FCC Certification Test Report

FCC Certification Test Report for Pelican Accessories 07X-SW-1

December 16, 2002

Prepared for:

Pelican Accessories
1840 East 27th Street
Vernon, CA 90058

Prepared By:

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

FCC Certification Test Program

FCC Certification Test Report
for the
Pelican Accessories
D2028P (PL651) PS2 Wireless Controller
07X-SW-1

December 16, 2002

WLL JOB# 7299

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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 a 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 D2028P (PL651) PS2 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. 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 D2028P (PL651) PS2 Wireless Controller complies with the limits for a Intentional Radiator device under Part 15.249 of the FCC Rules and Regulations.

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1 Introduction

1.1 Compliance Statement

The Pelican Accessories D2028P (PL651) PS2 Wireless Controller 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 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: 60403

1.4 Test Dates

Testing was performed from October 14, 2002 to October 18, 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

The Pelican Accessories D2028P (PL651) PS2 Wireless Controller is part of the wireless controller system for the Sony™ PlayStation 2® video game system. The D2028P (PL651) replaces the hard-wired controller, and transmits and receives play commands to the Pelican system interface (the D2028H "dongle", separate certification).

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-SW-1
EUT Name:	PS2 Wireless Controller
Model:	D2028P (PL651)
FCC Rule Parts:	§15.249
Frequency Range:	906 MHz to 926.5 MHz: CH1 ~906M, CH2 ~926.5M, CH3 ~920M and CH4 ~913MHz
Maximum Output Power:	<1mW
Modulation:	FSK
Necessary Bandwidth:	242 kHz
Keying:	Manual
Type of Information:	Control
Number of Channels:	4
Power Output Level	Fixed
Antenna Type	Fixed/Integral
Interface Cables:	None
Power Source & Voltage:	3VDC from batteries

2.2 Test Configuration

The D2028P (PL651) was configured with a Sony PlayStation 2 game console, a television set, and a Pelican D2028H (Dongle) interface.

2.3 Testing Algorithm

The D2028P (PL651) was operated continuously by transmitting play commands to the interface/game console.

The D2028P (PL651), PlayStation 2 and television were powered on a game was inserted into the PlayStation 2. Once communication was established the D2028P (PL651) continuously transmitted to the D2028H connected to the PlayStation 2 console. All controller pad buttons were pressed to determine the worst case duty cycle

operation. It was verified that there was no difference in duty cycle or bandwidth for pressing different buttons.

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	10/20/03
Antenna Research Associates LPB-2520	Biconilog Antenna Site 2	1044	00007	6/19/03
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	7/05/03
Hewlett Packard 85685A	RF Preselector (Site 2)	3221A01395	00071	5/17/03
Hewlett Packard 8568B	Spectrum Analyzer (Site 2)	2928A04750	00072	7/03/03
Solar Electronics 8012-50-R-24-BNC	LISN	8379493	00124	7/05/03

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 = $N_1L_1 + N_2L_2 + \ldots + N_{N-1}L_{N-1} + N_NL_N$, 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 20log[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:
    - Duty cycle = $(N_1L_1 + N_2L_2 + \ldots + N_{N-1}L_{N-1} + N_NL_N)/100$ 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.

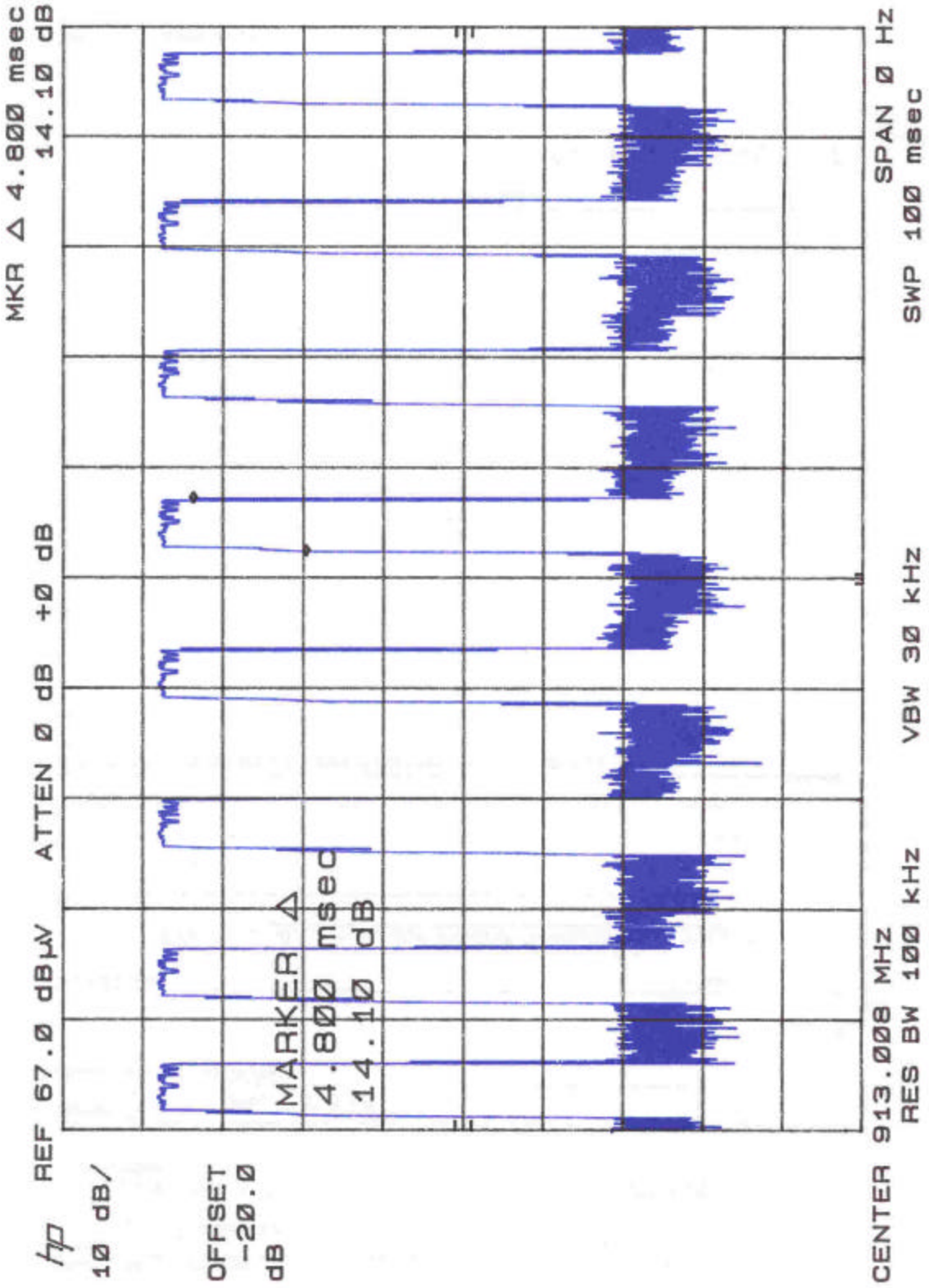

Figure 1. Duty Cycle Plot Full Period

From the data in Figure 1the following calculations are made.

On Time Per 100ms (worst case):

8 x 4.8ms = 38.4ms

Duty cycle calculation:

38.4ms/100ms = 38.4% on time = -8.3dB 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.

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

:

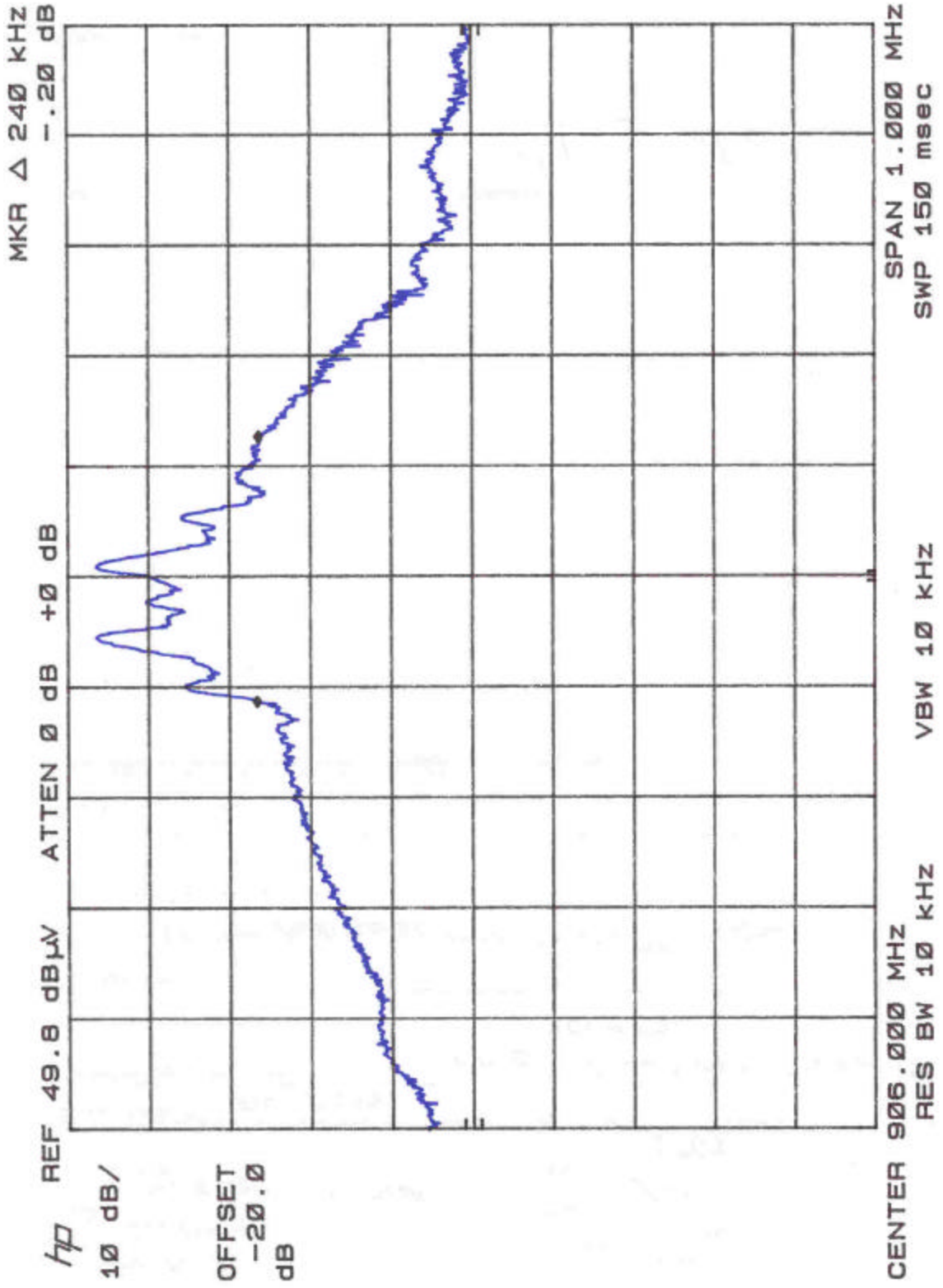

Figure 2. Occupied Bandwidth, Low

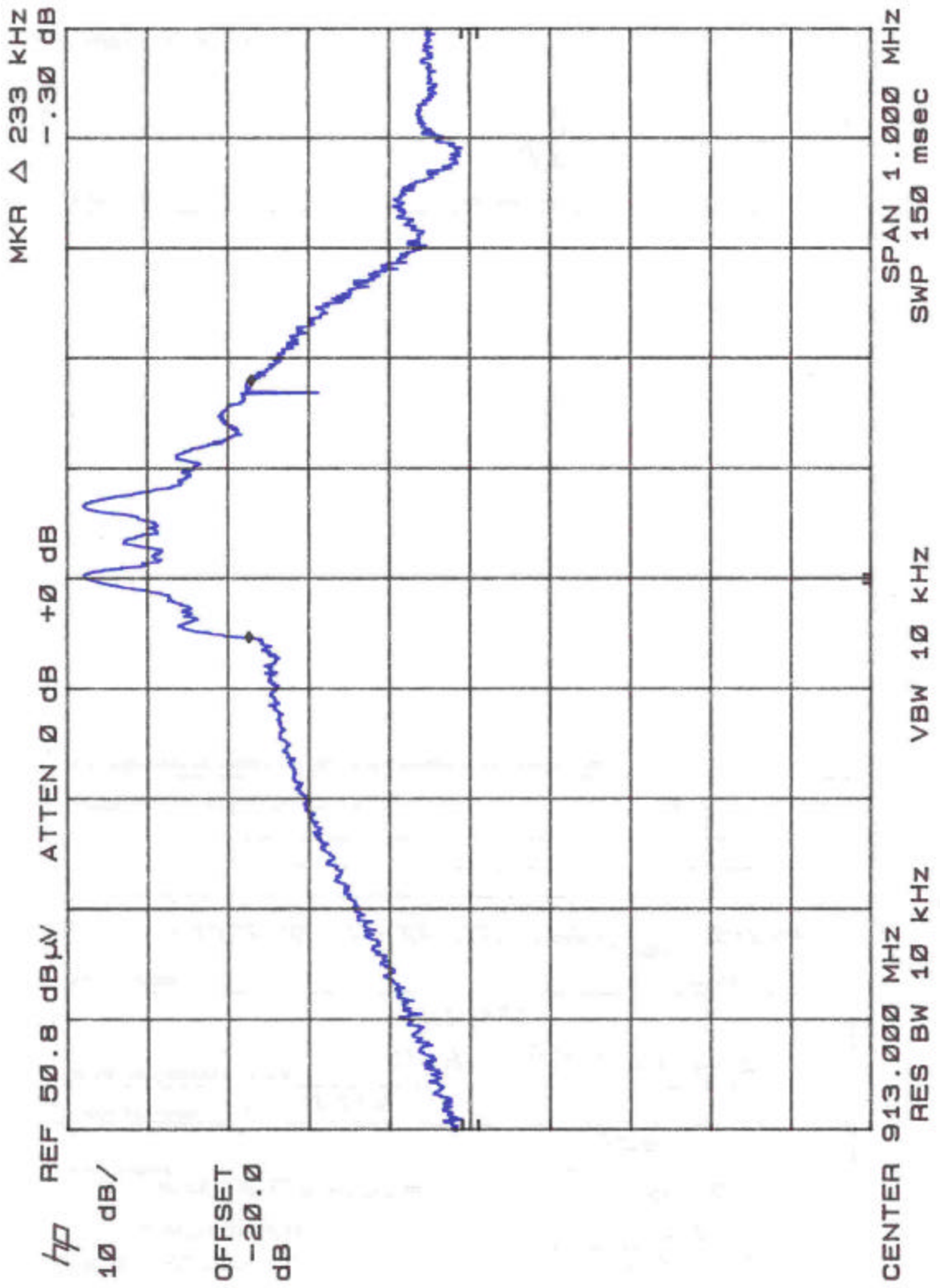

Figure 3. Occupied Bandwidth, Mid

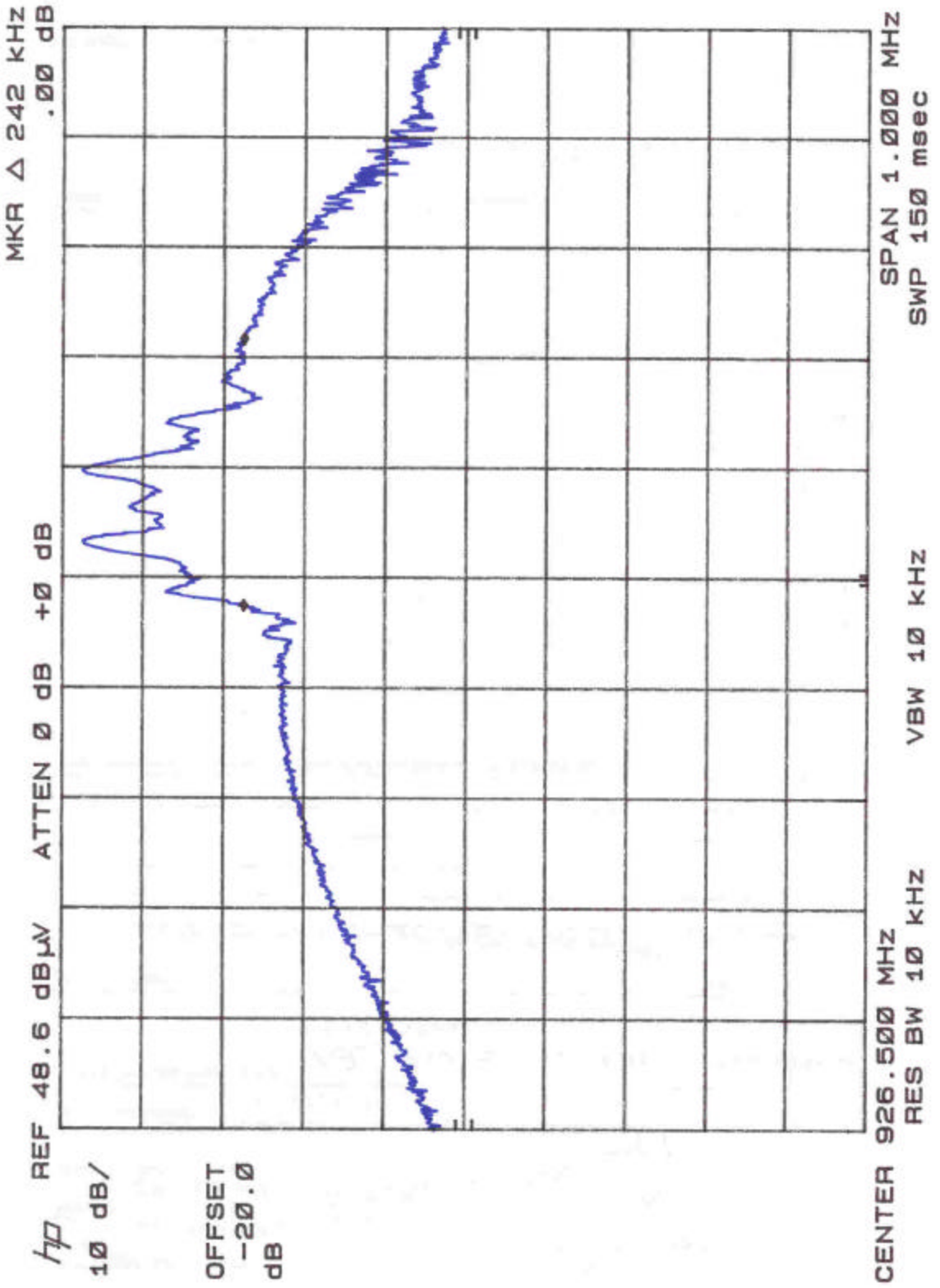

Figure 4. Occupied Bandwidth, High

Table 3 provides a summary of the Occupied Bandwidth Results.

Table 3. Occupied Bandwidth Results

Channel	Frequency	Bandwidth
Low	906.00MHz	240 kHz
Middle	913.00MHz	233 kHz
High	926.50MHz	242 kHz

4.3 Radiated Emissions: (FCC Part §2.1053)

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 (µV/m)**	**Field Strength of Harmonics (µV/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	1MHz (peak)

Emissions were measured to the 10th harmonic of the transmit frequency. The controller was tested in three orthogonal planes. 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 dBµV
Antenna Factor (Ant Corr):	AFdB/m
Cable Loss Correction (Cable Corr):	CCdB
Duty Cycle Correction (Average)	DCCdB
Amplifier Gain:	GdB
Electric Field (Corr Level):	EdBµV/m = VdBµV + AFdB/m + CCdB + DCCdB - GdB

Table 5. Radiated Emissions Test Data

CLIENT:	Electro-Source	DATE:	10/7/02
TESTER:	Ken Gemmell	JOB #:	7299
EUT Information:		**Test Requirements:**	
EUT:	Shockwave	TEST STANDARD:	FCC Part 15
CONFIGURATION:	With PS2	DISTANCE:	3m
CLOCKS:	906 MHz TX (CH1)	CLASS:	15.249
Test Equipment			
ANTENNA:	A_00007		
CABLE:	CSITE2_3m		
AMPLIFIER (dB)	0		

Frequency (MHz)	Polarity H/V	Azimuth Degree	Ant. Hght (m)	SA Level (QP) (dBuV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dBuV/m)	Corr. Level (uV/m)	Limit (uV/m)	Margin dB	Notes
EUT (Ch.4, 913 MHz)											
912.99	H	90.0	1.0	50.7	22.0	7.6	80.3	10374.9	50000.0	-13.7	X
912.99	V	90.0	1.0	42.6	22.0	7.6	72.2	4083.0	50000.0	-21.8	X
EUT (Ch.1, 906 MHz)											
906.00	H	22.0	1.0	45.0	21.7	7.6	74.3	5164.2	50000.0	-19.7	X
906.00	V	180.0	0.0	40.3	21.7	7.6	69.6	3006.1	50000.0	-24.4	Z
EUT (Ch.2, 926.5MHz)											
926.50	H	90.0	1.0	48.7	22.3	7.8	78.8	8709.6	50000.0	-15.2	X
926.50	V	90.0	1.0	40.7	22.3	7.8	70.8	3467.4	50000.0	-23.2	Y

Table 6: Radiated Emission Test Data, Average Data Above 1GHz

CLIENT: Electro-Source
TESTER: Ken Gemmell
DATE: 10/18/02
JOB #: 7299

EUT Information:
EUT: Shockwave
CONFIGURATION: With PS2

Test Requirements:
TEST STANDARD: FCC Part 15
DISTANCE: 3m
CLASS: 15.247

Test Equipment/Limit:
ANTENNA: A_00004
CABLE: CSITE2_HF
LIMIT: LFCC_3m_Class_B
AMPLIFIER (dB) 34

Frequency (MHz)	Polarity H/V	Azimuth Degree	Ant. Hght (m)	SA Level (Peak) (dBuV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Duty Cycle Corr.	Corr. Level (Avg) (dBuV/m)	Corr. Level (uV/m)	Limit (uV/m)	Margin dB
CH 1											
1812.00	V	225.0	1.0	61.6	28.3	3.1	-8.3	50.7	342.8	500.0	-3.3
1812.00	H	180.0	1.0	61.2	28.3	3.1	-8.3	50.3	327.3	500.0	-3.7
2718.00	V	90.0	1.0	59.8	30.3	2.9	-8.3	50.7	341.9	500.0	-3.3
2718.00	H	90.0	1.0	59.7	30.3	2.9	-8.3	50.6	338.0	500.0	-3.4
3624.00	V	90.0	1.0	52.3	31.4	2.8	-8.3	44.1	160.0	500.0	-9.9
3624.00	H	90.0	1.0	50.8	31.4	2.8	-8.3	42.6	135.7	500.0	-11.3
4530.00	V	90.0	1.0	52.6	32.4	3.7	-8.3	46.5	211.2	500.0	-7.5
4530.00	H	270.0	1.0	49.8	32.4	3.7	-8.3	43.6	151.6	500.0	-10.4
5436.00	H	180.0	1.0	47.9	33.9	4.3	-8.3	43.8	155.4	500.0	-10.2
5436.00	V	180.0	1.0	47.6	33.9	4.3	-8.3	43.4	148.5	500.0	-10.5
6342.00	H	0.0	1.0	44.6	35.9	4.2	-8.3	42.4	132.4	500.0	-11.5
6342.00	V	0.0	1.0	43.6	35.9	4.2	-8.3	41.4	117.4	500.0	-12.6
7248.00	V	0.0	1.0	45.6	37.8	4.5	-8.3	45.6	190.7	500.0	-8.4
7248.00	V	0.0	1.0	44.5	37.8	4.5	-8.3	44.5	168.8	500.0	-9.4
8154.00	H	0.0	1.0	45.5	38.5	4.9	-8.3	46.6	212.8	500.0	-7.4
8154.00	V	0.0	1.0	44.6	38.5	4.9	-8.3	45.6	190.6	500.0	-8.4
9060.00	H	0.0	1.0	43.8	39.1	4.9	-8.3	45.4	187.3	500.0	-8.5
9060.00	V	0.0	1.0	42.1	39.1	4.9	-8.3	43.8	154.3	500.0	-10.2
CH 4											
1826.00	V	180.0	1.0	61.4	28.3	3.1	-8.3	50.6	337.8	500.0	-3.4
1826.00	H	90.0	1.0	60.1	28.3	3.1	-8.3	49.2	289.5	500.0	-4.7
2739.00	H	135.0	1.0	58.7	30.3	2.9	-8.3	49.6	300.6	500.0	-4.4
2739.00	V	180.0	1.0	58.1	30.3	2.9	-8.3	49.0	280.8	500.0	-5.0
3652.00	H	180.0	1.0	53.8	31.4	2.8	-8.3	45.7	191.8	500.0	-8.3
3652.00	V	270.0	1.0	52.3	31.4	2.8	-8.3	44.2	161.4	500.0	-9.8
4565.00	V	90.0	1.0	49.8	32.5	3.8	-8.3	43.7	153.8	500.0	-10.2
4565.00	H	0.0	1.0	48.9	32.5	3.8	-8.3	42.9	139.0	500.0	-11.1
5478.00	V	90.0	1.0	46.7	34.0	4.2	-8.3	42.6	135.1	500.0	-11.4
5478.00	H	0.0	1.0	46.4	34.0	4.2	-8.3	42.3	130.6	500.0	-11.7
6391.00	V	0.0	1.0	45.1	36.1	4.2	-8.3	43.1	142.5	500.0	-10.9

Frequency (MHz)	Polarity H/V	Azimuth Degree	Ant. Hght (m)	SA Level (Peak) (dBuV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Duty Cycle Corr.	Corr. Level (Avg) (dBuV/m)	Corr. Level (uV/m)	Limit (uV/m)	Margin dB
6391.00	H	0.0	1.0	44.7	36.1	4.2	-8.3	42.6	135.6	500.0	-11.3
7304.00	H	0.0	1.0	44.6	37.9	4.6	-8.3	44.7	172.2	500.0	-9.3
7304.00	V	0.0	1.0	43.7	37.9	4.6	-8.3	43.8	155.2	500.0	-10.2
8217.00	H	0.0	1.0	43.8	38.5	4.9	-8.3	44.9	175.2	500.0	-9.1
8217.00	V	0.0	1.0	43.6	38.5	4.9	-8.3	44.7	172.6	500.0	-9.2
9130.00	H	0.0	1.0	41.7	39.1	4.9	-8.3	43.4	148.4	500.0	-10.6
9130.00	V	0.0	1.0	41.7	39.1	4.9	-8.3	43.4	148.2	500.0	-10.6
CH 2											
1853.00	H	180.0	1.0	57.8	28.4	3.2	-8.3	47.2	227.8	500.0	-6.8
1853.00	V	180.0	1.0	57.3	28.4	3.2	-8.3	46.6	213.8	500.0	-7.4
2779.50	H	180.0	1.0	59.6	30.4	2.9	-8.3	50.5	336.5	500.0	-3.4
2779.50	V	180.0	1.0	55.0	30.4	2.9	-8.3	45.9	198.1	500.0	-8.0
3706.00	H	180.0	1.0	53.5	31.4	2.8	-8.3	45.4	187.1	500.0	-8.5
3706.00	V	180.0	1.0	53.3	31.4	2.8	-8.3	45.2	181.3	500.0	-8.8
4632.50	V	315.0	1.0	49.7	32.6	3.9	-8.3	43.9	155.9	500.0	-10.1
4632.50	H	180.0	1.0	47.5	32.6	3.9	-8.3	41.6	120.3	500.0	-12.4
5559.00	V	90.0	1.0	47.4	34.2	4.2	-8.3	43.5	149.2	500.0	-10.5
5559.00	H	0.0	1.0	47.1	34.2	4.2	-8.3	43.2	144.4	500.0	-10.8
6485.50	H	0.0	1.0	48.9	36.3	4.2	-8.3	47.1	227.6	500.0	-6.8
6485.50	V	0.0	1.0	48.7	36.3	4.2	-8.3	46.9	222.2	500.0	-7.0
7412.00	H	0.0	1.0	47.5	37.9	4.6	-8.3	47.8	245.3	500.0	-6.2
7412.00	V	0.0	1.0	46.2	37.9	4.6	-8.3	46.4	209.7	500.0	-7.5
8338.50	V	0.0	1.0	46.2	38.6	4.9	-8.3	47.4	234.1	500.0	-6.6
8338.50	H	0.0	1.0	45.9	38.6	4.9	-8.3	47.1	225.9	500.0	-6.9
9265.00	H	0.0	1.0	46.6	39.2	5.0	-8.3	48.5	267.0	500.0	-5.4
9265.00	V	0.0	1.0	44.5	39.2	5.0	-8.3	46.5	211.4	500.0	-7.5

Table 7: Radiated Emission Test Data, Peak Data Above 1GHz

CLIENT: Electro-Source
TESTER: Ken Gemmell
EUT Information:
EUT: Shockwave
CONFIGURATION: With PS2
CLASS: 15.247
Test Equipment/Limit:
ANTENNA: A_00004
CABLE: CSITE2_HF
LIMIT: LFCC_3m_Class_B
AMPLIFIER (dB) 34

DATE: 10/18/02
JOB #: 7299
Test Requirements:
TEST STANDARD: FCC Part 15
DISTANCE: 3m

Frequency (MHz)	Polarity H/V	Azimuth Degree	Ant. Hght (m)	SA Level (Peak) (dBuV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dBuV/m)	Corr. Level (uV/m)	Limit (uV/m)	Margin dB
CH 1										
1812.00	V	225.0	1.0	61.6	28.3	3.1	59.0	891.3	5000.0	-15.0
1812.00	H	180.0	1.0	61.2	28.3	3.1	58.6	851.1	5000.0	-15.4
2718.00	V	90.0	1.0	59.8	30.3	2.9	59.0	891.3	5000.0	-15.0
2718.00	H	90.0	1.0	59.7	30.3	2.9	58.9	881.0	5000.0	-15.1
3624.00	V	90.0	1.0	52.3	31.4	2.8	52.4	416.9	5000.0	-21.6
3624.00	H	90.0	1.0	50.8	31.4	2.8	50.9	350.8	5000.0	-23.1
4530.00	V	90.0	1.0	52.6	32.4	3.7	54.8	549.5	5000.0	-19.2
4530.00	H	270.0	1.0	49.8	32.4	3.7	51.9	393.6	5000.0	-22.1
5436.00	H	180.0	1.0	47.9	33.9	4.3	52.1	402.7	5000.0	-21.9
5436.00	V	180.0	1.0	47.6	33.9	4.3	51.7	384.6	5000.0	-22.3
6342.00	H	0.0	1.0	44.6	35.9	4.2	50.7	342.8	5000.0	-23.3
6342.00	V	0.0	1.0	43.6	35.9	4.2	49.7	305.5	5000.0	-24.3
7248.00	V	0.0	1.0	45.6	37.8	4.5	53.9	495.5	5000.0	-20.1
7248.00	V	0.0	1.0	44.5	37.8	4.5	52.8	436.5	5000.0	-21.2
8154.00	H	0.0	1.0	45.5	38.5	4.9	54.9	555.9	5000.0	-19.1
8154.00	V	0.0	1.0	44.6	38.5	4.9	53.9	495.5	5000.0	-20.1
9060.00	H	0.0	1.0	43.8	39.1	4.9	53.7	484.2	5000.0	-20.3
9060.00	V	0.0	1.0	42.1	39.1	4.9	52.1	402.7	5000.0	-21.9
CH 4										
1826.00	V	180.0	1.0	61.4	28.3	3.1	58.9	881.0	5000.0	-15.1
1826.00	H	90.0	1.0	60.1	28.3	3.1	57.5	749.9	5000.0	-16.5
2739.00	H	135.0	1.0	58.7	30.3	2.9	57.9	785.2	5000.0	-16.1
2739.00	V	180.0	1.0	58.1	30.3	2.9	57.3	732.8	5000.0	-16.7
3652.00	H	180.0	1.0	53.8	31.4	2.8	54.0	501.2	5000.0	-20.0
3652.00	V	270.0	1.0	52.3	31.4	2.8	52.5	421.7	5000.0	-21.5
4565.00	V	90.0	1.0	49.8	32.5	3.8	52.0	398.1	5000.0	-22.0
4565.00	H	0.0	1.0	48.9	32.5	3.8	51.2	363.1	5000.0	-22.8
5478.00	V	90.0	1.0	46.7	34.0	4.2	50.9	350.8	5000.0	-23.1
5478.00	H	0.0	1.0	46.4	34.0	4.2	50.6	338.8	5000.0	-23.4
6391.00	V	0.0	1.0	45.1	36.1	4.2	51.4	371.5	5000.0	-22.6
6391.00	H	0.0	1.0	44.7	36.1	4.2	50.9	350.8	5000.0	-23.1

Frequency (MHz)	Polarity H/V	Azimuth Degree	Ant. Hght (m)	SA Level (Peak) (dBuV)	Ant. Corr. (dB/m)	Cable Corr. (dB)	Corr. Level (dBuV/m)	Corr. Level (uV/m)	Limit (uV/m)	Margin dB
7304.00	H	0.0	1.0	44.6	37.9	4.6	53.0	446.7	5000.0	-21.0
7304.00	V	0.0	1.0	43.7	37.9	4.6	52.1	402.7	5000.0	-21.9
8217.00	H	0.0	1.0	43.8	38.5	4.9	53.2	457.1	5000.0	-20.8
8217.00	V	0.0	1.0	43.6	38.5	4.9	53.0	446.7	5000.0	-21.0
9130.00	H	0.0	1.0	41.7	39.1	4.9	51.7	384.6	5000.0	-22.3
9130.00	V	0.0	1.0	41.7	39.1	4.9	51.7	384.6	5000.0	-22.3
CH 2										
1853.00	H	180.0	1.0	57.8	28.4	3.2	55.5	595.7	5000.0	-18.5
1853.00	V	180.0	1.0	57.3	28.4	3.2	54.9	555.9	5000.0	-19.1
2779.50	H	180.0	1.0	59.6	30.4	2.9	58.8	871.0	5000.0	-15.2
2779.50	V	180.0	1.0	55.0	30.4	2.9	54.2	512.9	5000.0	-19.8
3706.00	H	180.0	1.0	53.5	31.4	2.8	53.7	484.2	5000.0	-20.3
3706.00	V	180.0	1.0	53.3	31.4	2.8	53.5	473.2	5000.0	-20.5
4632.50	V	315.0	1.0	49.7	32.6	3.9	52.2	407.4	5000.0	-21.8
4632.50	H	180.0	1.0	47.5	32.6	3.9	49.9	312.6	5000.0	-24.1
5559.00	V	90.0	1.0	47.4	34.2	4.2	51.8	389.0	5000.0	-22.2
5559.00	H	0.0	1.0	47.1	34.2	4.2	51.5	375.8	5000.0	-22.5
6485.50	H	0.0	1.0	48.9	36.3	4.2	55.4	588.8	5000.0	-18.6
6485.50	V	0.0	1.0	48.7	36.3	4.2	55.2	575.4	5000.0	-18.8
7412.00	H	0.0	1.0	47.5	37.9	4.6	56.1	638.3	5000.0	-17.9
7412.00	V	0.0	1.0	46.2	37.9	4.6	54.7	543.3	5000.0	-19.3
8338.50	V	0.0	1.0	46.2	38.6	4.9	55.7	609.5	5000.0	-18.3
8338.50	H	0.0	1.0	45.9	38.6	4.9	55.4	588.8	5000.0	-18.6
9265.00	H	0.0	1.0	46.6	39.2	5.0	56.8	691.8	5000.0	-17.2
9265.00	V	0.0	1.0	44.5	39.2	5.0	54.8	549.5	5000.0	-19.2