



FCC Certification Test Report
for
Pelican Accessories
O7X-WAVE1

July 3, 2002

Prepared for:

Pelican Accessories
1840 East 27th Street
Vernon, CA 90058

Prepared By:

Washington Laboratories, Ltd.
7560 Lindbergh Drive
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FCC Certification Test Program

FCC Certification Test Report for the Pelican Accessories PL-621 Wavestation O7X-WAVE1

July 3, 2002

WLL JOB# 7144

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Abstract

This report has been prepared on behalf of Pelican Accessories to support the attached Application for Equipment Authorization. The test report and application are submitted for an Intentional Radiator under Part 15.249 of the FCC Rules and Regulations. This Federal Communication Commission (FCC) Certification Test Report documents the test configuration and test results for a Pelican Accessories PL-621 Wavestation.

Testing was performed on an Open Area Test Site (OATS) of Washington Laboratories, Ltd, 7560 Lindbergh Drive, Gaithersburg, MD 20879. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

The Pelican Accessories PL-621 Wavestation complies with the limits for a Intentional Radiator device under Part 15.249 of the FCC Rules and Regulations.

Table of Contents

Abstract.....	ii
1 Introduction.....	1
1.1 Compliance Statement.....	1
1.2 Test Scope	1
1.3 Contract Information.....	1
1.4 Test Dates	1
1.5 Test and Support Personnel.....	1
1.6 Abbreviations.....	2
2 Equipment Under Test.....	3
2.1 EUT Identification & Description.....	3
2.2 Test Configuration.....	3
2.3 Testing Algorithm.....	3
2.4 Test Location.....	3
2.5 Measurements.....	4
2.5.1 References.....	4
2.6 Measurement Uncertainty.....	4
3 Test Equipment	5
4 Test Results	6
4.1 Occupied Bandwidth: (FCC Part §2.1049)	6
4.2 Band Edge Plots:.....	10
4.3 Radiated Spurious Emissions: (FCC Part §15.249).....	13
4.3.1 Test Procedure	13
4.4 Conducted Emissions (AC Powerline)	21

List of Tables

Table 1. Device Summary	3
Table 2: Test Equipment List	5
Table 3. Occupied Bandwidth Results	10
Table 4. Radiated Emissions Limits.....	13
Table 5: Radiated Emission Test Data (§15.249), Low Channel.....	15
Table 6: Radiated Emission Test Data (§15.249), Middle Channel	17
Table 7: Radiated Emission Test Data (§15.249), High Channel.....	19
Table 8: AC Power Line Conducted Emissions Test Data Sheet	22

List of Figures

Figure 1. Occupied Bandwidth, Low Channel.....	7
Figure 2. Occupied Bandwidth, Middle Channel.....	8
Figure 3. Occupied Bandwidth, High Channel.....	9
Figure 4: 902MHz Band Edge Plot.....	11
Figure 5: 928MHz Band Edge Plot.....	12

1 Introduction

1.1 Compliance Statement

The Pelican Accessories PL-621 Wavestation complies with the limits for an Intentional Radiator device under Part 15.249 of the FCC Rules and Regulations.

1.2 Test Scope

Tests for radiated and conducted emissions were performed. All measurements were performed according to the 1992 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation.

1.3 Contract Information

Customer: Pelican Accessories
1840 East 27th Street
Vernon, CA 90058

Quotation Number: 60113-A

1.4 Test Dates

Testing was performed from June 10, 2002 to July 2, 2002.

1.5 Test and Support Personnel

Washington Laboratories, LTD
Greg Snyder
James Ritter

1.6 Abbreviations

A	Ampere
Ac	alternating current
AM	Amplitude Modulation
Amps	Amperes
b/s	bits per second
BW	Bandwidth
CE	Conducted Emission
cm	centimeter
CW	Continuous Wave
dB	decibel
dc	direct current
EMI	Electromagnetic Interference
EUT	Equipment Under Test
FM	Frequency Modulation
G	giga - prefix for 10^9 multiplier
Hz	Hertz
IF	Intermediate Frequency
k	kilo - prefix for 10^3 multiplier
M	Mega - prefix for 10^6 multiplier
m	Meter
μ	micro - prefix for 10^{-6} multiplier
NB	Narrowband
LISN	Line Impedance Stabilization Network
RE	Radiated Emissions
RF	Radio Frequency
rms	root-mean-square
SN	Serial Number
S/A	Spectrum Analyzer
V	Volt

2 Equipment Under Test

2.1 EUT Identification & Description

Table 1. Device Summary

ITEM	DESCRIPTION
Manufacturer:	Pelican Accessories
FCC ID Number	O7X-WAVE1
EUT Name:	WaveStation
Model:	PL-621
FCC Rule Parts:	§15.249
Frequency Range:	905.992MHz to 923.476MHz
Maximum Output Power:	<1mW
Modulation:	FSK
Occupied Bandwidth:	? kHz
Keying:	Manual
Type of Information:	Control
Number of Channels:	6
Power Output Level	Fixed
Antenna Type	Fixed/Integral
Frequency Tolerance:	N/A
Interface Cables/Ports:	DC power port, (2) Controller Ports
Power Source & Voltage:	6Vdc from 4 'C' batteries or from 120Vac adapter

2.2 Test Configuration

The PL-621 was configured with two Sony PlayStation 2 controllers and an AC power adapter. For completing the configuration for continuous operation the WaveStation Console was connected to the PlayStation 2 which was connected to a television.

2.3 Testing Algorithm

The PL-621, PlayStation 2 and television were powered on a game was inserted into the PlayStation 2. Once communication was established the PL-621 continuously transmitted to the WaveStation Console connected to the PlayStation 2.

Worst case emission levels are provided in the test results data.

2.4 Test Location

All measurements herein were performed at Washington Laboratories, Ltd. test center in Gaithersburg, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

2.5 Measurements

2.5.1 References

ANSI C63.2 Specifications for Electromagnetic Noise and Field Strength Instrumentation

ANSI C63.4 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

Land Mobile FM or PM Communications Equipment Measurement and Performance Standards (ANSI/TIA/EIA-603-93)

2.6 Measurement Uncertainty

All results reported herein relate only to the equipment tested. For the purposes of the measurements performed by Washington Laboratories, the measurement uncertainty is ± 2.3 dB. This has been calculated for a *worst-case situation* (radiated emissions measurements performed on an open area test site).

The following measurement uncertainty calculation is provided:

$$\text{Total Uncertainty} = (A^2 + B^2 + C^2)^{1/2}/(n-1)$$

where:

A = Antenna calibration uncertainty, in dB = 2 dB

B = Spectrum Analyzer uncertainty, in dB = 1 dB

C = Site uncertainty, in dB = 4 dB

n = number of factors in uncertainty calculation = 3

Thus, Total Uncertainty = $0.5 (2^2 + 1^2 + 4^2)^{1/2} = \pm 2.3$ dB.

3 Test Equipment

Table 2 shows a list of the test equipment used for measurements along with the calibration information.

Table 2: Test Equipment List

Manufacturer & Model	Description	Serial Number	Property Number	Calibration Due Date
A.H. Systems SAS-200/518	Log Periodic Antenna	117	00001	3/1/03
Antenna Research Associates DRG-118/A	Horn Antenna	1010	00004	10/20/02
Antenna Research Associates LPB-2520	Biconilog Antenna Site 2	1044	00007	6/13/02
Hewlett Packard 8449B	Pre-Amplifier	3008A00729	00066	1/31/03
Hewlett Packard 8564E	Spectrum Analyzer	3643A00657	00067	4/18/03
Hewlett Packard 85650A	Q.P. Adapter (Site 2)	2811A01283	00068	6/29/02
Hewlett Packard 85685A	RF Preselector (Site 2)	3221A01395	00071	5/17/03
Hewlett Packard 8568B	Spectrum Analyzer (Site 2)	2928A04750	00072	6/29/02
Solar Electronics 8012-50-R-24-BNC	LISN	8379493	00124	8/15/02

4 Test Results

4.1 Occupied Bandwidth: (FCC Part §2.1049)

Occupied bandwidth was performed by coupling the output of the EUT to the input of a spectrum analyzer via a receive antenna.

At full modulation, the occupied bandwidth was measured for a low, middle and high channel as shown in Figures 1 through 3:

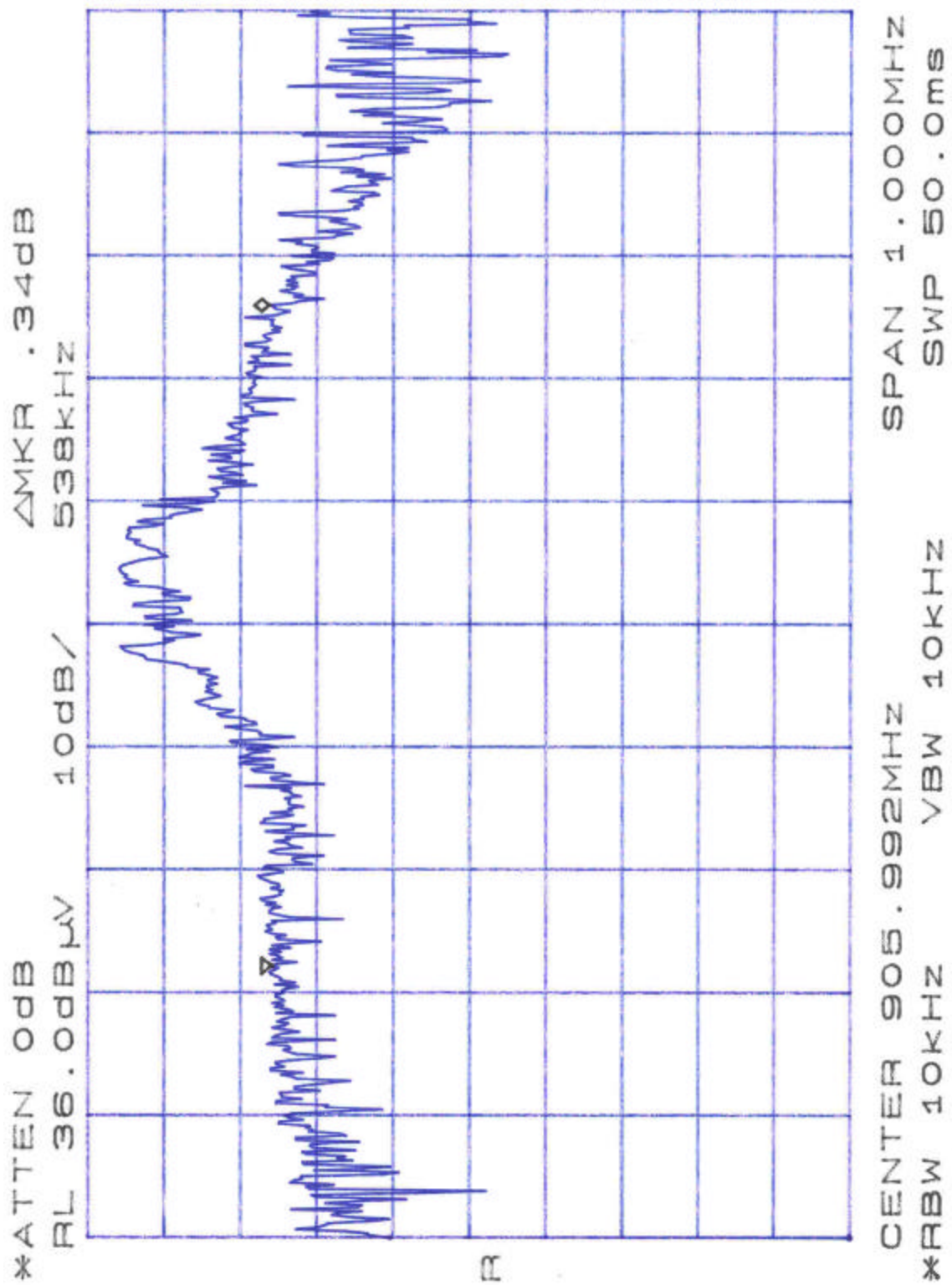


Figure 1. Occupied Bandwidth, Low Channel

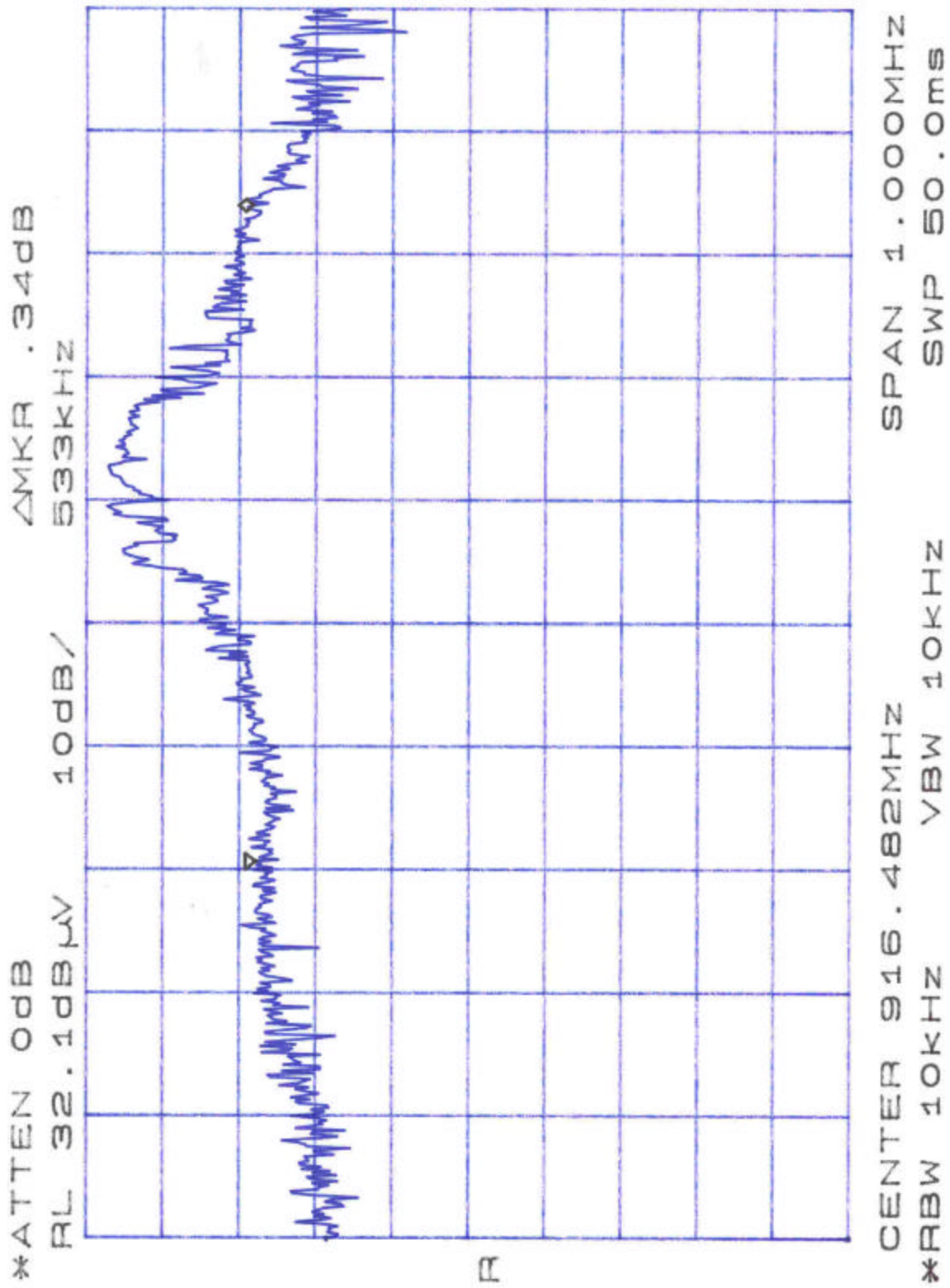


Figure 2. Occupied Bandwidth, Middle Channel

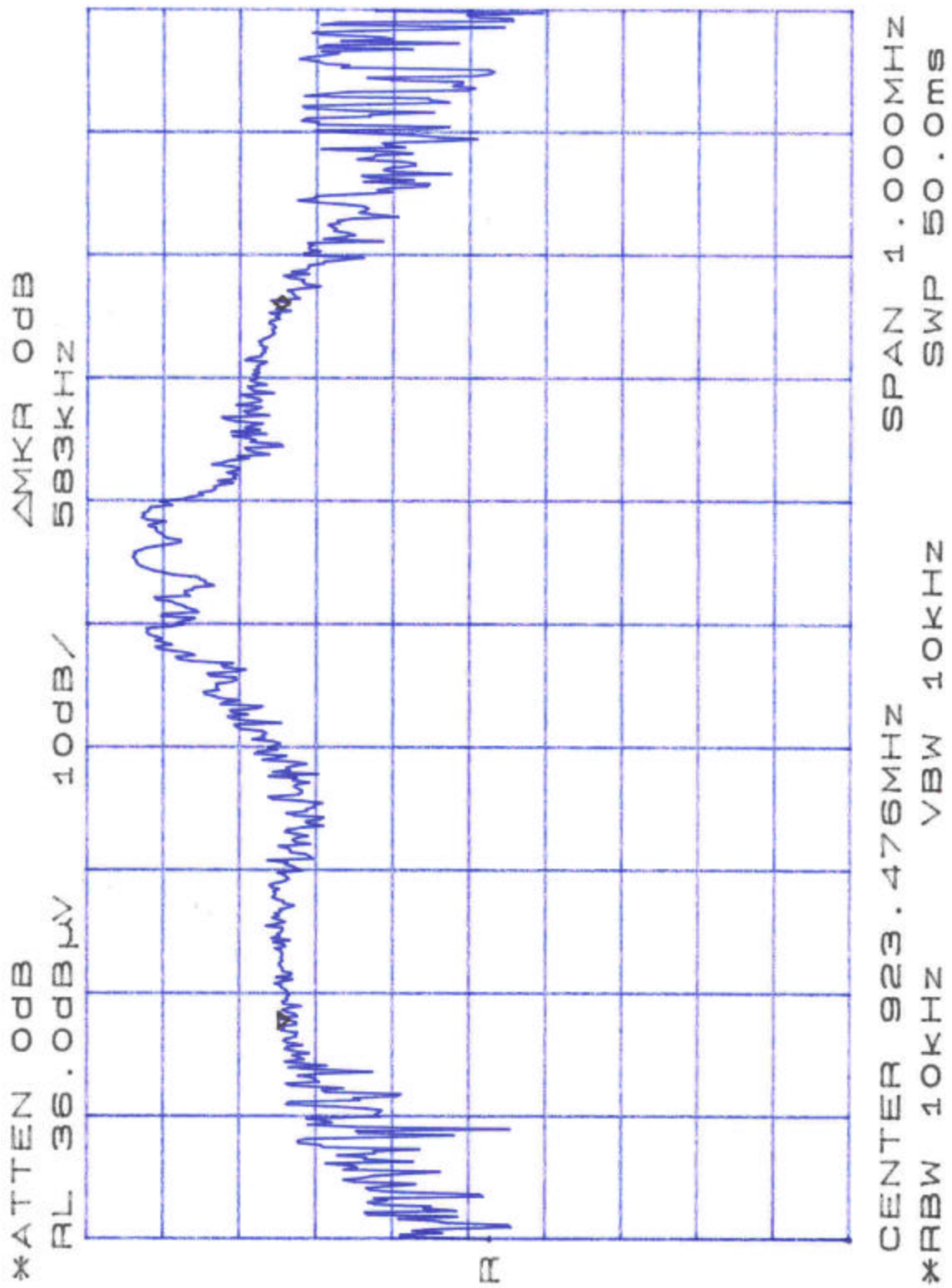


Figure 3. Occupied Bandwidth, High Channel

Table 3 provides a summary of the Occupied Bandwidth Results.

Table 3. Occupied Bandwidth Results

Frequency	Bandwidth
Low Channel 905.992 MHz	538 kHz
Mid Channel 916.482 MHz	533 kHz
High Channel 923.476 MHz	583 kHz

4.2 Band Edge Plots:

Band edge plots at 902MHz and 928MHz were made with the unit transmitting in the Low channel and the High channel respectively. The emissions were made on the OATS and all correction levels have been accounted for and entered as the reference level offset within the spectrum analyzer. Therefore the levels on the plots are corrected test results. Figure 4 and Figure 5 are plots of the band edge emissions. Emissions at the upper end of Figure 5 are ambient emissions not associated with the EUT.

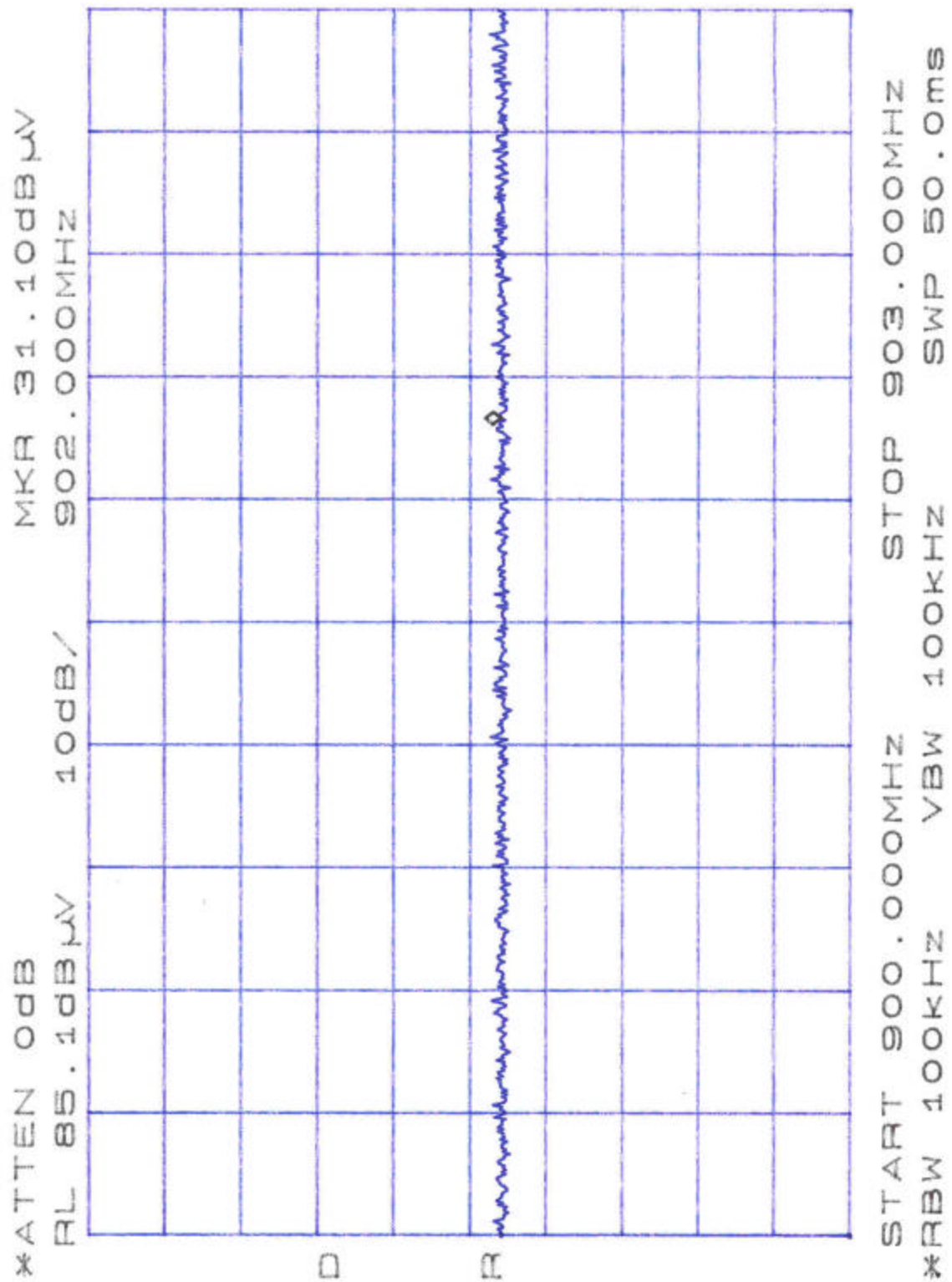


Figure 4: 902MHz Band Edge Plot

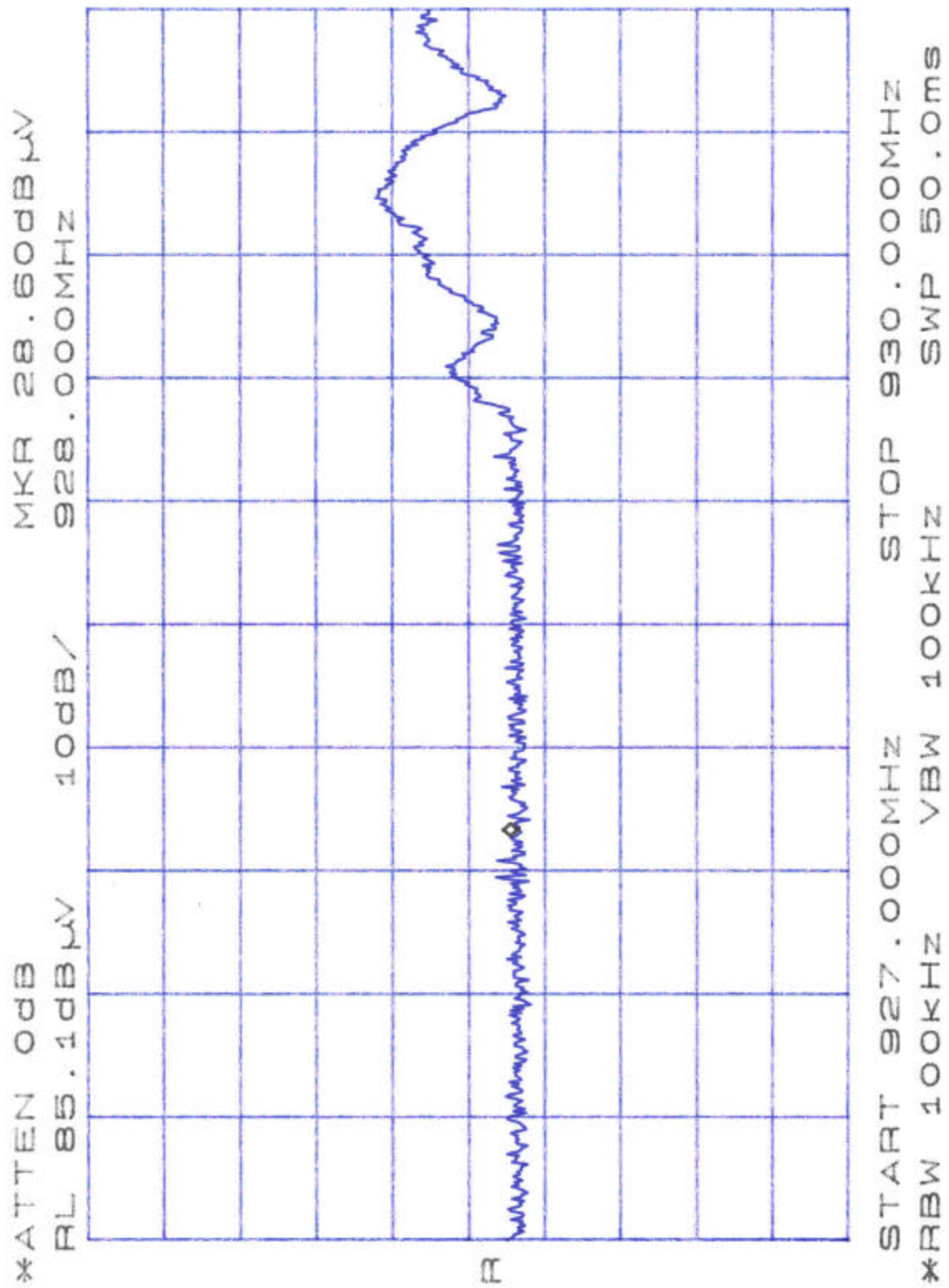


Figure 5: 928MHz Band Edge Plot

4.3 Radiated Spurious Emissions: (FCC Part §15.249)

The EUT must comply with the radiated emission limits of 15.249(a). The limits are as shown in the following table.

Table 4. Radiated Emissions Limits

Fundamental Frequency	Field Strength of Fundamental ($\mu\text{V/m}$)	Field Strength of Harmonics ($\mu\text{V/m}$)
902 – 928 MHz	50,000	500
2400 – 2483.5 MHz	50,000	500
5725 – 5875 MHz	50,000	500
24.00 – 24.25 MHz	250,000	2500

4.3.1 Test Procedure

The EUT was placed on motorized turntable for radiated testing on a 3-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The peripherals were placed on the table in accordance with ANSI C63.4-1992. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The emissions were measured using the following resolution bandwidths:

Frequency Range	Resolution Bandwidth	Video Bandwidth
30MHz-1000 MHz	100kHz	>100kHz
>1000 MHz	1 MHz	10Hz (avg), 1MHz (peak)

Harmonic and spurious emissions that were identified as coming from the EUT were checked in Peak and in Average Mode. It was verified that the peak-to-average ratio did not exceed 20dB.

Emissions were measured to the 10th harmonic of the transmit frequency.

The following is a sample calculation used in the data tables for calculating the final field strength of spurious emissions and comparing these levels to the specified limits.

Sample Calculation:

Spectrum Analyzer Voltage (SA Level): V dBμV
Antenna Factor (Ant Corr): AFdB/m
Cable Loss Correction (Cable Corr): CCdB
Amplifier Gain*: GdB
Electric Field (Corr Level): EdBμV/m = VdBμV + AFdB/m + CCdB
 - GdB

Table 5: Radiated Emission Test Data (§15.249), Low Channel

CLIENT: *Electrosource* DATE: *6/28/2002*
TESTER: *Greg Snyder* JOB #: *7144*

EUT Information:

EUT: *WaveStation*

Test Equipment/Limit:

ANTENNA: LPB-2520 and DRG/118/A TEST STANDARD: *FCC Part 15*
CABLE: Site 2 3m and Site 2 HF DISTANCE: *3m*
LIMIT: 15.249 CLASS: *B*

AMPLIFIER (dB) 35 above 1GHz only

Test Requirements:

Average Measurements:

Freq.	Pol.	Azimuth	Ant. Height	SA Level (Avg)	Ant. Corr.	Cable Corr.	Corr. Level	Corr. Level	Limit	Margin	Notes
(MHz)	H/V	Degree	(m)	(dBuV)	(dB/m)	(dB)	(dBuV/m)	(uV/m)	(uV/m)	dB	
905.99	V	22.5	1.5	53.7	21.7	7.6	82.9	13997.5	50000	-11.1	QP
905.99	H	22.5	1.5	57.4	21.7	7.6	86.6	21431.4	50000	-7.4	QP
1811.98	V	0.0	1.5	50.3	31.1	3.1	48.5	266.2	500.0	-5.5	
2717.98	V	22.5	1.0	47.6	35.2	2.9	49.7	306.9	500.0	-4.2	
3623.97	V	0.0	1.0	41.8	37.0	2.8	45.5	188.8	500.0	-8.5	
4529.96	V	90.0	1.0	39.8	37.7	3.7	45.2	182.8	500.0	-8.7	
5435.95	V	90.0	1.0	35.0	39.5	4.3	42.7	137.2	500.0	-11.2	
6341.94	V	0.0	1.0	37.4	40.7	4.2	46.3	206.5	500.0	-7.7	
7247.94	V	0.0	1.0	35.8	41.6	4.5	46.0	199.3	500.0	-8.0	amb
8153.93	V	0.0	1.0	35.4	42.6	4.9	46.9	220.3	500.0	-7.1	amb
9059.92	V	0.0	1.0	35.7	46.4	4.9	51.0	352.9	500.0	-3.0	amb
1811.98	H	270.0	1.5	51.4	31.1	3.1	49.6	302.1	500.0	-4.4	
2717.98	H	270.0	1.0	46.1	35.2	2.9	48.2	258.3	500.0	-5.7	
3623.97	H	90.0	1.0	43.0	37.0	2.8	46.7	216.8	500.0	-7.3	
4529.96	H	90.0	1.0	35.4	37.7	3.7	40.8	110.2	500.0	-13.1	
5435.95	H	0.0	1.0	35.6	39.5	4.3	43.3	147.0	500.0	-10.6	
6341.94	H	0.0	1.0	35.2	40.7	4.2	44.1	160.3	500.0	-9.9	
7247.94	H	0.0	1.0	35.8	41.6	4.5	46.0	199.3	500.0	-8.0	amb
8153.93	H	0.0	1.0	35.4	42.6	4.9	46.9	220.3	500.0	-7.1	amb
9059.92	H	0.0	1.0	35.7	46.4	4.9	51.0	352.9	500.0	-3.0	amb

Peak measurements above 1GHz:

Freq.	Pol.	Azimuth	Ant. Height	SA Level (Peak)	Ant. Corr.	Cable Corr.	Corr. Level	Corr. Level	Limit	Margin	Notes
(MHz)	H/V	Degree	(m)	(dBuV)	(dB/m)	(dB)	(dBuV/m)	(uV/m)	(uV/m)	dB	
1811.98	V	90.0	1.5	72.4	31.1	3.1	70.6	3389.6	5000.0	-3.4	
2717.98	V	0.0	1.0	65.0	35.2	2.9	67.1	2275.3	5000.0	-6.8	
3623.97	V	22.5	1.0	52.8	37.0	2.8	56.5	669.8	5000.0	-17.5	
4529.96	V	22.5	1.0	53.4	37.7	3.7	58.8	875.1	5000.0	-15.1	
5435.95	V	180.0	1.0	47.2	39.5	4.3	54.9	559.0	5000.0	-19.0	
6341.94	V	0.0	1.0	46.2	40.7	4.2	55.1	568.8	5000.0	-18.9	
7247.94	V	0.0	1.0	47.3	41.6	4.5	57.5	748.9	5000.0	-16.5	amb
8153.93	V	0.0	1.0	49.2	42.6	4.9	60.7	1078.8	5000.0	-13.3	amb
9059.92	V	0.0	1.0	48.0	46.4	4.9	63.3	1454.4	5000.0	-10.7	amb
1811.98	H	90.0	1.5	71.6	31.1	3.1	69.8	3091.3	5000.0	-4.2	
2717.98	H	0.0	1.0	64.3	35.2	2.9	66.4	2099.2	5000.0	-7.5	
3623.97	H	0.0	1.0	53.7	37.0	2.8	57.4	743.0	5000.0	-16.6	
4529.96	H	0.0	1.0	49.5	37.7	3.7	54.9	558.6	5000.0	-19.0	
5435.95	H	0.0	1.0	46.3	39.5	4.3	54.0	504.0	5000.0	-19.9	
6341.94	H	0.0	1.0	45.2	40.7	4.2	54.1	507.0	5000.0	-19.9	
7247.94	H	0.0	1.0	47.3	41.6	4.5	57.5	748.9	5000.0	-16.5	amb
8153.93	H	0.0	1.0	49.2	42.6	4.9	60.7	1078.8	5000.0	-13.3	amb
9059.92	H	0.0	1.0	48.0	46.4	4.9	63.3	1454.4	5000.0	-10.7	amb

Table 6: Radiated Emission Test Data (§15.249), Middle Channel

CLIENT: Pelican Acc.

DATE: 6/11/2002-6/14/2002

TESTER: Greg Snyder

JOB #: 7144

EUT Information:

EUT: WaveStation

Test Equipment/Limit:

ANTENNA: LPB-2520 and DRG/118/A

CABLE: Site 2 3m and Site 2 HF

LIMIT: 15.249

Test Requirements:

TEST STANDARD: FCC Part 15

DISTANCE: 3m

CLASS: B

AMPLIFIER (dB): 35 above 1GHz only

Average Measurements:

Freq.	Pol.	Azimuth	Ant. Height	SA Level (Avg)	Ant. Corr.	Cable Corr.	Corr. Level	Corr. Level	Limit	Margin	Notes
(MHz)	H/V	Degree	(m)	(dBuV)	(dB/m)	(dB)	(dBuV/m)	(uV/m)	(uV/m)	dB	
916.60	V	270.0	1.5	52.9	21.4	7.7	82.0	12549.9	50000	-12.0	QP
916.60	H	0.0	1.0	59.1	21.4	7.7	88.2	25623.7	50000	-5.8	QP
1833.17	V	0.0	1.0	51.3	31.2	3.1	49.7	304.1	500.0	-4.3	
2770.47	V	135.0	1.0	46.7	35.4	2.9	49.0	281.8	500.0	-5.0	
3667.00	V	0.0	1.0	46.7	37.0	2.8	50.5	333.9	500.0	-3.5	
4583.00	V	0.0	1.0	38.8	37.7	3.8	44.4	165.1	500.0	-9.6	
5499.58	V	0.0	1.0	30.5	39.7	4.2	38.4	83.5	500.0	-15.5	amb
6416.16	V	0.0	1.0	31.0	40.8	4.2	40.0	99.5	500.0	-14.0	amb
7332.75	V	0.0	1.0	31.5	41.6	4.6	41.7	121.3	500.0	-12.3	amb
8249.33	V	0.0	1.0	31.8	42.5	4.9	43.2	144.6	500.0	-10.8	amb
9165.92	V	0.0	1.0	32.0	46.3	5.0	47.2	229.7	500.0	-6.8	amb
1833.17	H	90.0	1.0	49.2	31.2	3.1	47.6	238.8	500.0	-6.4	
2770.47	H	180.0	1.0	41.7	35.4	2.9	44.0	158.4	500.0	-10.0	
3667.00	H	0.0	1.0	42.6	37.0	2.8	46.4	208.3	500.0	-7.6	
4583.00	H	0.0	1.0	32.0	37.7	3.8	37.6	75.5	500.0	-16.4	
5499.58	H	0.0	1.0	30.0	39.7	4.2	37.9	78.9	500.0	-16.0	amb
6416.16	H	0.0	1.0	30.3	40.8	4.2	39.3	91.8	500.0	-14.7	amb
7332.75	H	0.0	1.0	31.0	41.6	4.6	41.2	114.5	500.0	-12.8	amb
8249.33	H	0.0	1.0	31.3	42.5	4.9	42.7	136.5	500.0	-11.3	amb
9165.92	H	0.0	1.0	31.8	46.3	5.0	47.0	224.5	500.0	-7.0	amb

Peak measurements above 1GHz:

Freq.	Pol.	Azimuth	Ant. Height	SA Level (Peak)	Ant. Corr.	Cable Corr.	Corr. Level	Corr. Level	Limit	Margin	Notes
(MHz)	H/V	Degree	(m)	(dBuV)	(dB/m)	(dB)	(dBuV/m)	(uV/m)	(uV/m)	dB	
1833.17	V	0.0	1.0	69.0	31.2	3.1	67.4	2333.2	5000.0	-6.6	
2749.75	V	135.0	1.0	65.0	35.3	2.9	67.2	2300.4	5000.0	-6.7	
3667.00	V	0.0	1.0	55.3	37.0	2.8	59.1	898.8	5000.0	-14.9	
4583.00	V	0.0	1.0	48.3	37.7	3.8	53.9	492.8	5000.0	-20.1	
5499.58	V	0.0	1.0	43.5	39.7	4.2	51.4	373.2	5000.0	-22.5	amb
6416.16	V	0.0	1.0	43.8	40.8	4.2	52.8	434.5	5000.0	-21.2	amb
7332.75	V	0.0	1.0	43.8	41.6	4.6	54.0	499.7	5000.0	-20.0	amb
8249.33	V	0.0	1.0	44.0	42.5	4.9	55.4	589.1	5000.0	-18.6	amb
9165.92	V	0.0	1.0	44.3	46.3	5.0	59.5	946.8	5000.0	-14.5	amb
1833.17	H	90.0	1.0	69.8	31.2	3.1	68.2	2558.3	5000.0	-5.8	
2749.75	H	180.0	1.0	59.0	35.3	2.9	61.2	1152.9	5000.0	-12.7	
3667.00	H	0.0	1.0	53.0	37.0	2.8	56.8	689.7	5000.0	-17.2	
4583.00	H	0.0	1.0	44.7	37.7	3.8	50.3	325.6	5000.0	-23.7	
5499.58	H	0.0	1.0	43.2	39.7	4.2	51.1	360.5	5000.0	-22.8	amb
6416.16	H	0.0	1.0	43.8	40.8	4.2	52.8	434.5	5000.0	-21.2	amb
7332.75	H	0.0	1.0	43.7	41.6	4.6	53.9	494.0	5000.0	-20.1	amb
8249.33	H	0.0	1.0	44.2	42.5	4.9	55.6	602.8	5000.0	-18.4	amb
9165.92	H	0.0	1.0	44.5	46.3	5.0	59.7	968.8	5000.0	-14.3	amb

Table 7: Radiated Emission Test Data (§15.249), High Channel

CLIENT:	Pelican Acc.	DATE:	6/28/2002
TESTER:	G. Snyder/J. Ritter	JOB #:	7144
<u>EUT Information:</u>			
EUT:	WaveStation		
<u>Test Equipment/Limit:</u>		<u>Test Requirements:</u>	
ANTENNA:	LPB-2520 and DRG/118/A	TEST STANDARD:	FCC Part 15
CABLE:	Site 2 3m and Site 2 HF	DISTANCE:	3m
LIMIT:	15.249	CLASS:	B

AMPLIFIER (dB): 35 above 1GHz only

Average Measurements:

Freq.	Pol.	Azimuth	Ant. Height	SA Level (Avg)	Ant. Corr.	Cable Corr.	Corr. Level	Corr. Level	Limit	Margin	Notes
(MHz)	H/V	Degree	(m)	(dBuV)	(dB/m)	(dB)	(dBuV/m)	(uV/m)	(uV/m)	dB	
923.48	V	22.5	1.5	53.7	22.5	7.7	84.0	15763.8	50000	-10.0	QP
923.48	H	22.5	1.5	58.4	22.5	7.7	88.7	27080.8	50000	-5.3	QP
1846.96	H	22.5	1.0	53.1	28.4	3.2	49.7	304.8	500.0	-4.3	
2770.44	H	22.5	1.0	43.7	30.3	2.9	41.9	124.9	500.0	-12.0	
3693.92	H	90.0	1.0	46.5	31.4	2.8	45.7	192.5	500.0	-8.3	
4617.4	H	90.0	1.0	38.4	32.5	3.9	39.8	97.9	500.0	-14.2	
5540.88	H	22.5	1.0	33.7	34.1	4.2	37.0	71.2	500.0	-16.9	
6464.36	H	0.0	1.0	34.0	36.3	4.2	39.5	94.1	500.0	-14.5	amb
7387.84	H	0.0	1.0	36.5	37.9	4.6	44.0	158.9	500.0	-10.0	amb
8311.32	H	0.0	1.0	35.8	38.6	4.9	44.3	163.1	500.0	-9.7	amb
9234.8	H	0.0	1.0	35.0	39.2	5.0	44.2	162.5	500.0	-9.8	amb
1846.96	V	0.0	1.0	49.7	28.4	3.2	46.3	206.1	500.0	-7.7	
2770.44	V	0.0	1.0	44.6	30.3	2.9	42.8	138.5	500.0	-11.1	
3693.92	V	22.5	1.0	40.5	31.4	2.8	39.7	96.5	500.0	-14.3	
4617.4	V	22.5	1.0	36.4	32.5	3.9	37.8	77.7	500.0	-16.2	
5540.88	V	22.5	1.0	33.8	34.1	4.2	37.1	72.0	500.0	-16.8	
6464.36	V	0.0	1.0	33.1	36.3	4.2	38.6	84.8	500.0	-15.4	amb
7387.84	V	0.0	1.0	36.5	37.9	4.6	44.0	158.9	500.0	-10.0	amb
8311.32	V	0.0	1.0	35.8	38.6	4.9	44.3	163.1	500.0	-9.7	amb
9234.8	V	0.0	1.0	35.0	39.2	5.0	44.2	162.5	500.0	-9.8	amb

Peak measurements above 1GHz:

Freq.	Pol.	Azimuth	Ant. Height	SA Level (Peak)	Ant. Corr.	Cable Corr.	Corr. Level	Corr. Level	Limit	Margin	Notes
(MHz)	H/V	Degree	(m)	(dBuV)	(dB/m)	(dB)	(dBuV/m)	(uV/m)	(uV/m)	dB	
1846.96	V	22.5	1.0	69.7	28.4	3.2	66.3	2060.6	5000.0	-7.7	
2770.44	V	22.5	1.0	60.2	30.3	2.9	58.4	834.7	5000.0	-15.5	
3693.92	V	0.0	1.0	55.6	31.4	2.8	54.8	548.8	5000.0	-19.2	
4617.4	V	0.0	1.0	47.0	32.5	3.9	48.4	263.4	5000.0	-25.6	
5540.88	V	0.0	1.0	40.4	34.1	4.2	43.7	153.9	5000.0	-30.2	
6464.36	V	180.0	1.0	42.2	36.3	4.2	47.7	241.8	5000.0	-26.3	amb
7387.84	V	0.0	1.0	45.3	37.9	4.6	52.8	437.7	5000.0	-21.2	amb
8311.32	V	0.0	1.0	46.5	38.6	4.9	55.0	559.2	5000.0	-19.0	amb
9234.8	V	0.0	1.0	44.7	39.2	5.0	53.9	496.4	5000.0	-20.1	amb
1846.96	H	0.0	1.0	67.7	28.4	3.2	64.3	1636.8	5000.0	-9.7	
2770.44	H	0.0	1.0	58.5	30.3	2.9	56.7	686.3	5000.0	-17.2	
3693.92	H	22.5	1.0	55.3	31.4	2.8	54.5	530.1	5000.0	-19.5	
4617.4	H	22.5	1.0	50.0	32.5	3.9	51.4	372.1	5000.0	-22.6	
5540.88	H	45.0	1.0	44.9	34.1	4.2	48.2	258.4	5000.0	-25.7	
6464.36	H	45.0	1.0	46.7	36.3	4.2	52.2	406.0	5000.0	-21.8	amb
7387.84	H	0.0	1.0	45.3	37.9	4.6	52.8	437.7	5000.0	-21.2	amb
8311.32	H	0.0	1.0	46.5	38.6	4.9	55.0	559.2	5000.0	-19.0	amb
9234.8	H	0.0	1.0	44.7	39.2	5.0	53.9	496.4	5000.0	-20.1	amb

4.4 Conducted Emissions (AC Powerline)

The EUT was placed on an 80 cm high 1 x 1.5 m non-conductive table above a ground plane. Power to the EUT was provided through a Solar Corporation 50 /50 mH Line Impedance Stabilization Network bonded to a 3 x 2 meter ground plane. The LISN has its AC input supplied from a filtered AC power source. Power and data cables were moved about to obtain maximum emissions.

The 50 output of the LISN was connected to the input of the spectrum analyzer and the emissions in the frequency range of 450 kHz to 30 MHz was measured. The detector function was set to quasi-peak or peak, as appropriate, and the resolution bandwidth during testing was at least 9 kHz, with all post-detector filtering no less than 10 times the resolution bandwidth.

AC Power Line conducted emissions test data are included in Table 8.

Table 8: AC Power Line Conducted Emissions Test Data Sheet

CLIENT: *Electro Source* DATE: *14-Jun-02*
TESTER: *Greg Snyder* JOB #: *7144*
TEST STANDARD: *FCC Part 15*
CLASS: *B*
TEST VOLTAGE: *120 VAC*
TEST CONFIGURATION: *WaveStation*

LINE 1 - NEUTRAL

Freq.	Voltage	Voltage	FCC	Margin
MHz	(QP) dBuV	uV	Limit uV	dB
0.47	36.5	66.8	250.0	-11.5
0.62	36.3	65.3	250.0	-11.7
0.89	33.8	49.0	250.0	-14.2
2.60	32.1	40.3	250.0	-15.9
14.74	35.6	60.3	250.0	-12.4
18.28	36.8	69.2	250.0	-11.2
20.50	36.3	65.3	250.0	-11.7
23.43	32.3	41.2	250.0	-15.7

LINE 2 - PHASE

Freq.	Voltage	Voltage	FCC	Margin
MHz	(QP) dBuV	uV	Limit uV	dB
0.53	34.2	51.3	250.0	-13.8
0.76	35.2	57.5	250.0	-12.8
2.40	33.0	44.7	250.0	-15.0
14.74	43.0	141.3	250.0	-5.0
18.00	33.8	49.0	250.0	-14.2
19.14	43.0	141.3	250.0	-5.0
28.30	41.2	114.8	250.0	-6.8
29.36	38.5	84.1	250.0	-9.5