

# 503 Vertical Curtain Antenna

The Model 503 family of antennas provides efficient long-haul or sectoral coverage service. A vertically polarized log-periodic dipole antenna with a narrow, low-angle elevation plane pattern, the 503 is suitable for medium- or long-distance coverage. Installation near seawater or use of an optional ground-screen kit improves low-angle coverage. Over average soil, the nominal take-off angle is  $15^\circ$  and the pattern provides excellent service from 1100 to 2400 km. Use of an optional ground-screen kit extends service range to approximately 3200 km.

**Communicate over long distances with a compact, economical structure.**

The 503 provides directional coverage over a  $120^\circ$  azimuthal sector. At the higher frequencies, most frequently used on long paths, the phase center of the structure is elevated, which gives increased gain and lower take-off angles. This results in increased signal strength on long paths.

Front-to-back ratio of the 503 is especially good (14 dB at 2.5 MHz, 19 dB above 4 MHz on 503-1), which reduces the susceptibility of the communications system to interference. VSWR is under 2.0:1.

The 503's novel structural design results in the smallest and shortest dipole log-periodic for a given bandwidth. The feedline is used as a catenary element, which greatly reduces the loads transferred by the radiators in severe environments. This permits the use of a flatter top catenary, elimination of "drop rod" material, and a shorter tower. The result is a much more compact, economical structure. As in other 500 series antennas, no fiberglass is used in the catenary and support structures. A precisely manufactured, electrically transparent Alumoweld structure is used instead.

## KEY FEATURES

- > For sectoral coverage or long-distance communications
- > Greatest gain and bandwidth with given-size land area and tower height
- > Higher gain and lower take-off angle at higher frequencies
- > Broad ( $180^\circ$ ) or narrower ( $120^\circ$ ) azimuthal variations available
- > No ground screen needed for impedance match



# 503 Vertical Curtain Antenna Specifications

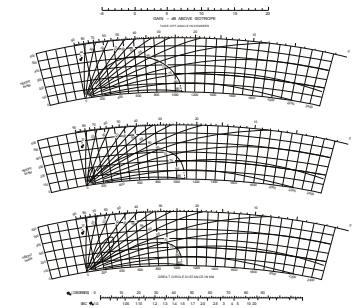
| Model 503 Specifications                  |                                                                                                                                                                                                          |
|-------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Polarization                              | Vertical                                                                                                                                                                                                 |
| Directive Gain Relative to Isotropic      | Greater than 12 dB                                                                                                                                                                                       |
| Radiation Pattern                         | Azimuthal Beamwidth: 120° between half-power points<br>Elevation Pattern Over Average Ground:<br>Lower Half-Power Point: 5°<br>Nominal Take-off Angle: 15°<br>Upper Half-Power Point: 26°                |
| Level of Side Lobes Relative to Main Lobe | -14 dB                                                                                                                                                                                                   |
| Front to Back Ratio                       | • 14 dB at low freq. limit<br>• 19 dB 20% above lowest rated frequency                                                                                                                                   |
| VSWR                                      | 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, 12mm (1/2") radial ice<br>Optional: 160 km/h (100 mi/h), no ice for 503-6 |

| Size         |                 |        |    |         |     |        |     |
|--------------|-----------------|--------|----|---------|-----|--------|-----|
| Model Number | Frequency Range | Height |    | Length* |     | Width* |     |
|              |                 | ft     | m  | ft      | m   | ft     | m   |
| 503-1-N      | 2.5–30 MHz      | 205    | 62 | 470     | 143 | 286    | 87  |
| 503-4-N      | 3.0–30 MHz      | 182    | 55 | 413     | 126 | 260    | 79  |
| 503-5-N      | 3.6–30 MHz      | 144    | 44 | 332     | 101 | 200    | 61  |
| 503-6-N      | 6.2–30 MHz      | 90     | 27 | 242     | 74  | 125    | 38  |
| 503-7-N      | 2.0–30 MHz      | 267    | 81 | 575     | 175 | 381    | 116 |
| 503-10-N     | 4.0–30 MHz      | 130    | 40 | 327     | 100 | 226    | 69  |

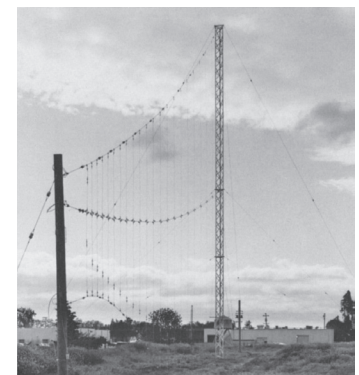
\* Measured from extreme guy points

| Power and Impedance Data |                 |                       |                           |
|--------------------------|-----------------|-----------------------|---------------------------|
| Model Number             | Input Impedance | Power                 | Connector                 |
| 503-N-02                 | 50 Ω coaxial    | Receive               | Type N Female             |
| 503-N-06                 | 50 Ω coaxial    | 1 kW Avg./ 2 kW PEP   | Type N Female             |
| 503-N-28                 | 50 Ω coaxial    | 5 kW Avg./10kW PEP    | 7/8" EIA Female           |
| 503-N-03                 | 50 Ω coaxial    | 10 kW Avg./ 50 kW PEP | 1-5/8" EIA Female         |
| 503-N-04                 | 200 Ω coaxial   | 25 kW Avg./50 kW PEP  | Customer to Furnish Balun |

ELEVATION PLANE PATTERN over perfect earth Origin of pattern plot is -5 dB relative to an Isotrope TCI Model 503 (top) at 2.5 MHz (center) at 15 MHz (bottom) at 27 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.



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

| Tel: 1-510-687-6100 | [tcibr.com](http://tcibr.com) | [in](#) [twitter](#) [youtube](#)

