E-3 Airborne Warning and Control System (AWACS)

The E-3B/C Airborne Warning and Control System (AWACS) is a commercial Boeing 707-320C airframe modified with an AN/APY-1 or AN/APY-2 radar. It is equipped with generalized and specialized mission computers, multipurpose displays, and clear and secure multiple-voice and data link communications. The United States has 33 E-3B/Cs assigned to Air Combat Command, Pacific Air Forces, and Air Force Material Command. AWACS has been employed in support of joint and multinational operations around the world since the late 1970s. NATO, the United Kingdom, France, and Saudi Arabia also operate variants of the E-3B/C. Finally, Japan operates a variant of the E-3B/C installed on a 767.

Block 40/45 will replace the aging AWACS computer system and the operator terminals with a network of commercial off-the-shelf operator workstations linked to several commercial off-the-shelf computers. A Gigabit Ethernet Local Area Network that adds digital communications for control of the radios, and for internal communications, will connect these computers. Block 40/45 will provide theater commanders enhanced surveillance and control capabilities while contributing to information superiority needed to control the battlespace. In addition, it will improve E-3B/C reliability and availability.

Block 40/45 upgrades will enable the Air Force to incorporate several necessary improvements to AWACS functionality including multisource integration, increased electronic support measures system memory, integration of the Intelligence Broadcast System, and data link infrastructure. These improvements will be achieved through new tracking algorithms, software control of the communications subsystem, improved human-machine interfaces, and reduced data link latency. The Block upgrade, which supports continued improvements to E-3B/C information correlation functions that will enable the E-3B/C to support the Single Integrated Air Picture, will extend AWACS capabilities through the 2025-2035 timeframe.

TEST & EVALUATION ACTIVITY

The Air Force established a Block 40/45 Test and Evaluation Working Integrated Product Team that produced a Test and Evaluation Master Plan, which DOT&E approved in May 2003.

TEST & EVALUATION ASSESSMENT

Re-hosted radar software led to problems during the E-3B/C Radar System Improvement Program. The problems were due to inadequate protection of aircraft radar hardware under certain operating conditions and degradation of the long-range detection and tracking performance of the beyond-the-horizon radar. Both issues have been corrected, and steps were taken in both the ground and air test procedures to prevent recurrences. The Block 40/45 program will require re-hosting significantly more software. DOT&E will work with the Air Force Operational Test and Evaluation Center and the Block 40/45 program to prevent a repetition of the types of problems experienced with the Radar System Improvement Program.

Block 40/45 upgrades will enable the Air Force to incorporate several necessary improvements to the Airborne Warning and Control System including multi-source integration, increased electronic support measures system memory, integration of the Intelligence Broadcast System, and data link infrastructure.