

C-130 Avionics Modernization Program / Common Avionics Architecture for Penetration (C-130 AMP/CAAP)

Executive Summary

- Since 1999, six program offices, in addition to the C-130 systems group, and two major Air Force commands have been responsible for this program. This has created nearly continuous programmatic and managerial challenges, including major technical and schedule risks.
- The C-130 Avionics Modernization Program (AMP)/Common Avionics Architecture for Penetration (CAAP) acquisition strategy has been out of date for two years. A current and credible acquisition strategy and test program are essential to the success of this program. The test program has an unresolved need for production representative test articles.
- The Air Force needs to submit an update to the Test and Evaluation Master Plan (TEMP).

System

- Legacy C-130s (excluding the C-130J) are four-engine turboprop aircraft used by the Air Force, Navy, Marines, and Special Operations units. Crew size varies from 4 to 13 depending on aircraft mission.
- The AMP adds glass cockpits, integrated digital avionics, and an integrated defensive systems suite. It also provides Communications, Navigation, and Surveillance (CNS) capabilities for Air Traffic Management (ATM) functions.
 - Special Operations aircraft build upon the AMP foundation and add CAAP functionality, to include secure communications, enhanced situational awareness, and Terrain Following/Terrain Avoidance capability.
 - Combat delivery C-130 AMP aircraft have six pallet positions.
 - See the table on the next page for C-130 AMP variants and associated special tests, listed by Mission Design Series (MDS).

Mission

- Units equipped with the C-130 primarily perform the tactical portion of the airlift mission, flying shorter distances and using austere airfields within combat zones.



- Combat Delivery includes:
 - Airdrop of paratroopers and cargo (palletized, containerized, bulk, and heavy equipment)
 - Airland delivery of passengers, troops, and cargo
- Specialized missions for C-130 variants include:
 - Covert operations
 - Aerial and rapid ground refueling
 - Emergency aeromedical evacuation
 - Combat search and rescue
 - Weather reconnaissance
 - Fire-fighting
 - Natural disaster relief
 - Antarctic sustainment and re-supply missions

Activity

- The Air Force Operational Test and Evaluation Center (AFOTEC) developed a test concept for the C-130 AMP and CAAP OT&E activities based on an acquisition strategy that is out of date.
- The first flight of a C-130 H2 developmental test aircraft occurred on September 19, 2006.
- An integrated government/contractor test team is performing developmental test flights. AFOTEC personnel will

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participate as part of the government contingent in preparation for an AMP OT&E

- A low-rate initial production decision (Milestone C) for both AMP and CAAP should have occurred in February 2006 as part of the original acquisition strategy. It did not take place. Full-rate production decisions for both the AMP and CAAP were to be in mid-2008 and late 2008, respectively. Without an approved acquisition strategy, it is unknown when the milestone or full-rate production decisions are planned.
- AFOTEC postponed an operational assessment of the AMP to support a Milestone C decision. AFOTEC tasks will be reassessed after a new acquisition strategy has been approved.

Assessment

- DOT&E approved a C-130 AMP/CAAP TEMP in September 2002 based upon the original acquisition strategy. The approval required an update to the TEMP prior to the start of developmental testing because of program changes that affected the sequence, scope, and duration of planned tests. The update has not been submitted.
- Impacts on test resources and test planning have been significant due to funding issues, engineering change proposals, and changes to the pool of aircraft to be modified.
- AFOTEC's original test concept requires a revision following adoption of a new AMP acquisition strategy.
- There are programmatic and oversight challenges. Besides the C-130 systems group, six other program offices and two major Air Force commands are responsible for the basic C-130 AMP/CAAP. Many of the candidate aircraft are in Air National Guard and Air Force Reserve units.

- Major issues include:
 - Mitigating technical and schedule risks
 - Establishing multiple full-rate production decision dates
 - Determining low-rate initial production quantities
 - Updating of the Operational Requirements Documents
 - Approving an adequate TEMP
- Production representative aircraft in appropriate mission configurations are required for adequate operational testing of the C-130 AMP variants.

Recommendations

- Status of Previous Recommendations. Both of the FY05 recommendations remain valid.
 - FY05 #1: Because of the technical and programmatic challenges of the C-130 AMP, DOT&E recommended that a comprehensive review of developmental and operational test and evaluation lessons learned from the C-5 AMP should be applied.
 - FY05 #2: DOT&E recommended in the 2004 and 2005 Annual Reports that since the acquisition strategy and the testing and evaluation strategy were not consistent, a rationalization of the program should be completed before the Special Operations Force demonstration flights began in March 2005. A credible acquisition strategy is essential prior to TEMP approval. Neither the rationalization nor the acquisition strategy were provided.
- FY06 Recommendation.
 1. The Air Force should submit an updated TEMP based on a credible acquisition strategy.

Mission Design Series	Nomenclature	Special Tests
C130/H/H1/H2/H3	Combat Delivery	CNS/ATM Capabilities, Traffic Alert and Collision Avoidance System, Terrain Awareness Warning System, Night Vision Imaging System, Flight Management System
AC-130H/U	Gunship	Gunfire Accuracy, Enhanced Situational Awareness, Defensive Systems
EC-130H	Compass Call	Mission Unique
HC-130N/P	Combat Rescue	Mission Unique
MC-130H	Combat Talon II	Terrain Following/Terrain Avoidance Navigation, Enhanced Situational Awareness, Defensive Systems
MC-130P	Combat Shadow	Mission Unique
LC-130H	Ski	Mission Unique