

Exhibit B: Test Report
Xanboo
Model XPC900 PCI Card and Auxiliary Unit

Project Number: 04042-10

Prepared for:
Xanboo
1626 Vineyard
Grand Praire , TX 75052

By

Professional Testing (EMI), Inc.
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December 2003

CERTIFICATION
Electromagnetic Interference Test Report
Xanboo
PCI Card and Auxiliary Unit, Model XPC900
(Intentional Radiator Portion)

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THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF PROFESSIONAL TESTING (EMI), INC.



Certificate of Compliance

Applicant: Xanboo
Applicant's Address: 1626 Vineyard
Grand Praire, TX 75052
FCC ID: OU4-XPC900
Project Number: 04042-10
Test Dates: July 7, 2003

I, Jeffrey A. Lenk, for Professional Testing (EMI), Inc., being familiar with the FCC rules and test procedures have reviewed the test setup, measured data and this report. I believe them to be true and accurate.

The **Xanboo, PCI Card and Auxilary Unit, Model XPC900** was tested to and found to be in compliance with FCC Part 15 Subpart C for an Intentional Radiator.

The highest emissions generated by the above equipment are listed below:

	<u>Frequency (MHz)</u>	<u>Level (dBμV/m)</u>	<u>Limit (dBμV/m)</u>	<u>Margin (dB)</u>
Fundamental	418	72.9	80.3	-7.4
Spurious	158	40.1	40	0.1
Conducted	0.210	43	53	10
Occupied Bandwidth	0.578			

Jeffrey A. Lenk
President

This report has been reviewed and accepted by Xanboo. The undersigned is responsible for ensuring that **Xanboo, PCI Card and Auxilary Unit, Model XPC900** will continue to comply with the FCC rules.

1.0 EUT Description

The Equipment under Test (EUT) is the **Xanboo, PCI Card and Auxiliary Unit, Model XPC900**. The EUT is part of a security system. It provides a link from the security sensors to a personal computer. The unit is powered by a PCI card in the host computer, so that data and power can run in the same cable bundle. The EUT operates at 418 MHz and is designed for compliance with 47 CFR 15.231 of the FCC rules. Specific test requirements for this device include the following:

47 CFR 15.209 & 15.231	Fundamental Transmit Power
47 CFR 15.231 & 15.205	Spurious Radiated Power
47 CFR 15.231	Occupied Bandwidth
47 CFR 15.203	Antenna Requirement
47 CFR 15.207	Conducted Emissions

The system tested consisted of the following:

<u>Manufacturer & Model</u>	<u>Serial #</u>	<u>FCC ID #</u>	<u>Description</u>
Xanboo, PCI Card and Auxiliary Unit, Model XPC900	N/A		PCI Card and transmitter
<u>Remote Equipment</u>			
Dell PC	7NQR501	None	PC
<u>System Peripherals</u>			
Dell Keyboard	0593	GYUM90SK	Keyboard
Logitech Mouse	LZA82053358	PZL211107	Bus Mouse
Dell Monitor	6204TA002D	NA	Color Monitor
Epson Printer	1F8E706637	BKMP630B	Dot Matrix Printer
Xanboo, XANPCI 3-A	NA	NA	Provides power and control to EUT

Cables and Cords:

Quantity	Length		Shielded	Unshielded	Type	Cable	Cord
	Each	Feet					
1	6	2	X		Video	X	
1	9	3	X		Printer	X	
1	6	2		X	Power		X

1.1 EUT Operation

The **Xanboo PCI Card and Auxiliary Unit, Model XPC900** was hosted in a PC and made to transmit at full band rate continuously.

2.0 Electromagnetic Emissions Testing

Professional Testing (EMI), Inc. (PTI), follows the guidelines of NIST for all uncertainty calculations, estimates and expressions thereof for EMC testing.

2.1 Conducted Emissions Measurements

Conducted emissions measurements were made on the mains terminals of the host computer of the **Xanboo PCI Card and Auxiliary Unit, Model XPC900** was attached to, to determine the line-to-ground radio noise emitted from each power-input terminal. Conducted emissions measurements on the mains terminals were performed at Professional Testing, located in Round Rock, Texas.

2.1.1 Test Procedure

The EUT was configured and operated in a continuously transmitting mode, which is an atypical mode used for the purpose of testing. The EUT power cord in excess of one meter was folded back and forth forming a bundle 30 to 40 cm long in the approximate center of the cable. Power supply cords for the peripheral equipment were powered from an auxiliary LISN. Excess interface cable lengths were separately bundled in a non-inductive arrangement at the approximate center of the cable with the bundle 30 to 40 centimeters in length. The conducted emissions were maximized, by varying the operating states and configuration of the EUT.

The tests were performed in a 12' x 16' RayProof modular shielded room. The EUT was placed on a non-metallic table 0.4 meters from a vertical metal reference plane and 0.8 meters from a horizontal metal reference plane.

The measurements were taken using a Line Impedance Stabilization Network (LISN). A Spectrum Analyzer with a measurement bandwidth of 10 kHz was used to record the conducted emissions measurements. The configuration of the shielded room showing the location of the EUT and the measurement equipment is given as Figure 1.

2.1.2 Test Criteria

The FCC Part 15.207 B conducted emissions limits are given below.

Frequency (MHz)	Limits (dB μ V) <u>Average</u>	Limits (dB μ V) <u>Quasi-Peak</u>
0.15 – .50	56 - 46	66 to 56
.50 - 5	46	56
5 – 30	50	60

The lower limit shall apply at the transition frequency.

2.1.3 Test Results

The conducted emissions data is included as Appendix A. The conducted emissions generated by the **Xanboo PCI Card and Auxiliary Unit, Model XPC900** as measured on the mains terminal of the host computer were found to be below FCC 15.207 maximum emissions criteria.

2.2 Radiated Emissions Measurements

Radiated emission measurements were made of the Fundamental and Spurious Emission levels for the **Xanboo PCI Card and Auxiliary Unit, Model XPC900**. Measurements of the occupied bandwidth were also made for the XPC900 Transmitter.

Measurements of the maximum emission levels for the fundamental and the spurious/harmonic emissions of the **Xanboo PCI Card and Auxiliary Unit, Model XPC900** were made at the Professional Testing "Open Field" Site 3, located in Round Rock, Texas to determine the radio noise radiated from the EUT. A "Description of Measurement Facilities" has been submitted to the FCC and approved pursuant to Section 2.948 of CFR 47 of the FCC rules.

Tests of the fundamental for the device were performed to determine the worst case polarization of the device.

2.2.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable which allows 360 degree rotation. For measurements of the fundamental signal, a measurement antenna was positioned at a distance of 3 meters as measured from the closest point of the EUT. For harmonic measurements above 1 GHz, the measurement antenna was placed 1 meter from the EUT. The radiated emissions were maximized by rotating the EUT.

A Spectrum Analyzer with peak detection was used to find the maximums of the radiated emissions during the variability testing. A drawing showing the test setup is given as Figure 2.

2.2.2 Test Criteria

The table below shows FCC Part 15.231 radiated limits for an intentional radiator operating at 418 MHz band. FCC Part 15.231 allows the use of its spurious limit which is higher than the 15.209 limit normally associated with the restricted bands outlined in 15.205. The spurious measurements of the harmonic were performed to the 3rd harmonic of the fundamental. The reference distance for each limit is also shown in this table.

<u>Signal Type</u>	<u>Test Distance (Meters)</u>	<u>Field Strength</u>	
		<u>(μV/m)</u>	<u>(dBμV/m)</u>
Fundamental 418 MHz	3	10351	80.3
Harmonics (through 3rd)	3	1035	60.3

Note: Radiated emissions above 1000 MHz were measured at 1 meter and the limit was increased by 9.5 dB.

2.2.3 Test Results

The radiated test data for the fundamental is included in Appendix A. Peak detection was used during the test and the corrected signal level was then averaged to account for the duty cycle of the pulsed transmission of the 418 MHz transmitter. The radiated emission test data for the harmonics is included in Appendix A. The emissions were maximized at each frequency and the highest emissions identified were measured using peak detection. The radiated emissions generated by the **Xanboo PCI Card and Auxiliary Unit, Model XPC900** are below the FCC Part 15.231 maximum emission criteria.

3.0 Occupied Bandwidth Measurements

Measurements of the occupied bandwidth for the fundamental signals of the FCC Part 15.231 were made at the Professional Testing's Round Rock, Texas site. All measurements were made in a controlled indoor environment in a configuration which did not present measurement distortion or ambient interference.

3.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the floor. The table was rotated to an angle which presented the highest signal level. The occupied bandwidth was measured on the device. The occupied bandwidth was based on a 20 dB criteria (20 dB down either side of the emission from the peak emission).

3.2 Test Criteria

According to FCC Part 15.231, the bandwidth of the emission shall not be wider than 0.25 % of the center frequency for the devices operating above 70 MHz and below 900 MHz. The limit is 1.045 MHz for the transmitter working at 418 MHz.

Measurement of the occupied bandwidth was performed to verify that the emission bandwidth from the EUT did not exceed 1.045 MHz. The typical occupied bandwidth for the module is 170 kHz.

FCC Part 15.249 deals with frequency bands. No occupied bandwidth criteria is set forth.

3.3 Test Results

The occupied bandwidth test data is included in Appendix B. The occupied bandwidth for the fundamental frequency 418MHz is 158 KHz. The figure is typical for the **PCI Card and Auxiliary Unit, Model XPC900** This occupied bandwidth complies with the FCC Part 15.231 requirement.

4.0 Antenna Requirement

An analysis of the **Xanboo PCI Card and Auxiliary Unit, Model XPC900** was performed to determine compliance with Section 15.203 of the Rules. This section requires specific handling and control of antennas used for devices subject to regulations under the Intentional Radiator portions of Part 15.

4.1 Evaluation Procedure

The structure and application of the **Xanboo PCI Card and Auxiliary Unit, Model XPC900** were analyzed with respect to the rules.

The EUT has an external antenna permanently screwed in and glued to the EUT. The antenna is not accessible to the user. No auxiliary antenna port is present.

4.2 Evaluation Criteria

Section 15.203 of the rules states that the subject device must meet at least one of the following criteria:

- (a) Antenna be permanently attached to the unit.
- (b) Antenna must use a unique type of connector to attach to the EUT.
- (c) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

4.3 Evaluation Results

The **PCI Card and Auxiliary Unit, Model XPC900** meets the criteria of this rule by virtue of having an external antenna permanently attached to the unit and an internal antenna not accessible to the user. The EUT is therefore compliant with §15.203.

5.0 Modifications to Equipment

There following modification was made on the **PCI Card and Auxiliary Unit, Model XPC900** during the performance of the test program in order to meet the FCC criteria.

1. Transmitter wire antenna was shortened by one inch to reduce signal by 2dB.

6.0 List of Test Equipment

A list of the test equipment utilized to perform the testing is given below. The date of calibration is given for each.

<u>Device</u>	<u>Description</u>	<u>Calibration Due</u>
<u>Electromagnetic Emissions</u> <u>Test Equipment</u>		
EMCO 3146	Log Periodic Antenna	December 2004
EMCO 3115	Ridge Guide Antenna	June 2004
HP 8447D	Preamplifier	November 2004
HP 8566B	Spectrum Analyzer	November 2004
Tektronix 2706	RF Preselctor	January 2005
Miteq 20 dB	Preamplifier	December 2003
Miteq 30 dB	Preamplifier	December 2003
Compliance Design B-100	Biconical Antenna	December 2004
Site Cables 30 – 1000 MHz		December 2003
Armored 10 meter		June 2004
Microwave Cable		

FIGURE 1: Conducted Emissions Mains Terminal Measurements

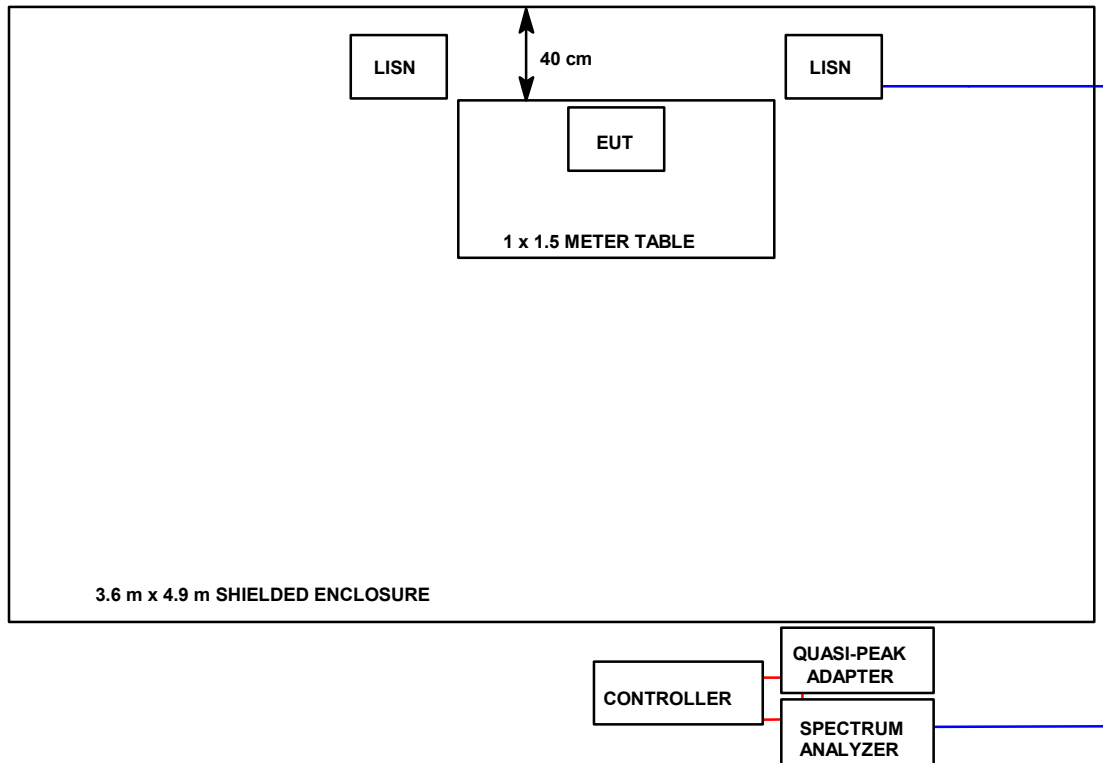
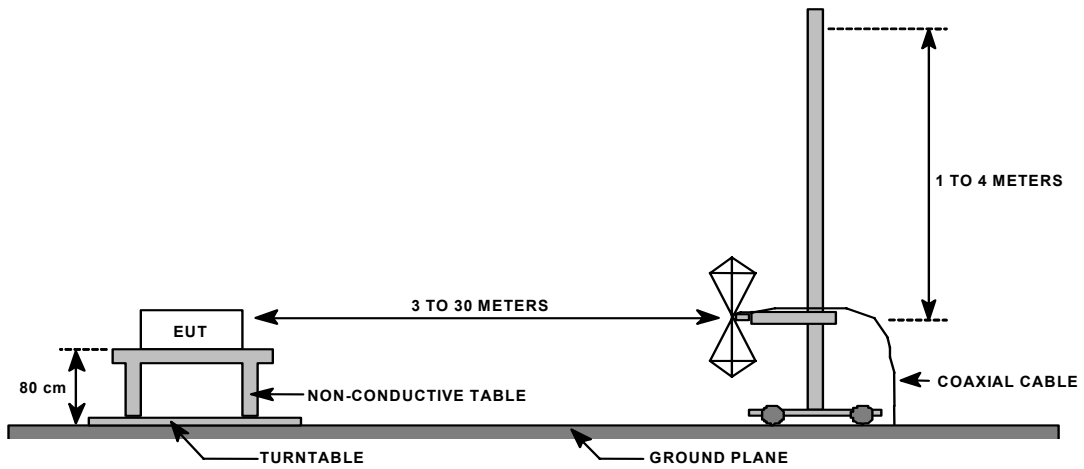
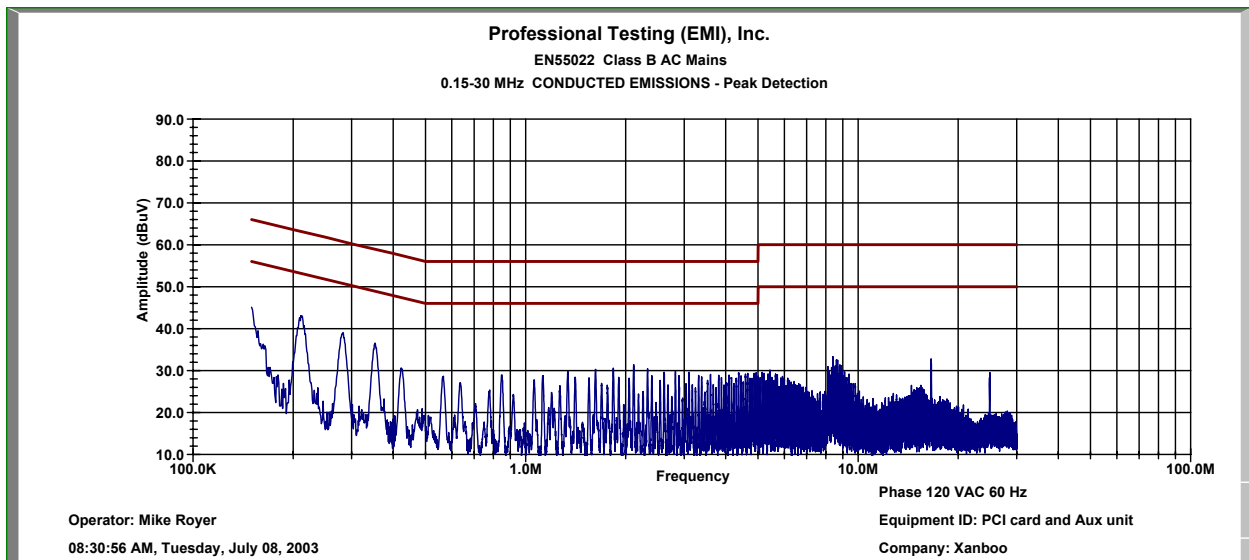
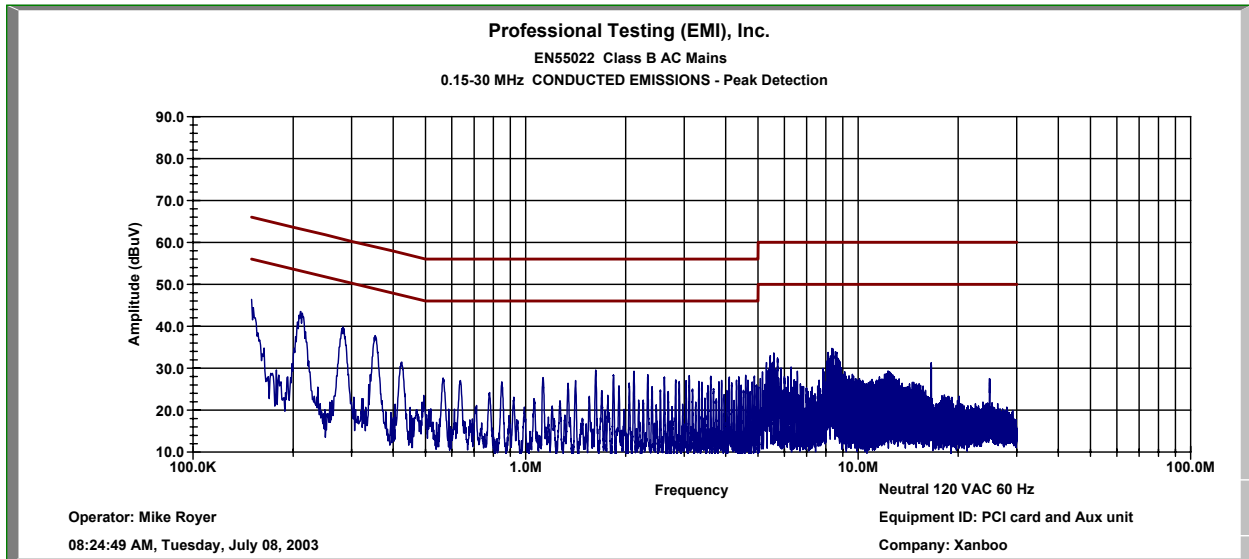


FIGURE 2: Radiated Emissions Test Setup



Conducted Data Sheet
Xanboo
PCI Card and Auxiliary Unit, Model XPC900
Transmitter

DATE: July 7, 2003
PROJECT: 04042-10



**Radiated Data Sheet
Fundamental
PCI Card and Auxiliary Unit, Model XPC900
Transmitter**

DATE: July 8, 2003
PROJECT: 04042-10

MEASUREMENT DISTANCE (m): 3
DETECTOR FUNCTION: Average

Line Measured: Horizontal

Freq. (MHz)	EUT Orientation-	EUT Dir (Deg.)	Antenna Elevation (Meters)	Test Distance (Meters)	Peak Corr Level (dBuV/m)	Averaging Factor (dB)	Average Corr Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
418	Vert	200	1.5	3.0	82.0	-14.4	67.6	80.3	-12.7
418	Horiz	180	1	3.0	87.3	-14.4	72.9	80.3	-7.4

Line Measured: Vertical

Freq. (MHz)	EUT Orientation-	EUT Dir (Deg.)	Antenna Elevation (Meters)	Test Distance Meters	Peak Corr Level (dBuV/m)	Averaging Factor (dB)	Average Corr Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
418	Vert	240	1	3.0	87.9	-14.4	73.5	80.3	-6.8
418	Horiz	330	1	3.0	81.1	-14.4	66.7	80.3	-13.6

Averaging Factor = $20 \text{ Log}(19\text{ms}/100\text{ms}) = 14.4 \text{ dB}$

Test Engineer: Mike Royer

**Radiated Data Sheet
Spurious
PCI Card and Auxiliary Unit, Model XPC900
Transmitter**

DATE: July 8, 2003
PROJECT: 04042-10

MEASUREMENT DISTANCE (m): 3
DETECTOR FUNCTION: Quasi-Peak
Line Measured: Horizontal

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
66.5	180	2.5	45	26.4	7.9	3.0	29.5	40	-10.5
67.7	180	2.5	35.4	26.4	7.6	3.0	19.6	40	-20.4
111.2	210	2	46	26.3	12.6	3.8	36.1	43.5	-7.4
135.5	100	2	47.9	26.5	12.2	5.0	38.6	43.5	-4.9
158	110	1	49.3	26.7	13.7	5.2	41.6	43.5	-1.9
180.6	100	1	45.6	26.7	16.3	5.4	40.6	43.5	-2.9
191.9	100	1	44	26.7	17.0	5.4	39.7	43.5	-3.8
203.2	90	1.5	52.7	26.7	13.0	5.6	44.6	46	-1.4
214.5	80	1.5	51.5	26.6	13.2	5.9	43.9	46	-2.1
232	80	1	52	26.6	13.6	6.3	45.3	46	-0.7
266.4	270	1	47.6	26.7	15.1	6.6	42.6	46	-3.4
324	50	1.5	46	27.1	17.0	7.3	43.1	46	-2.9
331.44	350	1.5	39.22	27.1	17.3	7.3	36.7	46	-9.3
351	150	1	45.2	27.1	18.1	7.2	43.4	46	-2.6
836.1	340	2	36.2	26.1	24.4	10.9	45.5	60.3	-14.8

Corrected Level = Recorded Level - Amplifier Gain + Antenna Factor + Cable Loss

TEST ENGINEER: Mike Royer

**Radiated Data Sheet
Spurious
PCI Card and Auxiliary Unit, Model XPC900
Transmitter**

DATE: July 7, 2003
PROJECT: 04042-10

MEASUREMENT DISTANCE (m): 3
DETECTOR FUNCTION: Quasi-Peak
Line Measured: Vertical

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elevation (Meters)	Recorded Level (dBUV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBUV/m)	Limit (dBUV/m)	Margin (dB)
66.44	250	1.5	38.9	26.4	7.9	3.0	23.4	40	-16.6
79	100	1	40.1	26.5	7.7	3.3	24.6	40	-15.4
110.6	110	1.5	37.5	26.3	12.6	3.8	27.6	40	-12.4
122.8	180	1	37.5	26.5	12.5	4.4	27.9	40	-12.1
158	170	1	47.8	26.7	13.7	5.2	40.1	40	0.1
180.6	340	1	41.2	26.7	16.3	5.4	36.2	40	-3.8
203.2	170	1	44.2	26.7	13.0	5.6	36.1	46	-9.9
214.5	0	1.5	43	26.6	13.2	5.9	35.4	46	-10.6
232	240	1	46.13	26.6	13.6	6.3	39.4	46	39.4
324	270	1	45	27.1	17.0	7.3	42.1	46	-3.9
333.5	100	1	42.1	27.1	17.4	7.3	39.6	46	-6.4
351	110	1	42.3	27.1	18.1	7.2	40.5	46	-5.5

Corrected Level = Recorded Level - Amplifier Gain + Antenna Factor + Cable Loss

TEST ENGINEER: Mike Royer

**Microwave Radiated Data Sheet
Harmonics
Xanboo
PCI Card and Auxiliary Unit, Model XPC900
Transmitter**

DATE: July 7, 2003
PROJECT: 04042-10

MEASUREMENT DISTANCE (m): 1
DETECTOR FUNCTION: Peak

Antenna Horizontal

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/M)	Cable Loss (dB)	Corrected Level (dBuV/M)	Limit (dBuV/M)	Margin (dB)
1254	90	1	69.6	23.3	24.4	2.0	72.7	80.3	-7.6
1672	90	1	49.4	23.0	26.0	2.3	54.7	80.3	-25.6
1254	90	1	59.4	23.3	24.4	2.0	62.5	80.3	-17.8
1672	90	1	41.6	23.0	26.0	2.3	46.9	80.3	-33.4

Antenna Vertical

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/M)	Cable Loss (dB)	Corrected Level (dBuV/M)	Limit (dBuV/M)	Margin (dB)
1254	30	1	59.6	23.3	24.4	2.0	62.7	80.3	-17.6
1672	200	1	43.7	23.0	26.0	2.3	49.0	80.3	-31.3
1254	90	1	69.5	23.3	24.4	2.0	72.6	80.3	-7.7
1672	90	1	43.5	23.0	26.0	2.3	48.8	80.3	-31.5
2090	100	1	42.1	22.7	27.7	2.6	49.7	80.3	-30.6

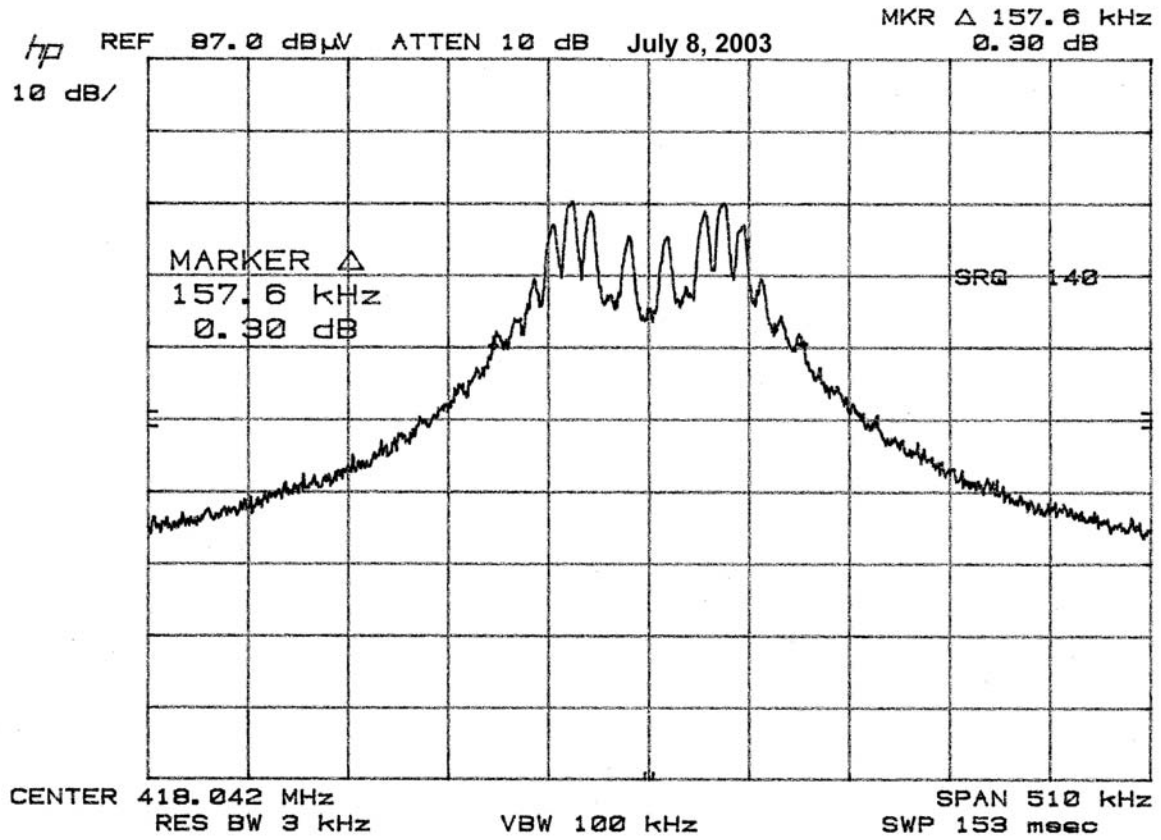
Corrected Level = Recorded Level - Amplifier Gain + Antenna Factor + Cable Loss

TEST ENGINEER: Mike Royer

Appendix B Occupied Bandwidth Data Sheets

Occupied Bandwidth Datasheet
Xanboo
PCI Card and Auxiliary Unit, Model XPC900

418 MHz Trasmmitter



Timing Measurement
Xanboo
PCI Card and Auxiliary Unit, Model XPC900

