



INSTRUCTION MANUAL

PARABOLIC ANTENNA

MODEL MTA-60

1.0 GHz – 10.0 GHz

INSTRUCTION MANUAL

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PARABOLIC ANTENNA

1.0 GHz – 10.0 GHz

ELECTRO-METRICS

MODEL MTA-60

SERIAL NO: N/A

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WARRANTY

This Model MTA-60 Parabolic 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 MTA-60 PARABOLIC ANTENNA

1.0 Introduction

The Electro-Metrics Model MTA-60 Parabolic Antenna is a broadband directional antenna covering 1.0 GHz to 10.0 GHz. The Model MTA-60 was designed for use in TEMPEST measurements and specification compliance testing in conjunction with the Electro-Metrics EMC-60 Microwave Receiver or other microwave receivers.

The MTA-60 comprises a 0.457 m (18-inch) spun aluminum parabolic reflector with two interchangeable feed units, pyramidal log periodic and waveguide horn.

The parabolic reflector dish is spin formed from an aluminum sheet to the correct parabolic shape required for the reflector. Three brackets on the inside face of the reflector support the antenna feed mounting plate. A metal rod at the center rear of the dish, with three additional support brackets, mounts the parabolic dish to the gimbaled tripod mounting bracket. Two adjustments allow the antenna to be positioned vertically and rotated 360° about its center axis. In addition, by loosening the tripod holding fastener on the tripod, the entire antenna and bracket can be rotated 360° in the horizontal plane.

The MTA-60 uses two types of feed units (both supplied with each antenna):

- a. Pyramidal Log Periodic,
- b. Waveguide Horn.

The pyramidal log periodic consists of two log periodic arrays which are fastened to a V-shaped frame. A piece of rigid coaxial cable, with the ground shield connected to one log periodic array and the center conductor connected to the other array, is at the center of the arrays and connected to a Type "N" (female) connector at the bottom of the feed unit.

The waveguide horn consists of a piece of copper waveguide, open at one end, with a female type "N" connector at the feed mounting plate end.

The pyramidal log periodic is utilized for normal use, with the waveguide horn used when the highest possible gain is required above 5 GHz. The feed unit selected is secured to the feed mounting plate using four knurled brass finger screws.

Each Model MTA-60 Antenna is individually calibrated during the manufacturing process. The antenna factor, apparent gain (at 1 meter from the outside lip of the antenna dish) and VSWR are checked and presented in the chart on Page 6. The chart contains the calibration data for both feeds supplied with the antenna, pyramidal log periodic and waveguide horn. Significant errors will result if the wrong factors are used.

The antenna factor should be used in specification compliance testing to convert the receiver reading, in dB(μ V), to field strength, in dB(μ V/m). The conversion is accomplished by adding the antenna factor in dB(m^{-1}) to the receiver reading in dB(μ V).

2.0 Specifications

2.1 Electrical

Frequency Range (Calibrated):	1 GHz to 10 GHz. (Antenna Factor Chart furnished with each antenna.)
VSWR:	≤2.6:1 (typical).
Gain (average):	8 dB @ 1 GHz 26 dB @ 10 GHz
Beamwidth (average):	approx. 45° @ 1.0 GHz approx. 6° @ 10 GHz
Input Impedance:	Calibrated for use in a 50Ω system.
Feeds:	Pyramidal Log Periodic (LPV). Waveguide Horn.

(NOTE: Both types of feed supplied with each antenna.)

Connector (both feeds):	Type N, female.
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2.2 Mechanical

Parabolic reflector diameter:	457 mm (18").
Weight (approx.):	4 kg (9 lbs).

3.0 Operating Procedure

3.1 Antenna Set-Up Procedure

- a. Mount the antenna assembly to the Model TRP-136 Tripod and secure it using the tripod holding fastener (screw in fastener in a clockwise direction, as viewed from above).

NOTE: If the EMC-60 Microwave Receiver is being used, the MTA-60 can be mounted to the AMT-60 Antenna Mount/Remoteable RF Tuner support unit. This will permit a short cable connection between the antenna and the RF Tuner Input.

- b. Position the antenna as required, vertically and horizontally, using the adjustments on the gimballed tripod mounting bracket. The antenna should be located so that it is fully illuminated by the signal. For most tests, the antenna should be located 1 meter from the EUT (Equipment Under Test).

NOTE: The 1 meter distance from the EUT (Equipment Under Test) is measured from the EUT to the outside lip of the parabolic reflector dish.

- c. Connect the microwave signal feed cable being used from the "Signal Out" Type N Connector on the antenna feed to the "RF Input" Connector of the microwave receiver being used (Electro-Metrics Model EMC-60 or equivalent).

3.2 Antenna Operation

For quantitative radiated measurements, the MTA-60 is normally mounted on the TRI-136 Tripod and located such that the antenna dish is fully illuminated by the signal.

For field strength measurements, the site chosen should be relatively free from trees, power/telephone lines, metal fences, buildings, etc which could distort the field strength patterns.

For the majority of radiated measurements, the wide bandwidth pyramidal log periodic feed will provide the sensitivity required. For those cases where the highest possible gain is required above 5 GHz, the waveguide horn is used. The antenna dish can be adjusted vertically and rotated 360° using the adjustments on the tripod mounting bracket.

To convert the two-terminal microwave receiver meter reading to the equivalent E-Field reading, add the antenna factor in dB (m^{-1}) to the meter reading in dB(μV) to obtain the E-Field strength reading in dB($\mu V/m$).

**GAIN, VSWR, ANTENNA FACTORS
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PARABOLIC ANTENNA
MODEL MTA-60
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