

# **BICONICAL ANTENNA**

30 - 300 MHz

**MODEL AB-100 / AB-900**

# WARRANTY

All equipment manufactured by **Com-Power Corporation** is warranted against defects in material and workmanship for a period of two (2) years from the date of shipment. Com-Power Corporation will repair or replace any defective item or material if notified within the warranty period.

You will not be charged for warranty service performed at our factory. You must, however, prepay inbound shipping costs and have a return authorization.

This warranty does not apply to:

- a) products damaged during shipment from your plant or ours.
- b) improperly installed products.
- c) products operated outside their specifications.
- d) improperly maintained products.
- e) products which have been modified.
- f) normal wear of material.
- g) calibration.

Any warranties or guarantees, whether expressed or implied, that are not specified set forth herein, will not be considered applicable to any equipment sold or otherwise furnished by Com-Power Corporation. Under no circumstances does Com-Power Corporation recognize or assume any liability for any loss, damage or expense arising either directly or indirectly from the use or handling of products manufactured by Com-Power Corporation, or any inability to use them separately or in combination with other equipment or material.

The warranty is void if items are shipped outside the United States, without prior approval of Com-Power Corporation.

## **Warranty Limitations**

The above warranty shall not apply to defects resulting from improper or inadequate maintenance by the buyer, unauthorized modification or misuse, operation exceeding specifications, or improper site preparation.

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## SAFETY PRECAUTIONS

The model AB-100 and model AB-900 Biconical antennas were designed for use in an EMI laboratory to measure and / or generate electric (E) field strength.

### **Test Operator and Test Location:**

The Model AB-900 antenna should be operated by trained personnel in the field of EMC for the purpose of generating electromagnetic fields. The Test location should be selected to avoid interference to other equipment and exposure of personnel to high electromagnetic fields.

### **Maintenance and Service:**

There are no user serviceable parts inside the balun. Do not remove the instrument cover. **Com-Power** provides calibration service for all equipment sold. Call the factory if calibration or other service is required.

## *About this Manual*

This manual provides instructions for testing and using the Biconical Antennas model AB-900.

Information contained in this manual is the property of Com-Power Corporation. It is issued with the understanding that none of this material may be reproduced or copied without written permission from Com-Power.

### **If You Need Assistance**

If you encounter problems while using the Model AB-100 or Model AB-900, contact Com-Power Corporation at (949) 587-9800.

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# General Information

# 1

This section includes the following:

- a) Introduction
  - b) General Description
  - c) Specifications
  - d) Equipment Supplied
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## 1.1 Introduction

This section contains general description of the biconical antennas Model AB-900. This section also contains general performance, background information and technical information about the antennas.

## 1.2 General Description

The Biconical Antenna is a broadband transducer which converts Electric field strength in dBuV/m to Volts. The Model AB-900 biconical antenna was specifically designed for radiated EMI measurement over a wide frequency range. It can also be used for transmitting during susceptibility testing.

Further information on the Biconical Antenna is given in Section 3.

## 1.3 Equipment Specifications

The functional and operational characteristics of the Model AB-900 biconical antenna are listed in Table 1.1

## 1.4 Equipment, Accessories, and Documents Supplied

Equipment, accessories, and documents supplied with the Model AB-100/AB-900 Biconical Antennas are as follows:

- a) One (1) Biconical Antenna balun
  - b) Two (2) Conical Elements
  - c) User's Guide
  - d) Calibration information
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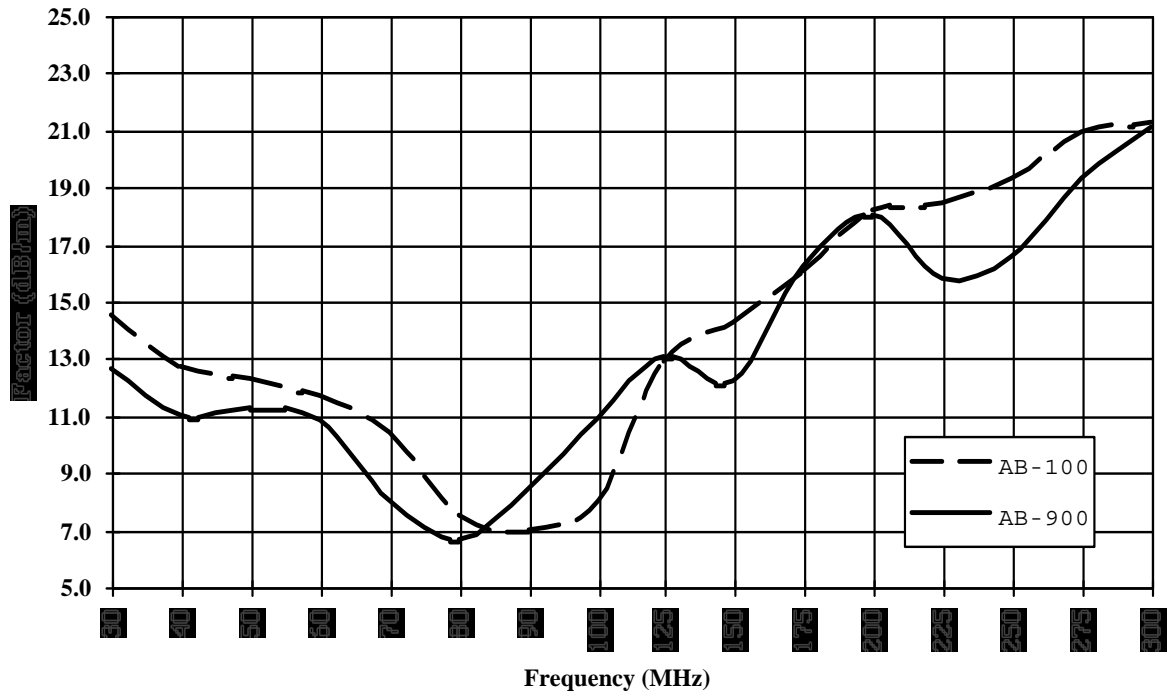
**Figure 1.1 Biconical Antenna (w/ tripod AT-100)**

**Table 1.1 Equipment Specifications**

<b>Model:</b>	<b>AB-100/AB-900</b>
Frequency Range:	30 - 300 MHz
Impedance:	50 ohms, nominal
Connector:	BNC type (female)
Power Handling:	50 Watts CW (AB-900 only)
Operating Temp:	0°- 40° C (ambient)
Weight:	7 lbs.
Dimensions:	
Length	57 inches max. end-to end
Diameter	22 inches



Figure 1.2

**Biconical Antenna Factors (typical)**

# Setup Procedure

# 2

This section explains the following:

- a) Introduction
- b) Setup

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## 2.0 Introduction

This section describes antenna setup and mounting for EMI measurement.

### 2.1 Antenna Setup

#### 2.1.1 Connecting

The Model AB-100 and Model AB-900 biconical antennas have BNC (f) connectors. The AB-100 connector is for antenna output only; the BNC connector in Model AB-900 biconical antenna is used for both signal input and output.

#### 2.1.2 Antenna setup for receiving signals

The Model AB-100 or Model AB-900 antenna can be used to measure EMI from an equipment under test (EUT). The antenna is mounted on either an antenna mast (Model AM-400) or an antenna tripod. The antenna balun has 1/4 inch x 20 threaded hole for mounting on AT-100 tripod or any similar tripod. A cable is used to connect the antenna to the a measureing instrument. If a long cable is used, cable loss must be measured and used in calculating the field strength.

#### 2.1.3 Antenna setup for transmitting signals

The Model AB-900 antenna can be used to receive and transmit signals. The antenna is mounted on either on an antenna mast (Model AM-400 antenna mast ) or antenna tripod (Model AT-100). To transmit signals, the antenna is connected to a signal generator and power amplifier. The Model AB-900 biconical antenna can transmit up to 50W continious power. The field generated by the antenna can be measured by using a field strength meter.

### **2.1.3 Test location**

The biconical antenna must be mounted and placed in area away from other conductive objects or materials when in use. Large conductive building, structures and electrical cables, can reflect emissions of the equipment under test, causing errors in the test data. In addition, care should be taken to keep measuring instruments and test personnel away from the test area to avoid interference to the test, and exposure of test personnel to electromagnetic fields.

# *Theory of Operation*

# 3

This chapter explains the following:

- a) Overview
- b) Theory of Operation

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## 3.0 Overview

This section describes the theory of operation of the AB-100 / AB-900 Biconical Antennas.

## 3.1 Theory of Operation

Broadband antennas allow measurement of signals over a wide frequency range. These antennas do not require any tuning or balun switching during measurement. It is very useful for sweep measurement over the frequency range of operation. Model AB-900 and AB-100 Biconical Antennas are broadband antennas that operate in the frequency range of 30 MHz to 300 MHz.

Model AB-100 antenna is a receive only antenna. It cannot transmit signals. However, Model AB-900 antenna can both receive and transmit signals over the frequency range of operation. Model AB-900 antennas are used for susceptibility and emissions testing in EMC Laboratories.

Before the Biconical antennas are used for measurement they have to be calibrated. Typically antenna calibration is performed in an open field test site (OATS). During calibration a known field strength (dBuV/m) is generated around the antenna at each frequency (30 -300 MHz). The difference between field strength (dBuV) received by the antenna and known field strength generated ( dBuV) is the antenna factor (dB) for that frequency. During EMC testing the antenna factor for the frequency of interest is added back to reading on the EMI meter or spectrum analyzer to measure field strength.

$$\text{dBuV/m (field strength)} = \text{dBuV (output measured)} + \text{Antenna Factor}$$