



501 Short-Range Antenna

Most communicators are well aware of the problems associated with “close-in” HF communications. Frequently it is easier to raise a station 2,000 km away than one’s base of operations 100 miles distant. To a large extent, the problems of short-range communications are related to inadequate antenna performance. Traditional antenna performance suffers from one or more of the following limitations:

- › Inadequate bandwidth and efficiency. No short-range broadband antenna before the 501 covered the most important lower frequencies down to 2 MHz with adequate efficiency.
- › Improper pattern. Vertically polarized radiators do not support the skywave (see Figure 1).

The performance of the Model 501 is tailored for the short-range and close-in sectoral coverage applications. The 501 radiates a broad, upwardly directed beam, slightly biased in one direction. Thus, it serves well for broad sectoral coverage and for short-range point-to-point.

Conquer the challenges of close-in HF communications.

The 501 is essentially 100 percent efficient from 2 to 30 MHz. While efficiency is not important for receiving applications at the lower frequencies, it is vital to transmitting applications, for the signal-to-noise ratio at the terminal end of the link is directly related to the transmitting antenna’s efficiency.

Models of the 501 that can accommodate up to 25 kW average, 50 kW peak, are available. The 501 is truly broadband, covering the 2 to 30 MHz range with essentially constant patterns and a low VSWR. TCI’s novel one-tower concept minimizes shipping and installation costs. As in all TCI designs, only the most reliable materials are employed. Alumoweld catenary sections, broken up by fail-safe insulators, are utilized throughout, instead of the more traditional fiberglass. No organic or hydrocarbon material is used in the entire structure. The balun transformer employs 30 percent fewer parts than alternative designs, thus setting a new standard for simplicity and reliability.

KEY FEATURES

- › Short-range communications
- › Full 2 to 30 MHz coverage
- › High efficiency



Model 501 Specifications

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Polarization	Horizontal
Directive Gain Relative to Isotropic	10 dB
Azimuth Beamwidth	64° nominal
Front-to-Back Ratio & Side Lobe Level	<ul style="list-style-type: none"> • Width between Half Power Points: 80° • Nominal Take-off Angle: 50° • Angle of Half-Power: UHPP 100° • Points: LHPP 28°
VSWR	<ul style="list-style-type: none"> • 2.5:1 (fo –1.25 fo) • 2.01 (1.25 fo –30 MHz)
Environmental Performance	Designed in accordance with EIA Specification RS-222C for loading of 225 km/h (140 mi/h) wind, no ice 145 km/h (90 mi/h) wind, 12 mm (1/2") radial ice Optional: 160 km/h (100 mi/h) wind, no ice, 96 km/h (60 mi/h) wind, 12mm (1/2") radial ice
Front Support Pole	Customer supplied, 3.66 m (12 ft.), Class 3

Size

Model Number	Frequency Range	Height		Length*		Width*	
		ft.	mtr.	ft.	mtr.	ft.	mtr.
501-1-N	2–30 MHz	141	43	312	95	400	123
501-2-N	3.8–30 MHz	75	26	168	51	230	70
501-3-N	5.75–30 MHz	50	15	140	43	140	43

* Measured from extreme guy points

Power and Impedance Data

Model Number	Input Impedance	Power	Connector
501B-N-02	50 Ω coaxial	Receiving	Type N Female
501B-N-03	50 Ω coaxial	10 kW Avg./ 50 kW PEP	1-5/8" EIA Female
501B-N-06	50 Ω coaxial	1 kW Avg./ 2 kW PEP	Type N Female



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