INSTRUCTION MANUAL

BROADBAND DIPOLE

ANTENNA

MODEL BDA-30

20 MHz – 200 MHz

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BROADBAND DIPOLE ANTENNA

20 MHz – 200 MHz

ELECTRO-METRICS

MODEL BDA-30

SERIAL NO: N/A

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WARRANTY

This Model BDA-30 Broadband Dipole 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 BDA-30 AND MODEL BDA-30S BROADBAND DIPOLE ANTENNA

1.0 Description BDA-30

The BDA-30 Broadband Dipole Antenna performs electric field measurements and measure field strength intensities from 20 MHz to 200 MHz. The BDA-30 is designed to perform essentially like a tuned dipole antenna that is the reference antenna for both FCC and VDE measurements above 30 MHz. Therefore, the results obtained using the BDA-30 correlate to those obtained using a tuned dipole antenna.

The antenna operates with three fixed dipole lengths and is furnished with two sets of extension elements that vary the frequency coverage of the antenna as follows:

a. 480 mm (19") main elements: 100-200 MHz,

b. 530 mm (21") elements: 45-100 MHz,

c. 910 mm (36") elements: 20-45 MHz.

The element rods are 25 mm (1") in diameter to provide lower Q, resulting in improved broadband sensitivity.

A balum transformer, located within the dipole mounting, transposes the balanced dipole to unbalanced coaxial line. The impedance presented to the 50-ohm coaxial line is slightly mismatched to provide optimum broadbanding of its reception characteristics.

The pickup pattern of the antenna is a figure-8 pattern with two equal lobes with axes 180 ° spaced and both perpendicular to the dipole elements. This a convertional pattern for a half-wave dipole.

An antenna factor graph for the BDA-30 is included showing the antenna factor to be added to the two-terminal 50Ω analyzer/receiver meter reading to determine the field strength intercepted by the dipole.

The antenna is statically balanced and eqipped with an antenna adapter mount (AMT-30) that attaches to the TRI-136 Tripod.

2.0 Description BDA-30S

The BDA-30S antenna is identical to the standard BDA-30 except for having only one fixed set of elements. Each element is 875 mm (34.5") in length providing an overall dipole length of 1.8 m (74.5") tip-to-tip.

The antenna combines the simplicity of a single set of elements with an optimum balance between short elements (high antenna factor) and long elements (low antenna factor). It is designed for convient use within shielded rooms or at in-field open-area site testing. A separate antenna factor chart is included for the BDA-30S.

3.0 Specifications

3.1 BDA-30

3.1.1 Elecrical

Frequency Range:	20-200 MHz.
(Refer to Figure 1 for the Antenna Factor Chart)	
Impedance:	Matched to 50 ohms.
Output Connector:	TNC.

3.1.2 Mechanical

Length (Tip-To-Tip):	With 480 mm (19") elements: 1.1 m (43.5") With 530 mm (21") elements: 1.2 m (47.5") With 910 mm (36") elements: 2.0 m (77.5")
Weight:	4 kg (9 lbs).

3.2 BDA-30S

3.2.1 Electrical

Frequency Range:	20-200 MHz.
(Refer to Figure 2 for the Antenna Factor Chart)	
Impedance:	Matched to 50 ohms.
Output Connector:	TNC.

3.2.2 Mechanical

Length (Tip-To-Tip):	With 875 mm (34.5") fixed elements: 1.8 m (74.5").
Weight:	4 kg (9 lbs).

4.0 Operating Procedure

NOTE: The following procedure applies to both the BDA-30 and BDA-30S.

4.1 Setup

a. Mount the black bakelite antenna base to the TRI-136 Tripod by screwing it clockwise (as viewed from above). Check that the legs of the tripod are properly extended and secured to provide a stable platform for the antenna.

b. Insert the boom clamp onto the antenna boom and slide it approximately half-way towards the elements. Clamp it to the boom so that the mounting shaft is perpendicular to the plane including the boom and elements.

c. Slip the mounting shaft into the antenna base that was previously mounted to the tripod in Step a.

d. Connect the coaxial cable between the TNC connector on the BDA-30 and the RF Input connector of the analyzer/receiver.

e. Select the dipole length required for the frequency range being measured. The main and extender elements screw into each other and vary the frequency coverage of the antenna as follows:

1) 480 mm (19") main elements only: 100-200 MHz,

2) With 530 mm (21") elements added: 45-100 MHz,

3) With 910 mm (36") elements added: 20-45 MHz.

NOTE: If the BDA-30S antenna is being used, Step e is omitted. Proceed to Directly to Step f.

f. Position the antenna as required by the test method being employed. The antenna is now ready for use.

4.2 Narrowband Radiated Signal Measurements

With the Model BDA-30 Broadband Dipole Antenna, connected to the analyzer/receiver as described above, tune the analyzer/receiver to the frequency range of interest. Read the two-terminal voltage indicated by the analyzer/receiver for the particular signal of interest.

To convert the resulting two-terminal reading to the appropriate field strength when using the BDA-30, add the "antenna factor in **"dB"** at the frequency of interest from the Antenna Factor Chart for the antenna being used.

Example:

SIGNAL AMPLITUDE INDICATION.....+20 dB(µV)
Two-terminal voltage indication is thus.....+20 dB(µV)
Antenna factor from graph (typical).....+10 dB
Field Strength intercepted by antenna is.....+30 dB(µV/m)

4.3 Broadband Radiated Signal Measurements

After determining that the signal is truly a broadband signal (refer to Section II Para. 2.4.7 EMC-30 Manual for a method of Broadband/Narrowband signal determination), proceed to determine the correct two-terminal broadband level using the calibration and operating procedures for the receiver/ analyzer being used.

To convert the resulting two-terminal reading to the appropriate broadband field strength when using the BDA-30, add the **"antenna factor in dB"** at the frequency of interest from the Antenna Factor Chart for the antenna being used.

Example:

SIGNAL AMPLITUDE INDICATION.....+20 dB(µV)
Broadband Conversion Factor.....+60 dB(µV/MHz)
Two-terminal broadband signal level.....+80 dB(µV)
Antenna factor from graph (typical).....+10 dB
Broadband Field Strength.....+90 dB(µV/MHz)

Figure 1

Antenna Factor BDA-30

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Figure 2

Antenna Factor BDA-30s

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