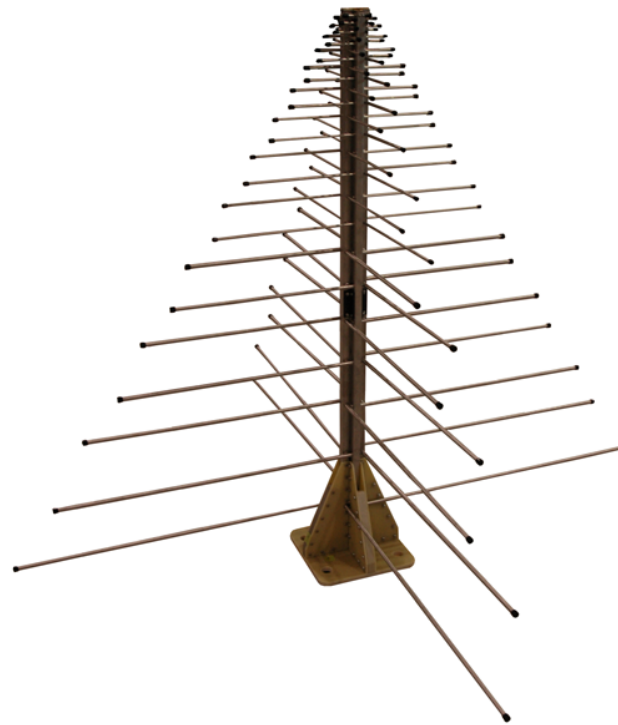


*Model 3145BDP*

# Dual-Polarized Log-Periodic Dipole Array

User Manual



ETS-Lindgren L.P. reserves the right to make changes to any product described herein in order to improve function, design, or for any other reason. Nothing contained herein shall constitute ETS-Lindgren L.P. assuming any liability whatsoever arising out of the application or use of any product or circuit described herein. ETS-Lindgren L.P. does not convey any license under its patent rights or the rights of others.

**© Copyright 2007–2008 by ETS-Lindgren L.P. All Rights Reserved. No part of this document may be copied by any means without written permission from ETS-Lindgren L.P.**

Trademarks used in this document: The *ETS-Lindgren* logo is a trademark of ETS-Lindgren L.P.

#### Revision Record

**MANUAL,3145BDP,LOG PERIODIC,DUAL-POLARIZED | Part #399803, Rev. A**

Revision	Description	Date
1	Custom Release	September, 2007
A	Standard Release; rebrand	June, 2008


# Table of Contents

<b>Notes, Cautions, and Warnings</b> .....	<b>v</b>
<b>1.0 Introduction</b> .....	<b>7</b>
Model 3145BDP Optional Items .....	7
ETS-Lindgren Product Information Bulletin .....	9
<b>2.0 Maintenance</b> .....	<b>11</b>
Annual Calibration .....	11
Replacement and Optional Parts .....	11
Service Procedures .....	12
<b>3.0 Specifications</b> .....	<b>13</b>
Electrical Specifications .....	13
Physical Specifications .....	13
<b>4.0 Practical Application</b> .....	<b>17</b>
<b>5.0 Mounting the Model 3145BDP</b> .....	<b>19</b>
Model 3145BDP Base .....	19
Model 3145BDP Mounting Diagram .....	21
<b>6.0 Typical Data</b> .....	<b>23</b>
Model 3145BDP Antenna Factor .....	23
Model 3145BDP Gain .....	24
<b>Appendix A: Warranty</b> .....	<b>25</b>

This page intentionally left blank.

## Notes, Cautions, and Warnings

---

	<p><b>Note:</b> Denotes helpful information intended to provide tips for better use of the product.</p>
<p><b>CAUTION</b></p>	<p><b>Caution:</b> Denotes a hazard. Failure to follow instructions could result in minor personal injury and/or property damage. Included text gives proper procedures.</p>
<p><b>WARNING</b></p>	<p><b>Warning:</b> Denotes a hazard. Failure to follow instructions could result in SEVERE personal injury and/or property damage. Included text gives proper procedures.</p>



See the ETS-Lindgren *Product Information Bulletin* for safety, regulatory, and other product marking information.

This page intentionally left blank.

## 1.0 Introduction

---

The **ETS-Lindgren Model 3145BDP Dual-Polarized Log-Periodic Dipole Array** is a dual linearly polarized, broadband antenna designed to operate over the frequency range of 100 MHz to 1.1 GHz. The precise design of the feed and positioning of the elements on the boom yields optimum phase relationship. This causes the active region, at any given frequency, to propagate RF energy towards the smaller elements, leaving the elements behind it electrically dead. The constant gain of the antenna yields an antenna factor which varies linearly with frequency. The variation is smooth; therefore, accurate interpolation of performance between specified frequency points is simple.

The Model 3145BDP is manufactured from stainless steel, making it ideal for prolonged outdoor use. A high resistance to oxidation and corrosion enables the antenna to withstand a harsh operating environment. For a lighter-weight antenna for indoor use, the Model 3145BDP may also be manufactured from aluminum. Contact the ETS-Lindgren Sales Department for information on custom antennas.

The Model 3145BDP is calibrated at 10 m per ANSI C63.5. Actual antenna factors and a signed *Certificate of Calibration Conformance* are included with the antenna.

### **Model 3145BDP Optional Items**

---

The base of the Model 3145BDP features four mounting holes and two Type N connectors. The holes may be used to mount the antenna to the optional **ETS-Lindgren 109620 Pedestal**, or to a customer-defined mounting solution.

The 109620 pedestal is a wheeled positioning system that provides tilt adjustment and horizontal and vertical polarization. A pneumatic cylinder is used to change polarization, and can be controlled remotely using an optional **ETS-Lindgren Model 2090 Multi-Device Controller** (or next generation ETS-Lindgren controller, if applicable).

For information on ordering optional items, contact ETS-Lindgren.



*109620 pedestal shown with mounted ETS-Lindgren Model 3159 antenna*

See *Mounting the Model 3145BDP* on page 19 for more information.



## **ETS-Lindgren Product Information Bulletin**

---

See the ETS-Lindgren *Product Information Bulletin* included with your shipment for the following:

- Warranty information
- Safety, regulatory, and other product marking information
- Steps to receive your shipment
- Steps to return a component for service
- ETS-Lindgren calibration service
- ETS-Lindgren contact information

This page intentionally left blank.

## 2.0 Maintenance

---

### CAUTION

Before performing any maintenance, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.



Maintenance of the Model 3145BDP is limited to external components such as cables or connectors.

If you have any questions concerning maintenance, contact ETS-Lindgren Customer Service.

### Annual Calibration

---

See the *Product Information Bulletin* included with your shipment for information on ETS-Lindgren calibration services.

### Replacement and Optional Parts

---

Following are the part numbers for ordering replacement or optional parts for the Model 3145BDP Dual-Polarized Log-Periodic Dipole Array.

Part Description	Part Number
Element, 0.99 L, 1/4 OD x .065 WT, SS	111763-1
Element, 1.17 L, 1/4 OD x .065 WT, SS	111763-2
Element, 1.37 L, 1/4 OD x .065 WT, SS	111763-3
Element, 1.60 L, 1/4 OD x .065 WT, SS	111763-4
Element, 1.86 L, 1/4 OD x .065 WT, SS	111763-5
Element, 2.16 L, 1/4 OD x .065 WT, SS	111763-6
Element, 2.50 L, 1/4 OD x .065 WT, SS	111763-7

Part Description	Part Number
Element, 2.89 L, 1/4 OD x .065 WT, SS	111763-8
Element, 3.32 L, 1/4 OD x .065 WT, SS	111763-9
Element, 3.81 L, 1/4 OD x .065 WT, SS	111763-10
Element, 4.38 L, 1/4 OD x .065 WT, SS	111763-11
Element, 5.02 L, 1/4 OD x .065 WT, SS	111763-12
Element, 5.75 L, 1/4 OD x .065 WT, SS	111763-13
Element, 6.57 L, 1/4 OD x .065 WT, SS	111763-14
Element, 7.51 L, 1/4 OD x .065 WT, SS	111763-15
Element, 8.58 L, 1/4 OD x .065 WT, SS	111763-16
Element, 9.80 L, 1/4 OD x .065 WT, SS	111763-17
Element, 11.18 L, 1/4 OD x .065 WT, SS	111763-18
Element, 12.62 L, 1/4 OD x .065 WT, SS	111763-19
Element, 14.40 L, 3/8 OD x .083 WT, SS	111764-1
Element, 16.40 L, 3/8 OD x .083 WT, SS	111764-2
Element, 18.70 L, 3/8 OD x .083 WT, SS	111764-3
Element, 21.34 L, 3/8 OD x .083 WT, SS	111764-4
Element, 24.31 L, 3/8 OD x .083 WT, SS	111764-5
Element, 27.68 L, 3/8 OD x .083 WT, SS	111764-6
Element, 31.52 L, 3/8 OD x .083 WT, SS	111764-7

### **Service Procedures**

---

For the steps to return a system or system component to ETS-Lindgren for service, see the *Product Information Bulletin* included with your shipment.

### 3.0 Specifications

---

#### Electrical Specifications

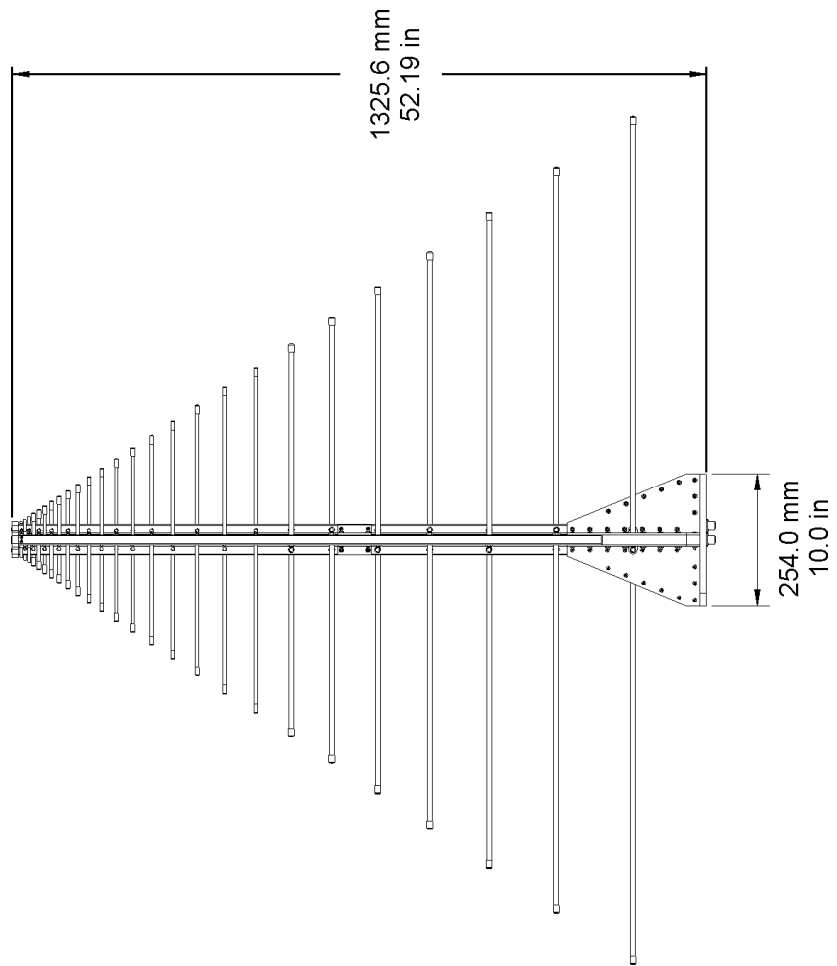
---

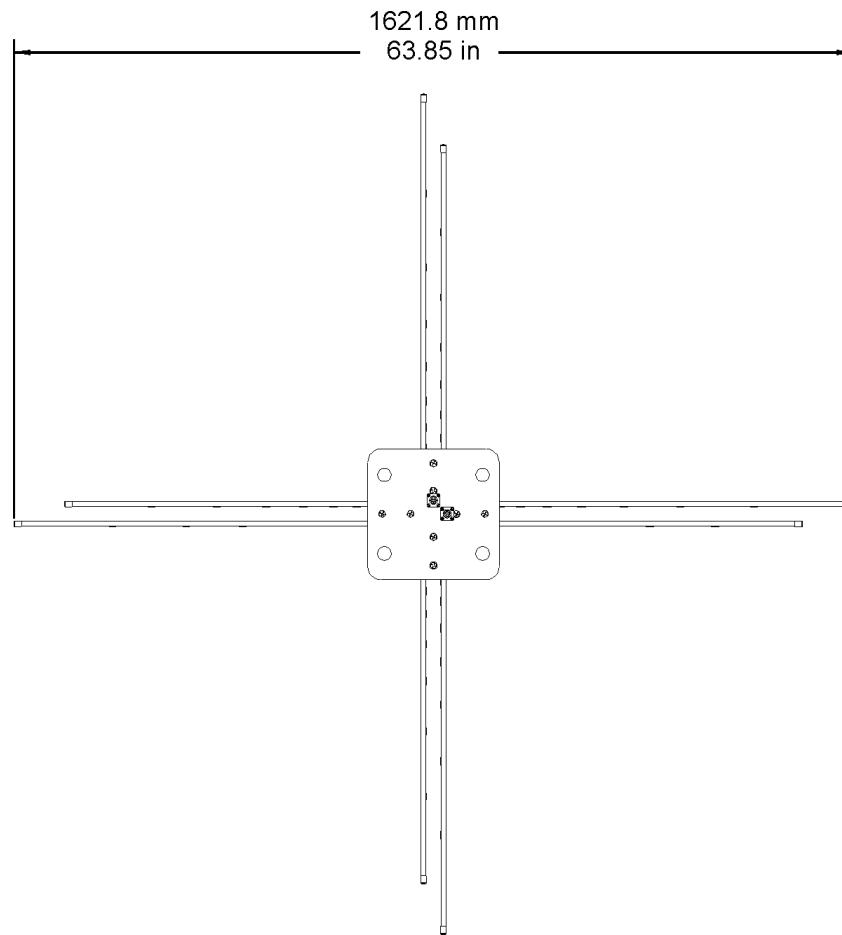
<b>Frequency Range:</b>	100 MHz – 1.1 GHz
<b>Input Impedance:</b>	50 $\Omega$
<b>VSWR:</b>	<ul style="list-style-type: none"><li>• Average – 1.5:1</li><li>• Maximum – 3.5:1 *</li></ul> <p>* At the extremes of the operational band.</p>
<b>CW Power:</b>	1000 W
<b>Connectors:</b>	Type N female (2)

#### Physical Specifications

---

Antenna	
<b>Height:</b>	1325.6 mm 52.19 in
<b>Width:</b>	1621.8 mm 63.85 in
<b>Weight:</b>	40.144 lb 18.2 kg
Base	
<b>Dimensions:</b>	254.0 mm x 254.0 mm 10.0 in x 10.0 in





This page intentionally left blank.



## 4.0 Practical Application

---

Horizontal and vertical polarizations are easily accomplished with the Model 3145BDP. Due to the length of the low-frequency elements, users should verify element clearance prior to switching the antenna to vertical polarization. Contact with any metal or non-metallic structure can capacitively load the antenna which may cause inconsistent results. Make sure that no part of the dipole elements are in contact with the tower, particularly in vertically-polarized tests. Where possible, run the feed cable straight back at least one meter or more from the Model 3145BDP before dropping vertically.

For emissions measurements, electric field strength in **dB[V/m]** is obtained from:

$$E(\text{dBV} / \text{m}) = V(\text{dBV}) + AF(\text{dB} / \text{m}) + \alpha(\text{dB})$$

**V** = receiver or spectrum analyzer voltage reading

**AF** = antenna factor

**$\alpha$**  = cable loss, if cable losses are non-negligible

For immunity testing, the electric field strength generated at a distance **d** can be approximated by:

$$E(\text{V} / \text{m}) = \frac{\sqrt{30pg}}{d}$$

**d** = in meters

**g** = numeric gain (10G[dB]/10)

**p** = antenna net input power, in watts

Actual transmitted field strength should be verified using an ETS-Lindgren HI-6005 electric field probe, or equivalent. For IEC 1000-4-3 testing, the antenna tip can be placed at any distance between one and three meters from the EUT as long as the reference plane is illuminated according to the 0, +6 dB uniform field specification. In general, closer distances require less power to create a given field strength.

This page intentionally left blank.

## 5.0 Mounting the Model 3145BDP

---

### **CAUTION**

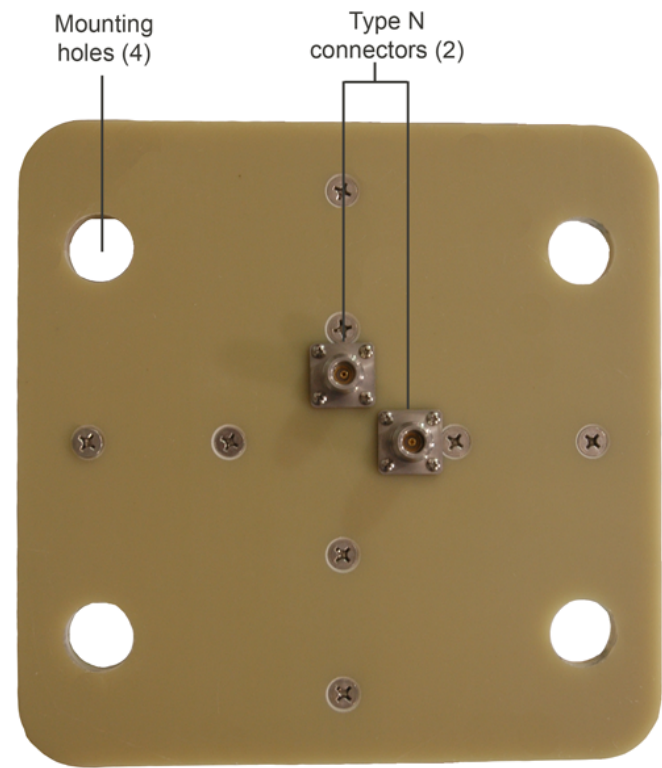
Before connecting any components, follow the safety information in the ETS-Lindgren *Product Information Bulletin* included with your shipment.

### **Model 3145BDP Base**

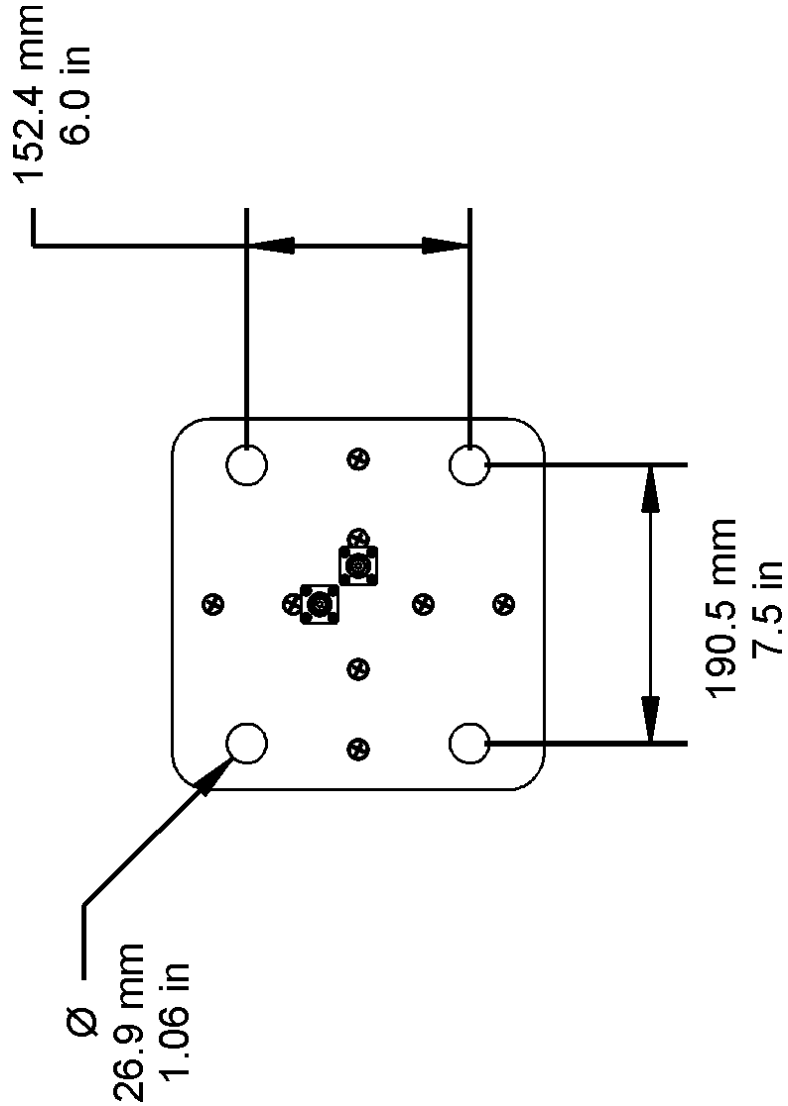
---

The base of the Model 3145BDP Dual-Polarized Log-Periodic Dipole Array features four mounting holes and two Type N connectors. The holes may be used to mount the antenna to the optional **ETS-Lindgren 109620 Pedestal**, or to a customer-defined mounting solution. For information on the 109620 pedestal, see page 7.

Mount the antenna with one-inch diameter fiberglass mounting studs, and then connect N-type coaxial cables from the connectors to a generator or receiver. A mounting diagram is provided in the next section.



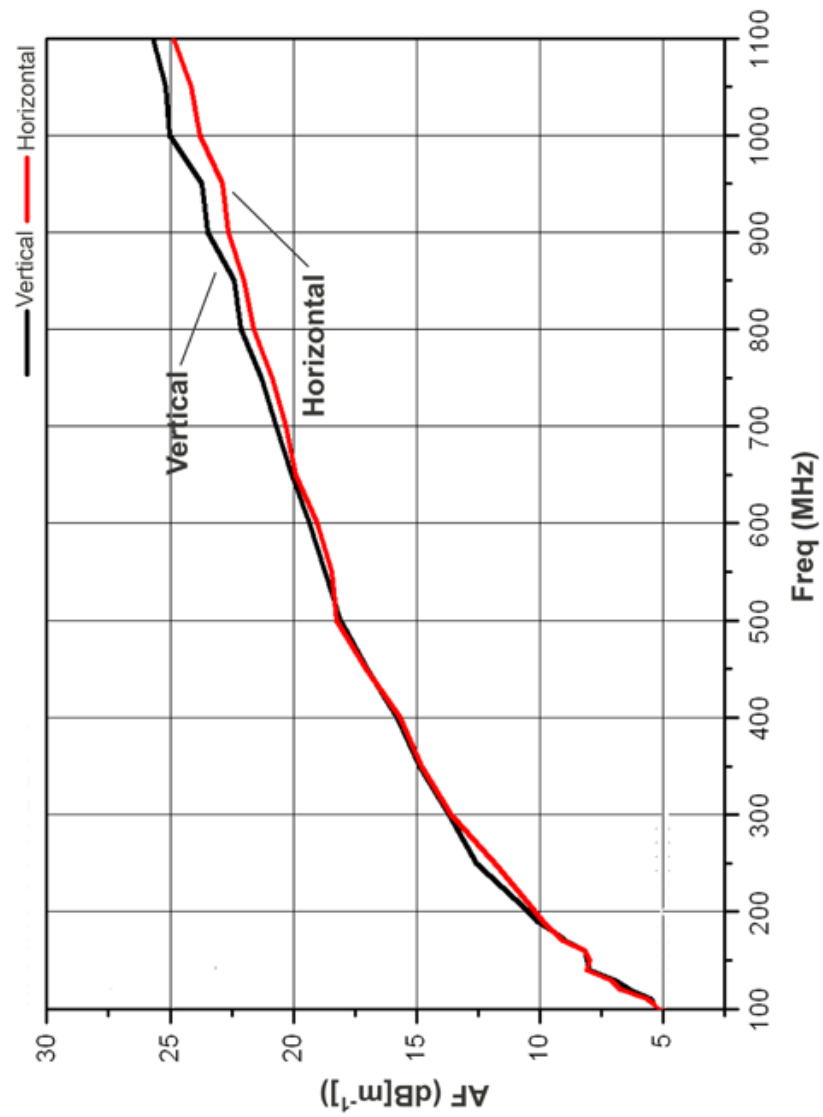
Model 3145BDP Mounting Diagram



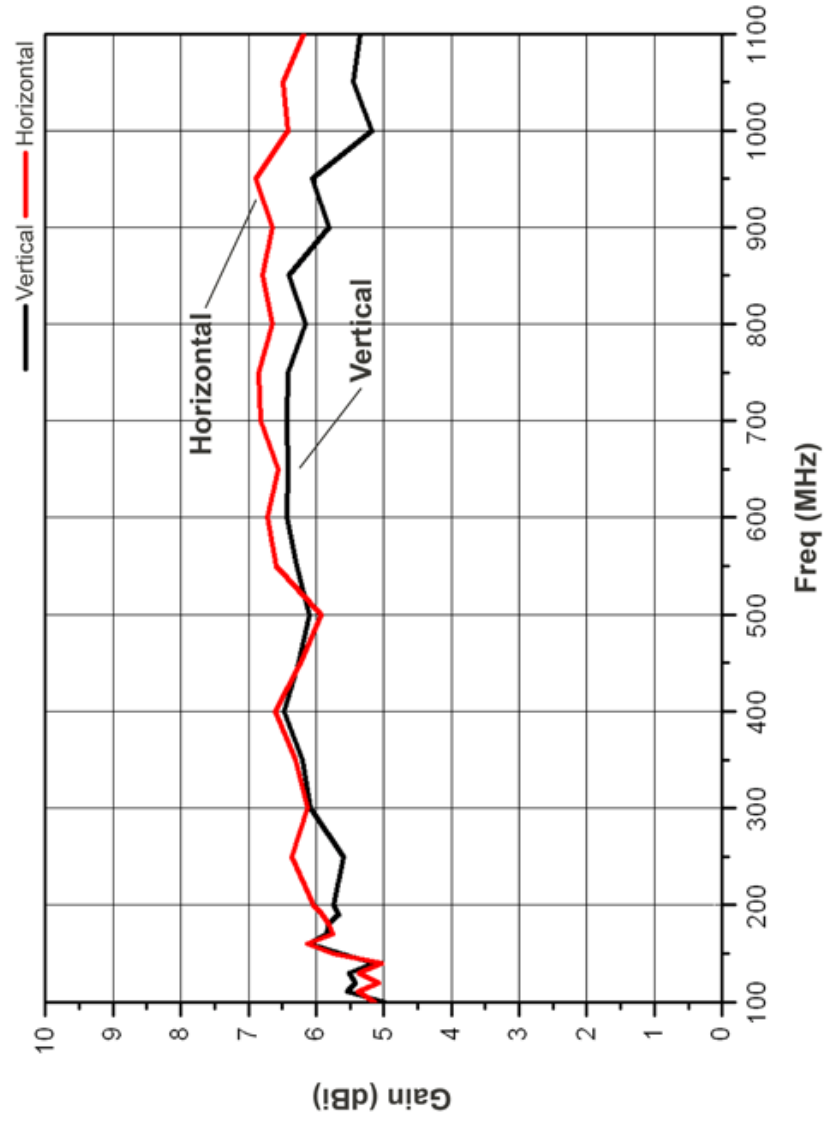
This page intentionally left blank.

## 6.0 Typical Data

### Model 3145BDP Antenna Factor



### Model 3145BDP Gain





## Appendix A: Warranty

---



See the *Product Information Bulletin* included with your shipment for the complete ETS-Lindgren warranty for your Model 3145BDP.

### DURATION OF WARRANTIES FOR MODEL 3145BDP

All product warranties, except the warranty of title, and all remedies for warranty failures are limited to two years.

Product Warranted	Duration of Warranty Period
Model 3145BDP Dual-Polarized Log-Periodic Dipole Array	2 Years