

Model 2.4m SM-LT Troposcatter Antenna

Troposcatter Antennas



The Strength to Perform

Carbon fiber/aluminum construction

Lightweight, precision surface, high stiffness, robust design for vehicle mounting

High performance, low sidelobes

Stow/deployment -- low profile, stow position on vehicle, precision alignment, automatic deploy and stow

Description

The VertexRSI 2.4m SM-LT antenna, configured for troposcatter operation, utilizes either a "conventional" C-band (4.4 to 5.0 GHz) feed or a proprietary dual-beam Ku-band feed (14.9 to 15.4 GHz) to provide high-quality, over-the-horizon communications. In C-band applications, space diversity is normally achieved using dual antennas in each terminal. For Ku-band applications, a unique, patent-pending, dual-beam feed is incorporated to provide two closely-spaced beams in elevation to achieve angle diversity in the troposcatter link.

Engineered to stringent standards for multiple applications, the 2.4m SM-LT delivers performance suitable for multi-band satcom and troposcatter operation. Various modes and/or frequency bands of operation are readily accommodated via interchangeable feed packages, making the antenna truly field-configurable. In any operational mode or frequency band, antenna performance is outstanding, with high gain, low sidelobes and high crosspol and port-to-port isolation values. The use of carbon fiber technology and precision-machined aluminum components provides the ultimate in transportability, wind performance and longevity in tactical environments.

With an integral azimuth over elevation cable drive and lower azimuth bearing, the antenna system is readily fitted to HMMWVs, trailers or transportable pallets. The 2.4m SM-LT is fully compatible with the industry-standard VertexRSI Model 123T Antenna Control System, which provides position control and tracking, as well as auto-deploy and auto-stow functionality for both troposcatter and satcom modes of operation.

Options

- Complete tropo terminals available, including amplifiers, frequency converters, modems, antenna control systems and monitor and control systems
- Reflector configurations (single or three-piece segmented)
- Finishes (green, tan or per customer spec)
- Integration (various TWT/amplifier mounting arrangements)
- Anti-icing
- Satcom capable (L, C, X, Ku, DBS, Ka, low-PIM)

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Technical Specifications

Mechanical	
Azimuth Travel	±150° continuous
Elevation Travel	-4° to +90°
Polarization Travel	±90° (satcom operation, linear only)
Drive Rates	0.3°/second (azimuth) 0.7°/second (elevation) 2.6°/second (polarization), satcom operation, linear only
Reflector	2.4-meter (94.5 in) carbon fiber (single or three-piece configuration)
Feed	Troposcatter or satcom multiband interchangeable
Finish	White (standard; other optional finishes also available)
Weight	515 lbs (234 kg) without feed or deicing
Stow Height	23.5 in (59.7 cm)
Electrical Interface	25 ft (7.6 m) cable, pre-connectorized for various controller options
Integration	150 lbs (68 kg) feed boom mounted 300 lbs (136 kg) positioner mounted

Environmental	
Wind Loading*	
Operational	45 mph (72 km/h) gusting to 60 mph (97 km/h)
Survival	45 mph (72 km/h) gusting to 75 mph (121 km/h) any position 90 mph (145 km/h) stow position
Pointing Loss (operational winds)	Maximum 2.0 dB Rx loss (Ku-band)
Temperature	
Operational	-22° to +122° F (-30° to +50° C)
Survival	-40° to +158° F (-40° to +70° C)
Rain	
Operational	4 in/h (10 cm/h)
Survival	6 in/h (15 cm/h)
Relative Humidity	0% to 100% with condensation
Solar Radiation	360 BTU/h/ft ² (1000 Kcal/h/m ²)
Radial Ice (survival)	1 in (25 mm) on all surfaces, 1/2 in (12 mm) on all surfaces with 80 mph (130 km/h) wind gusts*
Corrosive Atmosphere	As encountered in coastal regions and/or heavily industrialized areas

* Depending on vehicle capabilities.

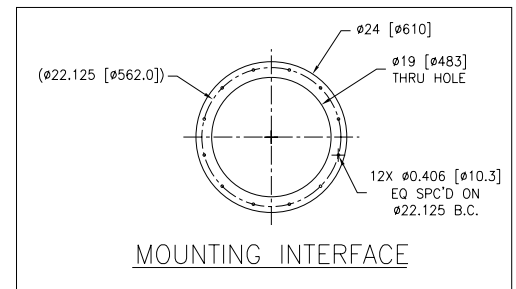
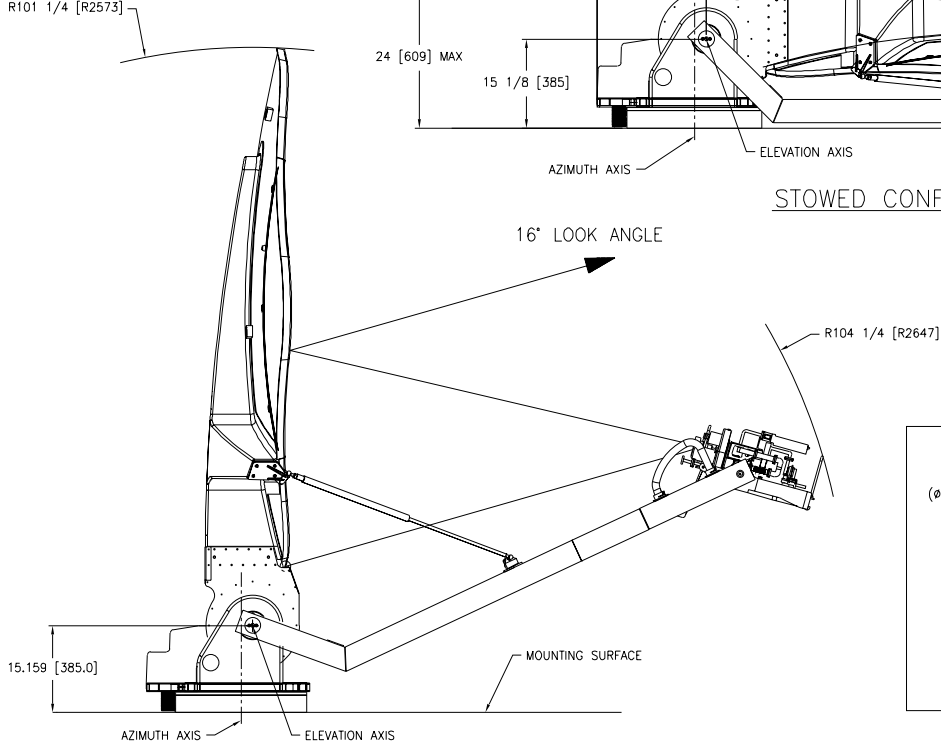
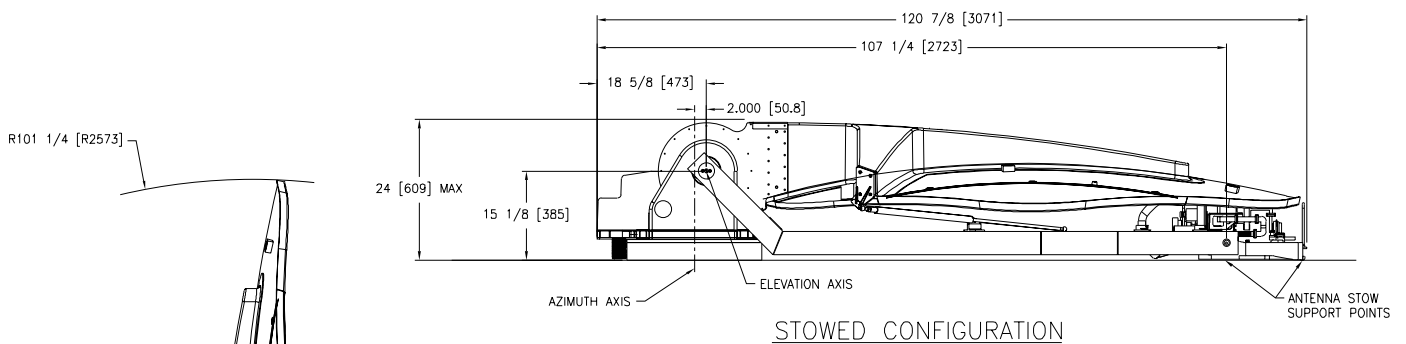
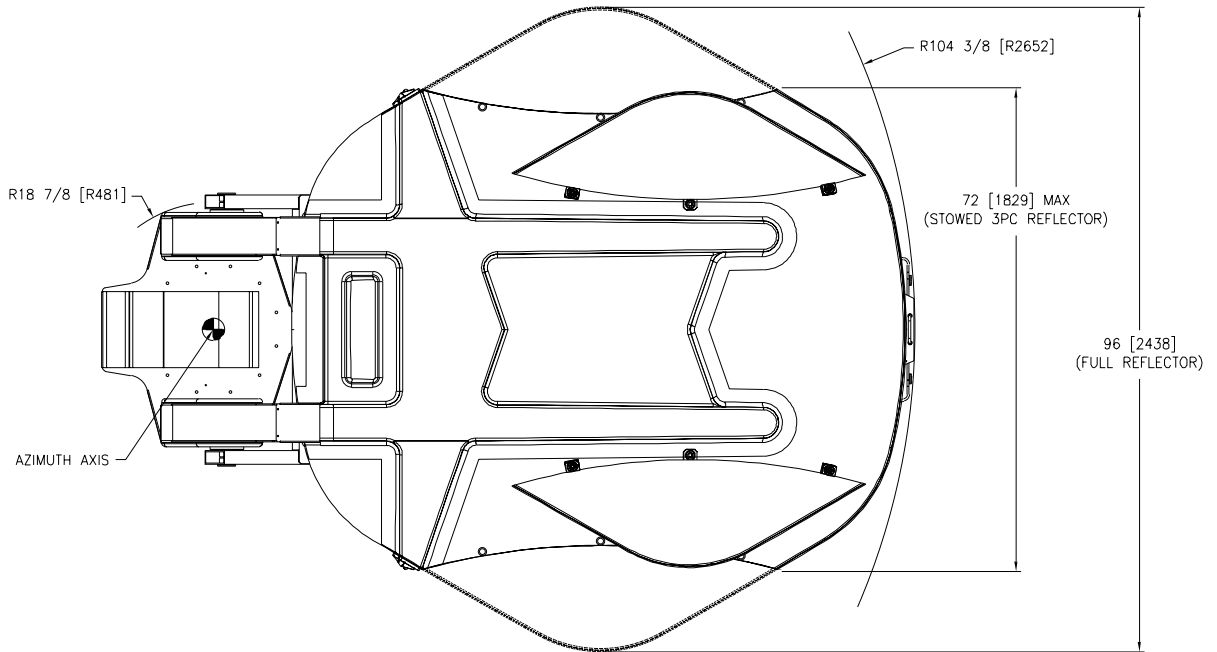
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Electrical**	Tropo C-Band 2-Port Linear Polarized***		Dual Beam Tropo Ku-Band 4-Port Linear Polarized	
	Receive	Transmit	Receive	Transmit
Frequency (GHz)	4.400 - 5.000	4.400 - 5.000	14.900 - 15.400	14.900 - 15.400
Antenna Gain at Midband, dBi	38.30	38.30	49.70	49.70
Antenna Noise Temperature	81 K (1° elevation)		121 K (1° elevation)	
	72 K (2° elevation)		101 K (2° elevation)	
	40 K (10° elevation)		58 K (10° elevation)	
	36 K (20° elevation)		50 K (20° elevation)	
Typical G/T				
at 20° Elevation, Clear Horizon, 4.400 GHz				
35° K LNA	18.1 dB/K			
50° K LNA	17.3 dB/K			
at 1° Elevation, Clear Horizon, 15.150 GHz				
70° K LNA			26.7 dB/K	
90° K LNA			26.2 dB/K	
Pattern Beamwidth (in degrees at midband)				
-3 dB Beamwidth	2.08	2.08	0.54	0.54
-15 dB Beamwidth	4.37	4.37	1.13	1.13
Sidelobe Performance				
First Sidelobe Across the Band	-20.0 ± 2 dB	-20.0 ± 2 dB	-20.0 ± 2 dB	-20.0 ± 2 dB
For Angle A from 14° to 22°	-26 dB	-26 dB	-26 dB	-26 dB
For Angles Greater Than 22°	-30 dB	-30 dB	-30 dB	-30 dB
Cross Polarization Isolation				
On Axis	30.0 dB	30.0 dB	30.0 dB	30.0 dB
Within 1.0 dB Beamwidth	30.0 dB	30.0 dB	30.0 dB	30.0 dB
VSWR	1.30:1	1.30:1	1.30:1	1.30:1
Port-to-Port Isolation				
Rx/Tx (Rx frequency)	0 dB	-30 dB	0 dB	-30 dB
Tx/Rx (Tx frequency)	-30 dB	0 dB	-30 dB	0 dB
Feed Insertion Loss	0.15 dB	0.15 dB	0.15 dB	0.15 dB
Waveguide Interface Flange	CPR-187G	CPR-187G	WR-62	WR-62
Total Power Handling Capability		2 kW CW		1 kW CW
RF Specification	975-3524		975-3358	

** Vehicle capabilities directly affect antenna performance during and following transportation.

*** Tropo C-band operation requires dual antennas to achieve signal diversity.

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