

C-130J AIRLIFT AIRCRAFT



The C-130J Hercules II is a medium-range, tactical airlift aircraft designed primarily for the transport of cargo and personnel within a theater of operations. The cargo area can adapt to accommodate a combination of passenger, cargo, and/or aeromedical airlift missions. Variants of the C-130J will perform missions such as psychological operations (EC-130J), weather reconnaissance (WC-130J), and aerial refueling (KC-130J).

The C-130J retains many structural characteristics of the C-130H, having the same overall interior/exterior dimensions. However, the C-130J is more than 70 percent unique, relative to previous models. Significant differences include an advanced integrated digital avionics system, a redesigned flight station intended to facilitate a two-person cockpit, a new propulsion system intended to provide improved take-off, climb and cruise performance, and cargo compartment enhancements.

BACKGROUND INFORMATION

The C-130J aircraft is a contractor-initiated improvement upon the C-130H-3. The United Kingdom, Australia, and Italy have purchased variants of the C-130J design. Creation of a C-130J acquisition program within DoD was directed to provide U.S. Air Force oversight of aircraft development. The C-130J aircraft procurement is proceeding under a commercial acquisition strategy.

Contractor DT&E commenced in spring 1996 and will likely continue through 2003. DT&E has focused on the satisfaction of aircraft requirements defined in the Model Specification. Government Qualification Test and Evaluation has occurred in two formats. Initially, it evaluated designated military utility issues. Subsequently, a Follow-On Test Program was established by the Air Force to permit evaluation of incremental development progress as well as formation airdrop, the towed-parachute retrieval system, defensive systems, and survivability.

DOT&E designated the C-130J aircraft for LFT&E Oversight in May 1995. In March 1998, the Director of OT&E and the Assistant Secretary of the Air Force agreed to a LFT&E program that addresses wing dry bay fire, composite propeller ballistic vulnerability, wing fuel tank hydrodynamic ram effects, engine and engine bay fires, vulnerability to man-portable air defense systems threats, and mission abort vulnerability. The agreement established a joint DOT&E/Air Force C-130J LFT&E program that takes advantage of testing and evaluation under both the DOT&E funded Joint Live Fire (JLF) program for the C-130E/H and the Air Force funded C-130J (LFT&E program) vulnerability

reduction program. The JLF program addresses potential vulnerabilities of wing fuel tanks to hydrodynamic ram impact and mission abort vulnerability. A TEMP describing the program was submitted to and approved by DOT&E in July 1999.

The Federal Aviation Administration (FAA) awarded Lockheed Martin a Type Certificate for a commercial version of the C-130J-30 aircraft (a stretch model designated as the 382J, which currently exists only on paper) on September 9, 1998. However, significant C-130J and C-130J-30 military requirements are not included in the FAA certification. This necessitates additional testing by the Air Force and other U.S. government users.

TEST & EVALUATION ACTIVITY

Qualification testing for mission software Version 5.3 was completed in May 2001. A number of deficiencies were identified for corrective action and retest. Operational testing of Version 5.4 is now scheduled for late CY04. The OT test team will test the interim versions as they are released. The operational test plan is being revised to reflect the current structure of the test program.

Contractor developmental testing and Air Force regression testing included airdrop testing at Edwards AFB and Pope AFB, with the support from the Army at Ft. Bragg.

Live Fire Test and Evaluation Phase 2 (composite blade testing) has finished testing and the team is in the process of analyzing the data. Phase 3 (manpads assessment) is complete. Engine nacelle testing has been funded (phase 4) and planning has started.

TEST & EVALUATION ASSESSMENT

Issues confronting the C-130J program have included: (1) logistics support and training systems funding; (2) delayed FAA certification; (3) hardware, software, and technical order deficiencies; (4) manufacturing quality; (5) sub-system reliability; (6) failure to meet required measures of system effectiveness and suitability; (7) lead command responsibilities; (8) resolution of documented deficiencies; (9) schedule credibility; and (10) parallel development of numerous variants to the basic platform.

These issues will continue to affect the program as it progresses through developmental testing and moves toward the final phase of operational testing and concurrent delivery of aircraft to selected users undergoing unit conversion training. Operational capabilities will be limited for the foreseeable future.

The overriding shortfall has been in software development and integration. A second critical issue impacting both OT&E and user implementation has been the lack of funding for logistics support and training systems. Future logistics shortfalls appear likely to render the C-130J not operationally supportable. Interim contractor support, repairable items, logistics and maintenance data, and maintenance training will all be degraded. These shortfalls will limit operational deployment of the C-130J.

Based on the evaluation test results, the aircraft is not operationally effective for the airland mission. Aircrew workload issues, software discrepancies, and cargo loading and constraint requirements were major contributors. The using command is unable to verify manpower requirements

to field this system until the crew workload evaluation is complete. Since the 400 lb paratrooper discrepancy has been lifted, paratroop airdrop testing has commenced. Airdrop evaluation is ongoing.

In addition, the aircraft is assessed as not suitable. The reliability, maintainability, availability, and logistics supportability demonstrated during Phase 1B were below operational requirements. Deficiencies were noted with on-aircraft integrated diagnostics and fault isolation systems, portable maintenance aids, maintenance technical orders, and availability of spare parts. Additional contractor field service representatives will be required to assist in the maintenance of the aircraft for the foreseeable future.

Although Block Upgrade 5.3 showed improved navigation functions, flight displays, technical publications, and reduced nuisance faults, there remains a large number of open deficiency reports that need to be resolved to achieve operational capability. Testing of full operational capability will not occur until the delivery of the Block 5.4 upgrade (Phase 2).

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