



540 Omni-Gain Antenna™

Communicators have long needed a broadband, omnidirectional, HF antenna with the highest possible power gain. Vertically polarized antennas traditionally used for HF omnidirectional coverage suffer serious ground losses (up to 8 dB) or poor pattern directivity, or both.

The Model 540 is a horizontally polarized, omnidirectional log-periodic antenna embodying a radical new design, and having remarkably high omnidirectional power gain. This allows a single Model 540 to replace up to six directional horizontal log-periodic antennas with enormous land and capital savings. It can also substitute for a rotatable log-periodic with almost no loss in performance and none of the mechanical maintenance or reliability problems normally associated with this type of antenna.

In addition to the 540's exceptional gain and omnidirectional pattern, its unique configuration provides a broad elevation plane lobe with high-angle radiation at lower frequencies, and a narrow lobe with low-angle radiation at higher frequencies.

The actual take-off angles closely parallel the statistical ideal, making the 540 superb for roll call, shore-ship, and ground-air applications involving transmission paths greater than 1,000 km.

Use fewer antennas and maximize omnidirectional gain.

The 540's horizontal polarization virtually eliminates ground losses, and arraying in elevation provides superior directivity. At 30 MHz, power gain exceeds 10 dBi over average soil, decreasing to 7 dBi at 3.6 MHz. VSWR does not exceed 2.5:1 over the 3.6 to 30 MHz spectrum. Performance is virtually independent of the ground beneath the antenna, and no ground screen is required.

As with all TCI antennas, the 540 employs high-quality, exhaustively tested components and materials. All radiators, feedlines, and catenaries are Alumoweld, a wire composed of a high-strength steel core and a highly conductive, corrosion-resistant, welded coating of aluminum. All feedline and radiator tip insulators are made of

high-strength, glazed alumina, a material with an extremely low loss tangent (.001), which is virtually impervious to the effects of ultraviolet radiation, dirt, and salt spray. No fiberglass is used in the antenna.

The 540 is supplied in preassembled kit form with all required materials, including towers, guys, guy anchors, radiating curtain, feed hardware, balun, and steel anchor hardware to be embedded in the concrete foundations, but not including concrete or concrete-reinforcing steel.

KEY FEATURES

- › Medium- to long-range omnidirectional coverage
- › Horizontally polarized to minimize ground loss
- › High true power gain
- › Rugged construction

Model 540 Specifications

	540-1	540-2
Polarization	Horizontal	Horizontal
Frequency	3.6–30 MHz	4.0–30 MHz
VSWR	2.0:1 nominal 2.5:1 maximum	2.0:1 nominal 2.5:1 maximum
Power Gain	7dBi at 3.6 MHz 10.5 dBi at 30 MHz	6 dBi at 4 MHz 10 dBi at 30 MHz
Take-Off Angle	30° at 3.6 MHz 9° at 30 MHz	38° at 4 MHz 10° at 30 MHz
Azimuth Plane Pattern	Circular within 1 dB	Circular within 1 dB
Height	36.6 m (120 ft.)	30.2 m (99 ft.)
Size	97 m (318 ft.) by 97 m (318 ft.)	82.6 m (271 ft.) by 82.6 m (271ft.)
Environmental	All versions designed in accordance with EIA RS-222C to withstand the forces of:	
Standard Towers	193 km/h (120 mi/h) wind, no ice; 112 km/h (70 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 masts.	
Heavy Towers	For Model 540-1, 225 km/h (140 mi/h) wind no ice; 124 km/h (90 mi/h) wind 12 mm (1/2") radial ice.	

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Power and Impedance Data

Model Number	Input Impedance	Power Handling Capability	Connector
540-N-02	50 ohms	Receive	Type N Female
540-N-06	50 ohms	1 kW Avg./ 2 kW PEP	Type N Female
540-N-28	50 ohms	5 kW Avg./ 10 kW PEP	7/8" EIA Female
540-N-03	50 ohms	10 kW Avg./ 50 kW PEP	1-5/8" EIA Female

Nomenclature, 540-2-05, AS-4133/F

NOTE: Balun support pole, normally class 1 Douglas Fir, is required for transmitting but not supplied by TCI. Check with TCI for specific requirements.

ELEVATION PATTERNS power gain in dBi, Model 540-1

