

Application for FCC Certification
On behalf of
L.R Nelson Corp.

Remote Rain

Model No.: 5917
Serial No.: E06071801

FCC ID : NYD5917

Prepared For : L.R Nelson Corp.
One Sprinkler Lane, Peoria, IL, USA

Prepared By : Audix Technology (Shanghai) Co., Ltd.
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Report No. : ACI-F06033
Date of Test : Jul 20-24, 2006
Date of Report : Aug 03, 2006

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TEST REPORT FOR FCC CERTIFICATION

Applicant : L.R Nelson Corp.
Manufacturer : Ningbo Nelson Gardening Equipments Co., Ltd.
EUT Description : Remote Rain
(A) Model No. : 5917
(B) Serial No. : E06071801
(C) Power Supply : DC 12V (Battery)
(D) Crystal Frequency : 433.92MHz

Test Procedure Used:

*FCC RULES AND REGULATIONS PART 15 SUBPART C FEBRUARY 2006
AND ANSI C63.4:2003*

The device described above is tested by Audix Technology (Shanghai) Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits radiated emission.

The test results are contained in this test report and Audix Technology (Shanghai) Co., Ltd. is assumed full responsibility for the accuracy and completeness of these measurements. This report shows that the EUT (M/N: 5917; S/N: E06071801), which was tested in 3m anechoic chamber on Jul 20-24, 2006 to be technically compliant with the FCC official limits also.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Audix Technology (Shanghai) Co., Ltd.

This report contains data that are not covered by the NVLAP accreditation.

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government by the client.

Date of Test : Jul 20-24, 2006

Prepared By:

Kathy Wang 2006.8.21
KATHY WANG / Assistant

Reviewer:

Sam Yick Chen 2006.08.21
SAM YICK CHEN / Deputy Assistant Manager
Audix Technology (Shanghai) Co., Ltd.

Approved Signatory:

Byron Kwo 2 Aug 06
.....BYRON KWONG.....
Authorized Signature(s)

1 SUMMARY OF STANDARDS AND RESULTS

1.1 Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Description / Test Item	Test Standard	Results	Meets Limit
Radiated Disturbance	FCC RULES AND REGULATIONS PART 15 SUBPART C FEBRUARY 2006 AND ANSI C63.4:2003	Pass	15.209
Fundamental and Spurious	FCC RULES AND REGULATIONS PART 15 SUBPART C FEBRUARY 2006 AND ANSI C63.4:2003	Pass	15.231 (b)
Bandwidth	FCC RULES AND REGULATIONS PART 15 SUBPART C FEBRUARY 2006 AND ANSI C63.4:2003	Pass	15.231 (c)

2 GENERAL INFORMATION

2.1 Description of Equipment Under Test

Description : Remote Rain

Type of EUT : ☒ Production ☐ Pre-product ☐ Pro-type

Model No. : 5917

Serial No. : E06071801

Note : The EUT has 2 buttons (On/Off).

Applicant : L.R Nelson Corp.
One Sprinkler Lane, Peoria, IL, USA

Manufacturer : Ningbo Nelson Gardening Equipments Co., Ltd.
No #1, Long Feng Village; Yuyao City, Ningbo,
Zhejiang Province, China

2.2 Description of Test Facility

Site Description (Semi-Anechoic Chamber) : Sept. 17, 1998 file on
August 15, 2003 Renewed
Federal Communications Commission
FCC Engineering Laboratory
7435 Oakland Mills Road
Columbia, MD 21046, USA

Name of Firm : Audix Technology (Shanghai) Co., Ltd.

Site Location : 3F 34Bldg 680 Guiping Rd.,
Caohejing Hi-Tech Park,
Shanghai, China 200233

FCC registration Number : 91789

Accredited by NVLAP, Lab Code : 200371-0

2.3 Measurement Uncertainty

Radiated Emission Expanded Uncertainty : U = 2.96dB

3 RADIATED EMISSION TEST

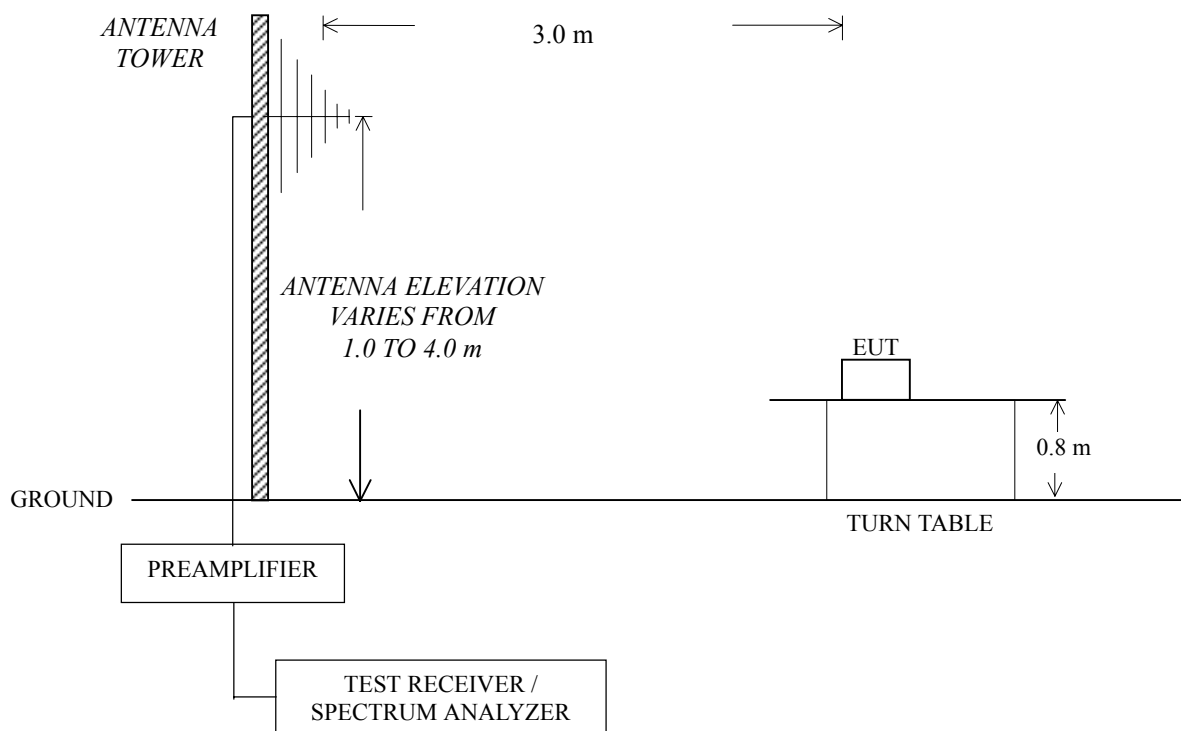
3.1 Test Equipment

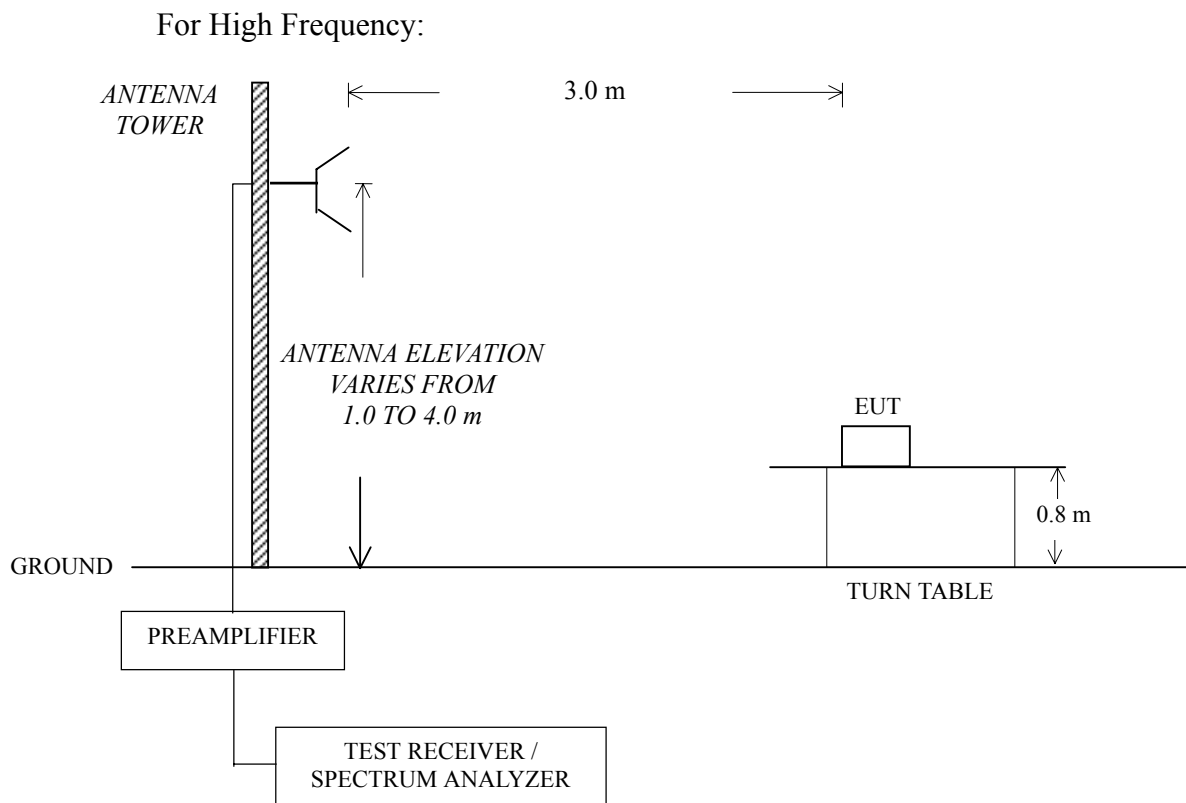
The following test equipment are used during the radiated emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3628A00167	Apr 18, 2006	Apr 18, 2007
2.	Bilog Antenna	Chase	CBL6111	1145	Mar 18, 2006	Sep 18, 2006
3.	Test Receiver	R&S	ESVS10	832699/004	Apr 18, 2006	Apr 08, 2007
4.	Preamplifier	HP	8447D	2944A10548	Mar 19, 2006	Sep 19, 2006
5.	Preamplifier	HP	8449B	3008A00864	Jun 02, 2006	Jun 02, 2007
6.	Horn Antenna	EMCO	3115	9607-4878	Apr 13, 2006	Apr 13, 2007
7.	50ΩCoaxial Switch	ANRITSU	MP59B	6200426390	Mar 18, 2006	Sep 18, 2006
8.	Software	Audix	E3	SET00200 9912M295-2	--	--

3.2 Block Diagram of Test Setup

For Low Frequency:





3.3 Radiated Emission Limit

Frequency (MHz)	Distance (m)	Field strength limits ($\mu\text{V/m}$)	
		($\mu\text{V/m}$)	dB ($\mu\text{V/m}$)
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
Above 960	3	500	54.0

NOTE 1 - Emission Level dB ($\mu\text{V/m}$) = 20 lg Emission Level ($\mu\text{V/m}$)

NOTE 2 - The tighter limit applies at the band edges.

NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4 Test Configuration

The EUT was installed as show on Sec. 3.2 in radiated emission test to meet FCC requirement and operating in a manner, which tend to maximize emission level in a normal application.

3.5 Operating Condition of EUT

- 3.5.1 Setup the EUT as shown in Sec. 3.2.
- 3.5.2 Turn on the power of all equipments and the EUT.
- 3.5.3 Set the EUT on the test modes, and then test.

3.6 Test Procedures

The EUT was placed on a turntable, which is 0.8 meter above the ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna moved up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (Calibrated Bilog Antenna or Horn Antenna) was used as a receiving antenna. Both horizontal and vertical polarization of the antenna was set on measurement. In order to find the maximum emission, all of the interference cables were manipulated.

The IF bandwidth setting on Test Receiver ESVS10 was 120 kHz when the frequency range from 30MHz to 1GHz was checked.

The IF bandwidth setting on Spectrum analyzer 8593EM was 1MHz when the frequency range from 1G MHz to 5GHz was checked.

The test modes are as follows:

On Lying	On Side	On Stand
Off Lying	Off Side	Off Stand

The test modes were done on radiated disturbance test.

Please refer to Sec.3.7.

3.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Test Mode	Data Page	Test Mode	Data Page
On Lying	P10 – P11	Off Lying	P16 – P17
On Side	P12 – P13	Off Side	P18 – P19
On Stand	P14 – P15	Off Stand	P20 – P21

NOTE 1 – Emission Level = Meter Reading + Antenna Factor + Cable Loss
– Preamp Factor.

NOTE 2 – The readings that below 1000 MHz are Quasi-Peak values and above 1GHz are Peak values.
Because the level has 20dB margin against peak limit line so the Average value are omitted.

NOTE 4 - 0° was the table front facing the antenna. Degree is calculated from 0° clockwise facing the antenna.

NOTE 5 - The worst emission at horizontal polarization was detected at 924.30 MHz (Test Mode: On Side) with corrected signal level of 29.07 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was height 1.00m and the turntable was at 42°.

NOTE 6 - The worst emission at vertical polarization was detected at 929.20 MHz (Test Mode: On Stand) with corrected signal level of 31.62 dB (μV/m) (limit is 46.00 dB (μV/m)), when the antenna was height 1.00m and the turntable was at 124°.

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : On Lying

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	31.00	25.60	16.30	0.98	28.14	14.74	40.00	25.26
	45.50	25.31	10.30	1.12	28.12	8.61	40.00	31.39
	130.90	25.71	11.38	1.99	27.85	11.23	43.50	32.27
	293.80	25.28	14.68	3.14	27.27	15.83	46.00	30.17
	584.80	27.74	20.03	4.54	28.77	23.54	46.00	22.46
	803.10	27.33	23.20	5.44	28.37	27.60	46.00	18.40
Vertical	31.90	25.97	15.72	0.99	28.13	14.55	40.00	25.45
	53.30	33.04	7.80	1.23	28.07	14.00	40.00	26.00
	130.90	34.29	11.38	1.99	27.85	19.81	43.50	23.69
	279.30	29.76	14.27	3.05	27.27	19.81	46.00	26.19
	575.10	26.64	20.03	4.49	28.76	22.40	46.00	23.60
	902.00	26.93	23.59	5.80	28.09	28.23	46.00	17.77

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : On Lying

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1036.60	44.60	24.27	6.28	37.60	37.55	74.00	36.45	PK
	1130.50	44.71	24.71	6.59	37.35	38.66	74.00	35.34	
	1271.40	44.08	25.31	7.05	37.01	39.43	74.00	34.57	
	1457.30	43.84	26.00	7.77	36.61	41.00	74.00	33.00	
	1631.10	44.80	26.56	8.27	36.29	43.34	74.00	30.66	
	1839.60	46.04	27.18	8.91	35.94	46.19	74.00	27.81	
Vertical	1060.10	44.24	24.39	6.35	37.54	37.44	74.00	36.56	PK
	1199.10	44.40	25.02	6.80	37.17	39.05	74.00	34.95	
	1318.40	44.97	25.50	7.26	36.90	40.83	74.00	33.17	
	1457.30	44.24	26.00	7.77	36.61	41.40	74.00	32.60	
	1640.50	44.23	26.59	8.27	36.27	42.82	74.00	31.18	
	1861.20	45.43	27.24	8.98	35.91	45.74	74.00	28.26	

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : On Side

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	31.90	26.06	15.72	0.99	28.13	14.64	40.00	25.36
	51.30	31.59	8.08	1.18	28.08	12.77	40.00	27.23
	138.60	26.78	11.09	2.05	27.82	12.10	43.50	31.40
	298.70	24.96	14.79	3.18	27.27	15.66	46.00	30.34
	698.30	27.54	21.70	4.98	28.63	25.59	46.00	20.41
	924.30	27.52	23.72	5.87	28.04	29.07	46.00	16.93
Vertical	31.00	25.58	16.30	0.98	28.14	14.72	40.00	25.28
	56.20	32.12	7.43	1.28	28.07	12.76	40.00	27.24
	124.10	34.25	11.54	1.94	27.88	19.85	43.50	23.65
	276.40	30.02	14.19	3.03	27.27	19.97	46.00	26.03
	521.80	29.50	20.03	4.23	28.71	25.05	46.00	20.95
	868.10	30.11	23.46	5.68	28.18	31.07	46.00	14.93

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : On Side

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1011.30	44.23	24.16	6.17	37.67	36.89	74.00	37.11	PK
	1133.40	44.44	24.73	6.59	37.34	38.42	74.00	35.58	
	1355.90	44.14	25.63	7.41	36.82	40.36	74.00	33.64	
	1529.70	43.73	26.24	8.00	36.47	41.50	74.00	32.50	
	1712.80	43.62	26.81	8.49	36.14	42.78	74.00	31.22	
	1898.70	44.73	27.34	9.10	35.85	45.32	74.00	28.68	
Vertical	1053.50	43.64	24.36	6.31	37.55	36.76	74.00	37.24	PK
	1185.00	43.41	24.96	6.73	37.21	37.89	74.00	36.11	
	1307.10	43.69	25.46	7.21	36.93	39.43	74.00	34.57	
	1457.30	43.84	26.00	7.77	36.61	41.00	74.00	33.00	
	1670.50	43.76	26.70	8.35	36.22	42.59	74.00	31.41	
	1900.60	44.43	27.34	9.10	35.85	45.02	74.00	28.98	

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : On Stand

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	31.90	26.11	15.72	0.99	28.13	14.69	40.00	25.31
	51.30	30.56	8.08	1.18	28.08	11.74	40.00	28.26
	125.10	26.35	11.59	1.94	27.88	12.00	43.50	31.50
	305.50	26.49	15.01	3.22	27.32	17.40	46.00	28.60
	557.70	27.22	20.03	4.41	28.74	22.92	46.00	23.08
	919.50	26.64	23.69	5.87	28.05	28.15	46.00	17.85
Vertical	31.00	25.93	16.30	0.98	28.14	15.07	40.00	24.93
	53.30	33.94	7.80	1.23	28.07	14.90	40.00	25.10
	121.20	32.85	11.37	1.91	27.89	18.24	43.50	25.26
	276.40	29.60	14.19	3.03	27.27	19.55	46.00	26.45
	688.60	26.14	21.55	4.93	28.64	23.98	46.00	22.02
	929.20	30.01	23.74	5.90	28.03	31.62	46.00	14.38

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : On Stand

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1031.90	44.50	24.26	6.24	37.61	37.39	74.00	36.61	PK
	1124.00	43.94	24.68	6.56	37.36	37.82	74.00	36.18	
	1213.20	44.62	25.08	6.85	37.14	39.41	74.00	34.59	
	1355.90	42.35	25.63	7.41	36.82	38.57	74.00	35.43	
	1487.40	43.51	26.10	7.87	36.55	40.93	74.00	33.07	
	1816.10	43.22	27.10	8.85	35.98	43.19	74.00	30.81	
Vertical	1064.80	43.80	24.42	6.35	37.52	37.05	74.00	36.95	PK
	1232.00	45.00	25.15	6.90	37.09	39.96	74.00	34.04	
	1448.00	43.96	25.97	7.77	36.63	41.07	74.00	32.93	
	1642.30	43.52	26.61	8.27	36.26	42.14	74.00	31.86	
	1818.90	44.40	27.12	8.85	35.97	44.40	74.00	29.60	
	1924.10	43.68	27.40	9.16	35.81	44.43	74.00	29.57	

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : Off Lying

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	31.90	26.04	15.72	0.99	28.13	14.62	40.00	25.38
	53.30	29.53	7.80	1.23	28.07	10.49	40.00	29.51
	109.50	25.57	10.66	1.81	27.95	10.09	43.50	33.41
	153.20	27.50	10.84	2.15	27.76	12.73	46.00	33.27
	269.60	25.35	14.00	2.98	27.27	15.06	46.00	30.94
	647.90	27.07	20.87	4.78	28.70	24.02	46.00	21.98
Vertical	31.90	26.01	15.72	0.99	28.13	14.59	40.00	25.41
	56.20	39.29	7.43	1.28	28.07	19.93	40.00	20.07
	101.80	35.08	10.15	1.74	27.99	18.98	43.50	24.52
	349.10	29.68	16.32	3.47	27.68	21.79	46.00	24.21
	601.30	26.83	20.07	4.61	28.78	22.73	46.00	23.27
	916.60	25.87	23.67	5.84	28.06	27.32	46.00	18.68

TEST ENGINEER: Dio Yang
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EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : Off Lying

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1058.20	43.65	24.39	6.35	37.54	36.85	74.00	37.15	PK
	1168.10	42.60	24.89	6.70	37.25	36.94	74.00	37.06	
	1316.50	44.44	25.49	7.26	36.90	40.29	74.00	33.71	
	1457.30	42.93	26.00	7.77	36.61	40.09	74.00	33.91	
	1670.50	43.39	26.70	8.35	36.22	42.22	74.00	31.78	
	1844.30	46.25	27.19	8.91	35.93	46.42	74.00	27.58	
Vertical	1050.70	44.15	24.35	6.31	37.55	37.26	74.00	36.74	PK
	1170.90	43.38	24.90	6.70	37.24	37.74	74.00	36.26	
	1396.30	43.93	25.78	7.56	36.74	40.53	74.00	33.47	
	1523.10	42.51	26.23	8.00	36.49	40.25	74.00	33.75	
	1668.60	42.71	26.68	8.35	36.22	41.52	74.00	32.48	
	1844.30	45.85	27.19	8.91	35.93	46.02	74.00	27.98	

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : Off Side

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	31.00	26.31	16.30	0.98	28.14	15.45	40.00	24.55
	101.80	26.26	10.15	1.74	27.99	10.16	43.50	33.34
	172.60	25.90	11.46	2.30	27.66	12.00	43.50	31.50
	271.50	25.68	14.05	3.00	27.27	15.46	46.00	30.54
	514.00	26.89	20.03	4.21	28.70	22.43	46.00	23.57
	814.70	26.53	23.26	5.47	28.33	26.93	46.00	19.07
Vertical	31.90	26.20	15.72	0.99	28.13	14.78	40.00	25.22
	53.30	38.51	7.80	1.23	28.07	19.47	40.00	20.53
	119.20	32.53	11.27	1.90	27.90	17.80	43.50	25.70
	276.40	30.09	14.19	3.03	27.27	20.04	46.00	25.96
	523.70	26.46	20.03	4.26	28.71	22.04	46.00	23.96
	778.80	26.54	22.92	5.34	28.43	26.37	46.00	19.63

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : Off Side

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1053.50	44.67	24.36	6.31	37.55	37.79	74.00	36.21	PK
	1121.10	45.27	24.68	6.56	37.37	39.14	74.00	34.86	
	1276.10	43.86	25.33	7.11	37.00	39.30	74.00	34.70	
	1459.20	43.96	26.01	7.77	36.61	41.13	74.00	32.87	
	1631.10	43.61	26.56	8.27	36.29	42.15	74.00	31.85	
	1816.10	45.22	27.10	8.85	35.98	45.19	74.00	28.81	
Vertical	1018.80	44.29	24.19	6.21	37.65	37.04	74.00	36.96	PK
	1121.10	45.27	24.68	6.56	37.37	39.14	74.00	34.86	
	1355.90	43.75	25.63	7.41	36.82	39.97	74.00	34.03	
	1527.80	43.69	26.24	8.00	36.48	41.45	74.00	32.55	
	1708.10	47.26	26.80	8.43	36.15	46.34	74.00	27.66	
	1939.10	48.08	27.44	9.22	35.79	48.95	74.00	25.05	

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : Off Stand

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	31.90	26.13	15.72	0.99	28.13	14.71	40.00	25.29
	53.30	33.64	7.80	1.23	28.07	14.60	40.00	25.40
	158.00	26.94	11.00	2.19	27.74	12.39	43.50	31.11
	386.00	25.85	17.32	3.65	27.95	18.87	46.00	27.13
	698.30	27.08	21.70	4.98	28.63	25.13	46.00	20.87
	900.10	26.74	23.57	5.77	28.10	27.98	46.00	18.02
Vertical	31.90	24.70	15.72	0.99	28.13	13.28	40.00	26.72
	48.40	30.73	8.93	1.15	28.09	12.72	40.00	27.28
	124.10	35.16	11.54	1.94	27.88	20.76	43.50	22.74
	277.40	29.60	14.22	3.03	27.27	19.58	46.00	26.42
	489.80	26.62	19.81	4.09	28.63	21.89	46.00	24.11
	790.50	25.54	23.07	5.37	28.40	25.58	46.00	20.42

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 22, 2006

Test Mode : Off Stand

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Emission Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)	Remark
Horizontal	1060.10	43.70	24.39	6.35	37.54	36.90	74.00	37.10	PK
	1210.40	43.61	25.06	6.80	37.15	38.32	74.00	35.68	
	1354.00	43.03	25.63	7.41	36.83	39.24	74.00	34.76	
	1527.80	43.97	26.24	8.00	36.48	41.73	74.00	32.27	
	1816.10	44.82	27.10	8.85	35.98	44.79	74.00	29.21	
	1987.00	46.75	27.57	9.40	35.72	48.00	74.00	26.00	
Vertical	1051.70	43.51	24.35	6.31	37.55	36.62	74.00	37.38	PK
	1172.80	45.39	24.90	6.70	37.24	39.75	74.00	34.25	
	1313.70	43.96	25.47	7.26	36.91	39.78	74.00	34.22	
	1457.30	44.22	26.00	7.77	36.61	41.38	74.00	32.62	
	1722.20	45.86	26.84	8.49	36.13	45.06	74.00	28.94	
	1939.10	46.24	27.44	9.22	35.79	47.11	74.00	26.89	

TEST ENGINEER: Dio Yang
(DIO YANG)

4 FUNDAMENTAL AND SPURIOUS EMISSIONS TEST

4.1 Test Equipment

The following test equipment are used during the fundamental and spurious emission test in a semi-anechoic chamber:

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Preamplifier	HP	8447D	2944A06849	Mar 20, 2006	Sep 20, 2006
2.	Bilog Antenna	Chase	CBL6111	1146	Mar 18, 2006	Sep 18, 2006
3.	Test Receiver	R&S	ESVS10	844077/020	Feb 10, 2006	Feb 10, 2007
4.	Amplifier	HP	8449B	3008A00864	Jun 02, 2006	Jun 02, 2007
5.	Spectrum Analyzer	HP	8593EM	3628A00167	Apr 18, 2006	Apr 18, 2007
6.	Horn Antenna	EMCO	3115	9607-4878	Apr 13, 2006	Apr 13, 2007
7.	Oscilloscope	HP	54602B	US36181094	Mar 19, 2006	Sep 19, 2006

4.2 Block Diagram of Test Setup

Same as Sec 3.2

4.3 Fundamental and Spurious Emission Limit

Frequency (MHz)	Distance (m)	Field strength limits of fundamental	Field strength limits of spurious emissions
		($\mu\text{V/m}$)	($\mu\text{V/m}$)
260 ~ 470	3	3750-12500*	375-1250*
NOTE 1 - Emission Level dB ($\mu\text{V/m}$) = 20 lg Emission Level ($\mu\text{V/m}$) NOTE 2 - The tighter limit applies at the band edges. NOTE 3 - Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system. NOTE 4 - "*" means linear interpolation. NOTE 5 - The fundamental frequency of the EUT is 433.92MHz, Emission Level dB ($\mu\text{V/m}$) = $20\lg(41.6667 \times 433.92 - 7083.3333) = 80.55 \text{ dB}$ ($\mu\text{V/m}$) and the limit of the Harmonic is 60.55$\mu\text{V/m}$.			

4.4 Test Configuration

The EUT was installed as show on Sec. 3.2 in fundamental and spurious emission test to meet ANSI C63.4:2003 requirements and operating in a manner that tend to maximize emission level in a normal application.

4.5 Operating Condition of EUT

4.5.1 Setup the EUT as shown in Sec. 3.2.

4.5.2 Turn on the power of all equipments and the EUT.

4.5.3 Set the EUT on the test modes, and then test.

4.5.4 The test modes are as follows:

On Lying	On Side	On Stand
Off Lying	Off Side	Off Stand

4.6 Test Procedures

The EUT was placed on a table that is 0.8 meter above ground. The turntable rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated antenna or Horn Antenna) was used as receiving antenna below 1000MHz. Horn antenna were used as receiving antenna above 1000MHz. Both horizontal and vertical polarization of the antenna was set on measurement. In order to find the maximum emission, all of the interference cables were manipulated according to FCC PART 15 Subpart C and ANSI C63.4:2003 requirements during fundamental and spurious emission test.

The bandwidth setting on Test Receiver ESVS10 is 120 kHz below 1000 MHz.

The bandwidth setting on Spectrum analyzer 8593EM is 1 MHz above 1000 MHz.

The frequency range from 30 MHz to 4339.2 MHz (the tenth harmonic) was checked. The EUT rotated through three orthogonal axes to determine which attitude and configuration produces the highest emission.

4.7 Test Results

<PASS>

The frequency and amplitude of the highest radiated emission relative the limit is reported. All the emissions not reported below are too low against the FCC limit.

Test Mode	Data Page	Test Mode	Data Page
On Lying	P25	Off Lying	P28
On Side	P26	Off Side	P29
On Stand	P27	Off Stand	P30

NOTE 1 - All readings are Peak Values.

NOTE 2 - Emission Level = Meter Reading + Antenna Factor + Cable Loss
– Preamp Factor – Correction Factor

NOTE 3 - Correction factor is calculated by averaging the sum of the pulse train.

Correction factor is measured as follows:

Turn on the EUT and set the spectrum to the fundamental frequency and set the scan width to 0 Hz. Then connect a storage oscilloscope to the video output of the spectrum that is used to detect the pulse train. Adjust the oscilloscope settings to observe the pulse train and determine the number and width of the pulses, as well as the period of the train.

$$\begin{aligned}\text{Correction Factor} &= |20\lg[(0.118*21+0.366*4)/15.56]| \\ &= |-11.926| \text{ dB} = 11.926 \text{ dB}\end{aligned}$$

NOTE 4 – Figure 1: The period of the pulse train

$$\Delta t = 15.56 \text{ ms}$$

Figure 2: The first pulse

$$\Delta t = 0.118 \text{ ms} \quad \text{total: 21}$$

Figure 3: The second pulse

$$\Delta t = 0.366 \text{ ms} \quad \text{total: 4}$$

(See Appendix I)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 23, 2006

Test Mode : On Lying

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Correction factor (dB)	Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	433.92	81.90	18.53	3.87	28.28	11.926	64.094	80.55	16.456
	867.84	39.20	23.46	5.68	28.18	11.926	28.234	60.55	32.316
	1301.76	59.68	25.43	7.21	36.94	11.926	43.454	60.55	17.096
	1735.68	46.62	26.89	8.55	36.11	11.926	34.024	60.55	26.526
Vertical	433.92	75.10	18.53	3.87	28.28	11.926	57.294	80.55	23.256
	867.84	34.10	23.46	5.68	28.18	11.926	23.134	60.55	37.416
	1301.76	54.79	25.43	7.21	36.94	11.926	38.564	60.55	21.986
	1735.68	45.74	26.89	8.55	36.11	11.926	33.144	60.55	27.406

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 23, 2006

Test Mode : On Side

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Correction factor (dB)	Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	433.92	83.80	18.53	3.87	28.28	11.926	65.994	80.55	14.556
	867.84	39.70	23.46	5.68	28.18	11.926	28.734	60.55	31.816
	1301.76	57.32	25.43	7.21	36.94	11.926	41.094	60.55	19.456
	1735.68	47.10	26.89	8.55	36.11	11.926	34.504	60.55	26.046
Vertical	433.92	73.50	18.53	3.87	28.28	11.926	55.694	80.55	24.856
	867.84	38.70	23.46	5.68	28.18	11.926	27.734	60.55	32.816
	1301.76	61.37	25.43	7.21	36.94	11.926	45.144	60.55	15.406
	1735.68	46.80	26.89	8.55	36.11	11.926	34.204	60.55	26.346

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 23, 2006

Test Mode : On Stand

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Correction factor (dB)	Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	433.92	79.30	18.53	3.87	28.28	11.926	61.494	80.55	19.056
	867.84	32.50	23.46	5.68	28.18	11.926	21.534	60.55	39.016
	1301.76	52.62	25.43	7.21	36.94	11.926	36.394	60.55	24.156
	1735.68	44.50	26.89	8.55	36.11	11.926	31.904	60.55	28.646
Vertical	433.92	83.20	18.53	3.87	28.28	11.926	65.394	80.55	15.156
	867.84	41.70	23.46	5.68	28.18	11.926	30.734	60.55	29.816
	1301.76	57.60	25.43	7.21	36.94	11.926	41.374	60.55	19.176
	1735.68	43.20	26.89	8.55	36.11	11.926	30.604	60.55	29.946

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 23, 2006

Test Mode : Off Lying

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Correction factor (dB)	Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	433.92	82.90	18.53	3.87	28.28	11.926	65.094	80.55	15.456
	867.84	35.20	23.46	5.68	28.18	11.926	24.234	60.55	36.316
	1301.76	43.90	25.43	7.21	36.94	11.926	27.674	60.55	32.876
	1735.68	42.30	26.89	8.55	36.11	11.926	29.704	60.55	30.846
Vertical	433.92	75.90	18.53	3.87	28.28	11.926	58.094	80.55	22.456
	867.84	32.70	23.46	5.68	28.18	11.926	21.734	60.55	38.816
	1301.76	43.70	25.43	7.21	36.94	11.926	27.474	60.55	33.076
	1735.68	43.30	26.89	8.55	36.11	11.926	30.704	60.55	29.846

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 23, 2006

Test Mode : Off Side

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Correction factor (dB)	Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	433.92	83.30	18.53	3.87	28.28	11.926	65.494	80.55	15.056
	867.84	36.10	23.46	5.68	28.18	11.926	25.134	60.55	35.416
	1301.76	44.50	25.43	7.21	36.94	11.926	28.274	60.55	32.276
	1735.68	41.10	26.89	8.55	36.11	11.926	28.504	60.55	32.046
Vertical	433.92	74.40	18.53	3.87	28.28	11.926	56.594	80.55	23.956
	867.84	33.50	23.46	5.68	28.18	11.926	22.534	60.55	38.016
	1301.76	46.90	25.43	7.21	36.94	11.926	30.674	60.55	29.876
	1735.68	42.60	26.89	8.55	36.11	11.926	30.004	60.55	30.546

TEST ENGINEER: Dio Yang
(DIO YANG)

EUT : Remote Rain Temperature : 28°C

Model No. : 5917 Humidity : 53%

Serial No. : E06071801 Date of Test : Jul 23, 2006

Test Mode : Off Stand

Polarization	Frequency (MHz)	Read Level dB (μV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Correction factor (dB)	Level dB (μV/m)	Limits dB (μV/m)	Margin (dB)
Horizontal	433.92	76.40	18.53	3.87	28.28	11.926	58.594	80.55	21.956
	867.84	32.40	23.46	5.68	28.18	11.926	21.434	60.55	39.116
	1301.76	44.80	25.43	7.21	36.94	11.926	28.574	60.55	31.976
	1735.68	41.70	26.89	8.55	36.11	11.926	29.104	60.55	31.446
Vertical	433.92	83.10	18.53	3.87	28.28	11.926	65.294	80.55	15.256
	867.84	34.80	23.46	5.68	28.18	11.926	23.834	60.55	36.716
	1301.76	45.10	25.43	7.21	36.94	11.926	28.874	60.55	31.676
	1735.68	42.25	26.89	8.55	36.11	11.926	29.654	60.55	30.896

TEST ENGINEER: Dio Yang
(DIO YANG)

5 BANDWIDTH MEASUREMENT

5.1 Test Equipment

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Next Cal.
1.	Spectrum Analyzer	HP	8593EM	3628A00167	Apr 18, 2006	Apr 18, 2007
2.	Test Receiver	R&S	ESHS10	844077/020	Feb 10, 2006	Feb 10, 2007
3.	Bilog Antenna	Chase	CBL6111	1146	Mar 18, 2006	Sep 18, 2006
4.	Preamplifier	HP	8447D	2944A06849	Mar 20, 2006	Sep 20, 2006
5.	Software	Audix	E3	SET00200 9912M295-2	--	--

5.2 Bandwidth Limit

The bandwidth of the emission shall be no wider than 0.25% of the center frequency.
Bandwidth is determined at the point 20dB down from the modulated carrier.
Bandwidth Limit is:

$$\text{Limit} = 0.25\% \times 433.92(\text{MHz}) = 1.0848(\text{MHz})$$

The bandwidth of Spectrum Analyzer (M/N: 8593EM) is 120kHz in the test.

5.3 Test Results

<PASS>

The bandwidth of the Fundament emission is:

For On Test Mode:

$$\text{B.W.} = 433.1 - 433.7 = 0.4\text{MHz}$$

For Off Test Mode:

$$\text{B.W.} = 434.0 - 433.8 = 0.2\text{MHz}$$

(See Appendix II)

6 OPERATION DESCRIPTION

Motion sensor with RF remote (M/N: 5917) employs a switch that will automatically deactivate the Controller within not more than 5 seconds of being released.

APPENDIX I

PLOT OF THE PULSE TRAIN

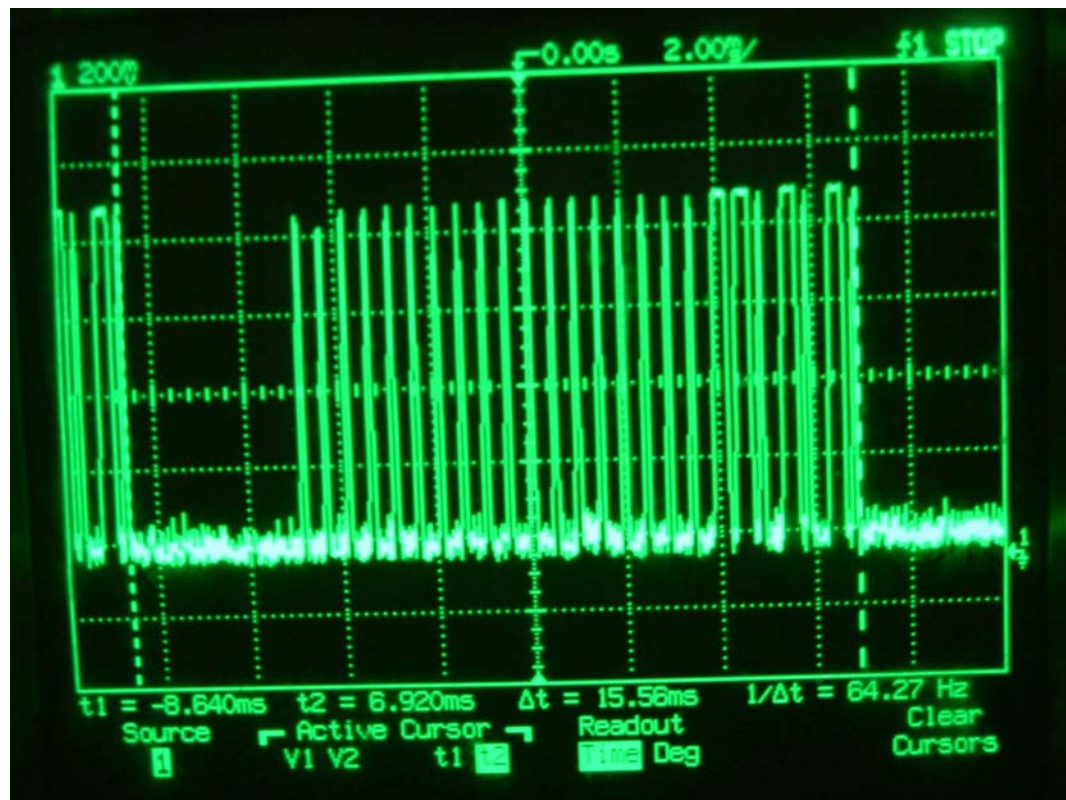


FIGURE 1

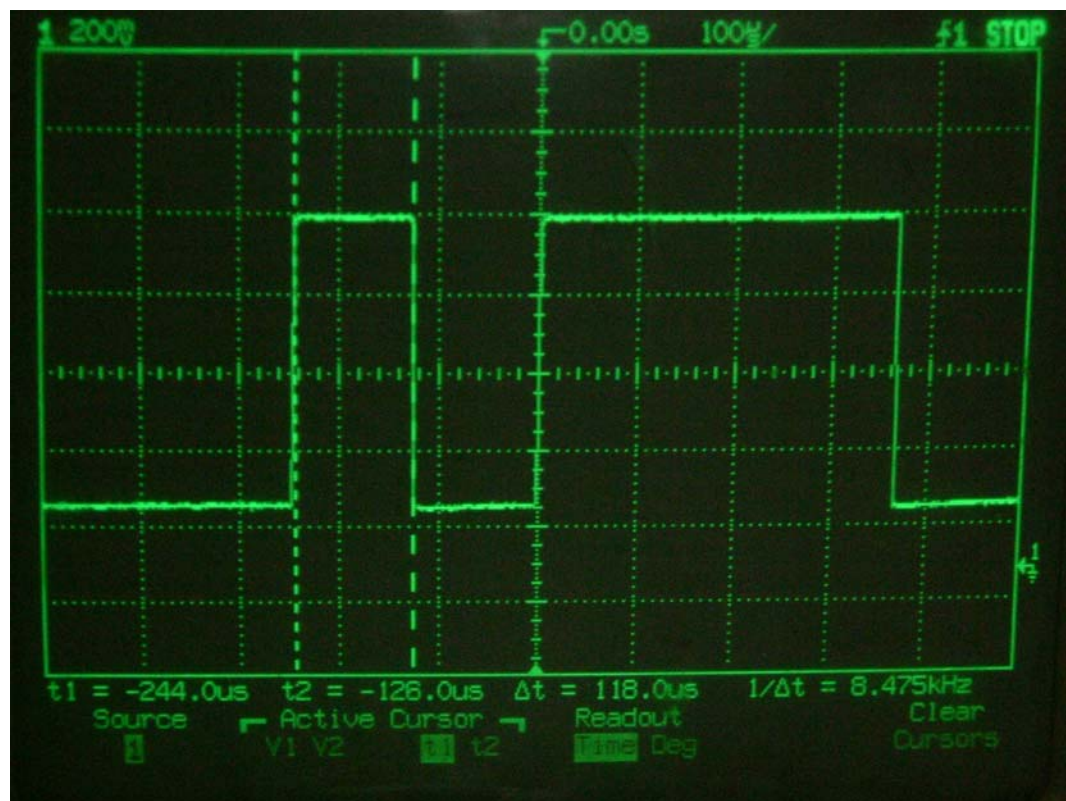


FIGURE 2

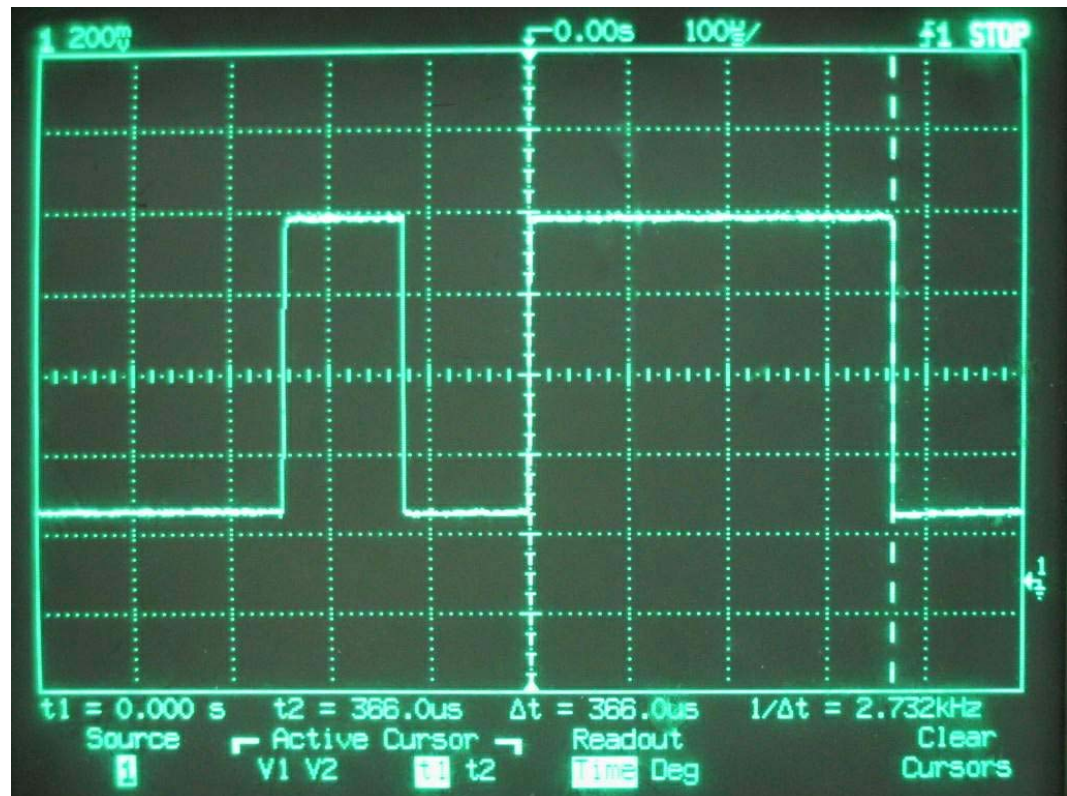


FIGURE 3

APPENDIX II

PLOT OF THE OCCUPIED BANDWIDTH

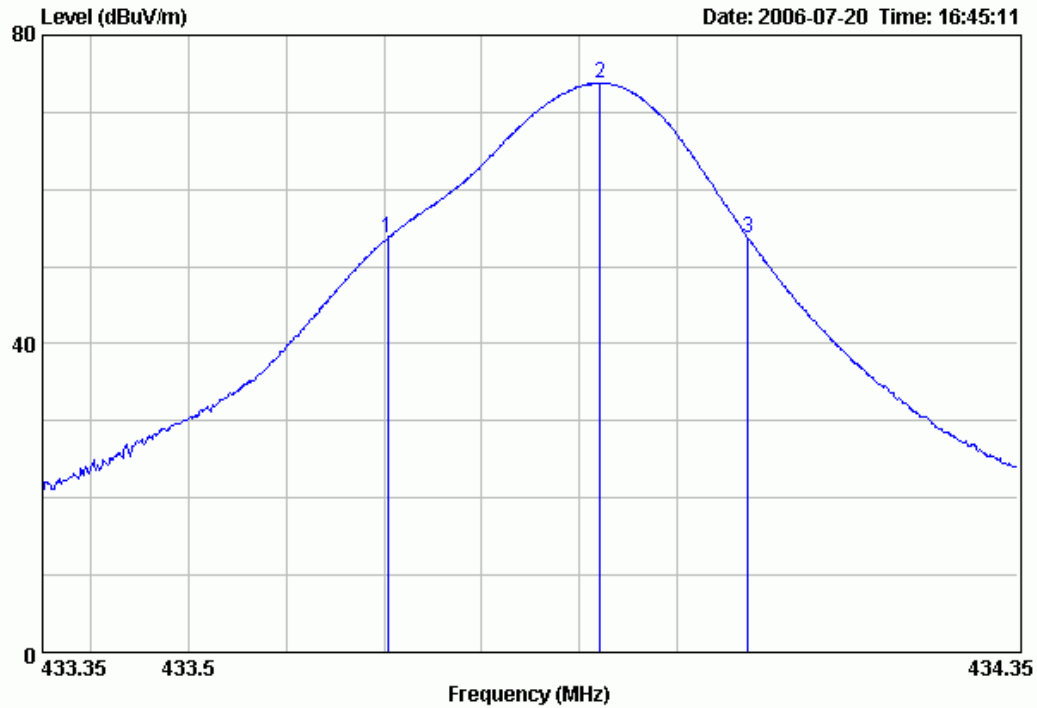


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Data: 3

File: C:\Program Files\3\nelson-.EMI\EM6 (58)

Date: 2006-07-20 Time: 16:45:11



Site : Chamber 3
 Condition : 3m 1145-2006.03.19 HORIZONTAL
 Project No. : AOE-001121-F1
 Applicant : L.R Nelson Corp.
 EUT : Remote Faucet Control
 M/N : 5917
 S/N : E06071801
 Power Supply : DC 12V
 Ambient : 28°C, 56%RH
 Test Mode : On Lying
 Test Engineer : Dio
 Memo : *Dio Yan*

	Freq	Level	Over	Limit	Read	Factor	Preamp	Antenna	Cable
	MHz	dBuV/m	Limit	Line	Level		Factor	Factor	Loss
			dB	dBuV/m	dBuV	dB/m	dB	dB/m	dB
1	433.7	53.76	-----	-----	59.65	-5.89	28.28	18.53	3.86
2	433.9	73.77	-----	-----	79.65	-5.88	28.28	18.53	3.87
3	434.1	53.79	-----	-----	59.67	-5.88	28.28	18.53	3.87

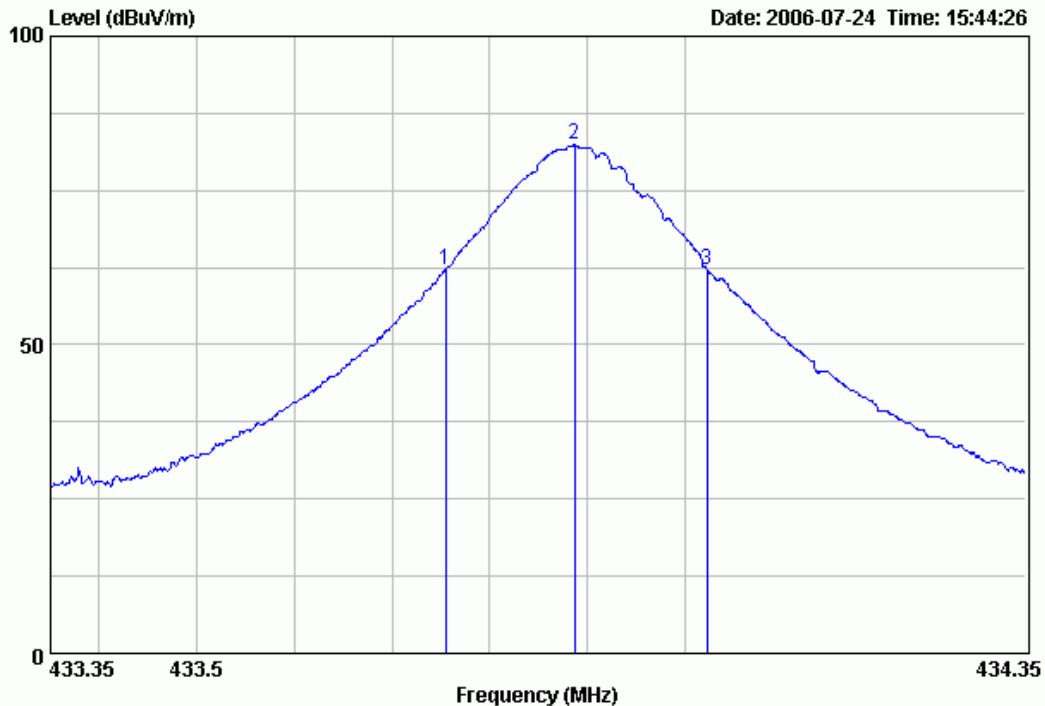


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Data: 15

File: C:\Program Files\3\nelson.EM6 (42)

Date: 2006-07-24 Time: 15:44:26



Site : Chamber 1
 Condition : 3m 1145-2006.03.19 HORIZONTAL
 Project No. : AOE-001121-F1
 Applicant : L.R Nelson Corp.
 EUT : Remote Faucet Control
 M/N : 5917
 S/N : E06071801
 Power Supply : DC 12V
 Ambient : 28°C, 56%RH
 Test Mode : Off Lying
 Test Engineer : Dio
 Memo : *Do Yan*

	Freq	Level	Over	Limit	Read		Preamp	Antenna	Cable
	MHz	dBuV/m	Limit	Line	Level	Factor	Factor	Factor	Loss
			dB	dBuV/m	dBuV	dB/m	dB	dB/m	dB
1	433.8	62.18	-----	-----	68.07	-5.89	28.28	18.53	3.86
2	433.9	82.33	-----	-----	88.21	-5.88	28.28	18.53	3.87
3	434.0	62.22	-----	-----	68.10	-5.88	28.28	18.53	3.87