# **Model 16.4m Cassegrain Antenna**

### Satcom Antennas



### The Strength to Perform

Fully interchangeable reflector components with aluminum reflector panels and galvanized steel backup structure

Designed for 1.5 to 15 GHz operation, meeting FCC and ITU-RS-580 requirements

Galvanized steel elevation over azimuth pedestal with jackscrews

Survives 125 mph winds in any position

#### **Description**

The General Dynamics SATCOM Technologies 16.4-meter antenna delivers exceptional performance for transmit/ receive and receive only applications in L through Ku-band frequencies. This antenna offers a reflector design that incorporates precision-formed panels, truss radials and hub assembly. It features an innovative Cassegrain feed and subreflector design which results in high gain, low noise temperature, high antenna efficiency and excellent rejection of noise and microwave interference. A large center hub provides spacious accommodation for equipment mounting. The reflector is supported by a galvanized elevation over azimuth kingpost pedestal that provides the required stiffness for pointing and tracking accuracy. The pedestals are designed for full orbital arc coverage and are readily adaptable to ground or rooftop installations. The electrical performance is compliant with FCC and ITU-RS-580 sidelobe specifications and Intelsat (A) and Eutelsat requirements.

#### **Options**

- L, S, C, X and Ku-band feed configurations
- C/Ku receive only feed systems
- CP/LP manual or remote switchable feeds
- Specialized feed systems (e.g., extended, multi-band)
- Antenna control system with tracking
- Reflector and feed deicing systems
- Environmental hub configurations
- Integrated transmit cross-axis kits
- Integrated LNA or LNB systems
- HPAs, converters and M&C systems
- Packing for sea and air transport
- Turnkey installation and testing

#### **Upgrades**

- X-band low PIM reflector/feed configurations
- Bullgear azimuth drive
- High wind configuration
- Low operating temperatures
- High power configurations

## Technical Specifications

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	C-Band 4-Port		C-Band 4-Port		Ext. C-Band 4-Port		Ext. C-Band 4-Port		C-Band 4-Port	
	Linear F	Polarized	Circular	Polarized	Linear F	Polarized	Circular	Polarized	CP/LP Sv	witchable
Electrical (1)	Receive	Transmit	Receive	Transmit	Receive	Transmit	Receive	Transmit	Receive	Transmit
Frequency (GHz)	3.625 -	5.850 -	3.625 -	5.850 -	3.400 -	5.850 -	3.400 -	5.850 -	3.625 -	5.850 -
	4.200	6.425	4.200	6.425	4.200	6.725	4.200	6.650	4.200	6.425
Antenna Gain, Midband dBi (2)	55.10	59.00	55.20	58.80	55.20	59.00	54.80	58.80	55.00	58.80
VSWR	1.25:1	1.25:1	1.25:1	1.25:1	1.30:1	1.30:1	1.30:1	1.30:1	1.30:1	1.30:1
Pattern Beamwidth (2)										
-3 dB, at midband	0.30°	0.19°	0.29°	0.19°	0.29°	0.19°	0.31°	0.19°	0.30°	0.19°
-15 dB, at midband	0.63°	0.40°	0.61°	0.40°	0.61°	0.40°	0.65°	0.40°	0.63°	0.40°
Antenna Noise Temperature										
5° Elevation	53 K		58 K		57 K		64 K		63 K	
10° Elevation	44 K		49 K		48 K		54 K		54 K	
20° Elevation	38 K		43 K		42 K		49 K		48 K	
40° Elevation	35 K		41 K		40 K		46 K		46 K	
Typical G/T (dB/K) (3)										
Midband, 35 K LNA	36.5		36.3		36.3		35.3		35.5 (10°	elevation)
Axial Ratio			0.50 dB	0.50 dB			0.51 dB	0.51 dB	0.51 dB	0.51 dB
Power Handling (total)		10 kW CW		10 kW CW		10 kW CW		10 kW CW		10 kW CW
Cross Polarization Isolation										
On Axis (dB)	35.0	35.0	30.8	30.8	35.0	35.0	30.7	30.7	30.7/35.0	30.7/35.0
Within 1.0 dB BW (dB)	30.0	30.0	30.8	30.8	30.0	30.0	30.7	30.7	30.7/30.0	30.7/30.0
Port to Port Isolation										
Rx/Tx (Rx frequency)	0 dB	-30 dB	0 dB	-70 dB	0 dB	-70 dB	0 dB	-30 dB	0 dB	-30 dB
Tx/Rx (Tx frequency)	-85 dB	0 dB	-85 dB	0 dB	-85 dB	0 dB	-30 dB	0 dB	-30 dB	0 dB
Rx/Rx, Tx/Tx (CP mode)			20 dB	23 dB			17 dB	17 dB	19 dB	19 dB
Rx/Rx, Tx/Tx (LP mode)	30 dB	30 dB			30 dB	30 dB			30 dB	30 dB
Sidelobe Performance	Meets FCC 25.209, Intelsat or ITU-RS-580						Meets Intelsat or ITU-RS-580			
RF Specification	975-	1365	975-	1237	975-	-1792	975-	-1924	975-	2490

<sup>(1)</sup> All values are at rear feed flange. (2) Rx values are at 4 GHz. (3) Typical G/T at 20° elevation with clear horizon using single bolt-on LNA to feed.

Mechanical/Environmental   Mechanical/Environm									
Antenna Type       Cassegrain design         Reflector Construction       40 precision-formed aluminum panels with heat-diffusing white paint, galvanized steel back—u structure         Hub Dimensions       86 in (218 cm) OD, 55.5 in (141 cm) depth         Mount Configuration       Elevation over azimuth pedestal, constructed of galvanized steel         Drive Type       Machine jack screws       Machine jack screw (EL), gear drive (AZ)       Machine jack screws         Azimuth Travel       205° (3 segments @ 85°)       205° continuous       0 to 90° continuous         Elevation Travel       0 to 90° continuous       0 to 90° continuous       0 to 90° continuous         Foundation (L x W x D)       31.5 x 31.5 x 33.5 x 35.ft (9.6 x 9.6 x 1.0 m)       36.5 x 36.5 x 36.5 x 35.5 x 3.5 ft (11.1 x 11.1 x 1.0 m)         Concrete       128.6 yds³ (9.8.3 m³)       173 yds³ (13.23 m³)       173 yds³ (13.23 m³)         Reinforcing Steel       14,575 lbs. (6,611 kg)       16,838 lbs. (7,638 kg)         Shipping Containers       One 40 ft flatrack, four 40 ft open top, two 40 ft standard         Operational Wind Loading Any Position       45 mph (72 km/h) gusting to 60 mph (97 km/h)       135 mph (217 km/h) @ 58° F (15° C)         Survival Temperature       45° to +122° F (-15° to +50° C)       125 mph (200 km/h) @ 58° F (15° C)       180 mph (290 km/h) @ 58° F (15° C)         Survival Temperature       -22°	Mechanical/Environmental (4)	Turning Head Pedestal (TH)	Turning Head - Full Motion (TH-BG)	High Wind Turning Head Pedestal (TH-HW)					
Reflector Construction Hub Dimensions 86 in (218 cm) 0D, 55.5 in (141 cm) depth  Mount Configuration Elevation over azimuth pedestal, constructed of galvanized steel  Drive Type Machine jack screws Machine jack screw (EL), gear drive (AZ) Azimuth Travel 205° (3 segments @ 85°) Elevation Travel Oto 90° continuous Oto	Antenna Diameter	16.4 meters (53.8 feet)							
Hub Dimensions         86 in (218 cm) OD, 55.5 in (141 cm) depth           Mount Configuration         Elevation over azimuth pedestal, constructed of galvanized steel           Drive Type         Machine jack screws         Machine jack screw (EL), gear drive (AZ)         Machine jack screws           Azimuth Travel         205° (3 segments @ 85°)         205° continuous         0 to 90° continuous           Elevation Travel         0 to 90° continuous         0 to 90° continuous         0 to 90° continuous           Foundation (L x W x D)         31.5 x 31.5 x 3.5 ft (9.6 x 9.6 x 1.0 m)         36.5 x 36.5 x 3.5 ft (11.1 x 11.1 x 1.0 m)           Concrete         128.6 yds³ (98.3 m³)         173 yds³ (132.3 m³)         173 yds³ (132.3 m³)           Reinforcing Steel         14,575 lbs. (6,611 kg)         16,838 lbs. (7,638 kg)           Shipping Containers         One 40 ft flatrack, four 40 ft open top, two 40 ft standard         Up to 60 mph (97 km/h)           Survival Wind Loading         45 mph (72 km/h) gusting to 60 mph (97 km/h)         Up to 60 mph (97 km/h)           At Zenith         125 mph (200 km/h) @ 58° F (15° C)         135 mph (217 km/h) @ 58° F (15° C)           At Zenith         150 mph         180 mph (290 km/h) @ 58° F (15° C)           Survival Temperature         +5° to +122° F (-15° to +50° C)         180 mph (290 km/h) @ 58° F (15° C)           Survival Temperature <th< td=""><td>Antenna Type</td><td colspan="8">Cassegrain design</td></th<>	Antenna Type	Cassegrain design							
Mount Configuration  Elevation over azimuth pedestal, constructed of galvanized steel  Drive Type  Machine jack screws Machine jack screws Azimuth Travel 205° (3 segments @ 85°) 205° continuous Dt o 90° con	Reflector Construction	40 precision-formed aluminum panels with heat-diffusing white paint, galvanized steel back-up structure							
Drive Type Machine jack screws Machine jack screw (EL), gear drive (AZ) 205° (3 segments @ 85°) 205° continuous 205° continuous 205° (3 segments @ 85°) 205° (20	Hub Dimensions	86 in (218 cm) OD, 55.5 in (141 cm) depth							
Azimuth Travel         205° (3 segments @ 85°)         205° continuous         205° continuous         0 to 90° continuous           Foundation (L x W x D)         31.5 x 31.5 x 3.5 ft (9.6 x 9.6 x 1.0 m)         36.5 x 36.5 x 3.5 ft (11.1 x 11.1 x 1.0 m)         36.5 x 36.5 x 3.5 ft (11.1 x 11.1 x 1.0 m)           Concrete Reinforcing Steel         14,575 lbs. (6,611 kg)         173 yds² (132.3 m³)         16,838 lbs. (7,638 kg)           Shipping Containers         One 40 ft flatrack, four 40 ft open top, two 40 ft standard         Vperational Wind Loading Survival Wind Loading At Position At Zenith         45 mph (72 km/h) gusting to 60 mph (97 km/h)         Vperational Temperature Protectional Temperature	Mount Configuration	Elevation over azimuth pedestal, constructed of galvanized steel							
Elevation Travel   0 to 90° continuous   0 to 90° continuous   0 to 90° continuous	Drive Type	Machine jack screws	Machine jack screw (EL), gear drive (AZ)	Machine jack screws					
Foundation (L x W x D)         31.5 x 31.5 x 3.5 ft (9.6 x 9.6 x 1.0 m)         36.5 x 36.5 x 3.5 ft (11.1 x 11.1 x 1.0 m)           Concrete         128.6 yds³ (98.3 m³)         173 yds³ (132.3 m³)           Reinforcing Steel         14,575 lbs. (6,611 kg)         16,838 lbs. (7,638 kg)           Shipping Containers         One 40 ft flatrack, four 40 ft open top, two 40 ft standard           Operational Wind Loading         45 mph (72 km/h) gusting to 60 mph (97 km/h)         Up to 60 mph (97 km/h)           Survival Wind Loading         125 mph (200 km/h) @ 58° F (15° C)         135 mph (217 km/h) @ 58° F (15° C)           At Zenith         150 mph         180 mph (290 km/h) @ 58° F (15° C)           Operational Temperature         +5° to +122° F (-15° to +50° C)         180 mph (290 km/h) @ 58° F (15° C)           Survival Temperature         -22° to +140° F (-30° to +60° C), low temperature options available         -22° to +140° F (-30° to +60° C), low temperature options available           Relative Humidity         0 to 100% with condensation         50ar Radiation         360 BTU/h/ft² (1,000 Kcal/h/m²)           Ice (survival)         1 in (2.5 cm) on all surfaces or 1/2 in (1.3 cm) on all surfaces with 80 mph (130 km/h) wind gusts           Atmospheric Conditions         As encountered in coastal regions and/or heavily industrialized areas	Azimuth Travel	205° (3 segments @ 85°)	205° continuous	205° (3 segments @ 85°)					
Concrete Reinforcing Steel       128.6 yds³ (98.3 m³)       173 yds³ (132.3 m³)       16,838 lbs. (7,638 kg)         Shipping Containers       One 40 ft flatrack, four 40 ft open top, two 40 ft standard       Up to 60 mph (97 km/h)         Operational Wind Loading Survival Wind Loading Any Position At Zenith       45 mph (200 km/h) @ 58° F (15° C)       135 mph (217 km/h) @ 58° F (15° C)         At Zenith       150 mph       150 mph       180 mph (290 km/h) @ 58° F (15° C)         Operational Temperature Survival Temperature       +5° to +122° F (-15° to +50° C)       +5° to +122° F (-15° to +60° C), low temperature options available         Rain       Up to 4 in/h (10 cm/h)         Relative Humidity       0 to 100% with condensation         Solar Radiation       360 BTU/h/ft² (1,000 Kcal/h/m²)         Ice (survival)       1 in (2.5 cm) on all surfaces or 1/2 in (1.3 cm) on all surfaces with 80 mph (130 km/h) wind gusts         Atmospheric Conditions       As encountered in coastal regions and/or heavily industrialized areas	Elevation Travel	0 to 90° continuous	0 to 90° continuous	0 to 90° continuous					
Reinforcing Steel 14,575 lbs. (6,611 kg) 16,838 lbs. (7,638 kg)  Shipping Containers One 40 ft flatrack, four 40 ft open top, two 40 ft standard  Operational Wind Loading Survival Wind Loading Any Position 125 mph (200 km/h) @ 58° F (15° C) 135 mph (217 km/h) @ 58° F (15° C) 135 mph (217 km/h) @ 58° F (15° C) 180 mph (290 km/h) @ 58° F (15° C)  Operational Temperature +5° to +122° F (-15° to +50° C) 180 mph (290 km/h) @ 58° F (15° C)  Survival Temperature -22° to +140° F (-30° to +60° C), low temperature options available  Rain Up to 4 in/h (10 cm/h)  Relative Humidity 0 to 100% with condensation  Solar Radiation 360 BTU/h/ft² (1,000 Kcal/h/m²)  Ice (survival) 1 in (2.5 cm) on all surfaces or 1/2 in (1.3 cm) on all surfaces with 80 mph (130 km/h) wind gusts  Atmospheric Conditions As encountered in coastal regions and/or heavily industrialized areas	Foundation (L x W x D)	31.5 x 31.5 x 3.5 ft (9.6 x 9.6 x 1.0 m)	36.5 x 36.5 x 3.5 ft (11.1 x 11.1 x 1.0 m)						
Shipping Containers Operational Wind Loading Operational Wind Loading Any Position At Zenith Operational Temperature Survival Temperature Rain Vup to 4 in/h (10 cm/h) Relative Humidity Solar Radiation Solar Radiation One 40 ft flatrack, four 40 ft open top, two 40 ft standard  Up to 60 mph (97 km/h) Up to 80 F (15° C)  135 mph (217 km/h) @ 58° F (15° C) 180 mph (290 km/h) @ 58° F (15° C) Up to 4 in/h (10 cm/h) Up to 4 in/h (10 cm/h) Up to 4 in/h (10 cm/h) Solar Radiation Solar Radiation 360 BTU/h/ft² (1,000 Kcal/h/m²) Ice (survival) Atmospheric Conditions As encountered in coastal regions and/or heavily industrialized areas	Concrete	128.6 yds³ (98.3 m³)	173 yds³ (132.3 m³)						
Operational Wind Loading Survival Wind Loading Any Position At Zenith 150 mph 150 mph 150 mph 150 to +122° F (-15° to +50° C) Survival Temperature Rain Relative Humidity Solar Radiation Solar Radiation 160 survival Temperature Solar Radion Solar Radion At mospheric Conditions  45 mph (72 km/h) gusting to 60 mph (97 km/h) 45 mph (97 km/h) 45 mph (97 km/h) 45 mph (97 km/h) 45 mph (210 km/h) 658° F (15° C) 180 mph (290 km/h) @ 58° F (1	Reinforcing Steel	14,575 lbs. (6,611 kg)	16,838 lbs. (7,638 kg)						
Survival Wind Loading Any Position 125 mph (200 km/h) @ 58° F (15° C) 135 mph (217 km/h) @ 58° F (15° C) 180 mph (290 km/h) @ 58° F (15° C) 180 mph (290 km/h) @ 58° F (15° C)  Operational Temperature +5° to +122° F (-15° to +50° C) Survival Temperature -22° to +140° F (-30° to +60° C), low temperature options available Rain Up to 4 in/h (10 cm/h)  Relative Humidity Oto 100% with condensation Solar Radiation 360 BTU/h/ft² (1,000 Kcal/h/m²) Ice (survival) 1 in (2.5 cm) on all surfaces or 1/2 in (1.3 cm) on all surfaces with 80 mph (130 km/h) wind gusts  Atmospheric Conditions As encountered in coastal regions and/or heavily industrialized areas	Shipping Containers	One 40 ft flatrack, four 40 ft open top, two 40 ft standard							
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At Zenith 150 mph 180 mph (290 km/h) @ 58° F (15° C)  Operational Temperature +5° to +122° F (-15° to +50° C)  Survival Temperature -22° to +140° F (-30° to +60° C), low temperature options available  Rain Up to 4 in/h (10 cm/h)  Relative Humidity 0 to 100% with condensation  Solar Radiation 360 BTU/h/ft² (1,000 Kcal/h/m²)  Ice (survival) 1 in (2.5 cm) on all surfaces or 1/2 in (1.3 cm) on all surfaces with 80 mph (130 km/h) wind gusts  Atmospheric Conditions As encountered in coastal regions and/or heavily industrialized areas	Survival Wind Loading								
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Atmospheric Conditions As encountered in coastal regions and/or heavily industrialized areas	Solar Radiation	360 BTU/h/ft² (1,000 Kcal/h/m²)							
· · ·	Ice (survival)	1 in (2.5 cm) on all surfaces or 1/2 in (1.3 cm) on all surfaces with 80 mph (130 km/h) wind gusts							
Shock and Vibration As encountered during shipment by airplane, ship or truck	Atmospheric Conditions	As encountered in coastal regions and/or heavily industrialized areas							
	Shock and Vibration	As encountered during shipment by airplane, ship or truck							

<sup>(4)</sup> Some specifications may vary based on the combination of equipment, options and/or upgrades ordered.

#### **GENERAL DYNAMICS**

SATCOM Technologies

http://www.SatelliteDish.com 954-941-8883