**UNITED STATES ARMY
SPACE AND MISSILE
DEFENSE COMMAND**

FWC
Future Warfare Center

SATURN

Space Application Technology User Reachback Node

Summary

- Triple Redundancy Global Commercial Satellite

- Data and Voice - IP Satellite (Ku Band), INMARSAT (L Band), and Iridium 9505

- Voice Through IP Connectivity Provides DSN Capability

- NSA Type 1 Approved Encryption Device

- Rapidly and Easily Deployable

- Global Reachback Capability

The SATURN provides the space Soldier with unprecedented global wideband commercial satellite communications to the warfighter.

The SATURN is designed as an easily deployable and globally capable tool-set to support Army and Joint Space Operations. The system provides global "reachback" broadband communication that supports forward deployed space Soldiers, who provide space services (e.g. analysis, estimate, IPB etc.).

Secure the High Ground

Introduction

To achieve full spectrum dominance, warfighters must apply combat power to, through, and from space while assuring full friendly exploitation of space-based capabilities. Rapid growth in space-based resources and technology is leading to exponentially greater capabilities available for support to warfighters. In response to this tremendous growth, the Space and Missile Defense Battle Lab (SMDBL) created the Space Application Technology User Reachback Node (SATURN). Integrating Commercial-off-the-Shelf (COTS) components allowed for rapid acquisition, product tailoring, and the integration of emerging technologies. Systems were successfully deployed with Army Space Support Teams (ARSST) and Joint Space Support Teams (JSST) in support of OPERATION ENDURING FREEDOM, OPERATION IRAQI FREEDOM, and current military operations.

Description

The architecture of the SATURN provides connectivity between the Space and Missile Defense Command Operations Center (SMDCOC) and remote sites with a triple redundant space-based communications suite that utilizes Internet Protocol Satellite (IPSAT), International Maritime Satellite (INMARSAT), and Iridium services. The IPSAT capability is made possible through the use of an iDirect NetModem with connectivity provided by Defense Information Systems Agency (DISA) Commercial SATCOM Branch (CSB). The IPSAT capability is the backbone of the SATURN's broadband communications. It operates in the Ku frequency band and provides 1Mbps downlink and 256Kbps uplink capability for the reachback node. Bandwidth can be increased dependent upon the geographical location of the terminal and antenna size. The data stream is encrypted by an Inline Network Encryption (INE) device.

The Iridium Satellite Phone provides initial voice communications. Voice through IP becomes the primary means when the IPSAT is operational. This is accomplished utilizing the V-100 multiplexer in conjunction with the IP Tube (tunneling through the IPSAT). This system gives the deployed user reachback connectivity to the home station's phone switch for DSN capability. The connection can be secured using a STE or STU device. The Iridium Secure Module (ISM) is included with the satellite phone for secure voice communications. Redundant voice capability is achieved using the STORM GAN over INMARSAT.

Triple redundant communications are provided by the IPSAT, INMARSAT terminal, and the Iridium Satellite Phone.

SATURN Overview

- NetModem II+ (IPSAT)
  – Global wideband commercial SATCOM
  – 9Mbps Downlink/4Mbps Uplink (scaleable depending on cost)
  – Ku or C Band
- V-100 (multiplexer)
  – 5 multiplexed channels (4 voice and data)
  – Secure communications (voice/data)
- INMARSAT (STORM GAN)
  – Redundant communications
  – Single Channel BRI (64Kbps)

- Iridium Commercial Satellite Phones, MT9505 with secure sleeve
  – Secure backup communications (voice)
- Man Machine Interface (MMI)
  – Diagnostic and maintenance
- Encryption
  – Inline Network Encryption Device
  – NSA Type 1 certified
- IP Tube
  – Point-to-point tunnel through the Internet
  – Primary communications for V-100
- Global Uninterruptible Power Supply
  – Input power 120-230 VAC, 50-60 Hz
  – Output power 120 VAC, 50-60 Hz
- Antenna
  – Either 1.2 or 1.8M (depends on destination of user)

Benefit to the Warfighter

The SATURN is designed as an easily deployable and globally capable tool-set to support Army and Joint Space Operations. The system provides global "reachback" wideband communication that supports forward deployed space Soldiers who provide space services (e.g. analysis, estimate, IPB etc.) and products (e.g. commercial imagery) to support operational commanders.

System Features Include:

- 100 percent COTS system
- Rapid and easily deployable
- Global "reachback" communications capabilities
- "One-stop" support center for deployed space forces
- Provides triple redundancy for the user
- Each system deploys with organic satellite installation kit
- Five-tier support system

Upcoming and Current Demonstrations:

- December 2004, VMOC/CLEO Demo in Washington D.C.
- October 2005, AUSA Symposium in Washington, D.C.
- December 2005, AUSA Symposium in El Paso, Texaso April 2005, Space Symposium in Colorado Springs, Colo.

Participated in Operations and Exercises:

- OPERATION ENDURING FREEDOM (OEF)
- OPERATION IRAQI FREEDOM (OIF) I & II
- ULCHI FOCUS LENSES (UFL)
- RECEPTION, STAGING, ONWARD MOVEMENT, AND INTEGRATION (RSOI)
- JOINT PROJECT OPTIC WINDMILL (JPOW)

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