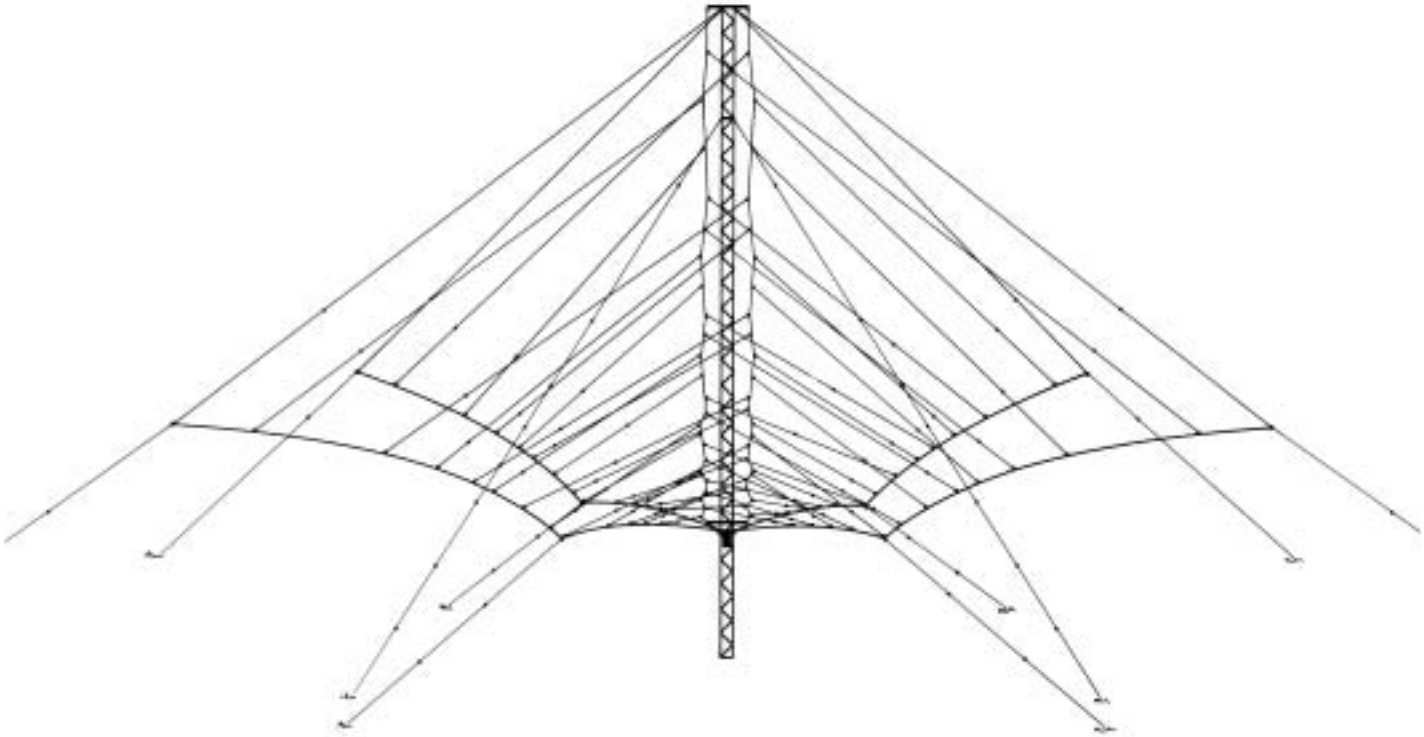
MODEL

530

Short Range Log-Periodic Antenna



HF communications in the 0–300 kilometer range can be difficult. Ground waves have very limited coverage over land, and sky waves radiated by traditional HF antennas tend to skip over the shorter ranges. The TCI Model 530 Log-periodic Antenna is designed specifically to support sky-wave communications at short (0–500 km) ranges. The Model 530 directs energy overhead to provide optimal support for short-range circuits. In addition, at the higher frequencies used for longer ranges, the 530 radiates significant energy at lower angles for medium- and long-range circuits.

The Model 530 antenna is horizontally polarized, thus avoiding the ground losses associated with vertically polarized antennas. (TCI Technical Note 2 describes ground loss and the attendant antenna gain reduction associated with vertically polarized antennas.) The efficiency of the 530 exceeds 95% throughout the band; no lossy terminations are used.

The TCI 530 is extremely useful for ground-air and ship-shore applications. Its radiation pattern is also suitable for secondary coverage of medium-range circuits, significantly outperforming traditional conical monopole and inverted cone antennas. A comparison of the gain of the TCI Model 530 with the gain of typical vertically polarized omnidirectional antennas (See reverse) clearly shows the superiority of the 530 for medium-range communications.

The Model 530 antenna uses only a single tower for support, minimizing installation costs and real estate requirements. The tower is made entirely of 6061-T6 corrosion-resistant structural aluminum alloy–the ideal material for antenna towers where long life and corrosion resistance are important considerations. Curtains and catenaries are fabricated in TCI's factory entirely of Alumoweld wire rope. All insulators are low-loss glazed ceramic fail-safe types. No organic or synthetic materials such as fiberglass or Kevlar are used anywhere in the antenna. These features ensure long life and low maintenance costs.

In periods of low sunspot activity when high effective radiated power is required to produce sufficient signal at the receiver, the Model 530 provides superior electrical performance. For short-range communications with secondary coverage of medium- and long-range targets, the TCI Model 530 outperforms all other HF antennas.

- **High-angle radiation for reliable short-range communications**
- **Horizontally polarized – no ground losses**
- **High power-gain**
- **Effective medium-range coverage**
- **Rugged construction**

Specifications

Polarization ..... Circular in horizontal plane. Either sense depending on requirements of application. Consult TCI regarding proper sense of polarization.

Direction of Beam Maximum ..... 90° at 2 MHz
90° at 8 MHz
30° at 20 MHz
20° at 30 MHz

Power Gain Relative to Isotropic Antenna ..... 6.5 dB at 2 MHz
5 dB at 8 MHz
6.5 dB at 20 MHz
5.5 dB at 30 MHz

Efficiency..... Greater than 95%

Azimuth Pattern ..... Essentially circular

Shipping Weight and Volume..... 530-3 3500 lb. 150 cu. ft.
1600 kg. 5.9 cu. m.
530-4 1900 lb. 95 cu. ft.
850 kg. 2.7 cu. m.
530-5 3000 lb. 140 cu. ft.
1350 kg. 4 cu. m.

VSWR ..... 2.5:1 maximum
2.0:1 maximum over 80% of frequency band

Ground Screen Requirement..... None Required

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. Also complies with EIA specification EIA-222-E for the indicated wind speeds at the top of the mast.

Size and Frequency Coverage

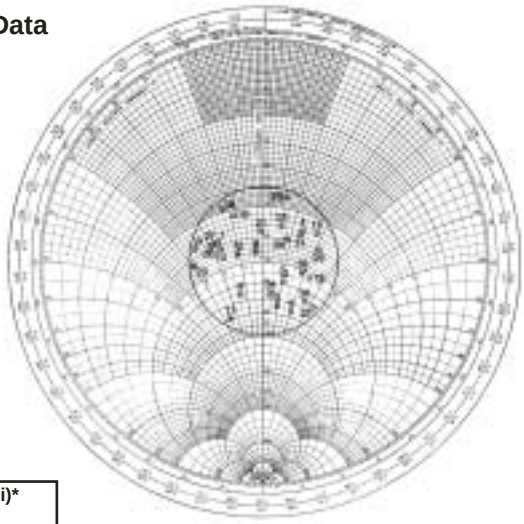
Model Number	Frequency Range	Height ft.	Height mtr.	Width (guy to guy) ft.	Width (guy to guy) mtr.
530-1-N	2–8 MHz	133	40.5	424 (300 sq.)	129.2 (91.4 sq.)
530-3-N	2–30 MHz	133	40.5	424 (300 sq.)	129.2 (91.4 sq.)
530-4-N	3–30 MHz	92	28.0	307 (218 sq.)	93.6

* Measured from extreme guy points.

Power & Impedance Data

Model Number	Input Impedance	Power Handling Capability	Connector
530-N-02	50 ohms	Receive	Type N Female
530-N-03	50 ohms	10 kW Avg. / 20 kW PEP	1-5/8" EIA Female
530-N-06	50 ohms	1 kW Avg. / 2 kW PEP	Type N Female
530-N-09	50 ohms	20 kW avg. / 40 kW PEP	1-5/8" EIA Female

Impedance Data

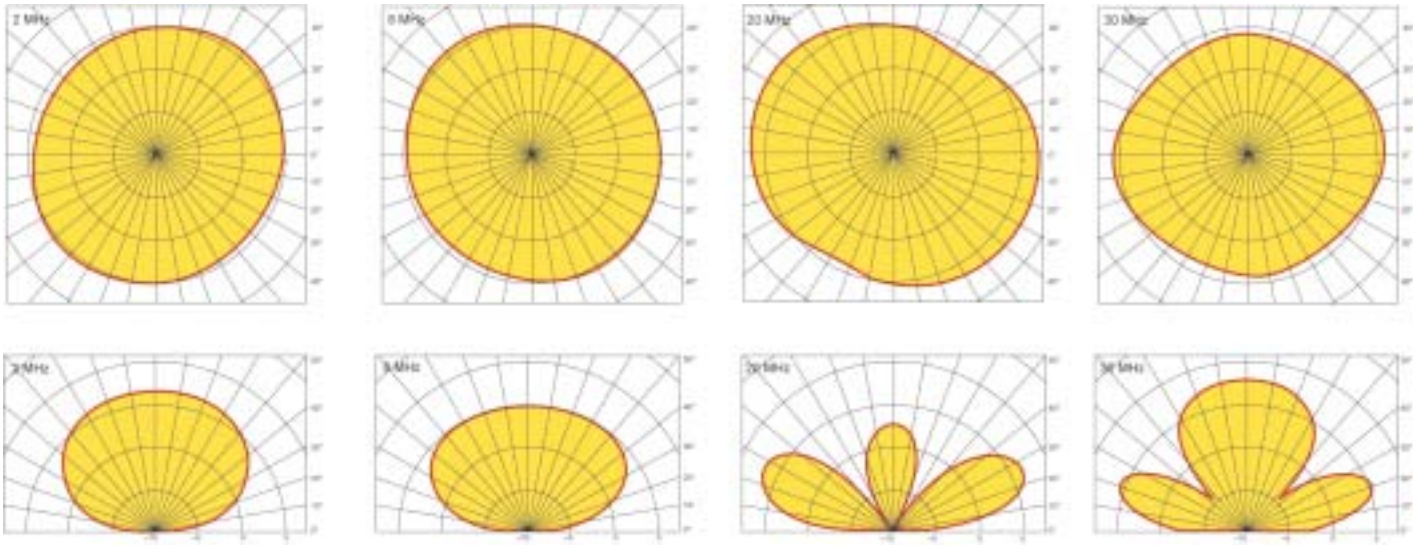


Gain of Model 530 vs. Typical Vertically Polarized Omnis

Path Length	TOA	Gain at 3 MHz (dBi)*			Gain at 12 MHz (dBi)*			Gain at 20 MHz (dBi)*		
		530	Inverted Cone	Conical Monopole	530	Inverted Cone	Conical Monopole	530	Inverted Cone	Conical Monopole
200 mi. (333 km)	60°	+6 dB	–3 dB	–1 dB	+5 dB	–4 dB	+3 dB	–	–	–
1000 mi. (1600 km)	17°	–1 dB	+2 dB	+3 dB	0 dB	–4 dB	–4 dB	+5 dB	1 dB	1 dB

*Gain calculated with antenna over average ground.

Elevation and Azimuth Patterns (Azimuth pattern at elevation angle of beam maximum) gain in dBi



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