ANTENNA DEVELOPMENT

FOR

OH-58A HELICOPTER

FINAL REPORT

206-099-212B

BELL HELICOPTER COMPANY
POST OFFICE BOX 482 • FORT WORTH, TEXAS 76101 A TEXTRON COMPANY

206-099-212B

ANTENNA DEVELOPMENT FOR OH-58A HELICOPTER (U)

Final Report

July 1969

By

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For

U. S. Army Aviation Material Command
Department of The Army

By

BELL HELICOPTER COMPANY

Fort Worth, Texas 76101

A Division of Bell Aerospace Corporation

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1.0 PURPOSE

The objective of the task described in this report was to design, develop, and manufacture an antenna system for use with the Standard Lightweight Avionics Equipment (SLAE) on OH-58A helicopters. This final report is submitted pursuant to paragraph 3.3.6.4 of MIL-A-7772B and paragraph 3.1.15 of Bell Helicopter Detail Specification 206-947-031, Appendix VI.

The antenna system consists of the following functionally independent components:

a. A communications antenna for use with the Number One AN/ARC-114 VHF/FM transceiver over the frequency range of 30 to 75.95 megahertz. BHC P/N 206-075-518.

b. A communications antenna for use with the Number Two AN/ARC-114 transceiver over the frequency range of 30 to 75.95 megahertz. AS-2485/ARC-114, BHC P/N 206-075-543.

c. A communications antenna for use with the AN/ARC-115 VHF/AM transceiver over the frequency range of 116.to 149.975 megahertz. BHC P/N 206-075-518.

d. A communications antenna for use with the AN/ARC-116 UHF/AM transceiver over the frequency range of 225 to 399.95 megahertz. AS-2487/ARC-116, BHC P/N 206-075-551.

e. A homing antenna for use with the AN/ARC-114 VHF/FM radio. AS-2486/ARC-114, BHC P/N 206-075-523.

2.0 GENERAL FACTUAL DATA

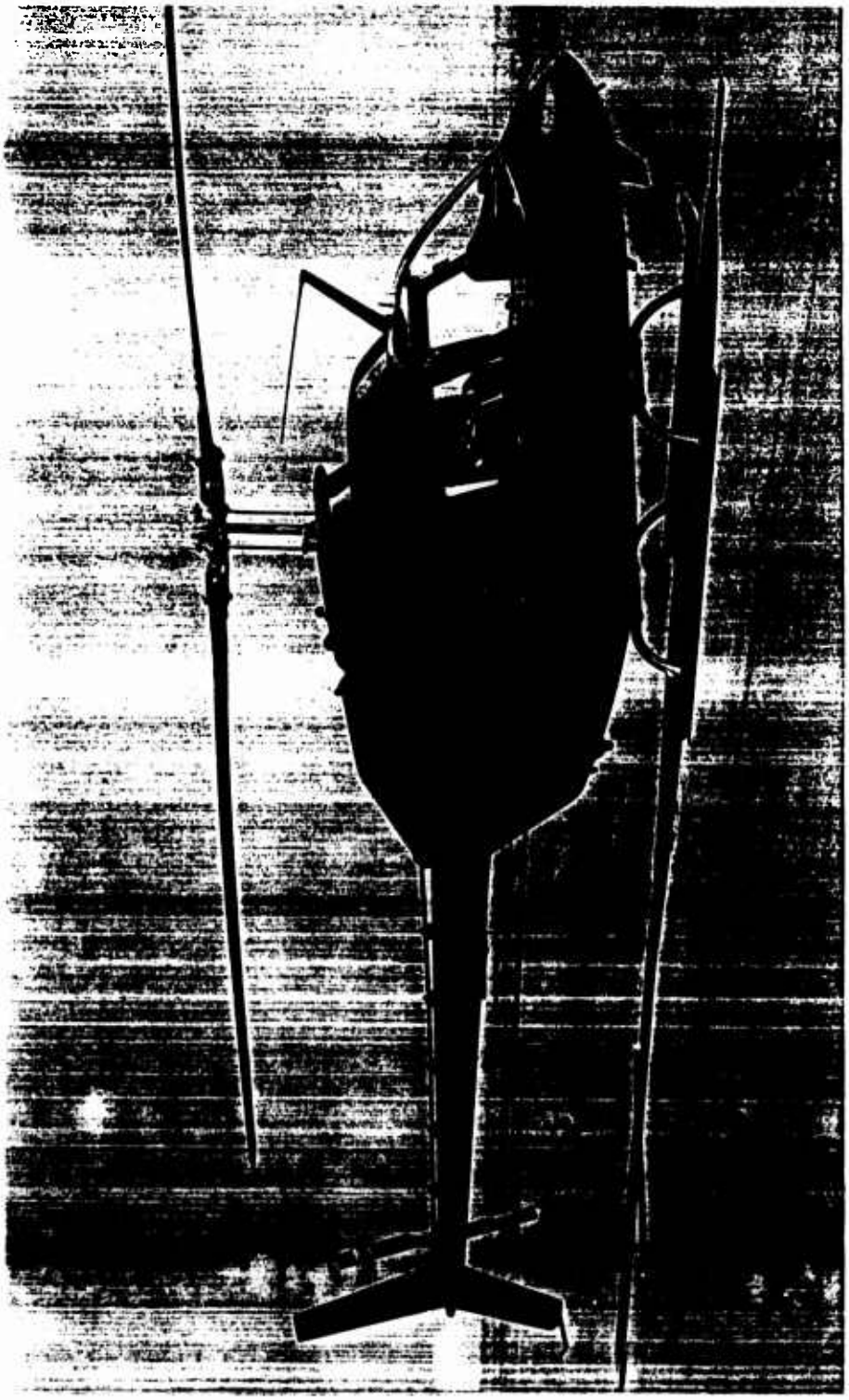
2.1 Summary

During the period covered by this report extensive testing of the antenna system described in BHC Reports 206-099-212 and 206-099-212A was accomplished. The results of this testing serve to confirm that the design of the antenna system will provide the OH-58A helicopter with clear and reliable communications and FM Homing.

In the course of this testing it was noted that severe tail rotor modulation of received and transmitted UHF signals was taking place. Therefore, the UHF element has been deleted from the vertical stabilizer antenna assembly and has been replaced by a lightweight blade type antenna mounted under the nose of the helicopter. Figure 1, page 4 illustrates the final location of all antennas, and photographs of the individual antennas may be found in Figures 2 thru 5, pages 5 thru 8.

Moving the UHF antenna to this forward location has the farther desirable effect of reducing the required transmission line run by a considerable amount, thus reducing line loss by approximately 2.5 db.

It was also determined during flight testing that the FM Homing system exhibited excessive sensitivity to the roll attitude of the aircraft. A slight modification to the tip loading of the FM Homing dipoles resulted in completely successful homing throughout the 30 to 76 MHz band.



BHC Photo No. 272508

FIGURE 1

OH-58A S/N 68-16688

BHC Photo No. 004985

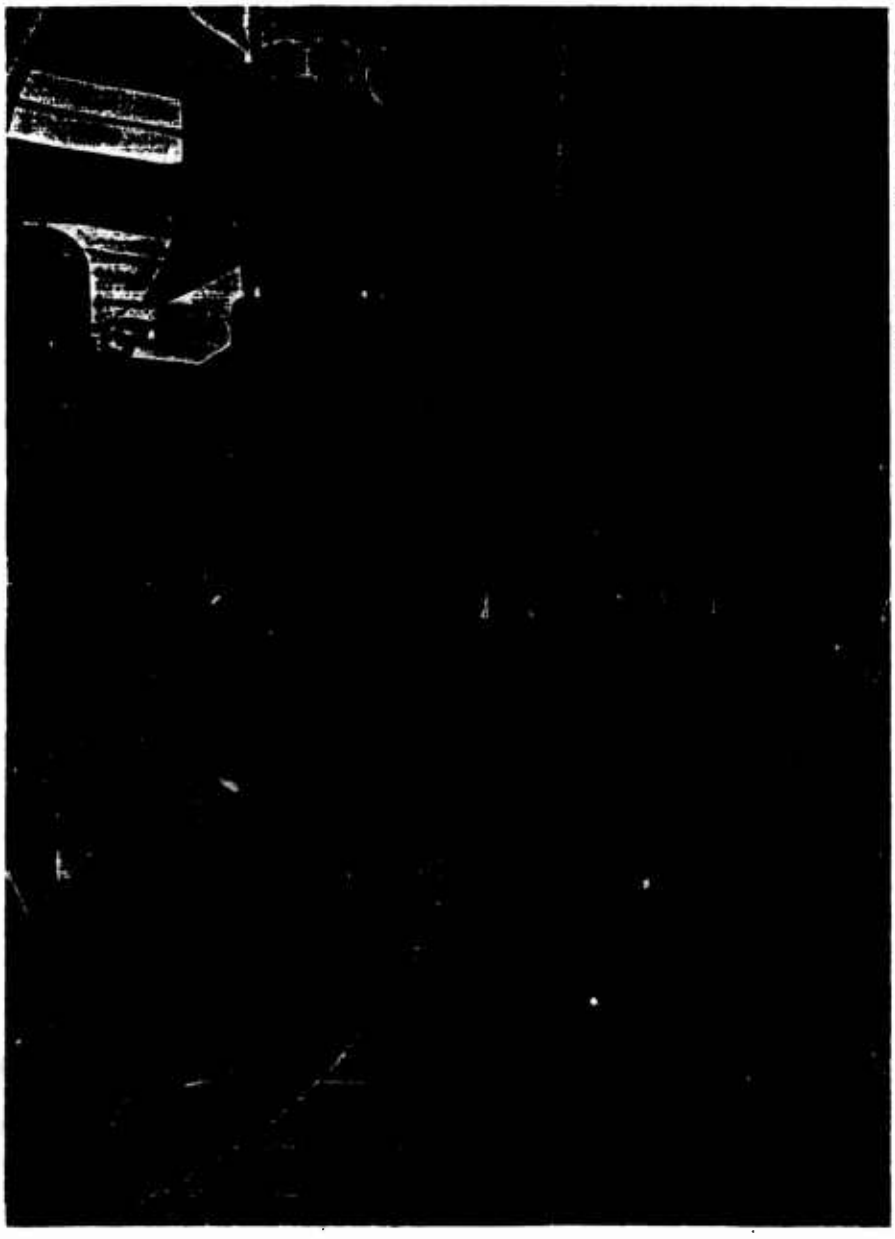
FIGURE 2

NUMBER ONE VHF/FM AND VHF/AM COMMUNICATION ANTENNA
BHC P/N 206-075-518

BHC Photo No. 004980

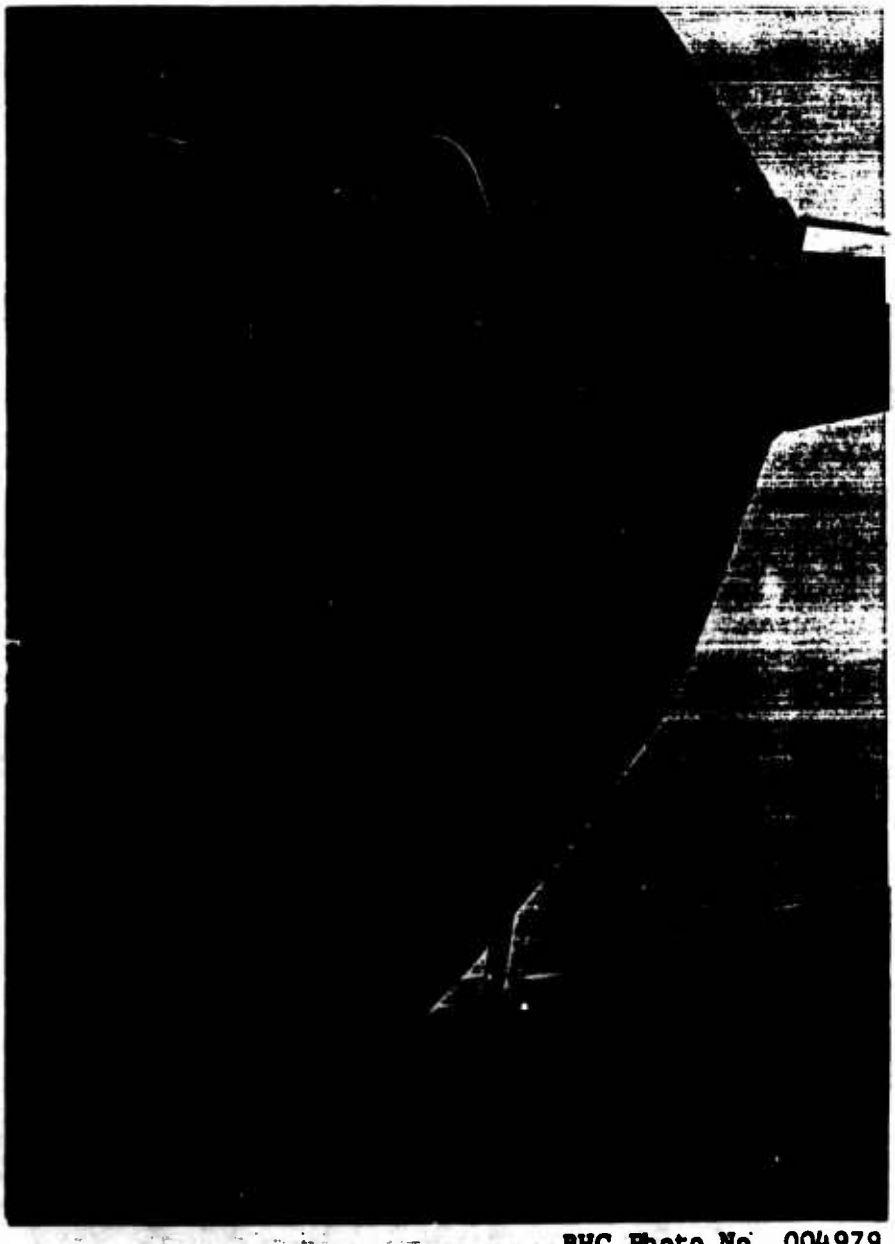
FIGURE 3

NUMBER TWO VHF/FM COMMUNICATION ANTENNA
AS-2485/ARC-114 BHC P/N 206-075-543



BHC Photo No. 004973

FIGURE 4
UHF/AM COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551



BHC Photo No. 004979

FIGURE 5

VHF/FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

2.1 Summary (Continued)

FM retransmission tests performed confirm that isolation between the numbers one and two FM communication antennas is sufficient to permit successful two-way retransmission between two ground stations separated by 80 miles.

2.2 Formula

Measured antenna pattern field strengths were corrected to free space values by the methods given by Bailey in TV & OTHER RECEIVING ANTENNAS, Chapter 5, pp. 214-220. Correction factors thus developed for the test frequencies used are given in Table I, page 10.

SAMPLE CALCULATION:

$$\frac{h}{h + h_0} = \frac{h}{1320 \frac{D984}{h_1 F} + \frac{D^2}{2}}$$

h = ground antenna height above terrain = 10 ft
h_1 = aircraft altitude above terrain = 1000 ft
h_0 = height of ground antenna first pattern maximum above terrain at aircraft location.
D = distance between aircraft and ground station = 18 mi.
F = frequency = 30.5 MHz

$$\frac{h}{h + h_0} = .01095$$

Referring to Figure 6, page 11 (from Bailey, P. 218)
Free Space Correction = 41 db

TABLE I

PROPAGATION CORRECTIONS

FREQUENCY MHz	CORRECTION FACTOR db
30.50	41.0
40.10	37.0
46.65	35.0
49.80	34.5
54.50	33.5
57.80	33.0
60.00	32.5
65.95	32.0
72.05	31.0
75.60	30.5
126.45	26.00
128.65	25.95
132.60	25.90
134.65	25.85
138.05	25.80
141.45	25.75
143.85	25.70
148.00	25.65
148.80	25.60
149.90	25.55
225.3	23.5
242.5	23.4
265.5	23.3
278.5	23.2
299.9	23.1
321.5	23.0
356.5	22.9
374.4	22.8
386.6	22.7
399.8	22.6

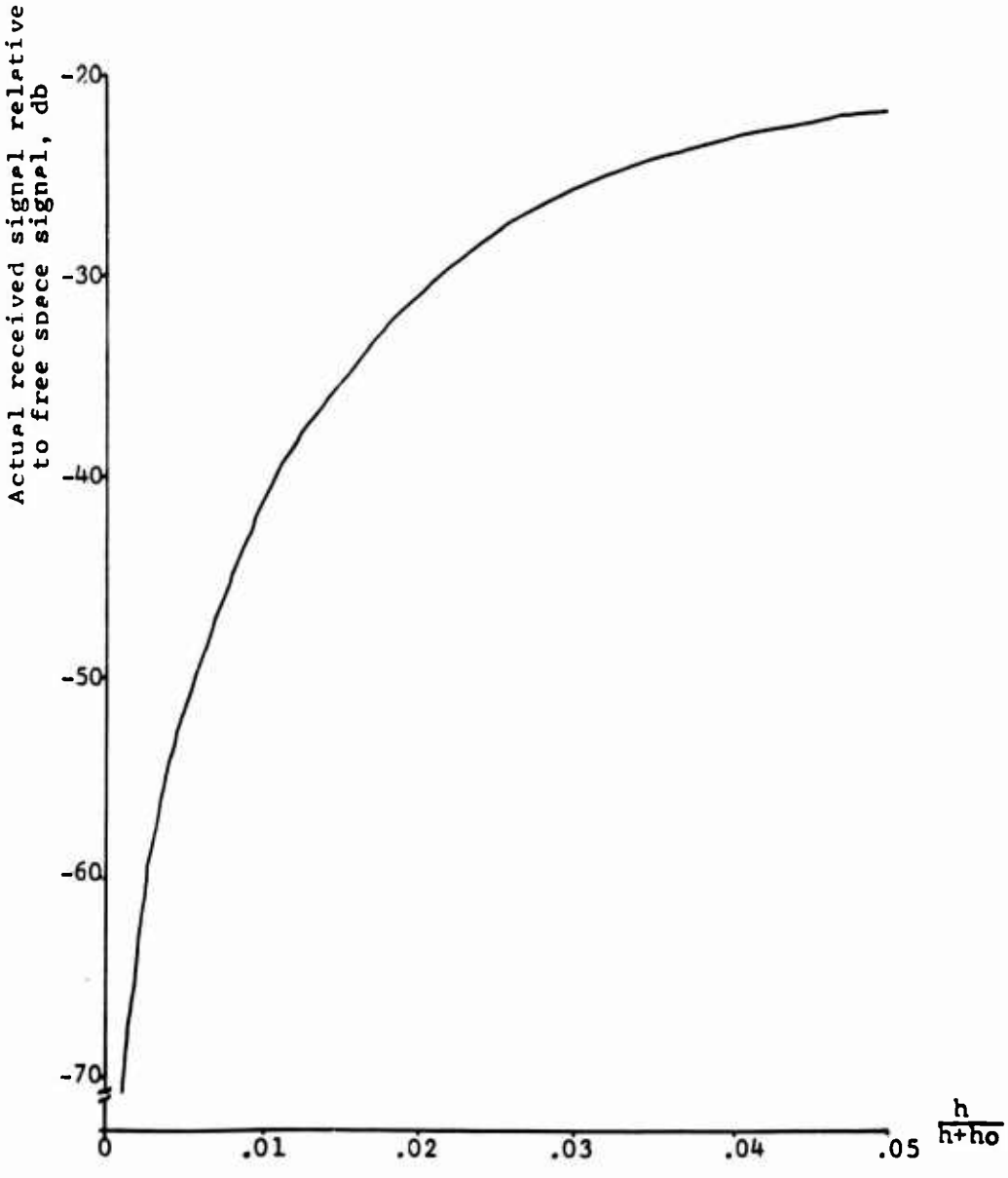


FIGURE 6

ACTUAL RECEIVED FIELD STRENGTH RELATIVE TO FREE SPACE FIELD VS RECEIVING ANTENNA HEIGHT FACTOR

(Redrawn from Bailey, P. 218)

2.3 Measurement Procedures

FM Homing antenna patterns were measured using the methods described in BHC Report No. 206-099-212, page 5. The radiation pattern of all other antennas described in this report were measured in flight using the method shown in the block diagram of Figure 7, page 13.

VSWR of the FM Homing Antennas were measured using a Hewlett-Packard Model 4815A RF Vector Impedance Meter. VSWR of the other antennas was measured with a Bird Model 4311 Directional Wattmeter.

2.4 Applicable Documents

206-947-031 R-4	Detail Specification for Model 206A (MOD) Light Observation Helicopter	11 March 69
MIL-A-7772B	Antenna Systems, Airborne; General Specification for the Design, Location, and Installation of	27 June 56
EL-CP1000-0007A(1)	FM Communications Antenna for LOH	26 Oct 67
EL-CP1000-0008A(1)	FM Homing Antenna for LOH	26 Oct 67
EL-CP1000-0009A(1)	VHF Antenna for LOH	26 Oct 67
EL-CP1000-0010A(1)	UHF Antenna for LOH	26 Oct 67
MIL-E-5400J	Electronic Equipment, Aircraft, General Specification for	7 Dec 66

TV and Other Receiving Antennas
by Arnold B. Bailey,
John F. Rider, Publisher

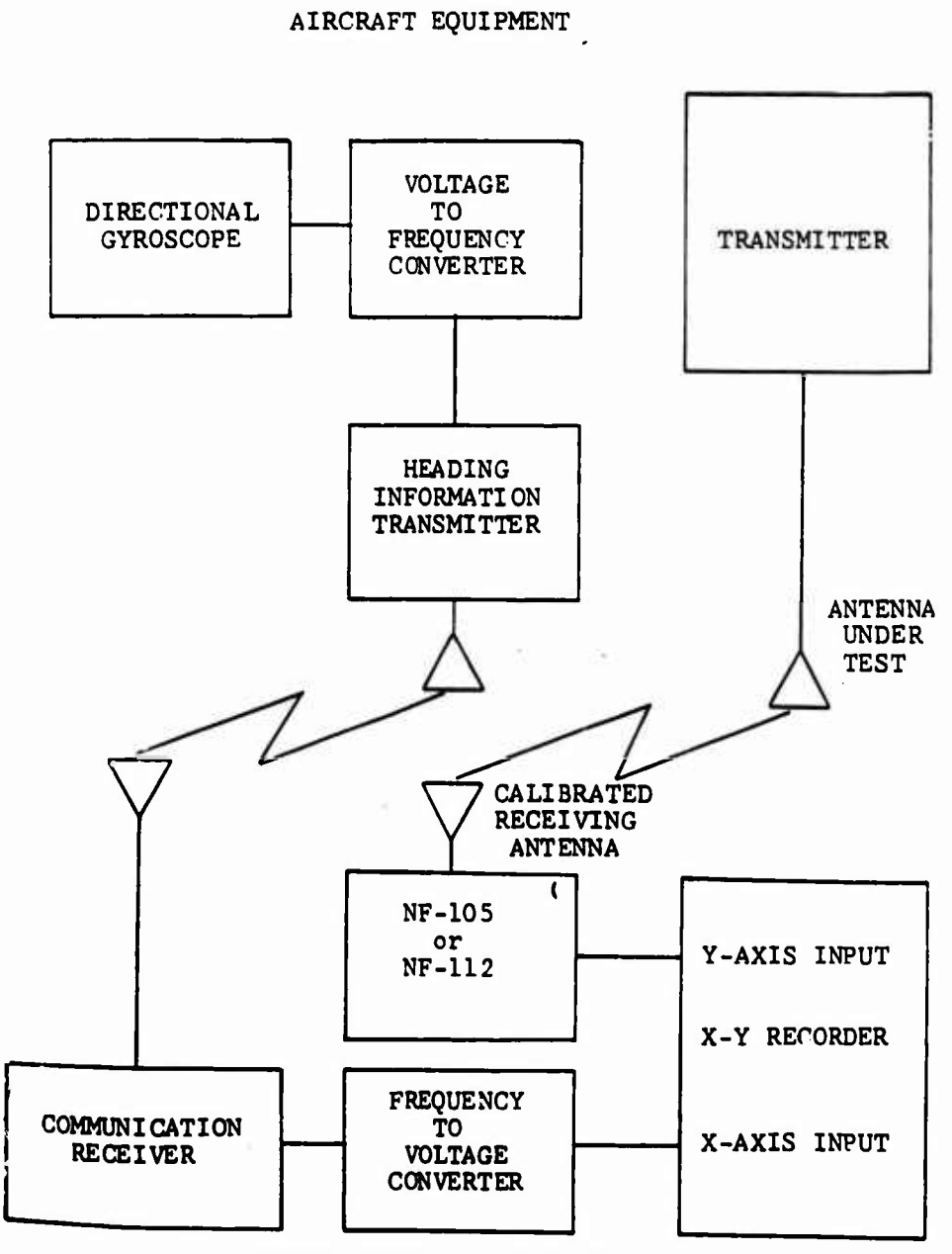


FIGURE 7

ANTENNA PATTERN RECORDING SCHEME

3.0 DETAIL FACTUAL DATA

3.1 Number One FM Communication Antenna BHC P/N 206-075-518

The number one FM communication antenna is a folded radiator enclosed within the upper half of the OH-58A vertical stabilizer. The radiating elements of the antenna are grounded for direct current and static charges and all matching circuitry is passive. The frequency range is 30 thru 76 MHz. The antenna provides vertically polarized radiation. VSWR in a 50 ohm system is 5:1 maximum, radiation efficiency varies from more than 25% at 30 MHz to better than 75% at 76 MHz, and pattern symmetry is generally better than 10 db. Final performance results of the 206-075-518 FM communication antenna S/N 002 are given in tabular form on Data Sheet 1, page 22 , part III of this report. Radiation pattern polar plots may be found on Data Sheets 2 thru 11, pp 23 thru 32 of part III.

3.2 FM Homing Antenna, AS-2486/ARC-114 BHC P/N 206-075-523

The FM homing antenna consists of two short vertical radiators, one mounted on each side of the helicopter. Each of the two elements is center fed via a balun and tip loaded at each end to provide the proper characteristics. The antenna provides vertical polarization and a VSWR not exceeding 2.5:1 in a 50 ohm system over the frequency range of 30 thru 76 MHz. Homing capability when tested in conjunction with a vertical whip six feet above the ground fed with four watts, is better than 20 statute miles with a maximum angular error of 10 degrees and no false indications

3.2 Continued

across the 30 thru 76 MHz band. Test results on the AS-2486/ARC-115 S/N 001 are presented on Data Sheet 12, page 33 and polar radiation patterns on Data Sheets 13 thru 22, pp 34 thru 42 , part III.

3.3 Number Two FM Communications Antenna AS-2485/ARC-114 BHC P/N 206-075-543

The number two FM communications antenna consists of a 22 inch vertical member extending up and forward at an angle of approximately 60 degrees from the horizontal, topped by a 44 in whip extension extending aft nearby horizontally. The antenna provides vertically polarized radiation with an efficiency exceeding 25% at 30 MHz to 75% at 76 MHz, and pattern symmetry of generally better than 10 db. A passive network in the antenna base matches the antenna to 50 ohm with a VSWR of less than 5:1. The AS-2485/ARC-114 is mounted on the roof of the OH-58A between the upper edge of the windshield and the forward edge of the boost cylinder cowl. Tabulated test results for the AS-2485/ARC-114 S/N 001 are presented on Data Sheet 23, page 44 and polar radiation patterns on Data Sheets 24 thru 33, pages 45 thru 54 , part III.

3.4 VHF Communication Antenna BHC P/N 206-075-518

Like the number one FM Communication antenna, the VHF communication antenna is integral to the OH-58A Vertical Stabilizer. The antenna is a vertical radiator which is shunt fed against a portion of the FM element in the 206-075-518 combination antenna. Matching in a 50 ohm

3.4 Continued

system to better than 2.5:1 VSWR over the 116 to 150 MHz band is provided by a passive network. Radiation is vertically polarized at an efficiency of better than 75% and pattern symmetry is better than 10 db. Tabulated test results of the 206-075-518 VHF communication antenna S/N 002 are given on Data Sheet 34, page 55 and radiation pattern polar plots on Data Sheets 35 thru 44, pages 56 thru 65 , part III.

3.5 UHF Communication Antenna AS-2487/ARC-116, BHC P/N 206-075-551

The AS-2487/ARC-116 is a blade type antenna 5.8 inches high, 11 inches long, and 2.25 inches wide at its base. The antenna is mounted underneath the OH-58A with its leading edge approximately 18 inches aft of the helicopter's nose. Passive matching provides a VSWR of better than 2.5:1 in a 50 ohm system over a frequency range of 225 to 400 MHz. A vertically polarized radiation efficiency of better than 75% with pattern symmetry better than 10 db is realized with this antenna. Test results of AS-2487/ARC-116 S/N 001 are presented in tabular form on Data Sheet 45, page 66 and polar radiation plots are on Data Sheets 46 thru 55, pages 67 thru 76 , part III.

4.0 WEIGHT CONTROL DATA

4.1 Summary

Total Weight of OH-58A Antenna System	Total Allowable Antenna System Weight
4.08 lb	18.0 lb

4.2 Number One VHF/FM and VHF/AM Communication Antennas

*Difference between weights of standard vertical fin and fin including 206-075-518 VHF/FM-VHF/AM Antenna Assembly	Specification Weight
Minus 0.95 lb	VHF/FM - 4 lb VHF/AM - 3 lb 7 lb

*Standard Vertical fin -13.4 lb
OH-58A Vertical fin including Antennas -12.45 lb

4.3 VHF/FM Homing Antenna

AS-2486/ARC-114 BHC P/N 206-075-523	Specification Weight
2.3 lb	4.0 lb

4.4 Number Two VHF/FM Communication Antenna

AS-2485/ARC-114 BHC P/N 206-074-543	Specification Weight
1.96 lb	6.0 lb

4.5 UHF/AM Communication Antenna

AS-2487/ARC-116 BHC P/N 206-075-551	Specification Weight
0.77 lb	1.0 lb

5.0 CONCLUSIONS

Based upon the work discussed in the preceding sections and the data presented in Part III of this report it is concluded that the final antenna configuration of the OH-58A provides performance which meets or exceeds the respective minimum requirements for each system.

6.0 RECOMMENDATIONS

No recommendations will be made at this time.

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DATA SHEET NO. 1

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518
S/N 002

Range 18 Miles Altitude 1000 feet

FREQ (MHz)	VSWR	MAX (uv/M)	MIN (uv/M)	MIN REQ (uv/M)	db Above Min Req.
30.50	4.0:1	1200	380	302	12.0
40.10	4.3:1	680	110	348	5.8
46.65	2.8:1	1600	610	380	12.5
49.80	2.0:1	2175	880	395	14.8
54.50	1.3:1	1500	710	417	11.2
57.80	1.3:1	1250	690	433	9.2
60.00	1.0:1	1950	1150	444	13.0
65.95	1.2:1	2600	1410	472	14.8
72.05	1.2:1	1800	900	501	11.0
75.60	1.4:1	2050	910	518	11.7

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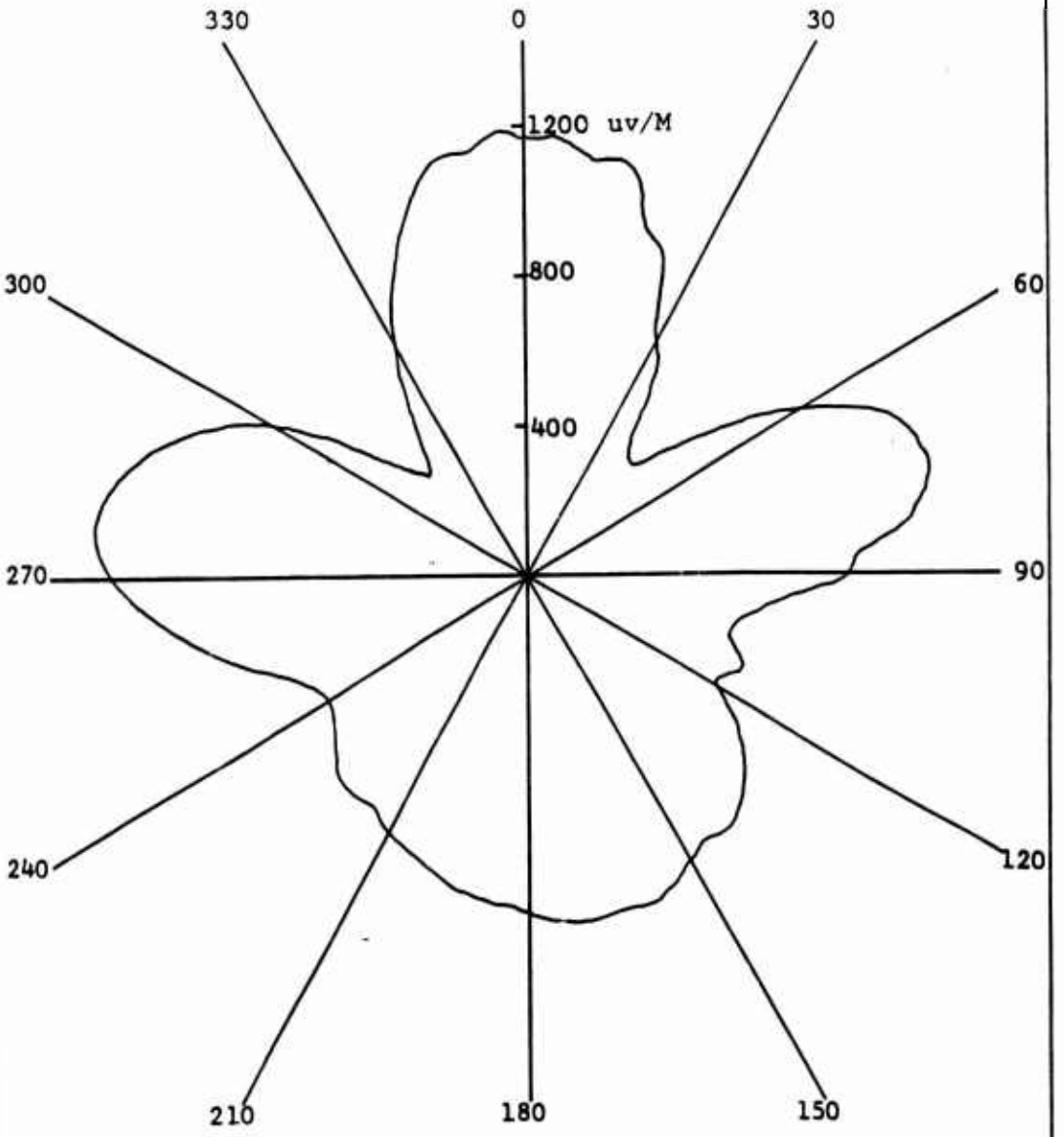
DATA SHEET NO. 2

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 feet

30.5 MHz



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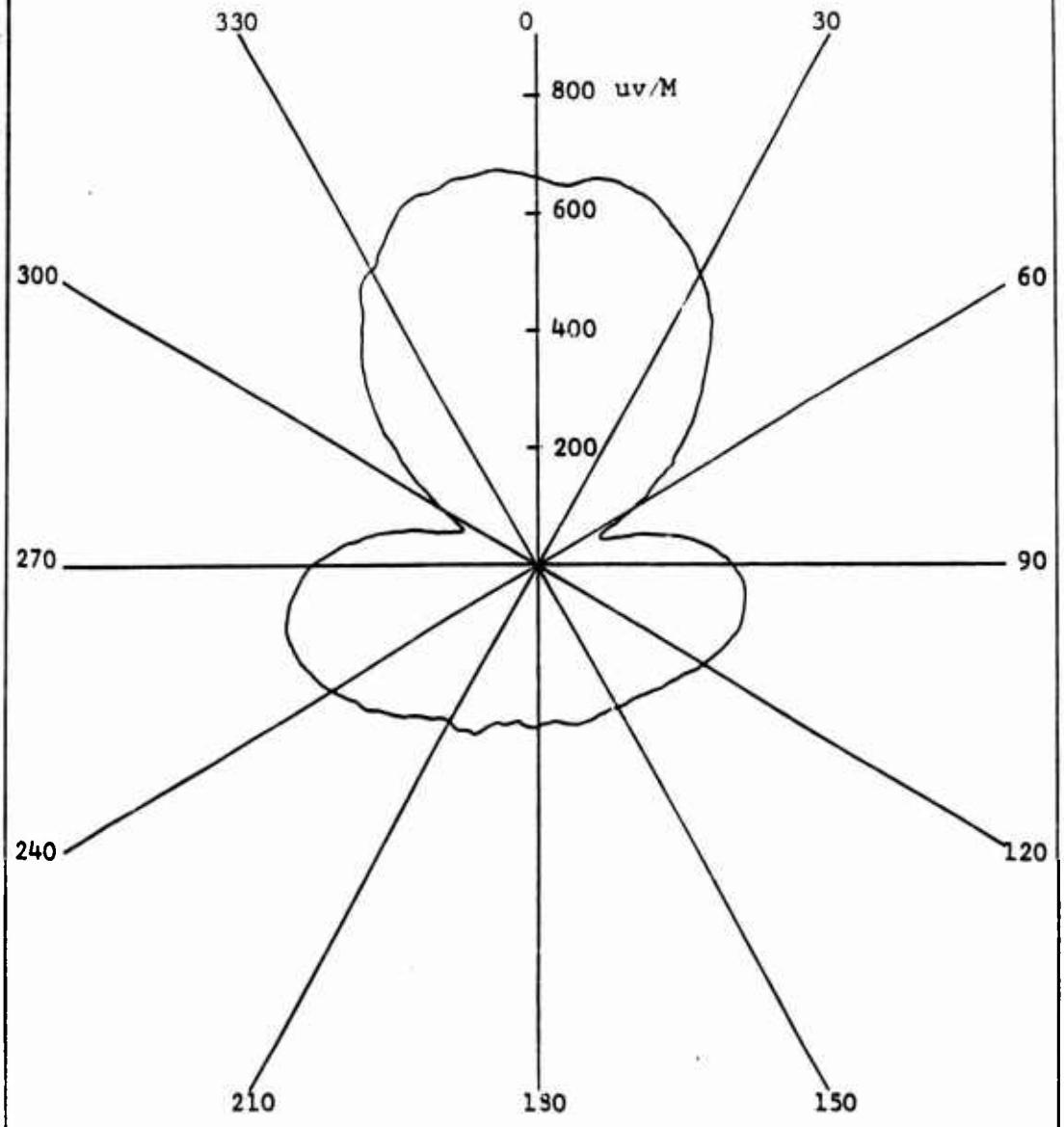
DATA SHEET NO. 3

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 feet

40.1 MHz



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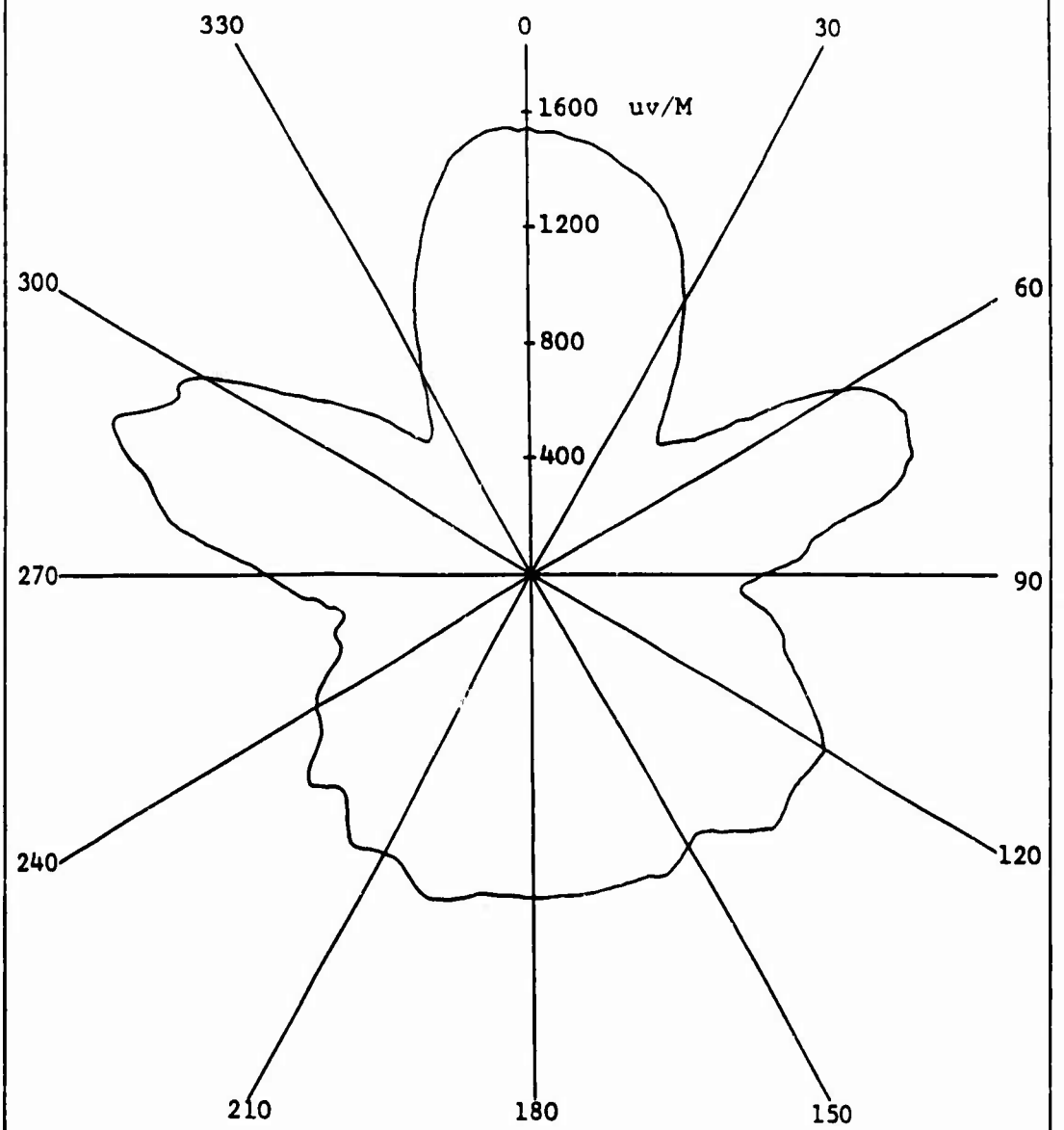
DATA SHEET NO. 4

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 feet

46.65 MHz



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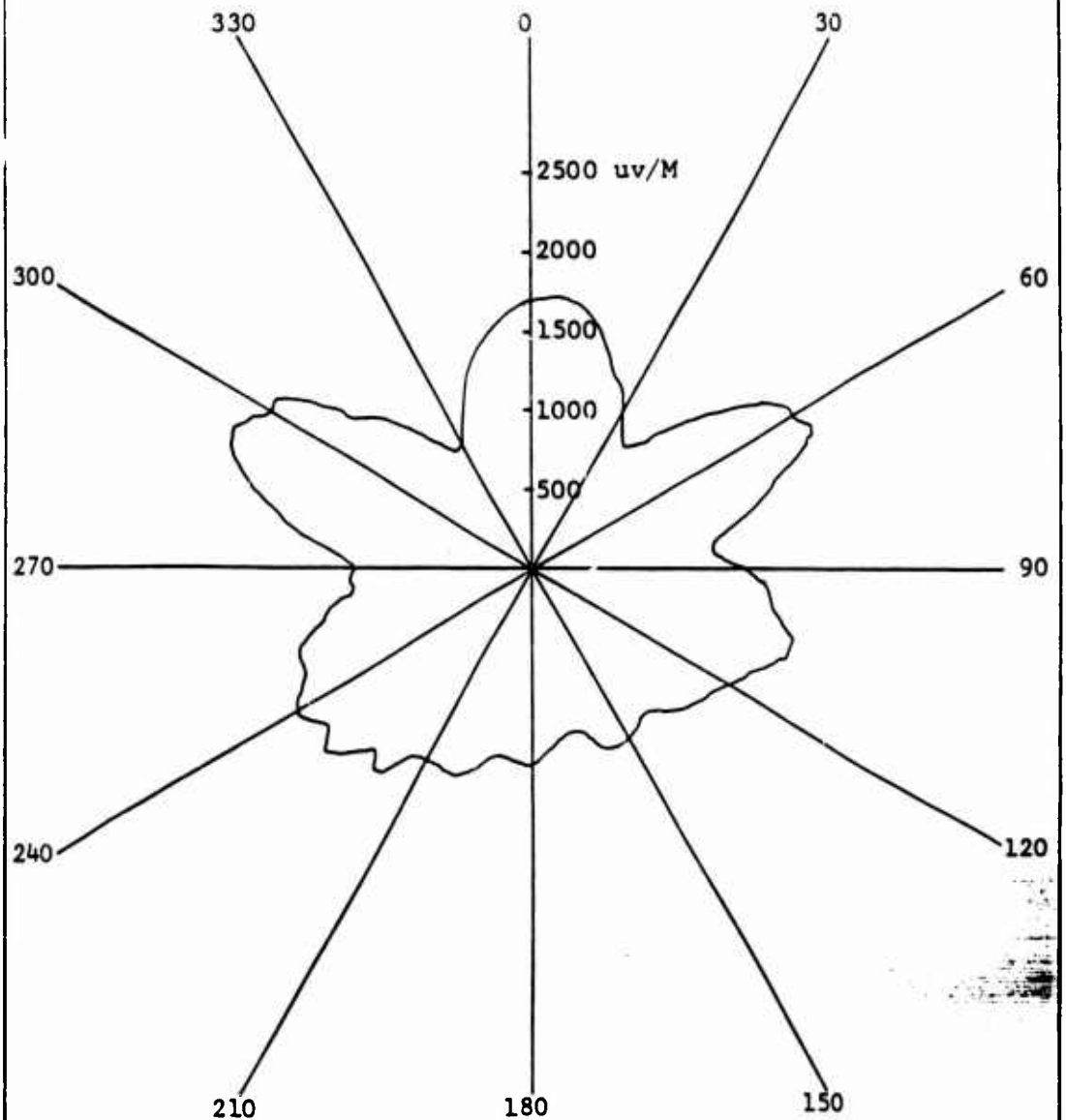
DATA SHEET NO. 5

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Rnage 18 Miles Altitude 1000 feet

49.80 MHz



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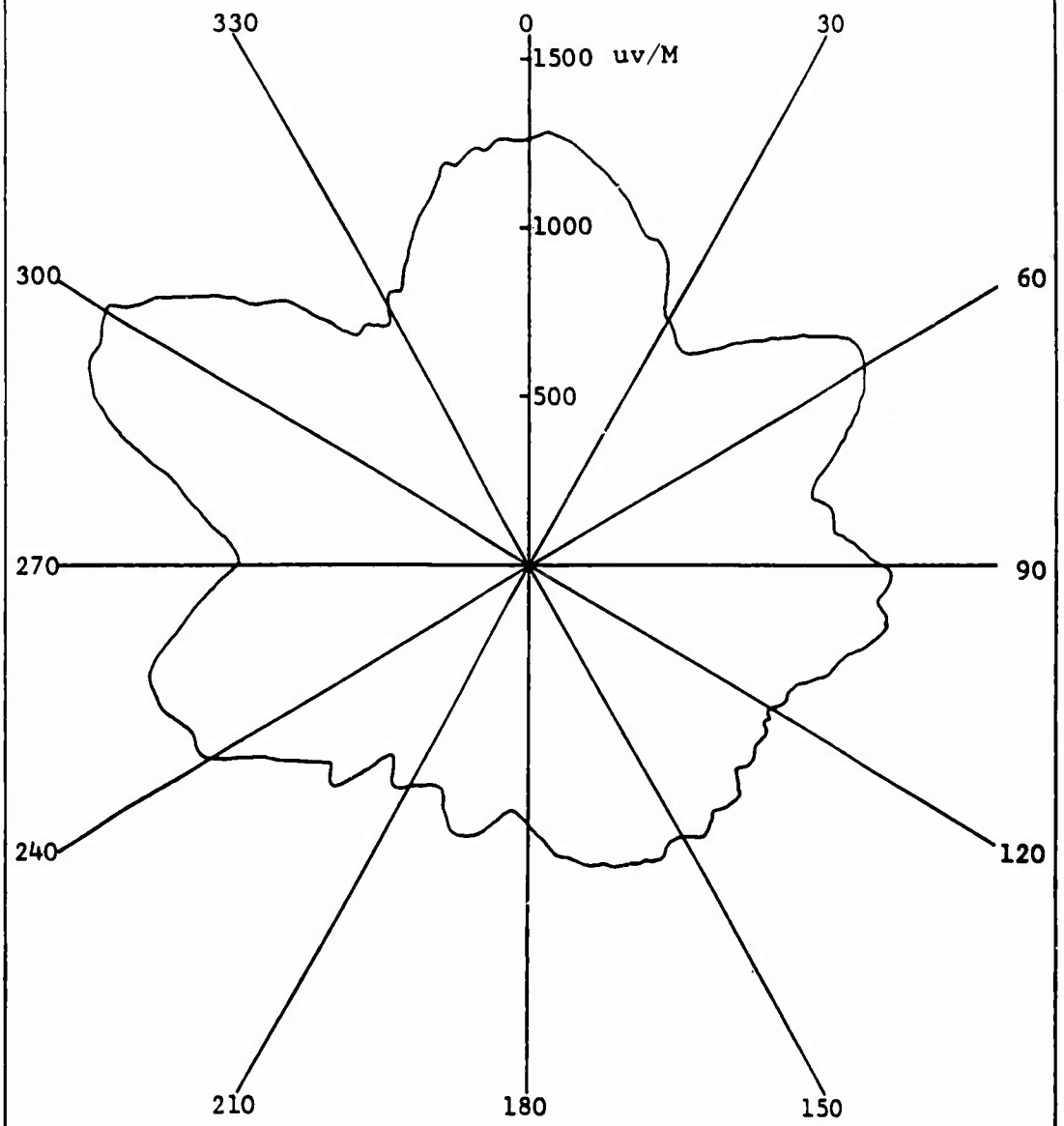
DATA SHEET NO. 6

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 feet

54.5 MHz



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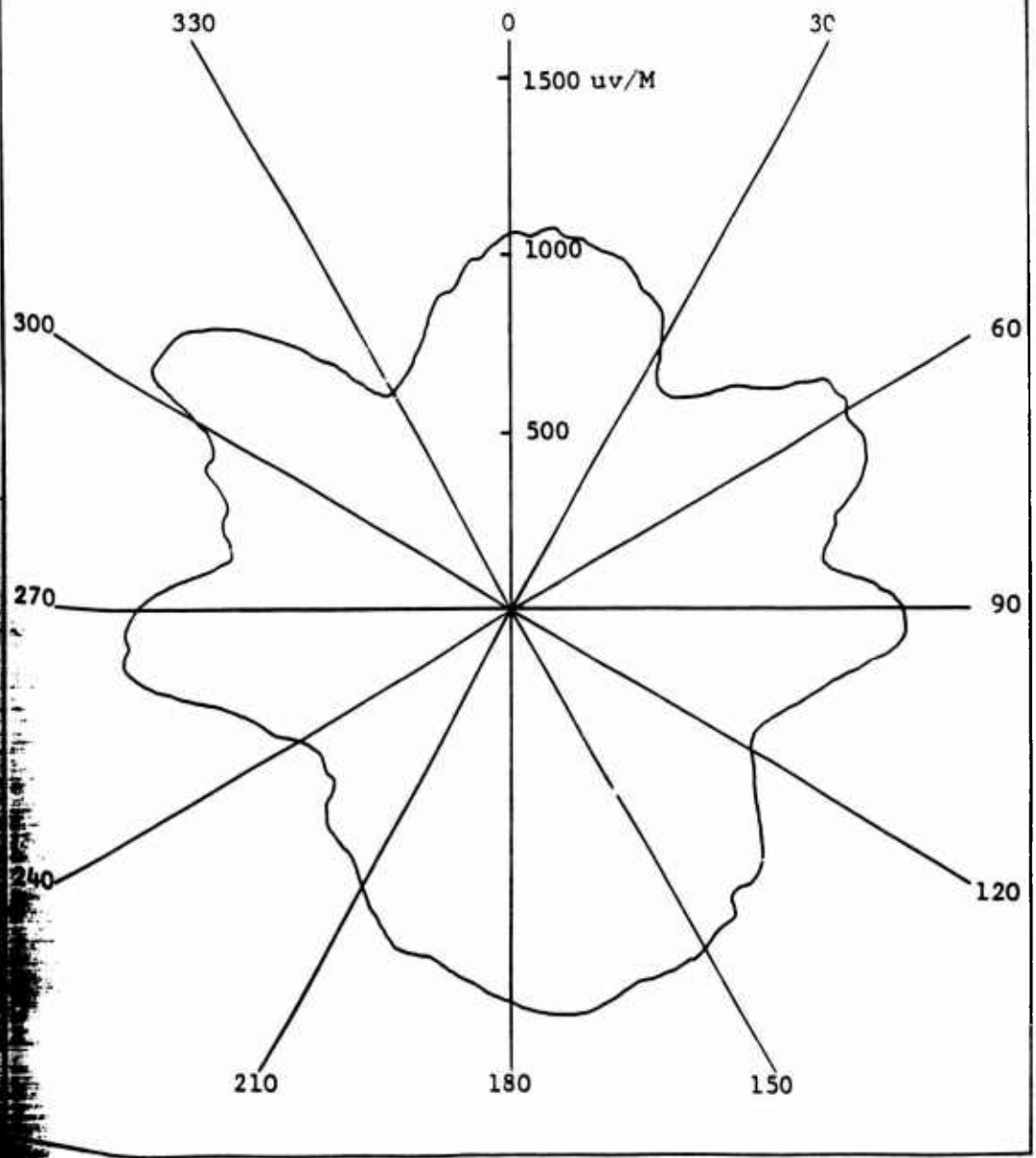
DATA SHEET NO. 7

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 feet

57.80 MHz

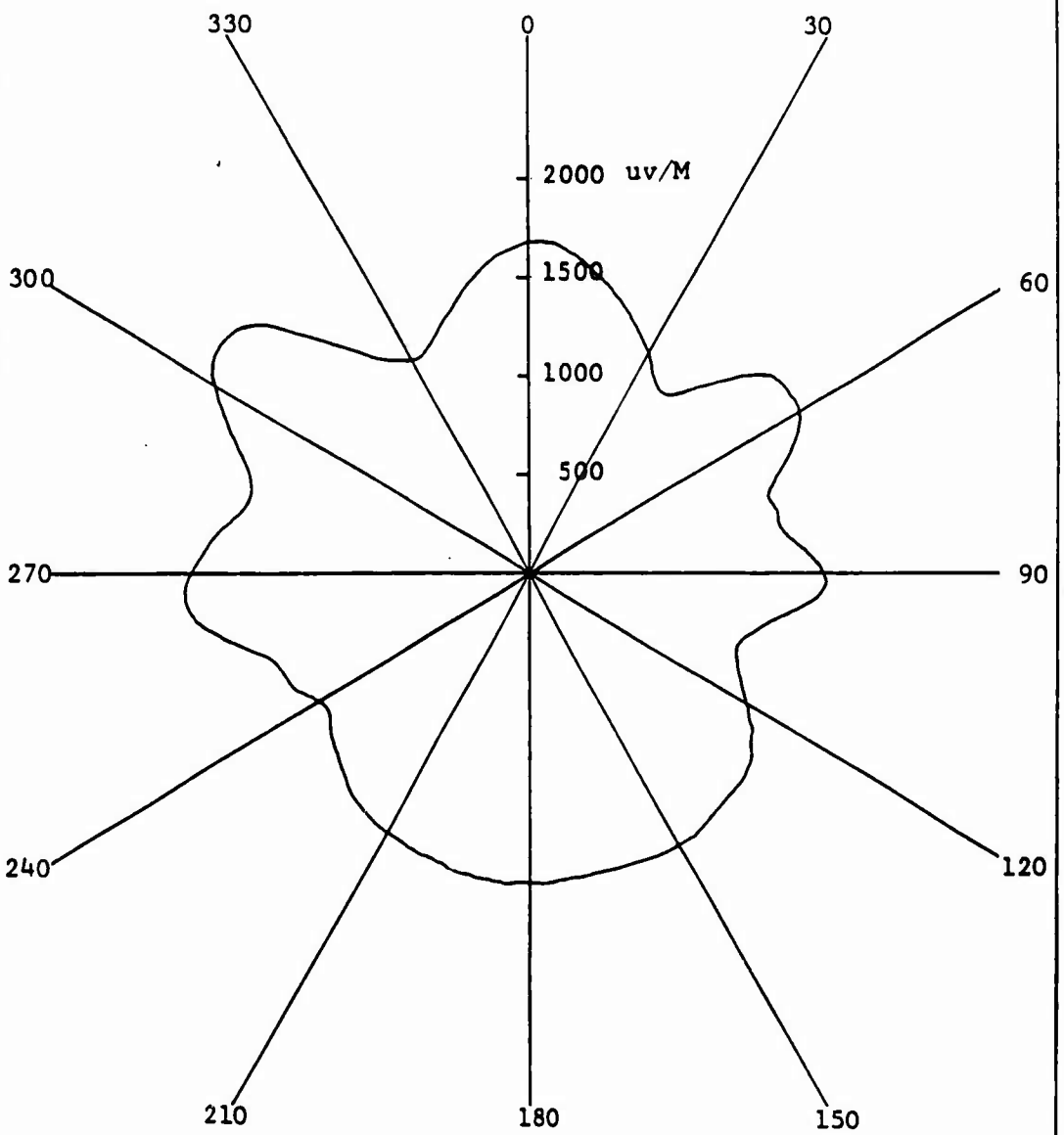


DATA SHEET NO. 8

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 feet

60.00 MHz



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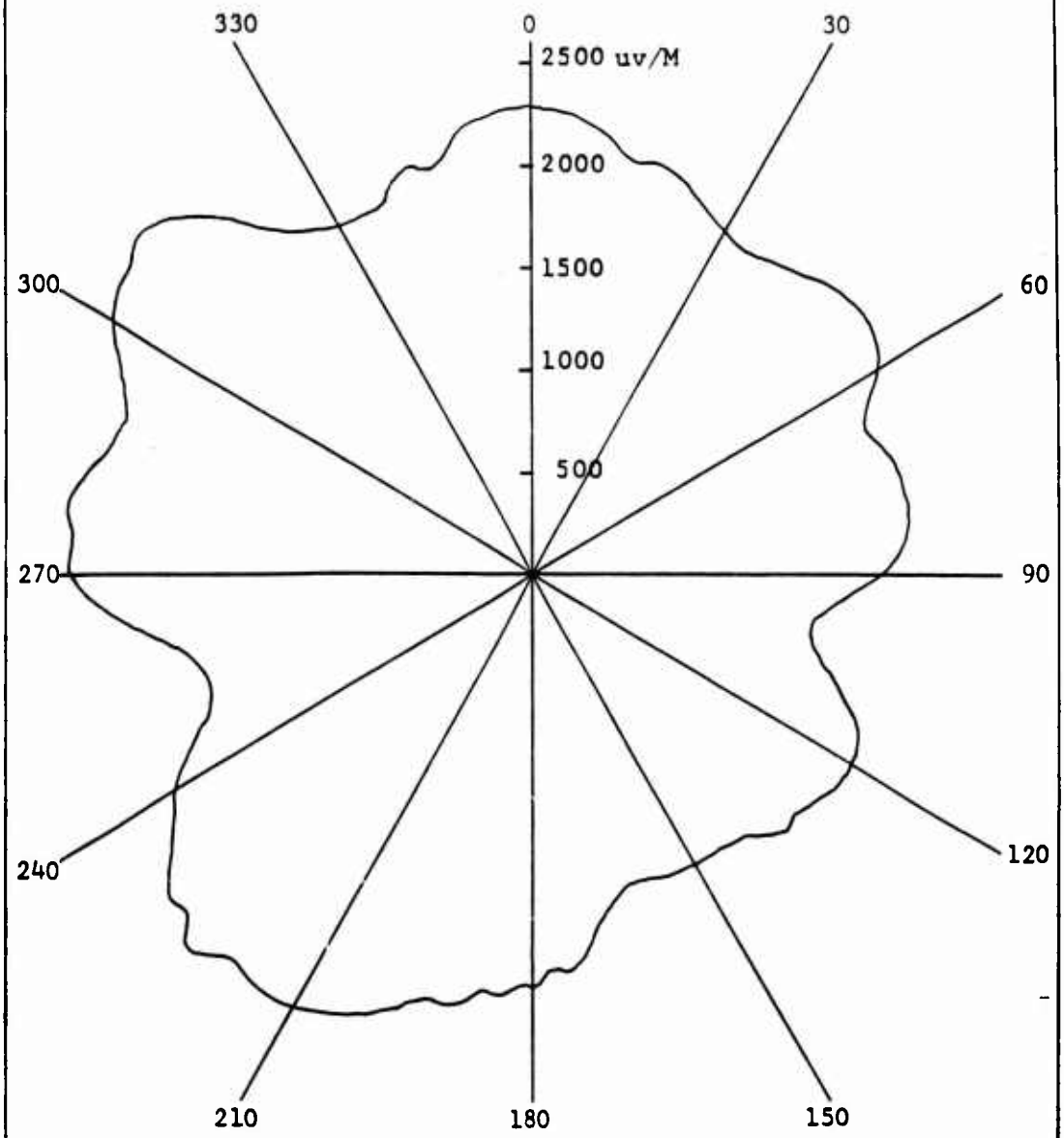
DATA SHEET NO. 9

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 feet

65.95 MHz



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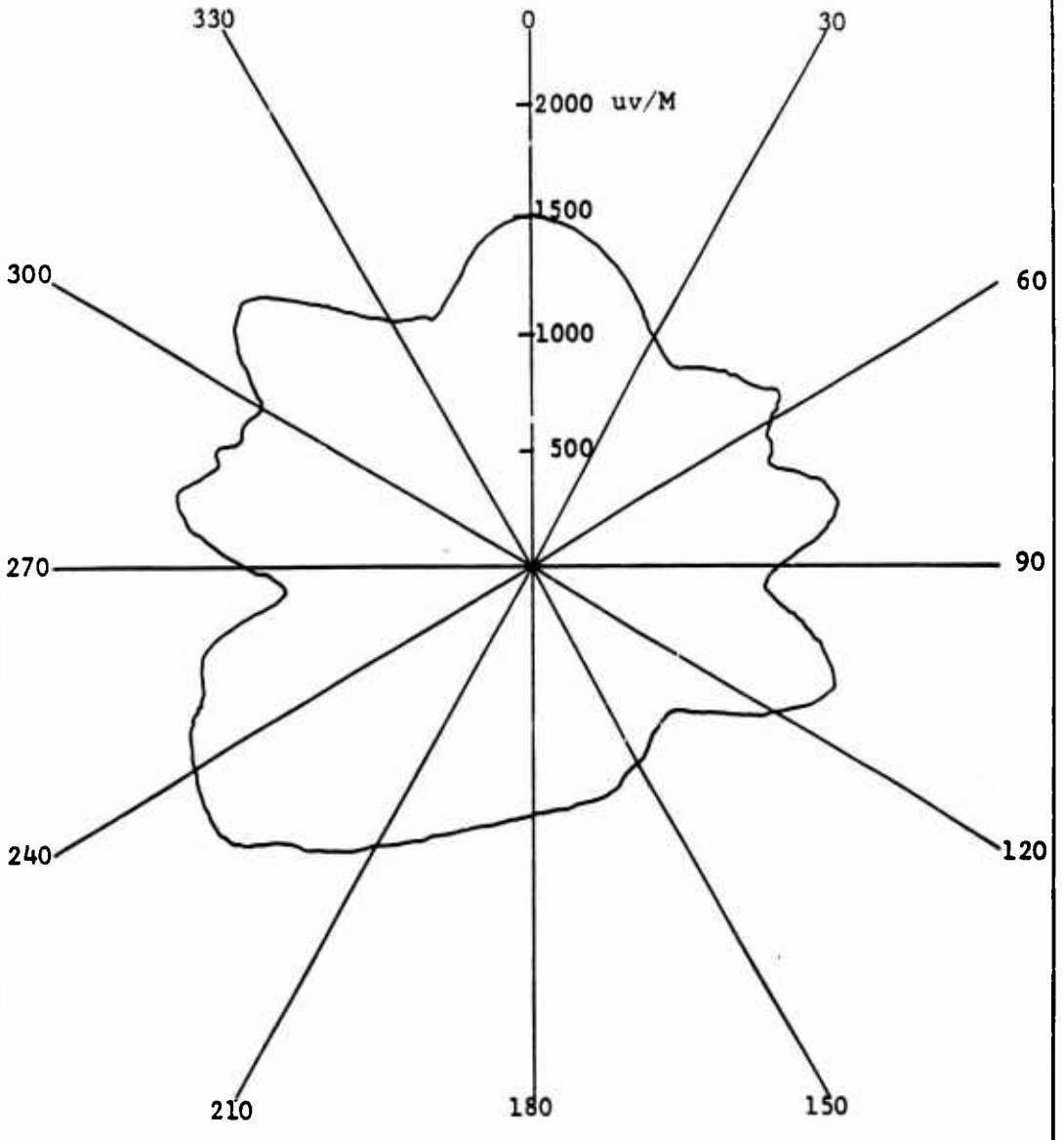
DATA SHEET NO. 10

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 feet

72.05 MHz



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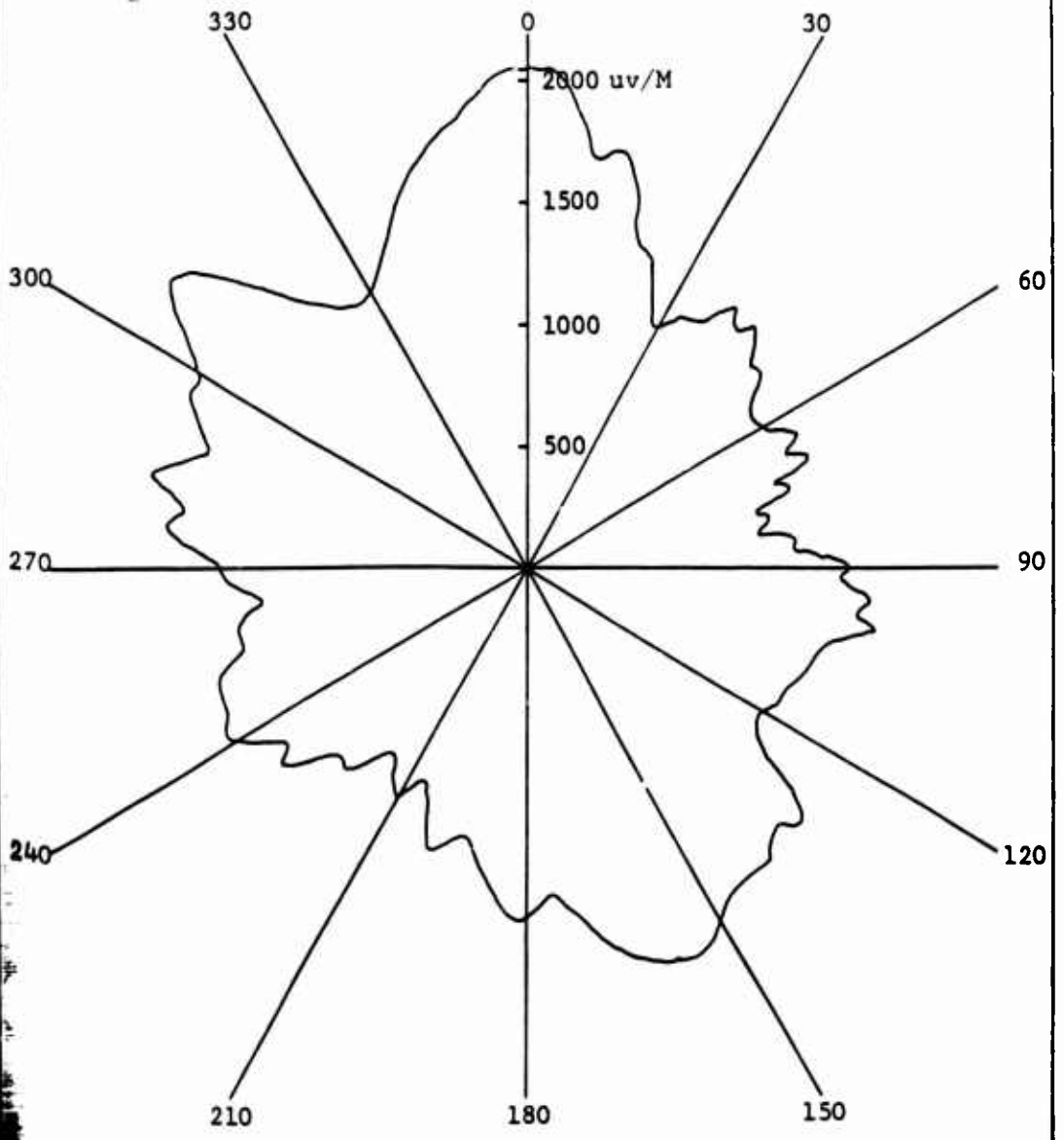
DATA SHEET NO. 11

NUMBER ONE FM COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles

Altitude 1000 feet

75.6 MHz



DATA SHEET NO. 12

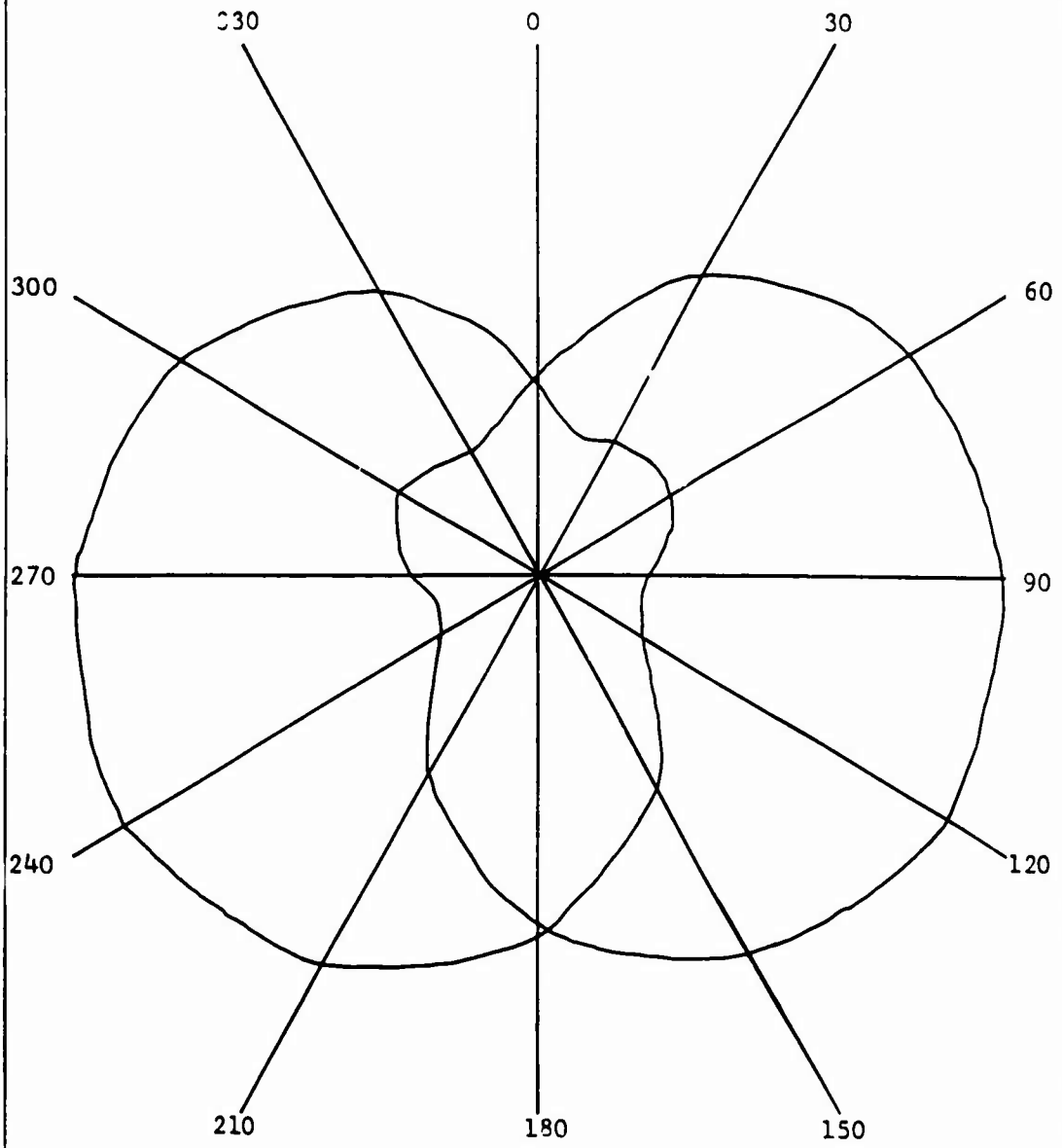
FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523
S/N 001

FREQ (MHz)	VSWR -1(L/H)	VSWR -2(R/H)	COURSE ERROR at 20 miles, 1000 feet On Course	COURSE ERROR at 20 miles, 1000 feet Reciprocal
30.00	1.74:1	1.66:1		
30.50			-5°	+5°
35.00	1.62:1	1.52:1		
40.00	1.56:1	1.56:1		
40.10			-5°	+5°
45.00	1.56:1	1.56:1		
46.65			0°	+5°
49.80			-5°	+5°
50.00	1.64:1	1.6:1		
54.50			0°	0°
55.00	1.66:1	1.66:1		
57.80			-5°	0°
60.00	1.6:1	1.56:1	-3°	+5°
65.00	1.5:1	1.48:1		
65.95			-5°	+10°
70.00	1.5:1	1.5:1		
72.05			+5°	+5°
75.60			0°	+7°
76.00	1.58:1	1.6:1		

DATA SHEET NO. 13

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

30.00 MHz



Plotted in Relative Voltage

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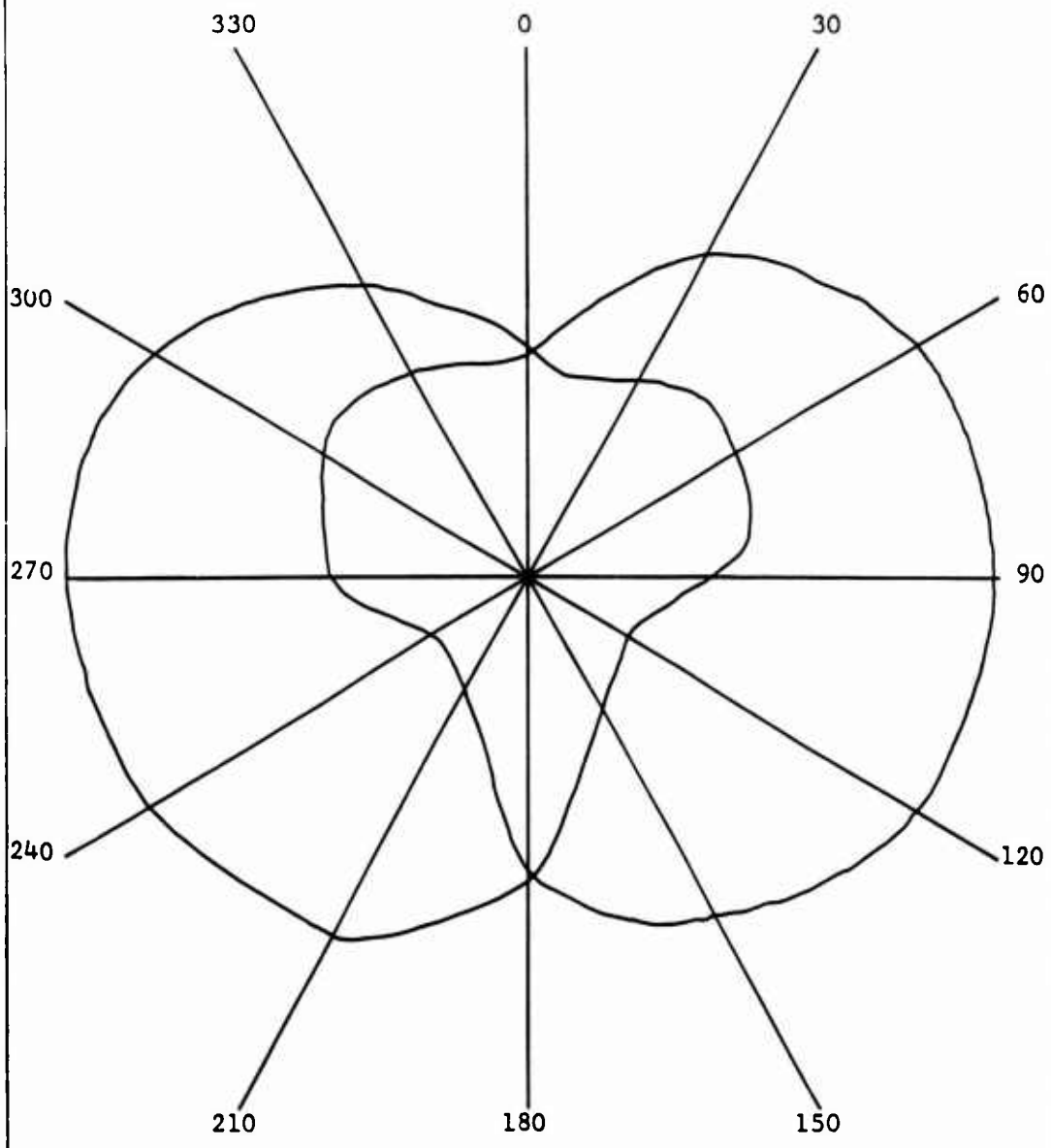
DATA SHEET NO. 14

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

36.00 MHz



Plotted in Relative Voltage

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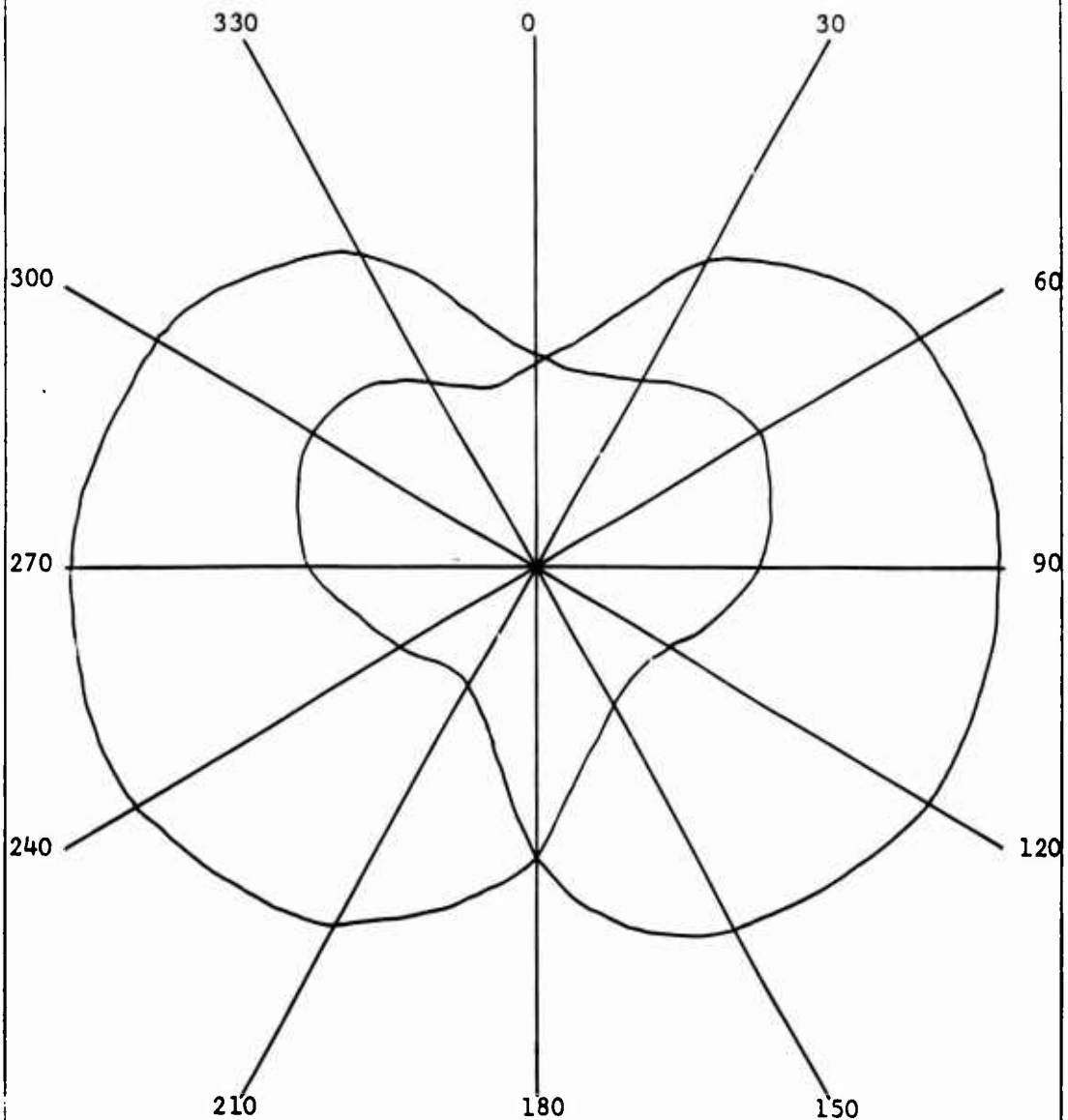
DATA SHEET NO. 15

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

40.00 MHz



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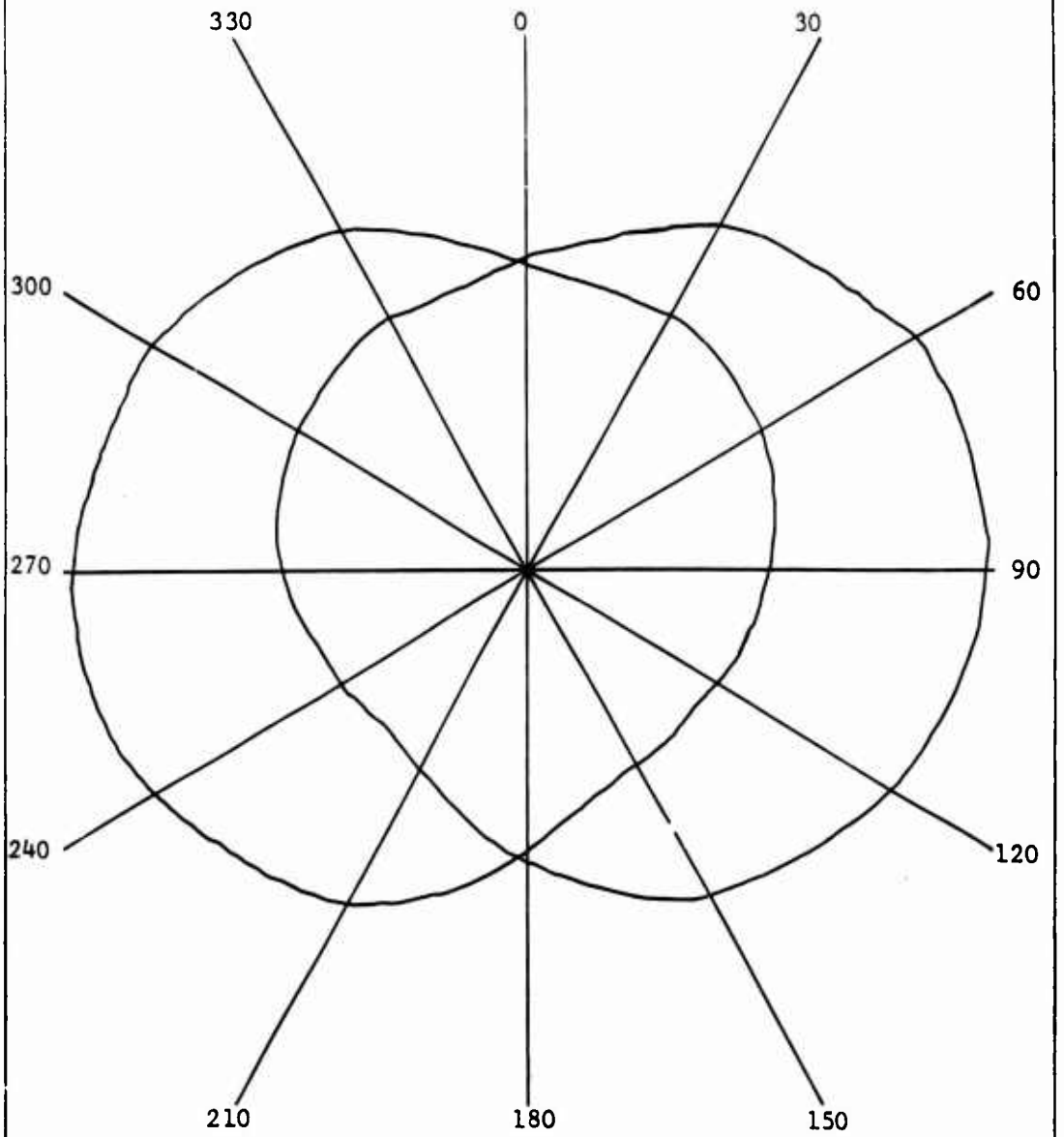
DATA SHEET NO. 16

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

45.00 MHz



Plotted in Relative Voltage

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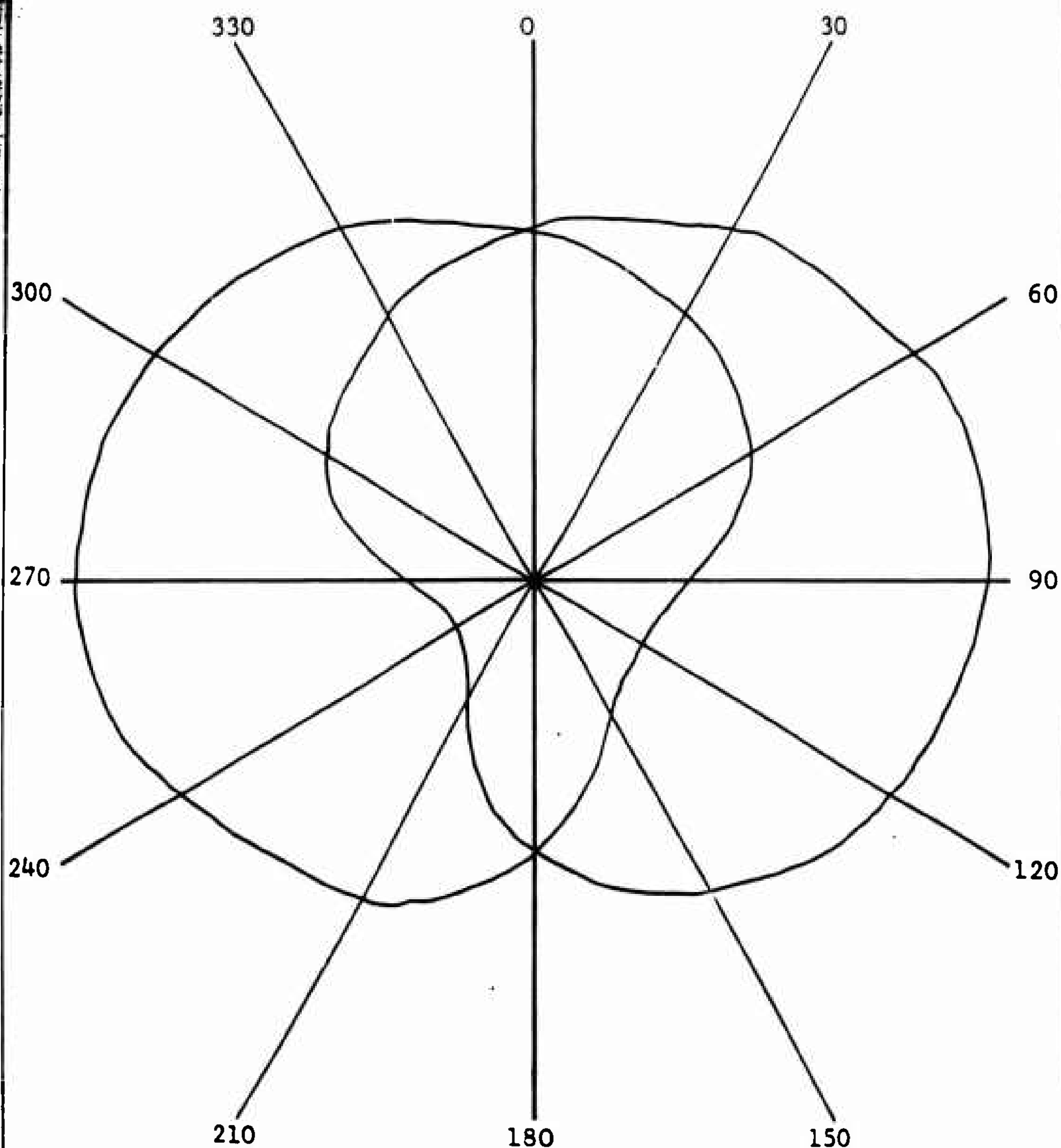
DATA SHEET NO. 17

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

50.00 MHz

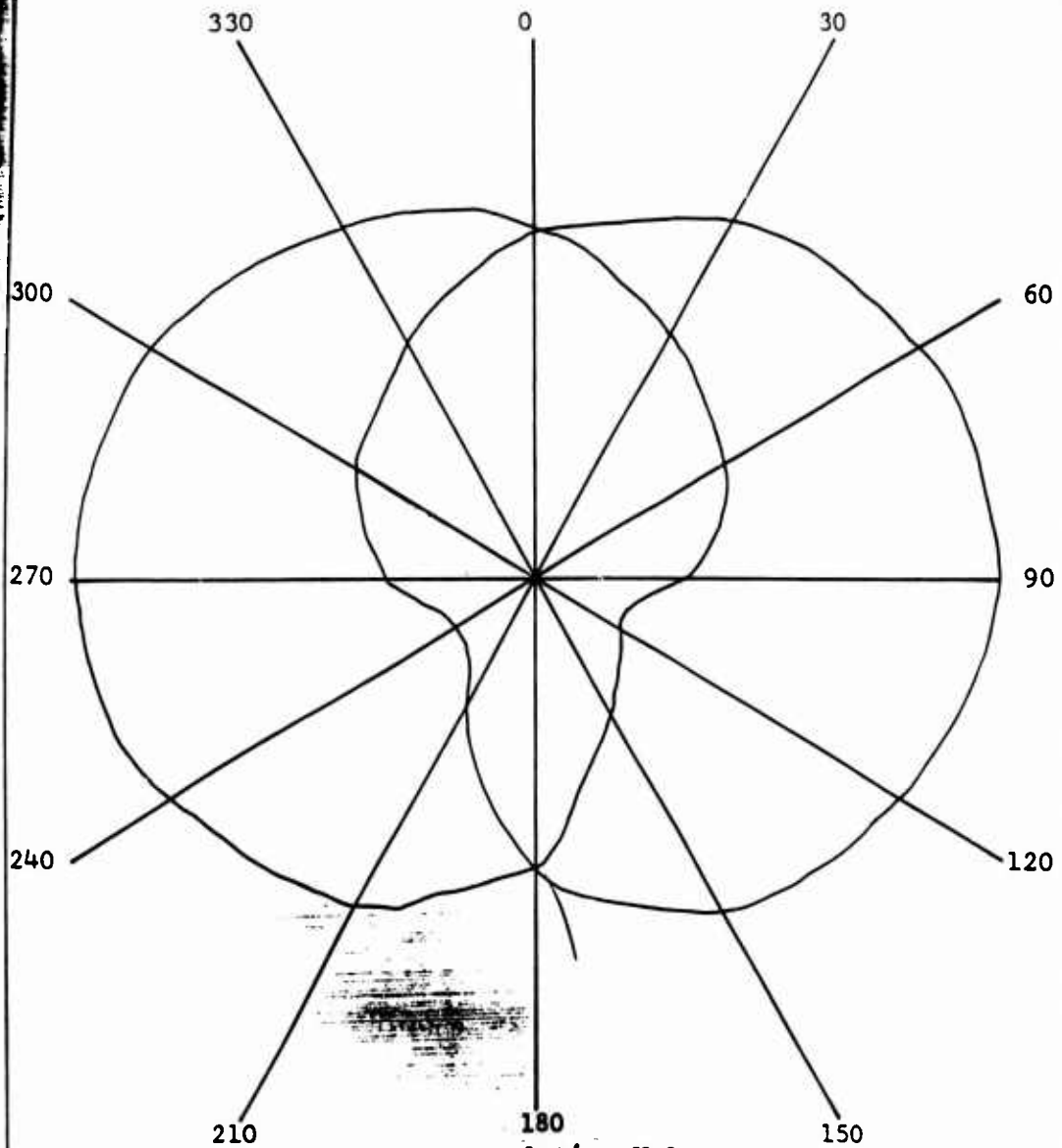


Plotted in Relative Voltage

DATA SHEET NO. 18

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

55.00 M Hz

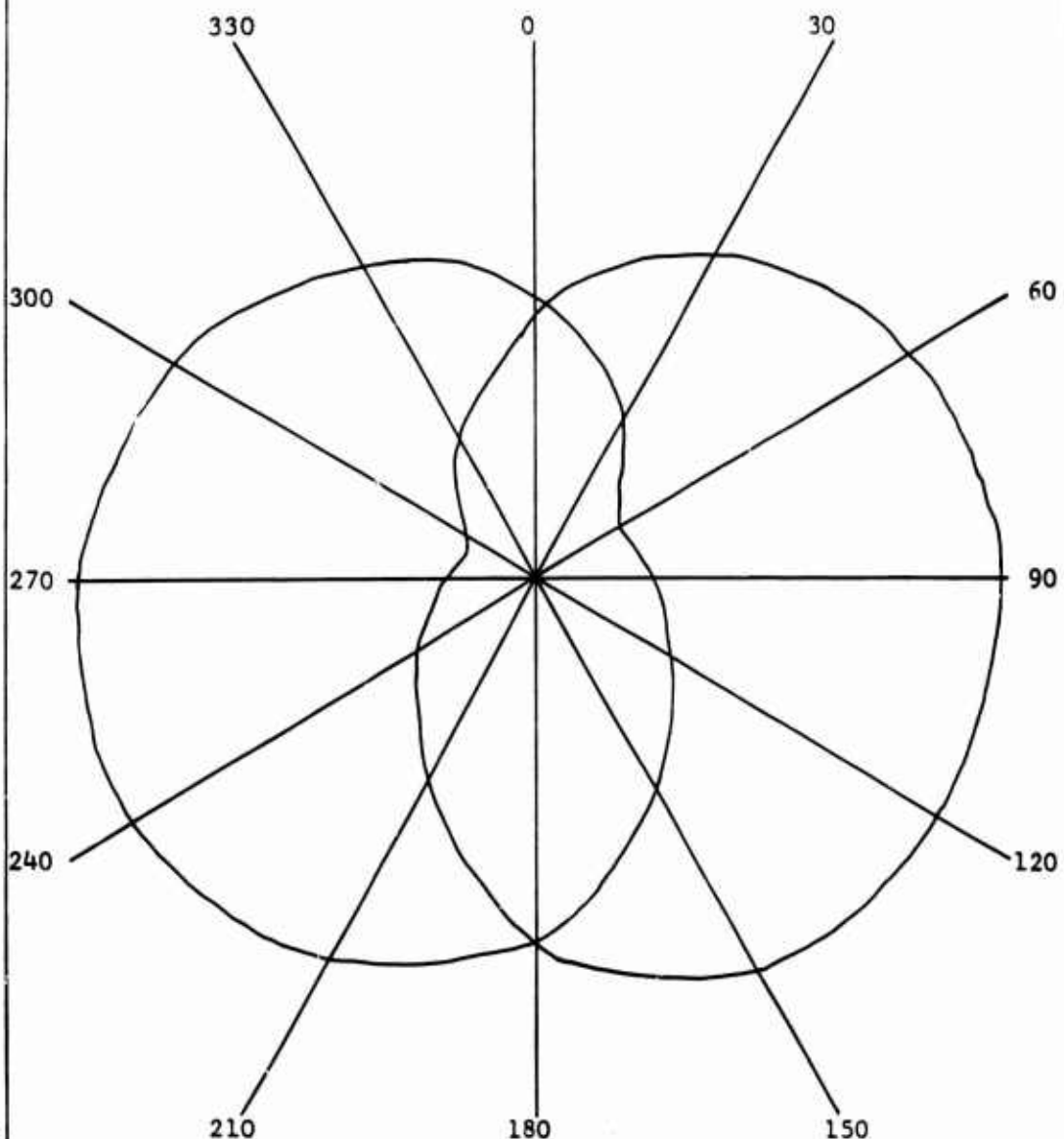


Plotted in Relative Voltage

DATA SHEET NO. 19

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

60.00 MHz



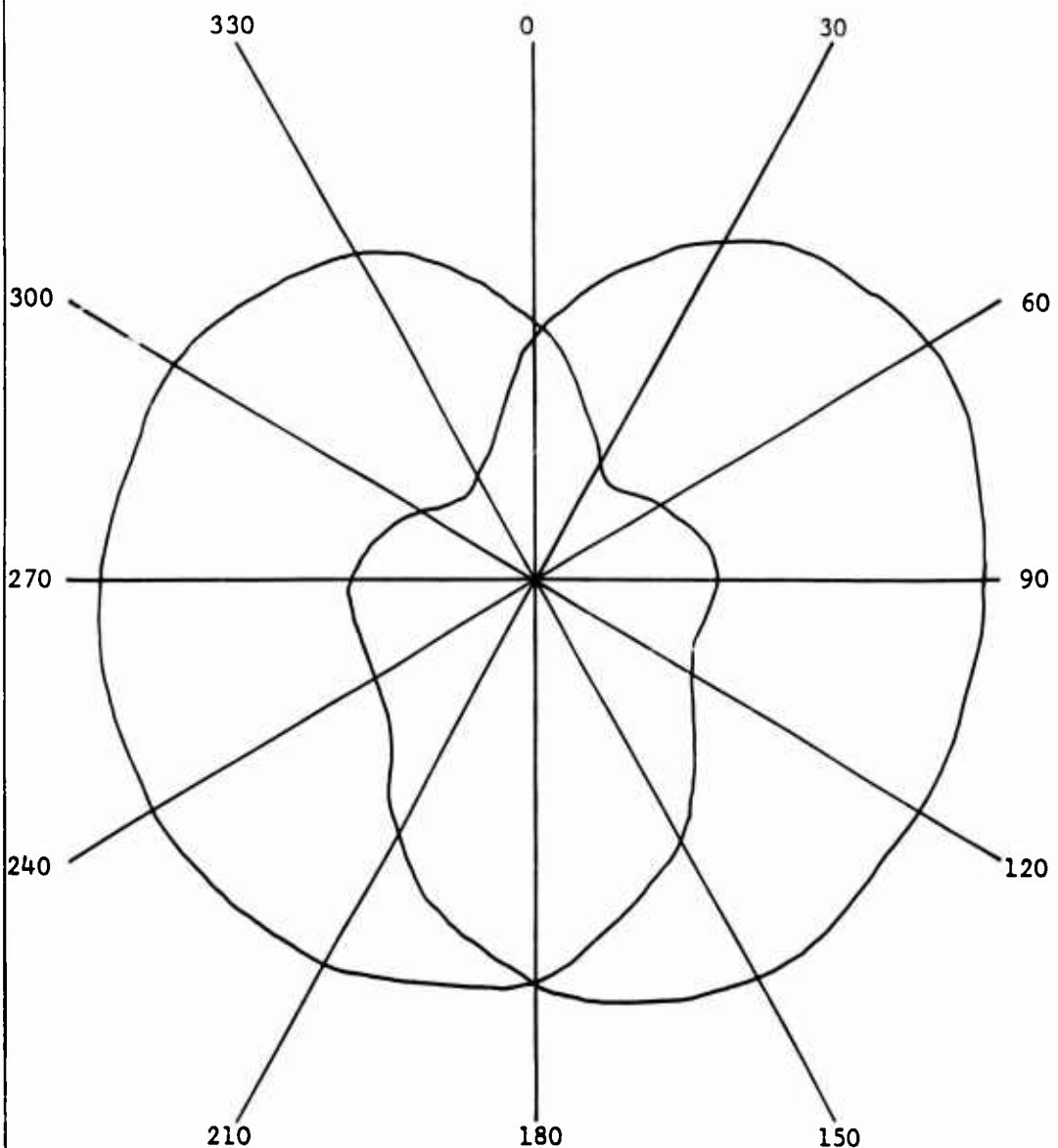
Plotted in Relative Voltage

BY J. Mast CHECKED R. Henschel	BELL HELICOPTER COMPANY POST OFFICE BOX 482 • FORT WORTH 1, TEXAS	MODEL OH-58A PAGE 41 RPT 206-099-212B

DATA SHEET NO. 20

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

65.00 MHz



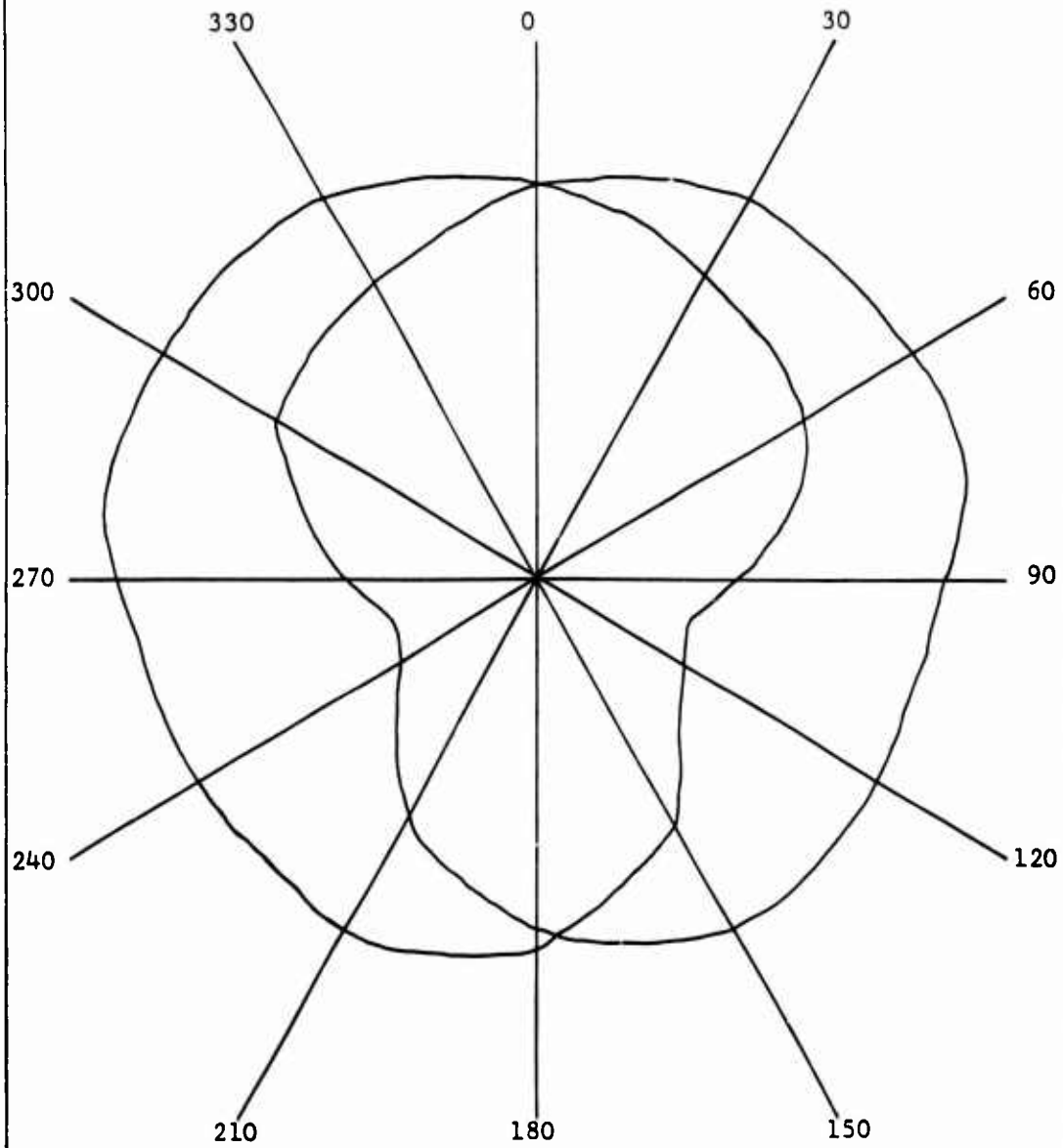
Plotted in Relative Voltage

BY J. Mast CHECKED R. Henschel	BELL HELICOPTER COMPANY POST OFFICE BOX 482 • FORT WORTH 1, TEXAS	MODEL OH-58A PAGE 42 RPT 206-099-212B

DATA SHEET NO. 21

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

70.00 MHz



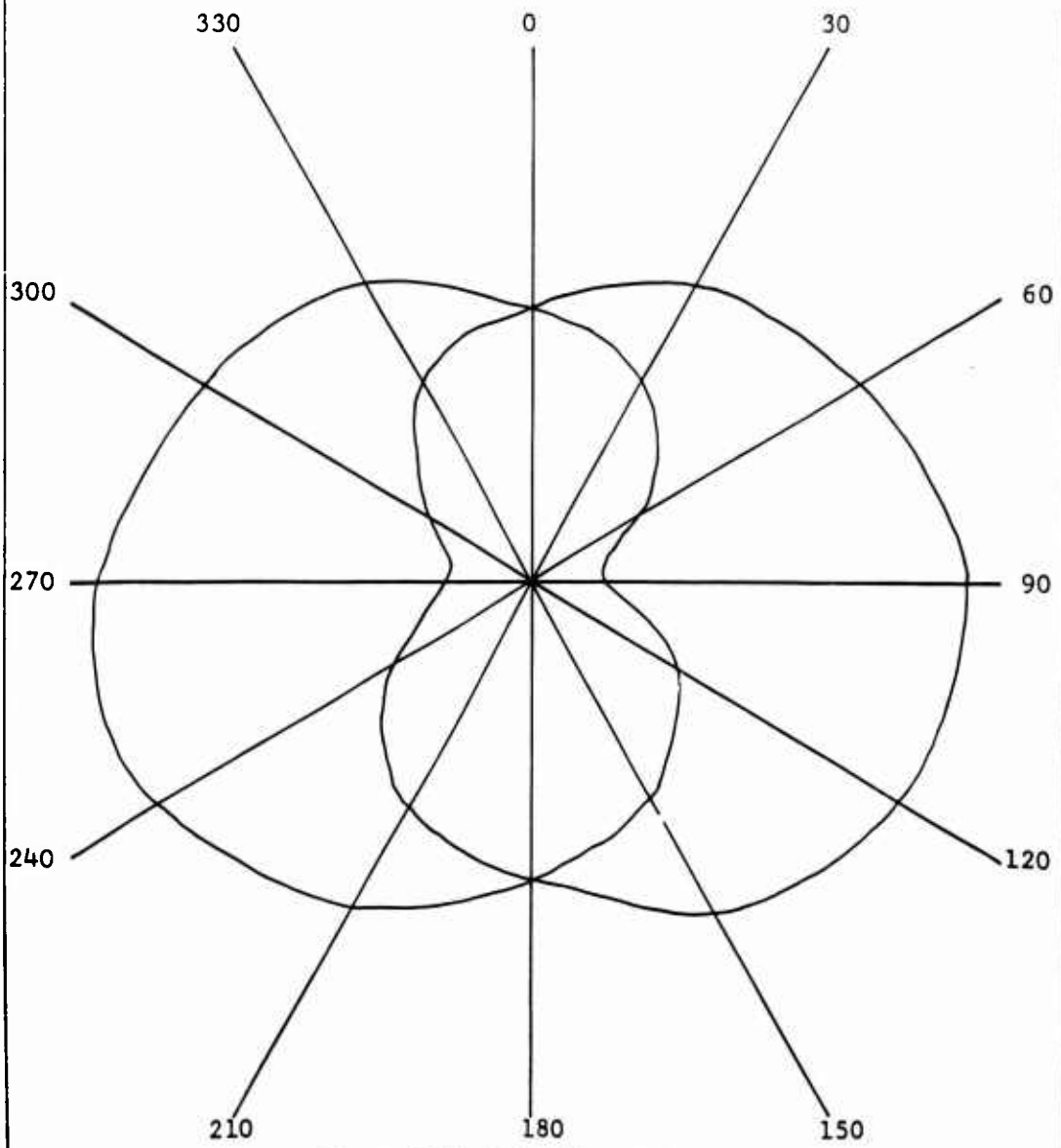
Plotted in Relative Voltage

7072 88428

DATA SHEET NO. 22

FM HOMING ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-523

76.00 MHz



Plotted in Relative Voltage

DATA SHEET NO. 23

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2485/ARC-114 BHC P/N 206-075-543
S/N 001

Range 18 Miles Altitude 1000 feet

FREQ (MHz)	VSWR	MAX (uv/M)	MIN (uv/M)	MIN REQ (uv/M)	db Above Min Req.
30.50	2.7:1	2100	1650	302	16.8
40.10	2.6:1	1160	630	348	10.5
46.65	2.9:1	870	440	380	7.2
49.80	2.9:1	910	400	395	7.3
54.50	3.3:1	760	340	417	5.3
57.80	2.7:1	1260	575	433	9.2
60.00	2.8:1	1130	292	444	8.1
65.95	2.0:1	1340	440	472	9.1
72.05	1.7:1	1440	600	501	9.1
75.60	1.8:1	640	205	518	1.6

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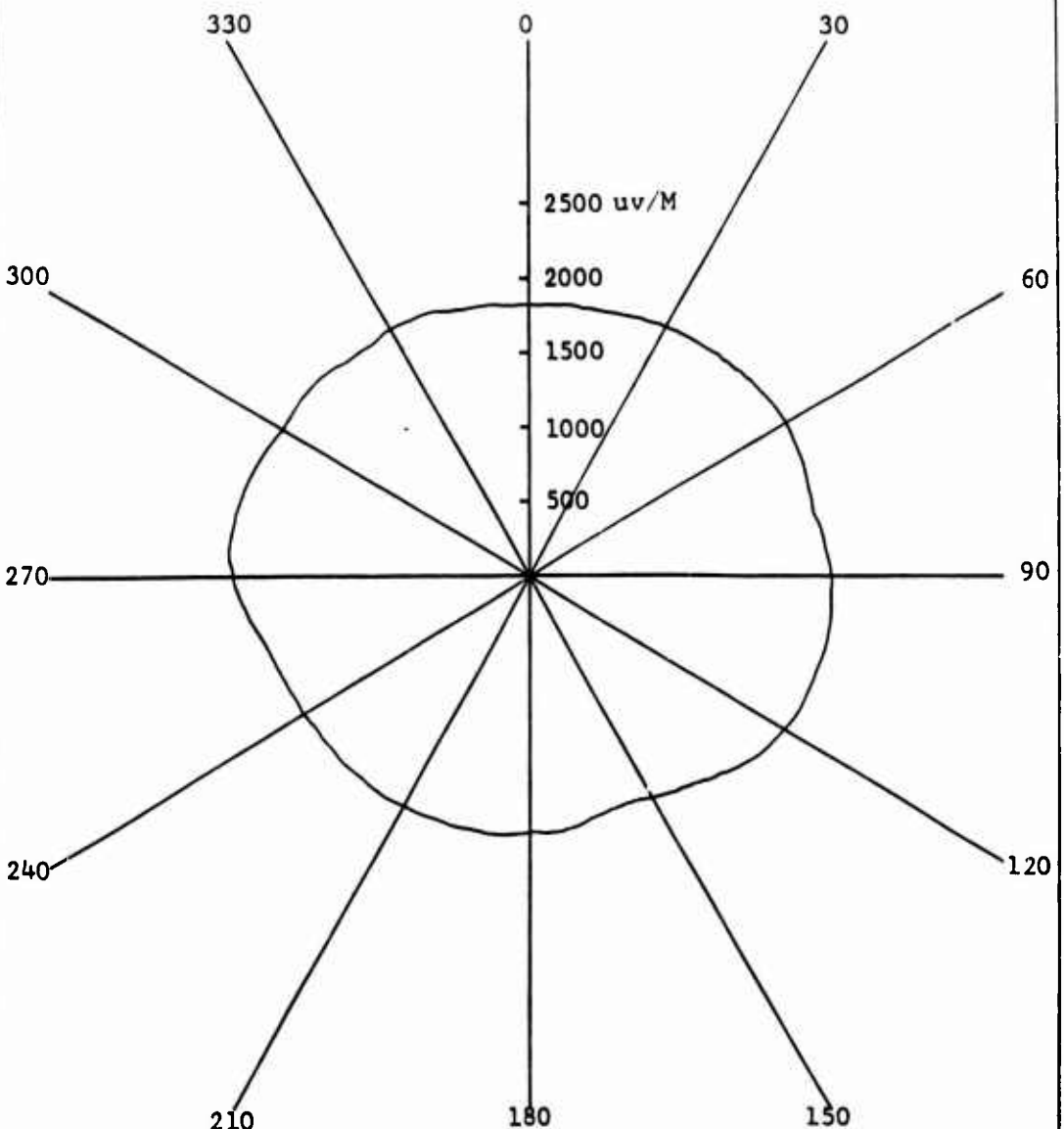
DATA SHEET NO. 24

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles Altitude 1000 feet

30.50 MHz

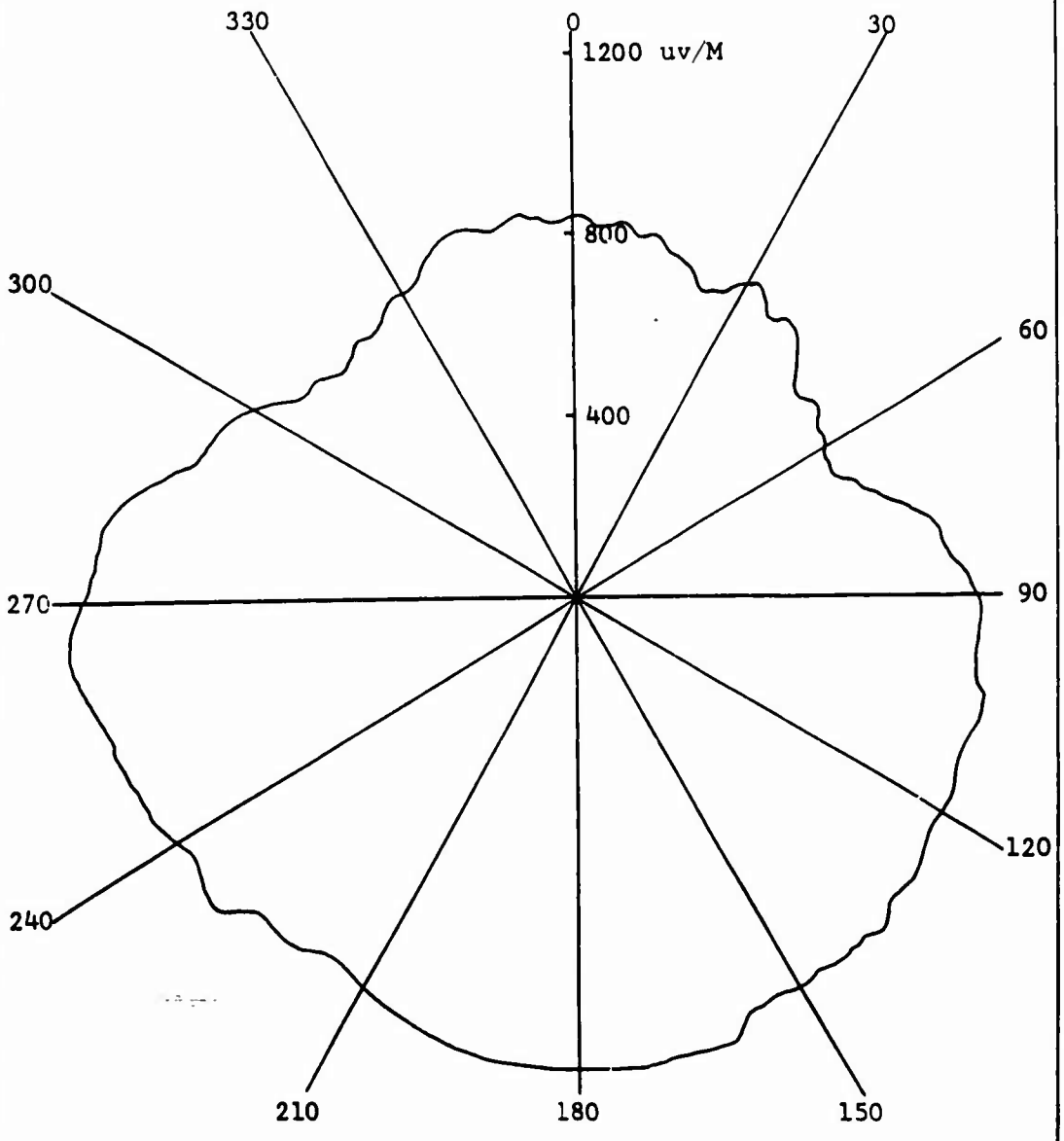


DATA SHEET NO. 25

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles Altitude 1000 feet

40.1 MHz



7872 53426

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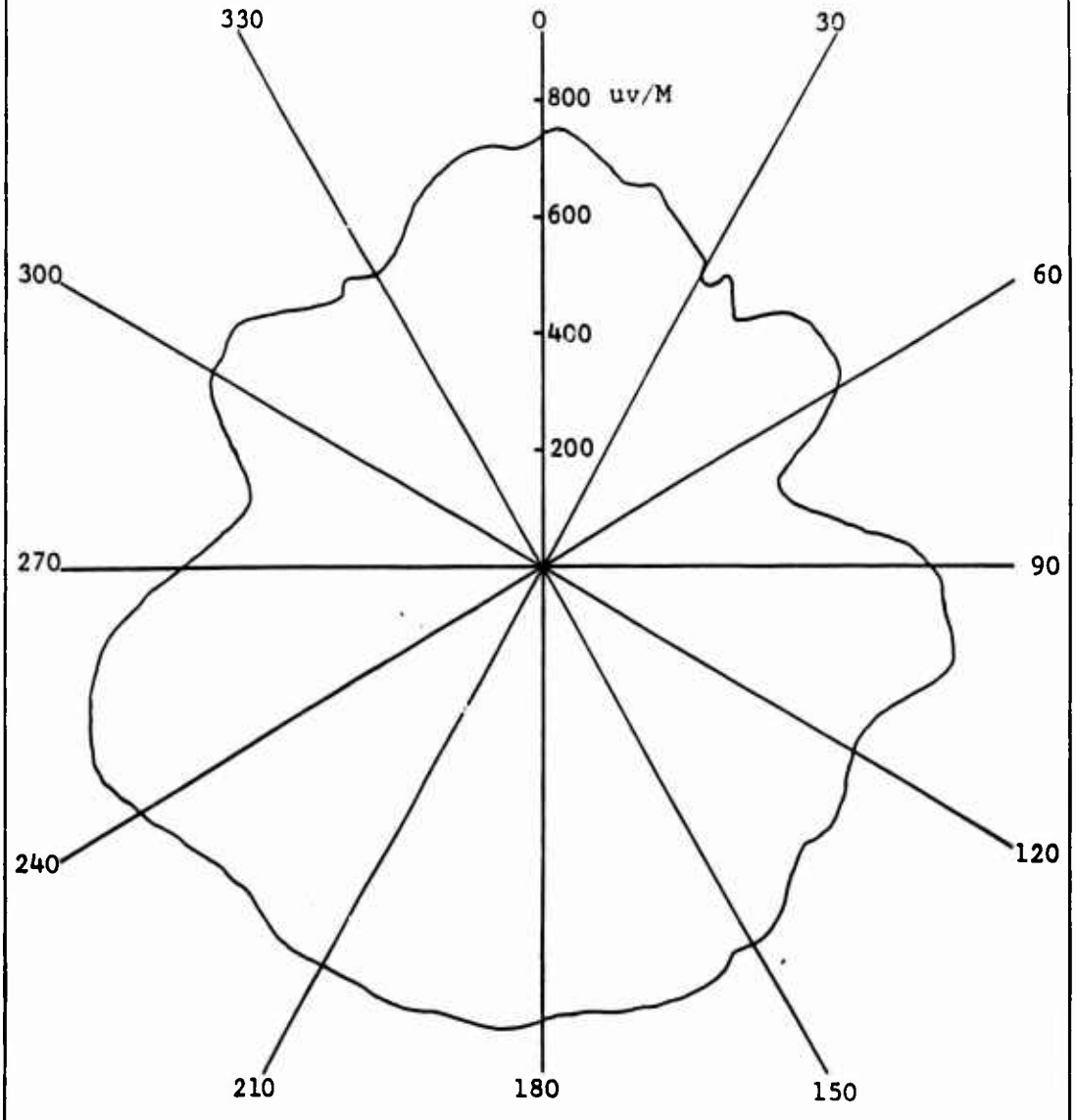
DATA SHEET NO. 26

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles Altitude 1000 feet

46.65 MHz

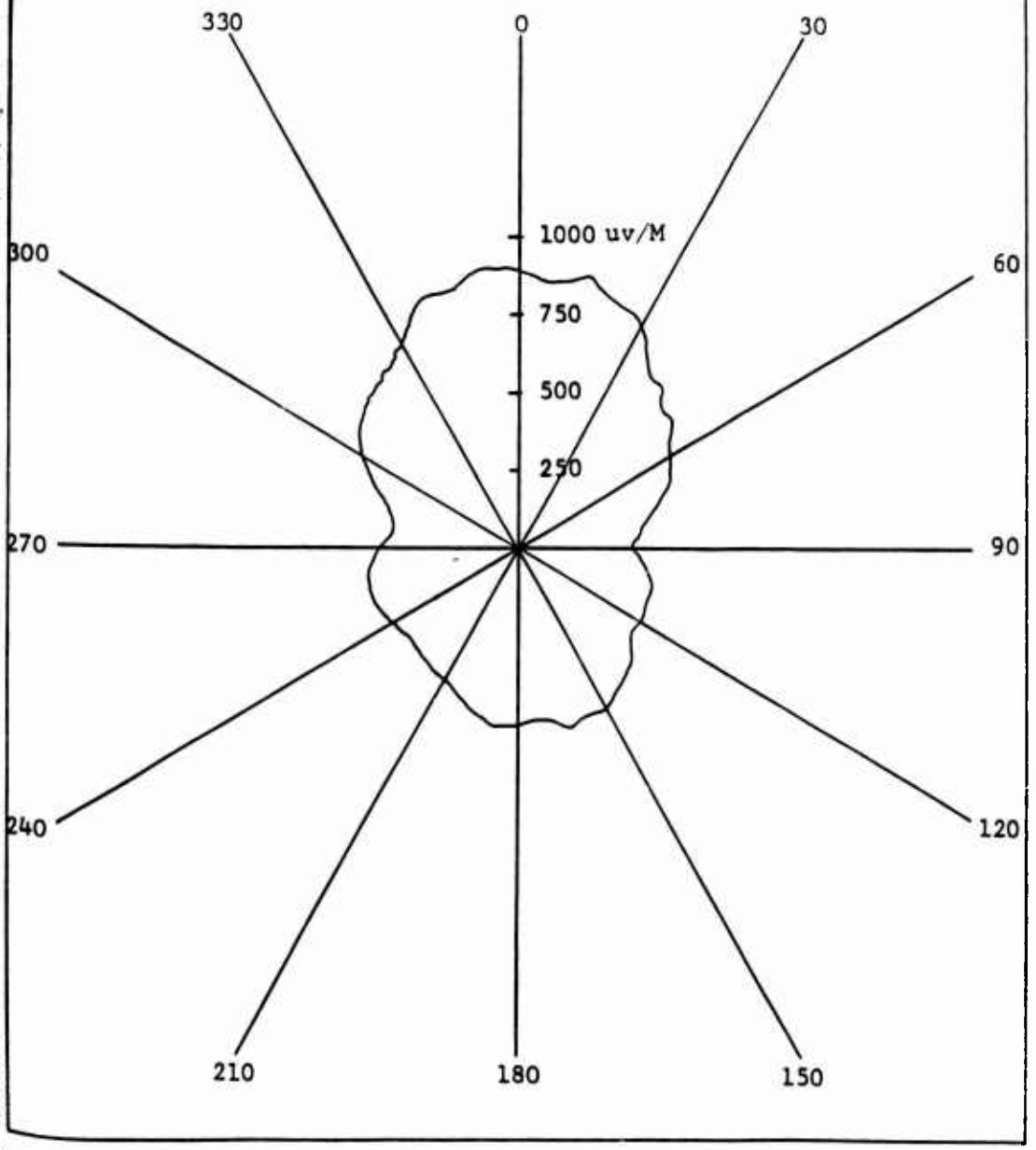


DATA SHEET NO. 27

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles . Altitude 1000 feet

49.80 MHz



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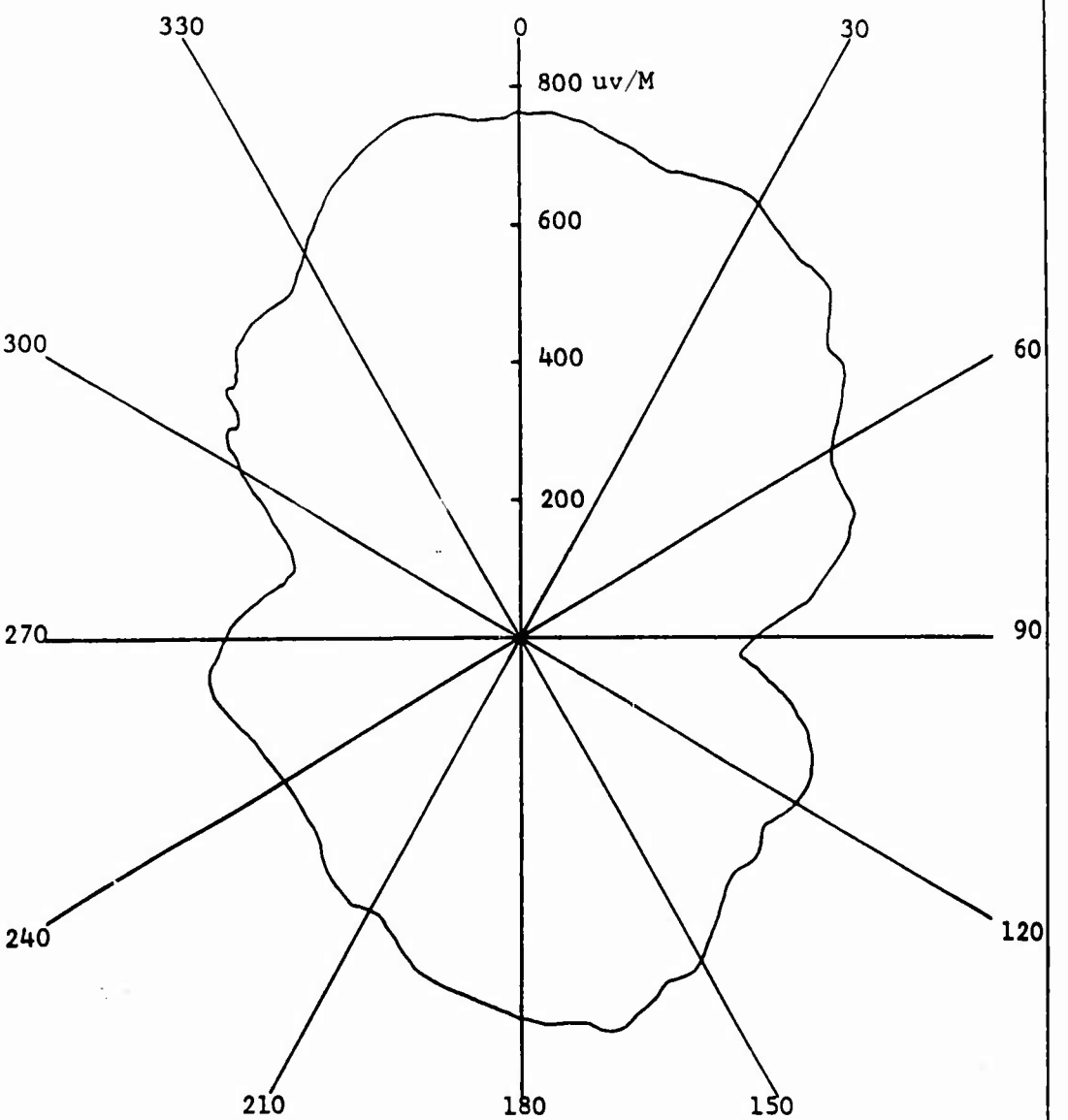
DATA SHEET NO. 28

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles Altitude 1000 feet

54.50 MHz



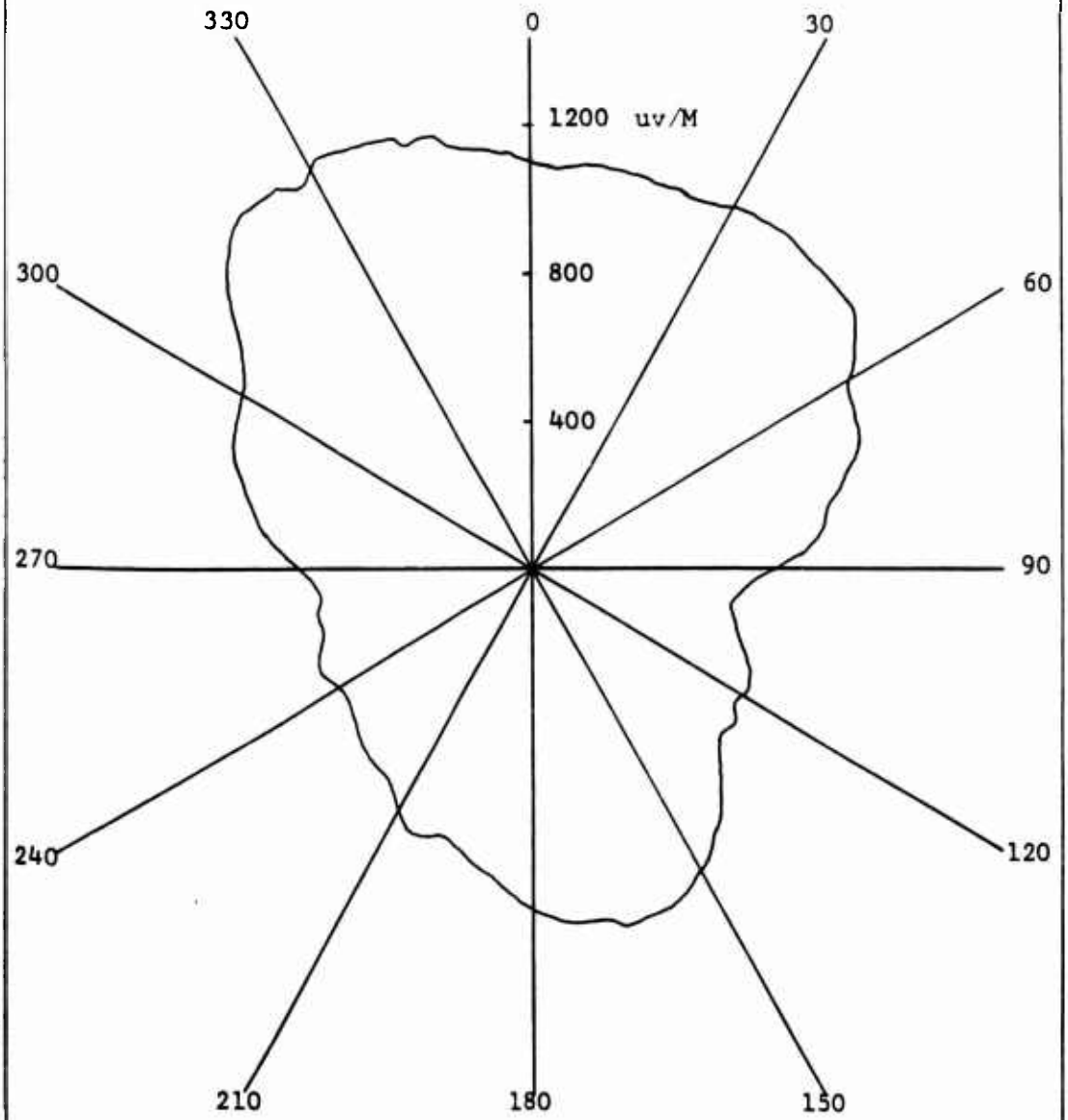
7872 55426

DATA SHEET NO. 29

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles Altitude 1000 feet

57.80 MHz



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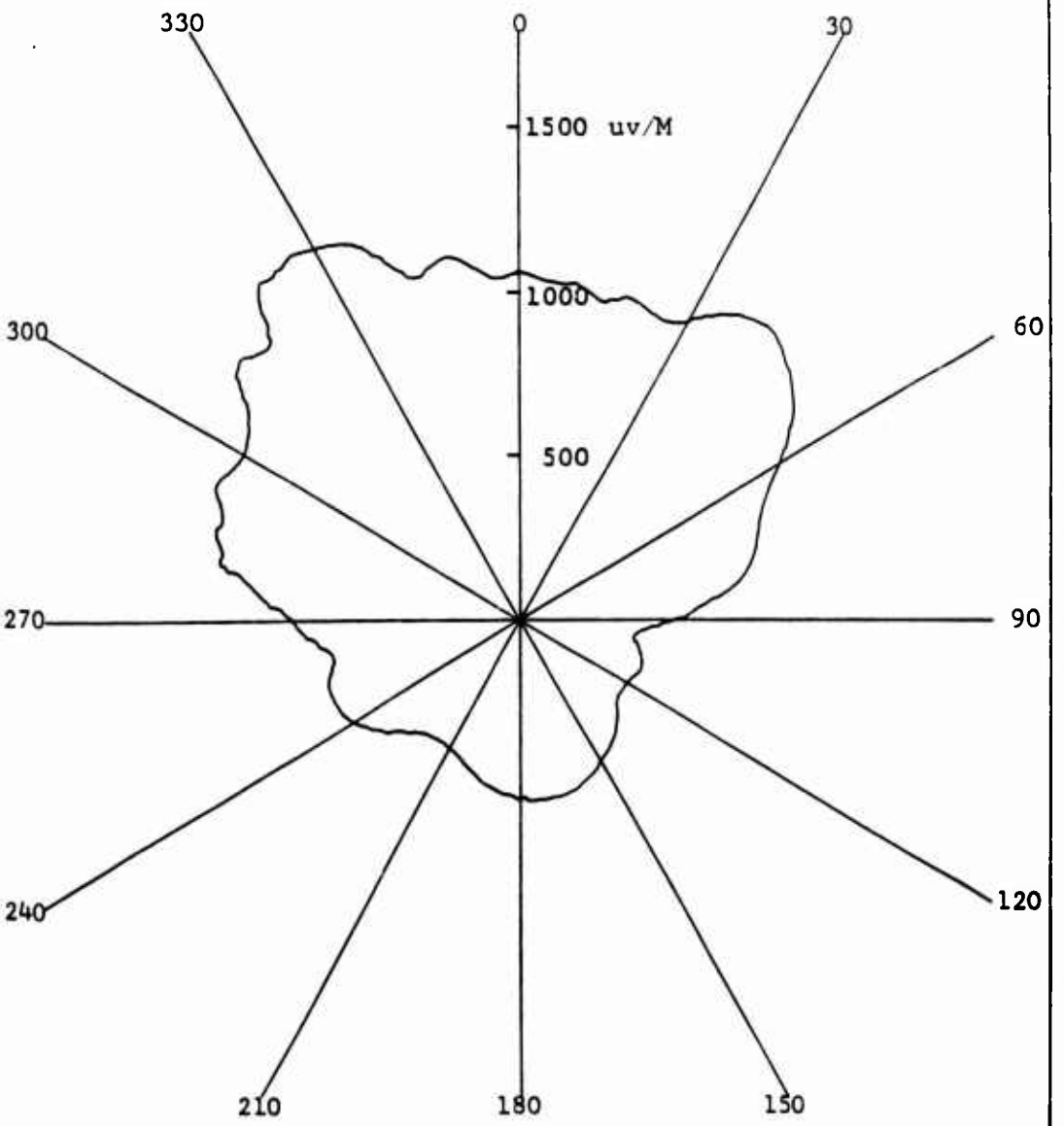
DATA SHEET NO. 30

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles Altitude 1000 feet

60.00 MHz

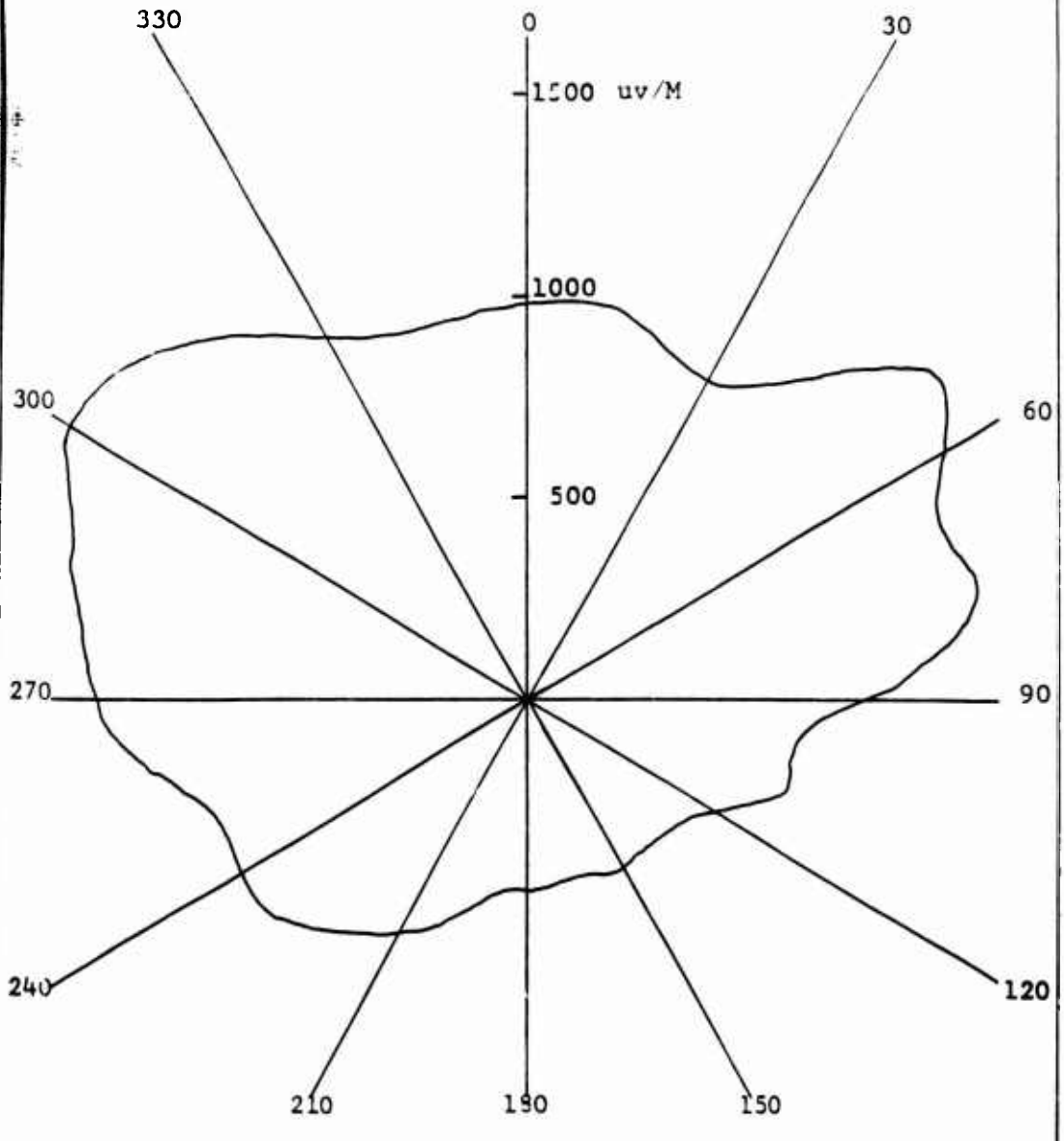


DATA SHEET NO. 31

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles Altitude 1000 feet

65.95 MHz

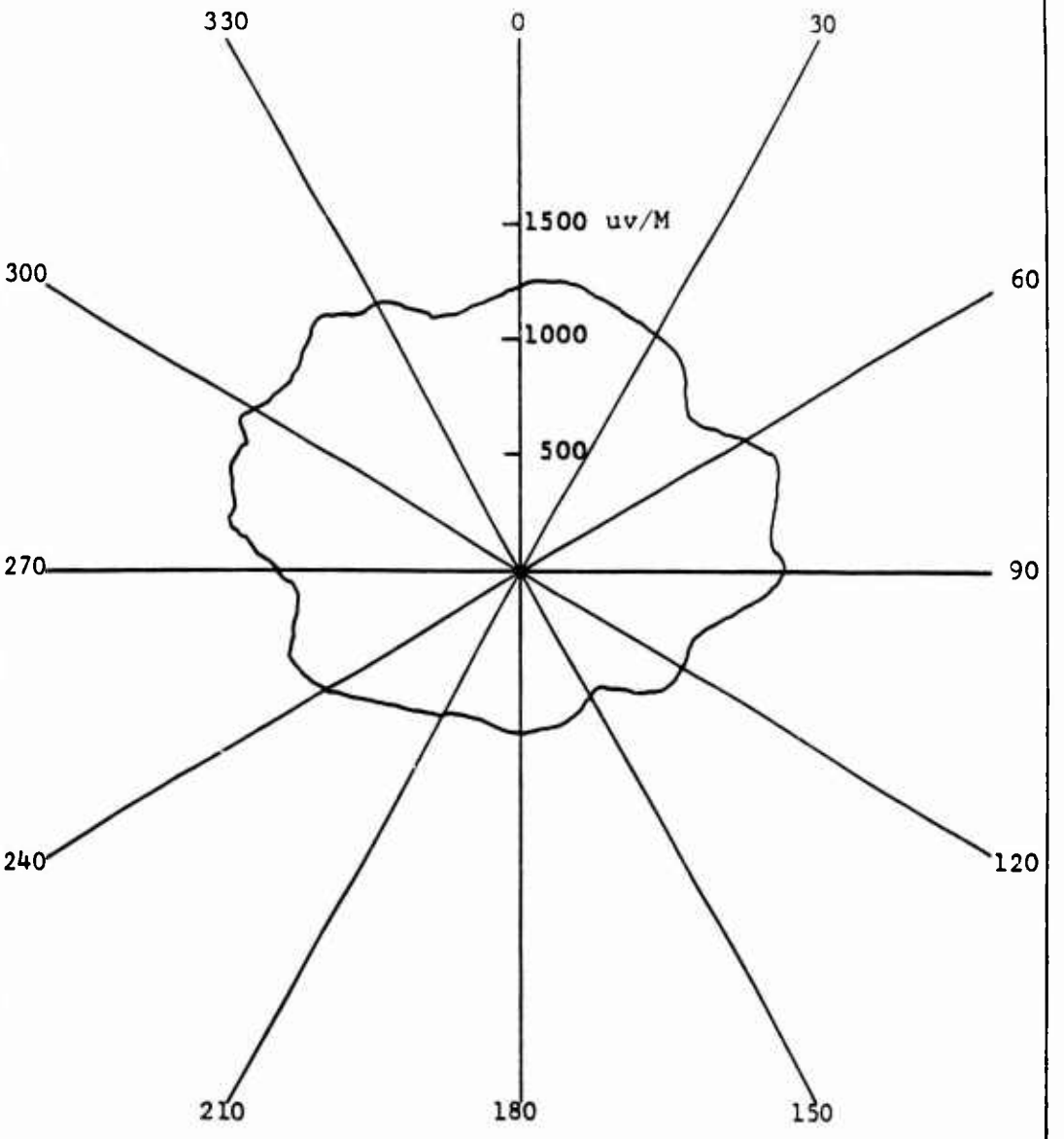


DATA SHEET NO. 32

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles Altitude 1000 feet

72.05 MHz



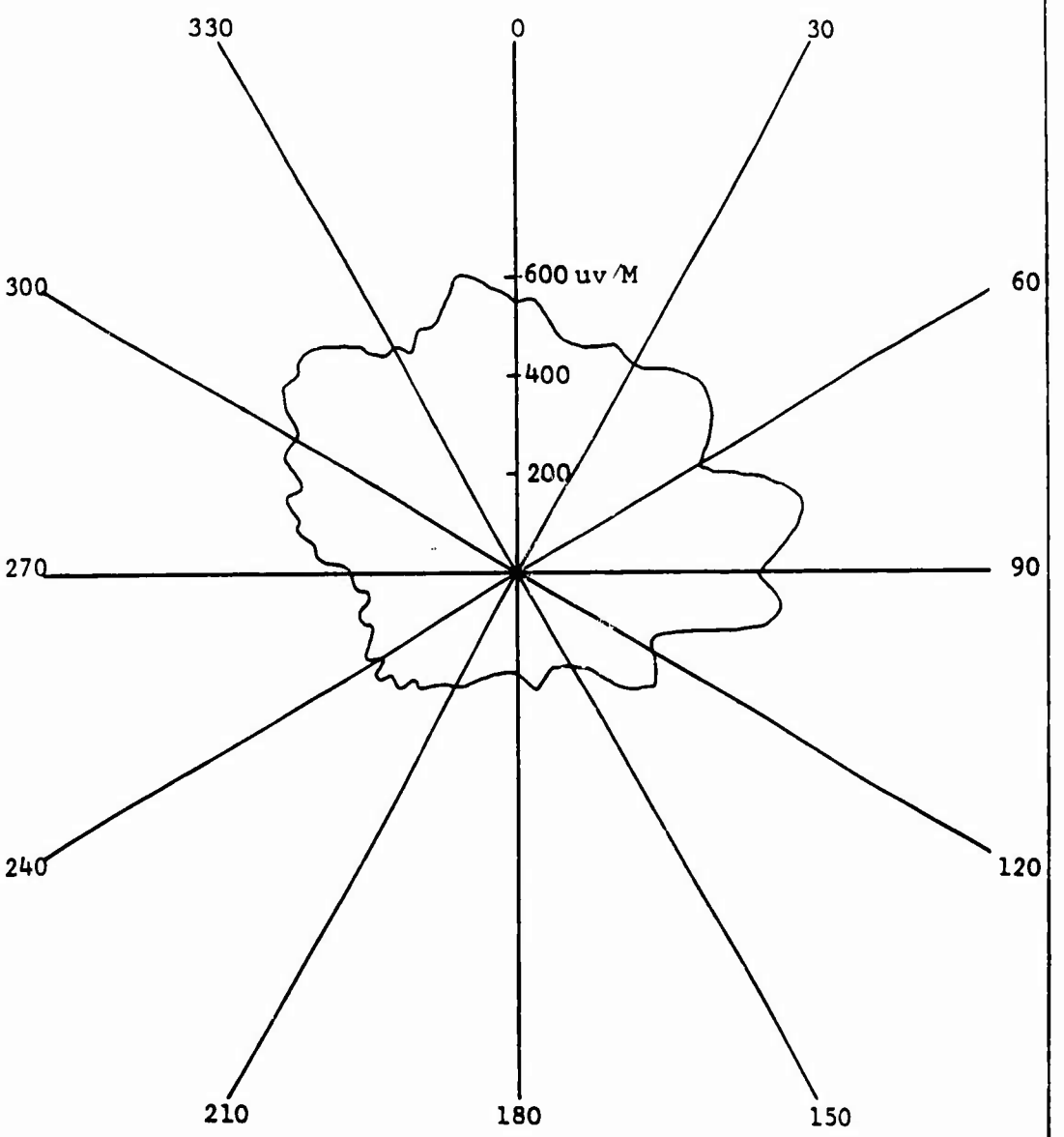
7872 89426

DATA SHEET NO. 33

NUMBER TWO FM COMMUNICATION ANTENNA
AS-2486/ARC-114 BHC P/N 206-075-543

Range 18 Miles Altitude 1000 feet

75.60 MHz



DATA SHEET NO. 34

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518
S/N 002

Range 18 Miles Altitude 1000 feet

FREQ (MHz)	VSWR	MAX (uv/M)	MIN (uv/M)	MIN REQ (uv/M)	db Above Min Req.
126.45	1.4:1	1750	940	520	10.6
128.65	1.5:1	2250	930		12.8
132.60	1.7:1	1260	475		7.7
134.65	2.0:1	1050	555		6.1
138.05	1.4:1	880	405		4.6
141.45	1.4:1	1050	550		6.1
143.85	1.0:1	1340	690		8.2
148.00	1.8:1	1350	805		8.3
148.80	1.8:1	670	440		2.2
149.90	1.9:1	1125	655	520	6.7

672 55426

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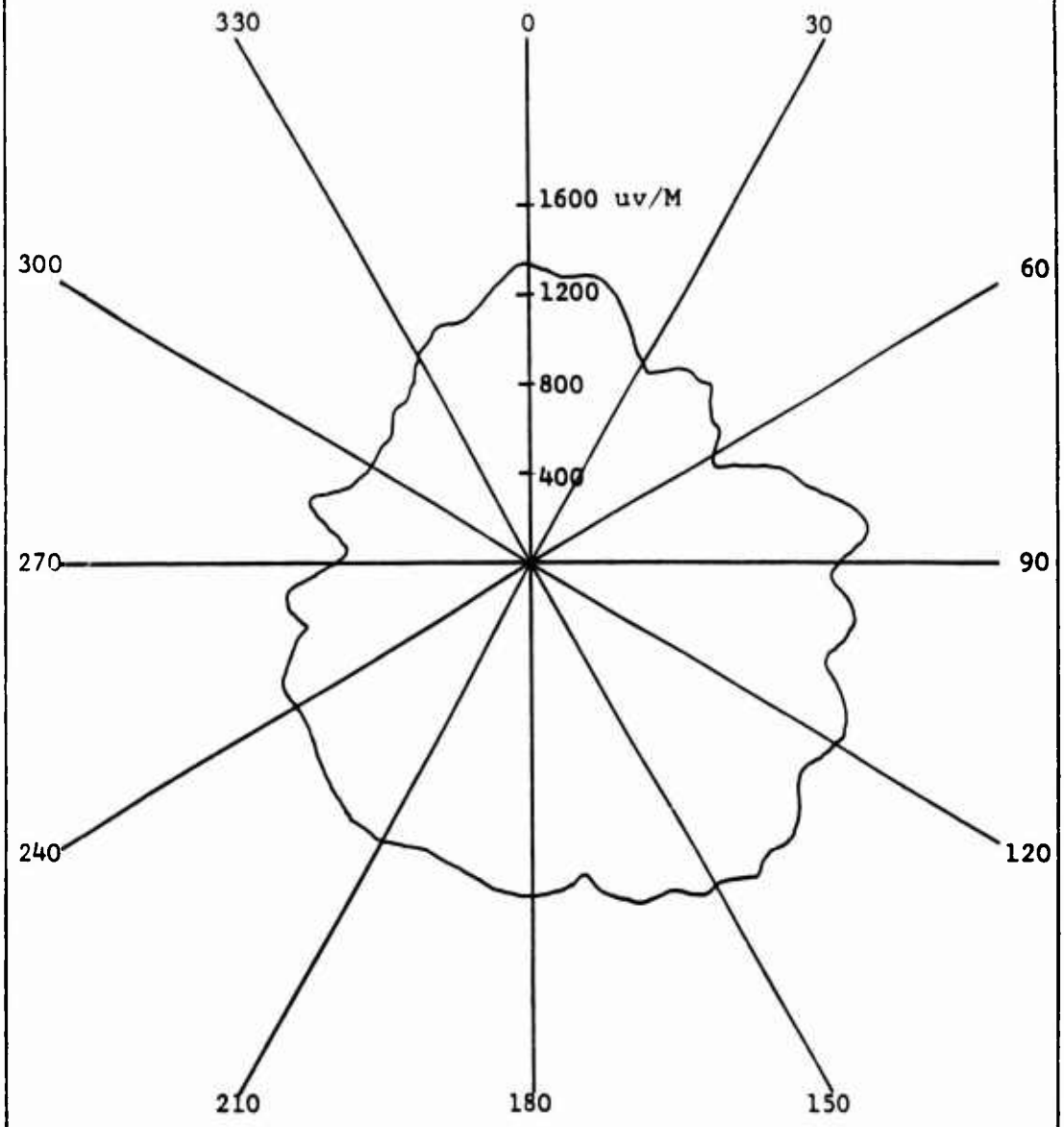
DATA SHEET NO. 35

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles

Altitude 1000 feet

126.45 MHz



7072 93420

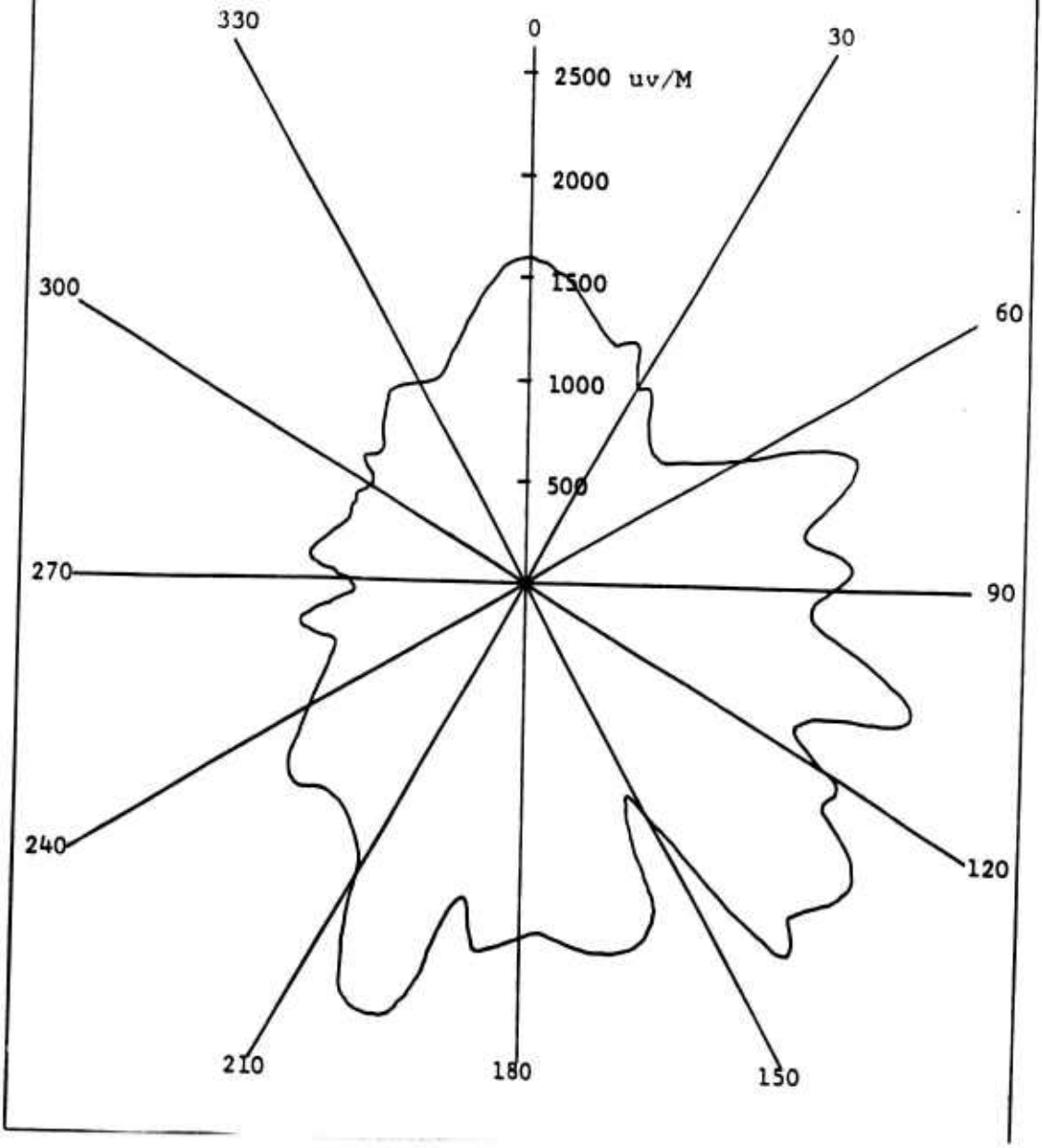
DATA SHEET NO. 36

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles

Altitude 1000 Feet

128.65 MHz



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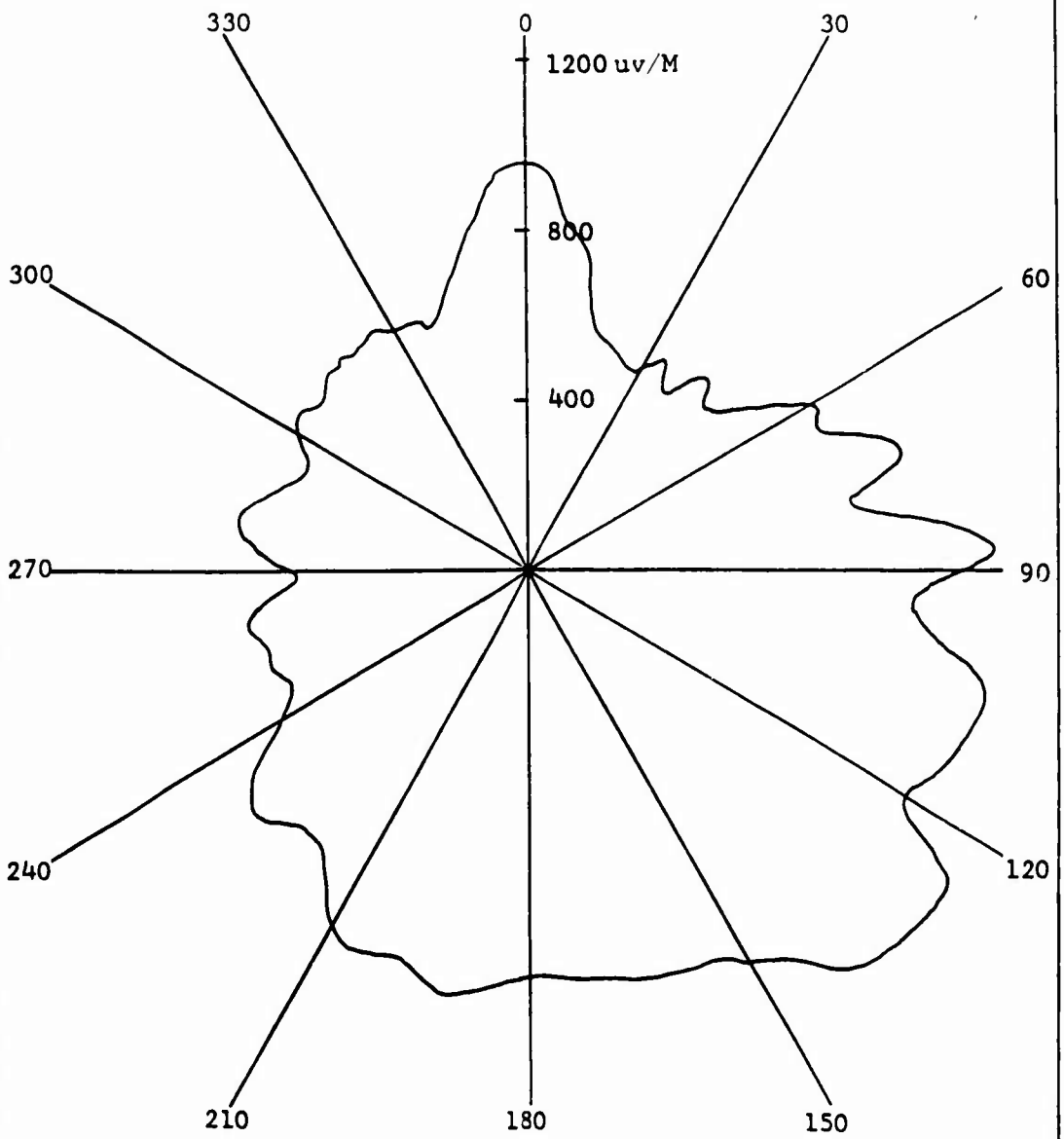
DATA SHEET NO. 37

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 Feet

132.60 MHz



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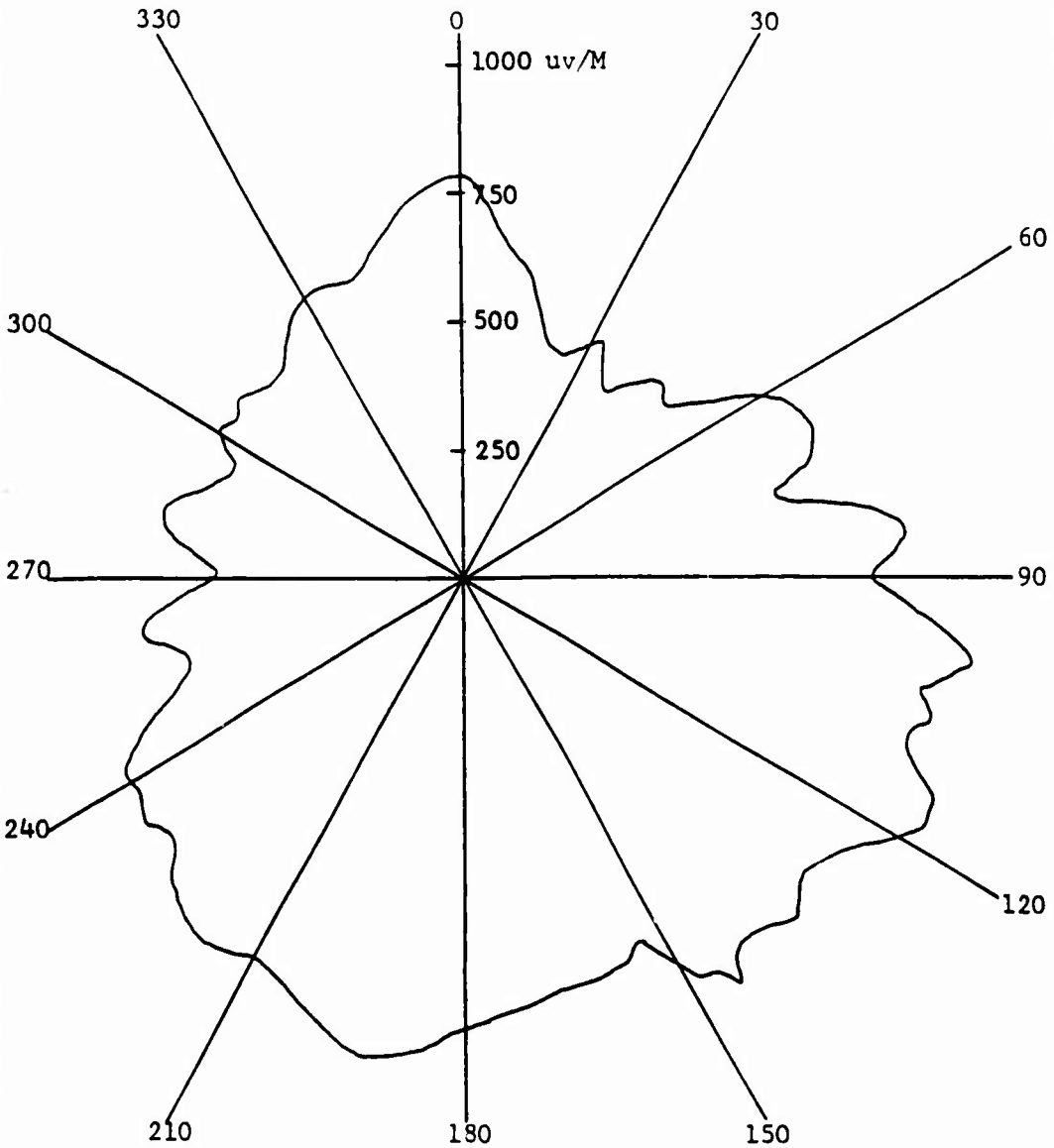
DATA SHEET NO. 38

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 Feet

134.65 MHz

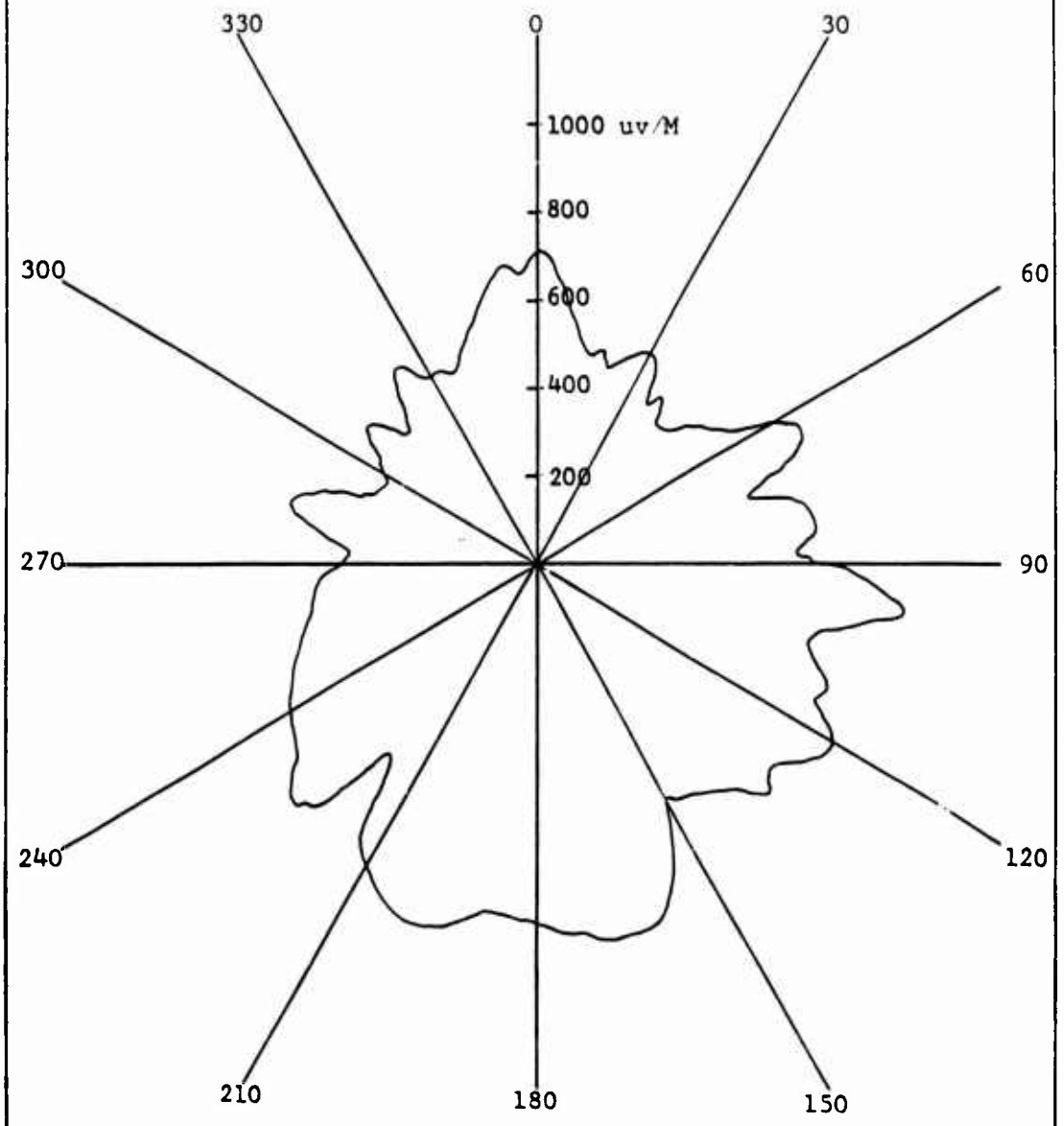


DATA SHEET NO. 39

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 Feet

138.05 MHz



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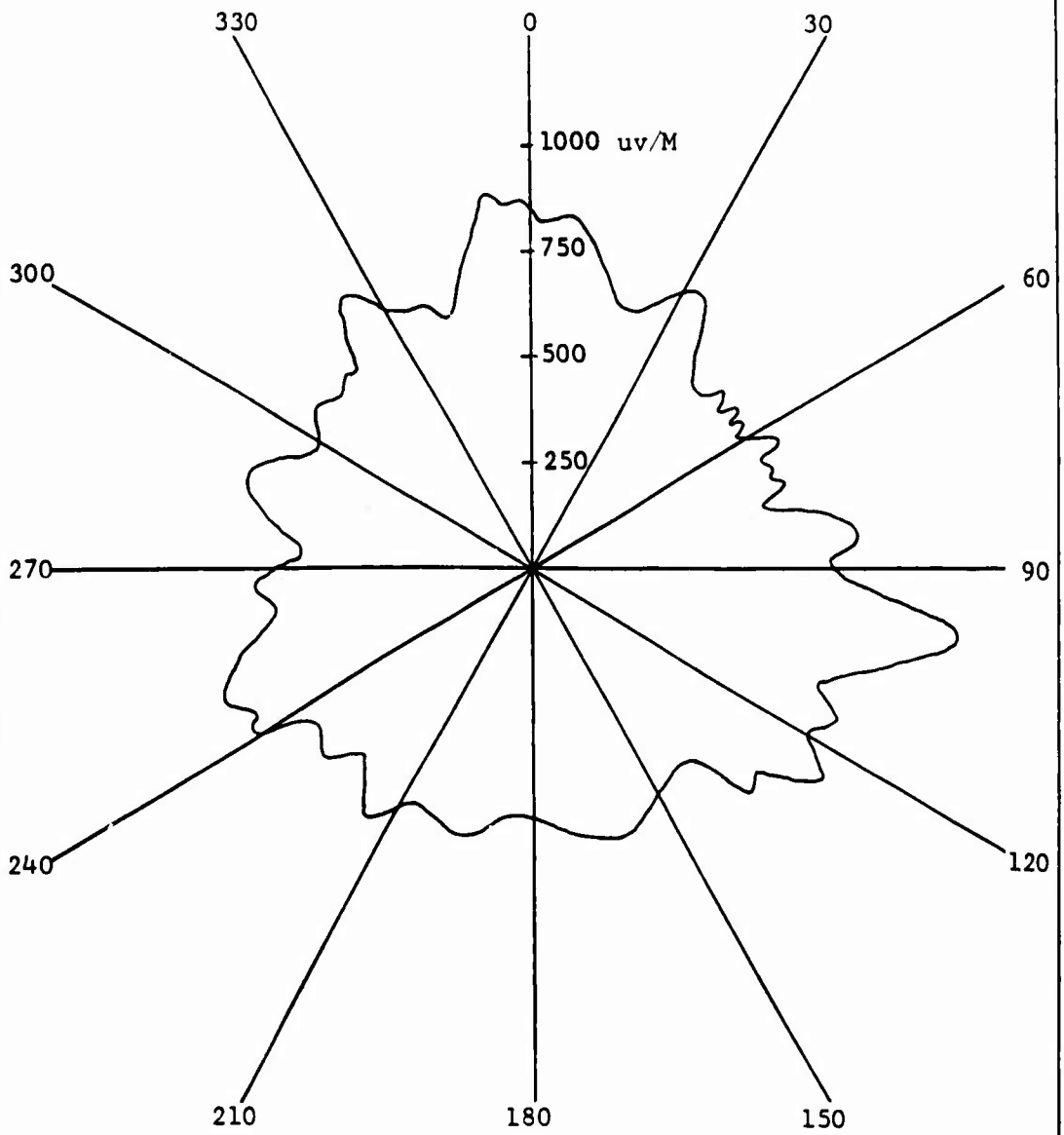
DATA SHEET NO. 40

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 Feet

141.45 MHz



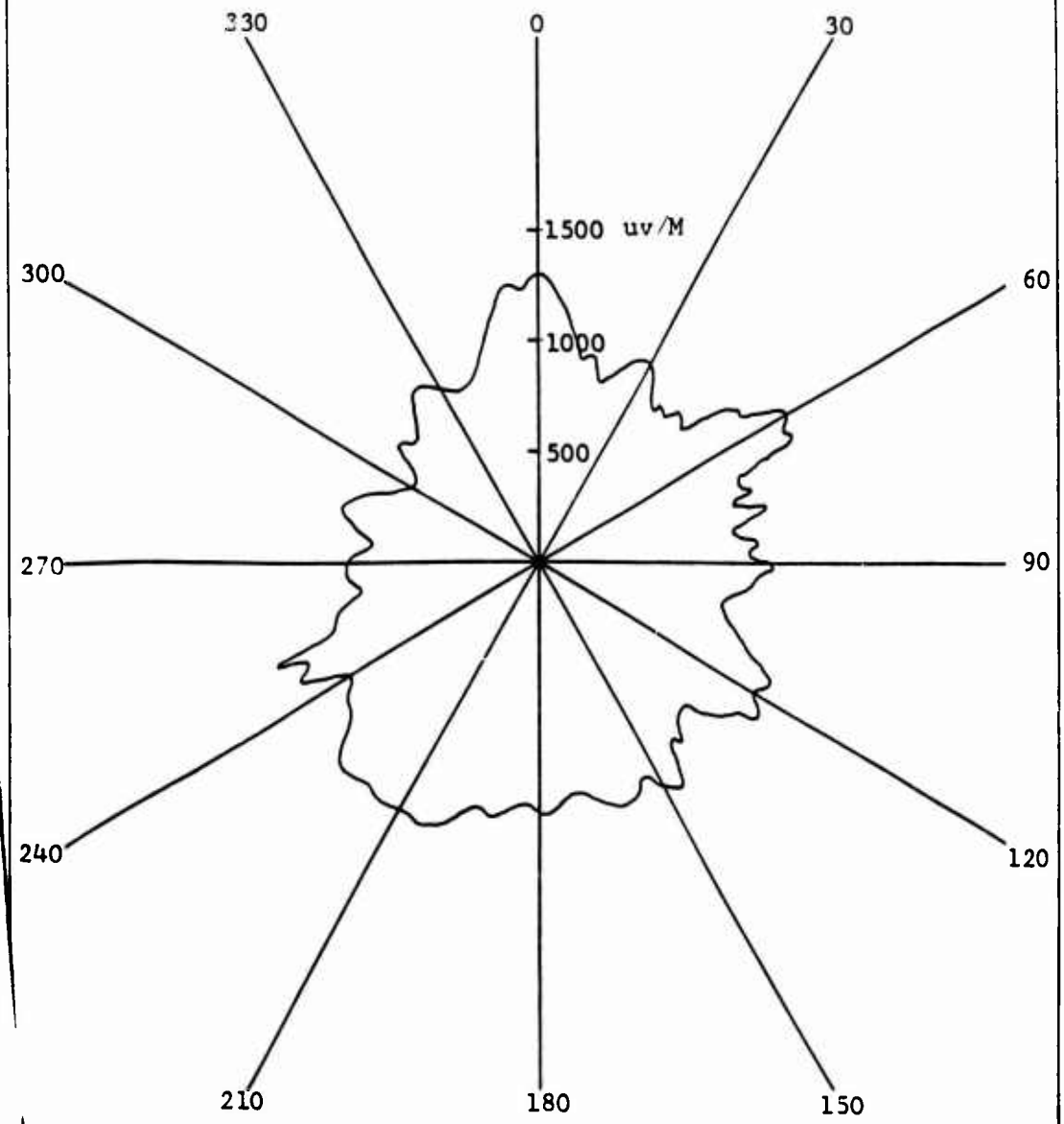
7872 89426

DATA SHEET NO. 41

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 Feet

143.85 MHz



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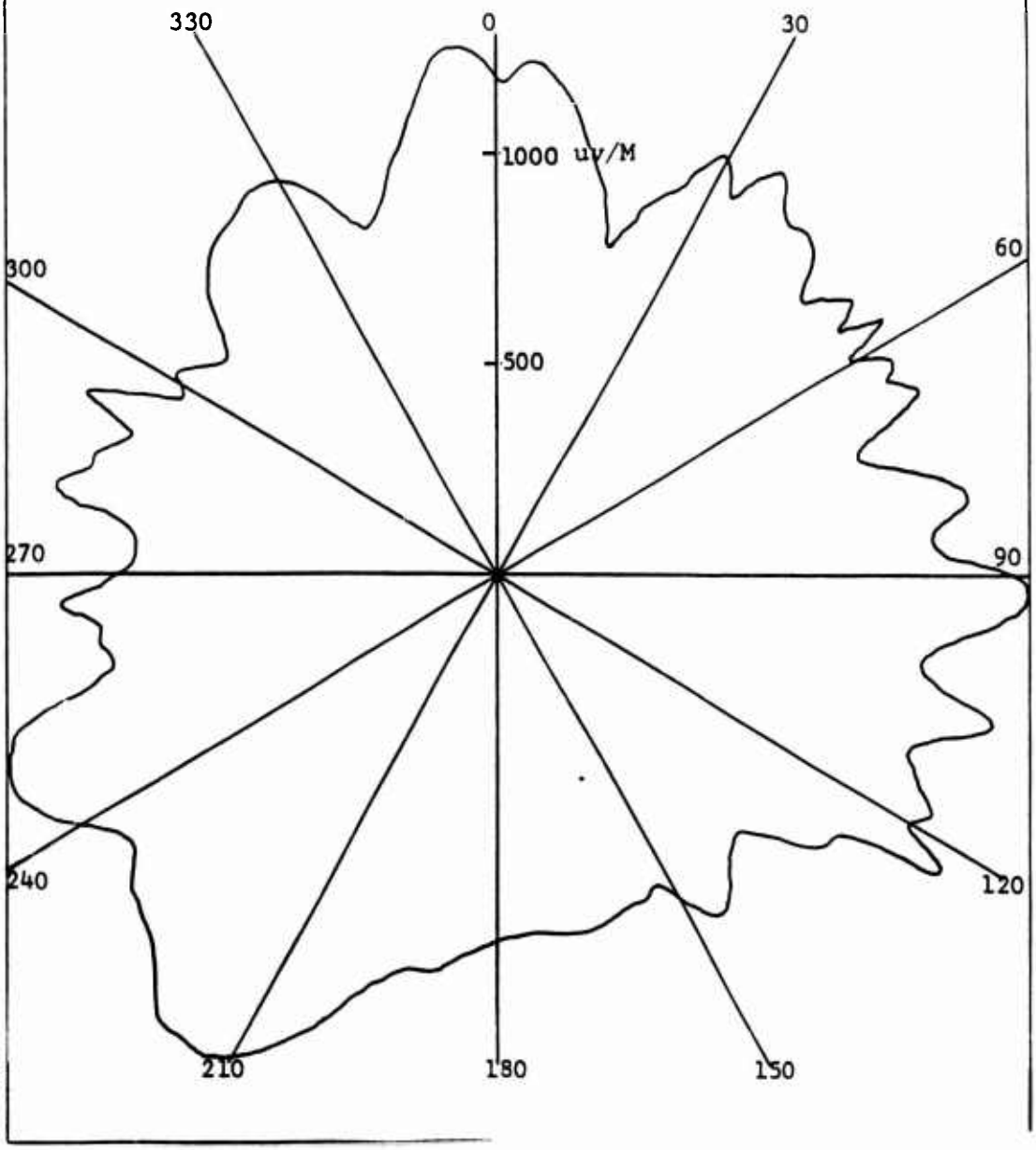
DATA SHEET NO. 42

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 Feet

148.00 MHz

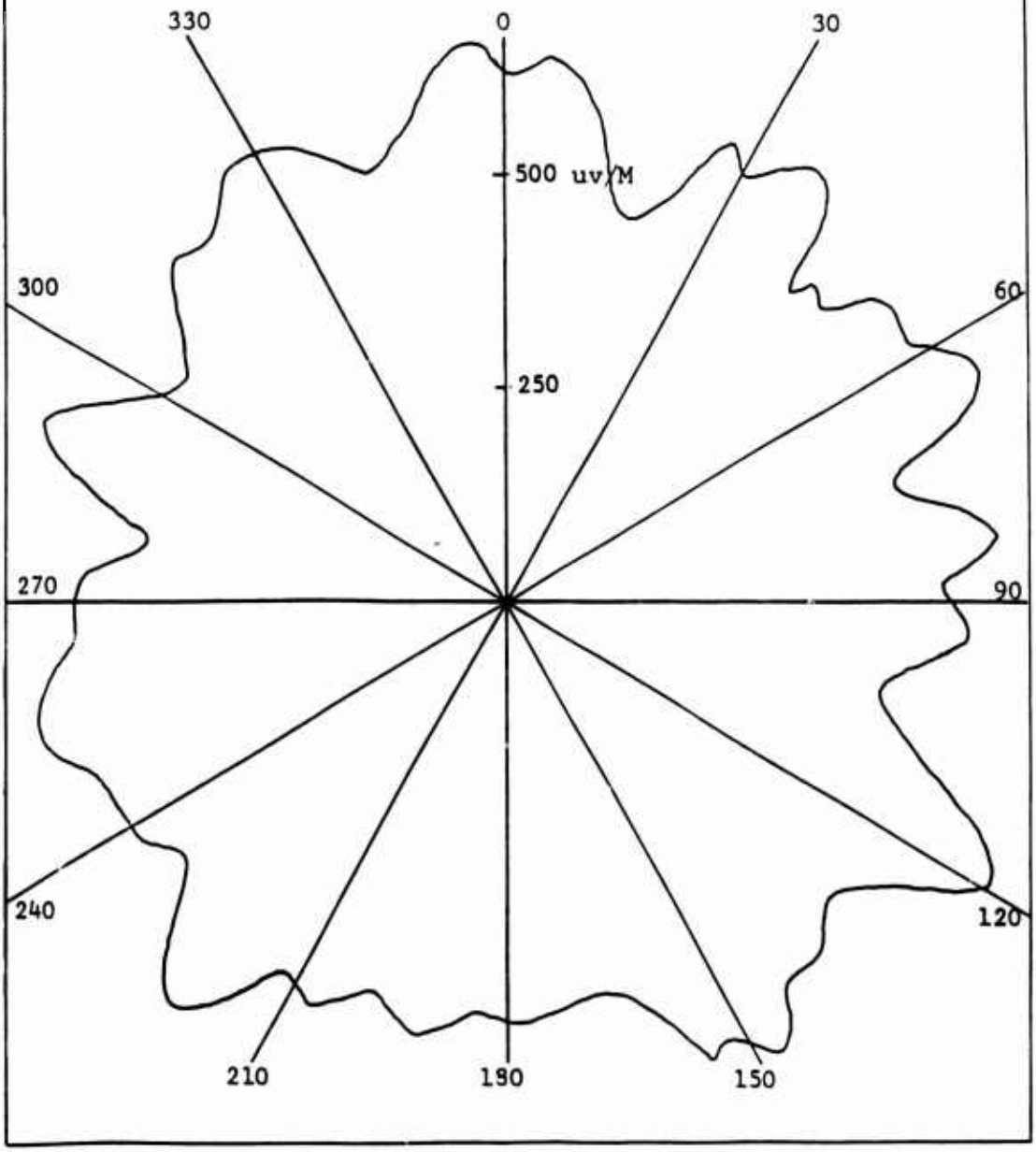


DATA SHEET NO. 43

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 Feet

148.80 MHz



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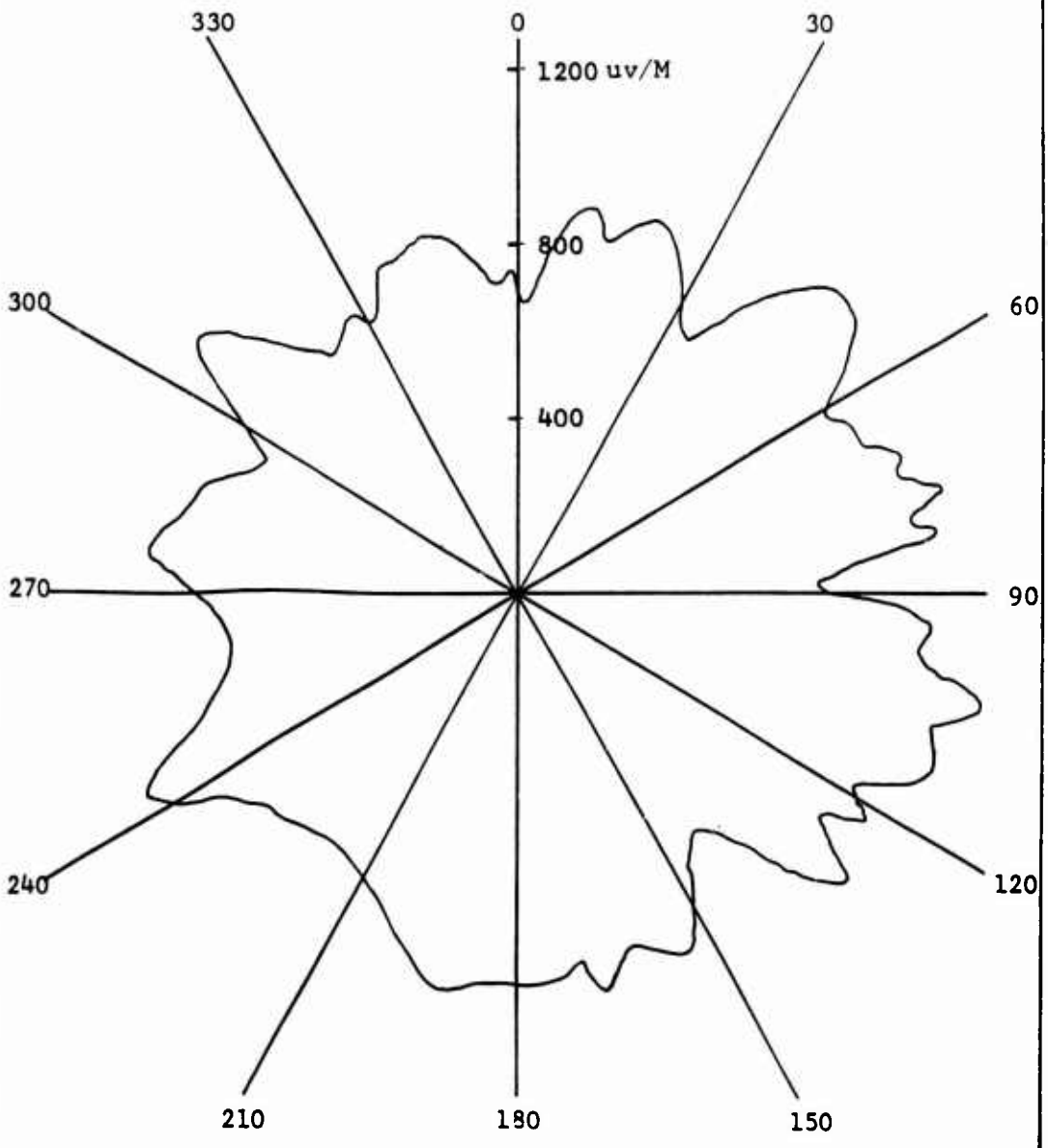
DATA SHEET NO. 44

VHF COMMUNICATION ANTENNA
BHC P/N 206-075-518

Range 18 Miles Altitude 1000 Feet

149.90 MHz



DATA SHEET NO. 45

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551
S/N 001

Range 18 Miles Altitude 1000 feet

FREQ (MHz)	VSWR	MAX (uv/M)	MIN (uv/M)	MIN REQ (uv/M)	db Above Min Req.
225.3	1.4:1	5500	2850	520	20.5
242.5	2.0:1	3900	2780		17.4
265.5	2.0:1	8300	4300		24.0
278.5	2.2:1	3500	2300		16.6
299.9	1.8:1	6300	3500		21.6
321.5	1.5:1	6500	3750		22.0
356.5	1.9:1	5500	3450		20.5
374.4	1.9:1	7800	3950		23.5
386.6	1.7:1	5800	4400		21.0
399.8	1.4:1	4500	2000	520	18.8

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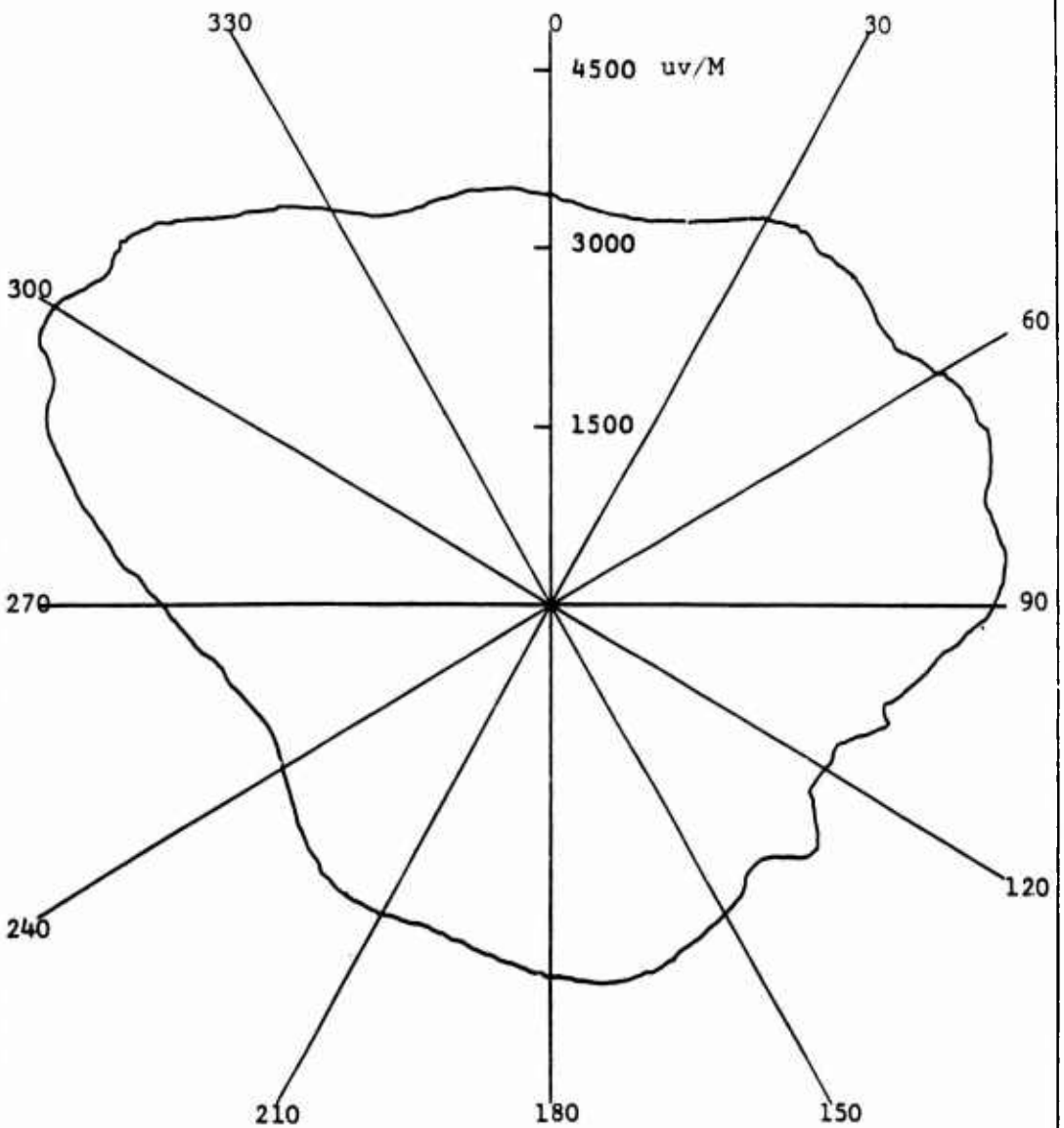
DATA SHEET NO. 46

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles Altitude 1000 Feet

225.30 MHz



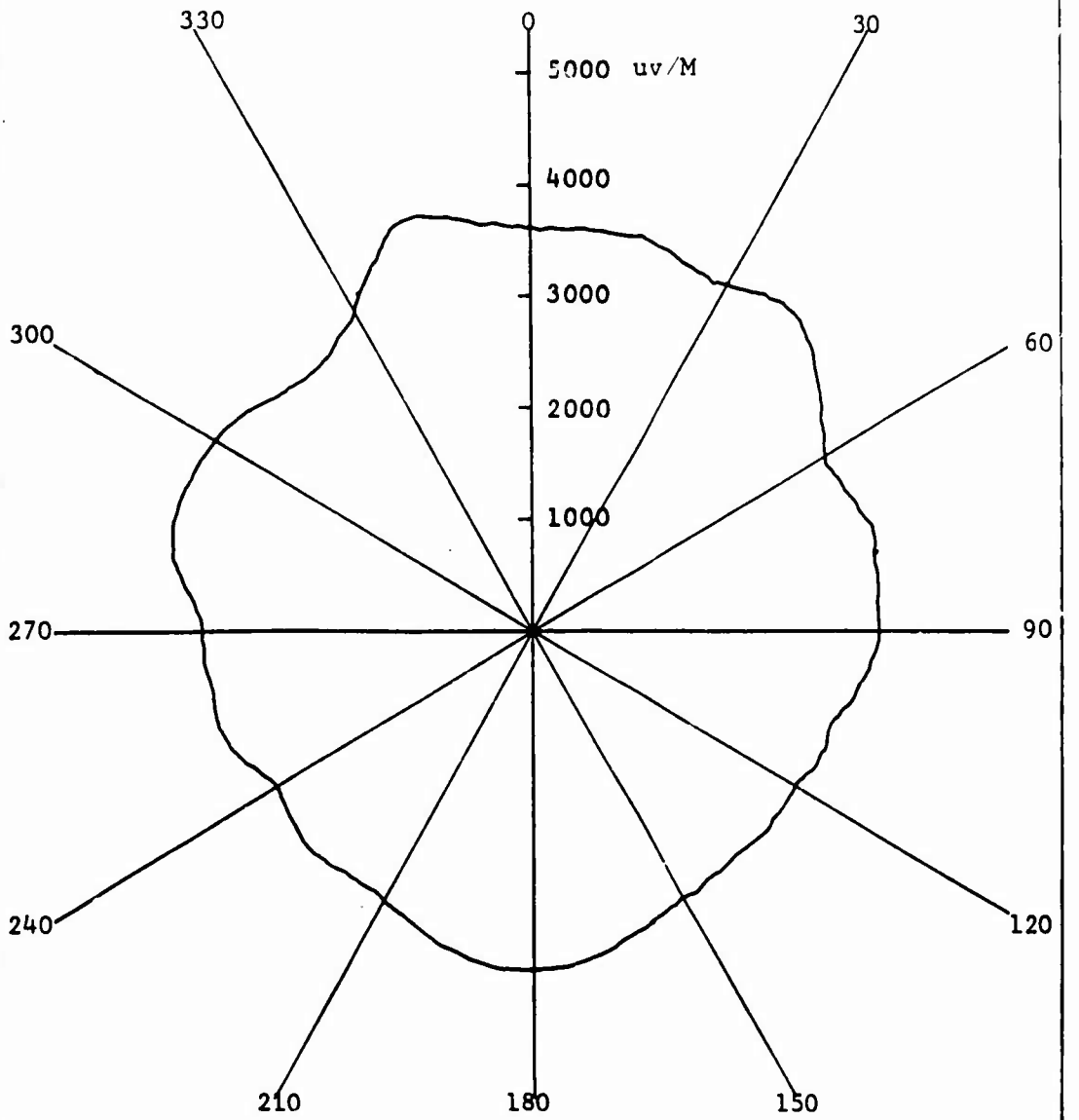
7072 55426

DATA SHEET NO. 47

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles Altitude 1000 Feet

242.50 MHz



7073 8626

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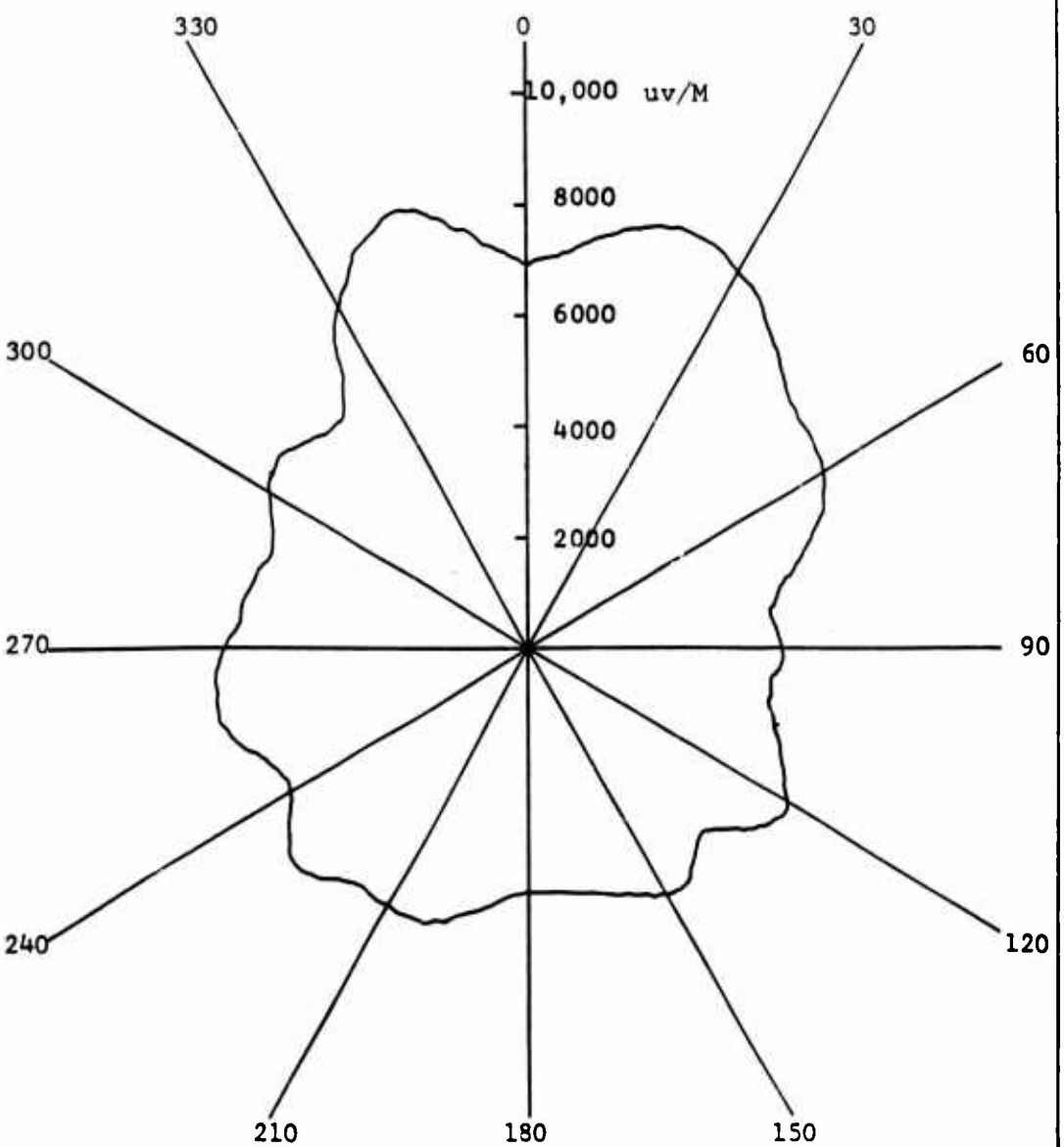
DATA SHEET NO. 48

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles

Altitude 1000 Feet

265.50 MHz



7872 99426

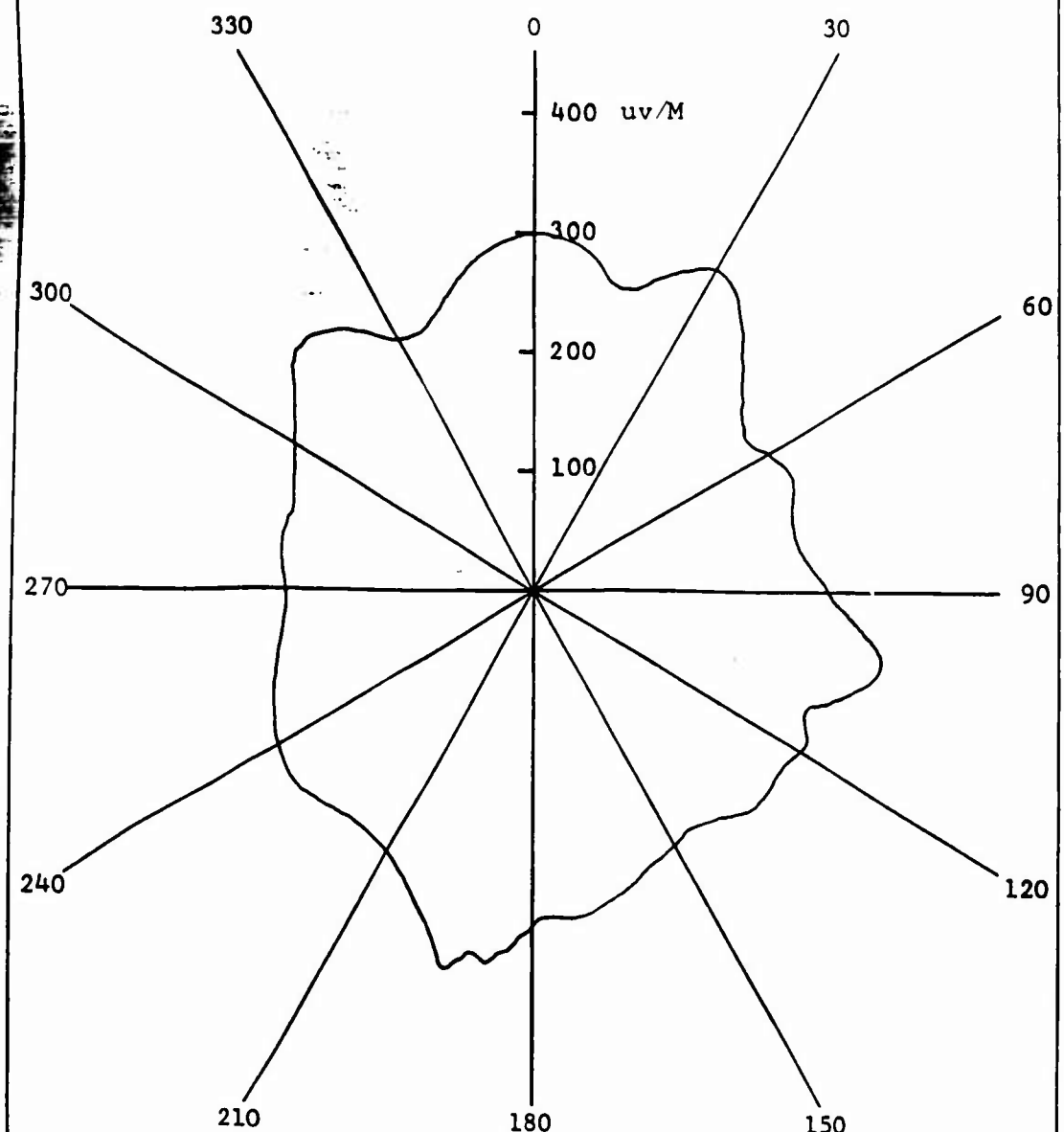
DATA SHEET NO. 49

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles

Altitude 1000 Feet

278.50 MHz



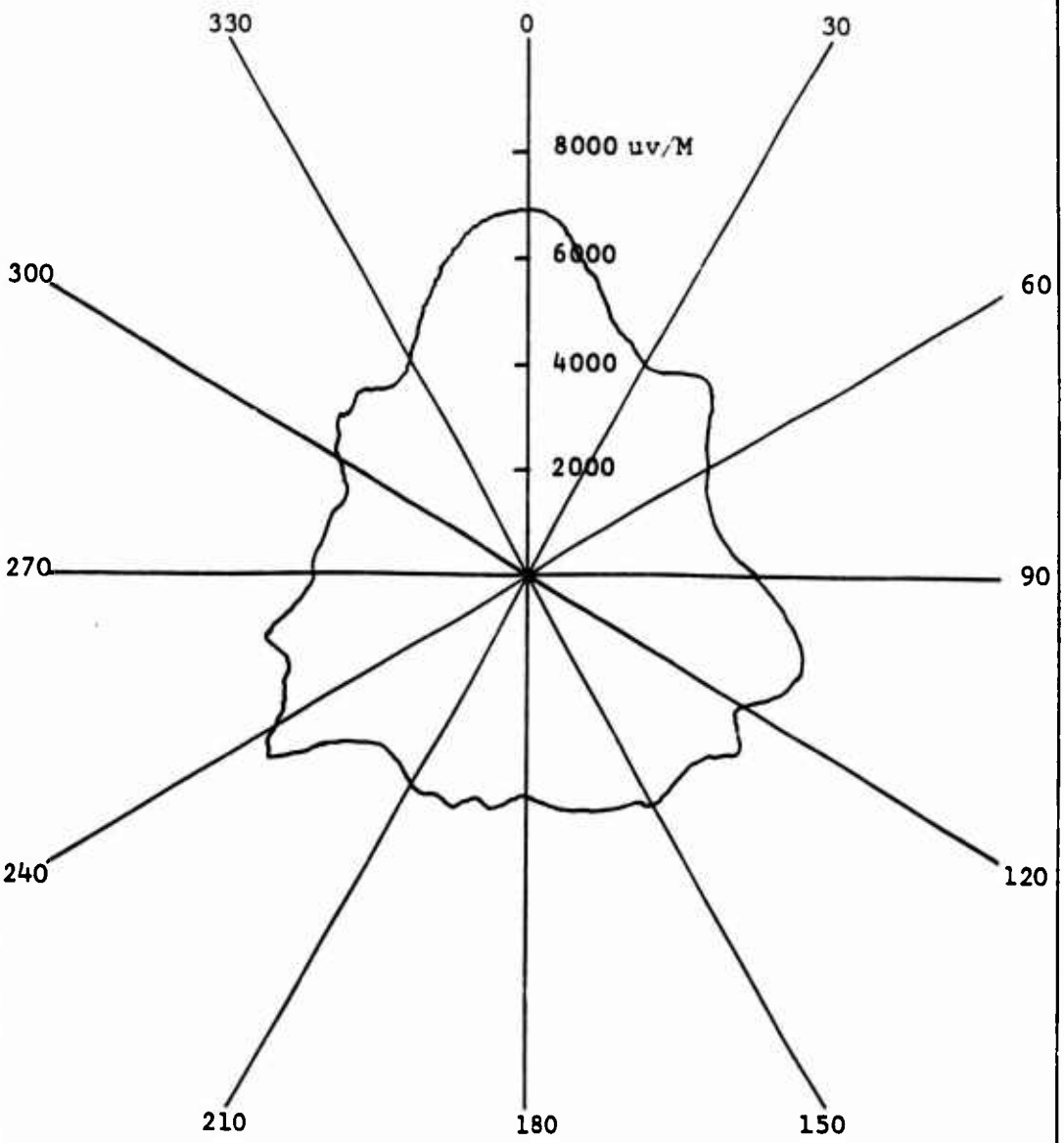
7872 58426

DATA SHEET NO. 50

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles Altitude 1000 Feet

299.90 MHz



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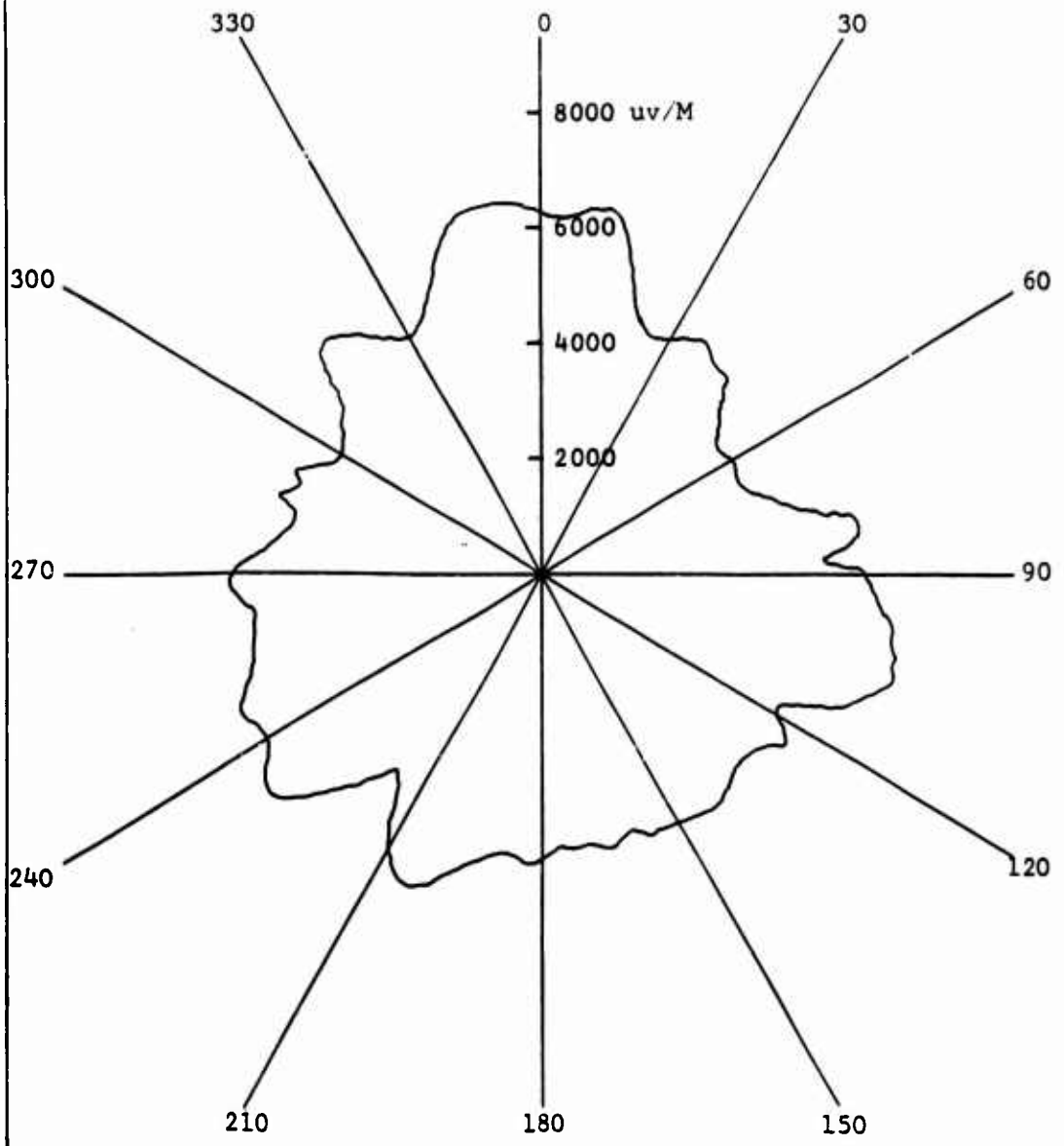
DATA SHEET NO. 51

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles Altitude 1000 Feet

321.50 MHz

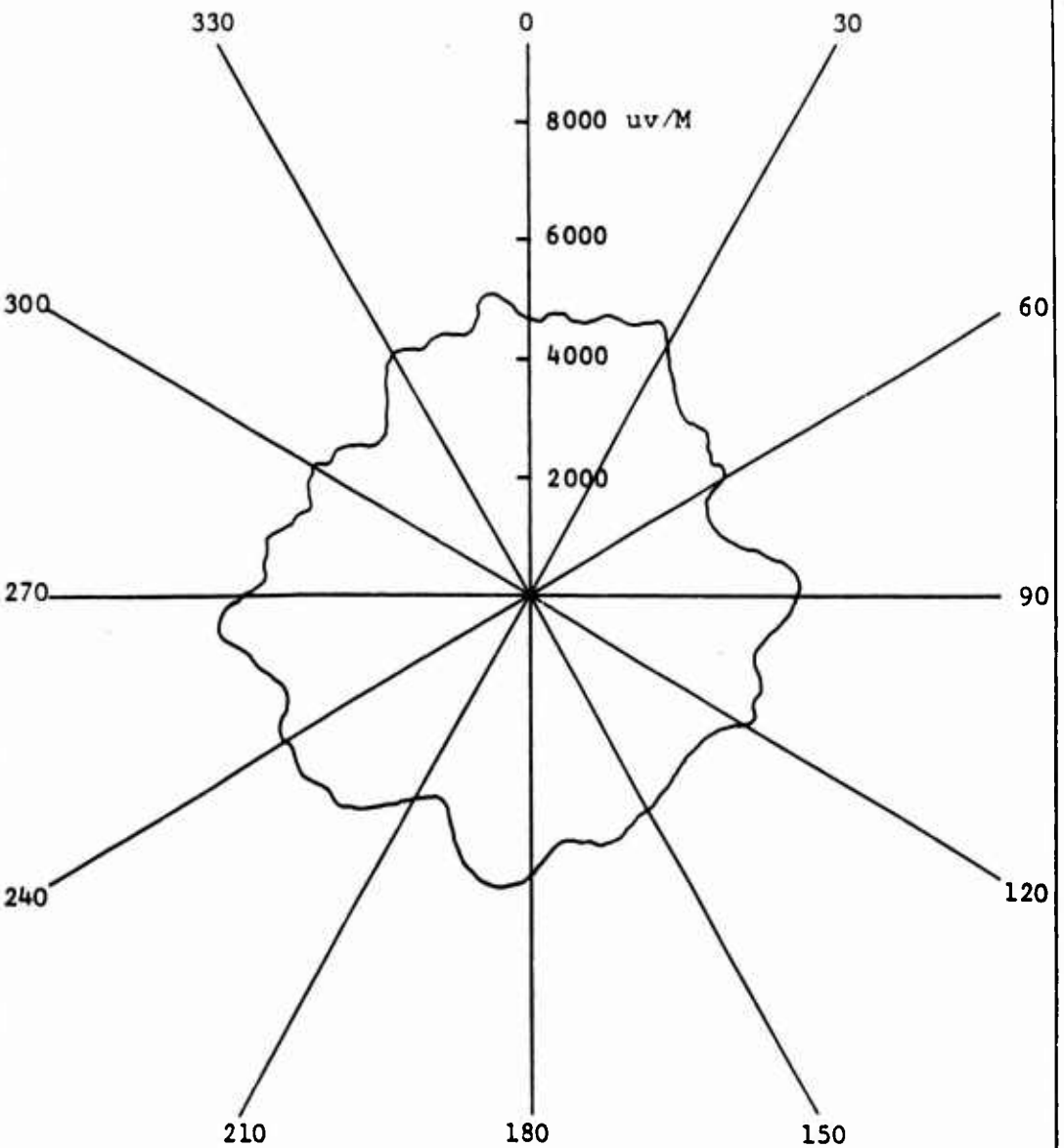


DATA SHEET NO. 52

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles Altitude 1000 Feet

356.50 MHz



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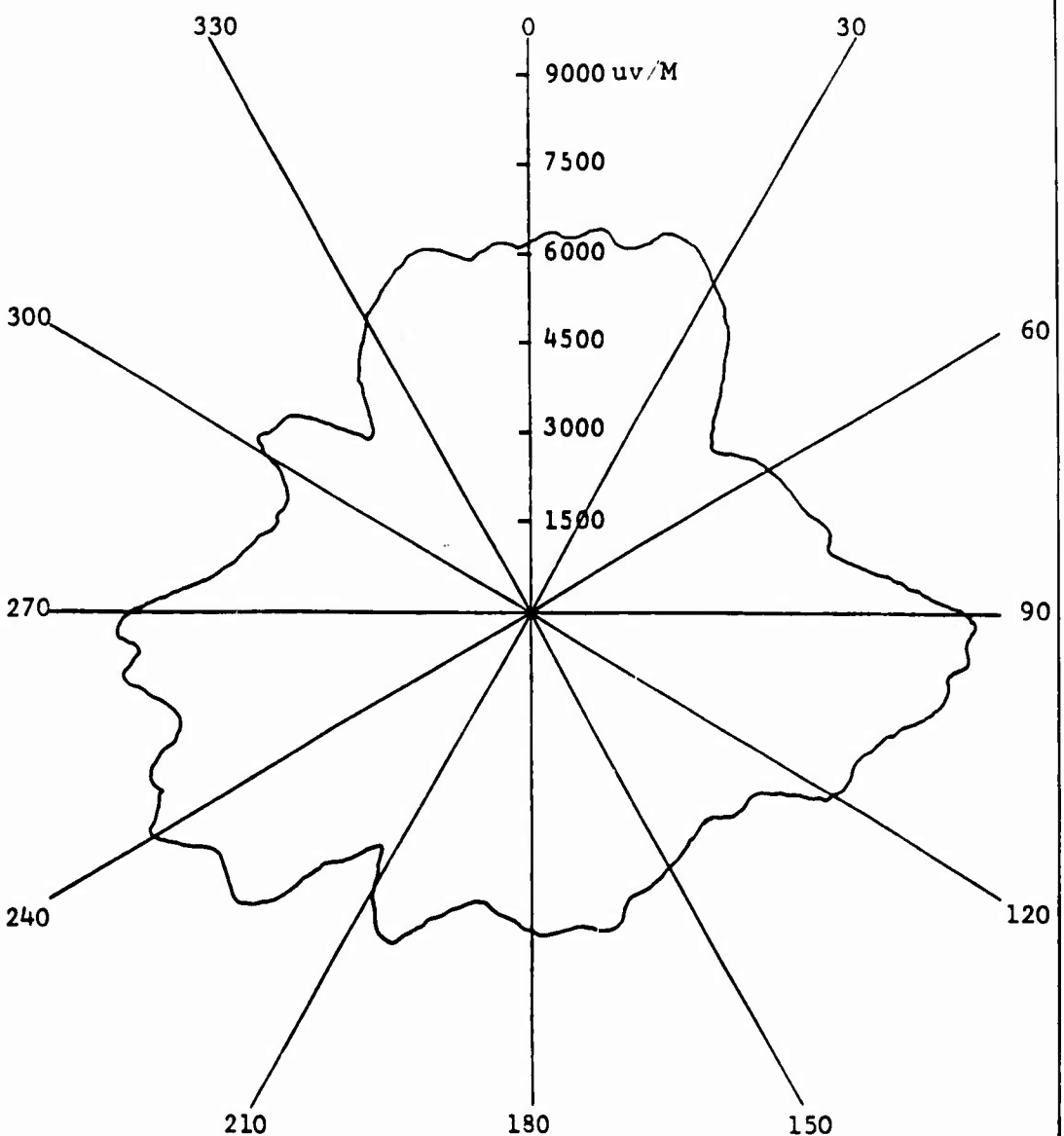
DATA SHEET NO. 53

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles Altitude 1000 Feet

374.40 MHz



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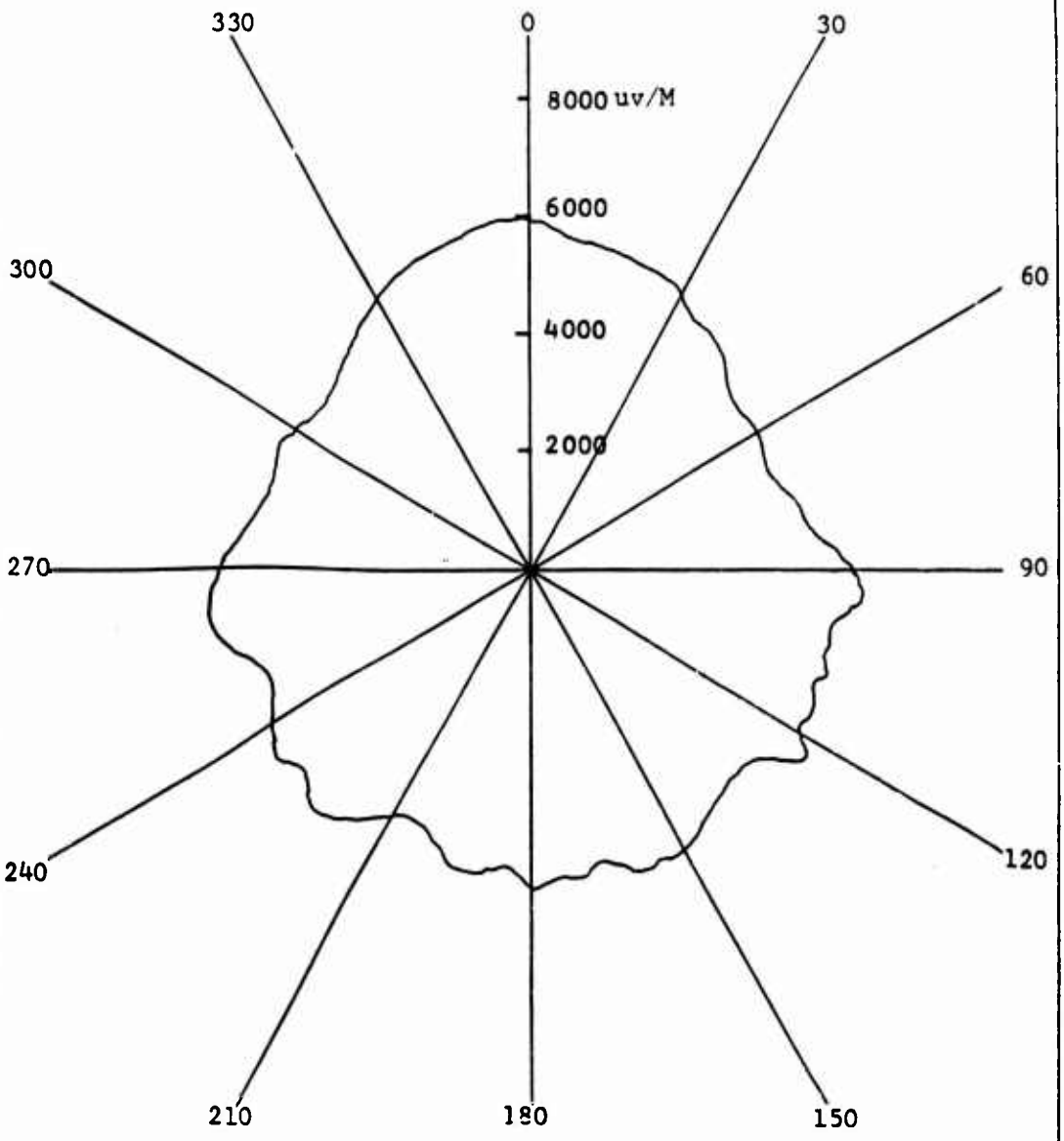
DATA SHEET NO. 54

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles Altitude 1000 Feet

386.60 MHz



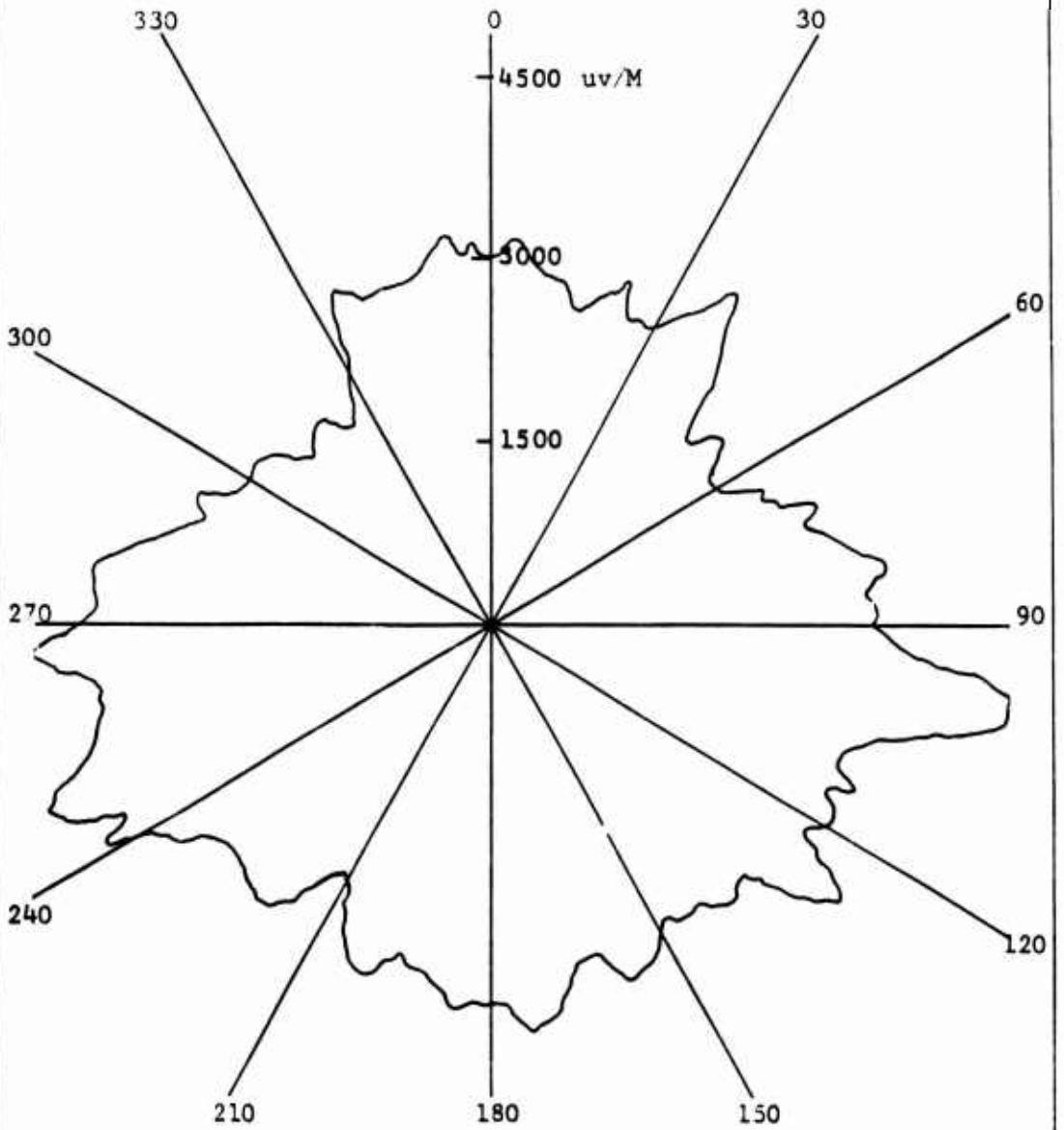
7872 93426

DATA SHEET NO. 55

UHF COMMUNICATION ANTENNA
AS-2487/ARC-116 BHC P/N 206-075-551

Range 18 Miles Altitude 1000 Feet

399.80 MHz



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10. AVAILABILITY/LIMITATION NOTICES

11. SUPPLEMENTARY NOTES	12. SPONSORING MILITARY ACTIVITY U.S. Army Aviation Material Command Dept. of the Army, St. Louis, Mo.

13. ABSTRACT

The OH-58A Communication Antenna System consists of a 30-76 MHz antenna and a 116-150 MHz antenna, both integral to the helicopters vertical stabilizer, a combination blade and whip 30-76 MHz antenna mounted on the cabin roof and a 225-400 MHz antenna mounted under the nose of the helicopter. FM homing is provided by a pair of vertical dipoles, one mounted on each side of the helicopter. All antenna utilize completely passive matching. Extensive testing has shown that this system provides excellent performance in all respects. Radiated field strengths exceed minimum requirements by as much as 24 db and pattern symmetry is generally better than 10 db. There are no false FM homing indications across the 30-76 MHz band. Isolation between the two 30-76 MHz communication antennas is sufficient to allow retransmission between two ground stations separated by 80 miles.

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14. KEY WORDS	LINK A		LINK B		LINK C	
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