9.2m Ka, Q and V-Band Turning Head Antenna

Antenna Technologies

Overview

The CPI Antenna Technologies' large diameter KaTx/QRx/VTx-Band antennas require unique design criteria which we have successfully demonstrated with the 9.2 meter product. Items such as reflector surface accuracy, antenna/feed design, structural antenna stiffness and integrity, thermal effects, anti-icing, monopulse tracking, hub redundant air-conditioning, installation and alignments and hub integration all require special engineering expertise at Ka, Q and V-Band.

We have 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 broadband companies in the world.

FEATURES:

- Precision Ka/Q/V-Band rated surface reflector on steel back-up structure with counterweight arms
- An elevation over azimuth all-steel antenna structure with high stiffness turntable bearing
- A circular polarized Ka/Q/V-Band cassegrain 4-port Tx/Rx feed assembly with TE21 tracking coupler (monopulse) and feed rain blower
- Brushless servo motor jackscrew drive in elevation
- Dual gear-pinion drives with anti-backlash in azimuth
- Access stairway and large work platform for ease of maintenance
- 9-foot dia. hub with five foot roll up access door
- Housing for up to eight high power amplifiers (HPA's)
- Up and down converter integration providing a wideband L-Band interface (or fiber optic)
- Easily accessible test and monitor points
- Strategically placed handles and storage to allow easy and safe access to hub
- Electric hoist on elevation platform for maintenance of hub RF electronics and drive components
- Elevation Maintenance Strut allowing maintenance of the EL actuator while maintaining service
- Lightning protection
- Redundant HVAC systems for hub and pedestal (pedestal is HVAC is optional)
- Hub and antenna mounted electrical outlets & lighting

OPTIONS:

- Power meter sensing of TX power capability
- Transmit signal block down converters allowing L-Band spectrum monitoring at control room
- Gas or electric (non-embedded heaters) anti-icing system for main reflector, subreflector & feed assembly
- Hub mounted test loop translator capability for station calibration with couplers
- IOT and CSM capabilities with precision calibrated couplers
- M&C System for monitoring and control of all hub components and RF (optional)
- Temperature monitoring

APPLICATIONS:

- Broadband Gateways (VHTS and HTS); TT&C; IOT; High Power Uplinks

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Specifications

PERFORMANCE PARAMETER [1]	KaTx/Q/Rx/VTx-Bands
Reflector	9.2 meter, counterweight
Optics Configuration	Cassegrain
Frequency Transmit – V Band Transmit – Ka Band	47.2 – 52.4 GHz 27.5 – 30.0 GHz
Receive-Q Band Tracking (Monopulse)	37.5 – 42.5 GHz 37.5 – 42.5 GHz (any 2 GHz of RX Band)
Antenna Gain Transmit @ Feed Tx Port Input (V-Band)	70.1 dBi @ 47.20 GHz 70.8 dBi @ 52.40 GHz
Transmit @ Feed Tx Port Input (Ka-Band)	65.7 dBi @ 27.50 GHz 66.6 dBi @ 30.00 GHz
Receive @ Feed Rx Port Output	68.9 dBi @ 37.50 GHz 69.8 dBi @ 42.50 GHz
G/T (min) @ 30° Elevation, 230K LNA Clear Sky, Primary Path	43.0 dBi/K @ 42.00 GHz
EIRP with 250W Peak TWTA @V-Band Linear EIRP @ 4 dB OBO (19 dB NPR)	85.6 dBW @ 47.2GHz 86.3 dBW @ 52.4 GHz
EIRP with 550W Peak TWTA @Ka-Band Linear EIRP @ 4 dB OBO (19 dB NPR)	87.4 dBW @ 27.5 GHz 88.3 dBW @ 30.0 GHz
Polarization (Transmit and Receive) 3 dB Beamwidth Transmit Receive	Dual Circular (RHCP/LHCP) 0.04° Typical @ 49.80 GHz; 0.06° Typical @ 28.50 GHz 0.05° @ 39.75 GHz
Axial Ratio @ 1dB BW (X-POL Isolation, dB) Transmit Receive	 ≤0.50 dB (≥30.7 dB) ≤0.50 dB (≥30.7 dB)
Port to Port Isolation Transmit to Receive Receive to Transmit Transmit to Transmit Receive to Receive	 85 dB 85 dB 18 dB 18 dB
VSWR/Return Loss Transmit Receive	 1.30:1/17.7 dB 1.30:1/17.7 dB
Sidelobe Performance	ITU-RS.580-6 (10% rule) FCC CFR-47 & 25.209
Power Handling	500 W CW ka-Gand, 100W V-Band CW per each TX port
Feed Waveguide Interface Transmit Receive	 WR-19 (V-Band), WR-34 (Ka-Band) WR-22

[1] **Some specifications may vary based on the combination of equipment, options and/or upgrades ordered.**

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Specifications

PERFORMANCE PARAMETER [1]	KaTx/Q/Rx/VTx-Bands
Pressurization Operational Maximum	0.25 psi 2.0 psi
Elevation Travel	0 to 90° continuous
Azimuth Travel	±100° continuous
AZ/EL Axis Velocity	0.5 °/s (AZ); 0.2 °/s (EL)
AZ/EL Axis Acceleration	0.2 °/s²
Azimuth Drive Configuration	Single motor with dual gear and pinion drives with mechanical anti-backlash mechanism
Elevation Drive Configuration	Single motor machine jackscrew drive
Motor Type for Azimuth and Elevation	Brushless servo motor
Antenna Two-Axis Pointing Performance (over 10 degree of axis travel)	0.005° RMS, No wind 0.02° RMS winds 30 mph gusting to 45 mph
Tracking Performance for Optrack (C/No: 45 dB-Hz)	0.004° RMS, No wind 0.008° RMS winds 30 mph gusting to 45 mph
Tracking Performance for Monopulse (C/No: 45 dB-Hz)	0.003° RMS, No wind 0.005° RMS winds 30 mph gusting to 45 mph
Tracking Modes	Monopulse Program Track Optrack Step Track
Deicing	Feed Blower Heated Subreflector Optional Primary Reflector – Gas or Electric (as required)

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9.2m KaQ/V-Band Antenna

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Specifications

ENVIROMENTAL PARAMETER [1]		KaTx/Q/Rx/VTx-Bands
Normal Conditions	Temperature	--22 to +122°F (-30 to +50°C, +55°C Optional)
	Wind	30 gusting to 45 mph (48 gusting to 72 km/hr)
	Humidity	30 to 100%, with condensation
	Rain	Up to 4 in/hr (100 mm/hr)
	Altitude	To 3280ft AMSL (1000m AMSL)
	Solar Radiation	1.1 kW/m²
Degraded Conditions	Wind	45 gusting to 60 mph (72 gusting to 97 km/hr)
Limit of Driving	Wind	60 gusting to 75 mph (97 gusting to 120 km/hr)
Survival Conditions	Temperature	-40 to +131°F (-40 to +55°C)
	Wind	125 mph (200 km/hr) Continuous at zenith stow position
	Humidity	30 to 100%, with condensation
	Altitude	To 3280 ft AMSL (1000m AMSL)
	Seismic	0.3g horizontal & 0.15g vertical acceleration
Design Life		20 years

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Contact us at CustomerCareSAT@cpii.com or call us at +1 770-689-2040

The data should be used for basic information only.
Formal, controlled specifications may be obtained from CPI for use in equipment design.

Communications & Power Industries

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