

Model 3121D

Adjustable Dipole

User Manual



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Revision Record | MANUAL 3121 | Part #399041, Rev. D


Revision	Description	Date
A–C	Initial Release; Updates	October, 1998– October, 2000
D	Updated content to Model 3121D; converted to half-size; rebranding	June, 2008

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Notes, Cautions, and Warnings

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

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1.0 Introduction

The **ETS-Lindgren Model 3121D Adjustable Dipole Antenna System** is designed to operate over the 30 MHz to 1 GHz frequency range for measurements to meet military, DOD, VDE, and FCC EME measurement specifications.



3121D DB-1

The Model 3121D includes the DB-1, DB-2, DB-3, and DB-4 antennas.

The antennas are lightweight and sturdily constructed for portability and ruggedness. A carrying case supplied with the antenna set allows for organized storage and access to all antenna components. Also included is a measuring tape for adjusting the dipole elements to frequency.



3121D DB-2

The dipole elements are made from nickel-plated brass extension elements with four special extension rods for operation at the lowest frequencies. Each set of elements is designed to be mounted into a particular balun.



3121D DB-3

The elements for baluns can be extended to dipole lengths above and below the specified frequency of each particular balun. The elements should be used with the specified balun and should not be adjusted to frequencies beyond the specified range of each balun. This is to prevent errors in calibration of the antenna receiving system.



A variety of mounting options are available for the Model 3121D. For information, see *Mounting Instructions* on page 21.

Tripod Options

ETS-Lindgren offers the following nonmetallic, non-reflective tripods for use at both indoor and outdoor EMC test sites.

- **Model 4-TR**—Constructed of linen phenolic and delrin, designed with an adjustable center post for precise height adjustments. Maximum height is 2.0 m (80.0 in), and minimum height is 94 cm (37.0 in). This tripod can support up to an 11.8 kg (26.0 lb) load.



- **Model 7-TR**—Constructed of PVC and fiberglass components, providing increased stability for physically large antennas. The unique design allows for quick assembly, disassembly, and convenient storage. Allows several different configurations, including options for manual or pneumatic polarization. Quick height adjustment and locking wheels provide ease of use during testing. Maximum height is 2.17 m (85.8 in), with a minimum height of .8 m (31.8 in). This tripod can support a 13.5 kg (30 lb) load.



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

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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 3121D 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 3121D Adjustable Dipole Antenna System.

Part Description	Available For 3121D Model:				Part Number
	DB-1	DB-2	DB-3	DB-4	
Element, Low Frequency (2)	√	√			3121LE
Element, Medium Frequency (2)			√		3121ME
Element Extension, 19.5 inches (4)	√				3121EE
Carrying Case	√	√	√	√	3121CASE

Part Description	Available For 3121D Model:				Part Number
	DB-1	DB-2	DB-3	DB-4	
Clamp Block	√	√	√	√	102108
Support Base	√	√	√	√	101942B
Support Rod	√	√	√	√	100733



For additional/optional mounting hardware, see *Additional Mounting Options* on page 24.

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

Frequency Range (Overall):	30 MHz–1 GHz
DB-1:	30 MHz–60 MHz
DB-2:	60 MHz–140 MHz
DB-3:	140 MHz–400 MHz
DB-4:	400 MHz–1 GHz
Impedance:	Matched to 50 Ω
Maximum Length:	17 ft
Maximum Power Handling Capability:	50 W
VSWR Ratio (Average):	< 1.6:1
Peak Power:	NA
Typical Balun Loss:	See <i>Typical Data</i> on page 27

Physical Specifications

	Model 3121D			
	DB-1	DB-2	DB-3	DB-4
Length:	26.87 in 68.25 cm	22.00 in 55.88 cm	20.50 in 52.07 cm	19.25 in 48.89 cm
Width:				
Minimum	16.50 in 41.91 cm	16.50 in 41.91 cm	14.00 in 35.56 cm	5.50 in 13.97 cm
Maximum	168.00 in 426.72 cm	129.00 in 327.66 cm	49.00 in 124.46	18.00 in 45.72 cm
Weight:	2.37 lb 1.07 kg	1.69 lb 0.76 kg	1.50 lb 0.68 kg	0.87 lb 0.39 kg

Element Length Frequency Chart

Frequency (MHz)	Single Element Length (mm)	Frequency (MHz)	Single Element Length (mm)
28	2577	130	540
29	2488	135	520
30	2412	140	502
31	2340	145	484
32	2272	155	453
34	2167	160	439
35	2073	165	425
36	2013	170	413
37	1954	175	401
38	1899	180	390
39	1848	190	370
40	1802	200	351
42	1713	210	334
44	1634	220	319
46	1561	230	305
48	1494	240	293
50	1434	250	281
55	1304	260	270
60	1194	270	260
65	1103	280	250
70	1022	290	241
75	951	300	234
80	887	310	226
85	836	320	219

Frequency (MHz)	Single Element Length (mm)
90	788
95	747
100	710
105	676
110	646
115	616
120	590
125	565

Frequency (MHz)	Single Element Length (mm)
330	212
340	206
350	200
360	195
370	190
380	185
390	180
400	175

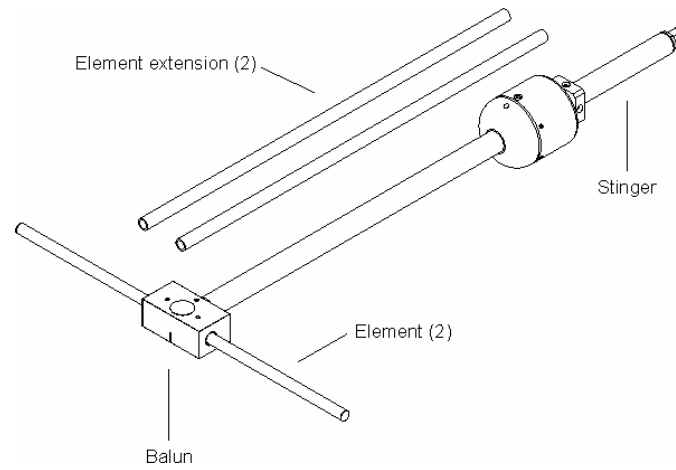
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4.0 Assembly Instructions

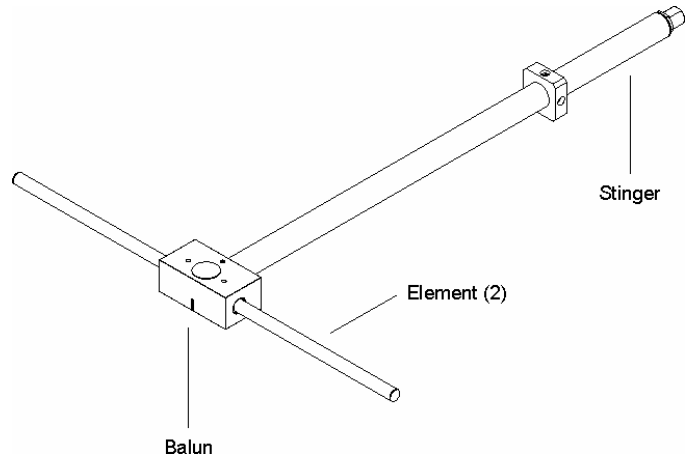
CAUTION

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

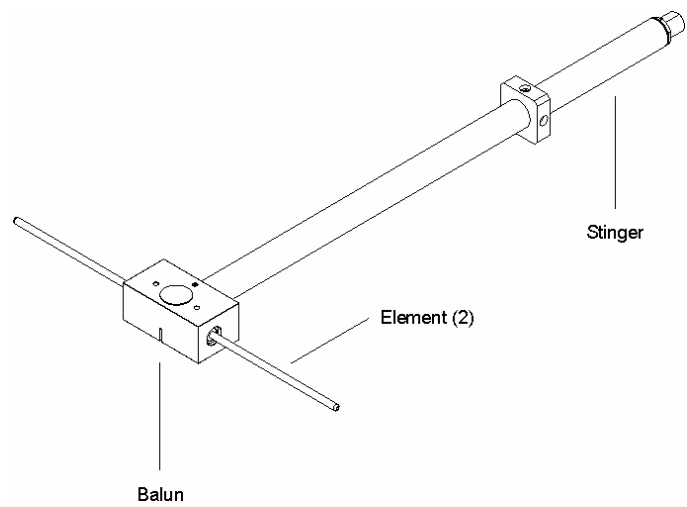
1. Choose a balun that meets the desired frequency.
2. On baluns DB-1, DB-2, and DB-3, insert the proper elements; the DB-4 is shipped with the elements inserted.



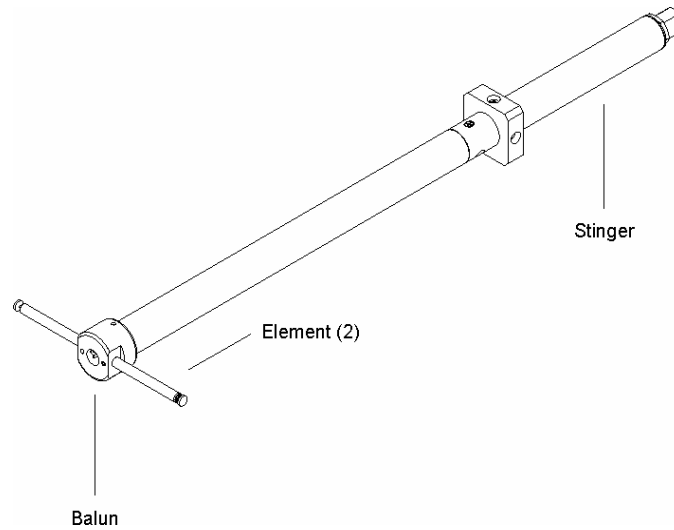
3121D DB-1



3121D DB-2



3121D DB-3



3121D DB-4

3. Balun DB-1 requires the use of two extension rods on each leg of the dipole. Attach the longest collapsible elements to the extension rods.
4. Place the balun in the tripod clamp and extend the elements to proper length as specified by the *Element Length Frequency Chart* on page 14. See *Mounting Instructions* on page 21 for the steps to mount the Model 3121D Adjustable Dipole Antenna System.

This method is used for baluns DB-1, DB-2, and DB-3. At frequencies above 400 MHz, balun DB-4 should be used and the dipole length adjusted as specified on the engraved plastic ruler.

Typical Data on page 27 provides the factors in dB which should be added to the receiver or spectrum analyzer reading in (dBuV) to calculate the field strength in dBuV/Meter.

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5.0 Mounting Instructions

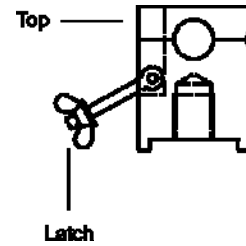
CAUTION

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

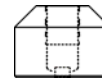
Using Included Mounting Adapters

The Model 3121D Adjustable Dipole Antenna System ships with these mounting adapters:

- **102108 Clamp Block**—Uses standard 7/8–14 threads and comes with a 1/4–20 thread adapter for mounting to an ETS-Lindgren tripod or most other tripods.



- **101942B Support Base**



- **100733 Support Rod**



To use these adapters to mount the Model 3121D to a 4-TR tripod:

3121D DB-1



**3121D DB-2,
3121D DB-3,
3121 DB-4**



1. Assemble the clamp block, support base, and support rod, and attach the support base to the 4-TR tripod.
2. Unscrew the clamp block latch and open the top.
3. Insert the balun into the clamp block and close the top over the balun.
4. Move the latch to the closed position and tighten so the balun is held securely.
5. Attach the cable to the output connector on the antenna.

Using the Stinger Mount

The stinger on the Model 3121D enables you to mount to antenna directly to an ETS-Lindgren 7-TR Tripod Positioner.



Additional hardware is required to use the stinger to mount the Model 3121D to a mast. For information on ordering optional mounting hardware, contact the ETS-Lindgren Sales Department.



Shown stinger-mounted onto a 7-TR

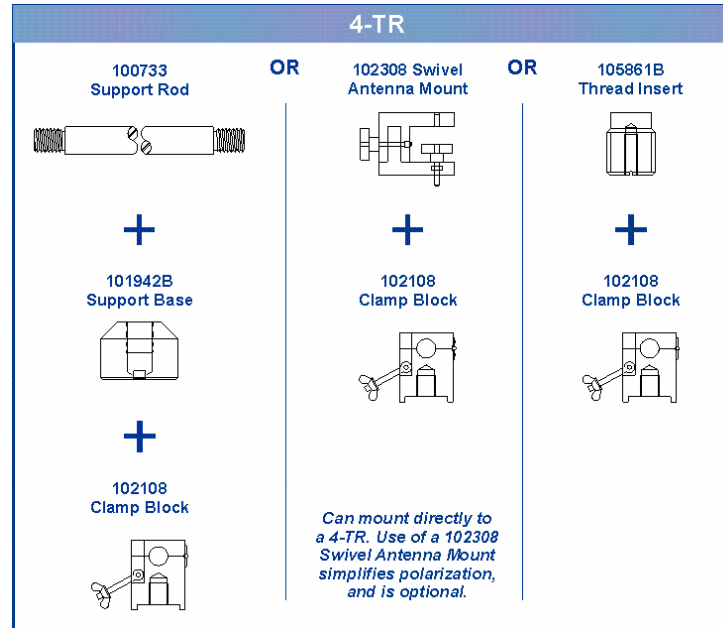


Do not use the stinger to mount the Model 3121D onto a 4-TR tripod.

Additional Mounting Options

4-TR MOUNTING OPTIONS

Following are additional options for mounting the Model 3121D onto an ETS-Lindgren 4-TR tripod. Contact the ETS-Lindgren Sales Department for information on ordering optional mounting hardware.



7-TR AND MAST MOUNTING OPTIONS

The stinger on the Model 3121D enables you to mount to antenna directly to an ETS-Lindgren 7-TR Tripod Positioner. Following are additional options for mounting the Model 3121D onto an ETS-Lindgren 7-TR Tripod Positioner.

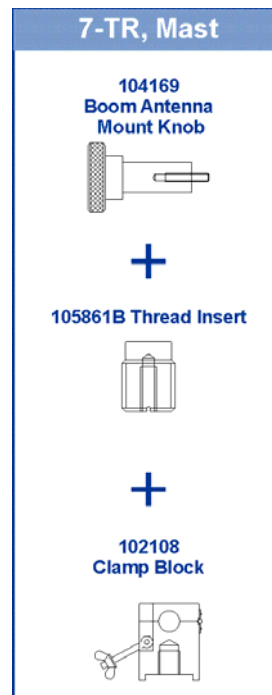
Contact the ETS-Lindgren Sales Department for information on ordering optional mounting hardware.



Mast refers to 2070 Series, 2075, and 2175 Antenna Towers.

7-TR refers to 109042, 106328, and 108197 booms:

- *109042 boom*—Straight boom; for general antenna mounting on a 7-TR
- *106328 boom*—Offset boom; for general antenna mounting on a 7-TR with pneumatic or manual polarization
- *108197 boom*—Center rotate boom; for rear-mount stinger-type antennas only

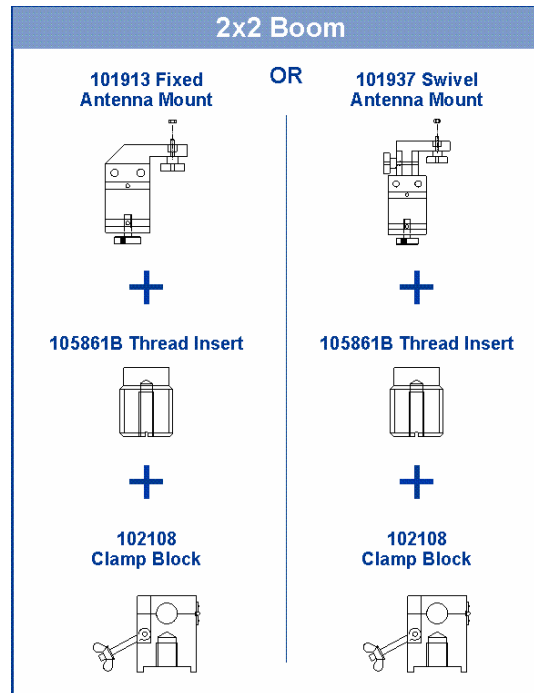


2x2 BOOM MOUNTING OPTIONS

Following are additional options for mounting the Model 3121D onto a 2x2 boom. Contact the ETS-Lindgren Sales Department for information on ordering optional mounting hardware.



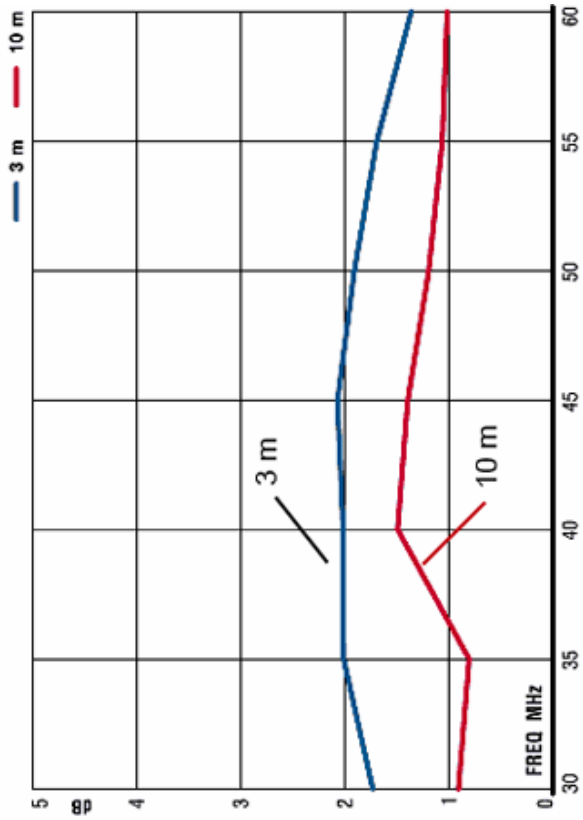
2x2 boom refers to a typical 2-inch by 2-inch boom.



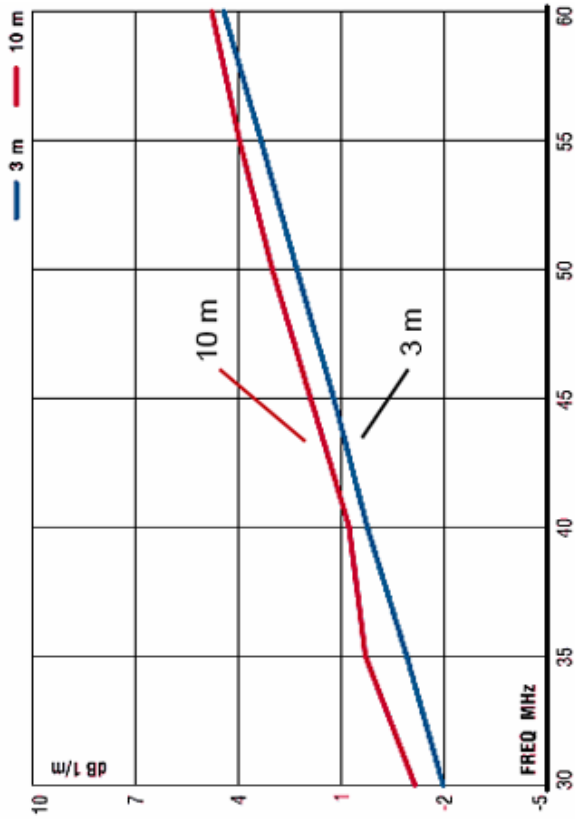
6.0 Typical Data

Model 3121D DB-1 Typical Data

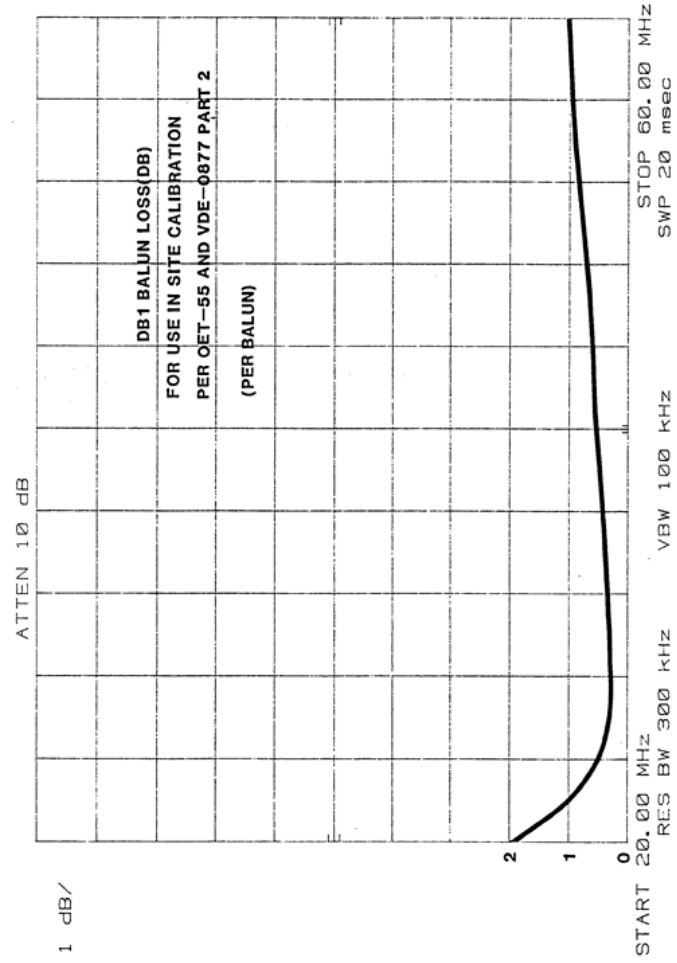
MODEL 3121D DB-1 GAIN



MODEL 3121D DB-1 ANTENNA FACTOR

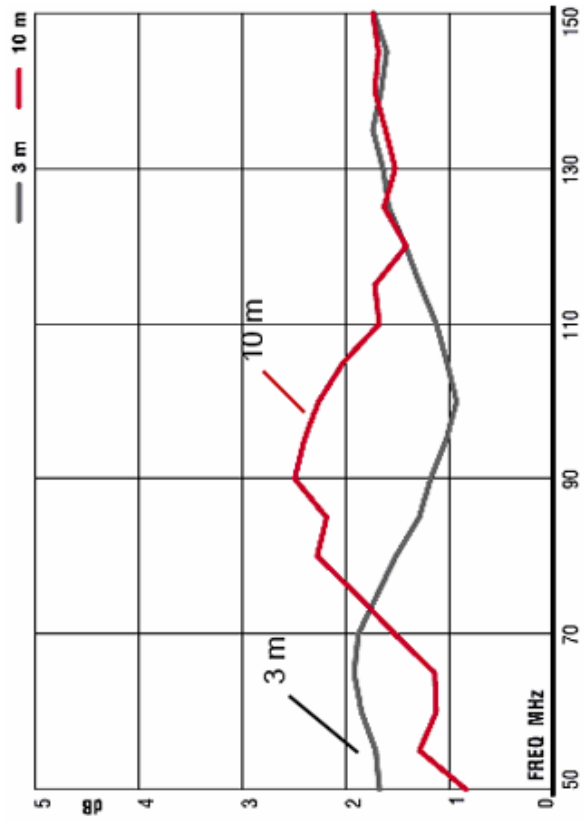


MODEL 3121D DB-1 TYPICAL BALUN LOSS

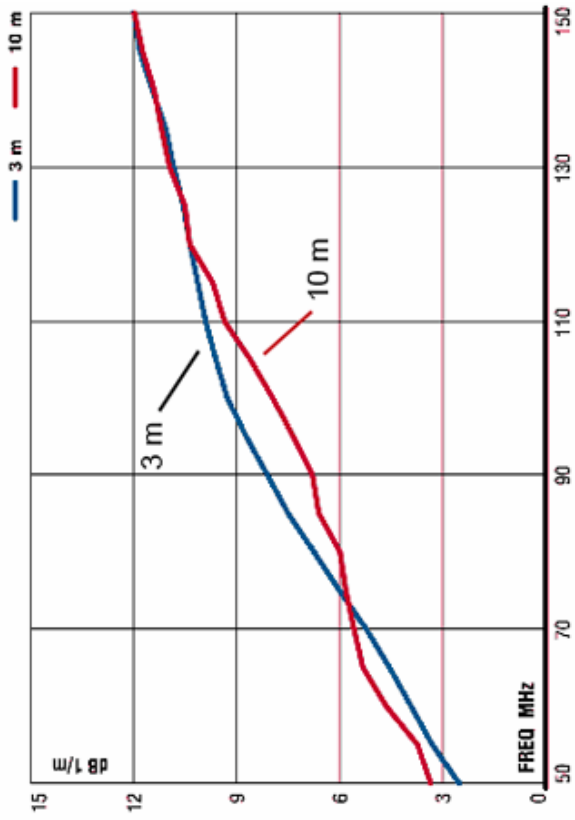


Model 3121D DB-2 Typical Data

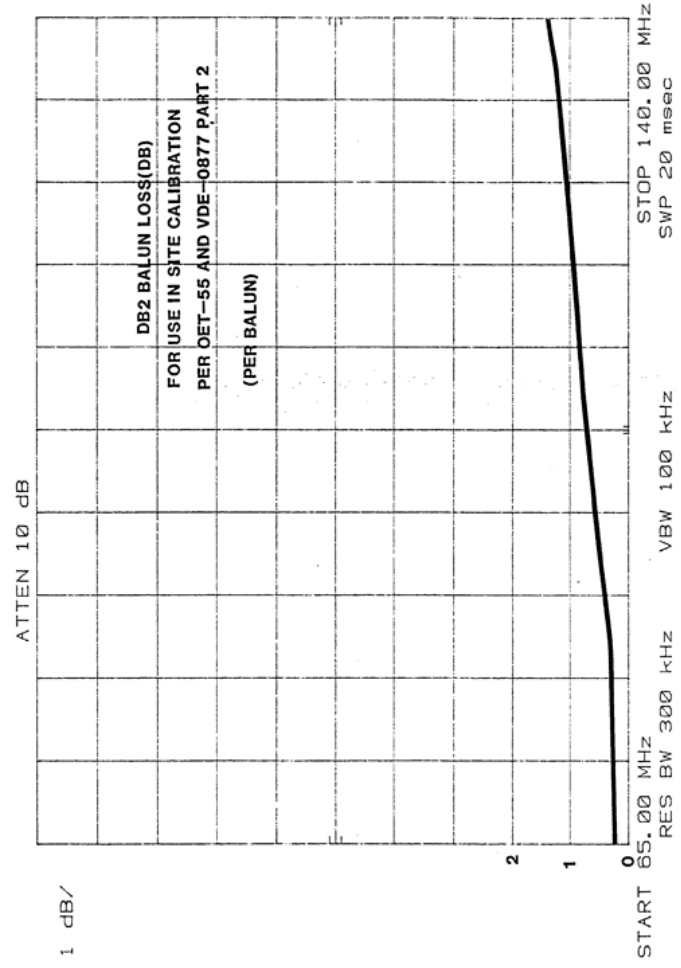
MODEL 3121D DB-2 GAIN



MODEL 3121D DB-2 ANTENNA FACTOR

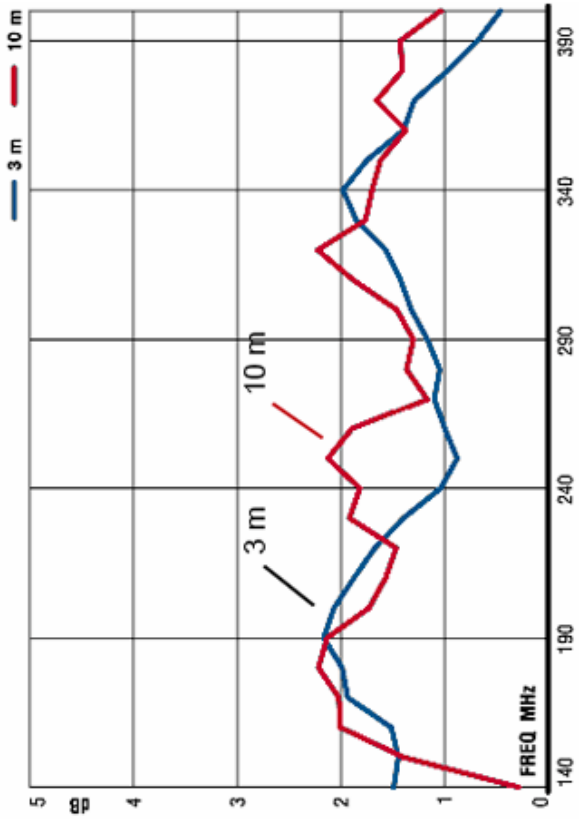


MODEL 3121D DB-2 TYPICAL BALUN LOSS

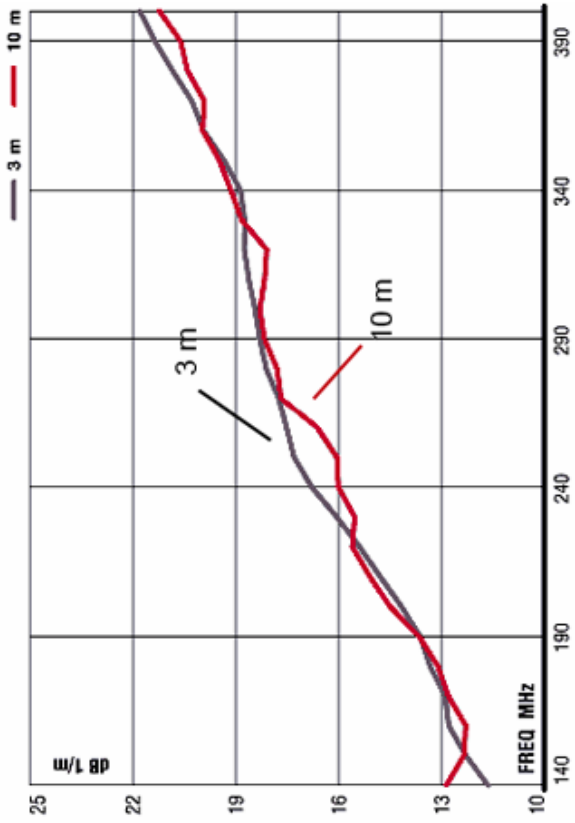


Model 3121D DB-3 Typical Data

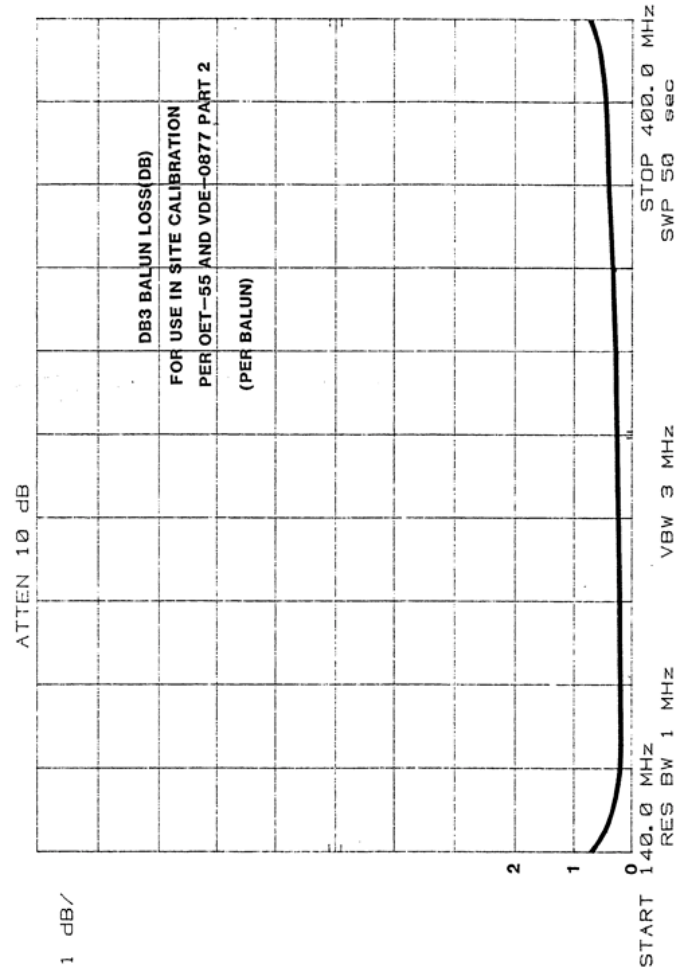
MODEL 3121D DB-3 GAIN



MODEL 3121D DB-3 ANTENNA FACTOR

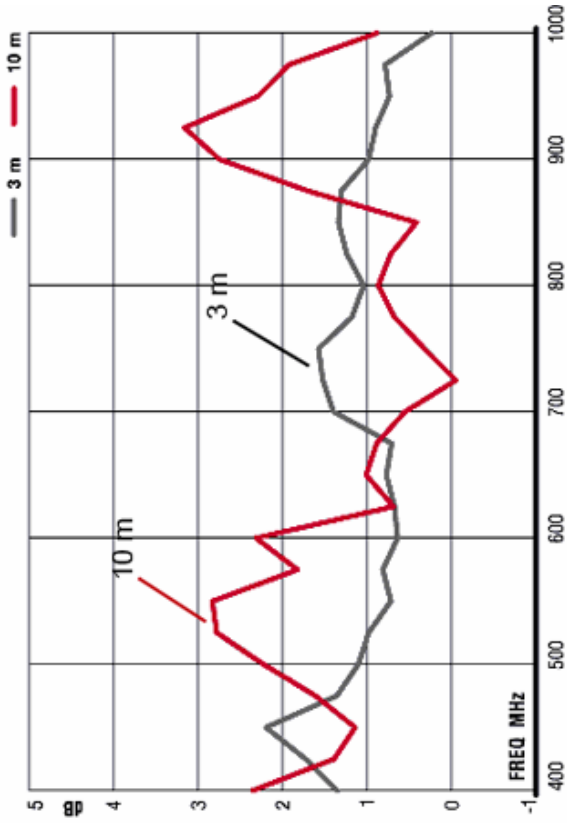


MODEL 3121D DB-3 TYPICAL BALUN LOSS

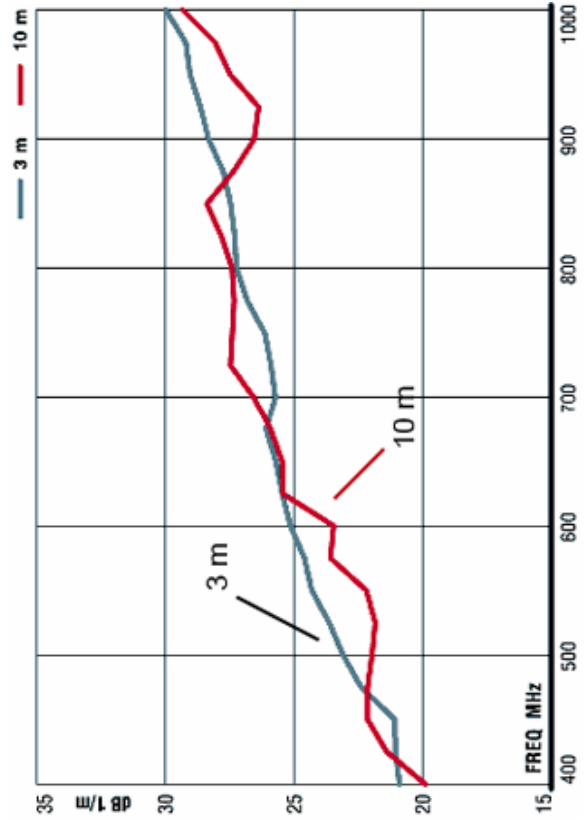


Model 3121D DB-4 Typical Data

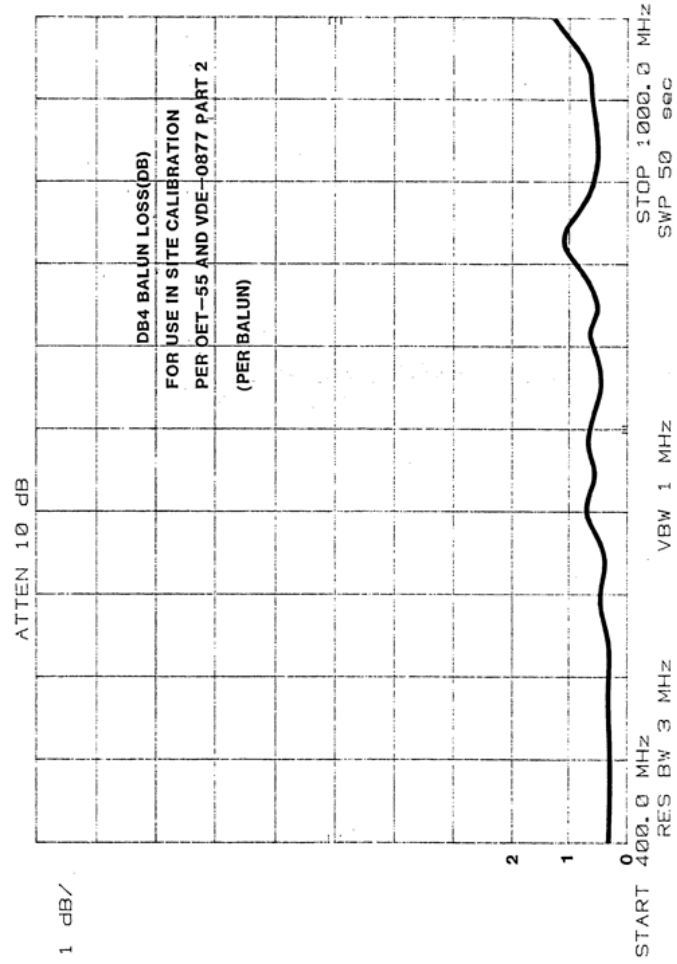
MODEL 3121D DB-4 GAIN



MODEL 3121D DB-4 ANTENNA FACTOR



MODEL 3121D DB-4 TYPICAL BALUN LOSS



Appendix A: Warranty



See the *Product Information Bulletin* included with your shipment for the complete ETS-Lindgren warranty for your Model 3121D Adjustable Dipole Antenna System.

DURATION OF WARRANTIES FOR MODEL 3121D

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 3121D Adjustable Dipole Antenna System	2 Years