



**FCC and Industry Canada Certification
Test Report**

for

Pelican Accessories

FCC ID: O7X-SPIRIT1

IC ID: 4954A2044

April 23, 2004

Prepared for:

**Pelican Accessories
1840 East 27th Street
Vernon, CA 90058**

Prepared By:

**Washington Laboratories, Ltd.
7560 Lindbergh Drive
Gaithersburg, Maryland 20879**



FCC and Industry Canada Certification Test Report
for the
Pelican Accessories
D2068P Spirit Wireless Controller
O7X-SPIRIT1

April 23, 2004

WLL JOB# 8083

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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 and Spectrum Management and Telecommunications Policy RSS-210 of Industry Canada. This Certification Test Report documents the test configuration and test results for a Pelican Accessories D2068P Spirit Wireless Controller.

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. The Industry Canada OATS numbers are 3035A-1 and 3035A-2 for Washington Laboratories, Ltd. Site 1 and Site 2, respectively. 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 D2068P Spirit Wireless Controller complies with the limits for an Intentional Radiator device under FCC Part 15.249 and Industry Canada RSS-210.

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1 Introduction

1.1 Compliance Statement

The Pelican Accessories D2068P Spirit Wireless Controller complies with the limits for an Intentional Radiator device under FCC Part 15.249 and Industry Canada RSS-210.

This test report reflects the testing performed for the certification of the D2068P Pad. Separate testing was performed under the DoC process for the D2068H Host receiver.

1.2 Test Scope

Tests for radiated and conducted emissions were performed. All measurements were performed according to the 2001 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

Client Purchase Order: 43007

WLL Quotation Number: 61523

1.4 Test Dates

Testing was completed on April 6, 2004.

1.5 Test and Support Personnel

Washington Laboratories, LTD

Ken Gemmell

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

The Pelican Accessories D2068P Spirit Wireless Controller is part of the wireless controller system for the Microsoft Xbox video game system. The D2068P replaces the hard-wired controller, and transmits play commands to the Pelican system interface (the D2068H “dongle”, receiver DoC). The RF controller pad is battery powered and has 4 selectable channels. Channels are selectable via a slide switch on the controller. Table 1 lists the channels and frequencies along with other characteristics.

Table 1. Device Summary

ITEM	DESCRIPTION
Manufacturer:	Pelican Accessories
FCC ID Number	O7X-SPIRIT1
IC ID Number	4954A2044
EUT Name:	Spirit Wireless Controller
Model:	D2068P
Rule Parts:	FCC §15.249 & RSS-210
Frequency Range:	906 – 923.5MHz CH1 ~907M, CH2 ~913M, CH3 ~919M, CH4 ~923.5M
Maximum Output Power:	<1mW
Modulation:	FSK
Occupied Bandwidth:	192.5kHz
Keying:	Manual
Type of Information:	Control
Number of Channels:	3
Power Output Level	Fixed
Antenna Type	Fixed/Integral
Interface Cables:	N/A
Power Source & Voltage:	3 Vdc from batteries

2.2 Test Configuration

The D2068P was configured with a D2068H Host video game console interface unit, a Microsoft Xbox video game console, and a television set.

2.3 Testing Algorithm

The D2068P was operated by strapping the ‘down’ controller button into position for continuous transmission. Various buttons and combinations were depressed to verify that there was no difference in the emissions.

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. The Industry Canada OATS numbers are 3035A-1 and 3035A-2 for Washington Laboratories, Ltd. Site 1 and Site 2, respectively. 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/Type	Function	Identification	Cal. Due
HP	8568B	Spectrum Analyzer	2634A02888	7/07/04
HP	85650A	Quasi-Peak Adapter	3303A01786	7/08/04
HP	HP 8593A	Spectrum Analyzer	3009A00739	6/25/04
HP	8449B	Microwave Preamp	3008A00385	9/29/05
Solar	8012-50-R-24BNC	LISN	8379493	6/30/04
ARA	LPB-2520	BiconiLog Antenna	1044	6/20/04
ARA	DRG118/A	Microwave Horn Antenna	1236	4/17/04
HP	85685A	RF Preselector	3221A01395	7/07/04
EMCO	3110B	Biconical Antenna	9808-1078	6/20/04
EMCO	3146A	Log Periodic Antenna	8912-1129	6/20/04

4 Test Results

4.1 Duty Cycle Correction

Measurements may be adjusted where pulsed RF is utilized to find the average level associated with a quantity. This calculation is applied to limits for pulsed licensed and unlicensed devices.

On time = $N_1L_1 + N_2L_2 + \dots + N_{N-1}L_{N-1} + N_NL_N$, where N_1 is number of type 1 pulses, L_1 is length of type 1 pulses, etc.

- For Licensed Transmitters basic formula can be stated as $20\log[\text{Duty Cycle}]$
- For Unlicensed Intentional Radiators under 47CFR Part 15, all duty cycle measurements compared to a 100 millisecond period
- i.e. duty cycle = on time/100 milliseconds or period, whichever is less
- Restating the basic formula:
 - o Duty cycle = $(N_1L_1 + N_2L_2 + \dots + N_{N-1}L_{N-1} + N_NL_N)/100$ or T, whichever is less

Where T is the period of the pulse train.

The following Figures show the plots of the modulated carrier. The spectrum analyzer was set to Zero Span and the video triggered to collect the pulse train of the modulation. Calculations of the duty cycle correction factor were obtained from time data provided by the plots.

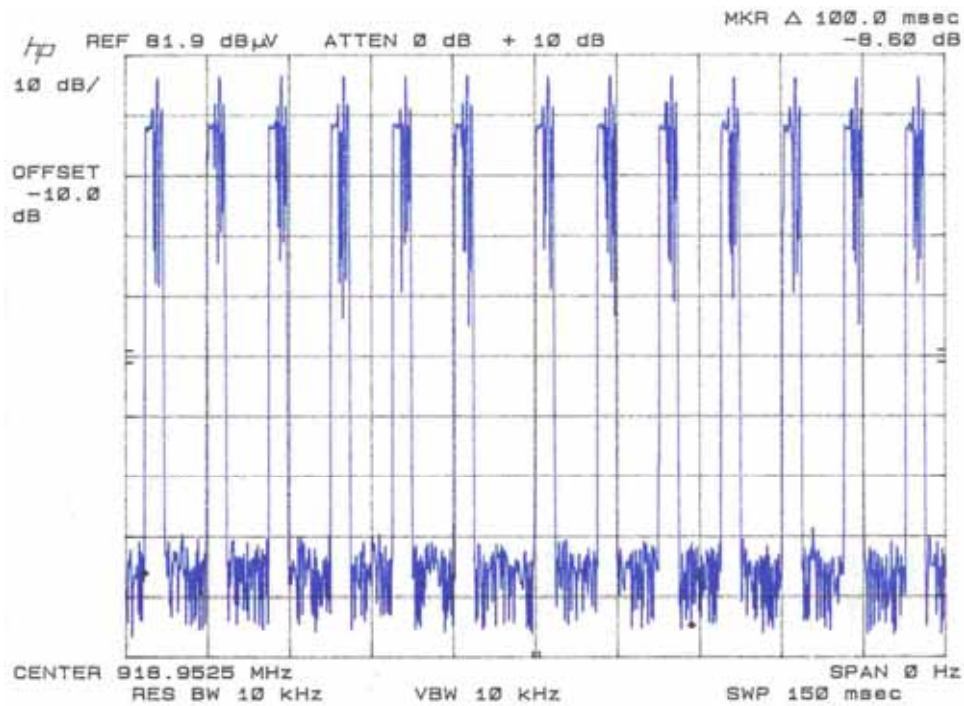


Figure 4-1. Duty Cycle Plot Full Period, Worst Case 100ms

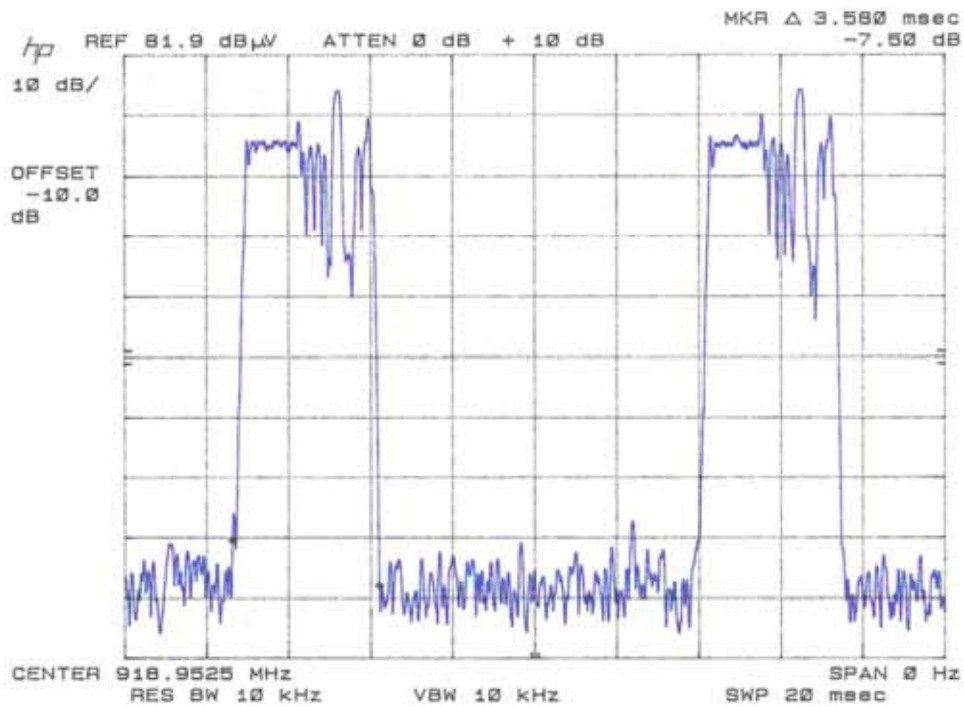


Figure 4-2. Duty Cycle Plot, Pulse Width

From the data in Figure 4-1 and Figure 4-2, the following calculations are made.

On Time Per 100ms (worst case):

$$9 \times 3.58\text{ms} = 32.22\text{ms}$$

Duty cycle calculation:

$$32.22\text{ms}/100\text{ms} = 32.22\% \text{ on time} = -9.83\text{dB duty cycle correction}$$

4.2 Occupied Bandwidth: (FCC Part §2.1049)

Occupied bandwidth was performed by coupling the output of the EUT to the input of a spectrum analyzer. The 20dB bandwidth was then measured and recorded.

At full modulation, the occupied bandwidth was measured as shown:

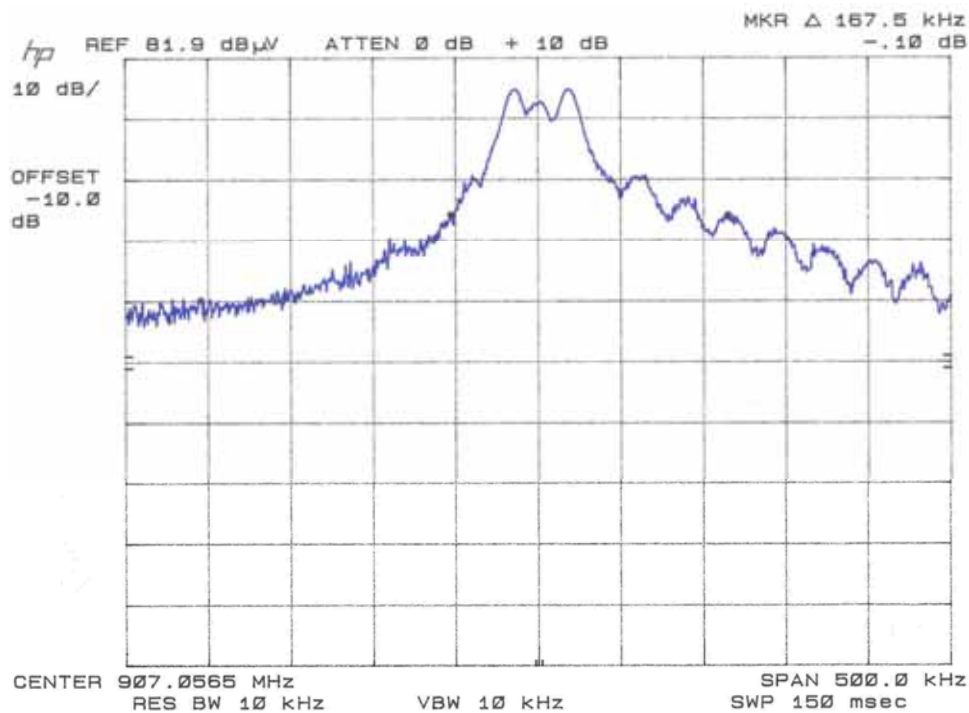


Figure 4-3. Occupied Bandwidth, Channel 1

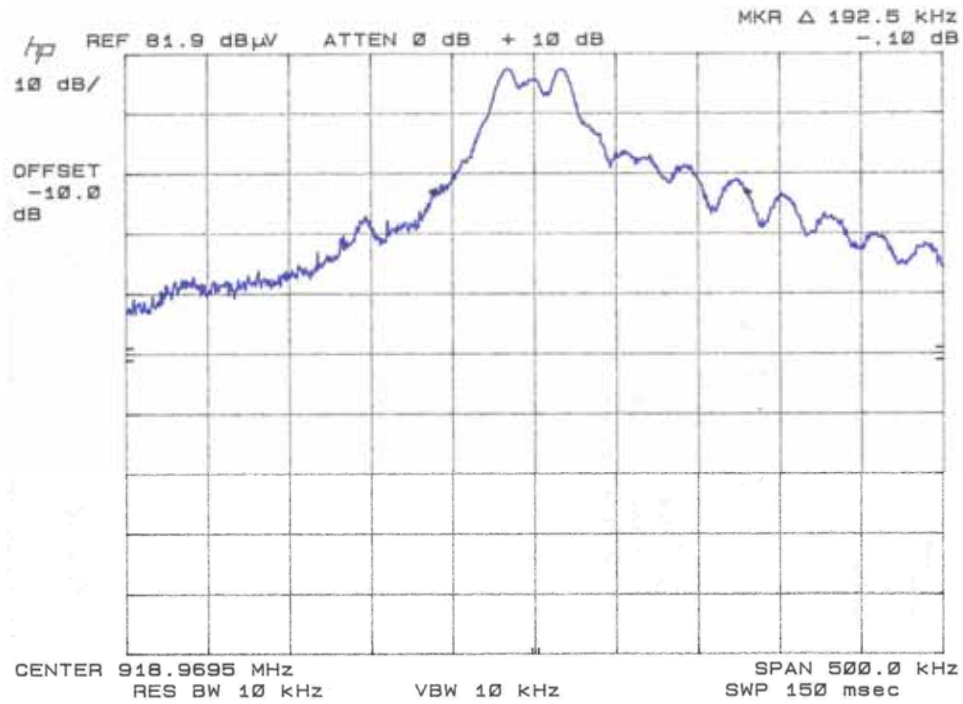


Figure 4-4. Occupied Bandwidth, Channel 3

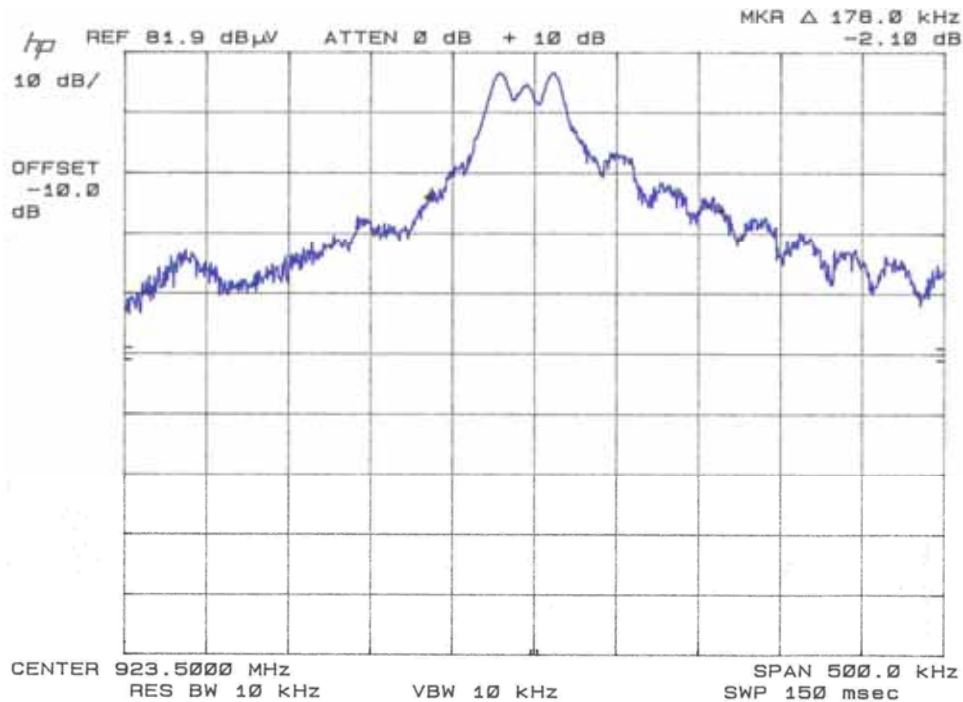


Figure 4-5. Occupied Bandwidth, Channel 4

Table 3 provides a summary of the Occupied Bandwidth Results.

Table 3. Occupied Bandwidth Results

Frequency	Bandwidth
Channel 1: 907.MHz	167.5kHz
Channel 3: 918.97MHz	192.5kHz
Channel 4: 923.5MHz	178kHz

4.3 Radiated Emissions

The EUT must comply with the radiated emission limits of 15.249(a) and RSS-210. 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 GHz	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 C63.4-2001. 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	1MHz (peak)

Emissions were measured to the 10th harmonic of the transmit frequency. Worst case emission levels are reported.

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 dB μ V

Antenna Factor (Ant Corr): AFdB/m

Cable Loss Correction (Cable Corr): CCdB

Duty Cycle Correction (Average)

DCCdB

Amplifier Gain:

GdB

Electric Field (Corr Level):

$EdB_{\mu V/m} = VdB_{\mu V} + AFdB/m + CCdB + DCCdB - GdB$

Table 5. Fundamental Emissions Data

CLIENT: Electrosource DATE: 4/6/2004
TESTER: Ken Gemmell JOB #: 8083

EUT Information:

EUT: Spirit
CONFIGURATION: On (button held down)
CLASS: B

Test Requirements:

TEST STANDARD: FCC Part 15
DISTANCE: 3m
S/N: S286

Test Equipment/Limit:

ANTENNA: A_00382 LIMIT: LFCC_3m_Class_B
CABLE: CSITE1_3m AMPLIFIER (dB) None

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Hght (m)	SA Level (QP) (dBμV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dBμV/m)	Corr. Level (μV/m)	Limit (μV/m)	Margin dB
X	Channel 1 Fundamental									
907.07	V	180.0	1.5	63.8	22.2	4.0	90.0	31594.0	50000.0	-4.0
907.07	H	202.5	1.0	64.4	22.2	4.0	90.6	33853.6	50000.0	-3.4
	Band Edge									
902.00	V	180.0	1.5	7.5	22.1	3.9	33.5	47.3	200.0	-12.5
901.86	H	202.5	1.0	11.6	22.1	3.9	37.6	75.9	200.0	-8.4
Y	Channel 1 Fundamental									
907.07	V	202.5	1.5	65.4	22.2	4.0	91.6	37984.3	50000.0	-2.4
907.07	H	180.0	1.0	55.9	22.2	4.0	82.1	12723.4	50000.0	-11.9
	Band Edge									
902.00	V	202.5	1.5	8.9	22.1	3.9	34.9	55.6	200.0	-11.1
902.00	H	180.0	1.0	4.5	22.1	3.9	30.5	33.5	200.0	-15.5
Z	Channel 1 Fundamental									
907.07	V	180.0	1.0	59.9	22.2	4.0	86.1	20165.3	50000.0	-7.9
907.07	H	180.0	1.2	64.6	22.2	4.0	90.8	34642.1	50000.0	-3.2
	Band Edge									
902.00	V	180.0	1.0	5.1	22.1	3.9	31.1	35.9	200.0	-14.9
902.00	H	180.0	1.2	9.7	22.1	3.9	35.7	61.0	200.0	-10.3
X	Channel 4 Fundamental									
923.00	V	180.0	1.0	62.1	22.8	3.9	88.8	27687.5	50000.0	-5.1
923.00	H	180.0	1.0	57.6	22.8	3.9	84.3	16492.4	50000.0	-9.6
	Band Edge									
928.00	V	180.0	1.0	7.5	22.8	3.9	34.2	51.2	200.0	-11.8
928.00	H	180.0	1.0	6.8	22.8	3.9	33.5	47.2	200.0	-12.5

Frequency (MHz)	Polarity H/V	Az Deg	Ant. Hght (m)	SA Level (QP) (dBµV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dBµV/m)	Corr. Level (µV/m)	Limit (µV/m)	Margin dB
Y	Channel 4 Fundamental									
923.00	V	180.0	1.0	64.4	22.8	3.9	91.1	36081.5	50000.0	-2.8
923.00	H	180.0	1.0	60.4	22.8	3.9	87.1	22765.9	50000.0	-6.8
	Band Edge									
928.00	V	180.0	1.0	13.2	22.8	3.9	39.9	98.7	200.0	-6.1
928.00	H	180.0	1.0	6.2	22.8	3.9	32.9	44.1	200.0	-13.1
Z	Channel 4 Fundamental									
923.00	V	225.0	1.0	58.0	22.8	3.9	84.7	17269.7	50000.0	-9.2
923.00	H	180.0	1.0	63.9	22.8	3.9	90.6	34063.1	50000.0	-3.3
	Band Edge									
928.00	V	225.0	1.0	5.2	22.8	3.9	31.9	39.3	200.0	-14.1
928.00	H	180.0	1.0	10.0	22.8	3.9	36.7	68.3	200.0	-9.3
X	Channel 3 Fundamental									
919.00	V	180.0	1.5	61.4	22.8	3.7	87.9	24900.6	50000.0	-6.1
919.00	H	180.0	1.0	63.8	22.8	3.7	90.3	32825.4	50000.0	-3.7
Y	Channel 3 Fundamental									
919.00	V	180.0	1.0	59.3	22.8	3.7	85.8	19552.8	50000.0	-8.2
919.00	H	180.0	1.0	64.3	22.8	3.7	90.8	34770.4	50000.0	-3.2
Z	Channel 3 Fundamental									
919.00	V	180.0	1.0	60.2	22.8	3.7	86.7	21687.5	50000.0	-7.3
919.00	H	180.0	1.2	58.0	22.8	3.7	84.5	16834.9	50000.0	-9.5

Table 6. Radiated Emissions Data, Channel 1 Emissions Above 1GHz

CLIENT:	Electrosources	DATE:	4/5/2004
TESTER:	Ken Gemmell	JOB #:	8083
<u>EUT Information:</u>		<u>Test Requirements:</u>	
EUT:	Spirit	TEST STANDARD:	FCC Part 15
CONFIGURATION:	On (button held down)	DISTANCE:	3m
CLASS:	B	S/N:	S286
<u>Test Equipment/Limit:</u>			
ANTENNA:	A_00425	LIMIT:	LFCC_3m_Class_B
CABLE:	CSITE1_HF	AMPLIFIER (dB)	A_00312

Frequency (MHz)	Pol H/V	Azimuth Degree	Ant. Hght (m)	SA Level (QP) (dBµV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Duty Cycle Corr (dB)	Corr. Level (dBµV/m)	Corr. Level (µV/m)	Limit (µV/m)	Margin dB
Channel 1 (EUT Sideways, Y) 907.0565 MHZ												
1814.11	V	90.0	1.0	52.2	27.5	2.4	34.0	-9.8	38.2	81.3	500.0	-15.8
2721.17	V	135.0	1.0	54.3	29.5	3.2	34.5	-9.8	42.7	136.8	500.0	-11.3
3628.23	V	225.0	1.0	52.5	30.7	3.7	34.6	-9.8	42.5	133.6	500.0	-11.5
4535.28	V	135.0	1.0	47.7	32.1	4.0	34.5	-9.8	39.3	92.5	500.0	-14.7
5442.34	V	0.0	1.0	46.2	33.5	4.2	34.4	-9.8	39.6	96.0	500.0	-14.3
6349.40	V	0.0	1.0	41.8	35.4	4.6	34.6	-9.8	37.4	73.7	500.0	-16.6
7256.45	V	0.0	1.0	43.8	37.1	5.0	34.8	-9.8	41.3	116.5	500.0	-12.7 a
8163.51	V	0.0	1.0	43.7	37.4	5.3	34.0	-9.8	42.5	133.3	500.0	-11.5 a
9070.57	V	0.0	1.0	42.3	38.1	5.5	33.0	-9.8	43.0	141.8	500.0	-10.9 a
1814.11	H	202.5	1.0	54.2	27.5	2.4	34.0	-9.8	40.2	102.4	500.0	-13.8
2721.17	H	135.0	1.0	55.8	29.5	3.2	34.5	-9.8	44.2	162.6	500.0	-9.8
3628.23	H	225.0	1.0	51.2	30.7	3.7	34.6	-9.8	41.2	114.7	500.0	-12.8
4535.28	H	180.0	1.0	50.7	32.1	4.0	34.5	-9.8	42.3	130.7	500.0	-11.7
5442.34	H	135.0	1.0	48.0	33.5	4.2	34.4	-9.8	41.5	118.5	500.0	-12.5
6349.40	H	0.0	1.0	42.8	35.4	4.6	34.6	-9.8	38.4	82.7	500.0	-15.6 a
7256.45	H	0.0	1.0	43.7	37.1	5.0	34.8	-9.8	41.2	114.4	500.0	-12.8 a
8163.51	H	0.0	1.0	42.8	37.4	5.3	34.0	-9.8	41.7	121.0	500.0	-12.3 a
9070.57	H	0.0	1.0	44.2	38.1	5.5	33.0	-9.8	44.9	175.2	500.0	-9.1 a

a = ambient reading

Table 7. Radiated Emissions Data, Channel 3 Emissions Above 1GHz

CLIENT:	Electrosorce	DATE:	4/5/2004
TESTER:	Ken Gemmell	JOB #:	8083
<u>EUT Information:</u>		<u>Test Requirements:</u>	
EUT:	Spirit	TEST STANDARD:	FCC Part 15
CONFIGURATION:	On (button held down)	DISTANCE:	3m
CLASS:	B	S/N:	#S286
<u>Test Equipment/Limit:</u>			
ANTENNA:	A_00425	LIMIT:	LFCC_3m_Class_B
CABLE:	CSITE1_HF	AMPLIFIER (dB)	A_00312

Frequency (MHz)	Pol H/V	Azimuth Degree	Ant. Hght (m)	SA Level (QP) (dBµV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Duty Cycle Corr (dB)	Corr. Level (dBµV/m)	Corr. Level (µV/m)	Limit (µV/m)	Margin dB
Channel 3 (EUT Sideways, Y) 918.9695 MHZ												
1837.94	V	90.0	1.0	51.5	27.6	2.4	34.0	-9.8	37.6	76.0	500.0	-16.4
2756.91	V	135.0	1.0	57.2	29.6	3.2	34.5	-9.8	45.7	191.7	500.0	-8.3
3675.88	V	225.0	1.0	51.8	30.8	3.7	34.6	-9.8	41.9	124.7	500.0	-12.1
4594.85	V	135.0	1.0	48.7	32.2	4.0	34.5	-9.8	40.4	105.2	500.0	-13.5
5513.82	V	0.0	1.0	44.0	33.7	4.2	34.4	-9.8	37.6	76.1	500.0	-16.4
6432.79	V	0.0	1.0	42.2	35.6	4.7	34.6	-9.8	37.9	79.0	500.0	-16.0
7351.76	V	0.0	1.0	43.0	37.1	5.0	34.8	-9.8	40.6	106.6	500.0	-13.4 a
8270.73	V	0.0	1.0	43.5	37.5	5.3	34.0	-9.8	42.4	132.3	500.0	-11.5 a
9189.70	V	0.0	1.0	44.0	38.2	5.6	33.0	-9.8	44.9	174.9	500.0	-9.1 a
1837.94	H	202.5	1.0	54.7	27.6	2.4	34.0	-9.8	40.8	109.5	500.0	-13.2
2756.91	H	135.0	1.0	57.8	29.6	3.2	34.5	-9.8	46.3	206.8	500.0	-7.7
3675.88	H	225.0	1.0	48.5	30.8	3.7	34.6	-9.8	38.6	85.0	500.0	-15.4
4594.85	H	180.0	1.0	49.7	32.2	4.0	34.5	-9.8	41.4	118.1	500.0	-12.5
5513.82	H	135.0	1.0	48.0	33.7	4.2	34.4	-9.8	41.6	120.6	500.0	-12.4
6432.79	H	0.0	1.0	42.7	35.6	4.7	34.6	-9.8	38.4	83.6	500.0	-15.5 a
7351.76	H	0.0	1.0	42.3	37.1	5.0	34.8	-9.8	39.9	98.7	500.0	-14.1 a
8270.73	H	0.0	1.0	42.7	37.5	5.3	34.0	-9.8	41.6	120.2	500.0	-12.4 a
9189.70	H	0.0	1.0	42.8	38.2	5.6	33.0	-9.8	43.7	152.9	500.0	-10.3 a

a = ambient reading

Table 8. Radiated Emissions Data, Channel 4 Emissions Above 1GHz

CLIENT:	Electrosorce	DATE:	4/5/2004
TESTER:	Ken Gemmell	JOB #:	8083
<u>EUT Information:</u>		<u>Test Requirements:</u>	
EUT:	Spirit	TEST STANDARD:	FCC Part 15
CONFIGURATION:	On (button held down)	DISTANCE:	3m
CLASS:	B	S/N:	#S286
<u>Test Equipment/Limit:</u>			
ANTENNA:	A_00425	LIMIT:	LFCC_3m_Class_B
CABLE:	CSITE1_HF	AMPLIFIER (dB)	A_00312

Frequency (MHz)	Pol H/V	Azth Degree	Ant. Hgh t (m)	SA Level (QP) (dBµV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Duty Cycle Corr (dB)	Corr. Level (dBµV/m)	Corr. Level (µV/m)	Limit (µV/m)	Margi n dB
923.475 MHz Channel 4 (EUT Flat, X)												
1846.95	V	90.0	1.0	51.7	28.7	2.4	34.0	-9.8	38.9	88.5	500.0	-15.0
2770.43	V	135.0	1.0	56.7	30.4	3.2	34.5	-9.8	46.0	199.1	500.0	-8.0
3693.90	V	225.0	1.0	47.5	31.1	3.7	34.6	-9.8	37.9	78.3	500.0	-16.1
4617.38	V	135.0	1.0	52.3	32.8	4.0	34.5	-9.8	44.8	173.0	500.0	-9.2
5540.85	V	0.0	1.0	42.2	34.5	4.3	34.4	-9.8	36.7	68.4	500.0	-17.3 a
6464.33	V	0.0	1.0	42.8	36.3	4.7	34.6	-9.8	39.3	92.4	500.0	-14.7 a
7387.80	V	0.0	1.0	42.2	37.8	5.1	34.8	-9.8	40.4	104.6	500.0	-13.6 a
8311.28	V	0.0	1.0	42.0	38.5	5.3	34.0	-9.8	42.0	125.5	500.0	-12.0 a
9234.75	V	0.0	1.0	43.3	39.3	5.6	33.0	-9.8	45.3	184.0	500.0	-8.7 a
1846.95	H	225.0	1.0	53.8	28.7	2.4	34.0	-9.8	41.1	113.2	500.0	-12.9
2770.43	H	180.0	1.0	52.8	30.4	3.2	34.5	-9.8	42.1	127.5	500.0	-11.9
3693.90	H	225.0	1.0	48.8	31.1	3.7	34.6	-9.8	39.2	90.9	500.0	-14.8
4617.38	H	180.0	1.0	48.2	32.8	4.0	34.5	-9.8	40.6	107.5	500.0	-13.3
5540.85	H	0.0	1.0	42.2	34.5	4.3	34.4	-9.8	36.7	68.4	500.0	-17.3 a
6464.33	H	0.0	1.0	42.8	36.3	4.7	34.6	-9.8	39.3	92.4	500.0	-14.7 a
7387.80	H	0.0	1.0	42.2	37.8	5.1	34.8	-9.8	40.4	104.6	500.0	-13.6 a
8311.28	H	0.0	1.0	42.0	38.5	5.3	34.0	-9.8	42.0	125.5	500.0	-12.0 a
9234.75	H	0.0	1.0	43.3	39.3	5.6	33.0	-9.8	45.3	184.0	500.0	-8.7 a
Channel 4 (EUT Sideways, Z)												
1846.95	V	90.0	1.0	49.2	28.7	2.4	34.0	-9.8	36.4	66.4	500.0	-17.5
2770.43	V	135.0	1.0	56.7	30.4	3.2	34.5	-9.8	46.0	199.1	500.0	-8.0
3693.90	V	225.0	1.0	48.7	31.1	3.7	34.6	-9.8	39.0	89.6	500.0	-14.9
4617.38	V	135.0	1.0	50.7	32.8	4.0	34.5	-9.8	43.1	142.9	500.0	-10.9
5540.85	V	0.0	1.0	43.8	34.5	4.3	34.4	-9.8	38.4	82.8	500.0	-15.6 a
6464.33	V	0.0	1.0	42.2	36.3	4.7	34.6	-9.8	38.7	85.6	500.0	-15.3 a
7387.80	V	0.0	1.0	43.2	37.8	5.1	34.8	-9.8	41.4	117.4	500.0	-12.6 a
8311.28	V	0.0	1.0	41.7	38.5	5.3	34.0	-9.8	41.7	120.9	500.0	-12.3 a
9234.75	V	0.0	1.0	43.0	39.3	5.6	33.0	-9.8	45.0	177.1	500.0	-9.0 a

Frequenc y (MHz)	Pol H/V	Azth Degree	Ant. Hgh t (m)	SA Level (QP) (dBµV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Amp Gain (dB)	Duty Cycle Corr (dB)	Corr. Level (dBµV/m)	Corr. Level (µV/m)	Limit (µV/m)	Margi n dB
1846.95	H	202.5	1.0	51.6	28.7	2.4	34.0	-9.8	38.8	87.3	500.0	-15.2
2770.43	H	135.0	1.0	57.3	30.4	3.2	34.5	-9.8	46.6	214.8	500.0	-7.3
3693.90	H	225.0	1.0	51.7	31.1	3.7	34.6	-9.8	42.0	126.5	500.0	-11.9
4617.38	H	180.0	1.0	48.8	32.8	4.0	34.5	-9.8	41.3	115.6	500.0	-12.7
5540.85	H	0.0	1.0	43.7	34.5	4.3	34.4	-9.8	38.2	81.3	500.0	-15.8 a
6464.33	H	0.0	1.0	43.3	36.3	4.7	34.6	-9.8	39.8	97.8	500.0	-14.2 a
7387.80	H	0.0	1.0	41.7	37.8	5.1	34.8	-9.8	39.9	98.8	500.0	-14.1 a
8311.28	H	0.0	1.0	41.5	38.5	5.3	34.0	-9.8	41.5	118.5	500.0	-12.5 a
9234.75	H	0.0	1.0	43.0	39.3	5.6	33.0	-9.8	45.0	177.1	500.0	-9.0 a
Channel 4 (EUT Upright Y)												
1846.95	V	90.0	1.0	50.8	28.7	2.4	34.0	-9.8	38.1	80.4	500.0	-15.9
2770.43	V	135.0	1.0	56.5	30.4	3.2	34.5	-9.8	45.8	195.3	500.0	-8.2
3693.90	V	225.0	1.0	51.5	31.1	3.7	34.6	-9.8	41.9	124.1	500.0	-12.1
4617.38	V	135.0	1.0	48.5	32.8	4.0	34.5	-9.8	40.9	111.3	500.0	-13.0
5540.85	V	0.0	1.0	43.7	34.5	4.3	34.4	-9.8	38.2	81.3	500.0	-15.8
6464.33	V	0.0	1.0	43.0	36.3	4.7	34.6	-9.8	39.5	94.2	500.0	-14.5
7387.80	V	0.0	1.0	42.7	37.8	5.1	34.8	-9.8	40.9	110.8	500.0	-13.1
8311.28	V	0.0	1.0	40.8	38.5	5.3	34.0	-9.8	40.8	109.7	500.0	-13.2
9234.75	V	0.0	1.0	41.8	39.3	5.6	33.0	-9.8	43.8	154.8	500.0	-10.2
1846.95	H	202.5	1.0	53.5	28.7	2.4	34.0	-9.8	40.8	109.3	500.0	-13.2
2770.43	H	135.0	1.0	58.8	30.4	3.2	34.5	-9.8	48.1	255.3	500.0	-5.8
3693.90	H	225.0	1.0	49.8	31.1	3.7	34.6	-9.8	40.2	102.4	500.0	-13.8
4617.38	H	180.0	1.0	50.8	32.8	4.0	34.5	-9.8	43.3	145.6	500.0	-10.7
5540.85	H	0.0	1.0	47.3	34.5	4.3	34.4	-9.8	41.9	123.8	500.0	-12.1
6464.33	H	0.0	1.0	41.8	36.3	4.7	34.6	-9.8	38.3	82.3	500.0	-15.7
7387.80	H	0.0	1.0	42.3	37.8	5.1	34.8	-9.8	40.6	106.5	500.0	-13.4
8311.28	H	0.0	1.0	42.3	38.5	5.3	34.0	-9.8	42.3	130.3	500.0	-11.7
9234.75	H	0.0	1.0	42.8	39.3	5.6	33.0	-9.8	44.8	173.7	500.0	-9.2

a = ambient reading