



9.2-Meter Ka-Band Limited Motion Antenna

Technical Data

Main Reflector Diameter Contour Surface Accuracy	9.2-Meter, Counterweight Shaped Paraboloid < 0.011 Inches RMS
Optics Configuration	Cassegrain
Mount	EL over AZ Axes Configuration
Frequency	
Transmit	20.2-21.2 GHz
Receive	30.0-31.0 GHz
Feed Type	4-Port Circularly Polarized Feed (RHCP/LHCP) with 2-Port Tracking
Elevation Travel	0 to 90° Continuous
Azimuth Travel	±120° Continuous
Axis Velocity	0.5 °/s (AZ); 0.2 °/s (EL)
Axis Acceleration	0.2 °/s ² (AZ/EL)
Azimuth Drive Configuration	Gear and Pinion
Elevation Drive Configuration	Jackscrew Actuator
Motor Type for AZ and EL Axes	Permanent Magnet DC Motor
Antenna Two Axis Pointing Error	< 0.007° RMS No Wind < 0.028° RMS Winds 45 mph gusting to 60 mph
Tracking Performance for Optrack	< 0.0093° RMS Winds 45 mph gusting to 60 mph S/No 45 dB-Hz
Antenna Two Axis Tracking for Gain Error (Monopulse)	< 0.004° RMS No Wind < 0.0044° RMS Winds 45 mph gusting to 60 mph S/No 45 dB-Hz
Tracking Modes	Program Track (NORAD, STAR, TABLE, INTELSAT) Step Track/Optrack Monopulse (Single Channel or 2-Channel Monopulse Tracking)



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<p>Environmental Conditions: Normal Degraded Limit of Driving Survival</p>	<p>Wind: 30 mph gusting to 45 mph Temperature: -40 to +122°F (-40 to +55°C) Humidity: 0 to 100% with condensation Rain: up to 4 inches/hr Snow & Ice: 12 in/hr and up to 1" buildup on structure Altitude: up to 10,000 ft AMSL Solar Radiation: 1.1kW/m² Wind: 45 mph gusting to 60 mph Wind: 70 mph Wind: 125 mph continuous, antenna at zenith Temperature: -40 to +167°F (-40 to +75°C) Seismic: 0.15g vertical; 0.3g horizontal</p>
<p>Life Span:</p>	<p>20 Years</p>
<p>9.2M Antenna Features: Antenna Hub Features:</p>	<ul style="list-style-type: none"> •Precision Ka-Band surface reflector with Counterweights •High stiffness turntable bearing •DC Motor jackscrew drive in Elevation •DC Motor gear-pinion drive with mechanical anti backlash in Azimuth •9.2 foot hub with five foot roll up access door •Housing for up to eight 250 watt Ka-Band HPAs, or 1:2 Redundant 500 watt Militron HPAs •HPA mounting utilizes slide mounts and a mechanical de-weighting mechanism making maintenance replacement as easy as possible •Up and Down Converter Integration providing a wideband L-Band interface •Easily accessible test and monitor point •Strategically placed handles and storage to allow easy and safe access to hub •Phase/Power combined HPA design •Power Meter sensing of TX power •Transmit signal block downconverters to allow spectrum monitoring at L-Band in the control building •Complete M&C capability for monitoring and control of all hub components •Electrical outlets and lighting •Lightning protection for electronics •Temperature monitoring •Optional Redundant two-channel monopulse tracking/single channel monopulse tracking •Redundant HVAC System for the hub (up to 5 ton)

9.2-Meter Ka-Band Limited Motion Antenna

R.F. Specification
For
I Dynamics 9.2 Meter Ka-Band Cassegrain Antenna
With Four Port Circularly Polarized Feed & 2-Port Tracking

	Receive	Transmit
Frequency in GHz.....	20.200-21.200	30.000-31.000
Port Type	Rx ₁ /Rx ₂	Tx ₁ /Tx ₂
Polarization.....	Circular	Circular
Feed Port Polarizations	RHCP/LHCP	LHCP/RHCP
Antenna Gain (Minimum)		
20.200 / 30.000 GHz	63.00 dBi	65.70 dBi
20.700 / 30.500 GHz	63.21 dBi	65.84 dBi
21.200 / 31.000 GHz	63.42 dBi	65.98 dBi
Antenna Noise Temperature 20.200 / 21.200 GHz		
5 degrees Elevation	166.7 / 193.1 K	
10 degrees Elevation	122.6 / 143.0 K	
20 degrees Elevation	91.8 / 104.8 K	
40 degrees Elevation	74.3 / 82.0 K	
Typical G/T at 20 deg Elevation, 21.200 GHz, Clear Horizon		
120 degree K LNA.....	40.0 dBi/K	
200 degree K LNA.....	38.7 dBi/K	
Pattern Beamwidth in degrees at 20.700 / 30.500 GHz		
-3 dB Beamwidth.....	0.11	0.07
-15 dB Beamwidth.....	0.20	0.14
Sidelobes		
For Angles from 1 to 180 Degrees	Meets FCC CFR-47 Regulation 25.209	
For Angles from 1 to 180 Degrees	Meets IESS (Intelsat) or ITU-RS-580	



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R.F. Specification For General Dynamics 9.2 Meter Ka-Band Cassegrain Antenna With Four Port Circularly Polarized Feed & 2-Port Tracking

	Receive	Transmit
Cross Polarization Isolation		
On Axis.....	30.7 dB	30.7 dB
Within 1.0 dB Beamwidth.....	30.7 dB	30.7 dB
VSWR (Return Loss).....	1.30:1 (17.7 dB)	1.30:1 (17.7 dB)
Axial Ratio	0.50 dB	0.50 dB
Feed Insertion or Ohmic Loss.....	0.75 dB	0.90 dB
Port to Port Isolation (Rx to Rx) / (Tx to Tx).....	20 dB*	20 dB*
Port to Port Isolation	0.0 dB (Input)	-85 dB
Port to Port Isolation	-85 dB	0.0 dB (Input)
Output Waveguide Flange Interface.....	WR-42	WR-34
Total Power Handling Capability.....		1000 Watts per Port

- Notes - Other operational frequencies available
- 10% of sidelobes may exceed the sidelobe specification where applicable.
 - Power handling capability is based on and limited by the physical characteristics of the feed components. Microwave power at these levels may contribute to the radiation hazard or exceed certain off axis EIRP Specifications.
 - G/T is calculated by bolting a single LNA directly to the feed. It does not allow for any post LNA effects.
 - All values are at the rear feed output flange.
- *35 dB Port-to-Port Isolation is optional.

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Data is preliminary and subject to change without notice. Contact General Dynamics for specific application recommendations.

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