

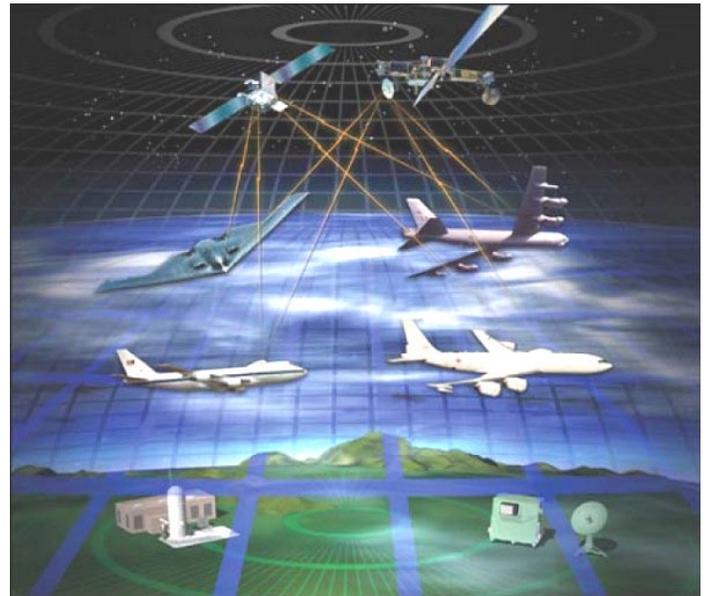
## Family of Advanced Beyond Line-of-Sight Terminals (FAB-T)

### Executive Summary

- The Air Force Operational Test and Evaluation Center (AFOTEC) conducted an Operational Assessment (OA-1) of the Family of Advanced Beyond Line-of-Sight Terminals (FAB-T) during contractor testing. The OA examined an engineering development model (EDM) terminal operating in the contractor's System Integration Laboratory (SIL). Due to software and integration issues, the assessment was limited to a demonstration that the FAB-T EDM could successfully log on to an operational Military Strategic, Tactical, and Relay (Milstar) satellite.
- AFOTEC conducted a second Operational Assessment (OA-2) in the 4QFY09. Developmental flight tests aboard the testbed aircraft in advance of OA-2 have shown the EDM terminal to be capable of over-the-air communication with other FAB-T terminals through the Milstar satellite.

### System

- FAB-T is an evolutionary acquisition program intended to provide a family of beyond line-of-sight satellite communications (SATCOM) and line-of-sight terminals.
- FAB-T consists of ground and aircraft qualified terminals with the capability to move large amounts of information to and from ground installations and airborne platforms.
- Depending on the terminal configuration, capabilities may include transmission and reception of voice, data, imagery, and video as well as broadcast reception over protected and wideband satellites and line-of-sight systems.
- The FAB-T Program Office will develop Increment 1 terminals capable of providing air and ground communications using the Extremely High Frequency (EHF) and Advanced Extremely High Frequency (AEHF) waveforms. Increment 1 Airborne Wideband Terminals are planned for the B-2, B-52, and RC-135 aircraft. The Command Post Terminal (CPT) will upgrade the existing fixed and transportable terminals employed with the ground and airborne (E-4 and E-6B) command posts.
- The FAB-T program plans multiple hardware and software releases (referred to as 'Blocks') within Increment 1. Block 6 terminals will be Low Data Rate capable and backward compatible with the legacy Milstar satellites. Block 6 terminals are developmental terminals and will not be fielded.



The plan is to field Increment 1 terminals in a Block 8 configuration that will be fully capable of operating with the AEHF satellites in addition to being backward compatible with Milstar.

- Future capabilities of FAB-T include interoperability with Ultra High Frequency Follow on – Enhanced/EHF Enhanced and Enhanced Polar System satellites.

### Mission

The entire chain of command including the President, the Secretary of Defense, Combatant Commanders, and support component forces will use FAB-T for worldwide, secure, survivable transmission and reception of voice, data, imagery, and video as well as broadcast reception over protected and wideband SATCOM systems to support the full range of military operations including nuclear warfare and all aspects of conventional warfare.

### Prime Contractor

- The Boeing Company, Command, Control & Communication Networks, Huntington Beach, California

### Activity

- AFOTEC conducted OA-1 September through November 2008 to inform the National Security Space Acquisition Policy 03-01 Key Decision Point C. AFOTEC

conducted the assessment in conjunction with contractor functional qualification testing.

# AIR FORCE PROGRAMS

- AFOTEC conducted OA-2 in 4QFY09 to inform the Advanced Wideband Terminal Low-Rate Initial Production (LRIP) decision scheduled for 2QFY10.
- AFOTEC is planning OA-3 for mid-FY11 to inform the CPT LRIP decision scheduled for 4QFY11. AFOTEC will conduct an IOT&E in FY12 to inform the FAB-T Increment 1 full-rate production decision scheduled for 1QFY13.
- Reliability growth testing commenced in August 2009, at a sub-contractor SIL. The program manager will use environmental chambers to replicate the stresses the terminal will experience in an operational aircraft environment.
- The integrated test team is updating the Test and Evaluation Master Plan to provide greater detail on future test events in preparation for the Advanced Wideband Terminal LRIP decision; to strengthen the testing in the threat environment; and to incorporate the plan for reliability growth testing.

## Assessment

- AFOTEC was unable to assess progress towards operational effectiveness or operational suitability through OA-1. Contractor SIL tests showed the Block 6 EDM terminal is capable of logging onto an on-orbit Milstar satellite; however, other software and system integration issues precluded completion of the planned OA activities in the time allocated.
- The developmental flight tests aboard the test bed aircraft in advance of OA-2 have shown the Block 6 EDM terminal to be capable of over-the-air communication with other FAB-T terminals through the Milstar satellite.
- The schedule for the delivery of the FAB-T CPT does not support the Air Force need for command and control of

AEHF. The Massachusetts Institute of Technology Lincoln Laboratory is developing an interim terminal to command and control AEHF until FAB-T CPTs are ready.

- The program is schedule driven; leading to an aggressive test schedule, with little reserve for correction of any significant deficiencies discovered during integration tests.
- The program manager reduced reliability growth testing to keep the development schedule on track. The re-planned reliability growth testing is insufficient to develop confidence in the results. The reliability growth program plan for post-LRIP has not been defined and may result in supportability risks to the program.

## Recommendations

- Status of Previous Recommendations. This is the first annual report for the program.
- FY09 Recommendations. The Air Force should:
  1. Ensure sufficient resources and test events are planned in order to realistically stress the system under conditions that replicate actual combat to the maximum extent feasible.
  2. Include FAB-T terminals in AEHF system tests as early as possible in order to identify any potential design deficiencies and to demonstrate interoperability with both satellite and ground systems.
  3. Develop and implement a comprehensive reliability growth plan to ensure the FAB-T terminal meets the mission needs for high availability with affordable costs.