

Integrated Defense Systems
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Transformational Satellite Communications System Space Segment (TSAT SS)

Description and Purpose:

TSAT is a key enabler for the Department of Defense (DoD) vision of Network Centric Operations (NCO). TSAT is a major element for the DoD's secure, global communications network providing survivable, protected, high-capacity, Internet-like connection for communication on the move (COTM); airborne intelligence, surveillance, and reconnaissance (AISR); and the secure, assured communications for control of strategic assets. The TSAT system is comprised of a satellite constellation plus ground control, network, and gateway elements.



Customer:

Acquisition customer is the U.S. Air Force's Satellite and Missile Systems Command (SMC) at the Los Angeles Air Force Base. TSAT will support all services for network centric operations including the U.S. Army's communications on the move needs.

General Characteristics:

TSAT will deliver information superiority for the warfighter anytime and anywhere.

- Boeing has the capability and experience to build TSAT and has assembled a world-class team to deliver the lowest-risk solution.
- TEAM TSAT has an on-orbit proof of concept in SPACEWAY™. The Boeing 702 spacecraft carrying the world's only packet-switched network payload gives us a unique perspective into the new capabilities TSAT will provide.
- After more than three years of continuous execution on the risk reduction phase TEAM TSAT stands ready to build and deliver a compliant, yet evolvable, TSAT system on schedule to the U.S. Air Force.
- Boeing has a 22 year-heritage of developing and building satellite hardware that is resistant to radiation from natural and man-made sources. Examples are,
 - UHF Follow-On
 - Much of the MILSTAR payload
 - AEHF timing generator unit

Background:

The Boeing Team is currently executing the TSAT Risk Reduction System Definition (RRSD) program, a \$664M contract, through January of 2009. The RRSD phase focuses on risk reduction of key enabling technologies (next-generation processor router, laser communications, information gateway and information assurance) required to implement TSAT. System engineering design efforts are also included in RRSD.

The Boeing team submitted its proposal for the TSAT Space Segment Development & Production phase to the Air Force on July 30, 2007. Subsequently, TEAM TSAT has been in discussions with the Air Force expanding on and clarifying its proposal. An award is projected by the end of 2008.

During 2007 and 2008, several major milestones were successfully met. TSAT hardware and software achieved Technology Readiness Level-6 (TRL-6) and multiple technology demonstrations were conducted. The Space Segment Design Review, held in April 2007, and the extensive End-to-End demonstration done there, made the future of MILSATCom real and validated requirements and system definition progress. The team also successfully completed the series of demonstrations on its Next-Generation Processor Router showing functionality, mission capabilities, and interoperability with the Government reference XDR+ ground terminal, Laser Communications confirming compliance with standards or interoperability and mission-level performance, and Gateway technology validating its autonomous operations. The successful completion of these demonstrations was a major step toward maturing these key technologies and validating readiness for the acquisition phase.

The Boeing-led "TEAM TSAT" includes Cisco Systems, Hughes, IBM, Harris Corp., Ball Aerospace & Technologies Corp., LGS Innovations, Raytheon, General Dynamics C4 Systems, L-3 Communications, BBN Technologies, EMS Technologies, SAIC and Innovative Communications Engineering (ICE).

Our team leverages proven commercial network technology, in-depth knowledge of emerging network standards and a long heritage of supporting our Air Force customers in the successful development of MILSATCom systems, most recently with Wideband Global SATCOM (WGS). Our low risk approach is based upon existing technology, previously qualified systems, and multiple generations of flight-proven digital payloads.

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