

# AIR FORCE PROGRAMS

## C-130J Family of Aircraft

### SUMMARY

- Lockheed Martin initially developed specific versions of the C-130J for the British Royal Air Force and the Royal Australian Air Force.
- Approximately 70 percent of the U.S. variants represent new development and system integration relative to the legacy C-130s flying today.
- The C-130J was neither operationally effective nor operationally suitable in its Initial Operational Test and Evaluation (IOT&E) Phase I.
- The Air Force intends to deploy the C-130J to Central Command early in FY05, before the completion of IOT&E Phase II. Capabilities are limited.
- The C-130J Test and Evaluation Master Plan is being updated for approval in early FY05.
- C-130J operational testing will likely continue past 2008 as the program shifts to spiral development.
- There are no milestone decision reviews planned for any variant of the C-130J.



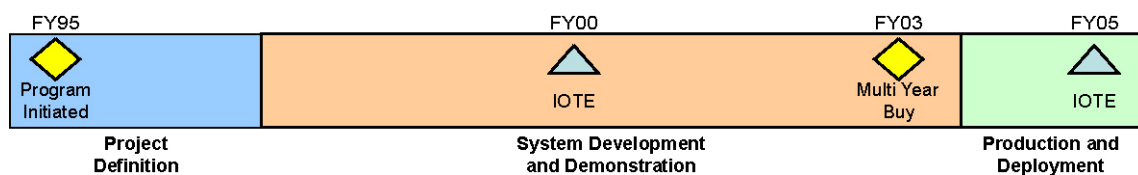
*The basic C-130J is a medium-range, tactical airlift aircraft designed primarily for the transport of cargo and personnel within a theater of operations.*

### SYSTEM DESCRIPTION AND MISSION

The basic C-130J 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 passengers, cargo, and/or aeromedical airlift missions. Variants of the C-130J are intended to perform missions such as fire fighting, weather reconnaissance (WC-130J), electronic combat (EC-130J), and aerial refueling (KC-130J). The combat delivery C-130J has more than 70 percent new equipment, relative to previous C-130 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 handling system enhancements. The Air Force intends to deploy the C-130J to Central Command early in FY05, before the completion of IOT&E Phase II. Capabilities are limited.

DOT&E designated the C-130J aircraft for Live Fire Test and Evaluation (LFT&E) oversight in May 1995 and approved the Test and Evaluation Master Plan in July 1999. Threats include man-portable air defense systems, surface-to-air missiles, anti-aircraft artillery, air-to-air missiles, rockets, and small arms. The C-130J LFT&E vulnerability reduction program addresses wing dry bay fire, composite propeller blade ballistic vulnerability, engine and engine bay fire, vulnerability to man-portable air defense systems threats, and mission-abort vulnerability.

### TEST AND EVALUATION ACTIVITY



# AIR FORCE PROGRAMS

Due to system immaturity, operational testing was initially segmented into three phases: Phase 1A, Phase 1B, and Phase 2. Phase 1A evaluated the ability of the aircraft to train pilots. Phase 1B evaluated the aircraft's ability to perform the airland mission. Phase 2, planned for FY06, will evaluate all combat delivery capabilities, including airdrop using the Enhanced Cargo Handling System.

Block 5.4 modifications are now designated as the production representative version, with operational testing scheduled for early FY06. Block 6.0 will include Communications, Navigation, and Surveillance for Air Traffic Management (CNS/ATM) capabilities, while Block 7.0 is undefined at this time. Many documented deficiencies will not be corrected until Block 6.0 or 7.0.

There were no Vulnerability Reduction Program activities in FY04. The Air Force delivered the Vulnerability Reduction Program Phase II (Composite Propeller Vulnerability) Test Report to DOT&E in June 2004. Phase IV (Engine Nacelle Fire Extinguishing Evaluation) testing is scheduled for FY05.

## TEST AND EVALUATION ASSESSMENT

### C-130J

Major issues confronting the C-130J program include funding of logistics support and training systems; hardware, software, and technical order deficiencies; manufacturing quality; sub-system reliability; failure to meet required measures of system effectiveness and suitability; and resolution of documented deficiencies. A program for the correction of deficiencies is being worked.

Based on the evaluation of test results from Phase 1A and Phase 1B, the aircraft is not operationally effective. However, the Air Mobility Command has released a limited cargo carrying capability based on results from a command-initiated Force Development Evaluation. The airdrop mission cannot be evaluated until deficiency corrections are implemented and the developmental and operational tests are completed as planned in FY06.

Aircrew workload issues, software discrepancies, and cargo loading and constraint requirements are still major issues. Air Force users are unable to verify manpower requirements to field this system until the crew workload evaluation is complete. Army developmental and operational test and evaluation for airdrop of cargo and personnel are now scheduled using Block 5.4 hardware and software. Air Force operational test and evaluation requires the completion of Army testing prior to start.

DOT&E determined that the aircraft is not operationally suitable. Phase 1B reliability, maintainability, availability, and logistics supportability results failed to meet operational requirements and legacy standards. Deficiencies were noted with on-aircraft integrated diagnostics and fault isolation systems, portable maintenance aids, maintenance technical orders, and the availability of spare parts. Additional contractor field service representatives are required to assist in the maintenance of the aircraft for the foreseeable future.

DOT&E determined that testing of defensive systems has not demonstrated their effectiveness and suitability. An integrated system-level test is required to characterize system capability. However, the Air Force intends to deploy the C-130J to Central Command early in FY05, before the completion of IOT&E Phase II and the integrated defensive system test. Capabilities are limited to airland operations.

Phase II of the Live Fire Vulnerability Reduction Program showed that the C-130J composite propeller blades are not vulnerable to catastrophic threat-induced failure. Completion of Phase IV testing will conclude Vulnerability Reduction Program testing.

### WC-130J

Three major issues confront the weather reconnaissance aircraft. They are the radar performance in the hurricane reconnaissance mission, propeller anti-ice protective cover peeling, and excessive vibration in the Drop Sonde Operator's station.

The low power color radar was designed as a weather-avoidance radar, but it was installed in the WC-130J to perform the weather penetration mission. The radar does not fully support operational requirements for the weather mission. The

## AIR FORCE PROGRAMS

program office has developed, but not fully funded, a spiral improvement plan to correct this critical deficiency. Developmental testing is being conducted, and if successful, operational testing will start in June 2006.

A proposed fix to the propeller problem has been installed on test aircraft. The fix must be tested in a hurricane environment, with some data being collected during the 2004 storm season. Integrated System Evaluations and combined developmental/operational test on the low power radar and propeller petal fixes are in progress. If the modifications are successful, then the next phase of OT&E can be performed on the WC-130J in storm season 2005. A possible fix to the excessive vibration problem is included in the Block 5.4 upgrade. Operational testing is planned for Fall 2005.

