Retlif Testing Laboratories

795 Marconi Avenue, Ronkonkoma, N.Y. 11779 (516) 737- 1500 - FAX 516-737-1497
(Branch Office)
101 New Boston Road, Goffstown, N.H. 03045 (603) 497-4600 - FAX (603) 497-5281

FCC COMPLIANCE TEST REPORT
ON
DETECTION SYSTEMS, INC.
304 MHz PULSED RF
SECURITY/ALARM TRANSMITTER
MODEL: RF3334/RF3332
FCC ID: ESV-0407-2

CUSTOMER NAME: Detection Systems

CUSTOMER P.O.: 104421SKI

DATE OF REPORT: July 15, 1998

TEST REPORT NO.: R-7612-1

TEST START DATE: June 25, 1998

TEST FINISH DATE: July 1, 1998

TEST TECHNICIAN: D. Cortes

TEST ENGINEER: T. Schneider

SUPERVISOR: R.J. Reitz

REPORT PREPARED BY: L. Anderson

GOVERNMENT SOURCE INSPECTION: Not Applicable

CERTIFICATION AND SIGNATURES

We certify that this report is a true report of the results obtained from the tests of the equipment stated. We further certify that the measurements shown in this report were made in accordance with the procedures indicated and vouch for the qualifications of all Retlif Testing Laboratories personnel taking them.

Thomas J. Schneider
EMC Test Engineer
NVLAP Approved Signatory

Richard J. Reitz
Laboratory Manager
NVLAP Approved Signatory

NON-WARRANTY PROVISION
The testing services have been performed, findings obtained, and reports prepared in accordance with generally accepted testing laboratory principles and practices. This warranty is in lieu of all other warranties, either express or implied.

NON-ENDORSEMENT
This test report contains only findings and results arrived at after employing the specific test procedures and standards listed herein. It is not intended to constitute a recommendation endorsement, or certification of the product or material tested. This report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

TABLE OF EXHIBITS

EXHIBIT 2

Equipment Photographs

Para. 2.1033(b)(7)

EXHIBIT 6

Report of Measurements

Para. 2.1033(b)(6)

APPLICANT	MANUFACTURER
Detection Systems 130 Perinton Parkway Fairport, NY 14450	SAME

TEST SPECIFICATION: FCC Rules and Regulations Part 15, Subpart C, Para. 15.231

TEST PROCEDURE: ANSI C63.4:1992

TEST SAMPLE DESCRIPTION

BRANDNAME: Detection Systems MODEL: RF3334/RF3332

TYPE: Pulsed RF Security/Alarm Transmitter

POWER REQUIREMENTS: Two (2) Duracell DL2025 Batteries

FREQUENCY OF OPERATION: 304 MHz

TESTS PERFORMED

Para. 15.231(a), Radiated Emissions, Fundamental & Spurious

Para. 15.231(c), Occupied Bandwidth

Duty Cycle Determination

I HEREBY CERTIFY THAT: The measurements shown here were in accordance with the procedure indicated and that the energy emitted by this equipment was found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements and vouch for the qualifications of all persons taking them.

I FURTHER CERTIFY THAT: On the basis of the measurements made, the device tested is capable of operation in compliance with the requirements of Part 15 of the FCC Rules under normal use and maintenance.

SIGN	PRINT	TITLE
Thomas J. Schneider	Thomas J. Schneider	EMC Test Engineer

REPORT OF MEASUREMENTS

Applicant:	Detection Systems
Device:	304 MHz Security Transmitter
FCC ID:	ESV-0407-2
Power Requirements:	Two (2) Duracell DL2025 Batteries
Applicable Rule Section:	Part 15, Subpart C, Section 15.231

TEST RESULTS

15.231 (a) - The device is a Remote/Control Security Transmitter designed to transmit arm, disarm signals and other signals to control devices within a residential security system.

15.231 (a)(1) - The transmitter is manually activated by pressing either the "arm", "disarm" or "panic" buttons.

15.231 (a)(3) - The unit does not perform periodic transmissions for system integrity and status purposes since it is manually activated.

15.231 (a)(4) - The device is used for Security purposes for remote control and the arming and disarming of home security systems.

15.231 (b) - The fundamental field strength did not exceed 5580 μV/M (Average) at a test distance of 3 meters. In addition, the requirements of section 15.35 for averaging pulsed emissions and for limiting peak emissions were met.

The field strength of harmonic and spurious emissions did not exceed 558μV/M (AVERAGE).

15.231 (c) - The device operates at 304 MHz. The bandwidth of emissions did not exceed 0.25% of the operating frequency (760 kHz).

DETERMINATION OF FIELD STRENGTH LIMITS

The field strength limits shown below are found in Section 15.231.

Frequency			Limit		
F1	=	260	3750	=	L1
Fo	=	304			Lo
F2	=	470	12500	=	L2

The formula below was utilized to determine the limits:

Limit = L1 + [(Fo-F1)(L2-L1)/(F2-F1)]

Solving yields:

Fundamental Limit = 5580 μV/M (AVERAGE) @ 3 Meters

Harmonic Limit = 558 μV/M (AVERAGE) @ 3 Meters

DETERMINATION OF DUTY CYCLE AS PER DETECTION SYSTEMS:

Each packet contains 76 data bits and the packet transmission time with a 5 kHz data rate is 15.2 milliseconds. The 50% duty cycle Manchester Coding of the transmission ensures a 50%on-air time for every packet which is 7.6 milliseconds. The minimum quiet time between packets is 100 milliseconds.

Packet Time = 15.2 milliseconds

Quiet Time Between Packets = 100 milliseconds

ON-AIR Time = (Packet Time) x 50% = 7.6 milliseconds, in 115.2 milliseconds

Factor = 20 LOG(ON-AIR time/100 milliseconds) = 20 LOG(0.076) = -22.38dB

SPECTRUM ANALYZER DESENSITIZATION CONSIDERATIONS

Due to the nature of the emissions being measured, care was taken to ensure that the resolution bandwidth of the spectrum analyzer was adequate to provide accurate measurements. The following formula was utilized:

Pulse Desensitization = 20 Log (PW * BW * 1.5)

Setting pulse desensitization equal to zero and utilizing the minimum observed pulse width of 100 microseconds yields a minimum required bandwidth of 6666.7 Hz. FCC specified bandwidths of 100kHz and 1MHz were utilized below and above 1GHz, respectively.

GENERAL NOTES:

1. All readings were taken utilizing a peak detector function at a test distance of 3 meters.

2. The duty cycle was applied to the peak readings in order to determine the average value of the emissions.

3. All measurements were made with two (2) new Duracell DL2025 Batteries.

4. The frequency was scanned from 30 MHz to 3.1 GHz. All emissions not reported were more than 20 dB below the specified limit.

Exhibit 6

Report of Measurements

Radiated Emissions Data, Para. 15.231(b)

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

TEST METHOD: **FCC Part 15 Subpart C Radiated Emissions**

CUSTOMER: Detections Systems, Inc. JOB No.: R-7612-1

TEST SAMPLE: Pulsed RF Transmitter
FCC ID: ESV-0407-2

MODEL No.: RF3334/RF3332 SERIAL No.: N/A

TEST SPECIFICATION: FCC Part 15 Subpart C
PARAGRAPH: 15.231

OPERATING MODE: Continuously Transmiting 304 Mhz Signal

TECHNICIAN: T. Schneider DATE: July 1,1998

NOTES: Test Distance: 3 Meters
Detector Function: Peak

Test Frequency	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading		Peak Limit
MHz	(H/V) / meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m		uV/m
304	H/1.4	X	85.2	-4.3	80.9	11091.7		55800
304	H/1.4	Y	85.1	-4.3	80.8	10964.8		55800
304	H/1.0	Z	88.9	-4.3	84.6	16982.4		55800
304	V/1.3	X	73.9	-4.3	69.6	3020.0		55800
304	V/1.3	Y	76.8	-4.3	72.5	4217.0		55800
304	V/1.3	Z	75.5	-4.3	71.2	3630.8		55800
608	H/1.3	X	38.6	2.4	41.0	112.2		5000
608	H/1.1	Y	41.8	2.4	44.2	162.2		5000
608	H/1.0	Z	44.8	2.4	47.2	229.1		5000
608	V/1.2	X	42.8	2.4	45.2	182.0		5000
608	V/1.7	Y	38.9	2.4	41.3	116.1		5000
608	V/1.4	Z	39.7	2.4	42.1	127.4		5000
912	H/1.0	X	33.4	8.3	41.7	121.6		5580
912	H/1.1	Y	40.5	8.3	48.8	275.4		5580
912	H/1.2	Z	35.7	8.3	44.0	158.5		5580
912	V/1.3	X	39.4	8.3	47.7	242.7		5580
912	V/1.0	Y	35.6	8.3	43.9	156.7		5580
912	V/1.0	Z	40.4	8.3	48.7	272.3		5580
1216	H/1.4	X	50.9	-6.3	44.6	169.8		5000
1216	H/1.3	Y	53.0	-6.3	46.7	216.3		5000
1216	H/1.5	Z	48.2	-6.3	41.9	124.5		5000
1216	V/1.3	X	52.4	-6.3	46.1	201.8		5000
1216	V/1.4	Y	52.3	-6.3	46.0	199.5		5000
1216	V/1.3	Z	51.5	-6.3	45.2	182.0		5000
1520	H/1.3	X	48.9	-4.8	44.1	160.3		5000
1520	H/1.2	Y	40.5**	-4.8	35.7	61.0**		5000
1520	H/1.4	Z	40.5**	-4.8	35.7	61.0**		5000
1520	V/1.2	X	47.8	-4.8	43.0	141.3		5000
1520	V/1.3	Y	50.4	-4.8	45.6	190.5		5000
1520	V/1.3	Z	40.5**	-4.8	35.7	61.0**		5000
	The frequency range was scanned from 30 MHz to 3.1 GHz. All emissions not recorded were more than 20dB below the specified limit. Emissions from the EUT do not exceed the specified limits.							
	**- Minimum system sensitivity measurement							

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

TEST METHOD: **FCC Part 15 Subpart C Radiated Emissions**

CUSTOMER: Detections Systems, Inc. JOB No.: R-7612-1

TEST SAMPLE: Pulsed RF Transmitter
FCC ID: ESV-0407-2

MODEL No.: RF3334/RF3332 SERIAL No.: N/A

TEST SPECIFICATION: FCC Part 15 Subpart C
PARAGRAPH: 15.231

OPERATING MODE: Continuously Transmiting 304 Mhz Signal

TECHNICIAN: T. Schneider DATE: July 1,1998

NOTES: Test Distance: 3 Meters
Detector Function: Peak

Test Frequency	Antenna Pol./Height	EUT Orientation	Meter Reading	Correction Factor	Corrected Reading	Converted Reading		Peak Limit
MHz	(H/V) / meters	X / Y / Z	dBuV	dB	dBuV/m	uV/m		uV/m
1824	H/1.3	X	52.2	-2.7	49.5	298.5		5580
1824	H/1.3	Y	45.9	-2.7	43.2	144.5		5580
1824	H/1.3	Z	47.1	-2.7	44.4	166.0		5580
1824	V/1.4	X	45.7	-2.7	43.0	141.3		5580
1824	V/1.5	Y	53.8	-2.7	51.1	358.9		5580
1824	V/1.4	Z	45.7	-2.7	43.0	141.3		5580
2128	H/1.3	X	53.4	-1.3	52.1	402.7		5580
2128	H/1.3	Y	51.3	-1.3	50.0	316.2		5580
2128	H/1.4	Z	48.0	-1.3	46.7	216.3		5580
2128	V/1.5	X	48.4	-1.3	47.1	226.5		5580
2128	V/1.6	Y	52.3	-1.3	51.0	354.8		5580
2128	V/1.3	Z	42.1**	-1.3	40.8	109.6**		5580
2432	H/1.0	X	46.9	-0.4	46.5	211.3		5580
2432	H/1.0	Y	42.5**	-0.4	42.1	127.4**		5580
2432	H/1.0	Z	42.5**	-0.4	42.1	127.4**		5580
2432	V/1.0	X	42.5**	-0.4	42.1	127.4**		5580
2432	V/1.0	Y	42.5**	-0.4	42.1	127.4**		5580
2432	V/1.0	Z	42.5**	-0.4	42.1	127.4**		5580
2736	H/1.0	X	42.8**	1.1	43.9	156.7**		5000
2736	H/1.0	Y	42.8**	1.1	43.9	156.7**		5000
2736	H/1.0	Z	42.8**	1.1	43.9	156.7**		5000
2736	V/1.0	X	42.8**	1.1	43.9	156.7**		5000
2736	V/1.0	Y	42.8**	1.1	43.9	156.7**		5000
2736	V/1.0	Z	42.8**	1.1	43.9	156.7**		5000
3040	H/1.0	X	43.9**	3.1	47.0	223.9**		5580
3040	H/1.0	Y	43.9**	3.1	47.0	223.9**		5580
3040	H/1.0	Z	43.9**	3.1	47.0	223.9**		5580
3040	V/1.0	X	43.9**	3.1	47.0	223.9**		5580
3040	V/1.0	Y	43.9**	3.1	47.0	223.9**		5580
3040	V/1.0	Z	43.9**	3.1	47.0	223.9**		5580
	The frequency range was scanned from 30 MHz to 3.1 GHz. All emissions not recorded were more than 20dB below the specified limit. Emissions from the EUT do not exceed the specified limits.							
	**-Minimum System Sensitivity							

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

TEST METHOD: **FCC Part 15 Subpart C Radiated Emissions**

CUSTOMER: Detections Systems, Inc. JOB No.: R-7612-1

TEST SAMPLE: Pulsed RF Transmitter
FCC ID: ESV-0407-2

MODEL No.: RF3334/RF3332 SERIAL No.: N/A

TEST SPECIFICATION: FCC Part 15 Subpart C PARAGRAPH: 15.231

OPERATING MODE: Continuously transmiting 304 Mhz Signal

TECHNICIAN: T. Schneider DATE: July 1,1998

NOTES: Test Distance: 3 Meters
Detector Function: Peak Worst Case Duty Cycle: 7.6% (-22.4 dB Duty Cycle Correction Factor)

Test Frequency	Antenna Pol./Height	EUT Orientation	Peak Corrected Reading	Duty Cycle Corr. Factor	Corrected Average	Converted Average		Average Limit
MHz	(H/V) / meters	X / Y / Z	dBuV/m	dB	dBuV/m	uV/m		uV/m
304	H/1.4	X	80.9	-22.4	58.5	841.4		5580
304	H/1.4	Y	80.8	-22.4	58.4	831.8		5580
304	H/1.0	Z	84.6	-22.4	62.2	1288.2		5580
304	V/1.3	X	69.6	-22.4	47.2	229.1		5580
304	V/1.3	Y	72.5	-22.4	50.1	319.9		5580
304	V/1.3	Z	71.2	-22.4	48.8	275.4		5580
608	H/1.3	X	41.0	-22.4	18.6	8.5		500
608	H/1.1	Y	44.2	-22.4	21.8	12.3		500
608	H/1.0	Z	47.2	-22.4	24.8	17.4		500
608	V/1.2	X	45.2	-22.4	22.8	13.8		500
608	V/1.7	Y	41.3	-22.4	18.9	8.8		500
608	V/1.4	Z	42.1	-22.4	19.7	9.7		500
912	H/1.0	X	41.7	-22.4	19.3	9.2		558
912	H/1.1	Y	48.8	-22.4	26.4	20.9		558
912	H/1.2	Z	44.0	-22.4	21.6	12.0		558
912	V/1.3	X	47.7	-22.4	25.3	18.4		558
912	V/1.0	Y	43.9	-22.4	21.5	11.9		558
912	V/1.0	Z	48.7	-22.4	26.3	20.7		558
1216	H/1.4	X	44.6	-22.4	22.2	12.9		500
1216	H/1.3	Y	46.7	-22.4	24.3	16.4		500
1216	H/1.5	Z	41.9	-22.4	19.5	9.4		500
1216	V/1.3	X	46.1	-22.4	23.7	15.3		500
1216	V/1.4	Y	46.0	-22.4	23.6	15.1		500
1216	V/1.3	Z	45.2	-22.4	22.8	13.8		500
1520	H/1.3	X	44.1	-22.4	21.7	12.2		500
1520	H/1.2	Y	35.7	-22.4	13.3	4.6		500
1520	H/1.4	Z	35.7	-22.4	13.3	4.6		500
1520	V/1.2	X	43.0	-22.4	20.6	10.7		500
1520	V/1.3	Y	45.6	-22.4	23.2	14.5		500
1520	V/1.3	Z	35.7	-22.4	13.3	4.6		500
	The frequency range was scanned from 30 MHz to 3.1 GHz. All emissions not recorded were more than 20dB below the specified limit. Emissions from the EUT do not exceed the specified limits.							

RETLIF TESTING LABORATORIES

TABULAR DATA SHEET

TEST METHOD: **FCC Part 15 Subpart C Radiated Emissions**

CUSTOMER: Detections Systems, Inc. JOB No.: R-7612-1

TEST SAMPLE: Pulsed RF Transmitter
FCC ID: ESV-0407-2

MODEL No.: RF3334/RF3332 SERIAL No.: N/A

TEST SPECIFICATION: FCC Part 15 Subpart C PARAGRAPH: 15.231

OPERATING MODE: Continuously transmiting 304 Mhz Signal

TECHNICIAN: T. Schneider DATE: July 1,1998

NOTES: Test Distance: 3 Meters
Detector Function: Peak Worst Case Duty Cycle: 7.6% (-22.4 dB Duty Cycle Correction Factor)

Test Frequency	Antenna Pol./Height	EUT Orientation	Peak Corrected Reading	Duty Cycle Corr. Factor	Corrected Average	Converted Average		Average Limit
MHz	(H/V) / meters	X / Y / Z	dBuV/m	dB	dBuV/m	uV/m		uV/m
1824	H/1.3	X	49.5	-22.4	27.1	22.6		558
1824	H/1.3	Y	43.2	-22.4	20.8	11.0		558
1824	H/1.3	Z	44.4	-22.4	22.0	12.6		558
1824	V/1.4	X	43.0	-22.4	20.6	10.7		558
1824	V/1.5	Y	51.1	-22.4	28.7	27.2		558
1824	V/1.4	Z	43.0	-22.4	20.6	10.7		558
2128	H/1.3	X	52.1	-22.4	29.7	30.5		558
2128	H/1.3	Y	50.0	-22.4	27.6	24.0		558
2128	H/1.4	Z	46.7	-22.4	24.3	16.4		558
2128	V/1.5	X	47.1	-22.4	24.7	17.2		558
2128	V/1.6	Y	51.0	-22.4	28.6	26.9		558
2128	V/1.3	Z	40.8	-22.4	18.4	8.3		558
2432	H/1.0	X	46.5	-22.4	24.1	16.0		558
2432	H/1.0	Y	42.1	-22.4	19.7	9.7		558
2432	H/1.0	Z	42.1	-22.4	19.7	9.7		558
2432	V/1.0	X	42.1	-22.4	19.7	9.7		558
2432	V/1.0	Y	42.1	-22.4	19.7	9.7		558
2432	V/1.0	Z	42.1	-22.4	19.7	9.7		558
2736	H/1.0	X	43.9	-22.4	21.5	11.9		500
2736	H/1.0	Y	43.9	-22.4	21.5	11.9		500
2736	H/1.0	Z	43.9	-22.4	21.5	11.9		500
2736	V/1.0	X	43.9	-22.4	21.5	11.9		500
2736	V/1.0	Y	43.9	-22.4	21.5	11.9		500
2736	V/1.0	Z	43.9	-22.4	21.5	11.9		500
3040	H/1.0	X	47.0	-22.4	24.6	17.0		558
3040	H/1.0	Y	47.0	-22.4	24.6	17.0		558
3040	H/1.0	Z	47.0	-22.4	24.6	17.0		558
3040	V/1.0	X	47.0	-22.4	24.6	17.0		558
3040	V/1.0	Y	47.0	-22.4	24.6	17.0		558
3040	V/1.0	Z	47.0	-22.4	24.6	17.0		558

The frequency range was scanned from 30 MHz to 3.1 GHz. All emissions not recorded were more than 20dB below the specified limit. Emissions from the EUT do not exceed the specified limits.

EQUIPMENT LIST

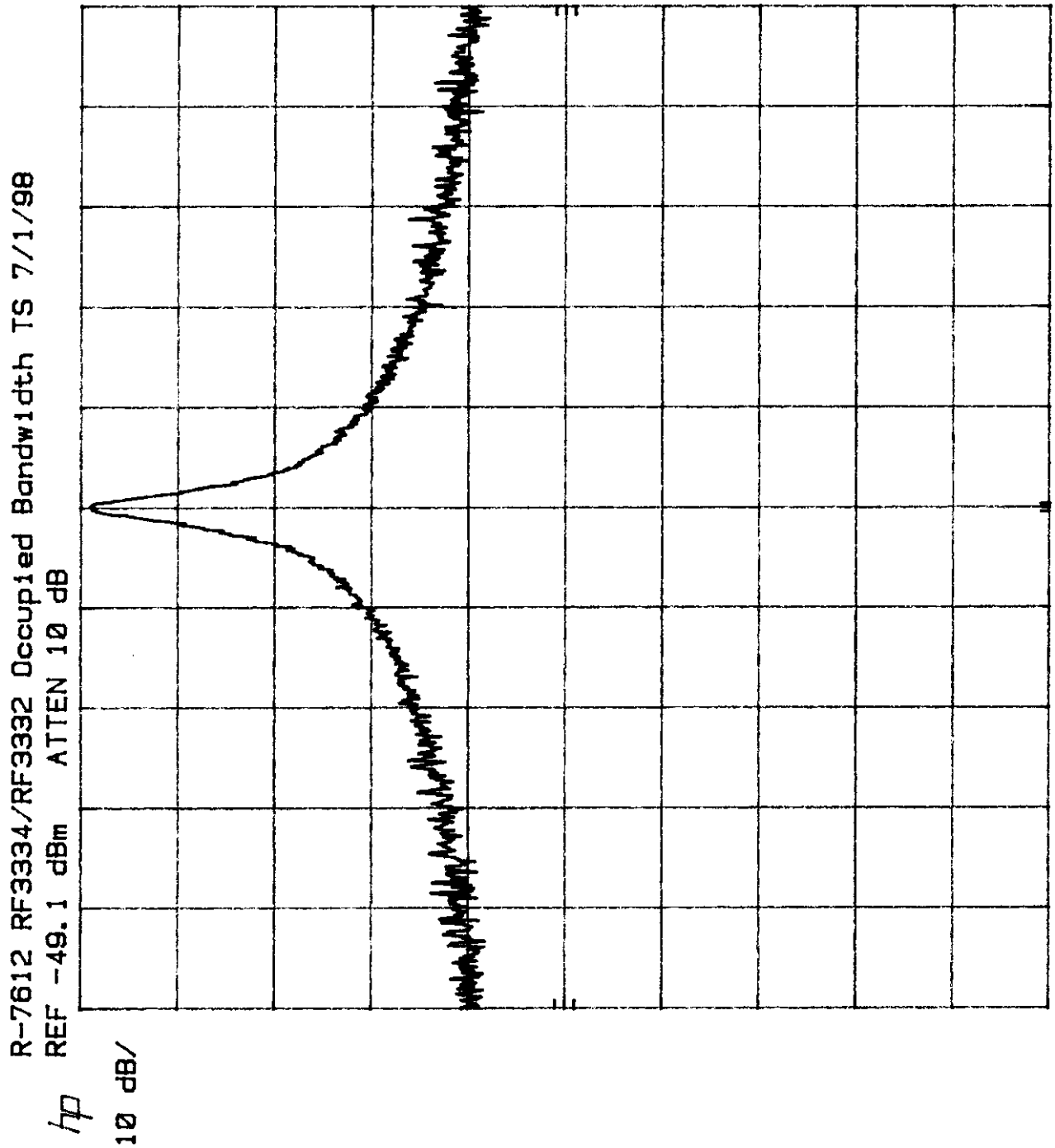
FCC Part 15 Subpart C Radiated Emissions

EN	Type	Manufacturer	Frequency Range	Model No.	Cal Date	Due Date
067	Open Area Test Site	Retlif	3 Meter	RNY	8/30/97	8/30/99
128C	Double Ridge Guide	Eaton Corporation	1 GHz - 18 GHz	96001	10/6/97	10/6/98
133	Broadband Pre-Amplifier	Electro-Metrics	10 kHz - 1 GHz, 26dB	BPA-1000	6/22/98	6/22/99
141	Spectrum Analyzer	Hewlett Packard	100 Hz - 40 GHz	8566B	3/2/98	9/2/98
141A	Graphics Plotter	Hewlett Packard	N/A	7470A	3/4/98	3/4/99
141B	Quasi-Peak Adaptor	Hewlett Packard	100 Hz - 1 GHz	85650A	3/3/98	9/3/98
206B	6.0 dB Attenuator	Texscan	0 - 1.0 GHz	FP-50 - 6 dB	6/22/98	6/22/99
523	Biconilog	Electro-Mechanics	26 MHz - 1100 MHz	3143	9/30/97	9/30/98
543	Preamplifier	Hewlett Packard	1.0 GHz - 26.5 GHz	8449B	8/12/97	8/12/98

Exhibit 6

Report of Measurements

Occupied Bandwidth, Para. 15.231(c)



Customer:	Detection Systems
Test Sample:	304 MHz Pulsed RF Transmitter
Model No.:	RF3334/RF3332, FCC ID: ESV-0407-2
Test Method:	Occupied Bandwidth
Notes:	Bandwidth does not exceed 0.25% of center frequency (760 kHz) as measured 20 dB down from modulated carrier

Date: July 1, 1998 Tech: T. Schneider Sheet: 1 of: 1

Retlif Testing Laboratories

Report No. R-7612-1