

**FCC Part 90 & Part 24 Test Report**  
for  
Advantra (UK) Limited  
on the  
4 Line Alphanumeric ReFlex Pager  
Model: AR1800  
FCC ID: XXXAR1800

Test Report #: 99030958A  
Date of Report: May 23, 2000

Job #: J99030958  
Date of Test: April 30, 2000

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**NVLAP**<sup>®</sup>

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FCC Part 90 Cert, Rev 9/99



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Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

### 1.0 Summary of Tests

### FCC ID: XXXAR1800 Model No.: AR1800

FCC RULE	DESCRIPTION OF TEST	RESULTS
2.1046	RF Power Output	Pass
90.205	Effective Radiated Power	Pass
2.1049, 90.209(b)(5), 90.210	Occupied Bandwidth, Bandwidth Limitation, Emission Masks	Pass
2.1051	Spurious Emissions at Antenna Terminals	Pass
2.1053, 15.109	Field Strength of Spurious Radiation	Pass
15.107	Line Conducted Emissions	Pass
2.1055	Frequency Stability vs. Temperature	Pass
2.1055	Frequency Stability vs. Voltage	Pass
2.914	Transient Frequency Behavior	N/A

Test Engineer: Xi-Ming Yang Date: 5-30-2000  
Xi-Ming Yang

EMC Site Manager: David Chernomordik Date: 5/30/00  
David Chernomordik, Ph.D.  
EMC Site Manager

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## 2.0 General Description

### 2.1 Product Description

The Advantra Model AR1800 is an easy to use 4 line alphanumeric ReFlex pager that uses a standard 1.5 volt alkaline AA high capacity battery

A production version of the sample was received on April 30, 2000 in good condition.

## Overview of 4 Line Alphanumeric ReFlex Pager

Applicant	Advantra (UK) Limited
Trade Name & Model No.	Advantra, AR1800
FCC Identifier	XXXAR1800
Use of Product	Digital Data Communication (Two-Way Pager)
Type of Transmission	4 Level FSK
Bit Rate	RX - 6400, Tx - 9600
Maximum Deviation	$\pm 2.4$ kHz
Range of RF Output	1 watt nominal into antenna, 100 mW EIRP, 8 position average
The dc voltage applied to and current into the several elements of the final RF amplifying device	Voltage: 2.5V Current: 0.4A
Frequency Range	896 – 902 MHz
Antenna(s) & Gain	-10 dBi
Detachable Antenna?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Receiver L.O. Frequency	884 – 897 MHz
External Input	<input type="checkbox"/> Audio <input checked="" type="checkbox"/> Digital Data

### 2.2 Related Submittal(s) Grants

None.

### 2.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is site . This test facility and site measurement data have been fully placed on file with the FCC and NVLAP accredited.

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### 3.0 RF Power Output, FCC § 2.985(a)

#### 3.1 Test Procedure

The transmitter output was connected to a calibrated coaxial attenuator, the other end of which was connected to a spectrum analyzer. The resolution bandwidth and the video bandwidth of the spectrum analyzer were set up to 3 MHz and 30 kHz respectively. The attenuator was included in spectrum analyzer OFFSET function.

Transmitter output was read off the spectrum analyzer in dBm.

#### 3.2 Test Equipment

Hewlett Packard 8481A Power Sensor, 435B Power Meter  
Hewlett Packard HP8566B Spectrum Analyzer, 100 Hz - 22 GHz  
Tektronix 2782 Spectrum Analyzer, 100 Hz - 40 GHz

#### 3.3 Test Results

Refer to the attached plots.

Plot Number	Power, dBm	Description
3-1	29.8	Low Channel - 896 MHz
3-2	30.0	Middle Channel - 898.5 MHz
3-3	29.9	High Channel - 902 MHz

Results: Passed

Plot 3-1

Mkr 896.0MHz

\*19.80dBm

Ref Lv1\*31.0dBm

10dB/

Normal

21.0

grn rd OFF

11.0

Max Hold

1.0

RD grn off

-8.0

Average

-18.0

rd grn OFF

-28.0

Math

-38.0

rd grn OFF

-48.0

With 10 dB external attenuator

-58.0

A = Normal

-68.0

rd grn OFF

Freq 896.0MHz

Span 20MHz

ResBW 10MHz

SWP 50mS

B = Reg# 1

rd grn OFF

LEVEL

SPAN

Ref Lv1\*31.0dBm

Tek WF VIEW

KNOB 2

KNOB 1

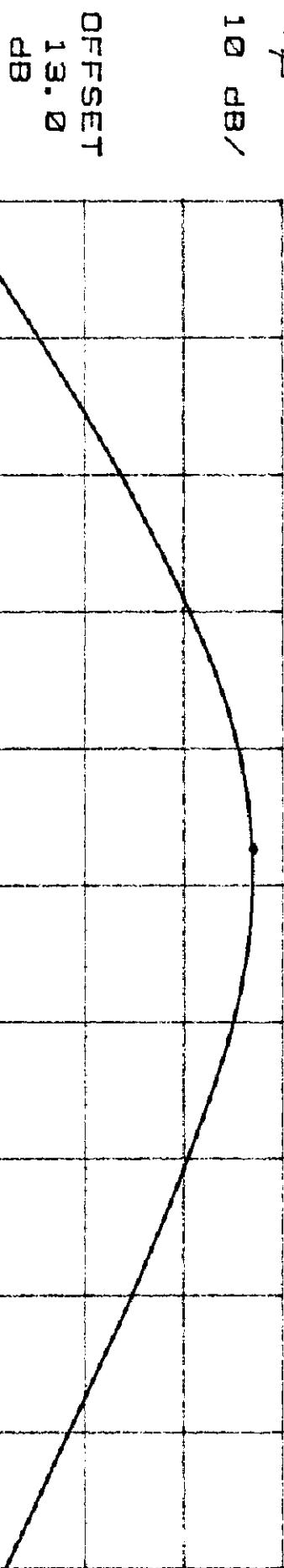
KEYPAD

2784

Plot 3-2

HP REF 33.0 dBm ATTEN 30 dB

MKR 898.23 MHz  
30.00 dBm



Plot 3-3

Mkr 901.5MHz

\* 19.90dBm

Ref Lvl\*31.0dBm

10dB/

Atten 40dB

Normal

grn rd OFF

RD grn off

Max Hold

Average

rd grn OFF

Math

rd grn OFF

rd grn OFF

A = Normal

with 10dB external  
attenuator

-60.0

-50.0

-40.0

-30.0

-20.0

-10.0

1.0

11.0

Freq 902.0MHz

ResBW 10MHz

MidBW 7MHz

Span 20MHz

B = Reg# 1

rd grn OFF

rd grn OFF

rd grn OFF

rd grn OFF

KNOB 2

KNOB 1

KEYPAD

Tektronix

2784

Advantra (UK) Limited, Model No. AR1800  
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**4.0 Occupied Bandwidth, Bandwidth Limitation, Emission Masks**  
FCC §2.989(I), 90.209(B)(5), 90.210, 24.133(a)(2)

**4.1 Test Procedure**

The antenna was disconnected from the transmitter and the short cable was connected to the transmitter RF output.

The RF output was connected to the input of the spectrum analyzer through sufficient attenuation.

The resolution bandwidth of the spectrum analyzer was set up at least 10 times higher than the authorized bandwidth of the transmitter. The spectrum analyzer reading was recorded and plotted. This reading is used as a reference for emission mask measurements.

The resolution bandwidth of the spectrum analyzer was set up to 100 Hz and the spectrum of the transmitting signal was recorded. This spectrum was compared to the required emission mask.

The emission designator was defined as 13K6F1D, where 13.6 kHz is the Authorized Bandwidth.

**4.2 Test Equipment**

Hewlett Packard 8481A Power Sensor, 435B Power Meter  
Hewlett Packard HP8566B Spectrum Analyzer, 100 Hz - 22 GHz  
Tektronix 2782 Spectrum Analyzer, 100 Hz - 40 GHz

**4.3 Test Results**

Plot Number	Description
4-1-1	898 MHz, Unmodulated
4-1-2	898 MHz, Modulated 50 kHz Span
4-1-3	898 MHz, Modulated 100 kHz Span
4-1-4	898 MHz, Modulated 200 kHz Span
4-1-5	898 MHz, Modulated 1 MHz Span
4-2-1	902 MHz, Unmodulated
4-2-2	902 MHz, Modulated 50 kHz Span
4-2-3	902 MHz, Modulated 100 kHz Span
4-2-4	902 MHz, Modulated 200 kHz Span
4-2-5	902 MHz, Modulated 1 MHz Span

Results: Passed

Plot 4-1-1

TEK MARKERS

Ref Lvl \*17.5dBm

10dB/

Auton 30dB

Marker  
on OFF

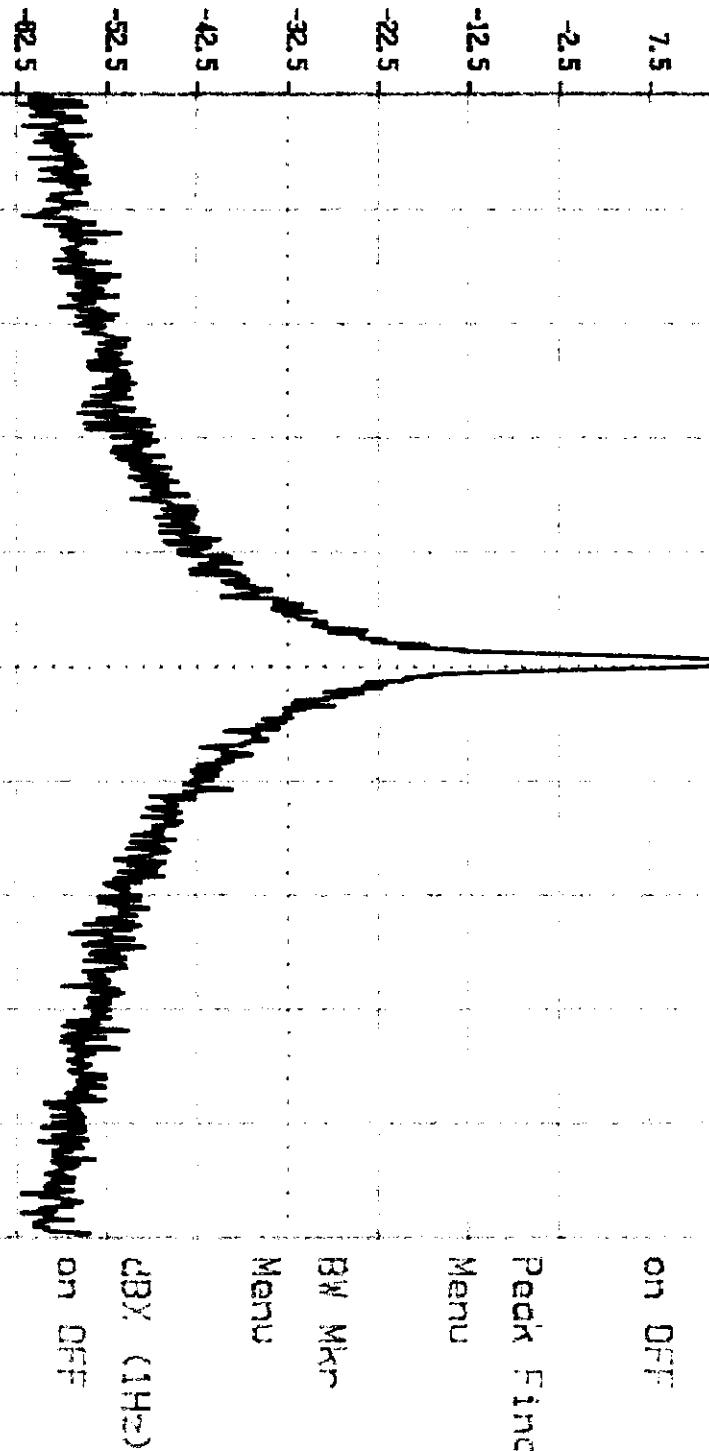
Pack Find

Menu

BW Mkr

Menu

dBX (1Hz)  
on OFF



with 10 dB external  
attenuator

Ref Lvl 3004  
SPAN 300Hz  
LEVEL SPAN  
Freq 898.501 40MHz

KNOB 2 KNOB 1 KEYPAD

Tektronix 2784

Plot 4-1-2

Mrp 898.501 45MHz

\*15.50dBm

Tek WFM

Ref Inv\*15.4dBm

10dB/

Avg 30dB

Normal

grn rd off

Max Hold

rd grn off

Average

rd grn off

Math

rd grn off

Freq 898.501 45MHz

with 10dB external  
attenuator

Ref Inv\*15.4dBm

Span 50kHz

Ref Inv\*15.4dBm

SWP 3.2s

B = Reg# 1  
rd grn off

LEV/CH

SPAN

KNOB 2

KNOB 1

KEYPAD

2784

Plot 4-1-3

Mr 398.539 MHz

\*-51.7dBm

Tek 475 100K

Ref L24\*15.4dBm

10dB, Average 30dB

Normal

8.4  
8.4  
grn rd grn  
Max Hold  
RD grn off

-3.6  
-13.6  
-23.6  
-33.6  
-43.6  
-53.6  
-63.6  
-73.6  
-83.6

Average  
rd grn off  
Math  
rd grn off  
rd grn off  
rd grn off

With 10dB external Attenuator  
Normal

Freq 898.501 MHz  
Rosc 300Hz  
Span 150kHz  
Vid 300Hz  
Slope 5.35  
B = Reg# 1  
rd grn off

KNOB 2 KNOB 1 KEYPAD

Tektronix 2784

Plot 4-1-4

Mkr 898.578 2MHz

\*-54.20dBm

Tek

WF VIEW

Ref Lv1\*16.4dBm

10dB/ Atten 30dB

Normal

6.4

grn rd OFF

-3.6

Max Hold

-13.6

RD grn off

-23.6

Average

-33.6

rd grn OFF

-43.6

Math

-53.6

rd grn OFF

-63.6

A = Normal

-73.6

rd grn OFF

-83.6

with 10dB external  
attenuator

Freq 898.501 4MHz

Span 200kHz

ResBW 300Hz

VidBW 300Hz

SWP 13S

LEVEL

SPAN

Span 200kHz

B = Reg# 1

rd grn OFF

KNOB 2

KNOB 1

KEYPAD

2784

Plot 4-1-5

Tek

WF VIEW

Ref Lvl\*16. 4dBm

10dB/

Atten 30dB

Normal

grn rd OFF

Max Hold

RD grn off

Average

rd grn OFF

Math

rd grn OFF

with 10 dB external  
attenuator

A = Normal  
rd grn OFF

B = Reg# 1  
rd grn OFF

Freq 898.501MHz

Span 1.0MHz

ResBW 1kHz

VidBW 1kHz

SWP 5.75

LEVEL

SPAN

ResBW 1kHz

KNOB 2

KNOB 1

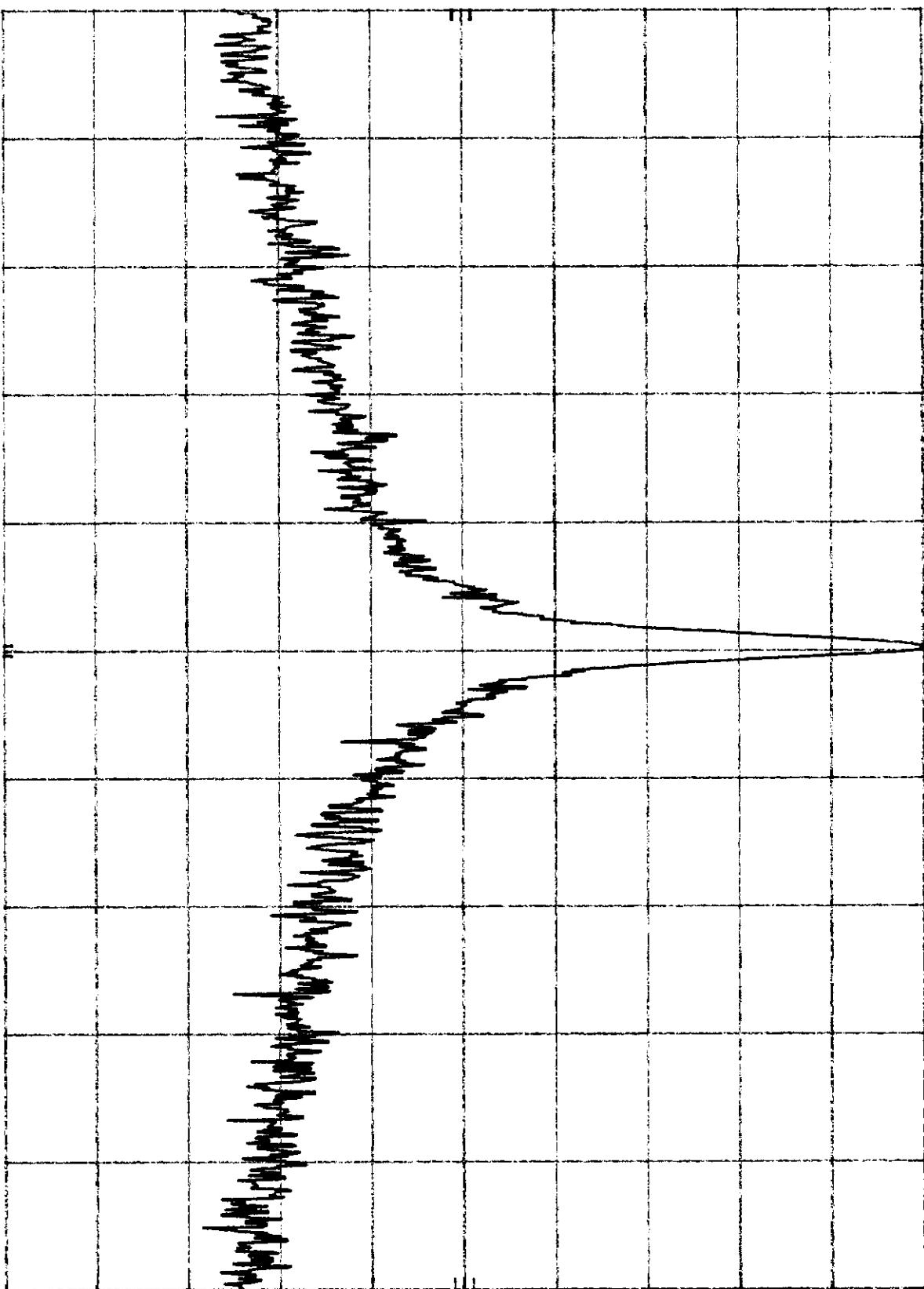
KEYPAD

2784

Plot 4-2-1

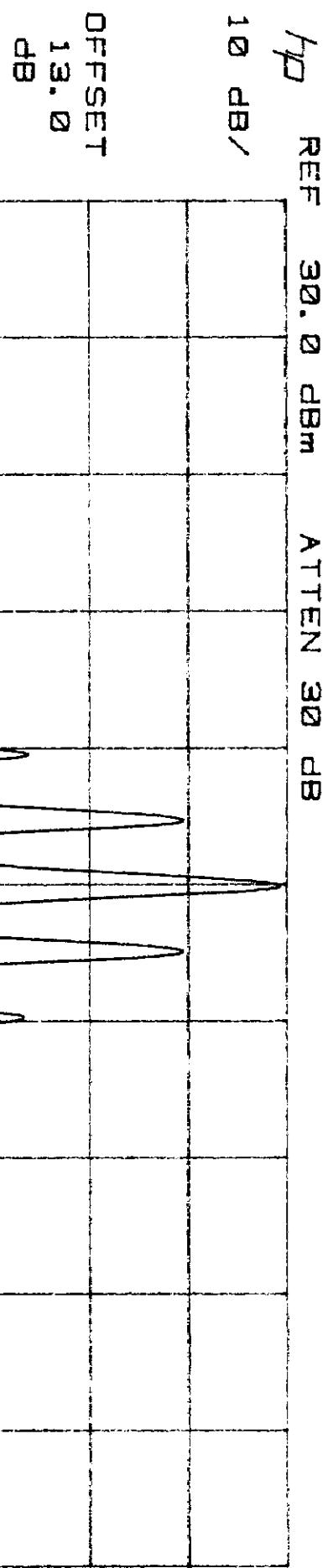
10 dB/REF 30.0 dBm ATTEN 30 dB

OFFSET  
13.0  
dB



CENTER 902.000 0 MHz  
RES BW 300 Hz  
VBW 300 Hz

Plot 4-2-2



CENTER 902.000 MHz    SPAN 50.0 kHz  
RES BW 300 Hz    VBW 300 Hz  
SWP 1.50 sec

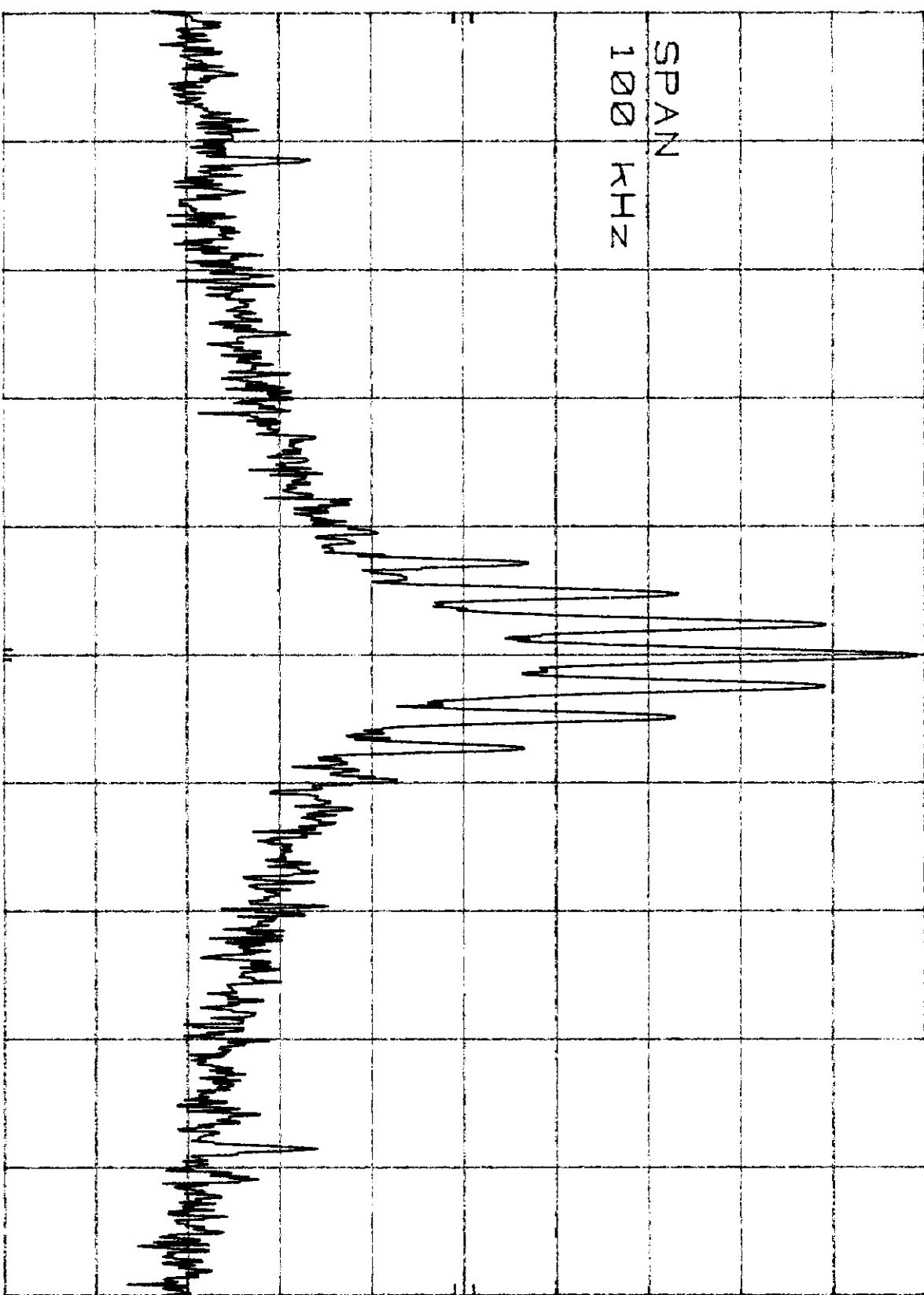
Plot 4-2-3

HP REF 30.0 dBm ATTEN 30 dB  
10 dB/

## OFFSET

dB

100 kHz



CENTER 902.000 MHz  
RES BW 300

VBM 300 Hz

SWP 3.00 SEC

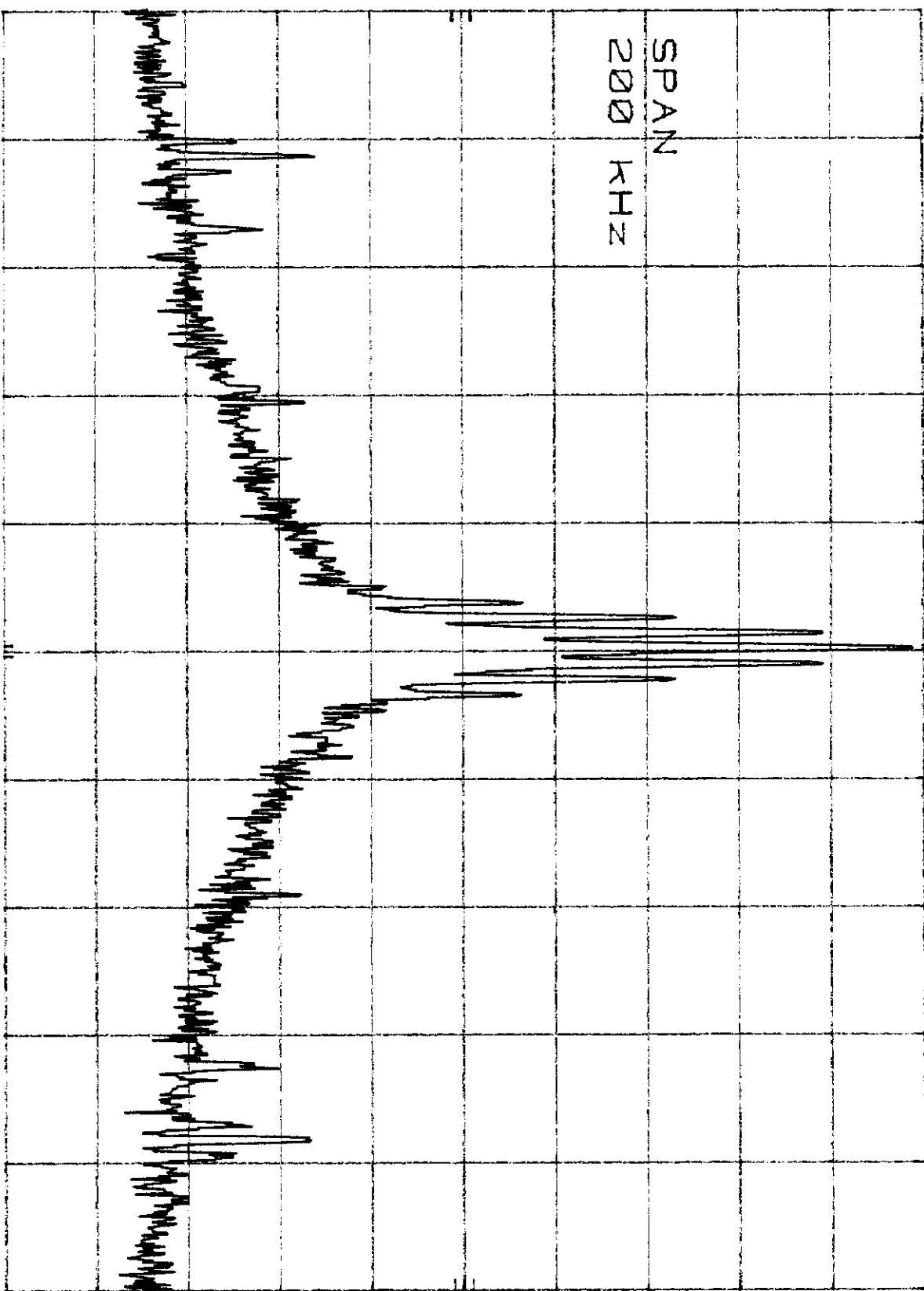
Plot 4-2-4

HP REF 30.0 dBm ATTEN 30 dB

10 dB/

OFFSET  
13.0  
dB

SPAN  
200 kHz

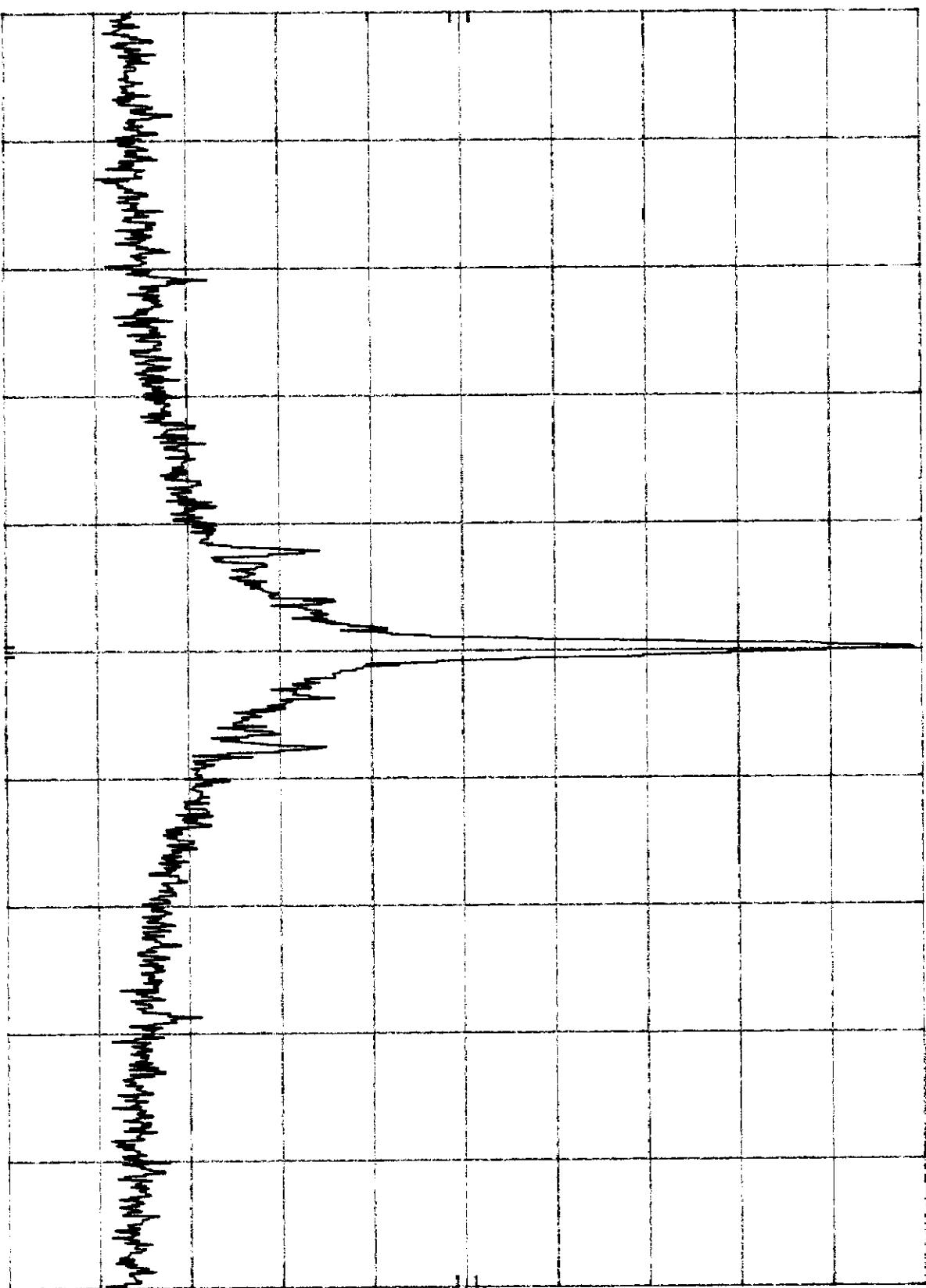


Plot 4-2-5

REF 30.0 dBm ATTEN 30 dB

1048

DEFENSE



CENTER 902.00 MHz  
RES BW 1 kHz  
VBW 1 kHz

SPAN 1.00 MHz  
SWP 3.00 sec

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### 5.0 Out of Band Emissions at Antenna Terminals, FCC §2.991

The power of emissions must be attenuated below the power of the unmodulated carrier (P) on any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth - at least  $43 + 10 \log P$  dB.

#### 5.1 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show the out-of-band emissions if any up to 10th harmonic.

#### 5.2 Test Equipment

HP 8566B Spectrum Analyzer, 100 Hz - 22 GHz  
HP 7470A Plotter

#### 5.3 Test Results

Refer to the attached plots.

Plot Number	Description
5-1-1	Channel 896 MHz, 1 - 100 MHz
5-1-2	Channel 896 MHz, 100 - 1000 MHz
5-1-3	Channel 896 MHz, 1 - 10 GHz
5-2-1	Channel 898.5 MHz, 11 - 100 MHz
5-2-2	Channel 898.5 MHz, 1000 - 2500 MHz
5-2-3	Channel 898.5 MHz, 2.5 - 10 GHz
5-3-1	Channel 902 MHz, 1 - 100 MHz
5-3-2	Channel 902 MHz, 100 - 1000 MHz
5-3-3	Channel 902 MHz, 1 - 10 GHz

Results: Passed

Plot 5-1-1

Mkr 50. 50MHz

\* -48. 60dBm

Ref Lv1\*31. CdBm

10dB/

Atten 40dB

Tek TRIGGER

21.0

11.0

1.0

-1.0

-8.0

-18.0

-28.0

-38.0

-48.0

-58.0

-68.0

to Knob 1

to Knob 2

Trig Level

HF Reject

on OFF

Slope

POS neg

Source

Menu

HF Reject

on OFF

Slope

POS neg

Source

Menu

HF Reject

on OFF

Slope

POS neg

Source

Menu

HF Reject

on OFF

Slope

POS neg

Source

Menu

HF Reject

on OFF

Slope

POS neg

Source

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HF Reject

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POS neg

Source

Menu

HF Reject

on OFF

Slope

POS neg

Plot 5-1-2

Tek WF VIEW

Ref Lvl\*31.0dB 10dB/ Atten 40dB

Normal

grn rd OFF

Max Hold

RD grn off

Average

Rd grn OFF

Math

Rd grn OFF

A = Normal

Rd grn OFF

100.0MHz to 1.000 GHz

ResBW 100kHz VidBW 100kHz Swp 510mS

LEVEL SPAN Stop 1.000 GHz

KNOB 2 KNOB 1 KEYPAD

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Plot 5-1-3

Mkr 2.674GHz

\*-25.30dBm

Ref Lv1\*31.0dBm

10dB/

Atten 40dB

| Normal

grn rd OFF

Max Hold

RD grn OFF

Average

rd grn OFF

Math

rd grn OFF

A = Normal

rd grn OFF

B = Reg# 1

rd grn OFF

1.000GHz

tc

10.000GHz

ResBW 100kHz

MidBW 100kHz

SWP 5.1s

LEVEL SPAN

Stop 10.000GHz

KNOB 2

KNOB 1

KEYPAD

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Plot 5-2-1

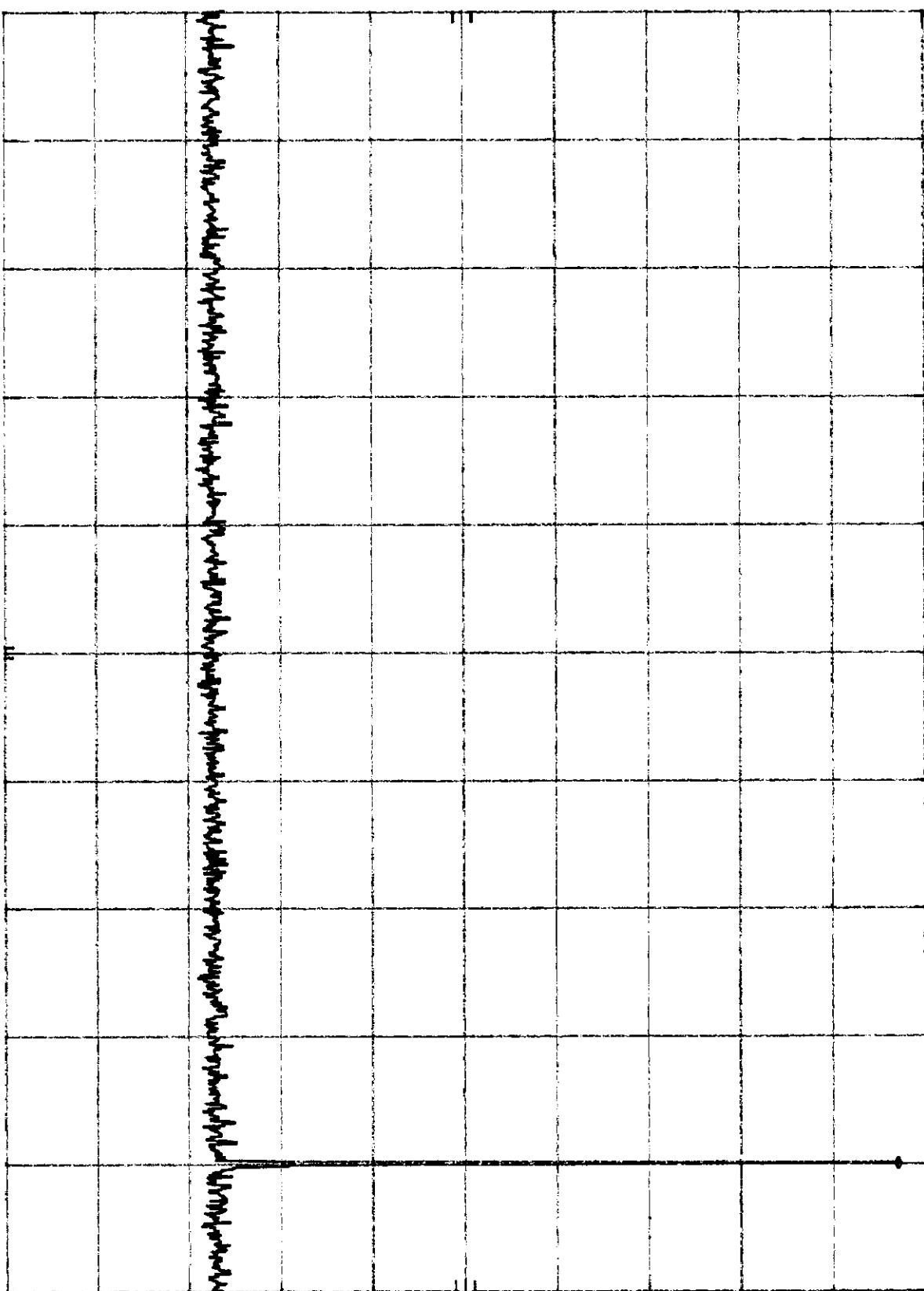
MKR 900.1 MHz  
30.00 dBm

HP REF 33.0 dBm ATTEN 30 dB

OFFSET

13.0 dB

10 dB/



START 11 MHz  
RES BW 100 kHz  
VBW 100 kHz

STOP 1.000 GHz  
SWP 297 msec

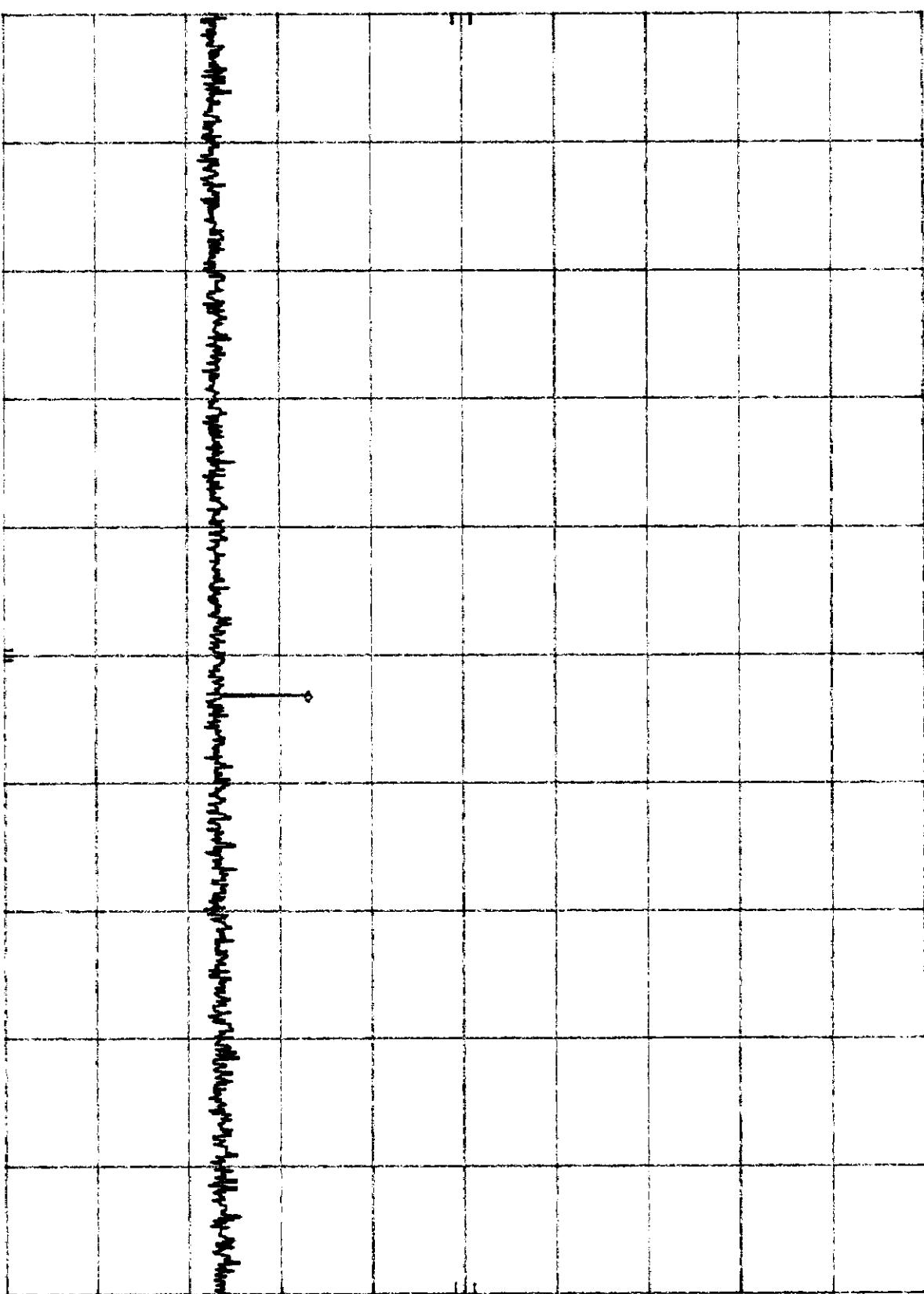
Plot 5-2-2

MKR 1.798 GHz

133.00

REF 33.0 dBm ATTEN 30 dB

OFFSET  
13.0  
dB



START 1.00 GHz  
RES BW

W 100 kHz

VBW 100 kHz

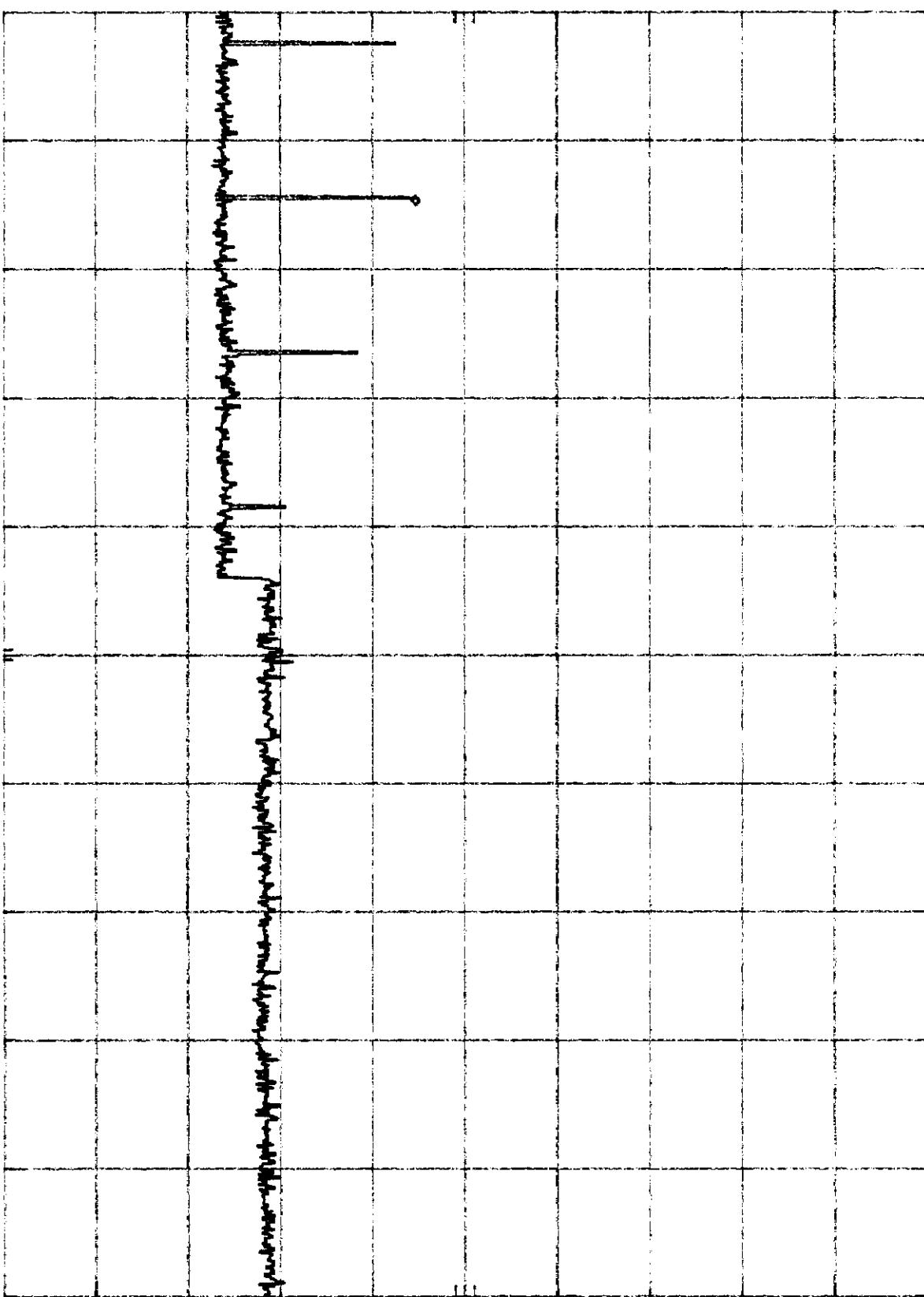
SWP 450 msec

Plot 5-2-3

MKR 3. 595 GHz  
-22.30 dBm

HP REF 33.0 dBm ATTEN 30 dB

OFFSET  
13.0 dB



START 2.50 GHz  
RES BW 100 kHz

VBW 100 kHz

STOP 10.00 GHz  
SWP 2.25 sec

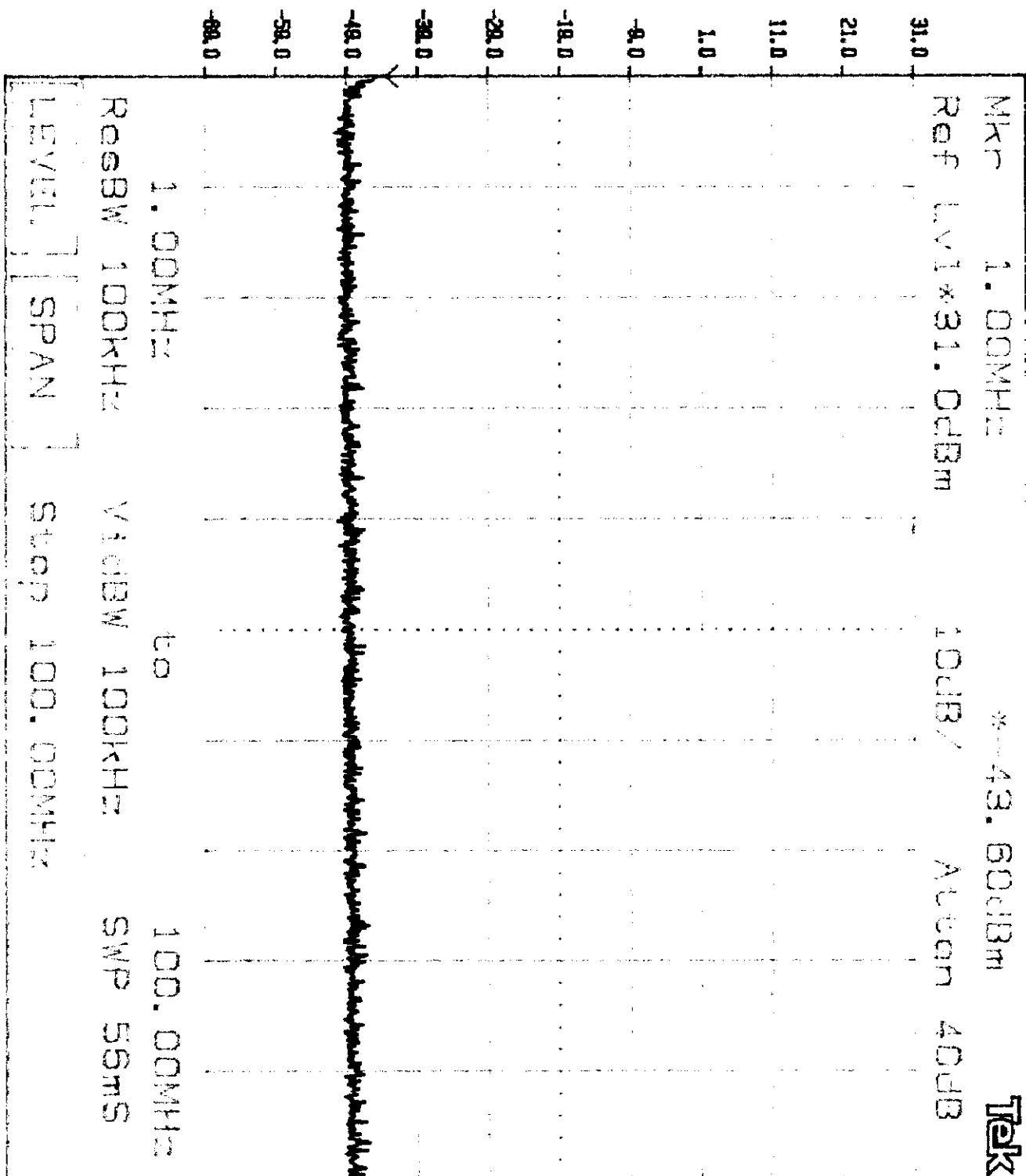
Plot 5-3-1

MKTG 1000

\* - 43. 60433

卷之三

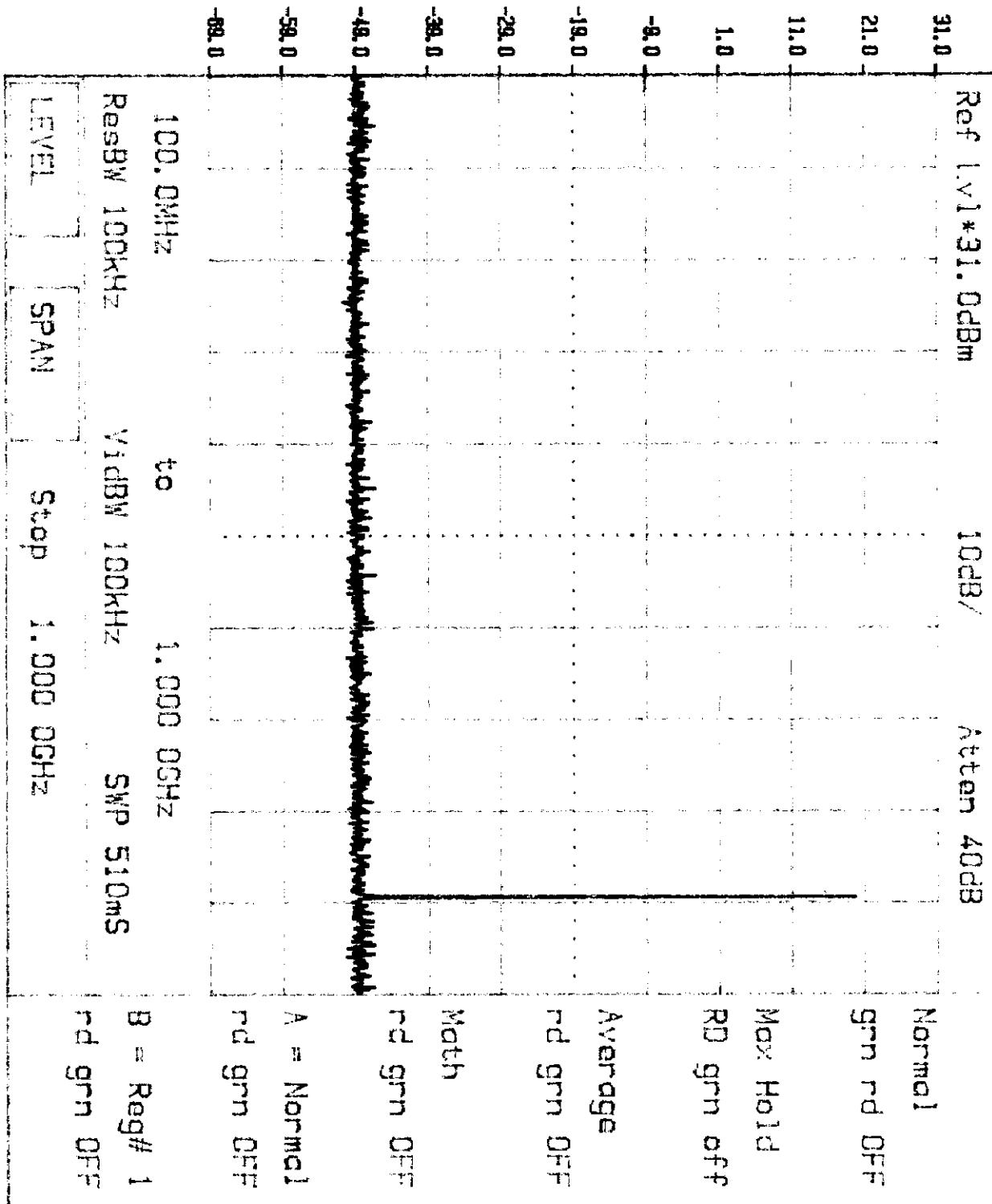
四



KNOB 2      KNOB 1      KEYPAD      Taktronix 2784

Plot 5-3-2

Tek NF VIEW



KNOB 2 KNOB 1 KEYPAD

Tektronix 2784

Plot 5-3-3

Mkr 2.692GHz

Ref Lvl x31.0dBm

4.25.7dBm

Atten 40dB

Tek WF VIEW

Normal

grn rd OFF

Max Hold

RD grn off

Average

rd grn OFF

Math

rd grn OFF

A = Normal

rd grn OFF

1.000GHz

10.000GHz

ResBW 100kHz

YidBW 100kHz

SWP 5.1S

B = Reg# 1  
rd grn OFF

LEVEL

SPAN

TRIG 0%

KNOB 2 KNOB 1 KEYPAD

Tektronix

2784

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Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

#### **6.0 Field Strength of Spurious Radiation, FCC §2.993, §15.109**

##### **6.1 Test Procedure**

The transmitter was placed on a wooden turntable.

The measurement antenna was placed at a distance of 3 meters from the EUT. During the tests, the antenna height and polarization as well as EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. The test was performed by placing the EUT on 3 orthogonal axis.

The frequency range up to tenth harmonic of the fundamental frequency was investigated.

The spurious harmonic attenuation was calculated as the difference between E in dB(uV/m) at the fundamental frequency and at the spurious emission frequency.

##### **6.2 Test Equipment**

CDI B100/200/300 Biconical Antennas  
EMCO 3115 Horn Antenna  
HP 8566B Spectrum Analyzer  
Preamplifiers

## **Radiated Emissions Test Data**

Company:	Advantra	Model #:	AR1800	Req.:	FCC 2.993
EUT:		S/N or FCC #:	OJ4ENT1	Test Dist.	3 meter
Project #:	J99030958	Test Date:	April 30, 2000	TP:	0.20 Watt
Test Mode:	Tx @ 896 MHz	Engineer:	Xi Ming Y.	Min. Att.	36.01 dBc

Antenna Used			Pre-Amp Used			Cable Used			Transducer Used	
Number:	7	21	8	13	8	10	0	0	12	0
Model:	EM LPA-25	3160-9	EMCO 3115	ACO/400	CDI_P1000	AFT18655	None	None	Gtr_M+L	None

**Notes:**

- a) O.C.F.: Other Correction Factor
- b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
- c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
- d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
- e) Negative signs (-) in Margin column signify levels **below** the limits.

## **Radiated Emissions Test Data**

Company:	Advantra	Model #:	AR1800	Req.	FCC 2.993
EUT:		S/N or FCC #:	OJ4ENT1	Test Dist.	3 meters
Project #:	J99030958	Test Date:	April 30, 2000	TP:	0.20 Watt
Test Mode:	Tx @ 898.5 MHz	Engineer:	Xi Ming Y.	Min. Attn.	36.01 dBc

Antenna Used			Pre-Amp Used			Cable Used		Transducer Used	
Number:	7	21	8	13	8	10	0	0	12
Model:	EM LPA-75	316G-9	EMCO-314S	ACO/400	CDI_PTD60	AFT18855	None	None	Gm_M+C

**Notes:**

- a) O.C.F.: Other Correction Factor
- b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
- c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
- d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
- e) Negative signs (-) in Margin column signify levels below the limits.

## ***Radiated Emissions Test Data***

Company:	Advantra	Model #:	AR1800	Req:	FCC 2.993
EUT:		S/N or FCC #:	OJ4ENT1	Test Dist:	3 meter
Project #:	J9903095 8	Test Date:	April 30, 2000	TP:	0.20 Watt
Test Mode:	Tx @ 901 MHz	Engineer:	Xi Ming Y.	Min. Attn:	36.01 dBc

Number:	Antenna Used	Pre-Amp Used	Cable Used	Transducer Used
Model:	EM LPA-3160-9 25	EMCO 3115 ACO/400 CDI_P1000 AFT18655	None	None Grn_M+L None

**Notes:**

- a) O.C.F.: Other Correction Factor
- b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
- c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
- d) Attn. = Field Strength (Fundamental) - Field Strength (Harmonics).
- e) Negative signs (-) in Margin column signify levels below the limits.

## **Radiated Emissions Test Data**

Company:	Advantra	Model #:	AR1800	Req:	FCC 2.993
EUT:		S/N or FCC #:	OJ4ENT1	Test Dist:	3 meters
Project #:	J9903095 8	Test Date:	April 30, 2000	TP:	0.20 Watt
Test Mode:	Tx @ 902 MHz	Engineer:	Xi Ming Y.	Min. Attn:	36.01 dBc

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used	
Number:	7	21	8	13	8	10	0	0	12	0	
Model:	EM LPA-25	3160-9	EMCC 3115	ACO/400	CDL/P1000	AFT18855	None	None	Grit M+L	None	

Frequency MHz	Reading dB(µV)	Detector P/A/G	Ant.	Amp	Ant. Pol.	Ant. Factor dB(1m)	Pre-Amp	Insert. Loss	Net	ERP	Attn.	Marg. dB
			#	#	H/V	dB	dB	dB	dB(µV/m)	mV	dBc	dB
902.00	93.1	Ave.	7		V	22.6	0.0	1.6	117.3	9.82E+01	0.0	N/A
1804.00	62.6	Ave.	8	8	V	27.2	29.3	2.1	62.6	3.33E-04	54.7	-18.7
2706.00	71.0	Ave.	8	8	V	30.6	28.4	2.3	75.5	6.49E-03	41.8	-5.8
3608.00	61.4	Ave.	8	8	H	33.5	27.8	2.7	69.8	1.73E-03	47.6	-11.5
4510.00	58.8	Ave.	8	8	V	33.5	27.9	3.2	67.6	1.05E-03	49.7	-13.7
5412.00	48.0	Ave.	8	8	V	34.9	28.3	3.5	58.1	1.18E-04	59.2	-23.2
6314.00	36.6	Ave.	8	8	V	36.9	28.0	3.9	49.4	1.61E-05	67.9	-31.8
7216.00	38.8	Ave.	8	8	V	38.0	28.0	4.3	53.1	3.75E-05	64.2	-28.2
8118.00	47.9	Ave.	8	8	V	38.7	27.2	4.8	64.2	4.79E-04	53.1	-17.1
9020.00	30.0	Ave.	8	8	V	40.4	26.8	4.7	48.3	1.25E-05	69.0	-33.0

**Notes:**

- a) O.C.F.: Other Correction Factor
- b) Insert. Loss = Cable A + Cable B + Cable C + Transducer.
- c) Net = Reading + Antenna Factor - Pre-Amp + Insert. Loss.
- d) Attn = Field Strength (Fundamental) - Field Strength (Harmonics).
- e) Negative signs (-) in Margin column signify levels below the limits.

## **Radiated Emissions Test Data**

Company:	Advantra	Model #:	AR1800	Standard:	FCC § 15B
EUT:		S/N #:	OJ4ENT1	Limits	2
Project #:	J99030958	Test Date:	April 30, 2000	Test Distance	3 meters
Test Mode:	Rx	Engineer:	Xi-Ming Y.	Duty Relaxation	0 dB

	Antenna Used			Pre-Amp Used			Cable Used			Transducer Used	
Number:	2	21	8	0	8	13	0	0	4	0	
Model:	EMCG 3143	3160-9	EMCG 311S	None	CDI P1000	ACO400	None	None	Site 3 3m	None	

**Notes:**

- a) D.C.F.:Distance Correction Factor
- b) Insert. Loss (dB) = Cable A + Cable B + Cable C .
- c) Net (dB) = Reading + Antenna Factor - Pre-amp + Insert. Loss. - Transducer Loss - Duty Relaxation (transmitter only).
- d) Negative signs (-) in Margin column signify levels below the limits.
- e) All other emissions not reported are below the equipment noise floor which is at least 20 dB below the limits.

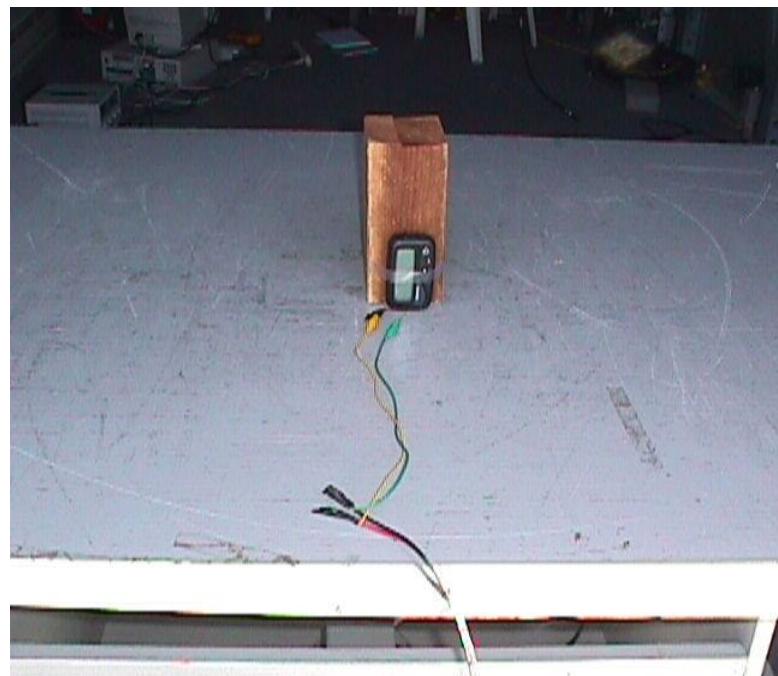
**A**

**1365 Adams Ct. Menlo Park, CA 94025**

Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

**6.3 Test Configuration Setup - Radiated Emission**



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Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

6.4 Test Results

See attached.

Results: Passed
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Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

**7.0 Line Conducted Emissions, FCC § 15.107**

**7.1 Test Procedure**

Not applicable, the EUT is battery powered.

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Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

**7.2 Test Configuration Setup – Line Conducted Emissions**

Not applicable, the EUT is battery powered.

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Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

### 7.3 Test Results

See attached test data.

<b>Results:</b> Not applicable, the EUT is battery powered.
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Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

#### 8.0 Frequency Stability vs Temperature, FCC § 2.995(a)

##### 8.1 Test Procedure

The equipment under test was connected to an external DC power supply and the RF output was connected to a frequency counter via feedthrough attenuators. The EUT was placed inside the temperature chamber.

The DC leads, RF output cable, exited the chamber through an opening

After the temperature stabilized for approximately 20 minutes, the frequency of the output signal was recorded from the counter.

##### 8.2 Test Equipment

Temperature Chamber, -50C to +100C

Hewlett Packard 5383A Frequency Counter

Tektronix 2784 Spectrum Analyzer

Goldstar DC Power Supply, GR303

##### 8.3 Test Results

Refer to the test data below.

Temperature, C	Difference (Hz)
+50	-337
+40	-50
+30	-75
+20	-50
+10	225
0	470
-5	697
-7	TX Inhibited

Results: Passed

Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

#### 9.0 Frequency Stability vs Voltage, FCC §2.995(d)(2)

##### 9.1 Test Procedure

An external variable DC power supply was connected to the EUT. The frequency of the transmitter was measured for 115% of the DC nominal value and for 85% of the nominal value.

##### 9.2 Test Equipment

Hewlett Packard 5383A Frequency Counter  
Tektronix 2784 Spectrum Analyzer  
Goldstar DC Power Supply, GR303

##### 9.3 Test Results

Refer to the test data below.

Voltage, VDC	Difference (Hz)
1.725	-51
1.5	-50
1.275	-55
1.05	-52

Results: Passed

Advantra (UK) Limited, Model No. AR1800  
FCC ID: XXXAR1800

Date of Test: April 30, 2000

#### 10.0 Transient Frequency Behavior, FCC §90.214

##### 10.1 Test Procedure

Test was performed according the TIA/EIA/IS-102.CAAA, Section 2.2.18. The transmitter was continuously transmitting a modulated signal (FSK, 2400 bits/sec.). The generator was generating FM signal (1 kHz tone, 12.5 kHz deviation). Several plots were made on the FM demodulator output with the EUT turned ON and OFF.

##### 10.2 Test Results

Results: Not Applicable
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