F-22A – Advanced Tactical Fighter

Executive Summary
- The F-22A successfully demonstrated air-to-ground mission roles capability during Follow-on Test and Evaluation (FOT&E) using 1,000-pound Joint Direct Attack Munitions.
- Many of the deficiencies highlighted in IOT&E were resolved, but additional deficiencies in air-to-ground weapons integration and defensive avionics suite capabilities were identified in follow-on testing.
- Defensive avionics deficiencies highlighted in user tests suggest the need for a comprehensive approach to address defensive suite shortfalls and assess improvements in follow-on test venues commensurate with follow-on F-22A operational flight program software releases.
- Modest improvements in some suitability measures were observed, but sortie generation capability remains hampered by low diagnostics accuracy, long repair times, and subsystem reliability that does not meet user requirements.

System
- The F-22A is an air superiority fighter that combines low observability to threat radars, sustained high speed, and integrated avionics sensors.
- F-22A low observability reduces threat capability to engage with current weapons.
- It maintains supersonic speeds without the use of an afterburner.
- Avionics that fuse information from the Active Electronically Scanned Array radar, other sensors, and data-linked information for the pilot enable employment of medium- and short-range air-to-air missiles and guns.
- It is intended to be more reliable and easier to maintain than current fighter aircraft.

- Its air-to-air weapons are the AIM-120C radar-directed missile and the AIM-9M infrared-guided missile.
- Its air-to-ground precision strike capability consists of two 1,000-pound JDAMs.
- The F-22A program is designed to deliver capability in increments.

Mission
- A unit equipped with the F-22A should be able to:
  - Provide air superiority over friendly or enemy territory
  - Defend friendly forces against fighter, bomber, or cruise missile attack
  - Escort friendly air forces into enemy territory
- Its air-to-ground capability includes counter-air, strategic attack, counter-land, and eventually, enemy air defense suppression missions.

Activity
- The Air Force Operational Test and Evaluation Center (AFOTEC) completed the first F-22A FOT&E in December 2005. Testing assessed F-22A air-to-ground mission capability using the 1,000-pound variant of the JDAM.
- Air Combat Command completed a series of user Force Development Evaluation (FDE) tests in January 2006 aiding in tactics development and assessment of F-22A defensive avionics suite capabilities.

Assessment
- At the conclusion of IOT&E in December 2004, DOT&E determined that the F-22A was operationally effective in the air-to-air mission role but not operationally suitable. AFOTEC FOT&E and Air Combat Command FDE testing conducted in FY05-06 led to the DOT&E determination that the F-22A was operationally effective in the air-to-ground mission role against fixed targets using JDAMs. However, the F-22A is still not operationally suitable.
- AFOTEC FOT&E and Air Combat Command FDEs revealed that:
  - The F-22A is operationally effective at air-to-ground missions against fixed targets and has resolved many of the deficiencies found in IOT&E.
  - Additional deficiencies were found in air-to-ground weapons integration that need to be addressed in future development efforts. Improvements require evaluation in follow-on operational testing.

- Air Combat Command FDE results highlighted shortfalls in defensive avionics suite capabilities to include threat identification, system response time, symbology resolution, and reliability. These shortfalls affect fundamental aspects of effectiveness in the operational environment in which the F-22A performs.

• While there were modest improvements in a few suitability measures, sortie generation capability is still hampered by low diagnostics accuracy, long repair times, and subsystem reliability that does not meet user requirements.

Recommendations

• Status of Previous Recommendations. FY05 recommendations to address IOT&E test limitations, as well as test the F-22A against adversary aircraft and other threat systems representative of the intended operational environment, are being incorporated in the AFOTEC FOT&E testing scheduled for FY07.

• FY06 Recommendation.

1. The Air Force should pursue a comprehensive approach to address the defensive avionics suite shortfalls and assess improvements in FOT&E and FDE venues commensurate with follow-on F 22A operational flight program software releases.