

**M. Flom Associates, Inc. - Global Compliance Center**

3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176

www.mflom.com info@mflom.com (480) 926-3100, FAX: 926-3598

Date: October 18, 2004

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Performance Health Technologies
Equipment: Wireless Monitor System
FCC ID: SJOMT01-T
FCC Rules: 15.247

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

Filing fees are attached.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,

A handwritten signature in black ink, appearing to read "Michael Schafer", with a long, sweeping horizontal line extending to the right.

Michael Schafer,
General Manager

enclosure(s)
cc: Applicant
MS/del

List Of Exhibits
(FCC **Certification** (Transmitters) - Revised 9/28/98)

Applicant: Performance Health Technologies

FCC ID: SJOMT01-T

By Applicant:

1. Letter Of Authorization
2. Identification Drawings
 - Id Label
 - Location Info
 - Attestation Statement(S)
 - Location of Compliance Statement
3. Documentation: 2.1033(B)
 - (3) User Manual(S)
 - (4) Operational Description
 - (5) Block Diagram
 - (5) Schematic Diagram
 - (7) External Photographs
 - Internal Photographs
 - Parts List
 - Tune Up Info
 - Active Devices

By M.F.A. Inc.

- A. Testimonial & Statement of Certification



M. Flom Associates, Inc. - Global Compliance Center

3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176

www.mflom.com info@mflom.com (480) 926-3100, FAX: 926-3598

Transmitter Certification

of

FCC ID: SJOMT01-T

Wireless Monitor System Remote Transmitter

to

Federal Communications Commission

Rule Part(s) 15.247

Date Of Report: October 18, 2004

On the Behalf of the Applicant:

Performance Health Technologies

At the Request of:

P.O. 2004-09-23-E01

Performance Health Technologies
6654 Gunpark Drive
Second Floor
Boulder, CO 80301

Attention of:

Burl Amsbury, VP, Product Development
303-527-0600 ext 110; Fax: -1661
email: bamsbsury@performancehealth.com

Supervised By:

A handwritten signature in black ink, appearing to read 'D. Lee'.

David E. Lee,
Compliance Test Manager

The Applicant has been cautioned as to the following:

15.21 Information to User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Table Of Contents

Rule	Description	Page
	Test Report	1
2.1033(c)	General Information Required	2
	Standard Test Conditions and Engineering Practices	6
15.247(b)	Maximum Peak Output Power	7
15.247(c)	Out of Band Emissions	10
15.205	Restricted Bands Of Operation	12
15.247(a)(2)	Allowed Occupied Bandwidth	14
15.247(d)	Transmitter Power Density	17

Page Number 1 of 18.

Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a) **Test Report**

b) Laboratory: M. Flom Associates, Inc.
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d04a0029

d) Client: Performance Health Technologies
6654 Gunpark Drive
Second Floor
Boulder, CO 80301

e) Identification: Wireless Monitor System
Description: Remote Transmitter

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: October 18, 2004
EUT Received: September 29, 2004

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with MFA internal quality manual.

m) Supervised by:



David E. Lee,
Compliance Test Manager

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

Page Number 2 of 18.

List Of General Information Required For Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to

15.247

Sub-Part 2.1033

(c)(1): Name and Address of Applicant:

Performance Health Technologies
6654 Gunpark Drive
Second Floor
Boulder, CO 80301

Manufacturer:

Applicant

(c)(2): FCC ID:

SJOMT01-T

Model Number:

Wireless Monitor System
Remote Unit

(c)(3): Instruction Manual(s):

Please See Attached Exhibits

(c)(4): Type of Emission:

DSSS

(c)(5): FREQUENCY RANGE, MHz:

2400 – 2483.5

(c)(6): Power Rating, W:

0.001

☐ Switchable

☐ Variable

☒ N/A

(c)(7): Maximum Power Rating, W:

1.0

15.203: Antenna Requirement:

☒ The antenna is permanently attached to the EUT

☐ The antenna uses a unique coupling

☐ The EUT must be professionally installed

☐ The antenna requirement does not apply

Page Number 3 of 18.

Subpart 2.1033 (continued)

(c)(8): Voltages & Currents in All Elements in Final RF Stage, Including Final Transistor or Solid State Device:

Collector Current, A	= 0.01
Collector Voltage, Vdc	= 3.5
Supply Voltage, Vdc	= 4.5

(c)(9): **Tune-Up Procedure:**

Please See Attached Exhibits

(c)(10): **Circuit Diagram/Circuit Description:**

Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please See Attached Exhibits

(c)(11): **Label Information:**

Please See Attached Exhibits

(c)(12): **Photographs:**

Please See Attached Exhibits

(c)(13): **Digital Modulation Description:**

 Attached Exhibits
 X N/A

(c)(14): **Test And Measurement Data:**

Follows



A2LA

"A2LA has accredited M. Flom Associates, Inc. Chandler, AZ 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."

Certificate Number: **2152-01**



NIST

I am pleased to inform you that your laboratory has been validated by the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Your laboratory is now formally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office (TECRO) in the United States, covering equipment subject to Electro-Magnetic Compatibility (EMC) requirements. The names of all validated and nominated laboratories will be posted on the NIST website at <http://ts.nist.gov/mra> under the 'Asia' category."

BSMI Number: **SL2-IN-E-041R**

Page Number

5 of 18.

Sub-part
2.1033(b):**Test And Measurement Data**

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.1031, 2.1033, 2.1035, 2.1041, 2.1043, 2.1045, and the following individual Parts:

_____	15.209	Radiated emission limits; general requirements
_____	15.211	Tunnel radio systems
_____	15.213	Cable locating equipment
_____	15.214	Cordless telephones
_____	15.217	Operation in the band 160-190 kHz
_____	15.219	Operation in the band 510-1705 kHz
_____	15.221	Operation in the band 525-1705 kHz (leaky coax)
_____	15.223	Operation in the band 1.705-10 MHz
_____	15.225	Operation in the band 13.553-13.567 MHz
_____	15.227	Operation in the band 26-27.28 MHz (remote control)
_____	15.229	Operation in the band 40.66-40.70 MHz
_____	15.231	Periodic operation in the band 40.66-40.70 MHz and above 70 MHz
_____	15.233	Operation within the bands 43.71-44.49, 46.60-46.98 MHz 48.75-49.51 MHz and 49.66-50.0 MHz
_____	15.235	Operation within the band 49.82-49.90 MHz
_____	15.237	Operation within the bands 72.0-73.0 MHz, 74.6-74.8 MHz and 75.2-76.0 MHz (auditory assistance)
_____	15.239	Operation in band 88-108 MHz
_____	15.241	Operation in the band 174-216 MHz (biomedical)
_____	15.243	Operation in the band 890-940 MHz (materials)
_____	15.245	Operation within the bands 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10500-10550 MHz, and 24075-24175 MHz (filed disturbance sensors)
X _____	15.247	Operation within bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz (spread spectrum)
_____	15.249	Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz
_____	15.251	Operation within the bands 2.9-3.26 GHz, 3.267-3.332 GHz, 3.339-3.3458 GHz, and 3.358-3.6 GHz (vehicle identification systems)
_____	15.321	Specific requirements for asynchronous devices operating in the 1910-1920 MHz and 2390-2400 MHz bands (Unlicensed PCS)
_____	15.323	Specific requirements for isochronous devices operating in the 1920-1930 MHz sub-band (Unlicensed PCS)

**Standard Test Conditions
and
Engineering Practices**

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2000, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.

Page Number 7 of 18.

Name of Test: Maximum Peak Output Power

Specification: 47 CFR 15.247(b)

Spec. Limit: = 1 Watt peak (0.25 if <50 Hopping Channels)

Test Equipment: Attached

Measurement Data

Antenna Gain, dBi = -1dBi (Internal – estimated)
 Peak Output Power, Watts = 0.001
 Worst Case For
 All Channels

Radiated:
 g04a0108: 2004-Oct-04 Mon 08:54:00

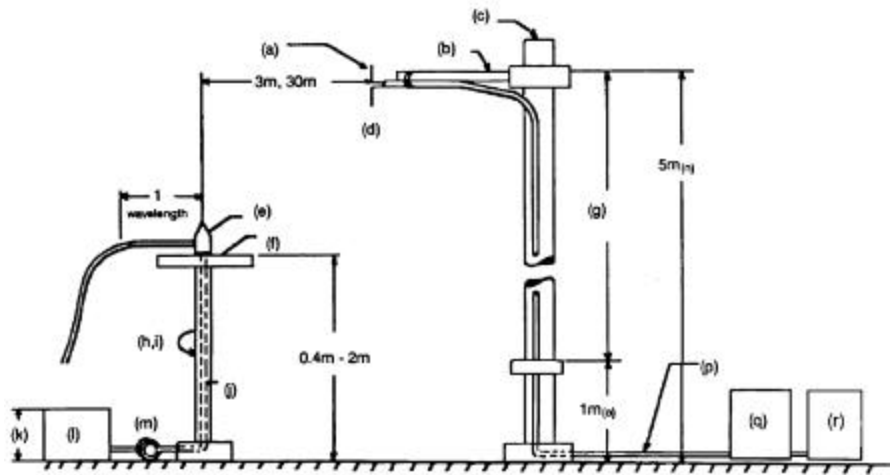
Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	EIRP, W
2402.000000	2419.738000	42.01	48.16	32247.79	-5.1	0.00031
2402.000000	2419.763000	45.46	48.16	47973.34	-1.6	0.00069
2402.000000	2419.913000	39.92	48.16	25351.29	-7.1	0.00020
2402.000000	2420.388000	40.99	48.16	28674.77	-6.1	0.00025
2402.000000	2420.663000	45.82	48.16	50003.45	-1.2	0.00076
2468.000000	2467.813000	42.3	48.54	34833.73	-4.4	0.00036
2468.000000	2468.113000	38.79	48.55	23280.91	-7.9	0.00016
2468.000000	2468.388000	44.53	48.55	45081.67	-2.1	0.00062

Supervised By:



David E. Lee,
 Compliance Test Manager

Radiated Test Setup



NOTES:

- (a) Search Antenna - Rotatable on boom
- (b) Non-metallic boom
- (c) Non-metallic mast
- (d) Adjustable horizontally
- (e) Equipment Under Test
- (f) Turntable
- (g) Boom adjustable in height.
- (h) External control cables routed horizontally at least one wavelength.
- (i) Rotatable
- (j) Cables routed through hollow turntable center
- (k) 30 cm or less
- (l) External power source
- (m) 10 cm diameter coil of excess cable
- (n) 25 cm (V), 1 m-7 m (V, H)
- (o) 25 cm from bottom end of 'V', 1m normally
- (p) Calibrated Cable at least 10m in length
- (q) Amplifier (optional)
- (r) Spectrum Analyzer

Asset	Description	s/n	Cycle	Last Cal
(as applicable)				
Transducer				
	i00088 EMCO 3109-B 25MHz-300MHz	2336	24 mo.	Sep-03
	i00089 Apr1 2001 200MHz-1GHz	001500	24 mo.	Sep-03
X	i00103 EMCO 3115 1GHz-18GHz	9208-3925	24 mo.	Sep-03
Amplifier				
X	i00028 HP 8449A	2749A00121	12 mo.	May-04
Spectrum Analyzer				
	i00029 HP 8563E	3213A00104	12 mo.	May-04
X	i00033 HP 85462A	3625A00357	12 mo.	Sep-04
Miscellaneous				
	Antenna	No	- Internal	
	All Ports Terminated	Yes		

Page Number

9 of 18.

Test Setup:

Radiated Emissions

State:



State:



Page Number 10 of 18.

Name of Test: Out of Band Emissions

Specification: 47 CFR 15.247(c), 15.209(a)

Spec. Limit: See Below

Test Equipment: As per previous page

Search Antennas:

10 kHz – 32 MHz:	LOOP 94598-1
32 MHz – 1 GHz:	SINGER DM105,T ₁ T ₂ T ₃
1 GHz – 18 GHz:	EMCO 3115

Limit

In any 100 kHz bandwidth outside these frequency bands, radio frequency power that is produced by the modulation products of the spreading sequence, information sequence, and the carrier frequency shall be either:

at least 20 dB below that in any 100 kHz bandwidth within the band that contains the highest level of the desired power

or

shall not exceed the general levels specified in 15.209(a), whichever results in the lesser attenuation. All other emissions outside these bands shall not exceed the general radiated emission limits specified in 15.209(a).

Measurements Procedure:

At first, bench tests were performed to locate the emissions around the antenna terminals.

In the field, tests were conducted over the range shown. The test sample was set up on a wooden turntable above ground, and at a distance of three meters from the antenna connected to the spectrum analyzer.

In order to obtain the maximum response at each frequency, the turntable was rotated, and the search antenna was raised and lowered. The EUT was also adjusted for maximum response.

The field strength was calculated from:

$$E \text{ } \mu\text{V/m @ 3 m} = \text{LOG}_{10}^{-1}(\text{dBm} + 107 + \text{A.F.} + \text{C.L.})$$

The following results are worst case conditions. Tests were conducted in Horizontal and Vertical polarization modes.

Measurement Results: Attached

Page Number 11 of 18.

Name of Test: Out of Band Emissions
g04a0110: 2004-Oct-04 Mon 16:07:00
State: 2:High Power

Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	Peak Average*
2400.000	4828.341	29.5	14.15	43.7	-51.6	Peak
2402.000	7387.666	28.8	17.1	45.9	-49.3	Peak
2402.000	9849.333	29.2	21.9	51.1	-44.1	Peak
2402.000	12311.000	30.8	15.9	46.8	-48.5	Peak
2402.000	14770.013	27.3	16.5	43.8	-51.4	Peak
2402.000	17231.680	24.5	10.9	35.4	-59.8	Peak

*Peak And Average Values

Supervised By:



David E. Lee,
Compliance Test Manager

Page Number 12 of 18.

Name of Test: Restricted Bands of Operation

Specification: 47 CFR 15.205

Test Equipment: As per attached page

Measurement Procedure

The EUT was set up on a three meter open field site according to the procedure on ANSI C63.4.

Sensitivity of system was measured:

Below 2 GHz:

CISPR Bandwidths	= 8 dB μ V
1 MHz RBW, 1 MHz VBW	= 12 dB μ V
1 MHz RBW, 10 Hz VBW	= 3 dB μ V

Above 2 GHz:

1 MHz RBW, 1 MHz VBW	= 33 dB μ V
1 MHz RBW, 10 Hz VBW	= 22 dB μ V

Sensitivity of system with preamps:

Below 2 GHz:

Preamps are not used in this range.

Above 2 GHz:

Peak	= 3 dB μ V
Average	= -8 dB μ V

Cable Loss:

915 MHz	= -0.8 dB μ V
2450 MHz	= -3 dB μ V

Note:

dB loss vs. frequency included in programmed software.

Reference Level Offset:

set @ 1 dB, accounts for cable and connector loss.

Test Results: No harmonic or spurious emissions were detected in the restricted bands in excess of the limits of 15.205. System measurement sensitivity was -130 dBm.



Supervised By:

David E. Lee,
Compliance Test Manager

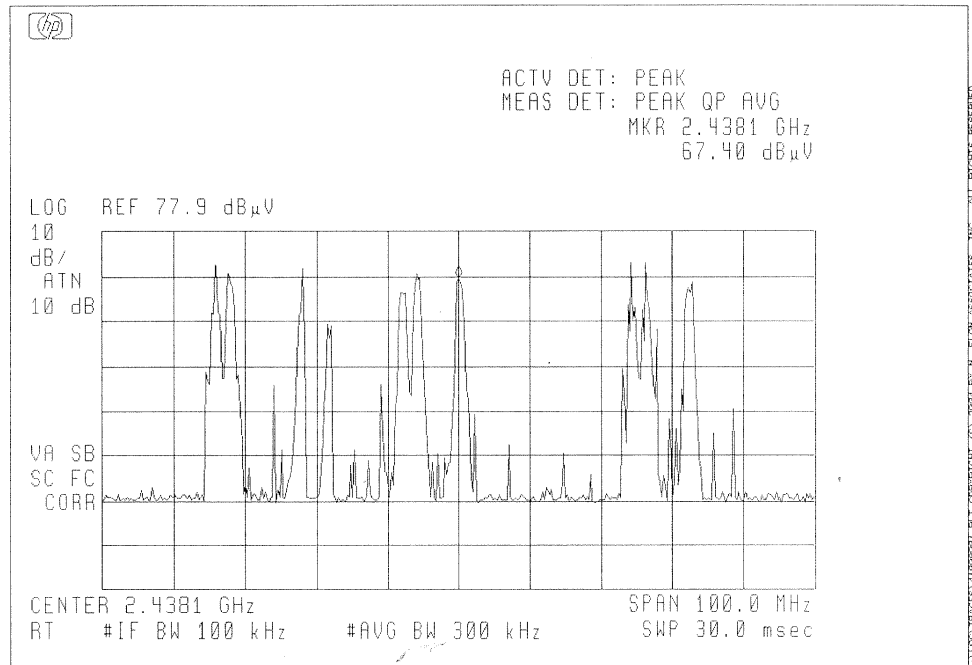
Page Number 13 of 18.

Name of Test: Emission at Band Edges (Radiated)
Transmitter Power Density

State: General


OSCILLOSCOPE PRESENTATION
PERFORMANCEHEALTH, Wireless Monitor System
2004-OCT-08, 08:54, FRI

MODULATION: NONE
REMARK: REMOTE SEARCHING



Power: High
Modulation: DSSS (Total Transmitted Spectrum)
Max Hold for 30 sec during search mode

Performed By:


David E. Lee,
Compliance Test Manager

Page Number 14 of 18.

Name of Test: Allowed Occupied Bandwidth

Specification: 47 CFR 15.247(a)(2)

Test Equipment: As per attached page

Limits

Rule	Type	BANDS (MHz)	LIMIT (kHz)
15.247(a)(1)(i)	F.H.	902-928	20 dB BW = 500
15.247(a)(1)(ii)	F.H.	2400-2483.5, 5725-5850	20 dB BW = 1000
15.247(a)(2)	D.S.	ALL	6 dB BW = 500

Measurement Data

Measured Bandwidth, kHz	=	>500kHz
Results	=	Attached

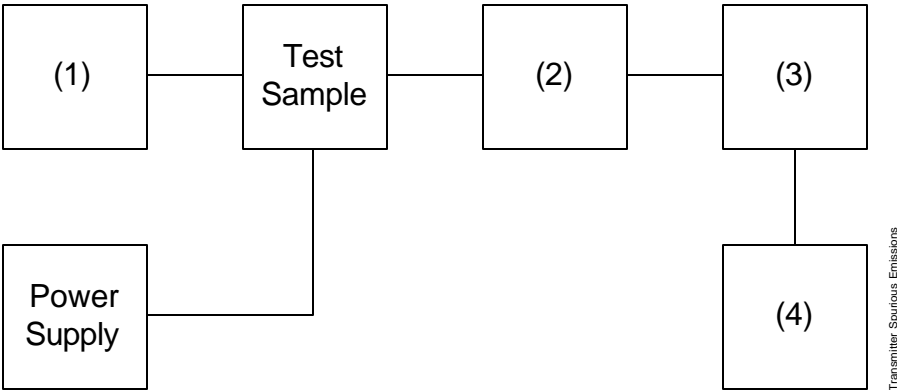
Supervised By:



David E. Lee,
Compliance Test Manager

Transmitter Spurious Emission

Test A. Occupied Bandwidth (In-Band Spurious)
Test B. Out-of-Band Spurious



Asset	Description	s/n	Cycle	Last Cal
(as applicable)				
(1)	Audio Oscillator/Generator			
i00017	HP 8903A	2216A01753	12 mo.	Apr-04
(2)	Coaxial Attenuator			
i00222	Pasternack 30dB	222	NCR	
i00223	Pasternack 30dB	223	NCR	
(3)	Filters; Notch, HP, LP, BP			
	N/A			
(4)	Spectrum Analyzer			
X	i00048	2511A01467	12 mo.	Sep-04
	i00029	3213A00104	12 mo.	May-04

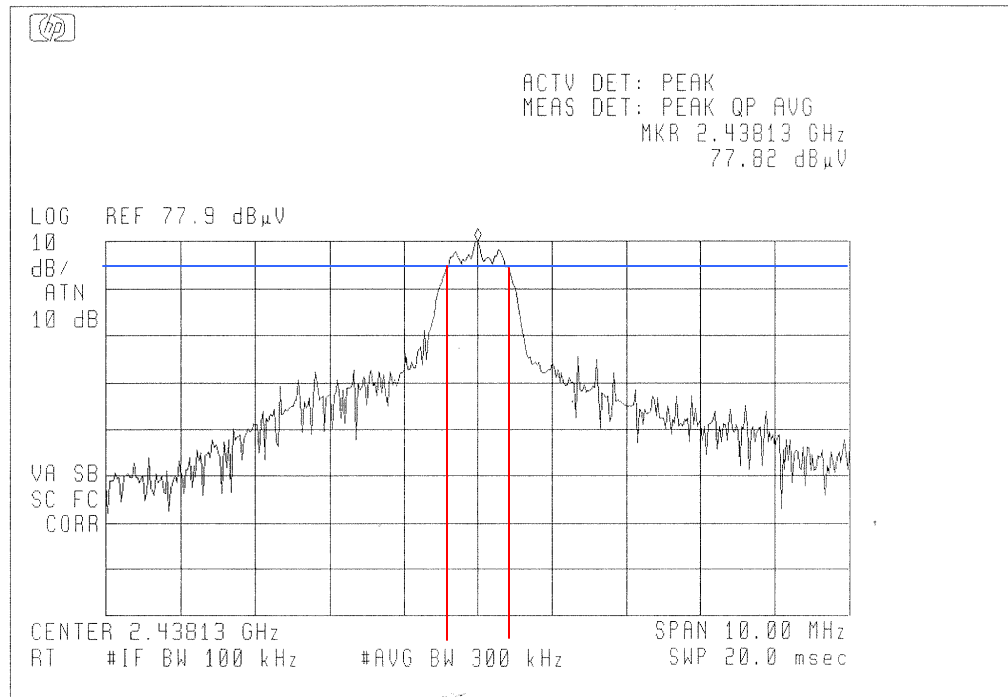
Page Number 16 of 18.

Name of Test: Emission Masks (Occupied Bandwidth)
Indicating 6/20 dB Bandwidth

State:

OSCILLOSCOPE PRESENTATION
PERFORMANCEHEALTH, Wireless Monitor System
2004-OCT-08, 08:48, FRI

MODULATION: NONE



Power:
Modulation:

High
DSSS
6dB Bandwidth = 860kHz

Supervised By:

David E. Lee,
Compliance Test Manager

Page Number 17 of 18.

Name of Test: Spread Spectrum Technology
Direct Sequence Systems

15.247(a)(2) Minimum 6 dB Bandwidth

Results: Please see results for "Allowed Occupied Bandwidth"

15.247(d) Transmitter Power Density

Limit: The transmitter power density peak over any 1 second interval shall not be greater than 8 dBm in any 3 kHz Bandwidth within these bands.

Results:

Frequency	Measured dBm @ 1Hz	Calculated dBm @ 3kHz	Margin dBm
2402.000	-39.9	-5.1	-13.1
2440.000	-40.6	-5.8	-13.8
2479.000	-40.1	-5.3	-13.3

Power Spectral Density per 3-kHz bandwidth = Power Spectral Density per 1-Hz bandwidth + Bandwidth Correction Factor.
Bandwidth Correction Factor = $10 \cdot \log(3 \text{ kHz} / 1 \text{ Hz}) = 34.8 \text{ dB}$

Supervised By:
End of Test Report



David E. Lee, Lab Manager

Radiated Measurements For Part 15 Transmitters with Integral Antennas

Radiated Measurements

Range of Measurement	Specification	Resolution B/W	Video B/A
30 to 1000 MHz	CISPR	=100 kHz	=100 kHz
>1000 MHz	FCC, 15.37(b)	1 MHz	=1 MHz
(if averaging)	FCC, 15.37(b)	1 MHz	10 Hz

Measuring Equipment

a. Antennas:

EMCO 3109	20 - 300 MHz
APREL AALP2001	200 - 1000 MHz
APREL AAB20200	20 - 200 MHz
APREL AAH118	1 - 18 GHz

b. Instruments:

HP8566B	Spectrum Analyzer
HP85685A	Preselector, w/ preamp below 2 GHz
HP85650A	Quasi Peak Adapter
HP8449	Preamp, above 2 GHz
HP8563E	Spectrum Analyzer, above 2 GHz

All test instrumentation is calibrated annually. In addition, all test instrumentation is verified daily, or as required by the manufacturer.

Occupied Bandwidth

Occupied Bandwidth is measured as a radiated signal without attenuators and/or filter. RBW, VBW and scan settings as shown were set to produce a meaningful result in accordance with ANSI C63.4, Section 13.1.7.

Part 15.21, Information to User

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly avoided by the party responsible for compliance could void the user's authority to operate the equipment.

§ 15.205 Restricted Bands of Operation

(a) Except as shown in paragraph (b) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.25
0.495-0.505	16.69475-16.69625	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2655-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-339.4	3600-4400	(2)
13.36-13.41			

**Testimonial
And
Statement Of Certification**

This is to certify that:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

Certifying Engineer:



David E. Lee,
Compliance Test Manager