MEASUREMENT/TECHNICAL REPORT

Company - Model: I.D. Systems, Inc.
System Monitor
FCC ID: N5VIDS01
May 14, 1999

Description: This is a report to support a request for an original grant of equipment authorization.

Equipment Type: Low Power Communications Device Transmitter

Report prepared for:

I.D. Systems, Inc.
90 William Street
New York, NY 10038
Phone: 212-677-3800
Fax: 212-677-3802

Report prepared by:

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Curtis-Straus LLC
527 Great Road
Littleton, MA 01460 USA
Phone: 978-486-8880
FAX: 978-486-8828

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Letter of Agency

I.D. SYSTEMS, INC.

One Silicon Alley Plaza 90 William Street New York, New York 10038
Phone: 212-677-3800 Fax: 212-677-3802

LETTER OF AGENCY

I, an officer of I.D. Systems, Inc., do hereby authorize Curtis-Straus, LLC to act on our behalf in front of the Federal Communications Commission with respect to all matters relating to certification of equipment under Part 15 of the FCC Rules until further notice.

I further certify that no party (as defined in #1,2002(b) of CFR 47, 1992) to this application, including myself, is subject to denial of federal benefits, that includes FCC benefits, pursuant to section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 853(a).

Certified by:

Jeffrey M. Jaffe
Chief Operating Officer/General Counsel

8/11/1998

Introduction

This report is an application for Certification of a Transmitter operating pursuant to Part 15.249 of the FCC Rules, Code of Federal Regulations 47. The model covered by this report is the System Monitor. This report is designed to demonstrate the compliance of this device with the requirements outlined in Part 15 of CFR 47 using the methods outlined in Part 2 of CFR 47. The current revision date, October 1,1997, of each Part has been used for technical requirements.

The confidential information and descriptions included in this application are detailed descriptions of the products, block diagrams, component specifications, and schematic diagrams. We hereby respectfully request under the provision of section 0.457d of the code that the documents listed below be held confidential.

Exhibit 6.1: Technical Description and Block Diagram

Exhibit 6.2: Schematics

Exhibit 6.3: Bill of Materials

I.D. Systems, Inc. is requesting that the Technical Description, Block Diagram, Schematics and Bill of Materials be kept confidential in the FCC application because of the proprietary design developed by I.D. Systems, Inc. that is unique to the industry.

EXHIBIT 1:

1.0 Statement of Conformity

The I.D. Systems, Inc. System Monitor has been found to conform with the following parts of the 47 CFR as detailed below:

Part 2	Part 15	Comments
	15.15(b)	The product contains no user accessible controls that increase transmission power above allowable levels.
2.925	15.19	The label is shown in the label exhibit.
	15.21	Information to the user is provided via a leaflet packaged with the product (see Instruction Manual Exhibit 7.0)
	15.27	No special accessories are required for compliance.
	15.203	This device may only be installed by an authorized professional installer.
	15.205 15.209	The fundamental is not in a Restricted band and the spurious and harmonic emissions in the Restricted bands comply with the general emission limits of 15.209.
	15.207	The unit passes the line conducted requirements of 15.207.
	15.249(a)	The unit complies with the field strength limits of the 15.249(a) table including the 20dB peak restriction of 15.35(b) and 15.249(d).
	15.249(c)	The unit complies with the field strength limits of the 15.209(a) table.

EXHIBIT 2

2.0 General Description

2.1 Product Description

The System Monitor is a fixed unit that is used to communicate and track mobile units such as VACs and Flextags. It is typically mounted indoors on a wall. The mobile units relay information to the System Monitors which then relay this information to a central computer. The unit is operated off of the AC Mains.

Unit Tested:
Model Number: System Monitor
Serial Number: Prototype

2.2 Related Submittal(s) Grants

There are no other approvals required for this device.

2.3 Test Methodology

Radiated emission testing was performed according to the procedures in ANSI C63.4 (1992). Radiated testing was performed at an antenna to EUT distance of 3 meters below 1 GHz, and at a distance of 3 or 1 meter(s) above 1 GHz. The actual test distance used is noted in the test data sheets. The device's performance was investigated to 10 times the fundamental frequency.

All other performance tests were made in accordance with the procedures outlined in Part 15 of CFR 47. The applicable sections provided under Part 15 are provided in the measurement section of this report, Exhibit 3.

2.4 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 527 Great Road, Littleton, MA 01460. Sites "T" and "F" were used. These test faciliies have been fully described in reports submitted to your office, and letters from your office dated August 8, 1997 and February 28, 1997 verified receipt of these reports and confirmed compliance of these sites. Please reference your file # 31040/SIT 1300F2 should you have any questions regarding the test site construction.

2.5 Test Equipment Used

SPECTRUM ANALYZER(S)

WHITE 8593E 9 kHz-22 GHz	HP	S/N:3547U01252	Calibration Due:05-JAN-00

ANTENNA(S)

YELLOW 3115 EMCO Horn Antenna	1-18 GHz	S/N:9608-4989	Calibration Due:10-MAR-00
GREEN CBL6112B Bilog 30 MHz-2 GHz	Chase	S/N:2435	Calibration Due:16-JUL-99
RED 3143 Biconilog 30 MHz-1.1 GHz	EMCO	S/N:1270	Calibration Due:28-MAY-99
BLACK 3115 Horn Antenna	EMCO 1-18 GHz	S/N:9703-5148	Calibration Due:16-MAR-99

PREAMPLIFIER(S)

RED ZFL-1000-LN RF Preamplifier 0.10 - 2000 MHz	MiniCircuits		Calibration Due:06-FEB-00
BLUE ZFL-1000-LN RF Preamplifier 0.05 - 2000 MHz	MiniCircuits		Calibration Due:14-OCT-99
WHITE SMC-12A RF Preamplifier 2000 - 18000 MHz	MITEQ	S/N:426643	Calibration Due:30-OCT-99

OPEN AREA TEST SITE(S)

SITE "T"	Calibration Due:28-MAY-99

Unless otherwise noted the calibration interval is one year. All equipment is calibrated using standards traceable to NIST or other nationally recognized calibration standard.

EXHIBIT 3

3.0 Measurement Results

3.1 Operating Frequency

This device operates at 905.6MHz and 910.0MHz.

3.2 Electric Field Strength Radiation Measurements

Data was obtained using the procedures outlined in ANSI C63.4 (1992). All signals from the transmitters within 10 dB of the emission limits are reported in the following data tables.

Radiated Emissions Chart — *Curtis-Straus LLC*

Date: 7/30/98 **Company:** ID Systems **Distance:** 3 m
Engineer: Michael Buchholz **EUT Desc:** System Monitor / Gateway **Table No:** 1
Notes: 905.6MHz Fundamental and Harmonics **Work Order:** 980599

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Distance Factor (dB)	Averaging Factor (dB)	Adjusted Reading (dBµV/m)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
V	905.6	80.9	21.7	23.7	3.0	0.0	0.0	85.9	94.0	-8.1	Pass
V	1811.1	36.2	18.4	28.0	1.2	0.0	6.7	40.3	54.0	-13.7	Pass
V/H	2716.7	33.1	19.1	30.8	1.5	0.0	6.7	39.6	54.0	-14.4	Pass
NF	3622.3	24.1	18.8	32.9	1.9	0.0	6.7	33.4	54.0	-20.6	Pass
V	4527.9	27.3	18.6	34.5	2.2	0.0	6.7	38.7	54.0	-15.3	Pass
V	5433.5	26.1	18.3	36.2	2.5	0.0	6.7	39.8	54.0	-14.2	Pass
NF	6399.1	23.7	18.1	36.6	2.8	10.0	6.7	28.3	54.0	-25.7	Pass
NF	7244.7	29.9	17.8	37.9	3.0	10.0	6.7	36.3	54.0	-17.7	Pass
NF	8150.3	31.1	17.6	38.9	3.2	10.0	6.7	38.9	54.0	-15.1	Pass
NF	9055.9	29.7	17.3	39.7	3.5	10.0	6.7	38.9	54.0	-15.1	Pass

Radiated Emissions Chart — *Curtis-Straus LLC*

Date: 18-Nov-98 **Company:** ID Systems **Distance:** 3 m
Engineer: David Heald **EUT Desc:** Wake up module **Table No:** 2
Notes: 910 MHz Harmonics **Work Order:** 980951

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Averaging Factor (dB)	Adjusted Reading (dBµV/m)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
H	910.0	82.0	22.5	20.3	0.7	0.0	80.5	94.0	-13.5	Pass
V	1820.0	21.9	19.4	27.9	1.2	6.7	24.9	54.0	-29.1	Pass
H	2730.0	28.1	19.1	30.5	1.5	6.7	34.3	54.0	-19.7	Pass
Noise floor	3640.0	19.8	18.8	33.1	1.9	6.7	29.3	54.0	-24.7	Pass
Noise floor	4550.0	20.3	18.6	34.5	2.2	6.7	31.7	54.0	-22.3	Pass
Noise floor	5460.0	19.8	18.3	36.2	2.5	6.7	33.5	54.0	-20.5	Pass
Noise floor	6370.0	18.9	18.1	36.6	2.7	6.7	33.4	54.0	-20.6	Pass
Noise floor	7280.0	26.2	17.8	38.3	3.0	6.7	43.0	54.0	-11.0	Pass
Noise floor	8190.0	26.4	17.6	39.3	3.3	6.7	44.7	54.0	-9.3	Pass
Noise floor	9100.0	25.9	17.3	40.5	3.5	6.7	45.9	54.0	-8.1	Pass

Pre-Amp: White, Red **OATS:** "F" **Cable:** 12' RG8A/U **Antenna:** Yellow, Green

Radiated Emissions Chart — Curtis-Straus LLC

Date: 7/30/98 **Company:** ID Systems **Distance:** 3 m
Engineer: Michael Buchholz **EUT Desc:** System Monitor / Gateway **Table No:** 3
Notes: Unintentional emissions 30-10000MHz. **Work Order:** 980599

Antenna Polarization (H / V)	Frequency (MHz)	Reading (dBµV)	Preamp Factor (dB)	Antenna Factor (dB/m)	Cable Factor (dB)	Adjusted Reading (dBµV/m)	FCC Class B Limit (dBµV/m)	FCC Class B Margin (dB)	FCC Class B Result (Pass/Fail)
Vbb	69.6	44.7	22.4	6.7	0.5	29.5	40.0	-10.5	Pass
Hbb	119.9	37.3	22.2	6.9	0.8	22.8	43.5	-20.7	Pass
V	141.1	35.4	22.3	9.7	0.9	23.7	43.5	-19.8	Pass
H nf	218.0	23.4	22.3	11.0	1.2	13.3	46.0	-32.7	Pass
H	310.5	39.3	22.2	14.2	1.5	32.8	46.0	-13.2	Pass
H nf	600.0	17.7	22.0	19.5	2.3	17.5	46.0	-28.5	Pass
V	976.6	32.1	21.6	23.5	3.2	37.2	54.0	-16.8	Pass
H nf	1000.0	17.8	21.6	23.4	3.3	22.9	54.0	-31.1	Pass
H	1953.2	24.0	18.2	28.7	1.2	35.7	54.0	-18.3	Pass
H	2929.8	26.5	19.0	31.6	1.6	40.7	54.0	-13.3	Pass
H	3906.4	25.2	18.8	33.1	2.0	41.5	54.0	-12.5	Pass
NF	4883.0	24.1	18.5	35.3	2.3	43.2	54.0	-10.8	Pass

Pre-Amp: Green OATS: "T" Cable: 50' RG8A/U

Conducted Emissions Chart — Curtis-Straus LLC

Date: 30-Jul-98 **Company:** ID Systems **Table No:** 4
Engineer: Michael Buchholz **EUT Desc:** System Monitor / Gateway **Work Order:** 980599
Notes:

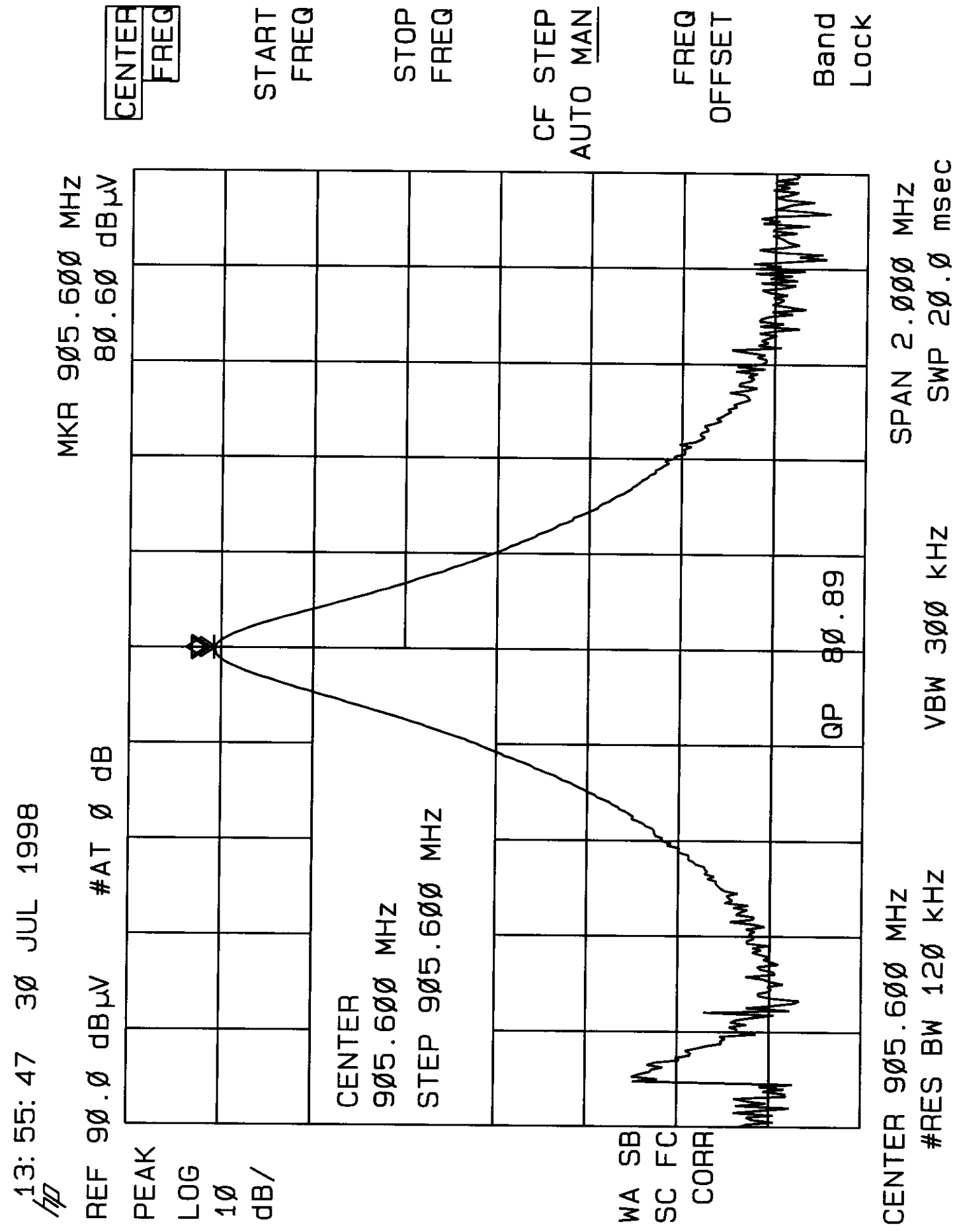
Range: 0.45 - 30.0 MHz **LISN(s):** Red **Spectrum Analyzer:** White

Frequency (MHz)	Quasi-Peak L1 (dBµV)	Quasi-Peak L2 (dBµV)	Quasi-Peak Reading (dBµV)	FCC Class B Limit (dBµV)	FCC Class B Result (Pass/Fail)	Average L1 (dBµV)	Average L2 (dBµV)	Average Reading (dBµV)	FCC Class B Limit (dBµV)	FCC Class B Result (Pass/Fail)
Receive Mode										
0.45	25.5	25.6	25.6	48.0	Pass			---	48.0	Pass
0.52	25.6	26.6	26.6	48.0	Pass			---	48.0	Pass
2.40	32.5	28.9	32.5	48.0	Pass			---	48.0	Pass
5.88	27.2	24.3	27.2	48.0	Pass			---	48.0	Pass
10.00	30.4	26.9	30.4	48.0	Pass			---	48.0	Pass
16.13	28.3	28.7	28.7	48.0	Pass			---	48.0	Pass
24.10	36.4	32.1	36.4	48.0	Pass			---	48.0	Pass
28.31	43.4	40.8	43.4	48.0	Pass			---	48.0	Pass
Transmit Mode										
0.45	20.7	21.1	21.1	48.0	Pass			---	48.0	Pass
0.52	20.9	20.9	20.9	48.0	Pass			---	48.0	Pass
1.21	30.3	31.1	31.1	48.0	Pass			---	48.0	Pass
2.40	23.2	25.0	25.0	48.0	Pass			---	48.0	Pass
5.88	22.2	20.5	22.2	48.0	Pass			---	48.0	Pass
10.00	19.7	21.6	21.6	48.0	Pass			---	48.0	Pass
16.13	19.7	24.4	24.4	48.0	Pass			---	48.0	Pass
24.10	29.2	26.2	29.2	48.0	Pass			---	48.0	Pass
28.31	41.0	46.0	46.0	48.0	Pass			---	48.0	Pass

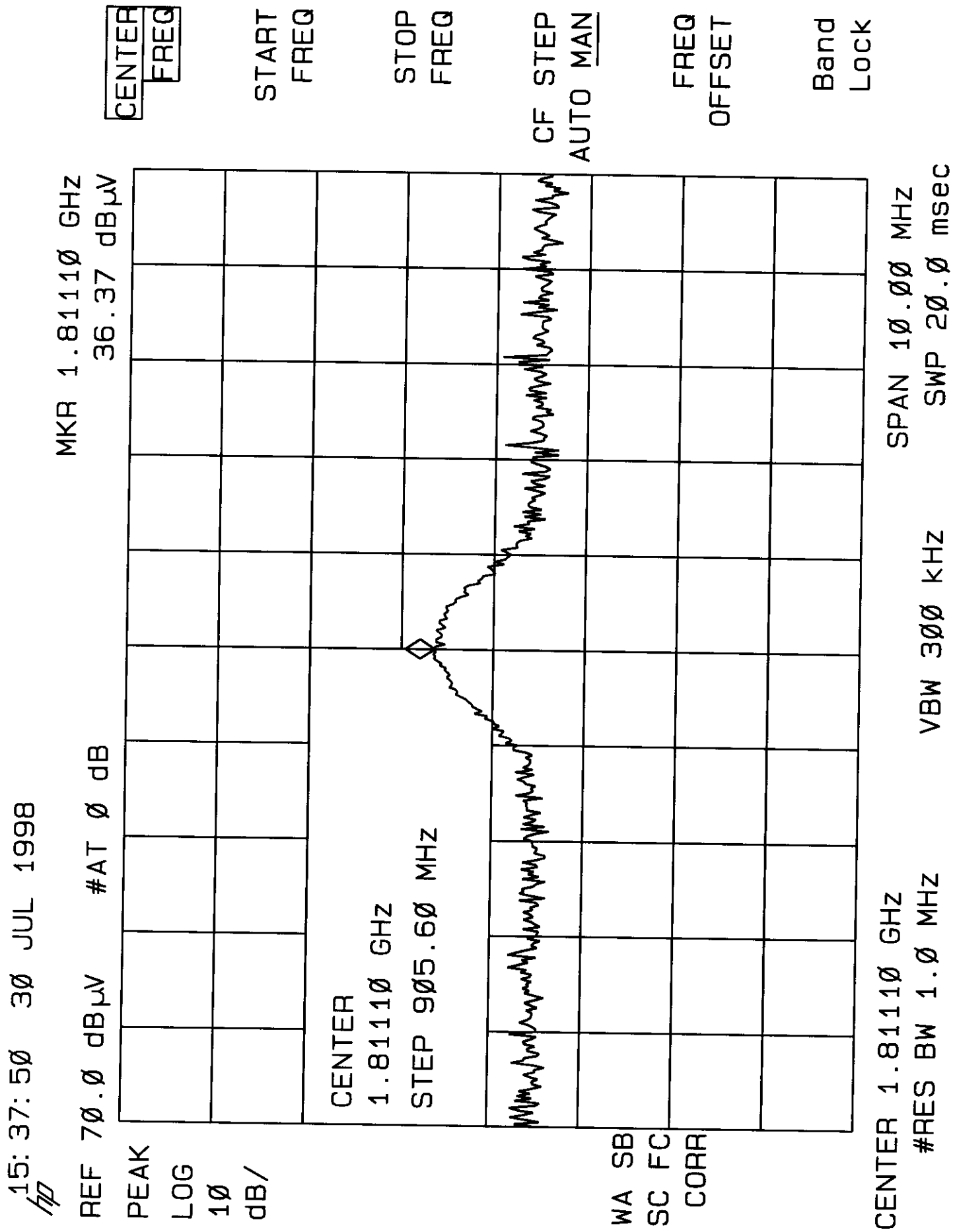
Radiated Emissions Plots:

905.6MHz Transmitter

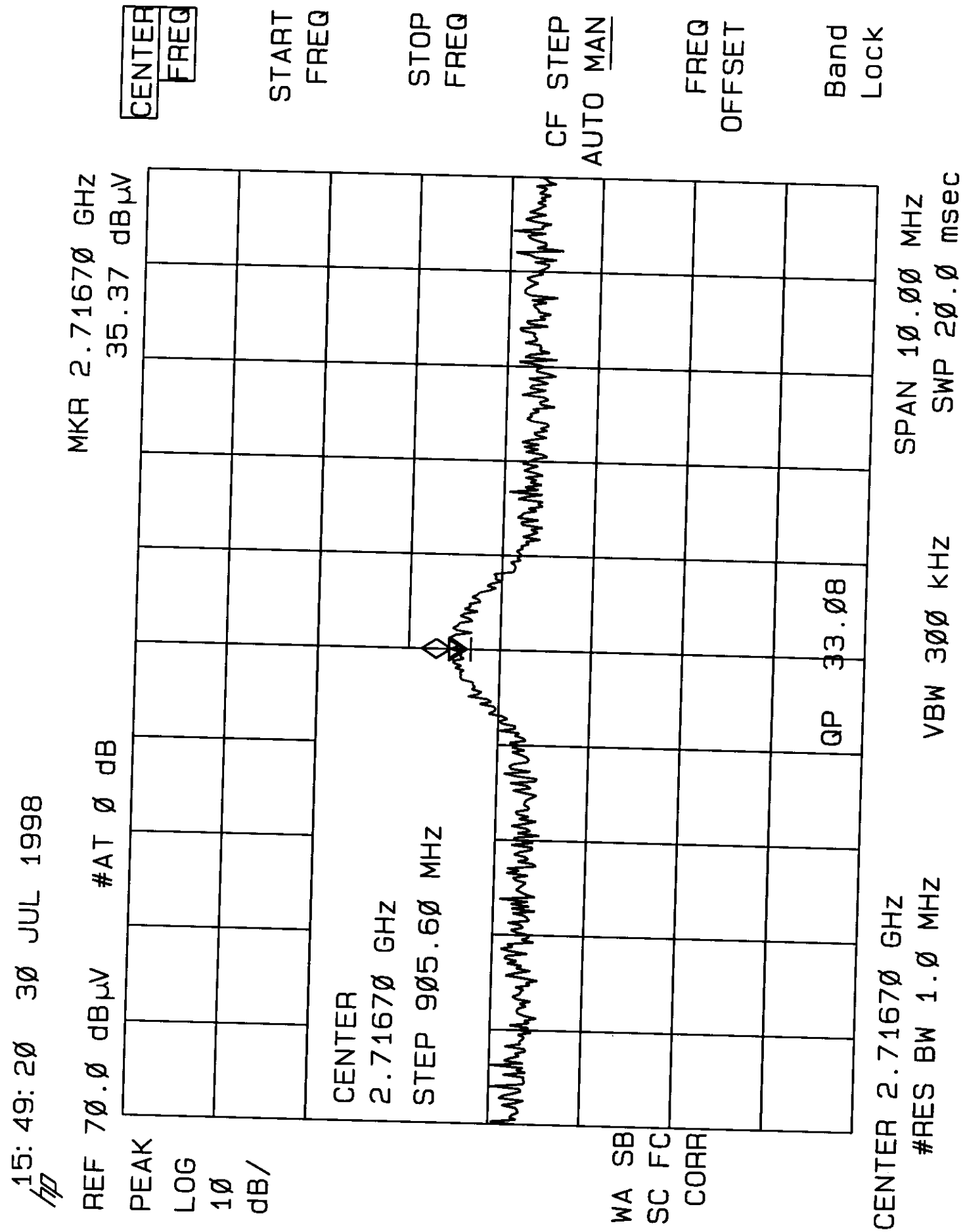
1st Harmonic



2nd Harmonic



3rd Harmonic



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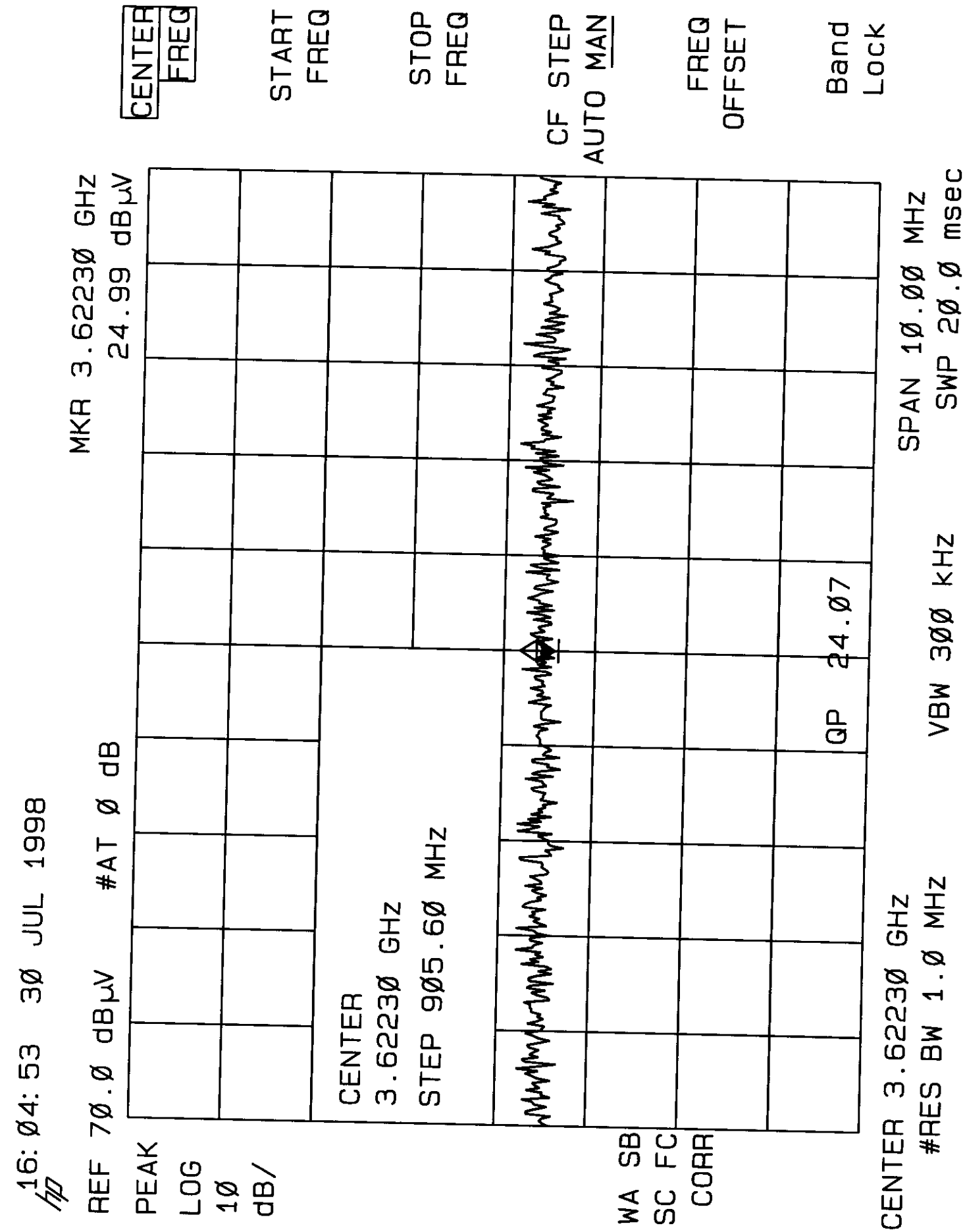

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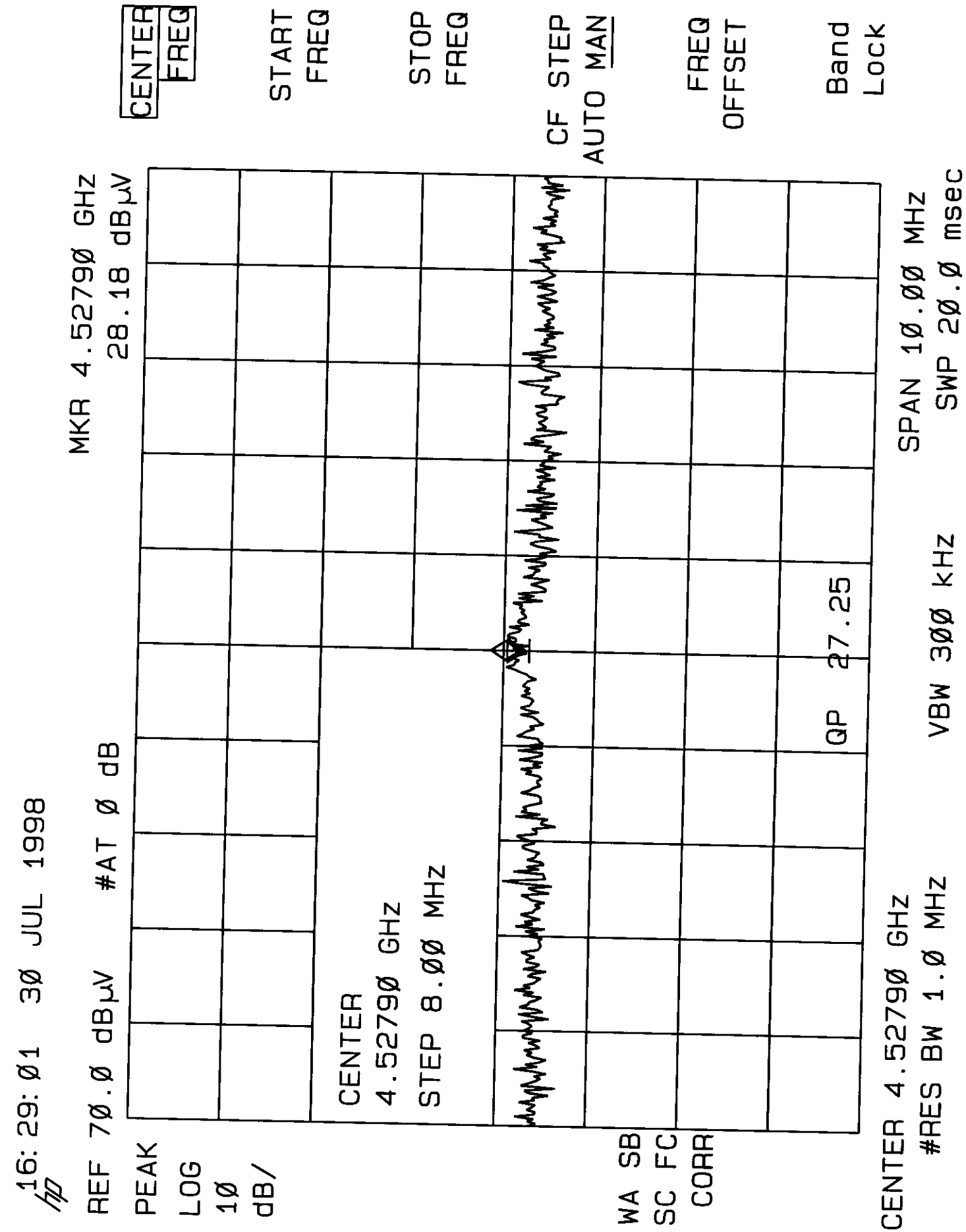
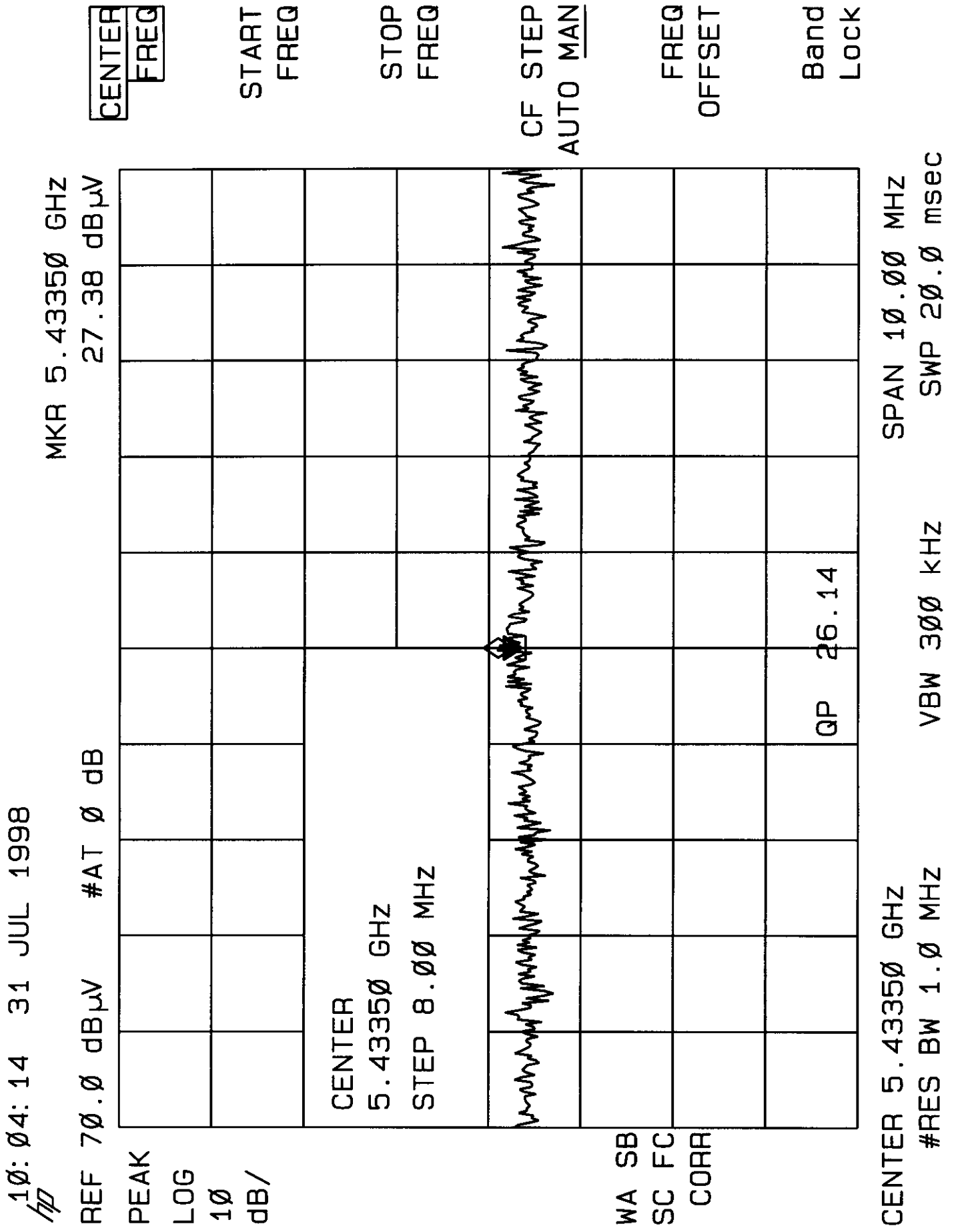
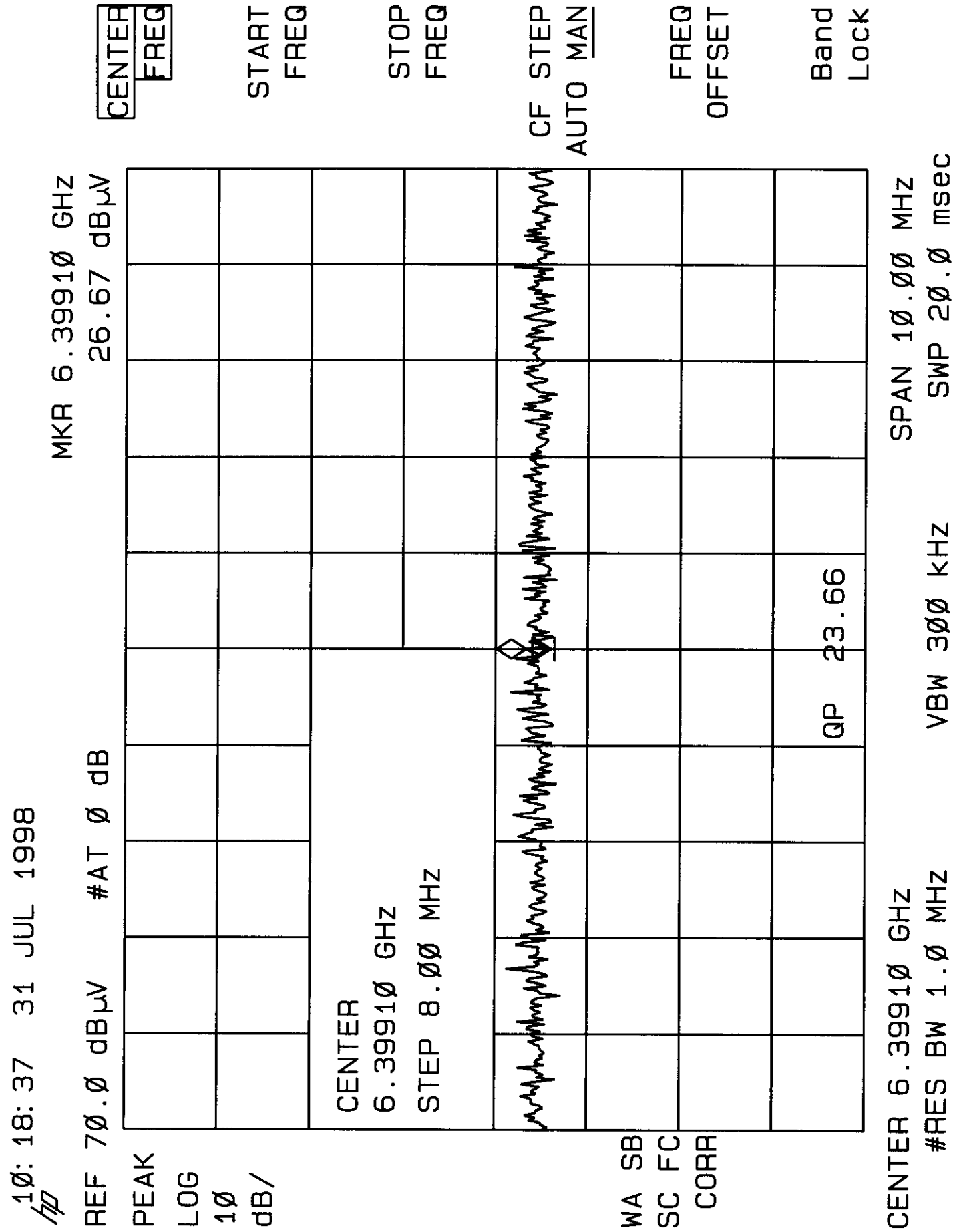


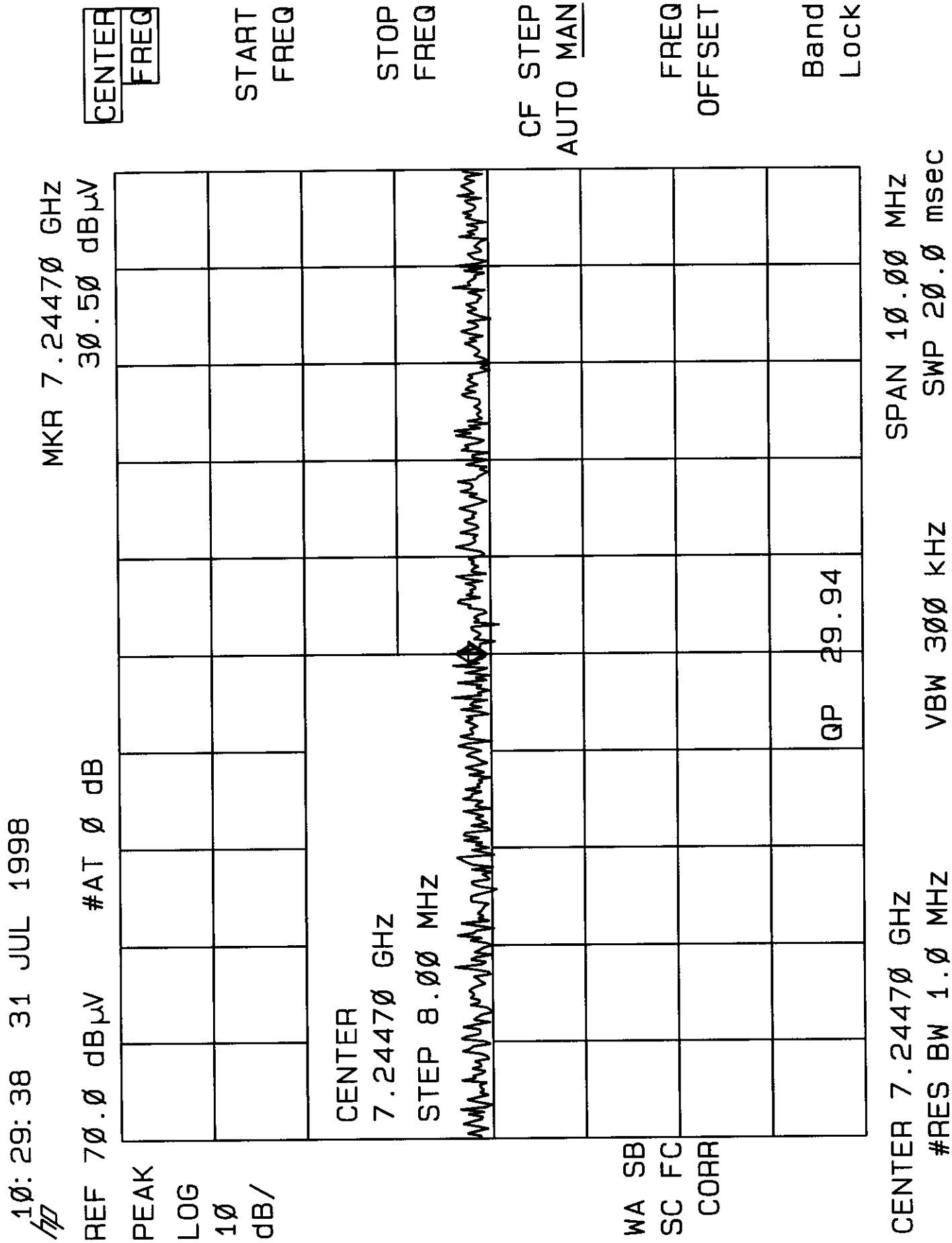
6th Harmonic

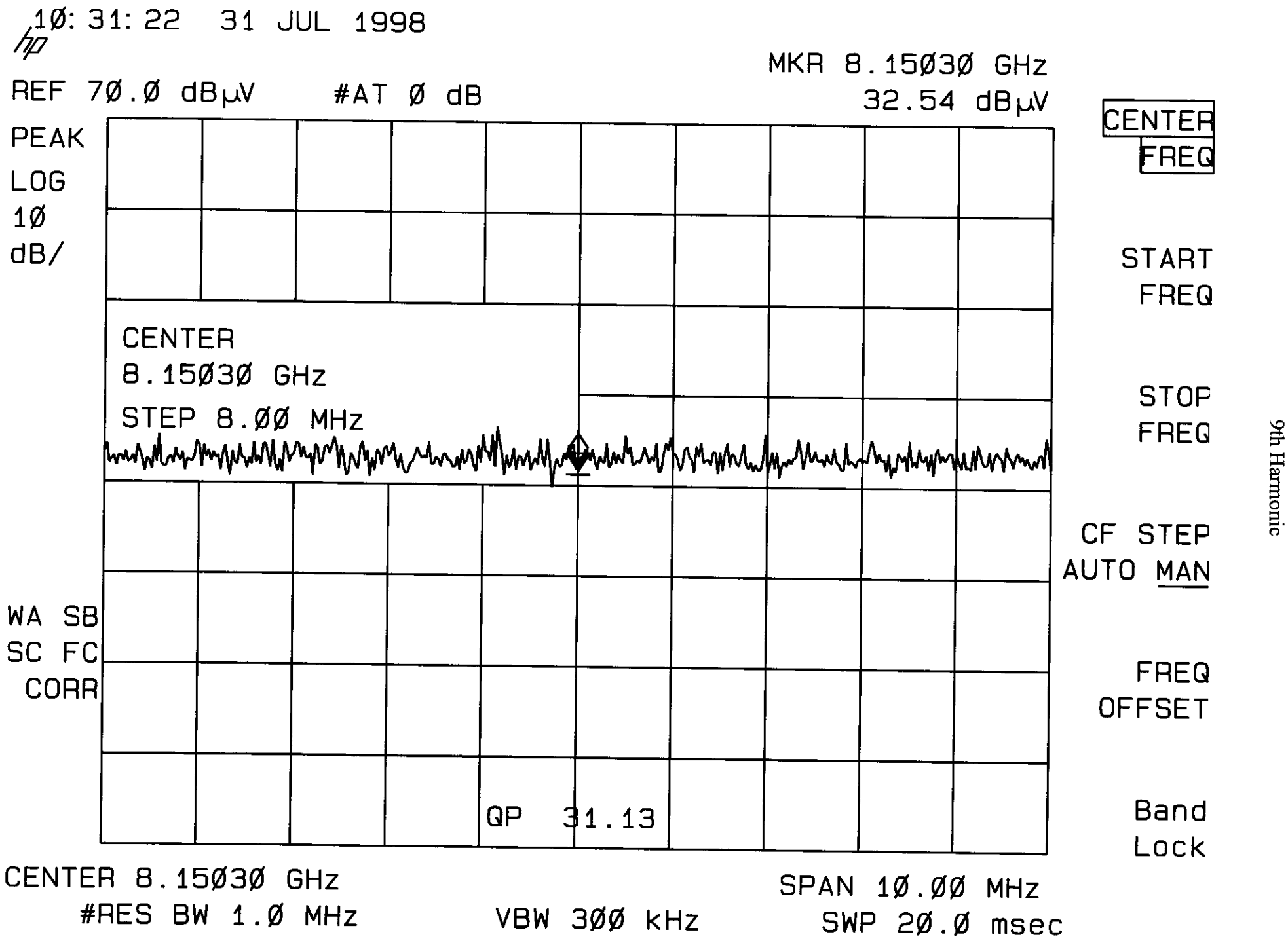


7th Harmonic



8th Harmonic

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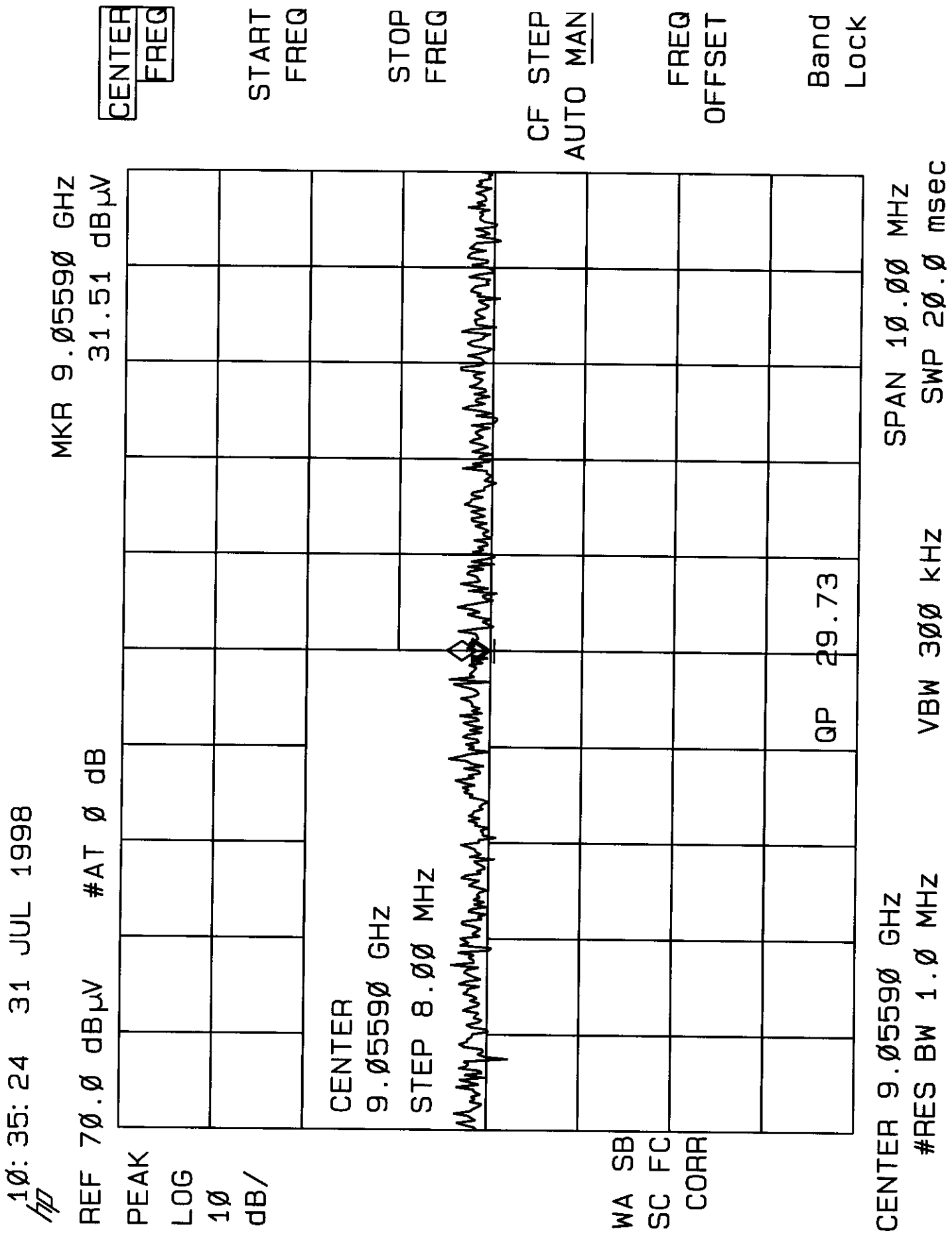
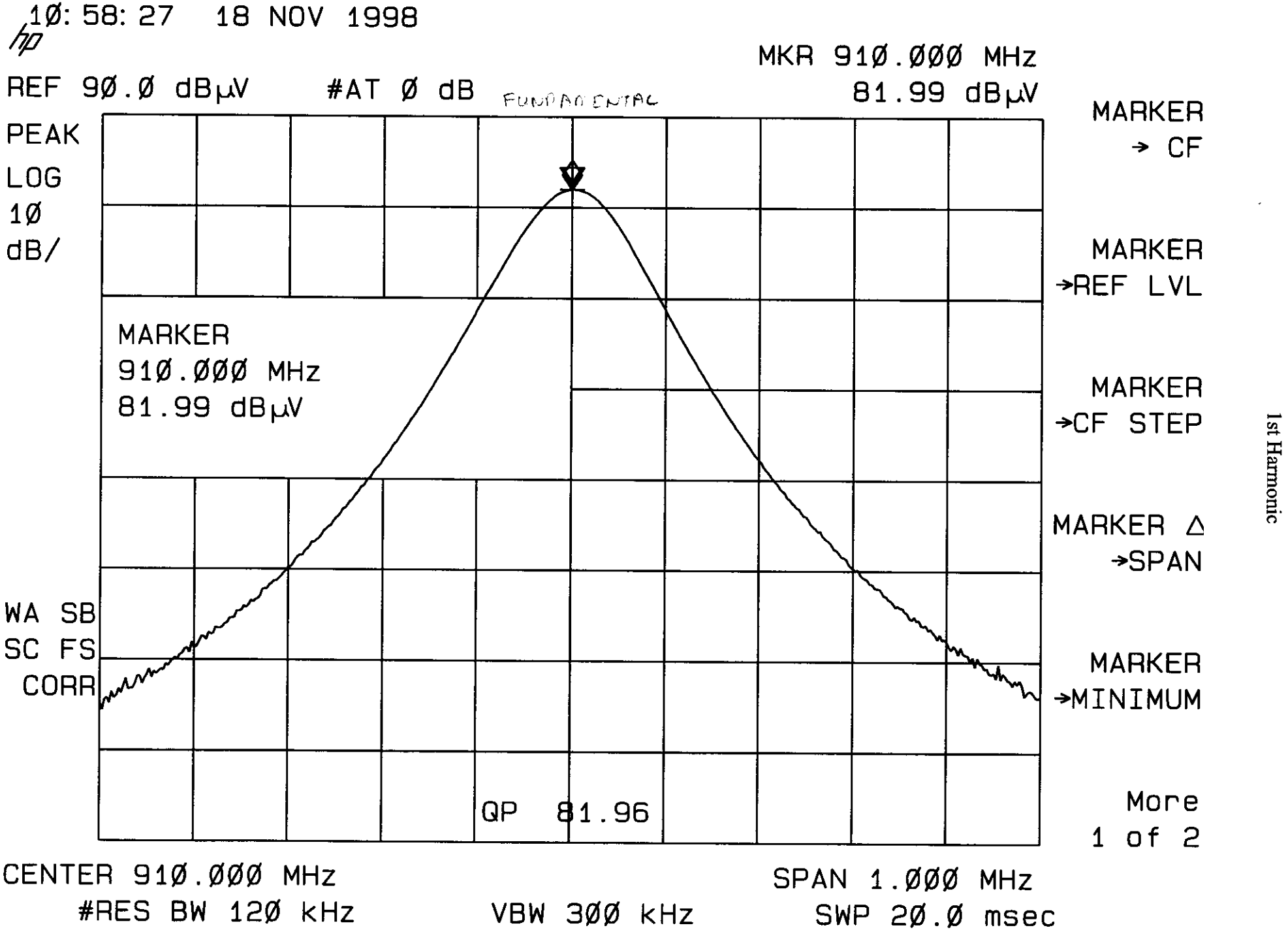
MKR 8.15030 GHz
32.54 dBµV
REF 70.0 dBµV
#AT 0 dB
PEAK
LOG
10
dB/
CENTER
8.15030 GHz
STEP 8.00 MHz
CENTER FREQ
START FREQ
STOP FREQ
CF STEP
AUTO MAN
FREQ OFFSET
Band Lock
WA SB
SC FC
CORR
QP 31.13
CENTER 8.15030 GHz
#RES BW 1.0 MHz
VBW 300 kHz
SPAN 10.00 MHz
SWP 20.0 msec
9th Harmonic

10th Harmonic

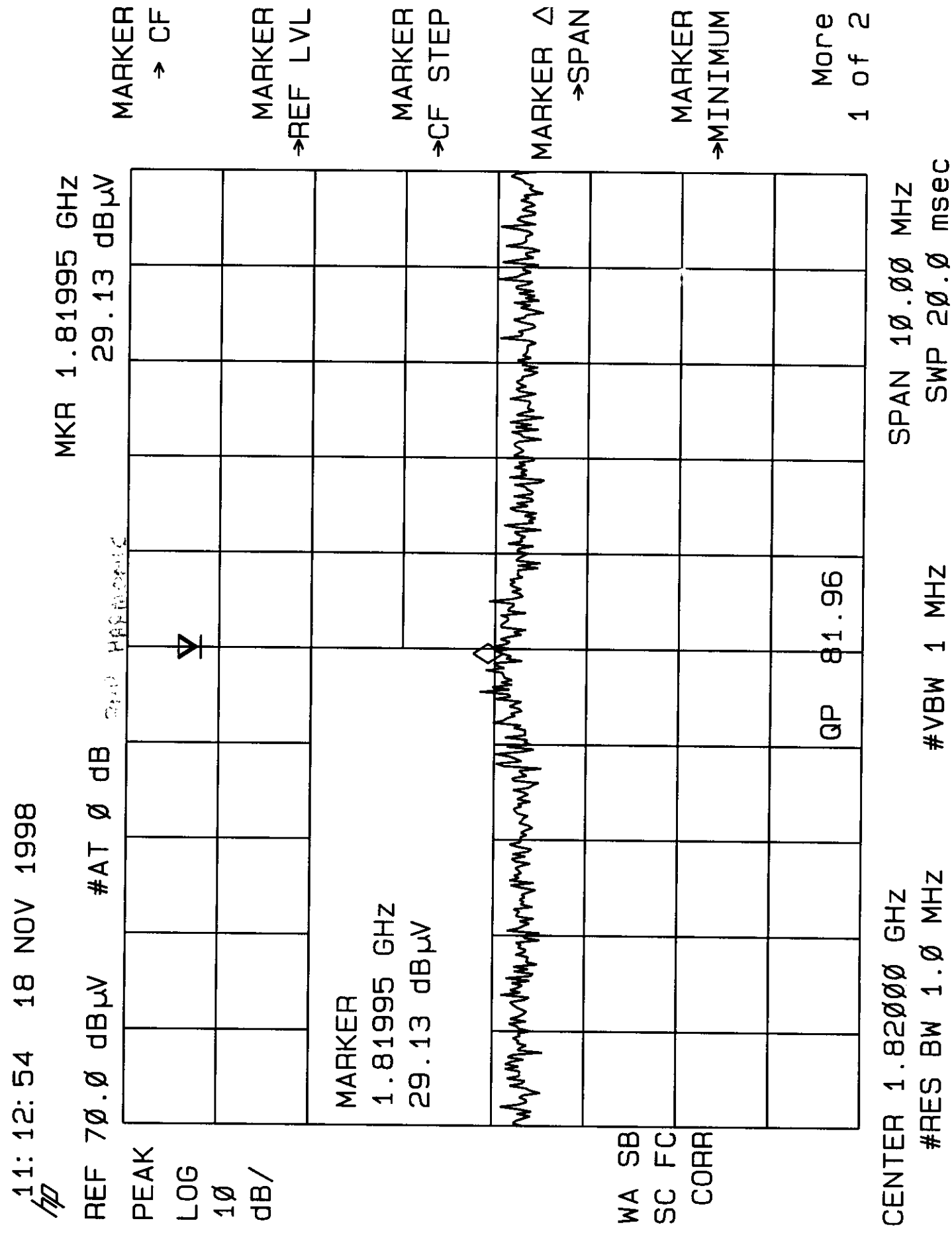


910.0MHz Transmitter



1st Harmonic

2nd Harmonic



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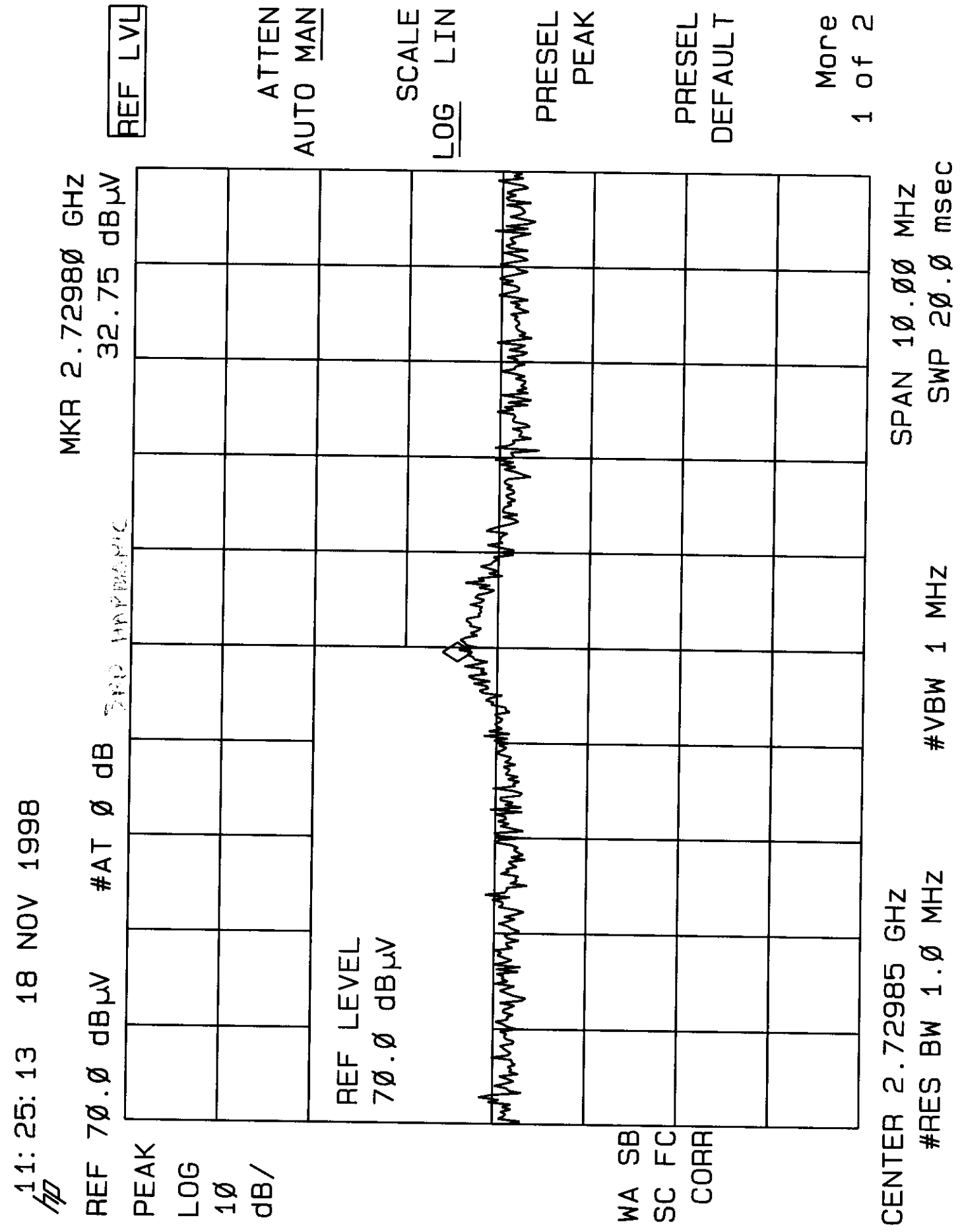

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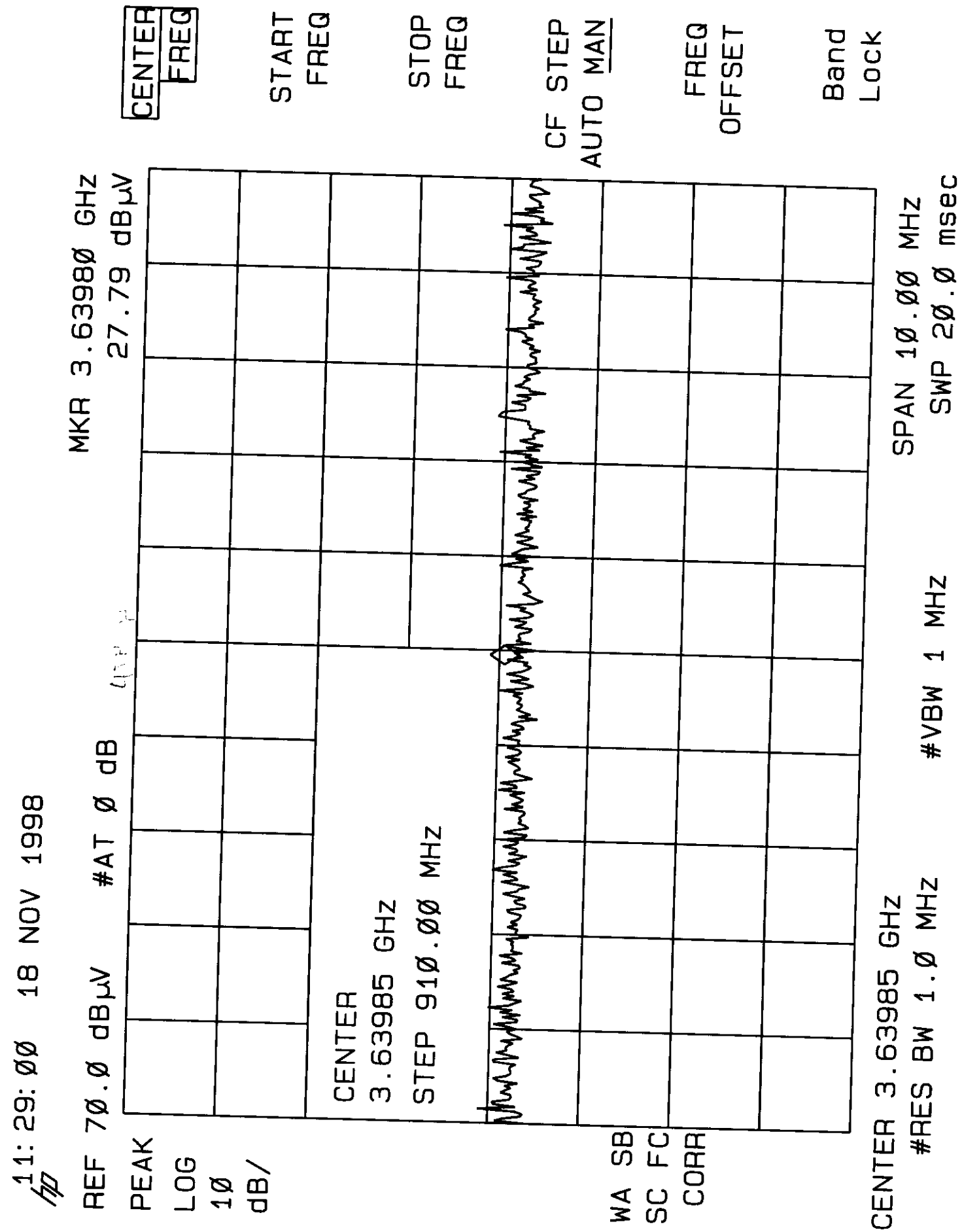

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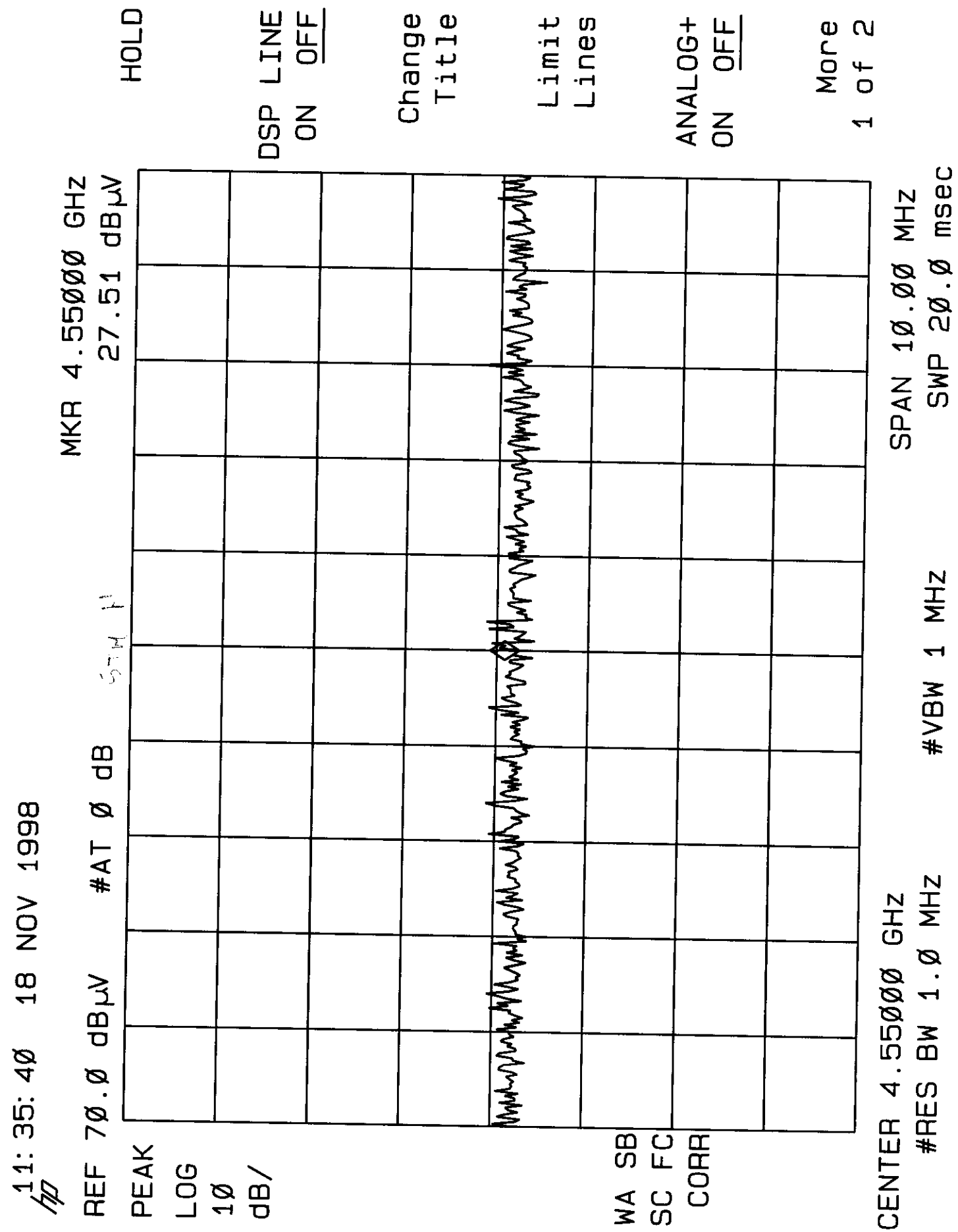
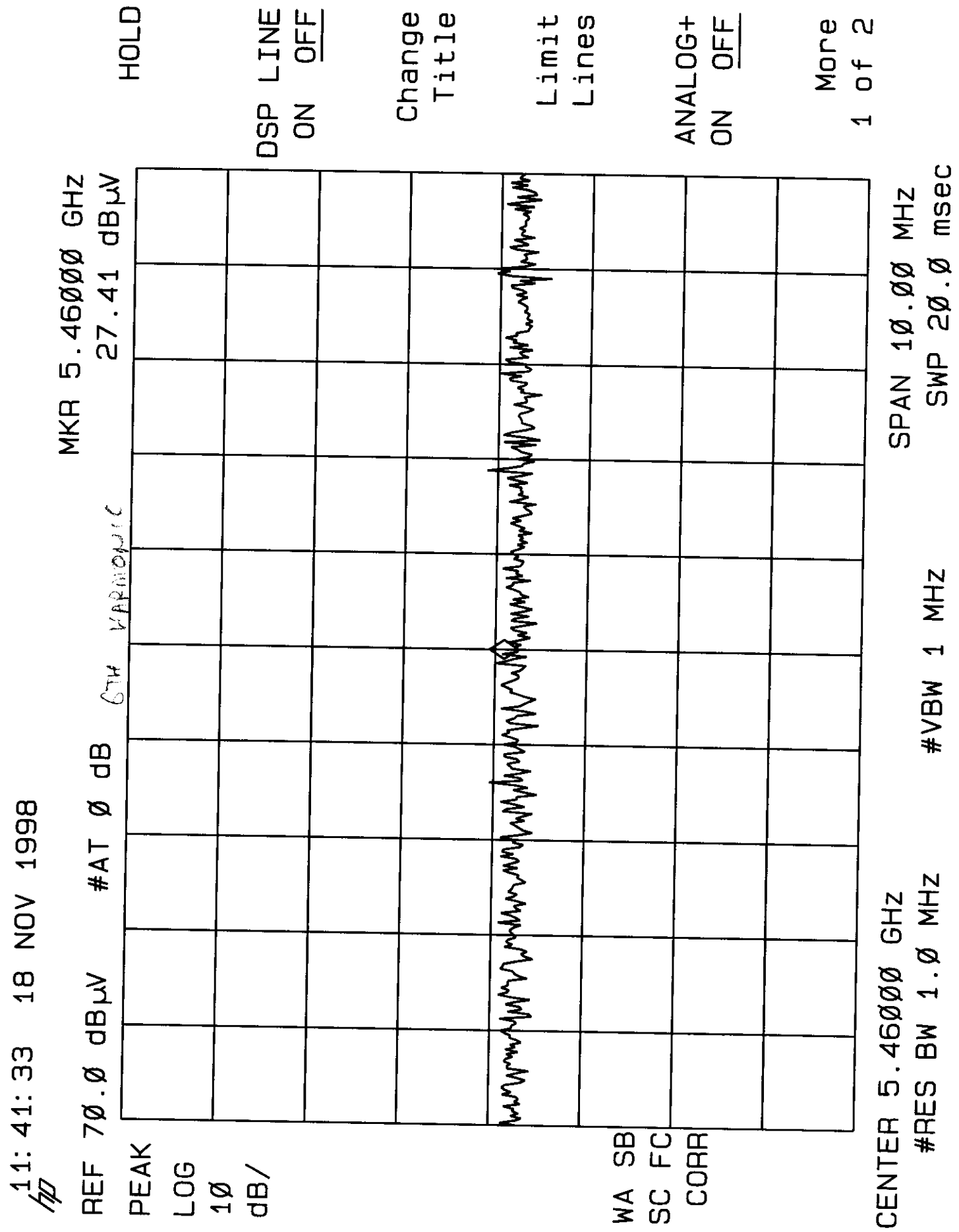


6th Harmonic



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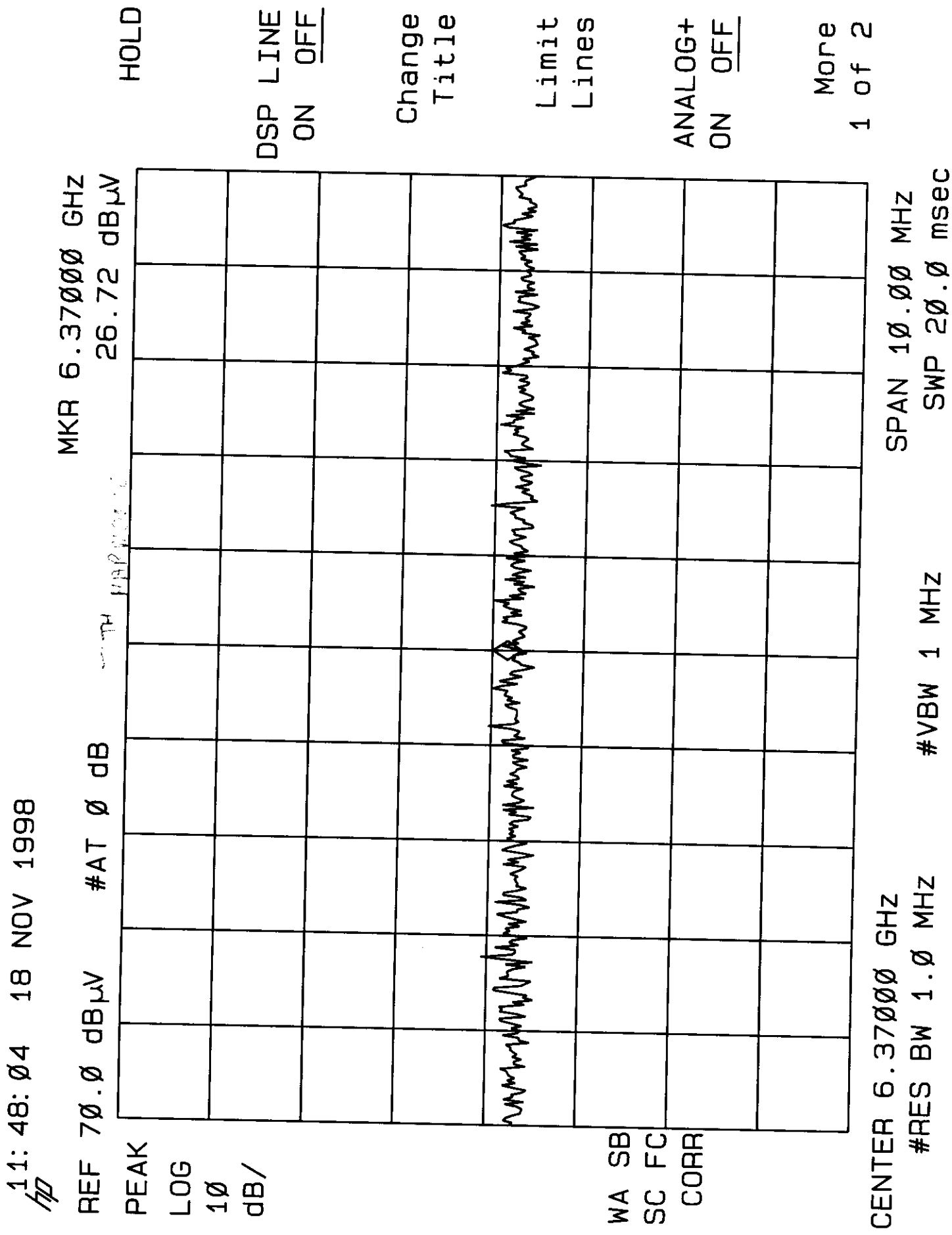
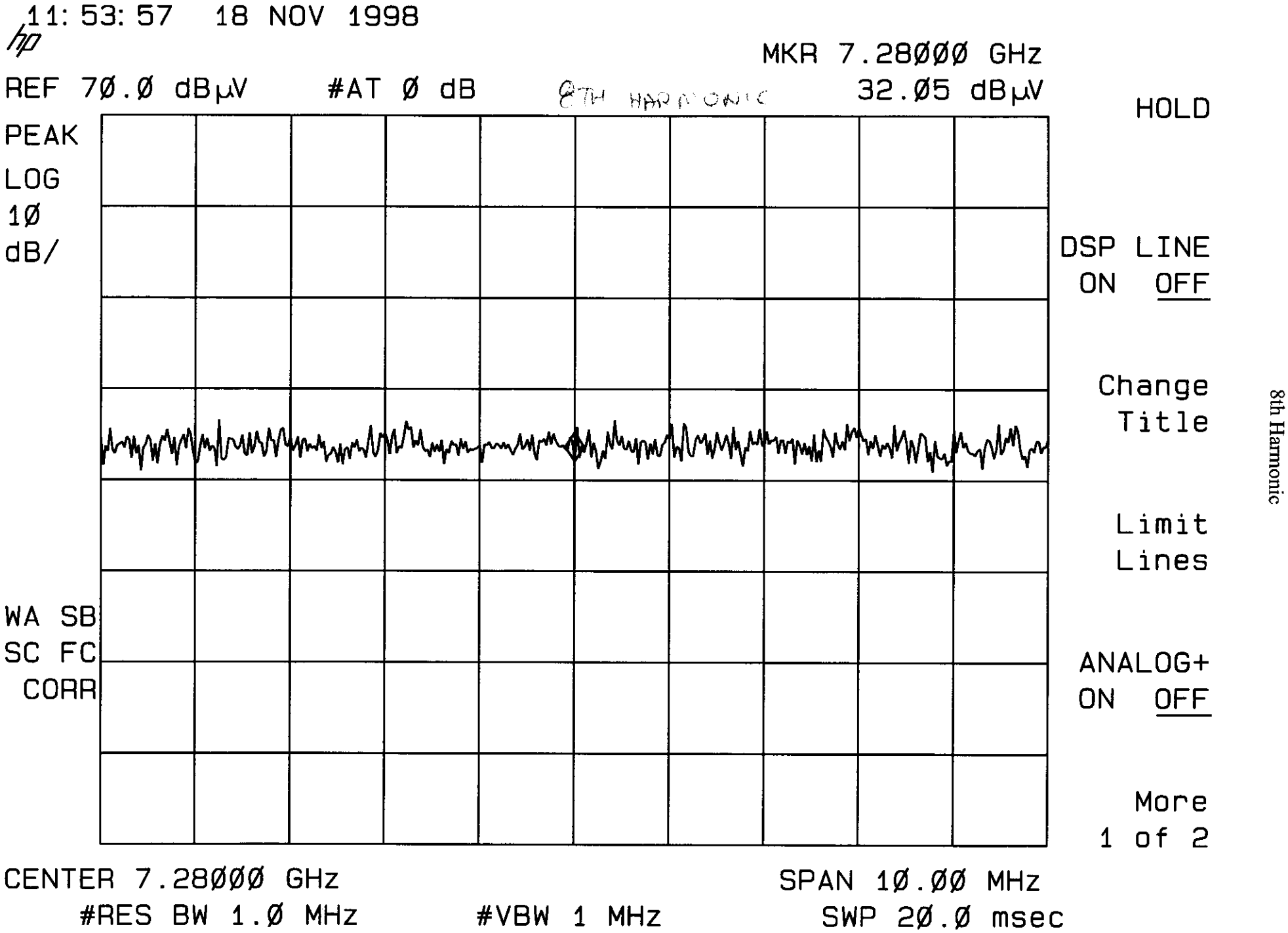
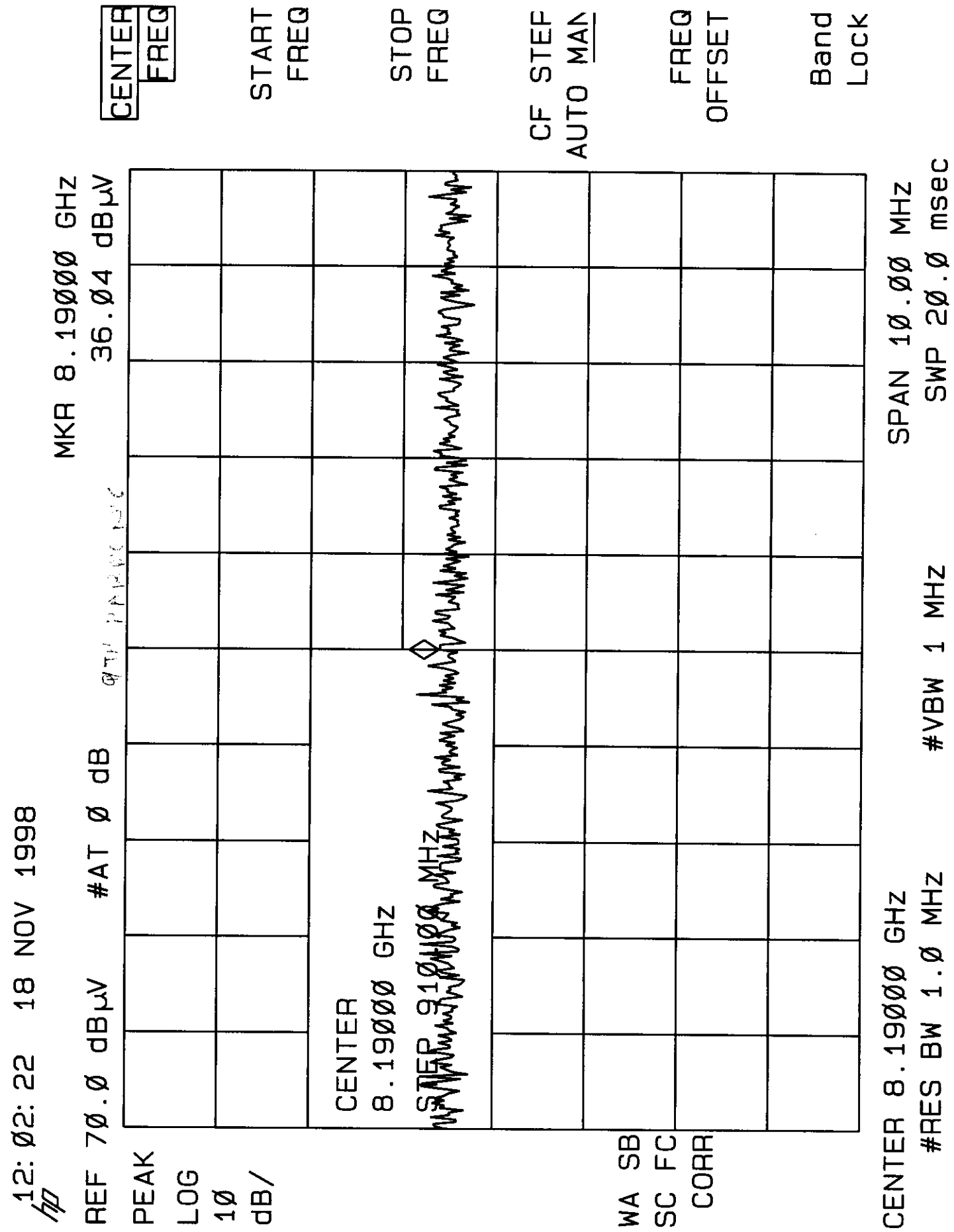
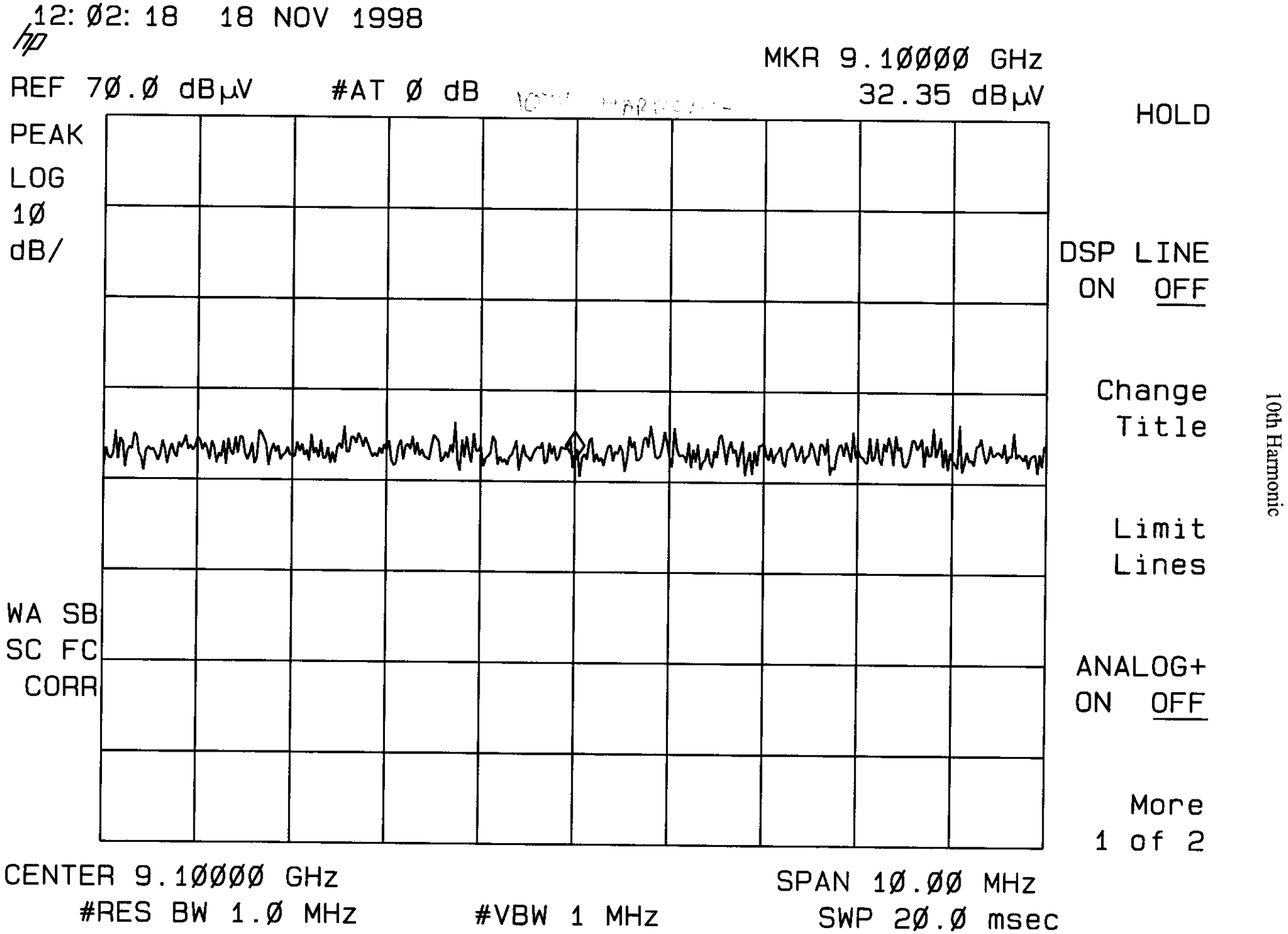




8th Harmonic

9th Harmonic

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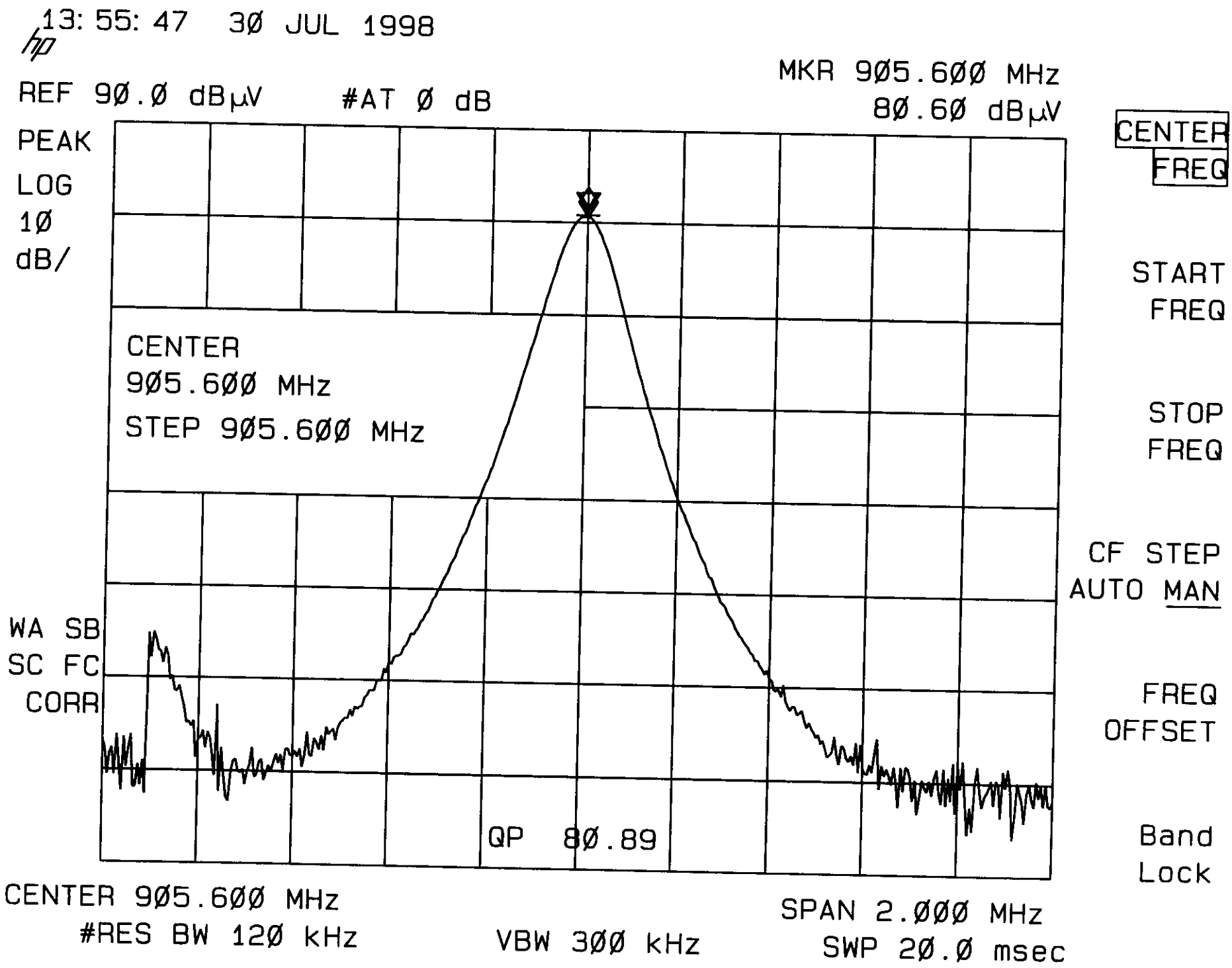
MKR 9.1ØØØØ GHz
32.35 dBµV
REF 7Ø.Ø dBµV
#AT Ø dB
HOLD
PEAK
LOG
1Ø
dB/
DSP LINE
ON OFF
Change
Title
Limit
Lines
WA SB
SC FC
CORR
ANALOG+
ON OFF
More
1 of 2
CENTER 9.1ØØØØ GHz
#RES BW 1.Ø MHz
#VBW 1 MHz
SPAN 1Ø.ØØ MHz
SWP 2Ø.Ø msec
10th Harmonic

3.3 Occupied Bandwidth Measurements

Plots were obtained with the unit operating with modulation. The bandwidths of the two transmit frequencies observed do not extend outside of the operating band 902-928MHz.


13: 55: 47 3Ø JUL 1998
REF 9Ø.Ø dBµV
#AT Ø dB
MKR 9Ø5.6ØØ MHz
8Ø.6Ø dBµV
PEAK
LOG
1Ø
dB/
CENTER
9Ø5.6ØØ MHz
STEP 9Ø5.6ØØ MHz
CENTER FREQ
START FREQ
STOP FREQ
CF STEP
AUTO MAN
FREQ OFFSET
Band Lock
WA SB
SC FC
CORR
QP 8Ø.89
CENTER 9Ø5.6ØØ MHz
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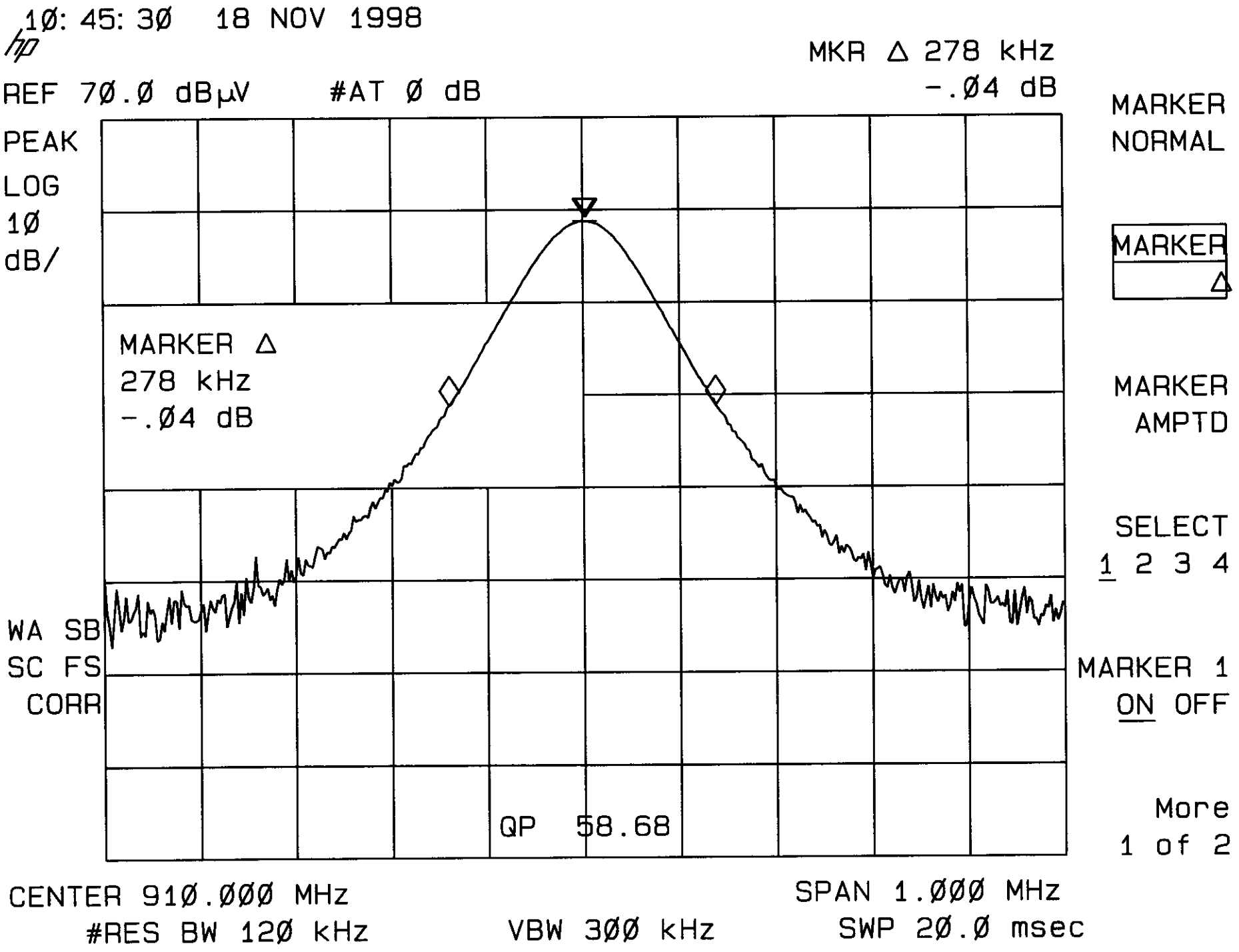
VBW 3ØØ kHz
SPAN 2.ØØØ MHz
SWP 2Ø.Ø msec

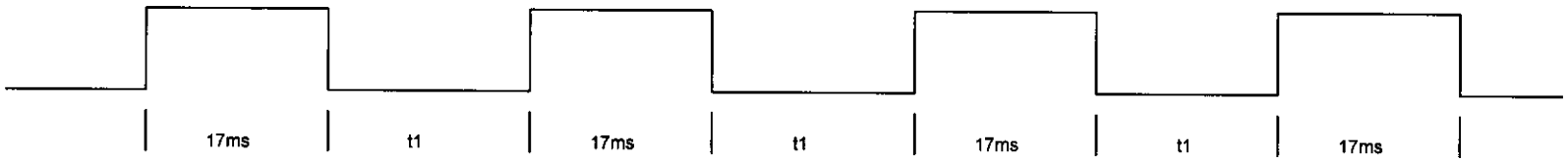

10: 45: 30 18 NOV 1998
MKR Δ 278 kHz
-.04 dB
REF 70.0 dBμV
#AT 0 dB
MARKER
NORMAL
PEAK
LOG
10
dB/
MARKER
MARKER Δ
278 kHz
-.04 dB
MARKER
AMPTD
SELECT
1 2 3 4
WA SB
SC FS
CORR
MARKER 1
ON OFF
QP 58.68
More
1 of 2
CENTER 910.000 MHz
#RES BW 120 kHz
VBW 300 kHz
SPAN 1.000 MHz
SWP 20.0 msec

3.4 Averaging factor derivation based on worst case 100mS period.

Attached is a timing diagram for the device. As can be seen, the worst case 100mS second period results in an averaging factor of 6.7dB.

Ave Factor = 20 x log (on time / total time)

Ave Factor = 20 x log (17 / 37) = ***-6.7dB***



t1 > = 20ms

Title: Timing Diagram for Transmission Sequence of System Monitor		
Size: A	Document Number: {Doc}	Rev: {RevCode}
Date: Tuesday, March 02, 1999	Sheet 1 of 1	

EXHIBIT 4

4.0 Equipment Photographs

4.1 External

4.2 Internal Photographs

EXHIBIT 6

6.0 Technical Specifications

6.1 Technical Description and Block Diagram

6.2 Schematics

6.3 Bill of Materials

Wake-Up Module Rev B Bill of Materials

P/N: 801-0013-01 Rev C

Revised: 10/1/98

Gerber data/PCB: 375-0013-01 Rev C01

Item	Quantity	Reference	Part	Mfg	Mfg Part Num	IDS Part Num	Package
1	6	C2,C31,C5,C8,C22,C36	0.01 uF	Panasonic	ECU-V1H103KBG	541-0103-01	0805 Chip
2	9	C3,C7,C9,C23,C24,C27	1000 pF	Panasonic	ECU-V1H102JCX	541-0102-01	0805 Chip
		C6,C20,C34					
3	3	C30,C4,C35	22 uF	Panasonic	ECS-T1ED226R	566-0226-01	D size
4	11	C10,C11,C12,C16,C25,C29	0.1 uF	Cal-Chip	GMC21X7R104K50N	541-0104-01	0805 Chip
		C37,C38,C39,C40,C41					
5	1	C13	[illegible]	Johanson	2320-4	571-2320-01	
6	6	C14,C17,C18,C19,C28,C42	100 pF	Panasonic	ECU-V1H101JCG	541-0101-01	0805 Chip
7	3	C15,C33,C21	27 pF	Panasonic	ECU-V1H270JCG	541-0270-01	0805 Chip
8	1	C32	10 pF	Panasonic	ECU-V1H100DCN	541-0100-01	0805 Chip
9	1	J1	CON20A	Samtec	TSW-110-14-L-D	325-0010-01	
10	1	J2	MCX connector	Johnson Comp.	133-3701-211	325-0011-01	Straight Con.
11	1	J3	CON8	Samtec	TSM-108-02-L-SV	325-0012-01	
12	1	L1	INDUCTOR 10nH	Coilcraft	1008HS-100XKBC	581-0100-01	1008 Chip
13	1	R17	62	Panasonic	ERJ-6GEYJ620	501-0620-01	0805 Chip
14	1	R4	97.6K 1%	Panasonic	ERJ-6ENF9762	501-9762-01	0805 Chip
15	1	R2	301K 1%	Panasonic	ERJ-6ENF3013	501-3013-01	0805 Chip
16	1	R3	270	Panasonic	ERJ-6GEYJ271	501-0271-01	0805 Chip
17	3	R5,R6,R11	10K	Panasonic	ERJ-6GEYJ103	501-0330-01	0805 Chip
18	1	R7	24K	Panasonic	ERJ-6GEYJ243	501-0243-01	0805 Chip
19	4	R8,R12,R16,R26	1MEG	Panasonic	ERJ-6GEYJ105	501-0105-01	0805 Chip
20	1	R9	3.6K	Panasonic	ERJ-6GEYJ362	501-0362-01	0805 Chip
21	2	R27,R10	1K	Panasonic	ERJ-6GEYJ102	501-0102-01	0805 Chip
22	1	R13	100	Panasonic	ERJ-6GEYJ101	501-0101-01	0805 Chip
23	1	R14	15K	Panasonic	ERJ-6GEYJ153	501-0153-01	0805 Chip
24	1	R15	[illegible]	Bourns	3342G	526-3342-01	
25	1	R18	130	Panasonic	ERJ-6GEYJ131	501-0131-01	0805 Chip
26	1	R19	75	Panasonic	ERJ-6GEYJ750	501-0750-01	0805 Chip
27	2	R21,R20	91	Panasonic	ERJ-6GEYJ910	501-0910-01	0805 Chip
28	6	R22,R23,R24,R25,R29,R32	100K	Panasonic	ERJ-6GEYJ104	501-0104-01	0805 Chip
29	1	R30	51	Panasonic	ERJ-6GEYJ510	501-1103-01	0805 Chip
30	1	R28	[illegible]	Panasonic	ERJ-6GEYJ510	501-0510-01	0805 Chip
31	1	R31	20K	Panasonic	ERJ-6GEYJ203	501-0203-01	0805 Chip
32	1	S1	SW DIP-3	C&K	SD03H0SK	406-0004-01	SOIC 6
33	2	U7,U1	LTF3216L-FR90G	Toko	LTF3216L-FR90G	591-0003-01	1206 Chip
34	2	U2, U10	MIC2951	Micrel	MIC2951-03BM	701-0003-01	SOIC 8
35	1	U3	VAM-6	Mini-Circuits	VAM-6	701-0015-01	
36	1	U4	AT-220	M/A Comm	AT-220	701-0016-01	SOIC 16
37	1	U5	MC145191F	Motorola	MC145191F	701-0017-01	SOIC 20
38	1	U6	MQE001-902	Murata	MQE001-902	650-0003-01	
39	1	U8	XC1736D-SO8	Xilinx	XC1736D-SO8I	775-0004-01	SOIC 8
40	1	U9	XC3042A	Xilinx	XC3042A-7VQ100I	775-0005-01	QFP 100
41	1	Y1	XTAL,12MHZ	US Crystal	USMX-18-120	660-0005-01	USMX-1S

42	1	Y2	Ceramic Res, 5MHz	Panasonic	EF0P5004B5	660-0001-01	

EXHIBIT 7

7.0 Instruction Manual

There is no manual supplied with this unit. The following required FCC user's manual warnings will appear on a leaflet packaged with the product.

Federal Communications Commission (FCC) Notice

This equipment has been tested and been found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used properly, may cause harmful interference to radio communications. However, this is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:

Reorient or relocate the receiving antenna.
Increase the separation between the equipment and receiver.
Connect the equipment to an outlet on a different circuit than the one to which the receiver is connected.
Consult an authorized service person for help.

Note: Unauthorized modification of this device could void the user's authority to operate this equipment.

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