

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

for

INTENTIONAL RADIATOR

434 MHz CAR ALARM TRANSMITTER

MODEL NO: 2908S

FCC ID NO: H5OT16

REPORT NO: 01E9587

ISSUE DATE: July 22, 2001

Prepared for

**ADVANCE SECURITY INC.
3F, 48 TA AN STREET, HIS-CHIH,
TAIPEI HSIEN, TAIWAN, R.O.C.**

Prepared by

**COMPLIANCE ENGINEERING SERVICES, INC.
NO. 199, CHUNG SHENG ROAD,
HSIN TIEN CITY, TAIPEI,
TAIWAN, R. O. C.**

d.b.a.

COMPLIANCE CERTIFICATION SERVICES



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

**U.S.A. : P.O.BOX 612650, SAN JOSE, CA 95161-2650
TAIPEI : P.O.BOX 17-82, HSIN TIEN, TAIWAN, R.O.C.**

TABLE OF CONTENTS	PAGE
1. VERIFICATION OF COMPLIANCE.....	1
2. Product Description.....	2
3. Test Facility.....	2
4. Measurement Standards	2
5. Test Methodology	2
6. Measurement Equipment Used	2
7. POWERLINE RFI LIMIT	3
8. RADIATED EMISSION LIMITS	3
9. SYSTEM TEST CONFIGURATION.....	4
10. Test Procedure.....	5
11. Equipment Modifications.....	6
12. TEST RESULT	7
12.1 Maximum Modulation Percentage (M%)	7
12.2 The Emissions Bandwidth.....	7

TEST DATA

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

1. VERIFICATION OF COMPLIANCE

COMPANY NAME: ADVANCE SECURITY INC.
3F, 48 TA AN STREET, HIS-CHIH,
TAIPEI HSIEN, TAIWAN, R.O.C.

CONTACT PERSON: Michael Chen / President

TELEPHONE NO.: 8648-1688

EUT DESCRIPTION: 434 MHz CAR ALARM TRANSMITTER

MODEL NAME/NUMBER: 2908S

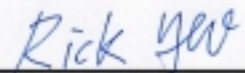
FCC ID: H5OT16

DATE TESTED: July 10 ~ July 20, 2001

REPORT NUMBER: 01E9587

TYPE OF EQUIPMENT	SECURITY EQUIPMENT (INTENTIONAL RADIATOR)
EQUIPMENT TYPE	434 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	434 MHz
Power Source	12V Battery
Transmitting Time	Periodic \leq 5 seconds
Associated Receiver	FCC ID: H5OR32

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
H.P.	8566B	Spectrum Analyzer (100Hz – 22GHz)	06/2002
H.P.	8595EM	Spectrum Analyzer (9KHz – 6.5GHz)	01/2002
EMCO	3115	Antenna (1-18GHz)	02/2002
SCHWARZBECK	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

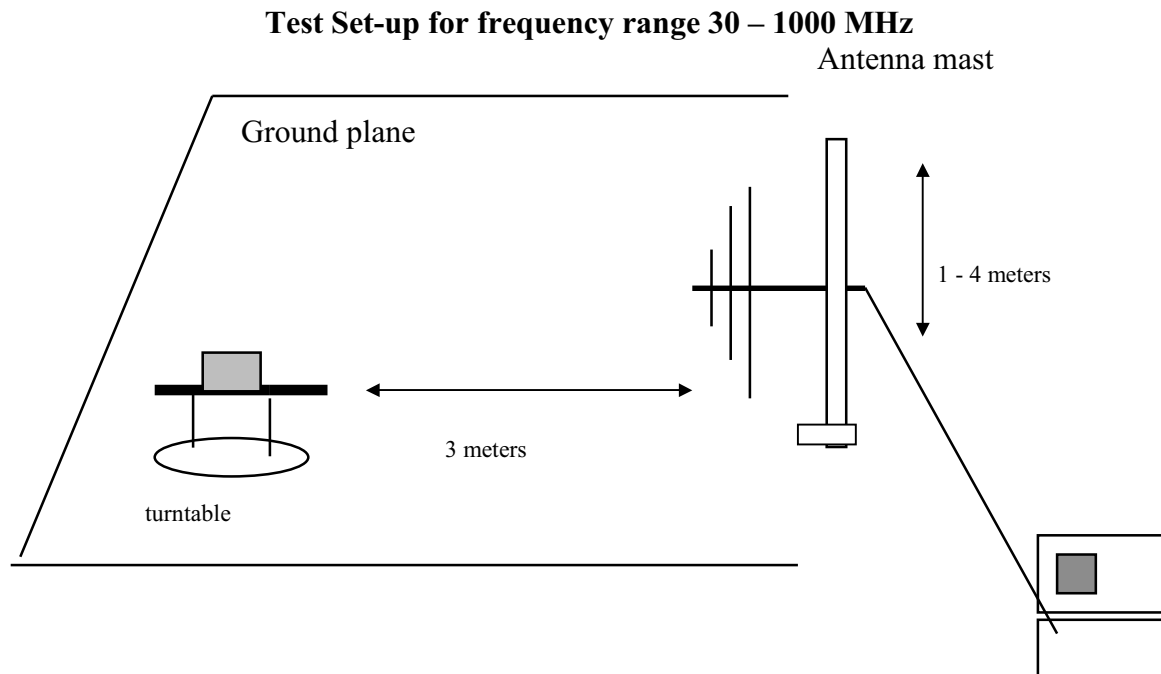
Use a block of foam and combined it with EUT wrapping rubber band around it. This way it can test X.Y, and Z axis. To activate continuous transmission, place a small plastic block between rubber band and EUT push button.



Radiated Open Site Test Set-up

10. Test Procedure

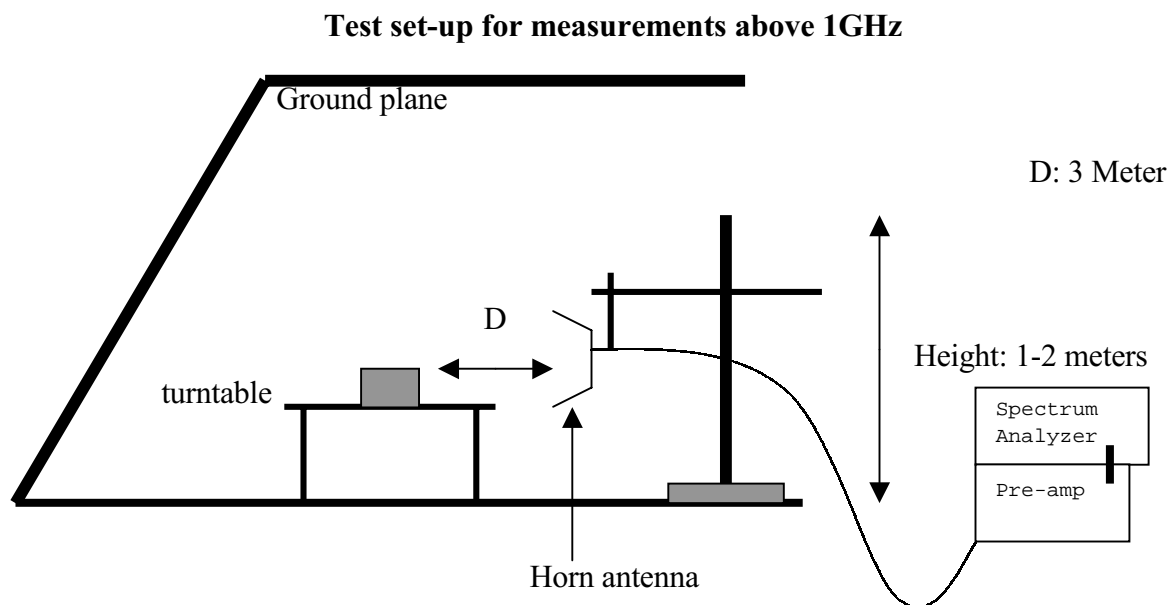
Radiated Emissions, 15.231(4)(b)



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 = 151 mS >100 mS. use 100 mS for calculation
 Long pulse = 1.457 mS
 Short pulse = 0.258 mS
 No of Long pulse = 27
 No of Short pulse = 29

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

Duty Cycle = ((27x1.457)+(29x0.258))/100=0.4682=46.82% or -6.5914dB

12.2 The Emissions Bandwidth

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

Center Frequency	Measured	Limits
434 MHz	400 kHz < (refer to plot)	434X0.25%=1085 kHz



Date 10.Jul.'01 Time 11:50:40

Ref.Lvl Delta

80.00 dBuV

-0.02 dB

151.000 ms

TRG

Res.Bw

TG.Lvl

CF.Stp

120 kHz [imp]

off

12.000 kHz

Vid.Bw

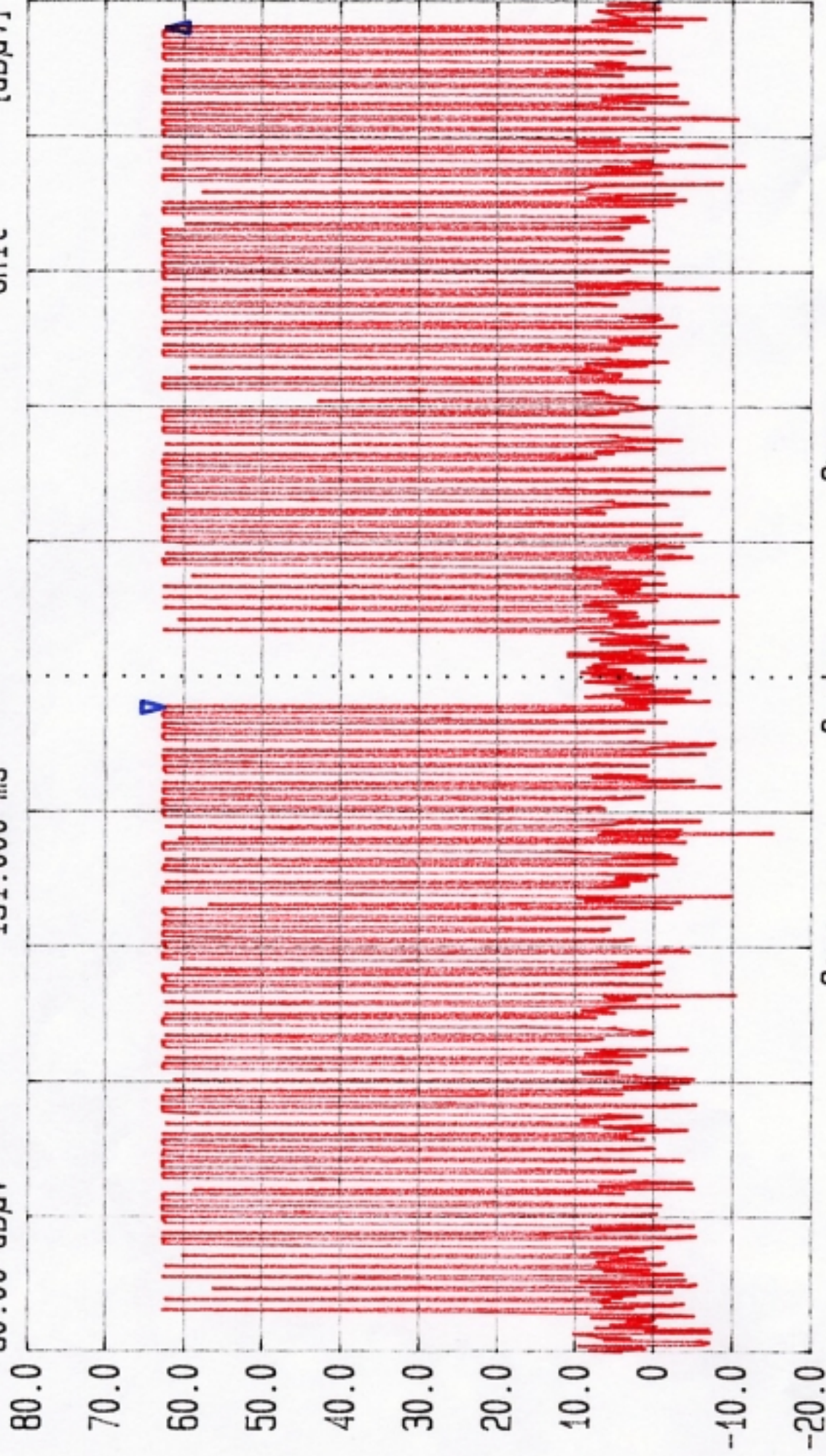
RF.Att

Unit

300 kHz

0 dB

[dBuV]



Span
0 Hz

Center
433.97111 MHz

Sweep
300 ms



Date 10.Jul.'01 Time 11:56:22

TRG

Ref.Lvl

80.00 dBuV

Res.Bw

TG.Lvl

CF.Stp

120 kHz [imp]

Off

12.000 kHz

Vid.Bw

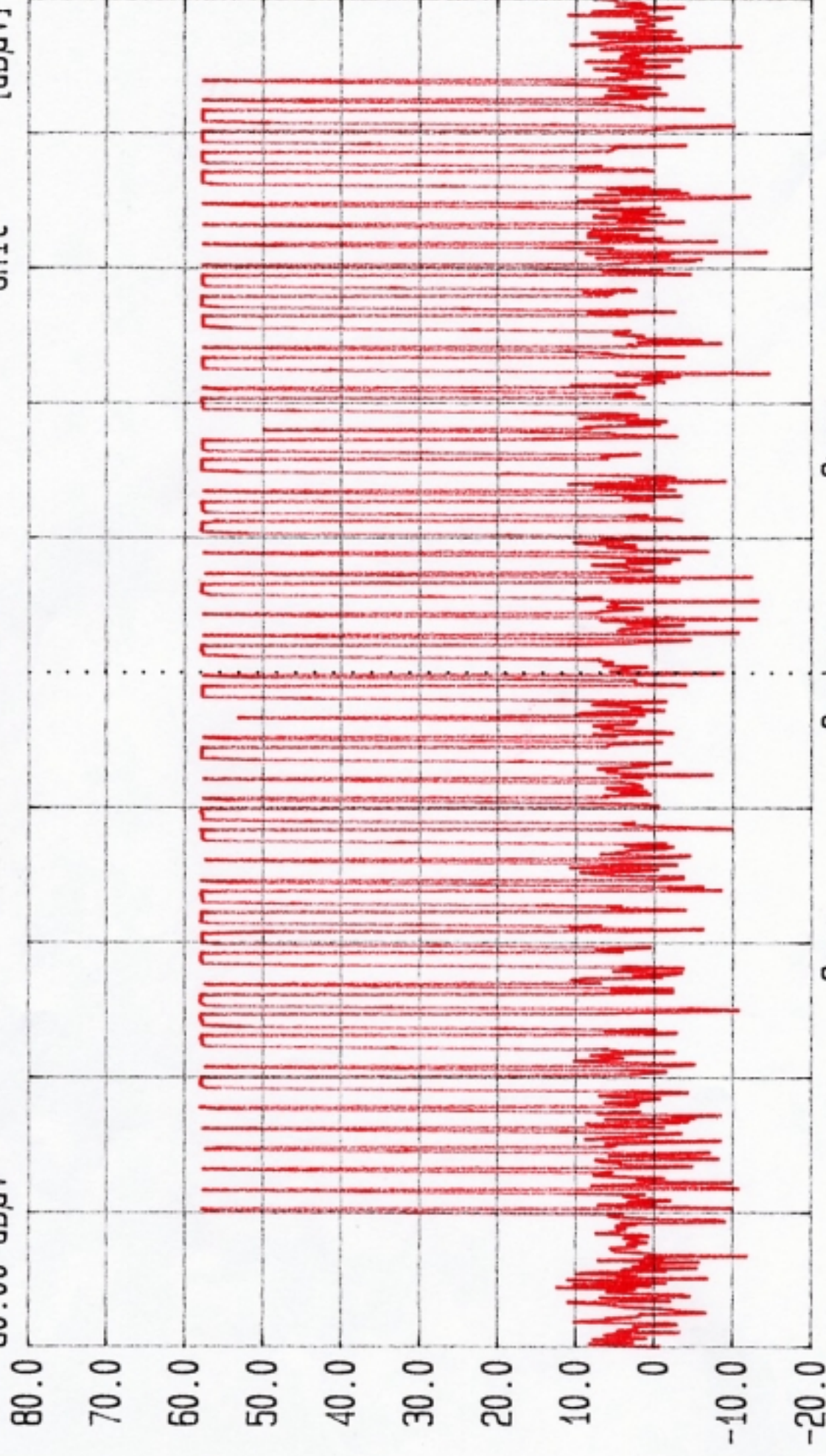
RF.Att

Unit

300 kHz

0 dB

[dBuV]





TRG

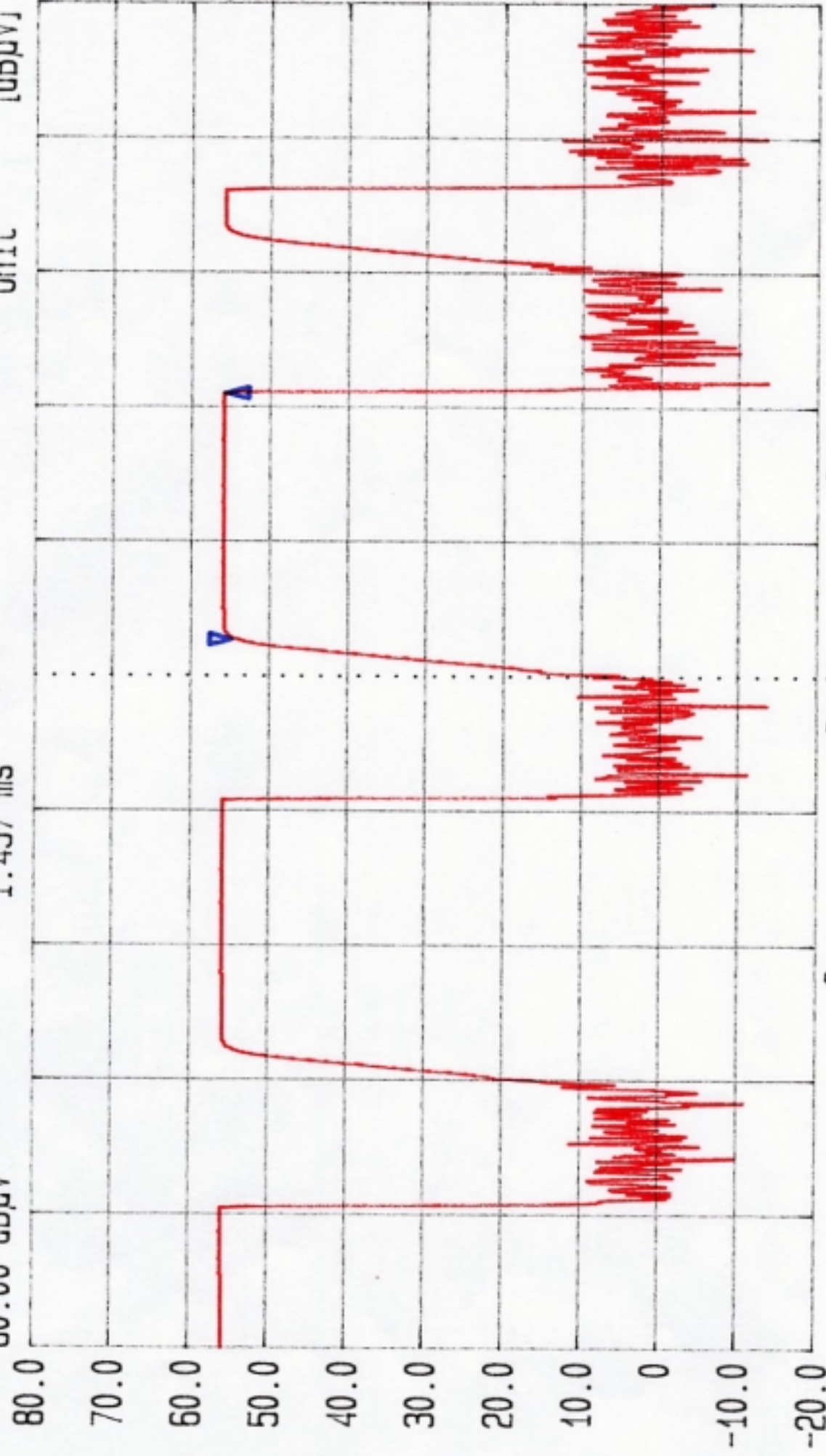
Date 10.Jul.'01 Time 11:41:40

Ref.Lvl Delta

80.00 dBuV

1.19 dB

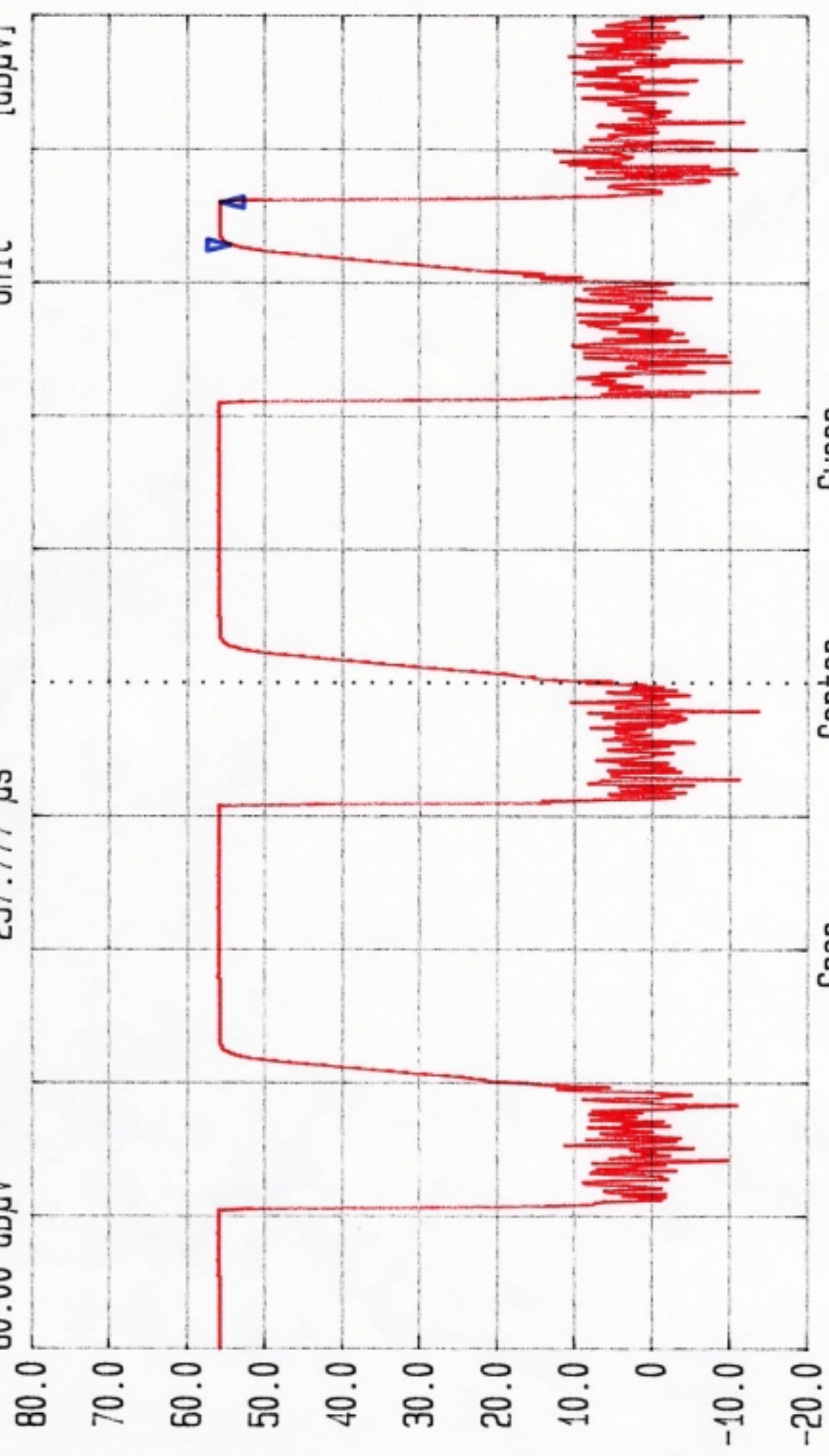
1.457 ms

Res.Bw
TG.Lvl
CF.Stp120 kHz [imp]
Off
12.000 kHzVid.Bw
RF.Att
Unit300 kHz
0 dB
[dBuV]



Date 10.Jul.'01 Time 11:45:15
Ref.Lvl Delta
80.00 dBuV 1.32 dB
257.777 μ s

TRG
Res.Bw
TG.Lvl
CF.Stp
120 kHz [imp]
off
12.000 kHz
Vid.Bw
RF.Att
Unit
300 kHz
0 dB
[dBuV]





Date 10.Jul.'01 Time 11:29:35

Ref.Lvl Delta

80.00 dBuV

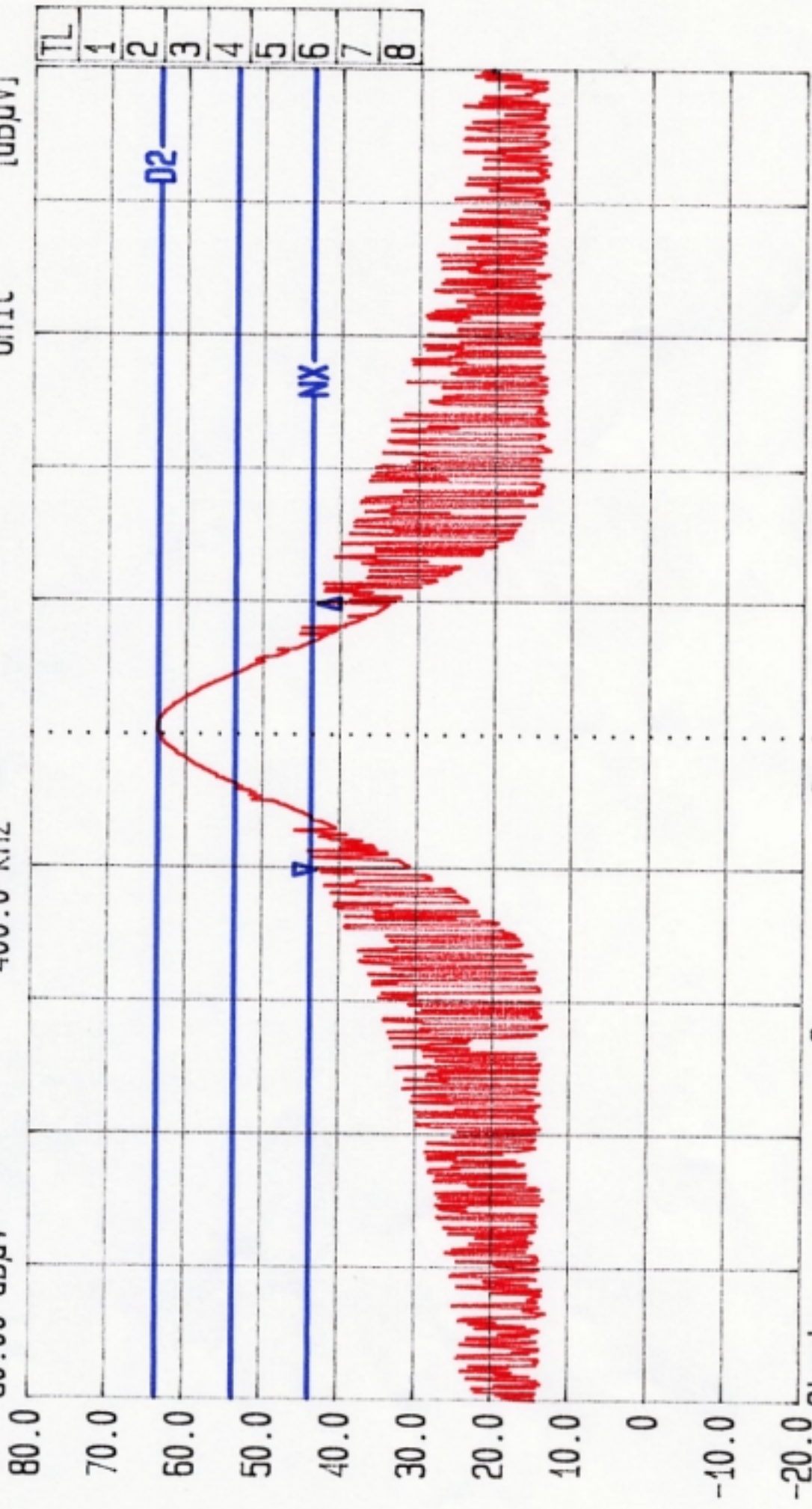
0.12 dB

400.0 kHz

Res.Bw
TG.Lvl
CF.Stp

120 kHz [imp]
off
200.000 kHz

Vid.Bw 300 kHz
RF.Att 0 dB
Unit [dBuV]



Start
432.966666 MHz

Span
2 MHz

Center
433.966666 MHz

Sweep
20 ms

Stop
434.966666 MHz

N dB down Level 20.0 dB
DELTA MARK 400.0 KHz

[illegible]

[illegible]

[illegible]

[illegible]



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

1366 BORDEAUX DRIVE, SUNNYVALE, CA 94089
PHONE: (408) 752-8166 FAX: (408) 752-8168

Project #: 01E9587
Report #: 9587D5
Date & Time: 2001/07/20
Test Engr: Vince Chiang

Company: ADVANCE SECURITY INC.
EUT Description: 2908S (Alarm Tx / 434MHz)
Test Configuration : EUT ONLY
Type of Test: FCC 15.231(b)/FCC 15.209
Mode of Operation: NORMAL MODE

☒ D-Site ☐ E-Site 6 W oist Des

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)
1304	53.46	46.87	24.9	3.5	38.00	37.31	54.0	-16.69	1mV	0	1.0	A
1304	50.59	44.00	24.9	3.5	38.00	34.44	54.0	-19.56	1mH	0	1.0	A

* No other emission were found within 20dB under the limits upto 4.5 GHz.

Total data #:2
V.2d

P(Peak): RBW=VBW=1MHz
A(Average): Pk Reading -6.5914dB