

**Application for Type Acceptance
for an RF Power Amplifier**

TPL Communications

3370 San Fernando Rd. # 206

Los Angeles, CA 90065

RF Power Amplifier:

Part # RS3-2AB-AIR

FCC ID: BBD3-2AB-A

Report # RA054491/80112

This report was prepared in accordance with the requirements of FCC rules and regulations Part 2, Subpart J, 2.981 thru 2.1005, Part 22, Part 90, and other applicable sections of the rules as indicated herein.

Prepared By:

Jake Tynes

**DNB ENGINEERING, INC.
3535 W. Commonwealth Ave.
Fullerton, Ca 92833**

04 May 1998

Table of Contents

Section	Title	Page #
1.0	ADMINISTRATIVE DATA	1
1.1	Certifications and Qualifications	1
1.2	Measurements Repeatability Information	1
Paragraph numbers in this report follow the application section numbers found in the FEDERAL COMMUNICATIONS COMMISSION Rules and Regulations, Part 2, Subpart J for Type Acceptance of electronic equipment.		
2.983(a)	Request for Type Acceptance	2
2.983(b)	Equipment Identification	2
2.983(c)	Anticipated Production	2
2.983(d)	Technical Description	3
2.983(d)(1)	Type or Types of Emissions	3
2.983(d)(2)	Frequency Range	3
2.983(d)(3)	Operating Power level	3
2.983(d)(4)	Maximum Power Allowed in Applicable part(s) of The Rules	4
2.983(d)(5)	Final RF Amplifier Input Power	4
2.983(d)(6)	Function of all Active Circuit Devices	4
2.983(d)(7)	Circuit Diagram	5
2.983(d)(8)	Instruction Book	5
2.983(d)(9)	Tune Up Procedure	5
	Figure 1. Circuit Diagrams	6
	Figure 2..Block Diagram (I/O Tests)	7
2.983(e)	Test Data	8
2.983(e)(1)	Measurement of RF Power Output Per 2.985 ..	8
2.983(e)(2)	Measurement of Modulation Characteristics Per 2.987(a)(1)	9
2.983(e)(3)	Measurement of Occupied Bandwidth Per 2.989	10
	Figure 3. Occupied Bandwidth (I/O Tests) ..	11
	Plots	12-39

Table of Contents

(Continued)

Section	Title	Page #
2.983(e) (4)	Measurement of Antenna Conducted Spurious Emission Per 2.991	40
	Figure 4. Block Diagram Surious Emissions	41
	Plots Spurious Emissions	42-55
2.983(e) (5)	Measurement of Radiated Spurious Per 2.993	56
	Table I	57
2.983(e) (6)	Measurement of Frequency Stability Per 2.995	58
2.983(e) (7)	Frequency Spectrum to be Investigated Per 2.997	58
2.983(f)	FCC ID: Label	59
2.983(g)	Photographs and/or Drawings Showing Equipment Construction Technique	60-67
2.983(h)	Description and Test Data for Encoding Device(s)	68
2.983(i)	Type Acceptance Data for an External power Amplifier used in the Amateur Radio Service Part 97	68
APPENDIX A	<i>Test Equipment</i>	A1
APPENDIX B	<i>Service/Operating Manual</i>	B1

1.0

ADMINISTRATIVE DATA

1.1

Certifications and Qualifications

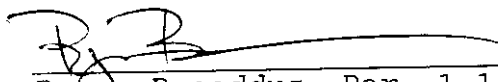
I certify that the tests performed in order to obtain the technical data presented in this application were performed by **DNB ENGINEERING, INC.** Also, based on the results of the enclosed data, I have concluded that the equipment tested meets or exceeds the requirements of the Rules and Regulations governing this application.

1.2

Measurement Repeatability Information

The test data presented in this report has been acquired using the guidelines set forth in FCC Part 2.981 through 2.1005, Part 22, and Part 90. The test results presented in this document are valid only for the equipment identified herein under the test conditions described. Repeatability of these test results will only be achieved with identical measurement conditions. These conditions include the same test distance, EUT height, measurement site characteristics, and the same EUT and system components. The system must have the same interconnecting cables arranged in identical placement to that shown in the setup photos, with the system and/or EUT functioning in the identical mode of operation (i.e. software and so on) as on the date of the test. Any deviation from the test conditions and environment on the date of test may result in measurement repeatability difficulties.

All changes made to the EUT during the course of testing as identified in this report must be incorporated in the EUT or identical models to ensure compliance with the FCC regulations.


Bryan Broaddus Par. 1.1
Manager, Test Department
DNB ENGINEERING, INC.
Phone # (714) 870-7781

2.983(a) **Request For Type Acceptance**

Name of Applicant: TPL Communications
3370 San Fernando Rd. # 206
Los Angeles, CA 90065

Applicant is: ☒ Manufacturer
☐ Vendor
☐ Licensee
☐ Prospective Licensee
☐ Other

Name of Manufacturer: TPL Communications

2.983(b) **Equipment Description**

The EUT is an RF Power Amplifier.

Part Number: RS3-2AB-AIR

FCC ID: BBD3-2AB-A

2.983(c) **Anticipated Production Quantity**

☐ One Unit
☒ Multiple Units

2.983(d) **Technical Description**

See the Service Manual Included in Appendix B
herein for the complete description.

2.983(d)(1) **Type(s) of Emissions**

A3E

2.983(d)(2) **Frequency Range**

118 - 136 MHz

2.983(d)(3) **Operating Power Level**

25 Watts

2.983(d)(4) **Maximum Power Allowed in Applicable Part(s) of the Rules**

<u>Rules Part</u>	<u>Maximum Power (Watts)</u>
Part 87	200 Watts

2.983(d)(5) **Final RF Amplifier Input Power**

4 Watts

2.983(d)(6) **Function of all Active Circuit Devices**

Please refer to Appendix B.

2.983(d)(7) **Circuit Diagram**

Refer to Figure in Appendix B.

2.983(d)(8) **Instruction Book(s)**

See Appendix B

2.983(d)(9) **Tune-Up Procedure**

Refer to Appendix B.

Circuit Diagram
2.983(d)(7)

SEE FIGURE IN APPENDIX B

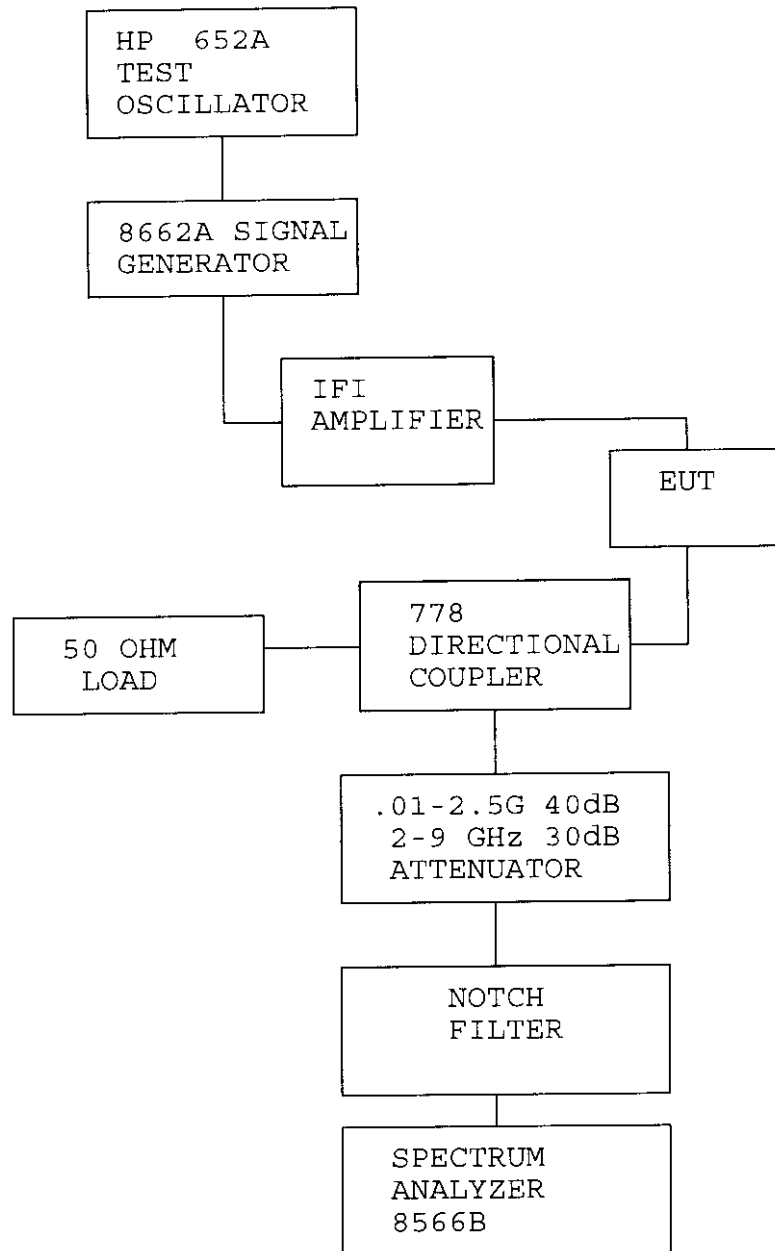


FIGURE 2. BLOCK DIAGRAM.
(POWER INPUT/OUTPUT TESTS)

2.983(e) **Test Data**

Refer to 2.983(e)(1) through 2.983(e)(7)

2.983(e)(1) **Measurement of RF Power Output per 2.985**

Definition: For RF Power Amplifiers.

Test Method: See Figure 2.

Output power is measured across a precision 50 ohm load with a wide-band sampling RF voltmeter.

Test Results:

Frequency	POWER OUTPUT		
	Nominal Voltage 26 VDC	85% Voltage 22.1 VDC	115% Voltage 29.9 VDC
136 MHz	25 W	21 W	29 W

2.983 (e) (2) **Measurement of Modulation Characteristics per
2.987(b)(1)**

This EUT is a power amplifier and contains no circuitry to modify the RF signal provided by the driver except to raise the power level.

2.983(e)(3) **Measurement of Occupied Bandwidth per 2.989**

Definition: Occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean power radiated by a given emission.

Test Method: Connect the equipment per Figure 3.

Measurements were made with the modulating signal at 2.5 kHz with 5 kHz of FM deviation.

Test Results: See Plots following Figure 3.

The center frequency of the signal did not shift with modulation. The spectrum bandwidth was well within the limits specified in the FCC regulations

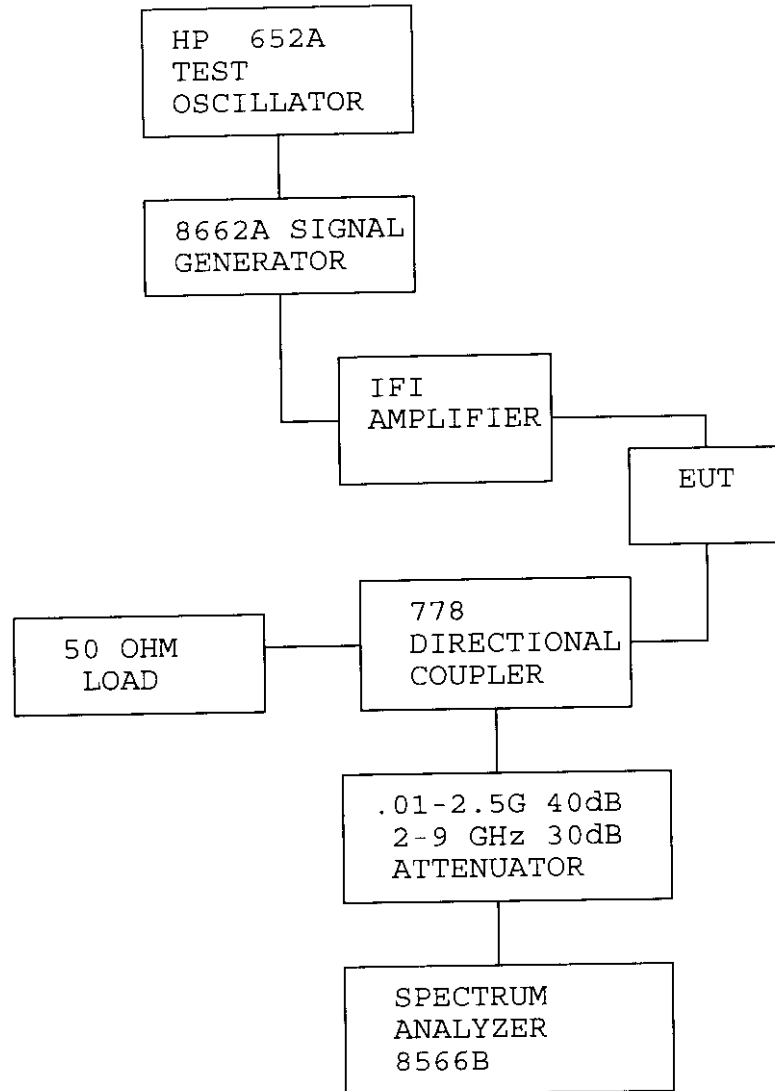


FIGURE 3. BLOCK DIAGRAM.
(OCCUPIED BANDWIDTH)

DRIVER OUTPUT: MODULATED CARRIER

MKR 118.000 0 MHz
35.30 dBm

4 WATTS

HP

REF

61.0 dBm

ATTEN 10 dB

10 dB/

POS PK

OFFSET

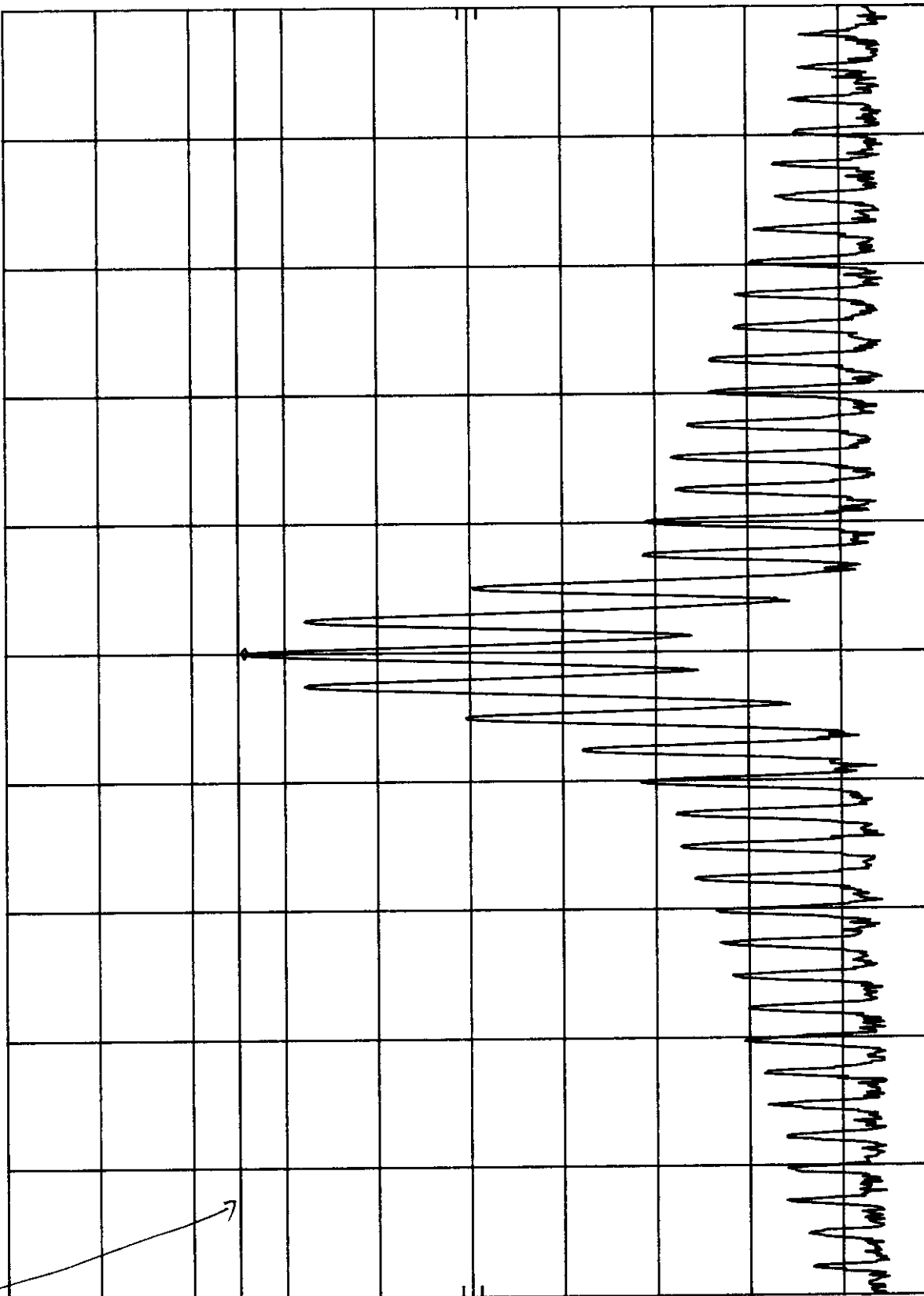
61.0

dB

DL

36.0

dBm



SPAN 100 kHz
SWP 3.00 sec

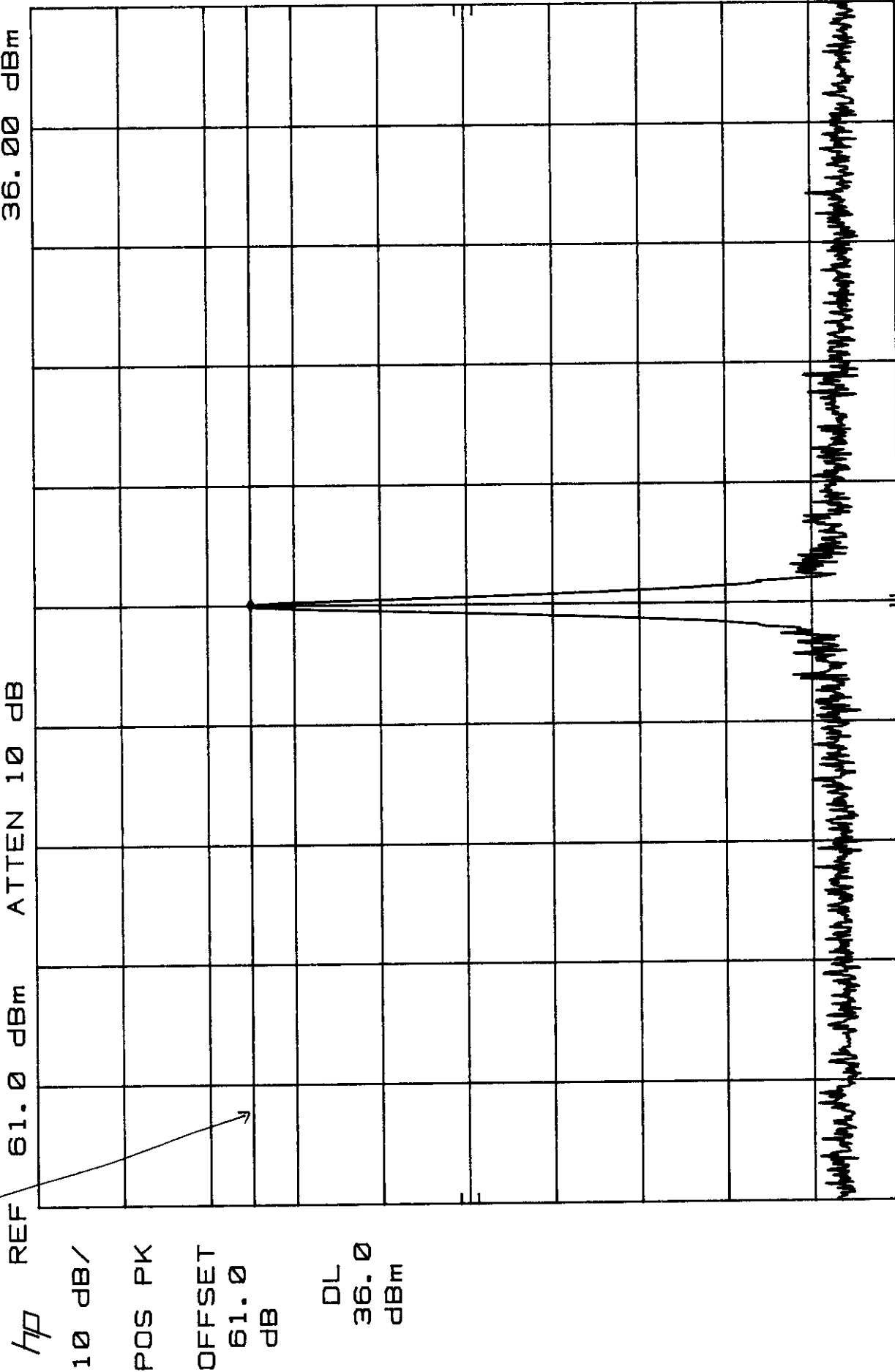
VBW 1 kHz

Hz

CENTER 118.000 MHz
RES BW 300

DRIVER OUTPUT: UNMODULATED CARRIER

DRIVER OUTPUT: UNMODULATED CARRIER

MKR 118.000 0 MHz
36.00 dBm

CENTER	118.000 MHz				
RES BW	300 Hz	VBW	1 kHz	SWP	3.00 sec
				SPAN	100 kHz

DRIVER OUTPUT: MODULATED CARRIER

MKR 122.000 0 MHz
35.30 dBm

4 WATTS

ATTEN 10 dB

61.0 dBm

REF

hp

10 dB/

POS PK

OFFSET

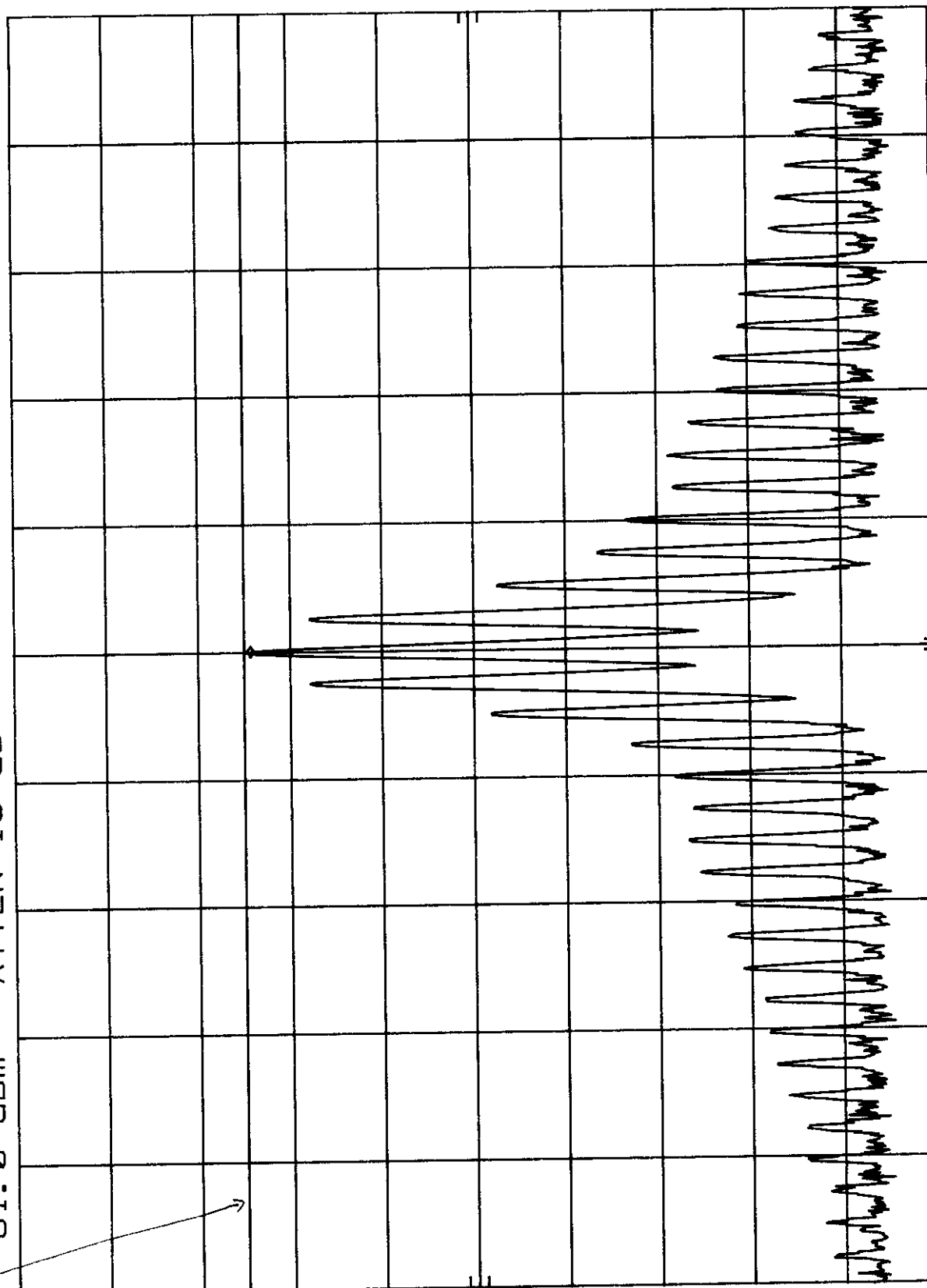
61.0

dB

DL

36.0

dBm



SPAN 100 kHz
SWP 3.00 sec

VBW 1 kHz

Hz

CENTER 122.000 MHz
RES BW 300

DRIVER OUTPUT: UNMODULATED CARRIER

MKR 122.000 0 MHz
36.00 dBm

4 WATTS

hp

10 dB/

POS PK

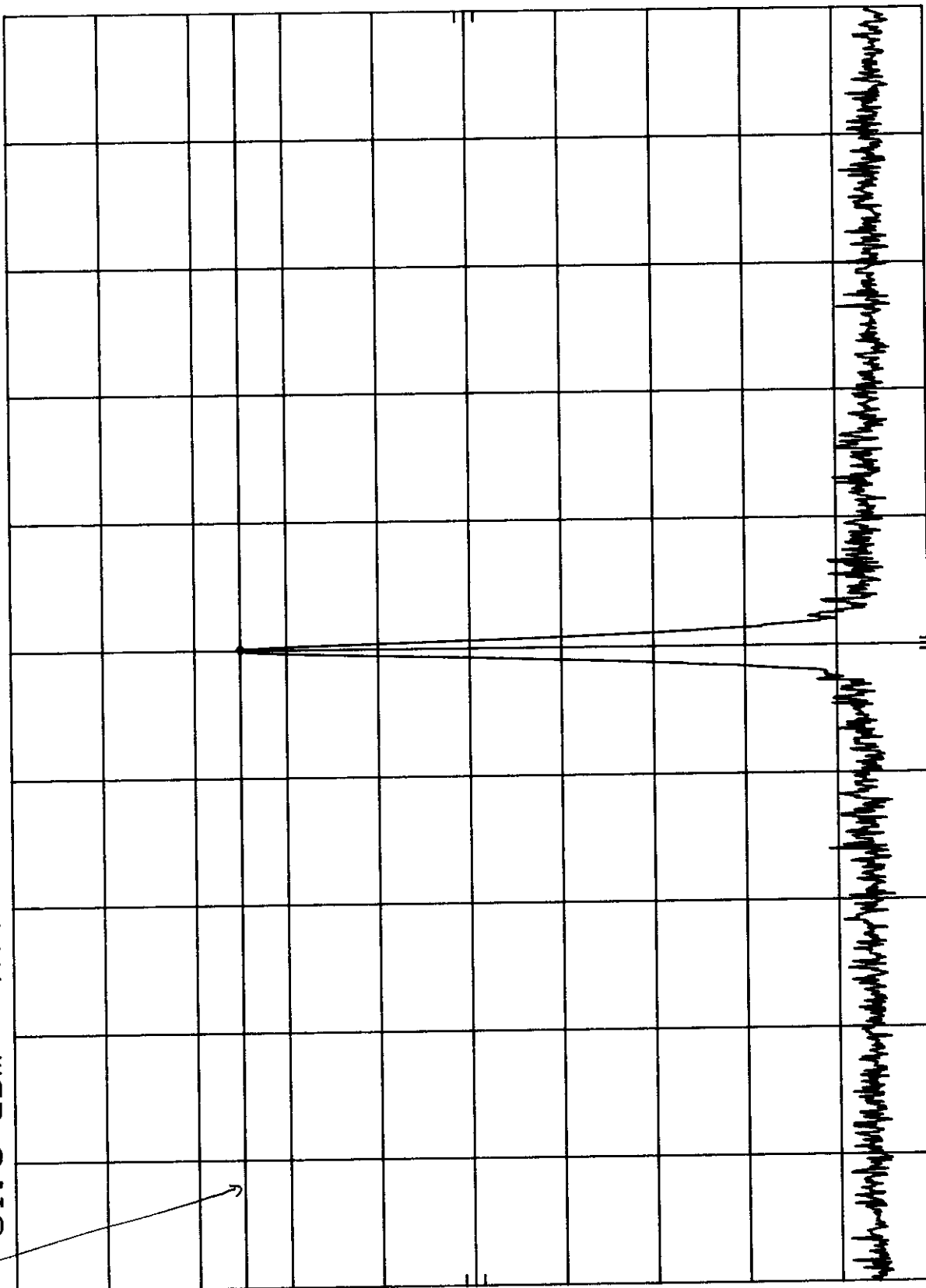
OFFSET

61.0
dB

DL
36.0
dBm

ATTEN 10 dB

REF 61.0 dBm



SPAN 100 KHz
SWP 3.00 sec

VBW 1 KHz

Hz

CENTER 122.000 MHz
RES BW 300

4 WATTS DRIVER OUTPUT: MODULATED CARRIER

MKR 123.000 0 MHz
35.30 dBm

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

POS PK

OFFSET

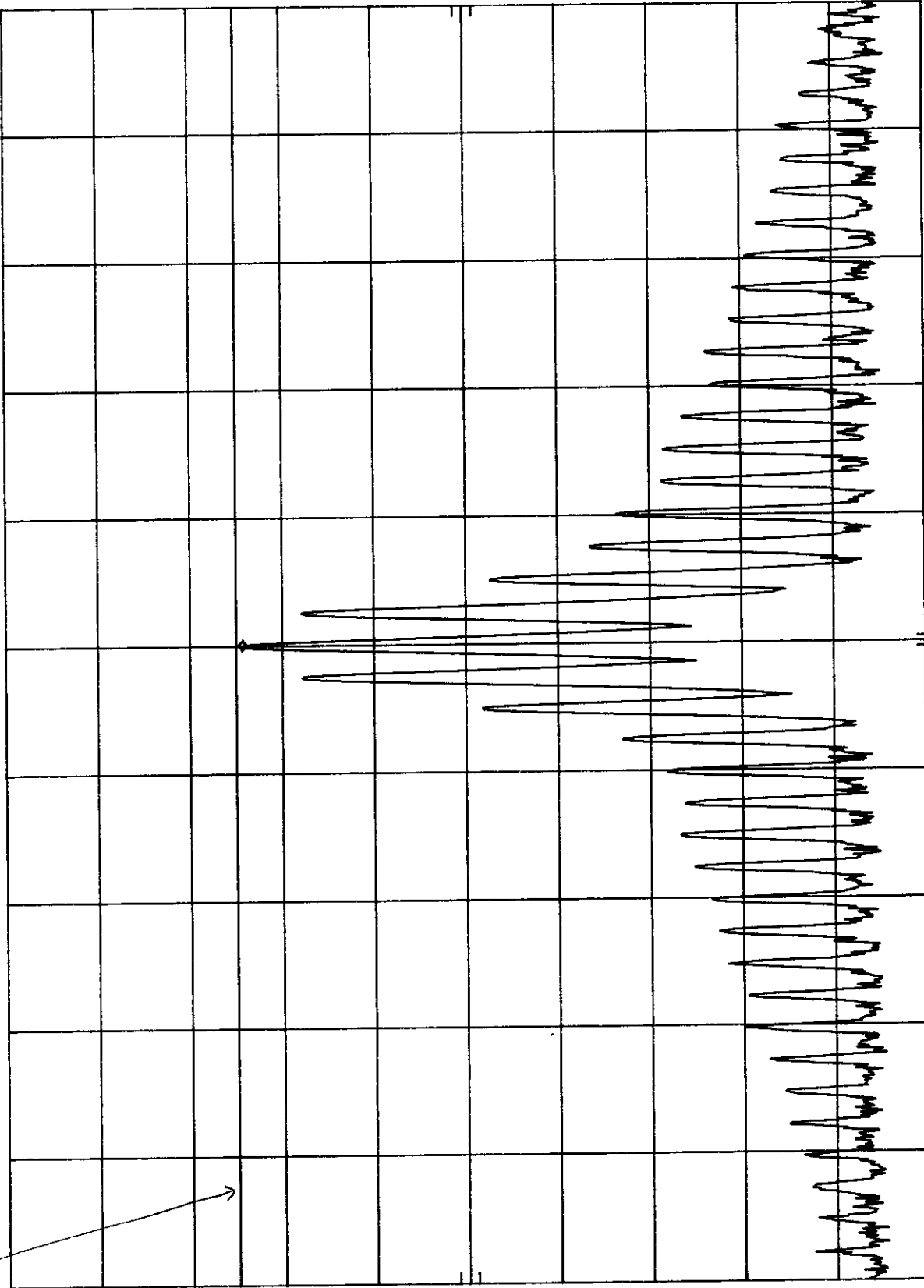
61.0

dB

DL

36.0

dBm



CENTER 123.000 MHz
RES BW 300 Hz

VBW 1 kHz

SPAN 100 kHz
SWP 3.00 sec

4 WATTS DRIVER OUTPUT: UNMODULATED CARRIER

MKR 123.000 0 MHz
36.00 dBm

h_p REF 61.0 dBm ATTEN 10 dB

h_p

10 dB/

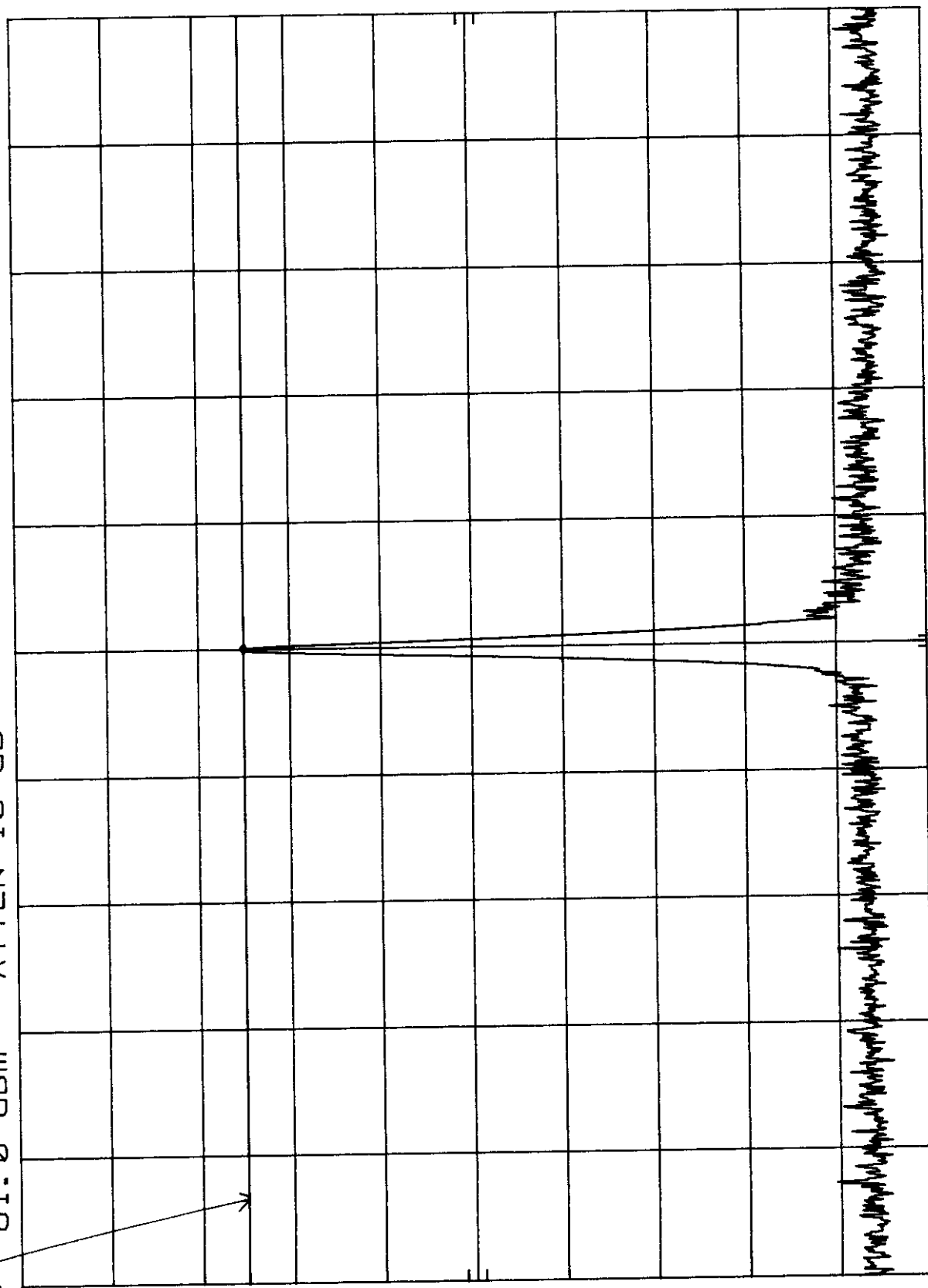
POS PK

OFFSET

61.0
dB

DL

36.0
dBm



CENTER 123.000 MHz
RES BW 300 Hz

SPAN 100 kHz
SWP 3.00 sec

VBW 1 kHz

4 WATTS DRIVER OUTPUT: MODULATED CARRIER

MKR 124.000 0 MHz
35.30 dBm

HP REF 61.0 dBm ATTN 10 dB

HP

10 dB/

POS PK

OFFSET

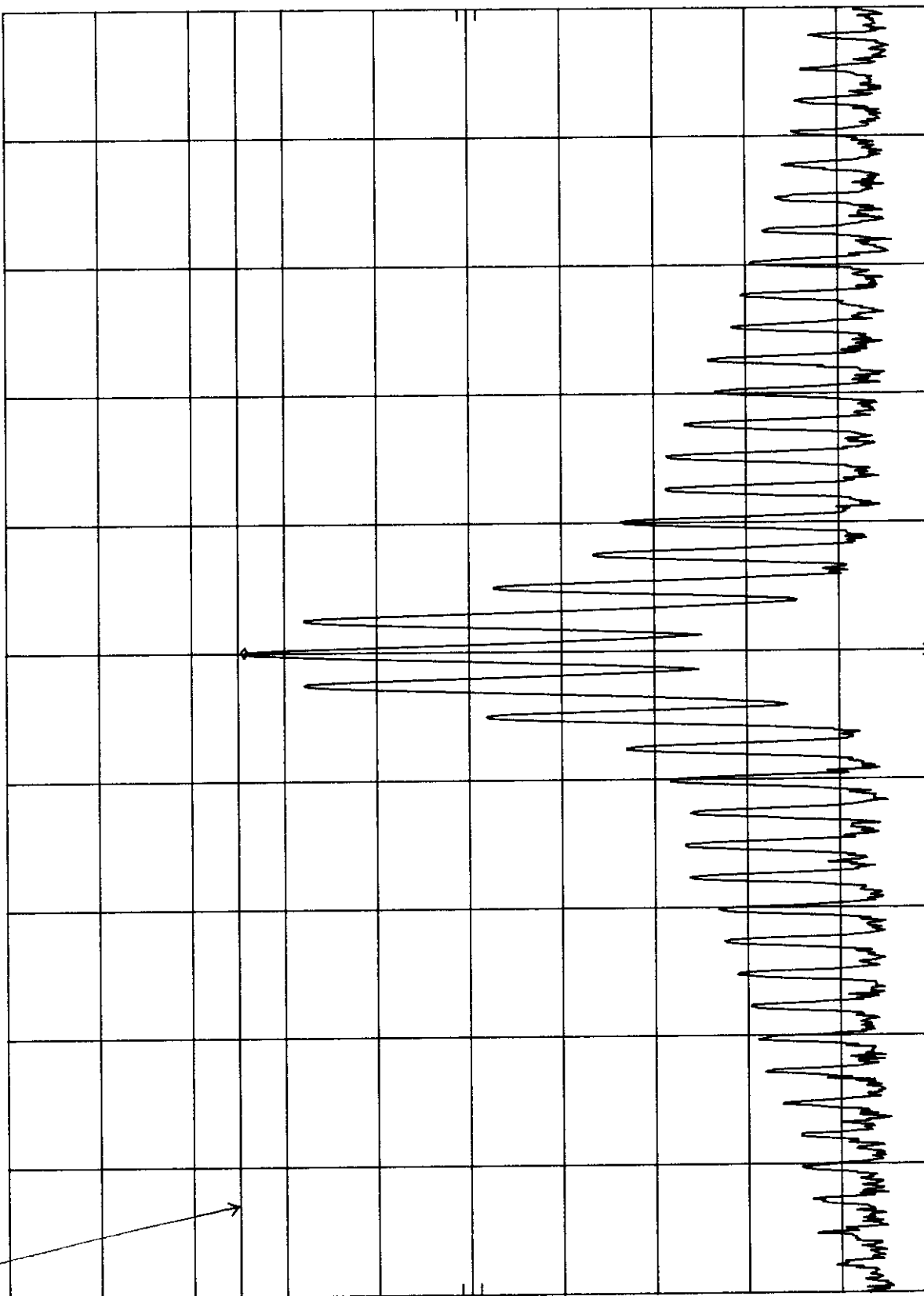
61.0

dB

DL

36.0

dBm



CENTER 124.000 MHz
RES BW 300 Hz
SPAN 100 KHz
SWP 3.00 sec
VBW 1 KHz

DRIVER OUTPUT: UNMODULATED CARRIER

MKR 124.000 0 MHz
36.00 dBm

4 WATTS

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

POS PK

OFFSET

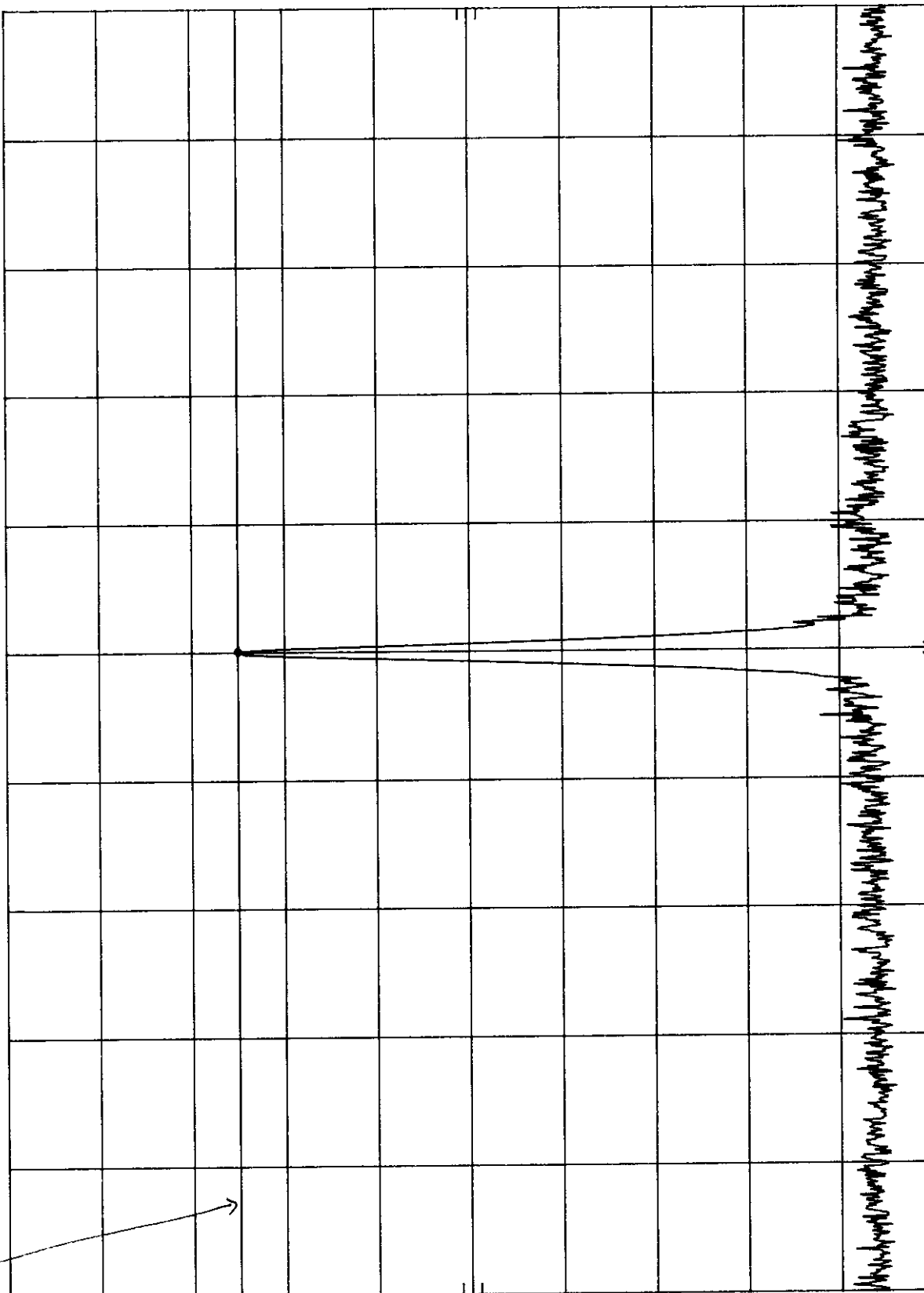
61.0

dB

DL

36.0

dBm



SPAN 100 KHz
SWP 3.00 sec

CENTER 124.000 MHz
RES BW 300 Hz

VBW 1 KHz

4 WATTS DRIVER OUTPUT: MODULATED CARRIER

MKR 128.000 0 MHz
35.30 dBm

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

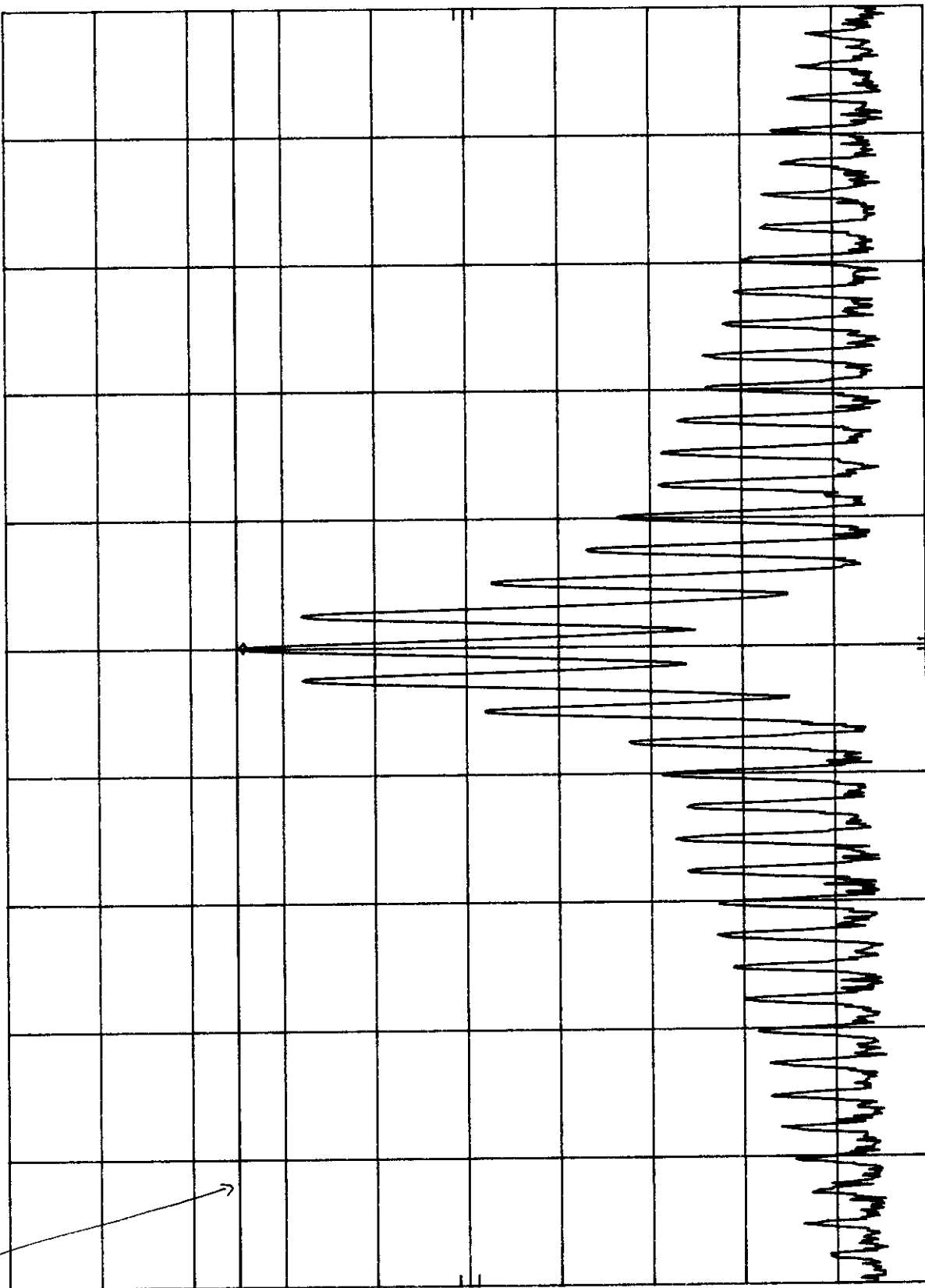
POS PK

OFFSET

61.0
dB

DL

36.0
dBm



SPAN 100 kHz
SWP 3.00 sec

VBW 1 kHz

Hz

CENTER 128.000 MHz
RES BW 300

4 WATTS DRIVER OUTPUT: UNMODULATED CARRIER

MKR 128.000 0 MHz
36.00 dBm

ATTEN 10 dB

REF 61.0 dBm

h₀

10 dB/

POS PK

OFFSET

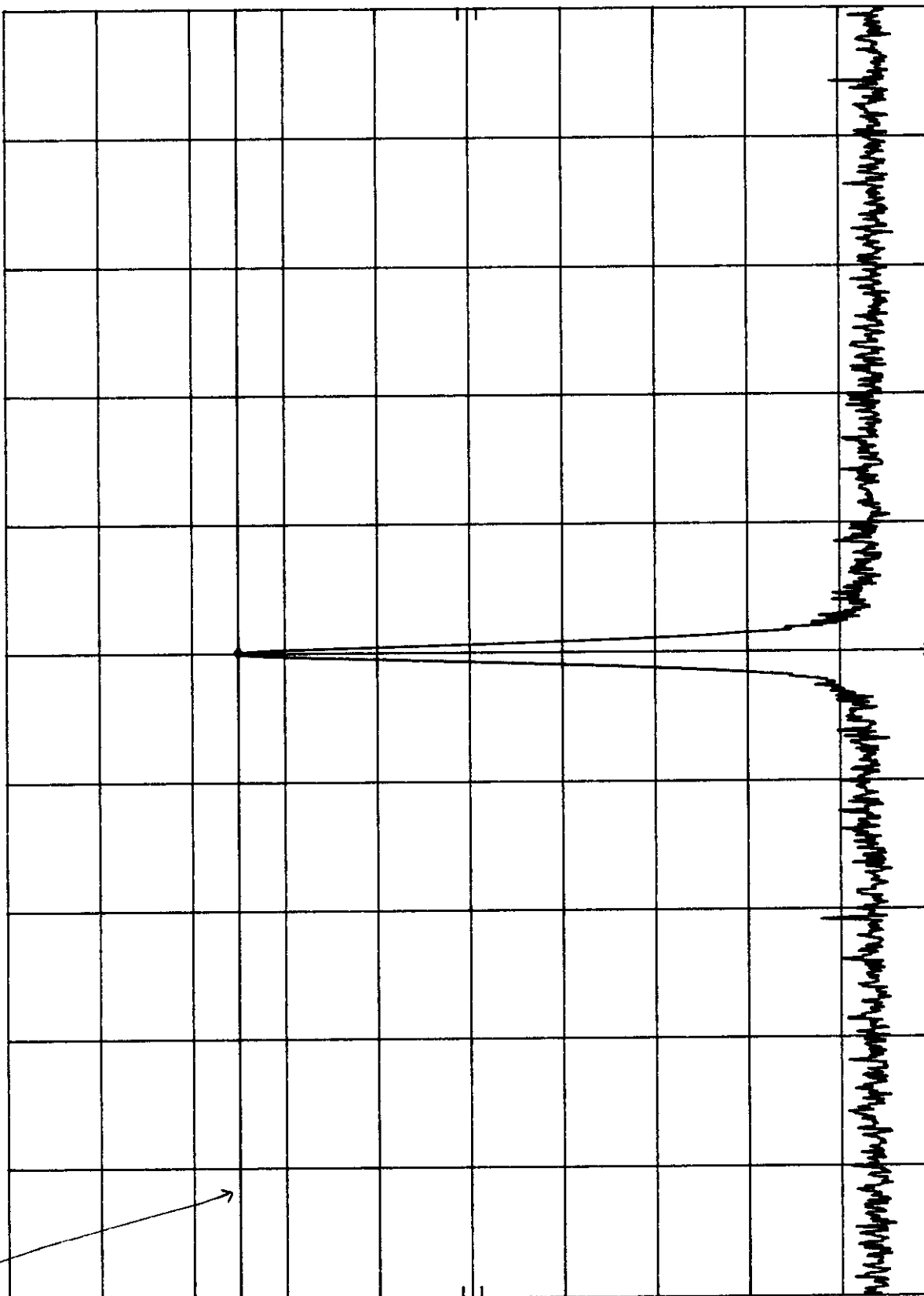
61.0

dB

DL

36.0

dBm



CENTER 128.000 MHz

Hz

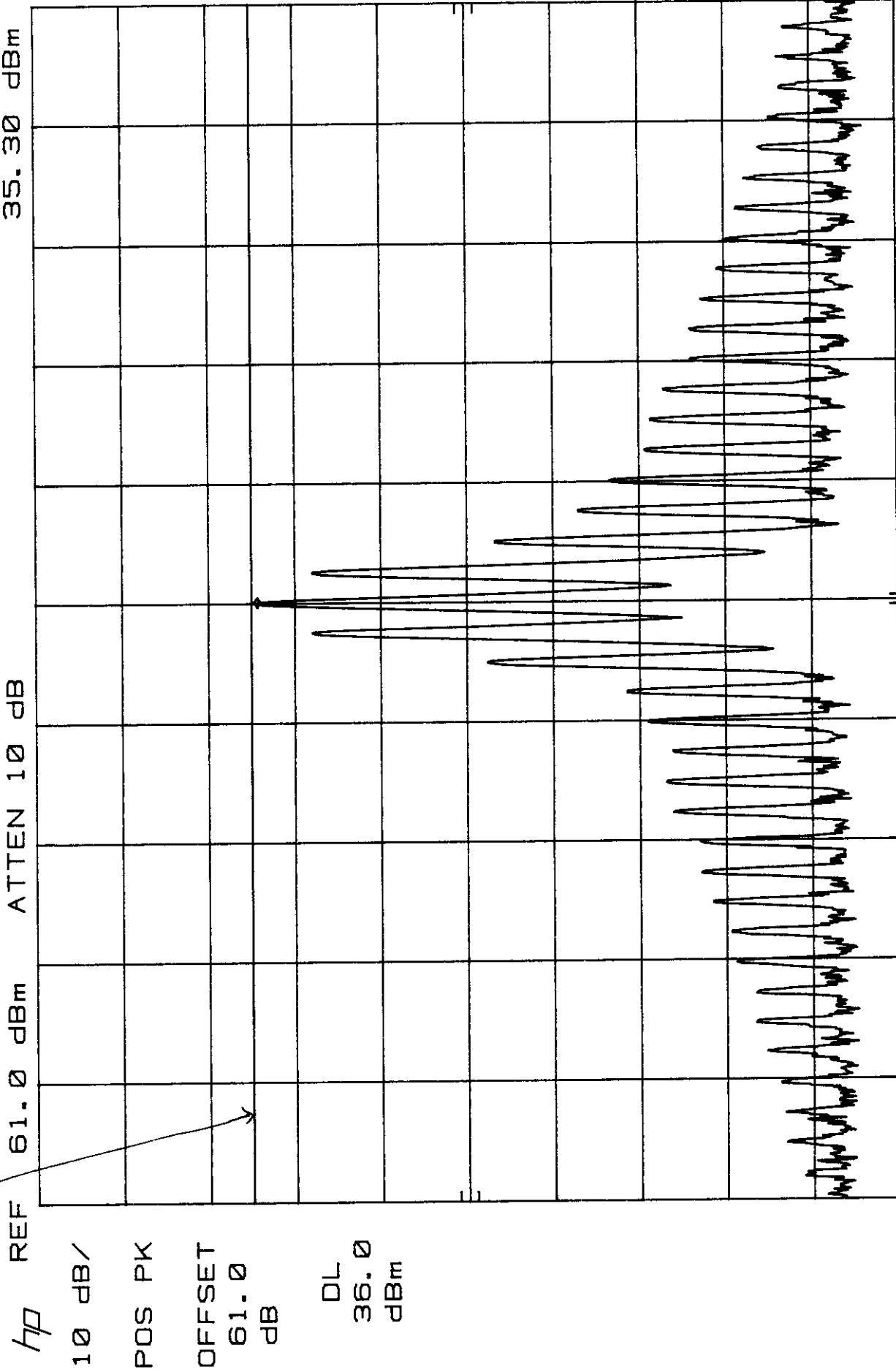
VBW 1 KHz

SWP 3.00 sec

SPAN 100 KHz

4 WATTS DRIVER OUTPUT: MODULATED CARRIER

MKR 132.000 0 MHz
35.30 dBm



4 WATTS DRIVER OUTPUT: UNMODULATED CARRIER

MKR 132.000 0 MHz
36.00 dBm

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

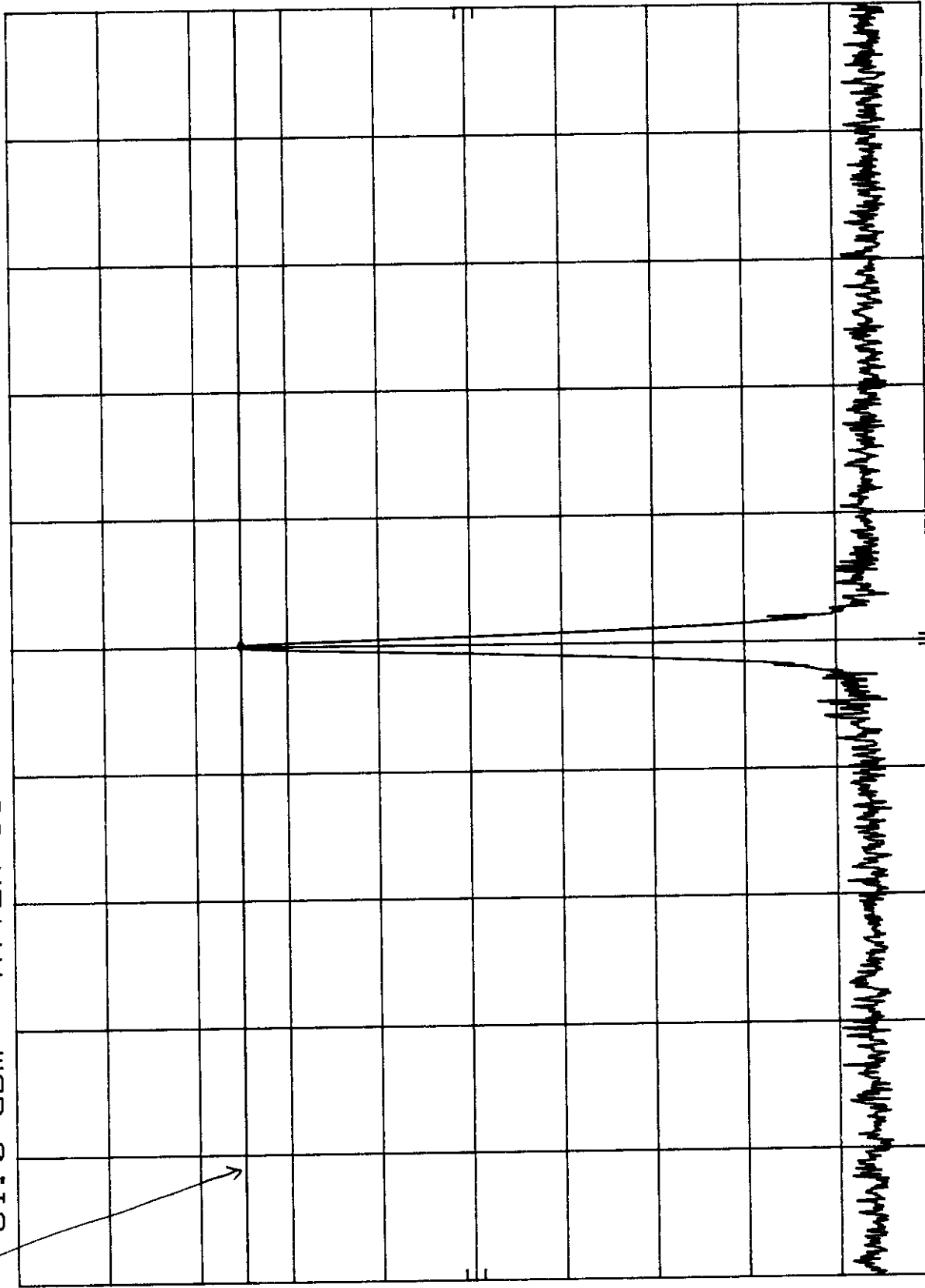
POS PK

OFFSET

61.0
dB

DL

36.0
dBm



CENTER 132.000 MHz
RES BW 300 Hz
VBW 1 KHz
SPAN 100 KHz
SWP 3.00 sec

4 WATTS DRIVER OUTPUT: MODULATED CARRIER

MKR 136.000 0 MHz
35.50 dBm

hp REF 61.0 dBm ATTN 10 dB

hp

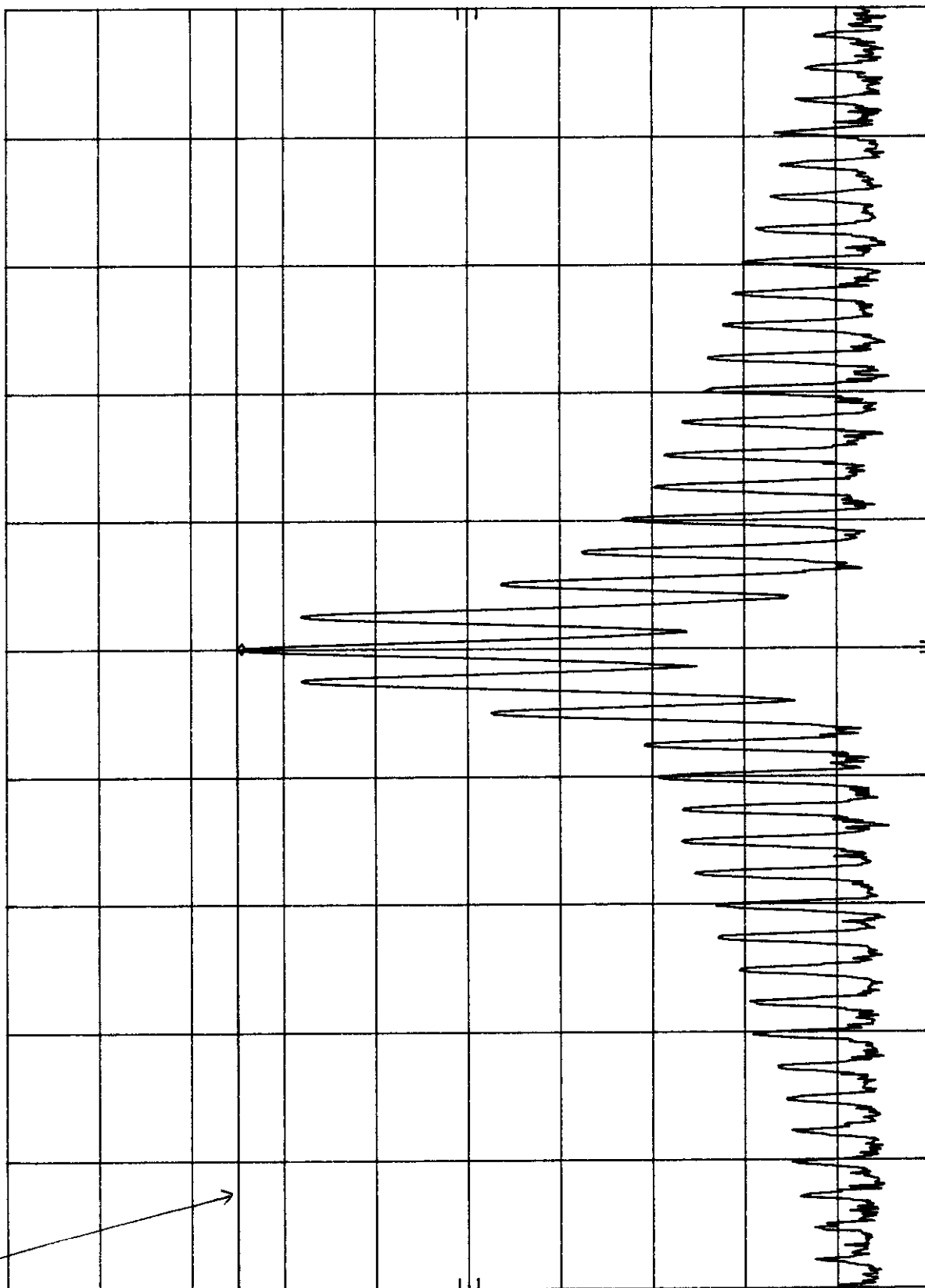
10 dB/

POS PK

OFFSET

61.0
dB

DL
36.0
dBm



CENTER 136.000 MHz
RES BW 300 Hz
SPAN 100 kHz
SWP 3.00 sec
VBW 1 kHz

4 WATTS DRIVER OUTPUT: UNMODULATED CARRIER

MKR 136.000 0 MHz
36.00 dBm

ATTEN 10 dB

REF 61.0 dBm

hp

10 dB/

POS PK

OFFSET

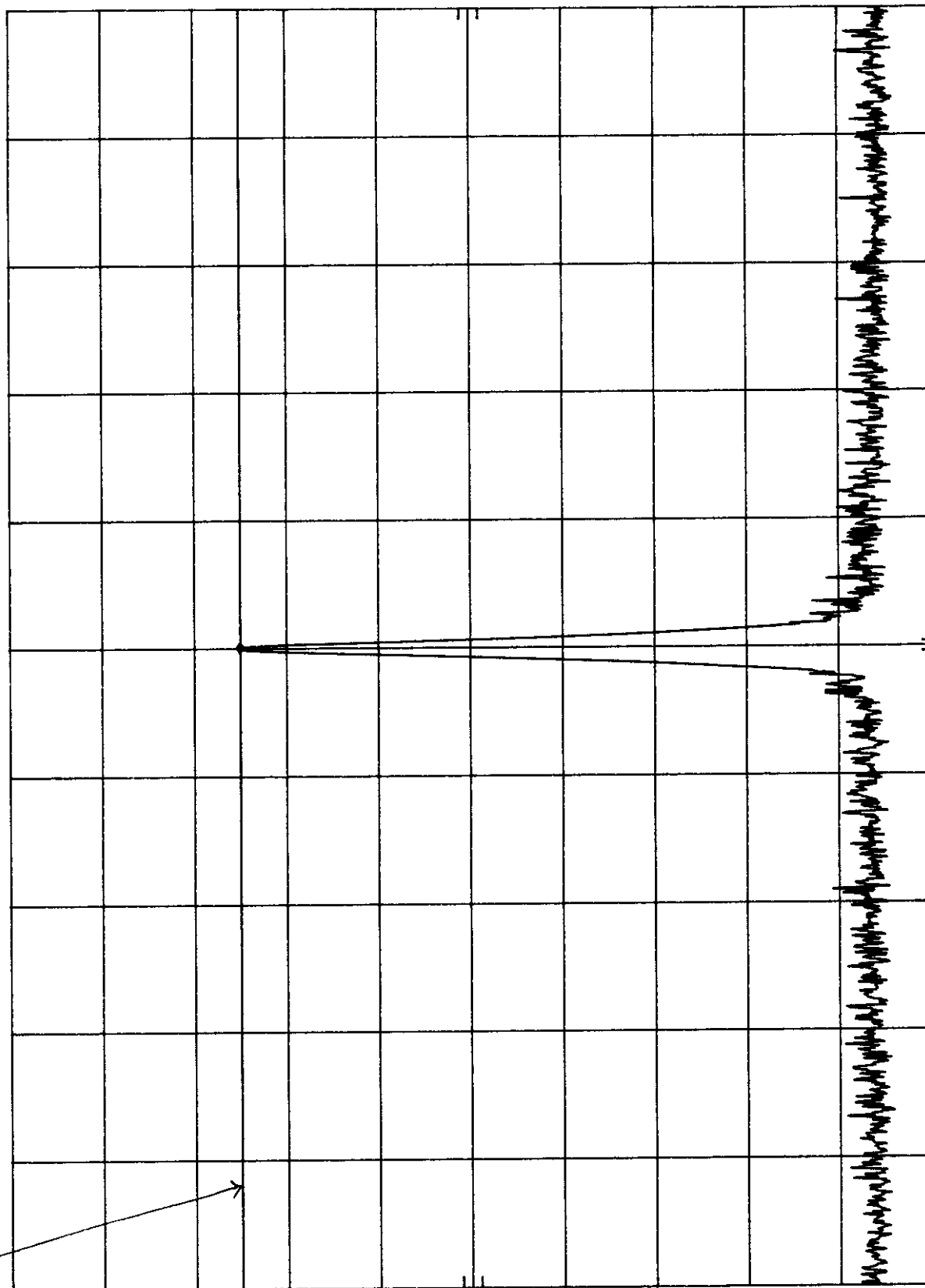
61.0

dB

DL

36.0

dBm



SPAN 100 kHz
SWP 3.00 sec

VBW 1 kHz

Hz

CENTER 136.000 MHz
RES BW 300

RS8-2AB-AIR
UNMODULATED CARRIER

25 WATTS

MKR 118.000 0 MHz
44.00 dBm

REF 61.0 dBm ATTN 10 dB

10 dB

POS PK

OFFSET

61.0

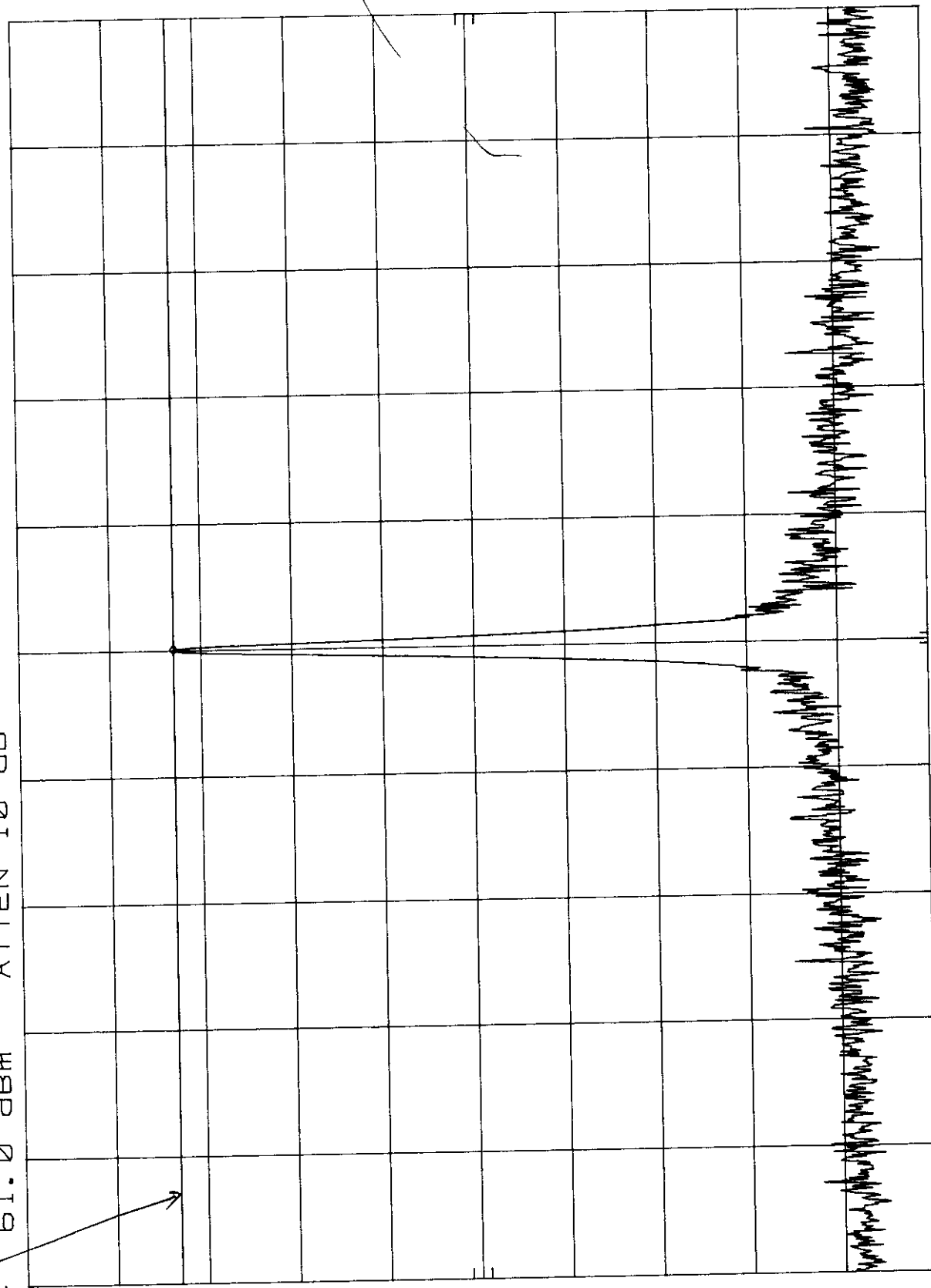
dB

DL

44.0

dBm

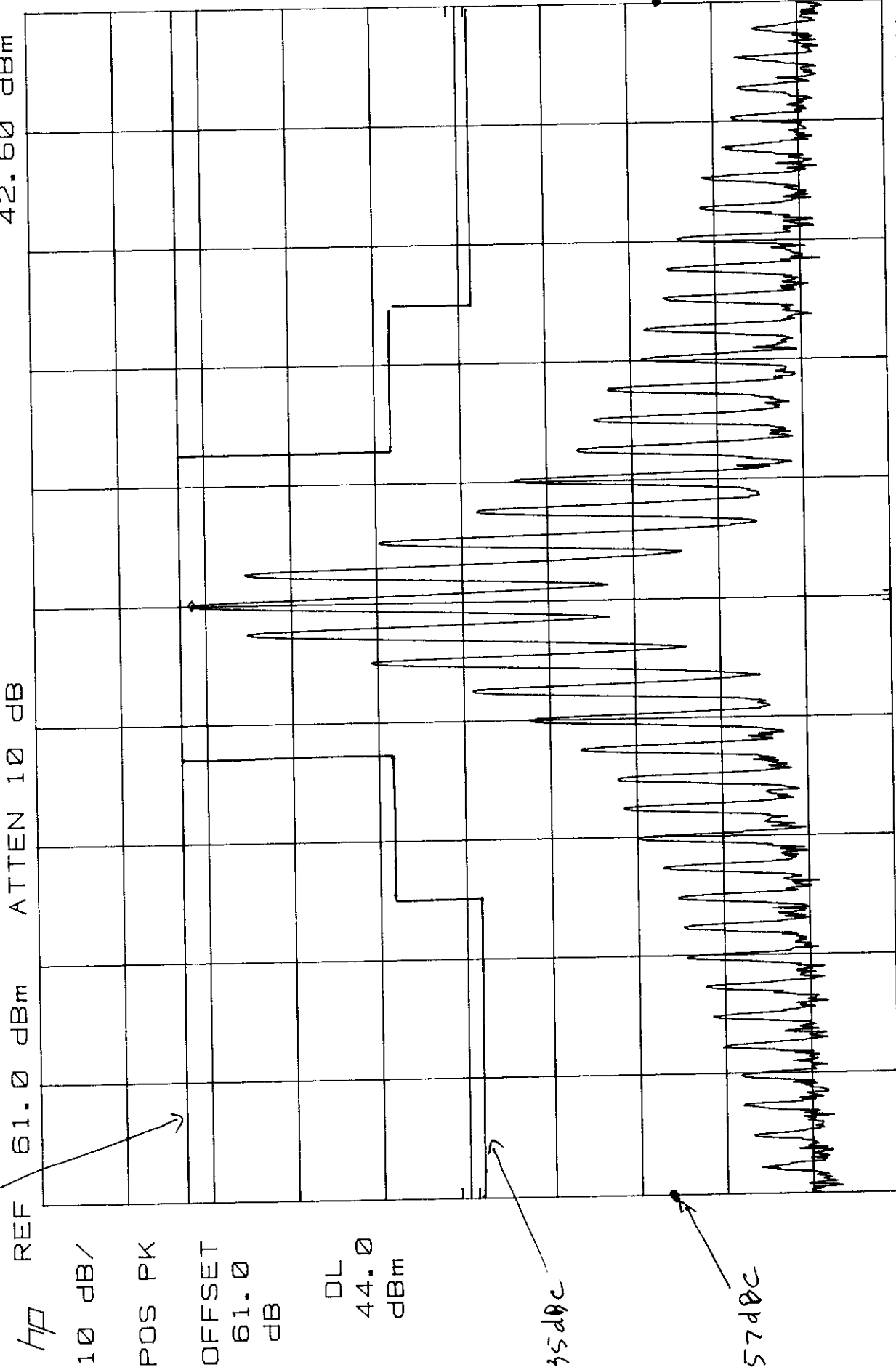
CENTER 117.999 MHz RES BW 300 Hz VBW 1 kHz SPAN 100 kHz SWP 3.00 sec



RS3-2AB - AIR OCCUPIED BANDWIDTH PART 37

25 WATTS

MKR 118.000 0 MHz
42.60 dBm



CENTER 117.999 MHz
RES BW 300 Hz
SPAN 100 KHz
SWP 3.00 sec
VBW 1 KHz

RS3-2A9-AIR
UNMODULATED CARRIER

25WATTS

MKR 122.000 0 MHz
44.00 dBm

ATTEN 10 dB

h_p

10 dB/

POS PK

OFFSET

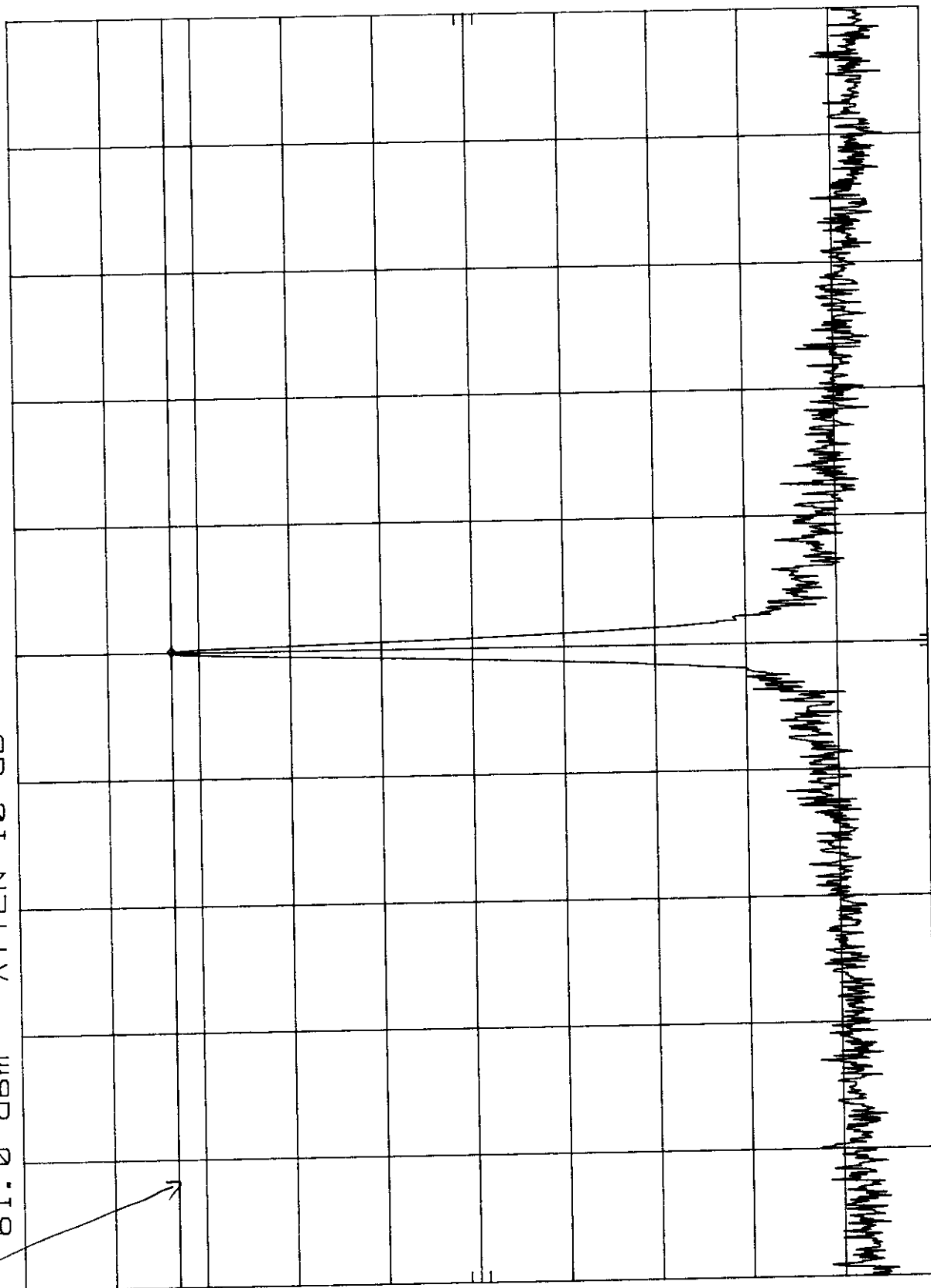
61.0

dB

DL

44.0

dBm



SPAN 100 kHz
SWP 3.00 sec

VBW 1 kHz

Hz

CENTER 122.000 MHz
RES BW 300

RS3-2AB-AIR OCCUPIED BANDWIDTH PART 87

25 WATTS

MKR 122.000 0 MHz
42.70 dBm

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

POS PK

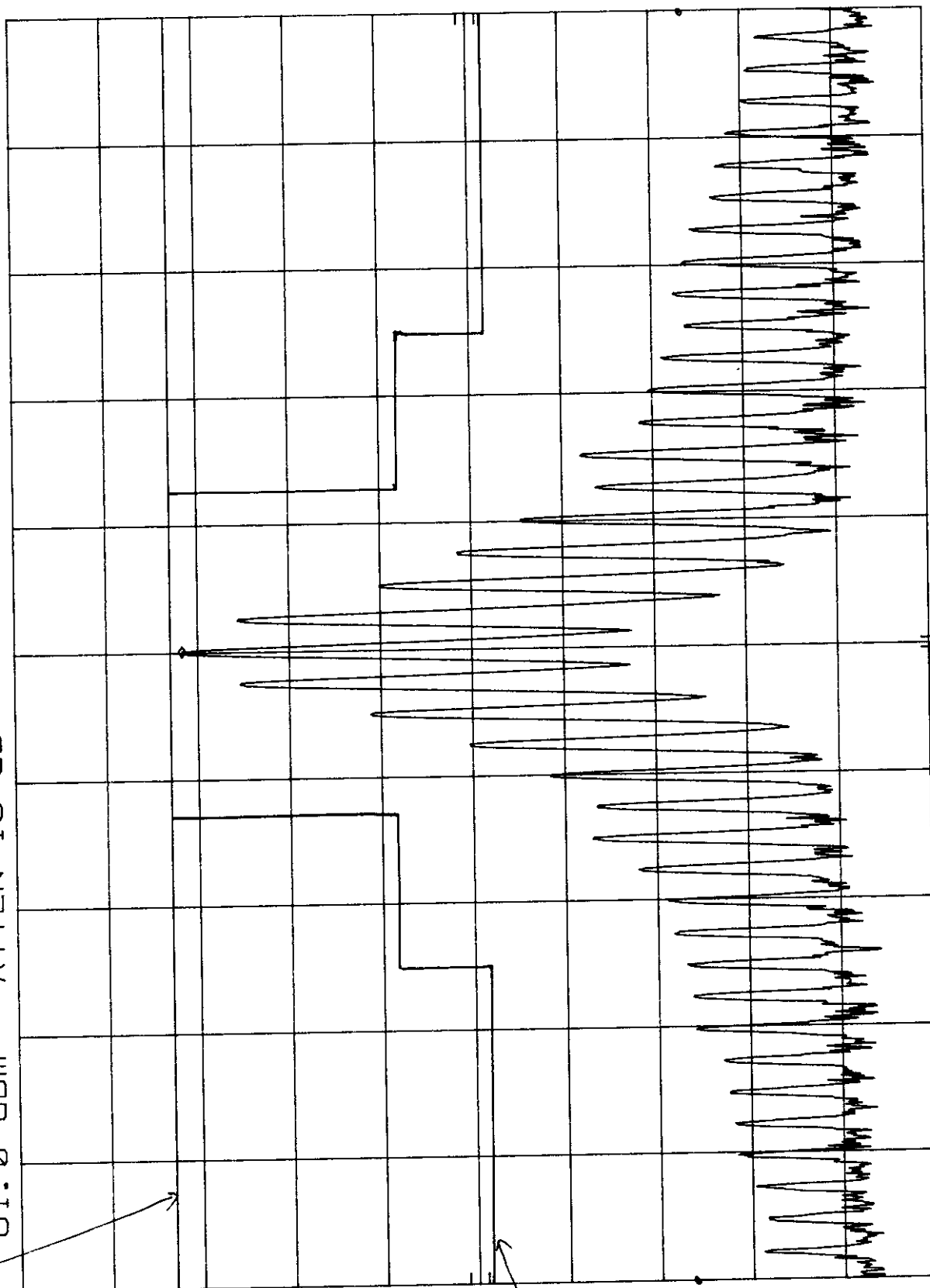
OFFSET

61.0
dB

DL
44.0
dBm

35dBc

57dBc



SPAN 100 KHz
SWP 3.00 sec

VBW 1 KHz

CENTER 122.000 MHz
RES BW 300 Hz

RS3-2AB-AIR
UNMODULATED CARRIER

25 WATTS

MKR 123.000 0 MHz
44.00 dBm

ATTEN 10 dB

hp

10 dB/

POS PK

OFFSET

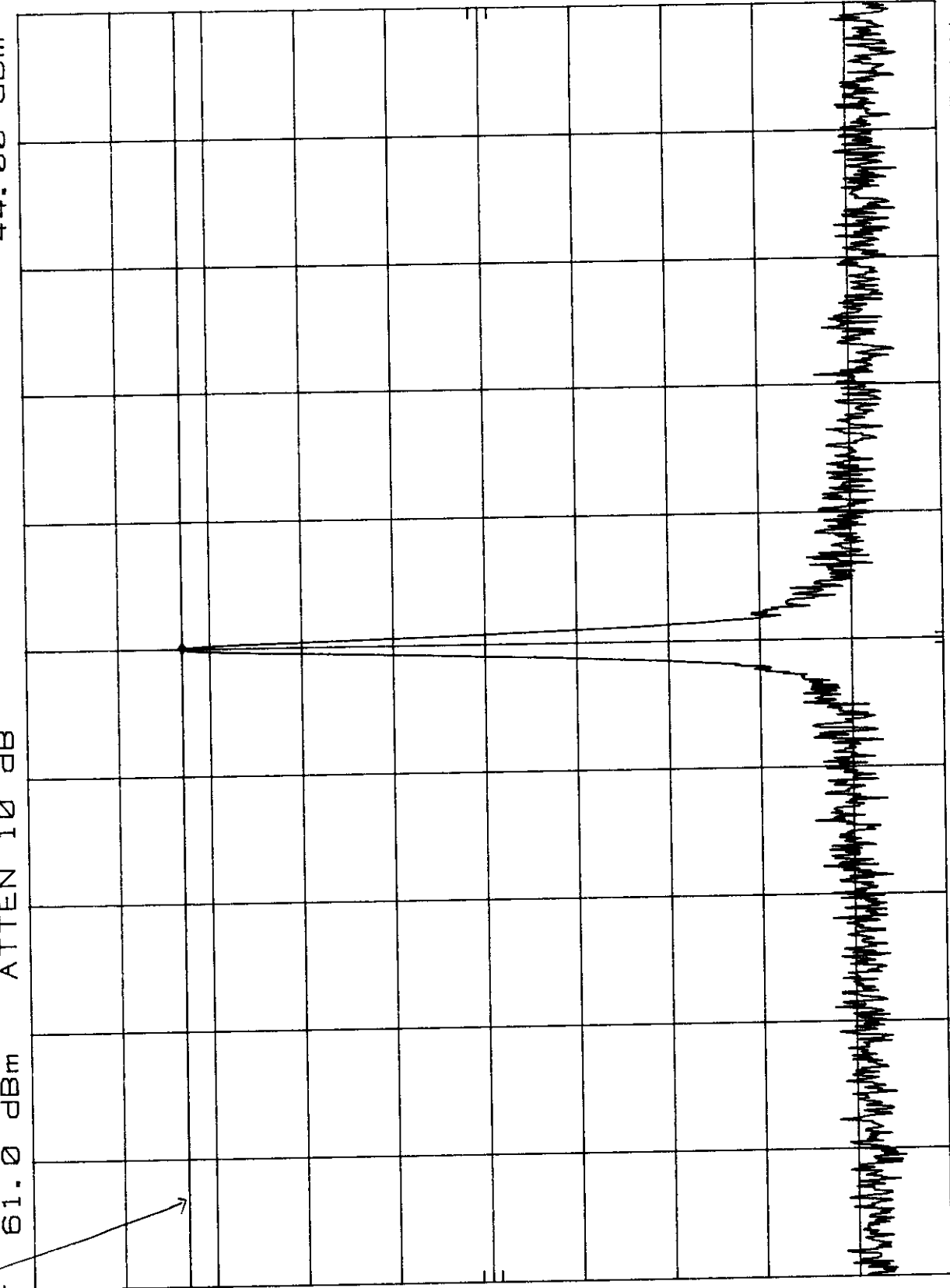
61.0

dB

DL

44.0

dBm



CENTER 123.000 MHz RES BW 300 Hz SPAN 100 KHz SWP 3.00 sec

RS3 - 2AB - AIR OCCUPIED BANDWIDTH PART 87

25 WATTS

MKR 123.000 0 MHz
42.60 dBm

ATTEN 10 dB

HP

10 dB/

POS PK

OFFSET

61.0
dB

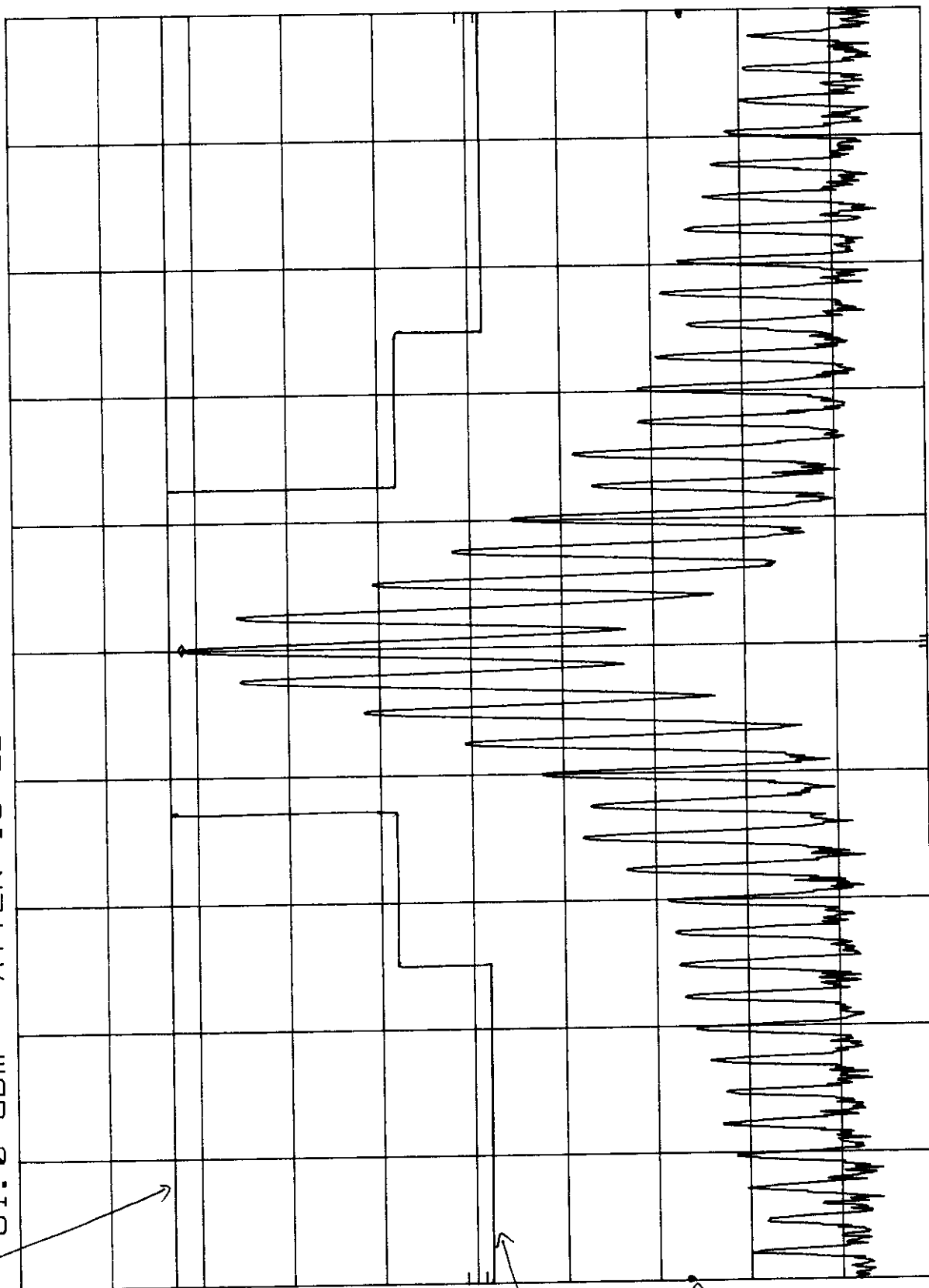
DL

44.0
dBm

31

35dBc

57dBc



SPAN 100 KHz
SWP 3.00 sec

VBW 1 KHz

CENTER 123.000 MHz
RES BW 300 Hz

R33-2AB-AIR
UNMODULATED CARRIER

25 WATTS

MKR 124.000 0 MHz
44.00 dBm

ATTEN 10 dB

HP

10 dB/

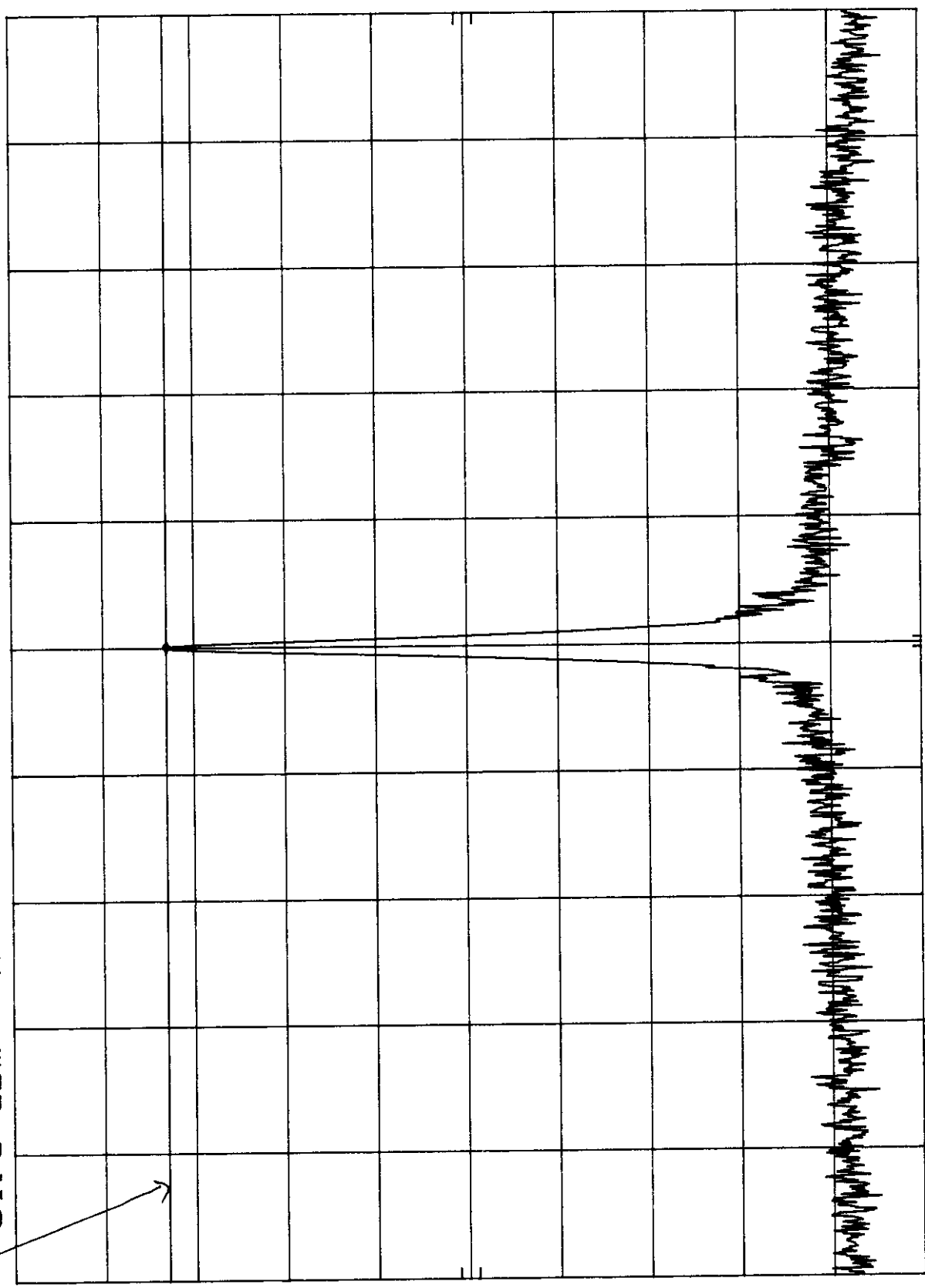
POS PK

OFFSET

61.0 dB

DL

44.0 dBm



SPAN 100 kHz
SWP 3.00 sec

VBW 1 kHz

CENTER 124.000 MHz
RES BW 300 Hz

RS3-2AB-AIR OCCUPIED BANDWIDTH PART 87

2.5 WATTS
MKR 124.000 0 MHz
42.60 dBm

HP REF 61.0 dBm ATTN 10 dB

10 dB/

POS PK

OFFSET

61.0
dB

DL

44.0
dBm

33

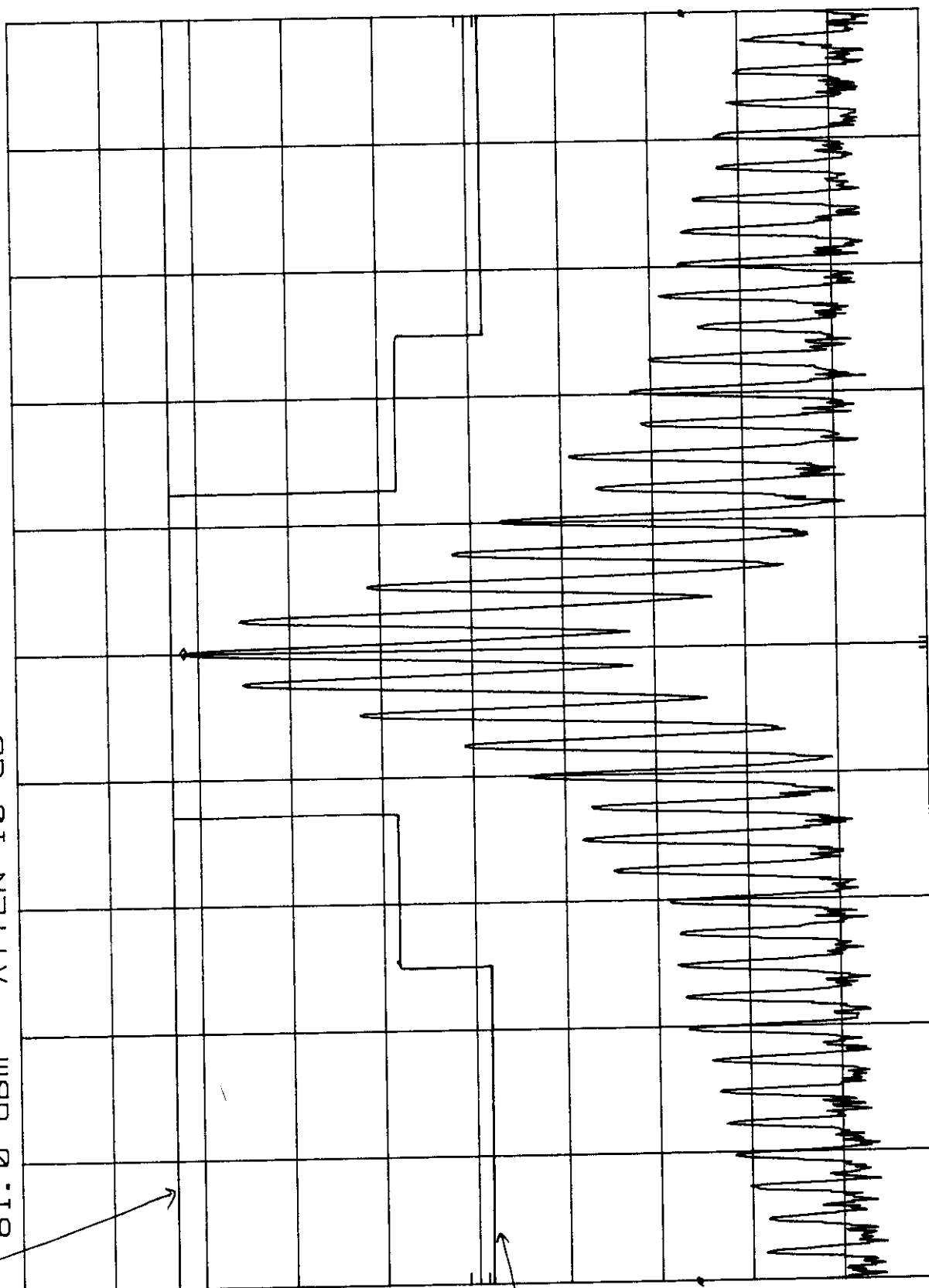
35dBc

57dBc

SPAN 100 KHz
SWP 3.00 sec

VBW 1 KHz

CENTER 124.000 MHz
RES BW 300 Hz



RS3-2AB-AIR
UNMODULATED CARRIER

25 WATTS

MKR 128.000 0 MHz
44.00 dBm

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

POS PK

OFFSET

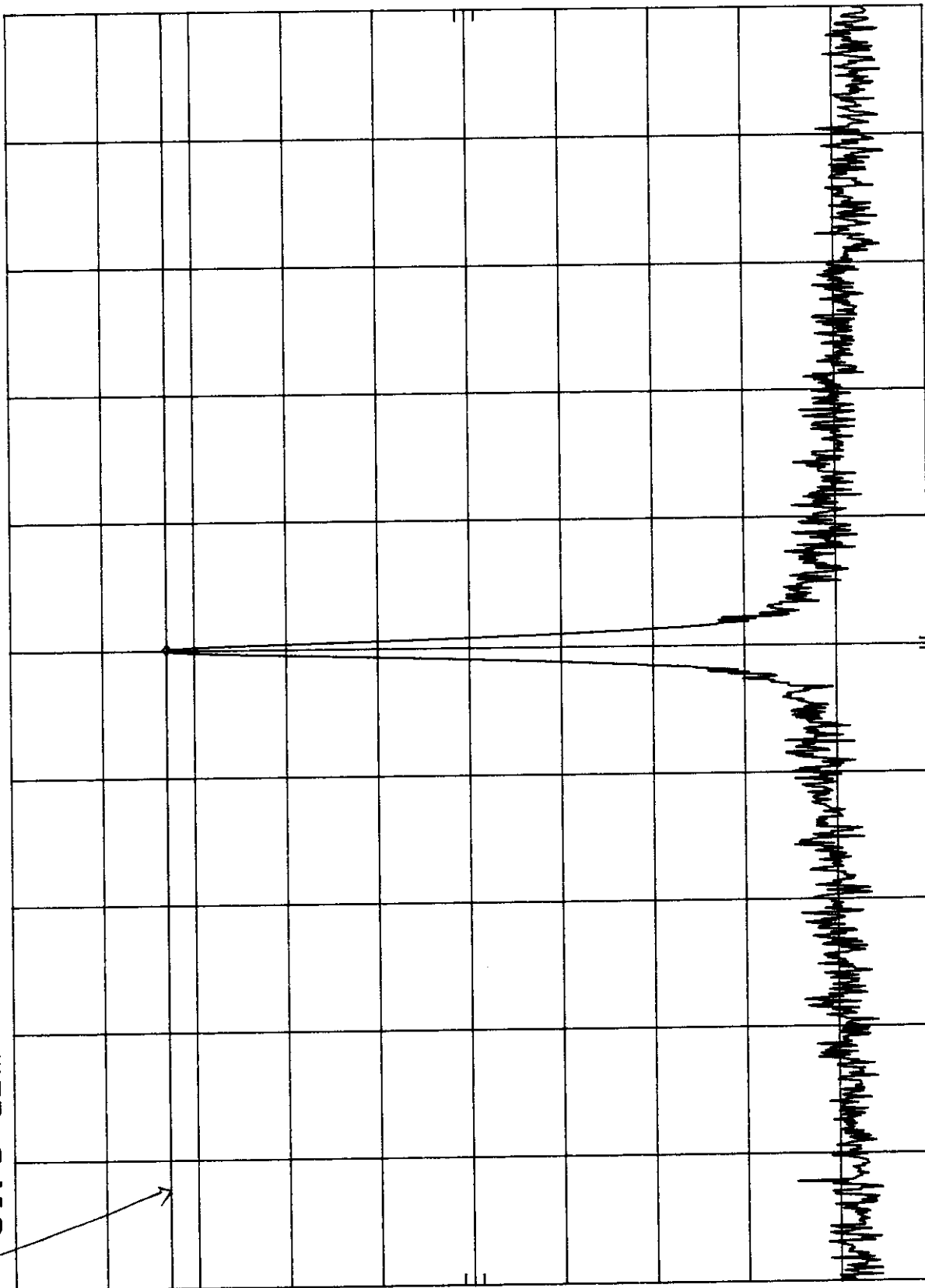
61.0

dB

DL

44.0

dBm



CENTER 128.000 MHz
RES BW 300 Hz

VBW 1 kHz

SPAN 100 kHz
SWP 3.00 sec

RS3-2AB-AIR OCCUPIED BANDWIDTH PART 87

25 WATTS

MKR 128.000 0 MHz
42.40 dBm

REF 61.0 dBm ATTEN 10 dB

hp

10 dB/

POS PK

OFFSET

61.0

dB

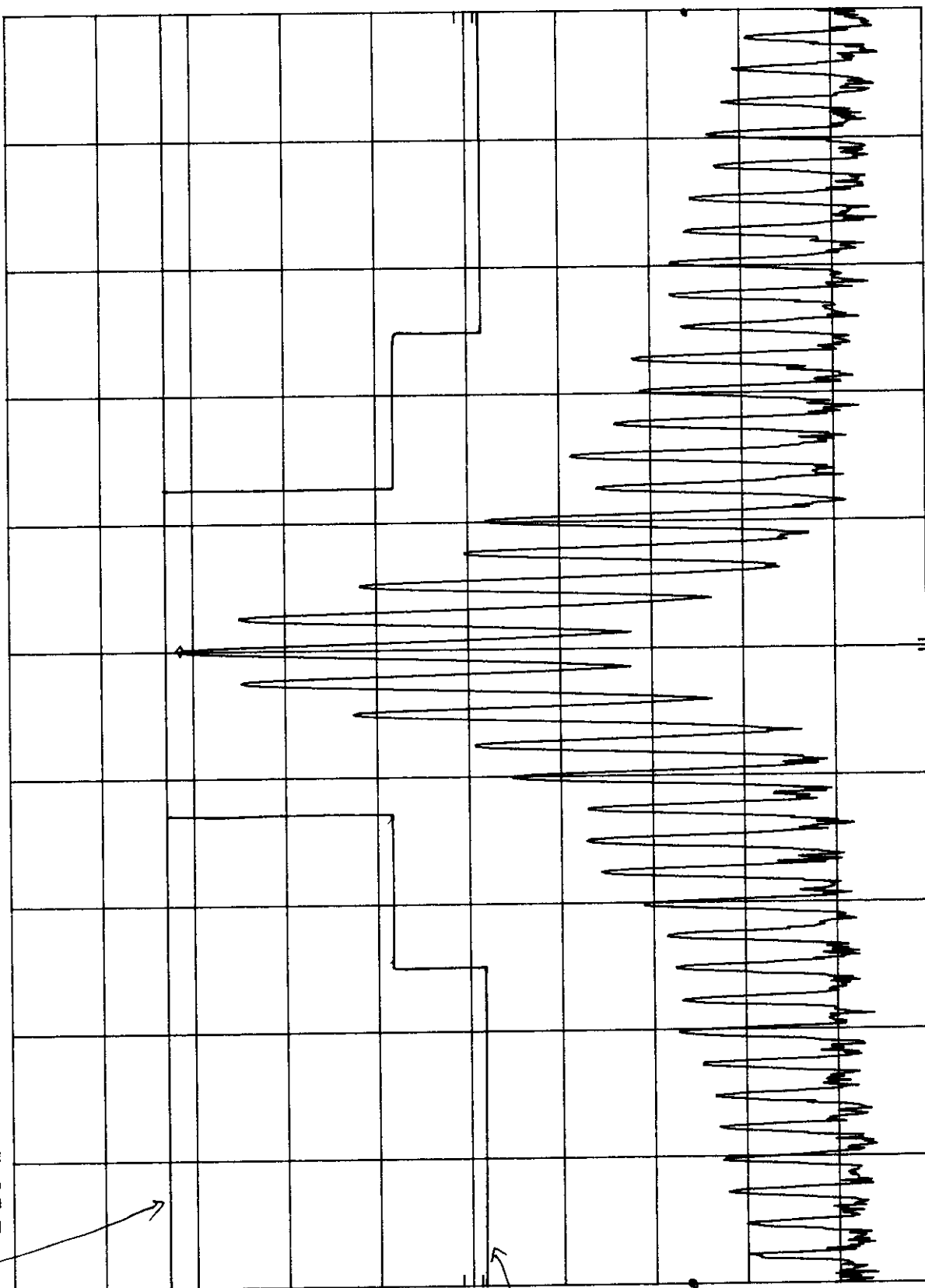
DL

44.0

dBm

35dBc

57dBc



SPAN 100 KHz
SWP 3.00 sec

VBW 1 KHz

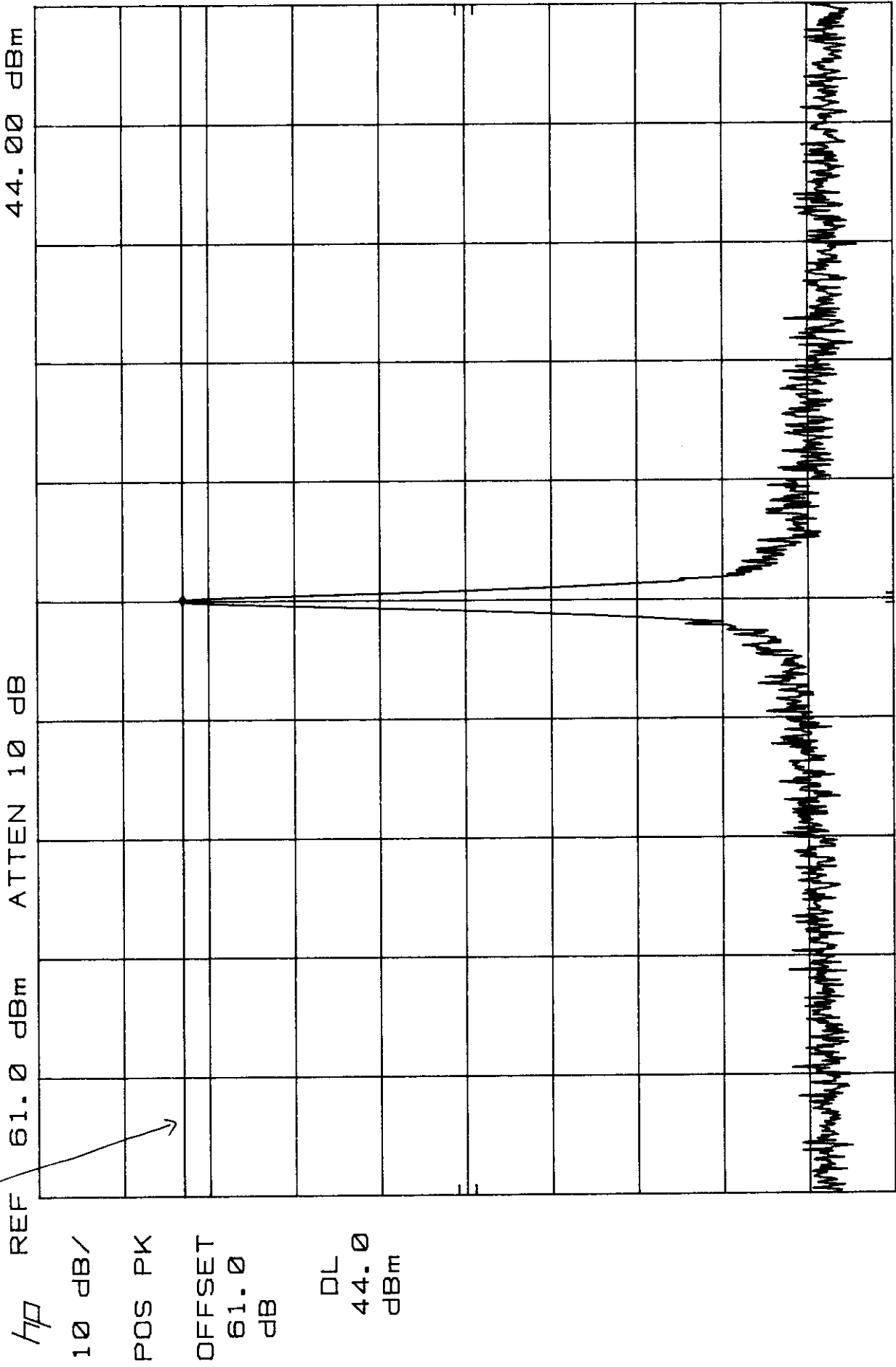
Hz

CENTER 128.000 MHz
RES BW 300

RS3 - 2AB - AIR
UNMODULATED CARRIER

25 WATTS

MKR 132.000 0 MHz
44.00 dBm



hp

10 dB/

POS PK

OFFSET

61.0

dB

DL

44.0

dBm

CENTER 132.000 MHz
RES BW 300 Hz
SPAN 100 KHz
SWP 3.00 sec

RS3-2A8 - AIR OCCUPIED BANDWIDTH PART 87

MKR 132.000 0 MHz
42.50 dBm

<5 WATTS

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

POS PK

OFFSET

61.0

dB

DL

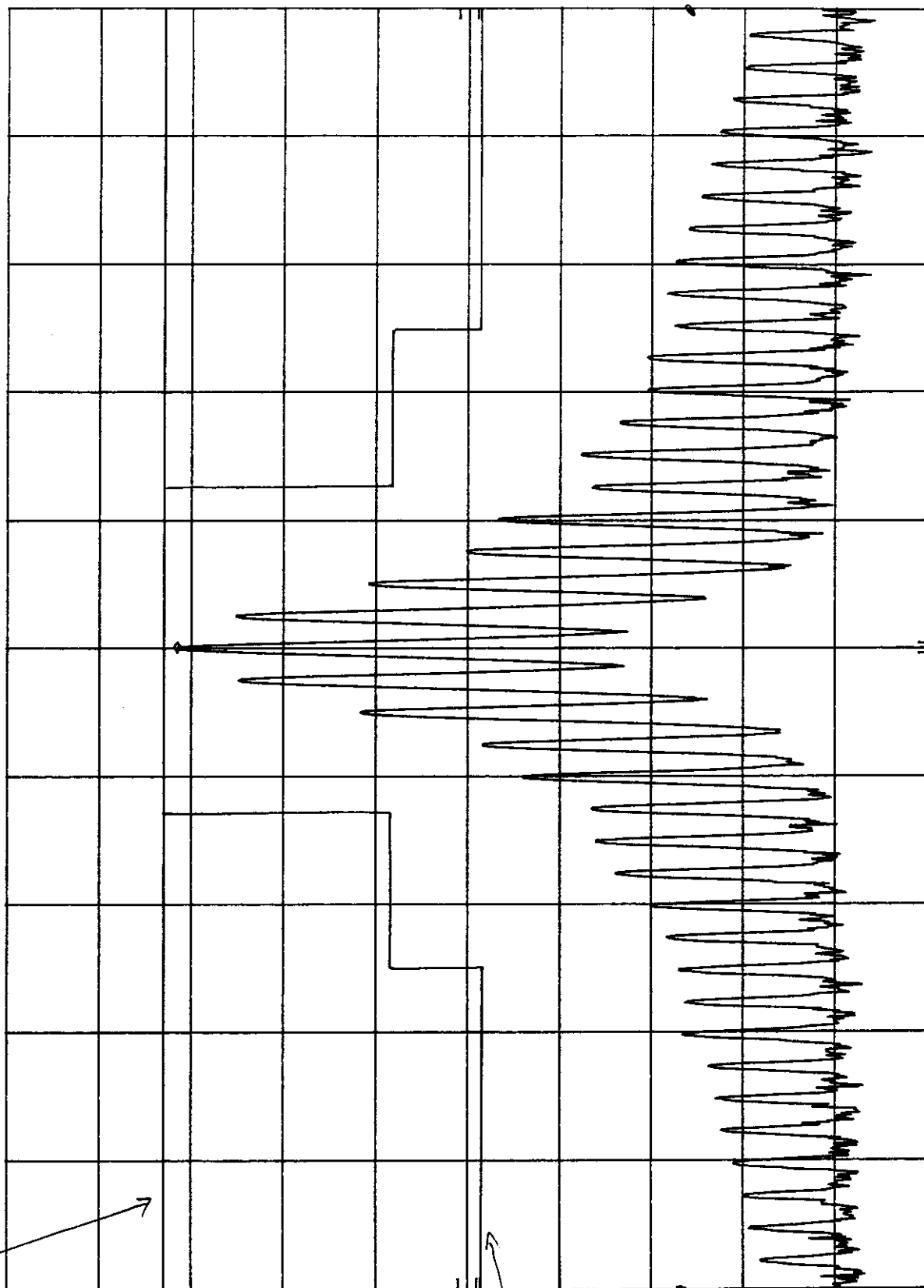
44.0

dBm

37

35dBc

57dBc



CENTER 132.000 MHz

RES BW 300

Hz

VBW 1 KHz

SPAN 100 KHz

SWP 3.00 sec

RS3-2AB-AIR
UNMODULATED CARRIER

25 WATTS

MKR 136.000 0 MHz
44.00 dBm

ATTEN 10 dB

HP

REF

61.0 dBm

10 dB/

POS PK

OFFSET

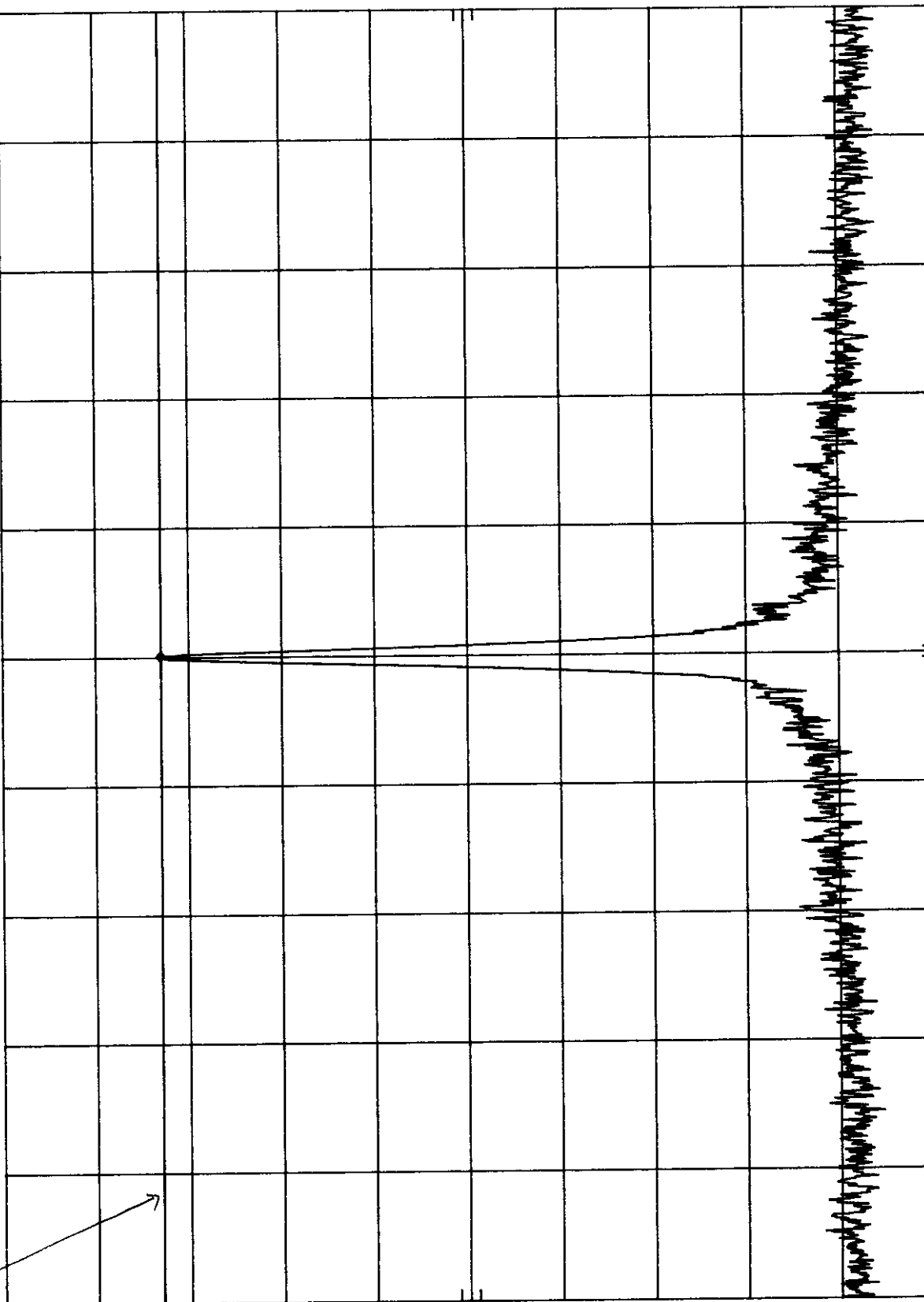
61.0

dB

DL

44.0

dBm



CENTER 136.000 MHz

RES BW 300 Hz

Hz

VBW 1 kHz

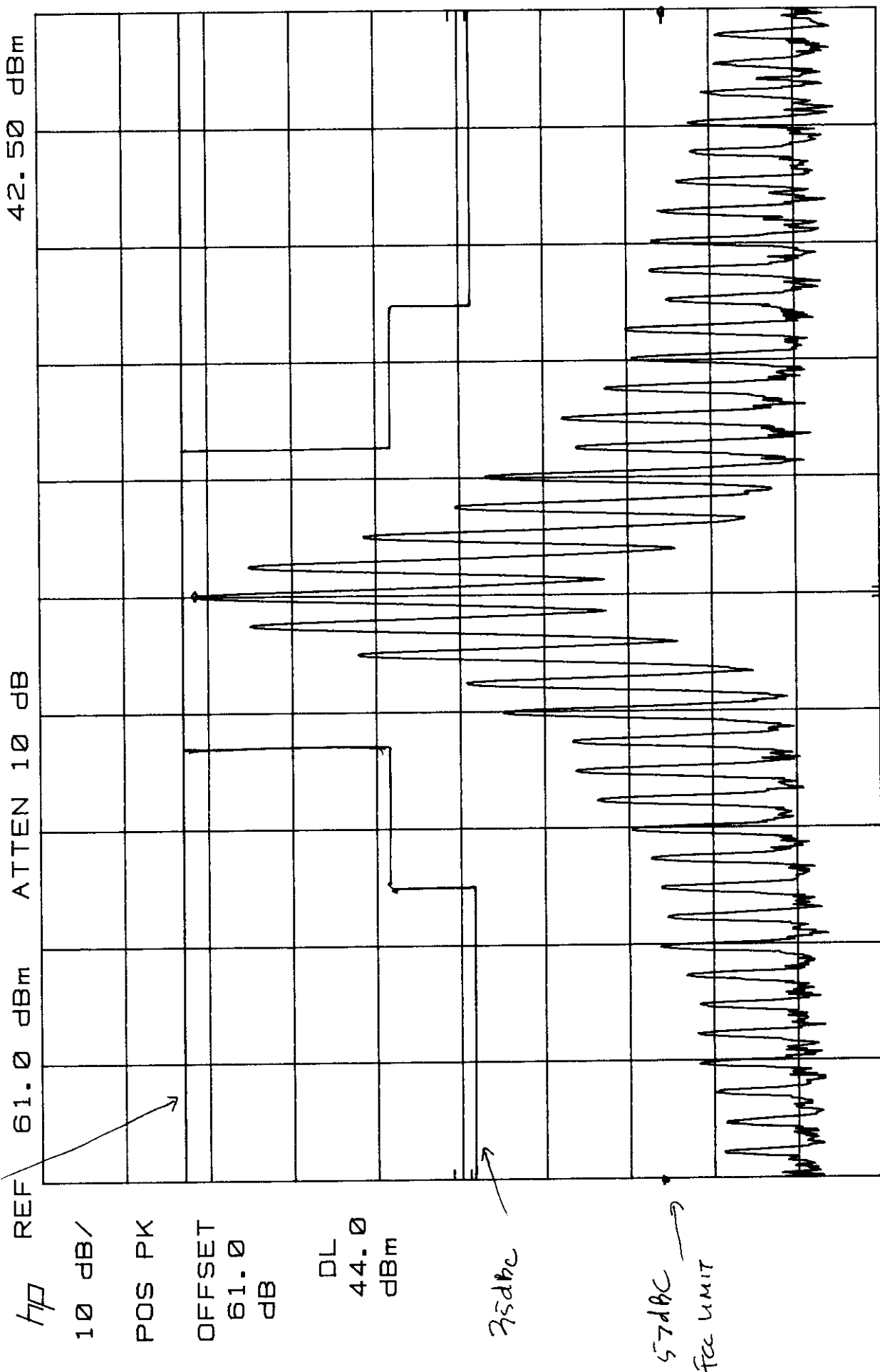
SWP 3.00 sec

SPAN 100 kHz

RS3 - 2AB - AIR

25 WATTS

OCCUPIED BANDWIDTH PART 87

MKR 136.000 0 MHz
42.50 dBm

CENTER 136.000 MHz	SPAN 100 KHZ
RES BW 300 Hz	SWP 3.00 sec
VBW 1 KHZ	

2.983(e)(4)

**Measurement of Antenna Conducted Spurious
Emissions Per 2.991**

Definition: Conducted Spurious Emissions are emissions at the antenna terminals on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communication desired. The reduction in the level of these spurious emissions will not affect the quality of the information being transmitted.

Conducted spurious emissions shall be attenuated below the maximum level of the carrier frequency in accordance with the following formula:

$$\text{Spurious attenuation in dB} = 43 + 10 \log_{10} P_o$$

Where P_o = output in watts

$$= 43 + 10 \log_{10} (25)$$

$$= 57.0 \text{ dB}$$

Test Method: Per EIA RS 152-B, Paragraph 4.

Connect the equipment as shown in FIGURE 4.

Adjust the audio oscillator so that the frequency deviation of the transmitter is 5 kHz at a modulation frequency of 2.5 kHz. Adjust the spectrum analyzer to display the modulated carrier.

Scan the frequency spectrum from the lowest radio frequency generated in the equipment through the 10th harmonic of the carrier frequency.

Test Results: See Plots Following Figure 4.

All spurious antenna conducted emissions are below the FCC specifications.

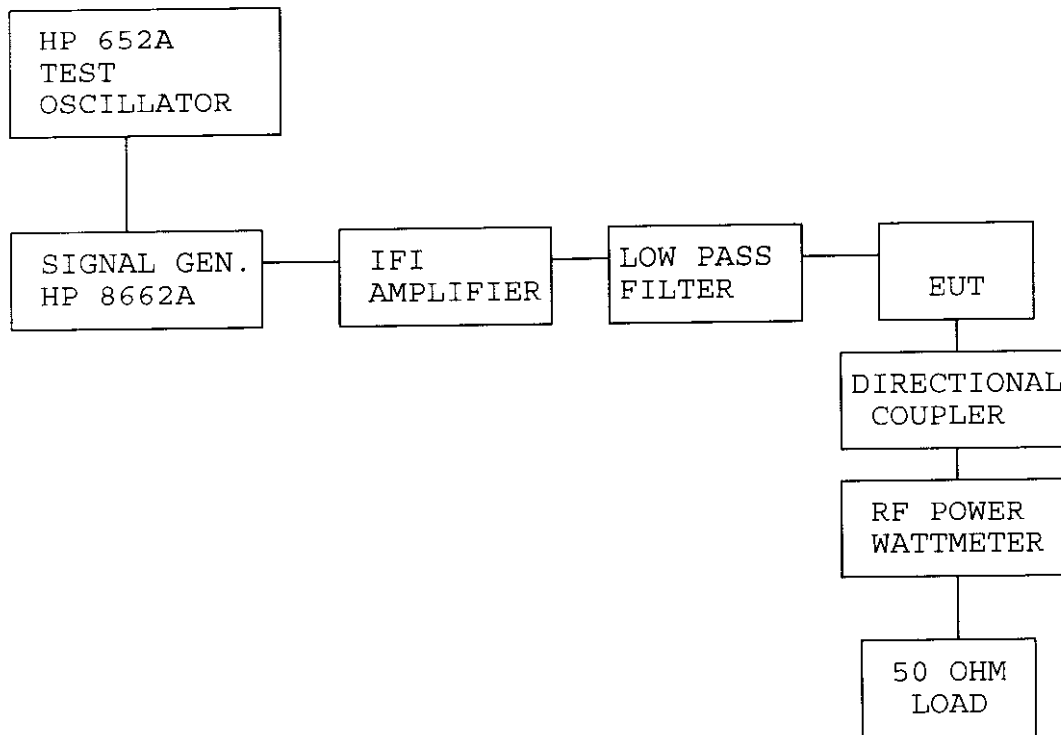


FIGURE 4. BLOCK DIAGRAM.
(SPURIOUS EMISSIONS TEST)

R53-2AB-AIR
ANTENNA CONDUCTED 5 PULSUS

MKR 118.0 MHz
47.90 dBm

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

POS PK

OFFSET

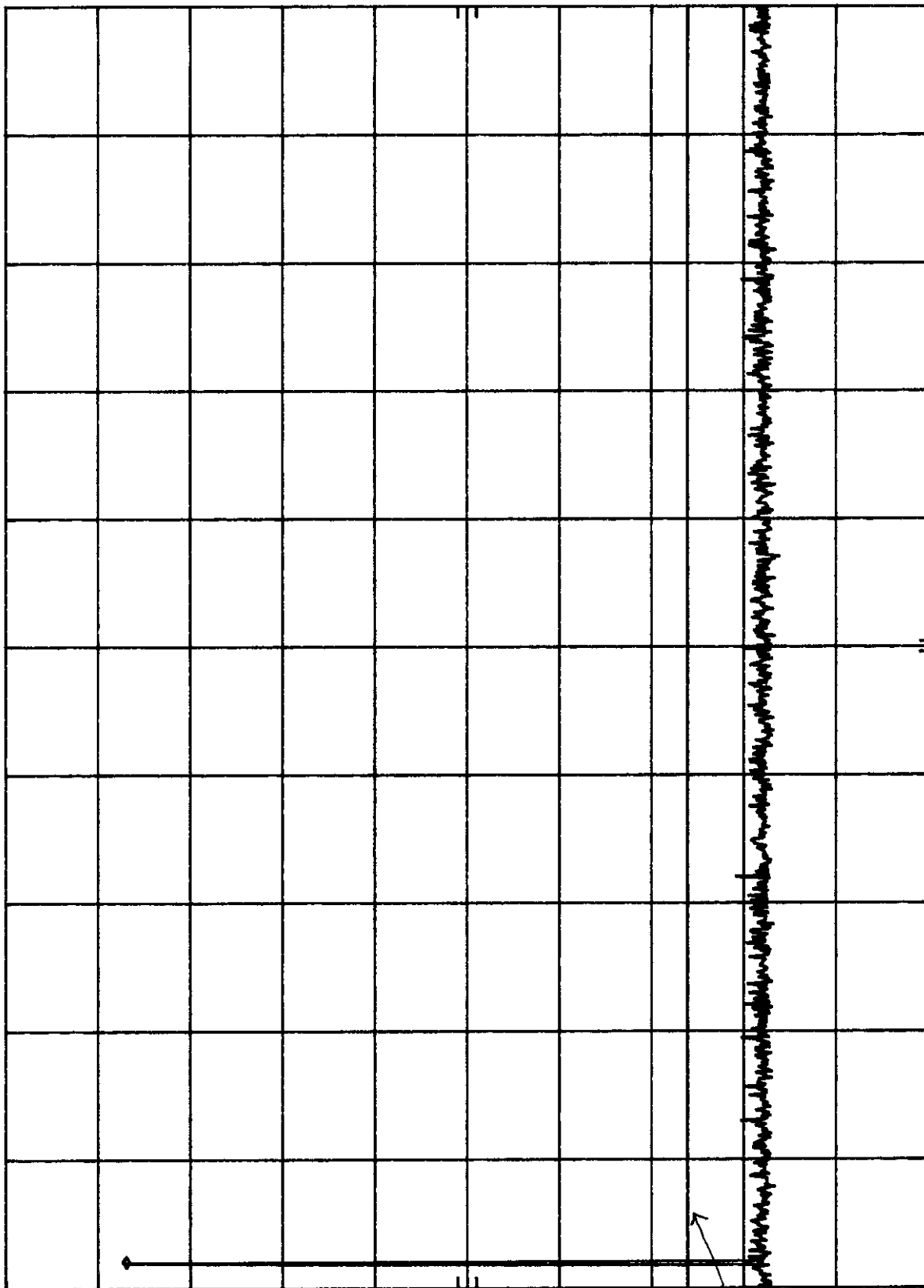
61.0

dB

DL

-13.0

dBm



STOP 1.000 GHz
SWP 2.70 sec

VBW 100 KHz

RES BW 30 KHz

START 100 MHz

57dBc
FCC LIMIT

ANTENNA CONDUCTED SPURIOUS

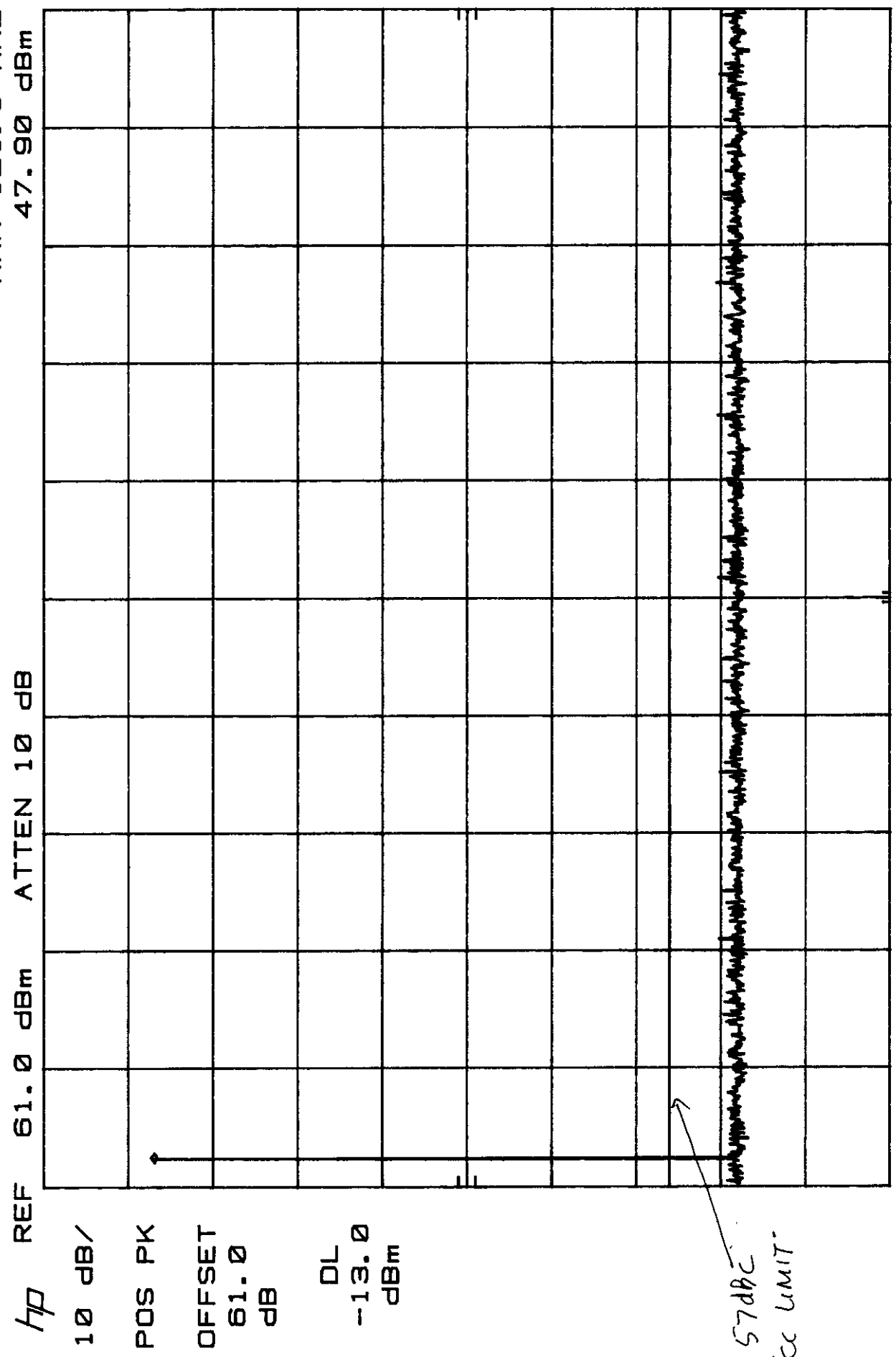
dBm

57dbc -
FCC LIMIT

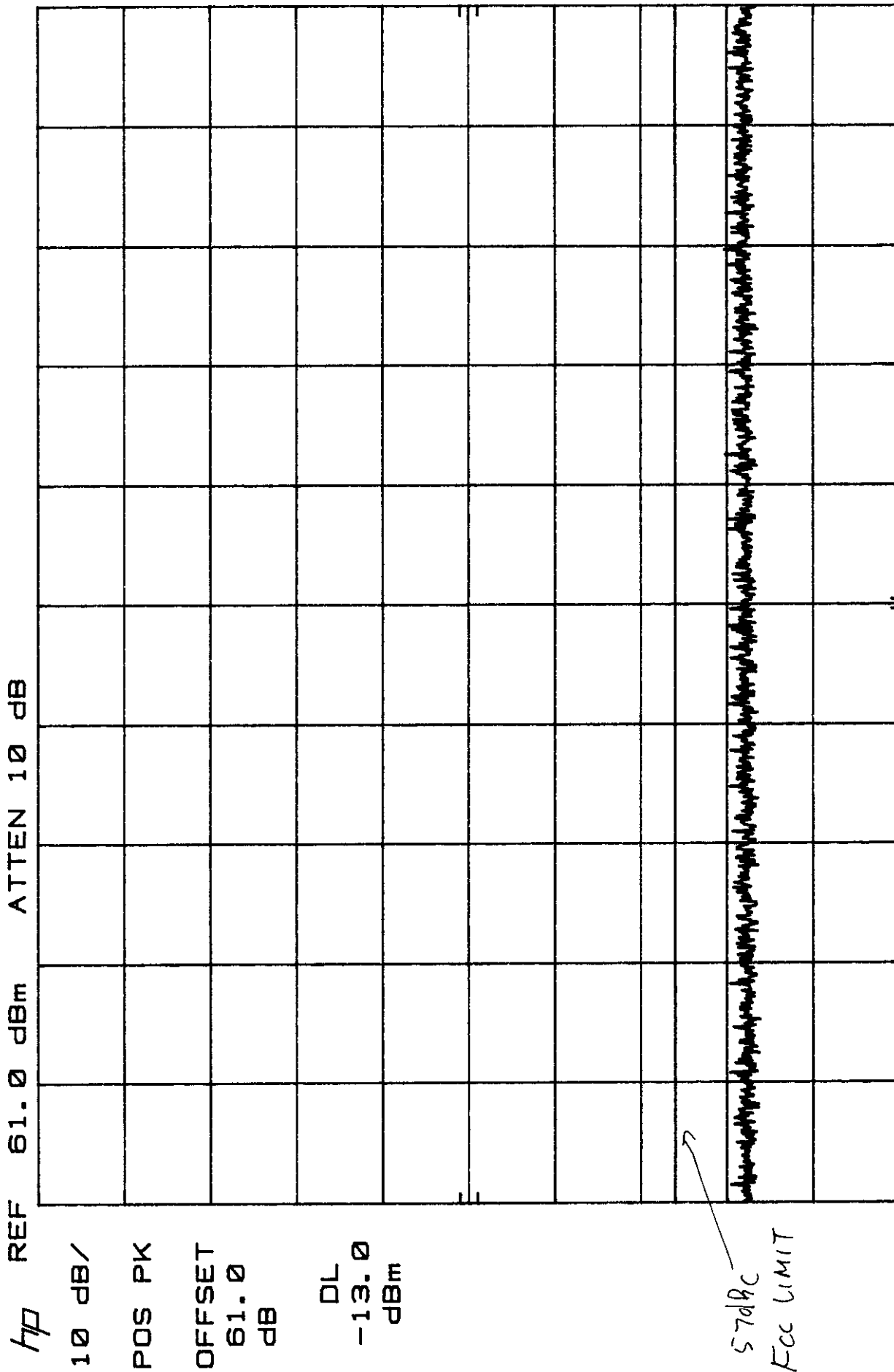
SWP 3.00 sec

RS3-2AB - AIR
 ANTENNA CONDUCTED SPURIOUS

MKR 121.6 MHz
 47.90 dBm



RS3-2AB-AIR
ANTENNA CONDUCTED SPURIOUS



RSB-2AB-AIR
ANTENNA CONDUCTED SPURIOUS

MKR 122.5 MHz
47.90 dBm

hp REF 61.0 dBm ATTN 10 dB

10 dB/

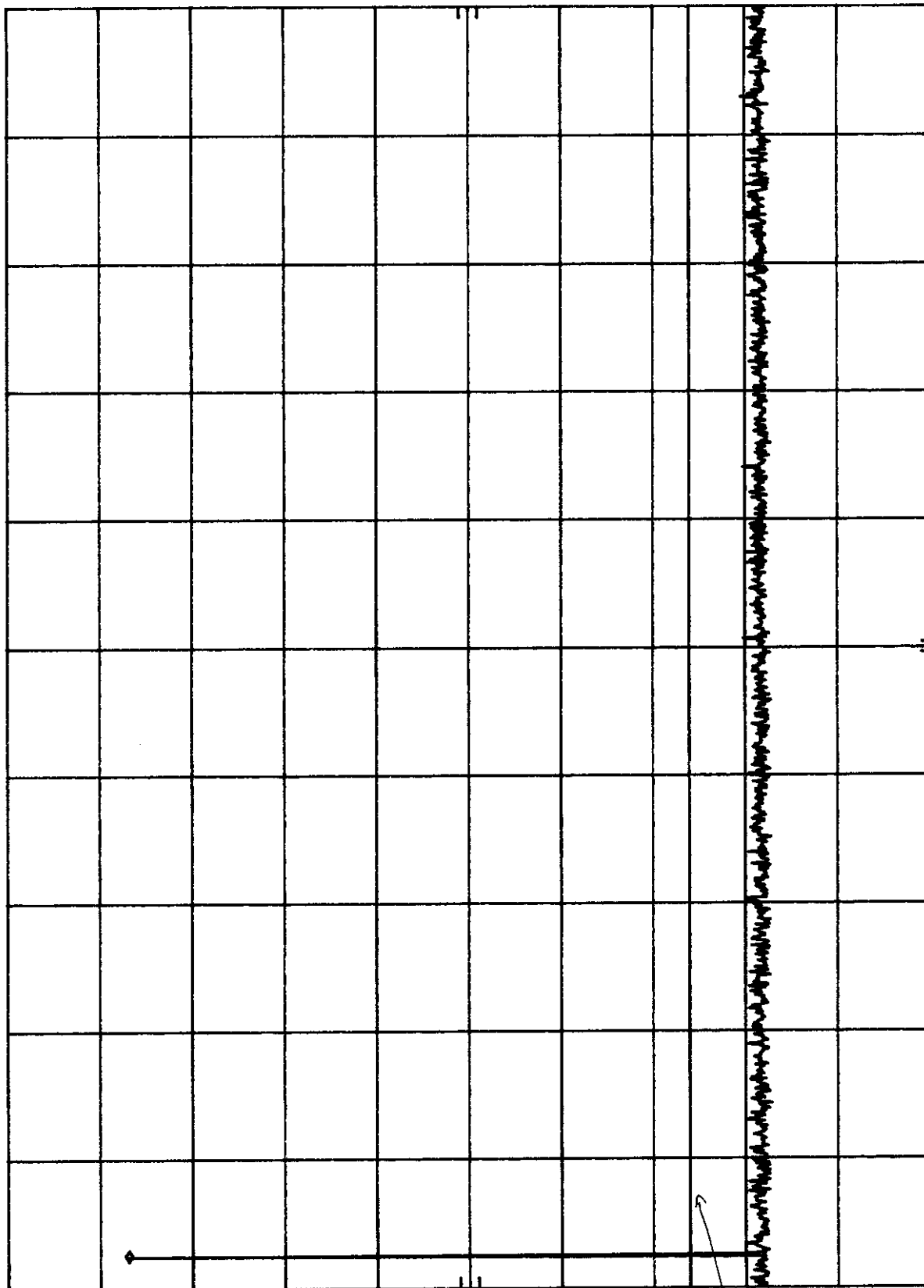
POS PK

OFFSET

61.0
dB

DL

-13.0
dBm



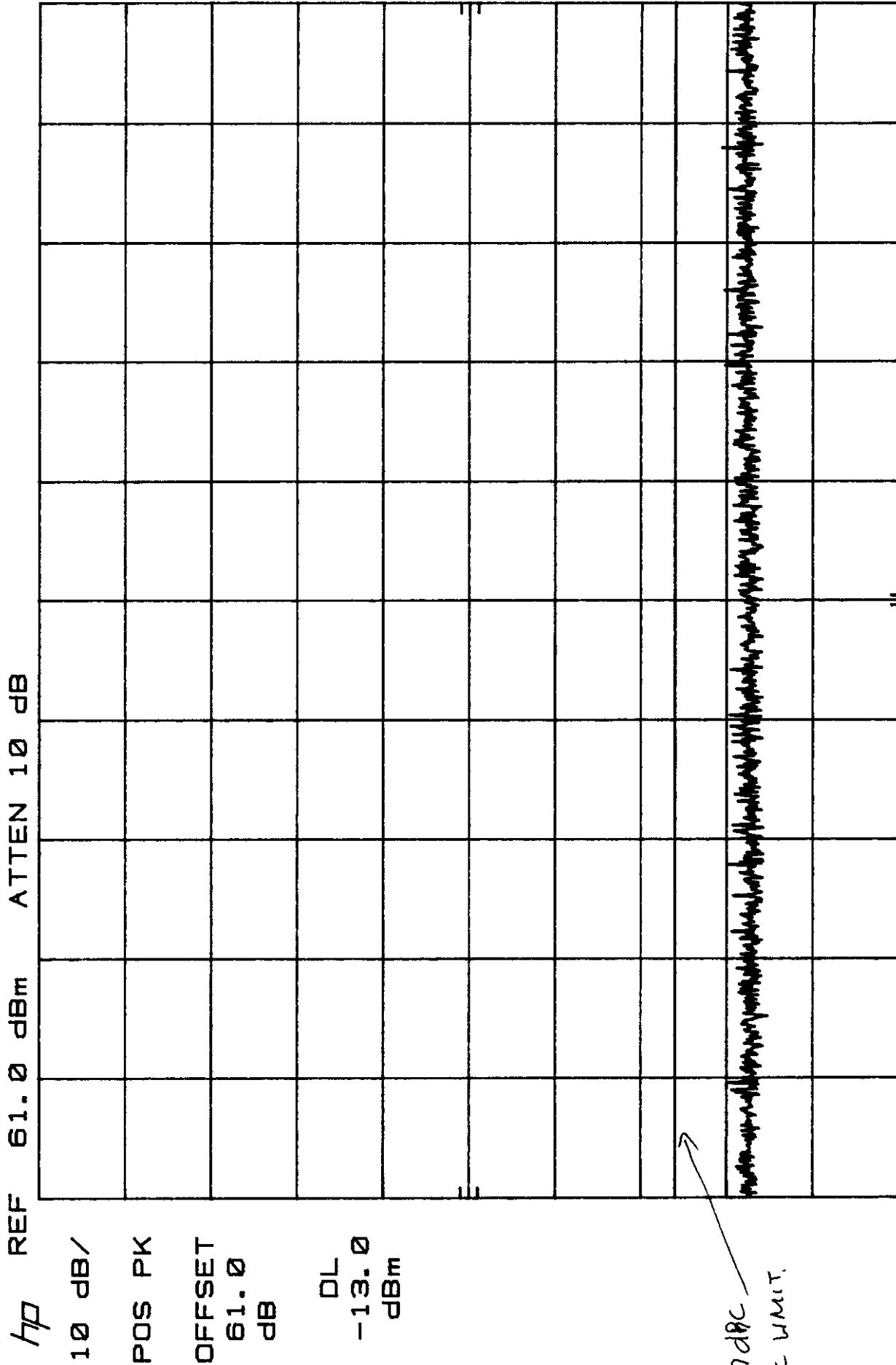
57dBc
FEC LIMIT

STOP 1.000 GHz
SWP 2.70 sec

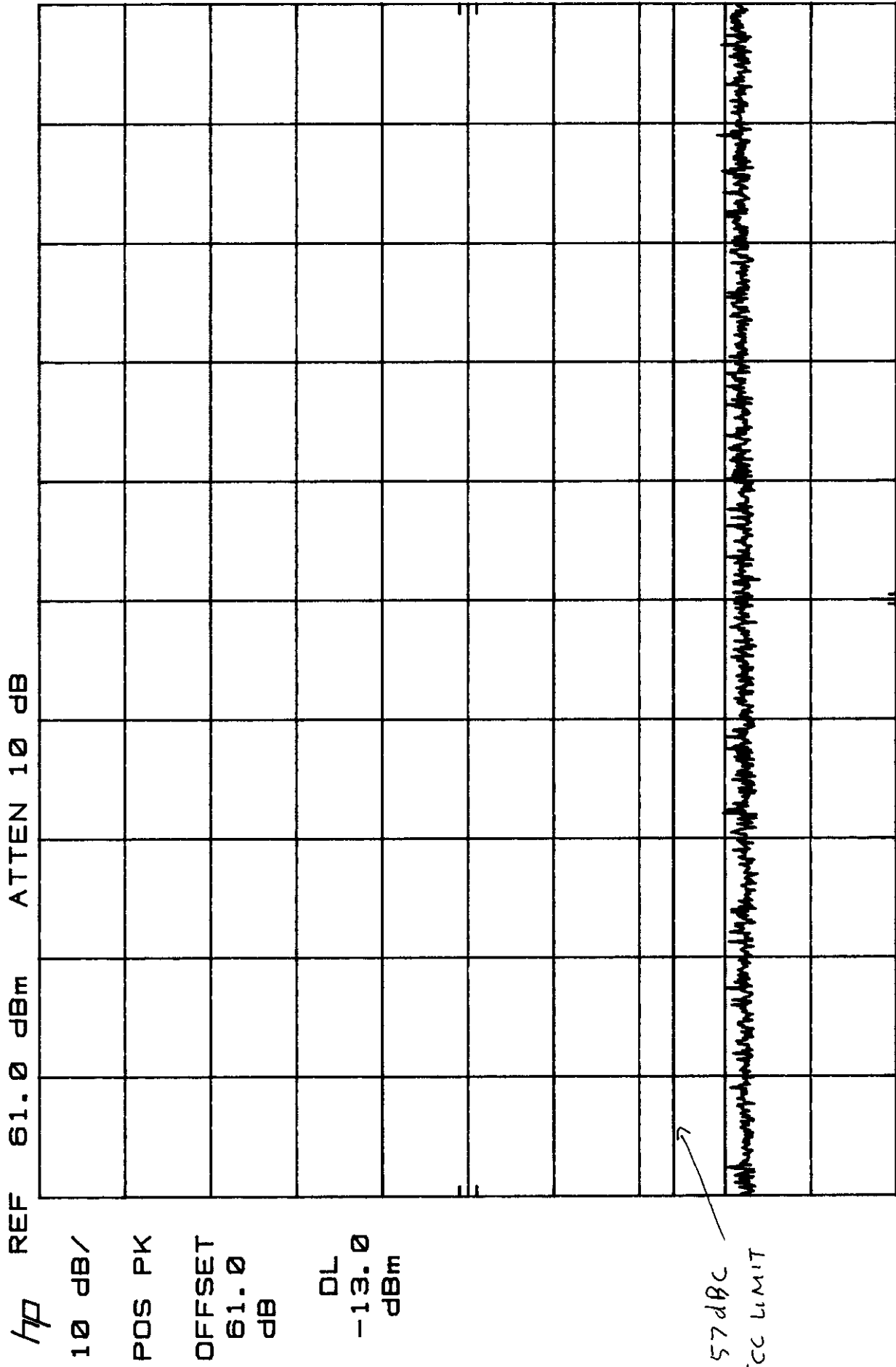
VBW 100 kHz

START 100 MHz
RES BW 30 kHz

RS3-2AB -AIR
ANTENNA CONDUCTED SPURIOUS



RS3 - 2AB - AIR
 ANTENNA CONDUCTED SPURIOUS



RS9-2AB - AIR
ANTENNA CONDUCTED SPURIOUS

MKR 123.4 MHz
47.90 dBm

ATTEN 10 dB

REF 61.0 dBm

hp

10 dB/

POS PK

OFFSET

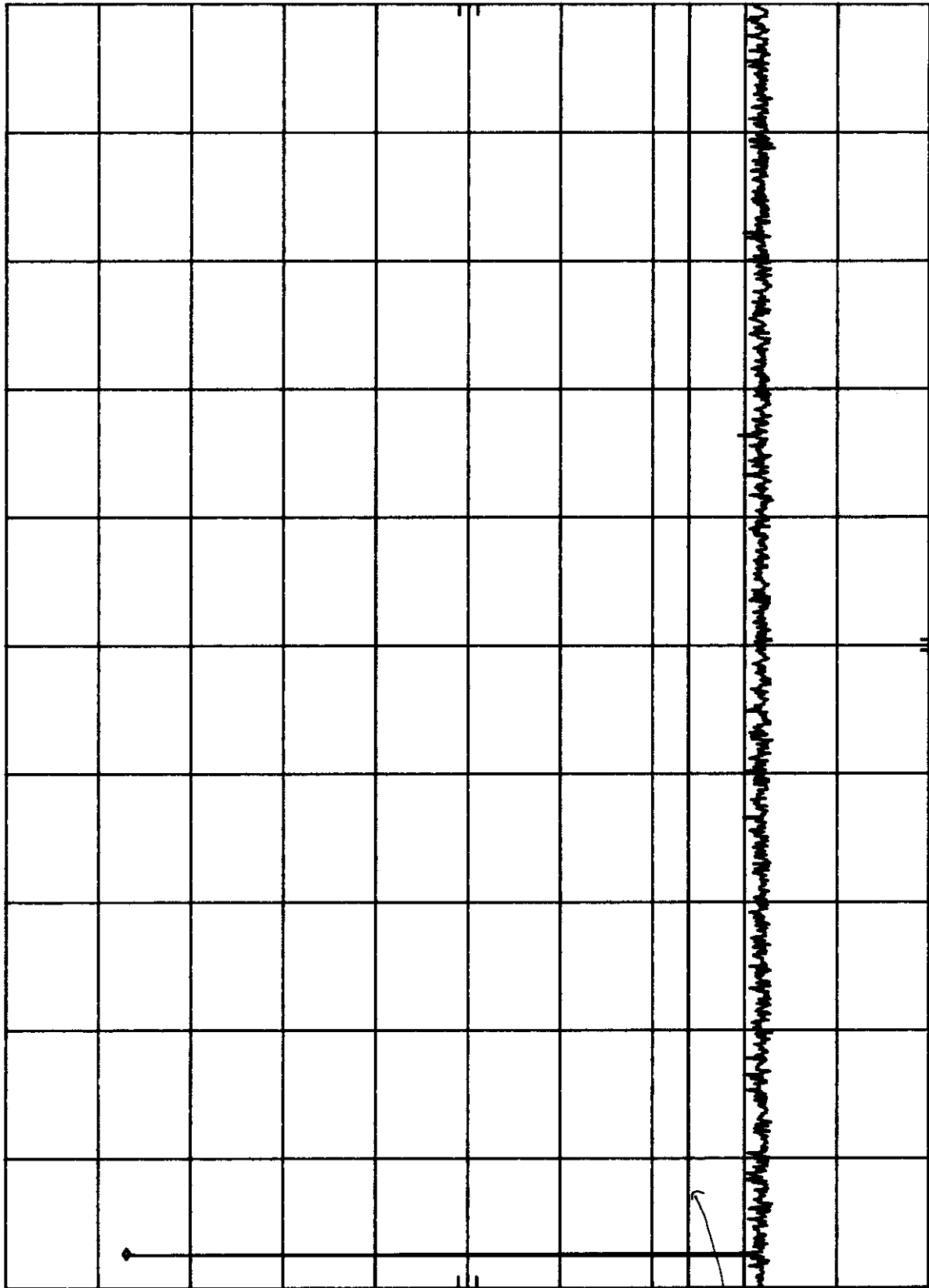
61.0

dB

DL

-13.0

dBm



57 dBc
FCC LIMIT

START 100 MHz

RES BW 30 kHz

VBW 100 kHz

STOP 1.000 GHz

SWP 2.70 sec

RS3-2AB-AIR
ANTENNA CONDUCTED SPURIOUS

MKR 127.9 MHz
47.40 dBm

ATTEN 10 dB

REF 61.0 dBm

h_p

10 dB/

POS PK

OFFSET

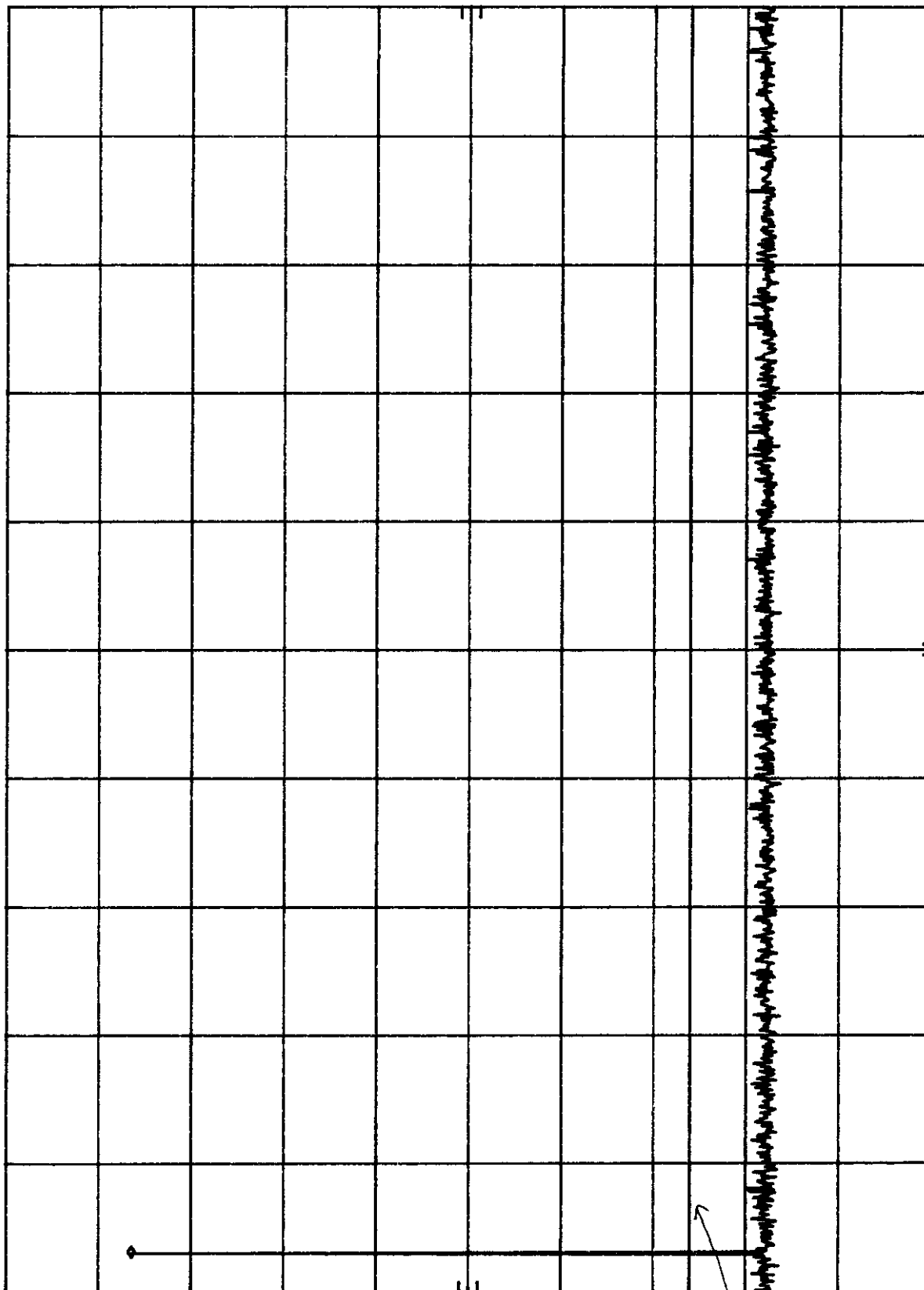
61.0

dB

DL

-13.0

dBm



57dBc

FCC LIMIT

START 100 MHz

RES BW 30 kHz

VBW 100 kHz

STOP 1.000 GHz

SWP 2.70 sec

RS3-2AB-AIR
ANTENNA CONDUCTED SPURIOUS

hp REF 61.0 dBm ATTEN 10 dB

10 dB/

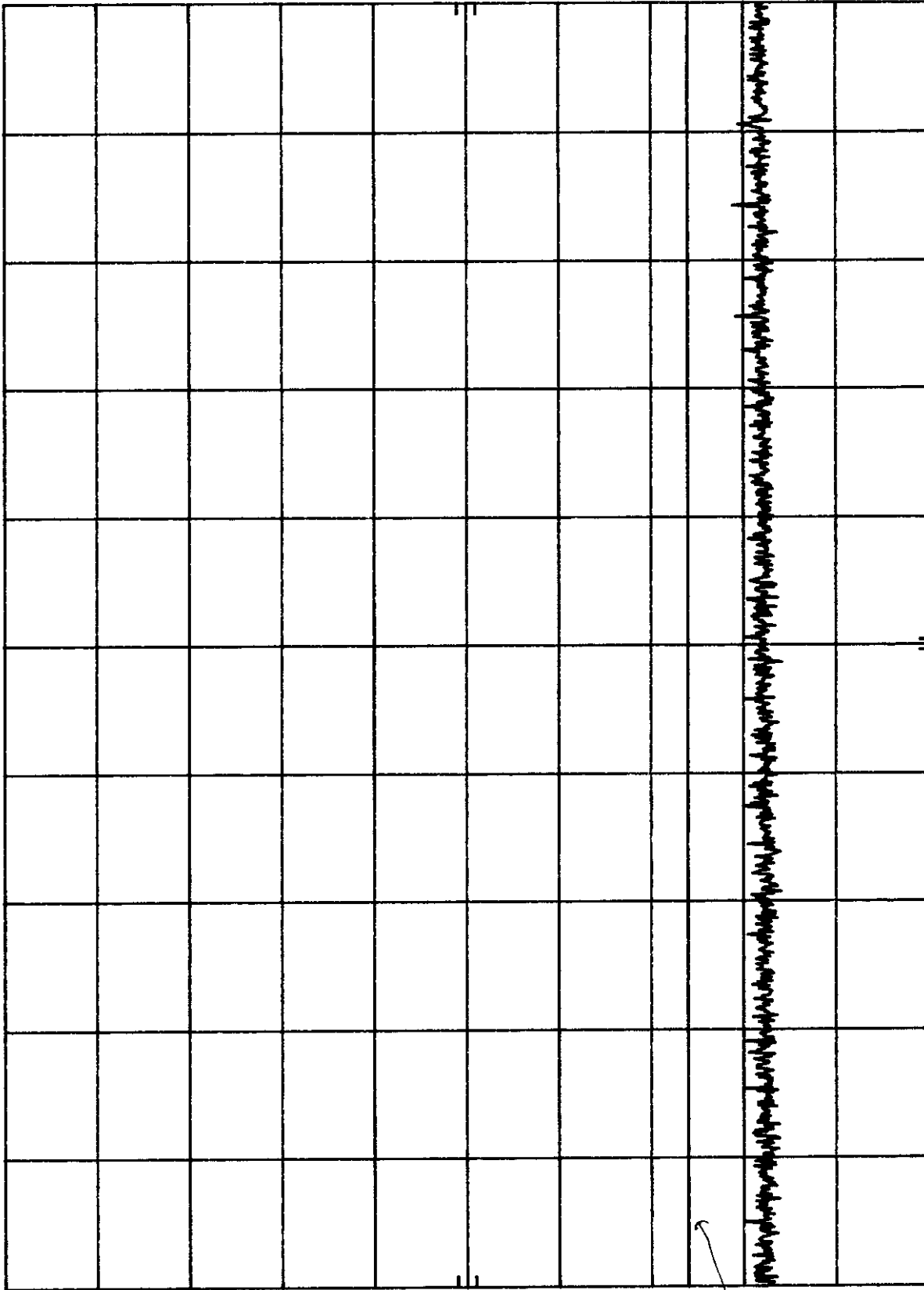
POS PK

OFFSET

61.0
dB

DL
-13.0
dBm

57dBc
FCC LIMIT



START 1.00 GHz RES BW 30 KHz VBW 100 KHz STOP 2.00 GHz SWP 3.00 sec

RS3-2AB-AIR
 ANTENNA CONDUCTED SPURIOUS

ATTEN 10 dB

MKR 131.5 MHz
 47.50 dBm

REF 61.0 dBm

hp

10 dB/

POS PK

OFFSET

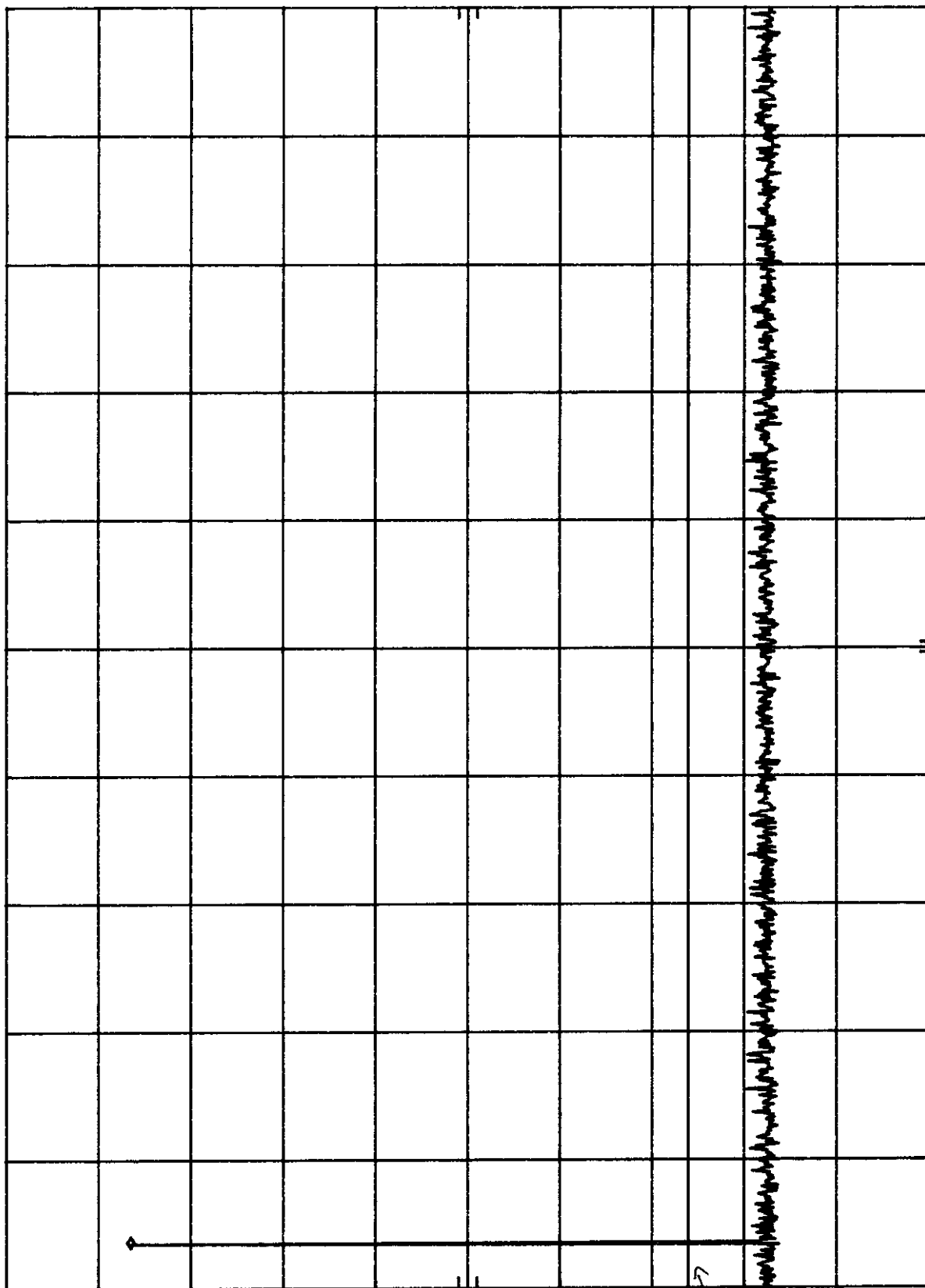
61.0

dB

DL

-13.0

dBm



57dBc

FCC LIMIT

START 100 MHz
 RES BW 30 kHz
 VBW 100 kHz
 STOP 1.000 GHz
 SWP 2.70 sec

RS3-2AB-AIR
ANTENNA CONDUCTED SPURIOUS

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

POS PK

OFFSET

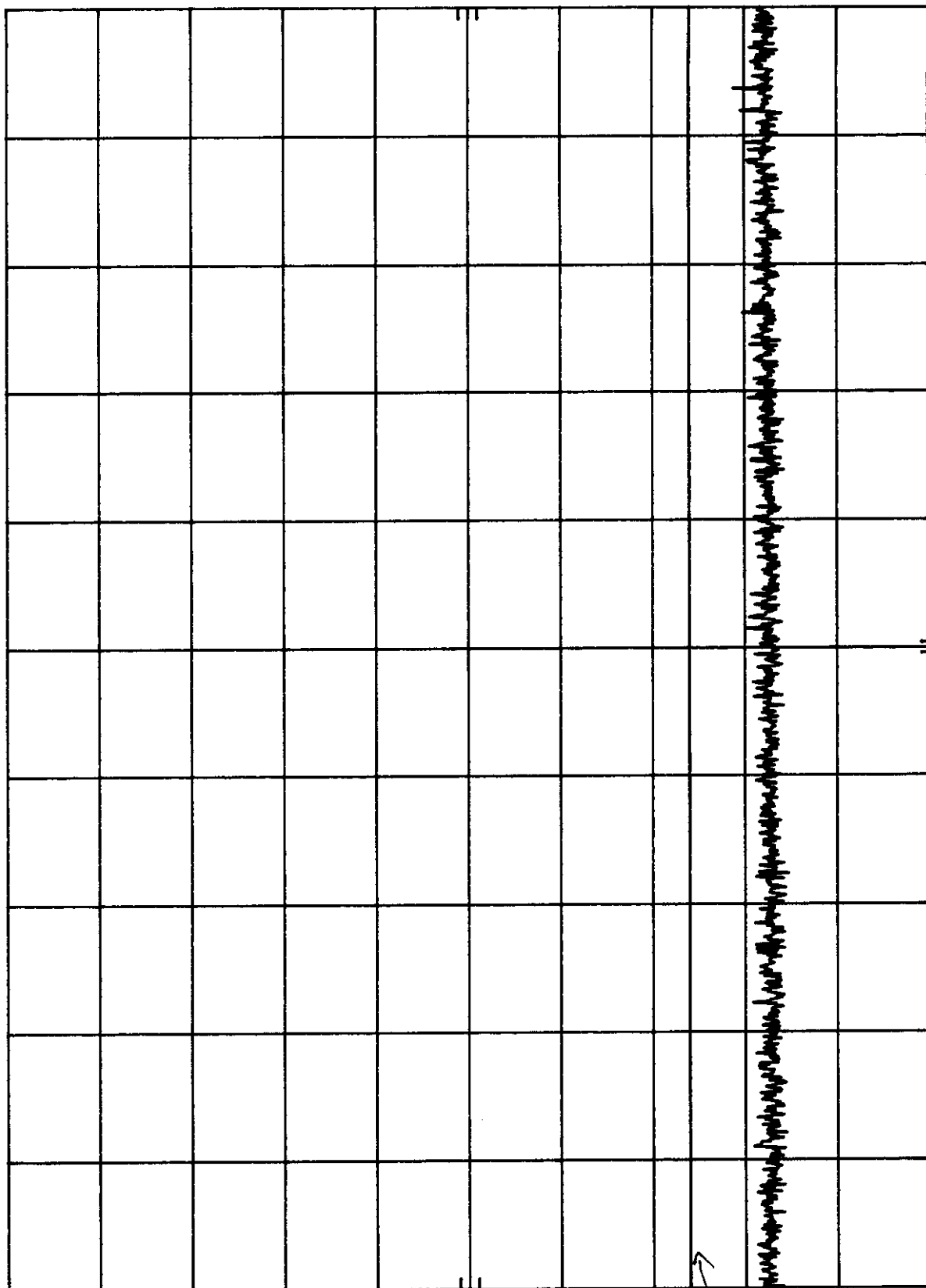
61.0

dB

DL

-13.0

dBm



57 dBc
FCC LIMIT

START 1.00 GHz

RES BW 30 kHz

VBW 100 kHz

STOP 2.00 GHz

SWP 3.00 sec

RS3-2AB-AIR

ANTENNA CONDUCTED SPURIOUS

MKR 136.0 MHz
47.30 dBm

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

POS PK

OFFSET

61.0

dB

DL

-13.0

dBm

57 dBc

FCC LIMIT

START 100 MHz

RES BW 30 kHz

VBW 100 kHz

STOP 1.000 GHz

SWP 2.70 sec

RS3 - 2AB-AIR
ANTENNA CONDUCTED SPURIOUS

ATTEN 10 dB

REF 61.0 dBm

HP

10 dB/

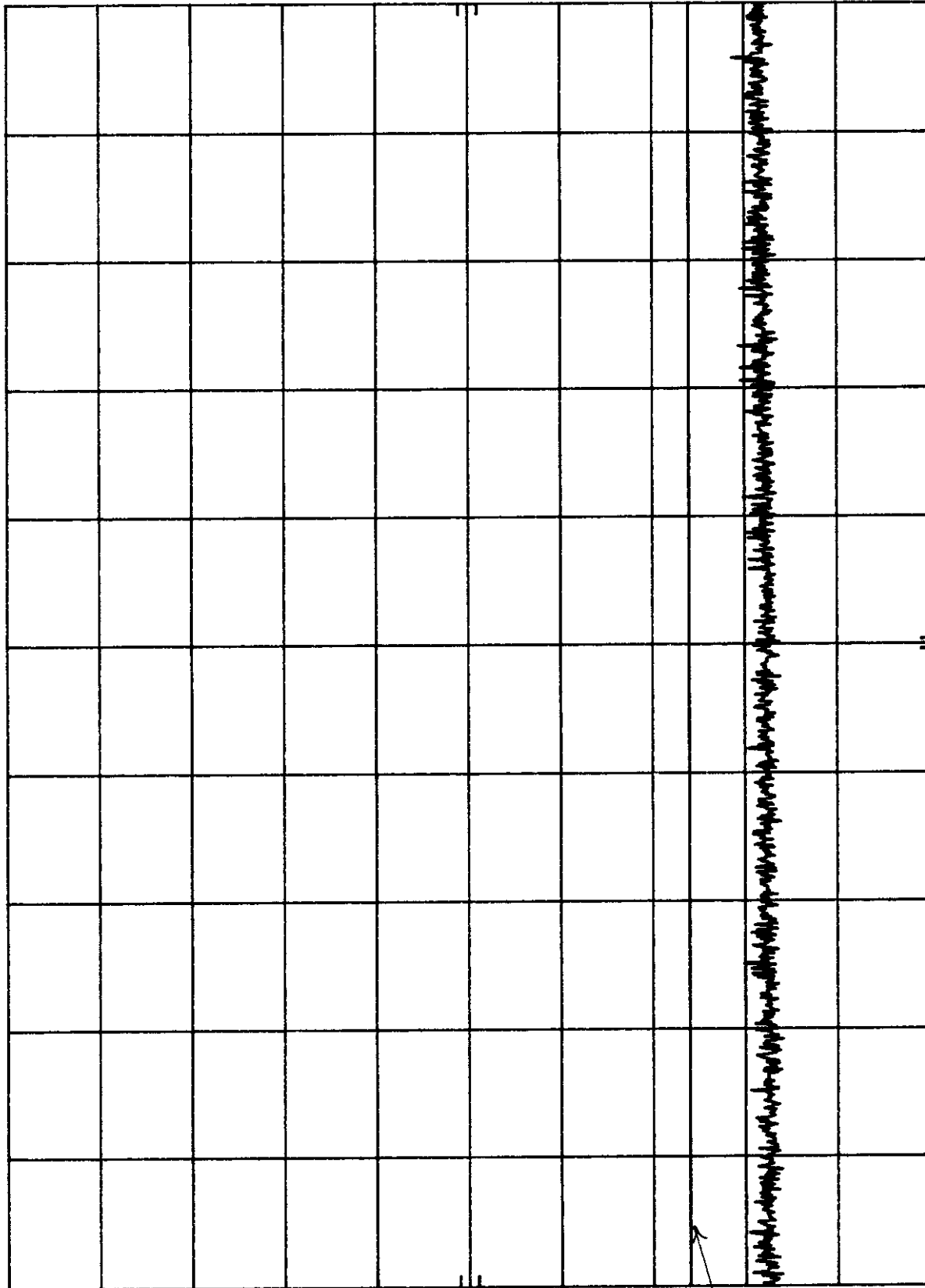
POS PK

OFFSET

61.0
dB

DL

-13.0
dBm



START 1.00 GHz STOP 2.00 GHz

VBW 100 kHz

RES BW 30 kHz

SWP 3.00 sec

2.983 (e) (5)

Measurement of Radiated Spurious Emissions Per 2.993

Definition: Emissions from the equipment when connected into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired. The reduction in the level of these spurious emissions will not effect the quality of the information being transmitted.

Test Method: Per EIA RS 152-B.

Connect the equipment and follow the procedure described in paragraph 2.2.1.1 and paragraph 5.0. Measure the amplitude of each spurious radiated signal through the 10th harmonic. The level in dBuV/m is calculated on the following page. The spurious signals are then measured on the 3 meter range.

$$\text{Spurious attenuation dB} = 10 \log \frac{\text{Po Watts}}{\text{Calc spurious pwr}}$$

Test Results: See TABLE I.

All Radiated spuirious emissions are below the FCC specifications.

SPURIOUS RADIATED SIGNAL MEASUREMENTS

(Ref: Part 2, Subpart J, 2.991 & 2.993)

Date <u>3-27-98</u>	Pass <u>X</u> Fail <u> </u> (at Freq. <u> </u>)
EUT <u>Power Amplifier</u>	Operating Power <u>Saturated</u>
Part No. <u>RS3-RAB-1112</u>	Operating Mode <u>AM</u>
Serial No. <u> </u>	Test Engineer <u>Bryan Bragg</u>

FREQUENCY TUNED TO 122 MHz

ANT POL	FREQ MHz	SPECTRUM ANALYZER (dBμV)	ANT. FACTOR (dB)	CABLE LOSS (dB)	AMP GAIN (dB)	dBμV/m	FUND FIELD STRENGTH dBμV/m	SPUR BELOW CARR- IER (dBc)
	122	—	—	—	—	—	141.3	—
V	244	91.5	13.9	3.2	30	78.6	}	64.7
V	366	86.2	17.0	3.9	30	77.1		64.2
V	488	80.4	19.7	4.3	30	74.4		66.9
H	610	78.2	20.9	5.1	30	74.2		67.1
V	732	72.4	22.8	6.7	30	71.9		69.4
H	854	68.0	23.6	7.6	30	69.2		72.1
H	976	63.2	24.8	8.5	30	66.5		74.8
V	1098	62.4	24.5	9.7	30	66.6		74.7
H	1220	61.5	25.1	10.6	30	67.2		74.1

$$\text{Fundamental Field Strength (V/m)} = 1/3 (R_o \times P_o)^{1/2} = 11.7 \text{ V/m}$$

$$R_o = \text{Amplifier Output Impedance (Ohms)} = 50 \Omega$$

$$P_o = \text{Amplifier Output Power (Watts)} = 25 \text{ W}$$

$$\text{Conversion from } \mu\text{V/m to dB}\mu\text{V/m} = (\mu\text{V/m}) \log \times 20 = 141.3 \text{ dB}\mu\text{V/m}$$

$$\text{FCC Limit} = 43 + 10 \log P_o = 56.9 \text{ dBc}$$

2.983(e)(6) **Measurement of Frequency Stability Per 2.995**

The EUT is a power amplifier and contains no circuitry for generating or stabilizing the RF signal. The driver will be responsible for this task.

2.983(e)(7) **Frequency Spectrum to be Investigated per 2.997**

The frequency was searched from the lowest radio frequency generated in the equipment through the 10th harmonic of the carrier frequency.