



INSTRUCTION MANUAL

WIDEBAND DISCONE

ANTENNA

MODEL EM-6105-1

30 MHz - 3 GHz

INSTRUCTION MANUAL

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WIDEBAND DISCONE ANTENNA

30 MHz - 3 GHz

ELECTRO-METRICS

MODEL EM-6105-1

SERIAL NO: TYPICAL

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WARRANTY

This Model EM-6105-1 Wideband Discone Antenna is warranted for a period of 12 months (USA only) from date of shipment against defective materials and workmanship. This warranty is limited to the repair of or replacement of defective parts and is void if unauthorized repair or modification is attempted. Repairs for damage due to misuse or abnormal operating conditions will be performed at the factory and will be billed at our commercial hourly rates. Our estimate will be provided before the work is started.

DESCRIPTION AND USE ELECTRO-METRICS MODEL EM-6105-1 WIDEBAND DISCONE ANTENNA

1.0 Introduction

The Model EM-6105-1 Wideband Discone Antenna is a broadband Omni-Directional antenna that performs electric field measurements from 30 MHz to 3 GHz. With an output impedance of 50 Ω (nominal), it can be used with any 50 Ω instrument.

The EM-6105-1 consists of two separate antenna designs:

- a. An upper passive vertical rod antenna covering from 30 MHz to 200 MHz,
- b. A lower passive discone antenna covering from 200 MHz to 2 GHz.

A combiner circuit connects the two antenna outputs to a single Type "N" (male) output connector.

The bottom of the base has a 1/4-20 threaded receptacle for mounting to the Model EM-TRI-3022 Tripod or for mounting a bottom base plate for use on a flat surface.

2.0 Specifications

2.1 Electrical

Frequency Range:	30 MHz to 3 GHz.
Impedance:	50 Ω nominal.
Polarization:	Vertical.
Connector:	Type "N" (Female).

2.2 Mechanical

Height:	
W/o upper rods:	500 mm (19.7").
With upper rods:	1770 mm (69.7").
Length:	
Upper Antenna Rod:	2 sections each 635 mm (25.0"). Total length: 1270 mm (50").
Lower Radial Elements:	406 mm (16").

Diameter:

Stowed Configuration: 114 mm (4.5").

Deployed Configuration: 457 mm (18").

Antenna Disk:
(Counterpoise) 321 mm (12.6").

Weight: 2.95 kg (6.5 lbs).

3.0 EM-6105-1 Description

The EM-6105-1 consists of a vertical tube with a circular base and topped by a circular antenna disk. Below the antenna disk are the radial elements of the discone antenna while above the antenna disk is the vertical rod antenna.

3.1 Vertical Rod

Frequency Range: 30 MHz-200 MHz.

The upper vertical rod consists of a two (2) piece rod screw onto a threaded stud located on the top of the antenna housing and a removable circular aluminum antenna disk. The rod length is 1270 mm (50").

The circular antenna disk (counterpoise) forms the ground plane for the rod antenna.

The output of the rod antenna is applied to a combiner circuit in the base of the EM-6105-1.

3.2 Passive Discone

Frequency Range: 200 MHz-3 GHz.

The Passive Discone consists of sixteen (16) 406 mm (16") radial elements inserted in a circular pattern below the removable antenna disk.

The circular antenna disk (counterpoise) now forms the disk end of the discone antenna.

3.3 Combiner Circuit

The combiner circuit consists of two passive filters and coupling circuits:

- a. A low pass filter for the 30 MHz-200 MHz range (vertical rod).
- b. A high pass filter for the 200 MHz-3 GHz range (discone).

The filtered signals are then combined and applied to the RF Signal Output Connector.

3.4 RF Signal Out Connector

Type: "N", Male.

Function:

To connect the output of the EM-6105-1 to the RF Input Connector of the 50 Ω instrument being used.

4.0 Operating Procedure

4.1 Antenna Set-Up Procedure



EMD-6105-1 Antenna Assembled

(EM61051-3)



EM-6105-1 Antenna Components Disassembled

A-1.1 Antenna Set-Up Procedure

- a.** Mount the antenna base to the tripod being used. The antenna base is secured to the tripod by screwing it in a clockwise direction, as viewed from above.

If the antenna is to be used without a tripod on a flat surface, a base plate is provided in the kit. The base plate is equipped with a $\frac{1}{4}$ -20 mounting screw, and a similar procedure is followed to mount the base to the antenna.

- b.** Insert the antenna disk (counterpoise) over the three bushings on the top of the antenna disk support ring. Secure the antenna disk by sliding the latches in place.
- c.** Screw the two sections of the antenna rod together and then mount the assembled rod by screwing it onto the threaded stud on the top of the antenna.

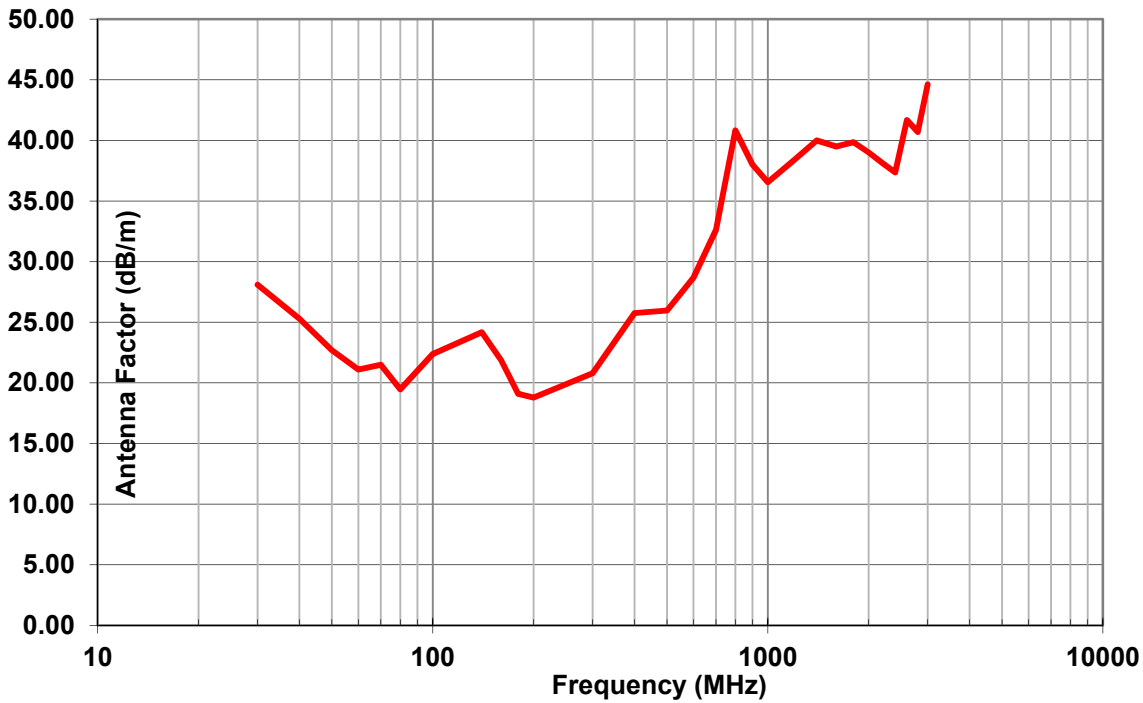
	EM-6105-1	
	ANTENNA	
FREQUENCY	FACTOR	GAIN
MHz	(dB/m)	dBi
30	30.00	-30.26
40	29.00	-26.76
50	27.00	-22.82
60	26.00	-20.24
70	25.00	-17.90
80	23.65	-15.38
100	21.80	-11.60
140	21.34	-8.22
160	21.55	-7.27
180	19.11	-3.80
200	24.52	-8.30
300	20.14	-0.40
400	25.34	-3.10
500	22.69	1.49
600	29.52	-3.76
700	31.63	-4.53
800	29.76	-1.50
900	31.79	-2.50
1000	31.24	-1.04
1200	32.03	-0.24
1400	32.63	0.50
1600	33.23	1.05
1800	37.73	-2.42
2000	37.23	-1.01
2200	39.28	-2.23
2400	43.50	-5.69
2600	42.46	-3.96
2800	42.18	-3.03
3000	45.37	-5.63

Figure 1

**Typical Gain And Antenna Factors
Model EM-6105-1
Wideband Discone Antenna**

1 Meter Calibration

EM-6105-1 Typical Antenna Factors



EM-6105-1 Typical Gain

