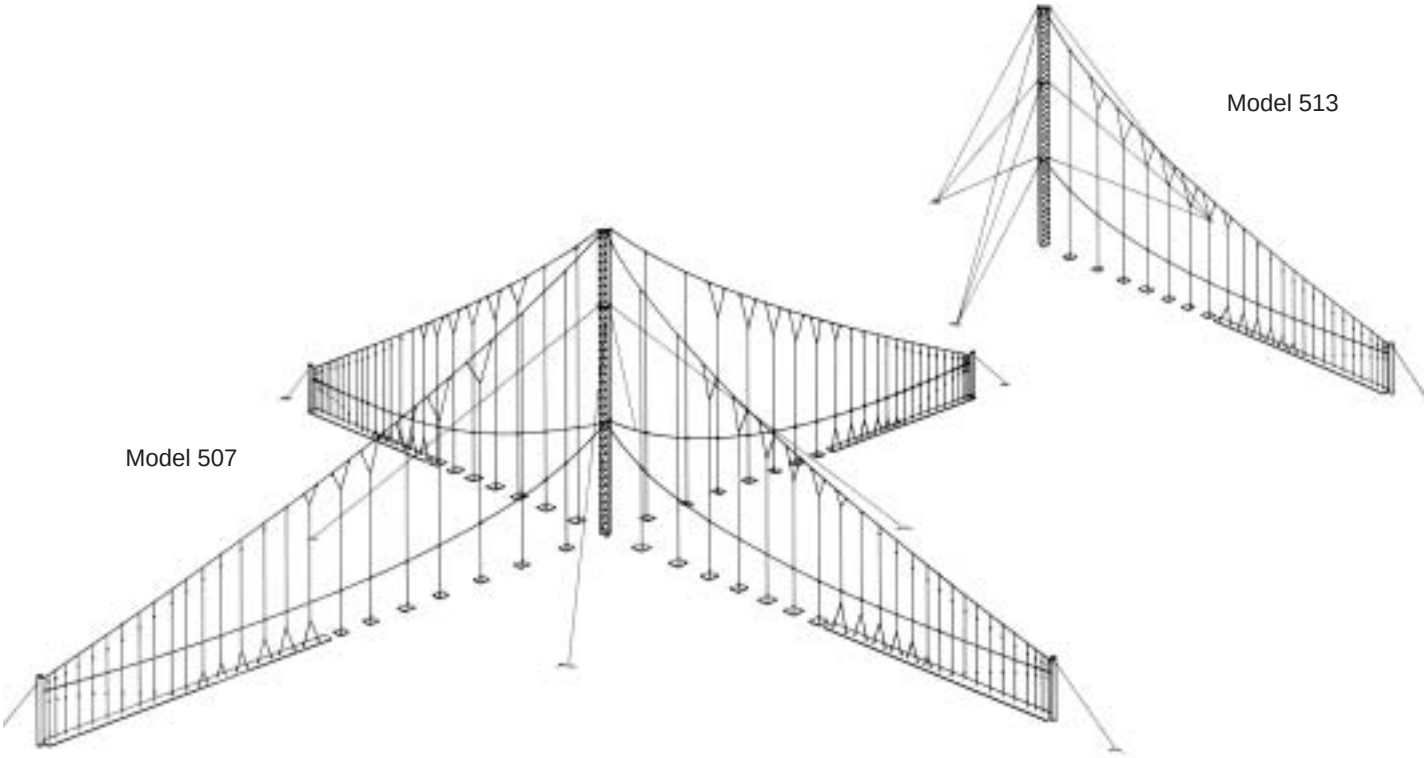
TCI
A Dielectric Company

MODELS

507&513

Di-Monopole* Hybrid Log-Periodic Antennas

*U.S. Patent No. 3,594,807



Vertical dipole log periodics offer the advantages of gain, substantial power handling capability, and no complicated ground screen for impedance matching. Unfortunately, to serve lower frequencies, large tower heights are required since the tower must be somewhat larger than a half wavelength at the lowest operating frequency. This is a penalty in severe environments and near airports.

Monopole log-periodic antennas, on the other hand, are smaller in the vertical dimension. This reduced height is a structural advantage, and an operational benefit near airports. However, monopole log-periodic antennas provide less gain and require, in general, a complicated and expensive-to-install ground screen.

The TCI 507 and 513 series of Di-Monopole Antennas represents a new class of improved log-periodic antennas which capitalize on the advantages of each of the older classes of verticals and largely circumvents their limitations. The front part of the Di-Monopole array is essentially identical to the TCI 503 vertical transposed dipole log-periodic antenna. In the center portion of the array a transition is gradually begun toward dipoles with their lower portions physically foreshortened. At the lowest frequency, the antenna's performance resembles that of a monopole array but with a balanced feed. At mid-band and above, the full performance of a dipole array is achieved. Because the ground screen necessary to support the impedance of the antenna is required for the lower frequencies only, the necessity of a fine mesh ground screen, which is complicated and expensive to install, is avoided. No ground screen is needed to support the impedance of the high frequency elements.

- **Highest gain, broadest bandwidth for a given tower height.**
- **Combines low tower height of monopole for low frequency operation with the gain of a dipole log periodic at higher frequencies.**
- **Minimal ground screen requirements.**
- **25 kW average, 50 kW PEP available.**
- **Full 2–30 MHz coverage.**

This class of antenna was designed utilizing TCI's unique Linear Wire Antenna Program which optimized various design parameters to eliminate residual common mode and to maximize the performance and bandwidth for a given size structure. The antenna has been built, fully tested and proven, and is now in production and operational use.

Specifications

	Model 507-1	Model 513
Polarization	Vertical	Vertical
Directive Gain Relative to Isotropic	6.6 dB at 2.0 9.2 dB at 2.3 10 dB at 7 MHz 12 dB at 13 MHz and above	9 dB at f_o 10 dB at 7 MHz 12 dB at 13 MHz and above
Nominal Azimuth Plane Beamwidth between Half Power Points	160° at 2 MHz 140° at 7 MHz 120° at 12 MHz and above	140° at f_o 120° at 12 MHz and above
Front-to-back Ratio	8.6 dB at 2.3 MHz 15 dB at 7 MHz and above	10 dB at f_o 15 dB at 7 MHz and above
VSWR	2.0:1 maximum	2.0:1 maximum
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	

Size and Frequency Coverage

Model Number	Frequency Range	Height ft.	Height mtr.	Length* ft.	Length* mtr.	Width* ft.	Width* mtr.
507-1-N	2–30 MHz	140	43	600	183	600	183
507-2-N	3–30 MHz	100	31	440	135	440	135
513-1-N	2–30 MHz	127	39	390	119	175	53
513-2-N	2.8–30 MHz	100	31	313	96	156	48
513-3-N	4.5–30 MHz	82	25	265	81	140	43

* Measured from extreme guy points.

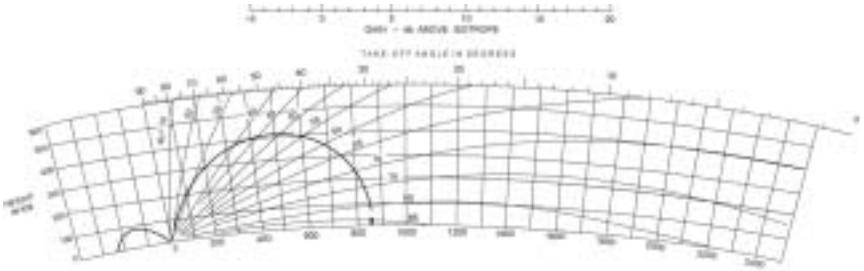
Power & Impedance Data

Model Number	Input Impedance	Power Handling Handling	Connector
507-N-02	50 Ω coaxial	Receiving	Type N Female
507-N-03	50 Ω coaxial	10 kW Avg. 50 kW PEP	1-5/8" EIA Female
507-N-04	50 Ω coaxial	25 kW Avg. 50 kW PEP	1-5/8" EIA Female
513-N-02	50 Ω coaxial	Receiving	Type N Female
513-N-03	50 Ω coaxial	10 kW Avg. 50 kW PEP	1-5/8" EIA Female
513-N-04	50 Ω coaxial	25 kW Avg. 50 kW PEP	1-5/8" EIA Female

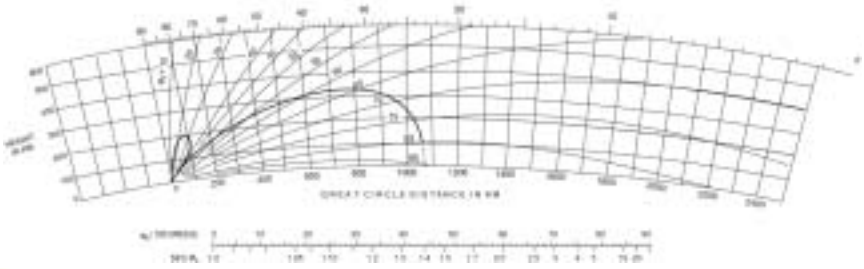
NOTE: Front support poles, normally class 2, 3, or 4 Douglas Fir, are required but not supplied by TCI. Check with TCI for specific requirements.

Elevation Plane Pattern* Origin of pattern plot is –5dB relative to an isotrope

TCI Model 507 and 513 at 2 MHz



TCI Model 507 and 513 at 15 MHz



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TCI A Dielectric Company 47300 Kato Road, Fremont, California 94538, USA • 1 800 824-8074 (USA) • Tel 1 510 687-6100 • Fax 1 510 687-6101