

**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
CERTIFICATION TO FCC PART 15 REQUIREMENTS**

for

INTENTIONAL RADIATOR

302 MHz CAR ALARM TRANSMITTER

MODEL NO: PRO-01LR

FCC ID NO: BGA2KTX

REPORT NO: 01E9644

ISSUE DATE: August 2, 2001

Prepared for

**AUDIOVOX CORPORATION
150 MARCUS BLVD., HAUPPAUGE, N.Y. 11788 U.S.A.**

Prepared by

**COMPLIANCE ENGINEERING SERVICES, INC.
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d.b.a.

COMPLIANCE CERTIFICATION SERVICES



**FCC, VCCI, CISPR, CE
UL, CSA, TÜV, VDE**

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TEST DATA

- Maximum Modulation Percentage Plot
- Emission Bandwidth Plot
- Radiated Emission Worksheet for Average Measurement

1. VERIFICATION OF COMPLIANCE

COMPANY NAME: AUDIOVOX CORPORATION
150 MARCUS BLVD., HAUPPAUGE, N.Y. 11788 U.S.A.

CONTACT PERSON: PAT LAVELLE / EXECUTIVE VICE PRESIDENT

TELEPHONE NO.: (516)231-7750

EUT DESCRIPTION: 302 MHz CAR ALARM TRANSMITTER

MODEL NAME/NUMBER: PRO-01LR

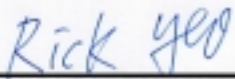
FCC ID: BGA2KTX

DATE TESTED: August 1, 2001

REPORT NUMBER: 01E9644

TYPE OF EQUIPMENT	SECURITY EQUIPMENT (INTENTIONAL RADIATOR)
EQUIPMENT TYPE	302 MHz CAR ALARM TRANSMITTER
MEASUREMENT PROCEDURE	ANSI C63.4 / 1992
LIMIT TYPE	CERTIFICATION
FCC RULE	CFR 47, PART 15

The above equipment was tested by Compliance Engineering Services, Inc. for compliance with the requirements set forth in the FCC CFR 47, PART 15. The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties. **Warning** : This document reports conditions under which testing was conducted and results of tests performed. This document may not be altered or revised in any way unless done so by Compliance Engineering Services, Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Engineering Services, Inc. will constitute fraud and shall nullify the document.



RICK YEO / EMC MANAGER
COMPLIANCE ENGINEERING SERVICES, INC.

2. Product Description

Fundamental Frequency	302 MHz
Power Source	12V Battery
Transmitting Time	Periodic $\leq$ 5 seconds
Associated Receiver	FCC ID: BGA2KRX

3. Test Facility

The open area test sites and conducted measurement facilities used to collect the radiated data are located at No. 199, Chung Sheng Road, Hsin Tien City, Taipei, Taiwan, R.O.C. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

4. Measurement Standards

The site is constructed and calibrated in conformance with the requirements of ANSI C63.4/1992.

5. Test Methodology

For an intentional radiator, the spectrum shall be investigated from the lowest radio frequency signal generated in the device, without going below 9 KHz, up to at least the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. (CFR 47 Section 15.33)

6. Measurement Equipment Used

Manufacturer	Model Number	Description	Cal Due Date
R & S	DSAI-D 804.8932.52	Spectrum Analyzer (20Hz – 5GHz)	11/2001
R & S	ESBI- RF/1005.4300.52	Spectrum Analyzer (20Hz – 5GHz)	11/2001
H.P.	8595EM	Spectrum Analyzer (9KHz – 6.5GHz)	01/2002
EMCO	3115	Antenna (1-18GHz)	02/2002
SCHWARZB ECK	VULB 9160	Antenna (30-2000 MHz)	05/2002
H.P.	8447D	Amplifier	05/2002
MITEQ	NSP2600-44	Amplifier(1-26GHz)	02/2002

7. POWERLINE RFI LIMIT

CONNECTED TO AC POWER LINE	SECTION 15.207
CARRIER CURRENT SYSTEM IN THE FREQUENCY RANGE OF 450 kHz TO 30 MHz	SECTION 15.205 AND SECTION 15.209, 15.221, 15.223, 15.225 OR 15.227, AS APPROPRIATE.
BATTERY POWER	NO REQUIRED.

8. RADIATED EMISSION LIMITS

GENERAL REQUIREMENTS	SECTION 15.209
RESTRICTED BANDS OF OPERATION	SECTION 15.205
PERIODIC OPERATION IN THE BAND 40.66 -40.70 MHz AND ABOVE 70 MHz.	SECTION 15.231

9. SYSTEM TEST CONFIGURATION

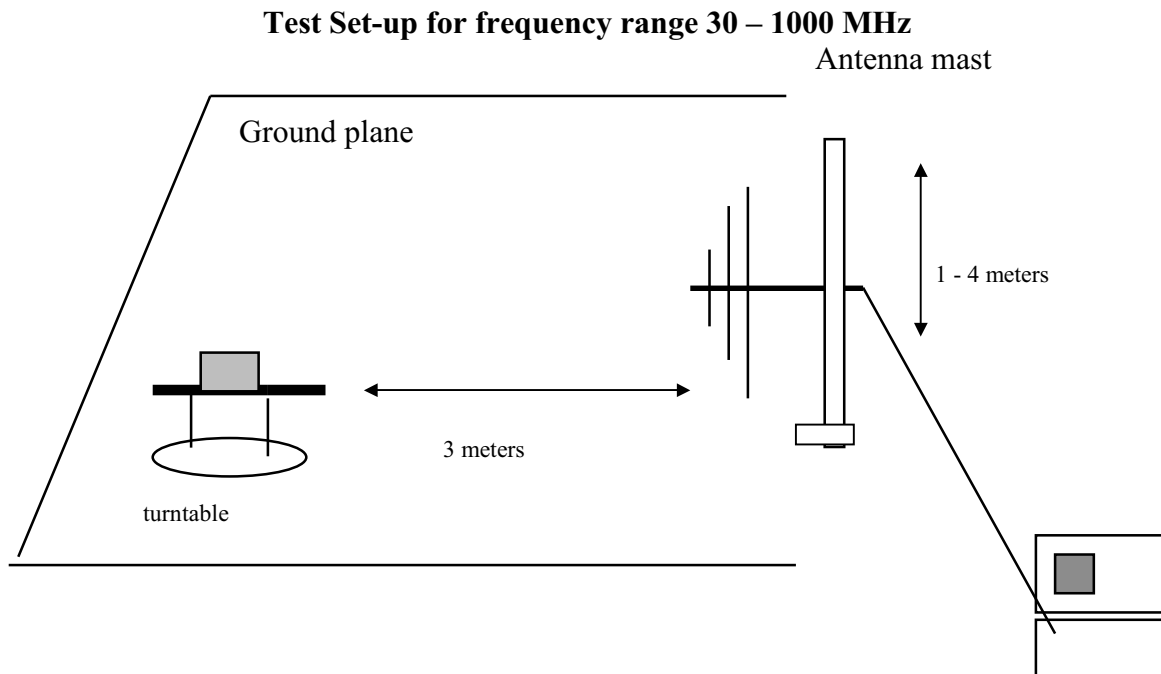
Use a block of foam and combined it with EUT wrapping rubber band around it. This way it can test X.Y, and Z axis. To activate continuous transmission, place a small plastic block between rubber band and EUT push button.



Radiated Open Site Test Set-up

10. Test Procedure

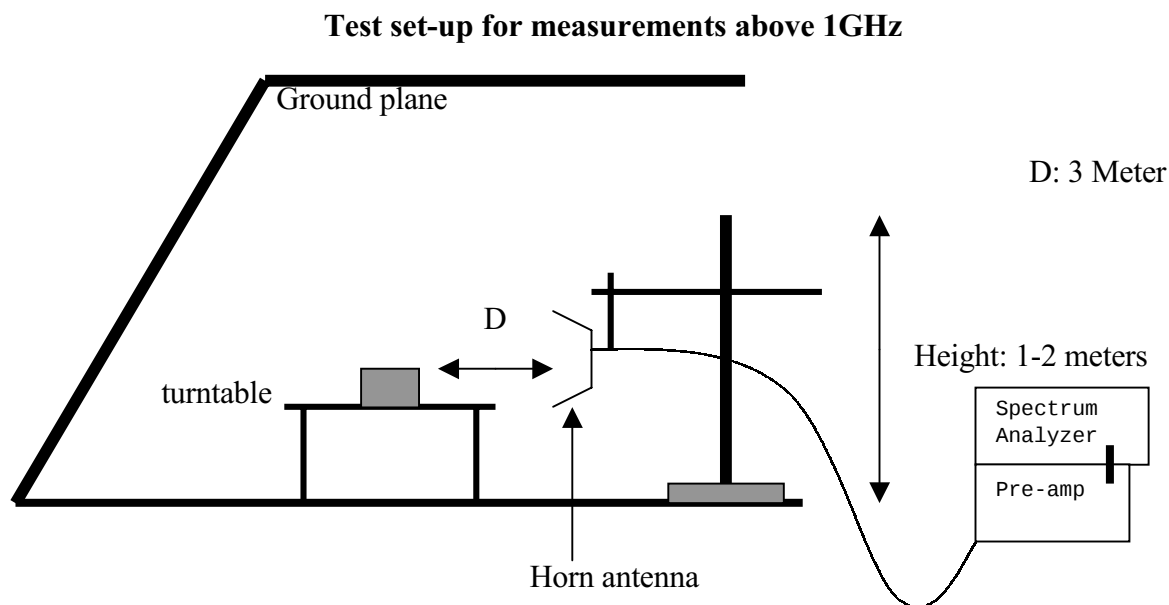
Radiated Emissions, 15.231(4)(b)



preamplifier/spectrum analyzer

Fig. 1

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 3-meters from the EUT.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.
3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.



1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 3-meters from the EUT. The EUT antenna was mounted vertically as per normal installation.
2. The turntable was slowly rotated to locate the direction of maximum emission at each emission falling in the restricted bands of 15.205. The EUT was moved throughout the XY, XZ, and YZ planes to maximize emissions received by the search antenna.
3. Once maximum direction was determined, the search antenna was raised and lowered in both vertical and horizontal polarizations. The maximum readings so obtained are recorded in the data listed below.

11. Equipment Modifications

To achieve compliance to FCC Section 15.231 technical limits, the following change(s) were made during compliance testing:

NONE

12. TEST RESULT

Powerline RFI Class B	Eut	Radiated Emission Limits	Eut
SECTION 15.207		SECTION 15.209	X
SECTION 15.205, 15.209, 15.221, 15.223, x 15.225 OR 15.227		SECTION 15.205	
BATTERY POWER	X	SECTION 15.231 (b)	X
		SECTION 15.231 (e)	

12.1 Maximum Modulation Percentage (M%)

CALCULATION:

Average Reading = Peak Reading (dBuV/m)+ 20log (Duty Cycle)

In order to determine possible Maximum Modulation percentage, alternations are made to the EUT. We measured:

WHERE 1 Period = 24.75 mS
 Long pulse = 0.562 mS
 Short pulse = 0.225 mS
 No of Long pulse = 8
 No of Short pulse = 5

Duty Cycle = (N1L1+N2L2+...+Nn-1Ln-1+NnLn)/100 or T

Duty Cycle = ((8x0.562)+(5x0.225))/24.75=0.2271=22.71% or -12.876dB

12.2 The Emissions Bandwidth

The bandwidth of the emissions were investigated per 15.231(c)

Center Frequency	Measured	Limits
302 MHz	464.4 kHz < (refer to plot)	302X0.25%=755 kHz

hp

MKR 24.750 msec
-21 dB

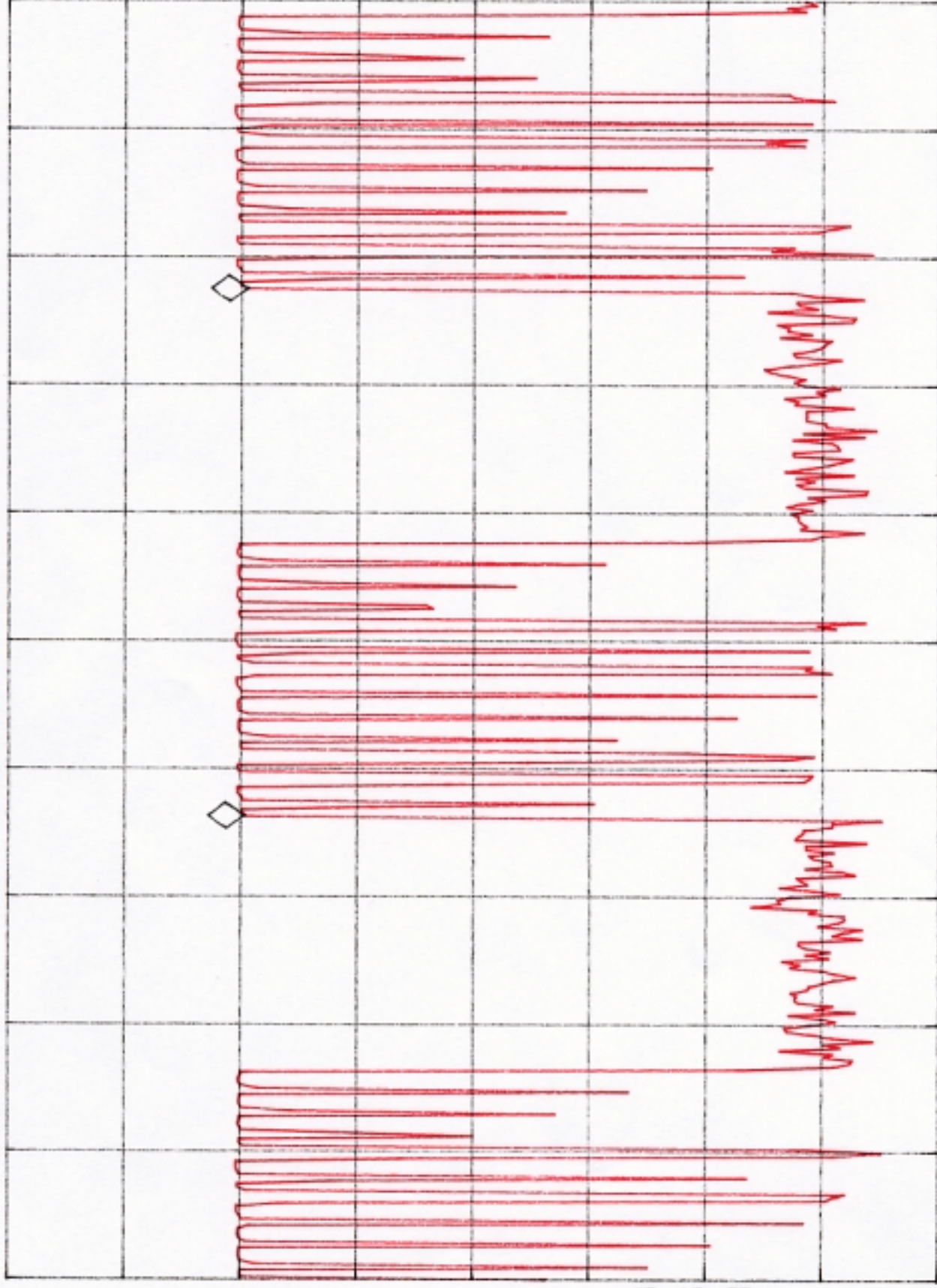
REF 80.0 dB μ V AT 10 dB

PEAK

LOG

10

dB/



WA SB
SC FS
CORR

CENTER 302.0000 MHz

RES BW 10 KHz

VBW 10 KHz

#SWP 60.0 msec

SPAN 0 Hz

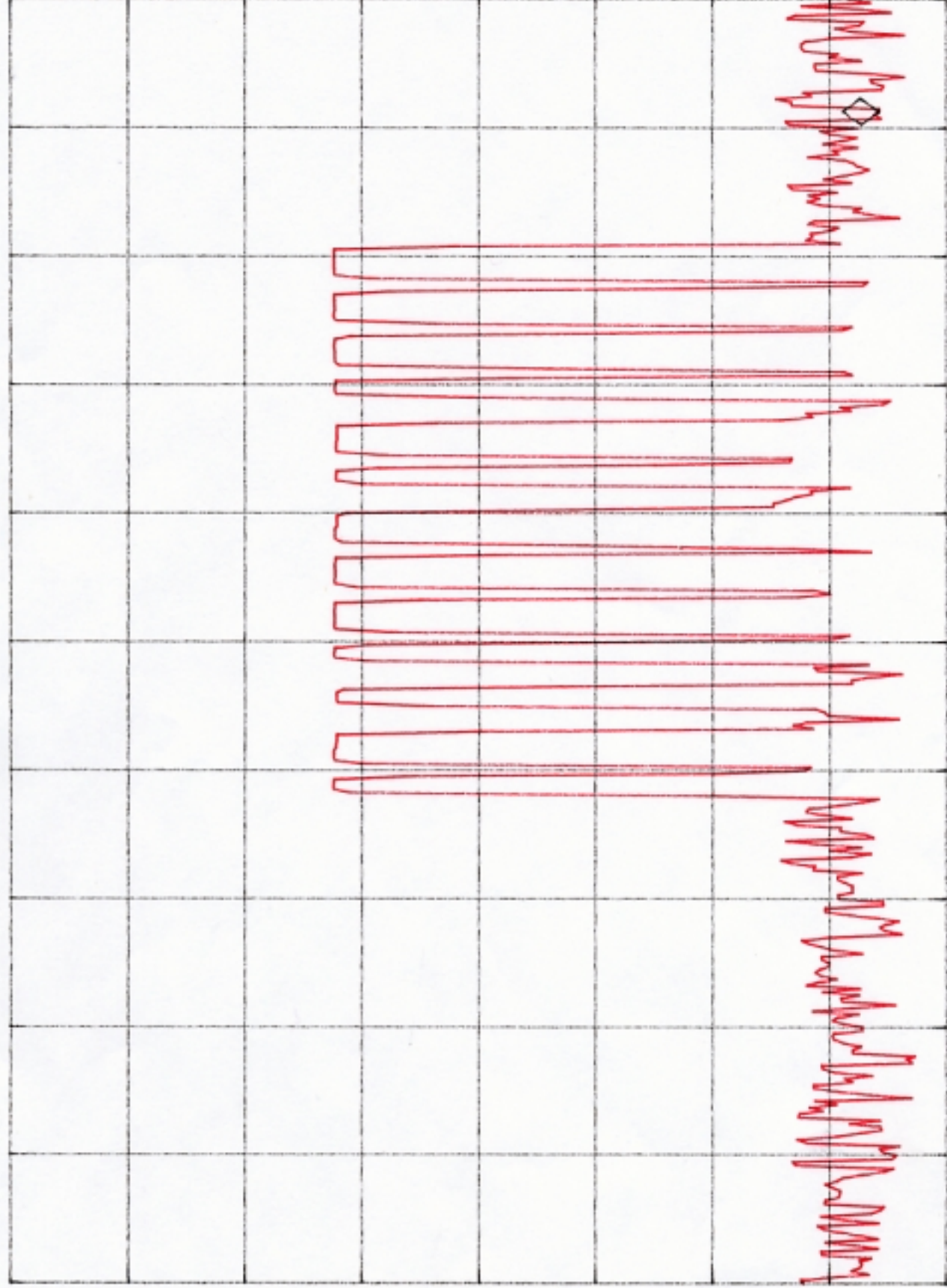
70

MKR 27.375 msec
5.70 dB μ V

AT 10 dB

REF 80.0 dB μ V

PEAK
LOG
10
dB/



WA SB
SC FS
CORR

CENTER 302.0000 MHz
RES BW 10 KHz

VBW 10 KHz

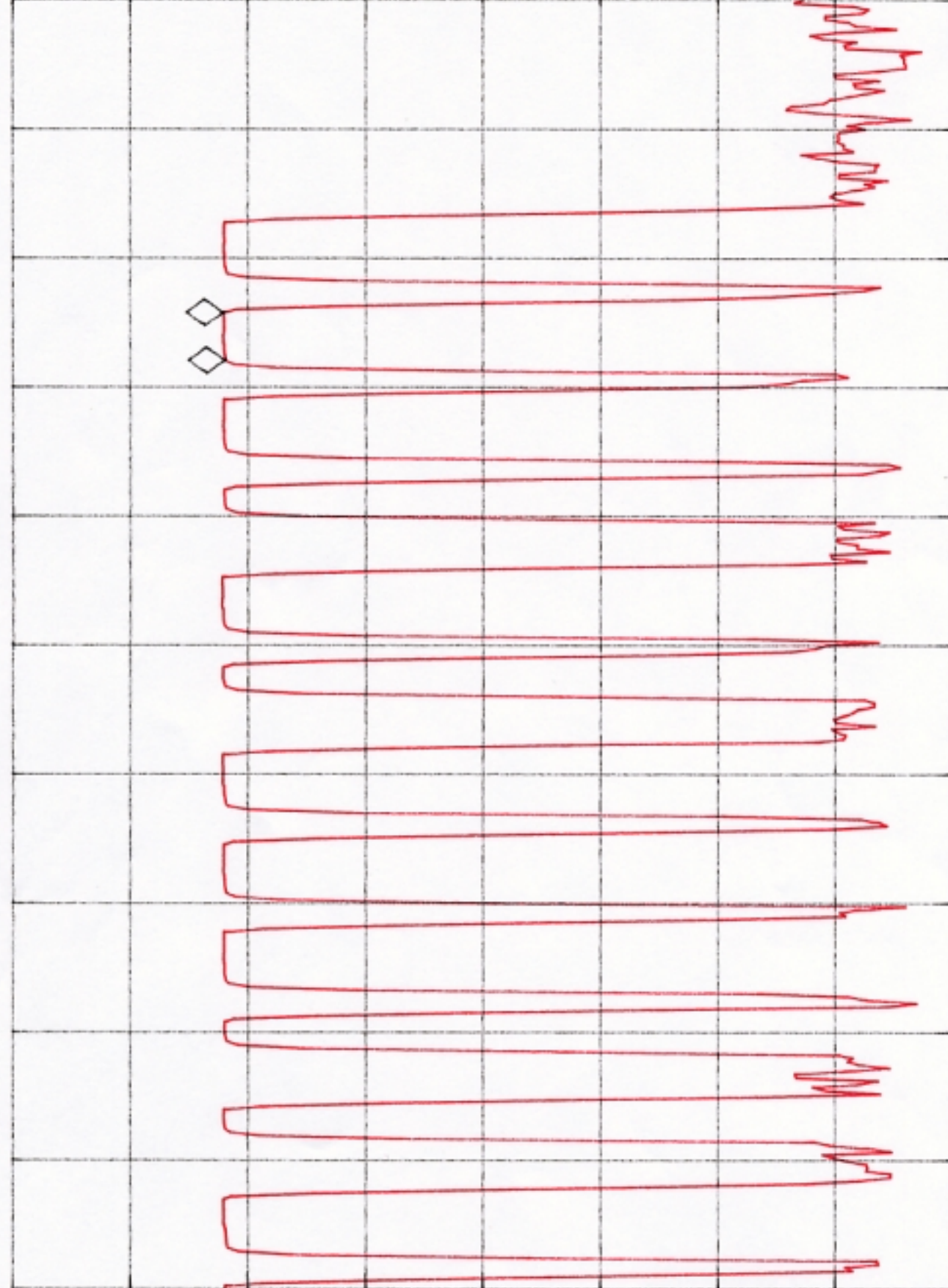
SPAN 0 Hz
#SWP 30.0 msec

70

MKR 562.00 μ sec

REF 80.0 dB μ V AT 10 dB

PEAK
LOG
10
dB/



WA SB
SC FS
CORR

CENTER 302.0000 MHz

RES BW 10 KHz

VBW 10 KHz

#SWP 15.0 msec

SPAN 0 Hz

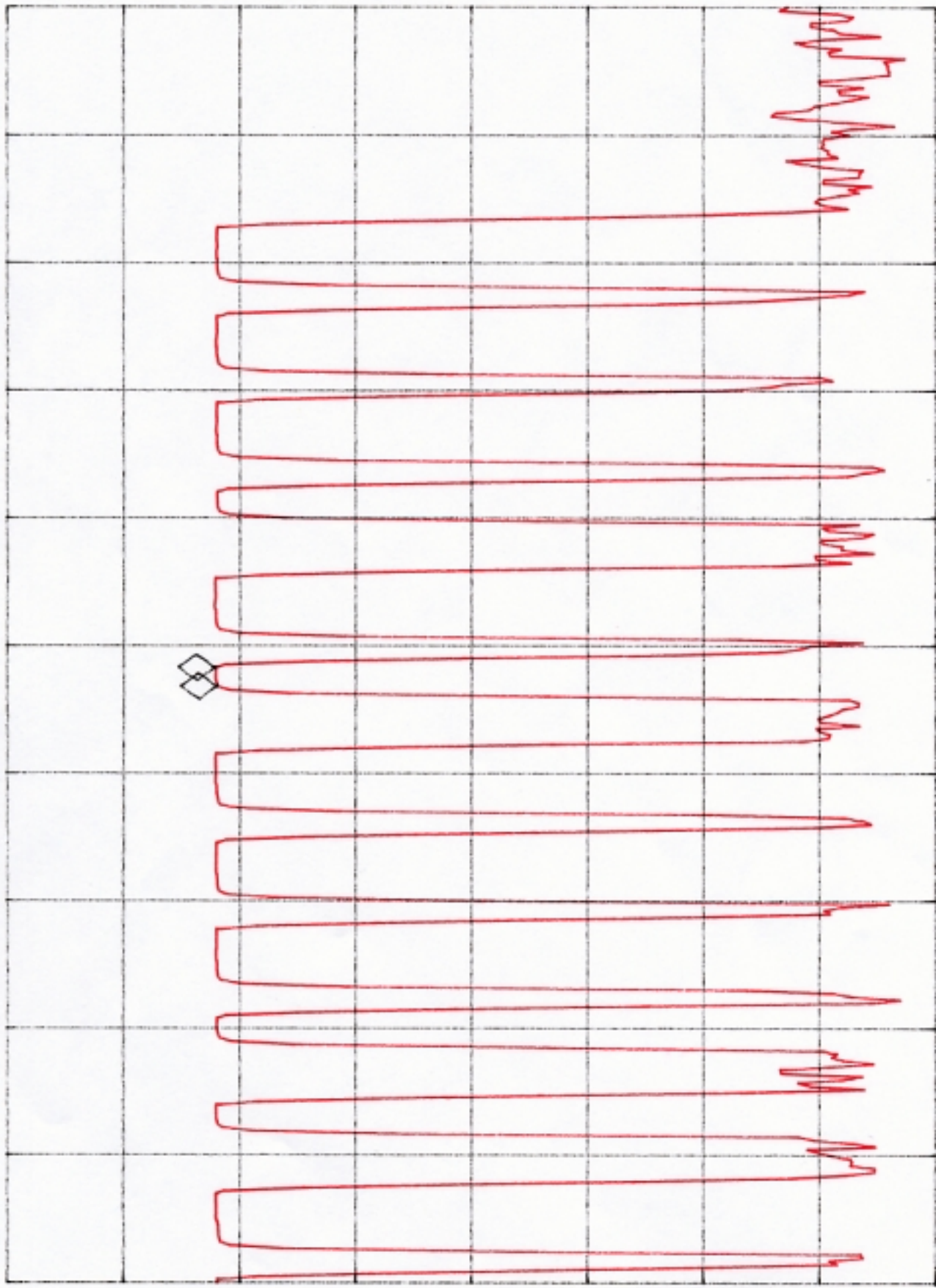
hp

MKR 225.00 μ sec
.20 dB

AT 10 dB

REF 80.0 dB μ W

PEAK
LOG
10
dB/



WA SB
SC FS
CORR

CENTER 302.0000 MHz

RES BW 10 KHz

VBW 10 KHz

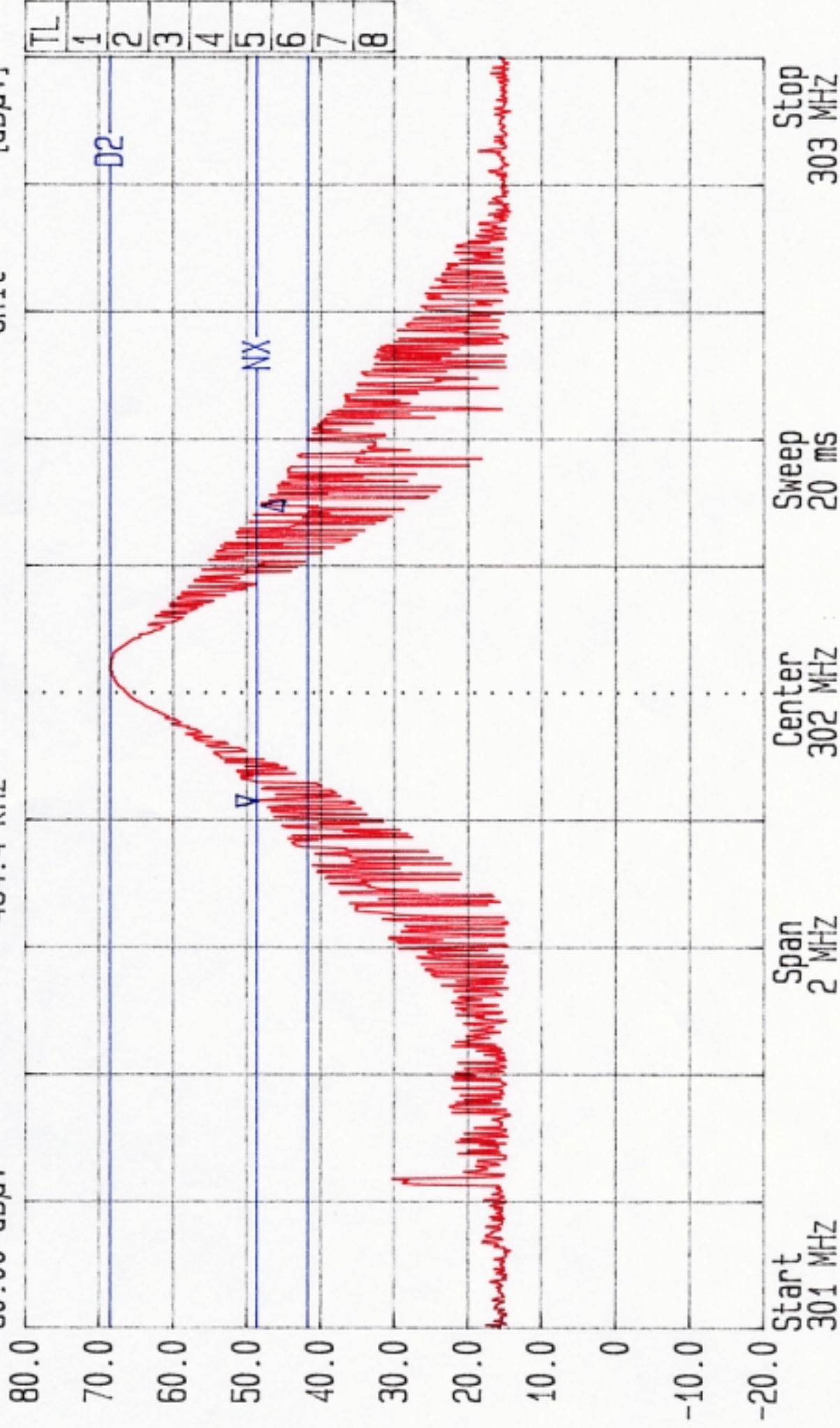
#SWP 15.0 msec

SPAN 0 Hz



Date 01.Aug.'01 Time 12:10:28
Ref.Lvl Delta
80.00 dBuV -0.30 dB
464.4 kHz

Res.Bw 120 kHz [imp] 300 kHz
TG.Lvl Off
CF.Stp 10.000 MHz
Unit RF.Att 0 dB



[illegible]



FCC, VCCI, CISPR, CE, AUSTEL, NZ
UL, CSA, TUV, BSMI, DHHS, NVLAP

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Project #: 01E9644
Report #: 9644D2
Date & Time: 2001/08/01
Test Engr: Vince Chiang

Company: AUDIOVOX CORPORATION
EUT Description: PRO-01LR (Alarm Tx / 302MHz)
Test Configuration : EUT ONLY
Type of Test: FCC 15.231(b)/FCC 15.209
Mode of Operation: NORMAL MODE



Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter)	Mark (P/Q/A)
1208	49.85	36.974	24.7	3.4	38.00	27.01	54.0	-26.99	1mV	0	1.0	A
1208	48.86	35.984	24.7	3.4	38.00	26.02	54.0	-27.98	1mH	0	1.0	A

* No other emission were found within 20dB under the limits upto 3.5 GHz.

Total data #:2
V.2d

P(Peak): RBW=VBW=1MHz
A(Average): Pk Reading -12.876dB