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570 Multimode Spiral Antenna

A major problem facing communicators is a lack of sufficient land for optimal antenna systems. Antenna performance is often compromised by the use of too few antennas, inefficient antennas, antennas with degraded gain, or antennas that cannot operate at sufficiently low frequencies. The Model 570 multimode spiral antenna significantly reduces the land area required for arrays of HF antennas.

The 570 operates with up to three simultaneous transmitters, reducing the number of antennas required at communications stations. It provides both low and high take-off angles that enhance communications performance at all ranges of interest, including very low take-off angles (around 3 degrees) that are used for long-range communications.

Operate more antennas on smaller plots of land.

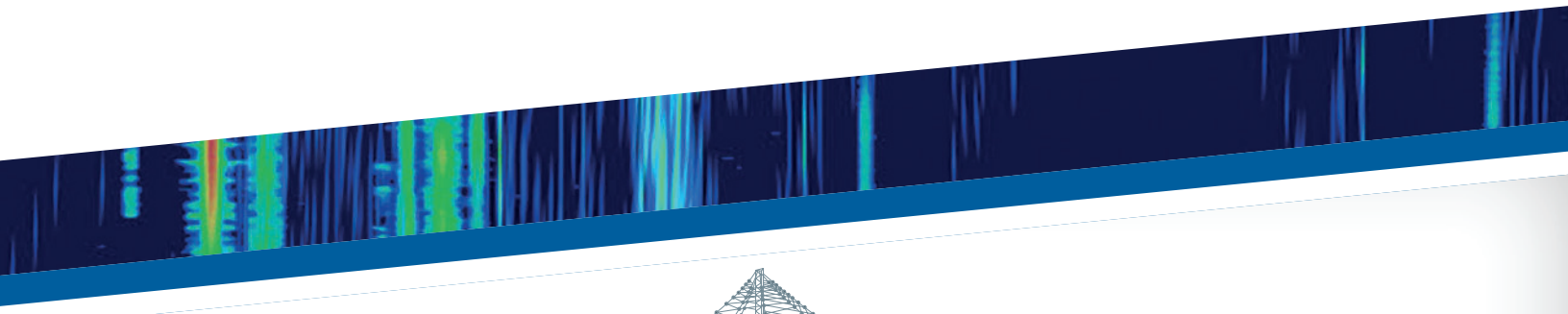
The 570's performance results from its optimized configuration. A four-arm spiral supported by a central mast, the antenna can be excited in three modes, two high-angle and one low-angle. Each mode is orthogonal with respect to the other two modes, virtually eliminating any coupling between them. Radiation is essentially omni-azimuthal at all elevation angles. Consequently, the 570 can operate in low-angle mode only, high-angle mode only, or simultaneously in both low- and high-angle modes.

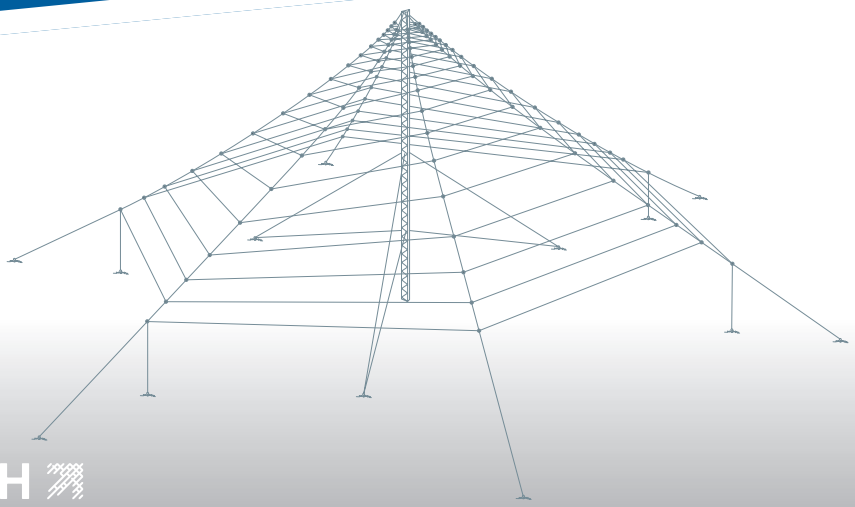
Polarization of the radiated signal lies in the horizontal plane, minimizing ground losses. The maximum possible gain without ground losses is provided at either high- or low- angle modes to enhance communications reliability.

Having the high-frequency active region at the top of the antenna generates very low take-off angles at higher frequencies, enhancing the gain and, therefore, the reliability for very long-range communications. Conversely, having the low-frequency active region near the ground results in high take- off angles that enhance the short-range communications supported by low- frequencies. Mast loads are low, which makes the system highly cost-effective and increases its long-term reliability. The 570 employs high-quality, exhaustively tested components that are highly resistant to corrosion and virtually impervious to the effects of ultraviolet radiation, dirt, and salt spray.

KEY FEATURES

- **Simultaneous operation of two or three transmitters**
- **Dual take-off angles provide optimum gain for short-, medium-, and long-range circuits**
- **Very low take-off angles for very long-range communications**
- **2–30 MHz operation**
- **Small land area**





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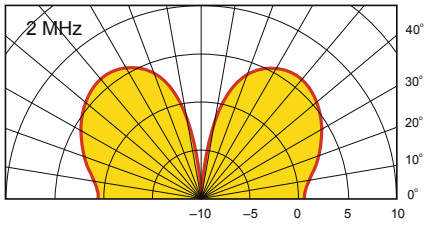
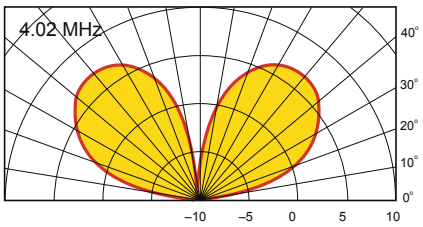
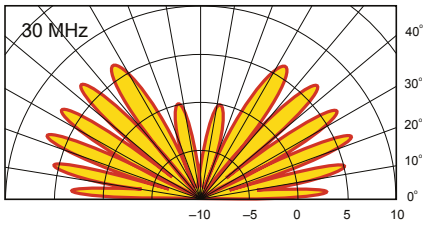
› Elevation Patterns Directive gain in dBi

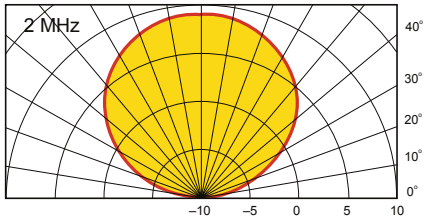
Low-Angle Mode

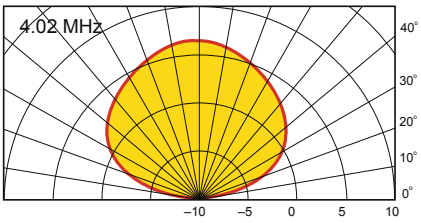


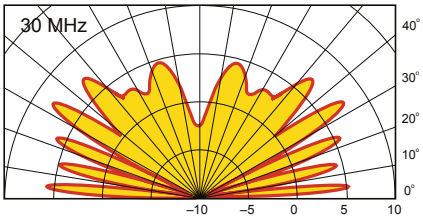




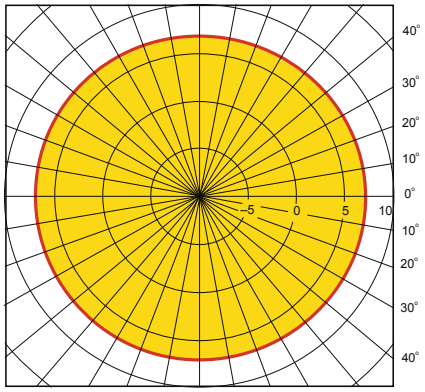
High-Angle Mode







› Typical Azimuth Pattern Directive gain in dBi



Antenna Efficiency			
Model Number	Frequency (MHz)	Efficiency (%)	
		Low-Angle Mode	High-Angle Mode
570-1	2	5	20
	2.5	10	40
	3	35	40
	3.5	60	50
	4	80	50
	5	95	65
	8	95	90
	30	95	90
570-2	2	5	6
	3	5	20
	4.5	35	40
	6	80	50
	7.5	95	65
	12	95	90
	30	95	90

Model 570 Specifications

Frequency	2-30 MHz
Power	Up to 2 simultaneous transmitters each 10kW average 20 kW PEP or 3 simultaneous transmitters each 1 kW average 2 kW PEP
VSWR	2.0:1 maximum (2.5:1 Max 2–2.5 MHz) including balun/coupler
Directive Gain	7 dBi nominal
Polarization	Circular in horizontal plane
Azimuthal Pattern	Nominally omni-azimuthal
Decoupling Between Modes	25 dB typical
Operational Modes	1. Single mode, single transmitter 2. Dual mode, two transmitters operating simultaneously 3. Triple mode, three transmitters operating simultaneously
Environmental Performance	Designed in accordance with EIA Specifi cation RS-222C for loading of 225 km/h (140 mi/h) wind, no ice or 96 km/h (60 mi/h) with 12mm (1/2") radial ice.

Available Multimode Options	
Single Mode (one input);	Receive, 1kW, 5 kW, 10 kW
Dual Mode (one high angle, one low angle input)	Receive, 1 kW, 5 kW, 10 kW
Triple Mode (two high angle, one low angle input)	Receive, 1kW

Elevation Approximate take-off angles optimized to be similar to the performance of rotatable log-periodic, as follows:		
Frequency	**Approximate TOA**	
	Low-Angle Mode	**High-Angle Mode**
2 MHz	51°	90°
4 MHz	48°	90°
30 MHz	Major lobes at 3.5°, 13°, 22° and 42°	Major radiation between 45° and 135°

Dimensions				
Model Number	**Height**		**Diameter***	
	ft	**m**	**ft**	**m**
570-1	120	37	370	113
570-2	80	24	254	77.4

*Includes guys. All dimensions are maximum

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CommTech team members collaborate across business segments and borders to deliver greater efficiencies and better ideas for helping customers succeed. This commitment to innovation supports an array of customers whose missions depend on having a clear picture of their electromagnetic environment. For over 50 years, TCI's technical developments and advanced production capabilities have earned it a reputation for excellence in high-performance communications, spectrum monitoring, and signals intelligence systems.

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