

Equipment Manual **Log-Periodic Antenna**

Model 3145



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WARRANTY

The Electro-Mechanics Company (EMCO) warrants that our products are free from defects in materials and workmanship for a period of two years from the date of shipment. If you notify us of a defect within the warranty period, we will, at our option, either repair or replace those products which prove to be defective. If applicable, we will also recalibrate the product

There will be no charge for warranty services performed at the location we designate. You must however, prepay inbound shipping costs and any duties or taxes. We will pay outbound shipping costs for a carrier of our choice, exclusive of any duties or taxes. You may request warranty services to be performed at your location, but it is our option to do so. If we determine that warranty service can only be performed at your location, you will not be charged for our travel related costs.

This warranty does not apply to:

1. Normal wear and tear of materials
2. Consumable items such as fuses, batteries, etc.
3. Products which have been improperly installed, maintained, or used.
4. Products which have be operated outside of specifications.
5. Products which have been modified without authorization.
6. Calibration of products, unless necessitated by defects.

THIS WARRANTY IS EXCLUSIVE. NO OTHER WARRANTY, WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

THE REMEDIES PROVIDED BY THIS WARRANTY ARE YOUR SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT ARE WE LIABLE FOR ANY DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO, DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.

Please contact our Sales Department for a Return Material Authorization Number before shipping equipment to us.

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**DESCRIPTION AND USE OF THE
EMCO MODEL 3145
LOG-PERIODIC ANTENNA**

Description

The EMCO Model 3145 Log-Periodic Antenna is a broadband, linearly polarized antenna designed to operate over the frequency range of 100-1000 MHz.

The antenna is designed to be as small and lightweight as possible to facilitate ease of handling and portability. It is constructed from aluminum and phenolic. The antenna comes completely assembled and no adjustment is necessary.

The antenna is fully calibrated for use in applicable FCC tests. It is capable of handling up to 1 KW of input power.

Specifications

Frequency Range:	100 - 1100 MHz
Nominal Impedance:	50 Ω
Connector:	Type N
Average VSWR:	less than 2:1
Assembled Dimensions:	
Length:	58.5" (150 cm)
Maximum Width:	59.0" (150 cm)
Depth:	2.5" (6.4 cm)
Weight:	7.5 lbs (3.4 kg)

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EMCO Calibration of Log Periodic Dipole Antennas

This EMCO Log Periodic antenna was calibrated at a spacing of 1 meter (m) per ARP-958. This document shows that R, the 1m spacing, should be measured tip-to-tip.

This antenna was also calibrated at spacings of 3m and 10m per ANSI C63.5. This document states that "The spacing R between log-periodic array antenna is measured from the projection onto the ground plane of the midpoint of the longitudinal axis of each antenna."

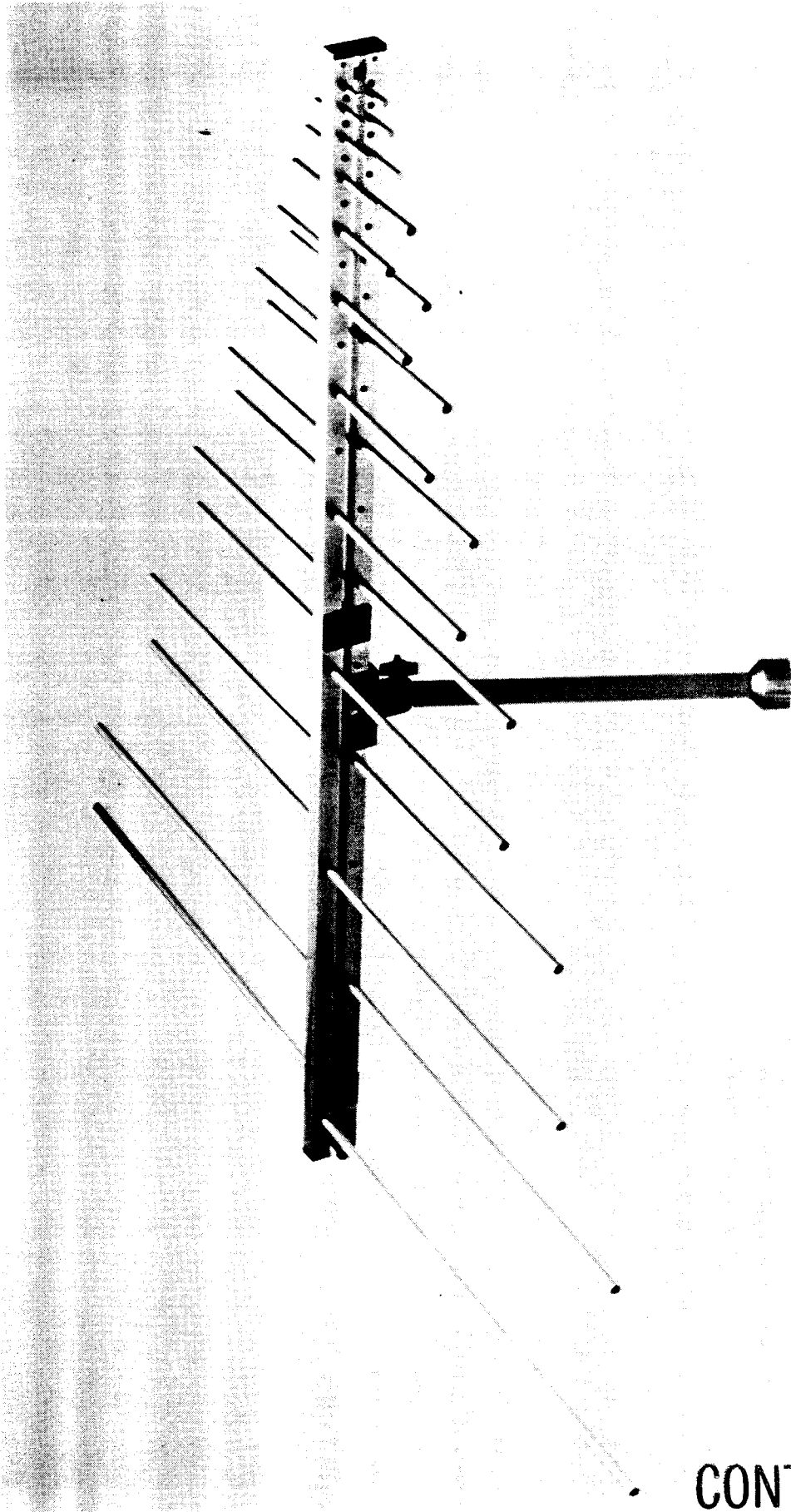
The ARP and ANSI specifications disagree because they were written for different purposes. It seems unlikely at this time that they will ever agree.

Therefore, when calibrating log-periodic array antennas, we measure R, the spacing between antennas, tip-to-tip for the 1m calibration (ARP 958 applications) and midpoint-to-midpoint for the 3m and 10m calibrations (ANSI C63.5 applications). It is important in compliance testing to measure the spacing as it is measured for calibration.

If you would like to discuss this matter, or if you have any other questions, please do not hesitate to contact EMCO.

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EMCO Model 3145 Log Periodic Antenna 100 MHz - 1.1 GHz

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Typical Antenna Calibration and Power Requirements at
1 Meter Spacing and 1000 Watts Maximum Continuous Power

Frequency (MHz)	Antenna Factor (dB)	Gain (dB)	Gain Numeric	FIELD STRENGTH (E V/m)				
				1 V/m	10 V/m	20 V/m	100 V/m	200 V/m
100	9.0	1.2	1.33	0.03	2.5	10.0	251.2	*
125	9.1	3.1	2.04	0.02	1.6	6.5	163.5	653.9
150	11.2	2.6	1.80	0.02	1.8	7.4	184.9	739.5
175	12.8	2.2	1.67	0.02	2.0	8.0	199.6	798.4
200	15.0	1.2	1.32	0.03	2.5	10.1	252.4	*
225	14.3	3.0	1.99	0.02	1.7	6.7	167.9	671.4
250	14.8	3.4	2.16	0.02	1.5	6.2	154.0	616.0
275	14.3	4.7	2.96	0.01	1.1	4.5	112.6	450.5
300	15.6	4.1	2.60	0.01	1.3	5.1	128.2	512.8
325	16.8	3.6	2.31	0.01	1.4	5.8	144.4	577.7
350	17.7	3.4	2.18	0.02	1.5	6.1	152.8	611.4
375	17.0	4.7	2.96	0.01	1.1	4.5	112.6	450.4
400	16.8	5.4	3.49	0.01	1.0	3.8	95.4	381.6
425	17.5	5.3	3.37	0.01	1.0	4.0	99.0	396.0
450	19.2	4.1	2.56	0.01	1.3	5.2	130.4	521.5
475	19.5	4.3	2.68	0.01	1.2	5.0	124.3	497.1
500	19.2	5.0	3.17	0.01	1.1	4.2	105.2	420.9
525	18.9	5.7	3.70	0.01	0.9	3.6	90.0	359.9
550	19.2	5.8	3.82	0.01	0.9	3.5	87.2	348.9
575	19.8	5.6	3.64	0.01	0.9	3.7	91.7	366.7
600	20.8	4.9	3.12	0.01	1.1	4.3	106.9	427.8
625	21.4	4.8	3.00	0.01	1.1	4.4	111.0	443.9
650	20.9	5.6	3.64	0.01	0.9	3.7	91.6	366.4
675	20.6	6.2	4.17	0.01	0.8	3.2	79.8	319.4
700	20.9	6.2	4.15	0.01	0.8	3.2	80.4	321.4
725	22.1	5.4	3.44	0.01	1.0	3.9	96.9	387.6
750	22.6	5.1	3.26	0.01	1.0	4.1	102.3	409.3
775	22.1	5.9	3.90	0.01	0.9	3.4	85.5	341.8
800	21.8	6.4	4.41	0.01	0.8	3.0	75.5	302.0
825	22.3	6.3	4.23	0.01	0.8	3.2	78.8	315.3
850	23.1	5.7	3.72	0.01	0.9	3.6	89.5	358.2
875	23.9	5.2	3.30	0.01	1.0	4.0	101.0	404.2
900	24.0	5.3	3.38	0.01	1.0	3.9	98.7	394.9
925	24.0	5.6	3.60	0.01	0.9	3.7	92.5	370.1
950	23.9	5.9	3.90	0.01	0.9	3.4	85.6	342.3
975	24.1	5.9	3.88	0.01	0.9	3.4	85.9	343.7
1000	24.8	5.4	3.45	0.01	1.2	3.9	96.5	386.2

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Typical Antenna Calibration and Power Requirements at
3 Meter Spacing and 1000 Watts Maximum Continuous Power

Frequency (MHz)	Antenna Factor (dB)	Gain (dB)	Gain Numeric	FIELD STRENGTH (E V/m)			
				1 V/m	10 V/m	20 V/m	100 V/m
100	8.4	1.8	1.53	0.20	19.6	78.6	
125	8.8	3.4	2.17	0.14	13.8	55.4	
150	9.9	3.8	2.40	0.12	12.5	50.0	
175	10.4	4.7	2.95	0.10	10.2	40.6	
200	11.4	4.9	3.06	0.10	9.8	39.2	980.0
225	12.5	4.7	2.97	0.10	10.1	40.5	
250	15.0	3.1	2.06	0.15	14.5	58.2	
275	13.8	5.1	3.27	0.09	9.2	36.7	916.9
300	14.2	5.5	3.59	0.08	8.4	33.4	835.9
325	14.4	6.0	3.98	0.08	7.5	30.1	753.7
350	15.9	5.2	3.33	0.09	9.0	36.1	901.4
375	16.2	5.5	3.52	0.09	8.5	34.1	852.4
400	17.2	5.0	3.20	0.09	9.4	37.5	938.1
425	17.5	5.3	3.37	0.09	8.9	35.7	891.5
450	18.6	4.7	2.92	0.10	10.3	41.1	
475	18.7	5.0	3.19	0.09	9.4	37.6	940.8
500	18.9	5.2	3.34	0.09	9.0	35.9	897.5
525	19.0	5.6	3.61	0.08	8.3	33.2	830.6
550	19.6	5.4	3.45	0.09	8.7	34.8	868.9
575	19.8	5.6	3.61	0.08	8.3	33.3	831.5
600	20.2	5.6	3.65	0.08	8.2	32.9	822.1
625	20.6	5.5	3.56	0.08	8.4	33.7	842.1
650	20.9	5.5	3.58	0.08	8.4	33.5	838.2
675	21.3	5.5	3.58	0.08	8.4	33.5	837.8
700	21.2	5.9	3.87	0.08	7.7	31.0	774.5
725	21.8	5.6	3.64	0.08	8.2	33.0	824.5
750	22.1	5.6	3.64	0.08	8.2	32.9	823.2
775	22.1	5.9	3.89	0.08	7.7	30.8	770.5
800	22.0	6.3	4.22	0.07	7.1	28.4	710.8
825	22.4	6.1	4.07	0.07	7.4	29.5	736.3
850	23.3	5.5	3.53	0.09	8.5	34.0	850.3
875	23.9	5.2	3.28	0.09	9.1	36.5	913.7
900	24.2	5.1	3.26	0.09	9.2	36.8	919.5
925	24.3	5.2	3.34	0.09	9.0	35.9	898.6
950	24.6	5.2	3.27	0.09	9.2	36.6	916.1
975	24.6	5.4	3.43	0.09	8.7	35.0	873.9
1000	25.0	5.2	3.29	0.09	9.1	36.5	911.4

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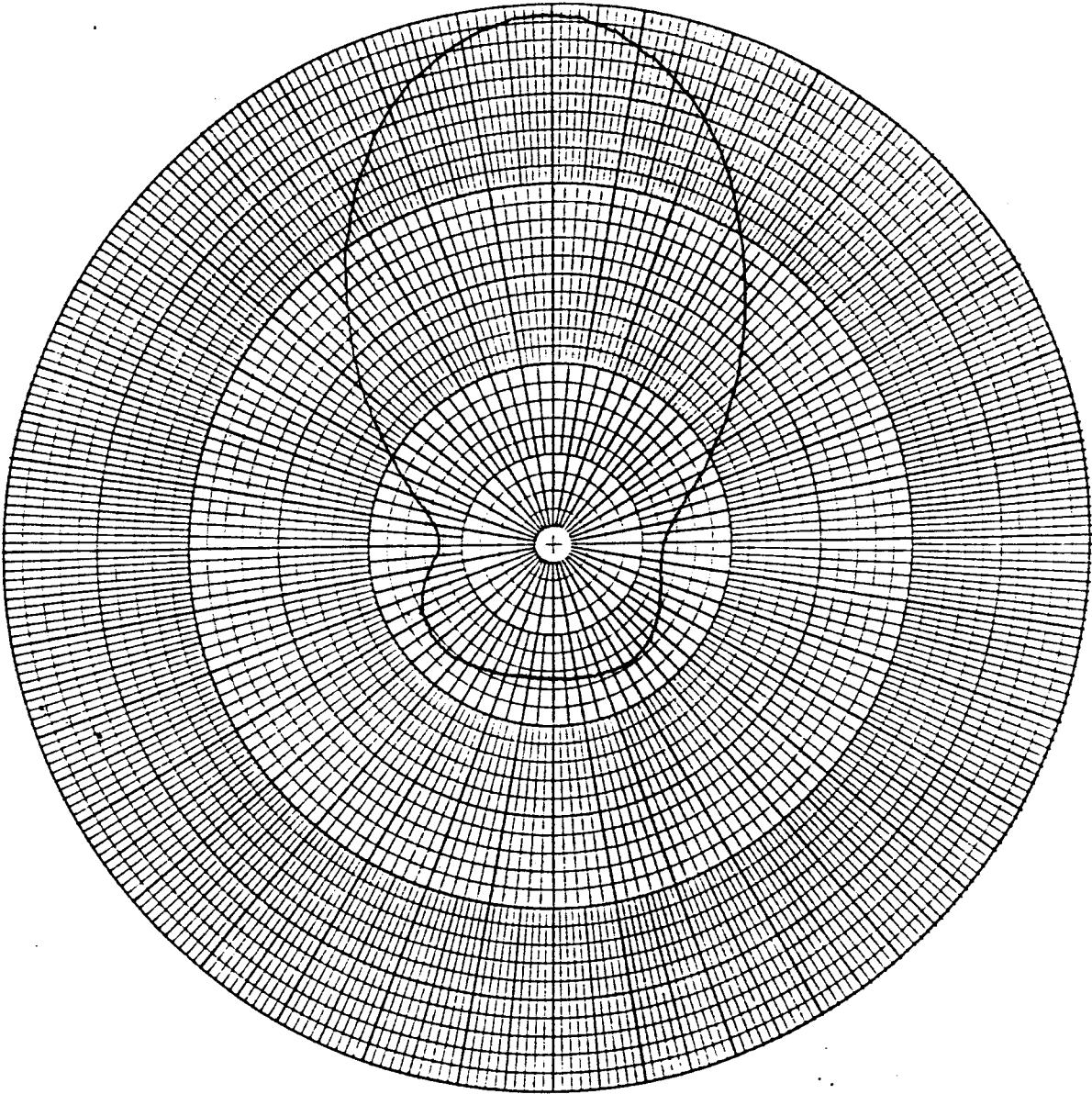
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EMCO Model No. 3145

Frequency: 200 MHz

Polarization: Horizontal

Antenna Axis: Parallel to Ground



Initials: FRU

Typical Antenna Radiation Pattern

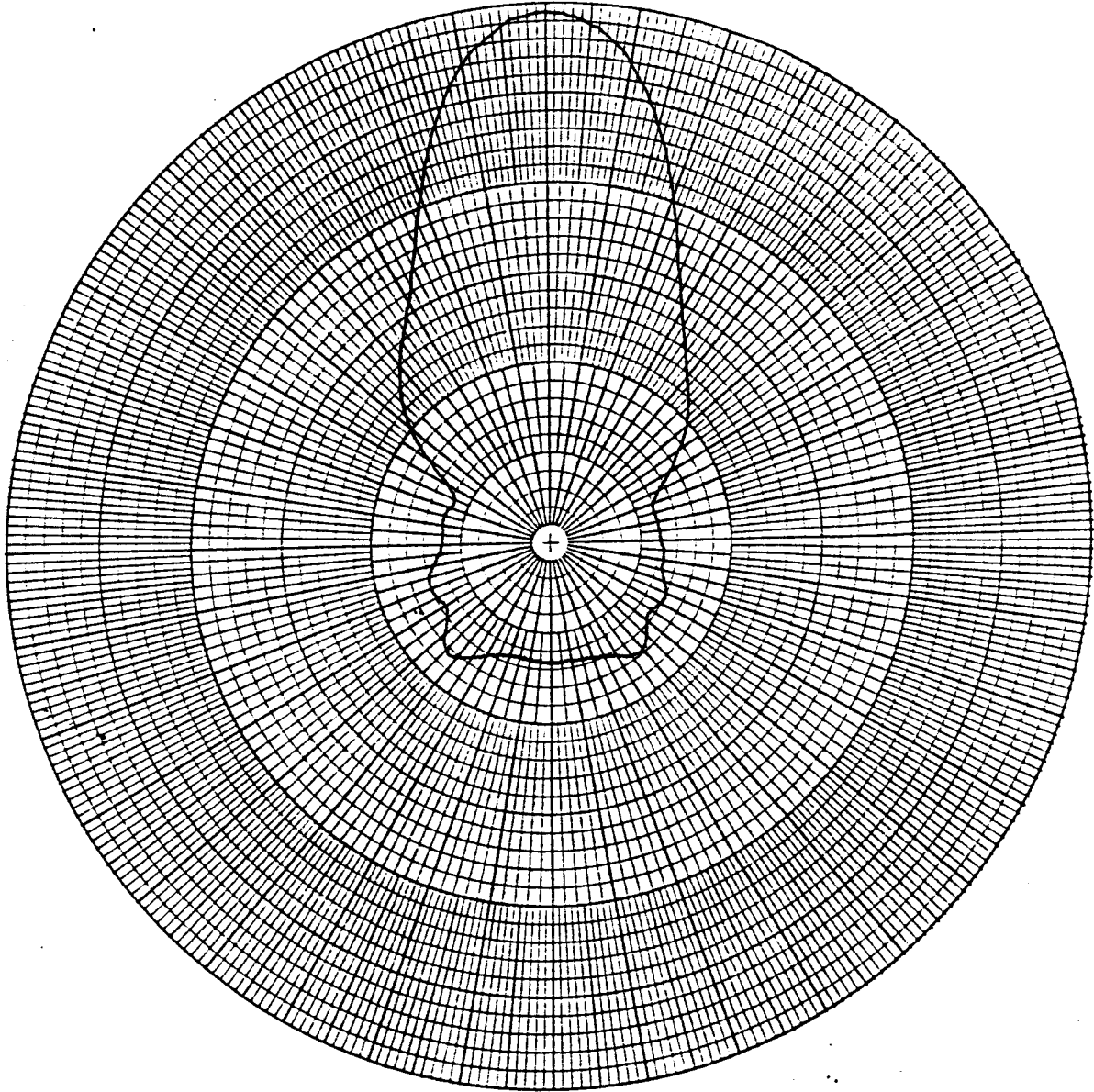
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EMCO Model No. 3145

Frequency: 500 MHz

Polarization: Horizontal

Antenna Axis: Parallel to Ground



Initials: FRU

Typical Antenna Radiation Pattern

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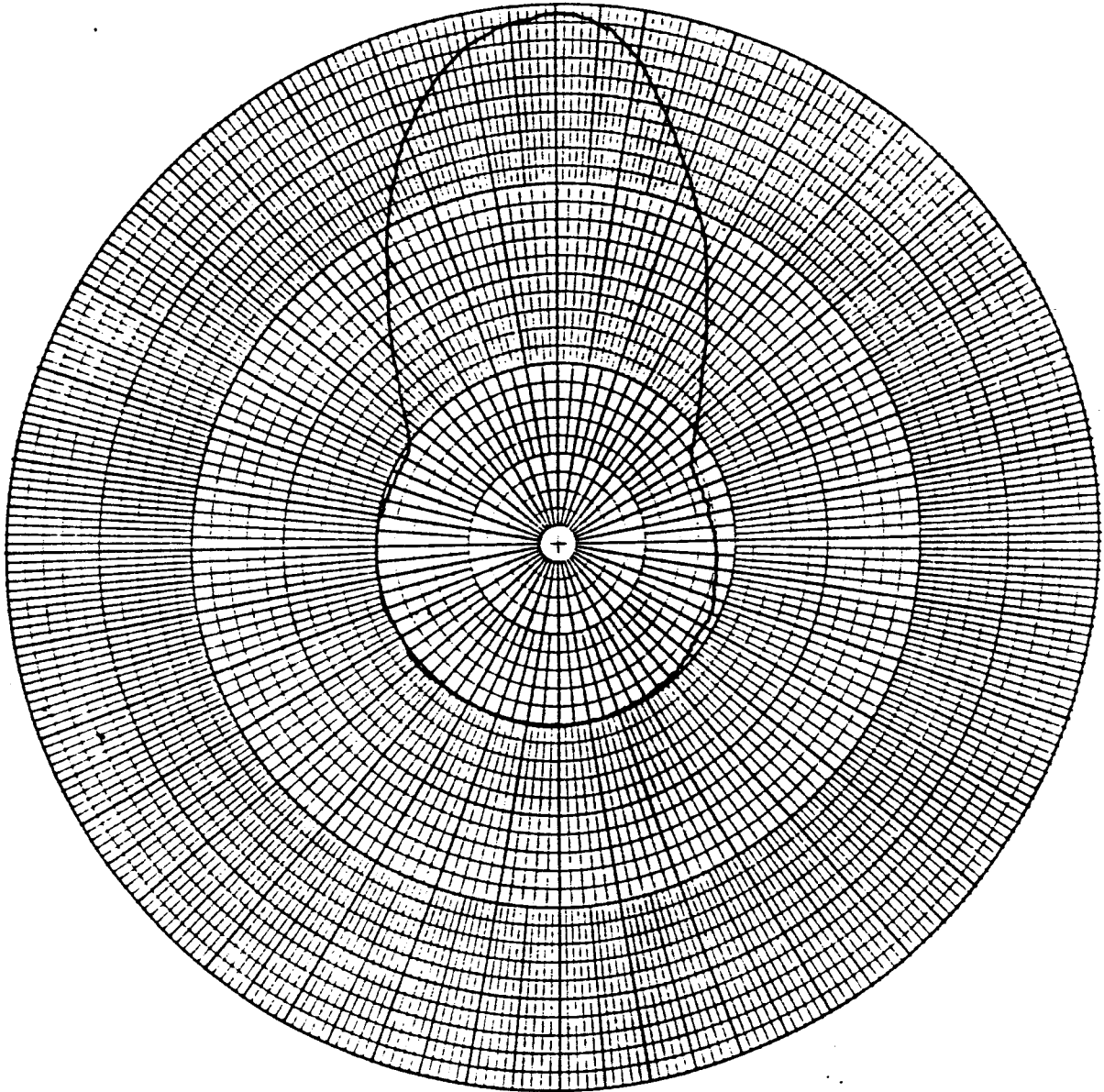
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EMCO Model No. 3145

Frequency: 1000 MHz

Polarization: Horizontal

Antenna Axis: Parallel to Ground



Initials: FRU

Typical Antenna Radiation Pattern

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WILTRON

300 NETWORK ANALYZER

MODEL: 3145
DEVICE:

DATE:
OPERATOR:

START: 0.1000 GHz
STOP: 1.0000 GHz
STEP: 0.0054 GHz

GATE START:
GATE STOP:
GATE:
WINDOW:

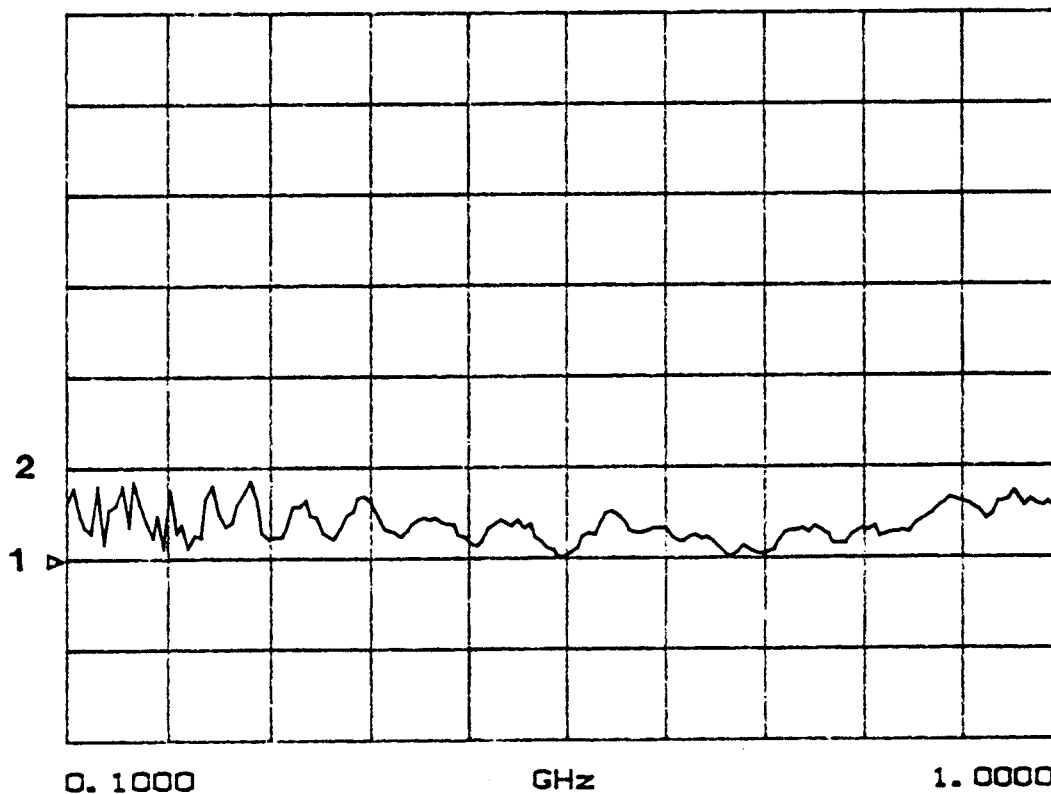
ERROR CORR: 1 - PATH
AVERAGING: 1 PTS
IF BNDWTH: REDUCED

S11 FORWARD REFLECTION

SWR

REF=1.000U

1.000U/DIV



TYPICAL VSWR VS FREQUENCY

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