

507/513 Di-Monopole Hybrid Log-Periodic Antennas

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.

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 in severe environments and near airports. However, monopole log-periodic antennas provide less gain and require, in general, a complicated and expensive-to-install ground screen.

Model 507 and 513 Di-Monopole Antennas represent a new class of improved log-periodic antennas, which capitalize on the advantages of each of the older classes of verticals and largely circumvent their limitations.

Combine the advantages of vertical dipoles and monopoles.

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 gradually begins 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.

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.

KEY FEATURES

- › 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
- › Full 2–30 MHz coverage



Model 507-1 Specifications

| | |
|---|---|
| Polarization | Vertical |
| Directive Gain | 6.6 dB at 2.0 |
| Relative to Isotropic | <ul style="list-style-type: none"> • 9.2 dB at 2.3 • 10 dB at 7 MHz • 12 dB at 13 MHz and above |
| Nominal Azimuth | 160° at 2 MHz |
| Plane Beamwidth between Half Power Points | <ul style="list-style-type: none"> • 140° at 7 MHz • 120° at 12 MHz and above |
| Front-to-back Ratio | <ul style="list-style-type: none"> • 8.6 dB at 2.3 MHz • 15 dB at 7 MHz and above |
| VSWR | 2.0:1 maximum |
| Environment 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 |

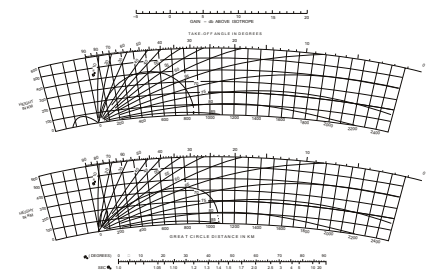
Model 513 Specifications

| | |
|---|---|
| Polarization | Vertical |
| Directive Gain | 9 dB at fo |
| Relative to Isotropic | <ul style="list-style-type: none"> • 10 dB at 7 MHz • 12 dB at 13 MHz and above |
| Nominal Azimuth | 140° at fo |
| Plane Beamwidth between Half Power Points | 120° at 12 MHz and above |
| Front-to-back Ratio | <ul style="list-style-type: none"> • 10 dB at fo • 15 dB at 7 MHz and above |
| VSWR | 2.0:1 maximum |
| Environment 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 |

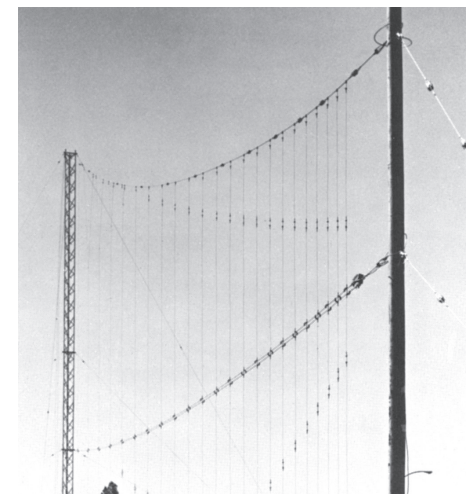
TCI INTERNATIONAL, INC.
3541 Gateway Blvd.
Fremont, CA 94538-6585 USA

TEL: 1-510-687-6100
USA: 1-800-824-8074
FAX: 1-510-687-6101
www.tcibr.com

✓ **ELEVATION PLANE PATTERN** Origin of pattern plot is -5dB relative to an isotropic TCI Model 507 and 513 (top) at 2 MHz (bottom) at 15 MHz



✓ **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.



Company proprietary

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Size and Frequency Coverage

| Model Number | Frequency Range | Height | | Length* | | Width* | |
|--------------|-----------------|--------|------|---------|------|--------|------|
| | | ft. | mtr. | ft. | mtr. | ft. | 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 and Impedance Data

| Model Number | Input Impedance | Power | 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 |
| 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 |

