

AC-130J Ghostriider

Executive Summary

- U.S. Special Operations Command (USSOCOM) is developing AC-130J through the integration of a modular Precision Strike Package (PSP) onto existing MC-130J aircraft. The PSP was previously developed and tested on several AC-130W aircraft since 2009.
- Modification of the first aircraft is underway and expected to be complete by the end of FY13 to support first flight in January 2014.
- The Test and Evaluation Master Plan (TEMP) submitted for Milestone B requires updates to reflect a new test and evaluation concept for IOT&E and a plan for testing intended future capabilities.
- The Live Fire Alternative Test Plan (ATP) will provide the data to assess differences in AC-130J survivability from that of the existing MC-130J aircraft given the changes in AC-130J systems (e.g., addition and location of the PSP), missions, and respective threat environments. The assessment will leverage comparable live fire, developmental, and operational test data from previously assessed C-130 legacy platforms, including the U.S. Marine Corps KC-130J Harvest Hawk.

System

- The AC-130J is a medium-sized, multi-engine, tactical aircraft with a variety of sensors and weapons for air-to-ground attack.
- USSOCOM is developing AC-130J through the integration of a modular PSP onto existing MC-130J aircraft. The AC-130J will retain the ability to be refueled in flight, but it will not retain the external hose-and-drogue pods used to refuel other aircraft.
- The PSP provides a weapons suite composed of a 30 mm side-firing chain gun; wing-mounted, GPS-guided Small Diameter Bombs; and Griffin laser-guided missiles mounted internally and launched through the rear cargo door. Future increments of AC-130J may incorporate a side-firing 105 mm howitzer and wing-mounted, laser-guided Hellfire missiles.
- The PSP also provides an Intelligence, Surveillance, and Reconnaissance suite composed of two electro-optical/infrared sensor/laser designator pods; a synthetic aperture radar pod; a pilot helmet-mounted cueing system; and multiple video, data, and communication links. All PSP subsystems are controlled from a dual-console Mission Operator Pallet in the cargo bay.
- The AC-130J retains all survivability enhancement features found on the HC/MC-130J aircraft. Susceptibility reduction



features include the AN/ALR-56M radar warning receiver, AN/AAR-47(V)2 missile warning system, and AN/ALE-47 countermeasures dispensing system. Vulnerability reduction features include fuel system protection (fuel tank foam to protect from ullage explosion), redundant flight critical components, and armor for crew and oxygen supply protection.

- The AC-130J will replace legacy AC-130H/U aircraft.

Mission

The Joint Task Force or Combatant Commander will use:

- The AC-130J to provide persistent strike operations, including close air support (CAS), air interdiction, and armed reconnaissance. These operations may also include time-sensitive CAS for troops in contact, helicopter/convoy escort, air base defense, and strike coordination and reconnaissance.
- The AC-130J sensor, data, and communications suite to provide battlespace-wide area surveillance and situational awareness; execute non-traditional Intelligence, Surveillance, and Reconnaissance operations; and support combat search and rescue operations.

Major Contractor

Lockheed Martin – Bethesda, Maryland

Activity

- DOT&E approved the Milestone B TEMP and the live fire ATP in May 2013. DOT&E developed a test and evaluation concept to guide the Milestone C TEMP update and IOT&E plan.
- The Air Force delivered the first MC-130J for conversion to an AC-130J to Eglin AFB in January 2013. Modification of the aircraft is ongoing with first flight planned for January 2014.

- The program conducted a Preliminary Design Review in March 2013 and a Critical Design Review in August 2013.
- The Integrated Test Team Working Group conducted its first Certification of Operational Test Readiness review in April 2013.
- The LFT&E Integrated Product Team (IPT) held its first meeting in September 2013. The IPT started an initial qualitative assessment of AC-130J survivability based on existing developmental, live fire, and operational test data. The IPT agreed to report on the applicability of prior data while considering any changes in AC-130J concept of operations/employment relative to legacy platforms.

Assessment

- USSOCOM has been developing and testing three increments of the PSP with increasing capabilities on the AC-130W aircraft since 2009. Experience on the AC-130W will provide risk reduction for development of the AC-130J. However, it is not clear whether the Air Force has collected sufficient reliability data on the AC-130W to augment the limited data to be collected during AC-130J testing.
- The Milestone B TEMP and the LFT&E ATP do not include any follow-on testing for intended future capability increments, such as a 105 mm side-firing gun or Hellfire missiles. Future capabilities will be included in the Milestone C TEMP update.
- To support the survivability assessment, USSOCOM will develop a list of AC-130J operational/tactical scenarios in projected theaters to include any low-level missions and relevant expected threats. The LFT&E IPT requires operator-defined scenarios for the AC-130J survivability assessment to show traceability from operational scenarios to realistic threats and associated testing and analyses.
- Armor requirements and the amount of armor differ significantly between the AC-130U and AC-130J aircraft. The AC-130U armor was designed to provide protection to the aircrew stations, personnel, ammunition, and critical systems against a single 37 mm high-explosive incendiary round at a range of 10,000 feet while the AC-130J's primary

crewmember positions and oxygen supplies should be protected against single 7.62 mm ball projectile at 100 meters (threshold). The Program Office will provide a rationale behind this difference to DOT&E and other members of the LFT&E IPT. The LFT&E IPT will quantify the effects of these changes on the survivability of the AC-130J for realistic threats.

- The planned armor layout on the AC-130J does not include the Mission Operator Pallet, which should be considered a "primary crewmember" position and protected in accordance with the associated Force Protection Key Performance Parameter (KPP).
- The Survivability KPP states that the AC-130J defensive systems will use spiral development to meet the threshold MC-130J Commando II capabilities established in the draft Commando II Capability Development Document. It will not be possible for the program or DOT&E to evaluate this KPP unless the Commando II capabilities are more explicitly stated.

Recommendations

- Status of Previous Recommendations. This is the first annual report for this program.
- FY13 Recommendations.
 1. The Program Office should update the TEMP and the ATP to reflect intended future capabilities and related follow-on testing as well as modified IOT&E conditions based on the DOT&E test and evaluation concept.
 2. The Program Office should collect and provide DOT&E with all available reliability data on the AC-130W that can augment the suitability evaluation for AC-130J.
 3. The survivability evaluation scenarios that USSOCOM will develop should differentiate between the current increment of capabilities and intended employment as well as planned future capability increments and intended employments (e.g., new weapons/defensive systems).
 4. The test team should identify the data needed to successfully run and verify the models used in support of the overall survivability assessment.