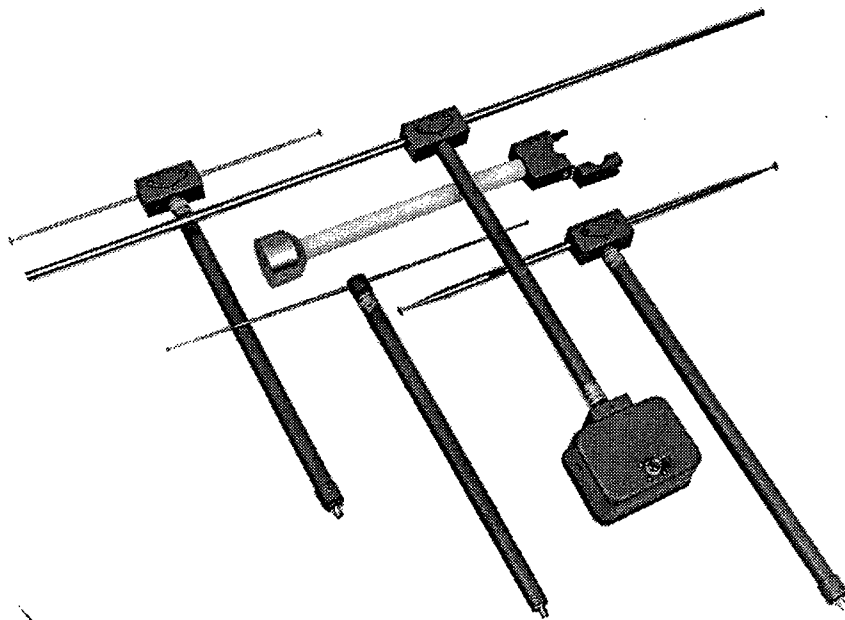


# *Equipment Manual* **Adjustable Dipole**

## **Model 3121C**



**USA**  
2205 Kramer Lane, Austin, Texas 78758-4047  
P.O. Box 80589 Austin, Texas 78708-0589  
Tel 512.835.4684 Fax 512.835.4729

**FINLAND**  
Euroshield OY  
Fankkeen Teollisuusalue  
27510, Eura, Finland  
Tel 358.2.838.3300 Fax 358.2.865.1233

**E-MAIL & INTERNET**  
support@emctest.com  
<http://www.emctest.com>

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## **WARRANTY**

The Electro-Mechanics Company (EMCO) warrants that our products are free from defects in materials and workmanship for a period of two years from the date of shipment. If you notify us of a defect within the warranty period, we will, at our option, either repair or replace those products which prove to be defective. If applicable, we will also recalibrate the product

There will be no charge for warranty services performed at the location we designate. You must however, prepay inbound shipping costs and any duties or taxes. We will pay outbound shipping costs for a carrier of our choice, exclusive of any duties or taxes. You may request warranty services to be performed at your location, but it is our option to do so. If we determine that warranty service can only be performed at your location, you will not be charged for our travel related costs.

This warranty does not apply to:

1. Normal wear and tear of materials.
2. Consumable items such as fuses, batteries, etc.
3. Products which have been improperly installed, maintained, or used.
4. Products which have be operated outside of specifications.
5. Products which have been modified without authorization.
6. Calibration of products, unless necessitated by defects.

**THIS WARRANTY IS EXCLUSIVE. NO OTHER WARRANTY, WRITTEN OR ORAL, IS EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.**

**THE REMEDIES PROVIDED BY THIS WARRANTY ARE YOUR SOLE AND EXCLUSIVE REMEDIES. IN NO EVENT ARE WE LIABLE FOR ANY DAMAGES WHATSOEVER, INCLUDING BUT NOT LIMITED TO, DIRECT, INDIRECT, SPECIAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES, WHETHER BASED ON CONTRACT, TORT, OR ANY OTHER LEGAL THEORY.**

Please contact our Sales Department for a Return Material Authorization Number before shipping equipment to us.

## **DESCRIPTION AND USE OF THE EMCO MODEL 3121C ADJUSTABLE DIPOLE ANTENNA**

### **Description**

The EMCO Model 3121C Adjustable Dipole Antenna System is designed to operate over the 28 MHz to 1000 MHz frequency range for measurements to meet Military, DOD, VDE, and FCC EME measurement specifications. The antennas are lightweight and sturdily constructed for portability and ruggedness. A carrying case supplied with the antenna set allows for neat storage and access to all antenna components. Also included is a measuring tape for adjusting the dipole elements to frequency.

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.

### **Operation**

Note that 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.

To set up antenna, choose a balun which covers the frequency desired. On Baluns DB-1, DB-2, and DB-3, insert the proper elements. (DB-4 elements are already inserted). The lowest frequency baluns DB-1 and DB-2 requires the use of two extension rods on each leg of the dipole, then the longest collapsible elements should be attached to the extension rods. Place the balun in the tripod clamp and extend the elements to proper length as specified by the "Length-Frequency Chart". This method is used for baluns DB-1, DB-2, 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.

The Antenna Factors on the pages following the "Length Frequency Chart" are the factors in dB which should be added to the receiver or spectrum analyzer reading (in dBuV) in order to calculate the field strength in dBuV/Meter.

### **Specifications**

Frequency Range:	28 - 1000 MHz overall
DB-1 (balun)	28 - 60 MHz
DB-2	60 - 140 MHz
DB-3	140 - 400 MHz
DB-4	400 - 1000 MHz
Impedance:	Matched to 50 ohms
Maximum Length:	17 feet

Maximum Power Handling Capability of 50 WATTS  
VSWR of less than 1.6 to 1  
Typical Balun loss (see Loss Factor data supplied).



EMCO Model 3121 Adjustable Element Dipole Antenna Set 28 MHz - 1 GHz

## LENGTH FREQUENCY CHART

### Element Length for EMCO Model 3121C Dipole Antenna

FREQ. MHz		LG. MM	FREQ. MHz		LG. MM
28	-	2577	130	-	540
29	-	2488	135	-	520
30	-	2412	140	-	502
31	-	2340	145	-	484
32	-	2272	155	-	453
34	-	2137	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
90	-	788	330	-	212
95	-	747	340	-	206
100	-	710	350	-	200
105	-	676	360	-	195
110	-	646	370	-	190
115	-	616	380	-	185
120	-	590	390	-	180
125	-	565	400	-	175

Use High Frequency Ruler for DB4

**TYPICAL BALUN LOSS FACTORS  
FOR THE MODEL 3121C DIPOLE SET**



ATTEN 10 dB

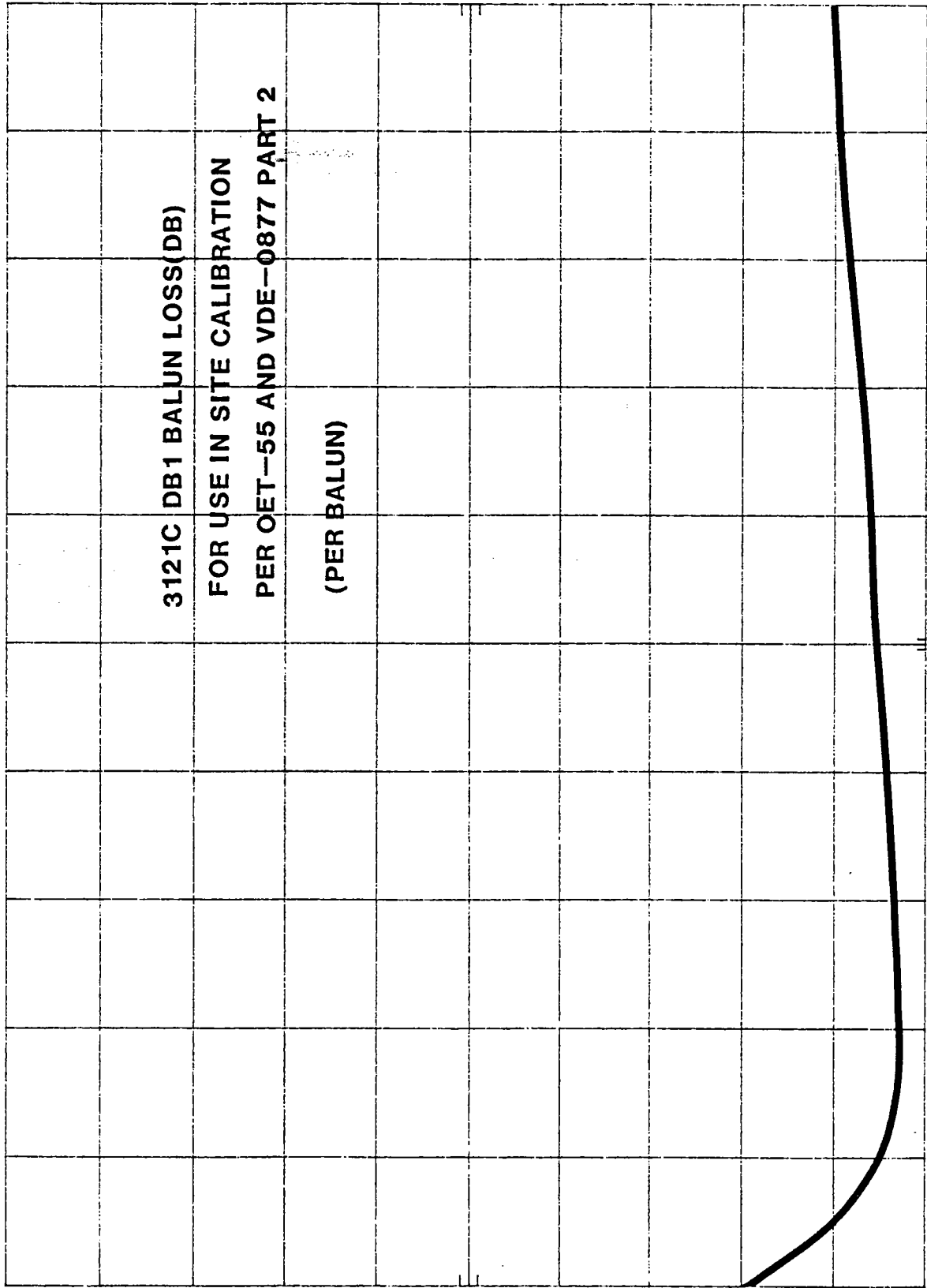
1 dB/

3121C DB1 BALUN LOSS(DB)

FOR USE IN SITE CALIBRATION

PER OET-55 AND VDE-0877 PART 2

(PER BALUN)



START 20.00 MHz

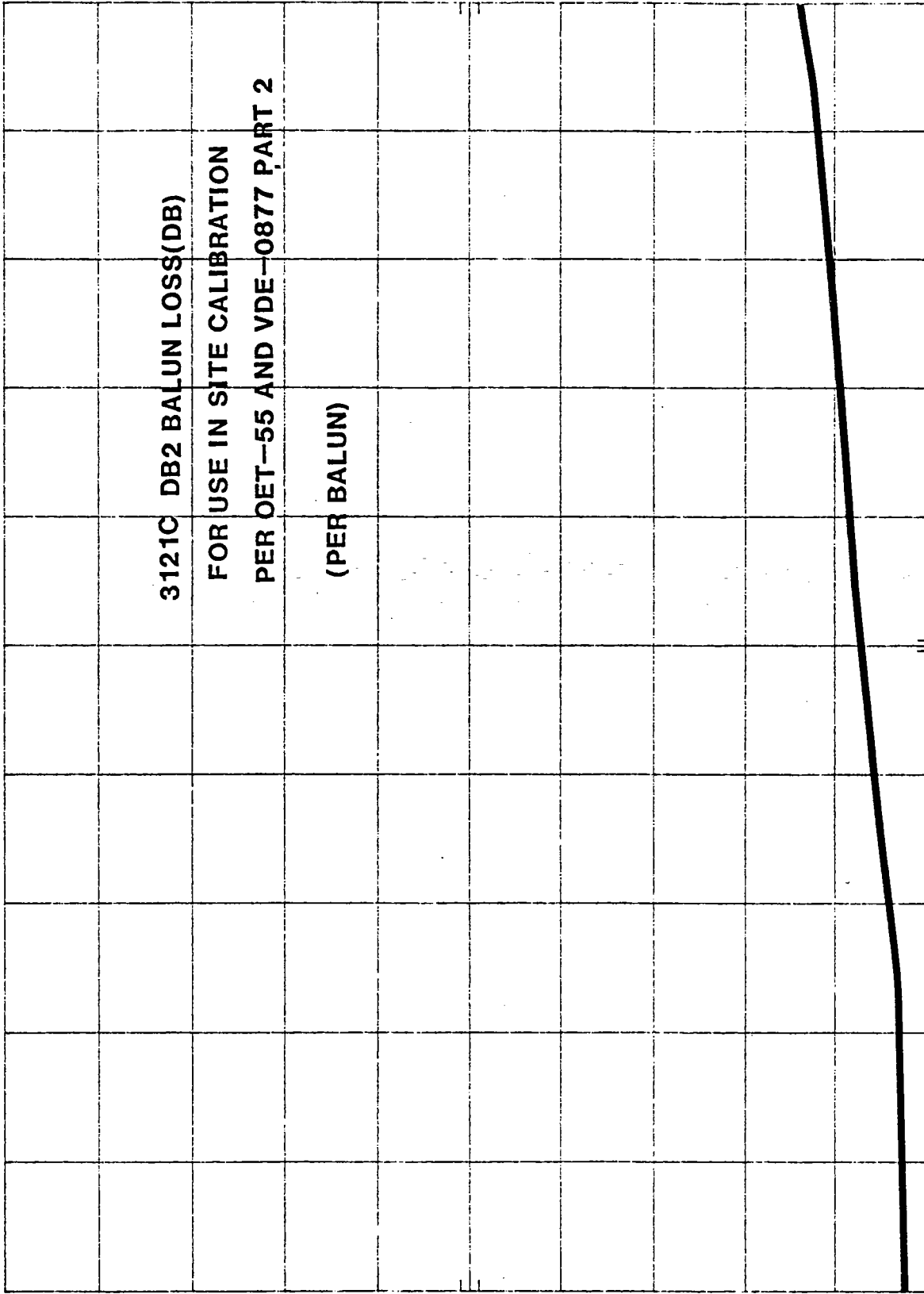
RES BW 300 KHZ

VBW 100 KHZ

STOP 60.00 MHz

SWP 20 msec

ATTEN 10 dB



3121C DB2 BALUN LOSS(DB)

FOR USE IN SITE CALIBRATION

PER OET-55 AND VDE-0877 PART 2

(PER BALUN)

1 dB/

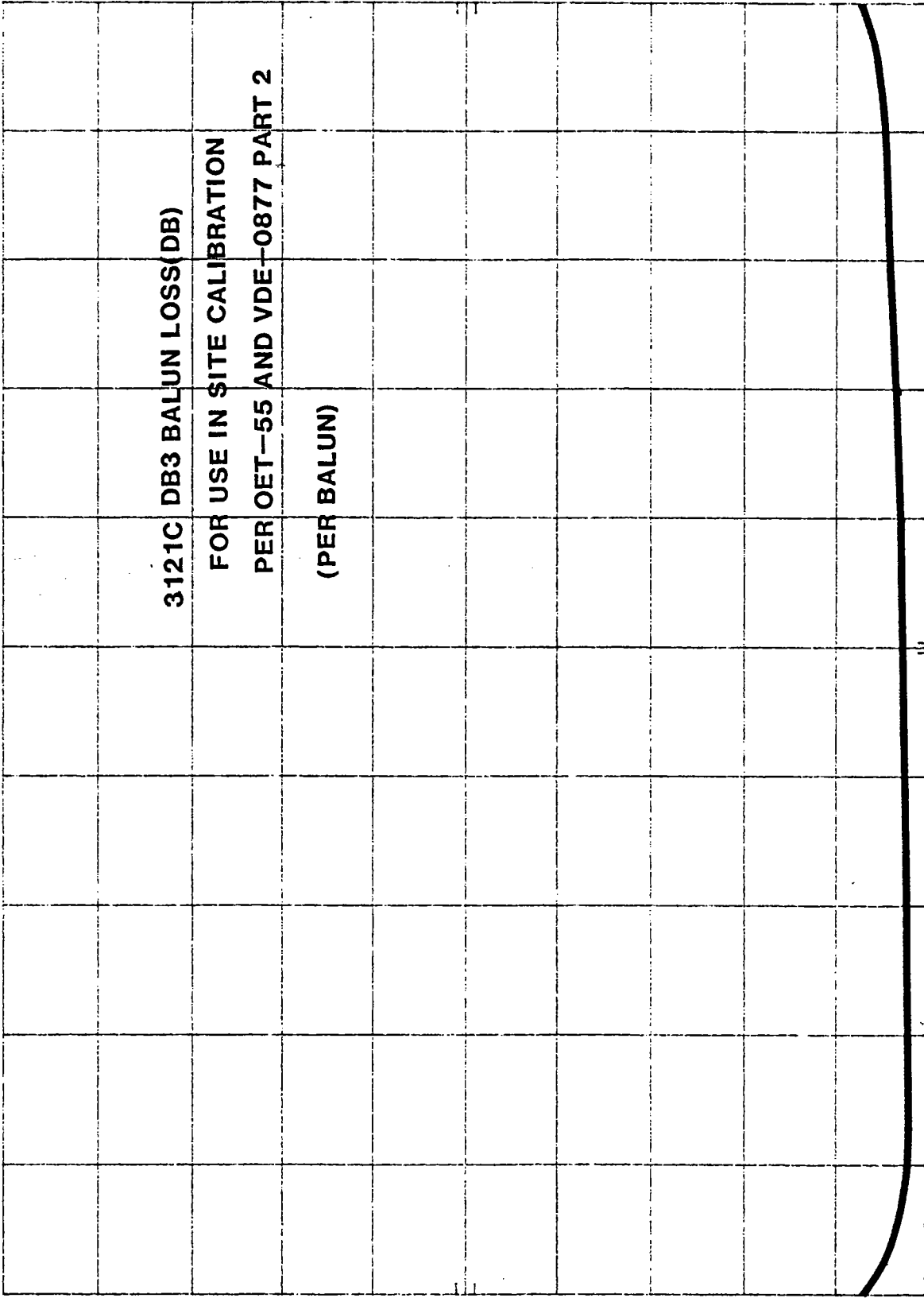
2

1

0

START 65.00 MHz      RES BW 300 kHz      VBW 100 kHz      STOP 140.00 MHz  
SWP 20 msec

ATTEN 10 dB



3121C DB3 BALUN LOSS(DB)

FOR USE IN SITE CALIBRATION

PER OET-55 AND VDE-0877 PART 2

(PER BALUN)

START 140.0 MHz RES BW 1 MHz STOP 400.0 MHz  
VBW 3 MHz SWP 50 sec

1 dB/

2

1

0

ATTEN 10 dB

1 dB/

3121C DB4 BALUN LOSS(DB)

FOR USE IN SITE CALIBRATION  
PER OET-55 AND VDE-0877 PART 2  
(PER BALUN)

2  
1  
0

START 400.0 MHz

RES BW 3 MHz

VBW 1 MHz

STOP 1000.0 MHz

SWP 50 sec