



Communications & Power Industries



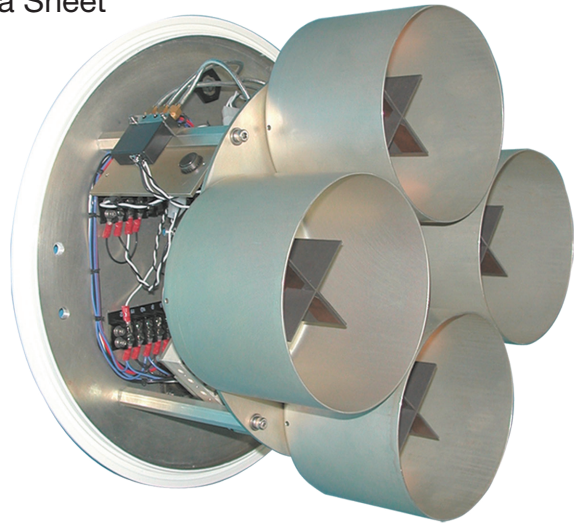
malibu division

Model ACQ SERIES Acquisition-Aid Antenna

Product Data Sheet

Features:

- Wide Frequency Bandwidth
- Broad Acquisition Range
- High Lobing Rates
- Low Sidelobe Levels
- Co-located with Feed or Side-Mounted



The ACQ Series of Acquisition-Aid Antennas are independent, automatically tracking antennas designed to assist the main telemetry antenna in acquiring the target or tracking during close in passes. This wide beam tracking antenna is mechanically coupled to the elevation axis and switching between the main antenna and the acquisition-aid antenna occurs automatically as a function of received signal level and tracking error magnitude or manually by push button operation via the front panel of the antenna control unit.

The acquisition-aid antenna design is based on the quadra-scan principle (psuedo-monopulse). The acquisition-aid antenna consists of a four-dipole array of crossed dipoles, with the linearly polarized dipole outputs combined to produce a SUM (S) and two DIFFERENCE (D) channels (azimuth & elevation) for each polarization (vertical & horizontal). These channels are then combined in a scan modulator, driven by the reference signals generated by the conically scanning feed or the antenna control unit, to produce an amplitude-modulated signal basically identical to the output of the main antenna's feed. Should circularly polarized outputs be required the linearly polarized outputs from the scan modulators would be routed to a quadrature hybrid to produce right hand and left hand circular outputs.

CPI Malibu Division has designed three slightly different models of the ACQ Acquisition-Aid Antenna in order to better suit particular system requirements.

The Model ACQ100 acquisition-aid antenna consists of the dipole array mounted in a diamond configuration on an 8-inch diameter cupped ground plane. This model is typically mounted directly on the rear of the main antenna feed (CONSCAN or SCM) and the addition of coaxial relays in the assembly allow for sharing of the bandpass filters and low noise amplifiers in each channel. Due to backlobe considerations this model is used for antenna systems having a reflector diameter of less than 2.4-meters (8-ft).

The Model ACQ200 acquisition-aid antenna consists of four individually cupped dipoles mounted in a diamond configuration. Each cup is designed to act as a circular waveguide in the band of interest, with the overall array diameter being 13.25 inches. This model can also be mounted directly on the rear of the main antenna feed in systems having a reflector diameter less than 4.6-meters (15-ft), thus sharing bandpass filters and low noise amplifiers. For antenna systems having a reflector diameter larger than 4.6-meters the acquisition-aid antenna is mounted to the side of the reflector, it is collimated with the main antenna, and possesses its own set of bandpass filters and low noise amplifiers.

The Model ACQ300 acquisition-aid antenna is similar to the Model ACQ200 with the exception that pyramidal horns are used instead of cupped dipoles in order to increase the antenna gain.

Related Data Sheets

- HD Pedestal Series
- Single Channel Monopulse Feed
- Conically Scanning Feed

Model ACQ SERIES

Specifications

KEY PERFORMANCE VALUES WITH STANDARD HARDWARE COMPLEMENT

Antenna Model	ACQ100	ACQ200	ACQ300
Operating Frequency ¹	1435-2400 MHz		2200-2400 MHz
Polarization ²	Simultaneous Right Hand and Left Hand Circular		
VSWR ³	2.0:1 maximum		
Axial Ratio ⁴	2.0 dB maximum		
Antenna Type	Quadra-Scan		
Antenna Gain (minimum)			
1435 MHz	6.5 dBi	10.5 dBi	-
1540 MHz	6.7 dBi	11.2 dBi	-
1710 MHz	7.2 dBi	12.0 dBi	-
1850 MHz	7.5 dBi	12.5 dBi	-
2200 MHz	8.2 dBi	13.2 dBi	18.0 dBi
2400 MHz	8.5 dBi	13.7 dBi	18.0 dBi
Antenna Beamwidth (3 dB) (nominal)			
1435 MHz	65°	35°	-
1540 MHz	62°	33°	-
1710 MHz	55°	28°	-
1850 MHz	52°	27°	-
2200 MHz	45°	25°	16.3°
2400 MHz	42°	22°	16.1°
Sidelobes (nominal)	8 dBp	12 dBp	14 dBp
Acquisition Angle			
1435 MHz	± 70°	± 50°	-
1540 MHz	± 67°	± 47°	-
1710 MHz	± 60°	± 40°	-
1850 MHz	± 55°	± 38°	-
2200 MHz	± 50°	± 37°	± 22°
2400 MHz	± 45°	± 36°	± 20°
Environmental Parameters			
Temperature	Operating	-20°C to +50°C	
	Storage/Transit	-54°C to +71°C	
Relative Humidity	Up to 100%, including condensation (radome protected)		
Rain	Up to 4 Inches per Hour		
Array Size -Diameter	8.00 inches	13.25 inches	22.63 inches
Weight	< 6 lbs (3 kg)	< 15 lbs (7 kg)	< 24 lbs (11 kg)

NOTES:

1. Other frequency bands available upon request.
2. Simultaneous orthogonal linear polarizations available.
3. Lower VSWR figures obtained with narrower frequency band.
4. Lower axial ratio figures obtained with narrower frequency band.

Subject to change without notice.

