

Client:	ShareWave	Date:	1/14/99	Test Engr:	Rudy Suy
Product:	Power Wave 2.4G Radio	File:	T29909	Proj. Eng:	Mark Briggs
Objective:	Final Qualification	Site:	SVOATS #1	Contact:	Dale Dorando
Spec:	FCC Part 15	Page:	1 of 6	Approved:	
Revision	Draft 0.1				

Ambient Conditions	
Temperature:	8 °C
Humidity:	85 %

## Test Objective

The objective of this test session is to perform final qualification testing of the EUT defined below relative to the specification(s) defined above for the Radio part. The digital device and receiver will be done at a later time.

## Test Summary

Run #1a - Maximized Spurious Radiated Emissions Scan in Restricted Bands, 30-24000MHz, High Channel 2455 MHz

**PASS** Results: FCC A                      -1.7 dB Avg. @ 2484.001 MHz    Horizontal

Run #1b - 6dB Bandwidth measurement MHz In Accordance With §15.247 (a) (2), High Channel

**PASS** Results: the minimum 6dB bandwidth was 18.9 MHz, measured via direct connection meeting the minimum requirement of 500 KHz.

Run #1c - Transmitted Power Measurements In Accordance With 15.247 (b), High Channel

**PASS** Results: Output power was measured to be 17.4 dBm

Run #1d - Power Density Measurements In Accordance With 15.247 (d), High Channel

**PASS** Results: Maximum Output power density in 3 KHz bandwidth was -3.3 dBm

Run #2a - Maximized Spurious Radiated Emissions Scan in Restricted Bands, 30-24000MHz, Center Channel 2440 MHz

**PASS** Results: FCC A                      -7.4 dB Avg. @ 4880.270 MHz    Horizontal



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Spec:	FCC Part 15	Page:	3 of 6	Approved:	
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## Equipment Under Test (EUT) General Description

The EUT is a spread-spectrum transceiver which is designed to communication digital information. Normally, the EUT would be placed on a table top during operation. The EUT was, therefore, placed in this position during emissions testing to simulate the end user environment. The electrical rating of the EUT is 5 VDC, at 0.65 Amps.

**Note: This unit is with cast aluminum shield and circular patch antenna instead of dipole antenna.**

## Equipment Under Test (EUT)

Manufacturer/Model/Description	Serial Number	FCC ID Number
ShareWave/ PowerWave/ Radio	FP42	none

## Power Supply and Line Filters

Description	Manufacturer	Model
None	-	-

The EUT power was derived from the host computer power supply.

## Printed Wiring Boards in EUT

Manufacturer/Description	Assembly #	Rev.	Serial Number	Crystals (MHz)
ShareWave/Radio	??	??		44

## Subassemblies in EUT

Manufacturer/Description	Assembly Number	Rev.	Serial Number
None	-	-	-

## EUT Enclosure(s)

The EUT enclosure is primarily constructed of aluminum. It measures approximately 6.4 cm wide by 14 cm deep by .64 cm high.

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## EMI Suppression Devices (filters, gaskets, etc.)

Description	Manufacturer	Part Number
None	-	-

## Local Support Equipment

Manufacturer/Model/Description	Serial Number	FCC ID Number
Dell D1025HT Monitor	8096677	AK8GDM17SE2T
Dell MMS P200s Host PC	8C74Q	E2KTERMIND
Microsoft 58264 Mouse	0372411	C3KAZB1
Dell SK-1000REV Keyboard	00087998	GYUR43SK

## Remote Support Equipment

Manufacturer/Model/Description	Serial Number	FCC ID Number
None	-	-

## Interface Cabling

Cable Description	Length (m)	From Unit/Port	To Unit/Port
Shielded Serial	2.0	Host PC	Keyboard
Shielded Serial	1.5	Host PC	Mouse
Shielded VGA	2.0	Host PC	Monitor
Shielded multi-conductor	1.4	Host PC	EUT I/O
Coax	0.3	EUT/ Ant	Ant./connector

## Test Software

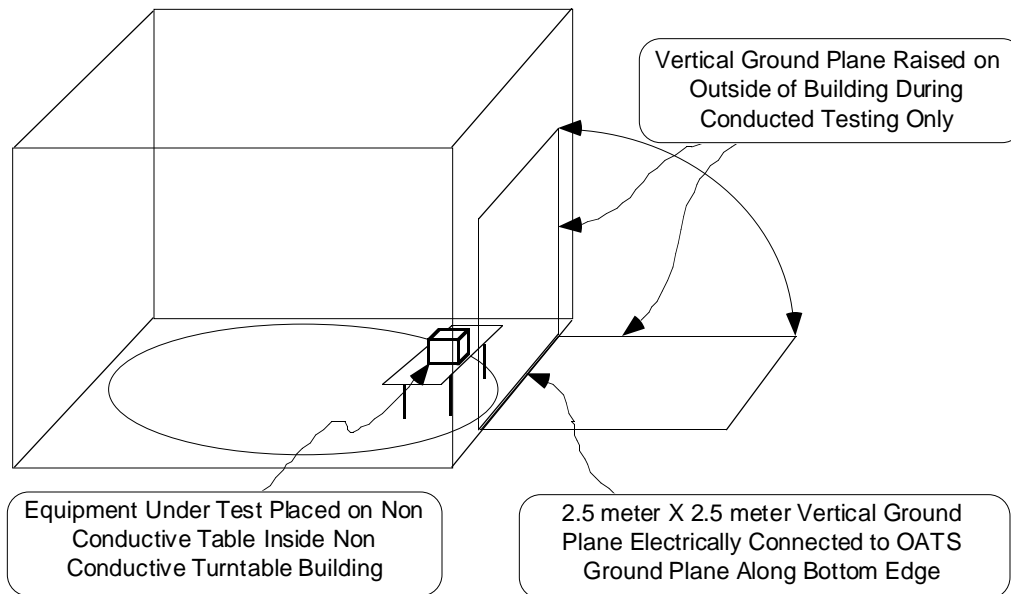
The EUT contained test software running during testing which continuously exercised the system by transmitting and receiving network traffic. The network traffic density was approximately 80% to simulate the worst case expected in the end user environment.

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Spec:	FCC Part 15	Page:	5 of 6	Approved:	
Revision	Draft 0.1				

## General Test Conditions

During radiated testing, the Host PC was connected to 120V, 60Hz power input. The EUT and all local support equipment were located on the turntable for radiated testing and conducted testing.

During conducted emissions testing, the Host PC was connected to 120V, 60Hz power input as noted. A 2.5 meter X 2.5 meter ground plane was raised to a vertical position 40 cm from the EUT as shown below:



## Test Data Tables

See attached data



## Emissions Test Data

Client:	ShareWave, Inc.	Date:	1/14/98	Test Engr:	Rudy Suy
Product:	PowerWave 2.4G Radio	File:	D29909	Proj. Engr:	Mark Briggs
Objective:	Final Qualification	Site:	SVOATS #1	Contact:	Dale Dorando
Spec:	FCC Part 15	Distance:	3m	Approved:	

### Ambient Conditions

Temperature: 8 °C  
Humidity: 85 %

### Run #1a: Maximized radiated scan, 1-24 GHz, Restricted Band Center Channel

Frequency MHz	Level dBuV/m	Pol v/h	FCC B Limit	FCC B Margin	Detector Pk/QP/Avg	Azimuth degrees	Height meters	Comments
4880.270	46.0	v	54.0	<b>-8.0</b>	Avg	180	1.9	
4880.270	44.8	h	54.0	<b>-9.2</b>	Avg	165	1.2	
4880.270	59.6	v	74.0	<b>-14.4</b>	Pk	180	1.9	
4880.270	59.2	h	74.0	<b>-14.8</b>	Pk	165	1.2	
7316.670	37.8	v	54.0	<b>-16.2</b>	Avg	180	1.2	
7316.670	37.1	h	54.0	<b>-16.9</b>	Avg	150	1.2	
7316.670	56.1	v	74.0	<b>-17.9</b>	Pk	180	1.2	
7316.670	58.6	h	74.0	<b>-15.4</b>	Pk	150	1.0	

Note: Frequencies above 8GHz the antenna was placed at 1 meter distance and no emissions were seen.

**Run #1b: 6 dB bandwidth measurement in accordance with part 15.247(a)(2), High Channel  
RESULTS: 6dB Bandwidth Measured Directly to Antenna Port To Be 18.9MHz.**

**Run #1c: Transmitted Power Measurements in accordance with part 15.247(b), High Channel  
RESULTS: Transmit Power Measured with Power Meter to be 17.4dBm.**

**Run #1d: Power Density Measurements in accordance with part 15.247(d), High Channel  
RESULTS: Power Density Measured Directly to Antenna Port To Be -3.3dBm.**



## Emissions Test Data

Client:	ShareWave, Inc.	Date:	1/14/98	Test Engr:	Rudy Suy
Product:	PowerWave 2.4G Radio	File:	D29909	Proj. Engr:	Mark Briggs
Objective:	Final Qualification	Site:	SVOATS #1	Contact:	Dale Dorando
Spec:	FCC Part 15	Distance:	3m	Approved:	

### Run #2a: Maximized radiated scan, 1-24 GHz, Restricted Band

#### Center Channel

Frequency MHz	Level dBuV/m	Pol v/h	FCC B Limit	FCC B Margin	Detector Pk/QP/Avg	Azimuth degrees	Height *	Comments
4880.270	46.6	h	54.0	-7.4	Avg	110	1.4	
4880.270	45.2	v	54.0	-8.9	Avg	120	1.2	
4880.270	62.5	h	74.0	-11.5	Pk	110	1.4	
4880.270	61.5	v	74.0	-12.5	Pk	120	1.2	
7316.670	36.3	v	54.0	-17.7	Avg	180	1.0	
7316.670	36.3	h	54.0	-17.7	Avg	100	1.0	
7316.670	47.6	v	74.0	-26.4	Pk	180	1.0	
7316.670	47.1	h	74.0	-26.9	Pk	100	1.0	

Note: Frequencies above 8GHz the antenna was placed at 1 meter distance and no emissions were seen.

### Run #2b: 6 dB bandwidth measurement in accordance with part 15.247(a)(2), High Channel

**RESULTS: 6dB Bandwidth Measured Directly to Antenna Port To Be 18.38MHz.**

### Run #2c: Transmitted Power Measurements in accordance with part 15.247(b), High Channel

**RESULTS: Transmit Power Measured with Power Meter to be 15.9dBm.**

### Run #2d: Power Density Measurements in accordance with part 15.247(d), High Channel

**RESULTS: Power Density Measured Directly to Antenna Port To Be -5.1dBm.**



# Emissions Test Data

Client:	ShareWave, Inc.	Date:	1/14/98	Test Engr:	Rudy Suy
Product:	PowerWave 2.4G Radio	File:	D29909	Proj. Engr:	Mark Briggs
Objective	Final Qualification	Site:	SVOATS #1	Contact:	Dale Dorando
Spec:	FCC Part 15	Distance:	3m	Approved:	

### Run #3a: Maximized radiated scan, 1-24 GHz, Restricted Band

#### Low Channel

Frequency	Level	Pol	FCC B	FCC B	Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
4850.143	44.2	h	54.0	-9.8	Avg	110	1.4	
4850.143	43.7	v	54.0	-10.3	Avg	120	1.2	
4850.143	60.0	h	74.0	-14.0	Pk	110	1.4	
4850.143	59.1	v	74.0	-14.9	Pk	120	1.2	
7279.930	36.8	v	54.0	-17.2	Avg	180	1.0	
7279.930	36.3	h	54.0	-17.7	Avg	100	1.0	
7279.930	48.8	v	74.0	-25.2	Pk	180	1.0	
7279.930	48.4	h	74.0	-25.6	Pk	100	1.0	

Note: Frequencies above 8GHz the antenna was placed at 1 meter distance and no emissions were seen.

### Run #3b: 6 dB bandwidth measurement in accordance with part 15.247(a)(2), High Channel

**RESULTS: 6dB Bandwidth Measured Directly to Antenna Port To Be 19.2MHz.**

### Run #3c: Transmitted Power Measurements in accordance with part 15.247(b), High Channel

**RESULTS: Transmit Power Measured with Power Meter to be 15.2dBm.**

### Run #3d: Power Density Measurements in accordance with part 15.247(d), High Channel

**RESULTS: Power Density Measured Directly to Antenna Port To Be -6.16dBm.**

### Run #4: Conducted Emissions, 120V/60Hz, High Channel (worst case)

Frequency	Level	Power	FCC B	FCC B	Detector	Comments
MHz	dBuV	Lead	Limit	Margin	Function	
15.6223	36.3	Line 1	48.0	-11.7	QP	
15.6406	35.6	Neutral	48.0	-12.4	QP	
8.3928	33.5	Neutral	48.0	-14.5	QP	
19.5319	27.6	Line 1	48.0	-20.4	QP	
19.5540	26.8	Neutral	48.0	-21.2	QP	
16.6932	25.2	Line 1	48.0	-22.8	QP	

Note: Quick scan was done on all three channels and High channel was the worst case configuration.

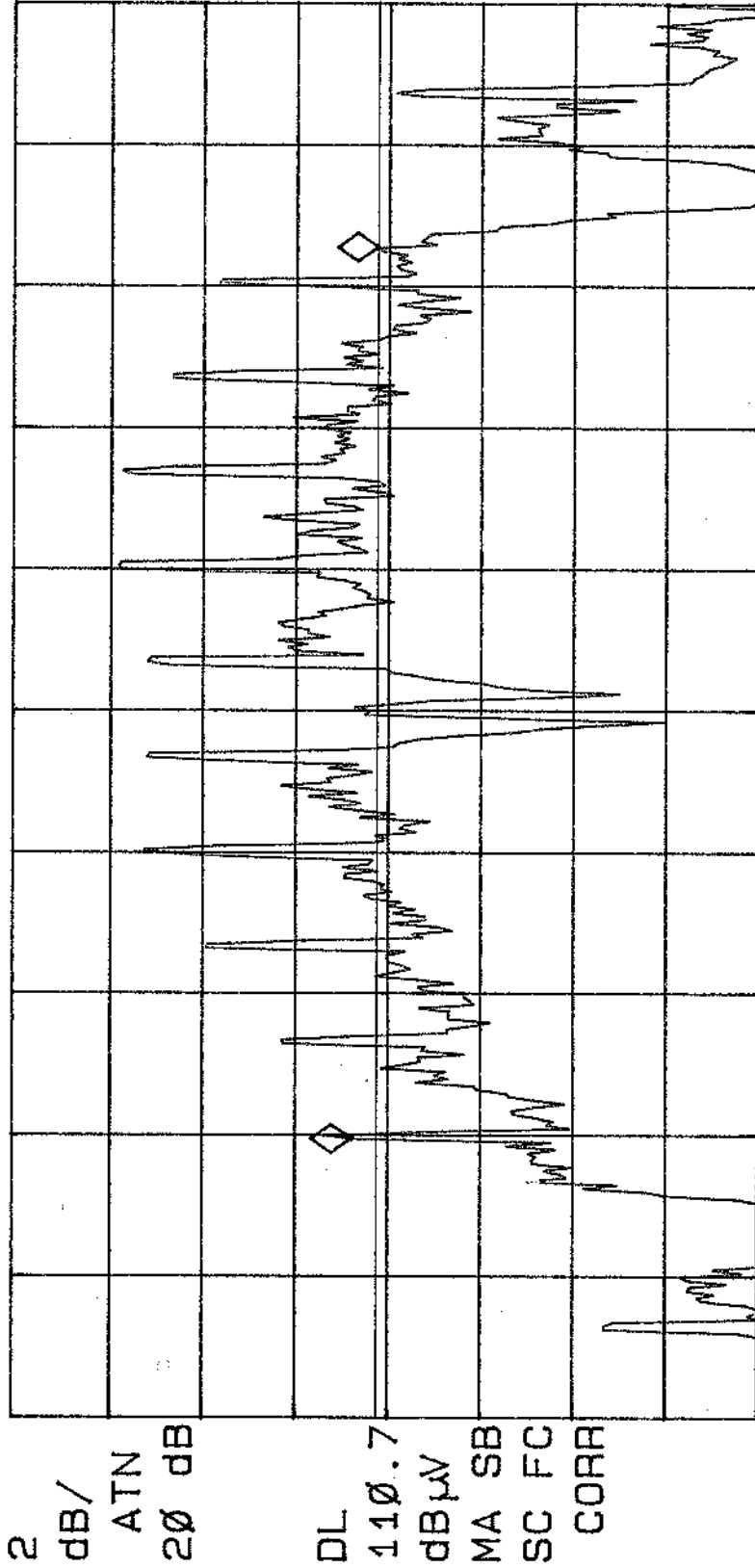


*6dB Bandwidth High Channel*

18:50:31 JAN 15, 1999  
HP

MARKER  $\Delta$  ACTV DET: PEAK  
18.90 MHz MEAS DET: PEAK QP AVG  
- .53 dB MKR 18.90 MHz  
- .53 dB

REF OFFST 10.0 dB  
REF 118.6 dB $\mu$ V



CENTER 2.45500 GHz SPAN 30.00 MHz  
#IF BW 100 KHZ #AVG BW 100 KHZ SWP 20.0 msec

Power Density High Channel

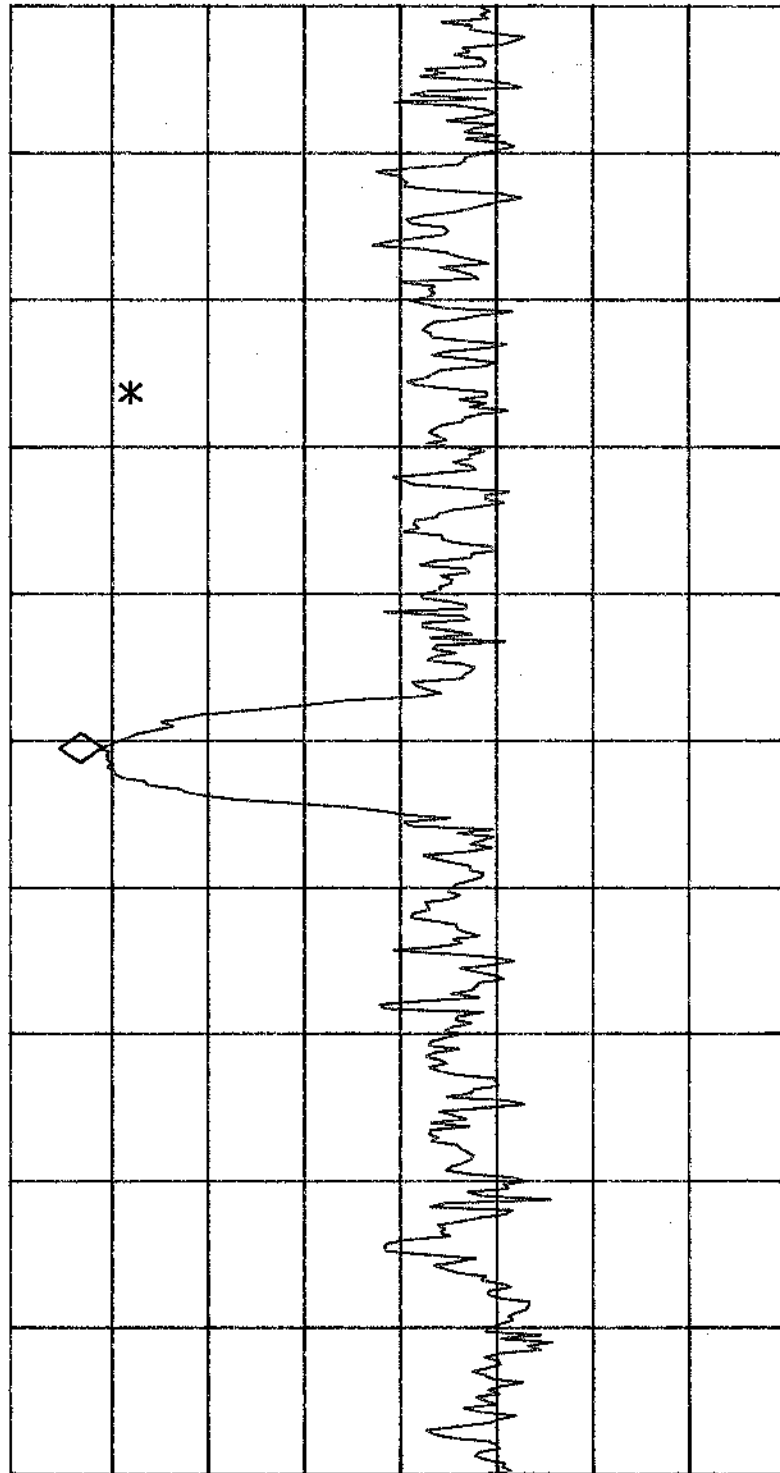
19:09:29 JAN 15, 1999  
HP

REF LEVEL  
-1.4 dBm

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 2.4599985 GHz  
-3.30 dBm

REF OFFST 10.0 dB  
REF -1.4 dBm

LOG 2  
dB/  
ATN  
10 dB



MA SB  
SC FC  
CORR

CENTER 2.4600000 GHz  
#IF BW 3.0 KHZ #AVG BW 3 KHZ SPAN 300.0 KHZ  
#SWP 100 sec

*Band edge High Channel*

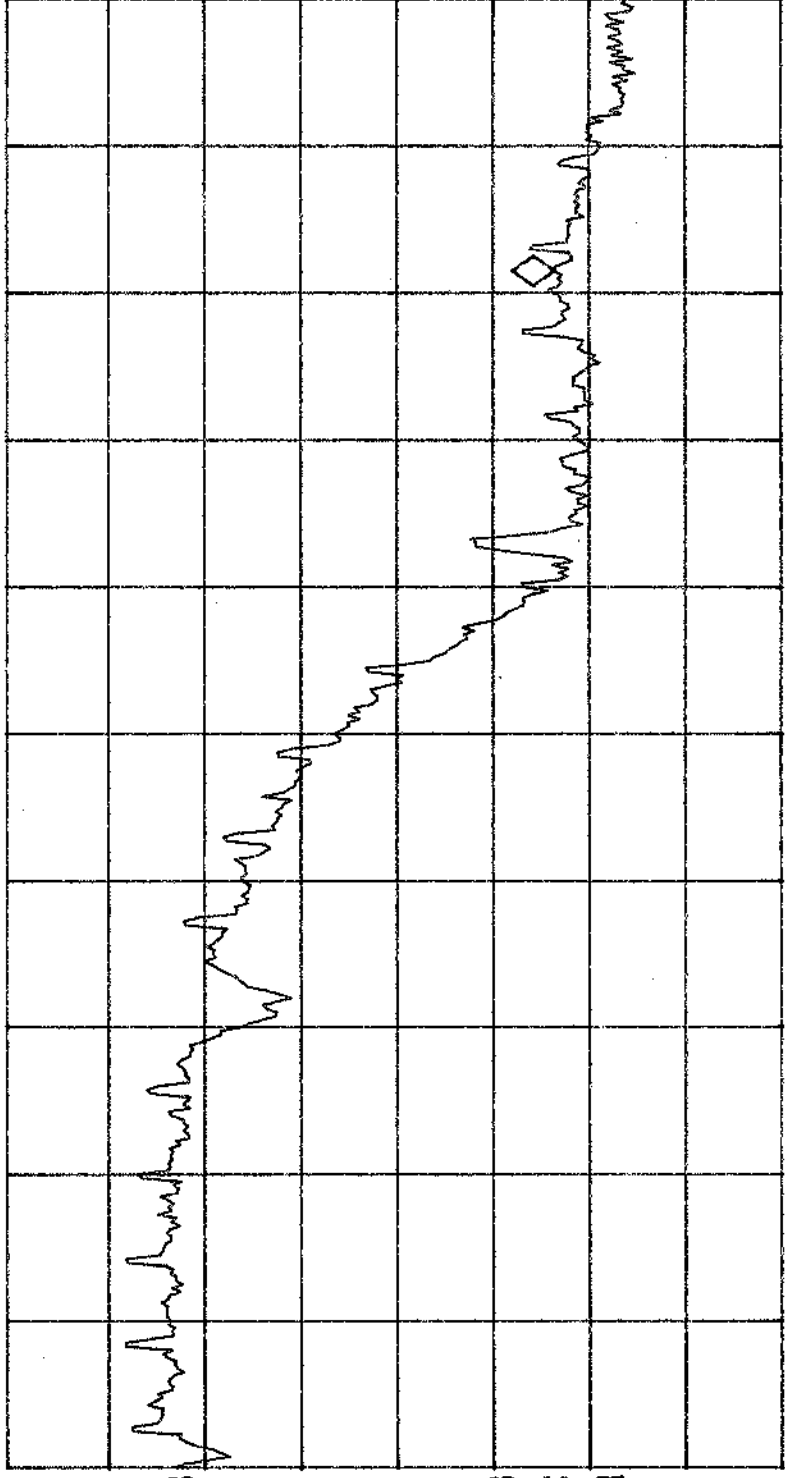
19:00:42 JAN 15, 1999

MARKER  
2.48353 GHz  
71.98 dB $\mu$ V

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 2.48353 GHz  
71.98 dB $\mu$ V

REF OFFST 10.0 dB  
REF 128.6 dB $\mu$ V

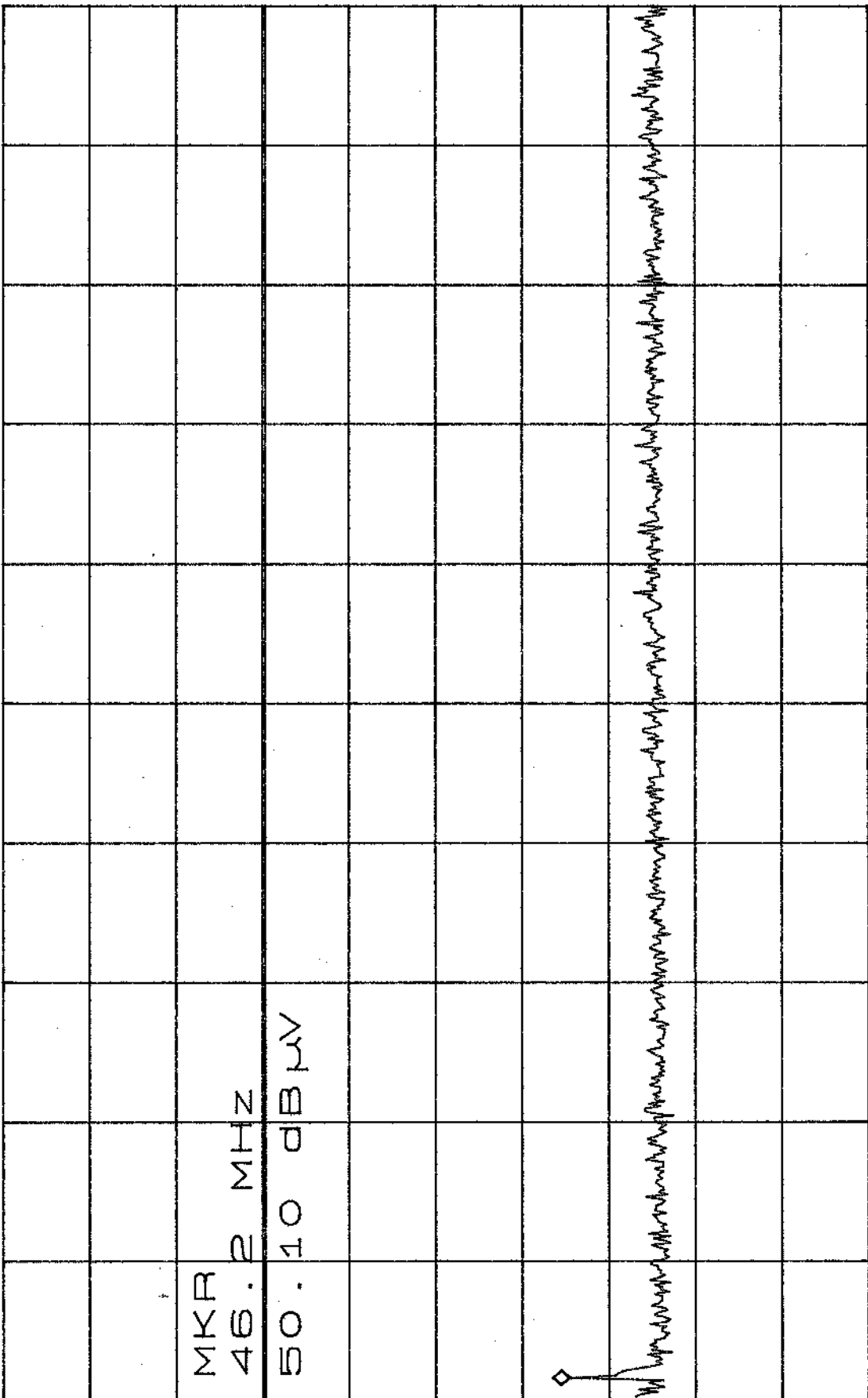
LOG 10 dB/ ATN 30 dB  
MA SB  
SC FC  
CORR



START 2.45500 GHz #IF BW 100 KHZ #AVG BW 100 KHZ STOP 2.49000 GHz SWP 20.0 msec

High Channel

ATTEN 20dB MKR 50.10dB  $\mu$ V  
RL 115.6dB  $\mu$ V 10dB / 46.2MHz



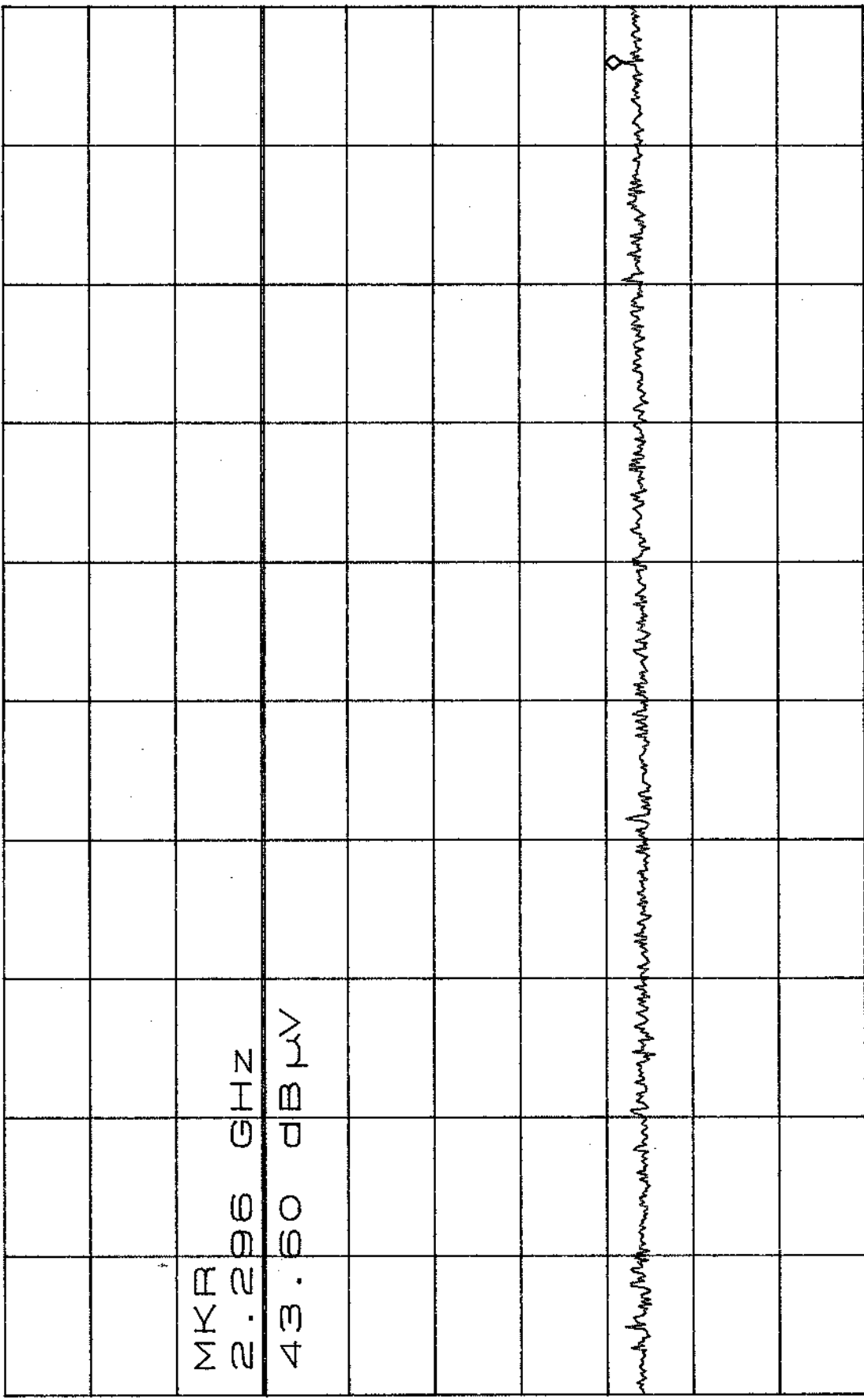
D

START 30.0MHz STOP 1.0000GHz  
\*RBW 100kHz \*VBW 100kHz SWP 250ms

High Channel

ATTEN 20dB MKR 43.60dBμV

RL 115.6dBμV 10dB/ 2.296GHz



MKR  
2.296 GHz  
43.60 dBμV

D

START 1.000GHz STOP 2.350GHz  
\*RBW 100kHz \*VBW 100kHz SWP 340ms

High Channel

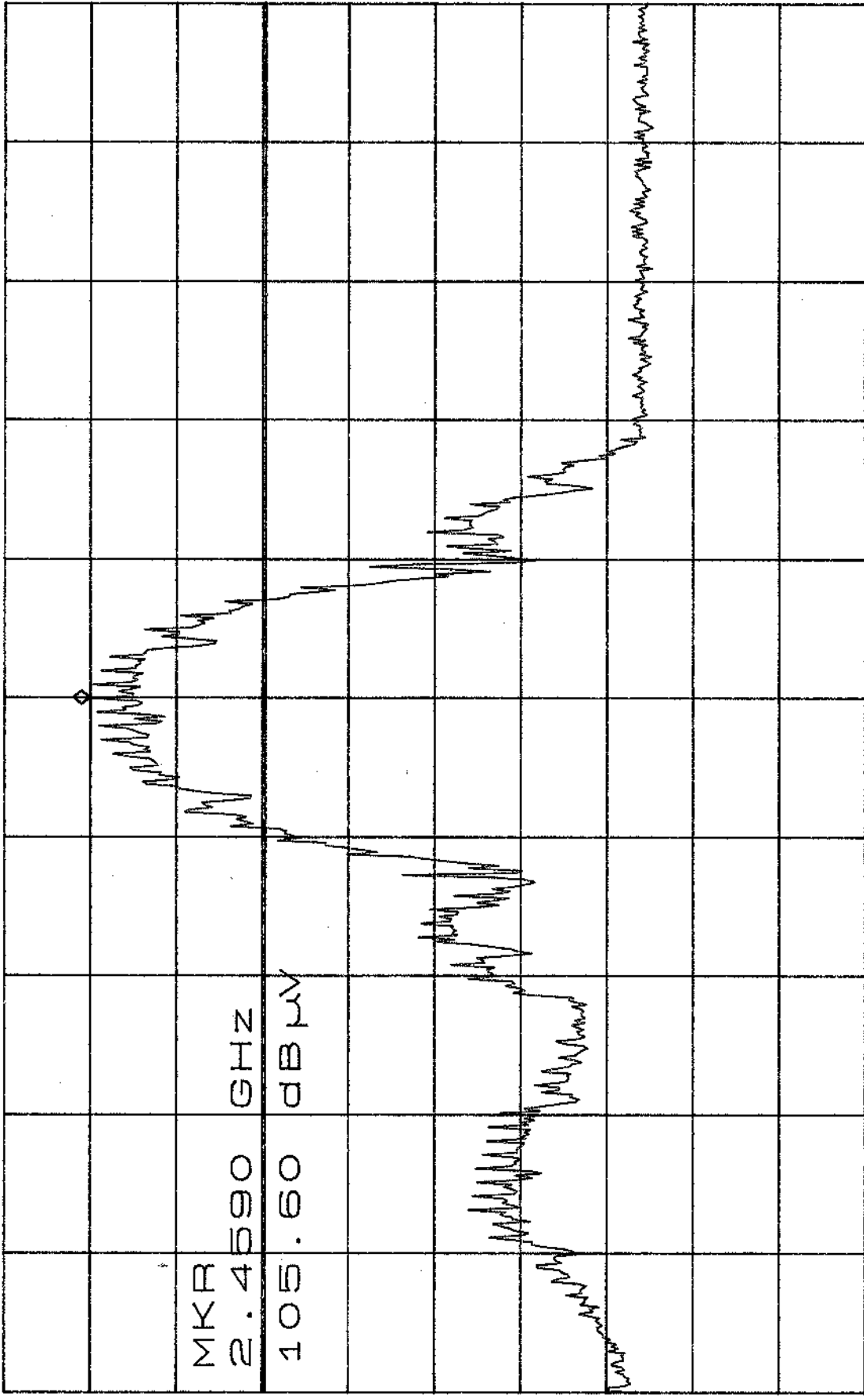
ATTEN 20dB

MKR 105.60dBμV

RL 115.6dBμV

2.4590GHZ

10dB/



MKR  
2.4590 GHZ

105.60 dBμV

D

CENTER 2.4590GHZ

SPAN 200.0MHZ

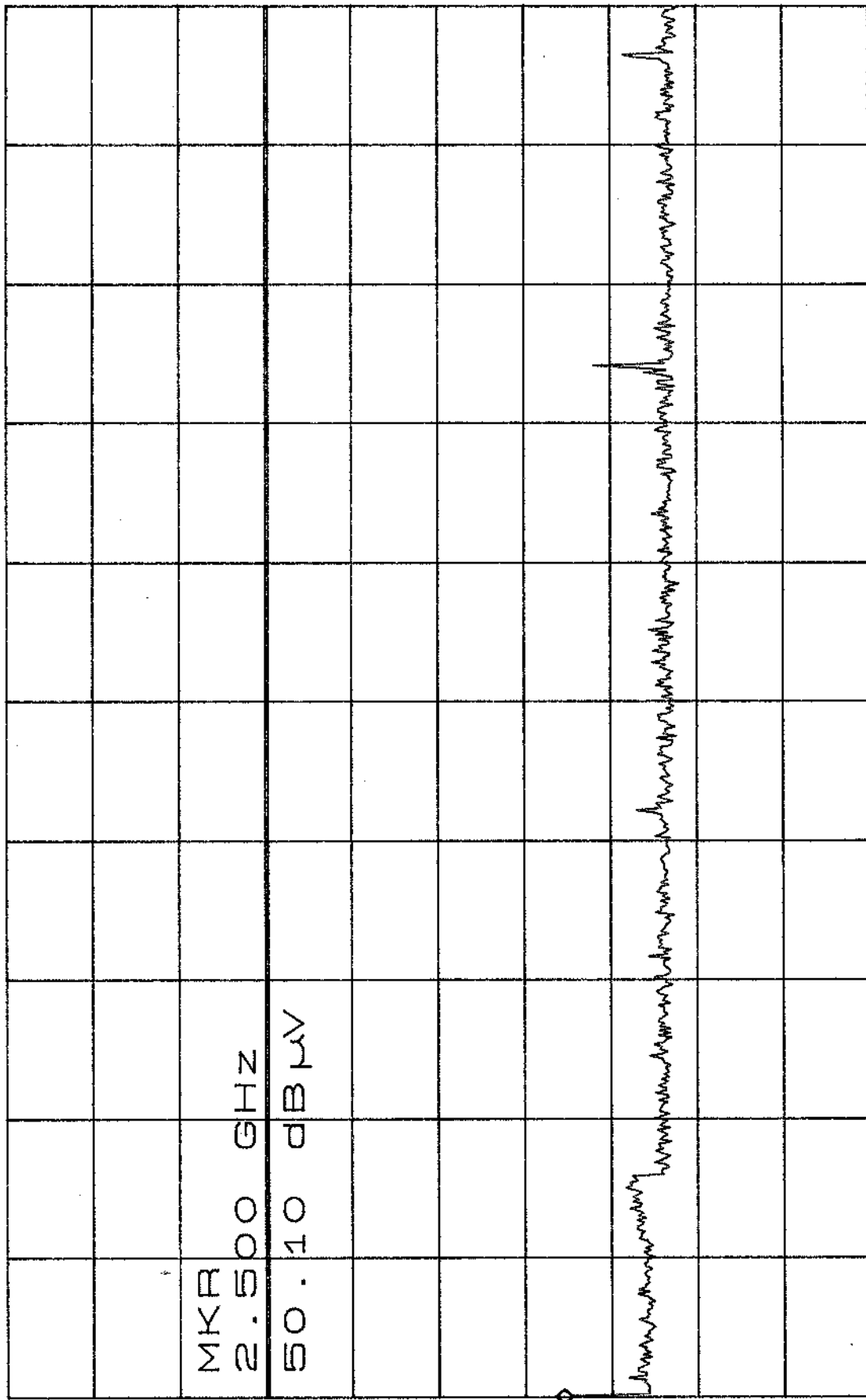
\*RBW 100KHZ

\*VBW 100KHZ

SWP 50MS

High Channel

ATTEN 20dB MKR 50.10dB  $\mu$ V  
RL 115.6dB  $\mu$ V 10dB/ 2.500GHZ



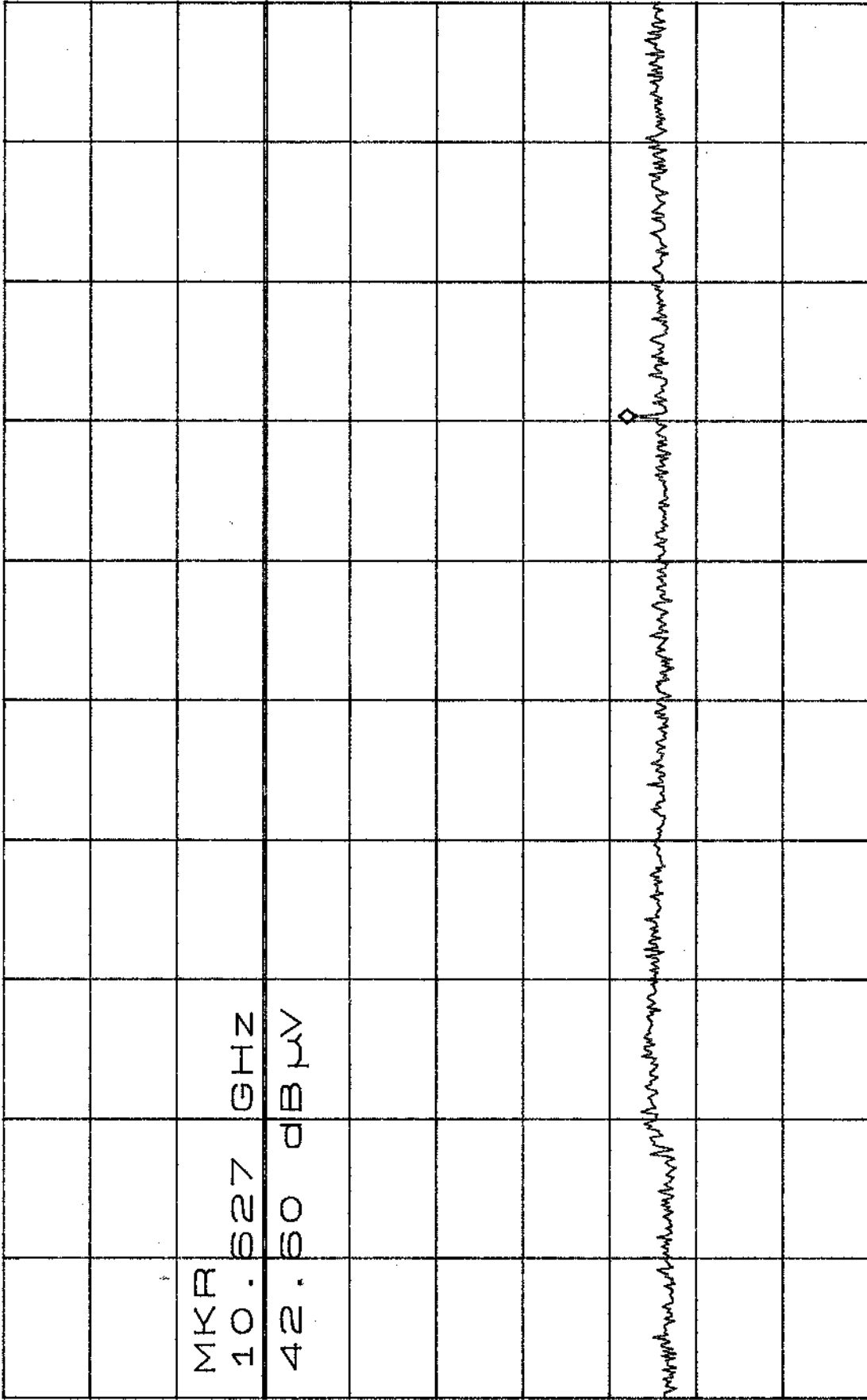
MKR  
2.500 GHZ  
50.10 dB  $\mu$ V

D

START 2.500GHZ STOP 5.000GHZ  
\*RBW 100KHZ \*VBW 100KHZ SWP 630ms

High Channel

ATTEN 20dB MKR 42.60dB  $\mu$ V  
RL 115.6dB  $\mu$ V 10dB/ 10.627GHz



MKR  
10.627 GHz  
42.60 dB  $\mu$ V

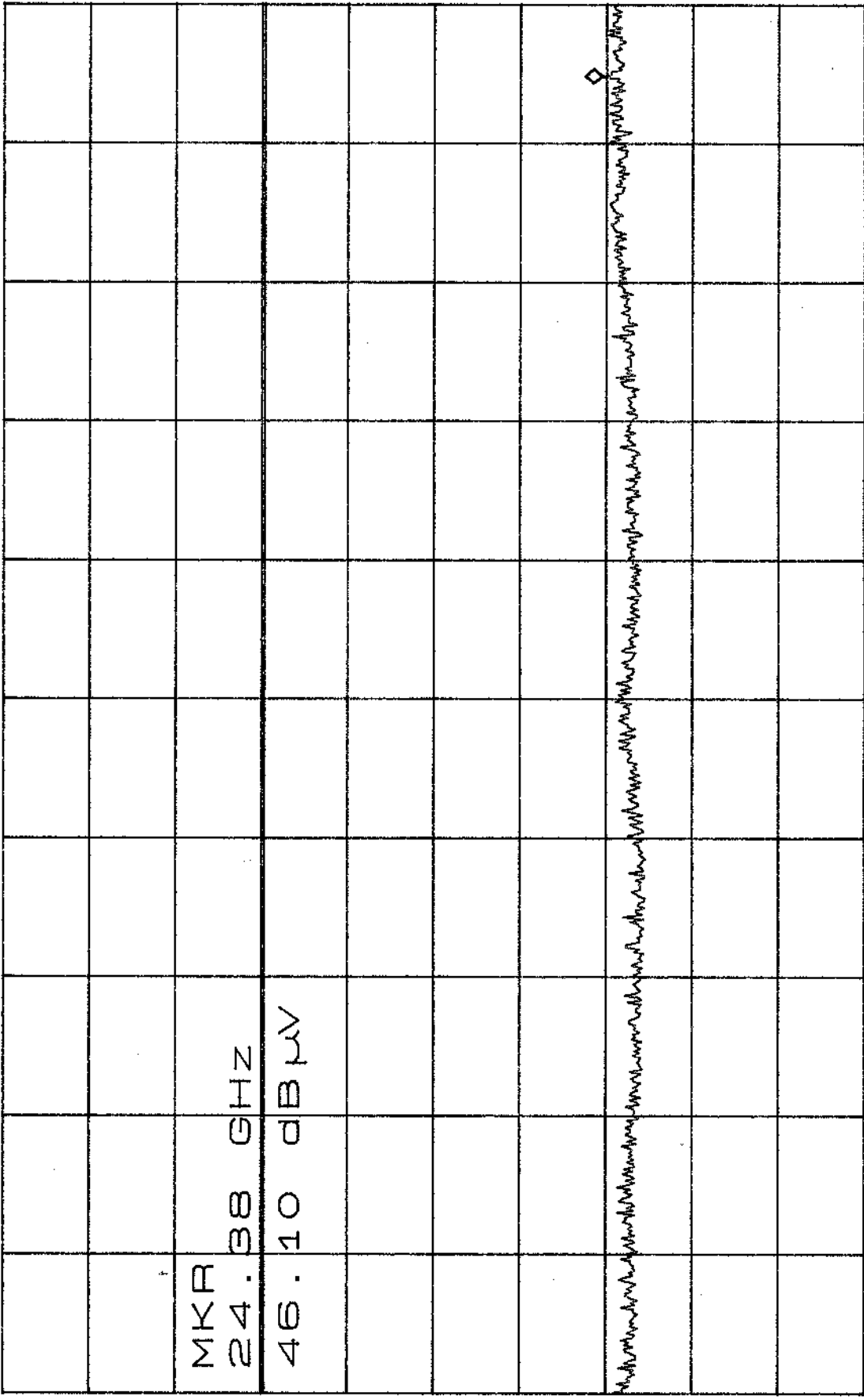
D

START 5.000GHz STOP 13.000GHz  
\*RBW 100kHz \*VBW 100kHz SWP 2.0sec



High Channel

ATTEN 20dB      MKR 46.10dB  $\mu$ V  
RL 115.6dB  $\mu$ V    10dB/    24.38GHz



D

START 13.00GHz      STOP 25.00GHz  
\*RBW 100kHz      \*VBW 100kHz      SWP 3.0sec

*6db Bandwidth Center Channel*

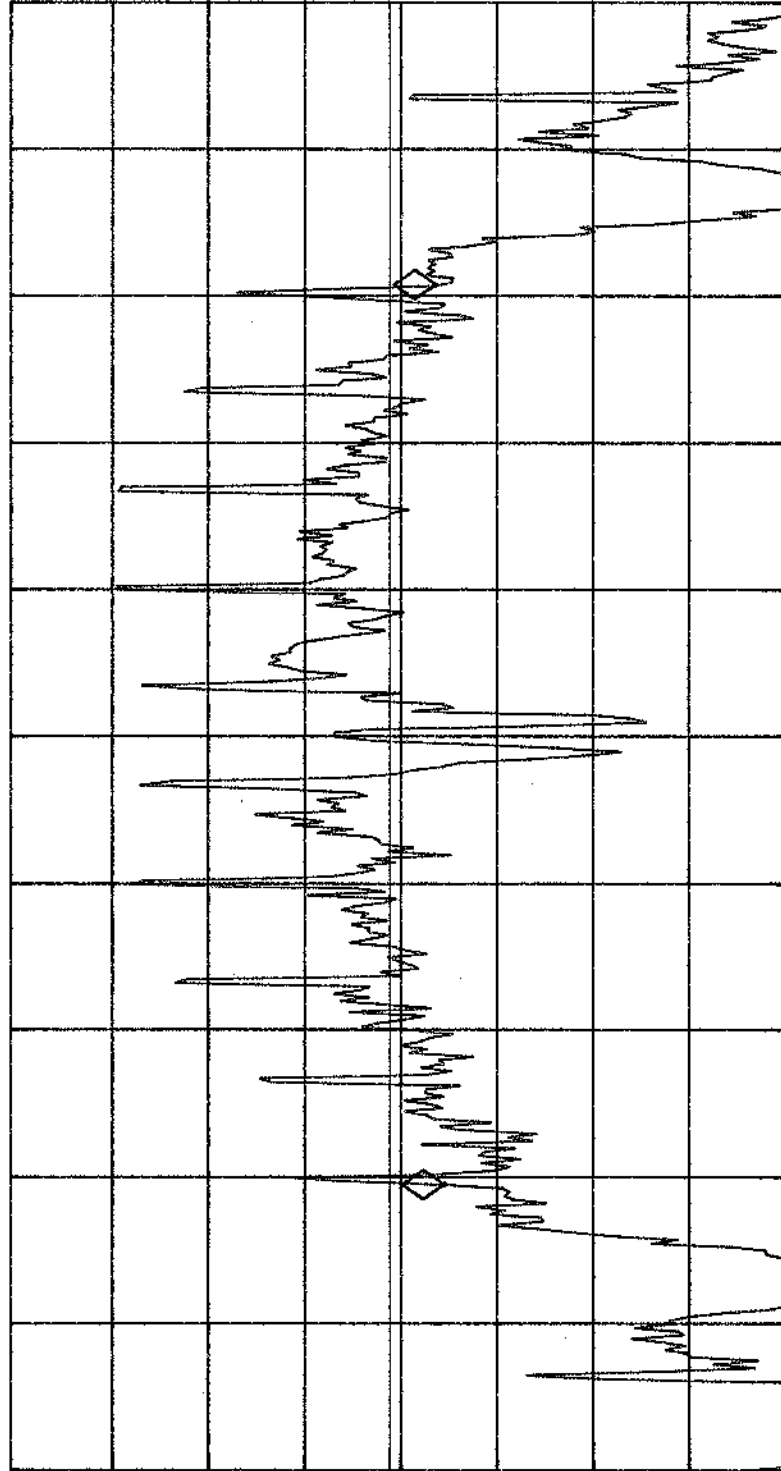
18:39:15 JAN 15, 1999  
HP

MARKER  $\Delta$   
18.38 MHz  
.18 dB

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 18.38 MHz  
.18 dB

REF OFFST 10.0 dB  
REF 116.6 dB $\mu$ V

LOG 2  
dB/  
ATN  
10 dB  
DL  
108.7  
dB $\mu$ V  
MA SB  
SC FC  
CORR



CENTER 2.44000 GHz  
#IF BW 100 KHz  
#AVG BW 100 KHz  
SPAN 30.00 MHz  
SWP 20.0 msec

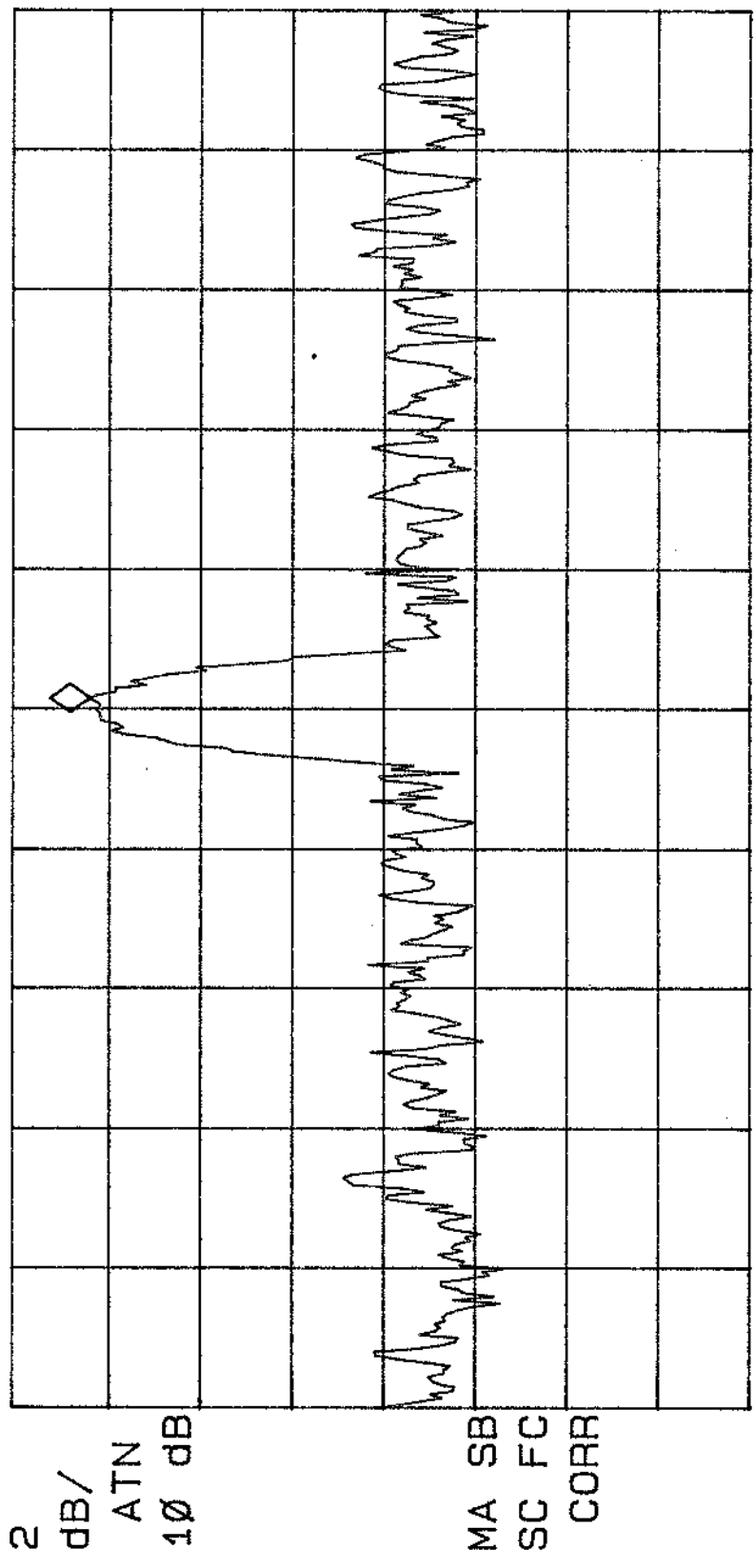
Power Density Center Channel

18:33:39 JAN 15, 1999

MARKER  
2.4429988 GHZ  
-5.09 dBm

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 2.4429988 GHZ  
-5.09 dBm

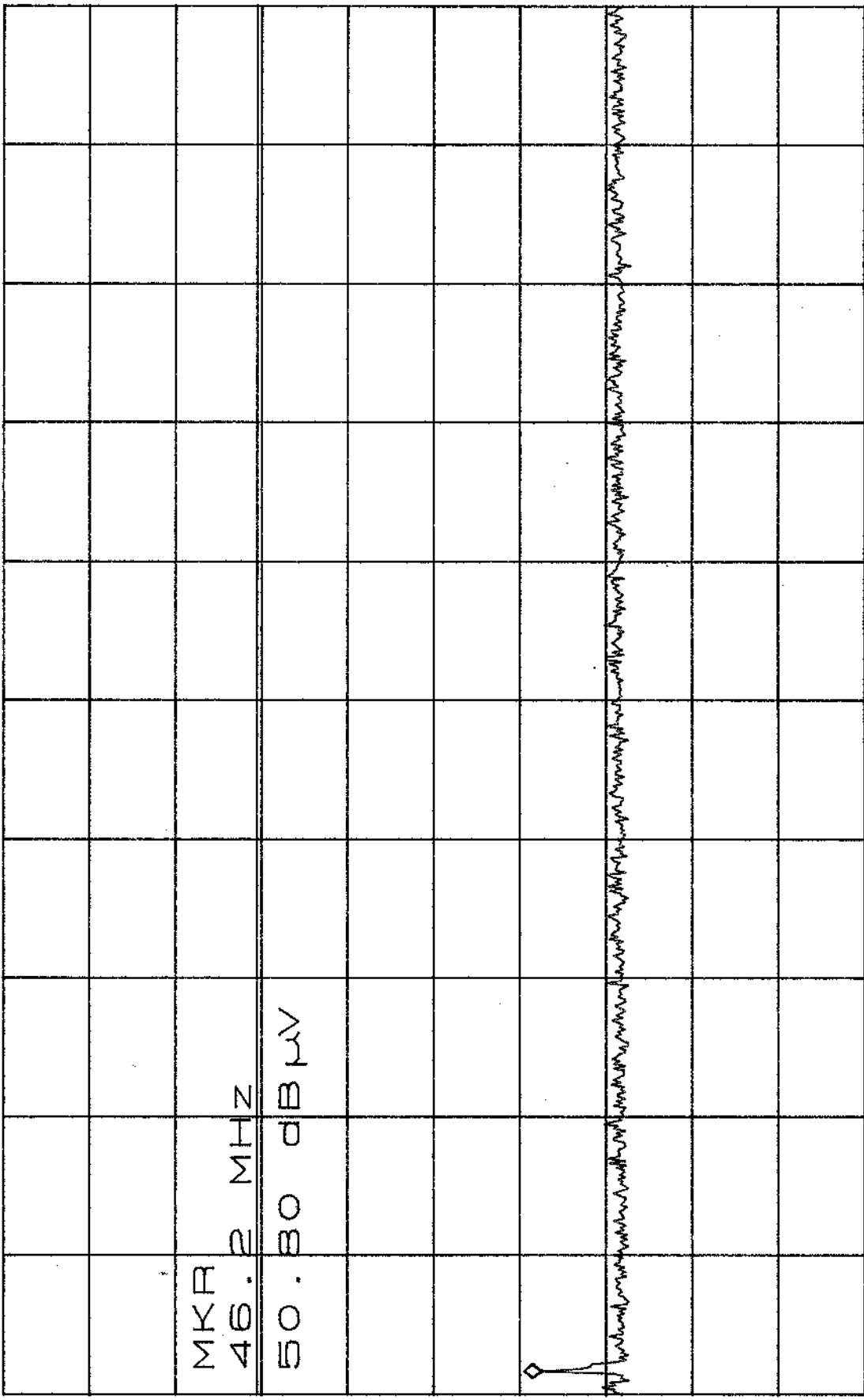
REF OFFST 10.0 dB  
REF -3.4 dBm



CENTER 2.4429966 GHZ  
#IF BW 3.0 KHZ #AVG BW 3 KHZ SPAN 300.0 KHZ  
#SMP 100 sec

CENTER CHANNEL

ATTEN 20dB MKR 50.80dB  $\mu$ V  
RL 113.3dB  $\mu$ V 10dB/ 46.2MHz



MKR  
46.2 MHz

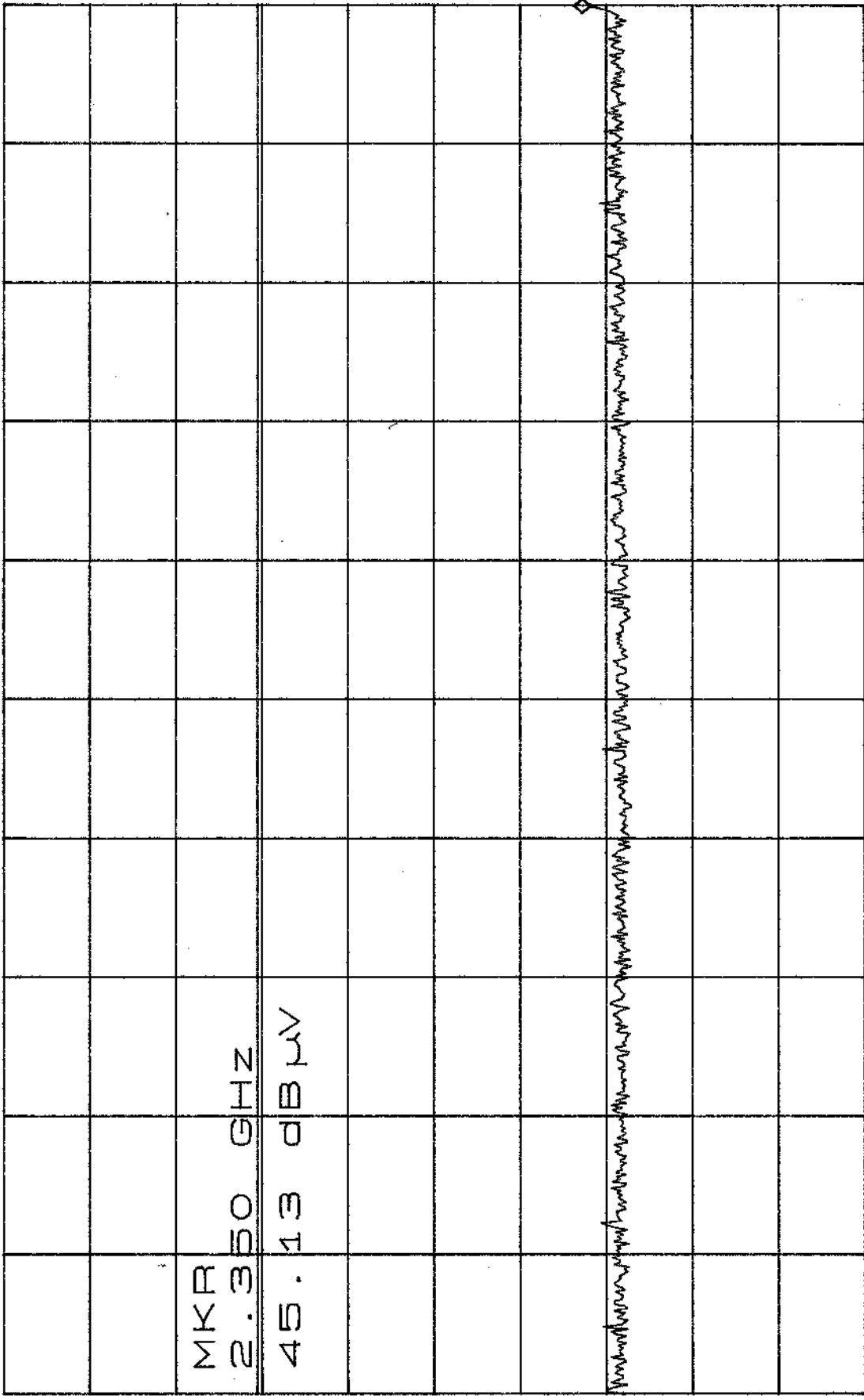
50.80 dB  $\mu$ V

START 30.0MHz STOP 1.0000GHz  
\*RBW 100kHz \*VBW 100kHz SWP 250ms

D

CENTER CHANNEL

ATTEN 20dB      MKR 45.13dB  $\mu$ V  
RL 113.3dB  $\mu$ V      10dB/      2.350GHZ



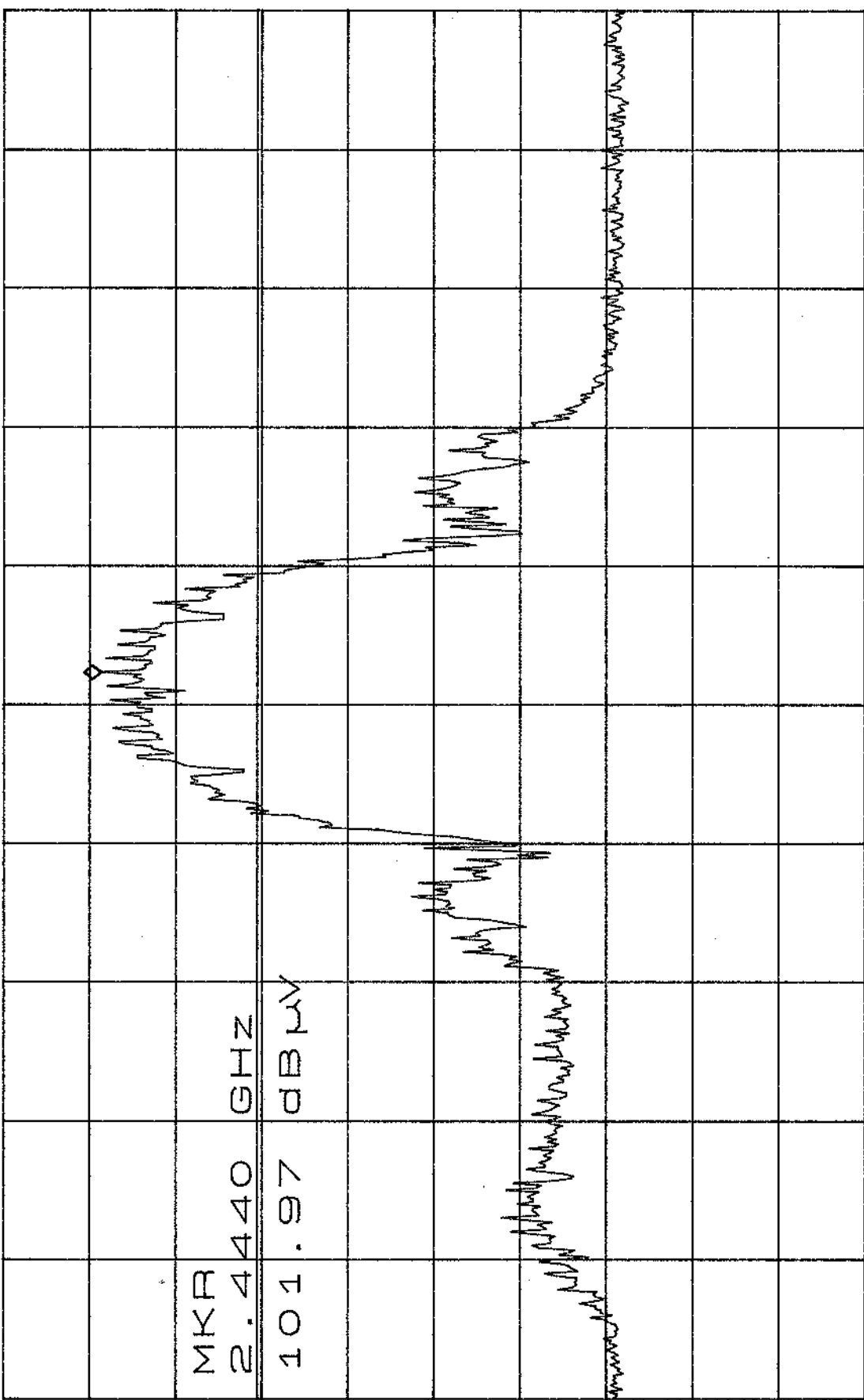
MKR  
2.350 GHZ  
45.13 dB  $\mu$ V

START 1.000GHZ      STOP 2.350GHZ  
\*RBW 100KHZ      \*VBW 100KHZ      SWP 340ms

D

Center channel

ATTEN 20dB      MKR 101.97dB $\mu$ V  
RL 113.3dB $\mu$ V      10dB/      2.4440GHZ



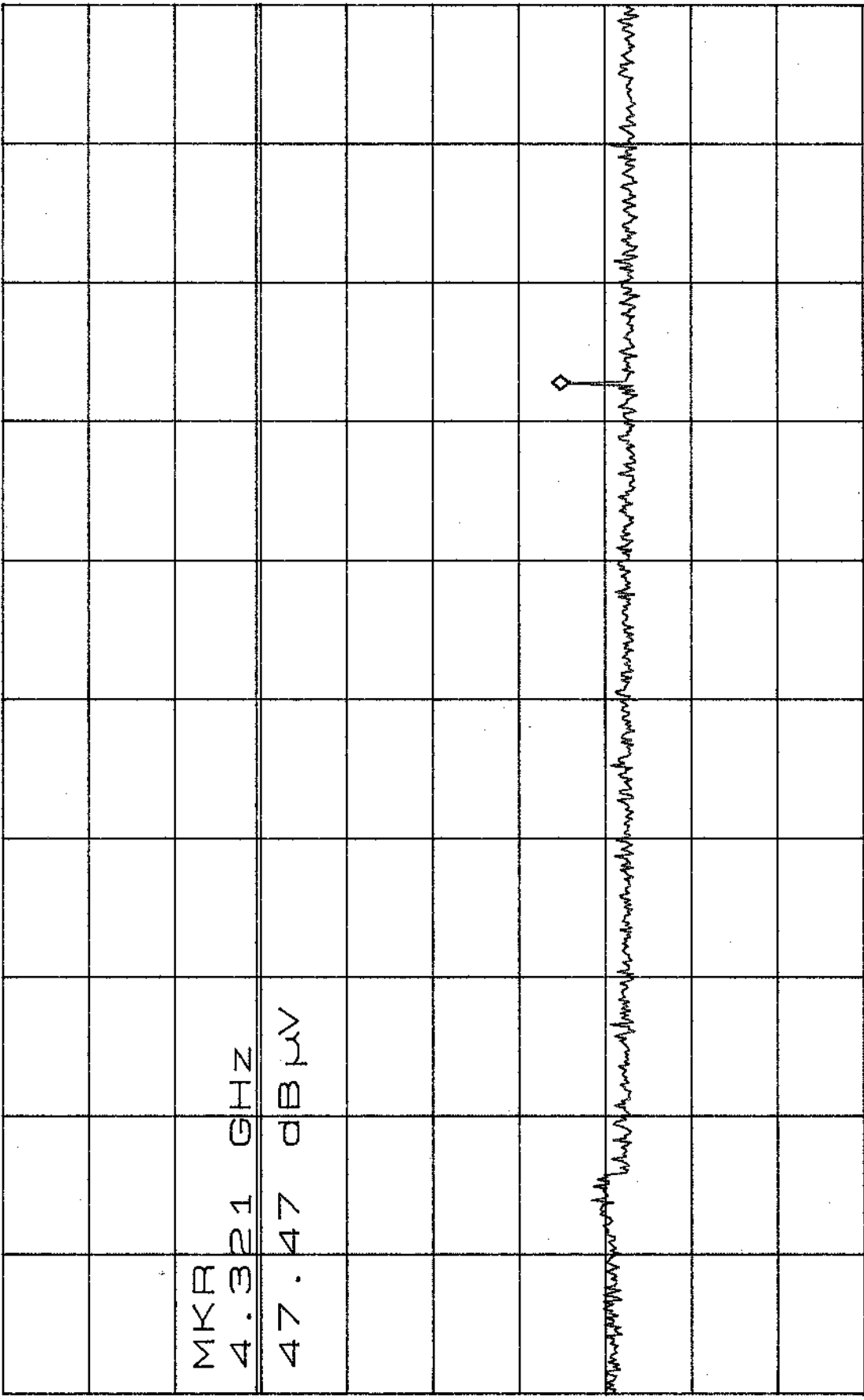
MKR  
2.4440 GHZ  
101.97 dB $\mu$ V

CENTER 2.43936GHZ      SPAN 200.0MHZ  
\*RBW 100KHZ      \*VBW 100KHZ      SWP 50ms

D

CENTER CHANNEL

ATTEN 20dB MKR 47.47dB  $\mu$ V  
RL 113.3dB  $\mu$ V 10dB/ 4.321GHz



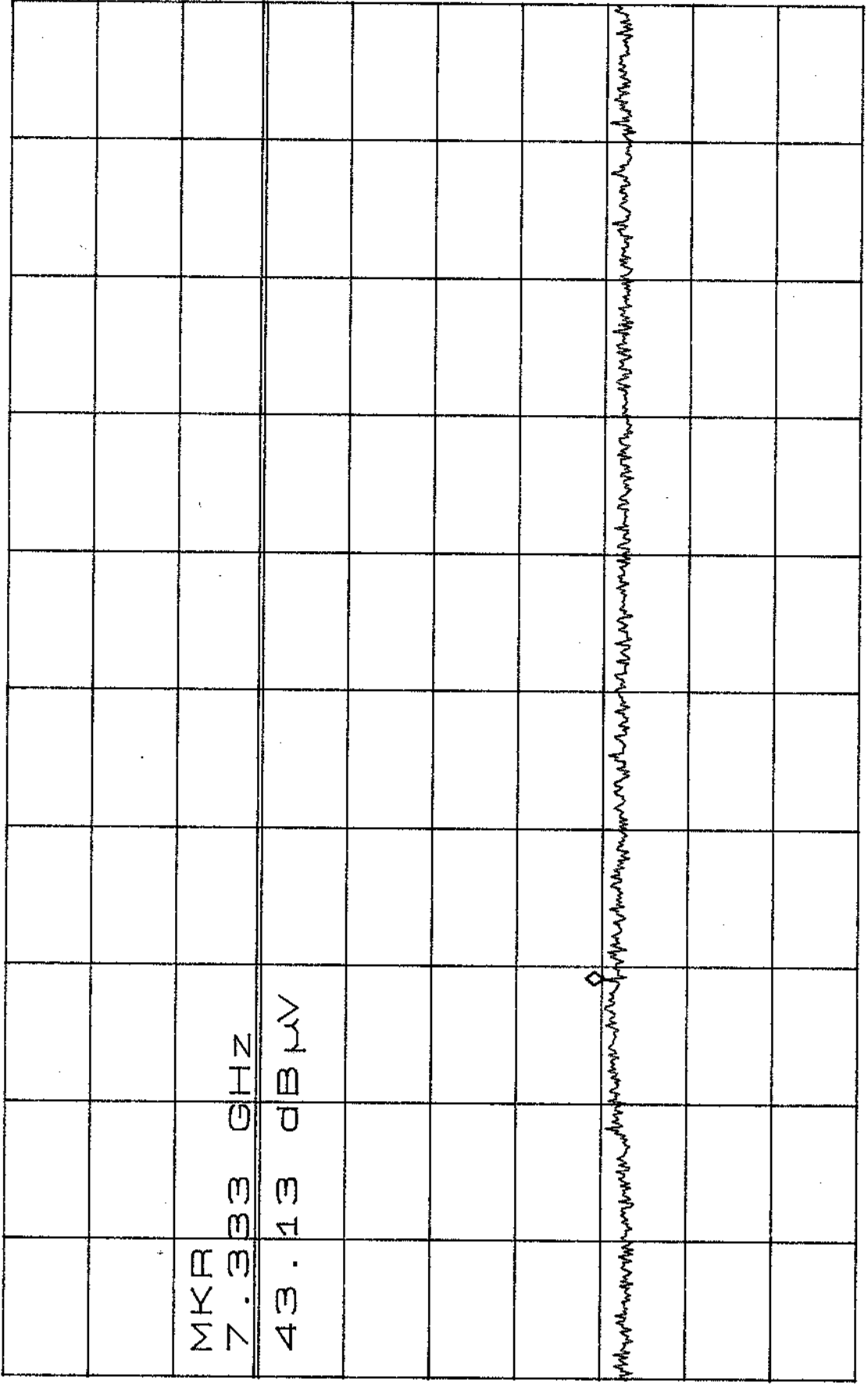
MKR  
4.321 GHz  
47.47 dB  $\mu$ V

D

START 2.500GHz STOP 5.000GHz  
\*RBW 100kHz \*VBW 100kHz SWP 630ms

CENTER CHANNEL

ATTEN 20dB MKR 43.13dBμV  
RL 113.3dBμV 10dB/ 7.333GHZ



MKR  
7.333 GHZ  
43.13 dBμV

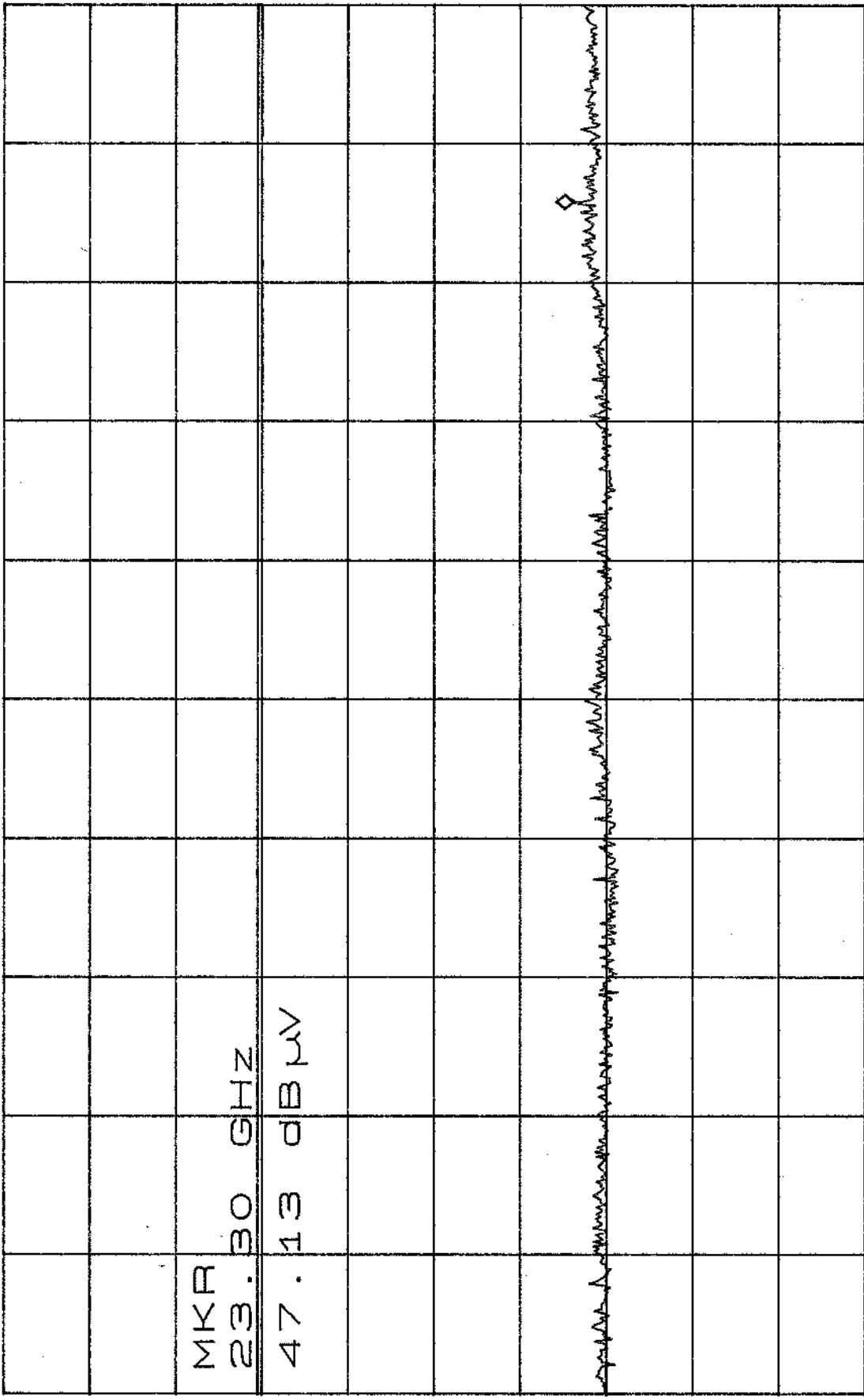
D

START 5.000GHZ STOP 13.000GHZ  
\*RBW 100KHZ \*VBW 100KHZ SWP 2.0sec



CENTER CHANNEL

ATTEN 20dB MKR 47.13dB  $\mu$ V  
RL 13.3dB  $\mu$ V 10dB/ 23.30GHZ



MKR  
23.30 GHZ  
47.13 dB  $\mu$ V

START 13.00GHZ STOP 25.00GHZ  
\*RBW 100KHZ \*VBW 100KHZ SWP 3.0sec

D

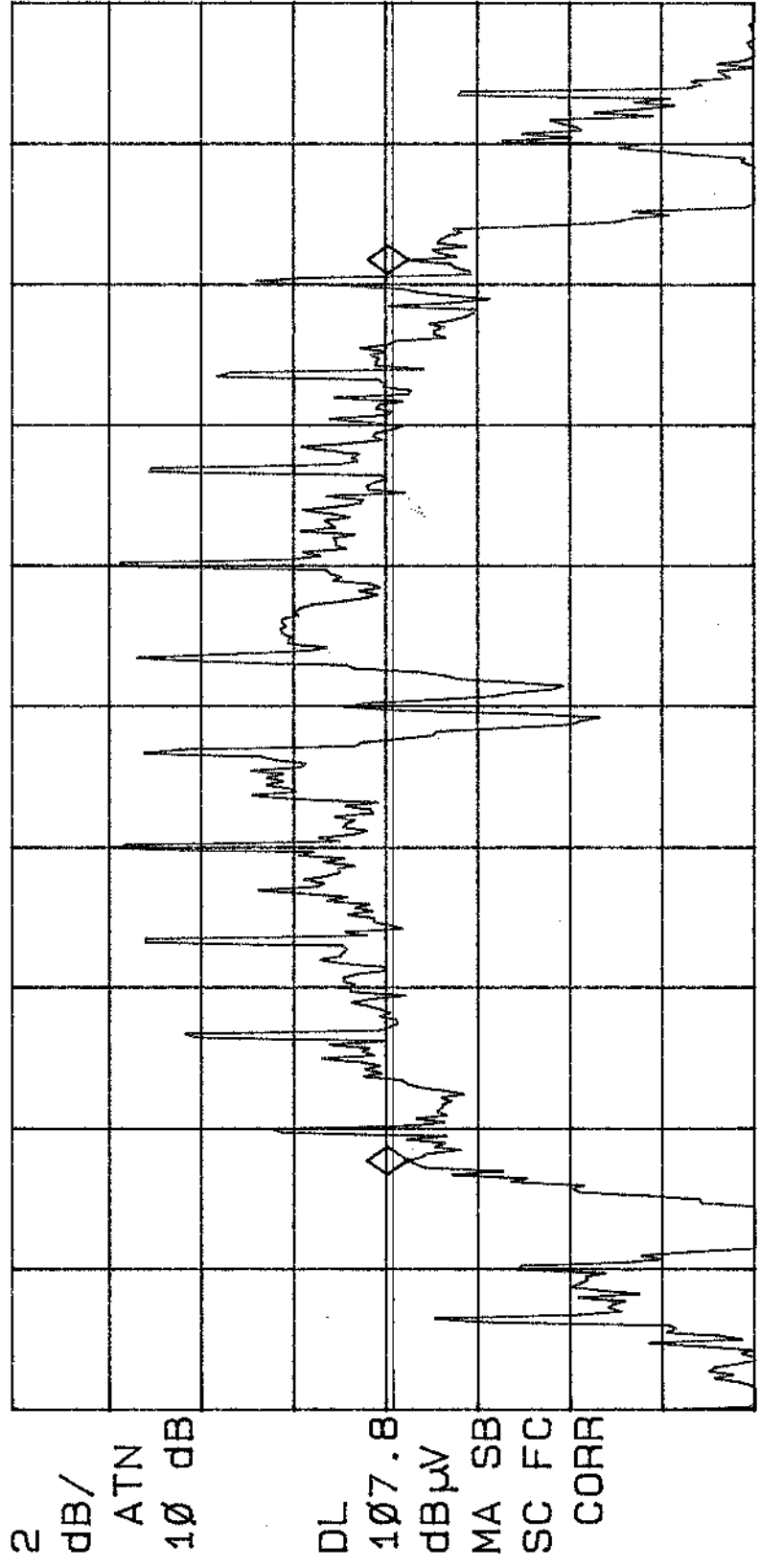
6db Bandwidth LOW CHANNEL

18:06:32 JAN 15, 1999

MARKER  $\Delta$   
19.20 MHz  
-.02 dB

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 19.20 MHz  
-.02 dB

REF OFFST 10.0 dB  
REF 116.0 dB $\mu$ V



CENTER 2.42500 GHz  
#IF BW 100 KHZ #AVG BW 100 KHZ SPAN 30.00 MHz  
SWP 20.0 msec

Power Density Low CHANNEL

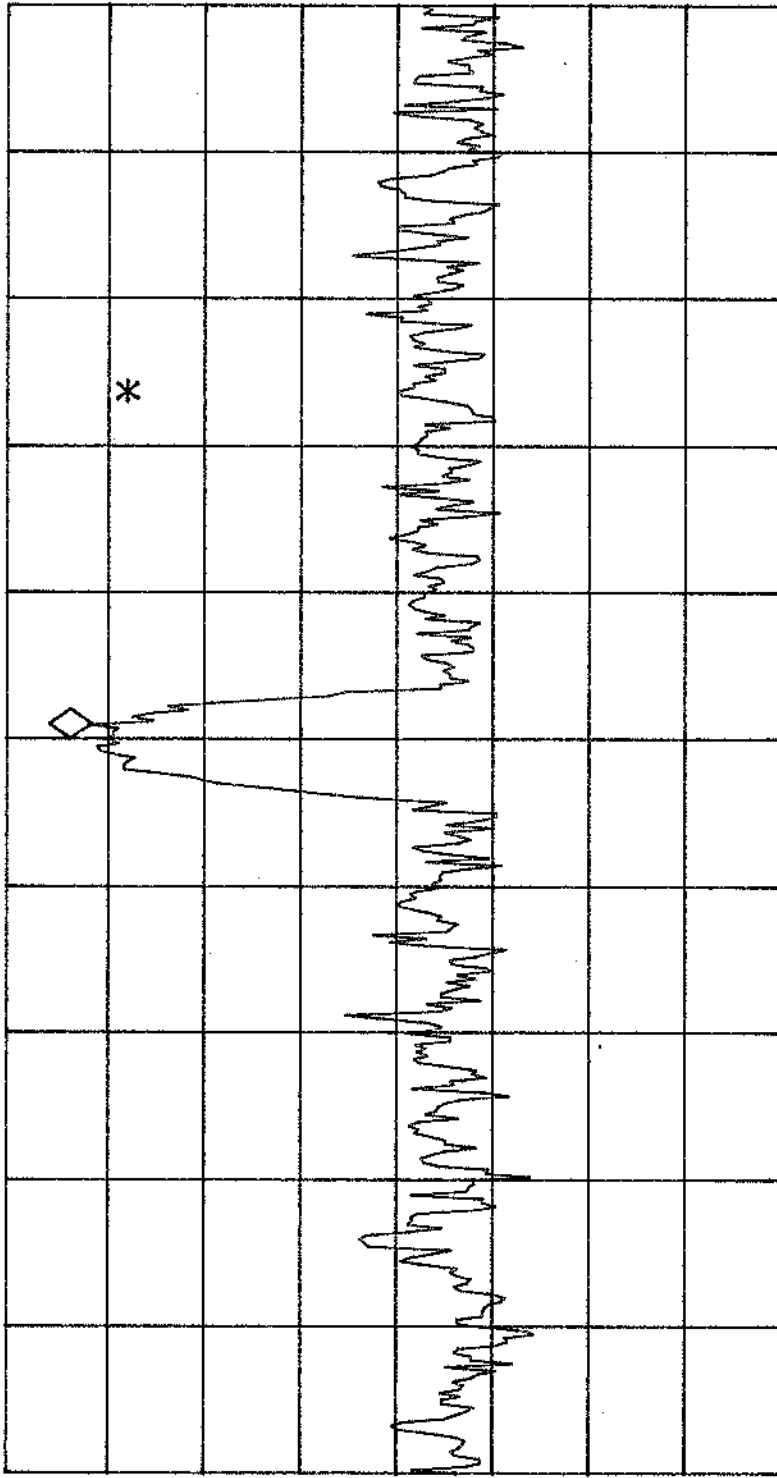
18:21:22 JAN 15, 1999  
HP

REF LEVEL  
-4.4 dBm

ACTV DET: PEAK  
MEAS DET: PEAK QP AVG  
MKR 2.4220003 GHz  
-6.16 dBm

REF OFFST 10.0 dB  
REF -4.4 dBm

LOG 2  
dB/  
ATN  
10 dB

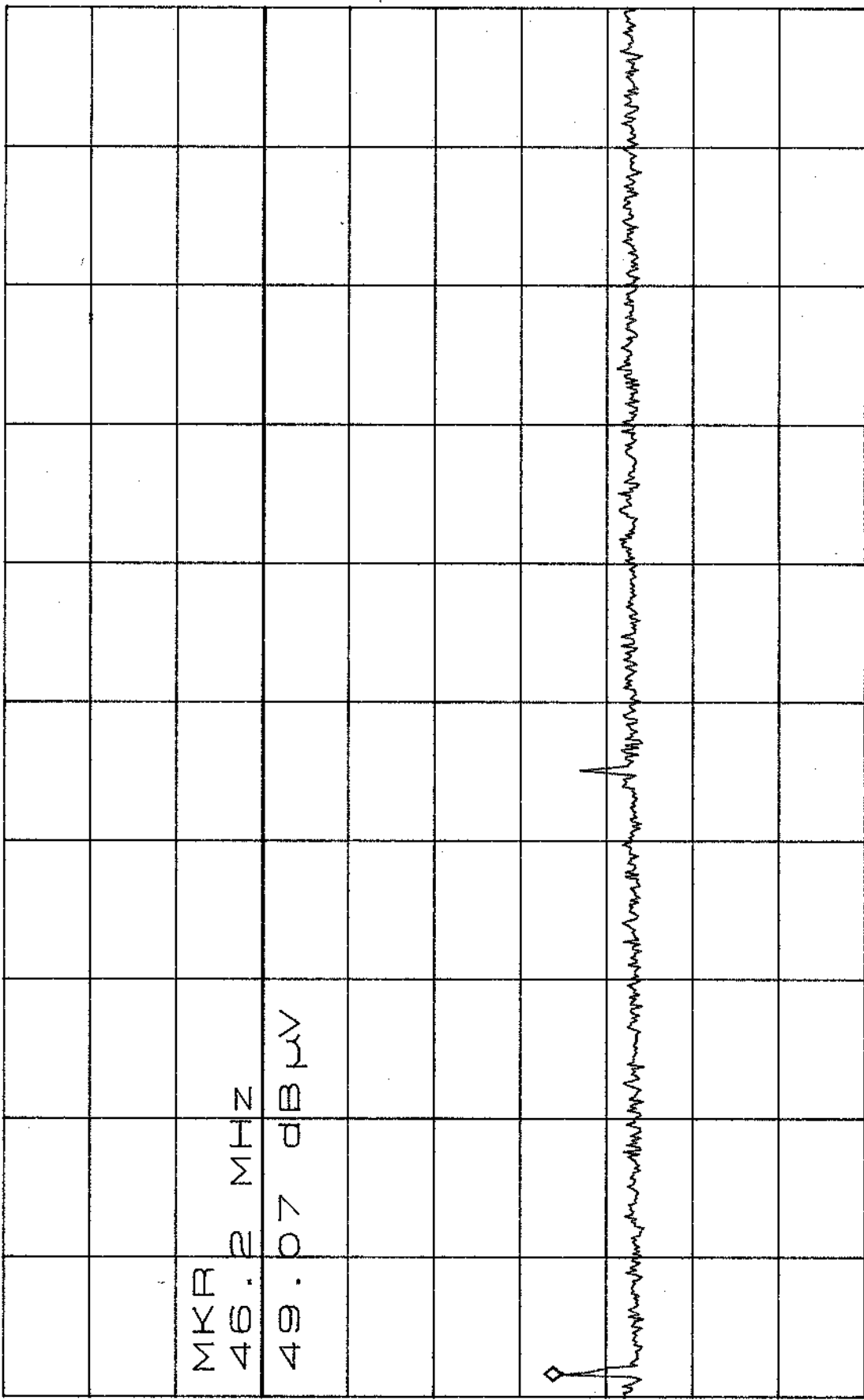


MA SB  
SC FC  
CORR

CENTER 2.4219973 GHz  
#IF BW 3.0 KHZ #AVG BW 3 KHZ SPAN 300.0 KHZ  
#SWP 100 sec

LOW CHANNEL

ATTEN 20dB MKR 49.07dB  $\mu$ V  
RL 113.9dB  $\mu$ V 10dB/ 46.2MHz



D

START 30.0MHz STOP 1.0000GHz  
\*RBW 100kHz \*VBW 100kHz SWP 250ms

LOW CHANNEL

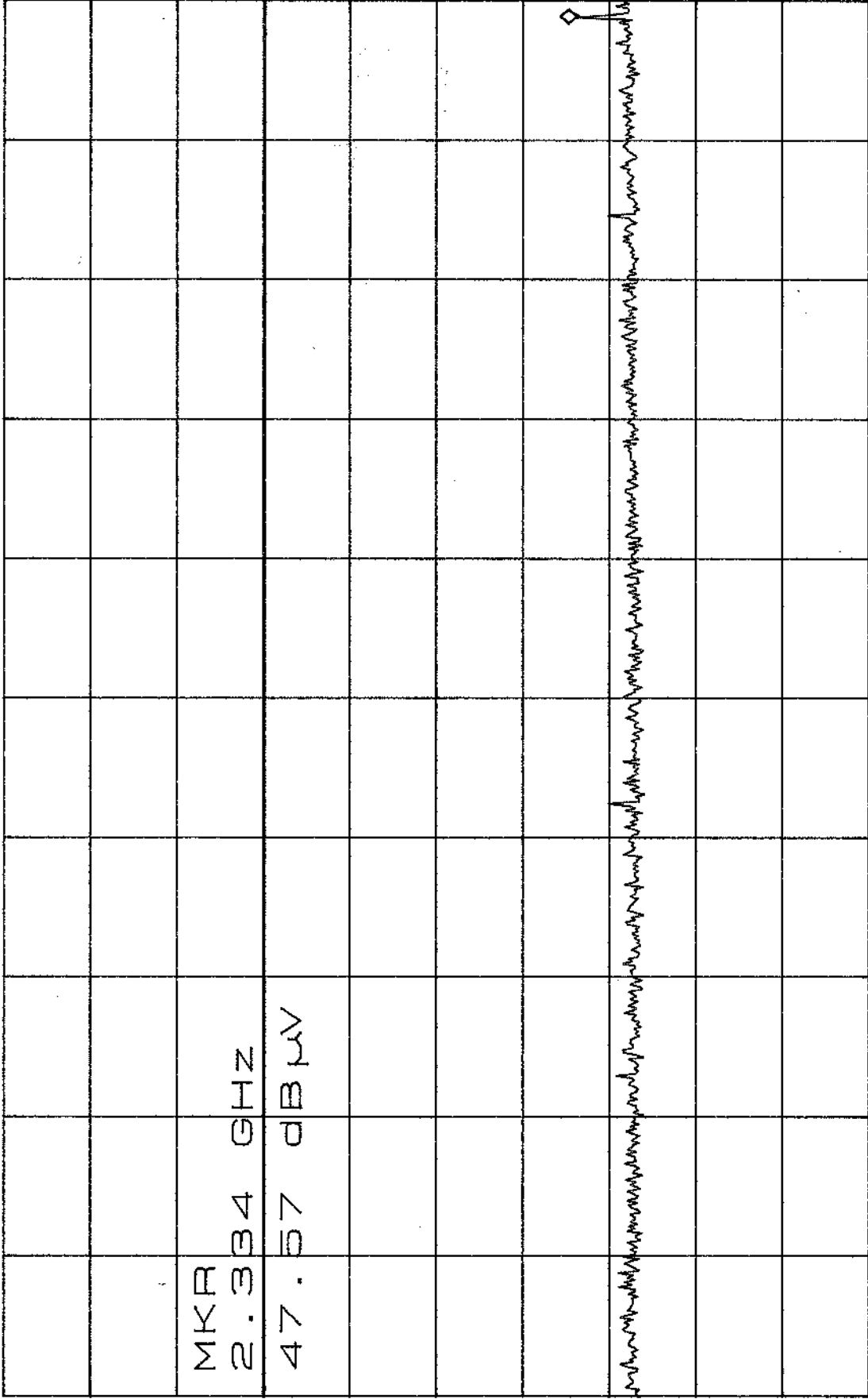
ATTEN 20dB

MKR 47.57dB $\mu$ V

RL 113.9dB $\mu$ V

2.334GHz

10dB/



D

START 1.000GHz

STOP 2.350GHz

\*RBW 100kHz

\*VBW 100kHz

SWP 340ms

LOW CHANNEL

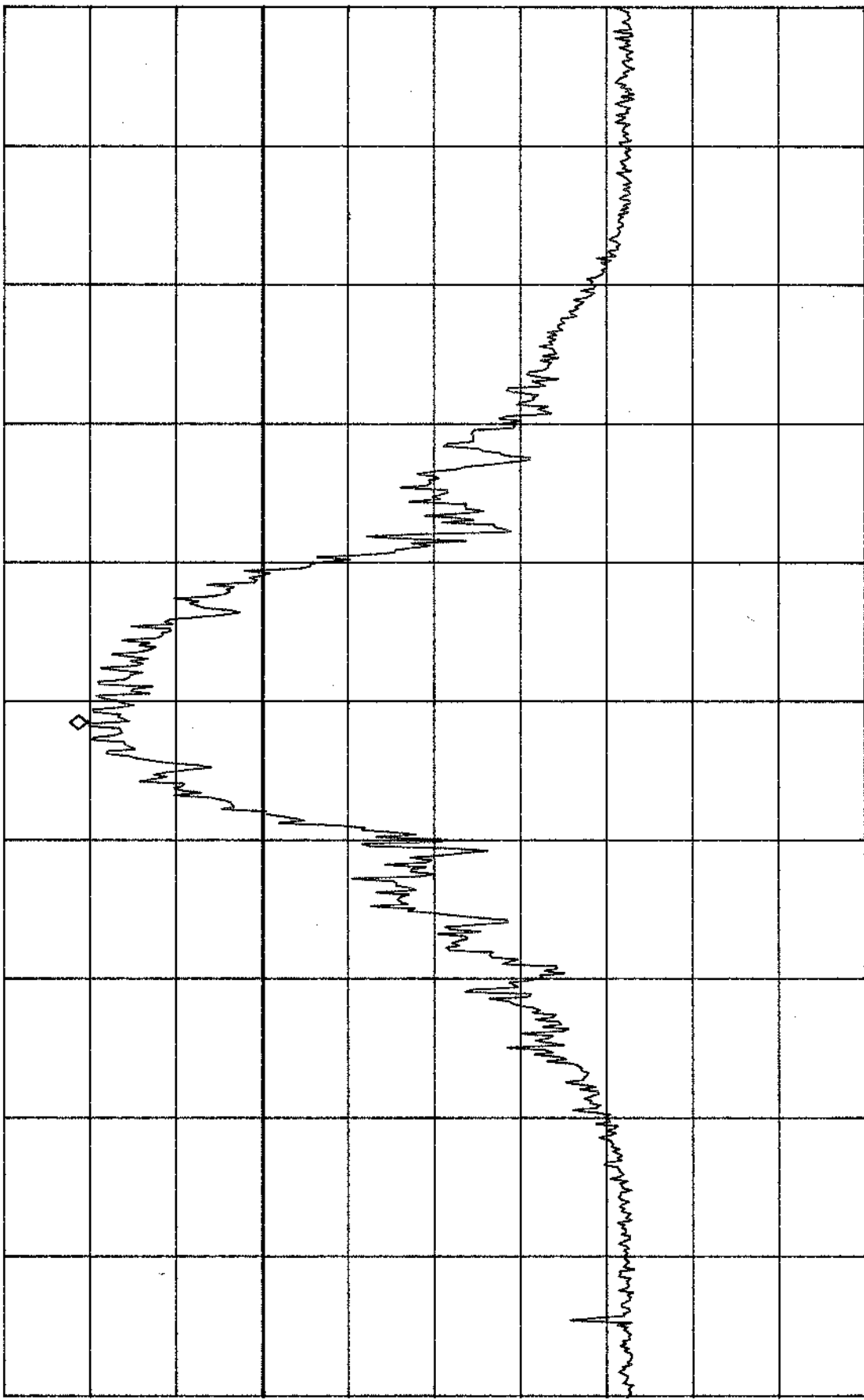
ATTEN 20dB

MKR 104.23dB $\mu$ V

RL 113.9dB $\mu$ V

10dB/

2.4210GHZ



D

CENTER 2.4240GHZ

SPAN 200.0MHZ

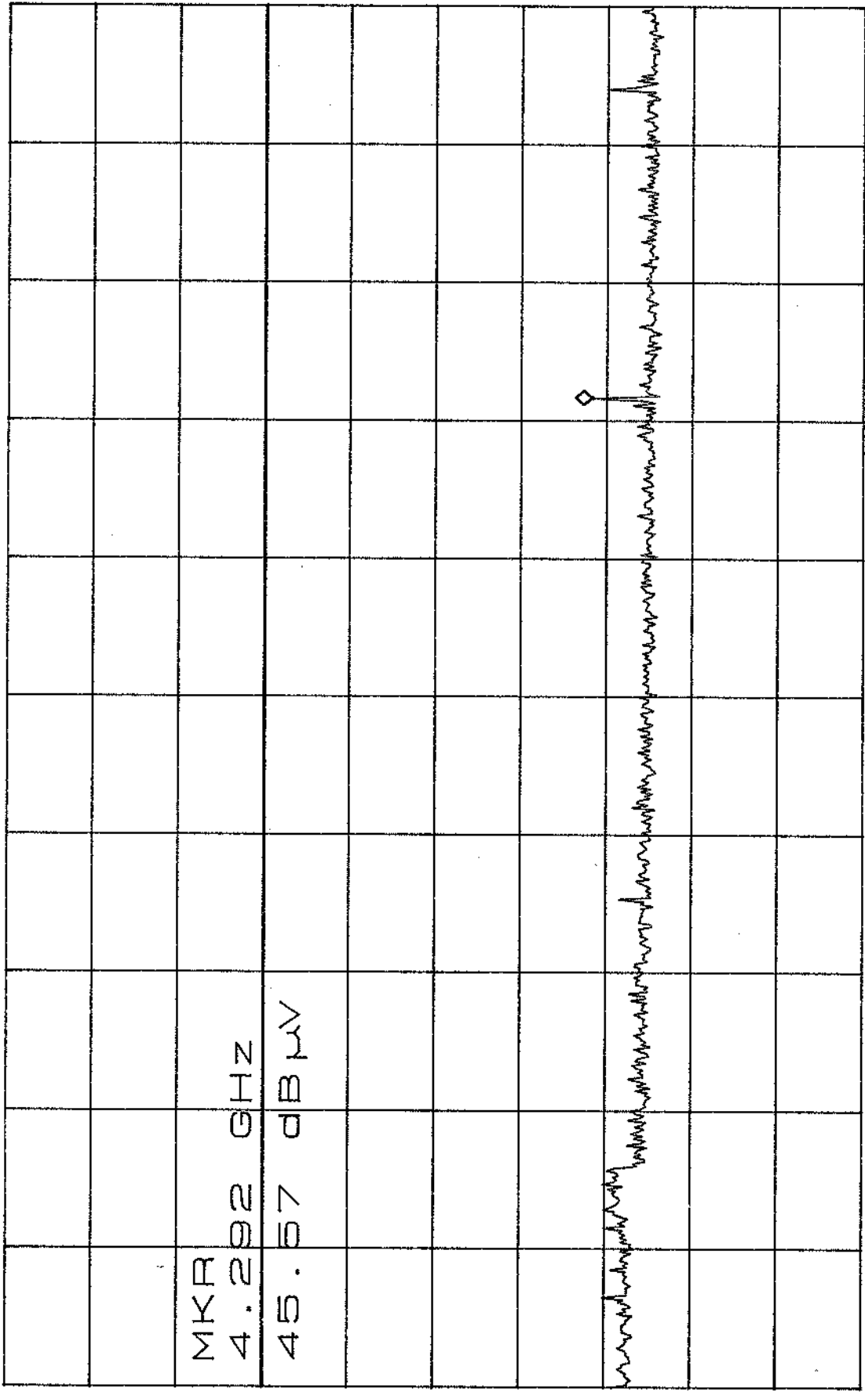
\*RBW 100KHZ

\*VBW 100KHZ

SWP 50MS

LOW CHANNEL

ATTEN 20dB MKR 45.57dB  $\mu$ V  
RL 113.9dB  $\mu$ V 10dB/ 4.292GHz

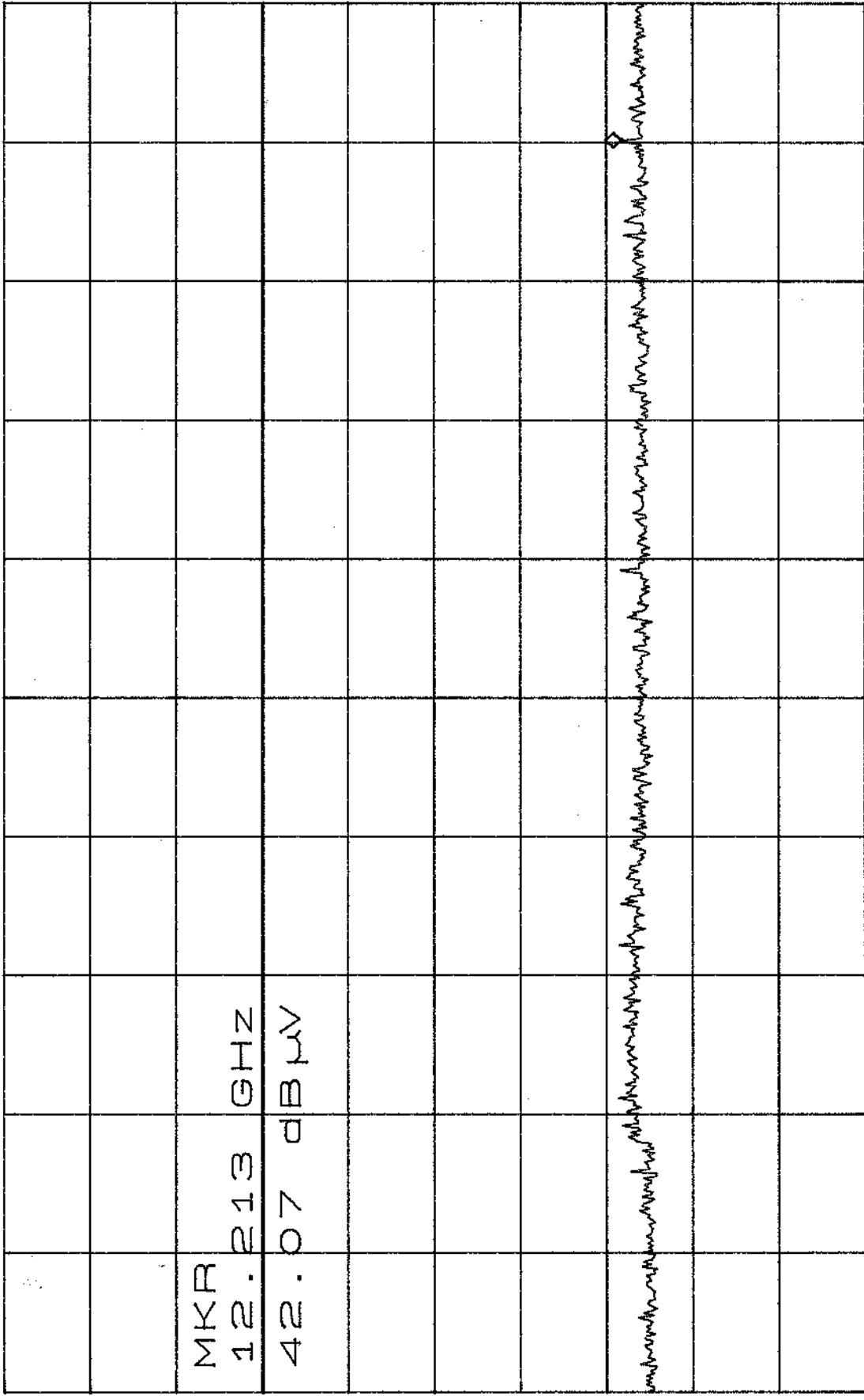


D

START 2.500GHz STOP 5.000GHz  
\*RBW 100kHz \*VBW 100kHz SWP 630ms

LOW CHANNEL

ATTEN 20dB MKR 42.07dB $\mu$ V  
RL 113.9dB $\mu$ V 10dB/ 12.213GHZ



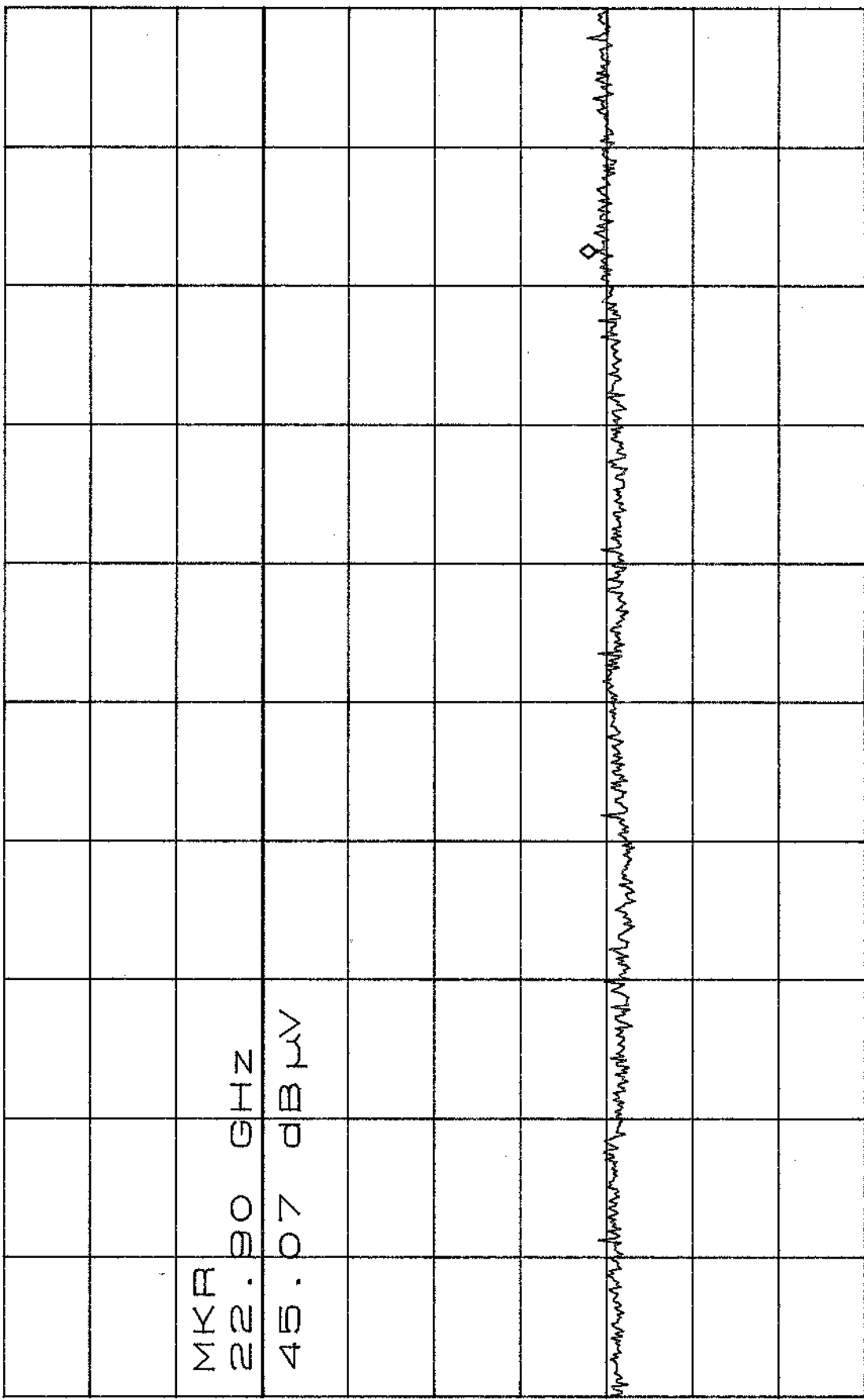
D

START 5.000GHZ STOP 13.000GHZ  
\*RBW 100KHZ \*VBW 100KHZ SWP 2.0sec



LOW CHANNEL

ATTEN 20dB MKR 45.07dB $\mu$ V  
RL 113.9dB $\mu$ V 10dB/ 22.90GHZ



D

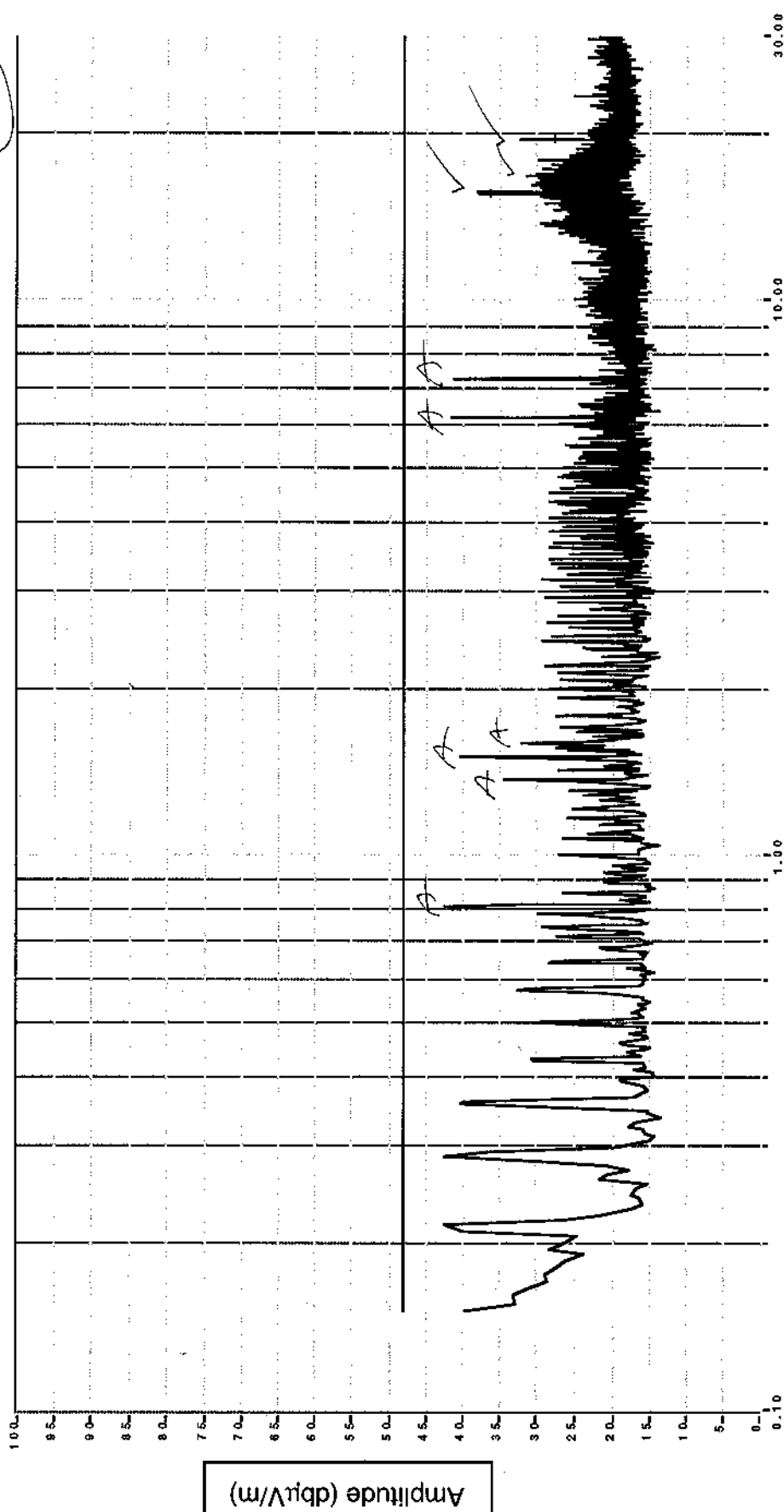
START 13.00GHZ STOP 25.00GHZ  
\*RBW 100KHZ \*VBW 100KHZ SWP 3.0sec



SVOATS #1: ShareWave 2.4GHz Radio Run

Spec:  
FCCB

Meins Lead  
Line 1



Scan  
Peak  
Gussl-peak  
Average  
QuasiPeak  
Limit 2

X \*  
+ +  
+ +  
+ +  
+ +  
+ +

1/15/1999  
Rudy Suy

Frequency (MHz)

120V, 60HZ.

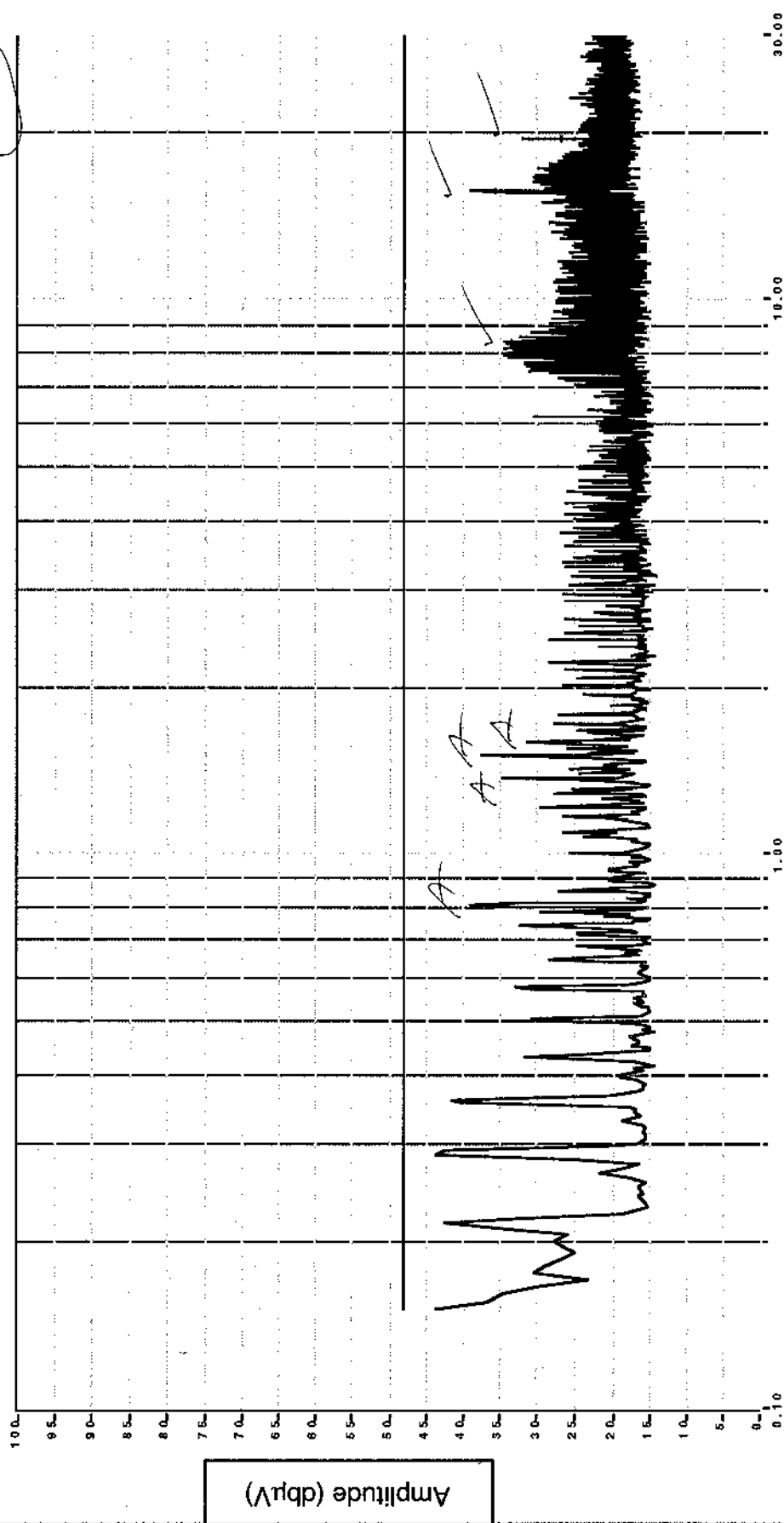
*VEUT A = AMBIENT*



SVOATS #1: ShareWave 2.4GHz Radio Run

Spec:  
FCC B

Minus Lead  
Neutral



Frequency (MHz)

120V, 60HZ

✓ EUT A = AMBIENT

Scan	Peak	Quasi-peak	Average	QuasiPeak	Limit 2

1/15/1999  
Rudy Suy

# Test Equipment List - SVOATS#1

January 4, 1999

<u>Manufacturer/Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Interval</u>	<u>Last Cal</u>	<u>Cal Due</u>
<input type="checkbox"/> Elliott Laboratories FCC / CISPR LISN	LISN-3, OATS	304	12	6/24/98	6/24/99
<input type="checkbox"/> EMCO Biconical Antenna, 30-300 MHz	3110B	363	12	4/8/98	4/8/99
<input type="checkbox"/> EMCO D. Ridge Horn Antenna, 1-18GHz	3115	487	12	6/18/98	6/18/99
<input checked="" type="checkbox"/> EMCO D. Ridge Horn Antenna, 1-18GHz	3115	868	12	9/22/98	9/22/99
<input type="checkbox"/> EMCO Log Periodic Antenna, 0.3-1 GHz	3146A	364	12	4/8/98	4/8/99
<input type="checkbox"/> Hewlett Packard EMC Receiver /Analyzer	8595EM	780	12	1/4/99	1/4/2000
<input type="checkbox"/> Hewlett Packard EMC Receiver /Analyzer	8595EM	787	12	11/23/98	11/23/99
<input type="checkbox"/> Hewlett Packard Microwave Preamplifier, 1-26.5GHz	8449B	263, (F303)	12	6/8/98	6/8/99
<input type="checkbox"/> Hewlett Packard Microwave Preamplifier, 1-26.5GHz	8449B	785	12	11/25/98	11/25/99
<input checked="" type="checkbox"/> Hewlett Packard Microwave Preamplifier, 1-26.5GHz	8449B	870	12	11/12/98	11/12/99
<input checked="" type="checkbox"/> Hewlett Packard Power Meter	432A	259, (F304)	12	3/10/98	3/10/99
<input checked="" type="checkbox"/> Hewlett Packard Spectrum Analyzer	8563E	284, (F194)	12	1/14/98	1/14/99
<input type="checkbox"/> Hewlett Packard Spectrum Analyzer, 9 KHz-6.5 GHz	8595E-041-103-	Metric, 885	12	5/11/98	5/11/99
<input type="checkbox"/> Hewlett Packard Thermistor Mount	478A	652	12	3/10/98	3/10/99
<input type="checkbox"/> Narda West High Pass Filter	HPF 180	821	12	8/10/98	8/10/99
<input type="checkbox"/> Narda-West EMI Filter 2.4 GHz, High Pass	60583 HPF-161	248	12	4/27/98	4/27/99
<input checked="" type="checkbox"/> Narda-West EMI Filter 5.6 GHz, High Pass	60583 HXF370	247	12	4/27/98	4/27/99
<input type="checkbox"/> Rohde & Schwarz 10 dB Pad / Pulse Limiter	ESH3Z2	372	12	6/22/98	6/22/99
<input checked="" type="checkbox"/> Rohde & Schwarz Test Receiver, 0.009-30 MHz	ESH3	215, (F197)	12	1/16/98	1/16/99
<input type="checkbox"/> Rohde & Schwarz Test Receiver, 20-1300MHz	ESVP	273	12	8/6/98	8/6/99

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File Number: 729909

Date: 1/15/99  
Engr: [Signature]

1/15/99  
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1/14/99  
[Signature]