ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT
CERTIFICATION TO FCC PART 15 REQUIREMENTS

for

INTENTIONAL RADIATOR

350 MHz CAR ALARM TRANSMITTER

MODEL NO: ND4

FCC ID NO: KTOND20108

REPORT NO: 01E9276

ISSUE DATE: March 29, 2001

Prepared for
ARGUS SECURITY CORPORATION
5F-3, NO. 18, LN. 609, SEC. 5, CHUNG-SHIN RD.,
SAN CHUNG, TAIWAN, R. O. C.

Prepared by
COMPLIANCE ENGINE ERING SERVICES, INC.
d.b.a.
COMPLIANCE CERTIFICATION SERVICES
1366 BORDEAUX DRIVE
SUNNYVALE, CA 94089, USA
TEL: (408) 752-8166
FAX: (408) 752-8168

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- Maximum Modulation Percentage Plot
- Emission Bandwidth Plot
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1. VERIFICATION OF COMPLIANCE

COMPANY NAME:	ARGUS SECURITY CORPORATION 5F-3, NO. 18, LN 609, SEC. 5, CHUNG-SHIN RD., SAN CHUNG, TAIWAN, R. O. C.
CONTACT PERSON:	SUNNY SHIAO/ INT'L SALES MANAGER
TELEPHONE NO.:	(02)2999-2079
EUT DESCRIPTION:	350 MHz CAR ALARM TRANSMITTER
MODEL NAME/NUMBER:	ND4
FCC ID:	KTOND20108
DATE TESTED:	February 17 & March 6, 2001
REPORT NUMBER:	01E9276

TYPE OF EQUIPMENT	SECURITY EQUIPMENT (INTENTIONAL RADIATOR)
EQUIPMENT TYPE	350 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 Certification Services 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 Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification will constitute fraud and shall nullify the document.

Rick Yeo

RICK YEO / EMC MANAGER
COMPLIANCE ENGINEERING SERVICES, INC.

COMPLIANCE ENGINEERING SERVICES, INC. CCS DOCUMENT NO:CCSUP4020B
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2. Product Description

Fundamental Frequency	**350 MHz**
Power Source	**12V Battery**
Transmitting Time	**Periodic ≤ 5 seconds**
Associated Receiver	**FCC ID: KTOLS002RX**

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)	12/2001
H.P.	8595EM	Spectrum Analyzer (9KHz – 6.5GHz)	01/2002
EMCO	3115	Antenna (1-18GHz)	09/2001
EMCO	3142	Antenna (30-2000MHz)	06/2001
T.E.C.	PA-102	Amplifier(30-2000MHz)	05/2001
MITEQ	NSP2600-44	Amplifier(1-26GHz)	12/2001

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

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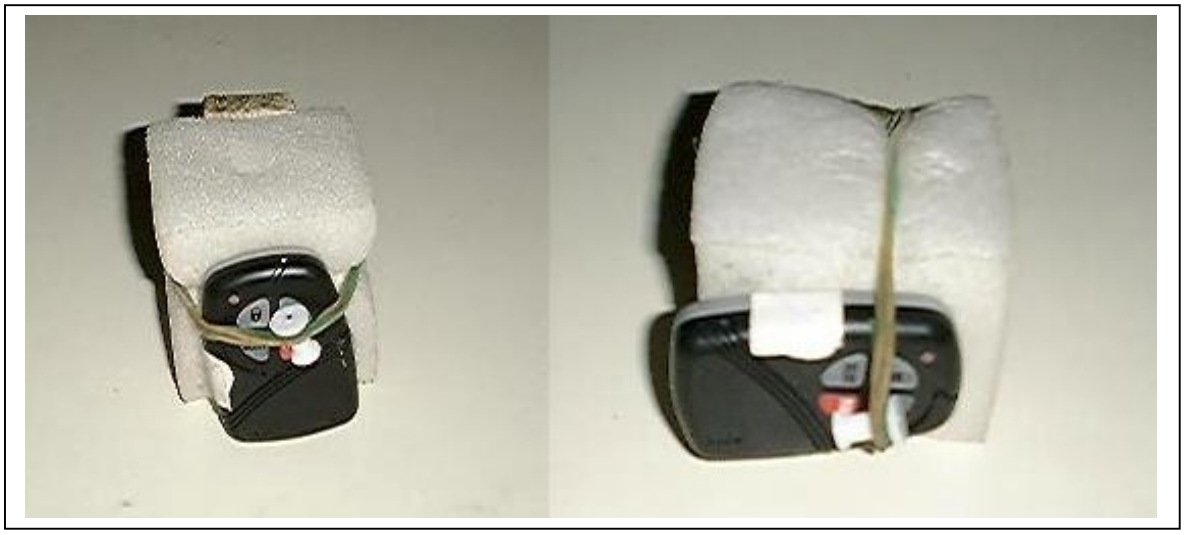
9. SYSTEM TEST CONFIGURATION

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)

Test Set-up for frequency range 30 – 1000 MHz

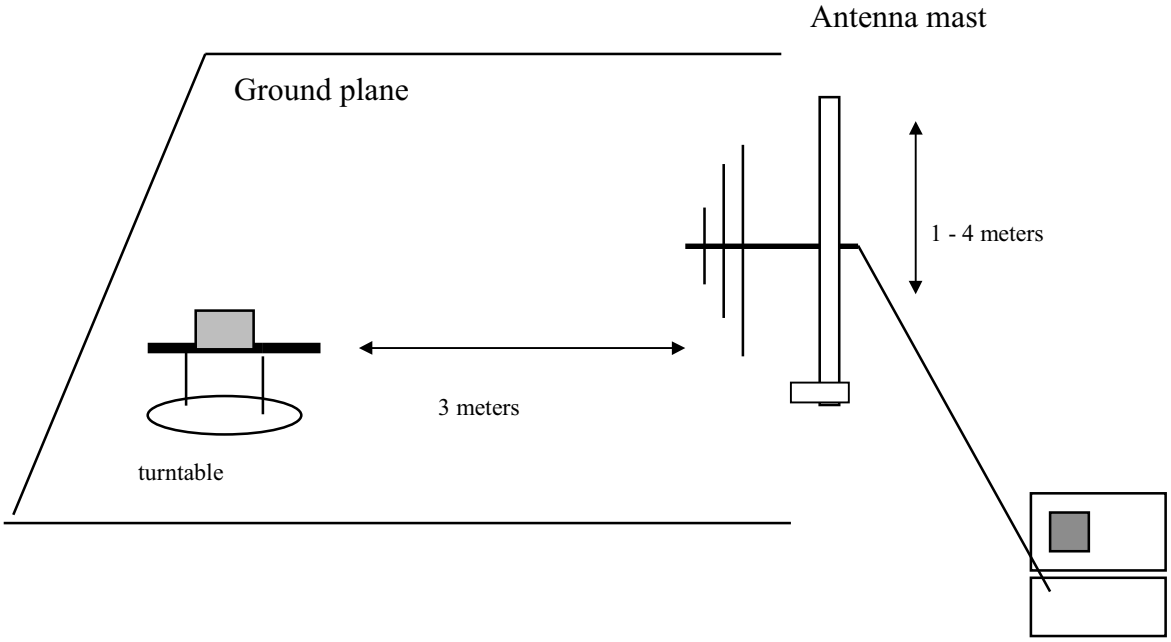


Fig. 1

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.

Test set-up for measurements above 1GHz

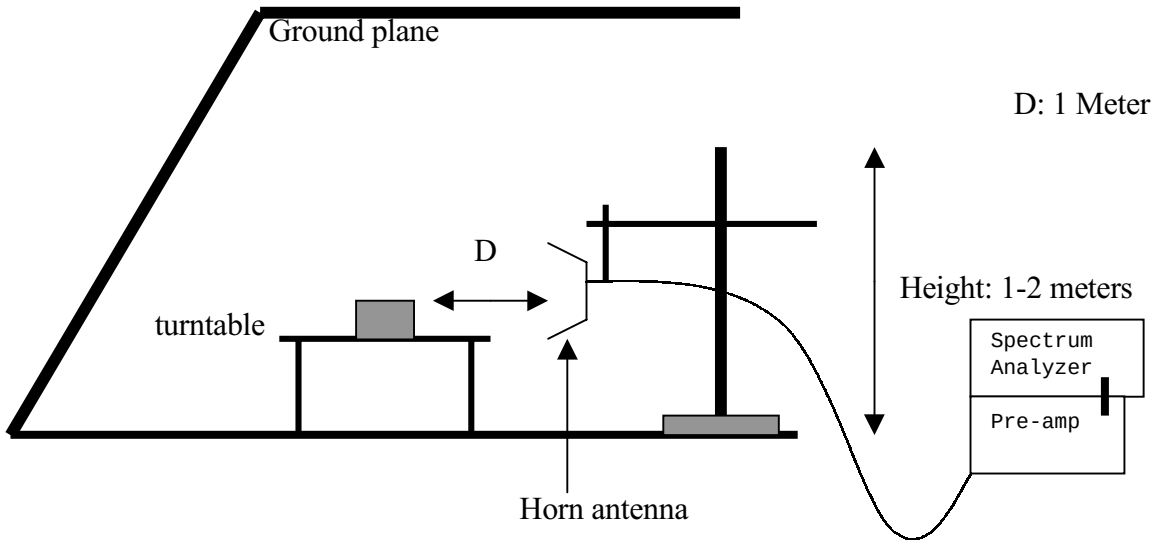


FIG. 2

1. The EUT was placed on a wooden table on the outdoor ground plane. The search antenna was placed 1-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 = 41.956 mS
Long pulse = 0.956 mS
Short pulse = 0.289 mS
No of Long pulse = 13
No of Short pulse = 13

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

Duty Cycle = ((13x0.956)+(13x0.289))/41.956=0.3858=38.58% or –8.27dB

12.2 The Emissions Bandwidth

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

Center Frequency	Measured	Limits
350 MHz	**437.7 kHz < (refer to plot)**	**350X0.25%=875 kHz**

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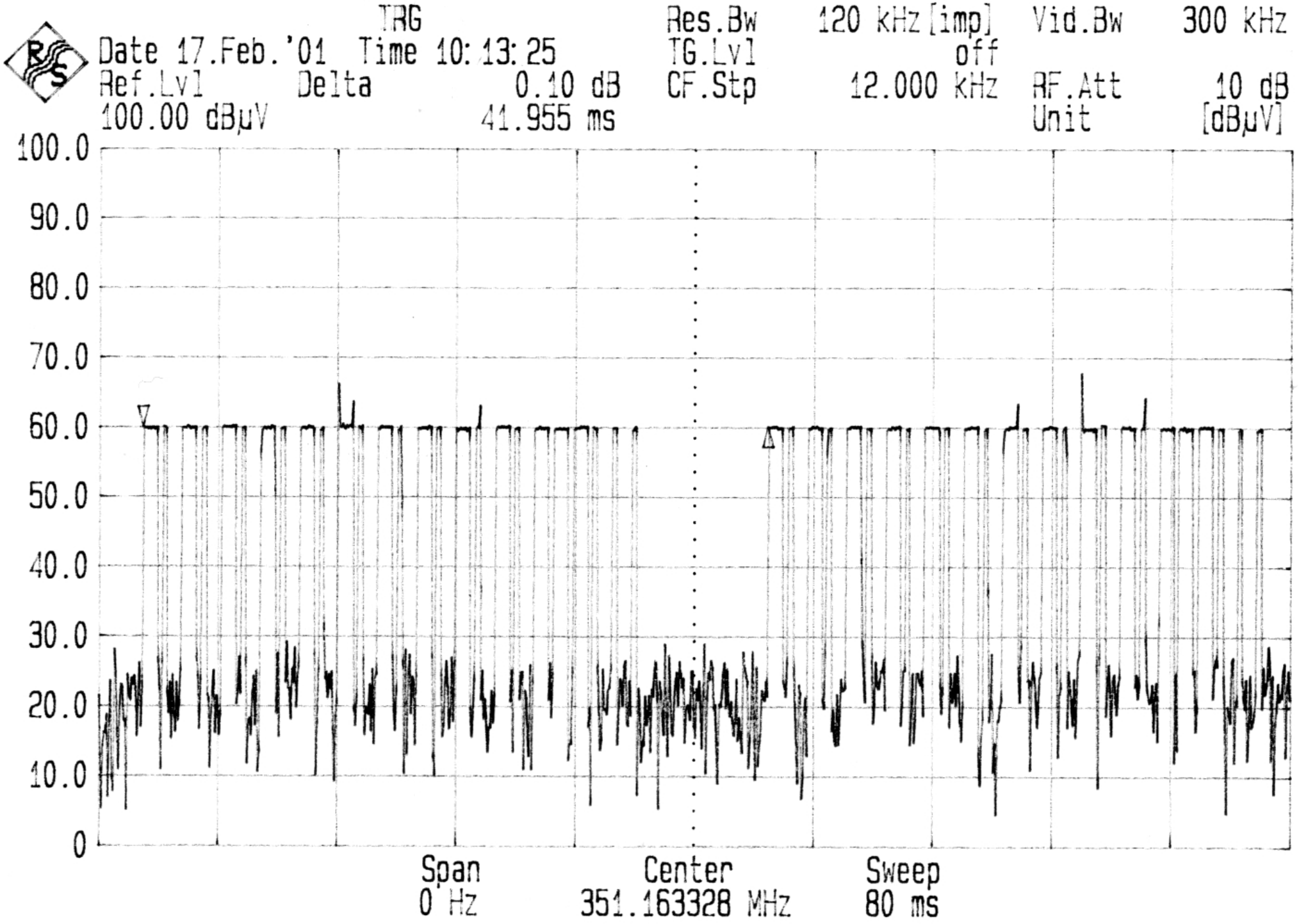
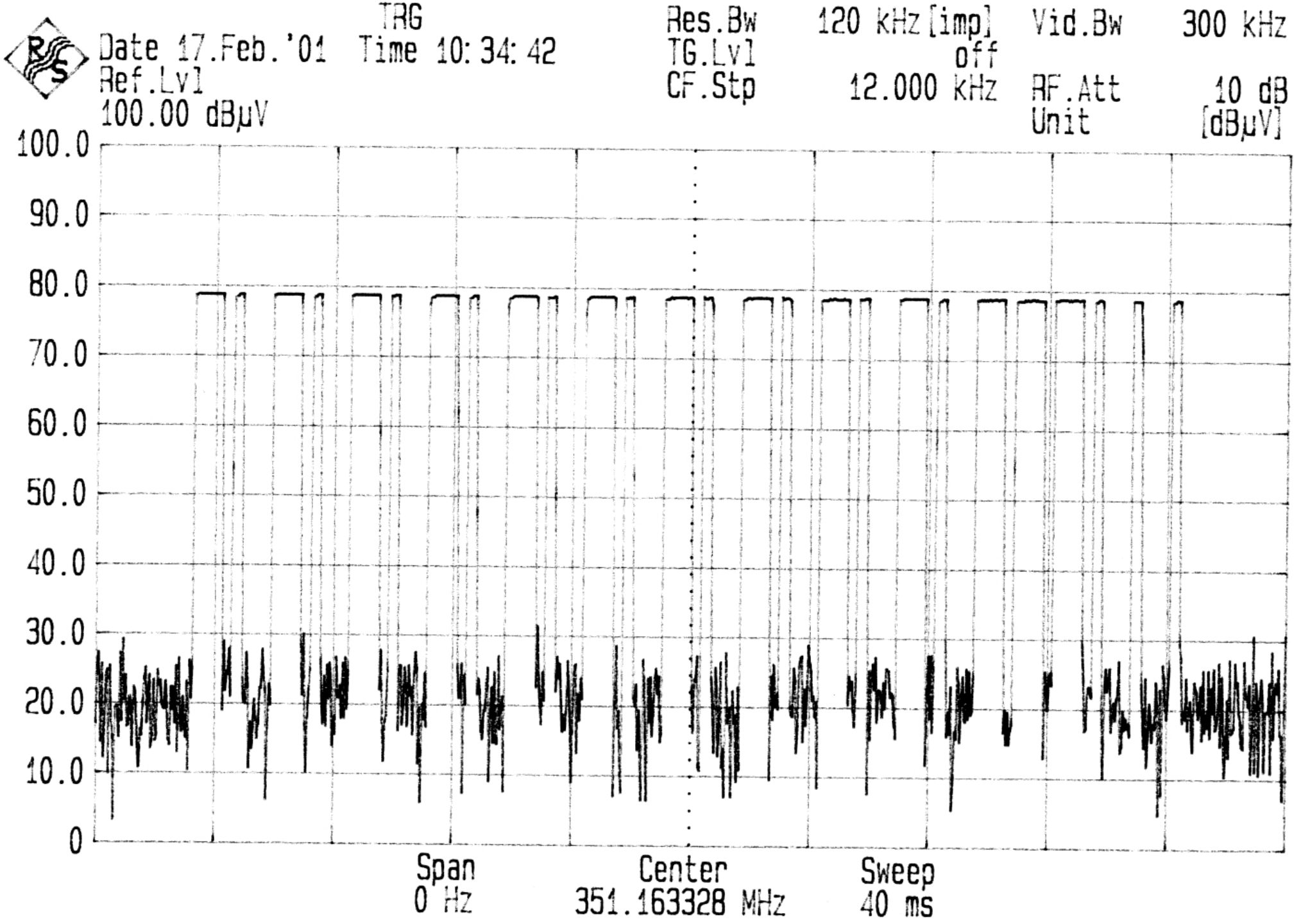
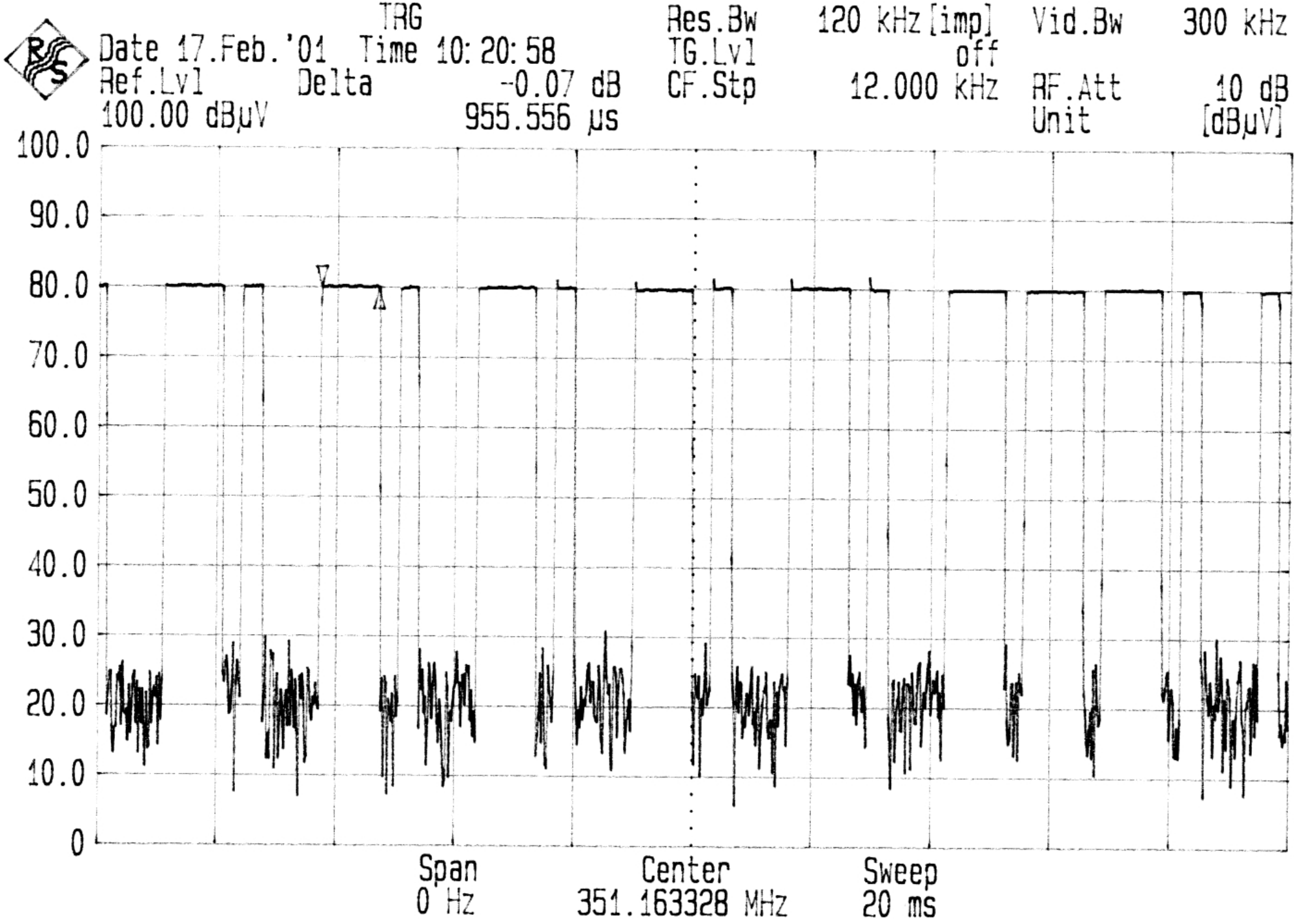
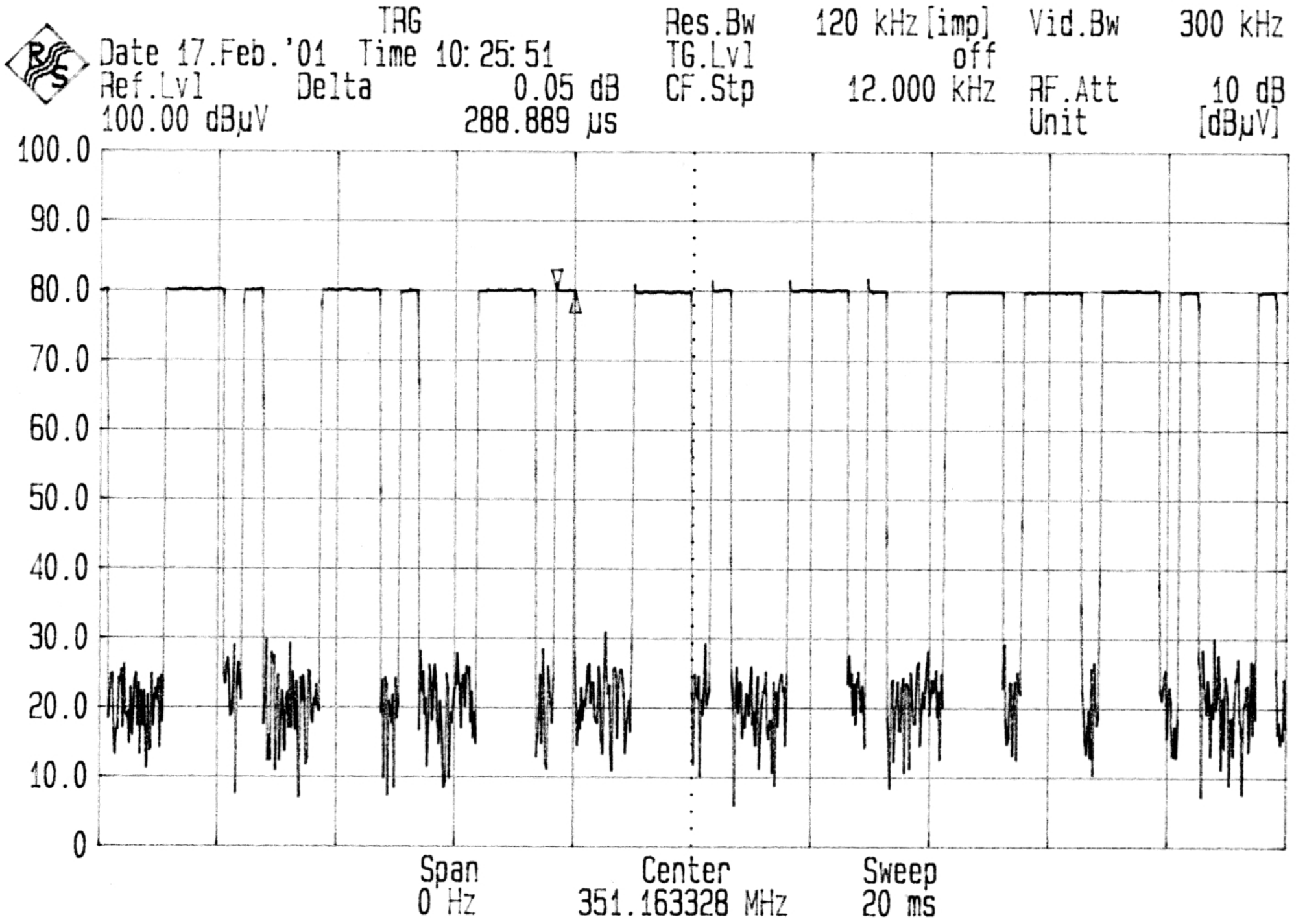
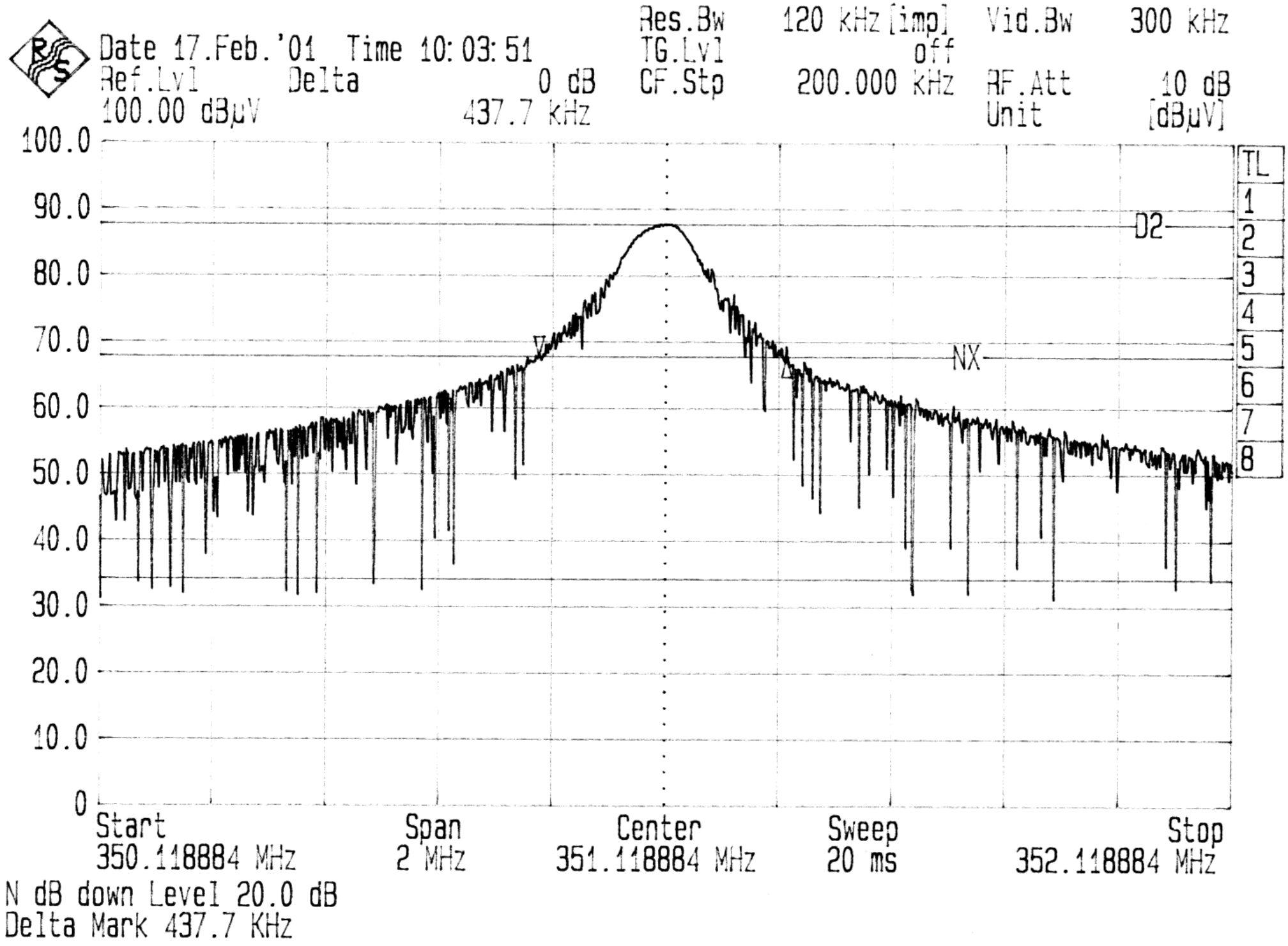

TRG
Res.Bw 120 kHz [imp]
Vid.Bw 300 kHz
Date 17.Feb.'01 Time 10:13:25
TG.Lvl off
Ref.Lvl Delta 0.10 dB
CF.Stp 12.000 kHz
RF.Att 10 dB
100.00 dBµV 41.955 ms
Unit [dBµV]
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
Span
0 Hz
Center
351.163328 MHz
Sweep
80 ms


TRG
Date 17.Feb.'01 Time 10:34:42
Ref.Lvl
100.00 dBµV
Res.Bw 120 kHz [imp]
TG.Lvl off
CF.Stp 12.000 kHz
Vid.Bw 300 kHz
RF.Att 10 dB
Unit [dBµV]
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
Span
0 Hz
Center
351.163328 MHz
Sweep
40 ms


TRG
Res.Bw 120 kHz [imp]
Vid.Bw 300 kHz
Date 17.Feb.'01 Time 10:20:58
TG.Lvl off
Ref.Lvl Delta -0.07 dB
CF.Stp 12.000 kHz
RF.Att 10 dB
100.00 dBµV 955.556 µs
Unit [dBµV]
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
Span
0 Hz
Center
351.163328 MHz
Sweep
20 ms


TRG
Res.Bw 120 kHz [imp]
Vid.Bw 300 kHz
Date 17.Feb.'01 Time 10:25:51
TG.Lvl off
Ref.Lvl Delta 0.05 dB
CF.Stp 12.000 kHz
RF.Att 10 dB
100.00 dBµV 288.889 µs
Unit [dBµV]
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
Span
0 Hz
Center
351.163328 MHz
Sweep
20 ms


Date 17.Feb.'01 Time 10:03:51
Res.Bw 120 kHz [imp]
Vid.Bw 300 kHz
TG.Lvl off
CF.Stp 200.000 kHz
RF.Att 10 dB
Unit [dBµV]
Ref.Lvl 100.00 dBµV
Delta 0 dB
437.7 kHz
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
TL
1
2
3
4
5
6
7
8
D2
NX
Start 350.118884 MHz
Span 2 MHz
Center 351.118884 MHz
Sweep 20 ms
Stop 352.118884 MHz
N dB down Level 20.0 dB
Delta Mark 437.7 KHz

COMPLIANCE Certification Services
FCC, VCCI, CISPR, CE, AUSTEL, NZ
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PHONE: 02-2217-0894 FAX: 02-2217-1254

Project #:	01E9276
Report #:	9276D1
Date& Time:	3/6/2001
Test Engr:	VINCE CHIANG

Company:	ARGUS SECURITY CORPORATION
EUT Description:	ND4 (Alarm TX / 350MHz)
Test Configuration :	EUT ONLY
Type of Test:	FCC 15.231(b)
Mode of Operation:	NORMAL MODE

(●) D-Site ( ) E-Site

M% = ((t1+t2+t3+…)/T) * 100% = **38.58 %**

Av Reading = Pk Reading + 20*log(M%)
20*log(M%) = **-8.2728**

	Freq.	Pk Rdg	Av Rdg	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height
	(MHz)	(dBuV)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC_B	(dB)	(H/V)	(Deg)	(Meter)
	Button #1:											
X	350.86	72.77	64.50	15.76	2.86	21.37	61.75	77.54	-15.80	3mV	0	1.15
	701.71	43.13	34.86	21.72	3.89	20.83	39.64	57.54	-17.90	3mV	0	1.10
Y	350.86	83.60	75.33	15.76	2.86	21.37	72.58	77.54	-4.96	3mV	90	1.10
	701.70	53.51	45.24	21.72	3.89	20.83	50.02	57.54	-7.52	3mV	90	1.35
Z	350.86	83.52	75.25	15.76	2.86	21.37	72.50	77.54	-5.04	3mV	180	1.25
	701.71	56.84	48.57	21.72	3.89	20.83	53.35	57.54	-4.19	3mV	180	1.30
X	351.37	81.77	73.50	15.78	2.86	21.37	70.77	77.54	-6.77	3mH	0	1.10
	702.76	54.09	45.82	21.72	3.89	20.83	50.60	57.54	-6.94	3mH	0	1.20
Y	351.35	77.53	69.26	15.78	2.86	21.37	66.53	77.54	-11.01	3mH	180	1.00
	702.70	47.36	39.09	21.72	3.89	20.83	43.87	57.54	-13.67	3mH	180	1.10
Z	351.36	80.78	72.51	15.78	2.86	21.37	69.78	77.54	-7.76	3mH	90	1.25
	702.73	51.86	43.59	21.72	3.89	20.83	48.37	57.54	-9.17	3mH	90	1.20
	Button #2:											
X	351.46	70.37	62.10	15.76	2.86	21.37	59.35	77.54	-18.19	3mV	90	1.30
	702.92	40.66	32.39	21.72	3.89	20.83	37.17	57.54	-20.37	3mV	90	1.25
Y	351.46	82.15	73.88	15.76	2.86	21.37	71.13	77.54	-6.41	3mV	0	1.10
	702.90	55.66	47.39	21.72	3.89	20.83	52.17	57.54	-5.37	3mV	0	1.10
Z	351.47	82.91	74.64	15.76	2.86	21.37	71.89	77.54	-5.65	3mV	180	1.20
	702.92	52.31	44.04	21.72	3.89	20.83	48.82	57.54	-8.72	3mV	180	1.20
X	351.47	81.75	73.48	15.78	2.86	21.37	70.75	77.54	-6.79	3mH	0	1.10
	702.92	51.35	43.08	21.72	3.89	20.83	47.86	57.54	-9.68	3mH	0	1.20
Y	351.48	79.41	71.14	15.78	2.86	21.37	68.41	77.54	-9.13	3mH	180	1.25
	702.95	47.95	39.68	21.72	3.89	20.83	44.46	57.54	-13.08	3mH	180	1.10
Z	351.48	78.98	70.71	15.78	2.86	21.37	67.98	77.54	-9.56	3mH	90	1.20
	702.95	44.67	36.40	21.72	3.89	20.83	41.18	57.54	-16.36	3mH	90	1.25
	Total data #: 24											

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

No. 199 Chung Sheng Road
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Project #:	01E9276
Report #:	9276D2
Date& Time:	3/6/2001
Test Engr:	VINCE CHIANG

Company:	ARGUS SECURITY CORPORATION
EUT Description:	ND4 (Alarm TX / 350MHz)
Test Configuration :	EUT ONLY
Type of Test:	FCC 15.231(b)
Mode of Operation:	NORMAL MODE

(•) D-Site ( ) E-Site

M% = ((t1+t2+t3+…)/T) * 100% = **38.58 %**

Av Reading = Pk Reading + 20*log(M%)
20*log(M%) = **-8.2728**

	Freq.	Pk Rdg	Av Rdg	AF	Closs	Pre-amp	Level	Limit	Margin	Pol	Az	Height
	(MHz)	(dBuV)	(dBuV)	(dB)	(dB)	(dB)	(dBuV/m)	FCC_B	(dB)	(H/V)	(Deg)	(Meter)
	Button #3:											
X	351.33	70.67	62.40	15.76	2.86	21.37	59.65	77.54	-17.89	3mV	0	1.15
	702.66	45.79	37.52	21.72	3.89	20.83	42.30	57.54	-15.24	3mV	0	1.10
Y	351.26	82.18	73.91	15.76	2.86	21.37	71.16	77.54	-6.38	3mV	90	1.10
	702.53	55.72	47.45	21.72	3.89	20.83	52.23	57.54	-5.31	3mV	90	1.20
Z	351.32	82.76	74.49	15.76	2.86	21.37	71.74	77.54	-5.80	3mV	180	1.20
	702.65	52.64	44.37	21.72	3.89	20.83	49.15	57.54	-8.39	3mV	180	1.20
X	351.30	81.72	73.45	15.78	2.86	21.37	70.72	77.54	-6.82	3mH	0	1.10
	702.59	56.61	48.34	21.72	3.89	20.83	53.12	57.54	-4.42	3mH	0	1.20
Y	351.27	78.57	70.30	15.78	2.86	21.37	67.57	77.54	-9.97	3mH	0	1.25
	702.51	48.20	39.93	21.72	3.89	20.83	44.71	57.54	-12.83	3mH	0	1.20
Z	351.29	80.15	71.88	15.78	2.86	21.37	69.15	77.54	-8.39	3mH	180	1.10
	702.58	54.30	46.03	21.72	3.89	20.83	50.81	57.54	-6.73	3mH	180	1.10
	Button #4:											
X	351.37	69.28	61.01	15.76	2.86	21.37	58.26	77.54	-19.28	3mV	180	1.25
	702.73	45.10	36.83	21.72	3.89	20.83	41.61	57.54	-15.93	3mV	180	1.20
Y	351.37	82.18	73.91	15.76	2.86	21.37	71.16	77.54	-6.38	3mV	0	1.25
	702.72	55.56	47.29	21.72	3.89	20.83	52.07	57.54	-5.47	3mV	0	1.25
Z	351.37	82.28	74.01	15.76	2.86	21.37	71.26	77.54	-6.28	3mV	0	1.10
	702.74	56.38	48.11	21.72	3.89	20.83	52.89	57.54	-4.65	3mV	0	1.20
X	351.37	81.16	72.89	15.78	2.86	21.37	70.16	77.54	-7.38	3mH	90	1.00
	702.73	46.88	38.61	21.72	3.89	20.83	43.39	57.54	-14.15	3mH	90	1.10
Y	351.36	78.27	70.00	15.78	2.86	21.37	67.27	77.54	-10.27	3mH	180	1.25
	702.72	51.96	43.69	21.72	3.89	20.83	48.47	57.54	-9.07	3mH	180	1.20
Z	351.36	80.43	72.16	15.78	2.86	21.37	69.43	77.54	-8.11	3mH	0	1.10
	702.73	52.44	44.17	21.72	3.89	20.83	48.95	57.54	-8.59	3mH	0	1.25
	Total data #: 24											

COMPLIANCE Certification Services

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

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Project #:	01E9276
Report #:	9276D3
Date& Time:	3/06/2001
Test Engr:	Vince Chiang

Company:	ARGUS SECURITY CORPORATION
EUT Description:	ND4 (Alarm Tx / 350MHz)
Test Configuration :	EUT ONLY
Type of Test:	FCC 15.231(b)/FCC 15.209
Mode of Operation:	NORMAL MODE

(•) D-Site ( ) E-Site 6 Worst Descendin

Freq. (MHz)	Pk Rdg (dBuV)	Av Rdg (dBuV)	AF (dB)	Closs (dB)	Pre-amp (dB)	Dist dB	Level (dBuV/m)	Limit FCC_B	Margin (dB)	Pol (H/V)	Az (Deg)	Height (Meter	Mark (P/Q/A)
1049	**51.07**	**42.80**	**25.2**	**2.5**	**43.40**	**-9.5**	**17.62**	**54.0**	**-36.38**	**1mV**	**0**	**1.1**	**A**
1398	**51.26**	**42.99**	**25.1**	**2.9**	**43.22**	**-9.5**	**18.31**	**54.0**	**-35.69**	**1mV**	**0**	**1.1**	**A**
1748	**47.48**	**39.21**	**26.2**	**3.3**	**43.04**	**-9.5**	**16.15**	**57.5**	**-41.39**	**1mV**	**0**	**1.1**	**A**
1049	**52.92**	**44.65**	**25.2**	**2.5**	**43.40**	**-9.5**	**19.47**	**54.0**	**-34.53**	**1mH**	**0**	**1.1**	**A**
1399	**51.54**	**43.27**	**25.1**	**2.9**	**43.22**	**-9.5**	**18.59**	**54.0**	**-35.41**	**1mH**	**0**	**1.1**	**A**
1749	**50.28**	**42.01**	**26.2**	**3.3**	**43.04**	**-9.5**	**18.95**	**57.5**	**-38.59**	**1mH**	**0**	**1.1**	**A**

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

Total data #:6
V.2d

P(Peak): RBW=VBW=1MHz
A(Average): Pk Reading - 8.2728dB

Distance = 20log(1/3)= -9.5dB