



## **APPLICATION FOR FCC PART 90 TYPE ACCEPTANCE**

**Teledesign Systems Inc.**

**Radio Modem with 3422 Transceiver  
Model No.: TS4000-05Cff**

**FCC ID: JWFTS4000C**

**Report # J98033454C**

**Date of Report: December 21, 1998**

**Total No. of Pages Contained in this Report: 73**

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FCC Part 90 Type Acceptance

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998

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## 1.0 Introduction

### 1.1 Test Summary

FCC RULE	DESCRIPTION OF TEST	RESULT	PAGE
2.985(a)	RF Power Output	Pass	3
90.205	Effective Radiated Power	Pass	4
2.989(i), 90.209(b)(5), 90.210, 90.63(d)(7), 90.65(c)(18), 90.67(c)(14), 90.73(d)(13), 90.75(c)(19), 90.79(d)(6)	Occupied Bandwidth, Bandwidth Limitation, Emission Masks	Pass	5
2.991, 90.210	Spurious Emissions at Antenna Terminals	Pass	8
2.993, 15.109, 90.210	Field Strength of Spurious Radiation	Pass	10
15.107	Line Conducted Emissions	Pass	13
2.995(a)	Frequency Stability vs. Temperature	Pass	16
2.995(d)(3)	Frequency Stability vs. Voltage	Pass	17
90.214	Transient Frequency Behavior	Pass	18



Xi-Ming Yang  
Test Engineer

February 2, 1999  
Date

# **INTERTEK TESTING SERVICES - Menlo Park**

**Teledesign Radio Modem with 3422 Transceiver**

**Date of Test: December 18, 1998**

## 1.2 Product Description

The unit under test is a radio modem with 3422 transceiver.. For more details, see attached information.

## 1.3 Related Submittal(s) Grants

- [X] Type acceptance granted for the radio transceiver (see attached) used in this radio modem.  
Applicant: Johnson Data Telemetry Corporation  
FCC ID: ATH2423422-007  
Date of Grant: December 10, 1996  
File No.: 31010/EQU 17.9
  
- [X] DOC for computer section, a separate DOC is prepared.

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## 2.0 RF Power Output, FCC §2.985(a)

### 2.1 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 300 kHz and 300 kHz respectively. The attenuator was included in spectrum analyzer OFFSET function.

Transmitter output was read off the spectrum analyzer in dBm.

### 2.2 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

### 2.3 Test Results

Refer to the attached plot #2.1-2.3 and table below:

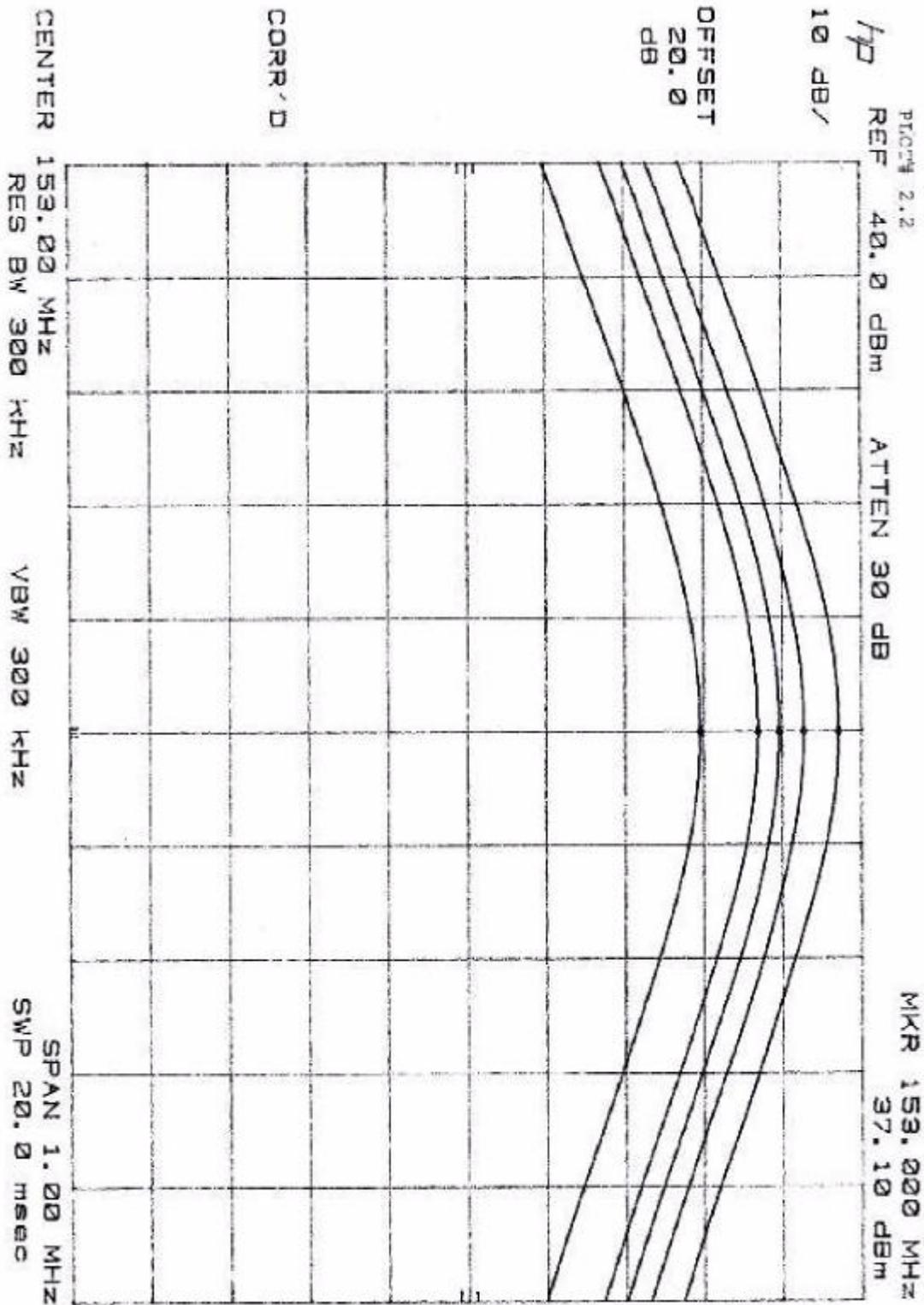
Power Level (Watt)	Reading, dBm		
	174 MHz	153 MHz	132 MHz
5	37.0	37.1	37.0
2	32.9	32.7	32.6
1	29.6	29.6	29.8
0.5	26.9	26.9	26.7
0.1	20.0	19.6	19.2



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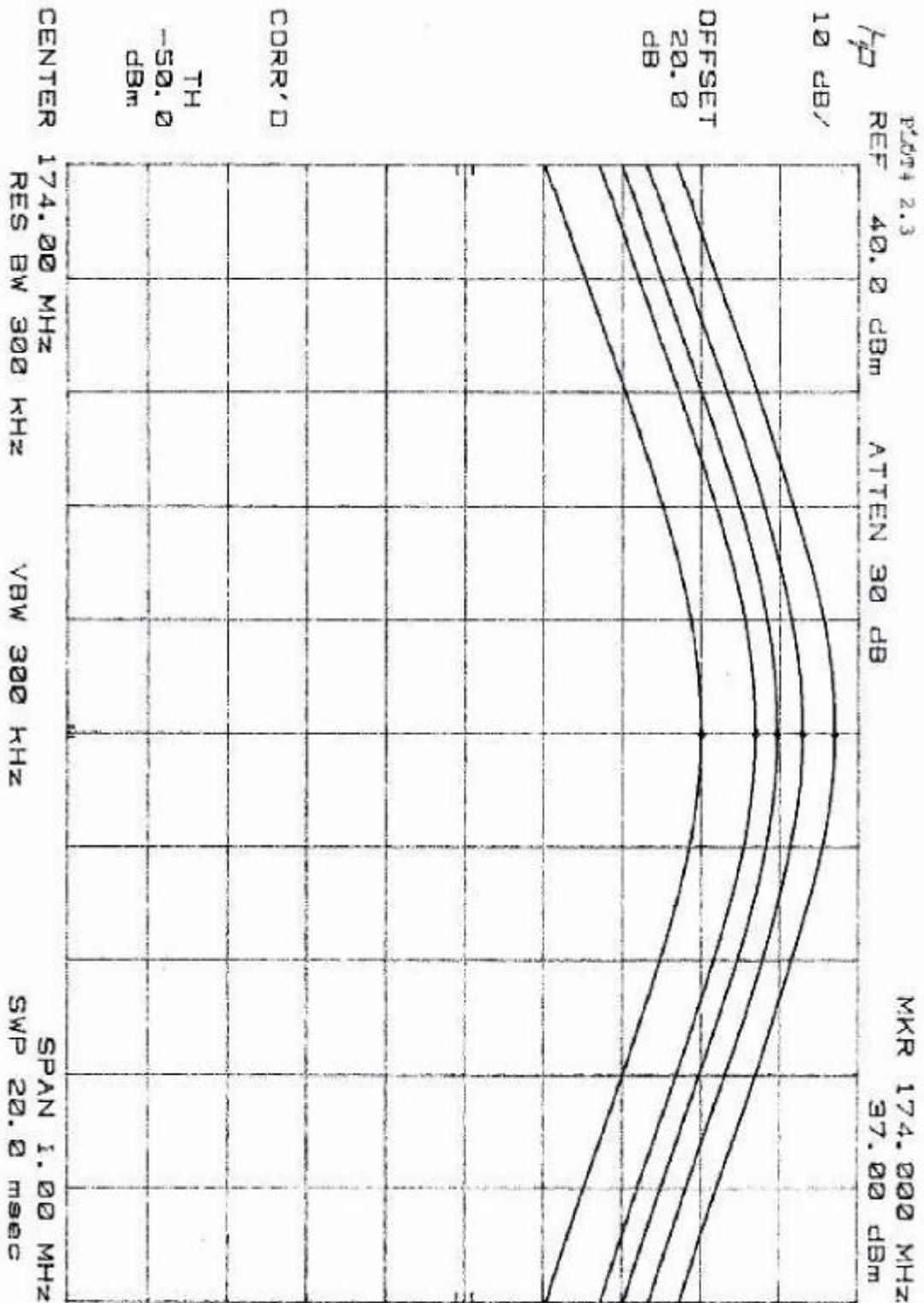
Date of Test: December 18, 1998



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Teledesign Radio Modem with 3422 Transceiver

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## 3.0 Effective Radiated Power, FCC § 90.205

### 3.1 Test Procedure

The EUT was positioned on a non-conductive turntable, 0.8m above the ground plane on an open test site.

The radiated emission at the fundamental frequency was measured at 3m distance with a test antenna and spectrum analyzer. During the measurement, the resolution and video bandwidth of the spectrum analyzer were set to 100 kHz. The maximum emission was recorded with the rotation of the turntable and the raising and lowering of the test antenna. The spectrum analyzer reading was recorded.

The ERP was calculated as follows:

$$ERP_{(dBm)} = E_{(dBuV/m)} + 20 \log D - 10 \log 30 - 10 \log G - 90$$

where D = 3m, distance

G = 1.64, gain of half-wave dipole

### 3.2 Test Equipment

Hewlett Packard HP8566B Spectrum Analyzer  
CDI Biconical Antenna

### 3.3 Test Results

The maximum ERP is 3.5W.

Refer to the attached data.

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Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998



Company: Teledesign System Inc.  
Project #: J98033454  
Model: JWFTS4000C  
Engineer: Xi-Ming Yang  
Date of test: Dec. 18, 1998

## FCC 90 Radiated Emissions

Frequency	Antenna	Reading	Antenna	Pre-amp	Cable	Corrected	EIRP	ERP
MHz	Polarity	dB(uV)	Factor	dB	Loss	dB(uV/m)	dB(pW)	dBm
132.0	V	125.0	7.8	0.0	0.1	132.9	127.7	35.5
153.0	V	121.9	10.5	0.0	0.1	132.5	127.3	35.1
174.0	V	123.7	8.3	0.0	0.2	132.2	127.0	34.8

Note: 1. All measurement were made at 3 meters

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4.0 **Occupied Bandwidth, Bandwidth Limitation, Emission Masks.** FCC §2.989(i), 90.209(b)(5), 90.210, 90.63(d)(7), 90.65(c)(18), 90.67(c)(14), 90.73(d)(13), 90.75(c)(19), 90.79(d)(6)

## 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 (random pattern) was recorded. This spectrum was compared to the required emission mask.

## 4.2 Test Equipment

HP 8566B Spectrum Analyzer, 100 Hz - 22 GHz

HP 7470A Plotter

## 4.3 Test Results

The EUT meets the requirements for the emission masks C and D for the Emission Designators:

20K0F1D

16K0F1D

11K2F1D

6K00F1D (For Subparts 90.63(d)(7), 90.65(c)(18), 90.67(c)(14), 90.73(d)(13), 90.75(c)(19), 90.79(d)(6) only).

Refer to the attached plots 4.1 - 4.22.

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Occupied Bandwidth Plots:

Transmitting at 153 MHz				
Plot #	Emission Mask	Type of Modulation	Emission Designator	Description
4.1	C	4LFSK	20K0F1D	B=32 kbps, M=4 kHz, D=6 kHz, Span 100 kHz
4.2	C	4LFSK	20K0F1D	B=32 kbps, M=4 kHz, D=6 kHz, Span 200 kHz
4.3	C	4LFSK	16K0F1D	B=24 kbps, M=3 kHz, D=5 kHz, Span 100 kHz
4.4	D	4LFSK	11K2F1D	B=15 kbps, M=1875 Hz, D=3750 Hz, Span 100 kHz
4.5	*	4LFSK	6K00F1D*	B=4.8 kbps, M=600 kHz, D=1.8 kHz, Span 100 kHz
4.6	C	GMSK, BT=0.3	20K0F1D	B=19.2 kbps, M=6.4 kHz, D=3.6 kHz, Span 100 kHz
4.7	C	GMSK, BT=0.3	20K0F1D	B=19.2 kbps, M=6.4 kHz, D=3.6 kHz, Span 200 kHz
4.8	C	GMSK, BT=0.3	16K0F1D	B=19.2 kbps, M=6.4 kHz, D=1.6 kHz, Span 100 kHz
4.9	D	GMSK, BT=0.3	11K2F1D	B=9.6 kbps, M=3.2 kHz, D=2.4 kHz, Span 100 kHz
4.10	*	GMSK, BT=0.3	6K00F1D*	B=2.4 kbps, M=800 Hz, D=1.5 kHz, Span 100 kHz
4.11	C	GMSK, BT=0.5	20K0F1D	B=14 kbps, M=7 kHz, D=3 kHz, Span 100 kHz
4.12	C	GMSK, BT=0.5	20K0F1D	B=14 kbps, M=7 kHz, D=3 kHz, Span 200 kHz
4.13	C	GMSK, BT=0.5	16K0F1D	B=10 kbps, M=5 kHz, D=3 kHz, Span 100 kHz
4.14	D	GMSK, BT=0.5	11K2F1D	B=7.2 kbps, M=3.6 kHz, D=2 kHz, Span 100 kHz
4.15	C	4LFSK	20K0F1D	B=32 kbps, M=4 kHz, D=6 kHz, Span 200 kHz, Low Power
4.16	C	GMSK, BT=0.5	20K0F1D	B=14 kbps, M=7 kHz, D=3 kHz, Span 200 kHz, Low Power

\* = These are for special subparts of the Rules (See General Information Sheet with Bandwidths)  
 B = Channel Baud Rate, M = Modulation Frequency, D = Peak Deviation

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Transmitting at 174 MHz				
Freq. MHz	Emission Mask	Type of Modulation	Emission Designator	Description
4.17	C	4LFSK	20K0F1D	B=32 kbps, M=4 kHz, D=6 kHz, Span 200 kHz
4.18	C	GMSK, BT=0.3	20K0F1D	B=19.2 kbps, M=6.4 kHz, D=3.6 kHz, Span 200 kHz
4.19	C	GMSK, BT=0.5	20K0F1D	B=14 kbps, M=7 kHz, D=3 kHz, Span 200 kHz

Transmitting at 132 MHz				
Freq. MHz	Emission Mask	Type of Modulation	Emission Designator	Description
4.20	C	4LFSK	20K0F1D	B=32 kbps, M=4 kHz, D=6 kHz, Span 200 kHz
4.21	C	GMSK, BT=0.3	20K0F1D	B=19.2 kbps, M=6.4 kHz, D=3.6 kHz, Span 200 kHz
4.22	C	GMSK, BT=0.5	20K0F1D	B=14 kbps, M=7 kHz, D=3 kHz, Span 200 kHz

B = Channel Baud Rate

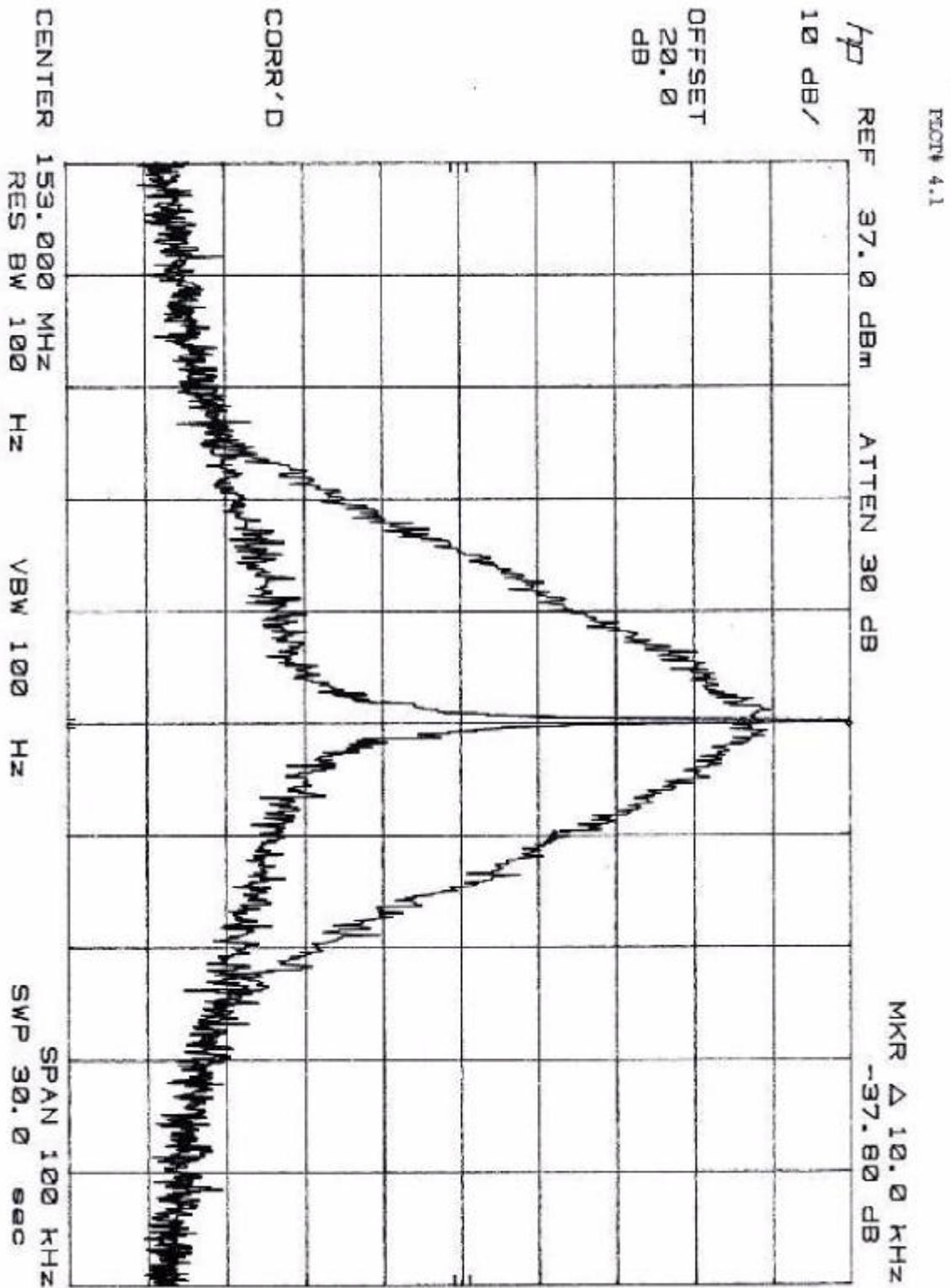
M = Modulation Frequency

D = Peak Deviation

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Teledesign Radio Modem with 3422 Transceiver

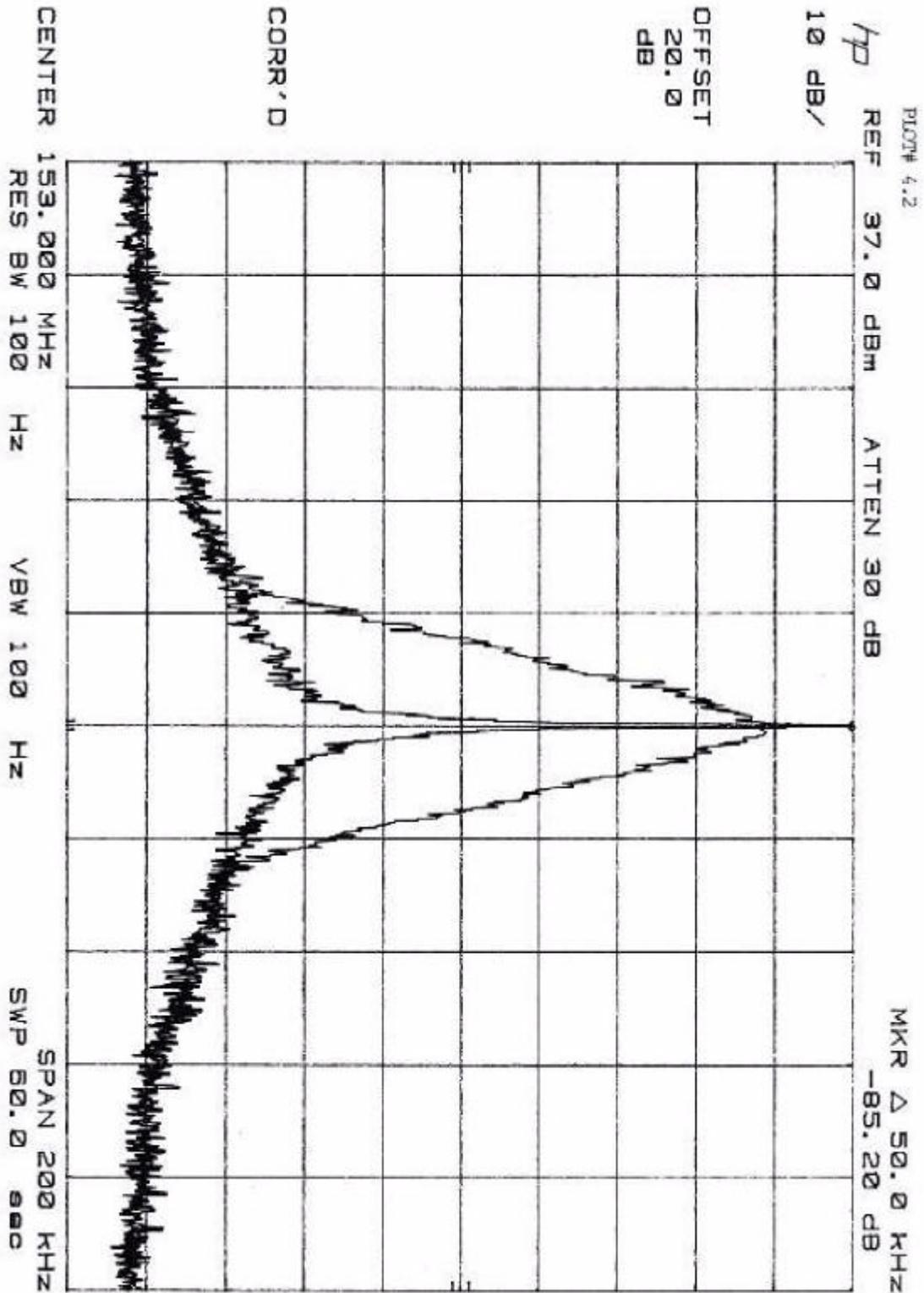
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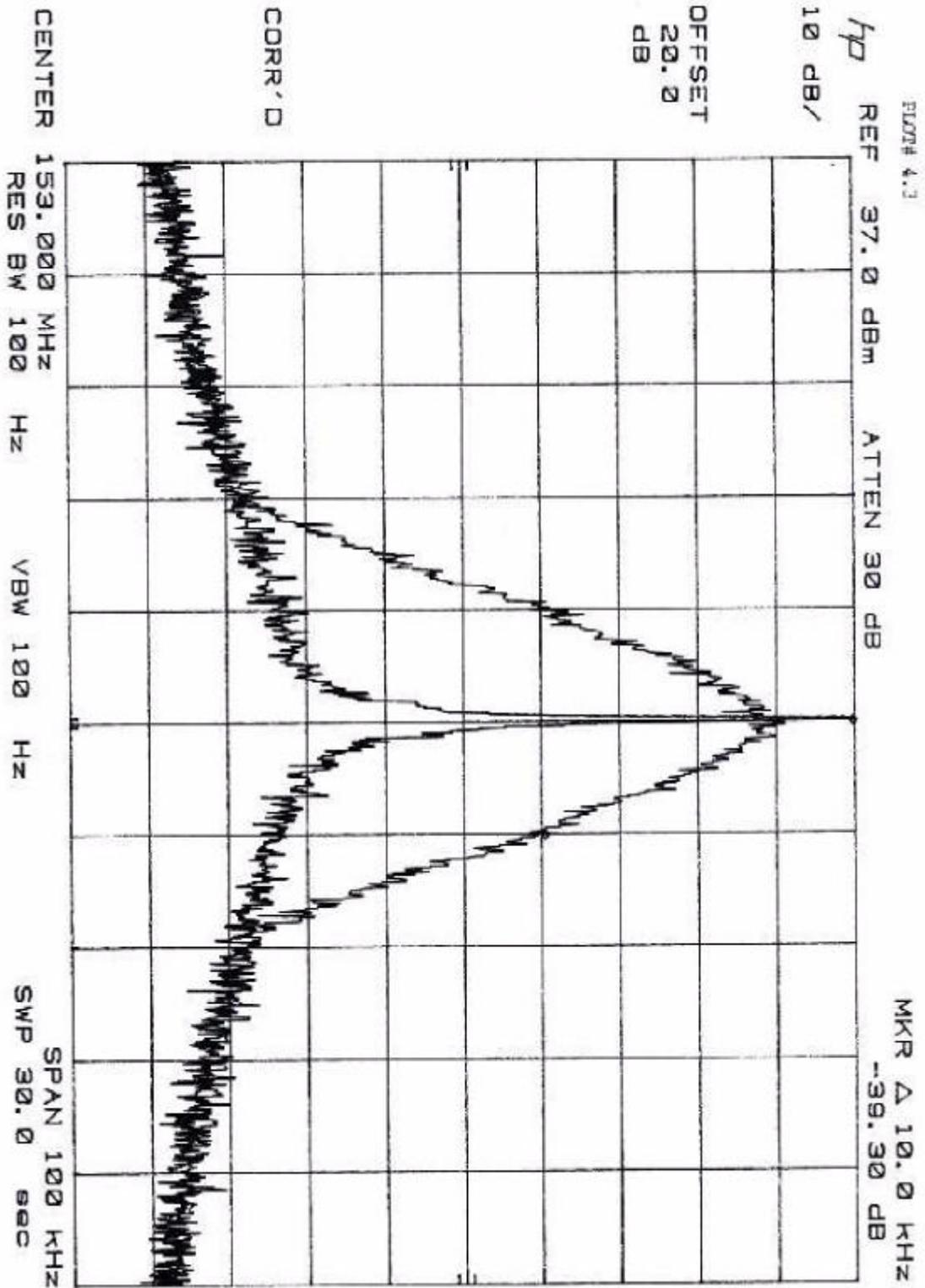
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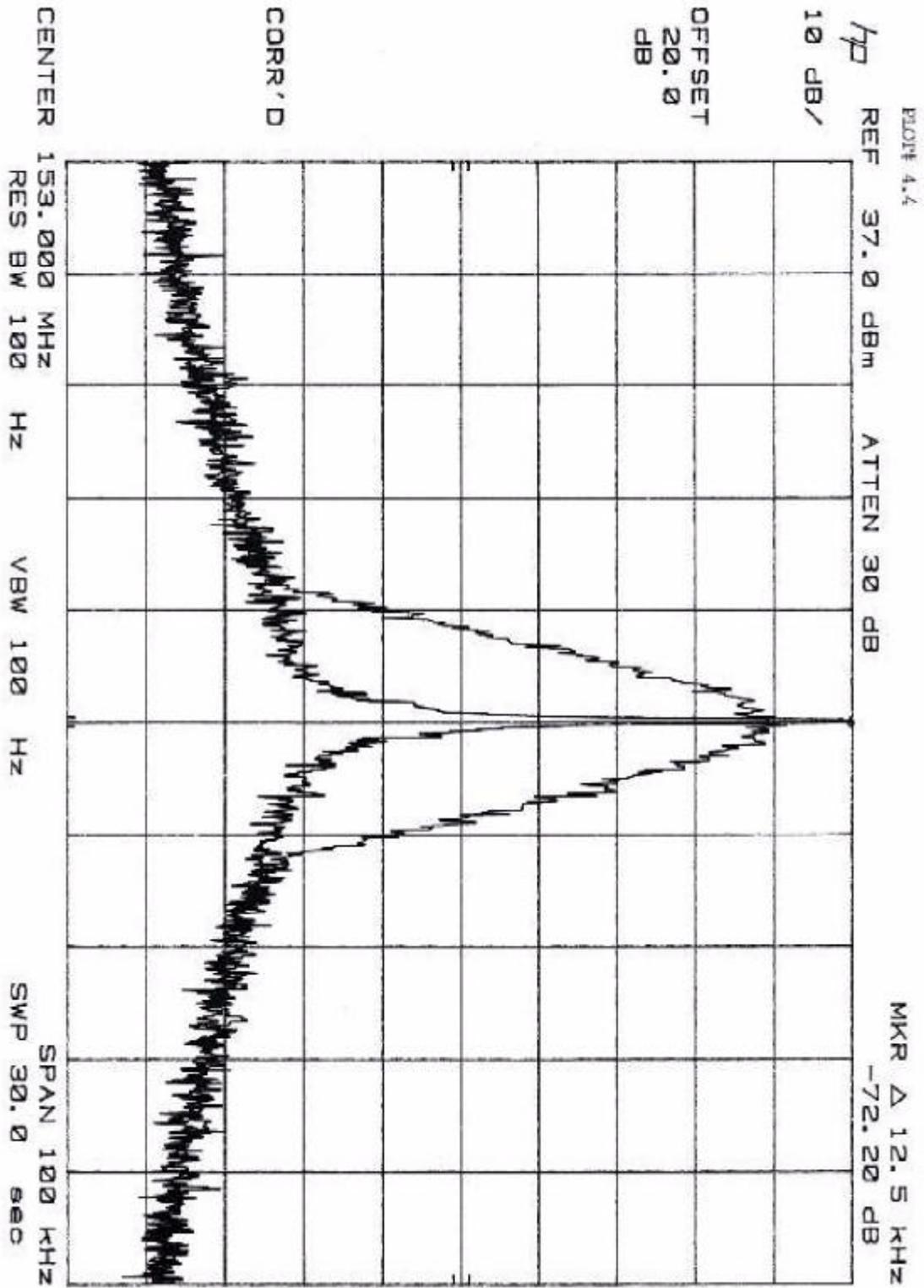
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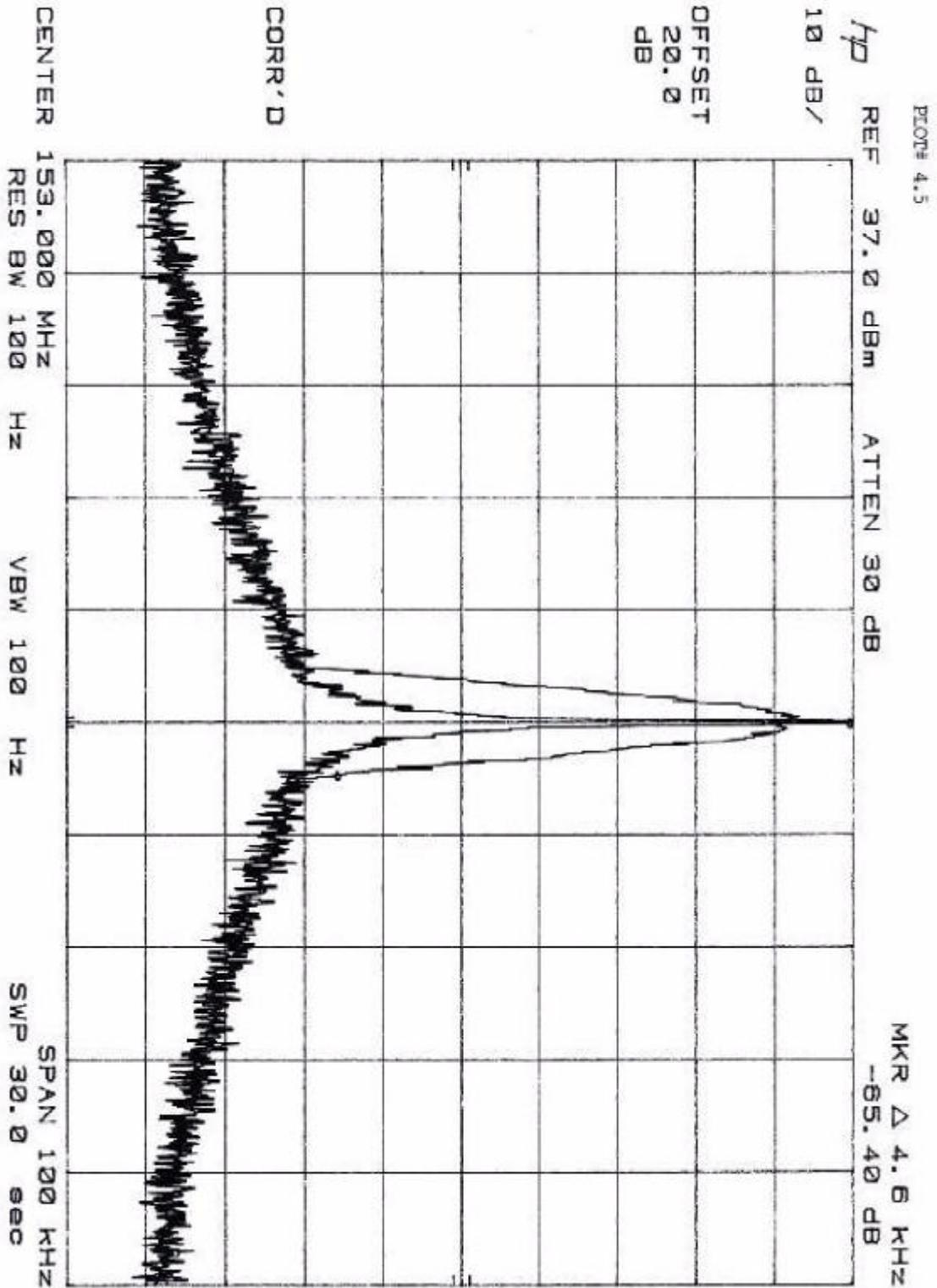
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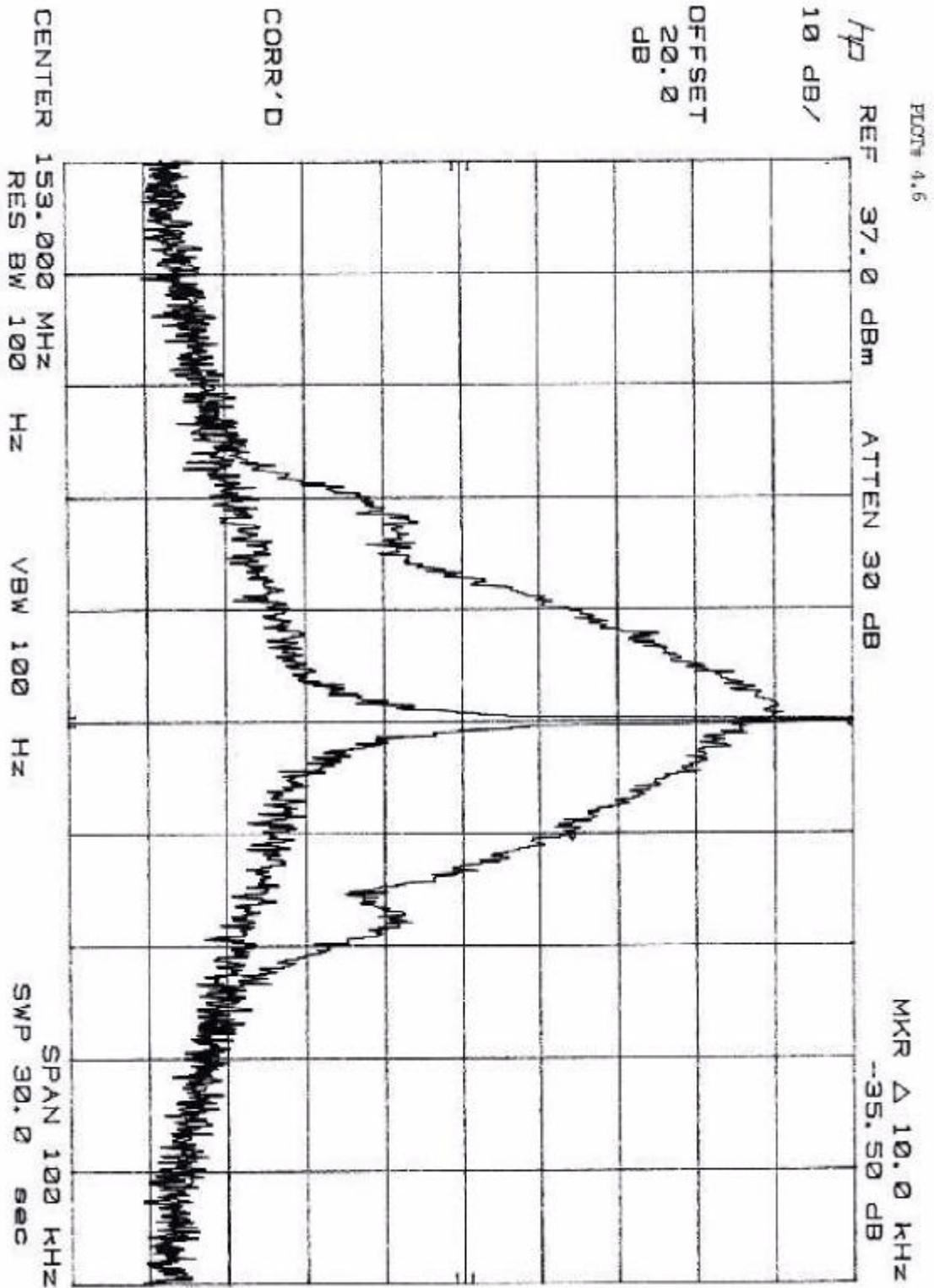
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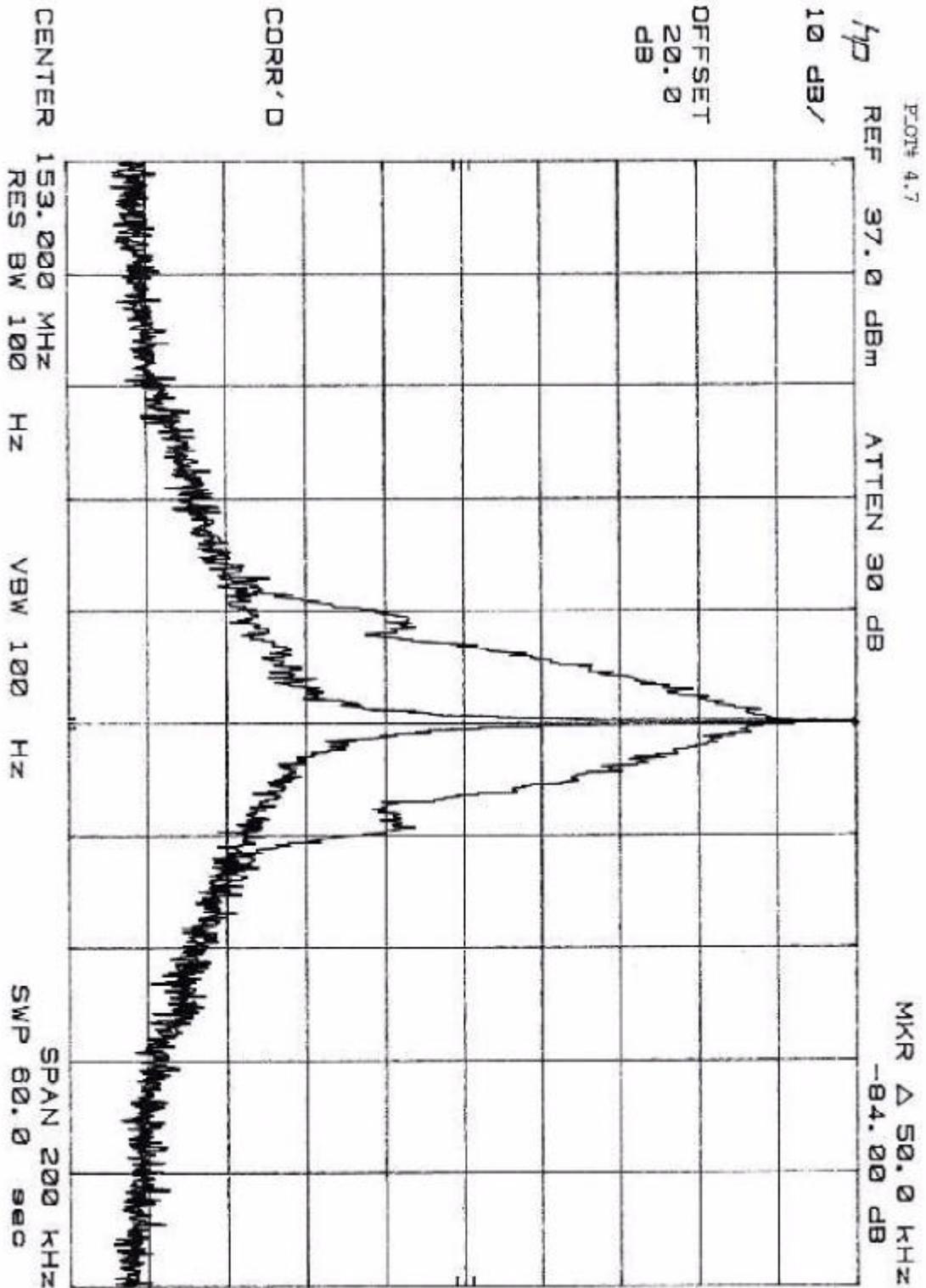
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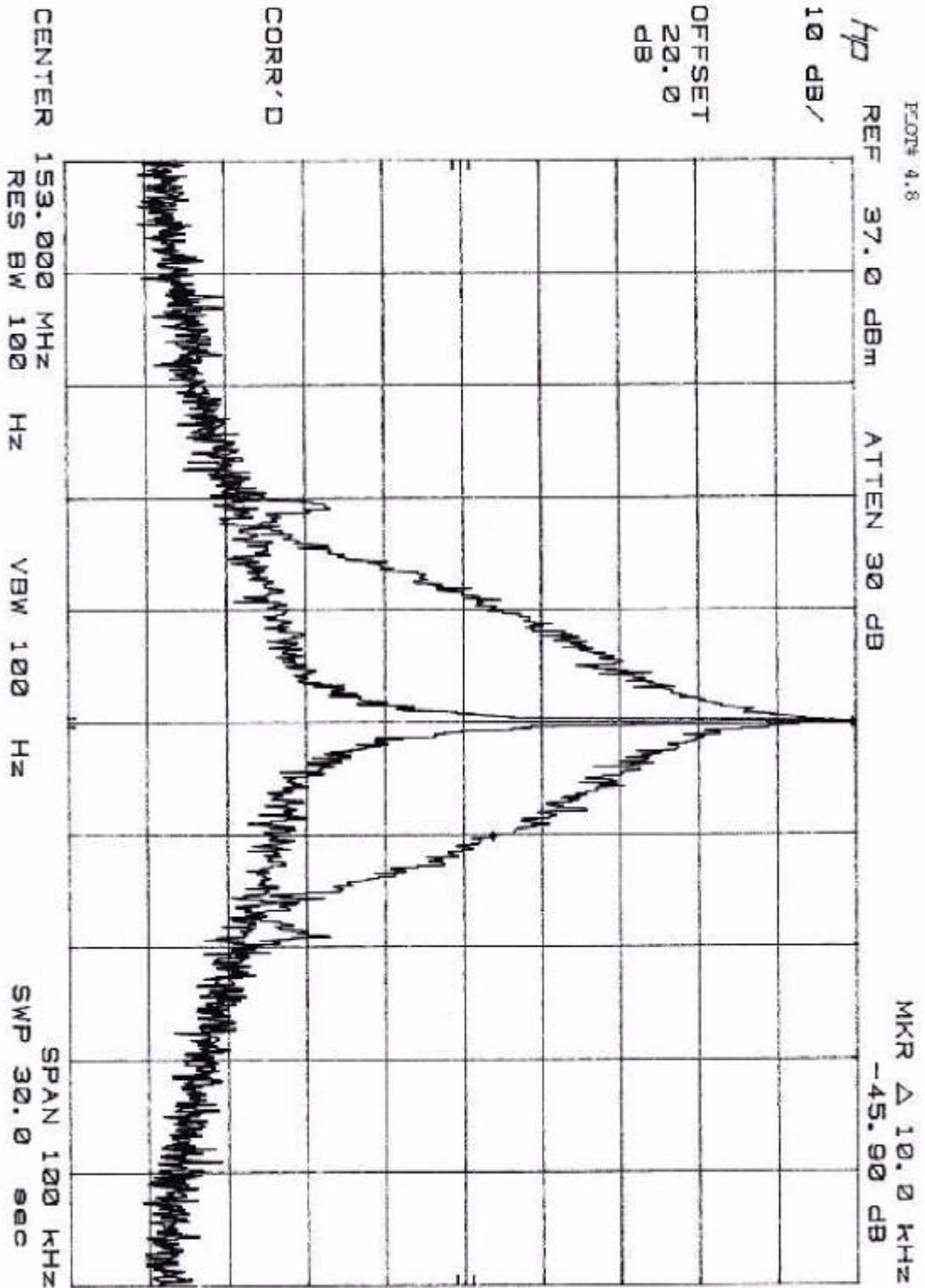
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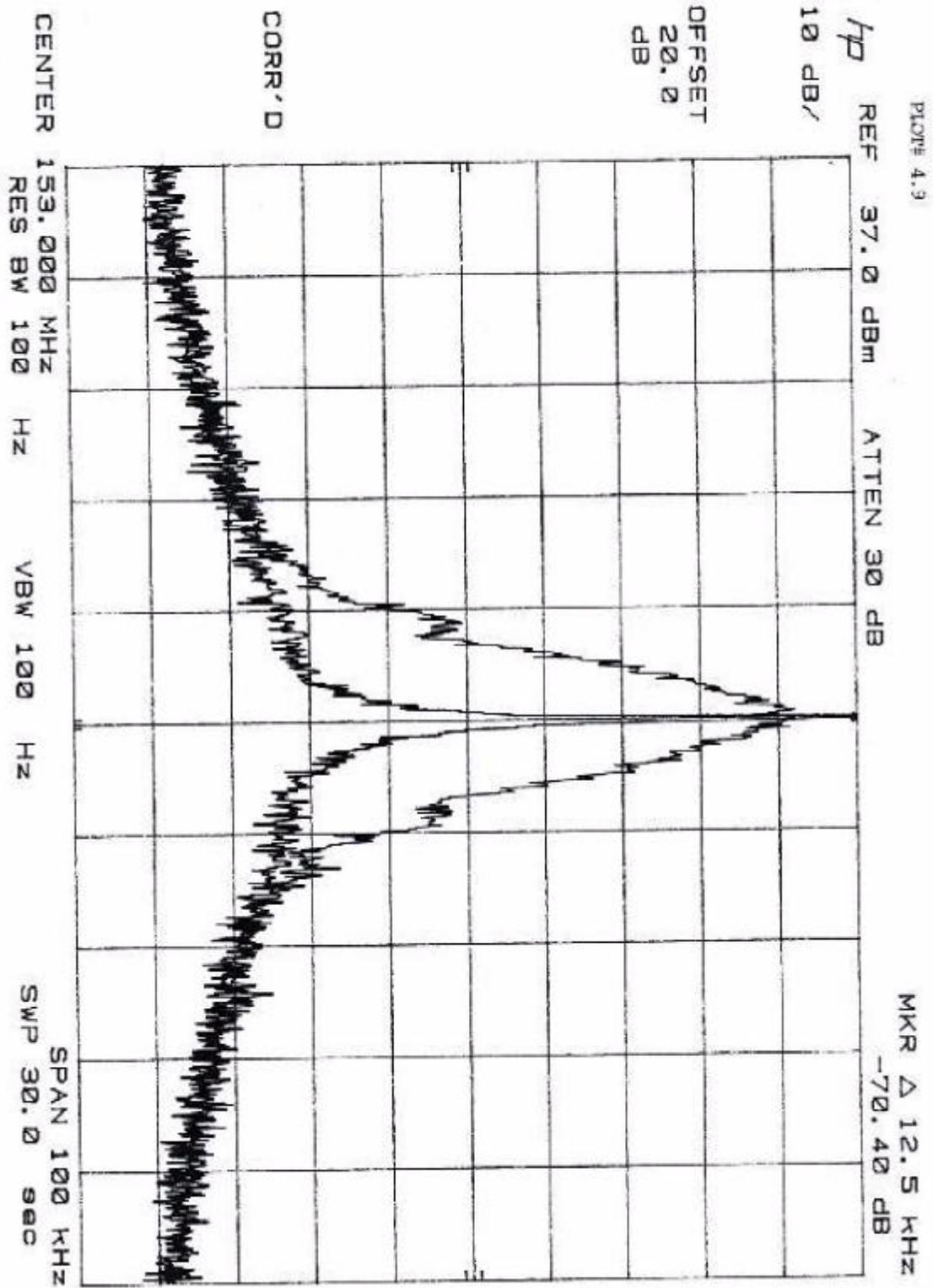
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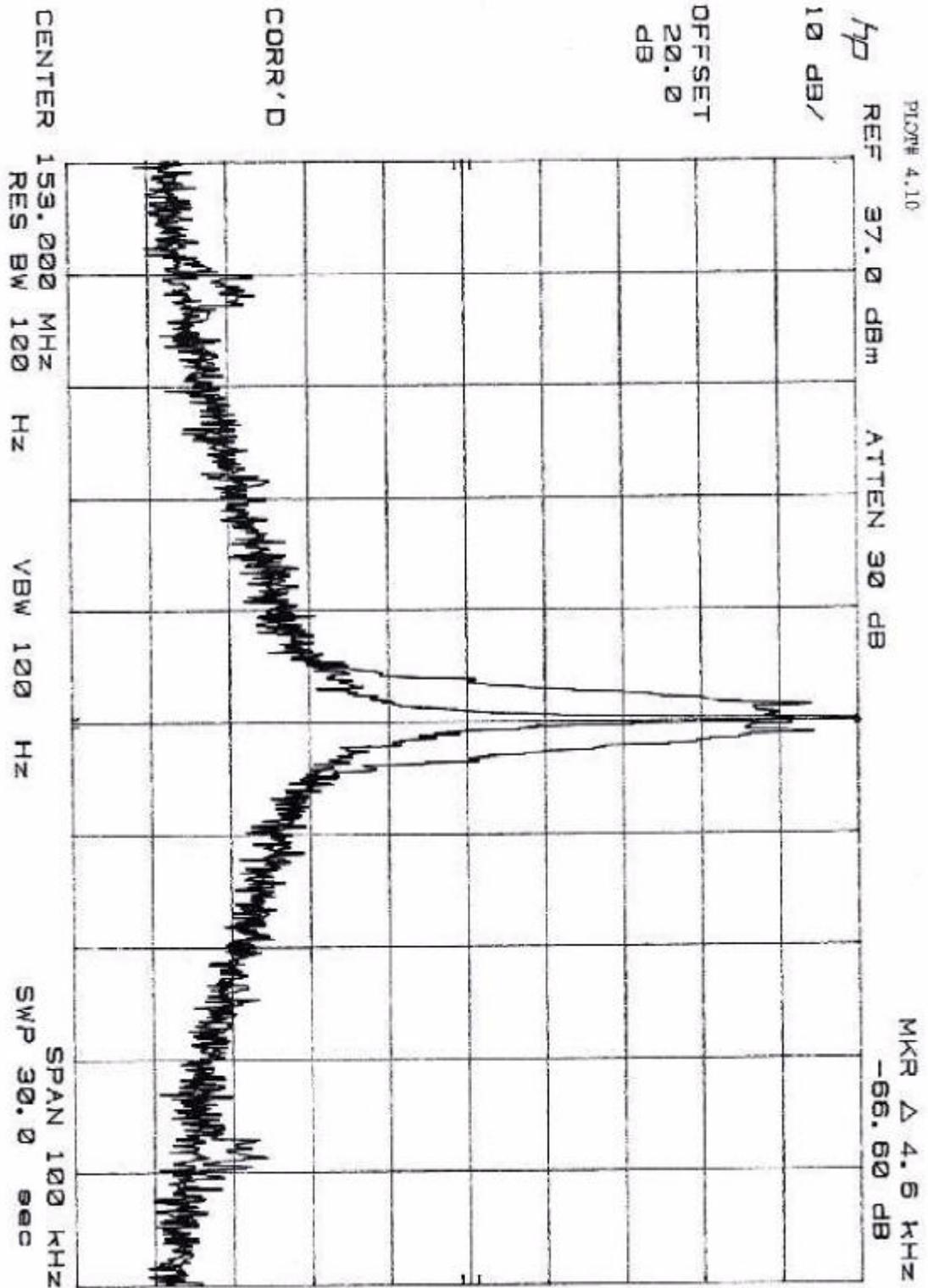
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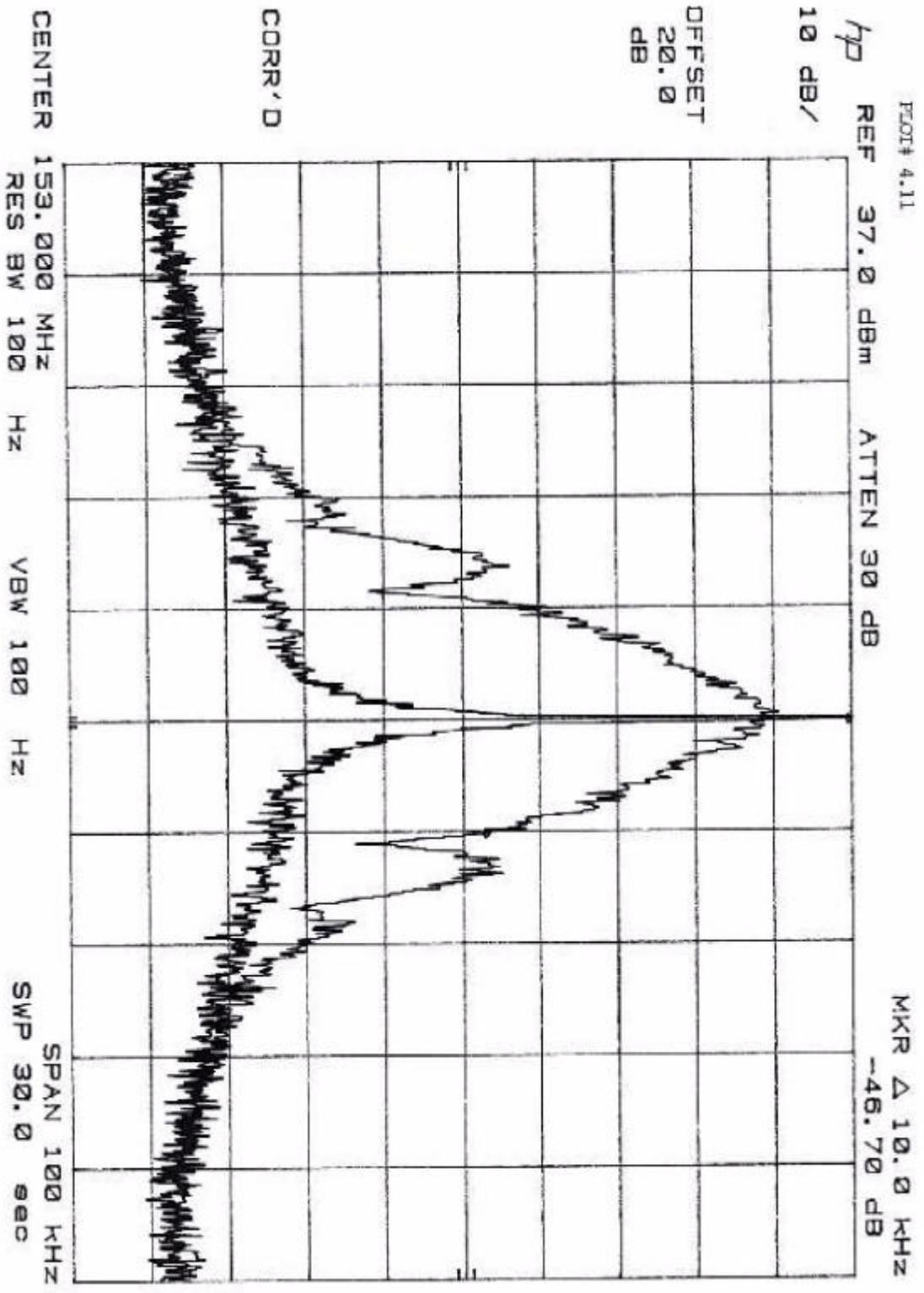
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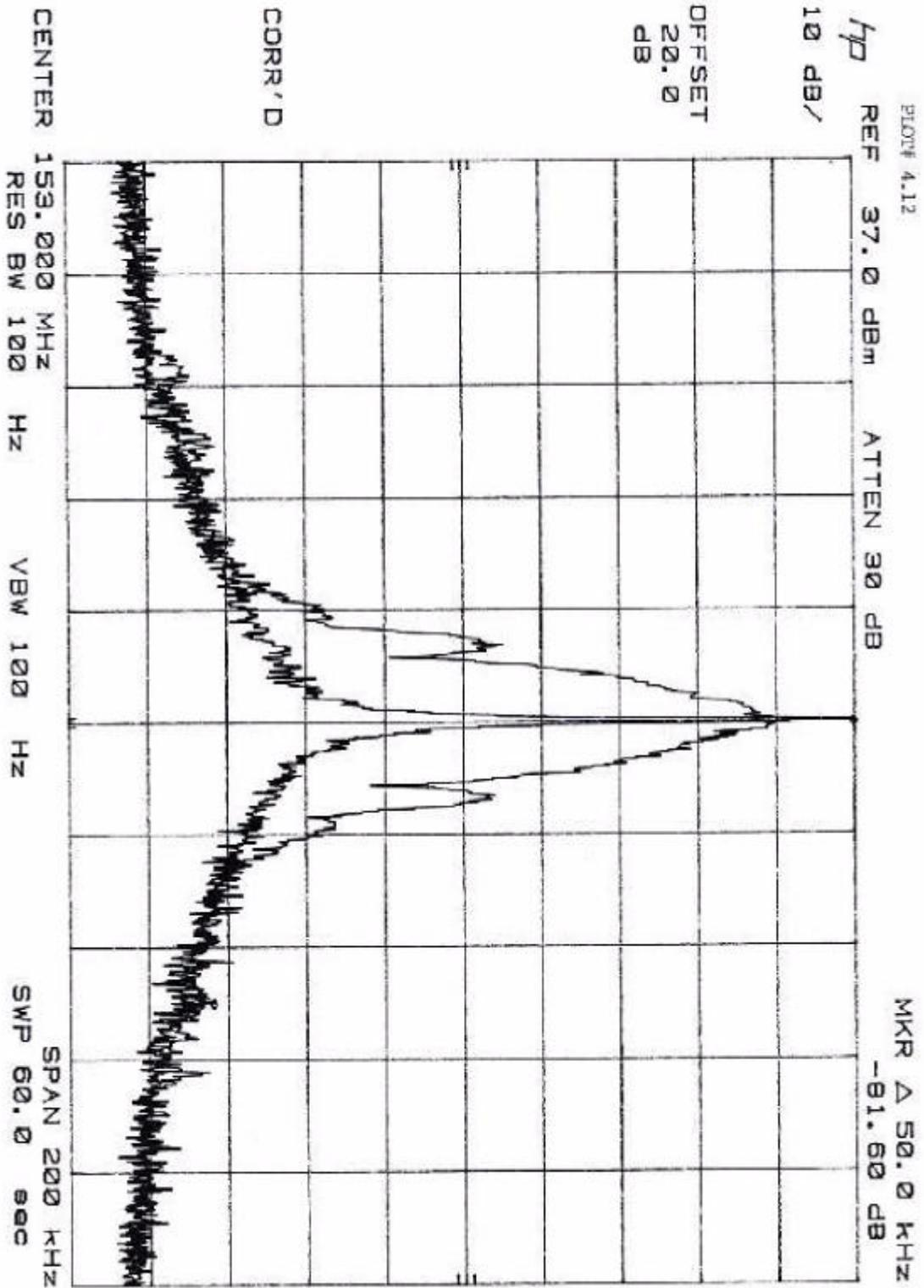
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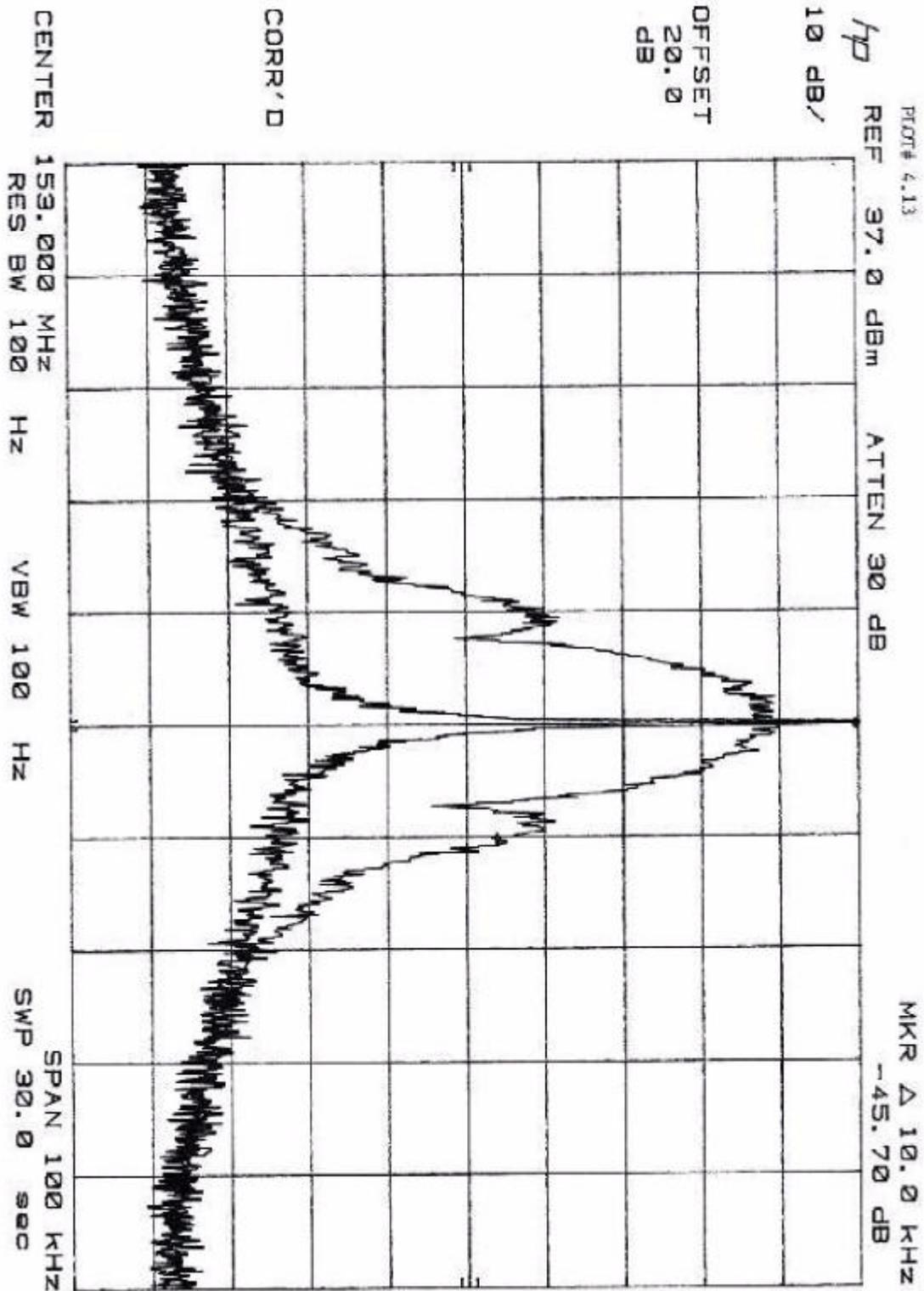
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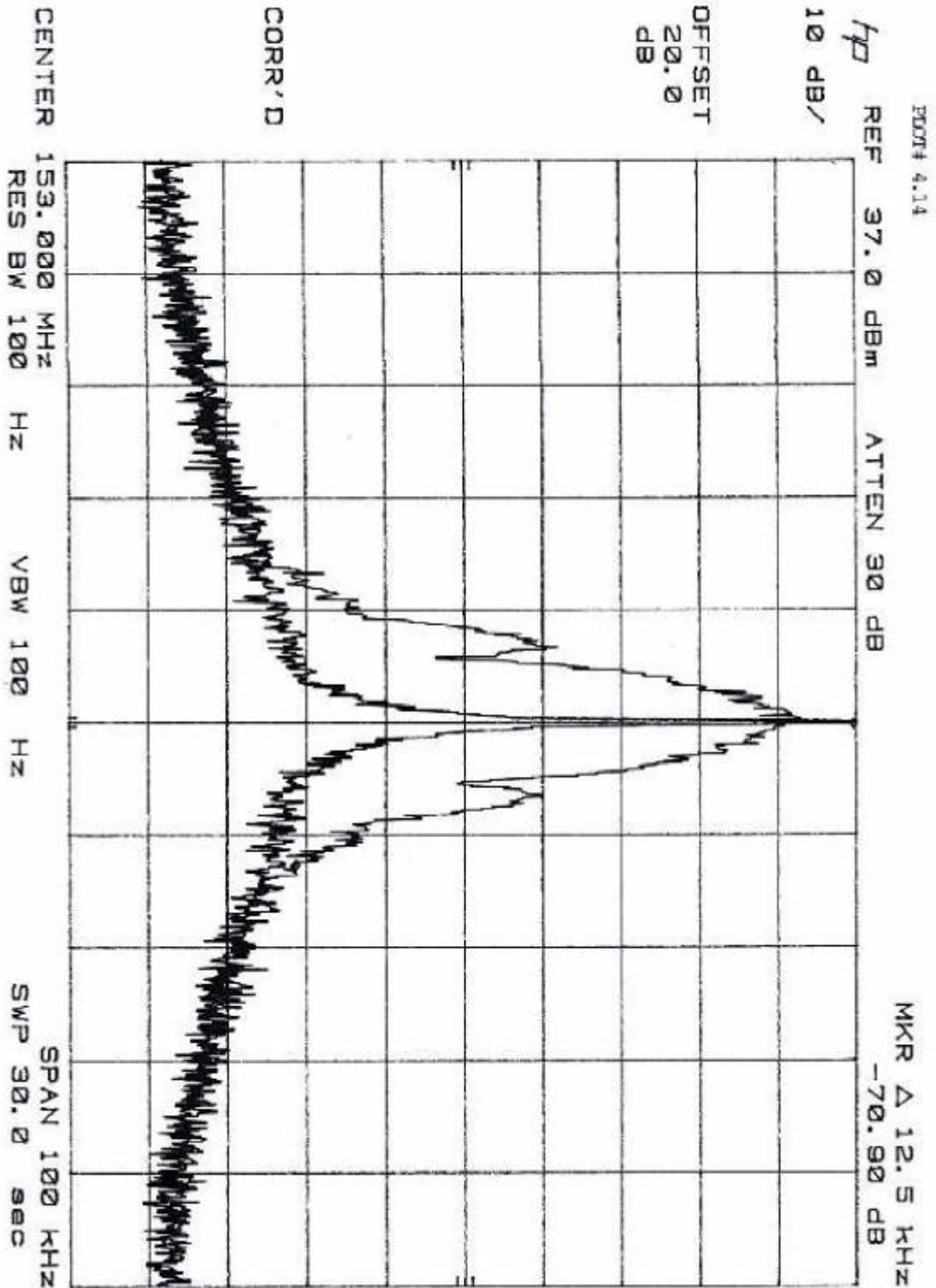
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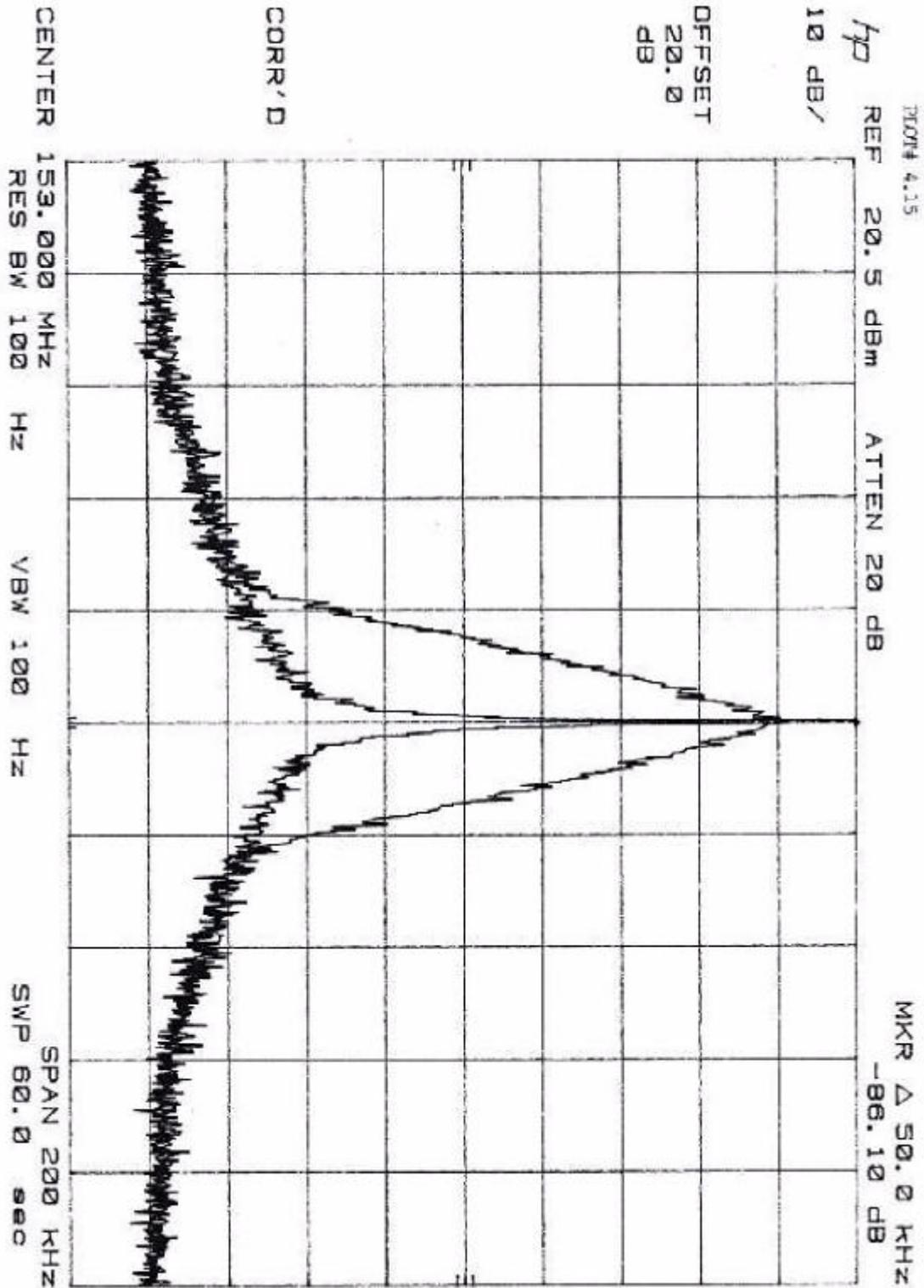
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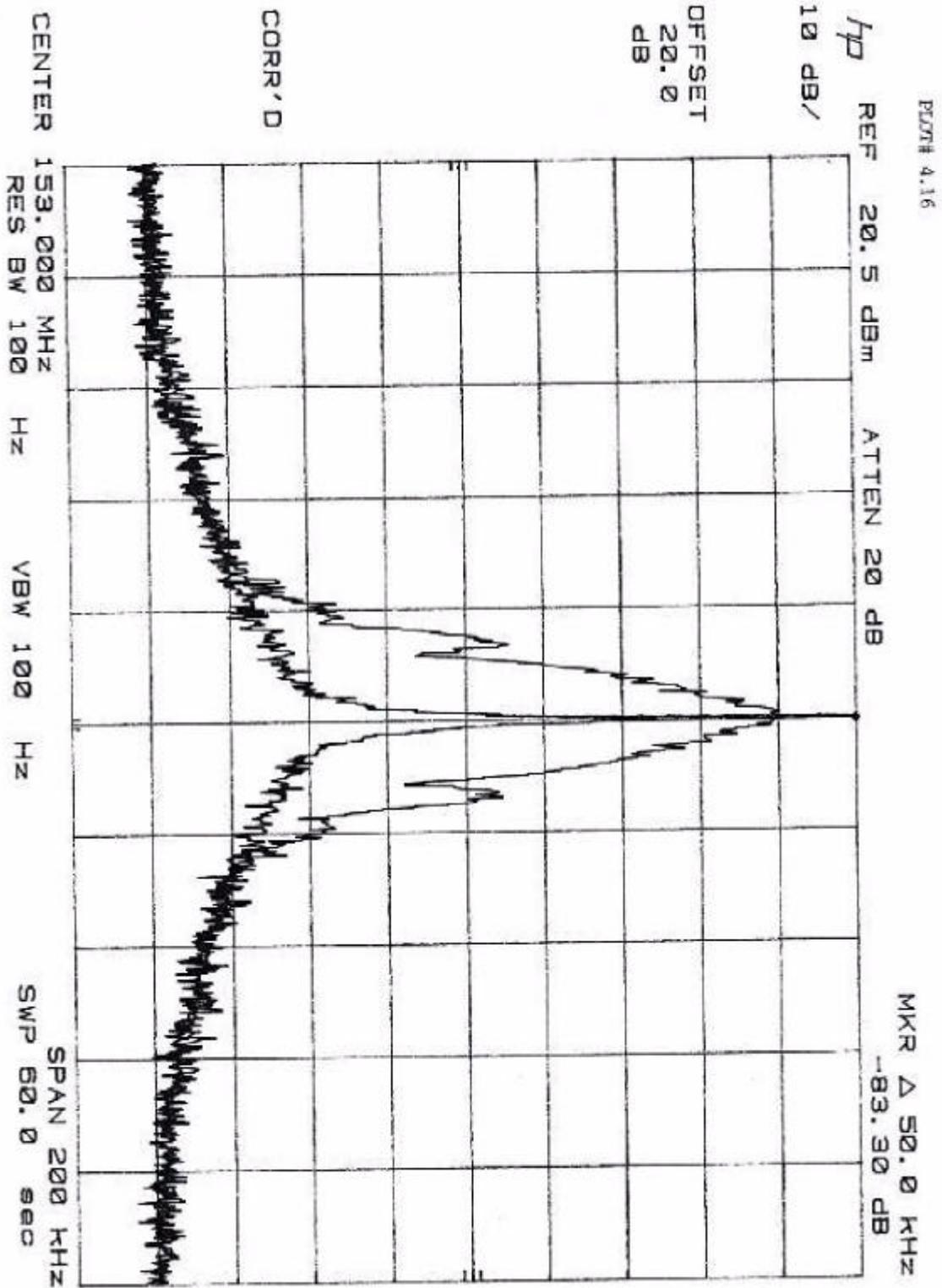
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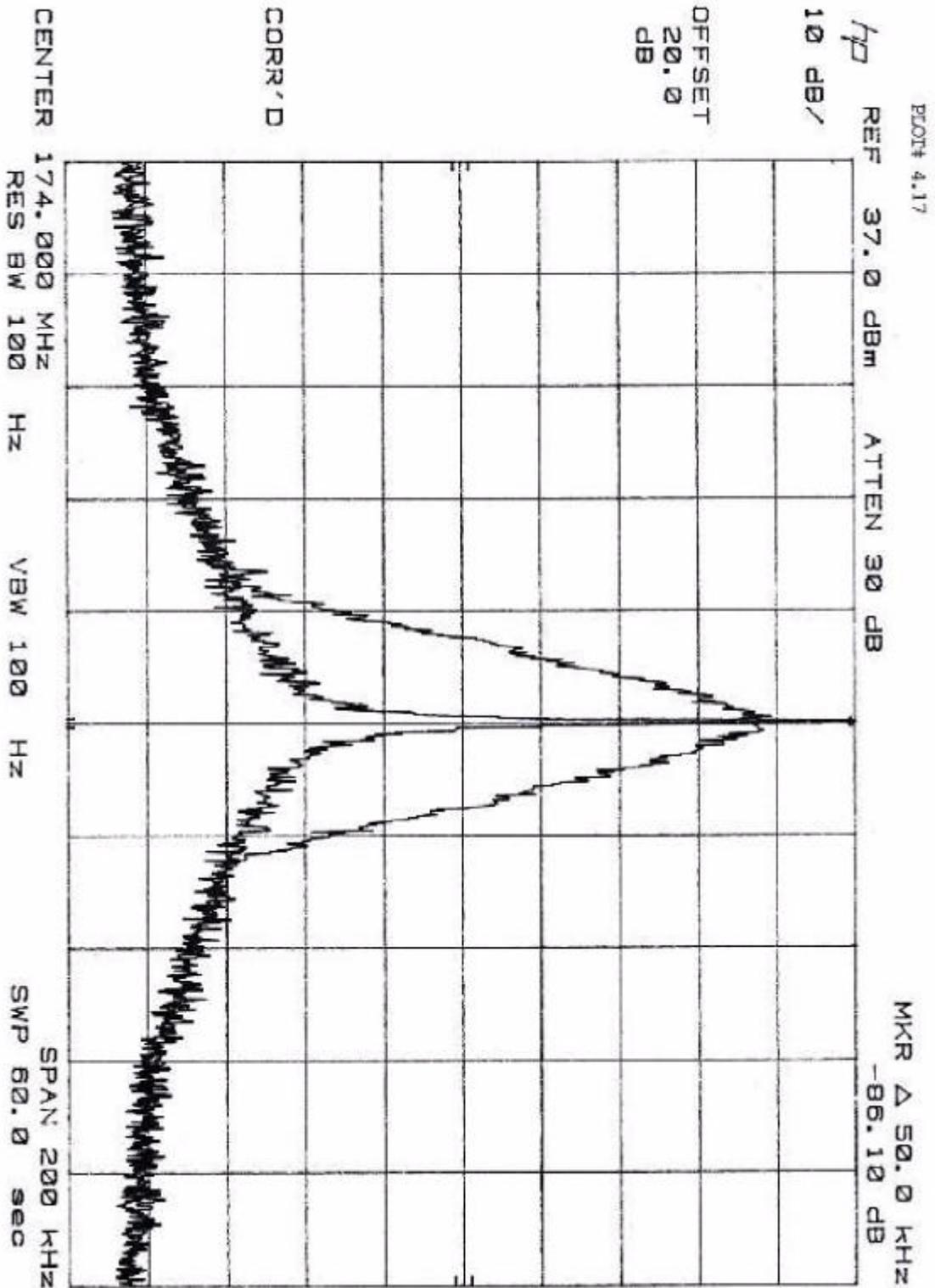
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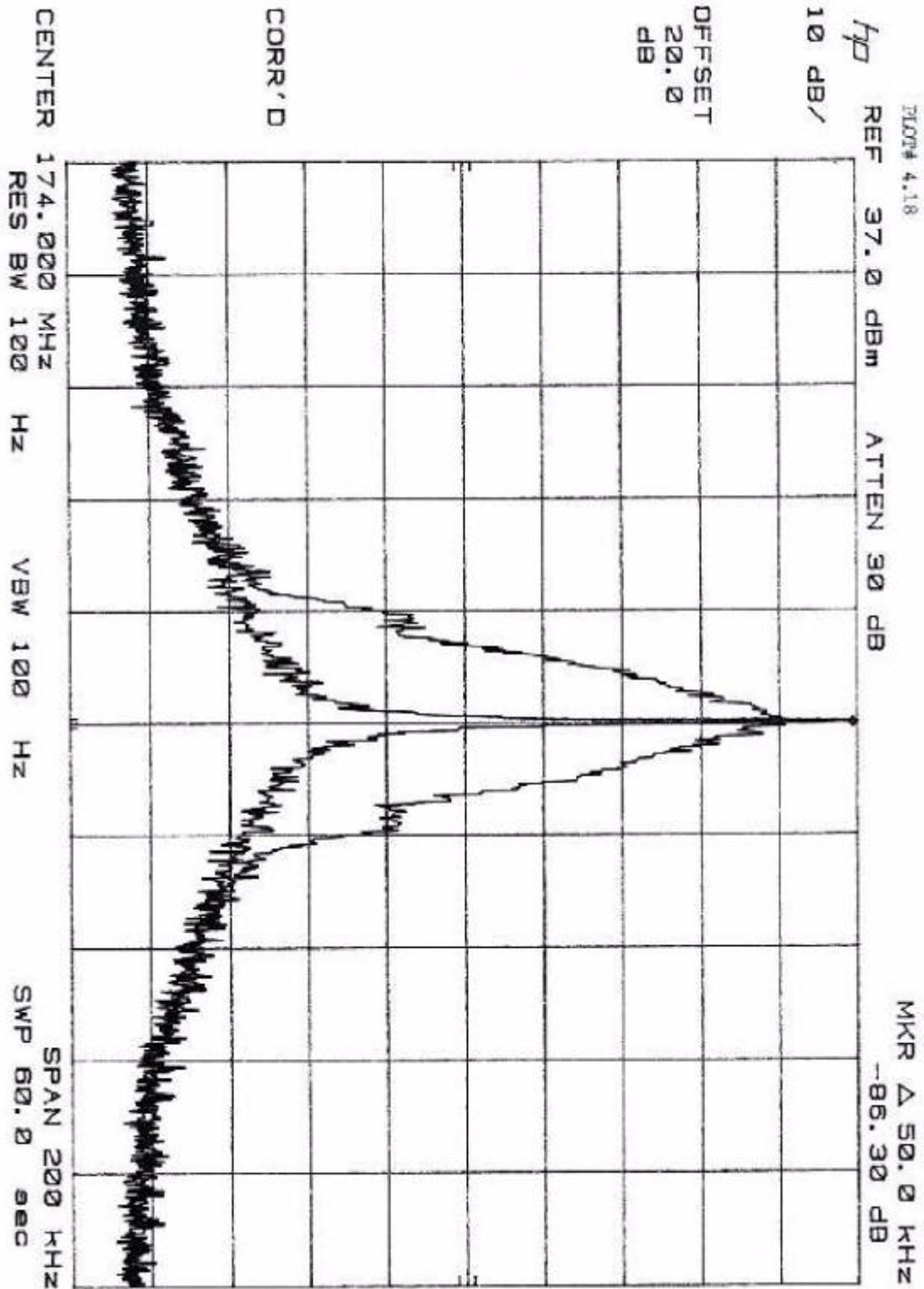
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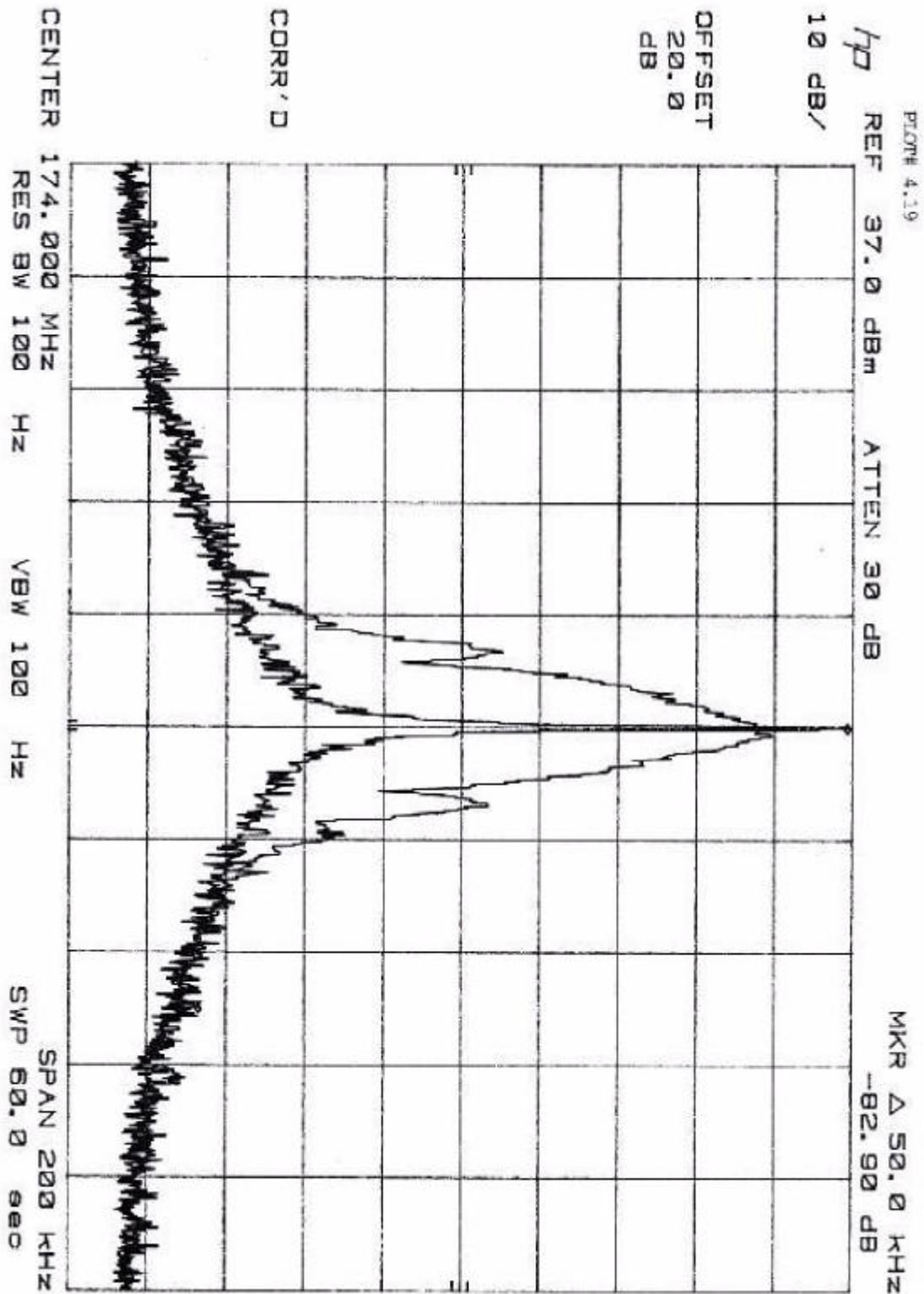
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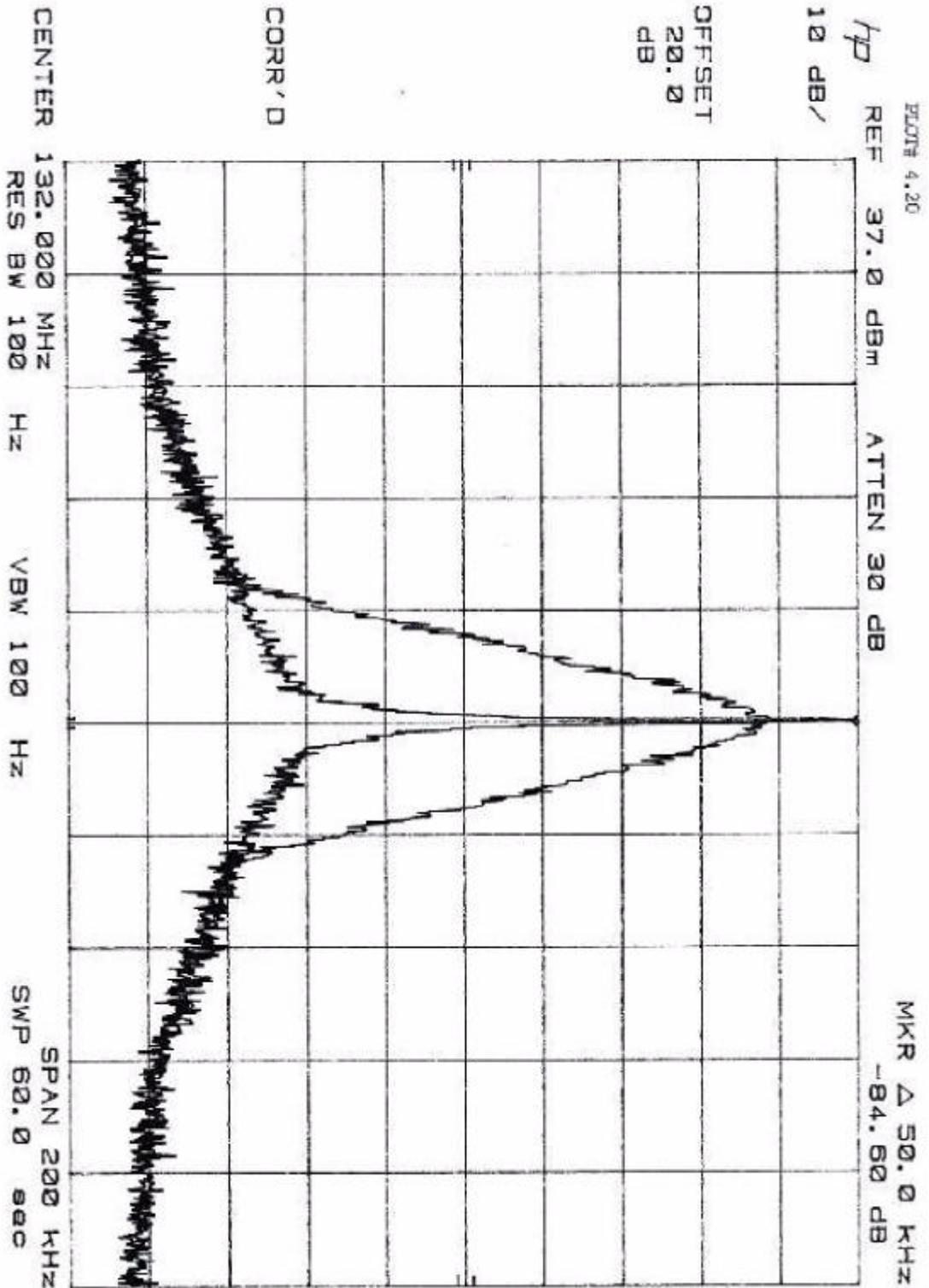
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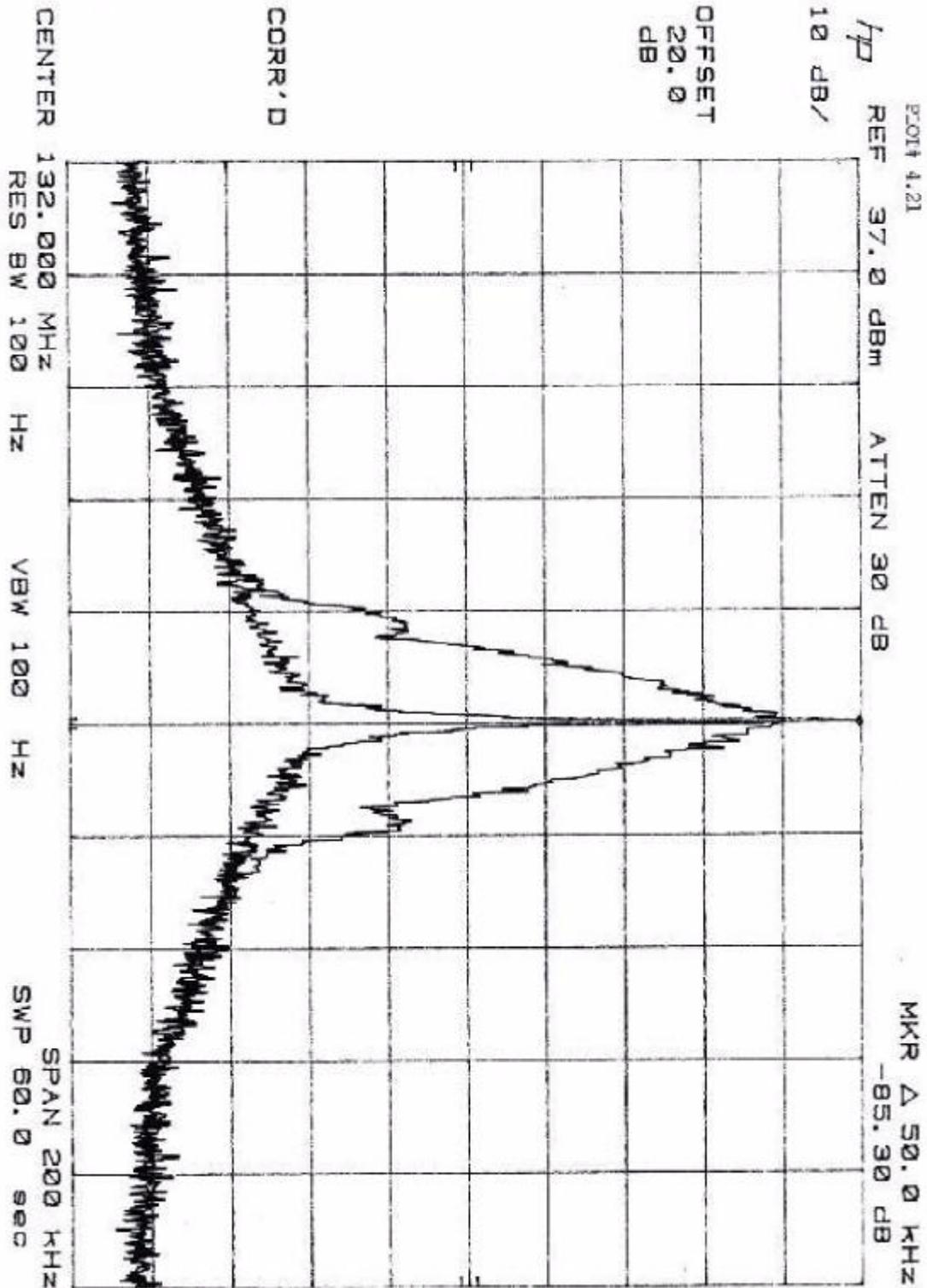
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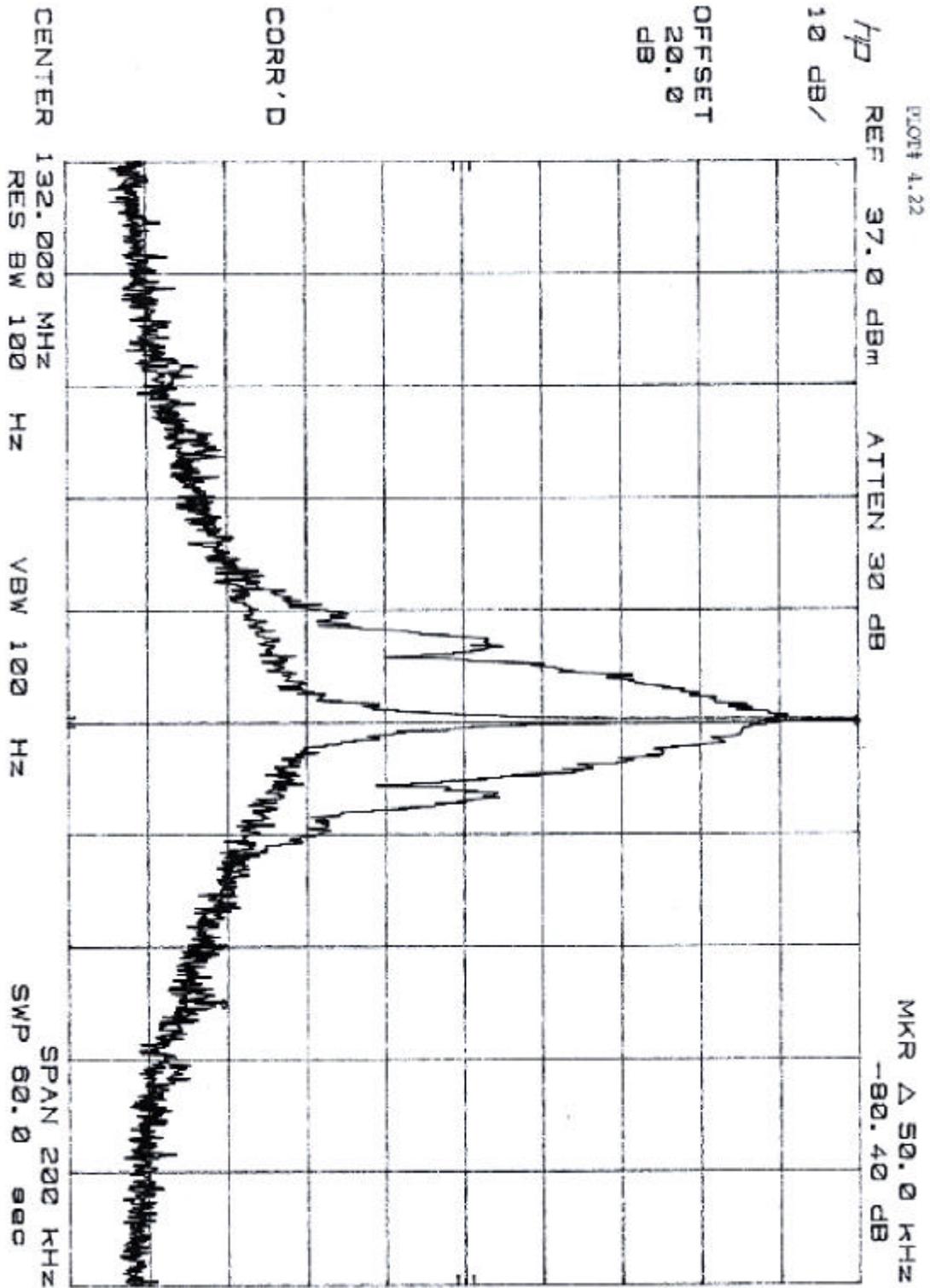
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## 5.0 Spurious Emissions at Antenna Terminals , FCC §2.991, §90.210

### Out of Band Emissions:

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  $50 + 10 \log P \text{ dB} = 50 + \text{LOG}(5) = 57$ .

### 5.1 Test Procedure

The RF output of the transceiver was connected to a spectrum analyzer through appropriate attenuation. 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

The EUT passed the test. Refer to the attached plots.

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Teledesign Radio Modem with 3422 Transceiver

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Transmitting at 132 MHz			
Plot Number	Type of Modulation	Emission Designator	Description
5.1	GMSK, BT=0.5	20K0F1D	Scan 1-100 MHz
5.2	GMSK, BT=0.5	20K0F1D	Scan 100-1000 MHz
5.3	GMSK, BT=0.5	20K0F1D	Scan 1-2.5 GHz

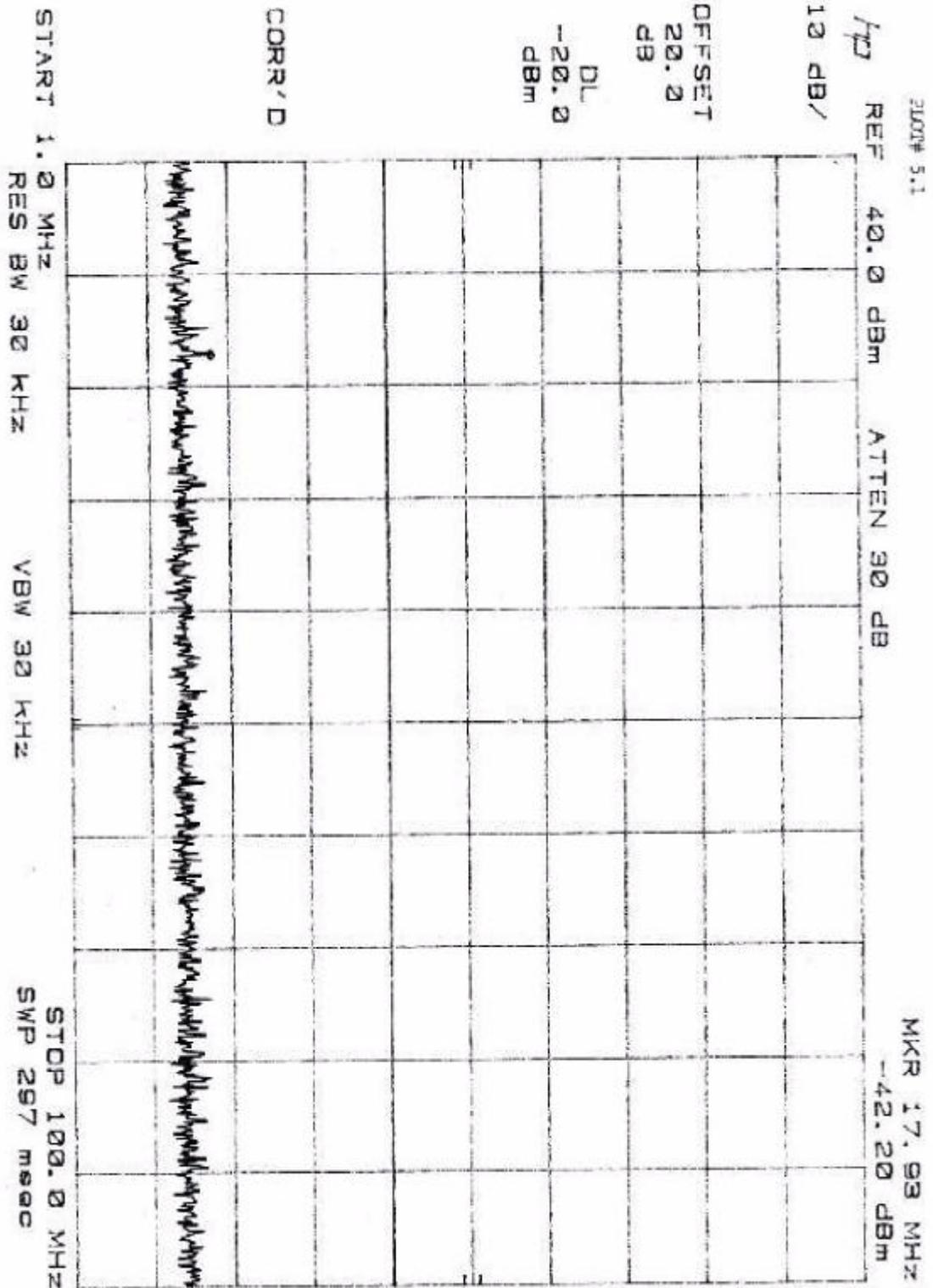
Transmitting at 153 MHz			
Plot Number	Type of Modulation	Emission Designator	Description
5.4	GMSK, BT=0.5	20K0F1D	Scan 1-100 MHz
5.5	GMSK, BT=0.5	20K0F1D	Scan 100-1000 MHz
5.6	GMSK, BT=0.5	20K0F1D	Scan 1-2.5 GHz

Transmitting at 174 MHz			
Plot Number	Type of Modulation	Emission Designator	Description
5.7	GMSK, BT=0.5	20K0F1D	Scan 1-100 MHz
5.8	GMSK, BT=0.5	20K0F1D	Scan 100-1000 MHz
5.9	GMSK, BT=0.5	20K0F1D	Scan 1-2.5 GHz

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

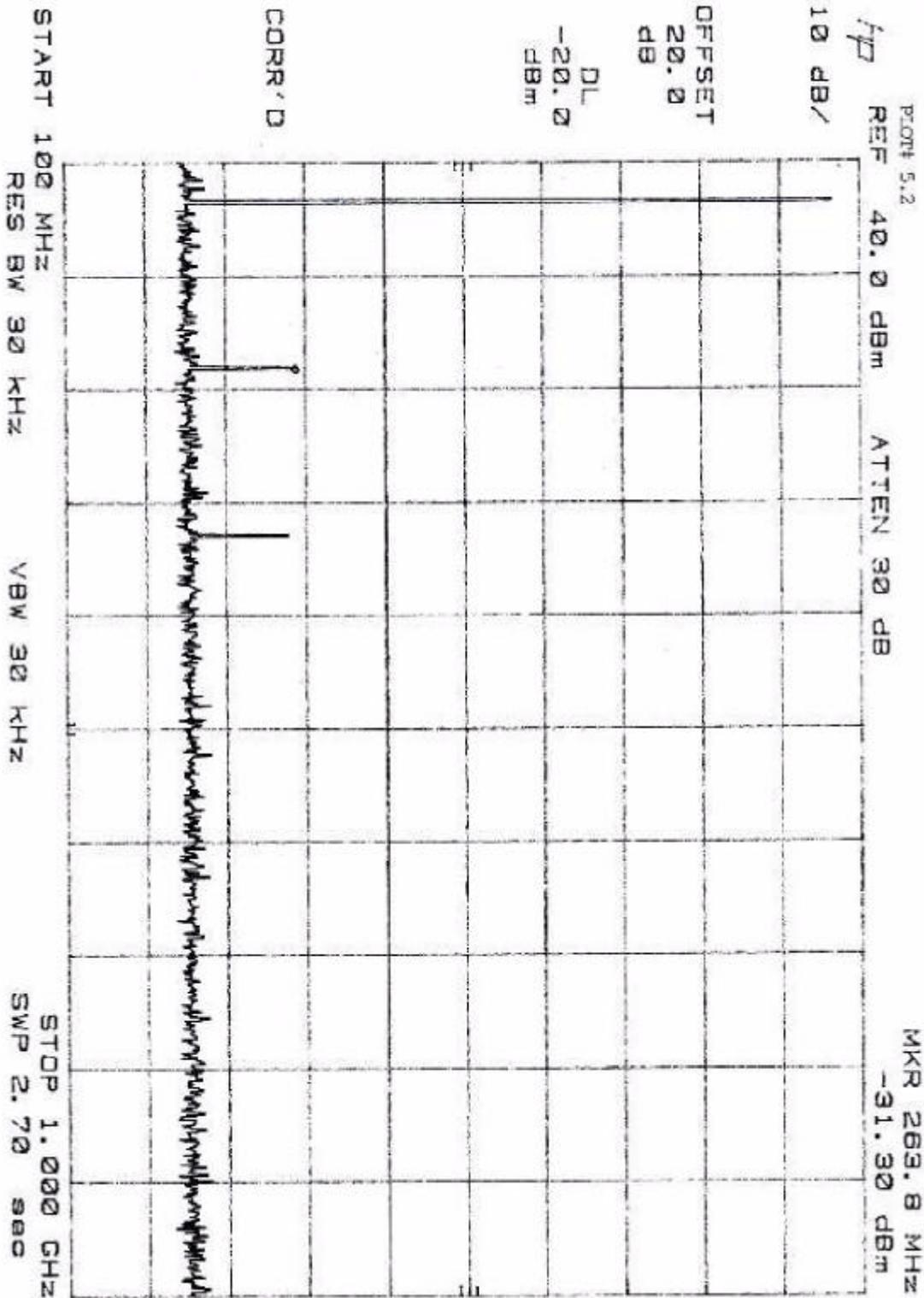
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Teledesign Radio Modem with 3422 Transceiver

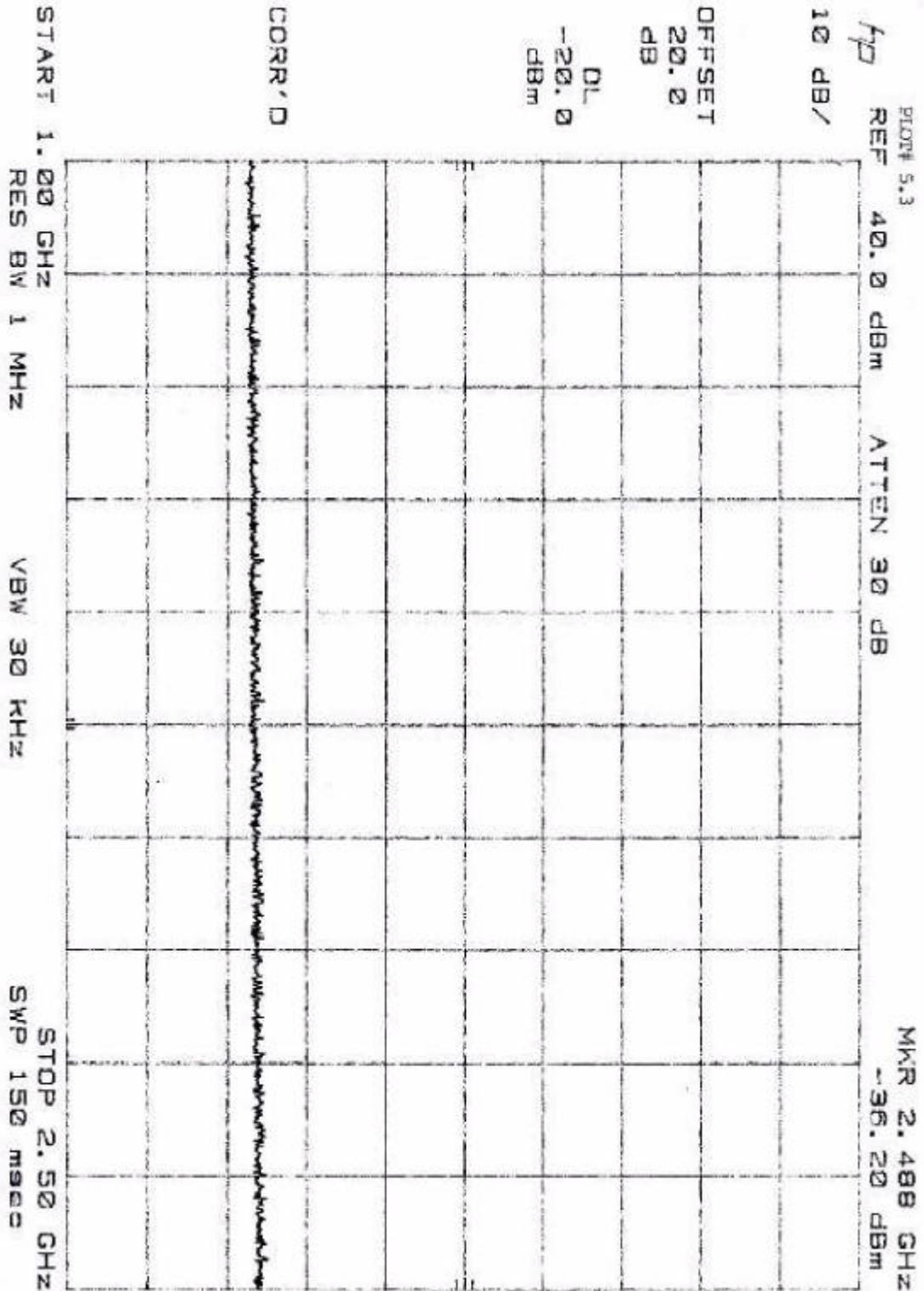
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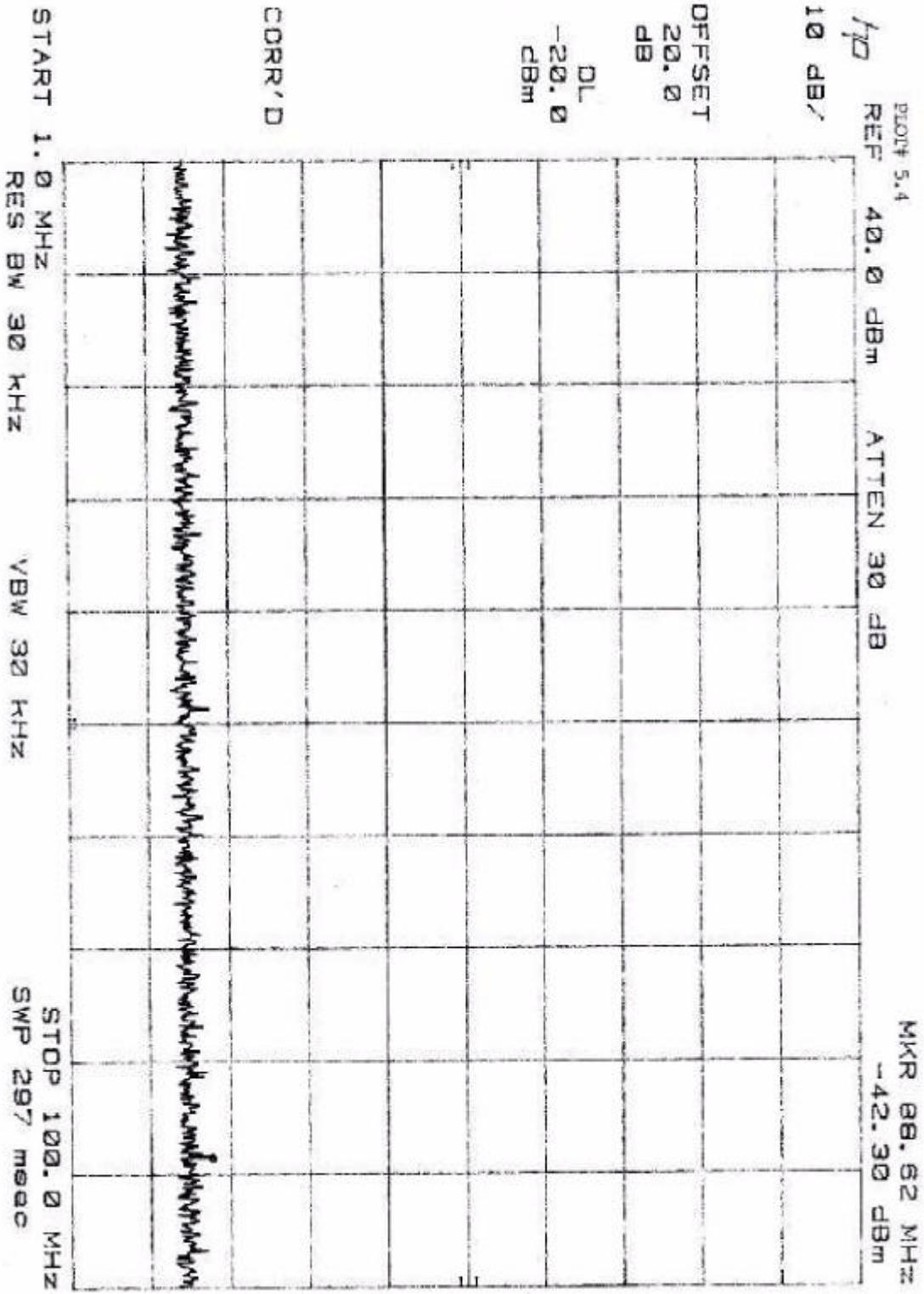
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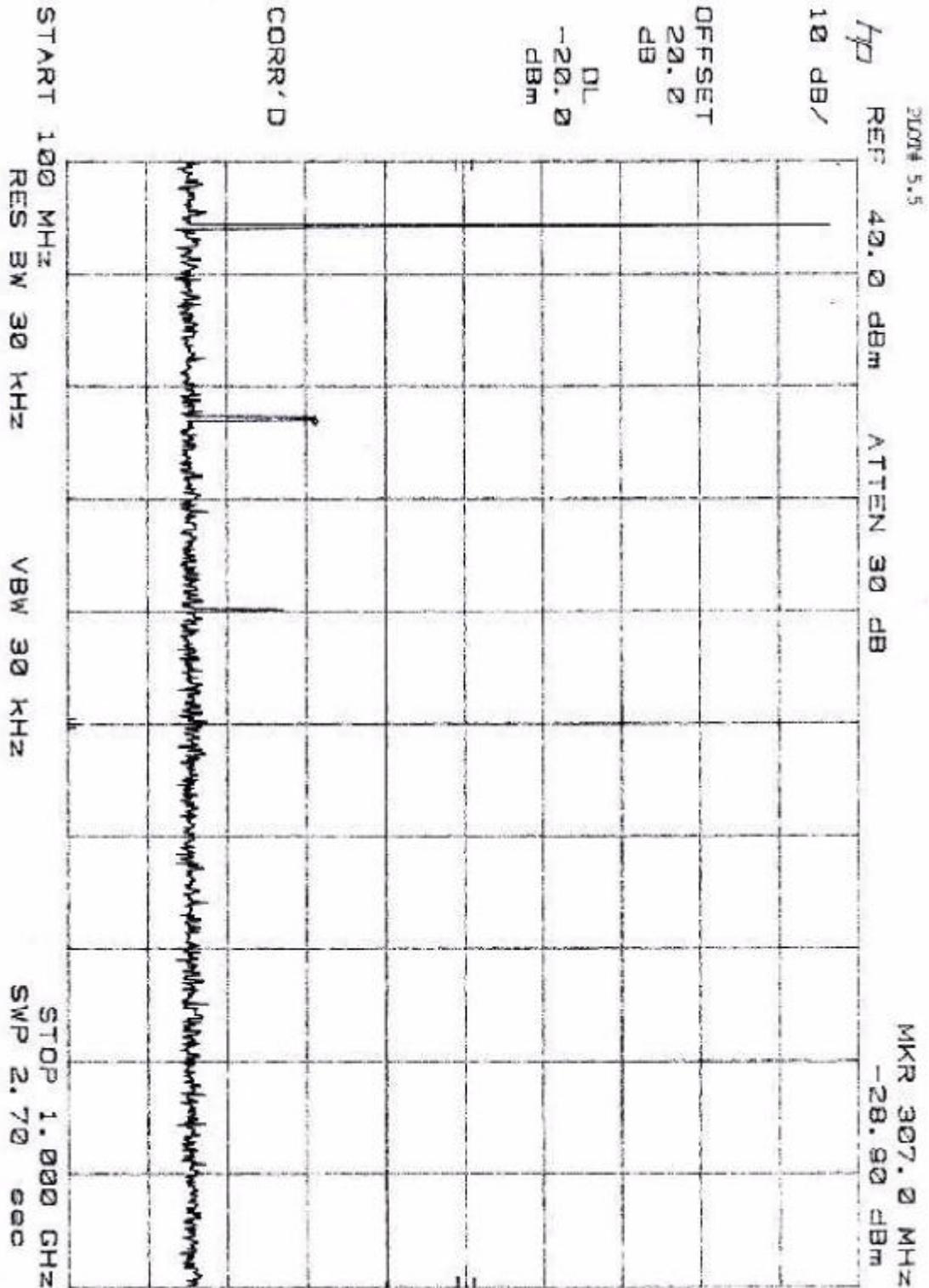
Date of Test: December 18, 1998



# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

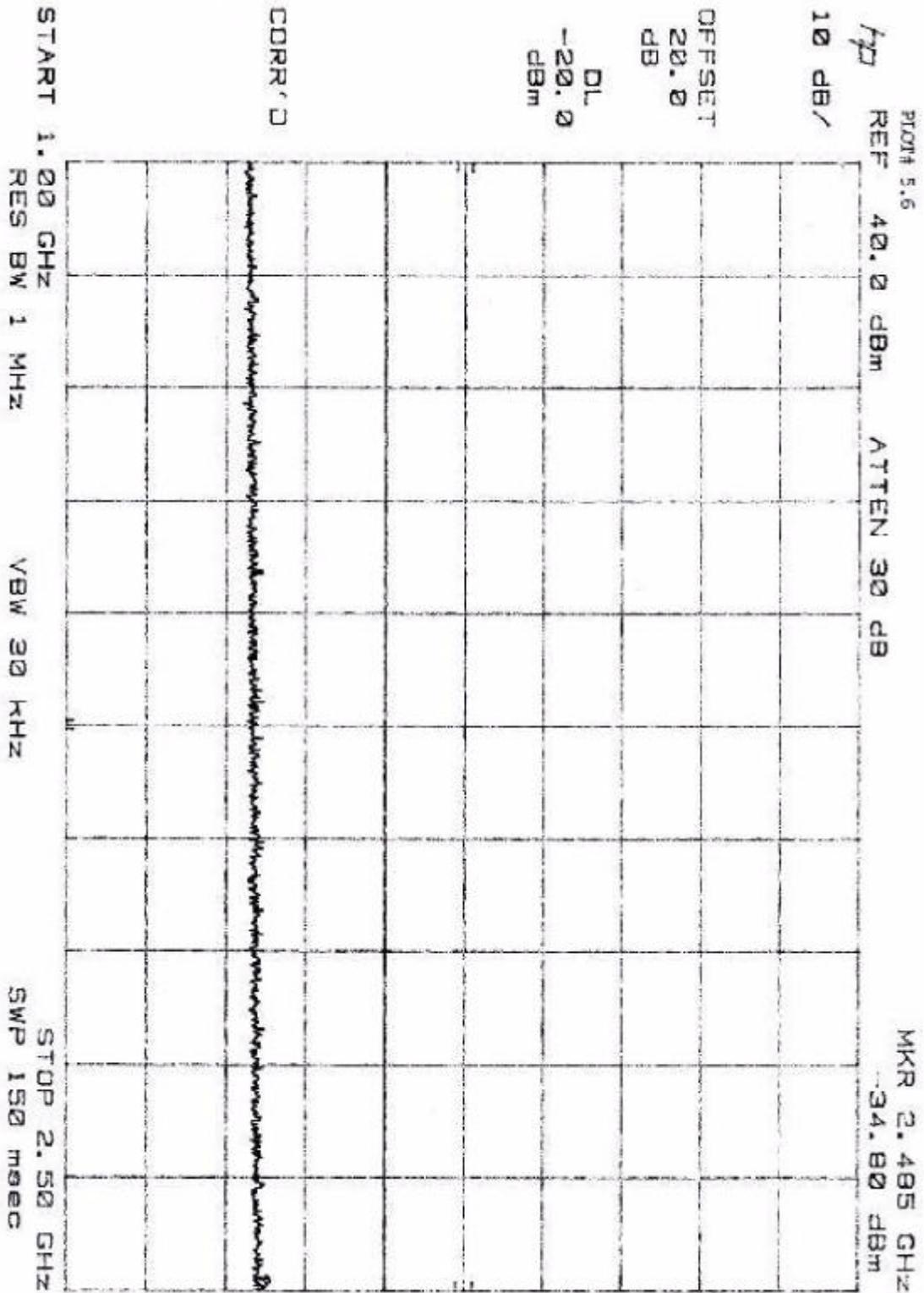
Date of Test: December 18, 1998



# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

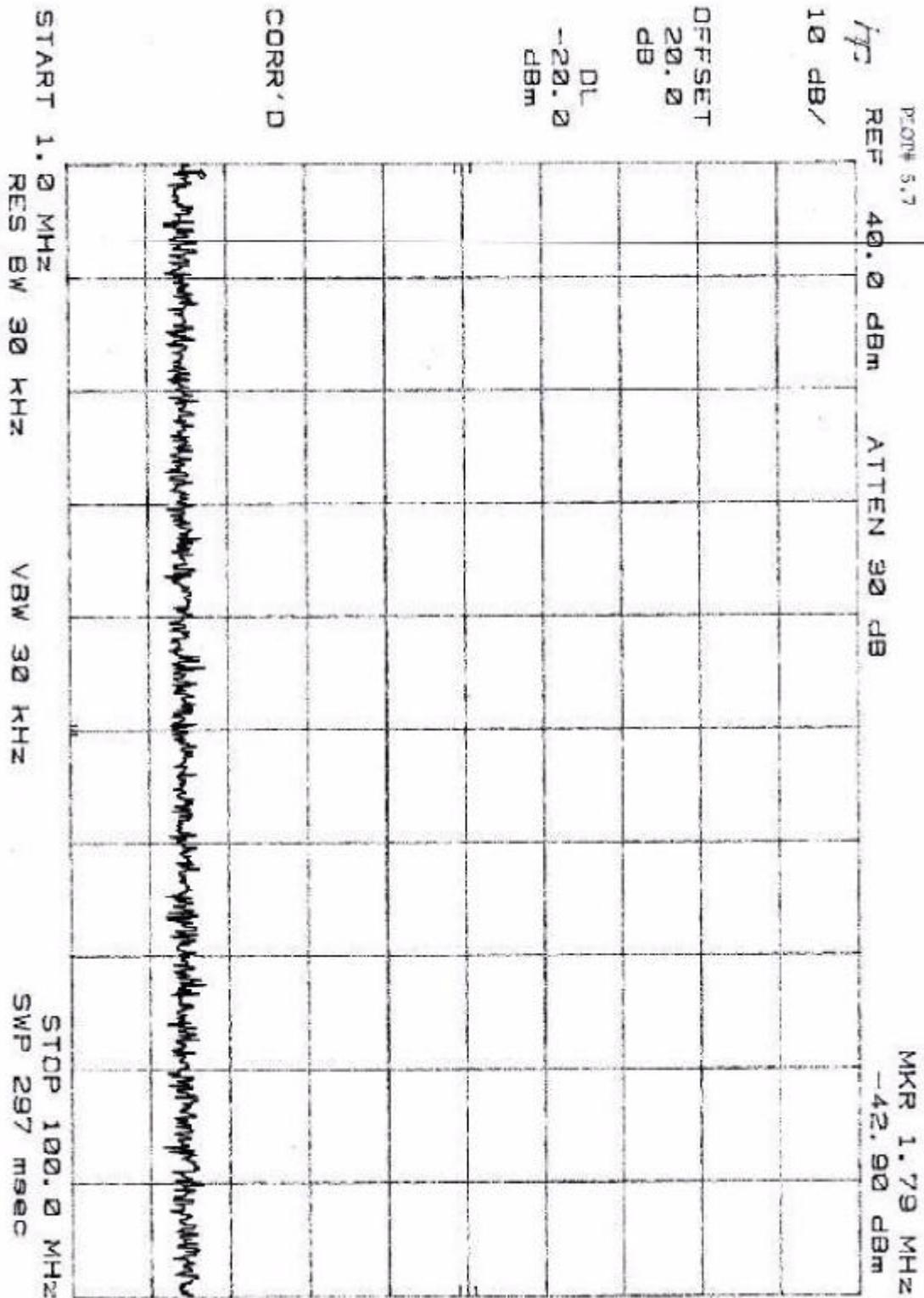
Date of Test: December 18, 1998



# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

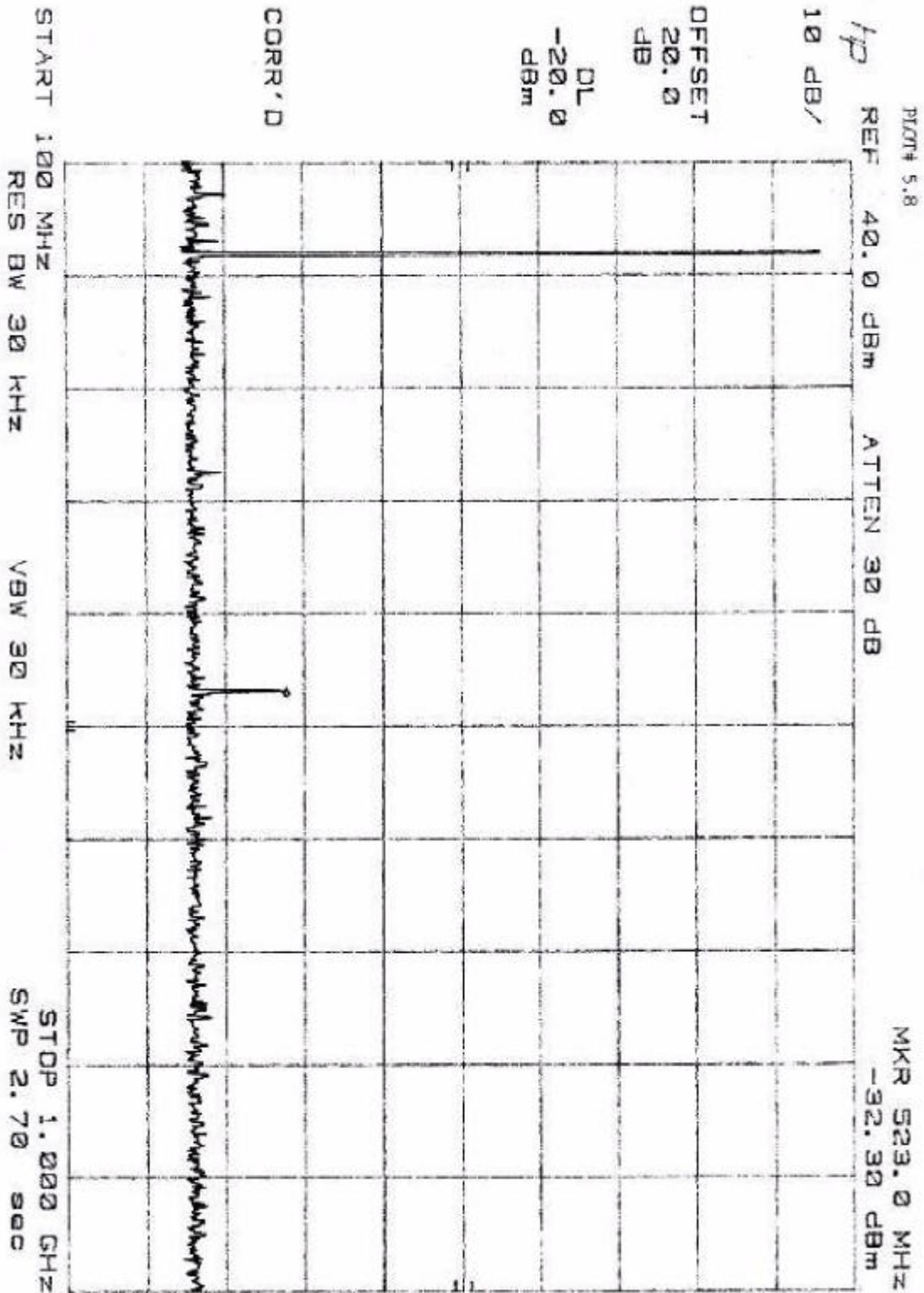
Date of Test: December 18, 1998



# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

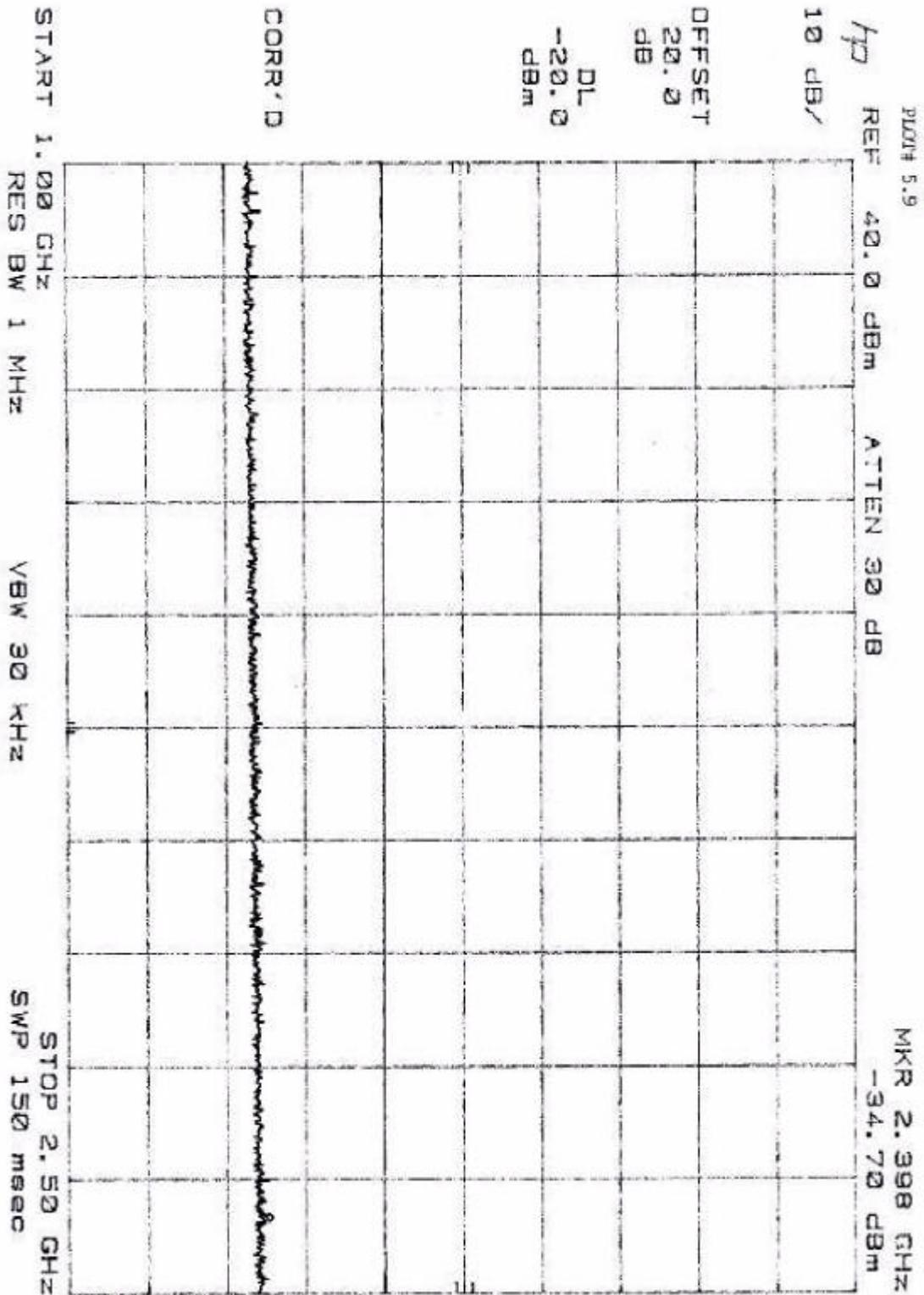
Date of Test: December 18, 1998



# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998



# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998

## 6.0 Field Strength of Spurious Radiation, FCC § 2.993, §15.109, §90.210

### 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

EMCO 3143 Bilog antenna

EMCO 3115 Horn Antenna

HP 8566B Spectrum Analyzer

Preamplifiers: CDI P950, 10 - 1000 MHz

CDI P1000+, 1 - 10 GHz

# **INTERTEK TESTING SERVICES - Menlo Park**

**Teledesign Radio Modem with 3422 Transceiver**

**Date of Test: December 18, 1998**

## **6.3 Test Results**

Refer to the attached data sheets.

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998



Company: Teledesign System Inc.  
Project #: J98033454  
Model: JWFTS4000C (Tx @ 132.0 MHz)  
Engineer: Xi-Ming Yang  
Date of test: Dec. 18, 1998

## FCC 90 Radiated Emissions

Frequency	Antenna	Reading	Antenna	Pre-amp	Cable	Field	Spurious	Margin
MHz	Polarity	dB(uV)	Factor	dB	Loss	Strength	Attenuation	dB
	H/V		dB(1/m)		dB	dB(uV/m)	dB	
264.0	H	23.0	13.2	0.0	0.2	36.4	96.5	-39.5
396.0	V	21.0	16.5	0.0	0.4	37.9	95.0	-38.0
528.0	H	25.0	19.2	0.0	0.5	44.7	88.2	-31.2
660.0	H	36.0	21.0	0.0	0.6	57.6	75.3	-18.3
792.0	H	21.0	22.2	0.0	0.8	44.0	88.9	-31.9
924.0	V	20.0	24.8	0.0	0.9	45.7	87.2	-30.2
1056.0	V	20.0	23.1	0.0	1.0	44.1	88.8	-31.8
1188.0	V	20.0	23.5	0.0	1.1	44.6	88.3	-31.3
1320.0	V	20.0	24.3	0.0	1.3	45.6	87.3	-30.3

- Note:
1. All measurement were made at 3 meters
  2. Field Strength at the fundamental frequency equals 132.9 dBuV/m
  3. Spurious emissions attenuation limit equals  $50 + 10 \log P = 57.0$  dB

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998



Company: Teledesign System Inc.  
Project #: J98033454  
Model: JWFTS4000C (Tx @ 153.0 MHz)  
Engineer: Xi-Ming Yang  
Date of test: Dec. 18, 1998

## FCC 90 Radiated Emissions

Frequency	Antenna Polarity	Reading	Antenna Factor	Pre-amp	Cable Loss	Field Strength	Spurious Attenuation	Margin
MHz	H/V	dB(uV)	dB(1/m)	dB	dB	dB(uV/m)	dB	dB
306.0	H	29.0	12.6	0.0	0.3	41.9	90.6	-33.6
459.0	H	27.6	15.7	0.0	0.4	43.7	88.8	-31.8
612.0	H	45.0	18.7	0.0	0.6	64.3	68.2	-11.2
765.0	H	21.0	23.0	0.0	0.7	44.7	87.8	-30.8
918.0	H	31.0	24.5	0.0	0.9	56.4	76.1	-19.1
1071.0	H	29.0	23.1	0.0	1.0	53.1	79.4	-22.4
1224.0	H	25.0	24.0	0.0	1.2	50.2	82.3	-25.3
1377.0	H	25.2	24.5	0.0	1.3	51.0	81.5	-24.5
1530.0	H	25.2	24.9	0.0	1.5	51.6	80.9	-23.9

- Note:
1. All measurement were made at 3 meters
  2. Field Strength at the fundamental frequency equals 132.5 dBuV/m
  3. Spurious emissions attenuation limit equals  $50 + 10 \log P = 57.0$  dB

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998



Company: Teledesign System Inc.  
Project #: J98033454  
Model: JWFTS4000C (Tx @ 174.0 MHz)  
Engineer: Xi-Ming Yang  
Date of test: Dec. 18, 1998

## FCC 90 Radiated Emissions

Frequency	Antenna	Reading	Antenna	Pre-amp	Cable	Field	Spurious	Margin
MHz	Polarity	dB(uV)	Factor	dB	Loss	Strength	Attenuation	dB
	H/V		dB(1/m)		dB	dB(uV/m)	dB	
348.0	V	40.7	16.0	0.0	0.3	57.0	75.2	-18.2
522.0	H	37.0	19.2	0.0	0.5	56.7	75.5	-18.5
696.0	H	41.0	21.2	0.0	0.7	62.9	69.3	-12.3
870.0	V	33.0	23.4	0.0	0.8	57.2	75.0	-18.0
1044.0	V	38.7	23.1	0.0	1.0	62.8	69.4	-12.4
1218.0	H	23.7	23.8	0.0	1.2	48.7	83.5	-26.5
1392.0	H	30.0	24.2	0.0	1.4	55.6	76.6	-19.6
1566.0	H	22.0	24.9	0.0	1.5	48.4	83.8	-26.8
1740.0	H	16.5	26.3	0.0	1.7	44.5	87.7	-30.7

- Note:
1. All measurement were made at 3 meters
  2. Field Strength at the fundamental frequency equals 132.2 dBuV/m
  3. Spurious emissions attenuation limit equals  $50+10\log P = 57.0$  dB

# **INTERTEK TESTING SERVICES - Menlo Park**

**Teledesign Radio Modem with 3422 Transceiver**

**Date of Test: December 18, 1998**

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

### **7.1 Test Procedure**

Test procedure described in the ANSI C63.4 Standard was employed.

The EUT was connected to the DC power supply, that was connected to the AC line through the LISNs.

Both HOT and NEUTRAL leads were tested.

# **INTERTEK TESTING SERVICES - Menlo Park**

**Teledesign Radio Modem with 3422 Transceiver**

**Date of Test: December 18, 1998**

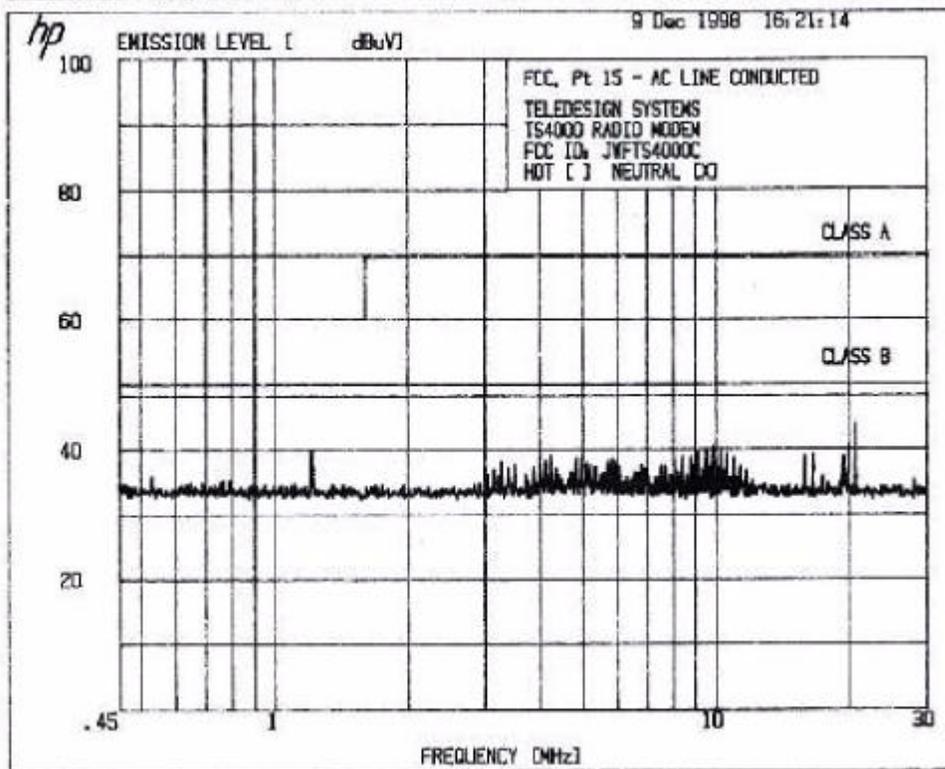
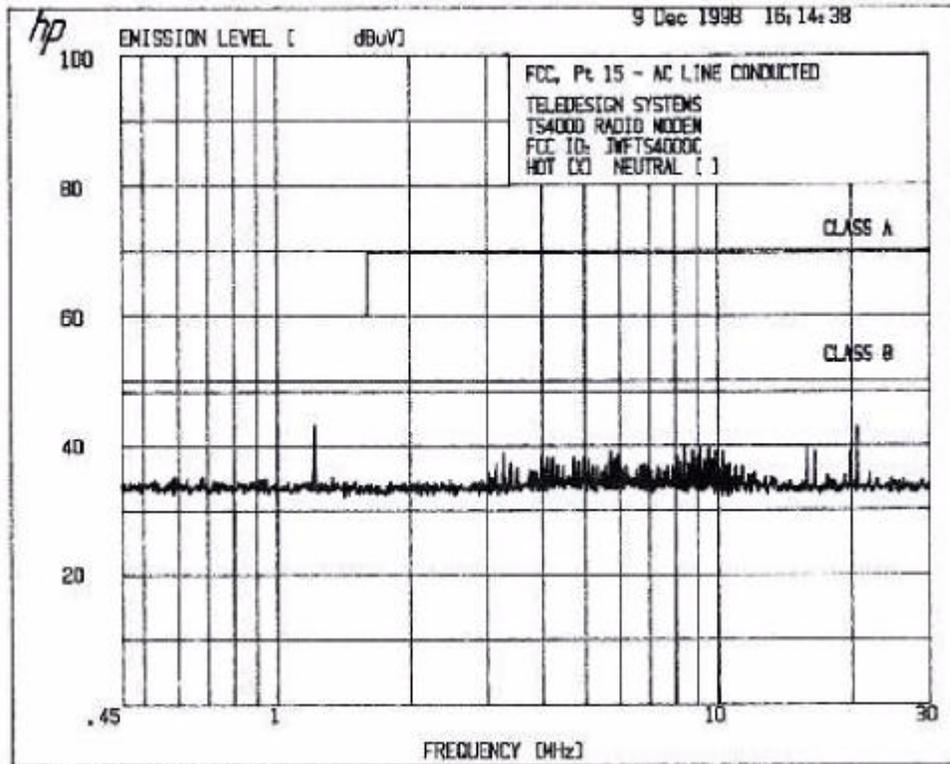
## 7.2 Test Results

See attached pages.

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998



# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998

9 Dec 1998 15:21:14

3. FCC CFR 47, Pt 15  
3.1 FCC, Pt 15 - AC LINE CONDUCTED

TELEDESIGN SYSTEMS  
TS4000 RADIO MODEM  
FCC ID: JWFTS4000C  
HOT [ ] NEUTRAL [X]

PEAKS FOUND ABOVE 39 dBuV

PEAK#	FREQ (MHz)	AMPL (dBuV)
1	1.221	39.7
2	4.246	39.0
3	9.190	39.5
4	9.583	39.9
5	9.910	40.2
6	10.29	39.5
7	10.64	39.2
8	16.60	39.0
9	19.97	40.4
10	20.74	43.7

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998

9 Dec 1998 10:14:00

3. FCC CFR 47, Pt 15  
3.1 FCC, Pt 15 - AC LINE CONDUCTED

TELEDESIGN SYSTEMS  
Y34000 RADIO MODEM  
FCC ID: JWFTS4000C  
HOT [X] NEUTRAL [ ]

PEAKS FOUND ABOVE 30 dBµV

PEAK#	FREQ (MHz)	AMPL(dBµV)
1	1.227	43.0
2	3.200	39.7
3	4.021	38.1
4	4.141	38.0
5	4.246	38.0
6	4.755	38.0
7	5.001	38.0
8	5.744	39.0
9	5.965	38.4
10	6.103	38.1
11	6.450	39.6
12	6.612	39.3
13	6.690	38.1
14	9.190	39.0
15	9.503	39.5
16	9.910	39.1
17	10.29	38.9
18	15.92	39.6
19	16.60	39.1
20	19.97	39.1
21	20.74	42.6

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998

## 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.

Frequency: 153 MHz, Tolerance  $\pm 382.5$  Hz

Frequency Stability vs Temperature	
Temperature, C	Difference (Hz)
+60	170
+50	100
+40	110
+30	35
+20	115
+10	140
0	80
-10	80
-20	165
-30	205

Justification: Passed

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998

## 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 the nominal supply voltage and at each extreme of the supply voltage range.

### 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.

Frequency: 153.00 MHz, Tolerance  $\pm 382.5$  Hz

Frequency Stability vs. Voltage	
Voltage	Difference (Hz)
11	85
14	95
20	10
24	100
28	105

Justification: Passed

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998

## 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 an unmodulated signal. 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.

PLOT #	FREQ. MHz	TRANSMIT MODULATION	DESCRIPTION
10.1	132	Low	Transmitter On, T1
10.2	132	Low	Transmitter On, T2
10.3	132	Low	Transmitter Off, T3
10.4	132	High	Transmitter On, T1, T2
10.5	132	High	Transmitter Off, T3
10.6	153	Low	Transmitter On, T1
10.7	153	Low	Transmitter On, T2
10.8	153	Low	Transmitter Off, T3
10.9	153	High	Transmitter On, T1, T2
10.10	153	High	Transmitter Off, T3
10.11	174	Low	Transmitter On, T1
10.12	174	Low	Transmitter On, T2
10.13	174	Low	Transmitter Off, T3
10.14	174	High	Transmitter On, T1, T2
10.15	174	High	Transmitter Off, T3

# **INTERTEK TESTING SERVICES - Menlo Park**

**Teledesign Radio Modem with 3422 Transceiver**

**Date of Test: December 18, 1998**

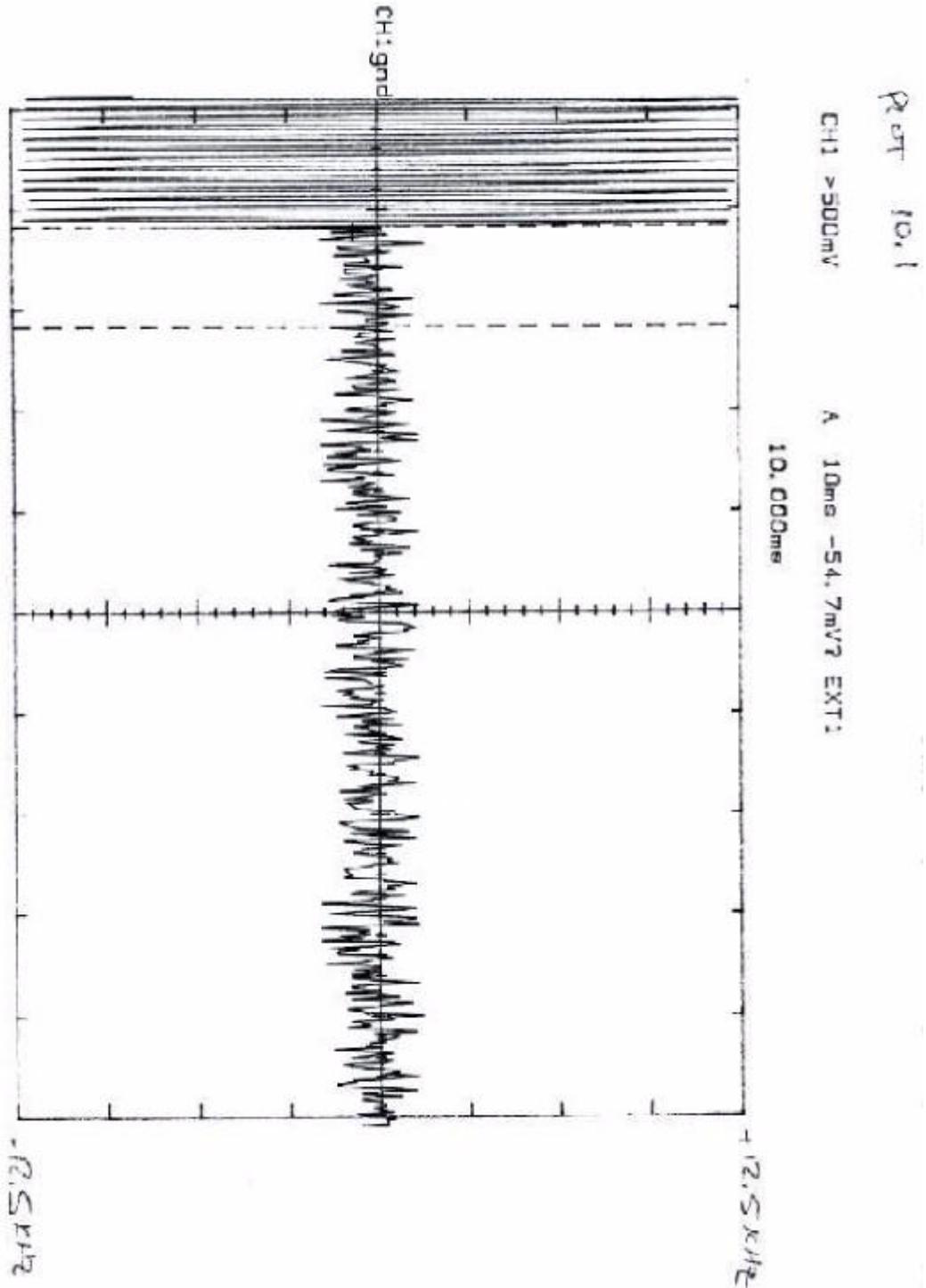
## 10.2 Test Result

For the test result, see attached plots. The EUT passed the test.

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

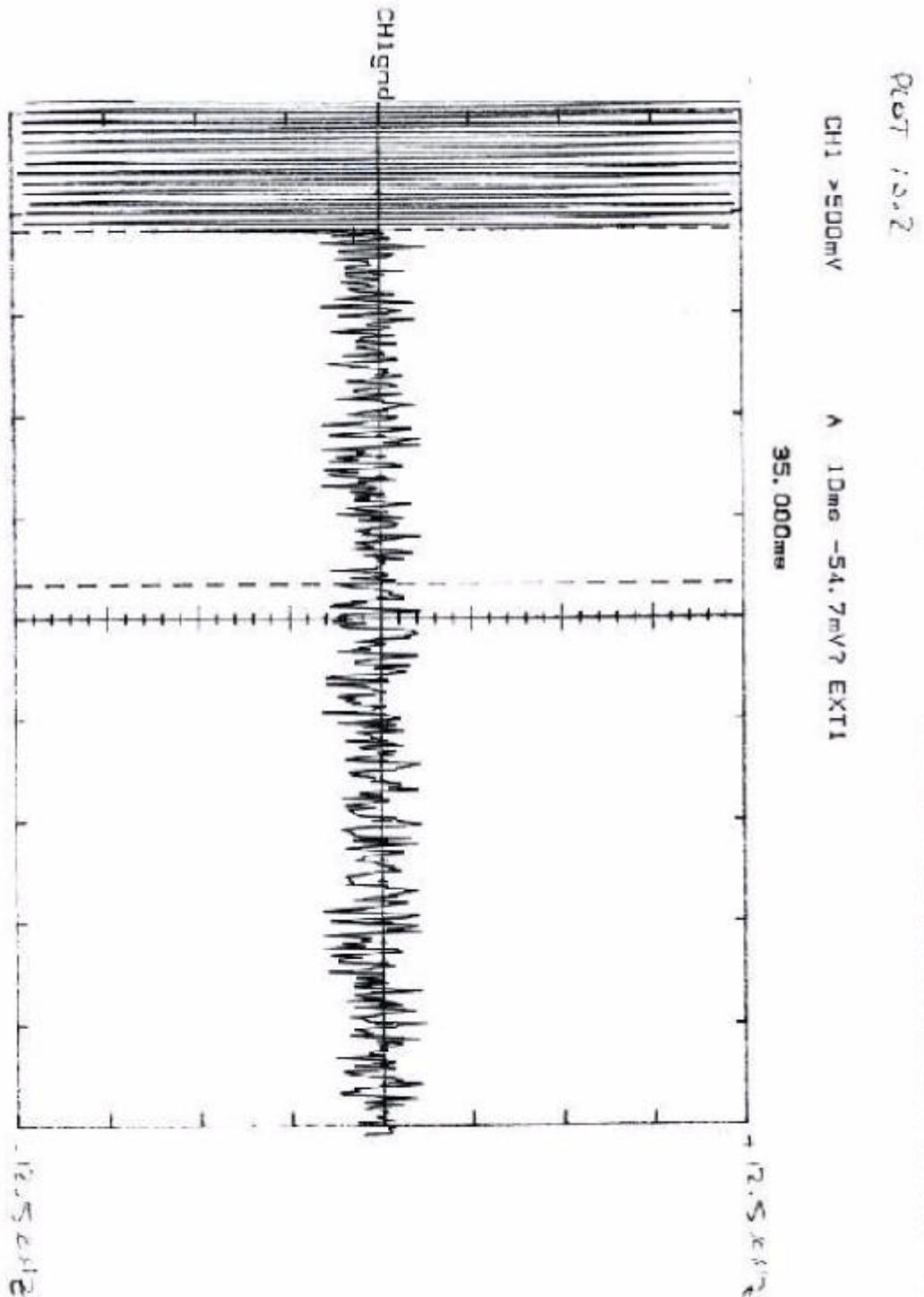
Date of Test: December 18, 1998



# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

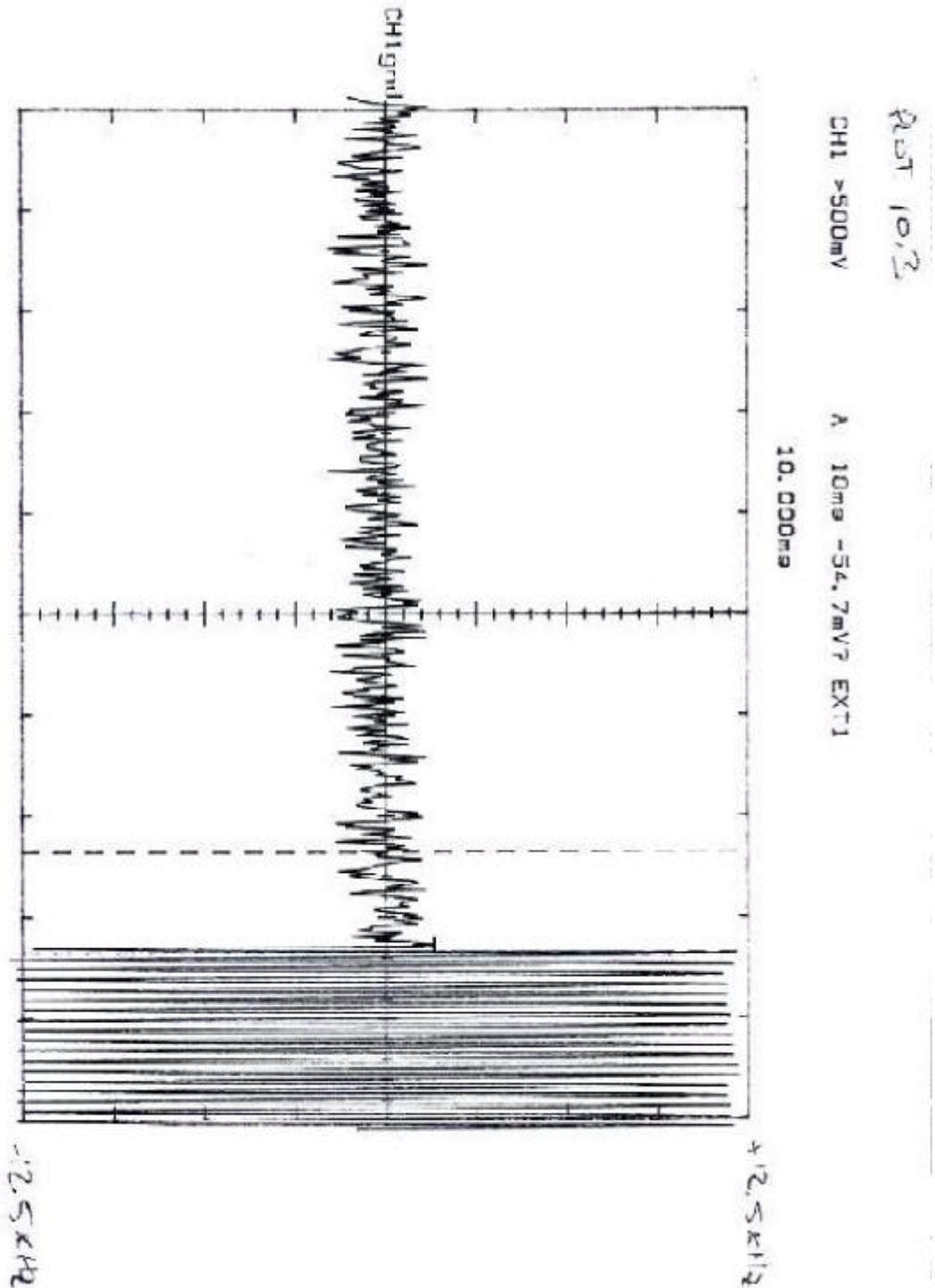
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# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

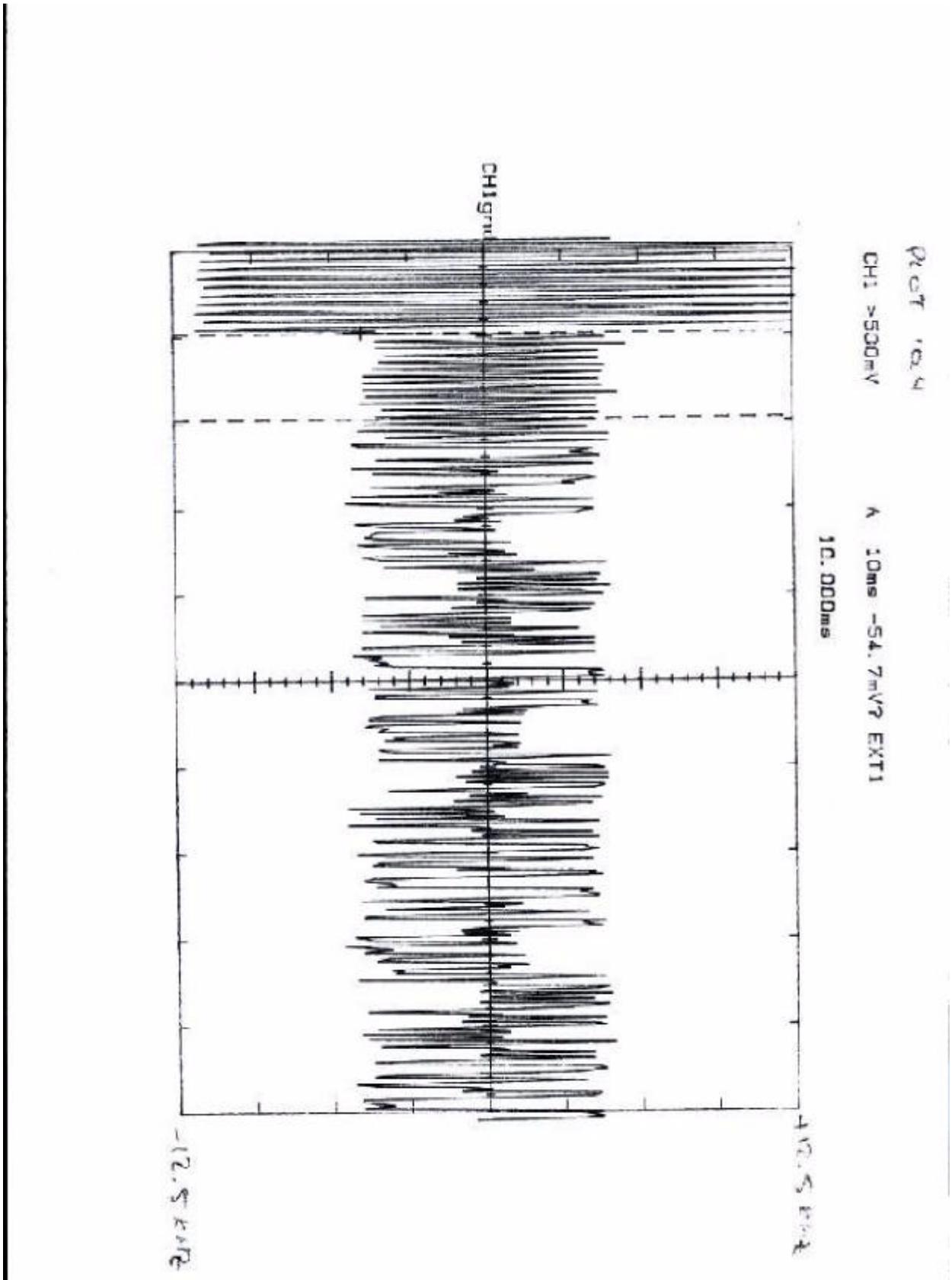
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# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

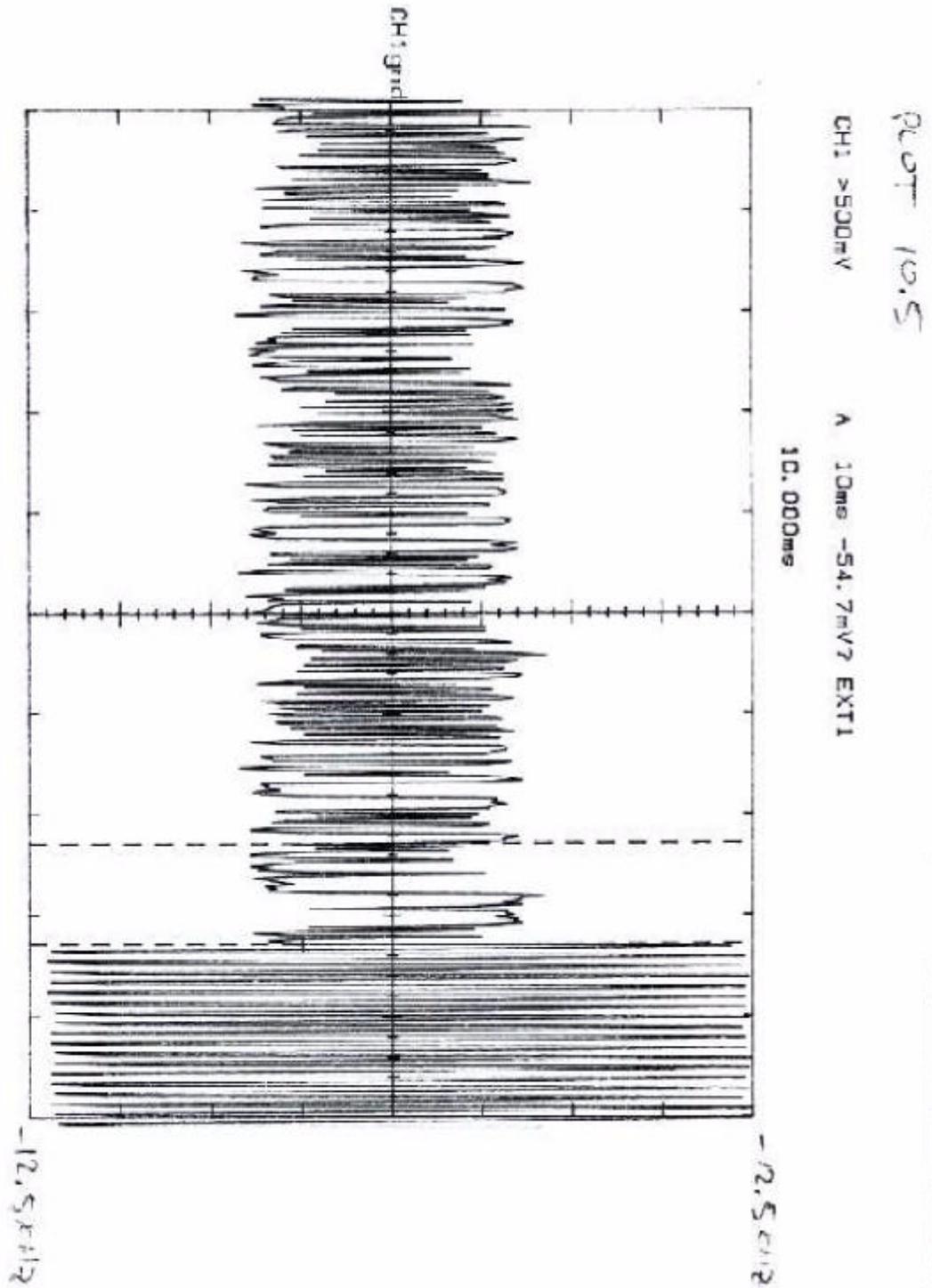
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# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

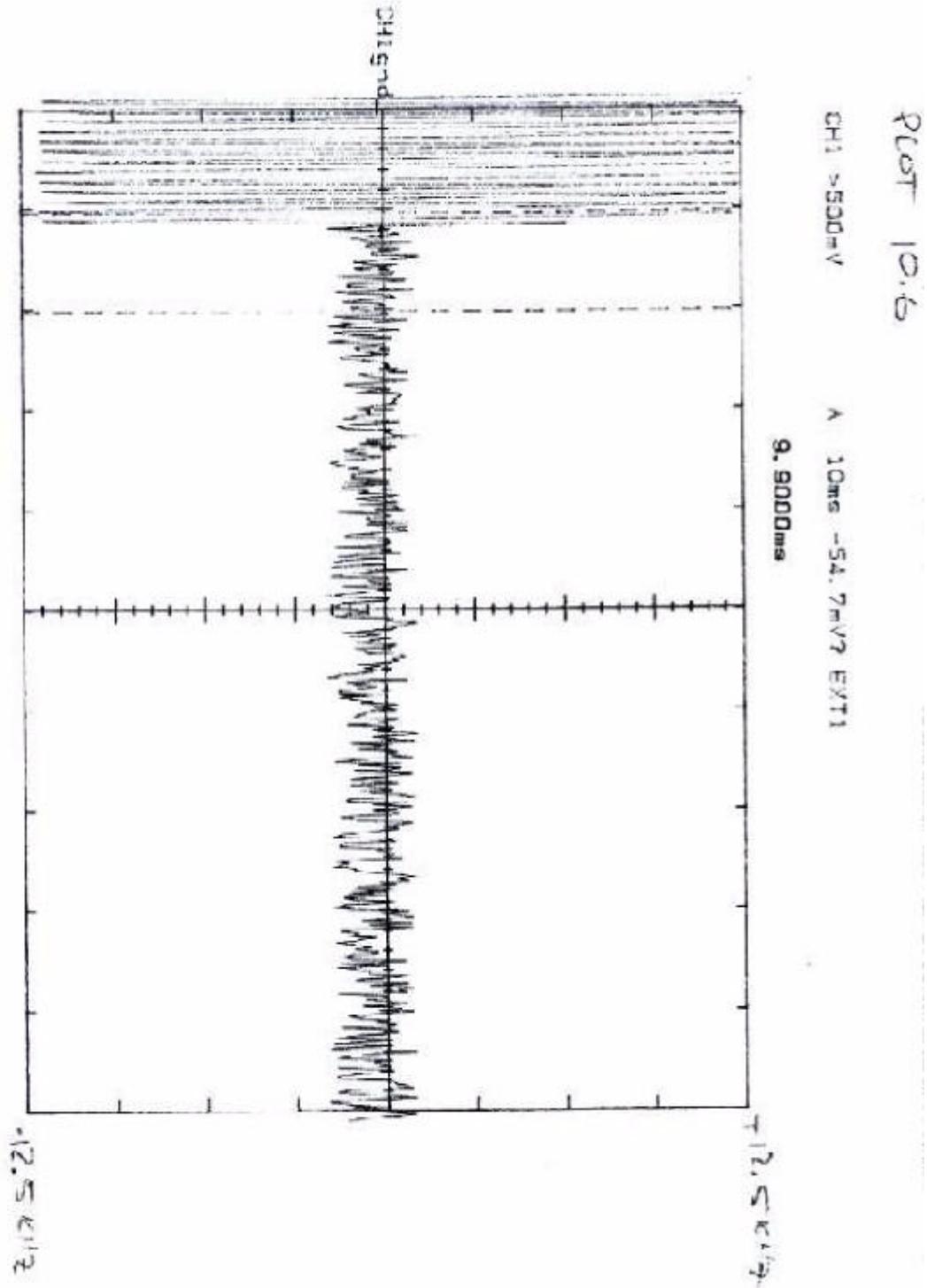
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# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

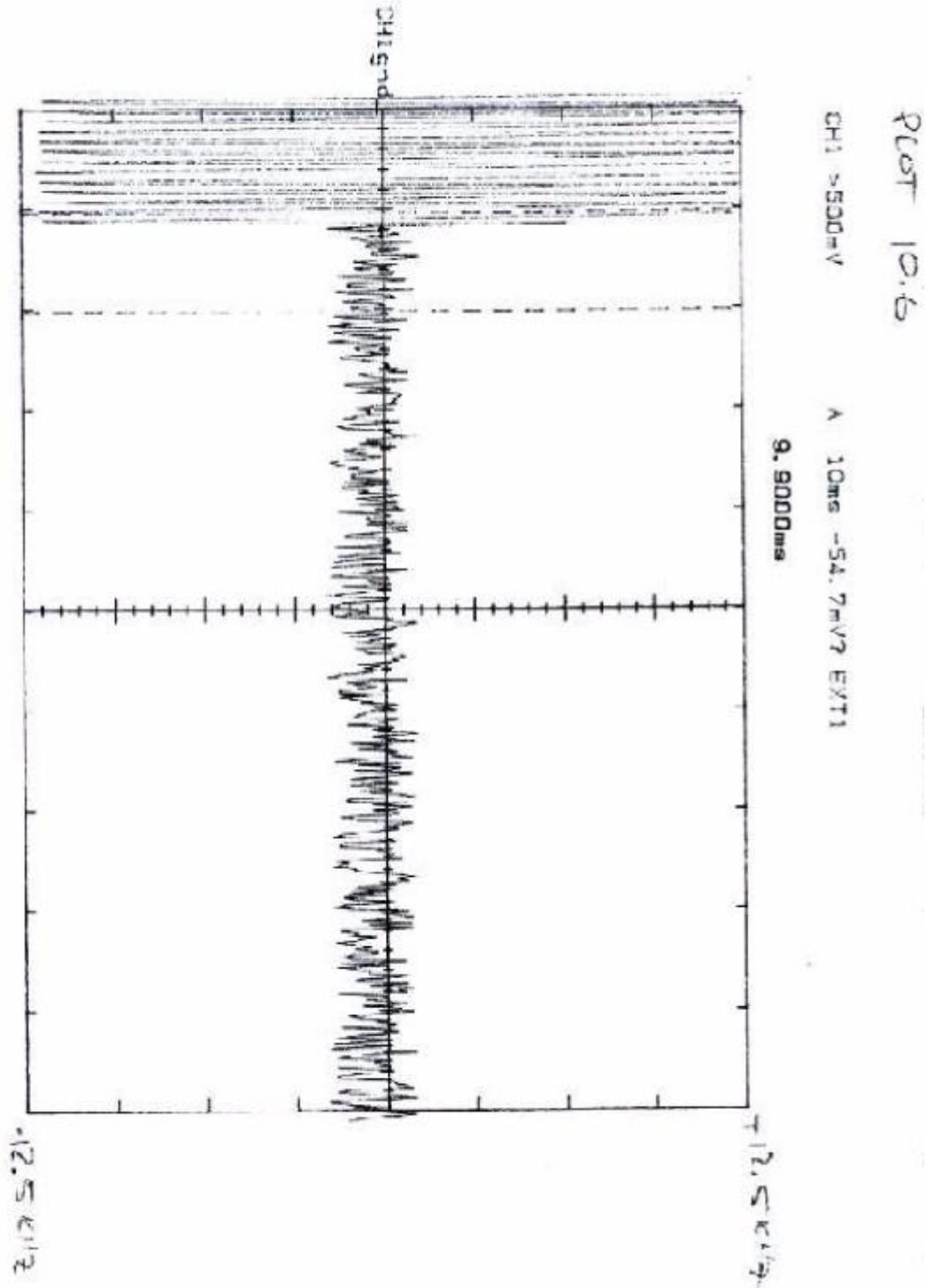
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# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

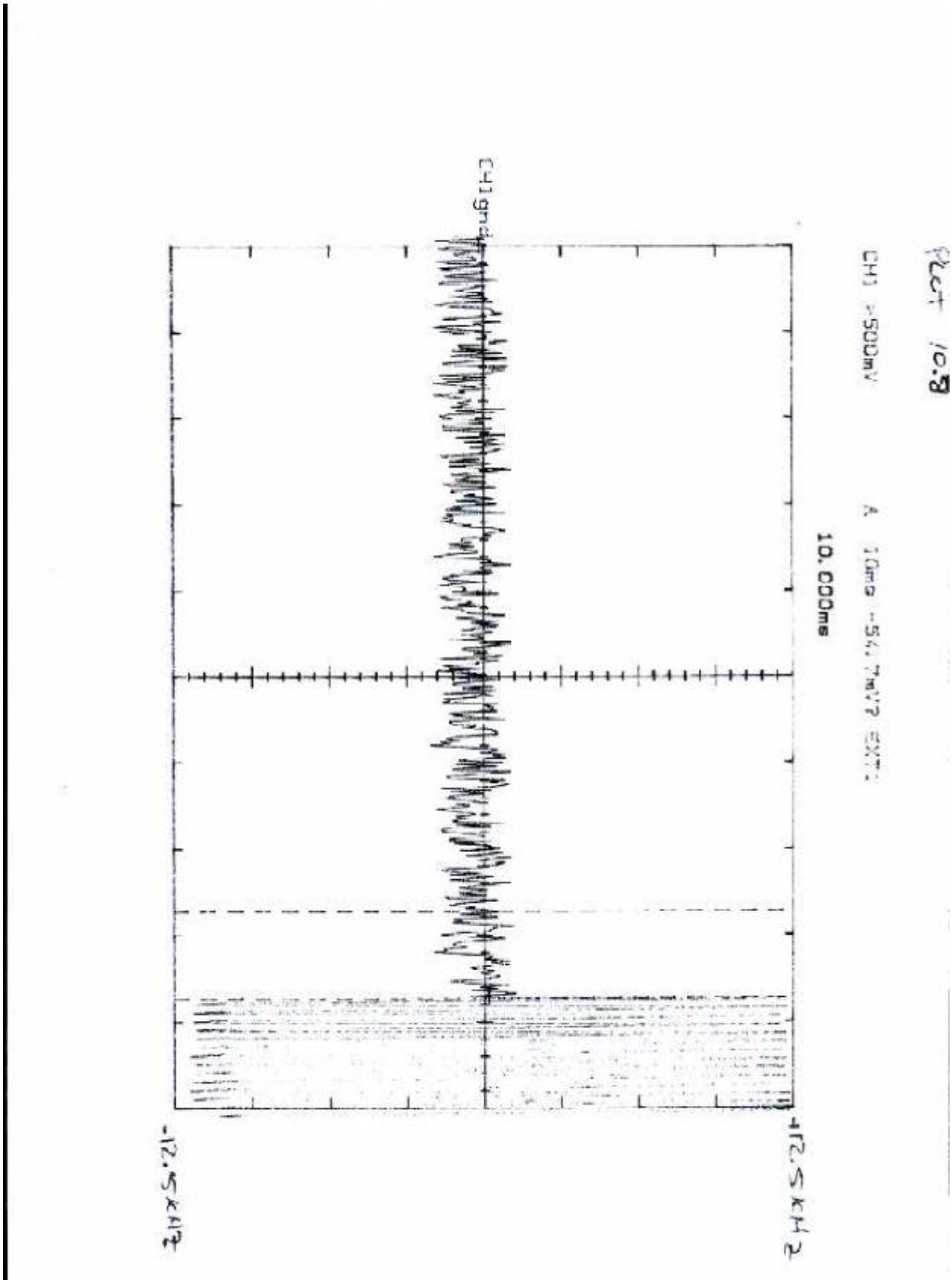
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# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

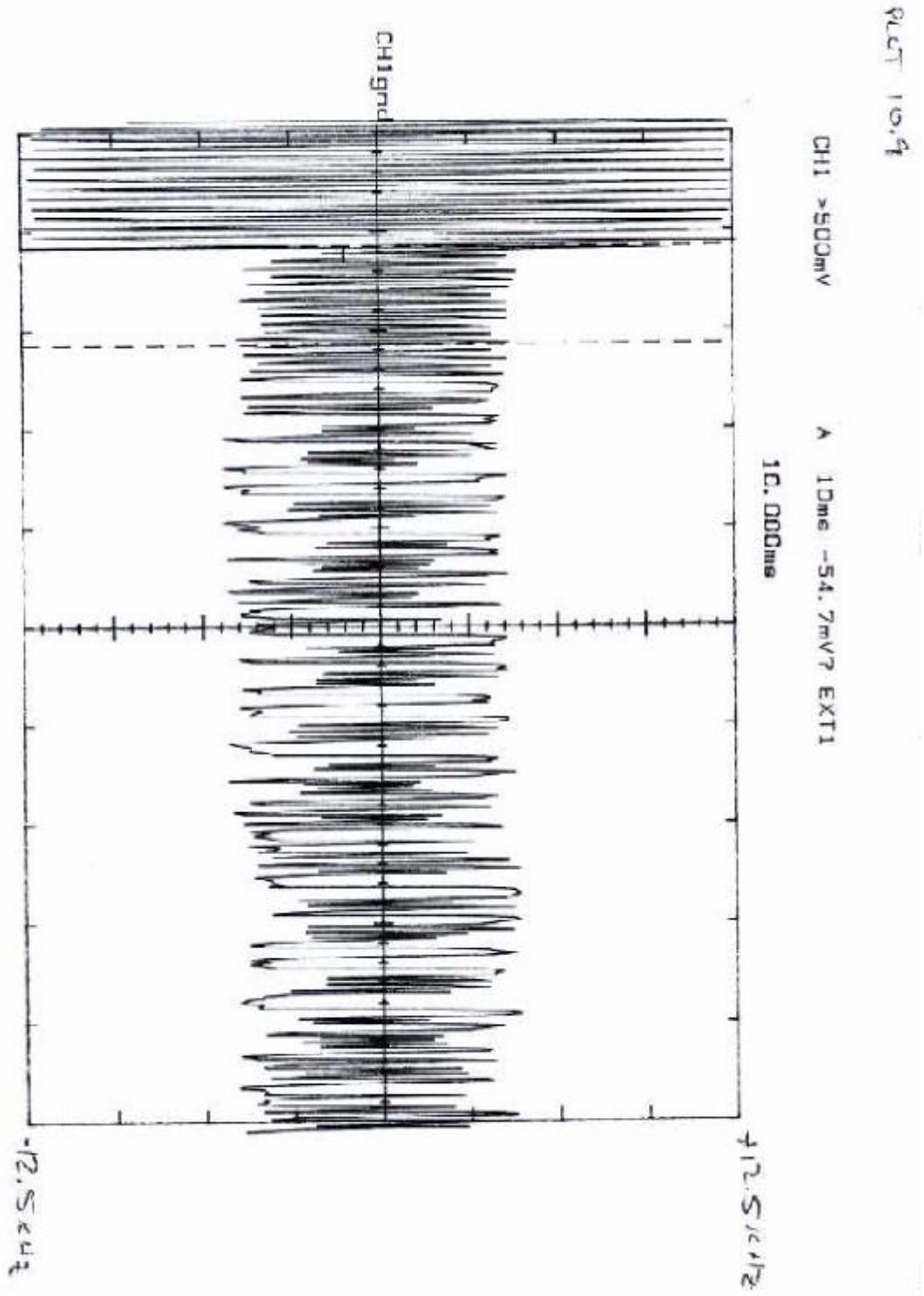
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# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

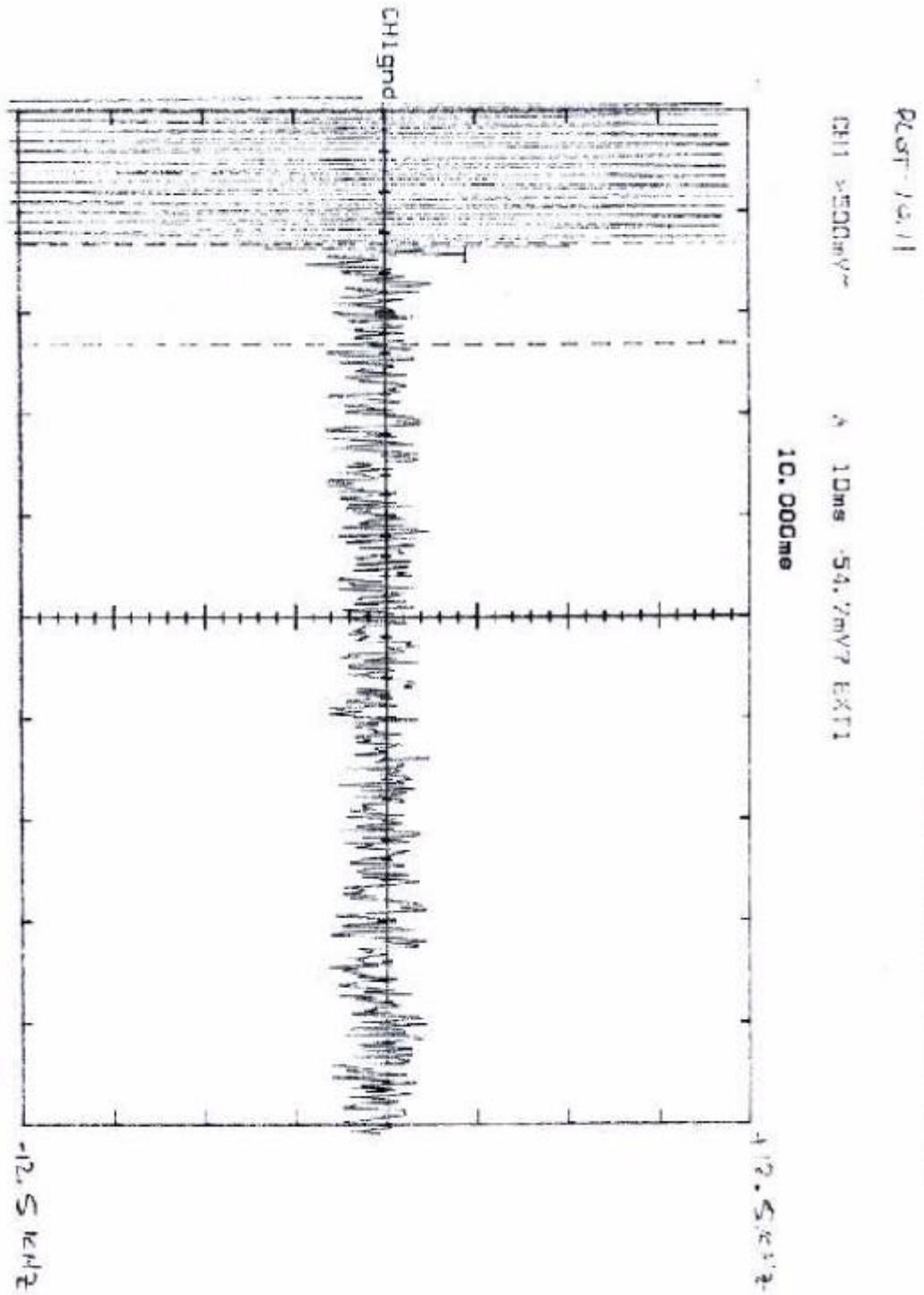
Date of Test: December 18, 1998



# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998



# **INTERTEK TESTING SERVICES - Menlo Park**

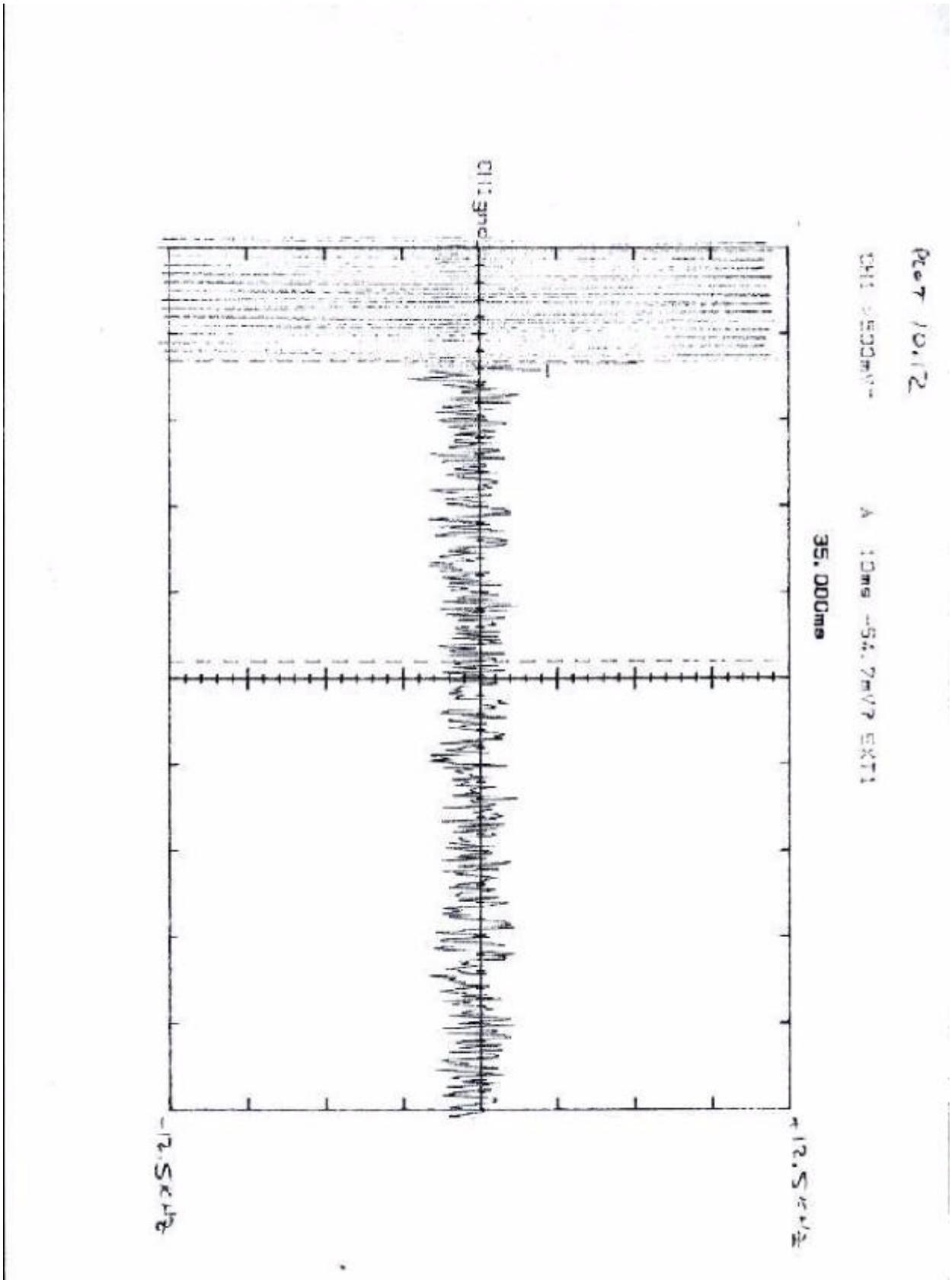
**Teledesign Radio Modem with 3422 Transceiver**

**Date of Test: December 18, 1998**

# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

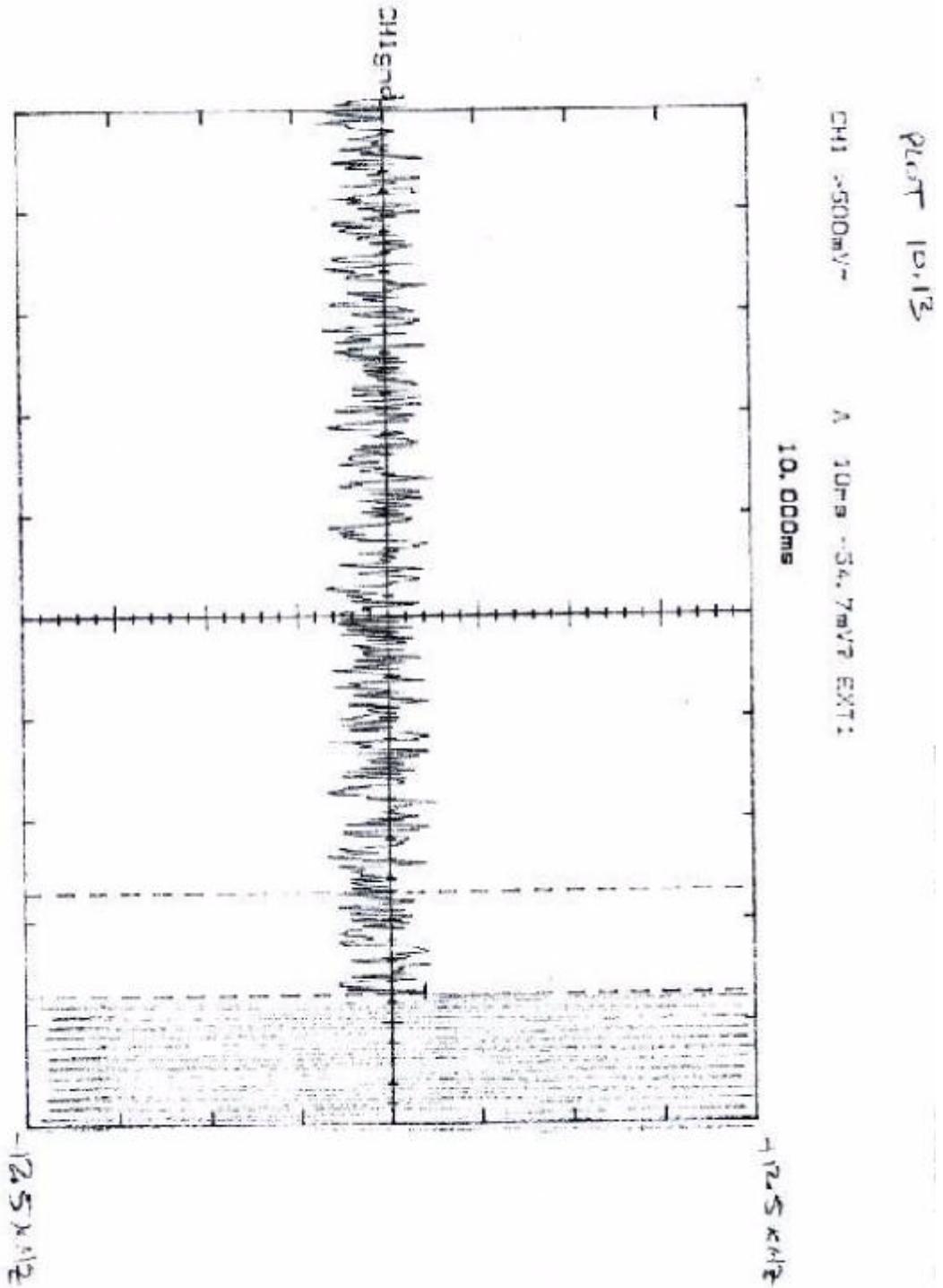
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Teledesign Radio Modem with 3422 Transceiver

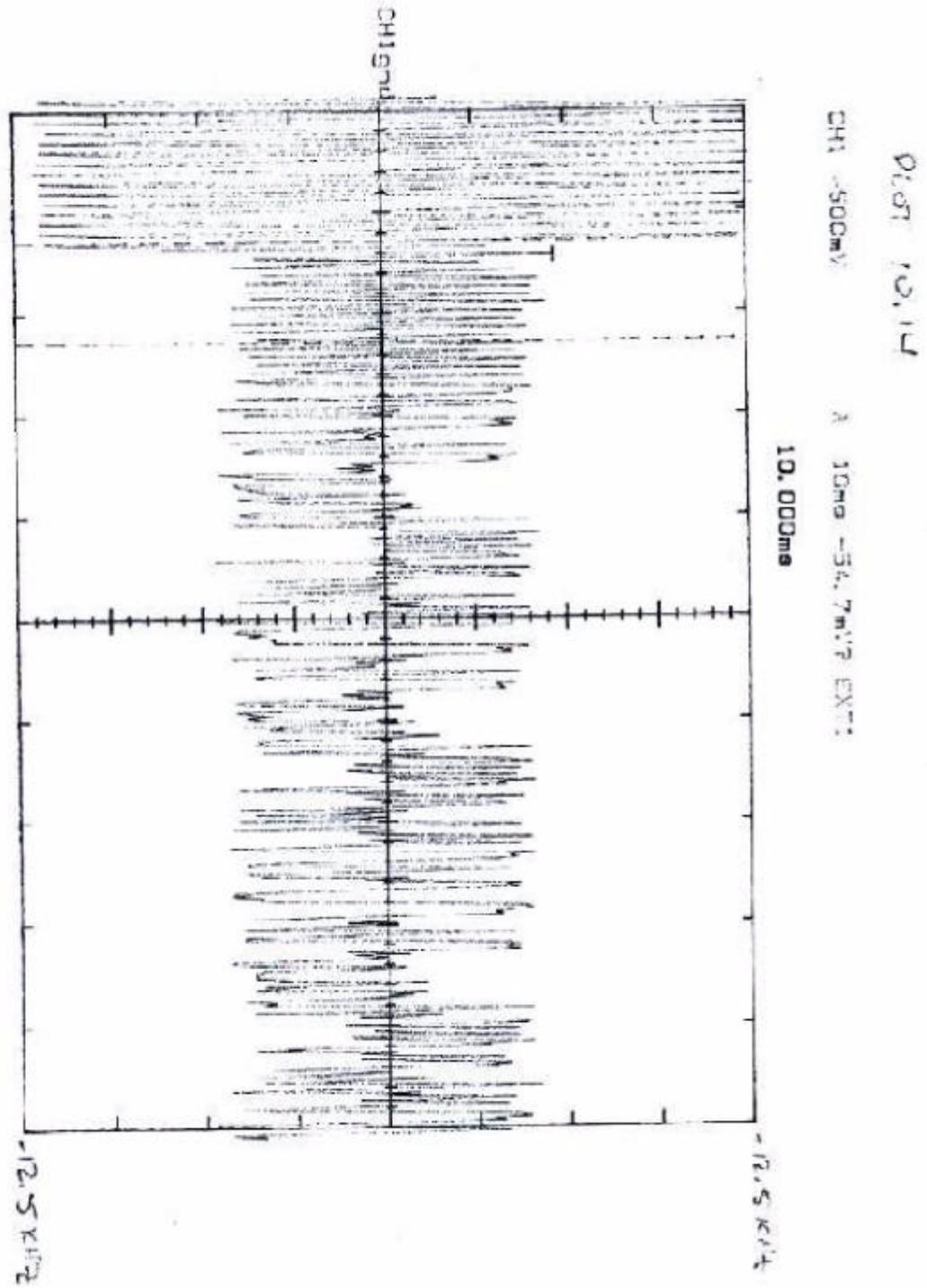
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# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

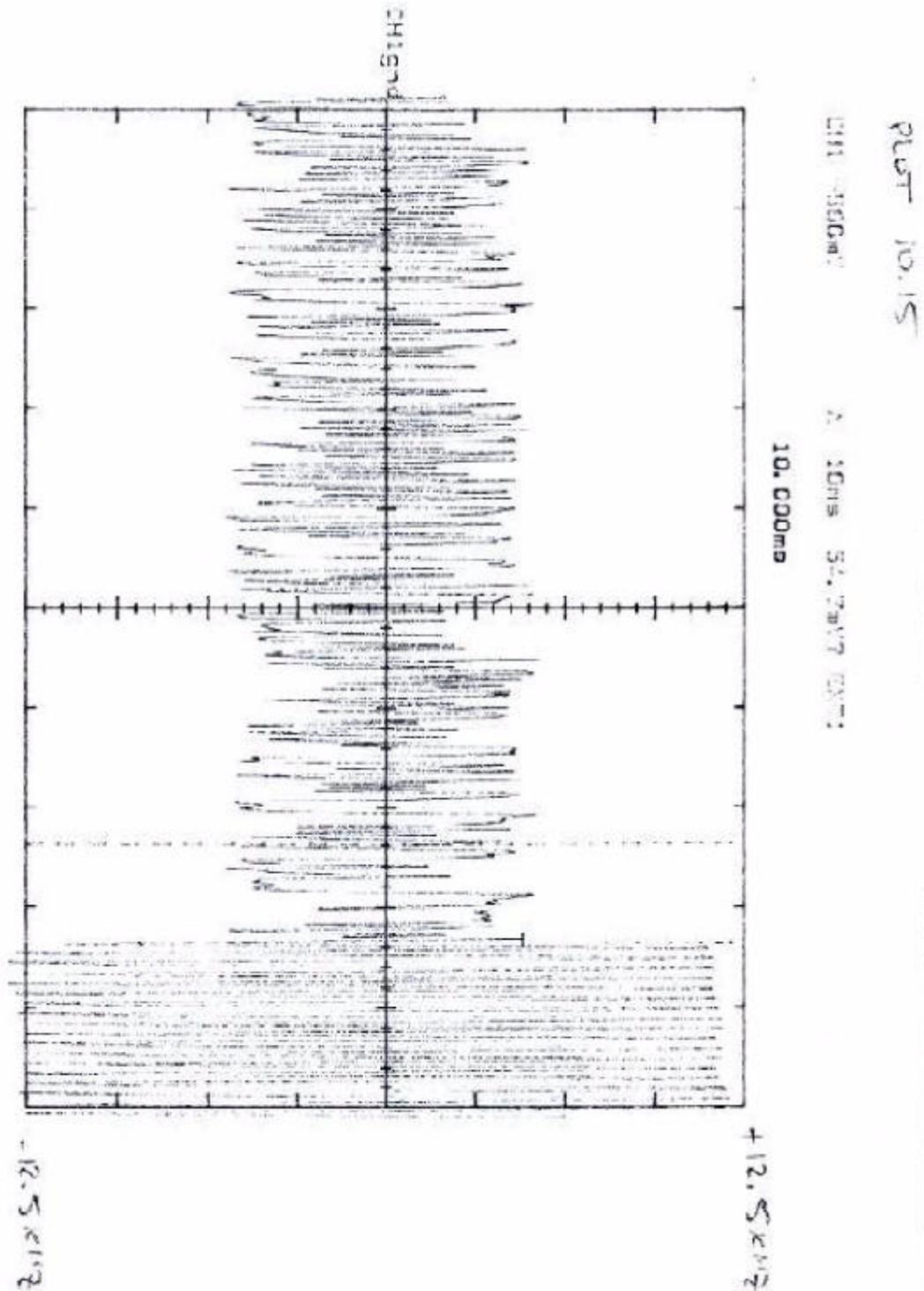
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# INTERTEK TESTING SERVICES - Menlo Park

Teledesign Radio Modem with 3422 Transceiver

Date of Test: December 18, 1998



# **INTERTEK TESTING SERVICES - Menlo Park**

**Teledesign Radio Modem with 3422 Transceiver**

**Date of Test: December 18, 1998**