Tactical SHF Satellite Terminal (TSST)

The AN/TSC-156 Tactical SHF Satellite Terminal (TSST) is the latest fully qualified, certified, stand-alone, quad-band terminal supporting world-wide, quick-deployment satellite communications.

Tactical SHF Satellite Terminal (TSST)

Key Features

Certified Quad Band

- Commercial, DSCS and WGS interoperability

Fully Qualified

- Ensured transportability, ruggedness and reliability

Interoperability

- Ease of expandability and technology insertion

L-Band Architecture

Full Towing Capability on both Vehicles

- System expansion and flexibility

20 Mbps MIL-STD Modem

- Sufficient throughput for future C4ISR communications

On Board Frequency Reference

- RF and baseband timing confidence

Remote Operation

- Manpower and location flexibility

LHGXA Interface

- Large aperture antenna provides enhanced G/T and EIRP for hub operation

Product Description

Communication Systems-West designed, qualified and delivered the 2.4 meter TSST under the Phoenix contract awarded in April of 2003. The system consists of a primary vehicle housing the communications equipment and a Mobile Power Unit (MPU) vehicle that provides power to the system in the form of a 10 kilowatt Tactical Quiet Generator (TQG) and storage for spares and support gear.

The system design accommodates quick set-up utilizing a pop-up 2.4 meter, quad-band antenna that features interchangeable feed assemblies. The HPA subsystem, consisting of redundant tri-band HPAs plus redundant Ka-band HPAs are integrated as part of the antenna sub-system. The baseline system is a four spoke hub system utilizing the L-3 Enhanced Tactical Satellite Signal Processor (ETSSP) featuring full interoperability with legacy GMF, STEP and Teleport systems. The system is delivered with both on-board manual redundancy and other critical spares and consumable items. A full logistics support program is implemented including Training, Electronic Technical Manuals (ETM), Authorized Stockage List (ASL), Spares and full Depot support.

The system has been fully qualified and certified as follows:

- Transportability
  - Rail, Fixed and Rotary Air, Munson Road
- Environmental
  - High temperature solar, low temperature, dust and sand, snow and ice, humidity, wind
- EMI MIL-STD-461
- DISA, ARSTRAT and INTELSAT Certified
- JITC Certified

KEY PERFORMANCE VALUES WITH STANDARD HARDWARE COMPLEMENT					
RF/Electrical Parameters		**C-band**	**X-band**	**Ku-band**	**Ka-band**
Frequency range (GHz)	Receive	3.625–4.200	7.250–7.750	10.950–12.750	20.200–21.200
	Transmit	5.850–6.425	7.900–8.400	13.750–14.500	30.000–31.000
Tuning step size		1.0 kHz			
Frequency stability		6×10^{-11}/month			
Receive antenna gain (minimum)		3.625 GHz: 36.7 dBi	7.25 GHz: 43.1 dBi	10.95 GHz: 46.6 dBi	20.2 GHz: 51.5 dBi
Receive G/T (minimum) at 10° elevation		> 17.8 dBi/k at 4.0 GHz	> 22.8 dBi/k at 7.25 GHz	> 26.0 dBi/k at 11.0 GHz	>28.0 dBi/k at 20.2 GHz
Transmit antenna gain (minimum)		5.85 GHz: 41.4 dBi	7.90 GHz: 44.3 dBi	13.75 GHz: 48.6 dBi	30.0 GHz: 54.5 dBi
Transmit linear EIRP (PMAX)		59.0 dBW (61.5)	67.0 dBW (68.5)	66.5 dBW (71.5)	68.0 dBW (71.0)
Polarization		2-port CP or linear	RX: LHCP TX: RHCP	2-port linear adjustable	2-port CP adjustable
Sidelobe performance		Meets IESS-601	MIL-STD-188-164A	Meets IESS-208 STD E1 47 CFR 25.209	Meets ITU 580 and 47 CFR 25.209
Axial ratio/Cross-pol discrimination		CP: < 2.3 dB, Linear: > 30 dB Meets IESS-601	< 2.0 dB Meets MIL-STD-188-164	Linear XPD: > 30 dB Meets IESS-208 STD E1	< 1.0 dB (Tx) < 1.5 dB (Rx)
Approved certification		Intelsat G	DSCS	Intelsat E1	ARSTRAT

Tactical SHF Satellite Terminal (TSST)

MECHANICAL AND ENVIRONMENTAL WITH STANDARD HARDWARE COMPLEMENT		
Mechanical Parameters		
Feed type		Prime focus, offset paraboloid/dual reflector at Ka-band
Mount type		Elevation over azimuth
Length		222 in. (primary vehicle) and 200 in. (MPU)
Width		94.0 in. (primary vehicle) and 96 in. (MPU)
Height (with Antenna, stowed)		102 in. (primary vehicle) and 102 in. (MPU)
Weight (including HMMWV)		10000 lbs (primary vehicle) and 10900 lbs (MPU)
Leveling Jacks		4 x 4,000 lbs capacity each
Antenna Travel Range		Degrees elevation: 5°–85°; Degrees azimuth: ±120° (continuous)
Tracking Modes		Auto Track, Program, Memory and Manual Track
Prime Power		10 kW TQG (Tactical Quiet Generator), 400 amp HMMWV alternator kit, or External 120/240 AC 50/60 Hz
Set-up/Tear-down		30 minutes with 3 people; 60 minutes with MOPP IV gear
Environmental Parameters		
Temperature range	Operating	-20°C to +49°C plus solar load
	Storage/transit	-40°C to +71°C
Wind loading	Non-operating	90 mph
	Operating	45 mph (steady); 60 mph (gust)
Humidity		100%, condensing
Altitude	Operating	7,000 ft
	Storage/transit	40,000 ft
Ice and snow	Non-operating	2 inches
Rain	Operating	2 inches per hour
Sand and dust		Sealed electronics transit case with on-board ECU

Physical Characteristics

Interfaces:

- 6 x DTGs up to 2.048 Mbps each
- 4 x T1/E1
- 1 x QTGM Mode 2 TFOCA -II
- 1 x CDI TFOCA-II
- 1 x DS3 FOM TFOCA-II
- 8 x NRZ Aggregate (EIA-530A)

Communication Systems – West
640 North 2200 West, P.O. Box 16850, Salt Lake City, Utah 84116-0850 | U.S. Toll Free: 800-874-8178 | International: +801-594-2000
Fax: 801-594-3003 | Email: CSW.Products@L-3com.com | www.L-3com.com/csw