

## E-8 Joint Surveillance Target Attack Radar System (JSTARS)

### Executive Summary

- The Qualification Operational Test and Evaluation (QOT&E) intends to test the Joint Surveillance Target Attack Radar System (JSTARS) Block 30 upgrades. The Air Force Operational Test and Evaluation Center (AFOTEC) has scheduled the OT&E for late FY08 or early FY09.
- Major upgrades to the JSTARS E-8C aircraft, including the Enhanced Land Maritime Mode (ELMM) / Advanced Radar Modes (ARM) capabilities, require operational testing beyond the planned QOT&E.
- The Air Force needs to write a new Test and Evaluation Master Plan (TEMP), which defines the test and evaluation strategy for the ongoing JSTARS modernization program.



### System

- JSTARS E-8C is an airborne target acquisition and tracking system.
- JSTARS consists of an Air Force E-8C aircraft, Army and Marine JSTARS Common Ground Work Stations, and a Surveillance and Control Data Link connecting them.
- JSTARS has Moving Target Indicator Radar and Synthetic Aperture Radar systems; a High Frequency, Ultra-High Frequency, and Very-High Frequency Satellite Communications suite; a multi-data link capability; 18 operator workstations; and an air refueling capability.

- The Block 30 upgrade adds an air-to-ground attack support upgrade, which includes Airborne Command and Control Center (ABCCC) replacement software and hardware.

### Mission

- Air and ground commanders use JSTARS for battlefield surveillance, ground-to-ground and air-to-ground battle management, and intelligence indications and warnings.
- Warfighting commanders use JSTARS to find, detect, track, and classify time-sensitive moving and stationary ground targets.

### Activity

- Ground and laboratory testing of JSTARS upgrades took place during much of FY07 while the JSTARS test aircraft was in scheduled maintenance from January to May 2007.
- Initial flight-testing began on the ELMM/ARM upgrade, which consists of new radar modes, a new tracking algorithm, nearly one million lines of additional software code, a new processor, and a new concept for maritime operations.
- The JSTARS program made modifications to operator manuals and the concept of operations to address shortfalls in conducting Close Air Support and alternate Air Support Operations Center missions.
- The test plan for the re-engining of the JSTARS E-8C aircraft is in development. The Air Force is planning flight tests with the new engines during FY09, and the first jet is to receive the new engines during 2QFY09.
- The 116th Air Control Wing and AFOTEC conducted a combined test force assessment of Attack Support Upgrade (Phase II) from June through August 2007. AFOTEC compiled operational exercise results and the final report is in signature coordination.

- The Air Force assigned the 605th Test and Evaluation Squadron (TES) to operationally test many of the upgrades to the JSTARS E-8C. The 605th TES will specifically address the operational issues coming from the warfighters, including tactics development, concept of operations, operational employment, and training.

### Assessment

- JSTARS continues to provide commanders with surveillance and situational awareness within the battlespace that was not available without JSTARS. The Air Force distributed the decommissioned ABCCC capabilities to other airborne systems, of which JSTARS was one. However, JSTARS aircrews could not effectively conduct all mission tasks previously assigned to a cancelled ABCCC system.
- The ELMM/ARM upgrade to JSTARS is significant in cost and scope, and requires operational testing. This upgrade is designed to enable JSTARS to find, fix, and track targets in a maritime environment using a joint concept of operations

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with the Navy. Thus far, no operational test concept has been developed and submitted for approval.

- The modifications to fix the shortfalls in conducting Close Air Support, alternate Air Support Operations Center missions, and radio problems require operational testing. AFOTEC will conduct this OT&E during the QOT&E in FY08 or FY09.
- After 18 months the Marine Corps and Army have failed to review and codify their JSTARS requirements.

### Recommendations

- Status of Previous Recommendations. DOT&E recommended that the Air Force operationally test the ELMM / Affordable Moving Surface Target Engagement (AMSTE) and battle management upgrades and update the TEMP (FY06). The

Air Force has reassessed the AMSTE upgrade, and has informally decided to eliminate that capability upgrade. The Air Force has been working to update the JSTARS TEMP (FY06). The Services have not formally reviewed or evaluated whether current and planned upgrades to JSTARS meet their warfighting requirements and enhance the ability to conduct their missions (FY06).

- FY07 Recommendations.
  1. The Air Force should operationally test the ELMM/ARM upgrades utilizing a joint concept of operations developed with the Navy.
  2. The Air Force must write a new TEMP, which defines the test and evaluation strategy for the JSTARS modernization program.