RADIO ENGINEERING
MICROWAVE RADIO
ANTENNA SPECIFICATIONS
KS-20012 SIX-FOOT FOUR-PORT 6- AND 11-GHZ

CONTENTS PAGE

1. GENERAL

1.01 The KS-20012 parabolic reflector antenna is a dual-frequency cross-polarized (four-port) antenna for use with short-haul, 6- and 11-GHz crossband diversity microwave radio systems such as TL/TM and TJ/TM.

2. TRANSMISSION CHARACTERISTICS

2.01 The frequency-gain characteristics are shown in Table A. Other transmission characteristics of the KS-20012 antenna are given in Table B.

2.02 Horizontal-directivity curves are shown in Fig. 1 and 2. Figure 1 is the smoothed horizontal-directivity curve for the 6-GHz band for either horizontal or vertical polarizations. Figure 2 is the smoothed horizontal-directivity curve for the 11-GHz band for either horizontal or vertical polarizations. These curves are drawn to cover all minor lobes that are likely to occur within the frequency band and are used as a worst case situation when making interference computations.

2.03 Figures 3 and 4 are polar graphs of the radiation patterns at 6.175 GHz for horizontally and vertically polarized signals. Figures 5 and 6 show the radiation patterns at 11.2 GHz. Figures 7 and 8 illustrate the antenna response to a cross-polarized signal for the 6.175- and 11.2-GHz signals. The polar patterns show numerous minor lobes and are the result of actual measurement. The engineer should not attempt to rely upon this fine grain information for making interference computations, as they will differ considerably from antenna to antenna and from one specific frequency to another.

TABLE A

FREQUENCY-GAIN CHARACTERISTICS

GAIN	
FREQUENCY (GHZ)	GAIN-MIN (DB) WITH RADOME
5.925	35.8
6.175	35.8
6.425	36.8
10.7	41.3
11.2	41.7
11.7	42.1

3. EQUIPMENT DESCRIPTION

3.01 The KS-20012 parabolic antenna consists of a six-foot diameter parabolic reflector equipped with a two-element feed assembly for transmission in the 5.925 to 6.425 GHz and 10.7 to 11.7 GHz microwave frequency bands. The reflector is a six-foot parabolic aluminum dish. It can be tower mounted or mounted horizontally for periscope type operation. The complete assembly includes a

TABLE B
TRANSMISSION CHARACTERISTICS

CHARACTERISTIC	FREQUENCY 6.175 GHZ	11.2 GHZ
Half-power beam width	2.1 degrees	1.1 degrees
Major sidelobe suppression	13 dB min	13 dB min
Radome insertion loss	0.3 dB max	1.0 dB max
Return loss	23 dB minimum	
Polarization discrimination	20 dB minimum	

mounting frame for attaching the reflector to the tower. A weather-protecting low-loss radome fits over the reflector and is required for the antenna to meet the design wind load requirements.

3.02 The two-element feed assembly is mounted in the center of the reflector and is fed by dominant mode rectangular waveguides. One WR159 waveguide with a gasketed flange is provided for each polarization of the 6-GHz frequency band and one WR90 rectangular waveguide with a gasketed flange is provided for each polarization of the 11-GHz frequency band.

3.03 The 6-GHz rectangular waveguide is split into half-height waveguides which surround the 11-GHz feed and terminate at a square flared horn which directs the 6-GHz signal toward the subreflector for illuminating the reflector.

3.04 The 11-GHz vertically and horizontally polarized signals connect to a combining network which couples the energy from the rectangular waveguide to a circular polyrod feed to illuminate the subreflector with the two polarizations of both frequency bands.

3.05 The feed assembly, including the subreflector, is strut supported. Both the 6- and 11-GHz feeds can be rotated 360 degrees independently of each other. The entire assembly with mounting frame will withstand wind loading of 40 pounds per square foot without damage or misalignment.

3.06 Reflector or feed heaters are not provided with this antenna.

3.07 Equipment information is shown in Table C. One of each List 1, 2, 4 and either 3 or 5 is required for a complete antenna.

TABLE C
EQUIPMENT INFORMATION

KS-20013	List 1	6-foot parabolic reflector
	List 2	Feed assembly
	List 3	Mounting frame
	List 4	Radome
	List 5	Mounting frame for horizontal roof mounting

3.08 On the used 6-GHz ports a KS-20148 filter is required to meet the isolation requirements. On unused ports a termination will be used. This equipment is not part of the antenna equipment and must be ordered separately.

3.09 The mounting frames are A-frame iron pipe assemblies. Each frame is equipped with separate azimuth and elevation adjustment screw assemblies for alignment purposes.

3.10 The weight of the reflector and feed assembly is approximately 110 pounds. The mounting frame weighs approximately 125 pounds and the radome approximately 40 pounds.

4. REFERENCES

SD-3C041-01	Parabolic Reflector Antennas—Passive Reflectors and Outdoor Waveguide Systems
940-340-131*	Microwave Radio, Waveguide Systems Design Considerations

*This section may not be issued. Consult the latest numerical index.

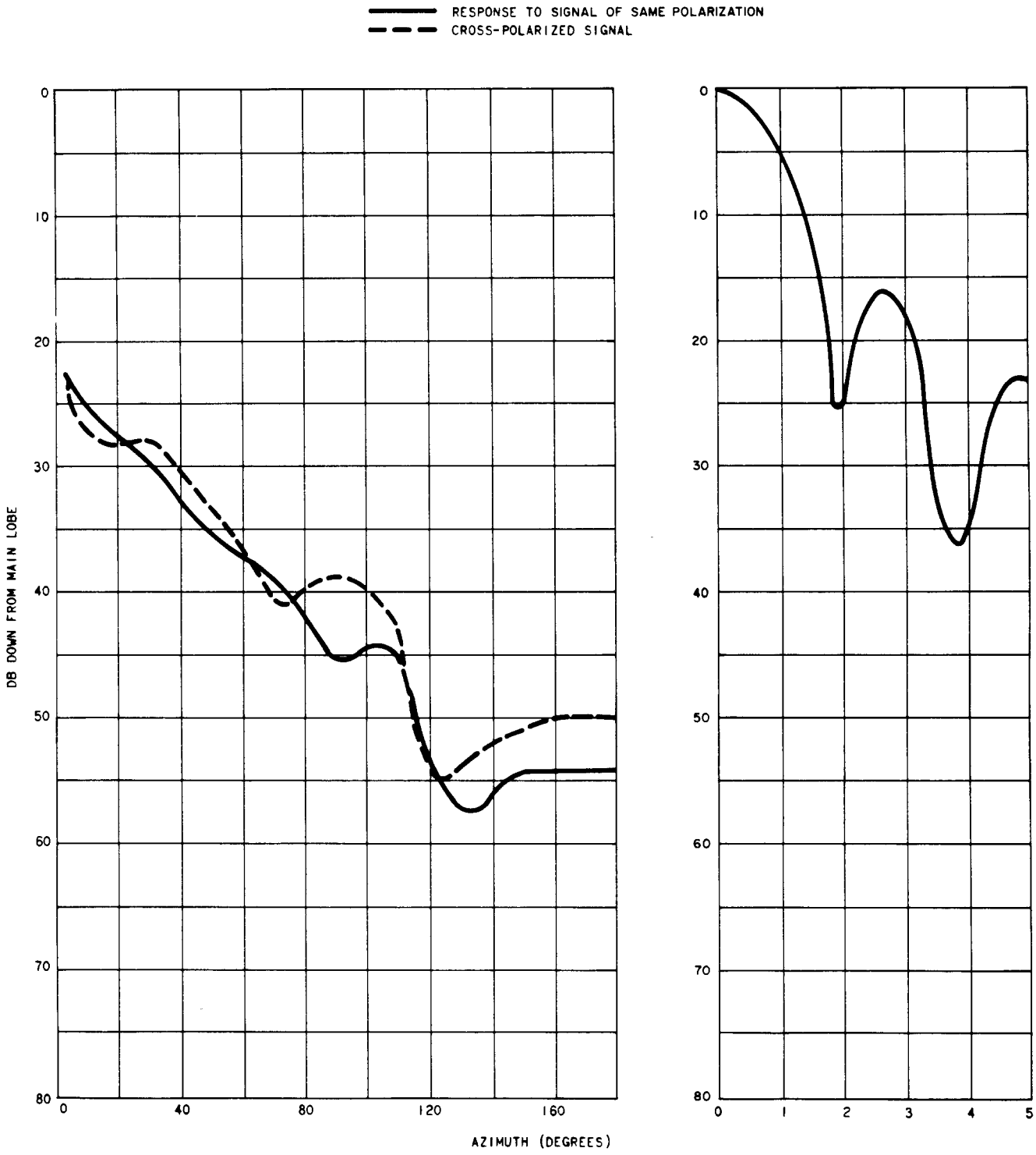

Fig. 1—Smoothed Horizontal Directivity—6 GHz

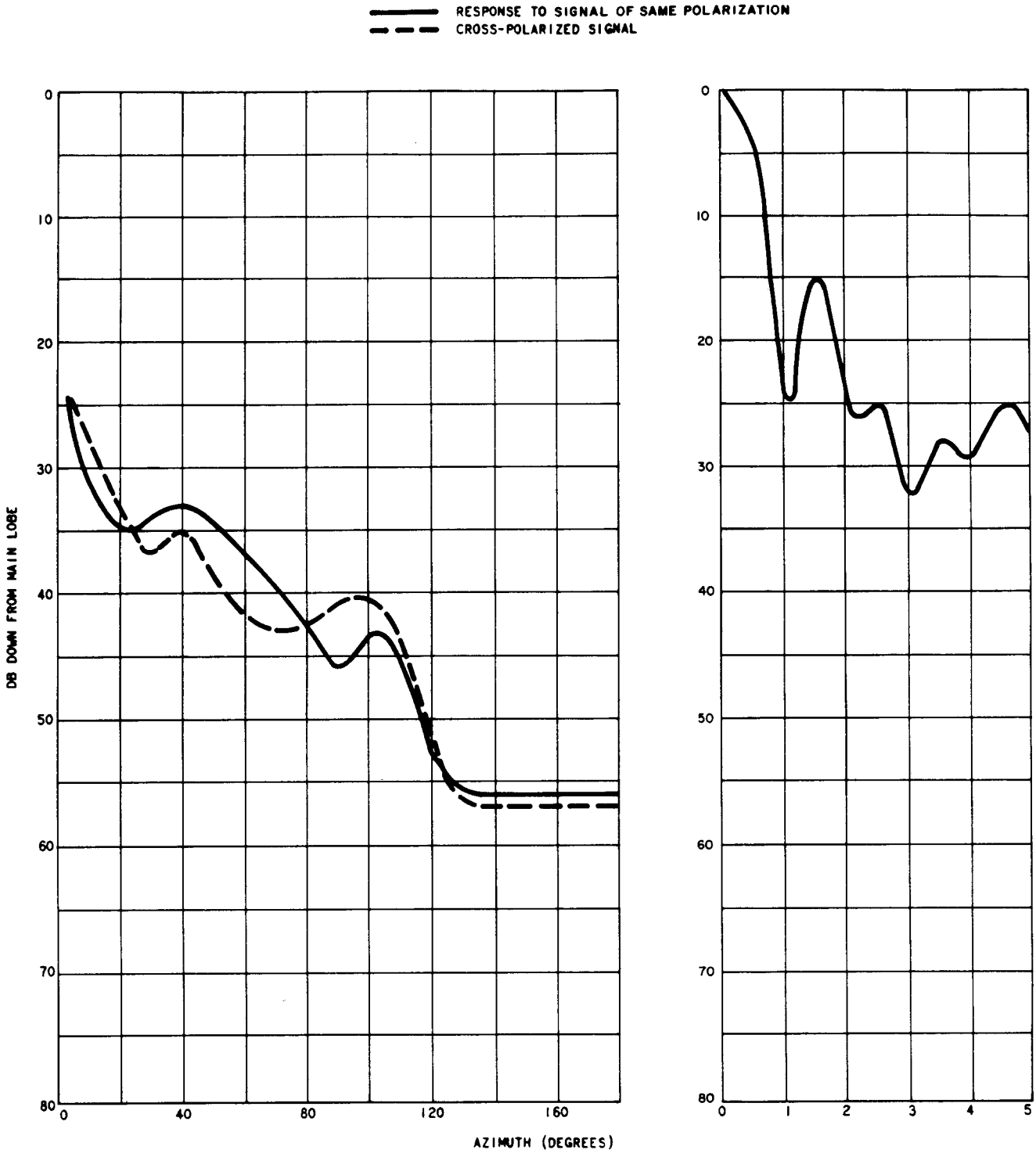

Fig. 2—Smoothed Horizontal Directivity—11 GHz

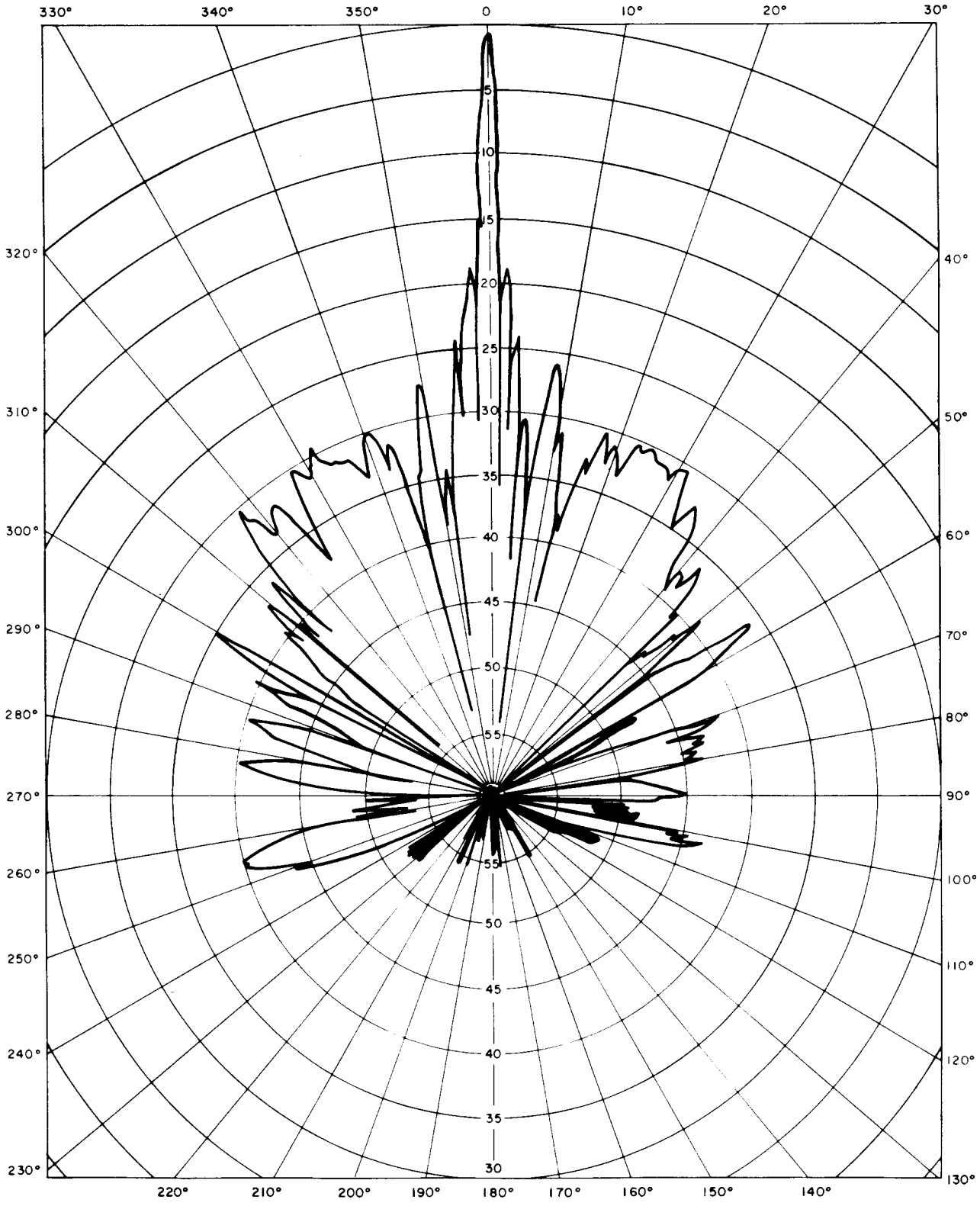

Fig. 3—Radiation Pattern for 6.175 GHz Horizontally Polarized Signal

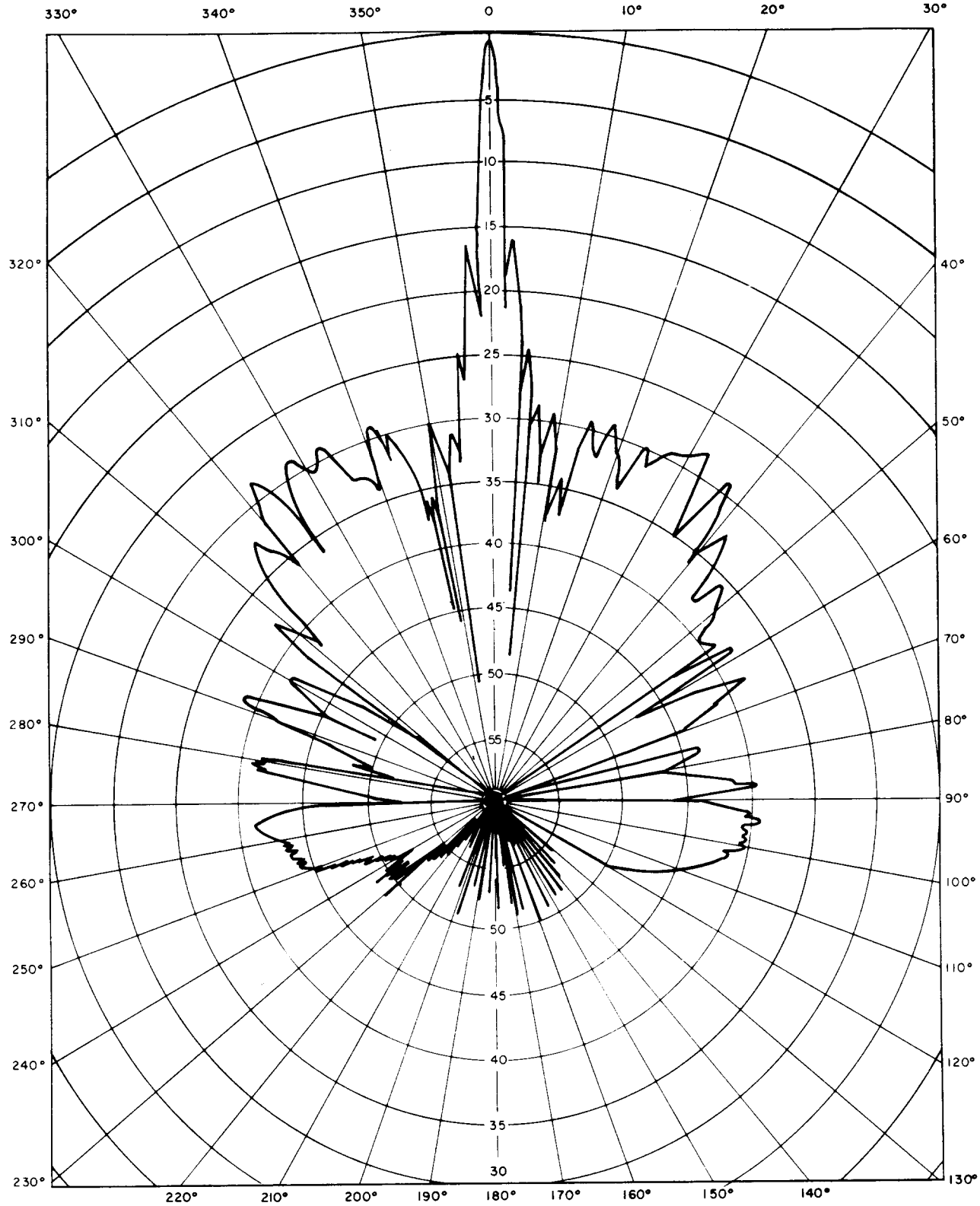

Fig. 4—Radiation Pattern for 6.175 GHz Vertically Polarized Signal

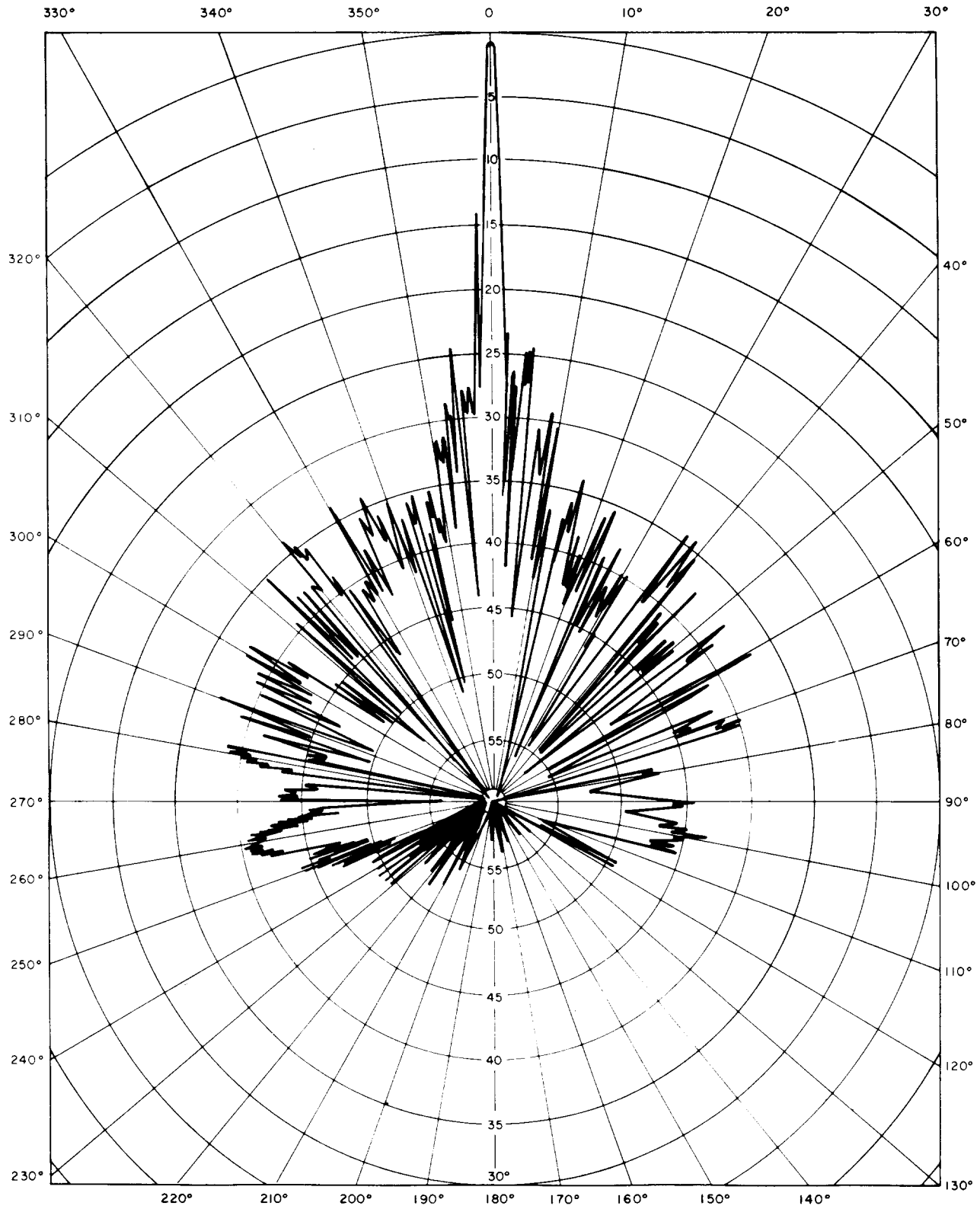

Fig. 5—Radiation Pattern for 11.2 GHz Horizontally Polarized Signal

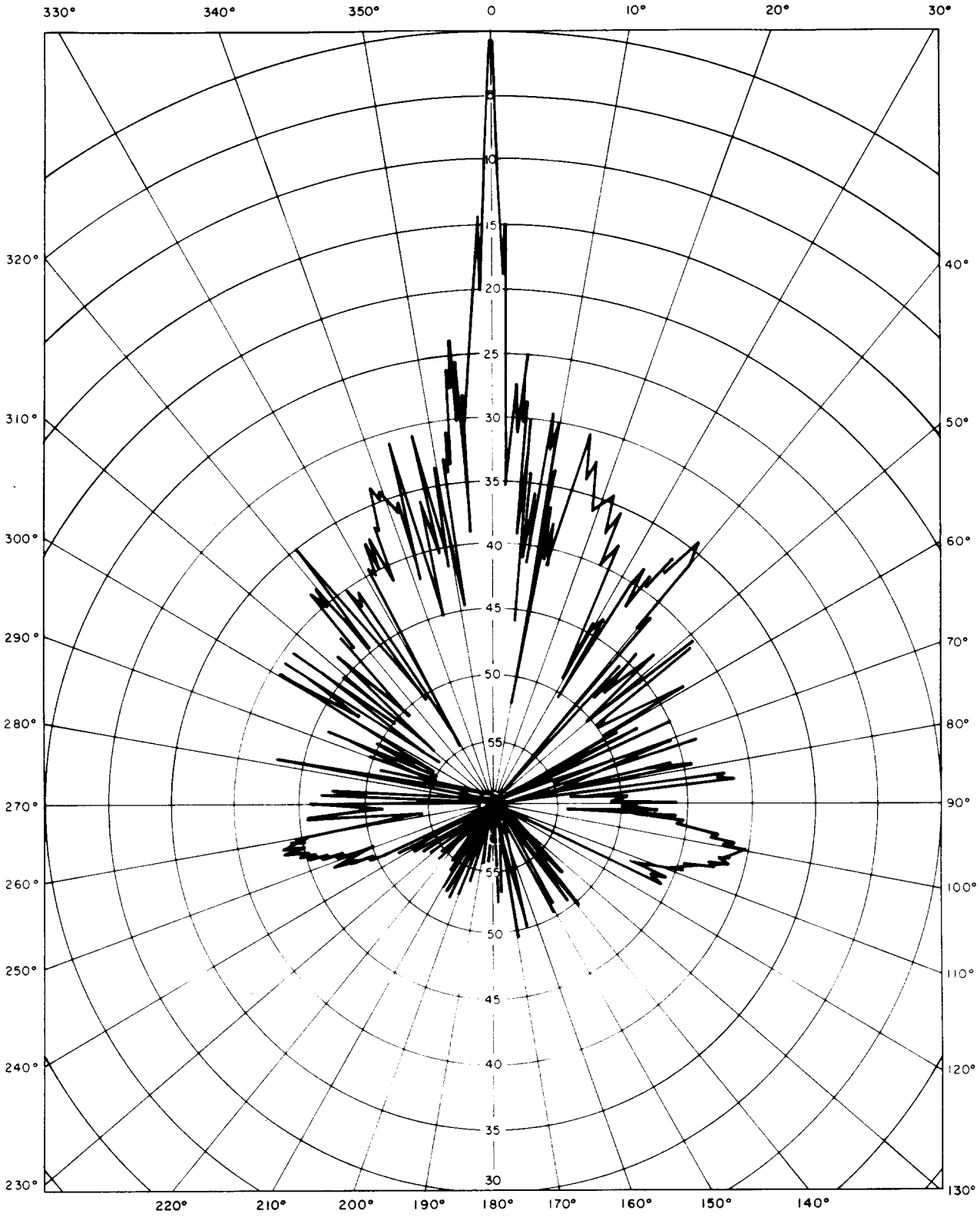

Fig. 6—Radiation Pattern for 11.2 GHz Vertically Polarized Signal

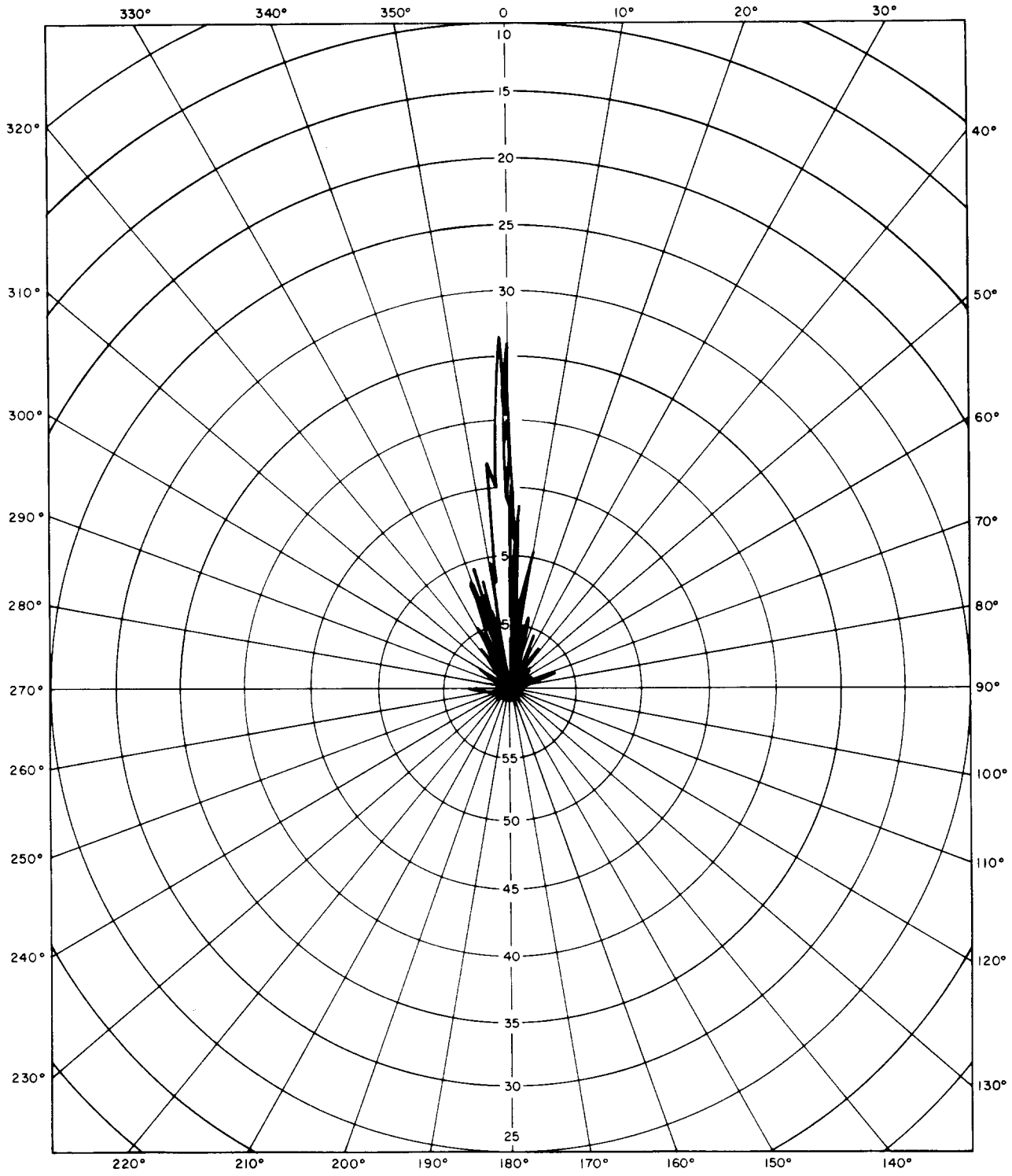

Fig. 7—Response to a Cross-Polarized 6.175 GHz Signal

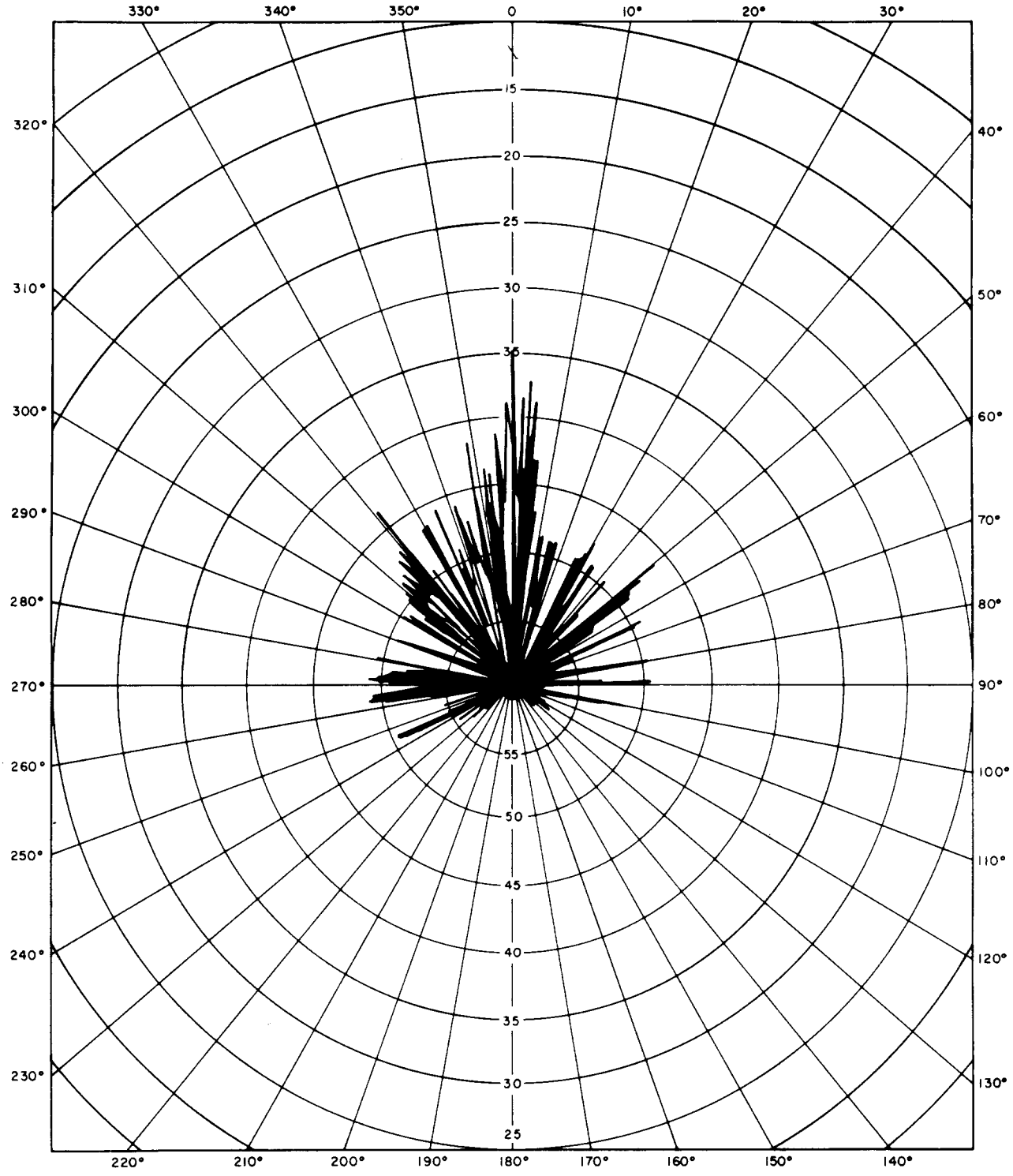

Fig. 8—Response to a Cross-Polarized 11.2 GHz Signal