

# Mobile User Objective System (MUOS)

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## Executive Summary

- The Mobile User Objective System (MUOS) throughput capacity will remain a major challenge requiring continued operational test agency involvement.
- Delays associated with the Joint Tactical Radio System add risk to the MUOS program. The Joint Tactical Radio System is one of the earth terminals.
- MUOS is being developed to offer significant improvement in narrowband satellite system availability.

## System

- The MUOS is a satellite-based communications network designed to provide worldwide, narrowband, beyond line-of-sight communications services to a multi-Service organization of mobile and fixed-site terminal users.
- MUOS will provide a graceful transition from the current generation of ultra-high frequency follow-on narrowband Satellite Communications (SATCOM) system.
- MUOS consists of the space, system transport and user entry, network management, satellite control, and land-based infrastructure segments.
- The operational MUOS satellite constellation will consist of four spacecraft in geosynchronous orbit.
- The system is designed to include a considerable increase from current narrowband SATCOM throughput capacity, as well as improved availability for small terminals with limited system access.
- MUOS is being developed under new DoD National Security Space Policy directives tailored for space programs.



## Mission

- Combatant commanders and U.S military forces deployed worldwide will use the integrated MUOS SATCOM system to provide:
  - Increased operational space-based narrowband, beyond line-of-sight communications throughput
  - Increased levels of system availability over the current constellation of ultra-high frequency follow-on satellites to accomplish globally assigned operational and joint force component missions

## Activity

- The Integrated Test and Evaluation Working Group analyzed the development of the MUOS system segments and successfully continued development of the MUOS Integrated Test Monitoring System during June and August 2005.
- The Combined Test Force developed a series of operational assessments that will lead up to a Multi-Service Operational Test and Evaluation planned for FY08. These are being integrated into the draft of the Test and Evaluation Master Plan.

## Assessment

- The MUOS system is continuing to make progress in developing the capability to provide improved joint interoperability, increased throughput capacity, and multi-hop satellite capability, communications-on-the-move, and additional military capability for current user terminals.

- The lack of MUOS spacecraft launch availability beyond FY09 could impact the current ultra-high frequency space constellation availability as the earlier generation of operational ultra-high frequency follow-on system satellites become unavailable for service.
- Schedule and technical risks continue to emerge due to the complexity of spacecraft control and software elements, the challenge of increasing operational system throughput capacity, and the dependency on the DoD Teleport and the Joint Tactical Radio Systems.
- Further delays in the Joint Tactical Radio System pose a major risk to the overall MUOS integrated development effort and to the test program, due to a lack of adequate earth terminals for both launch and early-orbit operations.

**Recommendations**

1. The adequate and timely assessment of MUOS system throughput capacity merits the focused attention of participating operational test agencies. The operational test agencies involved in capacity assessments should participate in the modeling and simulation efforts to guide and understand the system capacity verification modeling process.
2. The Navy modeling and simulation effort should explore an appropriate means to tailor tools for use in operational testing.
3. The MUOS program should develop an alternate strategy to assure there will be adequate earth terminals available to accomplish system testing and early-orbit operations.