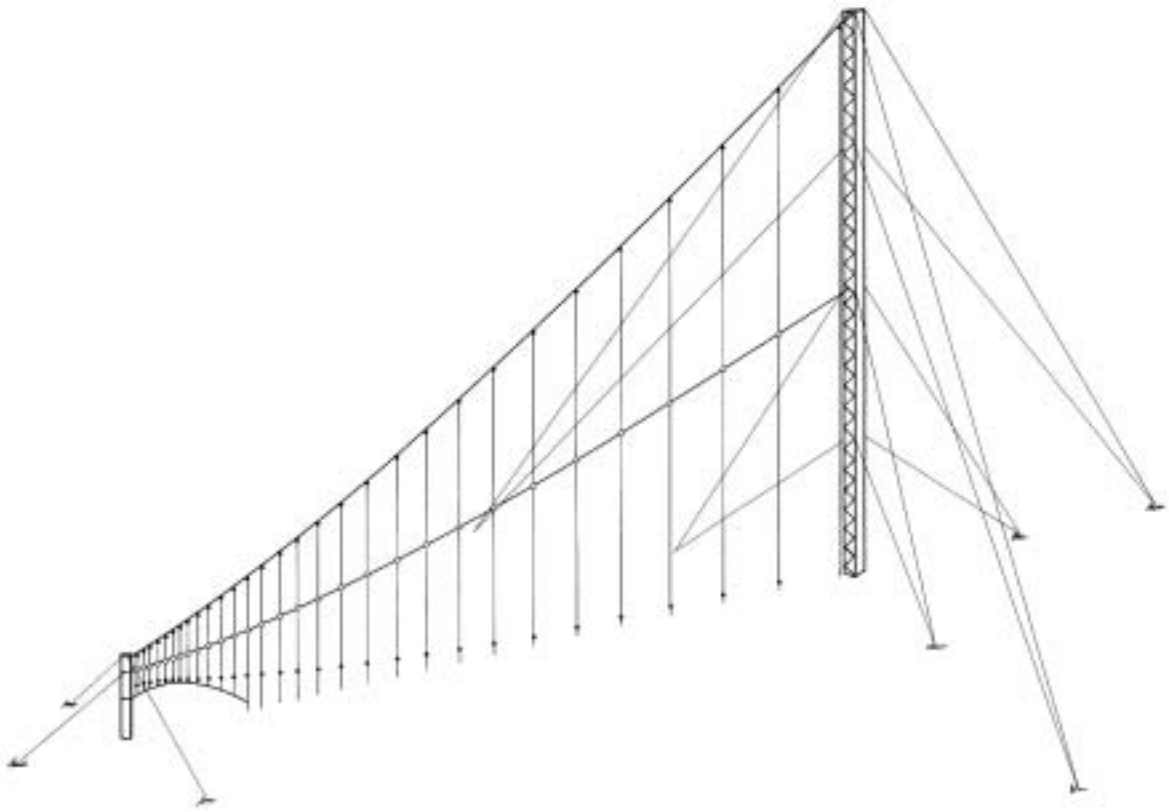
TCI
A Dielectric Company

MODEL

503

Vertical Curtain Antenna



TCI's Model 503 family of antennas provides efficient long-haul or sectoral coverage service. The Model 503 is a vertically polarized log-periodic dipole antenna with a narrow, low-angle elevation plane pattern, suitable for medium or long distance coverage. Installation near sea-water or use of an optional ground-screen kit improves low angle coverage. Over average soil the nominal take off angle is 15°, and the pattern provides excellent service from 1100 to 2400 km. With the use of an optional ground-screen kit, service range is extended to approximately 3200 km.

The Model 503 is available in either of two azimuthal beamwidths, 180°, generally used for broadest sectoral coverage and 120°, where a more directive pattern is desired. At the higher frequencies, most frequently used on long paths, the phase center of the structure is elevated, giving increased gain and lower take-off angles. This results in increased signal strength on long paths.

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

The Model 503 utilizes a novel structural design, resulting in the smallest and shortest dipole log periodic for a given bandwidth. The feedline is used as a catenary element, greatly reducing 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.

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

Specifications

Polarization ..... Vertical

Directive Gain Relative to Isotropic ..... Greater than 12 dB

Azimuth Plane Beam

Width between Half-Power Points ..... 120° (180° available on special order)

Nominal Take Off Angle ..... 15°over average ground

Angle of Half-Power Points ..... UHPP 26°

LHPP 5° (over average soil)

Level of Side Lobes Relative to Main Lobes ..... –14 dB

Front to Back Ratio ..... 14 dB at low freq. limit
19 dB 20% above lowest rated frequency

Cross Polarization ..... N/A

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 Optional: 160 km/h (100 mi/h), no ice

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.

Power & Impedance Data

Model Number	Input Impedance	Power Handling Capacity	Connector
501-N-02	50 Ω coaxial	Receiving	Type N Female
501-N-03	50 Ω coaxial	10 kW Avg. 50 kW PEP	1-5/8" EIA Female
501-N-04	50 Ω coaxial	25 kW Avg. 50 kW PEP	1-5/8" EIA Female
501-N-06	50 Ω coaxial	1 kW Avg. 2 kW PEP	Type N Female

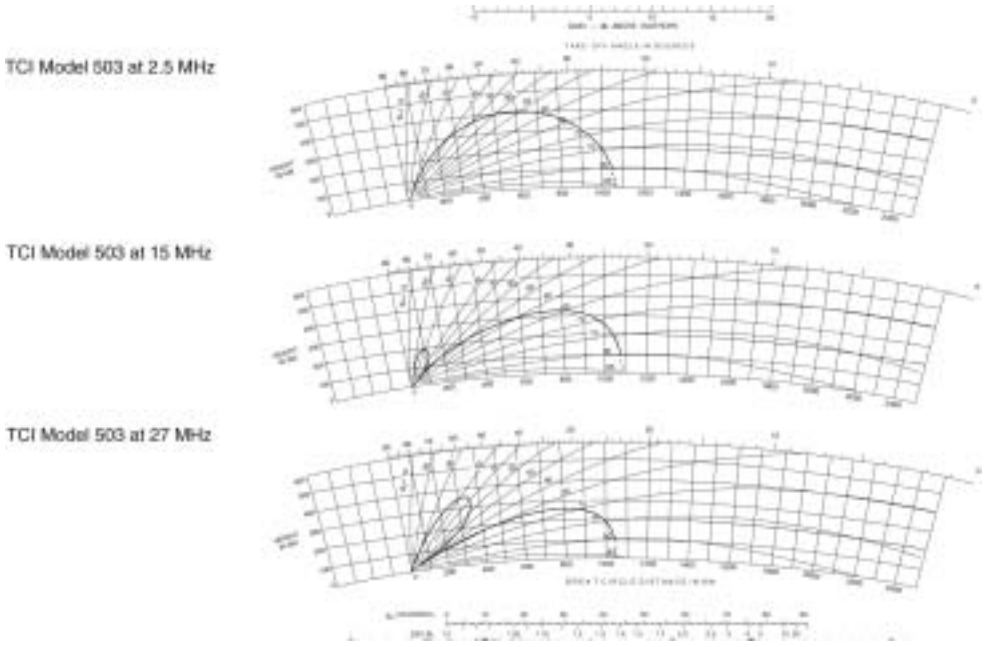
Size

Model Number	Frequency Range	Height ft.	Height mtr.	Length* ft.	Length* mtr.	Width* ft.	Width* mtr.
503-1-N	2.5–30 MHz	205	62	470	143	286	87
503-3-N	5.2–30 MHz	102	31	242	74	140	43
501-3H-N	5.2–30 MHz	102	31	242	74	140	43
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

ELEVATION PLANE PATTERN over perfect earth

Origin of pattern plot is –5 dB relative to an Isotrope



www.tcibr.com

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