

Model 2.4m SM-LT Mobile Antenna

Mobile Antennas



The Strength to Perform

Description

The VertexRSI lightweight 2.4-meter mobile antenna is designed for worldwide transmit and receive operation in C, X, Ku and Ka-band. This mobile antenna consists of a carbon fiber composite reflector and back beam mounted on a cable-driven, elevation-over-azimuth positioning system. This results in a low-weight antenna with superior stiffness and high performance under wind loading conditions.

The unique shape and the accurate reflector surface provide exceptionally low sidelobe and cross-polarization performance well within INTELSAT and EUTELSAT requirements. Repeatability is maintained with precision registration of the three reflector segments. A one-piece reflector is also available. The interchangeable feeds are palletized for quick, easy removal and replacement, allowing the end-user to effectively change frequency bands in the field within minutes.

Features

- Aluminum/Carbon fiber construction
 - Lightweight, precision surface, high stiffness, robust design for vehicle mounting
- High performance
 - Low sidelobes, high E.I.R.P. capability, compliant under operational wind conditions
- Stow/deployment
 - Low profile, stow position on vehicle, precision alignment, automatic deploy and stow
- Multiband antenna system with rapid interchange between C, X, Ku and Ka-band feeds
- INTELSAT type approved for C/Ku-band, EUTELSAT compliant

Options

- Reflector (single or three-piece segmented)
- Finishes (green, tan or per customer spec)
- Integration (various TWT/amplifier mounting arrangements)
- Anti-icing
- Troposcatter capable

Technical Specifications

Mechanical	
Azimuth Travel	±150° continuous
Elevation Travel	0° to 90° of reflector boresight
Polarization Travel	±90°
Drive Rates	0.3°/second (azimuth) 0.7°/second (elevation) 2.6°/second (polarization)
Reflector	2.4-meter (94.5 in) carbon fiber (single or three-piece configuration)
Feed	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 ¹	
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)	2.0 dB peak (Ka-band Rx), performance dependent on controller capability
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 ¹
Corrosive Atmosphere	As encountered in coastal regions and/or heavily industrialized areas

¹ Depending on vehicle capabilities.

² Vehicle capabilities directly affect antenna performance during and following transportation.

³ Angular values for Ka-band are 1° to 30°, 30° to 130° and 130° to 180°.

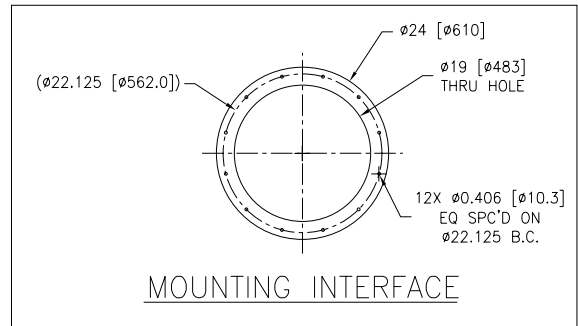
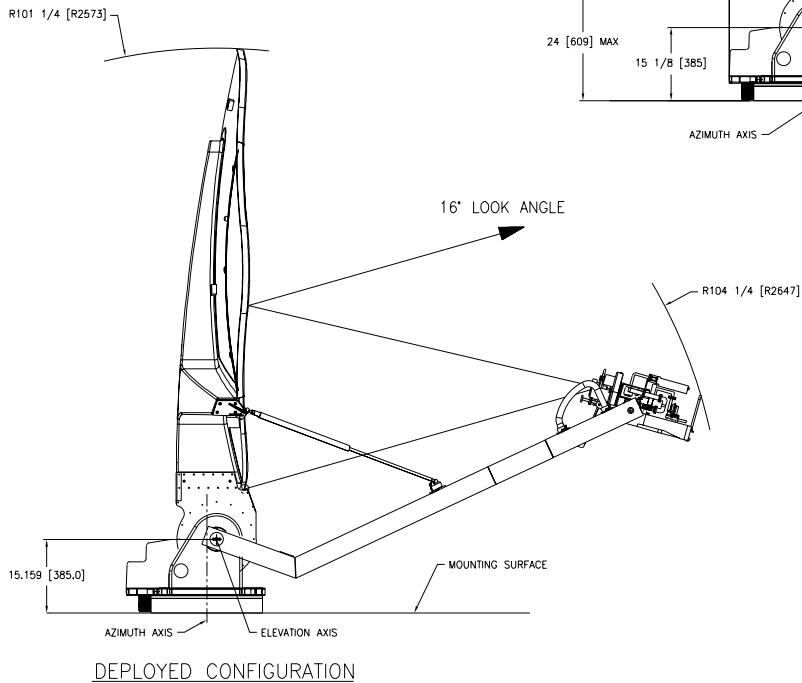
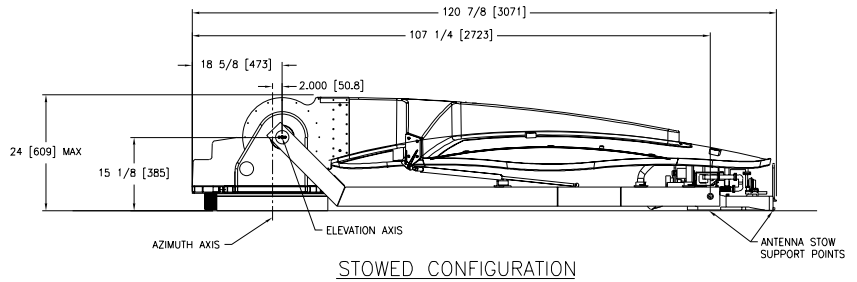
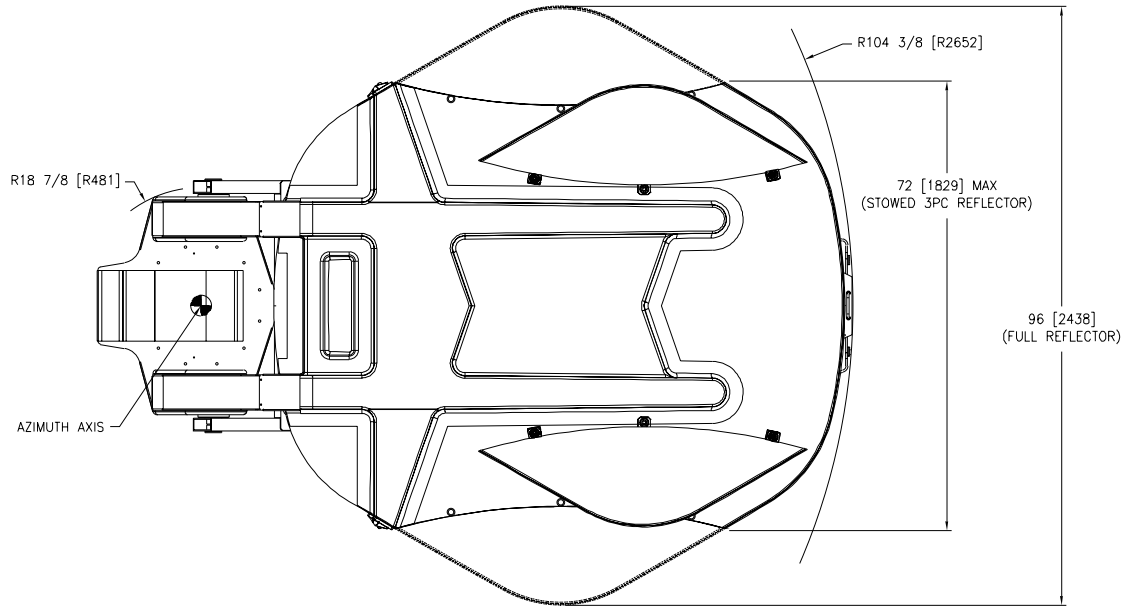
⁴ Ku-band is Intelsat Type Approved with the following note on Noise Temperature: 73.7 K, 10° elevation, 11 GHz.

⁵ X-band feed includes high isolation filter.

Model 2.4m SM-LT Mobile Antenna

Electrical ²	C-Band 2-Port Linear Polarized		C-Band 2-Port Circular Polarized		X-Band 2-Port Circular Polarized		Ku-Band 2-Port Linear Polarized		Ku-Band 4-Port Linear Polarized		Ka-Band 2-Port Circular Polarized	
	Receive	Transmit	Receive	Transmit	Receive	Transmit	Receive	Transmit	Receive	Transmit	Receive	Transmit
Frequency (GHz)	3.625 - 4.200	5.850 - 6.425	3.625 - 4.200	5.850 - 6.425	7.250 - 7.750	7.900 - 8.400	10.950 - 12.750	13.750 - 14.500	10.950 - 12.750	13.750 - 14.500	20.200 - 21.200	30.000 - 31.000
Antenna Gain at Midband, dBi	38.20	42.00	38.06	42.10	43.50	43.60	47.19	49.00	47.10	48.80	52.30	55.20
Antenna Noise Temperature												
5° Elevation	49 K		51 K		68 K		63 K		85 K		143 K	
10° Elevation	38 K		50 K		59 K		60 K ⁴		75 K		123 K	
20° Elevation	33 K		49 K		55 K		56 K		69 K		109 K	
40° Elevation	34 K		48 K		55 K		55 K		68 K		101 K	
Typical G/T at 4.0 & 7.5 GHz 20° Elevation, Clear Horizon	19.5 dB/K				23.1 dB/K							
Typical G/T at 4.0 & 10.95 GHz 10° Elevation, Clear Horizon			18.8 dB/K				25.4 dB/K					
C-Band 35° K LNA			18.1 dB/K									
C-Band 50° K LNA							24.7 dB/K					
Ku-Band 70° K LNA									25.7 dB/K			
Ku-Band 90° K LNA									25.1 dB/K			
Typical G/T at 11.85 GHz 20° Elevation, Clear Horizon											28.7 dB/K	
Ka-Band 120° K LNA											27.4 dB/K	
Ka-Band 200° K LNA												
Pattern Beamwidth (in degrees at midband)												
-3 dB Beamwidth	2.12	1.37	2.09	1.35	1.11	1.03	0.72	0.60	0.71	0.60	0.40	0.29
-15 dB Beamwidth	4.45	2.88	4.39	2.84	2.33	2.16	1.51	1.26	1.49	1.26	0.84	0.61
Sidelobe Performance ³												
For Angle A from 2° to 30° (typical)							29-25 Log A		29-25 Log A		29-25 Log A	
For Angle A beyond mainbeam to 20°	29-25 Log A		29-25 Log A		29-25 Log A							
For Angle A from 30° to 140°							-10 dBi		-10 dBi		-10 dBi	
For Angle A from 140° to 180°							0 dBi		0 dBi		0 dBi	
Cross Polarization												
On Axis	30.0 dB	30.0 dB	19.7 dB	27.3 dB	21.3 dB	21.3 dB	35.0 dB	35.0 dB	35.0 dB	35.0 dB	24.8 dB	24.8 dB
Within 1.0 dB BW	28.0 dB	28.0 dB	19.7 dB	27.3 dB	21.3 dB	21.3 dB	27.0 dB	35.0 dB	27.0 dB	35.0 dB	24.8 dB	24.8 dB
VSWR	1.30:1 (17.7 dB)	1.30:1 (17.7 dB)	1.30:1 (17.7 dB)	1.30:1 (17.7 dB)	1.30:1 (17.7 dB)	1.30:1 (17.7 dB)	1.35:1 (16.5 dB)	1.25:1 (19.0 dB)	1.35:1 (16.5 dB)	1.30:1 (17.7 dB)	1.30:1 (17.7 dB)	1.30:1 (17.7 dB)
Axial Ratio			1.81 dB	0.75 dB	1.50 dB	1.50 dB					1.00 dB	1.00 dB
Port-to-Port Isolation												
Rx/Tx (Rx frequency)	0 dB	-30 dB	0 dB	-50 dB	0 dB	-110 dB	0 dB	-30 dB	0 dB	-50 dB	0 dB	-50 dB
Tx/Rx (Tx frequency)	-60 dB	0 dB	-100 dB	0 dB	-110 dB	0 dB	-85 dB	0 dB	-85 dB	0 dB	-85 dB	0 dB
Feed Insertion Loss	0.15 dB	0.15 dB	0.40 dB	0.20 dB	0.45 dB	1.00 dB ⁵	0.30 dB	0.20 dB	0.60 dB	0.45 dB	0.30 dB	0.30 dB
Waveguide Interface Flange	CPR- 229G	CPR- 137G	CPR- 229G	CPR-137G	CPR- 112G	CPR-137G	WR-75 Flat	WR-75 Flat	WR-75 Flat	WR-75 Flat	WR-42 Flat	WR-28 Flat
Waveguide Interface Az Axis			CPR- 137G	CPR-137G			CPR-137G	WR-75 Flat	WR-75 Flat	WR-75 Flat		
Total Power Handling Capability	2 kW CW		2 kW CW		2 kW CW		1 kW CW		2 kW CW		250 W CW	
RF Specification	975-2837		975-2712		975-1012 ⁵		975-1575 ⁴		975-1708		975-2901	

Model 2.4m SM-LT Mobile Antenna



GENERAL DYNAMICS SATCOM Technologies

1104 Energy Drive • Kilgore, TX 75662 USA • Tel: (903) 984-7811 • Fax: (903) 984-7597 • Email: kilgore-sales@gdsatcom.com
Website: www.gdsatcom.com 655-0018B, 02/09