

Narda Satellite Networks

AN/USC-60A

Flyaway Tri-Band Satellite Terminal (FTSAT)

The AN/USC-60A is a Commercial-Off-The-Shelf (COTS) terminal supporting theater-deployed communications and special user requirements. It is a small, lightweight tri-band satellite communications terminal. The FTSAT is an affordable field proven satellite communications facility, certified for DSCS and qualified for INTELSAT operation.

The FTSAT incorporates L-3 Narda Satellite Networks' unique frequency conversion architecture and antenna design that meets stringent requirements for Defense Satellite Communications System (DSCS) Earth Terminal certification as well as commercial satellite requirements.

The AN/USC-60A (FTSAT) is an easily transported satellite communications terminal that is integrated, contained, and transported in rugged transit cases. All transit case units are commercial airline-checkable for ease of deployment. The terminal is also transportable on pallets by military aircraft. Terminal setup and satellite acquisition is accomplished in less than 50 minutes.

The terminal provides worldwide satellite communications over DSCS II and III, North Atlantic Treaty Organization (NATO) III and IV, INTELSAT, European Telecommunications Satellite Organizations (EUTELSAT), Pan American Satellite Organization (PANAMSAT), and domestic and regional satellites (DOMSATS). The modular architecture of the AN/USC-60A terminals easily accommodates capabilities expansions such as EOIP, digital video, digital voice/fax transmission, secure communication network control, RFMOW (Replacement Frequency Modulation Order Wire) and ETSSP (Enhanced Tactical Satellite Signal Processor).

Key Benefits

- Highest throughput
- DSCS certified
- INTELSAT qualified
- Interoperable with JMICS, ATM switching and EOIP Network
- Superior wind stability, pedestal and antenna
- UNIFOLD™ lightweight tripod
- Easily set up and operated
- Integrated logistics support
- 2.4 meter antenna system
- Modular architecture
- Highly transportable

**WGS Certified Ka-Band
Upgrade Kit Available!**



Narda Satellite Networks

AN/USC-60A

Flyaway Tri-Band Satellite Terminal (FTSAT)

PERFORMANCE SPECIFICATIONS

PARAMETER	C-BAND	X-BAND	KU-BAND	UNITS
Receive Frequencies	3.625 to 4.200	7.25 to 7.75	10.95 to 12.75	GHz
Transmit Frequencies	5.850 to 6.425	7.90 to 8.40	14.0 to 14.50	GHz

2.4 METER ANTENNA SYSTEM AN/USC-60A (TYPICAL)

Transmit Gain	42.2	45.1	49.3	dBi
Receive Gain	38.2	44.2	47.3	dBi
G/T	18.8	21.7	26.0	dB/K
EIRP (Linear)	61.5	64.8	66.5	dBW
EIRP (Saturated)	67.9	70.8	73.8	dBW

Modulation/Throughput BPSK, QPSK, OQPSK, 8 PSK @ 9.6 Mbps to 9.4 Mbps

Antenna Tracking Standard -- manual

Option Automatic/motorized for 2.4m antenna

Terminal Packaging 2.4 configuration -- 12 transit cases (total max weight is 1,325 lbs)

Environment Wind Loading Operational (steady-state): 25 MPH; 40MPH (anchored); survival (anchored); 45MPH steady-state; 60 MPH gusting

Temperature -20°C to +50°C (operating); -40°C to +70°C (storage)

Satellites WGS, INTELSAT, DSCS, NATO, PANMASAT, EUELSAT, DOMSATS, etc.

Prime Power 110/240 VAC +/- 10%, 47 to 63 Hz

Setup Time 45 Minutes (typical)

FEATURES:

- Lightweight 2.4 meter segmented antenna
- DSCS certified
- INTELSAT qualified
- Airline transportable
- Laptop computer
- Control and monitoring subsystem
- Compact and lightweight
- Advanced RF architecture
- UNIFOLD™ (patented) mechanical design
- Hub independent setup
- Built-in self test capability
- Signal acquisition and operational within minutes
- GPS receiver
- Flux gate compass
- Tri-band test translator
- Fiber optic IFL
- IF spectrum analyzer
- Environmentally protected equipment operation
- Antenna tie-down provisions for high wind operation
- Interactive training CD
- Automatic tracking subsystem for the 2.4 meter antenna (patented) with interactive training CD

OPTIONS:

- Single/dual band configuration
- Other antenna sizes and various HPA power levels
- Ka-band upgrade kit (WGS Certified)
- Orderwire
- ETSSP
- IP upgrade kit: Interoperable with iDirect, DVB and Linkway
- 52 Mbps data rate modem



SATCOM Group

Narda Satellite Networks

435 Moreland Road
Hauppauge, NY 11788
Toll Free: 800.666.7060
Outside US: +1.631.231.1700 ext. 5818
E-mail: SN.mktg@L3com.com
www.L-3com.com/satellitenetworks



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ISO 9001:2008 and AS9100 Registered

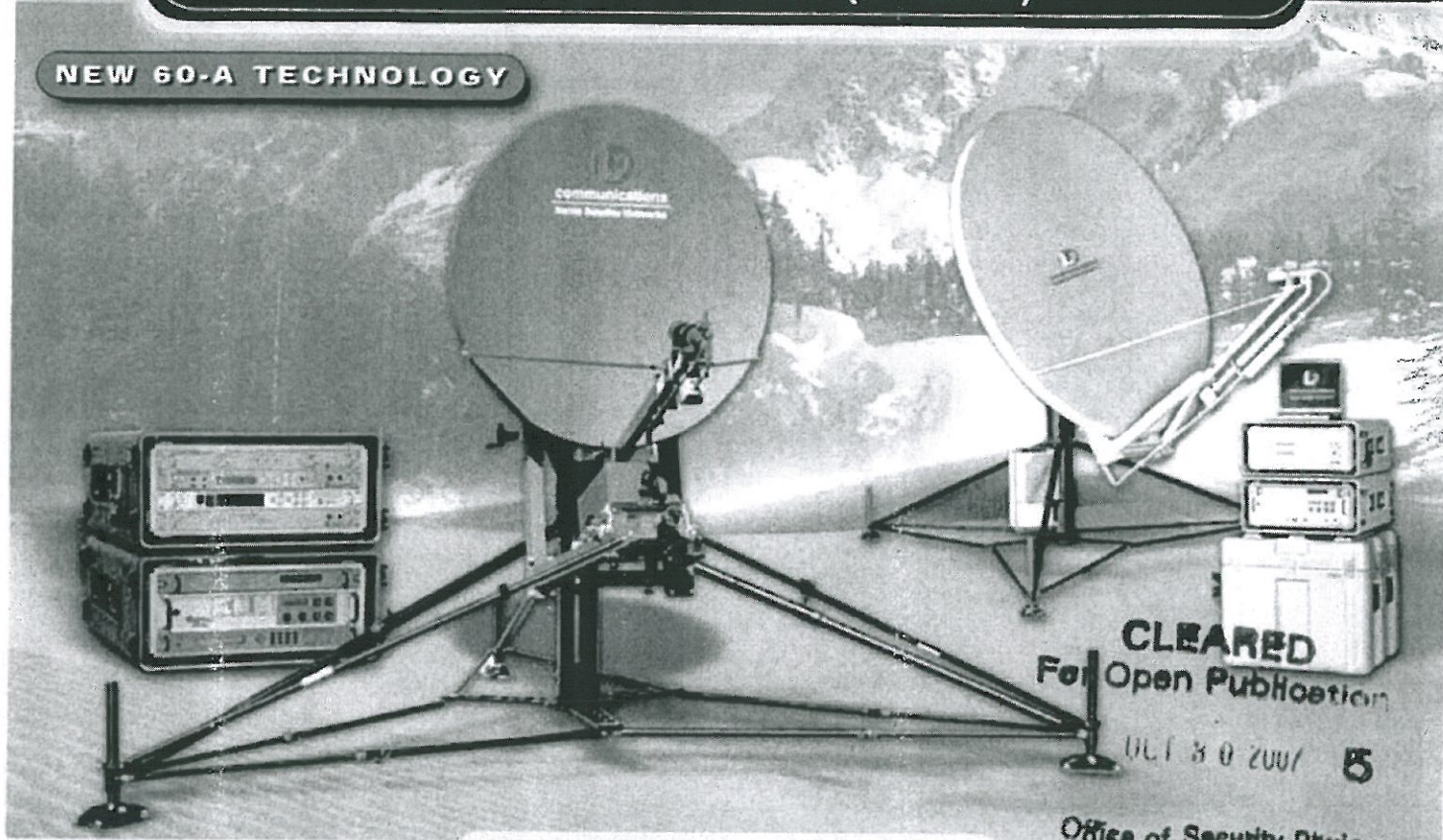
L-3. Headquarters in New York City, L-3 Communications is a prime contractor in aircraft modernization and maintenance, C³ISR (Command, Control, Communications, Intelligence, Surveillance and Reconnaissance) systems and government services. L-3 is also a leading provider of high technology products, subsystems and systems.

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Rev. 1/19/10

Ka-Band Upgrade for AN/USC-60A (FTSAT)

NEW 60-A TECHNOLOGY



KEY DESIGN FEATURES

- AN/USC-60A Ka-Band capability (DoD-Bands)
- Low logistics and training costs
- In process of ARSTRAT certification
- Retained original FTSAT performance at C-, X- and Ku-Band
- Lightweight Quad-Band terminal
- 1.2 Meter — four (4) segmented Ka-Band reflector
- DMD 2050 52 Mbps modem (standard)

L-3 Communications Narda Satellite Networks (L-3 NSN), in anticipation of a successful launch of the Wideband Global SATCOM (WGS) satellite, is offering a Ka-Band Upgrade to the AN/USC-60A (FTSAT) therewith keeping the 250 plus fielded 60As updated through technology insertion. The Ka-Band Upgrade System (Model 1.2 Ka-60A) is intended primarily for the AN/USC-60A; potentially it can be integrated with other Multi-Band SHF-SATCOM systems, as well. The Ka-Band Upgrade will not effect the integrity of the FTSAT or degrade the operational performance and proven

reliability. This upgrade will enhance the capabilities of the AN/USC-60A significantly.

The 1.2 Ka-60A, when integrated with the base system, (60A) will meet the latest WGS — Ka-Band Terminal Certifications Requirements (Version 2.0 dated 14 March 2006), MIL-STD-188-164A and ARSTRAT certification requirements.

The 1.2 Ka-60A consists of a 1.2-meter segmented carbon fiber reflector, adapter plate, linearized 175 Watt TWTA with built-in BUC and LNB.

The 1.2-meter reflector mounts directly to the pedestal AZ/EL head assembly using an adapter plate, and does not prevent reverting back to the 2.4-meter reflector for Tri-Band operations.

Setup and disassembly of the Ka-Band terminal is less than one hour for two trained personnel.



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08-S-0/06

Ka-Band Upgrade for AN/USC-60A (FTSAT)

SPECIFICATIONS

1.2M Antenna Subsystem

Parameter	Ka-Band	Units
Receive Frequencies	20.2 to 21.2	GHz
Transmit Frequencies	30.0 to 31.0	GHz
Transmit Gain	49.4	dBi
Receive Gain	46.2	dBi
G/T	21.0	dB/K
EIRP (Linear)	66.0	dBW
EIRP (Saturated)	67.5	dBW

Physical Characteristics

- **Configuration:** Transit cases (2)
- **Weight (total):** 299 lbs
- **Storage Space:**
 - TWTA case 36"W x 36"L x 30.5"H
 - 1.2M reflector case 52"W x 28"L x 21"H

Setup time: 60 minutes

Take-down time: 60 minutes or less

Certifications

- DSCS (X-Band)
- ARSTRAT (Ka-Band)
- NATO

Qualified:

- INTELSAT
- EUTELSAT
- DOMSAT

Options:

- Single/multi-band configuration
- Other antenna sizes and various HPA power levels
- ETSSP
- IP Upgrade Kit: interoperable with iDirect, DVB and Linkway
- 52 Mbps up to 155 Mbps data rate modem
- Various other options available

Environmental Conditions

Temperature:

Operating: -20° C to +50° C **Non-Operating:** -40° C to +70° C

Humidity:

As low as 5% at +50° C

As high as 100% at -32° C to +30° C, with condensation at all temperature lower than 30° C

Altitude: (feet)

Operating: up to 8,000 ft above sea level

Non-Operating: up to 50,000 ft above mean sea level

Snow, Sand and Dust: (for periods up to 72 hrs)

Operating / Non-Operating: (1) snow crystals 0.02 to 0.9 mm diameter driven by 40 mph winds. (2) Sand particles 0.01 to 1.0 mm diameter driven by 40 mph winds.

(3) Dust particles 0.0001 to 0.01 mm diameter driven by 15 mph winds.

Shock: MIL-STD-810F, Method 516.5

Vibration:

MIL-STD-810F, Method 514.5

PROC. I, Category: 4, 7 and 8

Wind:

Operating: Steady-state - 25 mph (40 mph anchored); Gusting - 60 mph

Non-Operating: Steady-state - 45 mph; Gusting - 60 mph

SUMMARY

The AN/USC-60A Ka-Band Upgrade is a very cost-effective option for Ka-Band terminals.

Cost savings include:

- Minimal new equipment cost — *reusing existing Tri-Band terminal equipment*

- Minimum Quad-Band terminal investment — *Tri-Band terminal already exists in inventory*

- Minimum training for Ka-Band equipment — *setup and operation based on standard Tri-Band terminal*

- Minimum logistics cost for a Quad-Band terminal — *logistics, spares and training already exist for the Tri-Band terminal portion*

The Ka-Band upgrade component will also provide the same high performance and high quality of the field-proven AN/USC-60A.



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Narda Satellite Networks

435 Moreland Road • Hauppauge, New York 11788

Tel: 631-231-1700 • Fax: 631-231-1558

Email: SN.mktg@L-3Com.com

Website: www.L-3Com.com/satellitenetworks

Toll Free for Technical Support 1-800-666-7060

From Outside US +1-631-231-1700 ext. 5818

ISO 9001

10/07

Specifications subject to change without notice.

3.9M Multi-band Lightweight Medium Aperture Antenna (LMAA)



The L-3 Narda Satellite Networks 3.9M Lightweight Medium Aperture Antenna (LMAA) is a lightweight, high gain, quad-band antenna subsystem for delivering quick response satellite communications (SATCOM). The 3.9 LMAA addresses military and civil government requirements for a medium aperture antenna packed in transit cases less than one half of a 463L pallet.

THE 3.9M LIGHTWEIGHT MEDIUM APERTURE ANTENNA (LMAA) INCLUDES:

- 3.9-meter segmented reflector
- Transit case configuration
- Functional packaging
- Advanced technology antenna control available
- ACU override for manual control

QUAD-BAND OPERATING FREQUENCIES

Government: X- and Ka-Band
Commercial: C-, Ku-Band and XTAR

FEATURES

- Quad-Band (C-, X-, Ku-, Ka-Bands)
- DSCS/ARSTRAT WGS certified
- Pedestal designed for superior stability in high winds
- Lightweight construction
- Field-replaceable components
- Automatic satellite acquisition and tracking
- Ruggedized transit cases, five of which form integral part of the support structure
- Lightning protection
- Quick setup/take-down <1 hour
- Packs in transit cases less than one half of a 463L pallet
- XTAR- and WGS-ready



3.9M Multi-band Lightweight Medium Aperture Antenna (LMAA)

ELECTRICAL/PERFORMANCE

	C-Band 2-Port Linear Cross Pol Feed		C-Band 2-Port Circular Pol Feed or Linear Co-Pol Feed		X-Band 2-Port Reversible Circular Cross Pol Feed		Ku-Band 3-Port Co & Cross Pol Feed		Ka-Band 2-Port Reversible Circular Pol Feed	
	Receive	Transmit	Receive	Transmit	Receive	Transmit	Receive	Transmit	Receive	Transmit
Frequency (GHz)	3.400-4.200	5.850-6.650	3.625-4.200	5.850-6.425	7.250-7.750	7.900-8.400	10.950-12.750	13.750-14.500	20.200-21.200	30.000-31.000
Antenna Gain at Lowband (dBi)	40.2	45.1	40.7	45.1	46.7	47.7	50.2	52.5	55.2	58.3
G/T at 10° Elevation/EIRP	21.3 dB/K	67.5 dBW	21.8 dB/K	67.5 dBW	25.5 dB/K	71.0 dBW	29.0 dB/K	74.5 dBW	31.5 dB/K	75.5 dBW
Cross-Polarization On-Axis within 0.5 dB Beamwidth	30 dB 28 dB	30 dB 28 dB	30 dB 28 dB	30 dB 28 dB			35 dB 27 dB	35 dB 35 dB		
Sidelobes	IESS Std F-1		IESS Std F-1		MIL-STD-188-164A DSCS TCR		IESS Std E-2		MIL-STD-188-164A WGS TCR	
Axial Ratio (VAR)			1.16 VAR	1.09 VAR	1.15 VAR	1.26 VAR			1.19 VAR	1.12 VAR
VSWR Performance	1.30:1	1.30:1	1.30:1	1.35:1	1.30:1	1.30:1	1.35:1	1.30:1	1.30:1	1.30:1

PORT-TO-PORT ISOLATION

Tx/Rx (Rx Freq) transmit reject filtering incl.	30 dB		30 dB		26 dB		35 dB		35 dB	
Tx/Rx (Tx Freq) transmit reject filtering incl.		95 dB		95 dB		95 dB		90 dB		90 dB
Waveguide Interface Flange	CPR-229	CPR-137	CPR-229	CPR-137	CPR-137	WR-112	WR-75	WR-75	WR-42	WR-28
Total Power Handling Capability		1 kW CW		500 W CW		1 kW CW		1 kW CW		500 W CW

ENVIRONMENTAL

Wind	Operation	25 mph Steady-state (unanchored) with gusts up to 45 mph, 40 mph Ka (anchored)
	Survival Deployed	45 mph gusting to 60 mph (w/ anchoring)
	Survival Stowed	90 mph max. (w/ anchoring)
	Pointing Loss	≤ 2.0 dB (Ka-Band); 25 mph, gusting 40 mph
Solar Radiation	360 BTU/h/ft²	
Temperature	Operational	-22° to 140° F (-30° to 60° C)
	Survival	-40° to 160° F (-40° to 71° C)
Rain	Non-operational	Up to 4 in/hr (102 mm/hr)
	Operational	Up to 2 in/hr
Ice	Operational	1/2" (13mm)
	Survival	1"
Snow	Survival	10 lbs/ft²
Relative Humidity	5% to 100%	
Sand	Particles driven by wind up to 40 mph (64 km/h)	
Salt	As encountered in moderately corrosive coastal environments	

MECHANICAL

Total Weight	Approx. 1800 lbs
Volume	< 1/2 of a 463L pallet
Setup	< 1 hr
Fasteners	Captive

DESIGN FEATURES

The entire antenna subsystem is contained in nine (9) ruggedized transit cases. These cases are designed for military transport, by road, rail and air. Five (5) of the interlocking transit cases also function as part of the pedestal/support structure.

The highly efficient antenna design provides excellent gain and side-lobe pattern performance at C-, X-, Ku- and Ka- frequency bands.

Sustainability is optimized with field-replaceable components and minimal maintenance requirements.

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Hauppauge, NY 11788
Toll Free: 800.666.7060
Outside US: +1.631.231.1700 ext. 5818
Email: SN.mktg@L-3com.com
www.L-3com.com/satellitenetworks



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AS9100 / ISO 9001

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Narda Satellite Networks

AN/TSC-179

GROUND MULTI-BAND TERMINAL (GMT)

Mission

Deployable satellite communications contained in transit cases required for repeated tactical deployments with continuous operations when deployed worldwide for C⁴ISR missions.

Solution

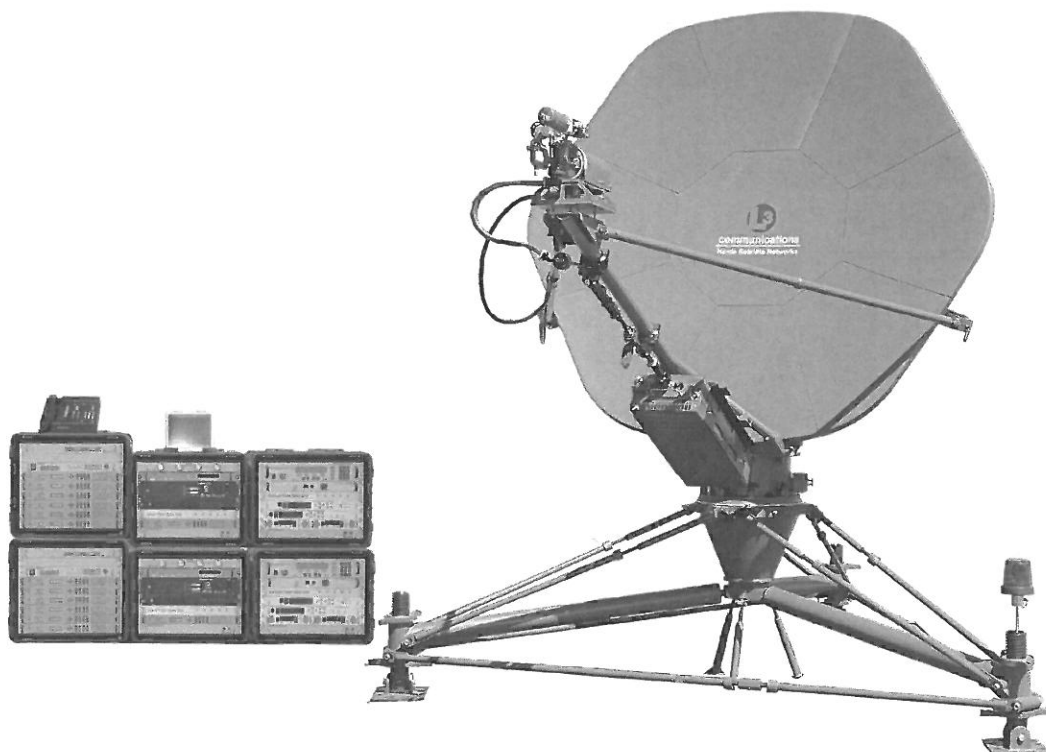
L-3 Narda Satellite Networks provides the quad-band dual hub Ground Multi-band Terminal (GMT) in response to the complex, transitional communication missions confronting today's warfighters.

Second-Generation

Quad-band Dual Hub SATCOM Terminal

The GMT is an extension to the successful forerunner — QHSAT or AN/TSC-168 — providing increased transmission capacity, enhanced operational functionality, mission adaptability through "Plug and Play" architecture and reliability.

- The GMT provides advanced technology SATCOM solutions to a wide range of DoD theater-deployable communications requirements — current and future!
- Multi-band (C-, X-, Ku- and Ka-band), high data throughput, operational availability, flexibility, reduced logistics, high reliability and low operating cost provide the answers to the forward-deployed Commanders.
- High wind stability, ease of deployment and operations enables the troops to execute critical C⁴ISR (Command, Control, Communications, Computers, Intelligence, Surveillance and Reconnaissance) missions securely and quickly.



Narda Satellite Networks

AN/TSC-179

GROUND MULTI-BAND TERMINAL (GMT)

ENVIRONMENTAL CONDITIONS		SYSTEM RELIABILITY	CONFIGURATION FLEXIBILITY
Temperature (operating)	-30° to +55° C with the addition of solar loading for all exposed equipment/transit cases	GMT has a Mean Time Between Critical Failure (MTBCF) greater than 2000 hours. The GMT's operational availability is greater than 96.5 percent over a 30-day period.	• Supports operations in four bands (C-, X-, Ku-, Ka-) • Spoke, Hub, Hub/Spoke, Dual Hub • Inter Facility Link (IFL) length of up to 1.2 miles • Interoperable with QDHT, FTSAT, QHSAT • Interfaces with large aperture antennas including LMAA, LHGXA, QRSA, LAMDA
Wind (operating)	45 mph with gusts to 60 mph		
Rain (operating)	2 in./hr. with 25 mph wind		
Ice (operating)	1/2 in. ice		
Snow (operating)	20 lbs./square ft. on horizontal surfaces		

The GMT is designed for setup, operation, maintenance, and teardown by personnel wearing arctic gear.

PERFORMANCE SPECIFICATIONS

BAND	TRANSMIT	RECEIVE	EIRP	G/T
C-band	5850 – 6425 MHz	3400 – 4200 MHz	63.0 dBW	16.5 dB/K
X-band	7900 – 8400 MHz	7250 – 7750 MHz	67.0 dBW	21.0 dB/K (22.0 dB/K available)
Ku-band	13.75 – 14.5 GHz	10.95 – 12.75 GHz	70.0 dBW	Per paragraph 1.1 of Intelsat Earth Station Standards (IESS)-208 for standard E-1
Ka-band	30.0 – 31.0 GHz	20.2 – 21.2 GHz	71.0 dBW	27.0 dB/K

Key Benefits

- Separable dual hub transit case configuration offers deployment flexibility
- Functional packaging
- Core terminal transportable on one 463L pallet
- Easy setup, satellite acquisition and operation
- XTAR-ready
- L-band IF architecture
- IP/TDMA capability optional
- Superior wind stability (60 mph operating)
- Data rate: 52 Mbps on each of two RF strings (274 Mbps optional)
- Integrated logistics support

Features

- Local and remote system Control Monitor Alarm (CMA) up to 1000 ft. (1.2 miles optional)
- DISA and ARSTRAT certified to operate over DSCS and WGS military satellites
- Interoperability certified by JITC (Joint Interoperability Test Command)
- Intelsat certified for commercial frequency bands
- High frequency stability
- Built-in self-test capability
- GMF-compatible
- Environmentally protected electronic cases for outdoor operation
- ETSSP operation up to 52 Mbps
- Dual-carrier certified for Ka- and Ku-band operation
- Consumption 15 KVA 99-264 VAC, 47-63 Hz auto-sensing
- Setup / take-down time: 60 minutes or less
- Auto acquisition and scan
- Extended operational frequency bands
- GPS-disciplined 5 MHz timing source
- Replacement Frequency Modulated Order Wire (RFMOW)
- Turbo product code-forward error correction

ISO 9001

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435 Moreland Road
Hauppauge, NY 11788
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Outside US: +1.631.231.1700 ext. 5818
E-mail: S.N.mktg@L3com.com
www.L-3com.com/satellitenetworks



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Narda Satellite Networks

L-3. Headquartered in New York City, L-3 Communications employs over 64,000 people worldwide and is a prime contractor in aircraft modernization and maintenance, C3ISR (Command, Control, Communications, Intelligence, Surveillance and Reconnaissance) systems and government services. L-3 is also a leading provider of high technology products, subsystems and systems.



Hawkeye™ III Series
Multiband VSAT Terminals



communications
GCS

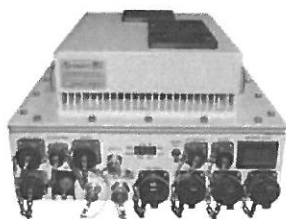
The Hawkeye™ III VSAT System

Common Architecture

The latest generation Hawkeye™ VSAT, the Hawkeye™ III, now gives the user the ability to switch between bands and apertures without having to purchase an additional system. The Hawkeye™ III terminals range in antenna size from 1.2M to 2.4M and utilize a universal ODU to eliminate reconfiguration and allow commonality of control. A simple swap of the feed boom assembly is all that is required to switch between bands. The Hawkeye™ series VSATs are proven reliable, lightweight and now even easier to use!

System Features

- Universal ODU
- Segmented carbon fiber reflector offers high performance and light weight
- Robust auto-acquisition to support Ku, X, Ka, and C bands
- Interchangeable Feed Boom design allows for easy RF Band change
- Interchangeable reflector design allows user to switch easily between aperture sizes
- 4 LAN ports or 3 LAN ports plus DSL option
- MIL-STD-810F tested



Universal ODU

- MIL-STD-810F tested
- Rugged design for outdoor usage
- Embedded iDirect INFINITI® iConnex 700 or iDirect Evolution® iConnex e800 modem with DVB-S2/ACM
- Embedded Ethernet switch
- 4 LAN ports
- DSL port option



Common GCS ViewSAT™ GUI across all platforms

ViewSAT™ is specifically designed to monitor and control the

Hawkeye™ and Cheetah™ series of VSAT terminals. The monitor and control is provided for the embedded iDirect modem, Antenna controller and some select BUC/SSPAs.

Frequency Bands and Availability:

Band	Receive (GHz)	Transmit (GHz)	Feed	1.2M	1.6M	2.0M	2.4M
C	3.625 - 4.20	5.85 - 6.425	Cir or Lin	N	N	Y	Y
X	7.25 - 7.75	7.90 - 8.40	Cir	Y	Y	Y	Y
Ku	10.95 - 12.75	13.75 - 14.50	Lin	Y	Y	Y	Y
Ka	20.2 - 21.2	30.0 - 31.0	Cir	Y	Y	Y	N

G/T and EIRP:

	G/T (dB/K)				EIRP			
	C-Band	X-Band	Ku-Band	Ka-Band	C-Band	X-Band	Ku-Band	Ka-Band
1.2M	-	16.8	20.7	21.7	-	53.4	25W: 56.2 40W: 58.2	61.1
1.6M	-	19.6	22.8	25.1	-	55.5	25W: 58.2 40W: 60.2	67.3
2.0M	16.9	20.7	25.1	27.1	55.7	57.8	25W: 60.3 40W: 62.3	68.3
2.4M	18.5	21.7	26.1	-	57.2	60.1	25W: 61.4 40W: 63.4	-

Note 1: G/T at mid-band frequency and 20 degrees elevation.

Note 2: For 1.6M, 2.0M and 2.4M systems, EIRP assumes standard 40W: C band, 60W: X band, 50W: Ka band

Note 3: For 1.2M EIRP assumes 40W: for X-band, 20W: for Ka-band.

Note 4: For ARSTRAT certified X band systems, EIRP may vary.



Hawkeye™ III Lite 1.2M System

2 cases. Each case < 100 lbs

Ku/ X / Ka

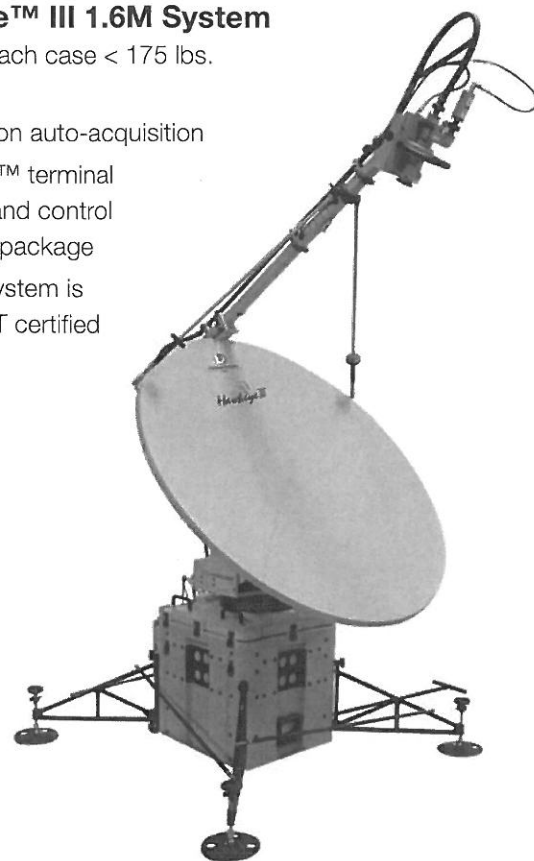
- One button auto-acquisition
- ViewSAT™ terminal monitor and control software package

Hawkeye™ III 1.6M System

6 cases. Each case < 175 lbs.

Ku/ X / Ka

- One button auto-acquisition
- ViewSAT™ terminal monitor and control software package
- X band system is ARSTRAT certified



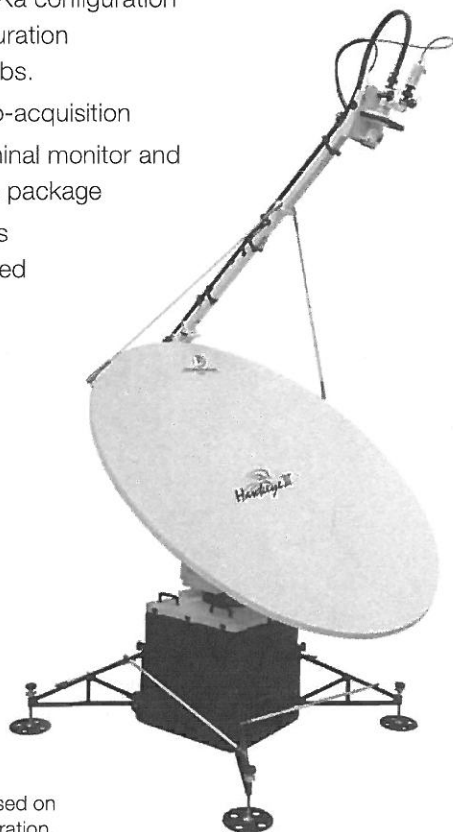
Hawkeye™ III 2.0M System

7 cases: X, Ku or Ka configuration

8 cases: C configuration

Each case < 175 lbs.

- One button auto-acquisition
- ViewSAT™ terminal monitor and control software package
- X band system is ARSTRAT certified



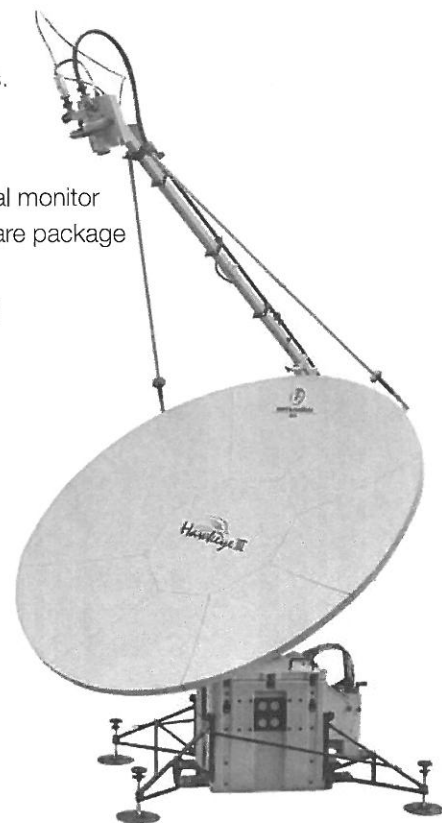
Hawkeye™ III 2.4M System

7 cases: Ku, X

8 cases: C

Each case < 175 lbs.

- One button auto-acquisition
- ViewSAT™ terminal monitor and control software package
- X band system is ARSTRAT certified



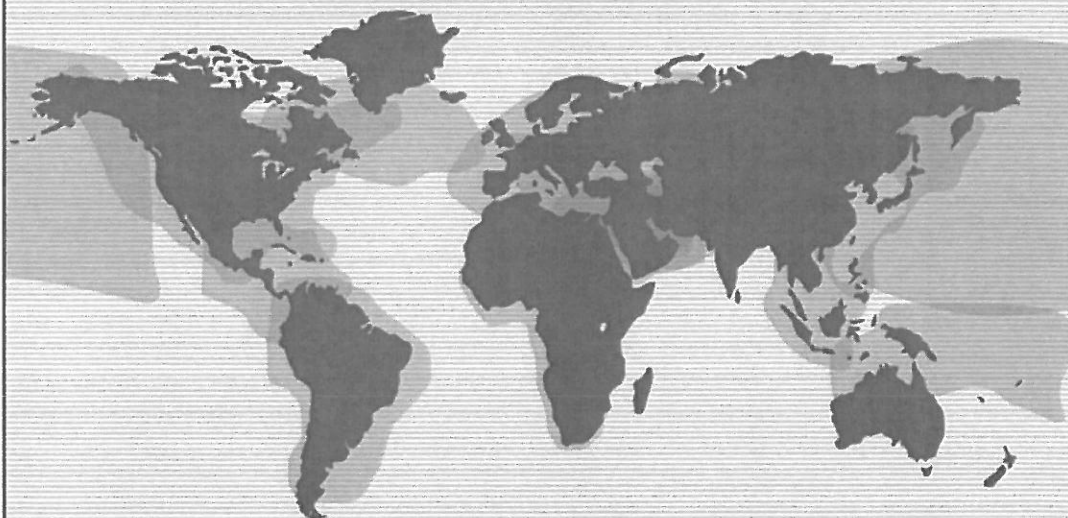
Case quantities are based on original system configuration.



System Specifications

AC Power	90-132 and 180-264 VAC Auto-ranging 47 – 440 Hz
Operational Temperature	-32° to +50° C
Storage Temperature	-40° to +60° C
Wind (Operational)	30 MPH gusting to 45 MPH (with anchors)
Feed	Offset, Prime Focus, 0.8 F/D (0.83 F/D on 2.4M); 0.6 F/D on 1.2M
Reflector	Segmented Carbon Fiber
Az/EI/Pol Drive System	Patented Roto-Lok elevation over azimuth with motorized linear feed
Controller	DVB Reference Satellite or iDirect SNR tuning. One button fully automatic satellite acquisition (all 3 axis) using GPS, compass, and level sensor inputs.
Accuracy	< ± 0.1° All axis
Data Interface	10/100 BT Ethernet (CAT-5) 4 ports. 10/100 BT Ethernet (CAT 5) 3 ports plus 1 DSL Port. (optional)
Modem	Embedded iDirect iNFINITI® iConnex 700 or iDirect Evolution® iConnex e800 modem. (L-Band Interface for external modem)
Tracking	Optional Beacon Receiver and software.

SATCOM Group Coverage Area



Teaming with our L-3 3Di partner we now offer the perfect addition to our Hawkeye III Series of Terminals – VSAT satellite network services that provide enterprise and military-quality satellite bandwidth and services around the world.



SATCOM Group

Headquarters: L-3 GCS

7640 Omnitech Place • Victor, NY 14564 USA

Web site: www.L-3com.com/GCS

E-mail: GCS.information@L-3com.com

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