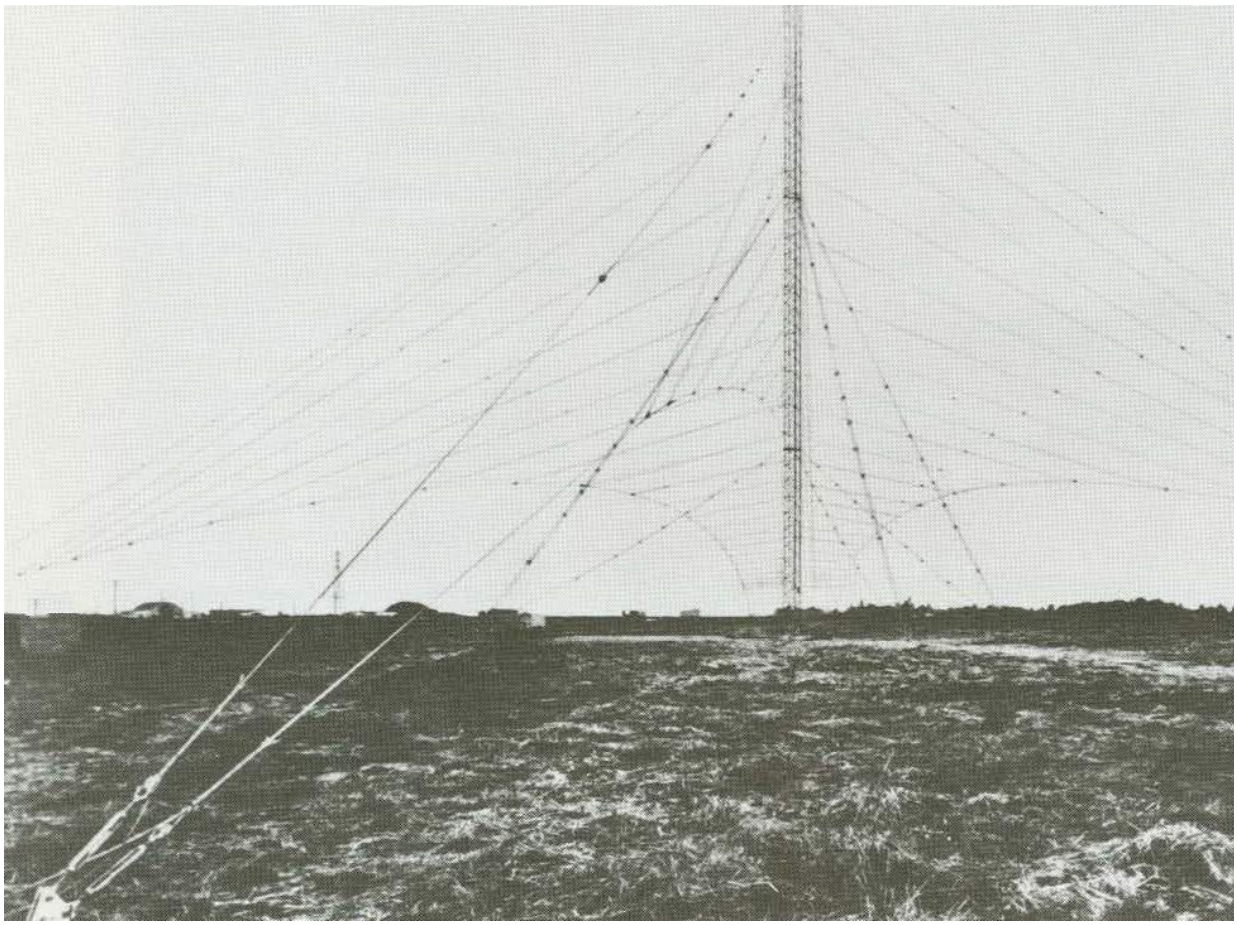
Type 2001 Series GRANGER™
Elliptically Polarized Broadband Antennas



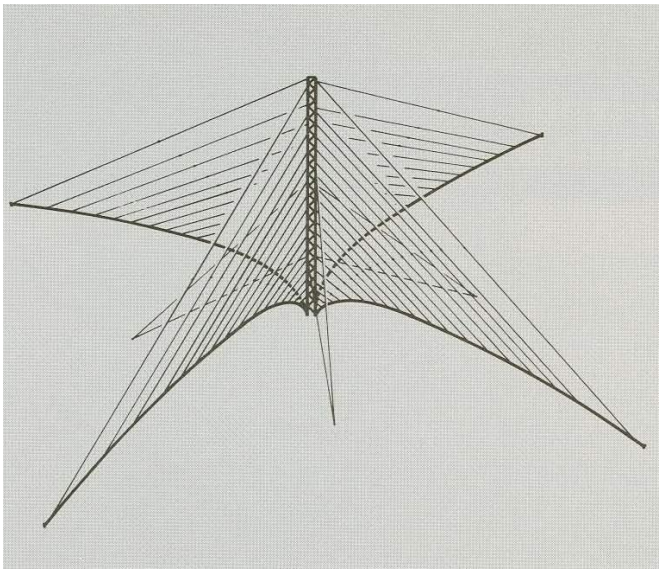
- **Broadband 2-30 MHz Frequency Range**
- **Up to 25 kW Average, 50 kW Peak Power Rating**
- **Horizontal-Elliptical Polarization to Reduce Fading**
- **Full Efficiency – No Resistive Loading**
- **Omindirectional**
- **2.0:1 Maximum VSWR**
- **Short-to-Medium-Range Communications**
- **On-Site Selection of Polarization Sense**

General Description

The Type 2001 Series antenna was developed to fill the need for a more efficient broadband antenna, capable of providing radiation characteristics essential for reliable short-to medium-range communications. Vertically polarized antennas cannot always provide reliable short-range coverage because of limitations in the radiation pattern or excessive attenuation of the ground wave. Existing horizontally polarized antennas are limited in the capacity to provide reliable medium-range communications because of lack of control of radiation patterns over adequate frequency ranges. With the elliptically polarized Type 2001 antennas, communication performance beyond that achieved with either vertically or horizontally polarized antennas is possible.

Features

Improved Reliability. The use of elliptical polarization has proven to be effective in avoiding deep fading because of polarization nulls caused by ionospheric rotation of the electric field. In 1966, an antenna was introduced, based on the log spiral principle, which provides horizontal elliptical polarization. Previous studies and subsequent real-time use have demonstrated that this type of polarization significantly reduces the effects of polarization null fading. Short-range circuits are particularly subject to this kind of fading, which



reduces circuit reliability. The 2001 Series antenna has both this very effective elliptical polarization and, in addition, is highly efficient (no lossy terminators) at all frequencies in the 20-30 MHz range.

All circuits are subject to some degree of take-off angle change, and it is imperative to have a radiation pattern free of nulls. Nulls are present at very high take-off angles with a vertical antenna such as a whip or conical monopole. Tuned dipoles, mounted a constant height above the ground, have frequency variable nulls at medium angles which inhibit circuit performance at medium ranges.

The 2001 Series antenna maintains a continuity of elevation plane pattern at all frequencies and gives reliable continuous coverage over variable circuit distances.

On-Site Selection of Polarization. The property of the ionosphere which causes fading also makes the use of an elliptically polarized signal desireable. The sense of polarization (clockwise or counterclockwise) is uniquely determined by the location of the antenna in the Northern or Southern Hemisphere. These exacting requirements make on-site selection of the sense of the elliptical polarization mandatory. The 2001 antenna has been designed to accommodate onsite selection of the polarization sense by station personnel, with ordinary tools. This feature provides significant savings in logistics costs.

Omnidirectional. The omnidirectional azimuth plane pattern provides optimum coverage for communications centers, airports and ground-air and shore stations for shore-ship communications.

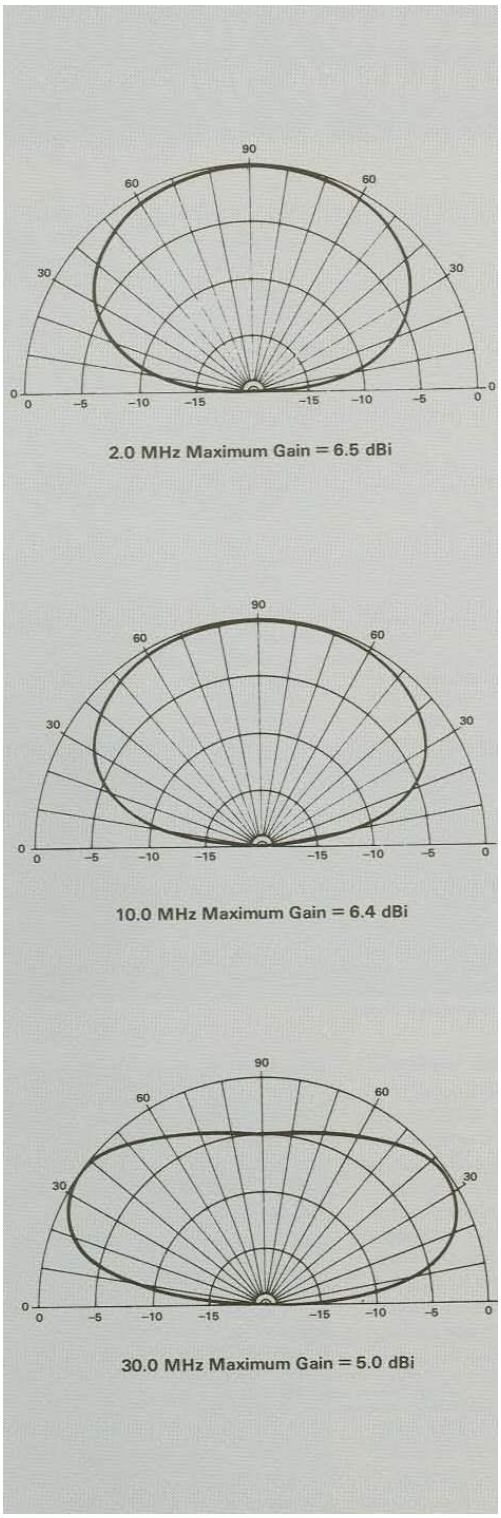
Accessories

The following accessories are available for ease of installation and maintenance: tower lighting kit, erection kit, paint kit, tool kit, lighting rod kit, anti-climbing kit, and spares kit.

Characteristics

Type	Omnidirectional broadband
Frequency Range, MHz	2.0, 2.85 or 4-30
Power Rating, kW	Up to 25 average, 50 peak
Polarization	Elliptical-either sense depending upon connection of radiators to feedline at time of installation.
Input Impedance, ohms	50, coaxial
VSWR	2.0:1 maximum
Gain, dBi	5 minimum; 7 maximum
Azimuth Plane Radiation Pattern	Omnidirectional
Efficiency	Greater than 95%
Wind Survival Rating, mph (km/h)	
Without Ice	140 (225)
With 0.5 in (12mm) Radial Ice	90 (145)

Typical Elevation Plane Patterns

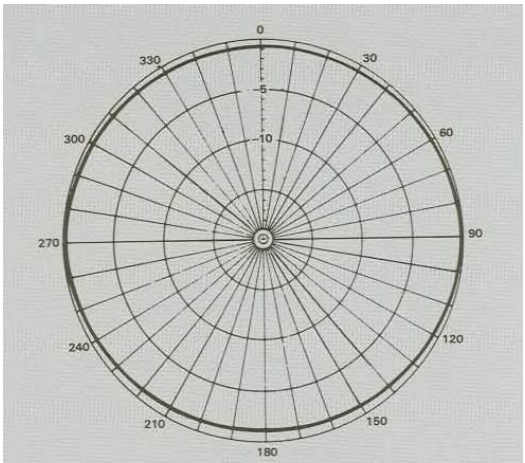


2.0 MHz Maximum Gain = 6.5 dBi

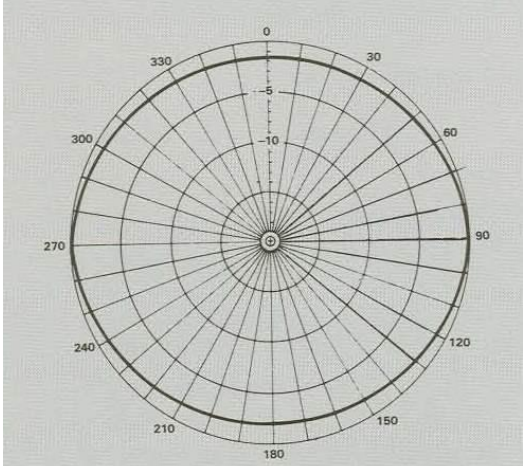
10.0 MHz Maximum Gain = 6.4 dBi

30.0 MHz Maximum Gain = 5.0 dBi

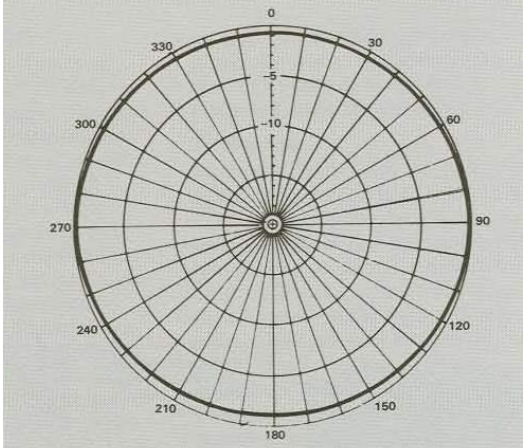
Typical Azimuth Plane Patterns



2.0 MHz Maximum Gain = 5.9 dBi

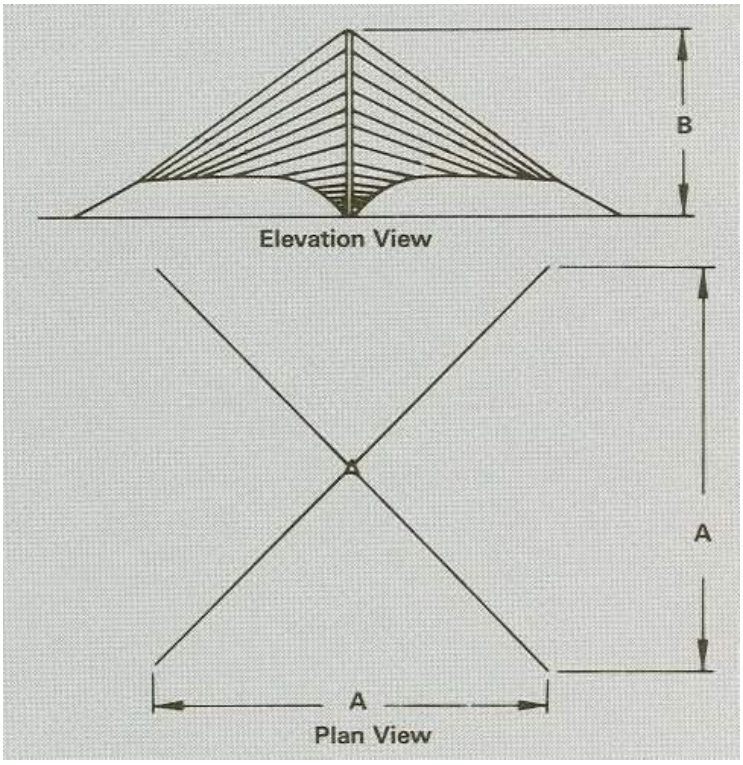


10.0 MHz Maximum Gain = 5.2 dBi



30.0 MHz Maximum Gain = 5.0 dBi

Antenna Dimensions



Ordering Information

Type Number	Frequency Range MHz	Power Rating kW Average	Peak	Input Connector Female	A Length & Width ft (m)	B Height Ft (m)
2001-1-1K	2-30	10	20	1-5/8" EIA	300 (91.5)	132 (40.2)
2001-1-2K	2-30	1.5	3	7/8" EIA	300 (91.5)	132 (40.2)
2001-1-3K	2-30	Receive Only	Receive Only	Type N Jack	300 (91.5)	132 (40.2)
2001-1-4K	2-30	25	50	3-1/8" EIA	300 (91.5)	132 (40.2)
2001-2-1K	2.85-30	10	20	1-5/8" EIA	210 (64.0)	92 (28.0)
2001-2-2K	2.85-30	1.5	3	7/8" EIA	210 (64.0)	92 (28.0)
2001-2-3K	2.85-30	Receive Only	Receive Only	Type N Jack	210 (64.0)	92 (28.0)
2001-2-4K	2.85-30	25	50	3-1/8" EIA	210 (64.0)	92 (28.0)
2001-3-1K	4-30	10	20	1-5/8" EIA	164 (50.0)	72 (21.9)
2001-3-2K	4-30	1.5	3	7/8" EIA	164 (50.0)	72 (21.9)
2001-3-3K	4-30	Receive Only	Receive Only	Type N Jack	164 (50.0)	72 (21.9)
2001-3-4K	4-30	25	50	3-1/8" EIA	164 (50.0)	72 (21.9)

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