

9.2M Ka-Band Antenna



Applications

TT&C

IOT

Broadband Gateways

High Power Uplinks

Description

Large diameter Ka-band antennas require unique design criteria which General Dynamics SATCOM Technologies has successfully demonstrated with both the 9.2 and 13.2 meter products. Items such as reflector surface accuracy, antenna/feed design, structural antenna stiffness and integrity, thermal effects, anti-icing, HPA phase combining, monopulse tracking, installation and alignments and hub integration all require special engineering expertise at Ka-band. SATCOM Technologies has proven our expertise in the above areas and has earned the position as a preferred antenna system provider and integrator to a number of major satellite broadcasting companies by providing in excess of fifty systems of this type over the past five years alone.

Features

- Precision Ka-band rated surface reflector with counterweights
- High stiffness turntable bearing
- DC motor jackscrew drive in elevation
- Dual DC motor gear-pinion drive with mechanical anti-backlash in azimuth
- Access stairway and large work platform for ease of maintenance
- 9.2 foot diameter hub with five foot roll up access door
- Housing for up to eight high power amplifiers (HPA's)
- HPA mounting via slide mounts and a mechanical de-weighting mechanism allows for easy maintenance and replacement
- Up and down converter integration providing a wideband L-band interface
- Easily accessible test and monitor points
- Strategically placed handles and storage to allow easy and safe access to hub
- Phase/power combined HPA design capability
- Power meter sensing of TX power capability
- 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.
- Hub and antenna mounted electrical outlets and lighting
- Lightning protection
- Temperature monitoring
- Redundant two channel monopulse tracking system
- Redundant HVAC systems for hub and pedestal

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Technical Specifications

PERFORMANCE PARAMETERS	KA-BAND	
Reflector	9.2 meter, counterweight	
Optics Configuration	Cassegrain	
Frequency	Standard Band	Custom Band
Transmit	28.35-30.00 GHz	27.50-31.00 GHz
Receive	18.30-20.20 GHz	17.70-21.20 GHz
Antenna Gain (Standard Band) Transmit @ Feed Tx Port Input Receive @ LNA Input	66.1+20Log(F/30.0) dBi 63.2+20Log(F/20.2) dBi	
G/T (min) @ 30° Elevation and 120K LNA (Standard Band)	39.2 + 20 Log (F/20.2) dBi/K (includes Feed to LNA losses for 1:2 LNA Redundancy)	
Polarization (Transmit and Receive)	Dual Circular (RHCP/LHCP)	
3 dB Beamwidth Transmit Receive	0.08° 0.12°	
Axial Ratio @ 1dB BW (X-POL Isolation in dB)	0.5 dB (30.7 dB)	
Port to Port Isolation Transmit to Receive Receive to Transmit Transmit to Transmit Receive to Receive	85 dB 85 dB 20 dB 20 dB	
VSWR	1.35:1 Max	
Sidelobe Performance (Tx/Rx)	ITU-RS.580-5 FCC CFR-47 & 25.209	
Power Handling	1 kW CW Per Port, 2 kW Total	
Feed Waveguide Flange	Rx (WR-42), Tx (WR-34)	
Pressurization Operational Maximum	0.5 psi 2.0 psi	
Elevation Travel	0 to 90° Continuous	
Azimuth Travel	±90° Continuous	
Axis Velocity	0.5°/s	
Axis Acceleration	0.2°/s ²	
Azimuth Drive Configuration	Gear and Pinion, Single Motor Drive	
Elevation Drive Configuration	Jackscrew, Single Motor Drive	
Motor Type for Azimuth and Elevation	Servo Motor	
Antenna Two-Axis Pointing Performance (over 10 degree of axis travel)	0.0066° RMS, No Wind 0.0140° RMS Winds 30 mph gusting to 45 mph	
Tracking Performance for Optrack (C/No: 45 dB-Hz)	0.0041° RMS, No Wind 0.0084° RMS Winds 45 mph gusting to 60 mph	
Tracking Performance for Monopulse (C/No: 45 dB-Hz)	0.0041° RMS, No Wind 0.0047° RMS Winds 45 mph gusting to 60 mph	
Tracking Modes	Program Track Optrack /Step Track Monopulse	
Anti-Icing	Feed Blower Heated Subreflector Optional Primary Reflector – Gas or Electric (as required)	

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