TGS Smart Book

Last update: 10 June 2016

Description:

- Multi-INT ground station – SECRET/Collateral; leverages Army investments in virtualized design and common hardware & software

- Real-time receipt and processing of video feeds (UAV / camera), imagery, MTI, SAR, SIGINT

- Enables remote operations via network workstations: DCGS-A V3.2 and TGS 2.0 software baselines; common mission analysis tools; DIB / ABCS interfaces

End User: US Army – Corps, Div, BCT

Table of Contents

Page   **Topic**

TGS Overview

Nomenclature: Ground Station, Tactical Intelligence
Type Designation: AN/TSQ -179D (V)2
LIN: T37036
NSN: 5865-01-608-4795
BOIPFD: 21 April 2016 (Amended 5 Concurred by G8 and TCMs)
AAO: 89 of 100 Fielded
DD 61 from JETDAS: 27 June 2012

Full MWO Release: Last MWO-02 Feb 2012
Current Materiel Release: Full, 2002

Technical Manuals:
TM:11-5865-1058-1-Operator's Manual
TM:11-5865-1058-2-Operator's Manual
TM:11-5865-1058-23P- V&V being coordinated
TM:11-5865-1058-23-V&V being coordinated

BOIP: See page 8

ATO: June 13th 2016
SW Version: TGS 2.0SPB with current V3.1.7 SW Baseline

TGS Capabilities at a Glance

The Tactical Intelligence Ground Station (TGS), primary requirements are to receive, correlate, process, store, and display radar data from the Air Force Joint Surveillance Target Attack Radar System (Joint STARS) E-8 airborne platform and other sources. The Joint STARS E-8 provides the TGS with a near-real-time radar display of the deep and wide ground picture, which includes Moving Target Indicator (MTI) data, Fixed Target Indicators (FTI) data, and Synthetic Aperture Radar (SAR) imagery. The TGS also receives signal intelligence (TACELINT) reports from the Integrated Broadcast Service (IBS - S) and IBS Common Interactive Broadcast (CIB) intelligence networks. The IBS-S and IBS CIB networks disseminate intelligence information from multiple, tactical and national collection platforms/sensors. Additionally, the TGS can receive imagery products and telemetry data from select Unmanned Aerial Systems (UAS), U2, and Aerial Reconnaissance Low (ARL) for cross-sensor cueing. Collectively, these capabilities provide the army commander with an enhanced ability to conduct targeting, battle management, and intelligence reporting. The TGS can further supplement the ground picture through the receipt of Secondary Imagery Dissemination (SID) received from Army, other service, and national assets as well as reception of local media broadcasts. The TGS interfaces with Advanced Field Artillery Tactical Data System (AFATDS), and other Battlefield Assets (BFAs) through the Army Battlefield Command System (ABCS) networks. The TGS provides Motion Imagery capabilities with advanced analyst's tools for performing mission operations and ISR Forensics; SAIC Video Processing Capability (VPC) for processing MISP Compliant MPEG2/H.264 video streams; Global Broadcast System (GBS) and One System – Remote Video Terminal (OS-RVT) for processing near real-time video; TOCNET system interface for intercom and voice communications for the systems multiple radio's; and a four-user client interface to the system for using high performance laptops with dual 20-inch displays.

Provides support to Army field Commanders by simultaneously receiving, processing, manipulating, storing, displaying and disseminating intelligence information from multiple sensors and intelligence broadcast networks, and by disseminating targeting and intelligence information to intelligence, fire support and command and control elements from Brigade to Echelons Above Corps (EAC). The TGS architecture (hardware and software) facilitates the future addition of new capabilities, such as additional sensors and command and control interfaces, enhanced processing and display capabilities, and growth to other platforms via technology insertion.

TGS Points of Contact (POC)

PM-DCGS-A: TGS Team:
TGS APM: CPT Dean Tallant, 443-861-2449, dean.w.tallant.mil@mail.mil
TGS ILSM: Robert Murphy, 443-861-24440, Robert.t.murphy58.ctr@mail.mil
TGS Lead System Engineer: Joe Ruvolo, 443-861-2430, Joseph.M.Ruvolo.ctr@mail.mil
TGS SEC LNO: Jorge Pinargotte, 443-861-2426, jorge.l.pinargotte.ctr@mail.mil
FOFH PBO: Joyce Douglas, 254-288-1901 x (318), Joyce.a.douglas.ctr@mail.mil
DCGS-A Training Specialist, Ron Gurley SR, 254-288-1901 ext 246, ronald.e.gurley.ctr@mail.mil
TGS HSI: Kat Crenshaw, 443-861-2415, katarina.a.crenshaw.ctr@mail.mil

Tobyhanna TGS Team: Product Support Integrator (PSI): Sustainment
TGS TYAD: Amata (Amy) Pocius, 570-615-9887, amata.c.pocius.civ@mail.mil
TGS TYAD: Brian Warholic,570-615-7585, brian.warholic.civ@mail.mil
TGS TYAD: Ernie Timms, 570-615-6450, Ernest.N.Timms.CTR@mail.mil

CECOM SEC TGS Team: Software Sustainment
TGS Project Lead: Charlie Pham, 443-861-3156, charlie.c.pham.civ@mail.mil
TGS Tech Lead: Sean McIver, 443-861-3154, sean.t.mciver.ctr@mail.mil
TGS Operations Specialist: Sean Moran, 443-861-3165, sean.m.moran16.ctr@mail.mil

CECOM SEC TGS TEAM: FSE Support/Sustainment
Project Lead: Darren Jessop, (520) 538-4481, darren.w.jessop.civ@mail.mil
TGS FSE: Bryan Desoto, (520) 538-1845, bryan.k.desoto.civ@mail.mil

CECOM Logistic Readiness Center (LRC): TGS Team: Sustainment
ILS Manager: Gail Nicholas, 443-861-2564, gail.y.nicholas.civ@mail.mil
Provisioner: Christy Gatto, 443-861-2971, christy.a.gatto2.civ@mail.mil
Tech Writer: Robert DelMastro, 443-861-2976, robert.j.delmastro.civ@mail.mil
Item Manager-Rhonda Hazelton, 443-861-2960, rhonda.j.hazelton2.civ@mail.mil

NSTID TGS Team:
Chief, Collection and Reporting, Rich Cooksey, 520-538-2757, richard.r.cooksey.civ@mail.mil
Training Specialist, Bernard Mac Linhart,(520) 533-5633, bernard.m.linhart.civ@mail.mil

TGS Current SITREP

Final remaining 11 TGS systems (LOT E) are to built in FY16-18 at Aberdeen Proving Grounds (APG), MD.

TGS will stay consistent with form, fit, function (FFF) however, end of life (EOL) and Obsolete hardware components will be exchanged for latest PM-DCGS-A common hardware configuration.

TGS Technical Manuals (TMs) 11-5865-1058-23P will undergo a validation and verification June/July 2016

TGS 2.0SPD will be fielded by SEC 1QFY17 and all training and support is currently being updated and verified by appropriate venues.

TGS OSRVT: All fielded TGS OSRVT's will undergo a Tech Refresh conducted by TYAD FSR. Units will be contacted prior to effort and will be upgraded with an OSRVT-10, Rover 6

TGS GBS: 68 TGS systems that have crystal servers will undergo a Tech Refresh by TYAD FSR and receive a Dell M6440 in replacement. CF-31 laptop will remain and GBS Software will be updated with GRS SW (TSR-8) making WIN07 versus WINXP.

TGS Workstations: TGS's with M6300-M6500 will be exchanged with M6800 laptops based on fielding plan developed by TGS ILSM/TYAD/Field Office Fort Hood (FOFH).

TGS Base Order of Issue (BOIP)

MILITARY INTELLIGENCE:
 ONE PER MI CO (A/IBCT),/ABN WITHIN INTEL PROCESSING TEAM OR CGS TEAM
 ONE PER MI CO (SBCT) WITHIN INTEL PROCESSING TEAM OR CGS TEAM
 ONE PER COLLECTION AND EXPLOITATION CO OF THE EXPEDITIONARY MI BN (E-MIB)WITHIN THE PED CO w/TGS

HEADQUARTERS:
ONE PER SIGNAL- INTEL-SUST CO (DIV HQ) WITHIN THE TAC/ACE/INTEL/FUSION ELEMENT

 ONE PER SIGNAL- INTEL-SUST CO (CORPS HQ)/ABN WITHIN THE TAC/INTEL/ACE/FUSION ELEMENT

TDA REQUIREMENT:
 SEVEN PER USA INTELLIGENCE CENTER OF EXCELLENCE (WIE8AA)

TGS Hardware Sustainment Strategy

Sustainment Strategy: TGS uses a 2 level maintenance concept in which the 35T and regionally aligned Tobyhanna Army Depot (TYAD) FSR are the first line of troubleshooting and repairs.

Field Level Operators: performs both preventative maintenance checks and services and preliminary troubleshooting procedures.

Field Level Maintainers: fault isolates to a line replaceable unit (LRU), removes/replaces faulty LRC with a spare and evacuates it to the contractor depot.

Depot level Maintenance: performed by TYAD FSRs located at their main facility in PA or at TYAD Forward Repair Areas (FRA).

*Some components within TGS such as the M6800 laptops have a 5 year warranty and any repairs must go through Common Hardware Solutions (CHS). Hardware items must go to a CHS Regional Support Centers (RSCs). Please call-1-877-247-7711 for assistance.

Tobyhanna Army Depot (TYAD)

- **Performs Tech Refresh, MWOs to the TGS fleet as new capabilities or items are added to the TGS system (OSRVT, GBS, ENTRV2)**
    - Coordinate with Unit for install dates
    - Coordinate with Unit for required space, equipment, etc.
    - Arrange for TYAD FSR to travel TDY to the unit
    - Receive, store, inventory, and ship MWO kits to sites
    - Provide logistics support to TDY FSRs
    - Track installation of MWOs into the TGS Fleet
- **Upcoming upgrades**
    - OSRVT Rover -10 Upgrade
    - GBS Crystal Server to Dell 6440 Laptop

TGS Spares Support

TYAD maintains the PM owned spares for the TGS system and utilizes them to repair fielded TGS systems mainly in theater or at training exercises.

- Receive, stock, and store spares
- Maintain an inventory of all spares
- Configure/assemble/disassemble spares as required prior to shipment
- Ship spares as required to failed systems via FedEx

TGS Software Sustainment Strategy

Sustainment Strategy: TGS 2.0SP B & D are under sustainment through CECOM Software Engineering Center (SEC).

All TGS Software troubleshooting, repairs, installations, configurations are performed by SEC TGS Field Support Engineers (FSE) and supported by the Units 35T.

Current SEC TGS FSEs

TGS FSE Billets: x17
X-FSE Support: x8

403rd AFSB CFE Far East

FSE: 1+
- Ryan Nicoll (2ID)
+ Allen Hixson (501st, DCGS-A Fixed)
+ Kevin Rush (501st, OGS)

402nd AFSB CFE Pacific
404th AFSB CFE West

FSE: 4
- Edward Cortez (SBHI)
- Bryon Sarver (JBLM)
- Randy Dalbec (FWAK)
- Bryan Desoto (FHAZ)

407th AFSB CFE Central

FSE: 6+
- Nathan Andersen (FCCO)
- Chuck Godsey (FHTX)
- Miles Whitaker (FHTX)
- David Quartermaine (FHTX)
- Tex Shipman (FBTX)
- Cliff Dickinson (FRKS)
+ Erik Wiggins (GFSE FHTX, DCGS-A)
+ John Henderson (GFSE FHTX, DCGS-A)
+ Ernie Cabral (FCCO, ACE BLK II)

406th AFSB CFE East

FSE: 5+
- Mikal Furnell (FBNC)
- Anthony Ouankeo (FDNY)
- Jason Gee (FBNC)
- Vic Hall (FCKY)
- Angela Avery (FSGA)
+ Adam Durham (GFSE FBNC, DCGS-A)
+ Randall Peters (FDNY, DCGS-A)
+ Todd Slakoper (GFSE FBNC, DCGS-A)

405th AFSB CFE Europe

FSE: 1+
- Robert Gilbert, *Vicenza, IT*
+ Phil Rodammer (DCGS-A), Vilseck, GE

401st AFSB - SWA

1x Deployed from OMA staff

- Green text are TYAD GFSEs
- Blue text indicates TGS cross-trained FSE (X-FSE) billeted to another system

1

TGS Forecasts

Forecasts:

- Remaining 11 TGS Systems built FY17-18

- 11 TGS Fielded to EMIBs FY17-19

- TGS transitioned to sustainment FY20

- GBS upgrade to AN/TSR-8/TSR-11 configuration FY16-17

- OSRVT upgrade to Rover 6 (-10) configuration FY16-17

- TCDL/Mini-T2 Fielding Plan

- TGS SW v2.0 SP-D Fielded 1QTRFY17

- PM-DCGS-A V3.2.5 which incorporated TGS SW baseline tentatively to be fielded 3QTRFY17
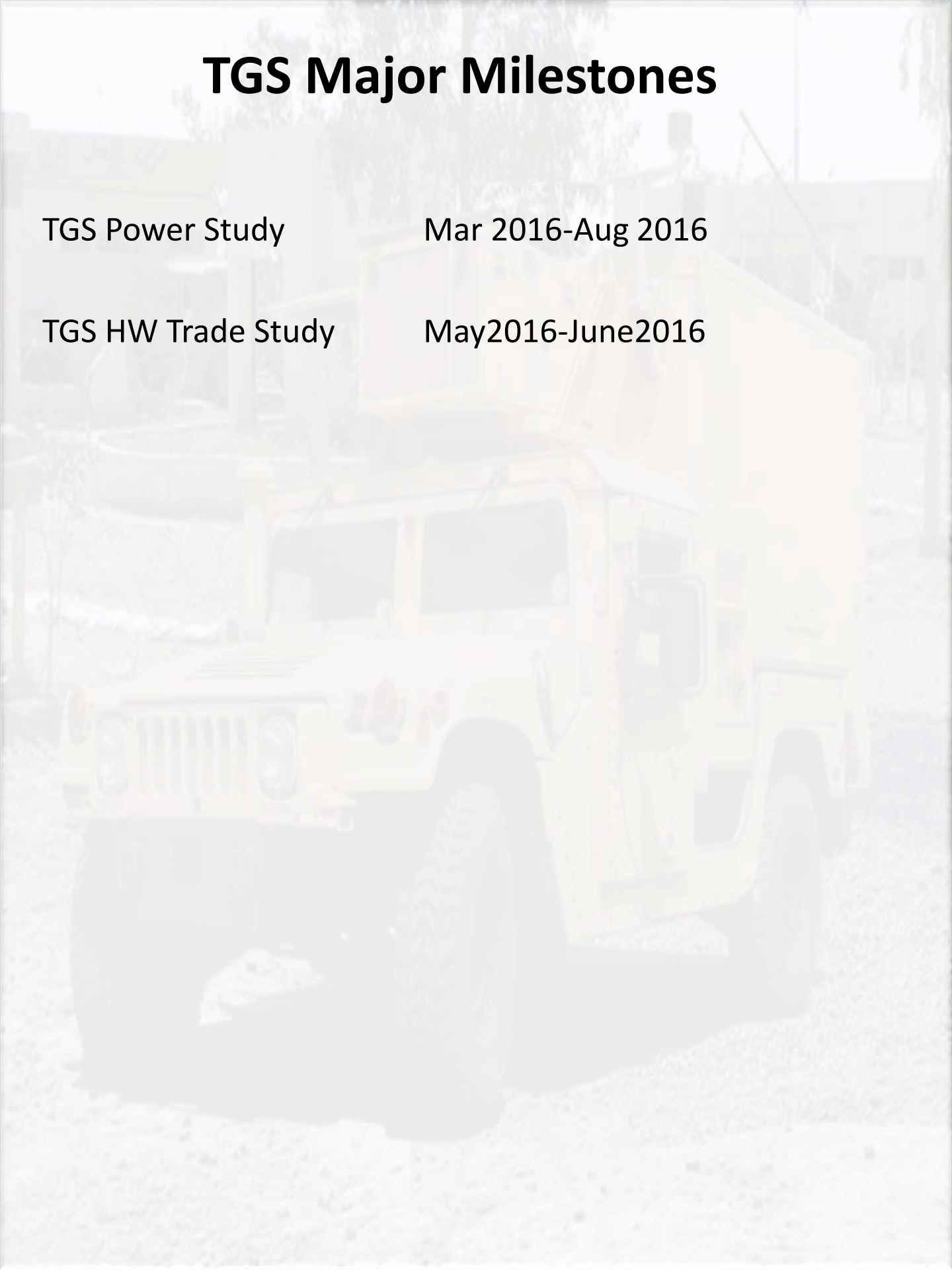
TGS Major Milestones

TGS Power Study   Mar 2016-Aug 2016
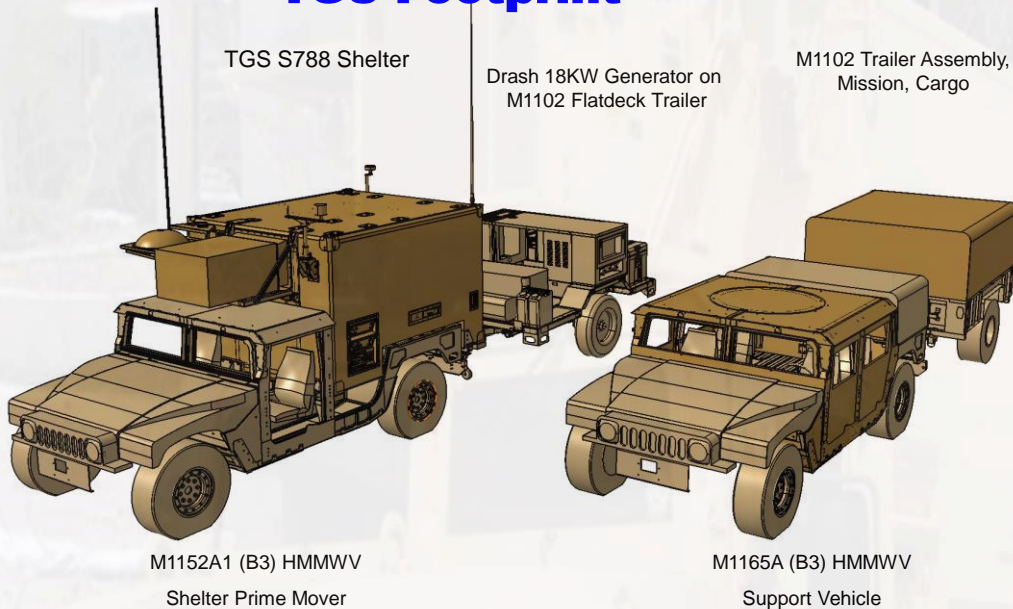
TGS HW Trade Study   May2016-June2016

TGS Configuration

TGS Footprint

TGS S788 Shelter

Drash 18KW Generator on M1102 Flatdeck Trailer

M1102 Trailer Assembly, Mission, Cargo

M1152A1 (B3) HMMWV
Shelter Prime Mover

M1165A (B3) HMMWV
Support Vehicle

TGS Hardware / Physical Design

PSC-5D VRC-92
UHF/VHF

JSTARS JTT
OTM Satcom

OSRVT
C, L-band

OSRVT

PSC-5D, VRC-92
UHF/VHF

18KW Generator Trailer

Cargo Trailer

Prime Mover

shown: GB8, SCDL, JTT (LOS), MDA8, TCDL

Signal Entry Panel
SEP

Support Vehicle

TGS Interior Configuration
Rack 1
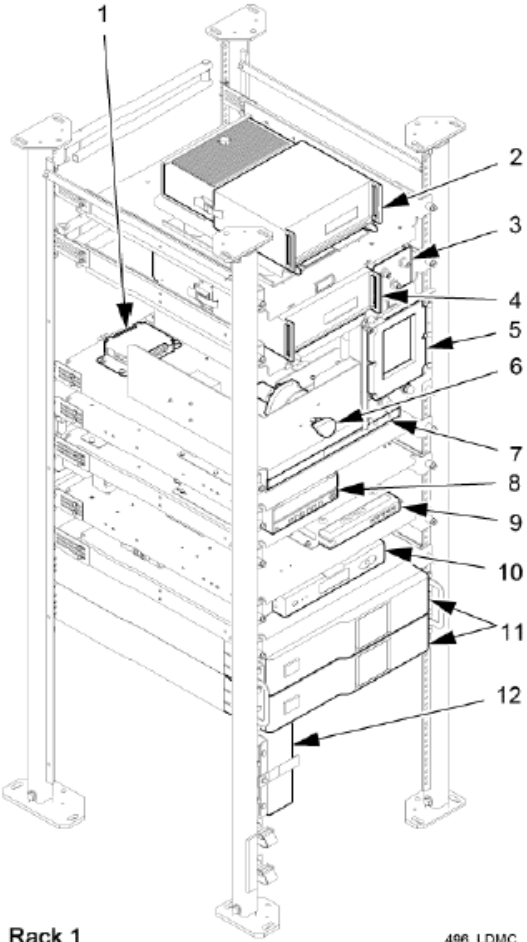
RACK 1	COMPONENT	FUNCTION
	1. TOCNET Switch	Network hub for TOCNET.
	2. PSC-5D Data Radio	Receives/transmits SATCOM, ARL, and File Transfer data.
	3. Mini Patch Panel	Interfaces external antennas for the PSC-5D voice radio.
	4. PSC-5D Voice Radio	Receives/transmits UHF voice communications.
	5. eCAU	(enhanced) Crew Access Unit. Provides access to all voice radios, telephones, and other eCAUs within a TOCNET.
	6. Antenna Selector Switch	Selects antenna connection for the PSC-5D data radio.
	7. DVD Player	Plays/records multiple types of CD-ROMs and DVDs in various formats.
	8. HD Videocassette Player	Plays/records HD videocassettes.
	9. PAL/SECAM TV Tuner	Receives analog PAL/SECAM TV signals.
	10. NTSC/ATSC TV Tuner	Receives analog NTSC/ATSC TV signals.
	11. UPS	Provides uninterrupted power to RAID, GBS Server, 48-Port Switch, KVM Switch, MI Video Trancoder, VM Servers, and NIA Servers.
	12. First Aid Kit	Contains first aid supplies.

Rack 1

496_LDMC

Figure 6. Rack 1.

TGS Interior Configuration
Rack 2
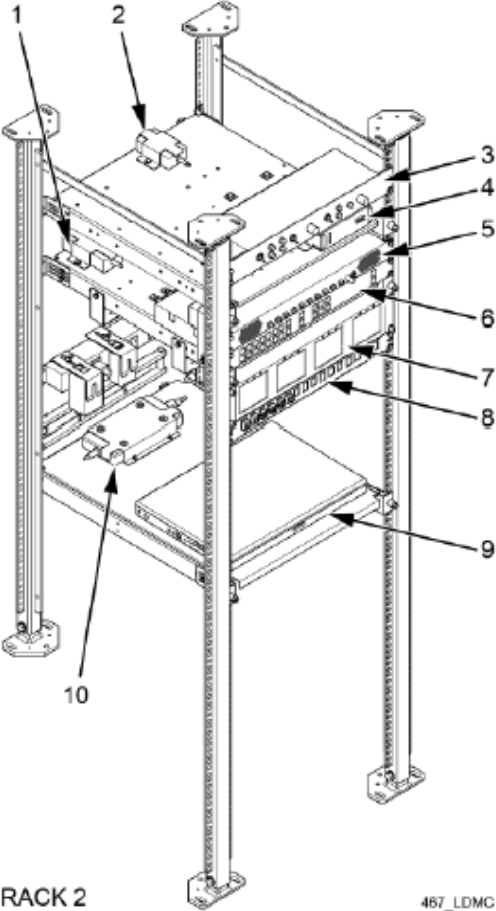
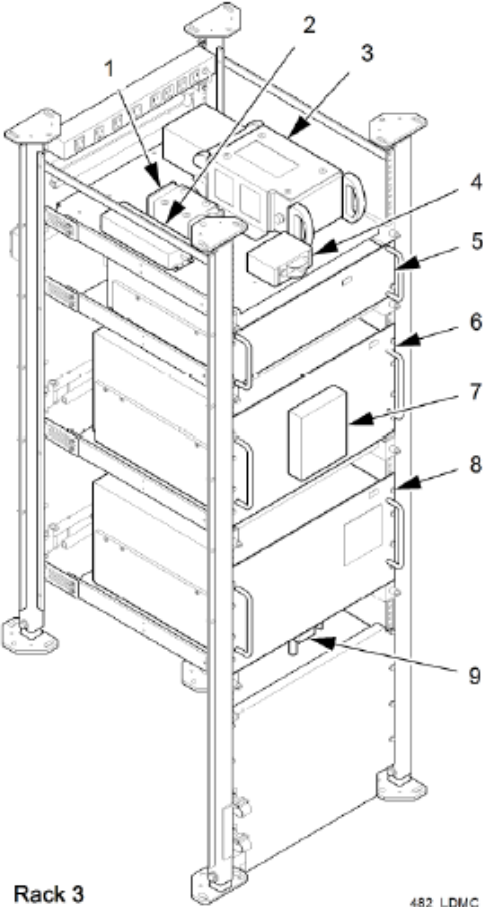| RACK 2	COMPONENT	FUNCTION
	1. LCD Panel Power Transformer	Power adapter for MI LCDs unit.
	2. MI Encoder Power Transformer	Power adapter for MI Encoder.
	3. Environmental Control Unit (ECU) Controller	Sets shelter interior temperature.
	4. MI Encoder	Digitizes analog video signals for use with Motion Imagery system.
	5. Dual Speaker Unit	Speakers for Motion Imagery system.
	6. MI Switch	Routing switcher for analog or digital video and analog audio.
	7. Display Unit (LCD)	Panel of four LCD displays for MI system video signals.
	8. Video I/O Panel	Provides I/O connections to Gigabit Ethernet switch and to Ethernet surge suppressor in Rack 6.
	9. Laptop	Processes data from various sources and presents information on high-resolution monitor. (SYSCON or P-MFWS)
	10. Power Supply for Laptop	Provides Laptop power.

Figure 7. Rack 2.

TGS Interior Configuration
Rack 3

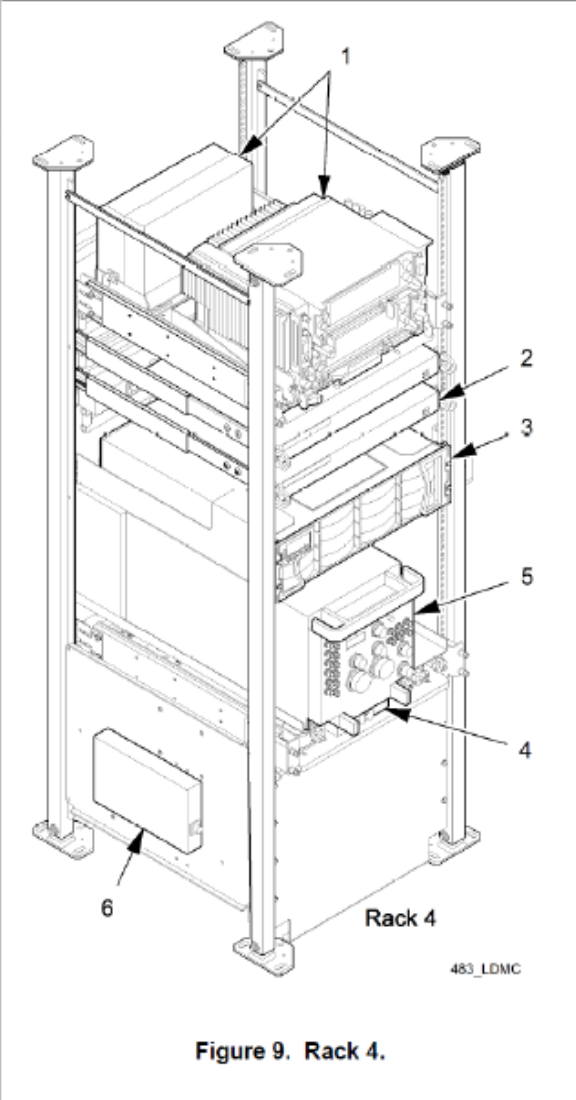| RACK 3	COMPONENT	FUNCTION
  Rack 3 Figure 8. Rack 3. 482_LDMC	1. OSRVT UHF Modem	Receives data from OSRVT UHF antenna, then processes and sends data to OSRVT Multi-band Receiver as RS-232 serial data.
	2. OSRVT UHF Modem Power Supply.	Provides power to the UHF modem.
	3. OSRVT Multiband Receiver	Receives video and telemetry data from the UHF band, C/L band, and Ku band.
	4. OSRVT RF Switch	There are two OSRVT Multi-band Receivers, Rover 4 and Rover 6. Identify which OSRVT Multiband Receiver is present before proceeding. Switches between Ku band reception and reception of UHF and C/L bands.
	5. AC/AC Converter (208VAC/40 lbs)	P/O GDT - Outputs 115/200 VAC, 400 Hz, 3-phase to LCU.
	6. JSTARS Interface Unit (JSIU) (208VAC/60 lbs)	P/O GDT - Provides encryption/decryption, controls BIT functions, distributes GDT data to data bus, and controls antenna parameters.
	7. KGV-8C	P/O GDT - Decrypts/outputs downlink data from LCU. Encrypts uplink data from system to LCU.
	8. Lower Control Unit (LCU) (208VAC/71 lbs)	P/O GDT - Encodes/decodes uplink/downlink data.
	9. 1553 Bus Interface	P/O GDT - Couples 1553 Bus from MTI Server to JSIU.

TGS Interior Configuration
Rack 4

RACK 4	COMPONENT	FUNCTION
Figure 9. Rack 4.	1. VRC-92 Radio Equipment	Receives/transmits VHF voice.
	2. NIA Red and Black Servers	Servers used in processing data from the TCDL network.
	3. RAID (100~240 VAC/80 lbs)	Provides data storage for the TGS system.
	4. JTT Radio Power Conditioner	Provides the Input DC voltage for the Radio Receiver power supplies.
	5. JTT Radio Receiver (120 VAC/70 lbs)	Provides RF Receive Communications, COMSEC, data processing, and data transport functions/support capabilities.
	6. Diplexer/Preamp	Electronic amplifier which precedes another amplifier to prepare an electronic signal for further amplification or processing.
	7. RF Transmit/Receive Assembly (Not Shown)	JTT system components: Diplexer-Preamp, LP Filters, Power Divder/Combiner, and DC Block.

TGS Interior Configuration
Rack 5

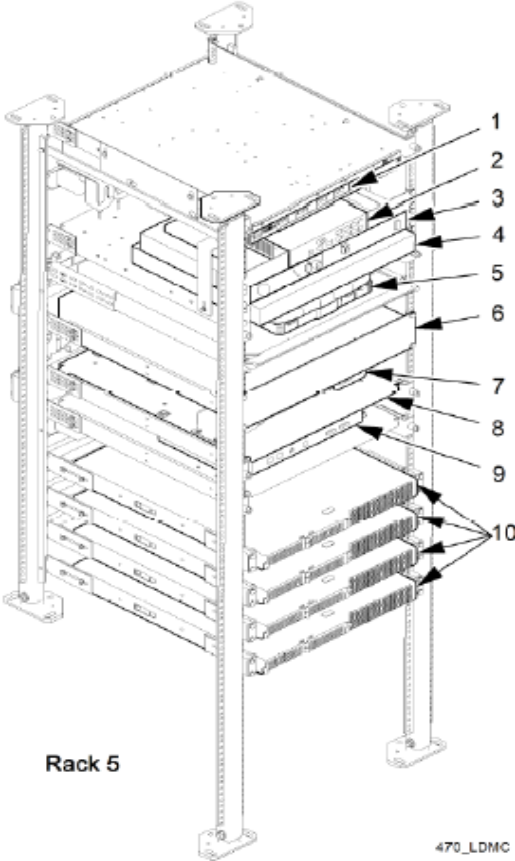| RACK 5	COMPONENT	FUNCTION
Rack 5 470_LDMC **Figure 10. Rack 5.**	1. 8 Port Fiber Control Switch	Interconnection point for the VM servers to the RAID and shelter hardware.
	2. GBS Network Switch	Controls Ethernet traffic among the TGS internal GBS devices and to external networks and devices.
	3. GBS COMSEC Tray	Houses the KG-250 Encryption Device, 5-port unmanaged Ethernet switch, and power supply for these devices.
	4. GBS Receiver/ Decoder	Extracts IP content from incoming video/telemetry streams and routes the content over an Ethernet connection.
	5. GBS Server	Stores received products or forwards products to end users on LAN.
	6. WISRD Tray (Optional)	Houses patch panel and interface for NIA servers containing the Mini T2 and Media convertor.
	7. KG-175D (Optional)	Encryption device used to encrypt data for the NIA servers.
	8. PXSe Serial Boxes	Serial interface boxes used to provide Asynchronous RS-232 to Ethernet for the GPS and Synchronous RS-232 to Ethernet for the ARL & SOS.
	9. OmniBus Box 1553	The OmniBus Box convers TDT 1553 data and GPS serial data to usable interface with the VM Servers over an Ethernet connection.
	10. Dart Frog VM Servers	The VM Servers receive and distribute data from linked sensor interfaces and communication devices and automates the TGS data processing functions.

TGS Interior Configuration
Rack 6

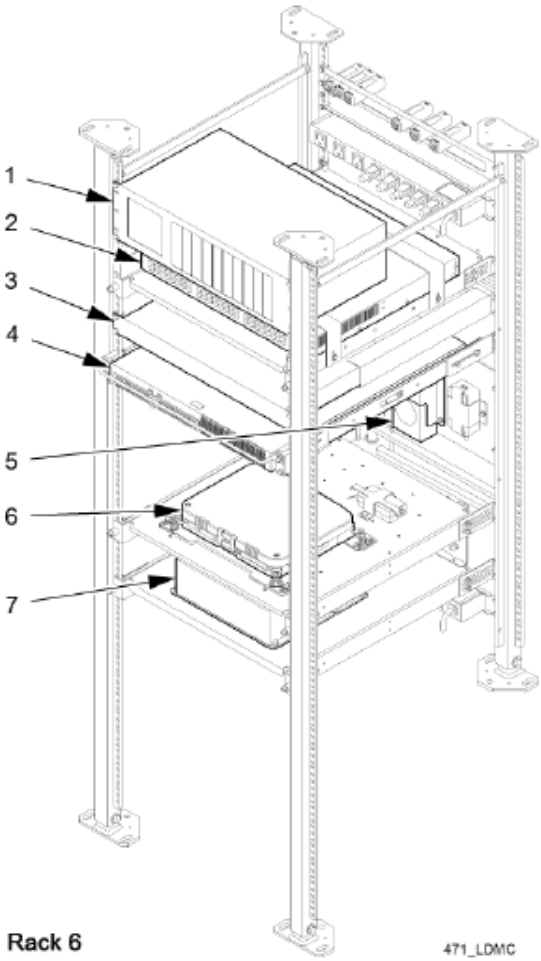| RACK 6	COMPONENT	FUNCTION
	1. Fiber Optic Chassis	Supplies DC Power to Fiber Optic Converters.
	2. Ethernet 48-Port Switch	Provides Packet Connectivity/Network Configuration with Ethernet Data Port.
	3. KVM Switch	Allows operator control of TGS servers and other equipment from the SYSCON or P-MFWS.
	4. MI Video Transcoder (HERO)	Adapts video from various sources to produce compressed video streams for broadcast.
	5. MI Radio Tuner	AM/FM radio receiver and speaker with software operation interface.
	6. OSRVT Server	Laptop computer containing OSRVT application software.
	7. eMSCU	Enhanced Micro Central Switching Unit for TOCNET Intercommunications System.

Rack 6

471_LDMC

Figure 11. Rack 6.
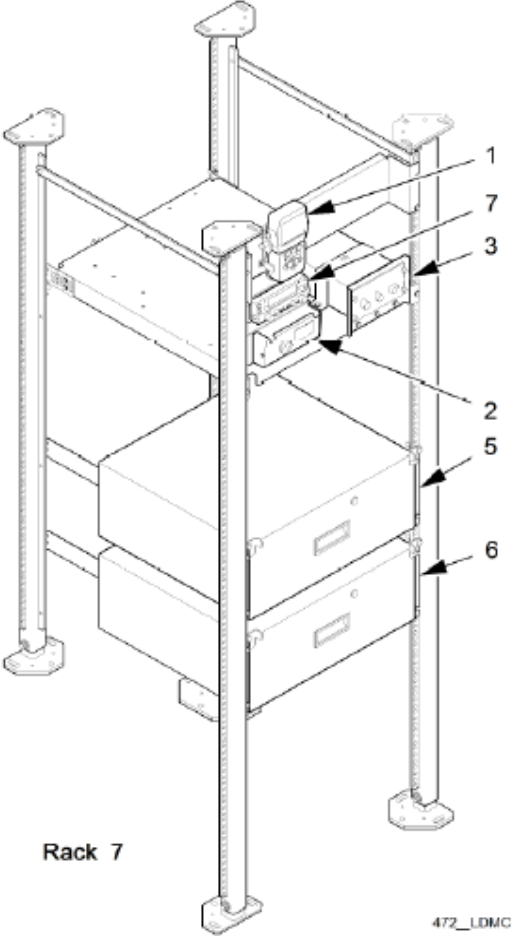
TGS Interior Configuration
Rack 7

| RACK 7	COMPONENT	FUNCTION
	1. DAGR	Defense Advanced GPS Receiver. Displays current location and time.
	2. 4:1 Serial Switch	Allows ARL, JSTARS SATCOM, or IP data (via VDC 550) to be transmitted/received by the PSC-5D radio.
	3. VDC-550 IP Data Controller	Routes IP data between PSC-5D radio and TGS LAN.
	4. GBS Terminal Laptop Connections (Not Shown)	Connections for GBS Laptop stored in Laptop Storage Drawer. Allows access to GBS Antenna.
	5. Storage Drawer for GBS Laptop	Storage for the GBS Terminal Laptop and power supply.
	6. Storage Drawer	General purpose storage for remote controls, documents, etc.
	7. MI Radio Tuner Control Panel	Allows operator control and adjustment of MI Radio

Figure 12. Rack 7.

TGS Antenna Configuration

OSRVT/ MDAS System Description

OSRVT is a combination of a Tablet PC, Multiband Transceiver, Modem, Antennas, and a variety of Cables which allows the receipt of Air Vehicle (AV) Live Video feed and Metadata from various Manned and Unmanned Platforms.

System Capabilities
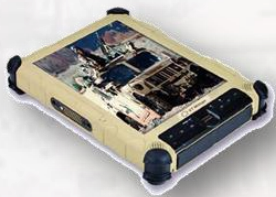
Tablet PC

- Rugged, Lightweight Tablet
- Battery Life - 4-6 hours of operation
- Weight - 5lbs
- LIN – FA950P
- NSN-TBD

ROVER 6 Transceiver

- DAGR GPS connection
- Video in/out connectors
- Type 1 Encryption
- Weight – 10lbs
- LOI3 Capable
- LIN - P05003
- NSN - 5821-01-599-8968

UHF Modem / Antenna

- **UHF Band** – 340 – 400 MHz
- Range – 50 km
- Weight – 1.5lbs
- Omni-Directional Antenna

Enhanced - C/L/S Antenna

- **C Band** – 4400 – 5850 MHz
- **L Band** – 1625 – 1850 MHz
- **S Band** – 2200 – 2500 MHz
- Range – Approx 10 Km
- Weight – 3lbs
- Omni-Directional Antenna

Ku Directional Antenna

- **Ku Band** – 14400 – 14830 MHz
- Range – Approx 25-35 Km
- Weight – 5lbs
- Directional Antenna
- Transmits 15150 – 15350 MHz

Mobile Directional Antenna System
(Additional Auth Item List - AAL)

- **C Band** – 4400 – 5850 MHz
- **L Band** – 1710 – 1850 MHz
- **Ku Band** – 14400 – 14830 MHz
- Range – Approx. 50 Km
- Weight – 77lbs w/tripod
- Directional Antenna
- NSLIN - FB8556
- NSN – 5985-01-590-5551

TGS
Size, Weight, and Power

TGS System	Power, total (watts)	Weight, total (Lbs)	Thermal Load (BTU/hr)
Lot A	14,973	12,843	29,059
Lot B	15,043	12,915	29,298
Lot C	15,644	12,998	31,541
Lot D	15,644	12,998	31,541
Limits	18,000	13,100	36,000

Top Weight Consumers

Shelter Components	Weight
ECU	290
SCDL Boxes & cables	226
Dual UPS	164
4x Dart Frog servers	100
JTT Assembly	99
Singars Radio Assembly	87
RAID	80
NIA Orbit Micro Server (2x)	43

Top Power Consumers

Shelter Components	Power
ECU	8800
4x Dart Frog servers	1600
SCDL Boxes & cables	902
Dual UPS	457
JTT Assembly	443
NIA Orbit Micro Server (2x)	260
RAID	240
Raytheon MXF-100-6C Power Supply	238