

Global Broadcast Service (GBS) System

Executive Summary

- The Air Force Operational Test and Evaluation Center (AFOTEC) conducted the second Global Broadcast Service (GBS) Multi-Service Operational Test and Evaluation (MOT&E) in 3QFY07.
- The test community is still evaluating data to determine if improvements to the system have corrected the deficiencies identified in the first MOT&E in September and October 2005 where the GBS receive segment was determined not to be operationally suitable due to failures in the receive suites' unattended mode.
- DOT&E completed the GBS Beyond Low-Rate Initial Production (BLRIP) Report in December 2006, reporting the system as effective with limitations, but not suitable.

System

- The GBS is a satellite-based broadcast system providing near worldwide, high capacity, one-way transmission of operational military data.
- The GBS system consists of three segments:
 - The space segment includes four GBS transponders on each of two Ultra-High Frequency follow-on (UFO) satellites and an additional government-leased satellite capability to meet operational demand.
 - The transmit segment broadcasts data streams and manages the flow of selected information through the orbiting satellites for broadcast to the appropriate theaters of operation; has fixed Primary Injection Point and mobile Theater Injection Point antennas.
 - The receive segment consists of ground and sea mobile terminals that extract the appropriate information for distribution to the end users within selected areas of operation.
- GBS Phase 1 was the Joint Broadcast Service fielded in 1996 in support of the Bosnia Command and Control Augmentation operations.
- GBS Phase 2 contains block upgrades to augment and interface with other military communications systems:
 - Phase 2 Block 1 hosted payload packages on UFO satellites 8, 9, and 10 based upon 1997's available technology. Air Force Space Command declared the Initial Operational Capability (IOC) 1 for GBS Phase 2 in 2003.



1 - Space segment: UFO satellite hosting the GBS payload
 2 - Transmit Segment in Theater: Theater Satellite Broadcast Manager (truck) and Theater Injection Point (antenna)
 3 - Receive Broadcast Manager
 4 - Receive Terminal
 5 - Transmit Segment: Primary Injection Point (white dish antenna) and Satellite Broadcast Manager (buildings)

- Phase 2 Block 2 employs broadcast capability for the Wideband Global Satellite Communications (WGS SATCOM) with transponder-like downlinks across the Ka-band and X-band frequencies. Block 2 functions are based upon an Internet Protocol transport.
- The Military Satellite Communications Joint Program Director is responsible for integrating the GBS and the WGS space and control capabilities.

Mission

- Combatant commanders and operational forces worldwide use GBS to provide a continuous high-speed and high-volume flow of data, audio, imagery, and video at multiple classification levels for sustained operations.
- Commanders use the GBS capability to provide intelligence and battlespace weather information, increasing the joint operations mission data available to deployed and garrisoned military forces across the globe.

Activity

- AFOTEC, with participation from the other Service operational test agencies, conducted the GBS MOT&E 2 in 3QFY07 in accordance with DOT&E-approved test plans.

Results will provide the basis for Air Force Space Command to declare IOC 2 and 3 for GBS Phase 2 Block 2.

AIR FORCE PROGRAMS

- The test community is finalizing the AFOTEC MOT&E 2 Test Report.
- DOT&E completed the BLRIP report in December 2006.
- The Army receive suite modifications were integrated into the program suitability baseline.
- The program standardized and validated the Army receive suite equipment configurations, training, and technical orders.
- The program updated the Interactive Electronic Technical Manual for current full-rate production equipment configurations and standards.
- The program released the Joint Integrated Logistics Plan to sustain integrated GBS operations and fielding.
- The Air Force integrated the WGS-related operating capabilities of the GBS Phase 2 system into the WGS Multi-Service Test and Evaluation Strategy.
- The GBS upgrade transition to an Internet Protocol capability demonstrated the ability to deliver increased volumes of high-speed data, compared to the previous mission configurations.
- The GBS Theater Injection Points of the transmit segment demonstrated the capability to deliver theater information.
- In support of the extension of the GBS capability through the WGS, AFOTEC continues to integrate WGS MOT&E with the mission capability testing of the GBS Phase 2.

Recommendations

Assessment

- DOT&E completed the GBS BLRIP report in December 2006, assessing the system as effective with limitations but not suitable. The GBS receive suite terminals were operationally effective, but did not deliver the level of service and dependability required since receive suites did not demonstrate the capability required while operated in the “unattended” mode. The GBS receive suite terminals were not operationally suitable due to reliability difficulties, technical order deficiencies, Information Assurance changes, system logistics shortfalls, and the need for more comprehensive system training.
- Status of Previous Recommendations. The Air Force made progress on the previous FY05 and FY06 DOT&E recommendations. Three of seven FY06 recommendations remain valid. The Air Force should insist on correcting system performance shortfalls and reliability deficiencies, to include GBS receive suite failures in the unattended mode. The Air Force should continue to press for completed system certifying authorizations from the receive suites, and the Services should provide proper training documents and technical orders.
- FY07 Recommendations. The Air Force should:
 1. Plan and conduct end-to-end operational testing for future GBS upgrades to include WGS, Defense Enterprise Computing Center, DoD Teleport, and future upgrades to receive suites.
 2. Plan and conduct follow-on testing and Information Assurance assessments for upcoming spiral software upgrades.