



*FCC PART 15, SUBPART B and C  
TEST REPORT*

*for*

Gas & Oil Monitor  
MODEL: SM1400-AN4  
FCC ID: TWE-SM1X00-XXX

Prepared for

OLEUMTECH CORPORATION  
29 PARKER  
IRVINE, CALIFORNIA 92618

Prepared by:\_\_\_\_\_

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DATE: DECEMBER 30, 2005

	REPORT BODY	APPENDICES					TOTAL
		A	B	C	D	E	
PAGES	21	2	2	2	13	68	108

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1	Conducted Emissions Test Setup
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## GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP, NIST or any other agency of the U.S. Government.

Device Tested: Gas & Oil Monitor  
Model: SM1400-AN4  
S/N: Prototype

Product Description: See Expository Statement.

Modifications: The EUT was modified during the testing. Please see the list located in Appendix B of this test report.

Manufacturer: OleumTech Corporation  
29 Parker  
Irvine, California 92618

Test Dates: December 23 - 29, 2005

Test Specifications: EMI requirements  
Limits: CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209 and 15.247

Test Procedure: ANSI C63.4: 2003

## SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 150 kHz – 30 MHz	The EUT is a battery operated unit; therefore this test was not performed.
2	Spurious Radiated RF Emissions for the Receiver Portion, 9 kHz - 9230 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15, Subpart B.
3	Spurious Radiated RF Emissions for the Digital Portion, 30 MHz – 9230 MHz	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15, Subpart B.
4	Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 9 kHz – 9230 MHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d)
5	Emissions produced by the intentional radiator in restricted bands, 9 kHz – 9280 GHz	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209(a), and section 15.247 (d).
6	6 dB Bandwidth	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(a)(2).
7	Peak Power Output	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(b)(3).
8	RF Conducted Antenna Test	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(d).
9	Peak Power Spectral Density Conducted from the Intentional Radiator to the Antenna	Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (e).

## **1. PURPOSE**

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Gas & Oil Monitor Model: SM1400-AN4. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2003. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209 and 15.247.



## **2. ADMINISTRATIVE DATA**

### **2.1 Location of Testing**

The EMI tests of the testing described herein were performed at the test facility of Compatible Electronics at 19121 El Toro Road Silverado, California 92676.

### **2.2 Traceability Statement**

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

### **2.3 Cognizant Personnel**

OleumTech Corporation

George Peters

Project Engineer

Compatible Electronics, Inc.

Joey Madlangbayan  
John Ethington  
Scott McCutchan

Test Engineer  
Senior Test Engineer  
Lab Manager (Silverado/Lake Forest Division)

### **2.4 Date Test Sample was Received**

The test sample was received on December 22, 2005.

### **2.5 Disposition of the Test Sample**

The sample has not been returned to OleumTech Corporation as of December 30, 2005.

### **2.6 Abbreviations and Acronyms**

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network

### **3. APPLICABLE DOCUMENTS**

The following documents are referenced or used in the preparation of this EMI Test Report.

<b>SPEC</b>	<b>TITLE</b>
ANSI C63.4 2003	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz
FCC Title 47, Part 15 Subpart B	FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators
FCC Title 47, Part 15 Subpart C	FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators

## 4. DESCRIPTION OF TEST CONFIGURATION

### 4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

The EUT was set up in a tabletop configuration with 3 pressure and 1 temperature sensor connected to the monitoring sensor ports.

A fresh battery was installed into the EUT throughout all tests.

#### Operation of the EUT during the testing

**For the intentional radiator and receiver portion of the test:** The EUT used a program that locked one channel at a time at the low, middle, and high channels in transmit, and then receive mode. For the transmit mode, the highest and lowest power levels were tested.

**For the digital portion of the test:** The EUT was set up in receive mode as described above.

The final radiated emissions data was taken in the modes listed above. Please see Appendix E for the data sheets.

#### **4.1.1 Cable Construction and Termination**

**Cable 1** This is a 1 meter metallic conduit shielded flex cable connecting the EUT to the Temperature sensor. The cable has a 4 pin E-series M12 type metallic connector at each end. The shield was grounded to the chassis via the connectors.

**Cable 2** This is a 1 meter metallic conduit shielded flex cable connecting the EUT to the Pressure sensor. The cable has a 4 pin E-series M12 type metallic connector at each end. The shield was grounded to the chassis via the connectors.

**Cable 3** This is a 1 meter metallic conduit shielded flex cable connecting the EUT to the Pressure sensor. The cable has a 4 pin E-series M12 type metallic connector at each end. The shield was grounded to the chassis via the connectors.

**Cable 4** This is a 1 meter metallic conduit shielded flex cable connecting the EUT to the Pressure sensor. The cable has a 4 pin E-series M12 type metallic connector at each end. The shield was grounded to the chassis via the connectors.

**Cable 5** This is a braid strap that connects the EUT to the ground plane. It has a standard lug connector at the EUT end and was bonded to the ground plane of the turntable.

## 5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

### 5.1 EUT and Accessory List

EQUIPMENT	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	FCC ID
GAS & OIL MONITOR (EUT)	OLEUMTECH CORPORATION	SM1400-AN4	SM11220575	TWE-1X00-XXX
TEMPERATURE SENSOR	OLEUMTECH CORPORATION	NONE	NONE	N/A
PRESSURE SENSOR	OLEUMTECH CORPORATION	PN: 5100-B3-0250-G-P1-OT	1817	N/A
PRESSURE SENSOR	OLEUMTECH CORPORATION	PN: 5100-B3-0250-G-P1-OT	1813	N/A
PRESSURE SENSOR	OLEUMTECH CORPORATION	PN: 5100-B3-0250-G-P1-OT	1889	N/A

## 5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. DUE DATE
Analyzer Spectrum – RF Section	Hewlett Packard	8566B	2747A04875	3/09/05	3/09/06
Analyzer Spectrum – Display Section	Hewlett Packard	85662A	2848A18214	3/09/05	3/09/06
Analyzer Spectrum - Quasi-Peak Adapter	Hewlett Packard	85650A	2811A01081	8/10/05	8/10/06
Antenna. Active Loop	Com Power	AL-130	17107	7/28/05	7/28/06
Antenna. Horn	Com-Power	AH-118	1319	5/14/04	5/14/06
Antenna. Biconical	Com Power	AB-100	14022	3/11/05	3/11/06
Antenna. Log Periodic	Com Power	AL-100	16016	1/13/05	1/13/06
Transient Limiter	Com Power	Hz-560	N/A	4/7/05	4/7/06
Computer Test Station	Hewlett Packard	Pavilion 4530	US91925466	N.C.R.	N/A
Generator Comb - Radiated	Com Power	CG-520	25164	N.C.R.	N/A
Hygrometer	Abbeon	HTAB169B	N/A	N.C.R.	N/A
Keyboard Test Station	Hewlett Packard	5183-7399	B91617825	N.C.R.	N/A
LISN EUT Side	Com Power	LI-215	12079	5/12/05	5/12/06
LISN Accessory Side	Com Power	LI-215	12073	5/12/05	5/12/06
Mast Antenna	Com Power	AM-400	N/A	N.C.R.	N/A
Monitor Test Station	Sony	CPD-100ES	7862A008	N.C.R.	N/A
Mouse Test Station	Hewlett Packard	M-S34	LZC911S8069	N.C.R.	N/A
Preamplifier	Com Power	PA-103	1541	1/22/05	1/22/06
Preamplifier	Com Power	PA-122	2120	3/3/05	3/3/06
Notch Filter	Microwave Circuits	H1G63G01	061703-01R	N.C.R.	N/A
High Pass Filter	Microwave Circuits	N03915M1	061703-01	N.C.R.	N/A
6dB Attenuator	Pulse Research Lab	PRL-DCX-6dB	None	N.C.R.	N/A

**5.3 EMI/EMC Measurement and Control Software Information**

LAB(S)	SOFTWARE TITLE	MANUFACTURER	VERSION
H, J	Compatible Electronics Data Capture Program	Compatible Electronics	3.1
H, J	Compatible Electronics Emissions Program	Compatible Electronics	2.3 (SR21)



## 6. TEST SITE DESCRIPTION

### 6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

### 6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was grounded to the ground plane via braid strap to the chassis lug of the EUT.

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## 7. CHARACTERISTICS OF THE TRANSMITTER

### 7.1 Antenna Gain

The antenna has a gain of 5.5 dBi.



## 8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

### 8.1 RF Emissions

#### 8.1.1 AC power Conducted Emissions Test

##### Test Results:

*The EUT is a DC powered device; therefore this test was not performed.*

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. A quasi-peak measurement was taken only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2003. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

### 8.1.2 Radiated Emissions (Spurious and Harmonics) Test

#### Test Results:

**For the Intentional Radiator, Digital and Receiver Portion:** The EUT complies with the **Class B** limits of CFR Title 47, Part 15 Subpart B for radiated emissions; and the limits of CFR Title 47, Part 15, Subpart C, Sections 15.205, 15.209, and 15.247 (d).

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. The Pre-amplifiers were used to increase the sensitivity of the instrument. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

A quasi-peak and/or average measurement was taken only for those readings which are marked accordingly on the data sheets.

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the spectrum analyzer to keep the amplitude reading calibrated.

The measurement bandwidths and transducers used for the radiated emissions test are indicated in the following table below.

FREQUENCY RANGE	EFFECTIVE MEASUREMENT BANDWIDTH	TRANSDUCER
9 kHz to 150 kHz	200 Hz	Active Loop Antenna
150 kHz to 30 MHz	9 kHz	Active Loop Antenna
30 MHz to 300 MHz	120 kHz	Biconical Antenna
300 MHz to 1 GHz	120 kHz	Log Periodic Antenna
1 GHz to 9280 GHz	1 MHz	Horn Antenna

**Radiated Emissions (Spurious and Harmonics) Test (con't)**

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 2003. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. The antenna mast allows height variation of the antenna from 1 meter to 4 meters. The measurement data was recorded in the configuration with the highest emissions radiated from the EUT, using the Radiated Emissions Manual Test software. At each recording, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (E field radiated field strength). The gun-sight method was used when measuring with the horn antenna in order to ensure accurate results.

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a distance of 3 meters to obtain the final data. The final radiated data is located in Appendix E.

## 8.2 6 dB Bandwidth

The 6 dB bandwidth was measured using the spectrum analyzer. For digitally modulated transmissions the bandwidth shall be at least 500kHz. The bandwidth was measured using a direct connection from the RF out of the EUT to the input of the spectrum analyzer. The resolution and video bandwidth was 10 kHz.

### Test Results:

The EUT complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (a)(2).

## 8.3 Peak Output Power

The Peak Output Power was measured using a direct connection to the input of the spectrum analyzer. An offset setting was in place to account for the attenuator. This test was performed at all power levels.

### Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (b)(3).

## 8.4 RF Antenna Conducted Test

The RF antenna conducted test was taken using the spectrum analyzer. The RF antenna conducted test was measured using a direct connection from the RF out on the EUT into the input of the analyzer. The resolution and video bandwidth was 100 kHz. A series of frequency bands were measured from 2MHz up to 10GHz.

### Test Results:

The EUT complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (d).

## 8.5 Spectral Density Output

The spectral density output was measured using the spectrum analyzer. The spectral density output was measured using a direct connection from the RF out of the EUT into the input of the spectrum analyzer. The resolution bandwidth was 3 kHz, and the video bandwidth was 10 kHz. The highest 100 kHz of the signal was used as the frequency span with the sweep rate being at least 1 second for every 3 kHz of span.

### Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (e).

## 8.6 RF Band Edges

This test was performed with a measurement span large enough to encompass those frequencies +/-4MHz from the top and bottom of the 902 MHz – 928 MHz frequency band.

### Test Results:

The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C section 15.247 (d).

**9. TEST PROCEDURE DEVIATIONS**

The test procedures were not deviated from during the tests.

**10. CONCLUSIONS**

The Gas & Oil Monitor meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209 and 15.247.





## APPENDIX A

### ***LABORATORY ACCREDITATIONS AND RECOGNITIONS***

---

**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
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## LABORATORY ACCREDITATIONS AND RECOGNITIONS



For US, Canada, Australia/New Zealand, Taiwan and the European Union, Compatible Electronics is currently accredited by NVLAP to ISO/IEC 17025 an ISO 9002 equivalent. Please follow the link to the NIST site for each of our facilities NVLAP certificate and scope of accreditation.

Silverado/Lake Forest Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2005270.htm>

Brea Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2005280.htm>

Agoura Division: <http://ts.nist.gov/ts/htdocs/210/214/scopes/2000630.htm>



Compatible Electronics has been accredited by ANSI and appointed by the FCC to serve as a Telecommunications Certification Body (TCB). Compatible Electronics ANSI TCB listing can be found at: [http://www.ansi.org/public/ca/ansi\\_cp.html](http://www.ansi.org/public/ca/ansi_cp.html)



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for EMC under the US/EU Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/EU CAB listing can be found at: <http://ts.nist.gov/ts/htdocs/210/gsig/emc-cabs-mar02.pdf>



Compatible Electronics has been nominated as a Conformity Assessment Body (CAB) for Taiwan/BSMI under the US/APEC (Asia-Pacific Economic Cooperation) Mutual Recognition Agreement (MRA). Compatible Electronics NIST US/APEC CAB listing can be found at: <http://ts.nist.gov/ts/htdocs/210/gsig/apcbsmi-cabs-may02.pdf>



Compatible Electronics has been validated by NEMKO against ISO/IEC 17025 under the NEMKO EMC Laboratory Authorization (ELA) program to all EN standards required by the European Union (EU) EMC Directive 89/336/EEC. Please follow the link to the Compatible Electronics' web site for each of our facilities NEMKO ELA certificate and scope of accreditation. <http://www.celectronics.com/certs.htm>

We are also certified/listed for IT products by the following country/agency:



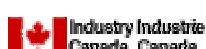
Compatible Electronics VCCI listing can be found at:  
[http://www.vcci.or.jp/vcci\\_e/member/tekigo/setsubi\\_index\\_id.html](http://www.vcci.or.jp/vcci_e/member/tekigo/setsubi_index_id.html)

Just type "Compatible Electronics" into the Keyword search box.



Compatible Electronics FCC listing can be found at:  
[https://gullfoss2.fcc.gov/prod/oet/index\\_ie.html](https://gullfoss2.fcc.gov/prod/oet/index_ie.html)

Just type "Compatible Electronics" into the Test Firms search box.



Compatible Electronics IC listing can be found at:  
[http://spectrum.ic.gc.ca/~cert/labs/oats\\_lab\\_c\\_e.html](http://spectrum.ic.gc.ca/~cert/labs/oats_lab_c_e.html)

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## APPENDIX B

### ***MODIFICATIONS TO THE EUT***

---

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## MODIFICATIONS TO THE EUT

The modification listed below was made to the EUT to pass FCC Subpart B and Subpart C specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

Modification:

- 1) The transceiver board was removed and replaced with an identical board with the SAW filter enabled.  
(OleumTech PN: 14-3000-001)



## APPENDIX C

### ***ADDITIONAL MODELS COVERED UNDER THIS REPORT***

---

**Brea Division**  
**114 Olinda Drive**  
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**(949) 587-0400**

## **ADDITIONAL MODELS COVERED UNDER THIS REPORT**

**USED FOR THE PRIMARY TEST**

Gas & Oil Monitor  
 Model: SM1400-AN4-AN4  
 S/N: SM11220575

**ALSO APPROVED UNDER THIS REPORT:**

SM1400-AN4-AN1	Pressure Monitor (Pressure Monitor w/ 1 input)
SM1400-AN4-AN2	Pressure Monitor (Pressure Monitor w/ 2 inputs)
SM1400-AN4-AN4	Pressure Monitor (Pressure Monitor w/ 4 inputs)
SM1100-AN1	Temperature Monitor (Temperature Monitor w/ 1 input)
SM1100-AN2	Temperature Monitor (Temperature Monitor w/ 2 inputs)
SM1100-AN4	Temperature Monitor (Temperature Monitor w/ 4 inputs)
SM1200-AN2	Pressure & Temperature Monitor (w/ 1 Pressure & 1 Temperature Monitor input)
SM1300-AN4	Pressure & Temperature Monitor (w/ 2 Pressure & 2 Temperature Monitor inputs)
SM1500-AN4	Pressure & Temperature Monitor (w/ 1 Pressure & 3 Temperature Monitor inputs)

The above listed products are all electrically identical; see Appendix E for additional info regarding the detailed differences.



## APPENDIX D

### ***DIAGRAMS, CHARTS, AND PHOTOS***

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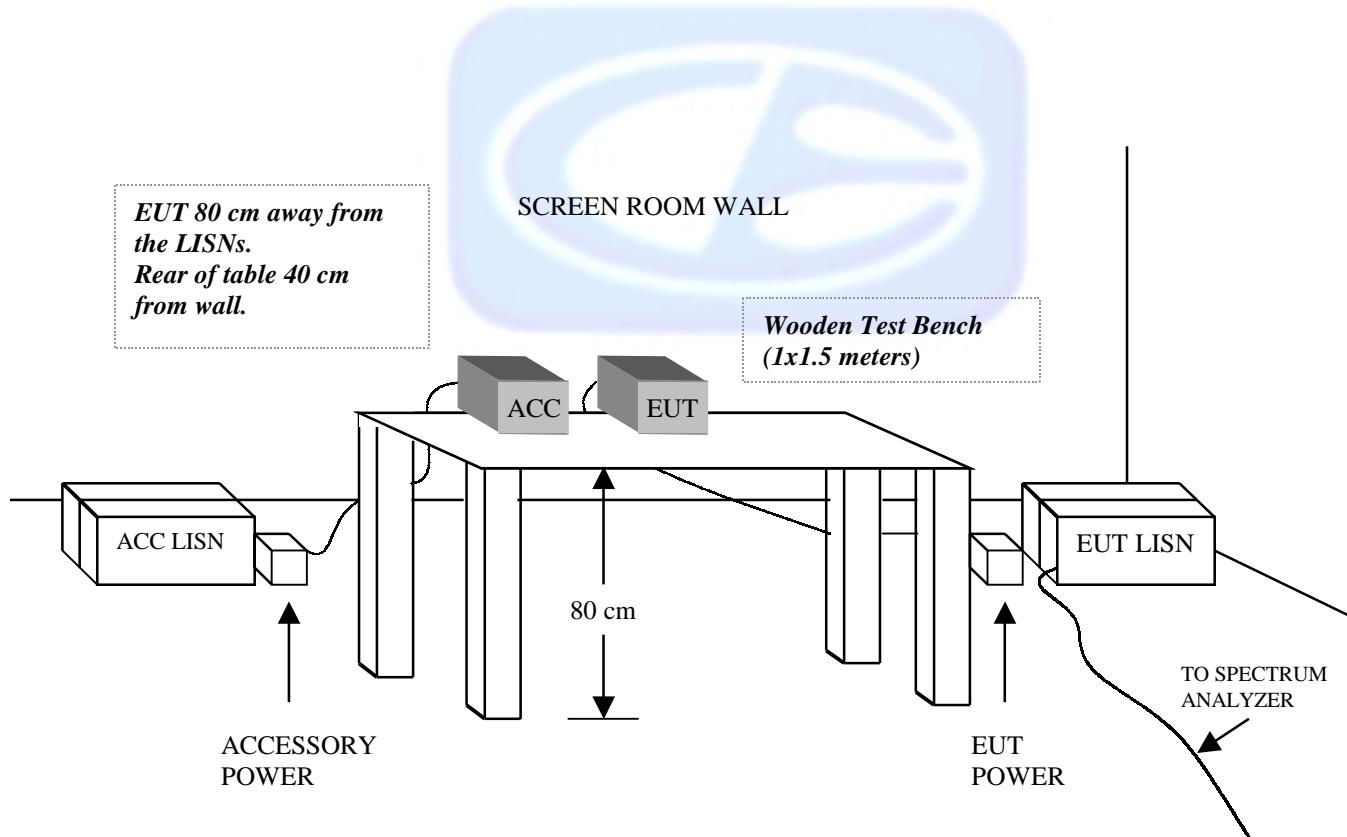
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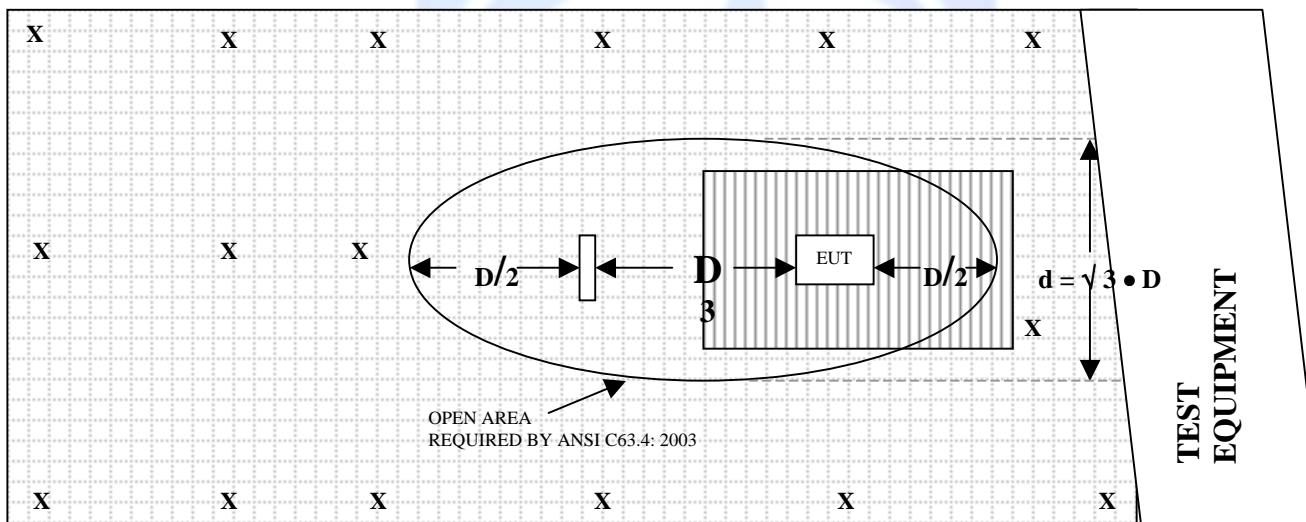
**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

**FIGURE 1: CONDUCTED EMISSIONS TEST SETUP**



**FIGURE 2: PLOT MAP AND LAYOUT OF 3 METER RADIATED SITE**

OPEN LAND > 15 METERS



**OPEN LAND > 15 METERS**

 <b>X</b>	= GROUND RODS	 <b></b>	= GROUND SCREEN
 <b>D</b>	= TEST DISTANCE (meters)	 <b></b>	= WOOD COVER

**FRONT VIEW****OLEUMTECH CORPORATION**

Gas &amp; Oil Monitor

MODEL: SM1400-AN4

FCC SUBPART B &amp; B, – RADIATED EMISSIONS – 12-29-05

**PHOTOGRAPH SHOWING THE TEST SET UP  
FOR MAXIMUM EMISSIONS**

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Brea Division  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

Agoura Division  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

Silverado Division  
19121 El Toro Road  
Silverado, CA 92676  
(949) 589-0700

Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**REAR VIEW****OLEUMTECH CORPORATION**

Gas &amp; Oil Monitor

MODEL: SM1400-AN4

FCC SUBPART B &amp; C – RADIATED EMISSIONS – 12-29-05

**PHOTOGRAPH SHOWING THE TEST SET UP  
MAXIMUM EMISSIONS**

**Brea Division**  
114 Olinda Drive  
Brea, CA 92823  
(714) 579-0500

**Agoura Division**  
2337 Troutdale Drive  
Agoura, CA 91301  
(818) 597-0600

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Silverado, CA 92676  
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**Lake Forest Division**  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400



### FRONT VIEW

OLEUMTECH CORPORATION  
Gas & Oil Monitor  
MODEL: SM1400-AN4  
FCC SUBPART B & B, – RADIATED EMISSIONS – 12-29-05

### PHOTOGRAPH SHOWING THE EUT CONFIGURATION

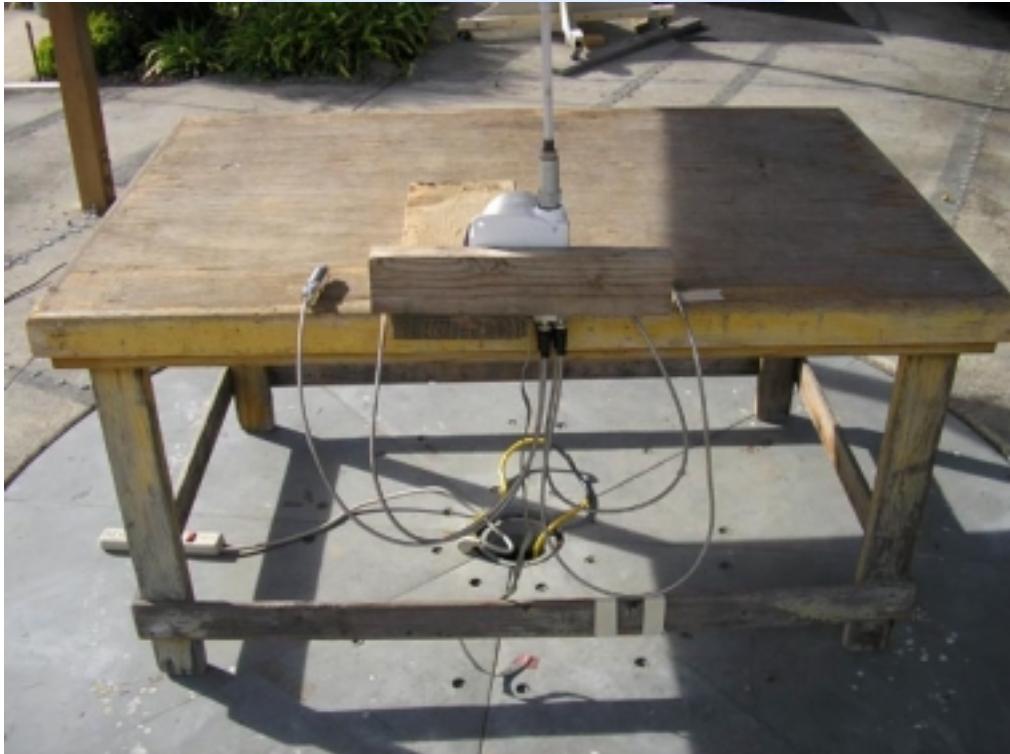
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Silverado, CA 92676  
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Lake Forest Division  
20621 Pascal Way  
Lake Forest, CA 92630  
(949) 587-0400

**REAR VIEW**

OLEUMTECH CORPORATION

Gas &amp; Oil Monitor

MODEL: SM1400-AN4

FCC SUBPART B &amp; C – RADIATED EMISSIONS – 12-29-05

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION**

Brea Division  
114 Olinda Drive  
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2337 Troutdale Drive  
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(949) 587-0400

**COM-POWER AL-130**
**LAB J – ACTIVE LOOP ANTENNA (E-FIELD)**
**S/N: 17107**
**CALIBRATION DATE: JULY 28, 2005**

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
0.009	11.99	1.0	11.71
0.01	11.58	2.0	12.2
0.02	11.04	3.0	11.9
0.05	10.8	4.0	11.8
0.07	11.2	5.0	12.4
0.10	11.34	10.0	12.17
0.20	8.7	15.0	9.53
0.30	11.44	20.0	8.9
0.50	11.2	25.0	10.63
0.70	11.63	30.0	3.4

COM-POWER AB-100

LAB J - BICONICAL ANTENNA

S/N: 14022

CALIBRATION DATE: MARCH 11, 2005

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30.0	9.9	120.0	10.7
35.0	13.0	125.0	10.4
40.0	13.0	140.0	11.9
45.0	11.6	150.0	12.4
50.0	11.4	160.0	12.8
60.0	10.9	175.0	13.6
70.0	9.5	180.0	12.7
80.0	9.2	200.0	14.4
90.0	8.0	250.0	17.5
100.0	10.7	300.0	19.2

COM-POWER AL-100

LAB J - LOG PERIODIC ANTENNA

S/N: 16016

CALIBRATION DATE: JANUARY 13, 2005

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
300	13.4	350	15.7
400	17.7	450	16.3
500	17.3	550	16.4
600	19.1	650	18.4
700	19.2	750	20.6
800	22.3	850	21.6
900	21.3	950	23.0
1000	23.0	-	-

**COM-POWER AL-118**
**LAB J - HORN ANTENNA**
**S/N: 01319**
**CALIBRATION DATE: MAY 14, 2004**

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
1000	24.74	10000	39.63
1500	25.39	10500	40.07
2000	27.90	11000	40.60
2500	28.44	11500	41.90
3000	30.01	12000	41.09
3500	30.61	12500	41.49
4000	30.72	13000	40.68
4500	31.22	13500	41.05
5000	33.03	14000	42.03
6000	33.84	14500	45.60
6500	34.70	15000	40.35
7000	36.51	15500	40.19
7500	37.61	16000	39.83
8000	37.63	16500	40.65
8500	38.12	17000	44.76
9000	38.33	17500	47.21
9500	39.54	18000	42.59

COM-POWER PA-103

LAB J - PREAMPLIFIER

S/N: 1541

CALIBRATION DATE: JANUARY 22, 2005

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	30.9	300	30.6
40	31.1	350	30.6
50	31.4	400	30.6
60	31.5	450	30.7
70	30.9	500	30.3
80	30.5	550	30.4
90	29.3	600	30.2
100	26.8	650	30.1
125	28.7	700	29.5
150	30.3	750	30.1
175	30.7	800	29.8
200	31.0	850	29.3
225	30.8	900	29.4
250	31.0	950	29.8
275	30.9	1000	29.3

COM-POWER PA-122

LAB J – HI-FREQUENCY PREAMPLIFIER

S/N: 25196

CALIBRATION DATE: MARCH 3, 2005

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
1000	33.2	6000	27.7
1100	32.1	6500	28.1
1200	32.0	7000	28.4
1300	31.9	7500	28.4
1400	31.8	8000	28.2
1500	31.7	8500	28.2
1600	31.5	9000	28.7
1700	31.2	9500	27.9
1800	31.0	10000	27.3
1900	30.8	11000	27.2
2000	30.8	12000	29.3
2500	30.1	13000	28.7
3000	29.9	14000	28.8
3500	29.4	15000	29.1
4000	28.7	16000	27.6
4500	28.3	17000	25.7
5000	27.9	18000	24.3
5500	27.4		



## **APPENDIX E**

### ***DATA SHEETS***

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**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
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**Agoura, CA 91301**  
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**Silverado Division**  
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**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**



## ***RADIATED EMISSIONS***

## ***TRANSMITTER PORTION***

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**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
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**Silverado, CA 92676**  
**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05	
EUT	Sentry Monitor												DUTY CYCLE	N/A	%
MODEL	SM1400-AN4												PEAK TO AVG	N/A	dB
S/N	SM1220575 (LEVEL 0 Lowest)												TEST DIST.	3	Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J	

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2710.5000	38.8	A	H	1.5	180			29.1	2.0	30.0			39.9	-14.1	54.0	
2710.5000	42.8	A	V	2.0	90			29.1	2.0	30.0			43.9	-10.1	54.0	
2736.0000	38.1	A	H	2.0	180			29.2	2.0	30.0		0.0	39.3	-14.7	54.0	
2736.0000	43.1	A	V	1.5	180			29.2	2.0	30.0		0.0	44.3	-9.7	54.0	
2769.0000	38.4	A	H	3.0	0			29.3	2.0	30.0		0.0	39.7	-14.3	54.0	
2769.0000	38.1	A	V	1.0	0			29.3	2.0	30.0		0.0	39.4	-14.6	54.0	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 0 Lowest)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3614.0000		A	H					30.6	2.4	29.2				54.0	no emission found	
3614.0000		A	V					30.6	2.4	29.2				54.0	no emission found	
3648.0000		A	H					30.6	2.5	29.2				54.0	no emission found	
3648.0000		A	V					30.6	2.5	29.2				54.0	no emission found	
3692.0000		A	H					30.6	2.5	29.1				54.0	no emission found	
3692.0000		A	V					30.6	2.5	29.1				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 0 Lowest)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
4517.5000		A	H					31.3	2.5	28.3				54.0	no emission found	
4517.5000		A	V					31.3	2.5	28.3				54.0	no emission found	
4560.0000		A	H					31.4	2.5	28.3				54.0	no emission found	
4560.0000		A	V					31.4	2.5	28.3				54.0	no emission found	
4615.0000		A	H					31.6	2.5	28.2				54.0	no emission found	
4615.0000		A	V					31.6	2.5	28.2				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 0 Lowest)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
5421.0000		A	H					33.8	2.8	27.5				54.0	no emission found	
5421.0000		A	V					33.8	2.8	27.5				54.0	no emission found	
5472.0000		A	H					33.8	2.8	27.4				54.0	no emission found	
5472.0000		A	V					33.8	2.8	27.4				54.0	no emission found	
5538.0000		A	H					33.9	2.8	27.4				54.0	no emission found	
5538.0000		A	V					33.9	2.8	27.4				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 0 Lowest)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
6324.5000		A	H					34.4	3.1	28.0				54.0	no emission found	
6324.5000		A	V					34.4	3.1	28.0				54.0	no emission found	
6384.0000		A	H					34.5	3.1	28.0				54.0	no emission found	
6384.0000		A	V					34.5	3.1	28.0				54.0	no emission found	
6461.0000		A	H					34.6	3.2	28.1				54.0	no emission found	
6461.0000		A	V					34.6	3.2	28.1				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 0 Lowest)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
7228.0000		A	H					37.0	3.4	28.4				54.0	no emission found	
7228.0000		A	V					37.0	3.4	28.4				54.0	no emission found	
7296.0000		A	H					37.2	3.4	28.4				54.0	no emission found	
7296.0000		A	V					37.2	3.4	28.4				54.0	no emission found	
7384.0000		A	H					37.3	3.5	28.4				54.0	no emission found	
7384.0000		A	V					37.3	3.5	28.4				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 0 Lowest)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
8131.5000		A	H					37.7	3.8	28.2				54.0	no emission found	
8131.5000		A	V					37.7	3.8	28.2				54.0	no emission found	
8208.0000		A	H					37.8	3.8	28.2				54.0	no emission found	
8208.0000		A	V					37.8	3.8	28.2				54.0	no emission found	
8307.0000		A	H					37.9	3.9	28.2				54.0	no emission found	
8307.0000		A	V					37.9	3.9	28.2				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 0 Lowest)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
9035.0000		A	H					38.4	4.3	28.6				54.0	no emission found	
9035.0000		A	V					38.4	4.3	28.6				54.0	no emission found	
9120.0000		A	H					38.6	4.3	28.5				54.0	no emission found	
9120.0000		A	V					38.6	4.3	28.5				54.0	no emission found	
9230.0000		A	H					38.9	4.3	28.3				54.0	no emission found	
9230.0000		A	V					38.9	4.3	28.3				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 3 HIGH)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
2710.5000	47.4		A	H	2.0	180		29.1	2.0	30.0		0.0	48.5	-5.5	54.0	
2710.5000	52.9	45.7	A	V	1.0	90		29.1	2.0	30.0			46.8	-7.2	54.0	
2736.0000	44.3		A	H	1.5	270		29.2	2.0	30.0		0.0	45.5	-8.5	54.0	
2736.0000	52.0	44.7	A	V	1.5	180		29.2	2.0	30.0		0.0	45.9	-8.1	54.0	
2769.0000	42.9		A	H	1.5	0		29.3	2.0	30.0		0.0	44.2	-9.8	54.0	
2769.0000	47.0		A	V	2.0	0		29.3	2.0	30.0		0.0	48.3	-5.7	54.0	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 3 HIGH)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
3614.0000		A	H					30.6	2.4	29.2				54.0	no emission found	
3614.0000		A	V					30.6	2.4	29.2				54.0	no emission found	
3648.0000		A	H					30.6	2.5	29.2				54.0	no emission found	
3648.0000		A	V					30.6	2.5	29.2				54.0	no emission found	
3692.0000		A	H					30.6	2.5	29.1				54.0	no emission found	
3692.0000		A	V					30.6	2.5	29.1				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 3 HIGH)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
4517.5000		A	H					31.3	2.5	28.3				54.0	no emission found	
4517.5000		A	V					31.3	2.5	28.3				54.0	no emission found	
4560.0000		A	H					31.4	2.5	28.3				54.0	no emission found	
4560.0000		A	V					31.4	2.5	28.3				54.0	no emission found	
4615.0000		A	H					31.6	2.5	28.2				54.0	no emission found	
4615.0000		A	V					31.6	2.5	28.2				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 3 HIGH)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
5421.0000		A	H					33.8	2.8	27.5				54.0	no emission found	
5421.0000		A	V					33.8	2.8	27.5				54.0	no emission found	
5472.0000		A	H					33.8	2.8	27.4				54.0	no emission found	
5472.0000		A	V					33.8	2.8	27.4				54.0	no emission found	
5538.0000		A	H					33.9	2.8	27.4				54.0	no emission found	
5538.0000		A	V					33.9	2.8	27.4				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 3 HIGH)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
6324.5000		A	H					34.4	3.1	28.0				54.0	no emission found	
6324.5000		A	V					34.4	3.1	28.0				54.0	no emission found	
6384.0000		A	H					34.5	3.1	28.0				54.0	no emission found	
6384.0000		A	V					34.5	3.1	28.0				54.0	no emission found	
6461.0000		A	H					34.6	3.2	28.1				54.0	no emission found	
6461.0000		A	V					34.6	3.2	28.1				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 3 HIGH)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
7228.0000		A	H					37.0	3.4	28.4				54.0	no emission found	
7228.0000		A	V					37.0	3.4	28.4				54.0	no emission found	
7296.0000		A	H					37.2	3.4	28.4				54.0	no emission found	
7296.0000		A	V					37.2	3.4	28.4				54.0	no emission found	
7384.0000		A	H					37.3	3.5	28.4				54.0	no emission found	
7384.0000		A	V					37.3	3.5	28.4				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 3 HIGH)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
8131.5000		A	H					37.7	3.8	28.2				54.0	no emission found	
8131.5000		A	V					37.7	3.8	28.2				54.0	no emission found	
8208.0000		A	H					37.8	3.8	28.2				54.0	no emission found	
8208.0000		A	V					37.8	3.8	28.2				54.0	no emission found	
8307.0000		A	H					37.9	3.9	28.2				54.0	no emission found	
8307.0000		A	V					37.9	3.9	28.2				54.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING

## RADIATED EMISSIONS (FCC SECTION 15.247 & 15.205)

COMPANY	OleumTech Corporation												DATE	12/29/05
EUT	Sentry Monitor												DUTY CYCLE	N/A %
MODEL	SM1400-AN4												PEAK TO AVG	N/A dB
S/N	SM1220575 (LEVEL 3 HIGH)												TEST DIST.	3 Meters
TEST ENGINEER	Joey Madlangbayan												LAB	J

Frequency MHz	Peak Reading (dBuV)	Average (A) or Quasi- Peak (QP)	Antenna Polar. (V or H)	Antenna Height (meters)	EUT Azimuth (degrees)	EUT Axis (X,Y,Z)	EUT Tx Channel	Antenna Factor (dB)	Cable Loss (dB)	Amplifier Gain (dB)	Distance Factor (dB)	Mixer Factor (dB)	*Corrected Reading (dBuV/m)	Delta ** (dB)	Spec Limit (dBuV/m)	Comments
9035.0000		A	H					38.4	4.3	28.6				54.0	no emission found	
9035.0000		A	V					38.4	4.3	28.6				54.0	no emission found	
9120.0000		A	H					38.6	4.3	28.5				54.0	no emission found	
9120.0000		A	V					38.6	4.3	28.5				54.0	no emission found	
9230.0000		A	H					38.9	4.3	28.3				68.0	no emission found	
9230.0000		A	V					38.9	4.3	28.3				68.0	no emission found	

\* CORRECTED READING = METER READING + ANTENNA FACTOR + CABLE LOSS - AMPLIFIER GAIN

\*\* DELTA = SPEC LIMIT - CORRECTED READING



## ***RADIATED EMISSIONS***

## ***DIGITAL PORTION***

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**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**



**Test Location** : Compatible Electronics **Page** : 1/1  
**Customer** : George Peters **Date** : 12/27/2005  
**Manufacturer** : OleumTech Corporation **Time** : 10:16:16 AM  
**Unit name** : Sentry Monitor **Lab** : J  
**Model** : SM1400-AN4 **Test Distance** : 3.00 Meters  
**Serial #** : SM1220575 level 3 High power 903.5  
**Specification** : FCC Pt. 15 - Class B  
**Distance correction factor (20 \* log(test/spec))** : 0.00  
**Test Mode** : 9kHz-9230MHz spurious TX mode  
No emissions found in RX mode & Low power TX & RX modes  
Test Engineer: Joey Madlangbayan Temp: 62degF Humid: 60%

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
1V	73.748	53.40	1.50	7.45	32.74	29.61	40.00	-10.39
2V	81.140	57.30	1.51	6.76	32.75	32.82	40.00	-7.18
3V	82.641	49.90	1.53	6.96	32.69	25.70	40.00	-14.30
4V	85.822	51.40	1.56	7.38	32.56	27.77	40.00	-12.23
5V	86.979	48.20	1.57	7.52	32.52	24.78	40.00	-15.22
6V	87.395	45.30	1.58	7.58	32.50	21.95	40.00	-18.05
7V	81.145	57.20	1.51	6.76	32.75	32.72	40.00	-7.28
7V power level was decreased to lowest setting (level 0)								
8H	81.156	51.00	1.51	6.76	32.75	26.52	40.00	-13.48



**Test Location** : Compatible Electronics **Page** : 1/1  
**Customer** : George Peters **Date** : 12/27/2005  
**Manufacturer** : OleumTech Corporation **Time** : 10:48:00 AM  
**Unit name** : Sentry Monitor **Lab** : J  
**Model** : SM1400-AN4 **Test Distance** : 3.00 Meters  
**Serial #** : SM1220575 level 3 High power 912  
**Specification** : FCC Pt. 15 - Class B  
**Distance correction factor (20 \* log(test/spec))** : 0.00  
**Test Mode** : 9kHz-9230MHz spurious TX mode  
No emissions found in RX mode & Low power TX & RX modes  
Test Engineer: Joey Madlangbayan Temp: 62degF Humid: 60%

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
1V	73.732	54.70	1.50	7.46	32.74	30.92	40.00	-9.08
2V	81.152	56.20	1.51	6.76	32.75	31.72	40.00	-8.28
3V	82.667	48.00	1.53	6.96	32.69	23.80	40.00	-16.20
4V	84.845	48.80	1.55	7.25	32.60	25.00	40.00	-15.00
5V	86.959	47.10	1.57	7.52	32.52	23.67	40.00	-16.33
6V	87.780	46.20	1.58	7.62	32.48	22.92	40.00	-17.08
7V	81.145	55.40	1.51	6.76	32.75	30.92	40.00	-9.08
7V power level decreased to lowest setting (level 0)								
8H	81.151	50.90	1.51	6.76	32.75	26.42	40.00	-13.58
9H	82.655	44.00	1.53	6.96	32.69	19.80	40.00	-20.20



**Test Location** : Compatible Electronics **Page** : 1/1  
**Customer** : George Peters **Date** : 12/29/2005  
**Manufacturer** : OleumTech Corporation **Time** : 01:49:38 PM  
**Eut name** : Sentry Monitor **Lab** : J  
**Model** : SM1400-AN4 **Test Distance** : 3.00 Meters  
**Serial #** : SM1220575 level 3 High power 923  
**Specification** : FCC Pt. 15 - Class B  
**Distance correction factor (20 \* log(test/spec))** : 0.00  
**Test Mode** : 9kHz-9230MHz spurious TX mode  
No emissions found in RX mode & Low power TX & RX modes  
Test Engineer: Joey Madlangbayan Temp: 65degF Humid: 50%

Pol	Freq	Reading	Cable loss	Antenna factor	Amplifier gain	Corr'd rdg = R	Limit = L	Delta R-L
	MHz	dBuV	dB	dB	dB	dBuV/m	dBuV/m	dB
1V	66.368	51.80	1.43	8.66	32.29	29.60	40.00	-10.40
2V	73.743	51.70	1.50	7.45	32.74	27.91	40.00	-12.09
3V	81.098	54.20	1.51	6.75	32.75	29.71	40.00	-10.29
4V	82.651	46.50	1.53	6.96	32.69	22.30	40.00	-17.70
5V	84.823	47.30	1.55	7.25	32.60	23.49	40.00	-16.51
6V	86.969	46.60	1.57	7.52	32.52	23.18	40.00	-16.82
7V	154.841	43.60	2.32	12.55	32.56	25.91	43.50	-17.59
8V	176.995	41.30	2.43	15.42	32.28	26.87	43.50	-16.63
9H	73.721	48.20	1.50	7.46	32.74	24.42	40.00	-15.58
10H	81.108	49.90	1.51	6.75	32.75	25.41	40.00	-14.59
11V	81.150	53.70	1.51	6.76	32.75	29.22	40.00	-10.78
	11V pwrOUT	reduced to lowest setting						



***PEAK POWER OUTPUT***

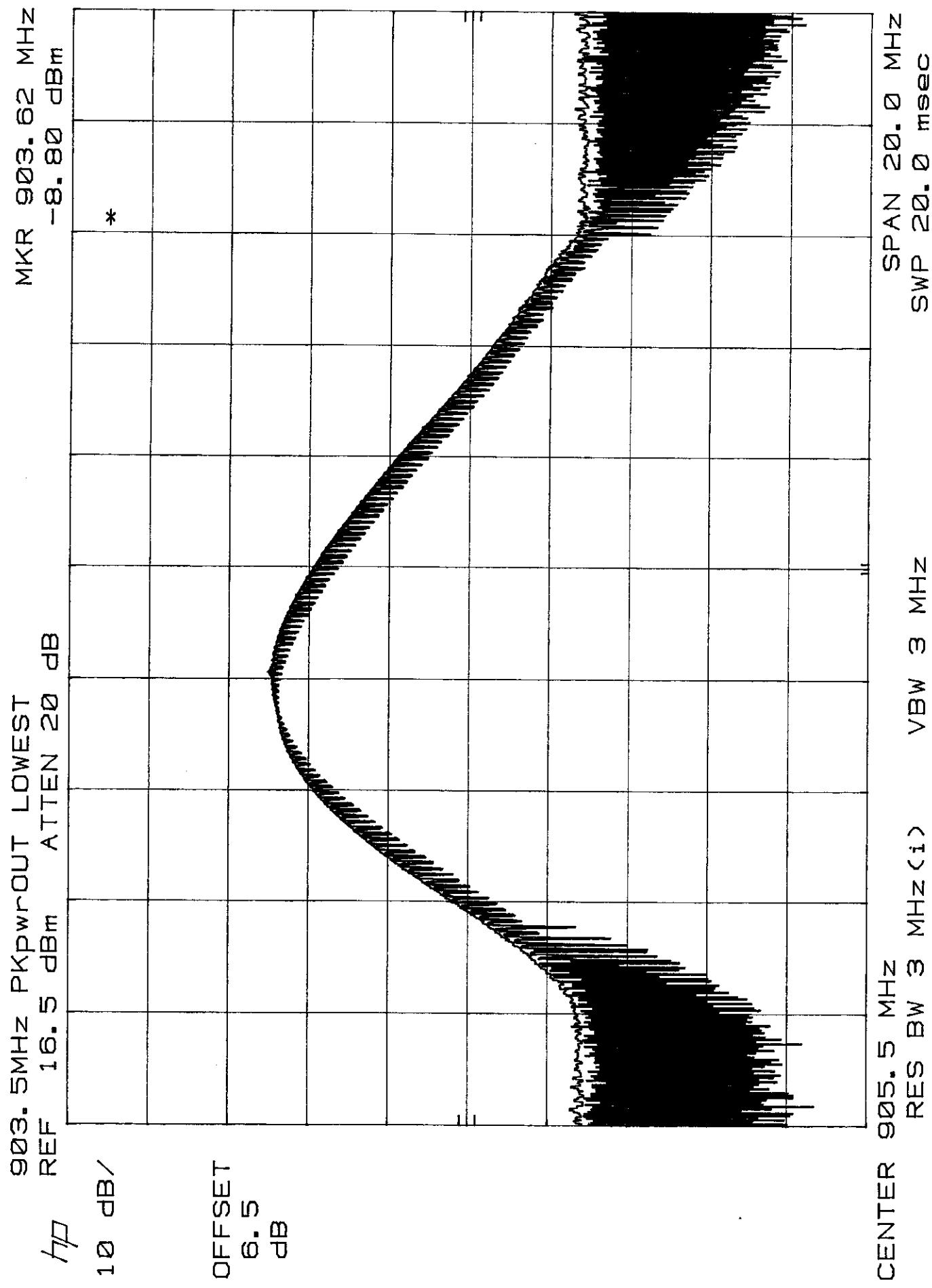
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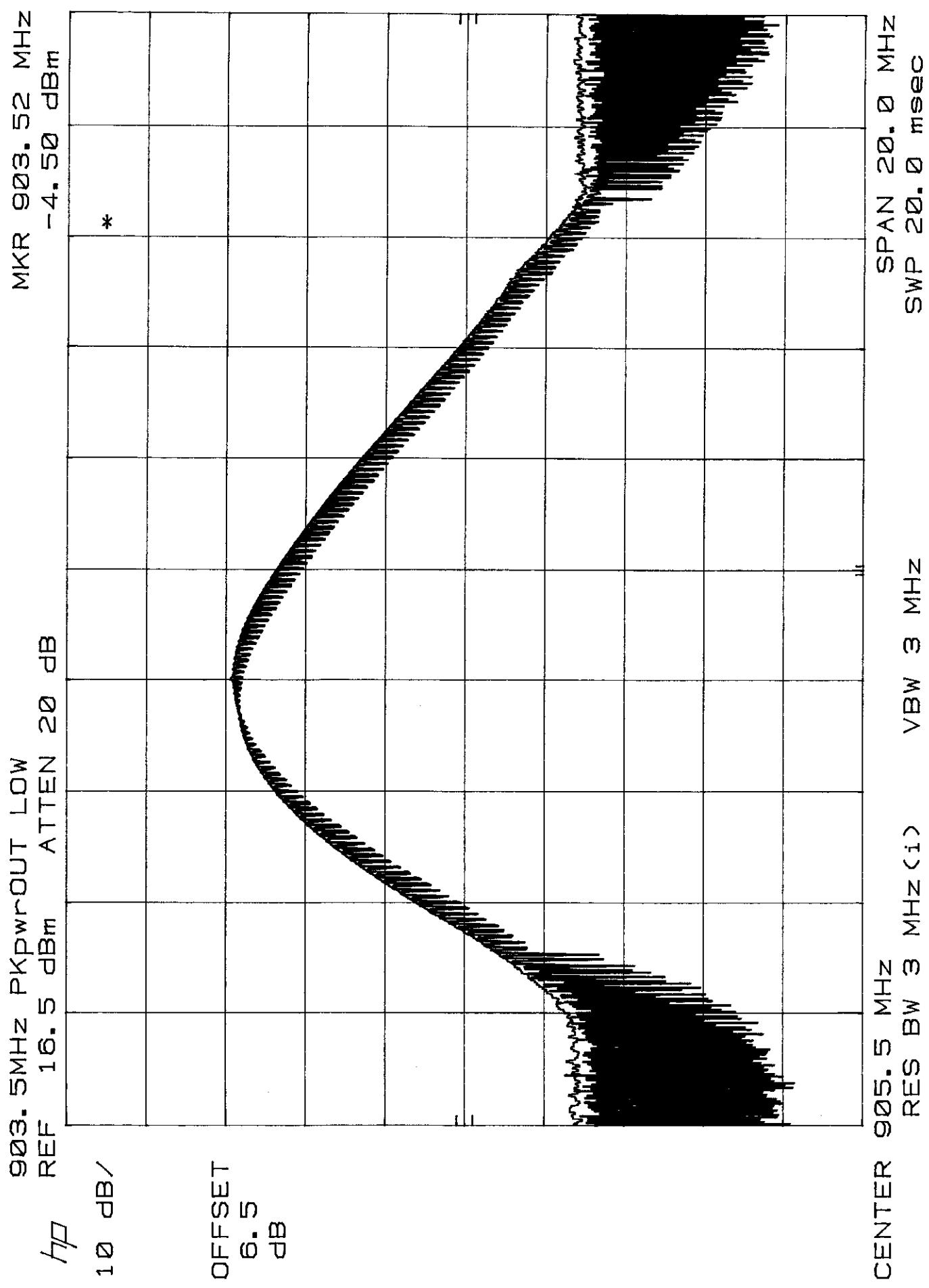
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**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

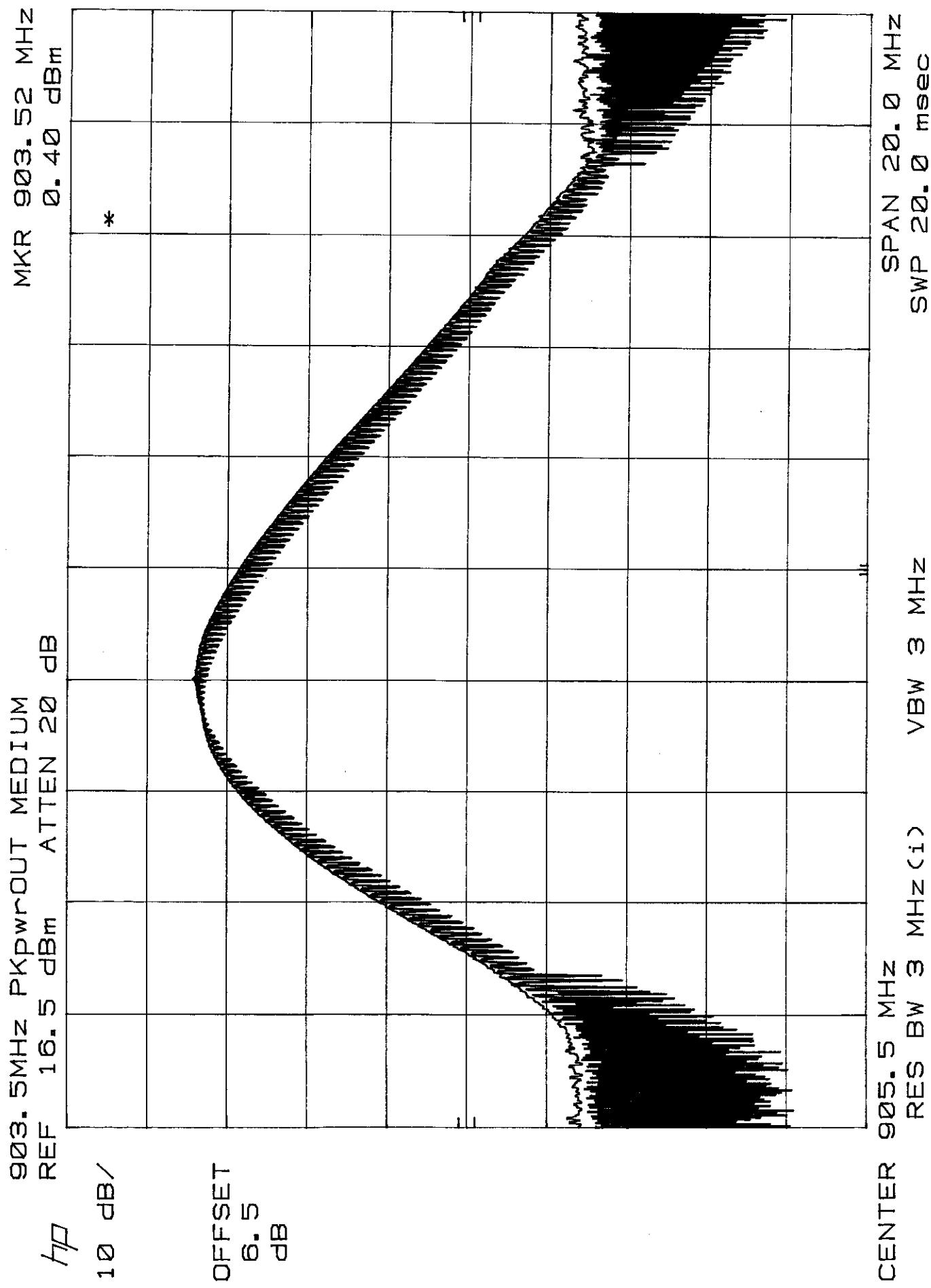
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**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

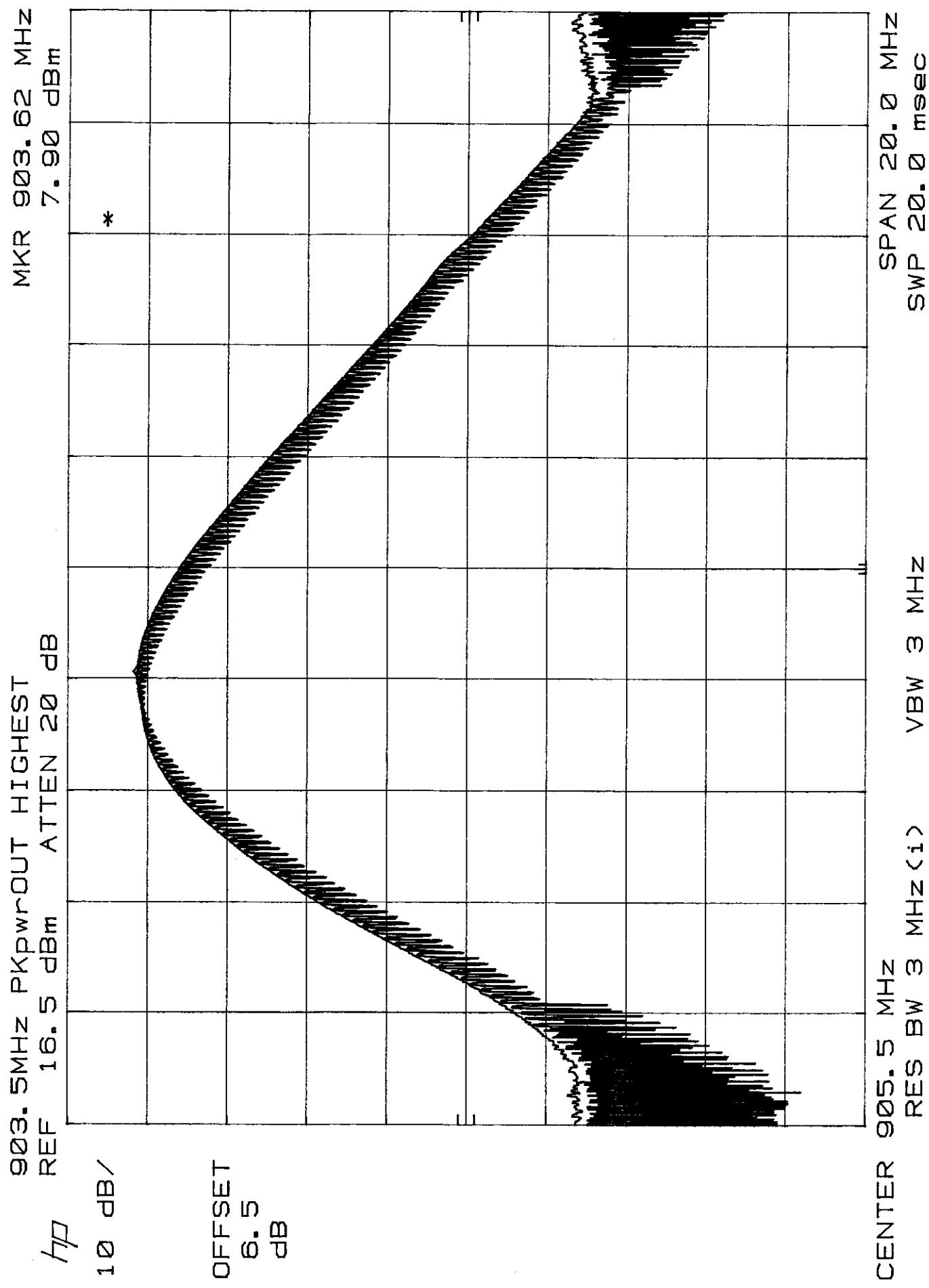
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**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

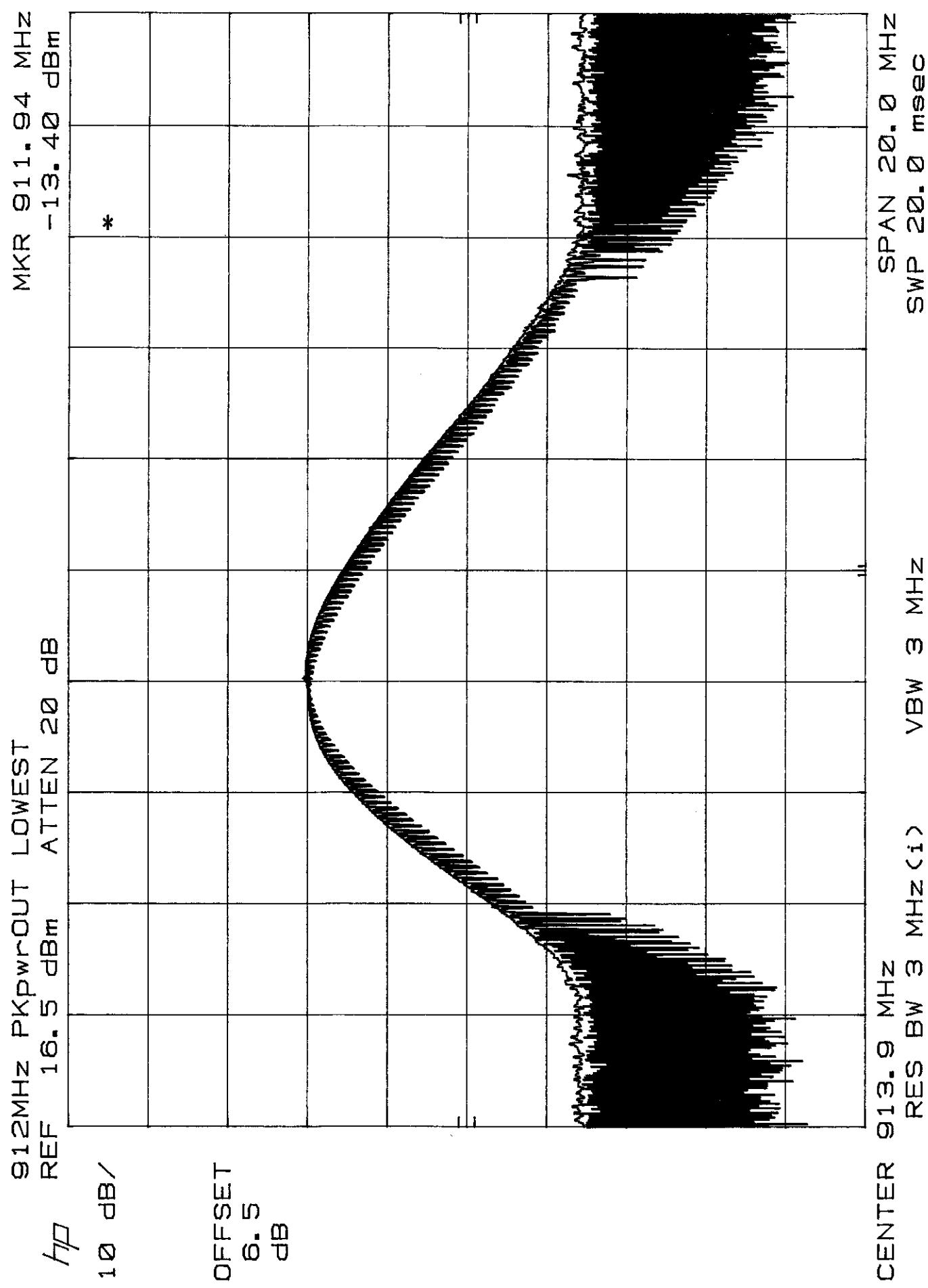
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**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

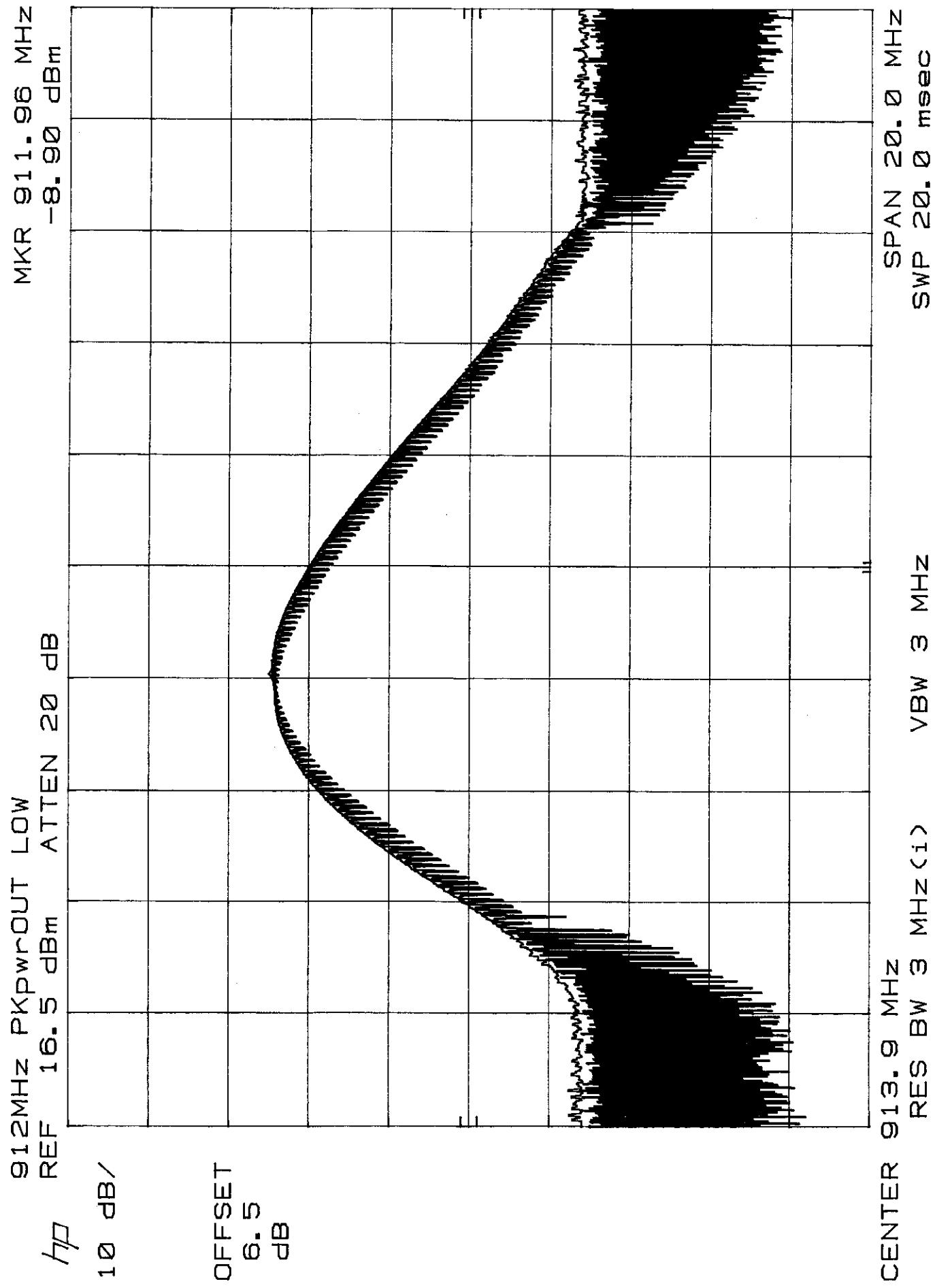


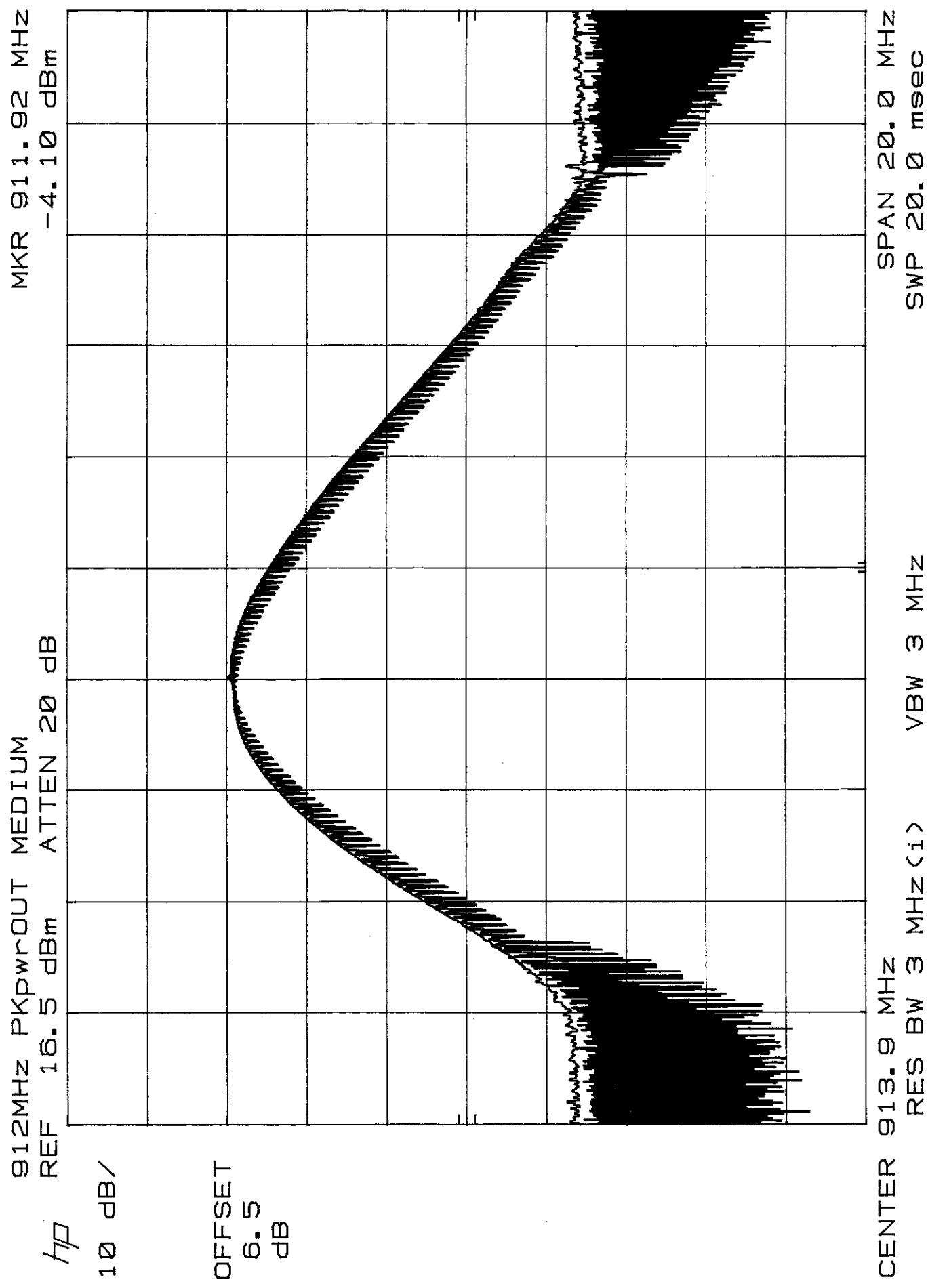


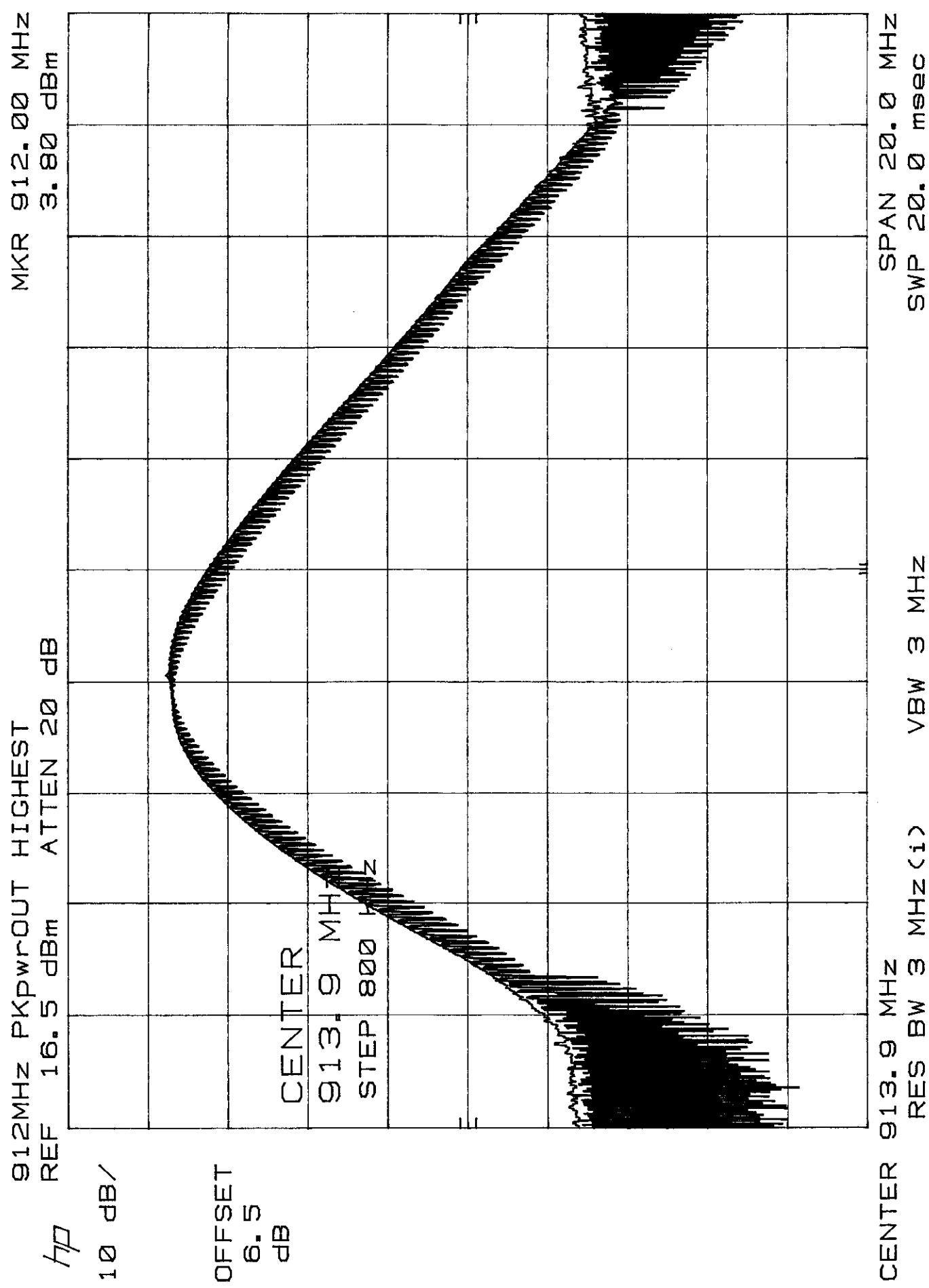


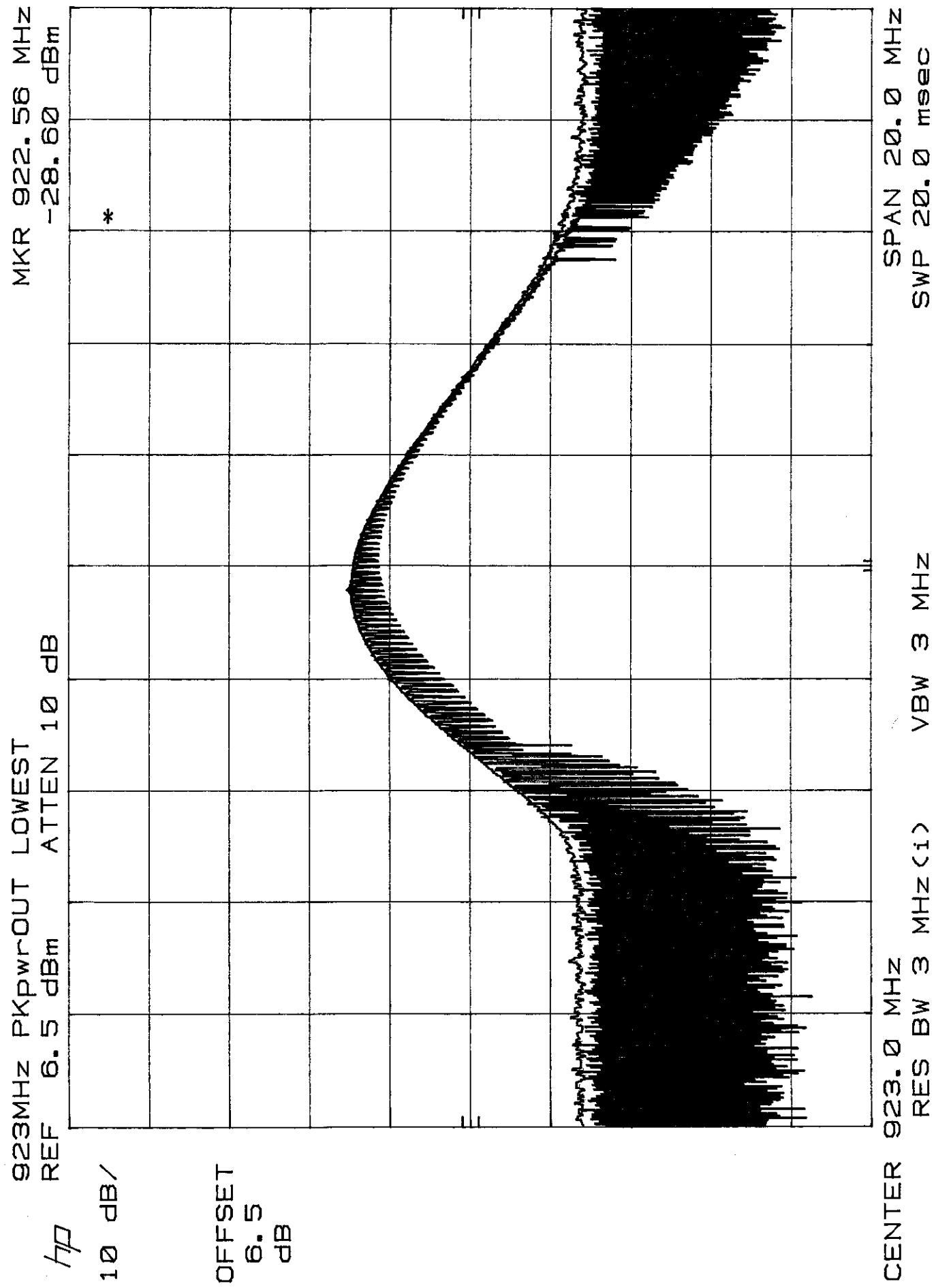


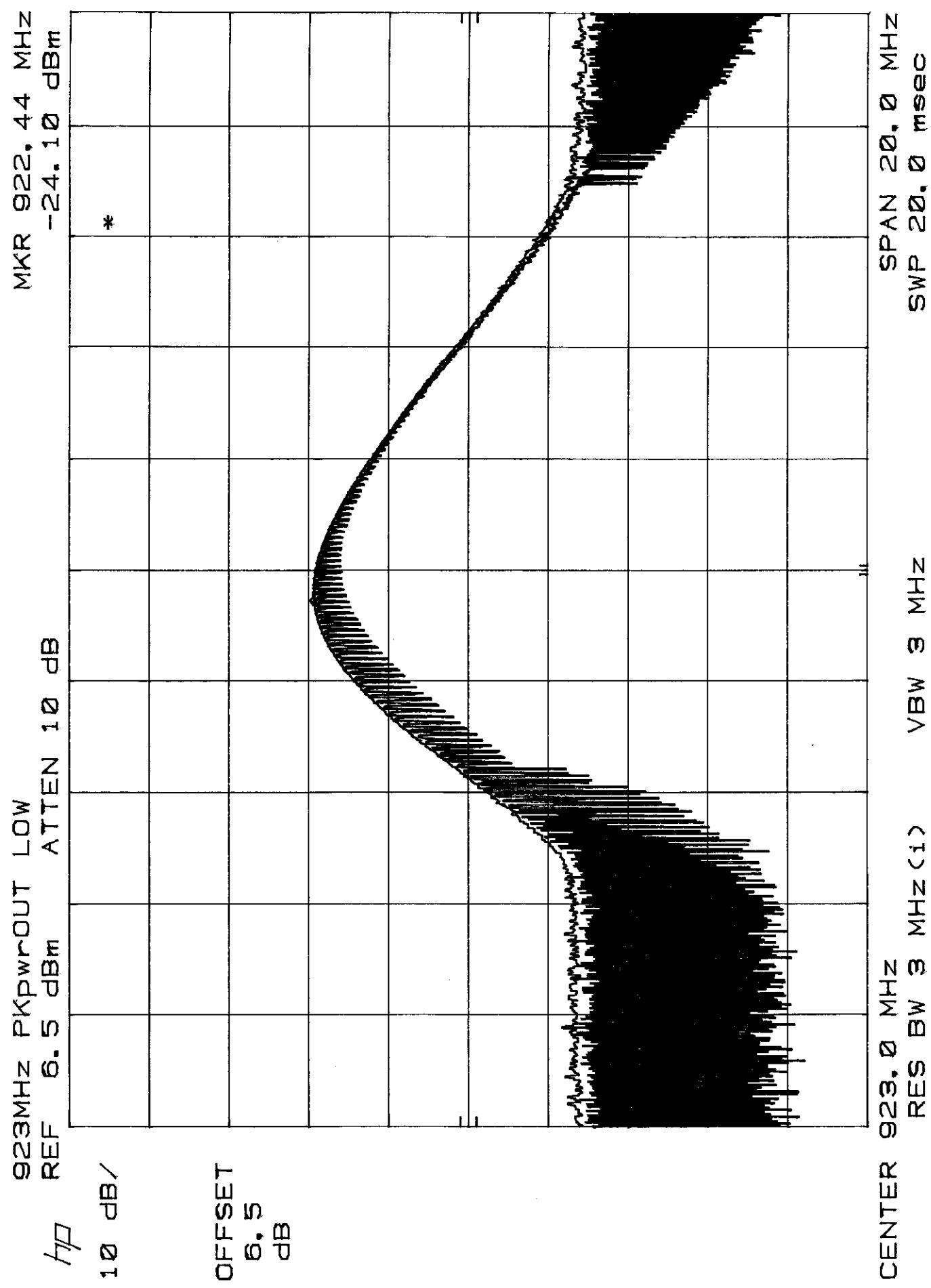


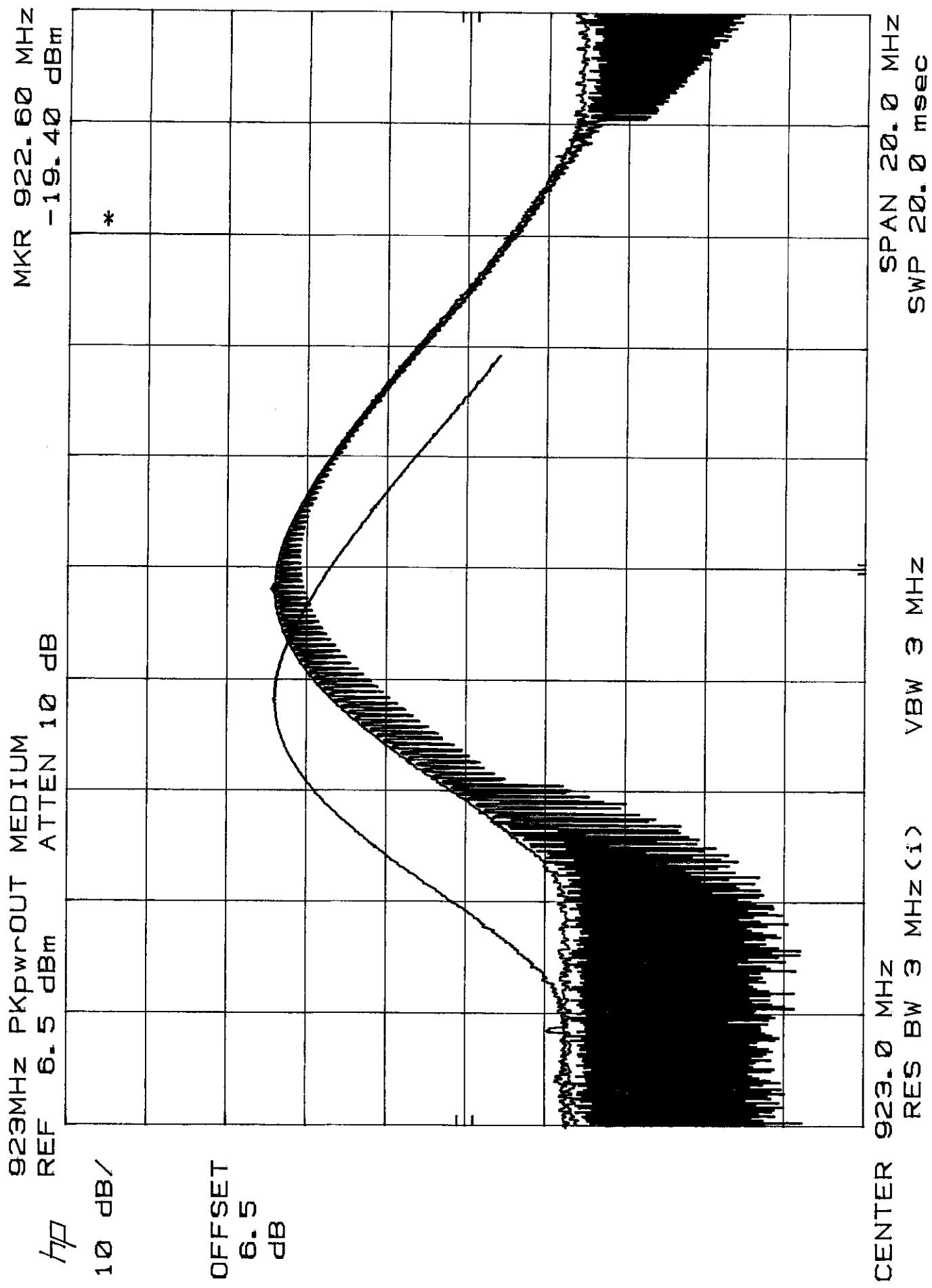


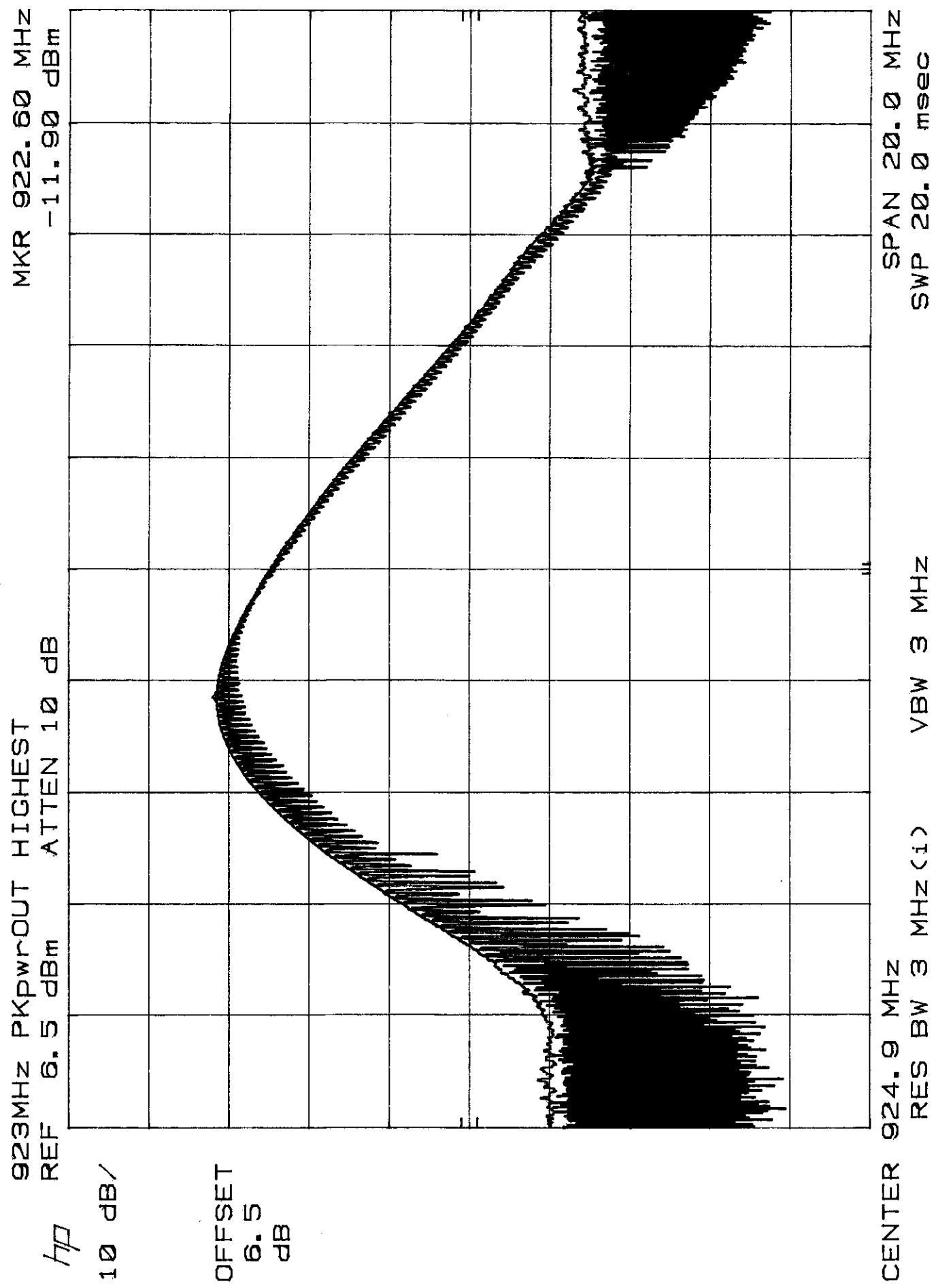














***BAND EDGES***

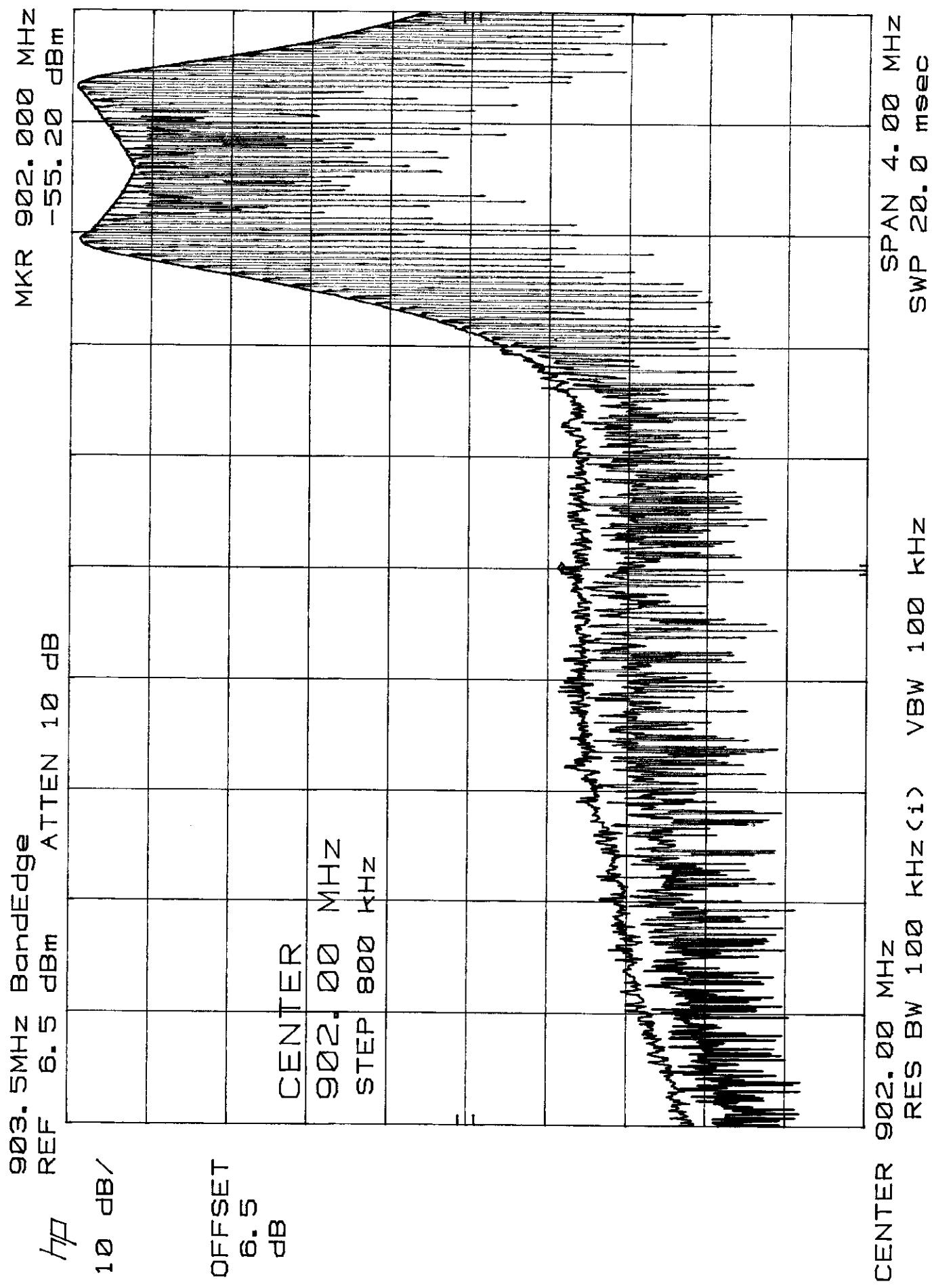
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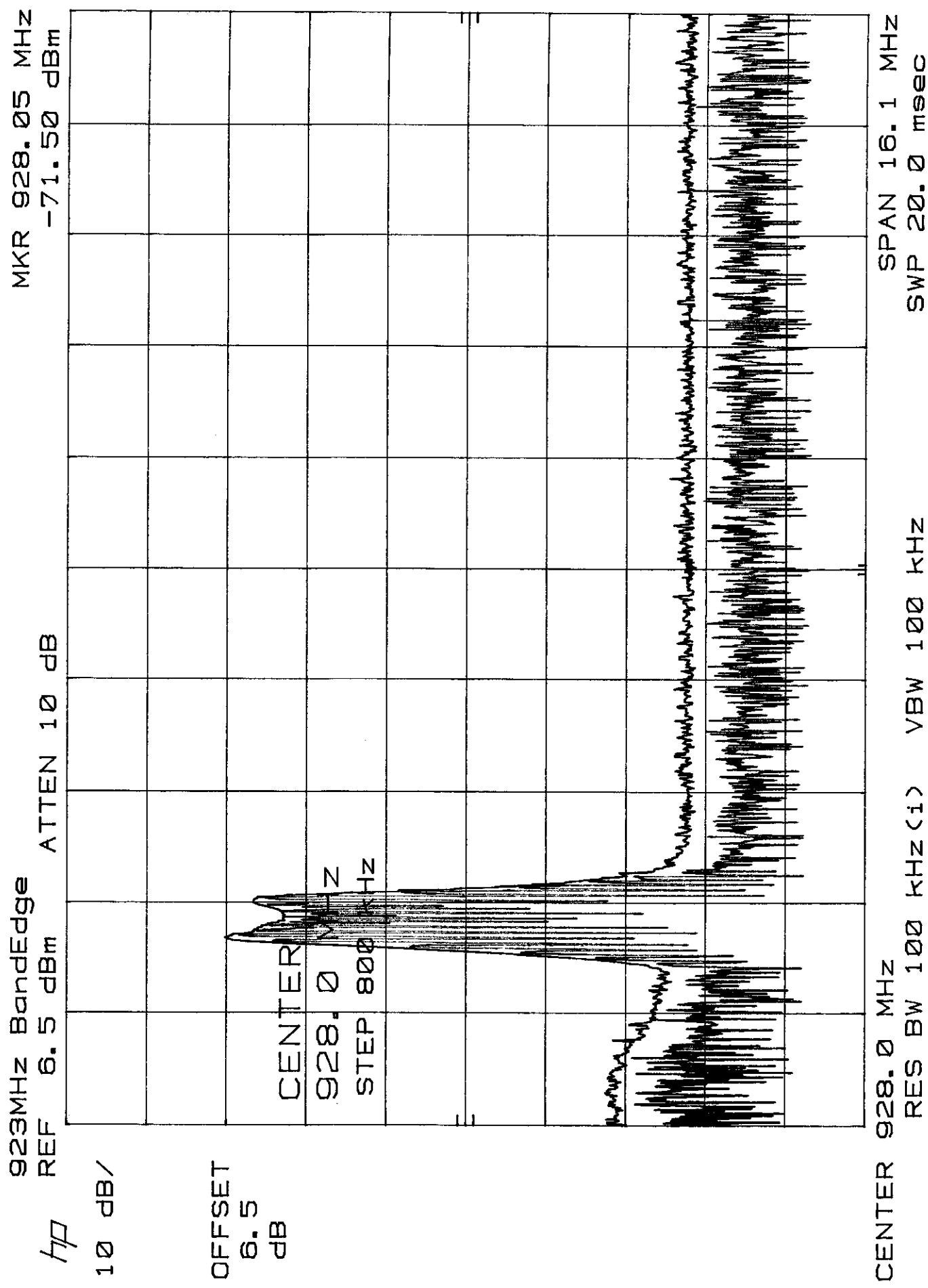
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**Lake Forest Division**  
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**Lake Forest, CA 92630**  
**(949) 587-0400**







***-6 dB BANDWIDTH***

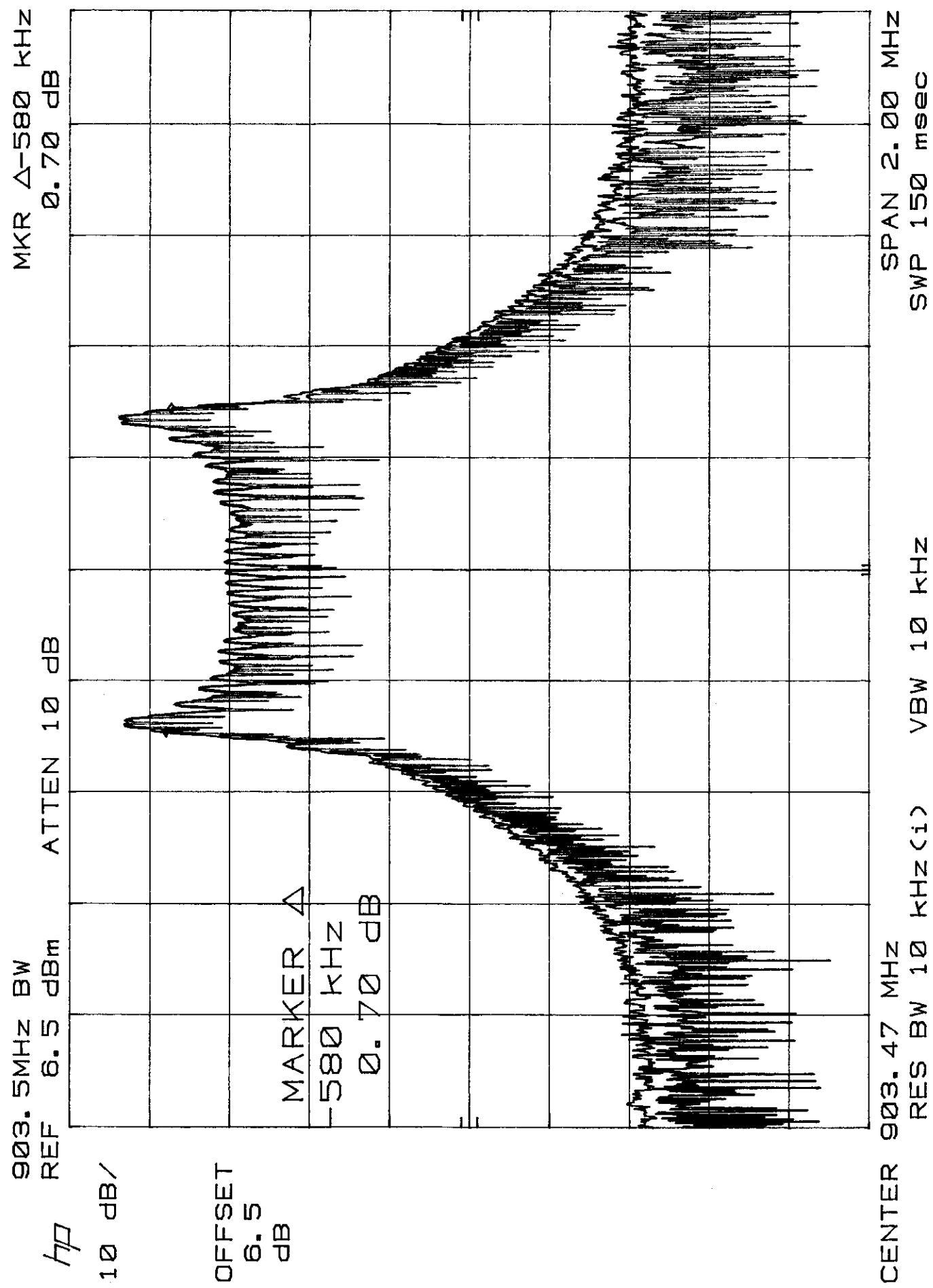
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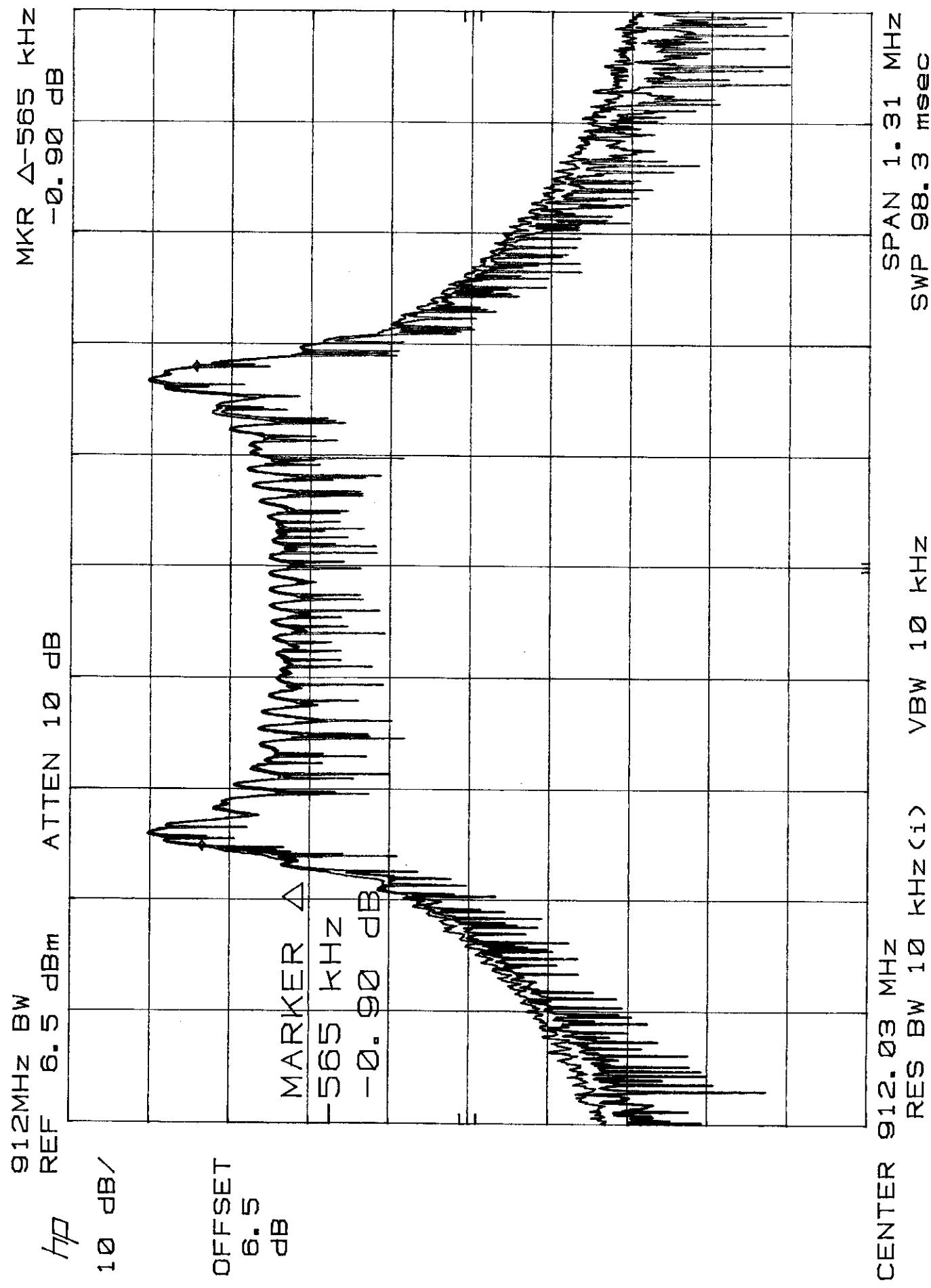
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**Brea, CA 92823**  
**(714) 579-0500**

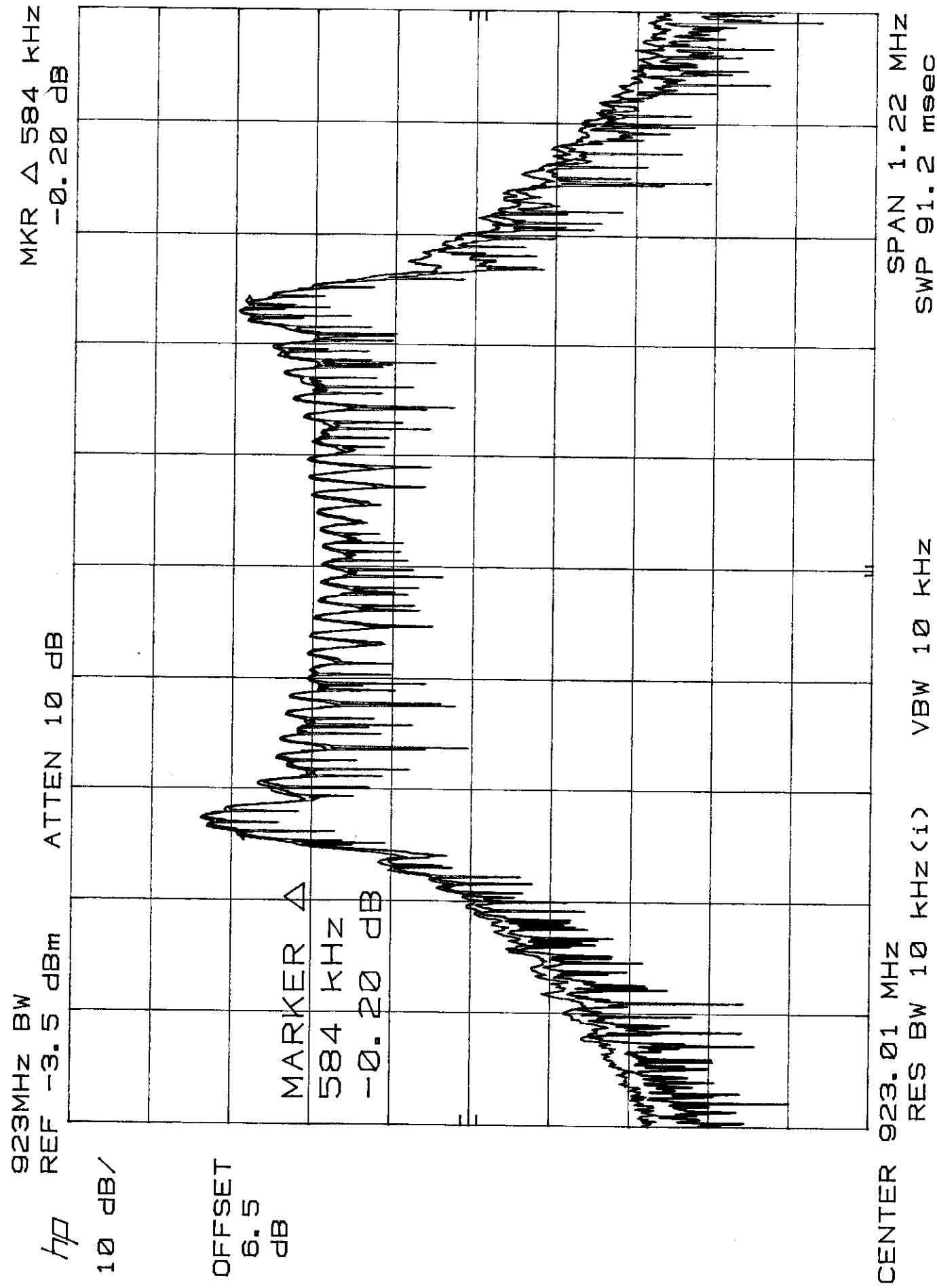
**Agoura Division**  
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**Agoura, CA 91301**  
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**Lake Forest Division**  
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**(949) 587-0400**









***RF ANTENNA CONDUCTED***

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**Brea Division**  
**114 Olinda Drive**  
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**Silverado Division**  
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**Silverado, CA 92676**  
**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

903.5MHz ANTport

hp REF 6.5 dBm ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB

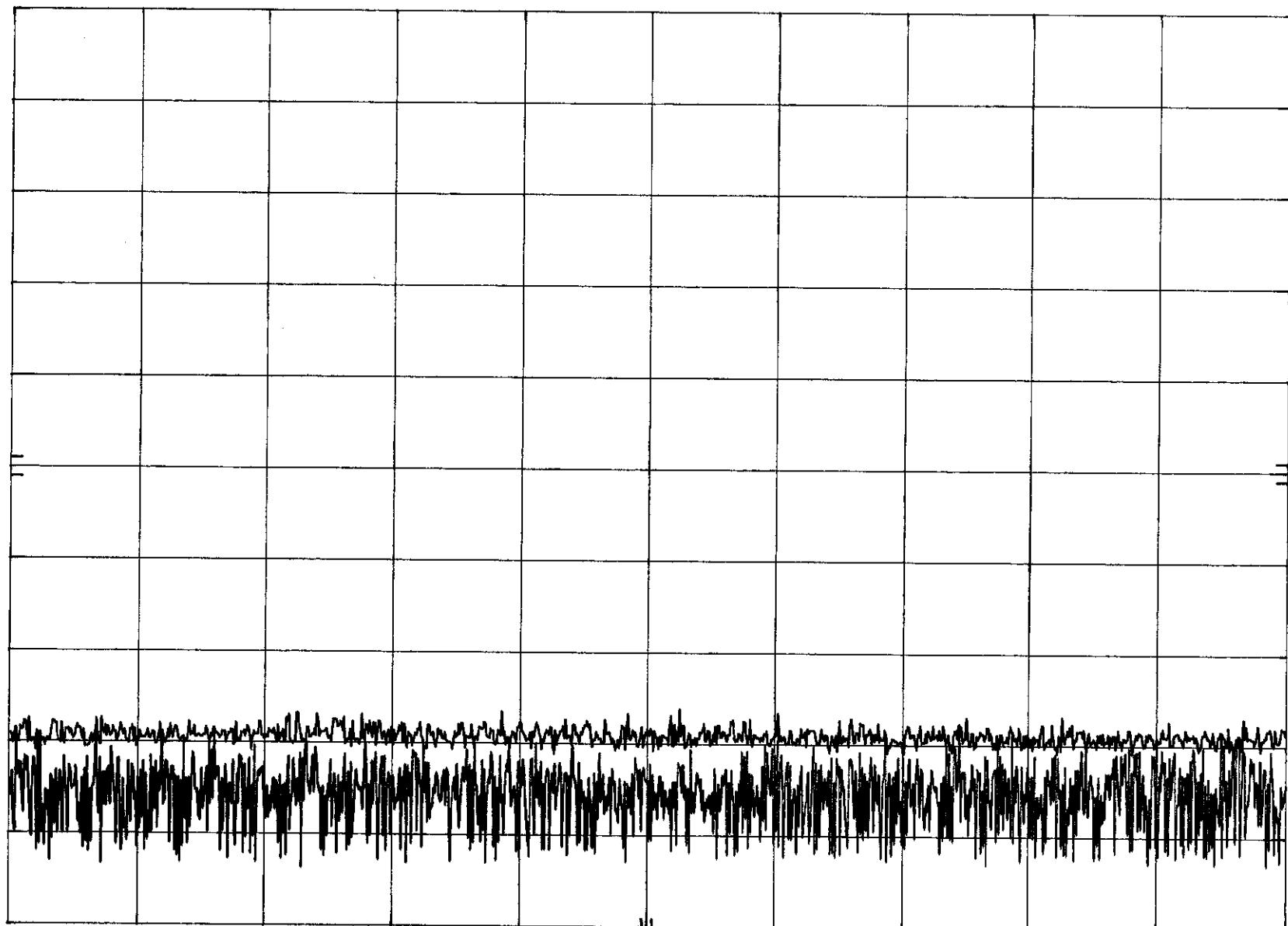
START 2.0 MHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 30.0 MHz

SWP 21.0 msec



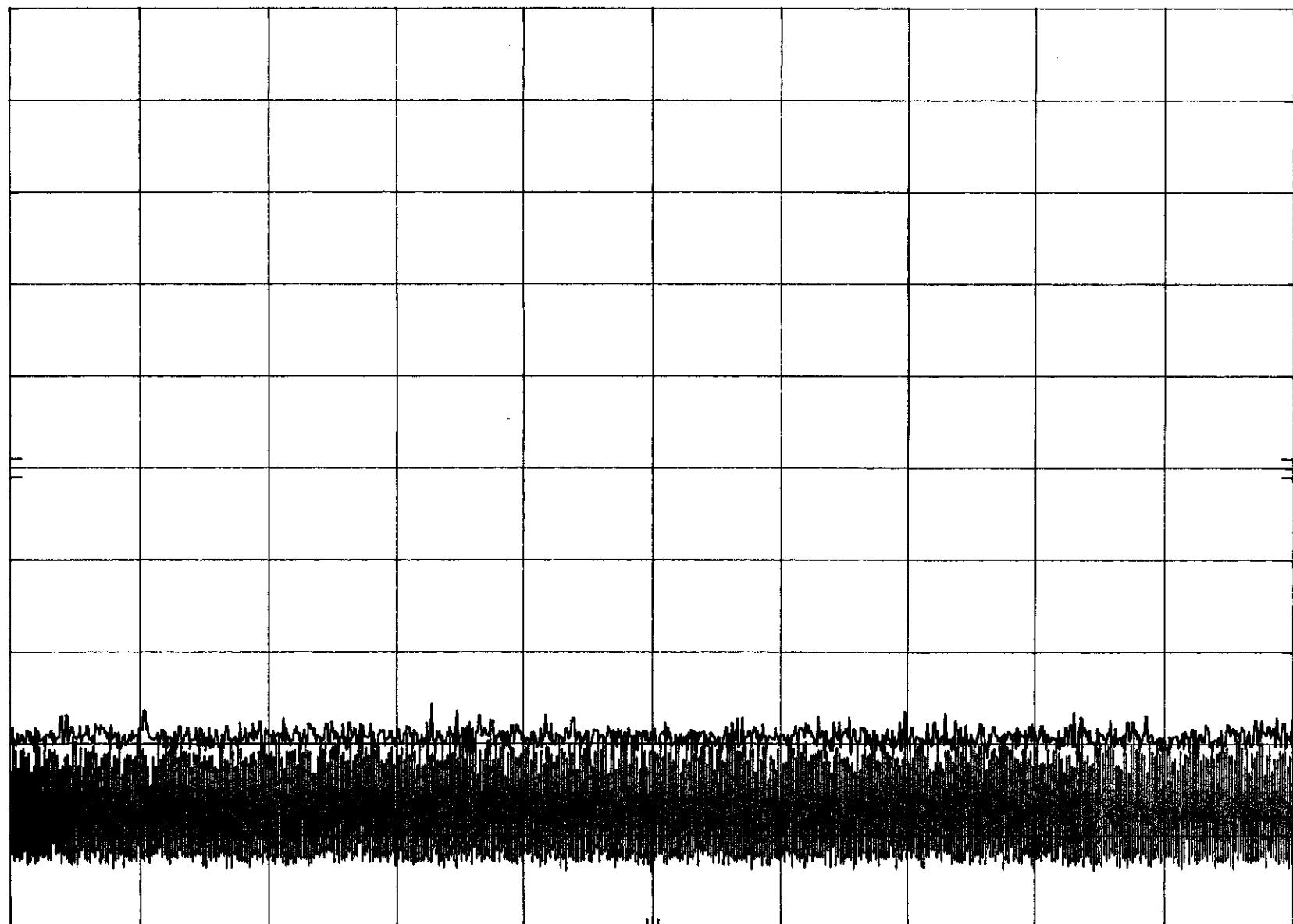
903.5MHz ANTport

REF 6.5 dBm ATTEN 10 dB

hp

10 dB/

OFFSET  
6.5  
dB



START 30 MHz

RES BW 100 kHz (i) VBW 100 kHz

STOP 200 MHz

SWP 128 msec

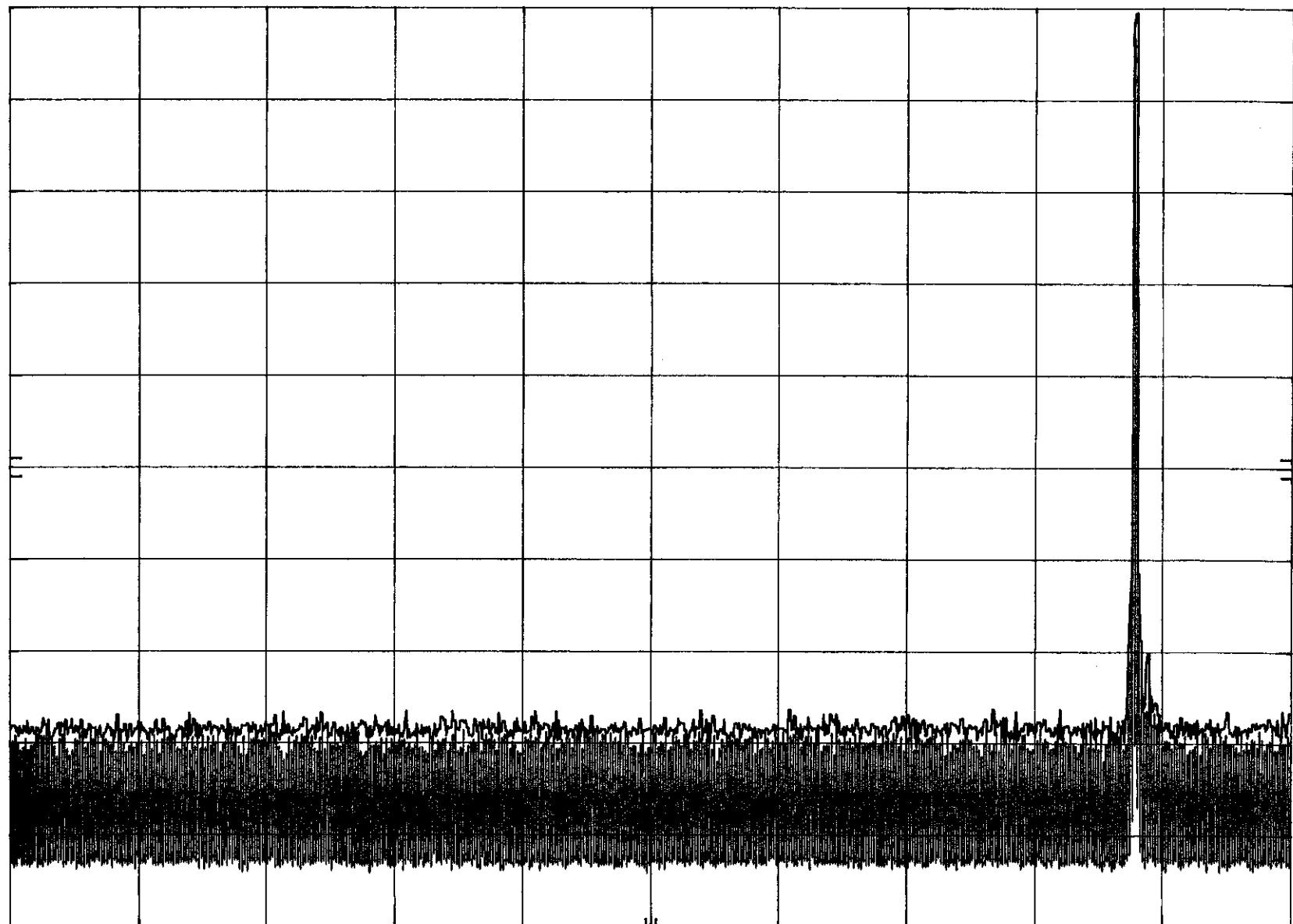
903.5MHz ANTport

hp

REF 6.5 dBm ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB



START 200 MHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 1.000 GHz

SWP 600 msec

903.5MHz ANTport

hp

REF 6.5 dBm ATTEN 10 dB

10 dB/

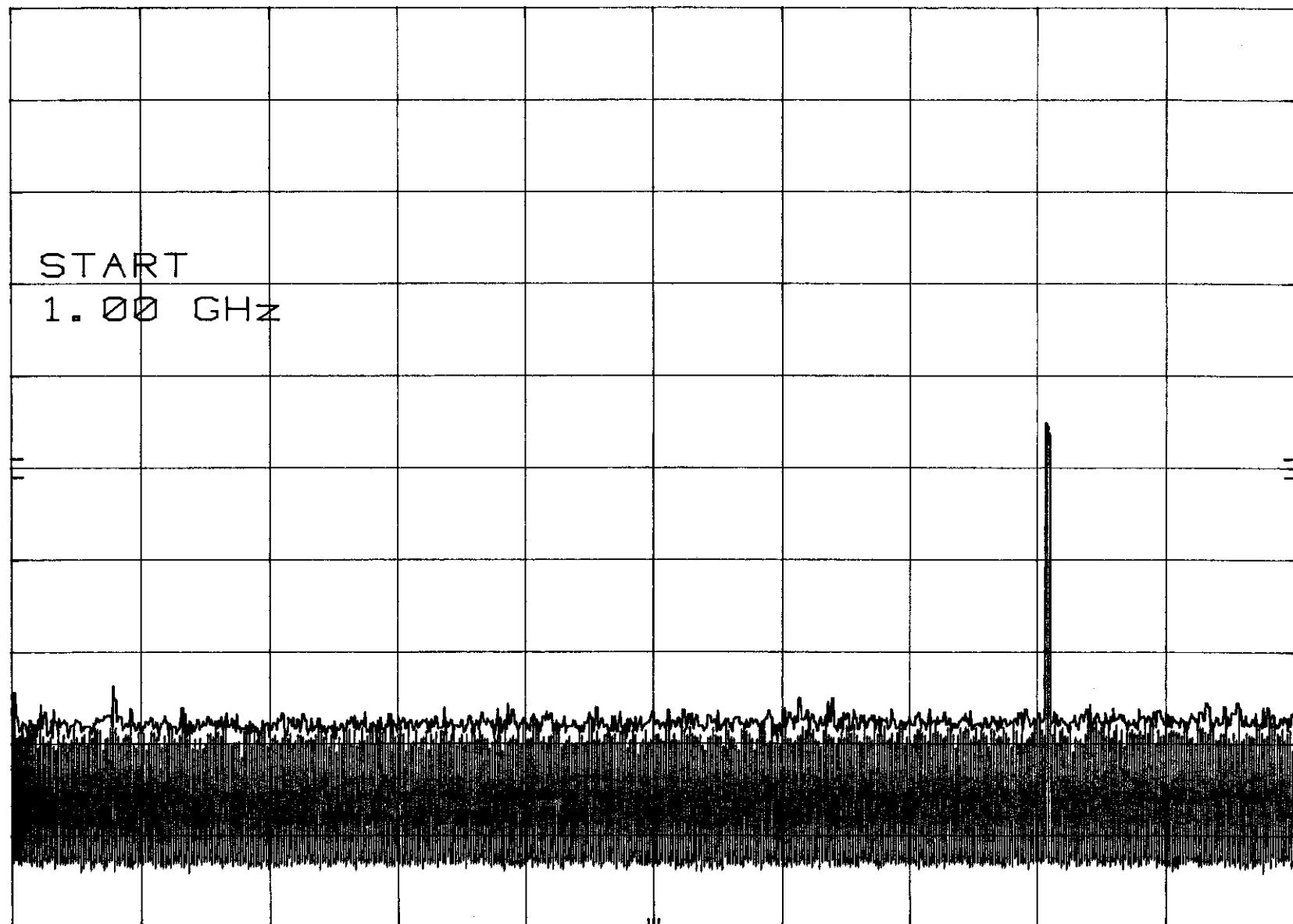
OFFSET

6.5

dB

START

1.00 GHz



START 1.00 GHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 2.00 GHz

SWP 750 msec

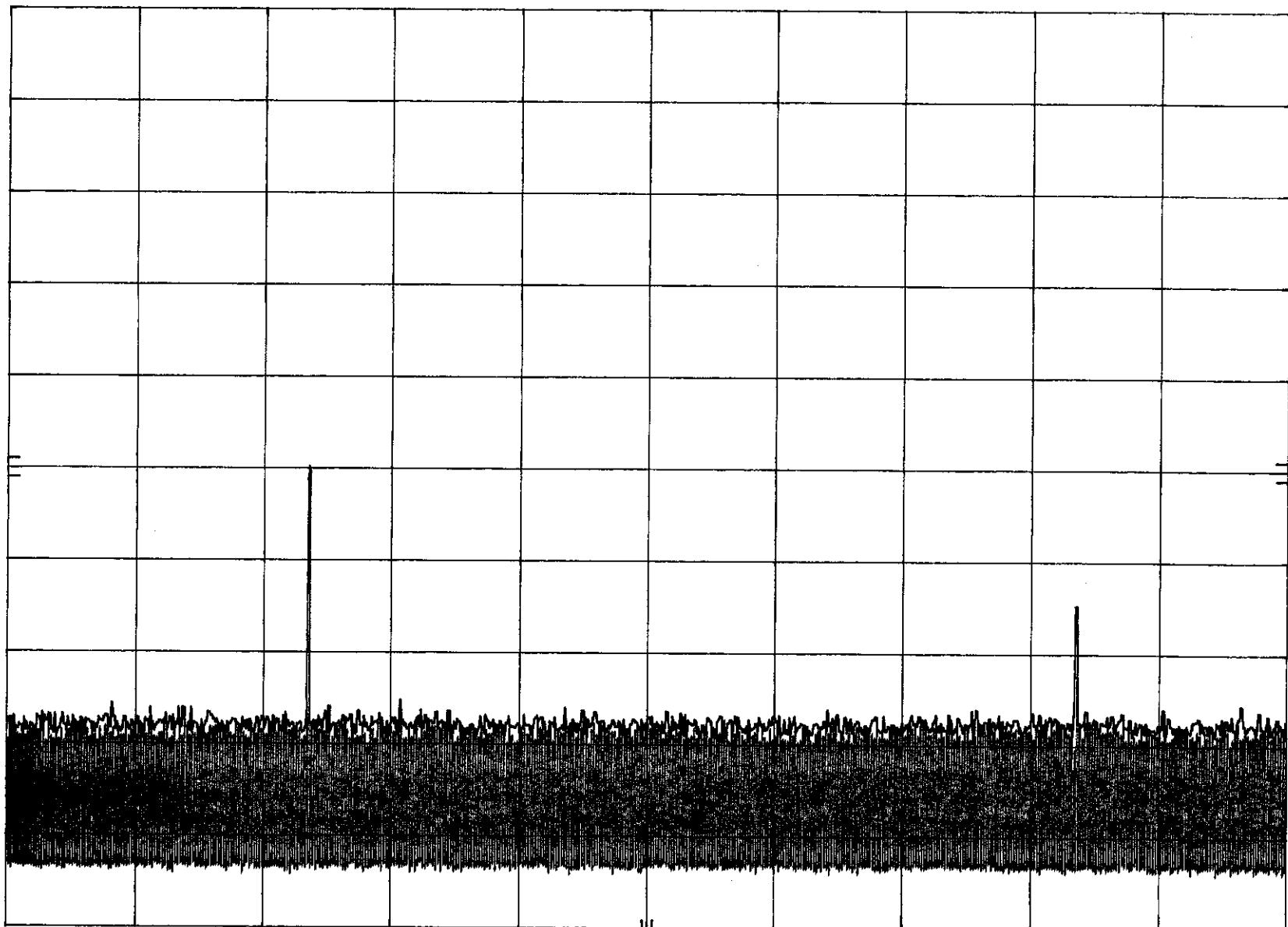
903.5MHz ANTport

hp

REF 6.5 dBm ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB



START 2.00 GHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 5.00 GHz

SWP 2.25 sec

903.5MHz ANTport

hp REF 6.5 dBm ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB

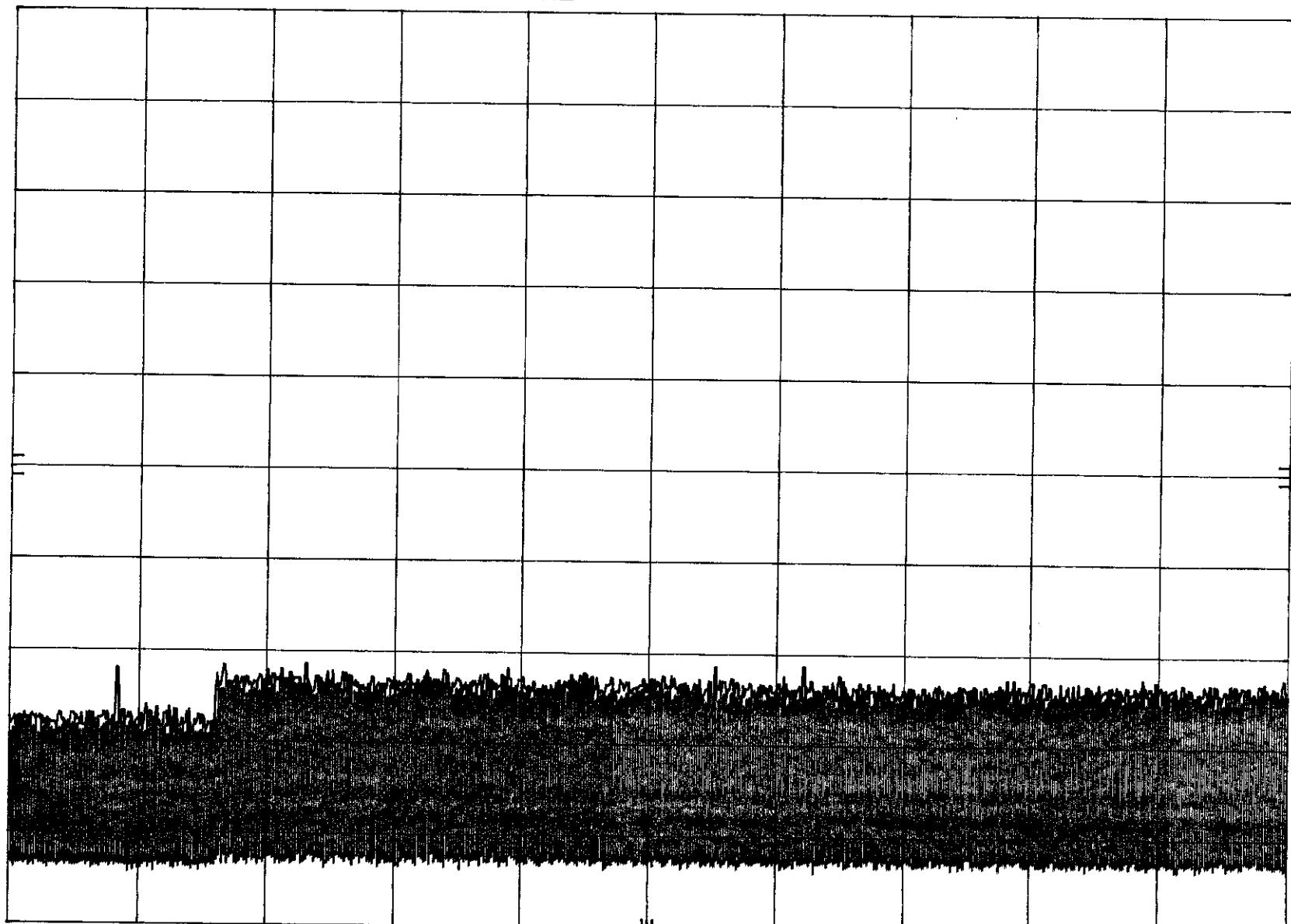
START 5.00 GHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 10.00 GHz

SWP 3.75 sec



912MHz ANTport

REF 6.5 dBm

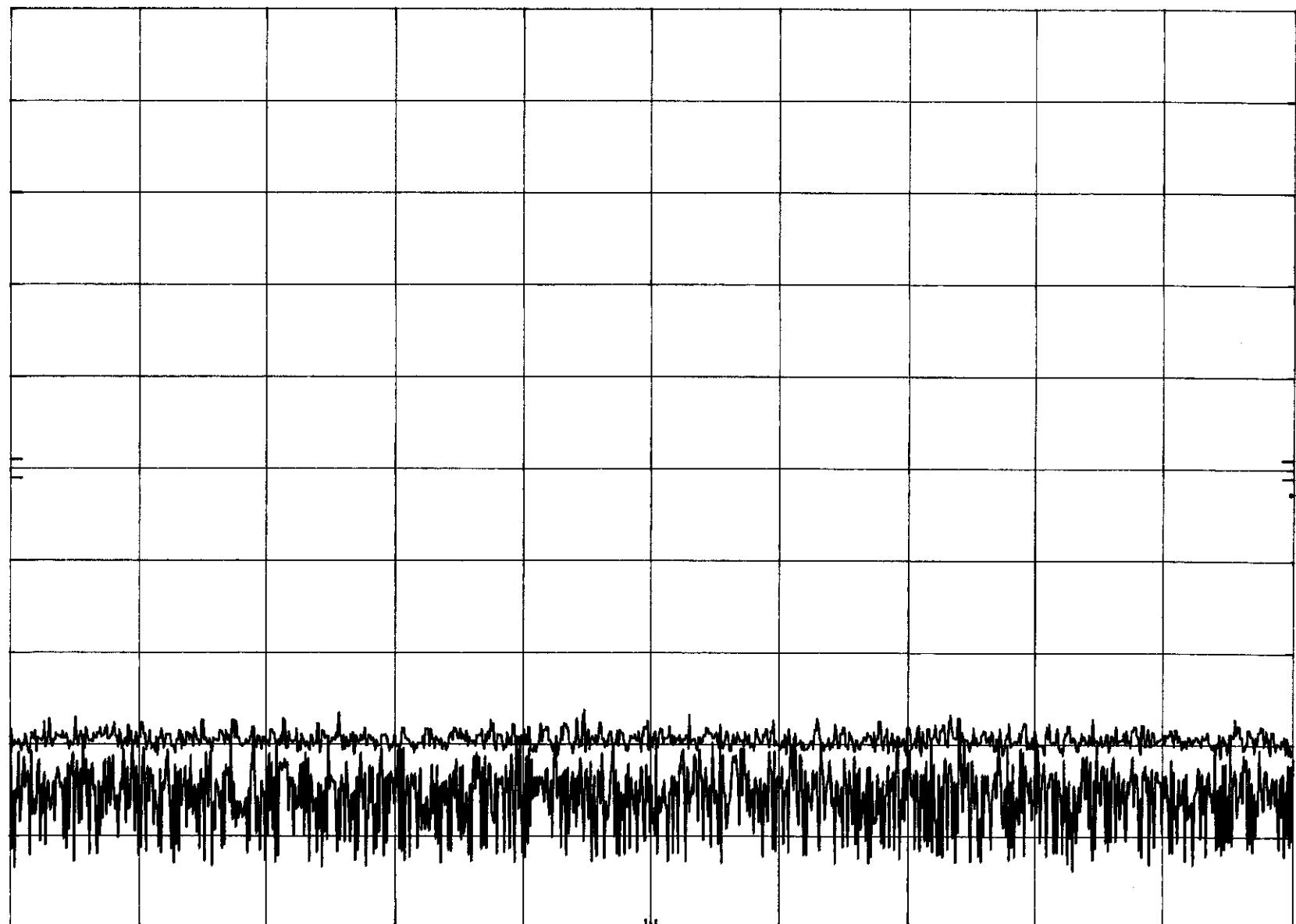
ATTEN 10 dB

hp

10 dB/

OFFSET

6.5  
dB



START 2.0 MHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 30.0 MHz

SWP 21.0 msec

912MHz ANTport

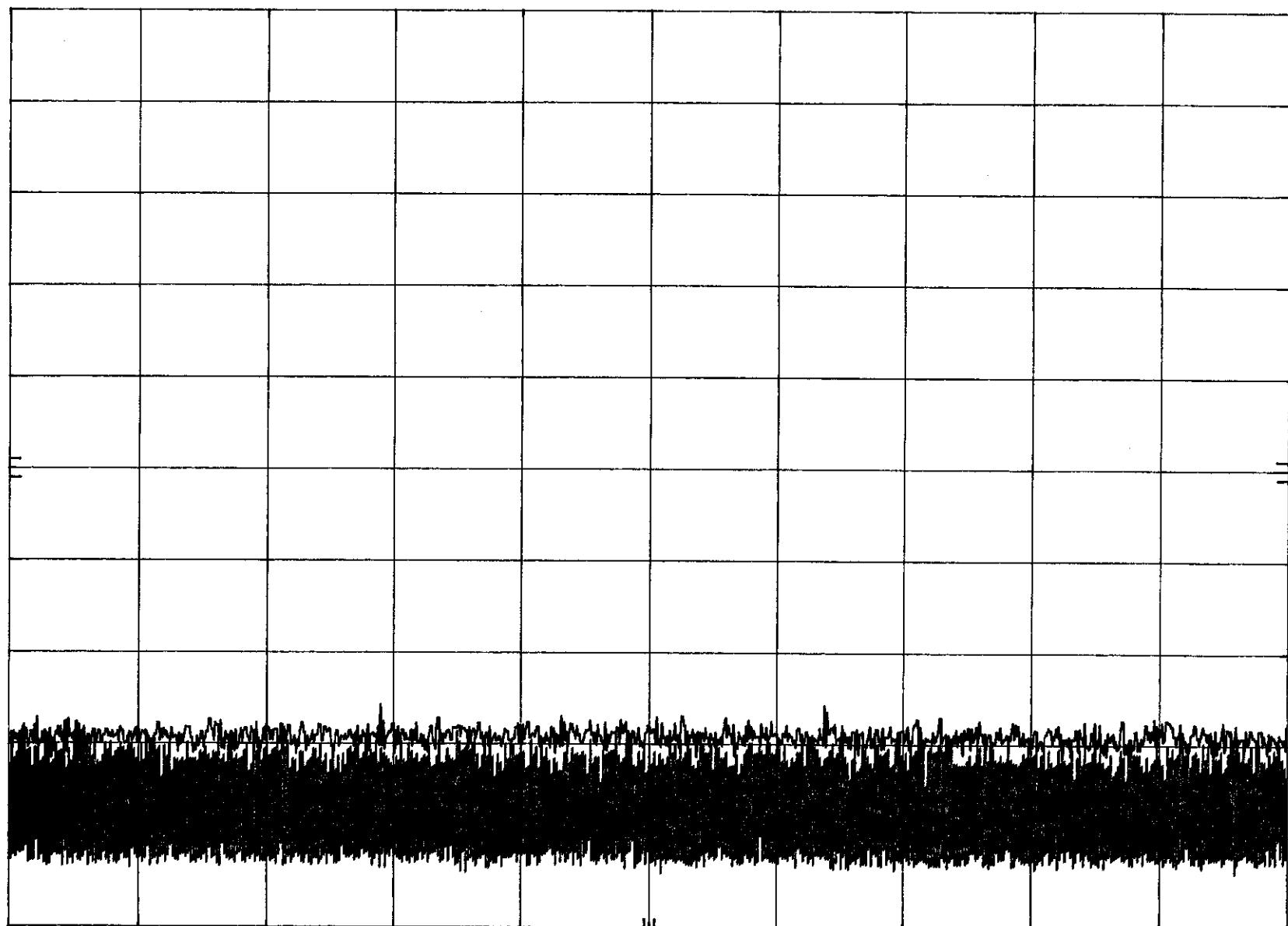
hp

REF 6.5 dBm

ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB



START 30 MHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 200 MHz

SWP 128 msec

912MHz ANTport

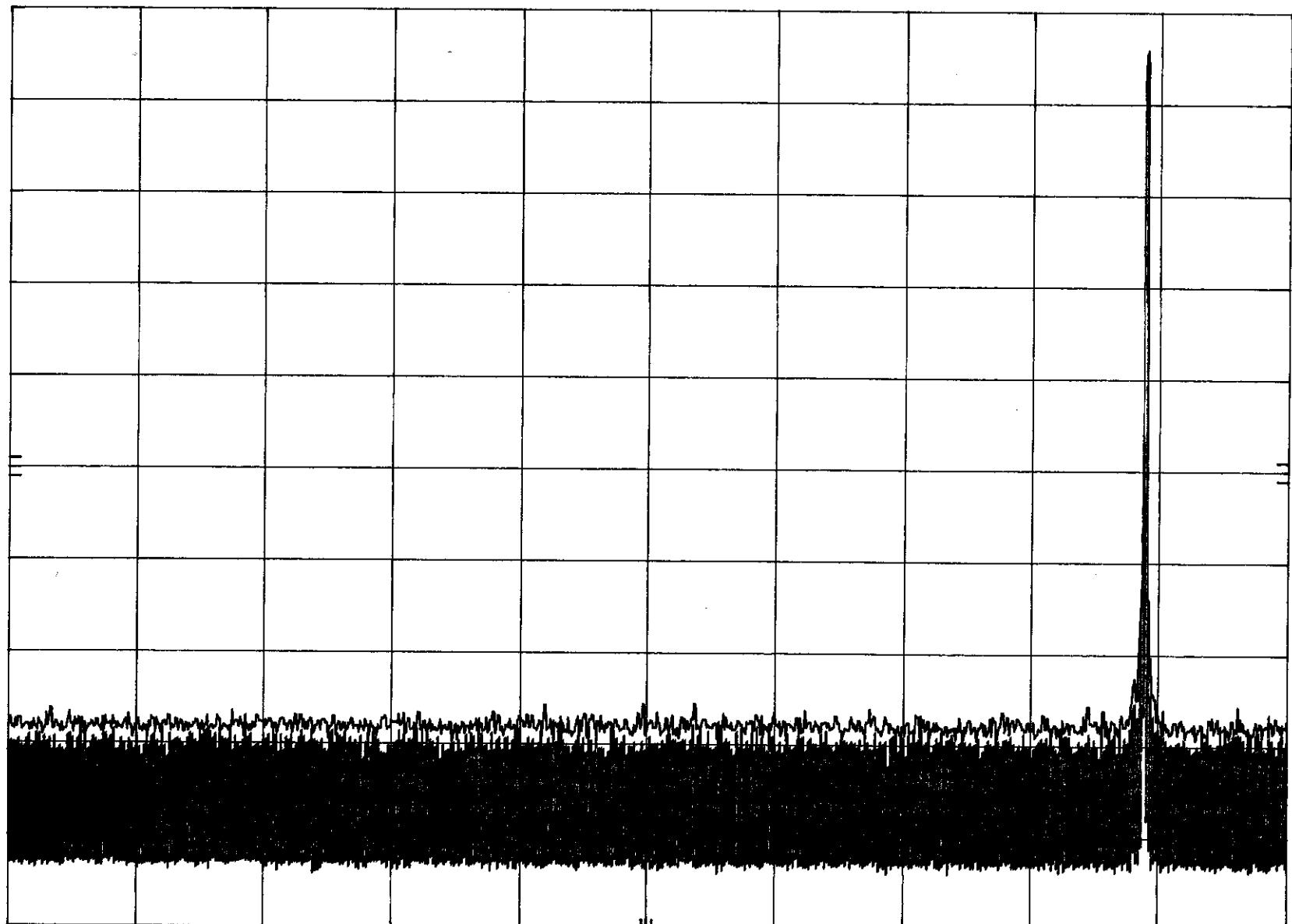
hp

REF 6.5 dBm

ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB



START 200 MHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 1.000 GHz

SWP 600 msec

912MHz ANTport

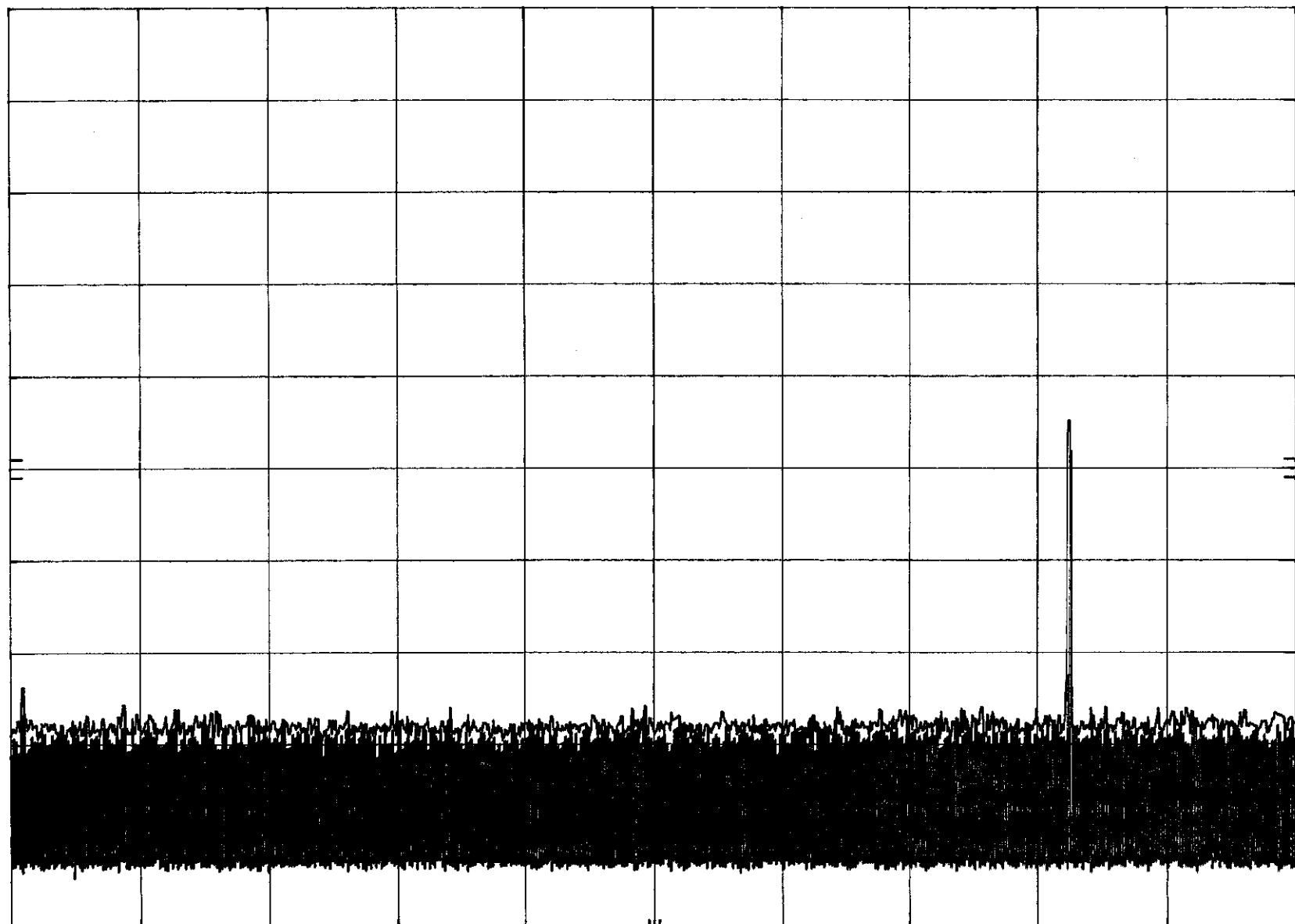
REF 6.5 dBm

ATTEN 10 dB

hp

10 dB/

OFFSET  
6.5  
dB



START 1.00 GHz

RES BW 100 kHz (i) VBW 100 kHz

STOP 2.00 GHz

SWP 750 msec

912MHz ANTport

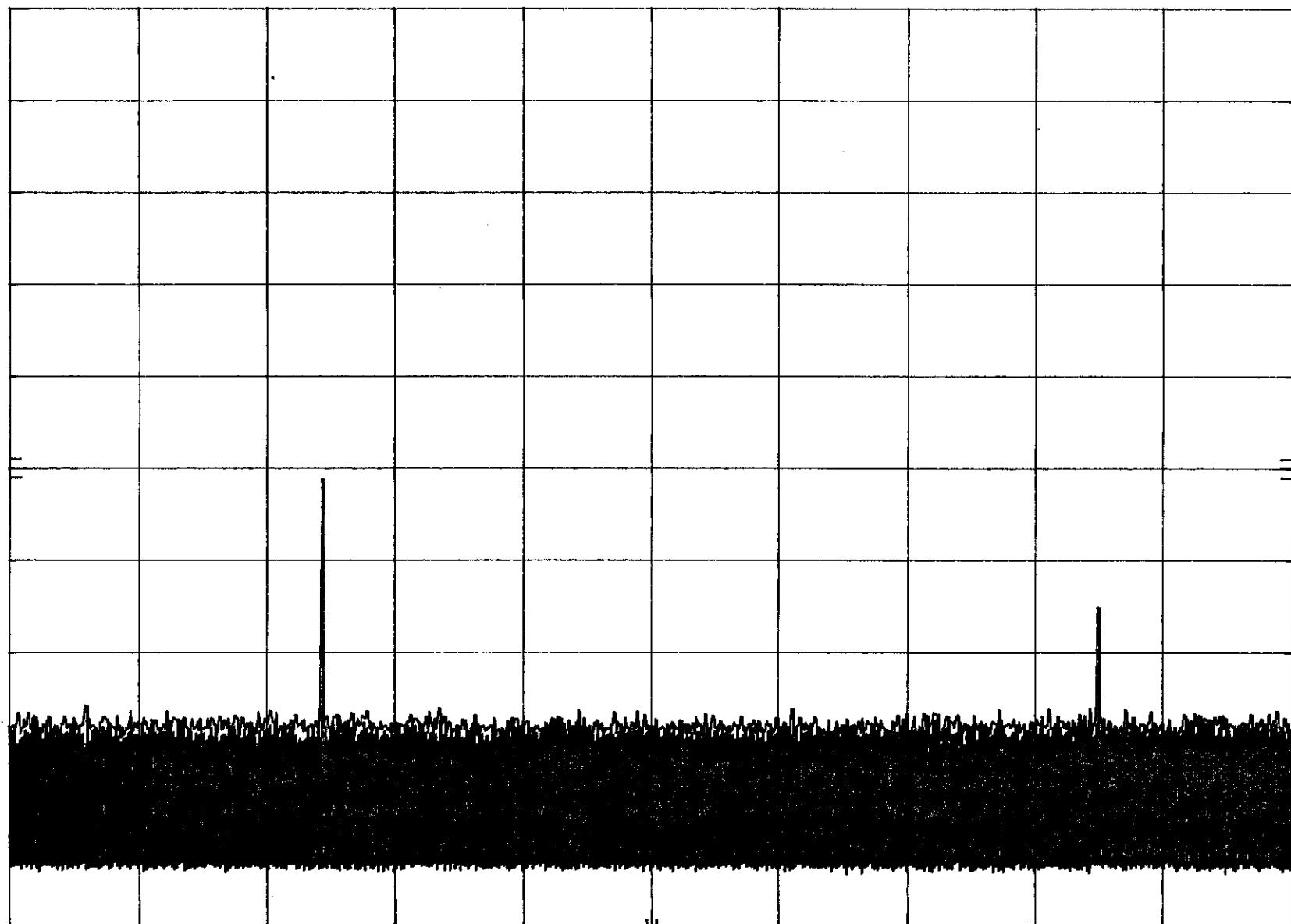
hp

REF 6.5 dBm

ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB



START 2.00 GHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 5.00 GHz

SWP 2.25 sec

912MHz ANTport

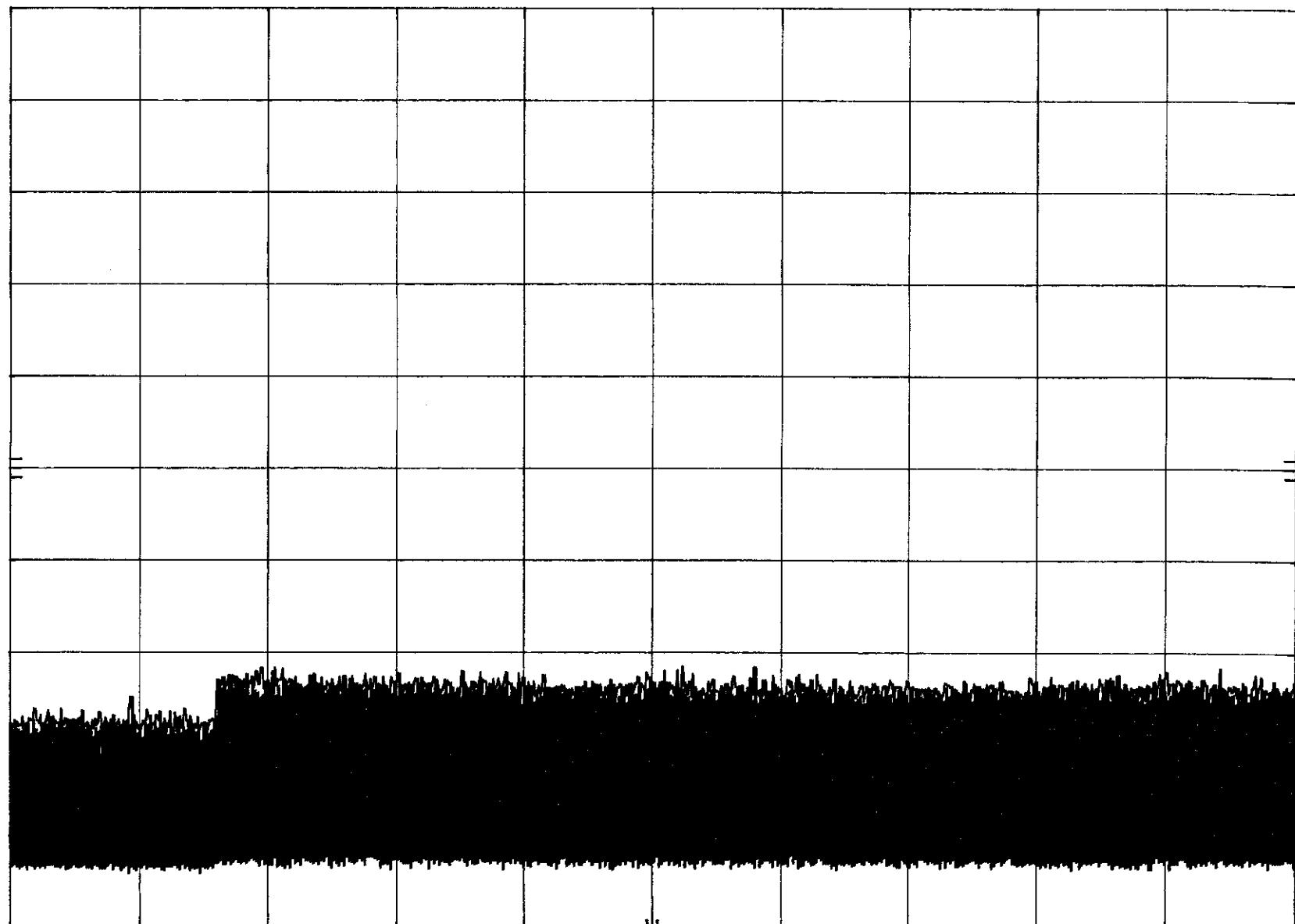
hp

REF 6.5 dBm

ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB



START 5.00 GHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 10.00 GHz

SWP 3.75 sec

923MHz ANTport

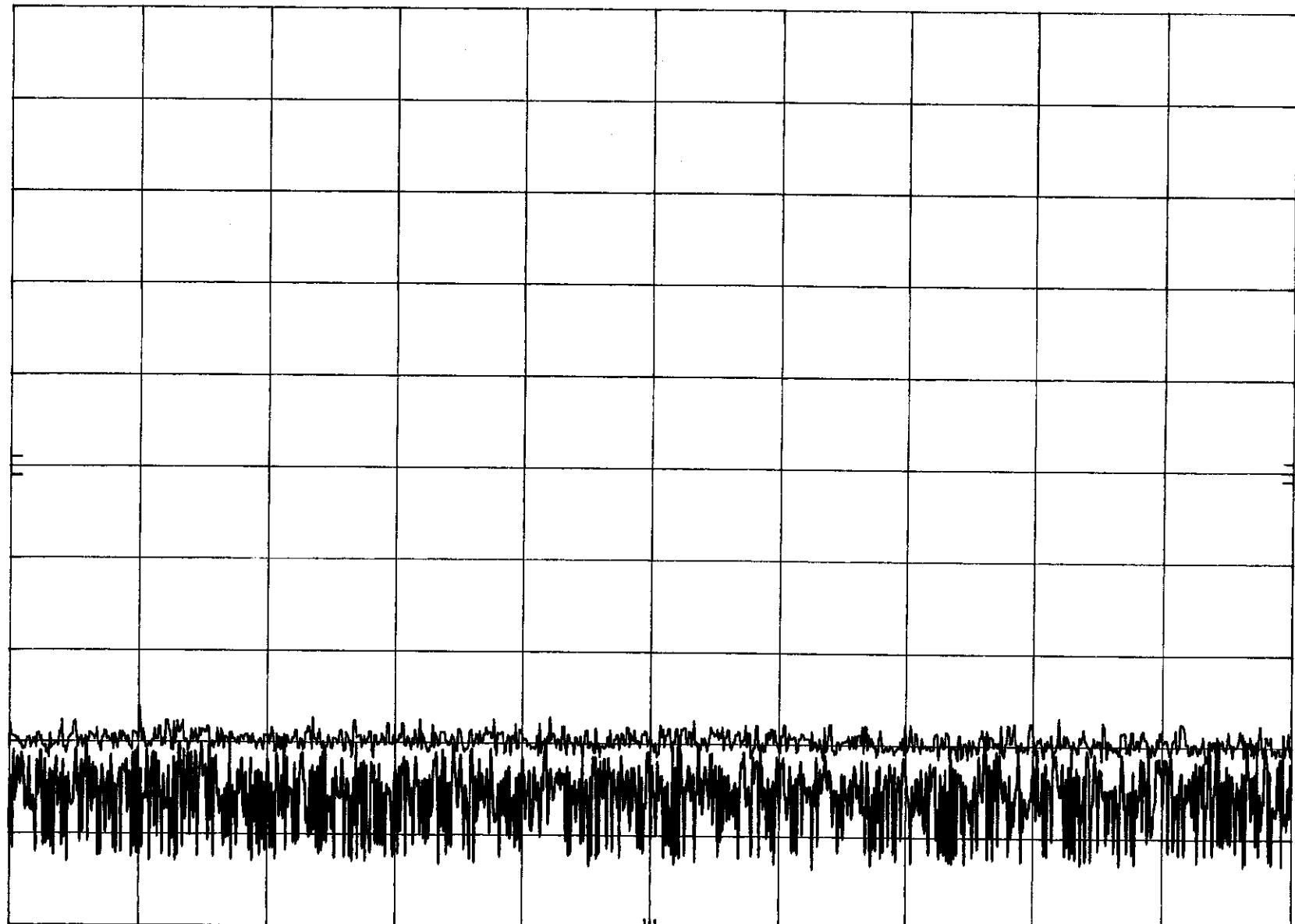
REF 6.5 dBm

ATTEN 10 dB

hp

10 dB/

OFFSET  
6.5  
dB



START 2.0 MHz

RES BW 100 kHz (i) VBW 100 kHz

STOP 30.0 MHz

SWP 21.0 msec

923MHz ANTport

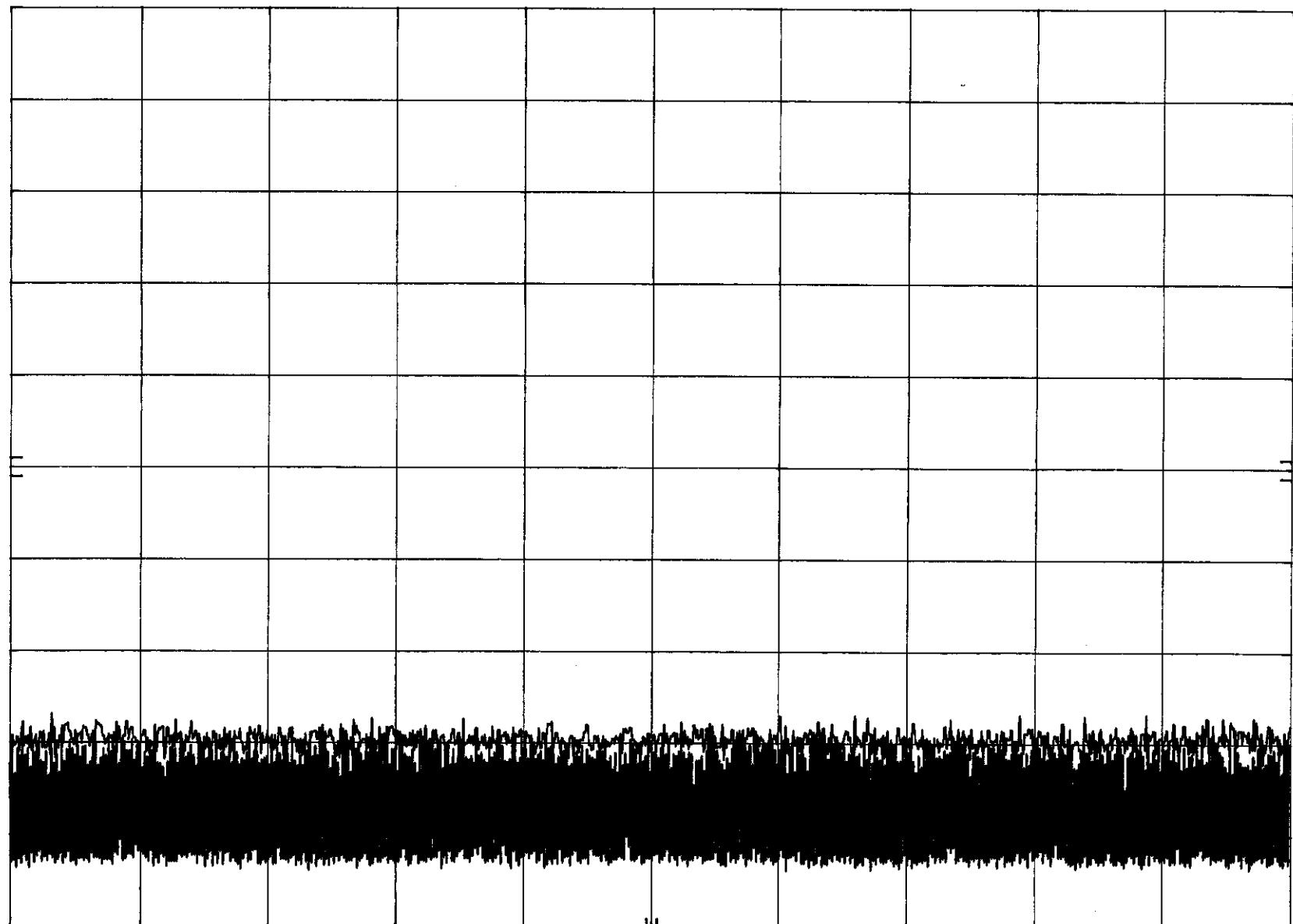
hp

REF 6.5 dBm

ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB



START 30 MHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 200 MHz

SWP 128 msec

923MHz ANTport

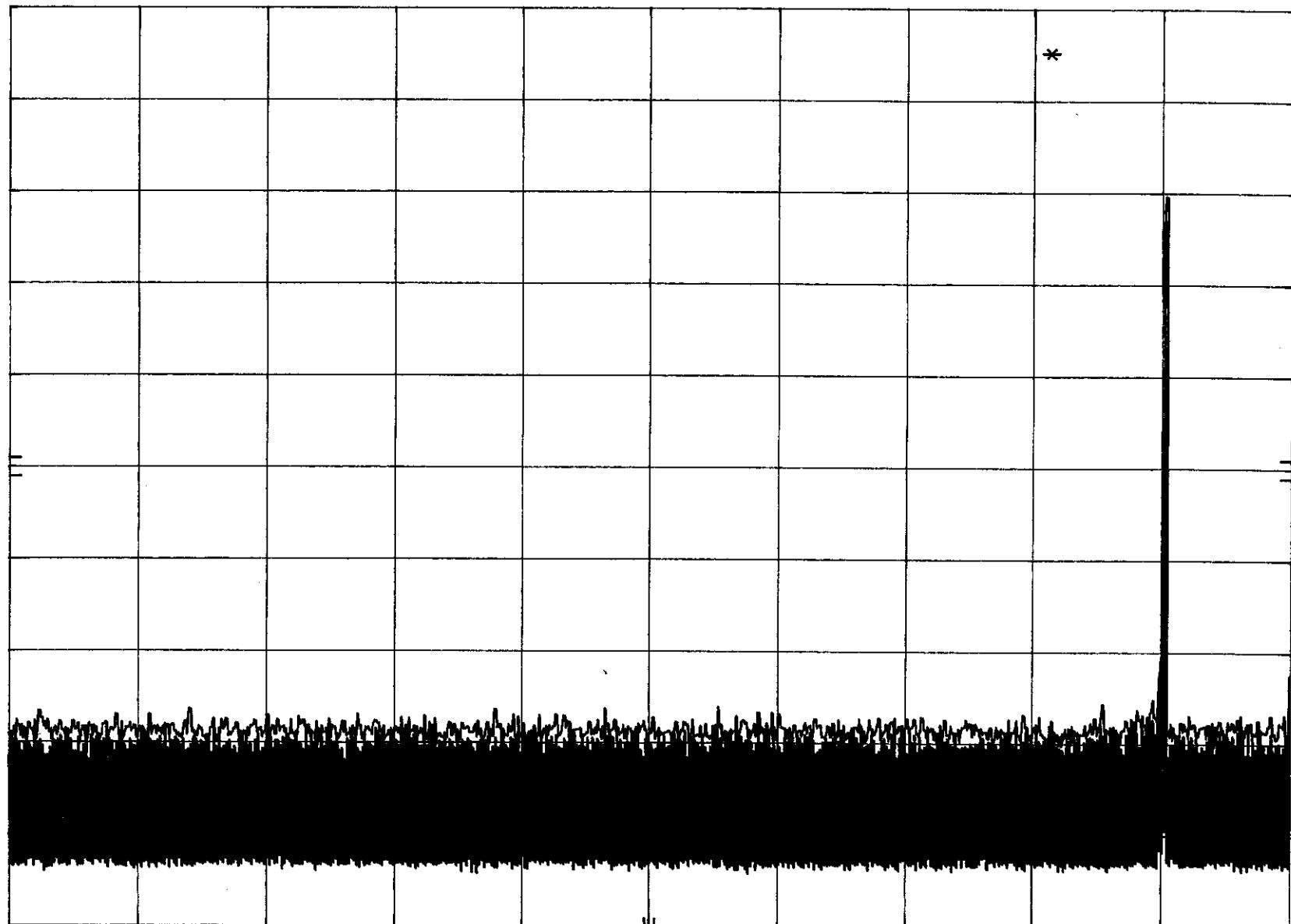
REF 6.5 dBm

ATTEN 10 dB

hp

10 dB/

OFFSET  
6.5  
dB



START 200 MHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 1.000 GHz

SWP 600 msec

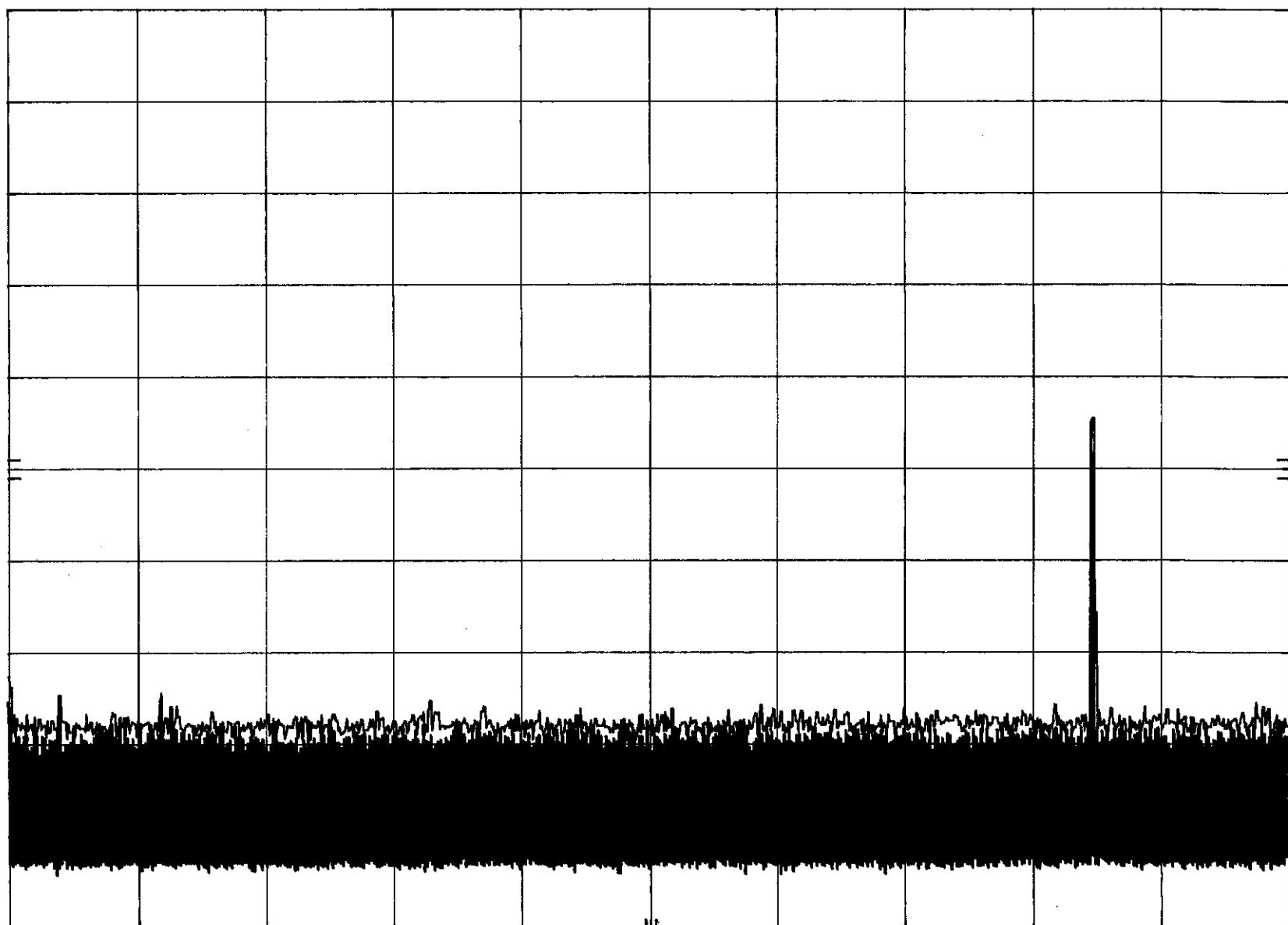
923MHz ANTport

hp REF 6.5 dBm

ATTEN 10 dB

10 dB/

OFFSET  
6.5  
dB



START 1.00 GHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 2.00 GHz

SWP 750 msec

923MHz ANTport

REF 6.5 dBm ATTEN 10 dB

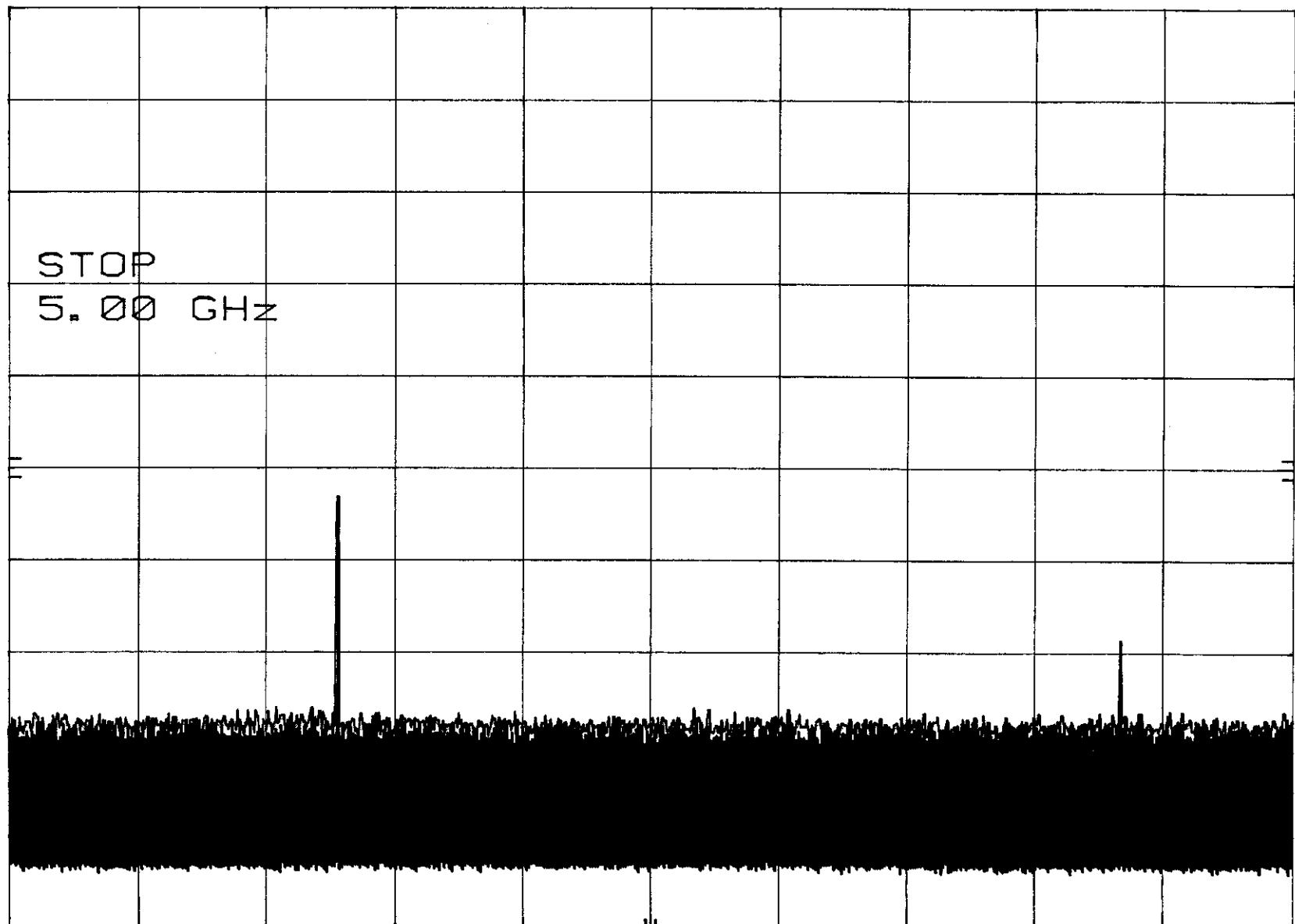
hp

10 dB/

OFFSET  
6.5  
dB

STOP

5.00 GHz



START 2.00 GHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 5.00 GHz

SWP 2.25 sec

923MHz ANTport

REF 6.5 dBm

ATTEN 10 dB

hp

10 dB/

OFFSET  
6.5  
dB

STOP

10.00 GHz

START 5.00 GHz

RES BW 100 kHz (i)

VBW 100 kHz

STOP 10.00 GHz

SWP 3.75 sec



***PEAK POWER SPECTRAL DENSITY***

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**Brea Division**  
**114 Olinda Drive**  
**Brea, CA 92823**  
**(714) 579-0500**

**Agoura Division**  
**2337 Troutdale Drive**  
**Agoura, CA 91301**  
**(818) 597-0600**

**Silverado Division**  
**19121 El Toro Road**  
**Silverado, CA 92676**  
**(949) 589-0700**

**Lake Forest Division**  
**20621 Pascal Way**  
**Lake Forest, CA 92630**  
**(949) 587-0400**

903.5 MHz SPECTRAL DENSITY FOX MESSAGE

hp REF 16.5 dBm ATTEN 20 dB

MKR 903.235 2 MHz  
4.00 dBm

10 dB/

OFFSET  
6.5  
dB

DL  
8.0  
dBm

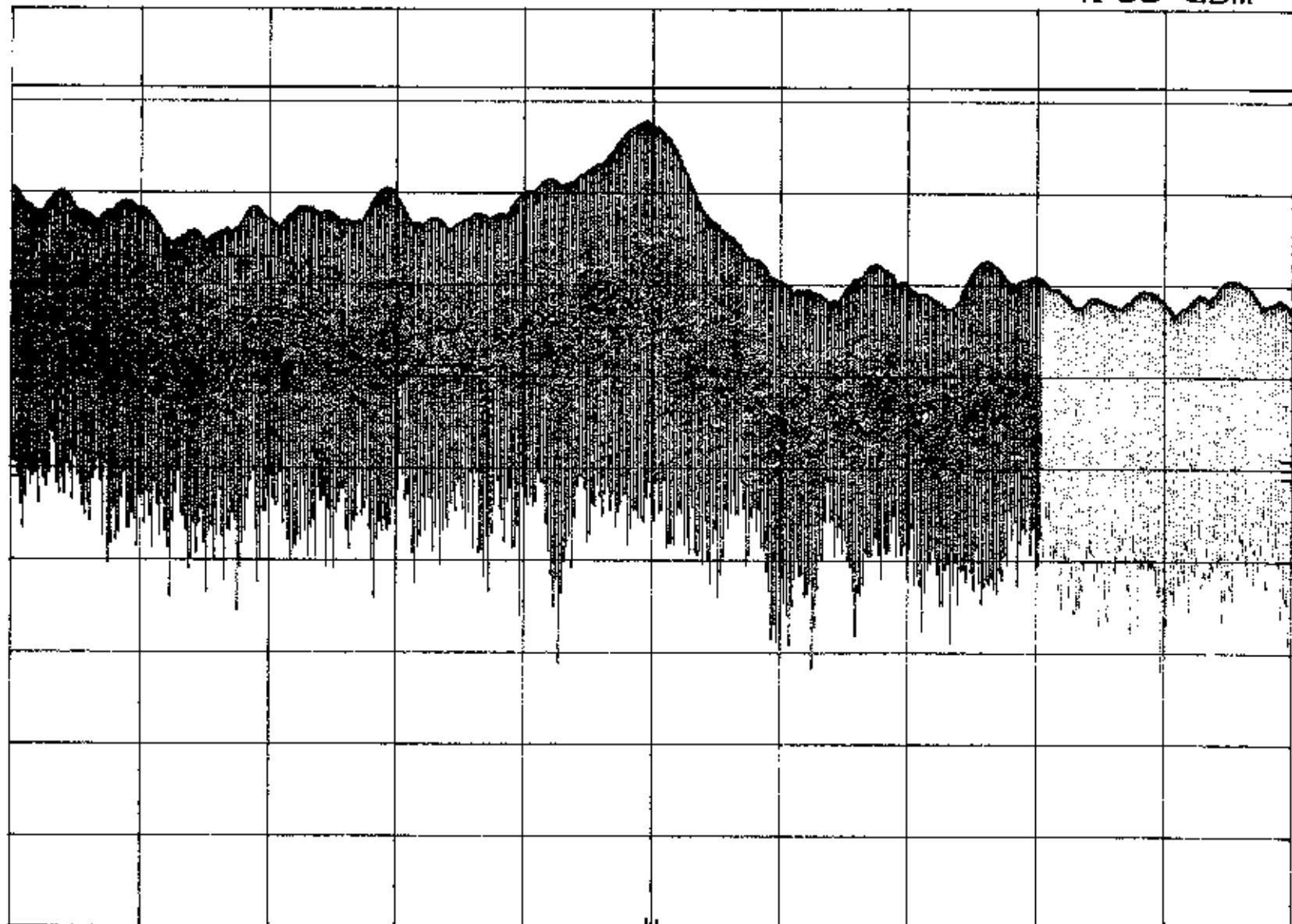
CENTER 903.235 MHz

RES BW 3 kHz (1)

VBW 10 kHz

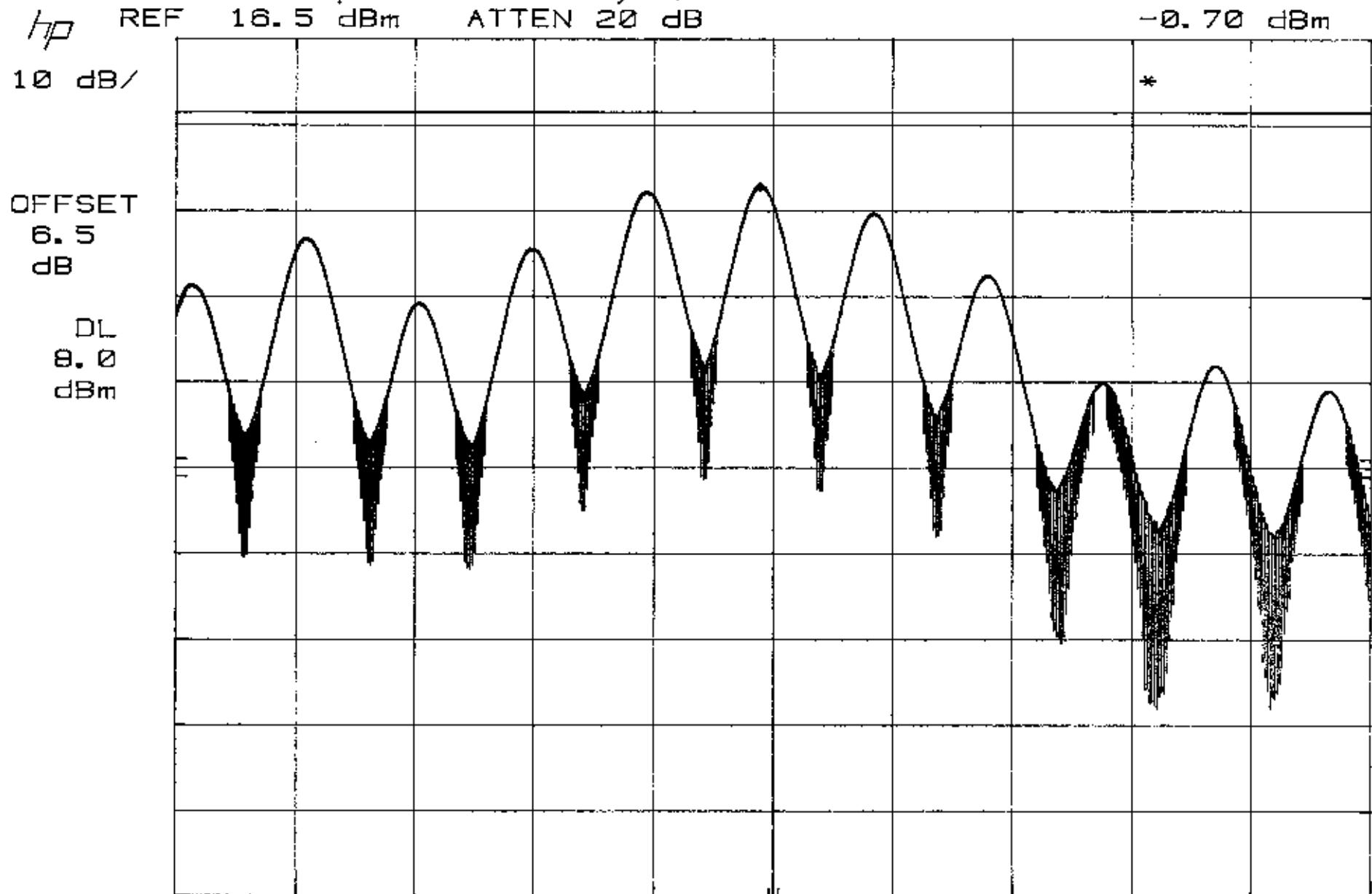
SPAN 100 kHz

SWP 33.0 sec



903.5 MHz Spectral Density I/O  
REF 16.5 dBm ATTEN 20 dB

MKR 903.746 8 MHz  
-0.70 dBm



912MHz Spectral Density FOX MESSAGE  
hp REF 16.5 dBm ATTEN 20 dB

MKR 911.753 6 MHz  
0.50 dBm

10 dB/

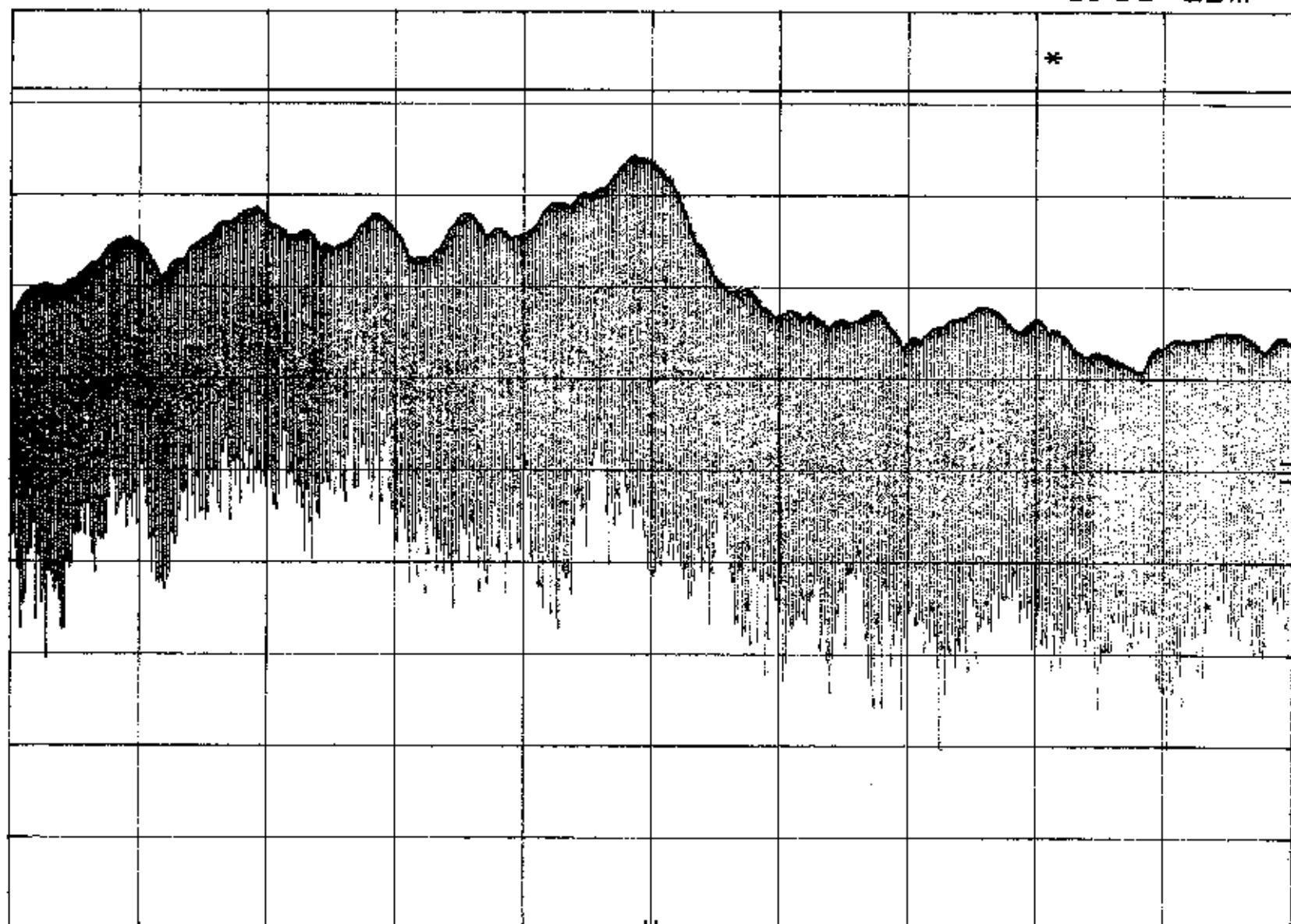
OFFSET  
6.5  
dB

DL  
8.0  
dBm

CENTER 911.755 MHz  
RES BW 3 kHz(i)

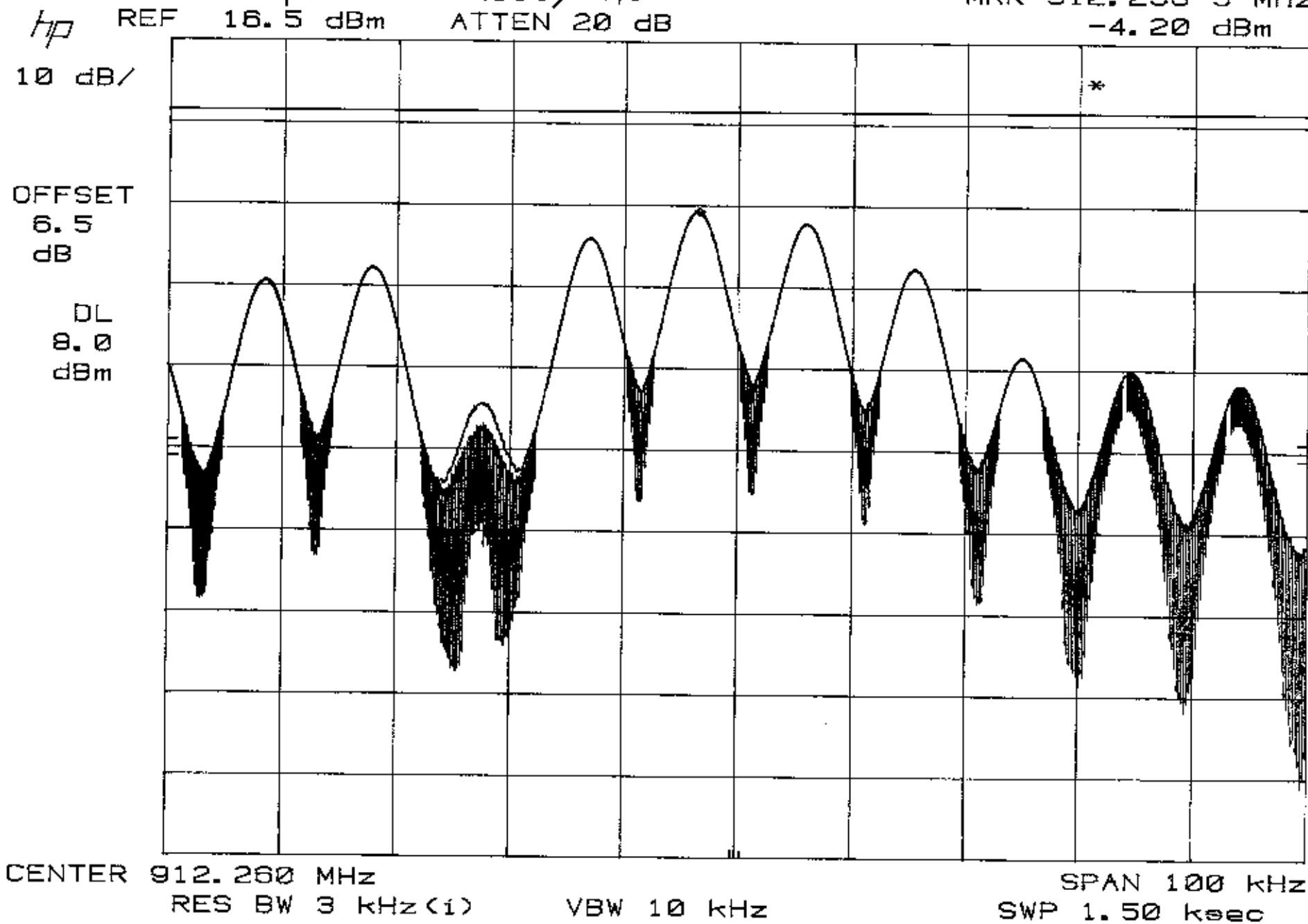
VBW 10 kHz

SPAN 100 kHz  
SWP 33.0 sec



912MHz Spetral Density I/O  
REF 16.5 dBm ATTEN 20 dB

MKR 912.256 5 MHz  
-4.20 dBm



923MHz Spectral Density FOX message  
REF 16.5 dBm ATTEN 20 dB

MKR 922.778 8 MHz  
-14.60 dBm

hp

10 dB/

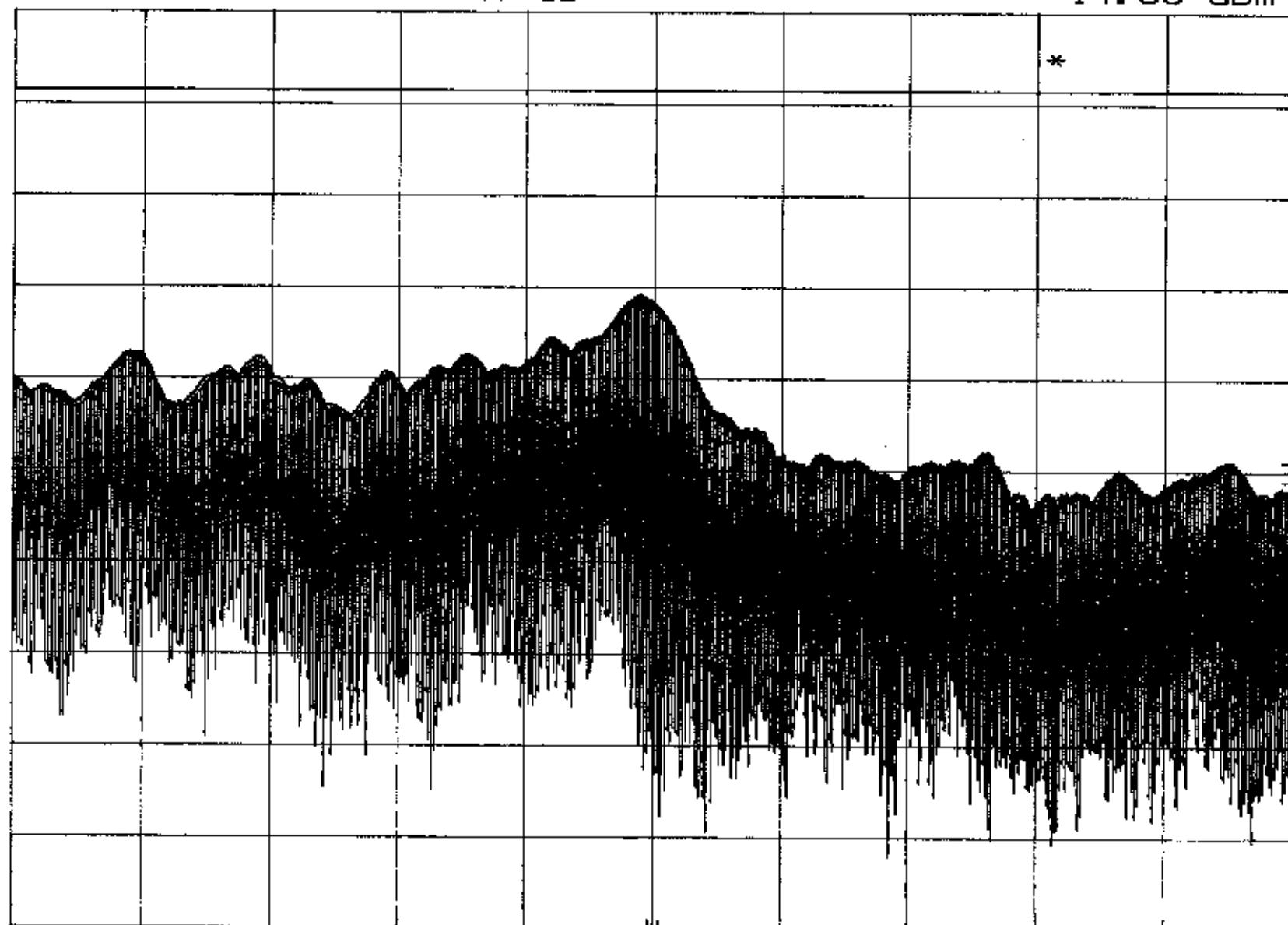
OFFSET  
16.5  
dB

DL  
8.0  
dBm

CENTER 922.780 MHz  
RES BW 3 kHz *(i)*

VBW 10 kHz

SPAN 100 kHz  
SWP 33.0 sec



923MHz Spectral Density I/O  
REF 16.5 dBm ATTEN 20 dB

MKR 922.747 9 MHz  
-20.90 dBm

hp

10 dB/

OFFSET  
6.5  
dB

DL  
8.0  
dBm

CENTER 922.748 MHz  
RES BW 3 kHz (i)

VBW 10 kHz

SPAN 100 kHz  
SWP 1.50 ksec

