

Apache Block III (AH-64D)

Executive Summary

- In November 2009, the Army conducted the Apache Block III (AB3) Limited User Test (LUT) in support of a September 2010 Milestone C Low-Rate Initial Production (LRIP) decision.
- During the LUT, an Air Weapons Team consisting of two AB3 aircraft and the surrogate Unmanned Aircraft System (UAS) successfully completed nine of 12 missions in a realistic operational environment. The addition of the surrogate UAS provided the AB3 crew with increased situational awareness from remote and secure locations.
- The Army conducted developmental testing of subsystems including the improved drive system; composite main rotor blades; integrated aircraft survivability equipment; Fire Control Radar (FCR); and 701-D engine with enhanced electronic controls and weapons accuracy, performance, and integration.
- The Apache Program Office continues to implement its reliability growth program by investigating potential improvements to reliability of AB3 and legacy components.
- DOT&E approved an Alternative LFT&E strategy in February 2010.

System

- The AB3 is a modernized version of the AH-64D Attack Helicopter. The Army intends to organize the AB3 into 24 aircraft Attack/Reconnaissance Battalions assigned to the Combat Aviation Brigades.
- The Army's acquisition objective is for 690 AB3 aircraft: 634 remanufactured and 56 new builds.
- The AB3 aircraft include the following:
 - Level 2 through 4 UAS control - Level 2 receives UAS video feed; Level 3 controls the UAS sensors; and Level 4 controls the UAS sensors and flight.
 - Improved Radar Electronic Unit to provide Radio Frequency Interferometer passive ranging, extended Fire Control Radar range, and maritime targeting
 - Improved performance with 701D engines, composite main rotor blades, weight reduction through processor and avionics upgrades, and an improved drive system



- Enhanced survivability with integrated aircraft survivability equipment and additional crew and avionics armoring
- Enhanced communication capability with an integrated communication suite to meet global air traffic management requirements, which includes satellite communication and Link 16 (data link)
- Improved reliability and maintainability using embedded system-level diagnostics, improved electronic technical manuals, and reduced obsolescence

Mission

The Attack/Reconnaissance Battalions assigned to the Combat Aviation Brigade will employ the AB3 to conduct the following missions:

- Attack
- Movement to contact
- Reconnaissance
- Security

Major Contractors

- Aircraft: The Boeing Company Integrated Defense Systems – Mesa, Arizona
- Sensors and UAS datalink: Longbow Limited – Orlando, Florida and Baltimore, Maryland

Activity

- The Army conducted the AB3 LUT in November 2009 at the Yuma Proving Ground, Arizona, to support a September 2010 Milestone C LRIP decision. The testing was conducted in accordance with a DOT&E-approved Test and Evaluation Master Plan/test plan. During the LUT an Air Weapons Team consisting of two AB3 aircraft and the surrogate UAS

- successfully completed nine of 12 missions in a realistic operational environment.
- The Army conducted developmental and operational flight-testing of the AB3 Aircraft Survivability Equipment (ASE) suite in August 2009 in side-by-side testing of the AB3 ASE suite with the legacy Apache Block II ASE suite.

ARMY PROGRAMS

- As of September 30, 2010, the AB3 program completed 1,247 developmental ground and flight hours on five prototype aircraft. Testing included: laboratory and ground qualification for the improved drive system and the redesigned 30 mm gun system controller, tethered hover flight, aerial rocket firing, avionics integration, FCR performance and navigation accuracy, the Integrated Helmet and Display Sight System, and UAS interoperability.
- Following completion of the LUT, prototype aircraft were reconfigured with the AB3 drive train, 701-D engine, and new composite main rotor blades.
- The LFT&E strategy, approved February 2010, includes non-destructive, controlled damage, and selected ballistic (static and dynamic) live fire testing at the component, subsystem, and system level. The start of LFT&E has been moved to 2QFY11 to accommodate continued improved drive system testing on the Ground Test Vehicle that will be used for system level LFT&E.
- The AB3 Milestone C requirement is 2.3 hours between essential maintenance actions. Current point estimates for reliability are 3.14 hours based on developmental flight testing and 2.6 hours based on the LUT. This indicates the AB3 program is on the projected growth curve for achieving reliability requirements.
- The integrated AB3 ASE suite improves pilot understanding of threat locations and provides new capability to locate and target threat systems.
- Mission planning tools do not allow creation of a flight plan for the UAS or multiple frequency settings for the ARC-231 radios.

Assessment

- The Army demonstrated in a realistic operational environment that teaming AB3 with a surrogate UAS provides the AB3 crew with increased situational awareness from remote and secure locations.
- The AB3 attained a Hover Out-of-Ground Effect capability that was approximately 99 percent of the required hover performance requirement. The 1 percent shortfall would have little operational impact.
- Initial FCR testing indicated performance comparable to that of the legacy FCR in most operating modes. However, the FCR generated excessive false targets in some operating modes.
- During the LUT, the Integrated Helmet and Display Sight System helmets did not fit well and limited the pilots' visibility of the Helmet Display Unit (HDU) imagery.

Recommendations

- Status of Previous Recommendations. Per the two FY09 recommendations, the Army continues to look for and implement reliability improvements on baseline and AB3 components as well as look for opportunities for test articles to support earlier Live Fire test events.
- FY10 Recommendations. The program should:
 1. Implement planned AB3 weight reduction initiatives, such as the Lightweight Hellfire Launcher.
 2. Continue FCR performance testing with hardware and software fixes in place to confirm that performance deficiencies have been resolved.
 3. Continue to refine the procedures for initiation of the Tactical Common Data Link between AB3 and UAS systems.
 4. Continue integration with mission planning software to facilitate full AB3 functionality and adequate operational mission planning.
 5. Test the AB3 with the MQ-1C Gray Eagle UAS using Soldiers at the earliest opportunity.