



MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*
33439 WESTERN AVENUE • UNION CITY, CALIFORNIA 94587 • PHONE (510) 489-6300 • FAX (510) 489-6372

Electromagnetic Compatibility Criteria Test Report

For the

Hospira, Inc.
PlumA + with MedNet Wireless Enabled Infuser with Models 11971-04 and 12391-04

Tested under

**Title 47 of the Code of Federal Regulations (CFR),
Chapter 1 Part 15 Subpart B
for a Class A Digital Device**

MET Report: EMCS16712-FCC

January 14, 2005

Prepared For:

Hospira, Inc.
755 Jarvis Drive
Morgan Hill, CA 95037

Prepared By:
MET Laboratories, Inc.
33439 Western Ave.
Union City, California 94587



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Tony Permsombut, Manager
Manager, Electromagnetic Compatibility Lab

Cheryl Anicete
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of Title 47 of the CFR, Chapter 1 Part 15, Subpart B for a Class A Digital Device under normal use and maintenance.

Kerwinn Corpuz, Project Engineer
Electromagnetic Compatibility Lab



Hospira, Inc.
PlumA + with MedNet Wireless Enabled Infuser with Models 11971-04 and 12391-04

Electromagnetic Compatibility
CFR Title 47, Part 15, Subpart B

Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	January 14, 2005	Initial Issue.



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List of Terms and Abbreviations

AC	Alternating Current
ACF	Antenna Correction Factor
Cal	Calibration
d	Measurement Distance
dB	Deci Bels
dBμV	Deci-Bels above one micro Volt
dBμV/m	Deci-Bels above one micro Volt per meter
DC	Direct Current
DCF	Distance Correction Factor
E	Electric Field
DSL	Digital Subscriber Line
ESD	Electrostatic Discharge
EUT	Equipment Under Test
f	Frequency
FCC	Federal Communications Commission
GHz	Giga Hertz
Hz	Hertz
ICES	Interference-Causing Equipment Standard
kHz	kilohertz
kPa	kilopascal
kV	kilo Volt
LISN	Line Impedance Stabilization Network
MHz	MegaHertz
μH	micro Henry
μF	micro Farad
μs	micro seconds
RF	Radio Frequency
RMS	Root-Mean-Square



1.0 Testing Summary

Title 47 of the CFR, Chapter 1 Part 15, Subpart B, Reference and Test Description	Results	Comments
15.107 (a) Conducted Emission Limits for a Class A Digital Device	Compliant	Measured emissions below applicable limits.
15.109 (a) Radiated Emission Limits for a Class A Digital Device	Compliant	Measured emissions below applicable limits.
ICES-003 Industry Canada's Electromagnetic Compatibility - Conducted Emission Limits for a Class A Digital Apparatus	Compliant	Satisfies requirement when compliant with 15.107 (a).
ICES-003 Industry Canada's Electromagnetic Compatibility – Radiated Emission Limits for a Class A Digital Apparatus	Compliant	Satisfies requirement when compliant with 15.109 (a).

Table 1. Summary of Test Results



2.0 Equipment Configuration

2.1 Overview

MET Laboratories, Inc. was contracted by Hospira, Inc. to perform testing on the PlumA + with MedNet Wireless Enabled Infuser with Models 11971-04 and 12391-04, under Hospira, Inc. purchase order number 3549820.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Hospira, Inc., PlumA + with MedNet Wireless Enabled Infuser with Models 11971-04 and 12391-04.

In accordance with §2.955(a) (3), the following data is presented in support of the verification of the Hospira, Inc., PlumA + with MedNet Wireless Enabled Infuser with Models 11971-04 and 12391-04. Hospira, Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the PlumA + with MedNet Wireless Enabled Infuser with Models 11971-04 and 12391-04 has been **permanently** discontinued, as per §2.955(b).

The results obtained relate only to the item(s) tested.

Model(s) Tested:	PlumA + with MedNet Wireless Enabled Infuser with Model 11971-04 and PlumA + with MedNet Wireless Enabled Infuser with Model 12391-04
Model(s) Covered:	N/A
Primary Power:	120 Vac, 60 Hz
Secondary Power:	N/A
Equipment Emissions Class:	A
Evaluated by:	Kerwinn Corpuz
Report Date:	January 14, 2005

Table 2. EUT Overview



2.2 Test Site

All testing was performed at MET Laboratories, Inc., 4855 Patrick Henry Drive, Building 6, Santa Clara, California 95054. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a semi-anechoic chamber. In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories. In accordance with §2.948(d), MET Laboratories has been accredited by the National Voluntary Laboratory Accreditation Program (Lab Code: 100273-0).

2.3 Description of Test Sample

The test samples consist of the Plum A+ Infusion pump as the host device containing a Connectivity Engine peripheral module that provides wired Ethernet and wireless 802.11b local area networking capabilities. This allows the Hospira Mednet™ networked application software for drug library downloads and Auto-programming to the infuser. The Connectivity Engine board is used with model List numbers 20679-04, 11971-04-03 and 12391-04 of the Plum A+ host device. The picture below depicts a general view of the test sample.



The Connectivity Engine board housing the wireless radio is a single PCBA housing a combination of a digital processor module and an 802.11b wireless module. The processor module uses a NetSilicon ARM7 processor available from NetSilicon with sufficient for Ethernet access and wireless 802.11b access. The ARM7 processor runs embedded Linux OS, a prism 2.5 WiFi controller, and an interface to the Plum A+ pump processor with decoded SRAM and flash.

The RF portion of the 802.11b radio circuitry is housed under a shield. The shield design and the layout of the components under the shield has been duplicated from the Intersil 802.11b Mini-USB reference design. The 802.11b radio has a single surface mount antenna that is integrated with the board housing assembly and connected to the RF port on the board via a 3" coaxial cable using standard MMCX connectors at both ends. The antenna and the antenna cable are not user accessible.



2.4 Equipment Configuration

The EUT was set up as outlined in Figure 1. All equipment incorporated as part(s) of the EUT are included in the following list.

Ref. ID	Name / Description	Model Number	Part Number	Serial Number	Rev. #
A	PlumA +	20679	N/A	ENG.205 wireless	N/A
	with MedNet Wireless Enabled Infuser	N/A	840-9S205-001	D075087-003	N/A

Table 3. Equipment Configuration

2.5 Support Equipment

All support equipment necessary for the operation and testing of the EUT are included in the following list.

Ref. ID	Name / Description	Manufacturer	Model Number	*Customer Supplied Calibration Data
B	Wireless Router	Cisco	AIR-AP1230B-A-K9	N/A

Table 4. Support Equipment

* All 'customer supplied' support equipment will include the equipments calibration data. This column will be marked as either not applicable, not available, or will contain the calibration date supplied by the customer.

2.6 Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty.	Length (m)	Shielded ?	Termination Box ID & Port ID
1	A, AC PWR Input	14 AWG PWR Cable	1	2	No	120Vac PWR Supply
2	A2, USB Port	USB	1	1	no	C, Laptop
3	A2, Antenna Port	Coax (SMA)	1	0.3	yes	D, Coupler

Table 5. Ports and Cabling Information

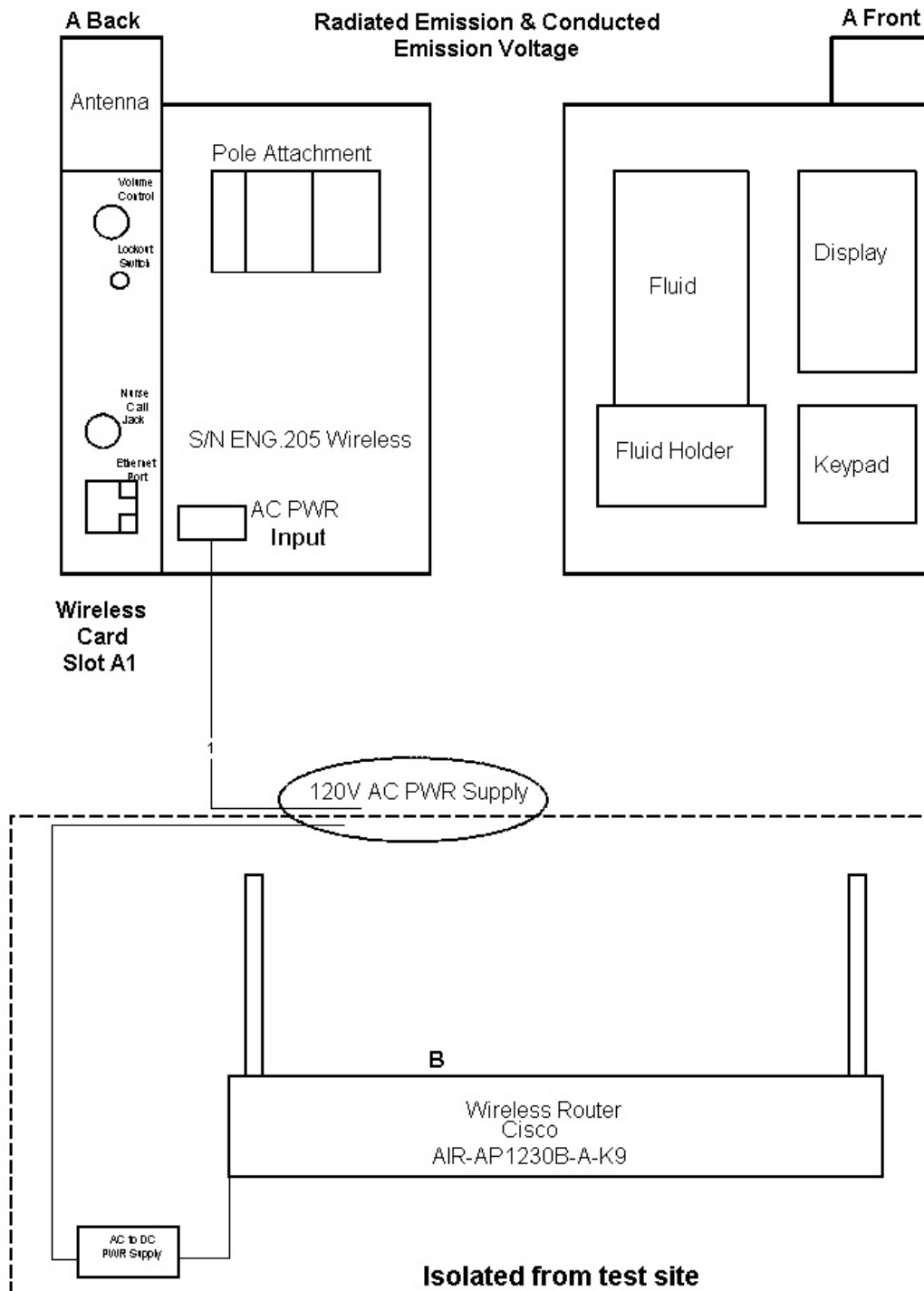


Figure 1. Block Diagram of Test Configuration



2.7 Mode of Operation

The EUT was set to transmit continuously as for test purpose only.

2.8 Method of Monitoring EUT Operation

A laptop was used to monitor the traffic of data between the EUT and Router.

2.9 Modifications

2.9.1 Modifications to the EUT

No modifications were made to the EUT.

2.9.2 Modifications to the Test Standard

No modifications were made to the test standard.

2.10 Disposition of EUT

The test sample including all support equipment (if any), submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Hospira, Inc. upon completion of testing.



3.0 Electromagnetic Compatibility Emission Criteria

3.1 Conducted Emission Limits

Test Requirement(s): **15.107 (a)** “Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in Table 6. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.”

15.107 (b) “For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in Table 6. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals. The lower limit applies at the band edges.”

Frequency range (MHz)	15.107(b), Class A Limits (dB μ V)		15.107(a), Class B Limits (dB μ V)	
	Quasi-Peak	Average	Quasi-Peak	Average
* 0.15- 0.5	79	66	66 - 56	56 - 46
0.5 – 5.0	79	66	56	46
5.0 - 30	73	60	60	50

Note 1 — The lower limit shall apply at the transition frequencies.
Note 2 — The limit decreases linearly with the logarithm if the frequency in the range 0.15 MHz to 0.5 MHz.
* — The FCC issued a Recommended Opinion and Order (RO&O) 989-80 in May 2002, providing transition into the emission limits and frequency ranges shown above.

Table 6. Conducted Limits for Radio Frequency Devices calculated from FCC Part 15 Section 15.107(a) (b)



Test Procedures: The EUT was placed on a 0.8m-high wooden table inside a shielded enclosure (See Photograph 1). The EUT was situated such that the back of the EUT was 0.4 m from one wall of the shielded enclosure, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface.

The EUT was powered from a 50 Ω /50 μ H Line Impedance Stabilization Network (LISN).

The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. Conducted Emissions measurements were made in accordance with ANSI C63.4-2001 "Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The measurements were performed over the frequency range of 150 kHz to 30 MHz using a 50 Ω /50 μ H LISN as the input transducer to an EMC field intensity meter.

Test Results: The EUT was Compliant with the requirement(s) of this section, Class A. Measured emissions below applicable limits.

Test Engineer(s): Billy Kwan

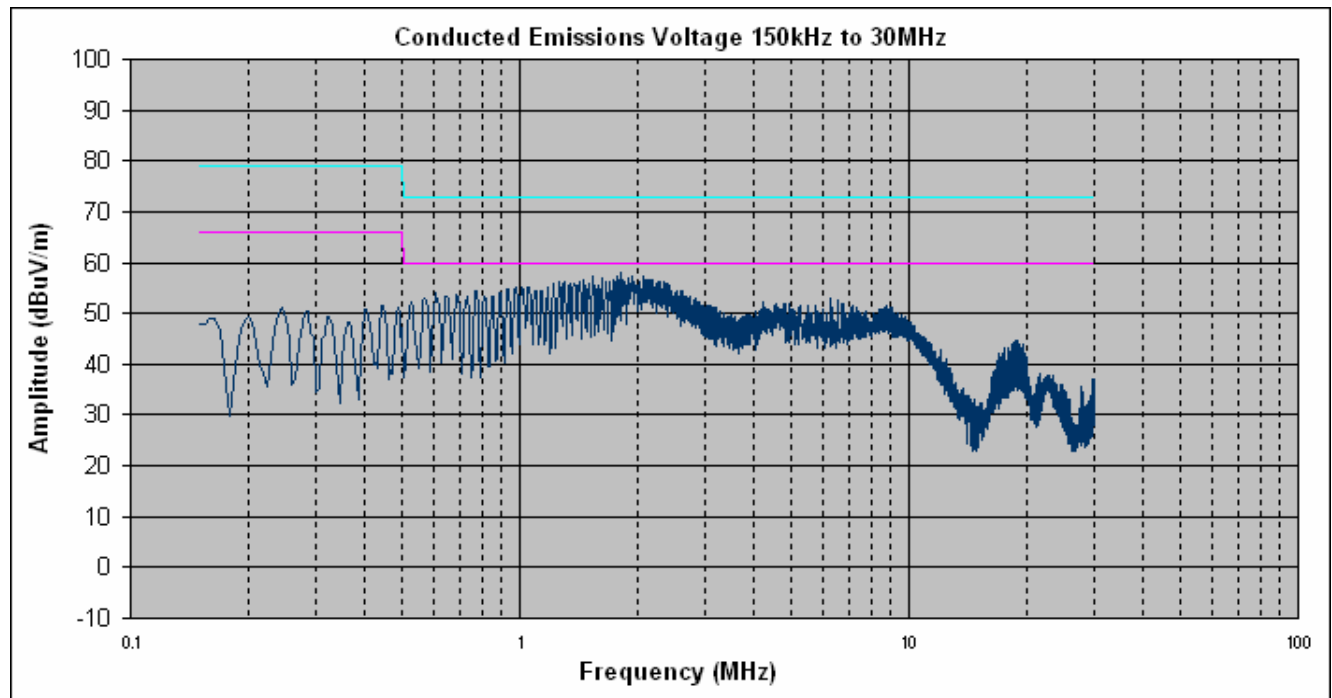
Test Date(s): 01/24/2005



**Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Phase Line; 120Vac, 60Hz
(Model: 11971-04)**

FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Pass/Fail QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Pass/Fail AVG	Margin (dB) AVG
0.728	52.61	73	PASS	-20.39	51.13	60	PASS	-8.87
1.8183	55.82	73	PASS	-17.18	54.39	60	PASS	-5.61
4.52	46.56	73	PASS	-26.44	41.38	60	PASS	-18.62
8.839	46.2	73	PASS	-26.8	41.22	60	PASS	-18.78
18.6518	34.44	73	PASS	-38.56	26.18	60	PASS	-33.82
25.86	25.32	73	PASS	-47.68	16.3	60	PASS	-43.7

Table 7. Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Phase Line; 120Vac, 60 Hz (Model 11971-04)

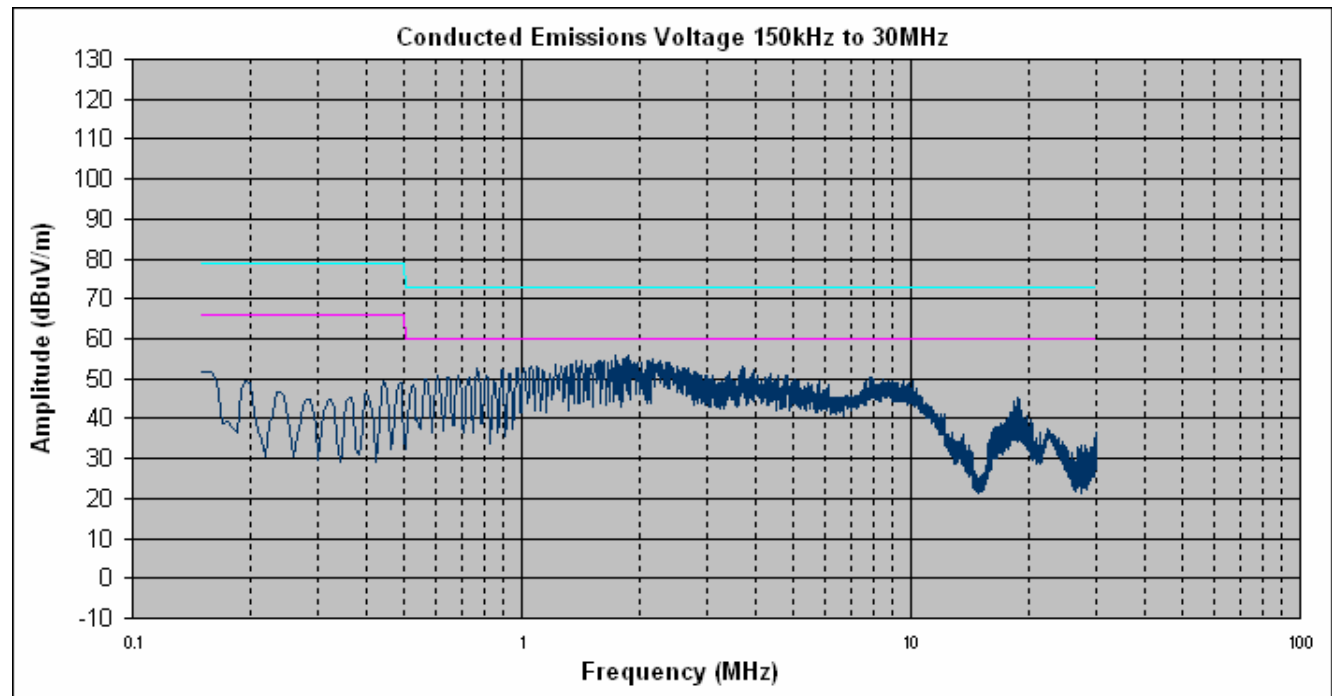




Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Neutral Line; 120Vac, 60Hz (Model: 11971-04)

FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Pass/Fail QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Pass/Fail AVG	Margin (dB) AVG
0.199	46.95	79	PASS	-32.05	40.91	66	PASS	-25.09
1.834	46.78	73	PASS	-26.22	36.9	60	PASS	-23.1
3.5938	45.8	73	PASS	-27.2	40.15	60	PASS	-19.85
9.61	44.16	73	PASS	-28.84	38.49	60	PASS	-21.51
17.82	32.84	73	PASS	-40.16	24.48	60	PASS	-35.52
23.83	29.43	73	PASS	-43.57	23.27	60	PASS	-36.73

Table 8. Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Neutral Line; 120Vac, 60Hz (Model: 11971-04)

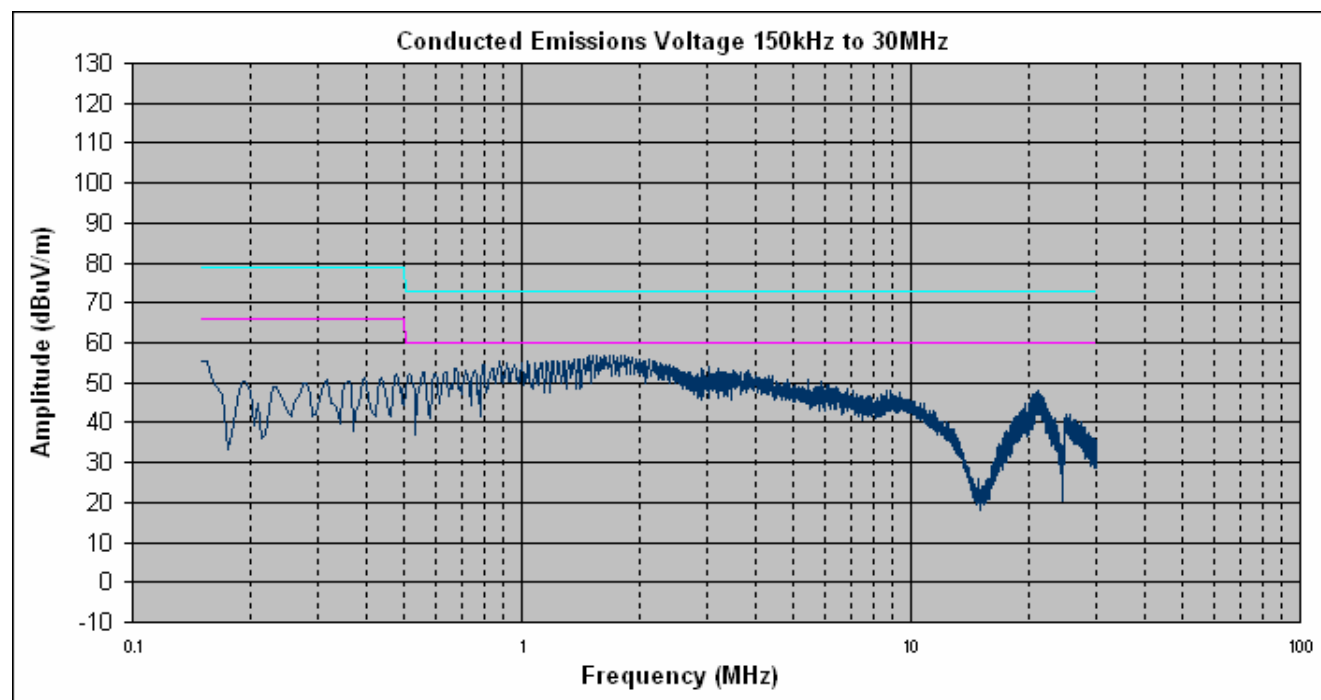




**Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Phase Line; 120Vac, 60Hz
(Model: 12391-04)**

FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Pass/Fail QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Pass/Fail AVG	Margin (dB) AVG
0.1963	47.23	79	PASS	-31.77	44.14	66	PASS	-21.86
1.2344	54.46	73	PASS	-18.54	52.18	60	PASS	-7.82
1.8731	55.29	73	PASS	-17.71	51.77	60	PASS	-8.23
3.0745	48.2	73	PASS	-24.8	43.28	60	PASS	-16.72
6.3379	42.3	73	PASS	-30.7	36.15	60	PASS	-23.85
20.9343	40.61	73	PASS	-32.39	33.7	60	PASS	-26.3

Table 9. Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Phase Line; 120Vac, 60Hz (Model: 12391-04)

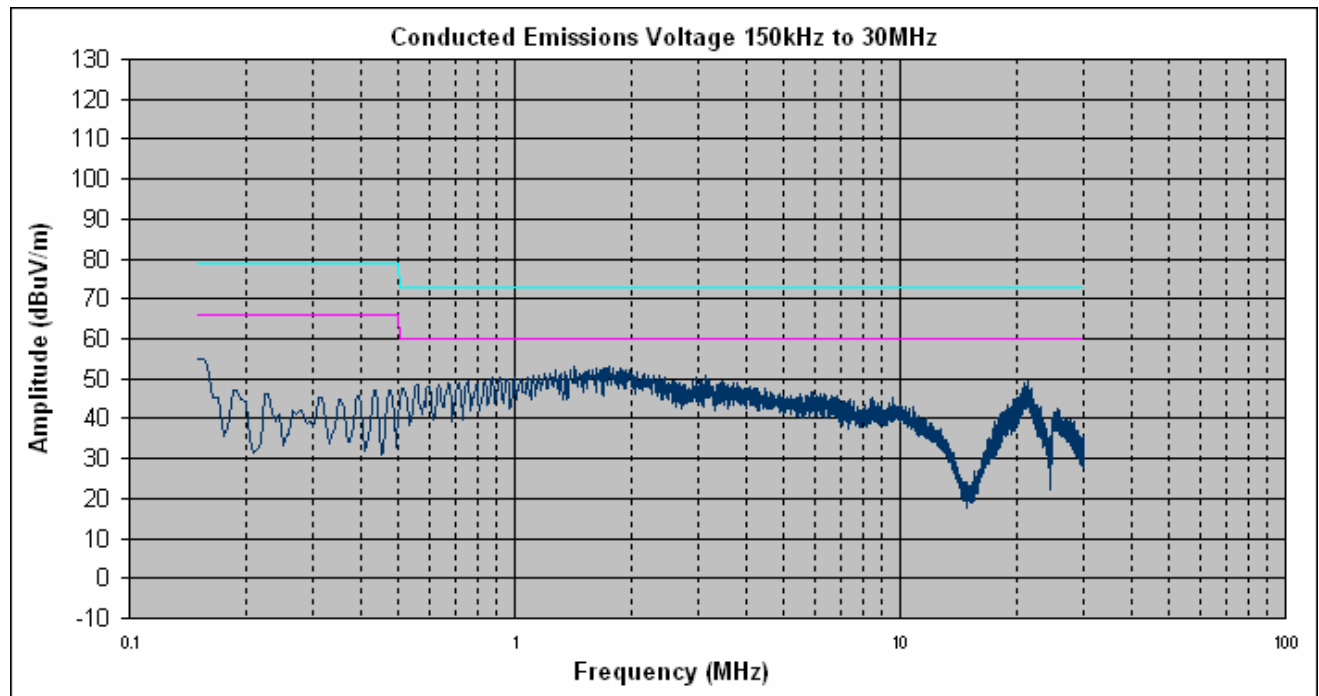




Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Neutral Line; 120Vac, 60Hz (Model: 12391-04)

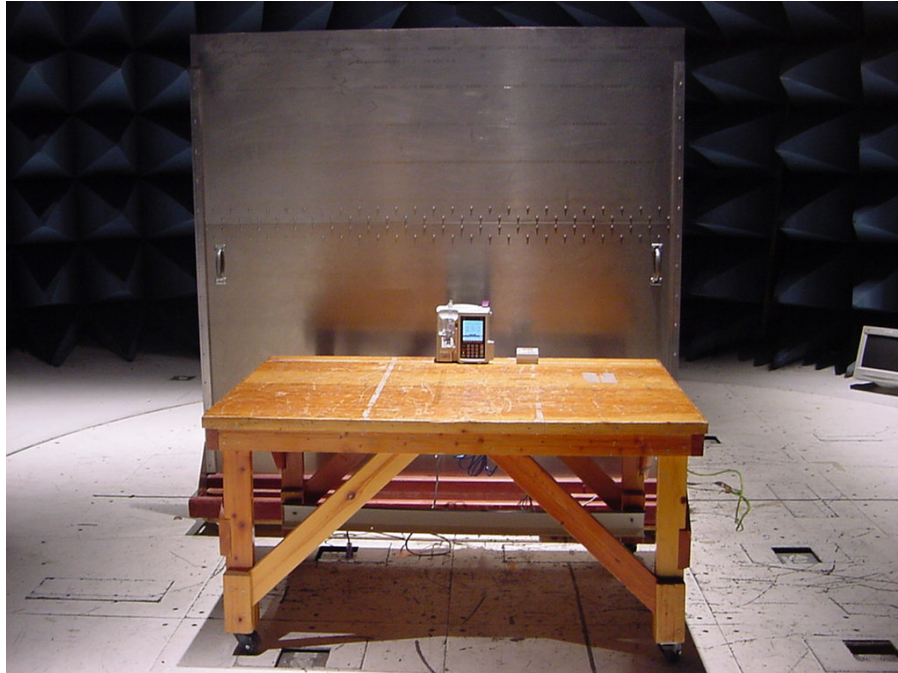
FREQ. (MHz)	Corrected Amplitude (dBuV) QP	Limit (dBuV) QP	Pass/Fail QP	Margin (dB) QP	Corrected Amplitude (dBuV) AVG	Limit (dBuV) AVG	Pass/Fail AVG	Margin (dB) AVG
0.201	36.94	79	PASS	-42.06	28	66	PASS	-38
1.545	50.87	73	PASS	-22.13	47.01	60	PASS	-12.99
2.7396	46.25	73	PASS	-26.75	41	60	PASS	-19
5.7901	39.25	73	PASS	-33.75	31.18	60	PASS	-28.82
21.3624	42.28	73	PASS	-30.72	35.23	60	PASS	-24.77
26.408	31.8	73	PASS	-41.2	24.86	60	PASS	-35.14

Table 10. Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Neutral Line; 120Vac, 60Hz (Model: 12391-04)





Conducted Emission Limits Test Setup



Photograph 1. Conducted Emissions Test Setup



3.2 Radiated Emission Limits

Test Requirement(s): **15.109 (a)** Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the Class B limits expressed in Table 11.

15.109 (b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the Class A limits expressed in Table 11.

Frequency (MHz)	Field Strength (dB μ V/m)	
	§15.109 (b), Class A Limit (dB μ V) @ 10m	§15.109 (a), Class B Limit (dB μ V) @ 3m
30 - 88	39.00	40.00
88 - 216	43.50	43.50
216 - 960	46.40	46.00
Above 960	49.50	54.00

Table 11. Radiated Emissions Limits calculated from FCC Part 15, §15.109 (a) (b)

Test Procedures: The EUT was placed on a 0.8m-high wooden table (See Photograph 2). Various antennas were placed near the EUT and measurements were taken of the field strengths and frequencies.

For final radiated measurements, the EUT was placed in semi-anechoic chamber, and located 10 m from an adjustable antenna mast. For pre-scanning, the spectrum analyzer scanned the frequency range from 30 MHz to 1 GHz to obtain an emission profile of the EUT.

For each point of measurement, the turntable was rotated, and the antenna height was varied between 1 m and 4 m, in order to find the maximum radiated emissions. Measurements above 30 MHz were taken using this technique with the antenna in two polarizations: horizontal and vertical.

Unless otherwise specified, measurements were made using a quasi-peak detector with a 120 kHz bandwidth for below 1 GHz. For above 1 GHz, measurements were made using an average detector with a 1 MHz Resolution bandwidth and 10 Hz Video bandwidth.

Test Results: The EUT was Compliant with the requirement(s) of this section, Class A. Measured emissions below applicable limits.

Test Engineer(s): Billy Kwan

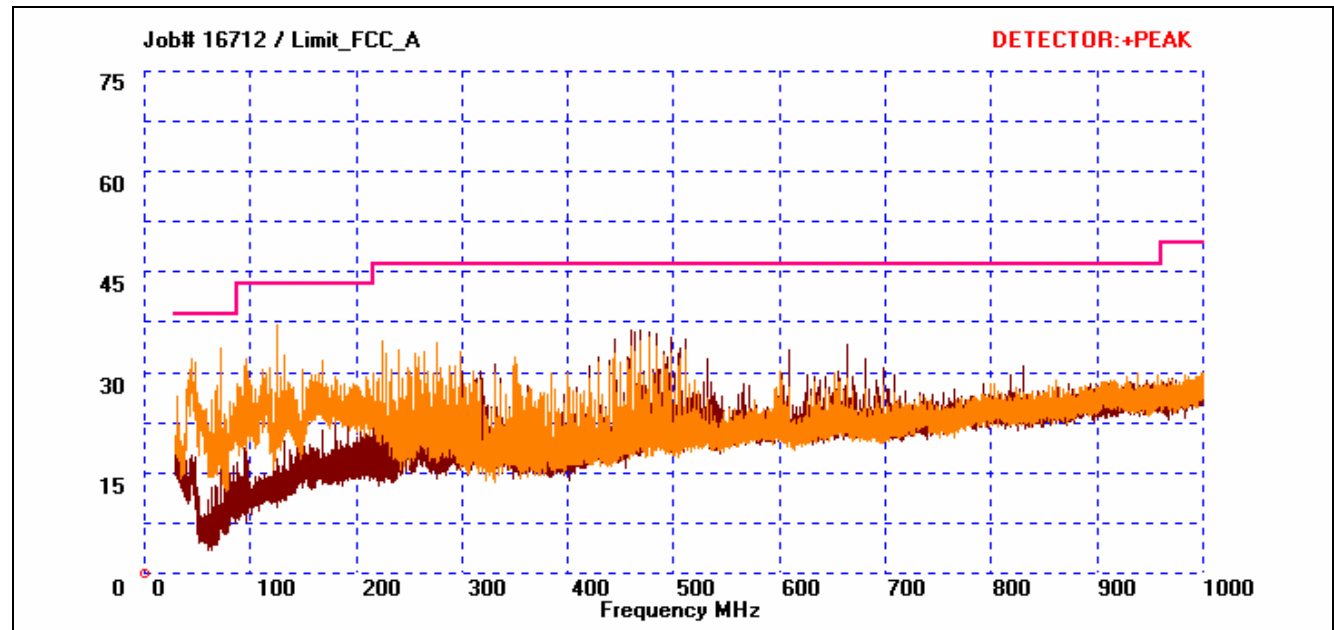
Test Date(s): 01/24/2004



Radiated Emissions Limits Test Results, Class A (Model: 11971-04)

Frequency (MHz)	Antenna Polarity (H/V)	EUT Azimuth (Degrees)	Antenna Height (m)	Uncorrected Amplitude (dBuV)	Antenna Correction Factor (dB/m) (+)	Pre Amp Gain (dB) (-)	Cable Loss (dB) (+)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
72	V	235	2.38	26.14	6.80	0.00	1.4	34.34	39.00	-4.66
125	V	157	1	24.89	11.48	0	1.99	38.356	43.5	-5.144
228.04	V	40	1.06	20.15	11.12	0.00	2.564	33.832	46.40	-12.568
276.48	V	196	1	18.45	13.40	0.00	2.77	34.62	46.40	-11.78
476.32	H	60	1.4	17.02	17.10	0.00	3.897	38.017	46.40	-8.383
663.56	H	193	1	13.18	19.50	0.00	4.851	37.531	46.40	-8.869

Table 12. Radiated Emissions Limits Test Results (Model: 11971-04)



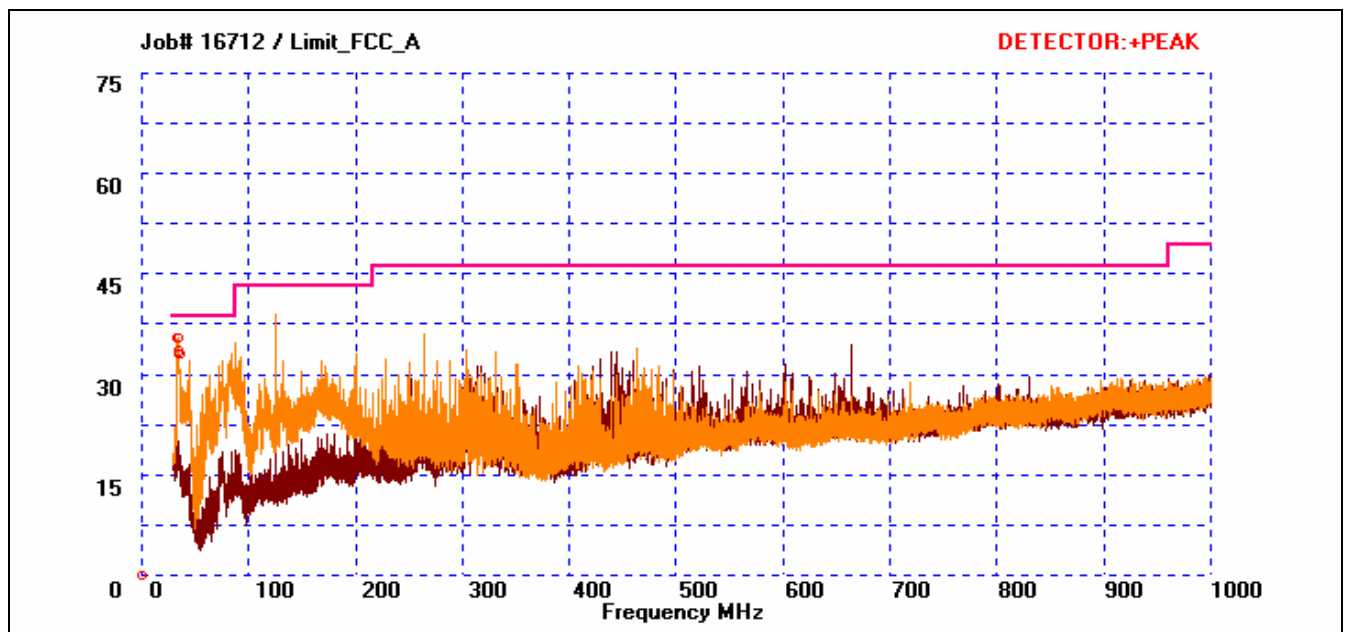
 = Vertical Polarization
 = Horizontal Polarization



Radiated Emissions Limits Test Results, Class A (Model: 12391-04)

Frequency (MHz)	Antenna Polarity (H/V)	EUT Azimuth (Degrees)	Antenna Height (m)	Uncorrected Amplitude (dBuV)	Antenna Correction Factor (dB/m) (+)	Pre Amp Gain (dB) (-)	Cable Loss (dB) (+)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
32.72	V	261	1.6	8.31	16.30	0.00	0.947	25.557	39.00	-13.443
125	V	96	1	22.46	11.48	0	1.99	35.926	43.5	-7.574
264.04	V	339	1	19.42	13.85	0.00	2.685	35.954	46.40	-10.446
331.76	V	289	1	15.43	14.41	0.00	3.102	32.938	46.40	-13.462
469.52	V	16	1	8.11	17.80	0.00	3.859	29.769	46.40	-16.631
663.6	H	33	1.1	11.56	19.50	0.00	4.851	35.911	46.40	-10.489

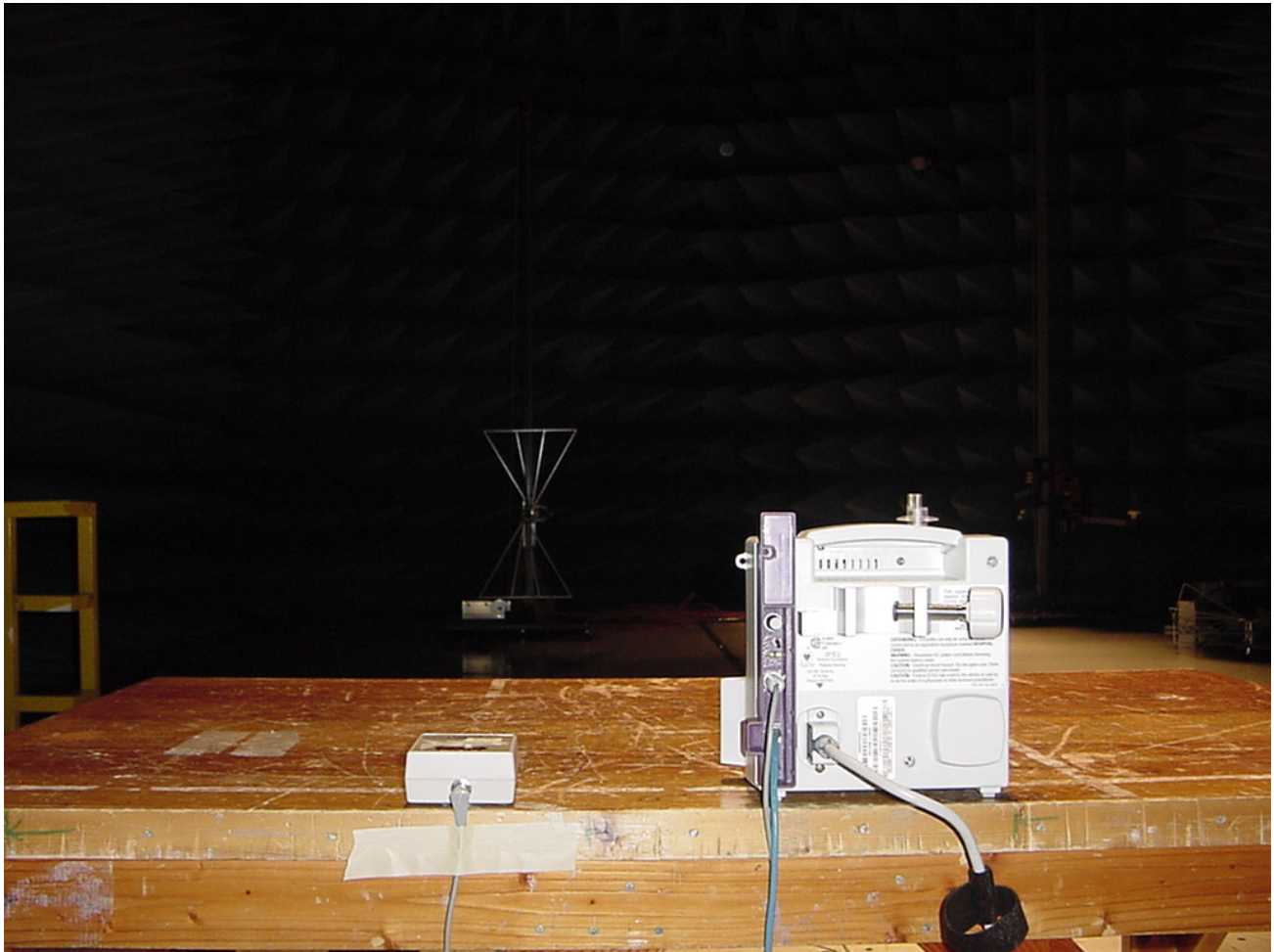
Table 13. Radiated Emissions Limits Test Results (Model: 12391-04)



 = Vertical Polarization
 = Horizontal Polarization



Radiated Emission Limits Test Setup



Photograph 2. Radiated Emission Limits Test Setup



4.0 Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ANSI/NCSL Z540-1-1994 and ANSI/ISO/IEC 17025:1999.

Test Name: Conducted Emissions			Test Date(s): 01/24/2005		
MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1S2109	EMI RECEIVER	HEWLETT PACKARD	8546A	6/29/2004	6/29/2005
1S2108	RF FILTER SECTION	HEWLETT PACKARD	85460A	6/29/2004	6/29/2005
1S2263	CHAMBER, 10 METER	RANTEC	N2-14	7/26/2004	7/26/2005
1S2372	LISN, CUSTOM	FCC	50A AC	1/8/2004	1/8/2005
Test Name: Radiated Emissions			Test Date(s): 01/24/2004		
MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1S2421	EMI RECEIVER	ROHDE & SCHWARZ	ESIB 7	2/4/2004	2/4/2005
1U0103	BILOG ANTENNA	EMCO	93110B	10/05/04	10/05/05
1S2263	CHAMBER, 10 METER	RANTEC	N2-14	7/26/2004	7/26/2005

Table 14. Test Equipment



5.0 Compliance Information

5.1 Verification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

§ 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of Emitting radio-frequency energy by radiation, conduction, or other means. Radio- frequency devices include, but are not limited to:

- (a) The various types of radio communication transmitting devices described throughout this chapter.
- (b) *The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.*
- (c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.
- (d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

§ 2.803 Marketing of radio frequency devices prior to equipment authorization.

- (a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:
 - (1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or
 - (2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.
- (d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.



- (e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:
- (i) *Compliance testing;*
 - (ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;
 - (iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;
 - (iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or
 - (v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.
- (e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.
- (f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a provision that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.



The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart J — Equipment Authorization Procedures:

§ 2.901 Basis and Purpose

- (a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.¹ *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.*
- (b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant.

§ 2.902 Verification.

- (a) *Verification is a procedure where the manufacturer² makes measurements or takes the necessary steps to insure that the equipment complies with the appropriate technical standards.* Submission of a sample unit or representative data to the Commission demonstrating compliance is not required unless specifically requested by the Commission pursuant to § 2.957, of this part.
- (b) Verification attaches to all items subsequently marketed by the manufacturer or importer which are identical as defined in § 2.908 to the sample tested and found acceptable by the manufacturer.

¹ In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.

² In this case, MET Laboratories, Inc. is acting as an agent of the manufacturer.



§ 2.948 Description of measurement facilities.

- (a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.
 - (1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.
 - (i) *If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.*
 - (ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.
 - (2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.

§ 2.952 Limitation on verification.

- (a) Verification signifies that the manufacturer or importer has determined that the equipment has been shown to be capable of compliance with the applicable technical standards if no unauthorized change is made in the equipment and if the equipment is properly maintained and operated. Compliance with these standards shall not be construed to be a finding by the manufacturer or importer with respect to matters not encompassed by the Commission's rules.
- (b) Verification of the equipment by the manufacturer or importer is effective until a termination date is otherwise established by the Commission.
- (c) No person shall, in any advertising matter, brochure, etc., use or make reference to a verification in a deceptive or misleading manner or convey the impression that such verification reflects more than a determination by the manufacturer or importer that the device or product has been shown to be capable of compliance with the applicable technical standards of the Commission's rules.



§ 2.953 Responsibility for compliance.

- (a) In verifying compliance, the responsible party, as defined in §2.909 warrants that each unit of equipment marketed under the verification procedure will be identical to the unit tested and found acceptable with the standards and that the records maintained by the responsible party continue to reflect the equipment being produced under such verification within the variation that can be expected due to quantity production and testing on a statistical basis.
- (b) The importer of equipment subject to verification may upon receiving a written statement from the manufacturer that the equipment complies with the appropriate technical standards rely on the manufacturer or independent testing agency to verify compliance. The test records required by §2.955 however should be in the English language and made available to the Commission upon a reasonable request, in accordance with §2.956.
- (c) In the case of transfer of control of equipment, as in the case of sale or merger of the grantee, the new manufacturer or importer shall bear the responsibility of continued compliance of the equipment.
- (d) Verified equipment shall be re-verified if any modification or change adversely affects the emanation characteristics of the modified equipment. The party designated in §2.909 bears responsibility for continued compliance of subsequently produced equipment.

§ 2.954 Identification.

Devices subject only to verification shall be uniquely identified by the person responsible for marketing or importing the equipment within the United States. However, the identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified or type accepted equipment. The importer or manufacturer shall maintain adequate identification records to facilitate positive identification for each verified device.

§ 2.955 Retention of records.

- (a) For each equipment subject to verification, the responsible party, as shown in §2.909 shall maintain the records listed as follows:
 - (1) A record of the original design drawings and specifications and all changes that have been made that may affect compliance with the requirements of §2.953.
 - (2) A record of the procedures used for production inspection and testing (if tests were performed) to insure the conformance required by §2.953. (Statistical production line Emission testing is not required.)
- (b) The records listed in paragraph (a) of this section shall be retained for two years after the manufacture of said equipment item has been permanently discontinued, or until the conclusion of an investigation or a proceeding if the manufacturer or importer is officially notified that an investigation or any other administrative proceeding involving his equipment has been instituted.



§ 2.956 FCC inspection and submission of equipment for testing.

- (a) Each responsible party shall upon receipt of reasonable request:
 - (1) Submit to the Commission the records required by §2.955.
 - (2) Submit one or more sample units for measurements at the Commission's Laboratory.
 - (i) Shipping costs to the Commission's Laboratory and return shall be borne by the responsible party.
 - (ii) In the event the responsible party believes that shipment of the sample to the Commission's Laboratory is impractical because of the size or weight of the equipment, or the power requirement or for any other reason, the responsible party may submit a written explanation why such shipment is impractical and should not be required.

Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

§ 15.19 Labeling requirements.

- (a) *In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:*
 - (1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.
 - (2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.
 - (3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.



- (4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.
- (5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

§ 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 approved by the party responsible for compliance could void the user's authority to operate the equipment.

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

§ 15.105 Information to the user.

- (a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.



5.2 ICES-003 Procedural & Labeling Requirements

From the Industry Canada Electromagnetic Compatibility Advisory Bulletin entitled, "Implementation and Interpretation of the Interference-Causing Equipment Standard for Digital Apparatus, ICES-003" (EMCAB-3, Issue 2, July 1995):

"At present, FCC and ICES technical requirements are essentially equivalent. Therefore, if you have FCC approval (either by meeting Part 15 of the FCC Rules or CISPR Publication 22), the only additional requirements are: to attach a note to the report of the test results for FCC compliance, indicating that these results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations; to maintain these records on file for the requisite five year period; and to provide the device with a notice of compliance in accordance with ICES-003."

Procedural Requirements:

According to Industry Canada's Interference Causing Equipment Standard for Digital Apparatus ICES-003 Issue 3, November 22, 1997:

- Section 6.1: A record of the measurements and results, showing the date that the measurements were completed, shall be retained by the manufacturer or importer for a period of at least five years from the date shown in the record and made available for examination on the request of the Minister.
- Section 6.2: A written notice indicating compliance must accompany each unit of digital apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus. Where because of insufficient space or other constraints it is not feasible to affix a label to the apparatus, the notice may be in the form of a statement in the user's manual.

Labeling Requirements:

The suggested text for the notice, in English and in French, is provided below, from the Annex of ICES-003:

This Class [¹] digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe [¹] est conforme à la norme NMB-003 du Canada.

¹ Insert either A or B but not both as appropriate for the equipment requirements.