with the FCR-equipped AH-64D. The Army acquisition strategy intends to upgrade 501 AH-64A Apaches in the fleet to the AH-64D configuration while equipping 227 aircraft with the FCR. This is an Acquisition Category IC program.

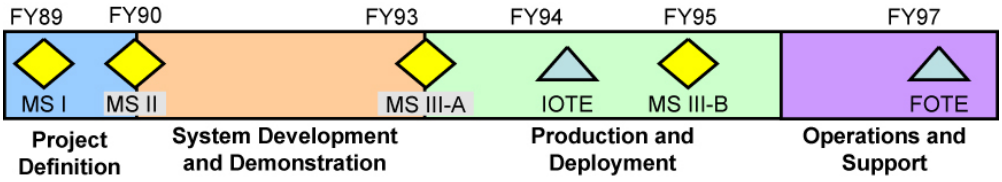
Due to operational needs, the Army is introducing the Combo-Pak internal auxiliary fuel system. The Combo-Pak consists of a 100 gallon, self-sealing, crashworthy fuel tank with a capacity for about 300 rounds of ammunition. The Combo-Pak replaces the baseline 1110 round ammunition package when installed.

As of August 2004, Boeing has delivered 367 AH-64D Longbow Apaches and scheduled 77 other airframes for conversion. The Army manages the conversion to AH-64D with a multi-year contract and considers production Lot 1 through Lot 6 as Block I aircraft. Block II aircraft begin with Lot 7 and include a Modernized Target Acquisition Designation System (M-TADS), upgraded processors, digital map, high frequency radio, and a digital data modem. The Army intends for the Block III configuration to have a significant increase in capability, as well as extending the service life of the current airframe. Planning is underway and funding committed to upgrade 284 current Block I aircraft out of the 501 AH-64D platforms to a Block III configuration. The Army plans to start fielding the Block III version in FY08.

During the past year, the Army deployed 50 AH-64A Apache and 128 AH-64D Longbow Apache aircraft to Afghanistan and Iraq. Both aircraft demonstrated remarkable survivability against enemy fire while conducting combat missions in harsh desert conditions. In spite of an intense operational tempo (37 flight hours per aircraft per month), both aircraft have maintained high mission capable rates. The mission-capable rate for the AH-64D Longbow Apache (0.84) was slightly higher than the mission capable rate for the AH-64A Apache (0.80).

The Army completed planned Live Fire Test and Evaluation (LFT&E) for the Longbow Apache in 1995, with the exception of the engine fire detection and suppression system test and the ballistic vulnerability testing of the new internal fuel and ammunition Combo-Pak. The Army initially deferred testing the fire detection and suppression system pending the expected introduction of a new Halon replacement, but will resume testing using Halon in FY05.

TEST AND EVALUATION ACTIVITY



Airworthiness and Flight Characteristics testing of Block I and Block II aircraft continued, but did not complete in FY04. The purpose of this testing is to accurately characterize the flight performance of all Longbow Apache aircraft.

The Army Aviation Test Directorate completed a Preliminary Airworthiness Evaluation of Block II aircraft in FY04. This testing supported evaluation of handling qualities, communications interoperability, and pilot workload of Block II aircraft. The Army has issued an airworthiness release and a conditional material release to support fielding of Block II aircraft.

The Army conducted technical testing of the Modernized Target Acquisition Designation System and the pilot's night vision sight at Yuma Proving Ground, Arizona, from January through March 2004.

The Army is currently preparing detailed test plans for the fire detection and suppression system and the Combo-Pak internal auxiliary fuel and ammunition system. The Army intends to use a fully-operational, though not flight-worthy, aircraft as the ground test vehicle for these tests.

TEST AND EVALUATION ASSESSMENT

The Airworthiness and Flight Characteristics testing of Block I aircraft confirms that the published performance charts for the AH-64D are in need of refinement. The Army is in the process of determining the magnitude and extent of the required changes. The Army reported no significant anomalies from the ongoing software regression testing.

DOT&E believes additional development and testing of Block II software and hardware is required. The Block II digital map display provides the potential for significant improvements in crew awareness of aircraft position and tactical situation. However, management of the display requires an excessive number of manual inputs, which forces the crew to have their heads down in the cockpit. The digital messaging capability is limited to low-volume air-to-air messages

between Block II aircraft. For instance, the Joint Variable Message Format Air Fire mission message does not work between the OH-58D Kiowa Warrior and AH-64D Lot 8 Longbow. The latency of digital messages, unrelated to voice communications, may sometimes be significant over both the Tactical Internet and the Fire Support protocals, but not readily apparent to the crew. Additionally, the airworthiness release for the aircraft states that present position and situational awareness icons should not be used to determine the disposition of friendly forces in a combat environment. This latent data will decrease confidence and situational awareness from both the aircrew and the air/ground commander's perspectives.

The Enhanced Position Location and Reporting System radio, fielded to one Longbow unit, assists with digital messaging, but also adds the potential for compromise of communications security during emergency shutdown. The improved image quality of the M-TADS/Pilot Night Vision System Forward Looking Infrareds will improve target acquisition and pilot capabilities. However, the Army must improve the Image Intensification sensor before it can be used to fly the aircraft safely. Additionally, the target tracker performance needs improvement and there is not yet enough data to estimate subsystem reliability.

The aircraft is currently operating with a Conditional Material Release (CMR). This CMR restricts full employment of the system for its intended use. With the exception of the Mission Display Processor reset problems, the Army has not corrected the deficiencies highlighted in the CMR in accordance with their "get well plan" for the system. The "get well plan" targeted September 30, 2004, as a completion date.