dBi Corporation
FCC Certification Test Report

Point Six, Inc.
Wireless Vibration Transmitter
FCC ID M5ZVM1
Report Number 02dBi011

ADMINISTRATIVE INFORMATION

Historical Record:
dBi Corporation is a test house, not a manufacturer, so the original test report will be provided to Point Six, Inc. dBi Corporation will keep a copy for its records to satisfy A2LA audit requirements. We strongly recommend archiving the unit that we tested, in case there are any future questions about the product.

FCC Records:
The FCC requires the responsible party to retain the records for Class A/B products for at least two years after permanently discontinuing manufacturing/importation. These records should include the original certification/verification test report, quality audit data, and the test procedures used.

Measurement Uncertainties:
The Lexmark Electromagnetic Compatibility Laboratory (EMC Lab) has documented calculations of the measurement uncertainties associated with tests performed at the Lexmark site.

Ongoing Compliance:
The data in this test report applies only to the specific unit tested by dBi Corporation, under the conditions described herein. The manufacturer must build production units from components having identical electrical and mechanical characteristics, to ensure that they will have similar performance. The manufacturer is also fully responsible for ensuring that the product continues to comply with the FCC rules during its manufacturing life, by checking any modifications to the product that may change its interference profile.

Accreditation Status:
The Federal Communications Commission (FCC) recognized the Lexmark site as meeting the requirements of section 2.948 of the FCC Rules in a letter dated December 10, 2001. This information is on file with the FCC under Registration No. 949691.

dBi Corporation is accredited to ISO/IEC 17025 by the American Association for Laboratory Accreditation (A2LA), to perform measurements under ANSI 63.4:1992. Copies of our Accreditation Certificate and Scope of Accreditation follow.

Note: This report may be reproduced as needed, but only if done so in its entirety.

THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

DBI CORPORATION
Lexington, KY

for technical competence in the field of

Electrical Testing

The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration Laboratories" and any additional program requirements in the identified field of testing. Testing and calibration laboratories that comply with this International Standard also operate in accordance with ISO 9001 or ISO 9002 (1994).

Presented this 14th day of June, 2002.

President
For the Accreditation Council
Certificate Number 1985-01
Valid to September 30, 2004

For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation

American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999

dBi CORPORATION[1]
216 Hillsboro Avenue
Lexington, KY 40511-2105
John R. Barnes Phone: 859 253 1178

ELECTRICAL (EMC)

Valid To: September 30, 2004 Certificate Number: 1985-01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following tests:

Test Technology	Test Method(s)
Radiated Emissions	CFR 47, FCC Method Part 15, Class A and B (using ANSI: C63.4-1992, C63.4-2000, C63.4-2001) AS/NZS 3548-1995, AS/NZS CISPR 22:2002 CISPR 22-1985, 1993, 1997 EN 55022-1994, 1998 VCCI 1997, 2002
Conducted Emissions	CFR 47, FCC Method Part 15, Class A and B (using ANSI C63.4-1992, C63.4-2000, C63.4-2001) AS/NZS 3548-1995, AS/NZS CISPR 22:2002 CISPR 22-1985, 1993, 1997 EN 55022-1994, 1998 VCCI 1997, 2002

On materials and products related to the following:

Information Technology Equipment - Computers, Printers, Peripheral Devices

[1] NOTE: Testing is performed using the equipment and facilities at Lexmark International EMC Laboratory (A2LA Accreditation Certificate 0872-01)

(A2LA Cert. No. 1985.01) 06/14/02 Page 1 of 1

5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8373 • Phone: 301-644 3248 • Fax: 301-662 2974

ADMINISTRATIVE DATA

Manufacturer:
Point Six, Inc.
391 Codell Dr
Lexington, KY 40509 USA

Device: Point Six Wireless Vibration Transmitter

FCC ID: M5ZVM1

Rating: Battery operated.

Measurement Equipment Used: see attached data sheets.

Measurements According to: ANSI C63.4:1992 Class B

Report Prepared by:
John R. Barnes

Testing Performed by:
dBi Corporation
216 Hillsboro Ave
Lexington, KY 40511-2105, USA

Testing Performed on:
August 7, 2002

Testing Performed at:
Lexmark International, Inc.
Development Lab
Lexington, KY 40550 USA

Suppression, Electrical Circuits: See attached sheet

INFORMATION RELATING TO PRODUCT RF INTERFERENCE

Device: Point Six Wireless Vibration Transmitter

Model/Serial Number: 277CC402

Suppression Components: none.

Clock Frequencies: 32.768kHz, 4MHz, 418MHz.

Cables: None.

Electronic Circuit Boards: P1316.

Size of Device: 20 mm high by 45 mm wide by 60 mm deep. Weight 0.05 kg.

RADIATED INTERFERENCE

Device: Point Six Wireless Vibration Transmitter

Host and Other Peripherals: None

Name of Test: Radiated Interference

Test Location: Lexmark test facility, located at Lexington Kentucky.

Test Instrumentation: See attached sheet

Test Procedure: ANSI C63.4:1992

Note: Transmitting at 1 second intervals to speed up testing. The radiated measurements were performed at 3 meters in the Lexmark 10m Semi-Anechoic chamber located at Lexington, KY.

Test Results: Tables 1, 2, and 3 show that this unit meets the Class B radiated interference requirements of FCC Part 15, for an intentional radiator licensed to operate at 418MHz under Section 15.231(e).

Under Section 15.231(e), the average limit for the fundamental is calculated by linear interpolation from 1500uV/m at 260MHz, to 5000uV/m at 470MHz:

Average limit = ((5000uV/m-1500uV/m)*(418MHz-260MHz)/(470MHz-260MHz))+1500uV/m
= 4133uV/m
= 20*log(4133 uV/m)
= 72.33dB(uV/m)

Average limit for unwanted emissions is 20dB lower, or 52.33dB(uV/m).

Peak limit = Average limit +20dB
= 92.33dB(uV/m)

Peak limit for unwanted emissions is 20dB lower, or 72.33dB(uV/m).

SIGNED_____DATE_____
John R. Barnes, PRESIDENT dBi Corp.

RADIATED MEASUREMENTS

TABLE 1 Quasipeak Measurements

Receiver Meas. Freq. MHz	Vertical Reading dB(uV)	Horizontal Reading DB(uV)	Antenna Factor DB(1/m)	Cable Factor DB	Vertical Field Str. dB(uV/m)	Horizontal Field Str. DB(uV/m)	Class B Limit dB(uV/m)
417.93	58.98	62.78	17.19	1.11	77.28	81.08	-----
835.86	19.24	19.70	22.82	1.69	43.75	44.21	46.02

TABLE 2 Average Measurements

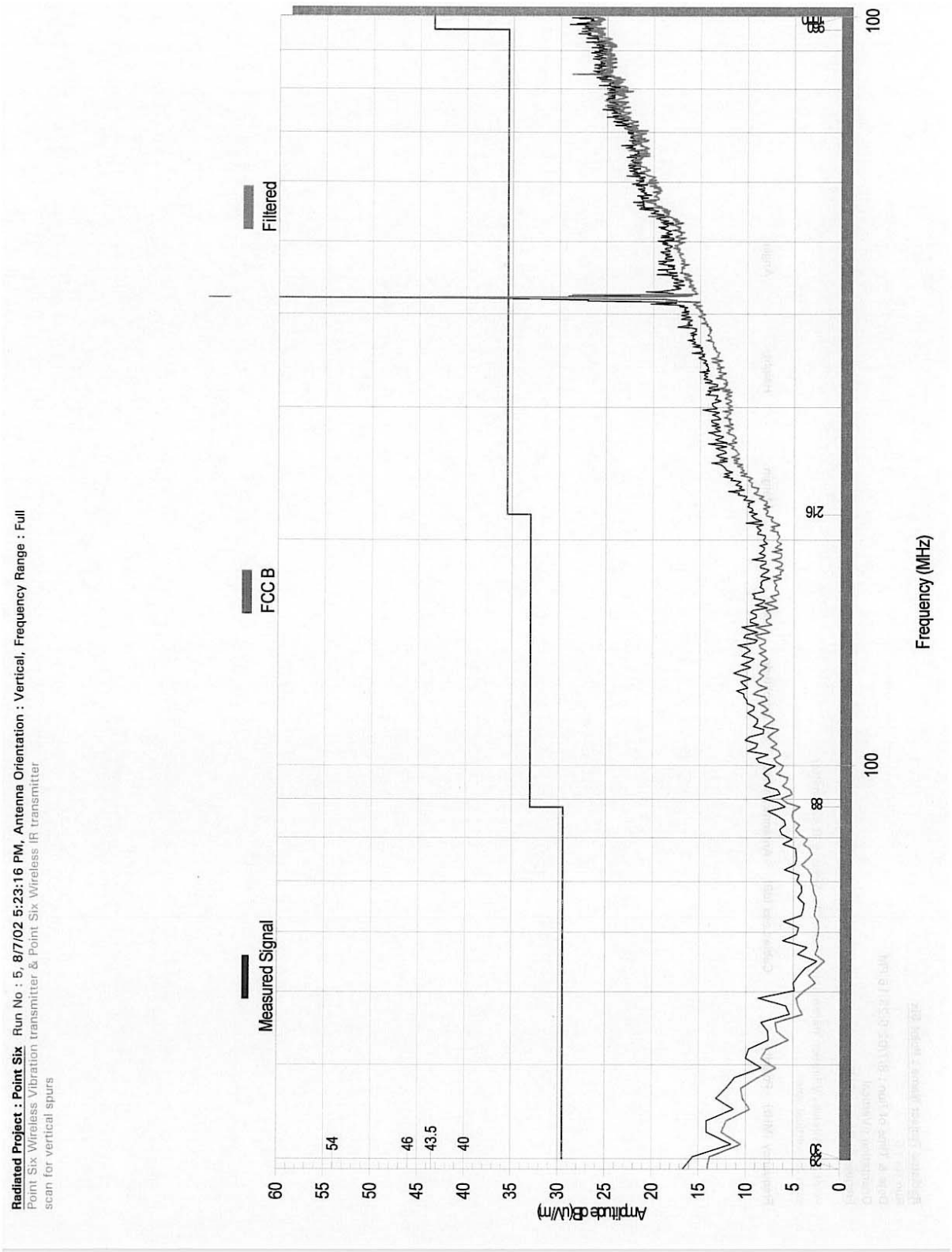
Receiver Meas. Freq. MHz	Vertical Reading dB(uV)	Horizontal Reading DB(uV)	Antenna Factor DB(1/m)	Cable Factor DB	Vertical Field Str. dB(uV/m)	Horizontal Field Str. DB(uV/m)	15.231(e) Limit dB(uV/m)
417.93	22.99	26.23	17.19	1.11	41.29	44.53	72.33
835.86	12.58	12.58	22.82	1.69	37.09	37.09	52.33
1253.72	16.60	16.60	24.06	2.13	42.79	42.79	52.33
1671.62	17.01	17.02	25.48	2.42	44.91	44.92	52.33
2089.53	18.71	18.73	26.90	2.89	48.50	48.52	52.33
2507.43	18.87	18.87	28.27	3.15	50.29	50.29	52.33
2925.34	18.17	18.19	29.65	3.63	51.45	51.47	52.33
3343.24	17.18	17.20	30.21	4.09	51.48	51.50	52.33
3761.15	17.22	17.23	30.59	4.07	51.88	51.89	52.33
4179.05	15.67	15.68	31.34	4.20	51.21	51.22	52.33

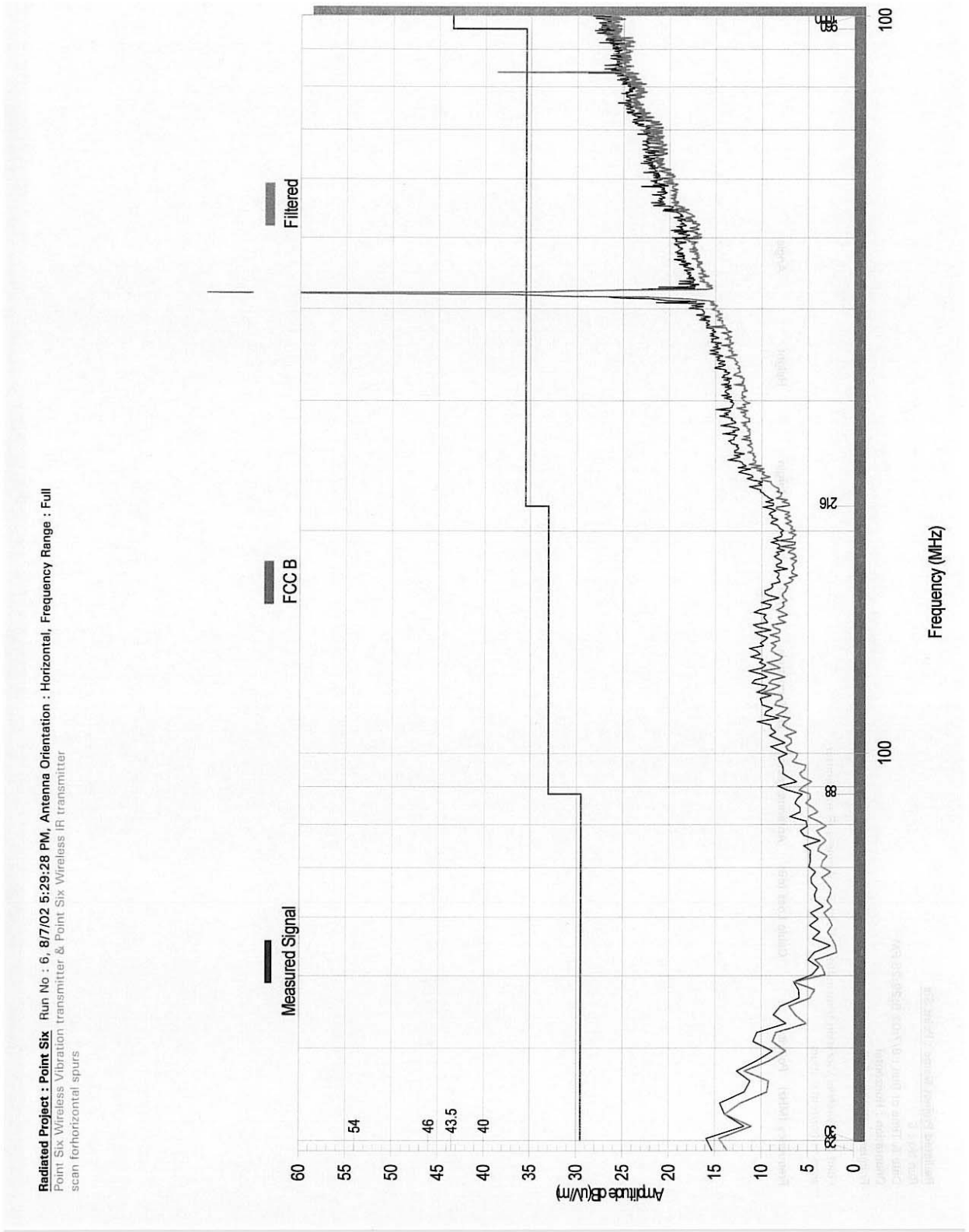
TABLE 3 Peak Measurements

Receiver Meas. Freq. MHz	Vertical Reading dB(uV)	Horizontal Reading DB(uV)	Antenna Factor DB(1/m)	Cable Factor DB	Vertical Field Str. DB(uV/m)	Horizontal Field Str. DB(uV/m)	15.231(e) Limit dB(uV/m)
417.93	62.90	66.61	17.19	1.11	81.20	84.91	92.33
835.86	25.72	27.48	22.82	1.69	50.23	51.99	72.33
1253.72	29.87	29.73	24.06	2.13	56.06	55.92	72.33
1671.62	30.37	30.10	25.48	2.42	58.27	58.00	72.33
2089.53	32.25	31.48	26.90	2.89	62.04	61.27	72.33
2507.43	33.32	32.00	28.27	3.15	64.74	63.42	72.33
2925.34	31.36	30.71	29.65	3.63	64.64	63.99	72.33
3343.24	30.84	31.24	30.21	4.09	65.14	65.54	72.33
3761.15	30.37	30.10	30.59	4.07	65.03	64.76	72.33
4179.05	28.57	29.09	31.34	4.20	64.11	64.63	72.33

Sample Calculation: Receiver reading dB(uV) plus Antenna correction factor dB(1/m) plus Cable factor dB equals Radiated Field Strength dB(uV/m).

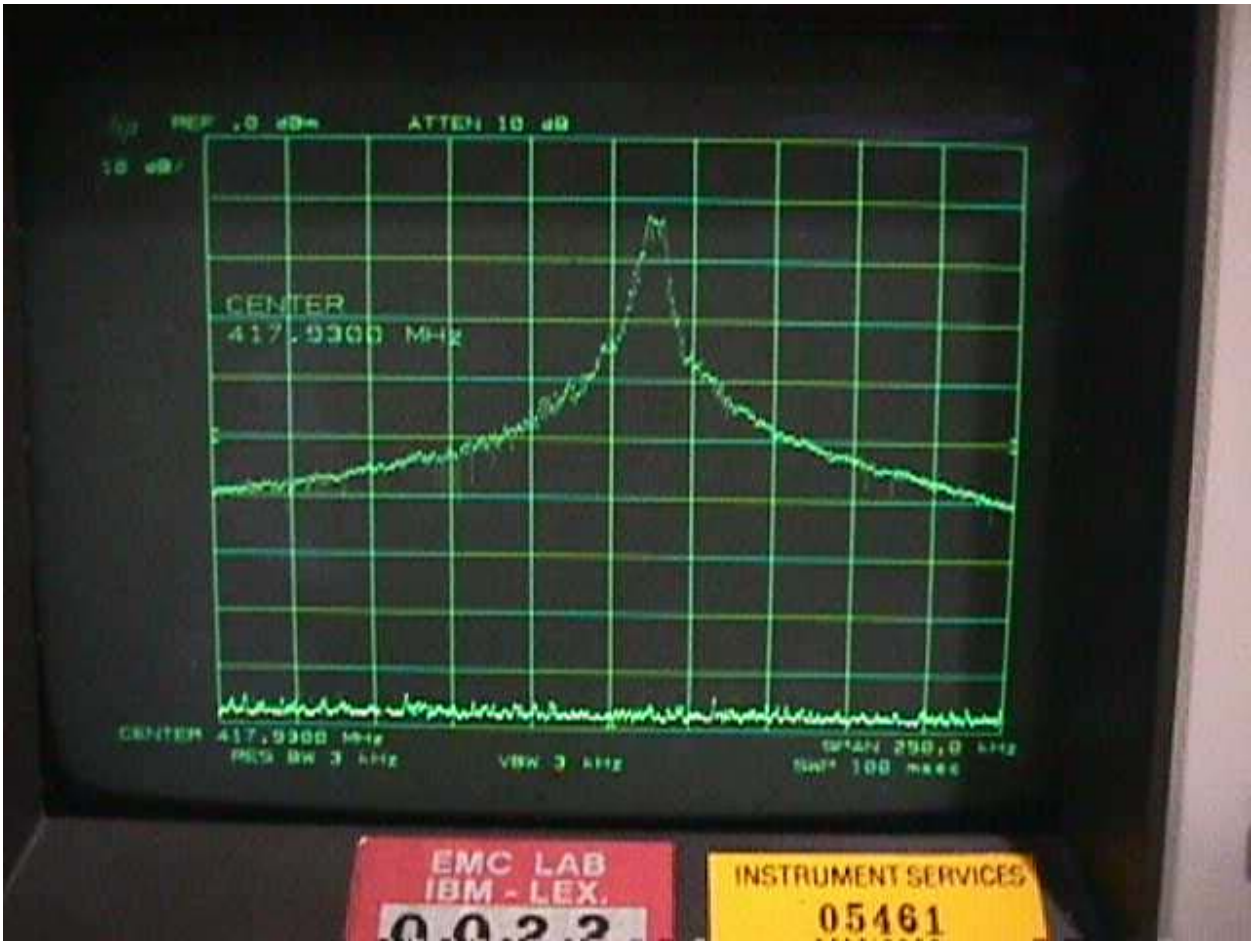
SIGNED_____DATE_____
John R. Barnes, PRESIDENT dBi Corp.


Radiated Project : Point Six Run No : 5, 8/7/02 5:23:16 PM, Antenna Orientation : Vertical, Frequency Range : Full
Point Six Wireless Vibration transmitter & Point Six Wireless IR transmitter
scan for vertical spurs
Measured Signal
FCC B
Filtered
Amplitude dB(uV/m)
Frequency (MHz)
54
46
43.5
40
216
88
100


Radiated Project : Point Six Run No : 6, 8/7/02 5:29:28 PM, Antenna Orientation : Horizontal, Frequency Range : Full
Point Six Wireless Vibration transmitter & Point Six Wireless IR transmitter
scan forhorizontal spurs
Measured Signal
FCC B
Filtered
Amplitude dB(uV/m)
Frequency (MHz)
60
55
50
45
40
35
30
25
20
15
10
5
0
54
46
43.5
40
88
216
100
100

TRANSMITTED BANDWIDTH MEASUREMENTS

The photo below shows that the 20dB transmitted bandwidth of the Wireless Vibration Transmitter is about 17.5kHz, well within the 1045kHz (0.25% of 418MHz) maximum bandwidth specified by FCC Part 15 Section 15.231(c). Each horizontal division is 25kHz, and each vertical division is 10dB.



SIGNED_____**DATE**_____

John R. Barnes, PRESIDENT dBi Corp.

CONDUCTED INTERFERENCE

Device: Point Six Wireless Vibration Transmitter

Host and Other Peripherals: None

Name of Test: Powerline Conducted Interference

Test Location: Lexmark test facility, located at Lexington Kentucky.

Test Instrumentation: See attached sheet

Test Procedure: ANSI C63.4:1992

Note: Transmitting at 1 second intervals to speed up testing.

Test Results: This unit operates off an internal battery, and has no mains port. Therefore it passes the the Class B conducted interference requirements of FCC Part 15 without testing.

SIGNED_____DATE_____
John R. Barnes, PRESIDENT dBi Corp.

CONDUCTED MEASUREMENTS

This unit operates off an internal battery and has no mains port. Therefore no conducted measurements were made.

SIGNED_____DATE_____
John R. Barnes, PRESIDENT dBi Corp.

TESTING AND MEASURING EQUIPMENT USED BY dBi

Radiated Interference Plots: 30...1,000 MHz

Hewlett Packard EMI Test Receiver #0413 RF Filter Section	85462A/85460A, S/N 3807A00454/3704A00416 (Cal date: 4/02, Cal due date: 4/03)
Schaffner-Chase BI-Log Antenna 30 to 1000 MHz #0509	CBL6111C, S/N 2459 (Cal date: 10/01, Cal due date: 10/02)

Radiated Interference Measurements: 30...1,000 MHz

Rohde & Schwarz EMI Test Receiver #0543	ESI40, S/N 839283/008 (Cal date:10/01, Cal due date:10/02)
Schaffner-Chase BI-Log Antenna 30 to 1000 MHz #0509	CBL6111C, S/N 2459 (Cal date: 10/01, Cal due date: 10/02)

Radiated Interference Measurements: 1GHz and up

Rohde & Schwarz EMI Test Receiver #0543	ESI40, S/N 839283/008 (Cal date:10/01, Cal due date:10/02)
ARA Horn Antenna, 1GHz to 18GHz #0389	DRG-118/A (Cal date: 12/97, Cal due date: not needed)

Transmitted Bandwidth Measurements: 30...1,000 MHz

Hewlett Packard Spectrum Analyzer #0033	HP8568B, S/N 2340A05705/2338A0 (Cal date:4/02, Cal due date:4/03)

Calibration: The measuring equipment used at Lexmark is calibrated according to the Instruction manual once a day. Once a week the accuracy of the test system is checked. This includes the test equipment, associated cables, and antennas. This is accomplished with a calibrated radiating source for the radiated portion and a synthesized signal generator for the conducted measurements.

All of the above equipment and all associated accessories are verified by Lexmark, International.

TEST SETUPS

RADIATED TEST CONFIGURATION, 30-1000MHz, Front

RADIATED TEST CONFIGURATION, 30-1000MHz, Back

RADIATED TEST CONFIGURATION, 1GHz AND UP, Front

RADIATED TEST CONFIGURATION, 1GHz AND UP, Back

TRANSMITTED BANDWIDTH CONFIGURATION