



MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*

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Firefly Mobile
250 Parkway Drive
Suite 220
Lincolnshire, IL 60069

December 1, 2004

Dear Mr. Joe Murphy,

Enclosed is the EMC test report for compliance testing of the Firefly Mobile, Cellular PCS-1900 Dual Band Handset, tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-03 ed.), Part 15, Subpart B of the Code of Federal Regulations, Section 15.101(a).

Based on these results, MET Laboratories, Inc. certifies that the Cellular PCS-1900 Dual Band Handset, tested as configured, meets the requirements and interference limitations contained in Section 15.107(a) and 15.109(a) for Class B Receivers under Part 15, Subpart B of Title 47, Ch. 1 (10-1-03 ed.), of the Code of Federal Regulations.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Christina M. Karlhoff
Documentation Department

Reference: (\Firefly Mobile\EMC16267-FCC)

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DOC-EMC707 11/23/2004



The Nation's First Licensed Nationally Recognized Testing Laboratory





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914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230-3432 • PHONE (410) 354-3300 • FAX (410) 354-3313

Electromagnetic Compatibility Criteria Test Report

For the

**Firefly Mobile
Cellular PCS-1900 Dual Band Handset**

**Authorized under the FCC Verification Rules
Contained in
Title 47 of the CFR, Part 15, Subpart B
For a Class B Receiver**

MET Report: EMC16267-FCC

December 1, 2004

Prepared for:

**Firefly Mobile
250 Parkway Drive
Suite 220
Lincolnshire, IL 60069**

**Prepared By:
MET Laboratories, Inc.
914 W. Patapsco Ave.**



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MET Report: EMC16267-FCC

Kevin A. Mehaffey
Manager, Electromagnetic Compatibility Lab

Christina M. Karlhoff
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, Part 15, Subpart B for a Class B Receiver under normal use and maintenance.

Liming Xu
Electromagnetic Compatibility Lab



Report Status Sheet

| Revision | Report Date | Reason for Revision |
|----------|------------------|---------------------|
| Ø | December 1, 2004 | 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, Part 15, Subpart B, Reference and Test Description | Results | Comments |
|--|----------------|---|
| 15.107 (a) Conducted Emission Limits for a Class B Receiver | Compliant | Measured emissions were below applicable limits. |
| 15.109 (a) Radiated Emission Limits for a Class B Receiver | Compliant | Measured emissions were below applicable limits. |
| ICES-003 Industry Canada's Electromagnetic Compatibility - Conducted Emission Limits for a Class B Receiver | Compliant | Satisfies requirement when compliant with 15.107 (a). |
| ICES-003 Industry Canada's Electromagnetic Compatibility – Radiated Emission Limits for a Class B Receiver | 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 Firefly Mobile to perform testing on the Cellular PCS-1900 Dual Band Handset, under Firefly Mobile purchase order number L093004-001.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Firefly Mobile, Cellular PCS-1900 Dual Band Handset.

An EMC evaluation to determine compliance of the Cellular PCS-1900 Dual Band Handset with the requirements of §15.101(a) for Class B Receivers was performed. (All references are to the most current version of Title 47 of the Code of Federal Regulations in effect). In accordance with §2.1075(a)(3), the following data is presented in support of the Declaration of Conformity of the Cellular PCS-1900 Dual Band Handset. Firefly Mobile should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Cellular PCS-1900 Dual Band Handset has been permanently discontinued, as per §2.1075(c).

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

| | |
|----------------------------|--|
| Model(s) Tested: | Cellular PCS-1900 Dual Band Handset |
| Model(s) Covered: | Cellular PCS-1900 Dual Band Handset |
| EUT Specifications: | Primary Power: Battery Operated (AC charger is 110VAC 60 Hz) |
| | Secondary Power: N/A |
| | Equipment Emissions Class: B |
| Evaluated by: | Liming Xu |
| Report Date: | December 1, 2004 |

Table 2. EUT Overview



2.2 Test Site

All testing was performed at MET Laboratories, Inc., Baltimore, MD 21230. 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 Cellular PCS-1900 Dual Band Handset, Equipment Under Test (EUT), is a Wireless Mobile Phone.

2.4 Equipment Configuration

The Firefly Mobile Firefly Spark F100 was configured to program the EUT to output a GMSK Modulation type RF signal. The EUT was configured for maximum signal gain and bandwidth. The EUT was operated in a manner representative of the typical usage of the equipment. During all testing, system components were manipulated with the confines of typical usage to maximize each emission.

2.5 Antenna Specifications

New Integrated antenna(See picture) was used for this EUT.
This antenna was modified for the 850MHz band performance

2.6 Mode of Operation

The Firefly Mobile Firefly Spark F100 was configured in accordance with the manufacturer's instructions and was operated as follows for all testing contained in this report unless stated otherwise:

2.7 Modifications

2.7.1 Modifications to EUT

The antenna was modified for the 850MHz band performance.

2.7.2 Modifications to Test Standard

No modifications were made to the test standard.

2.8 Disposition of EUT

The test sample including all support equipment (if any), submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Firefly Mobile 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 3. 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 3. 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 (dBµV) | | 15.107(a), Class B Limits (dBµV) | |
|---|-------------------------------------|---------|-------------------------------------|---------|
| | Quasi-Peak | Average | Quasi-Peak | Average |
| * 0.15- 0.45 | 79 | 66 | 66 - 56 | 56 - 46 |
| 0.45 - 0.5 | 79 | 66 | 56 | 46 |
| 0.5 - 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 3. Conducted Limits for Radio Frequency Devices calculated from FCC Part 15 Section 15.107(a) (b)



Test Procedures: The EUT was placed on a 0.8 m 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. Measured emissions were below applicable limits.

Test Engineer(s): Chris G. Eckert

Test Date(s): 11/30/2004



Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Phase Line (110 VAC 60 Hz)

| Frequency (MHz) | Quasi-Peak Amplitude (dBμV) | Quasi-Peak Limit (dBμV) | Quasi-Peak Margin (dBμV) | Average Amplitude (dBμV) | Average Limit (dBμV) | Average Margin (dBμV) |
|-----------------|-----------------------------|-------------------------|--------------------------|--------------------------|----------------------|-----------------------|
| 0.155* | 63.40 | 65.73 | -2.33 | 20.60 | 55.73 | -35.13 |
| 0.170* | 62.80 | 64.96 | -2.16 | 19.90 | 54.96 | -35.06 |
| 0.183 | 61.10 | 64.35 | -3.25 | 18.40 | 54.35 | -35.95 |
| 0.196* | 60.90 | 63.78 | -2.88 | 18.10 | 53.78 | -35.68 |
| 0.211 | 59.00 | 63.17 | -4.17 | 15.50 | 53.17 | -37.67 |
| 0.229 | 58.20 | 62.49 | -4.29 | 14.20 | 52.49 | -38.29 |
| 0.601 | 46.20 | 56.00 | -9.80 | 3.20 | 46.00 | -42.80 |

Table 4. Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Phase Line

Notes: * - At this frequency, the measured conducted-field strength exhibits a margin of compliance that is less than 3dB below the specification limit. We recommend that every emission measured, have at least a 3dB margin to allow for deviations in the emission characteristics that may occur during the production process.

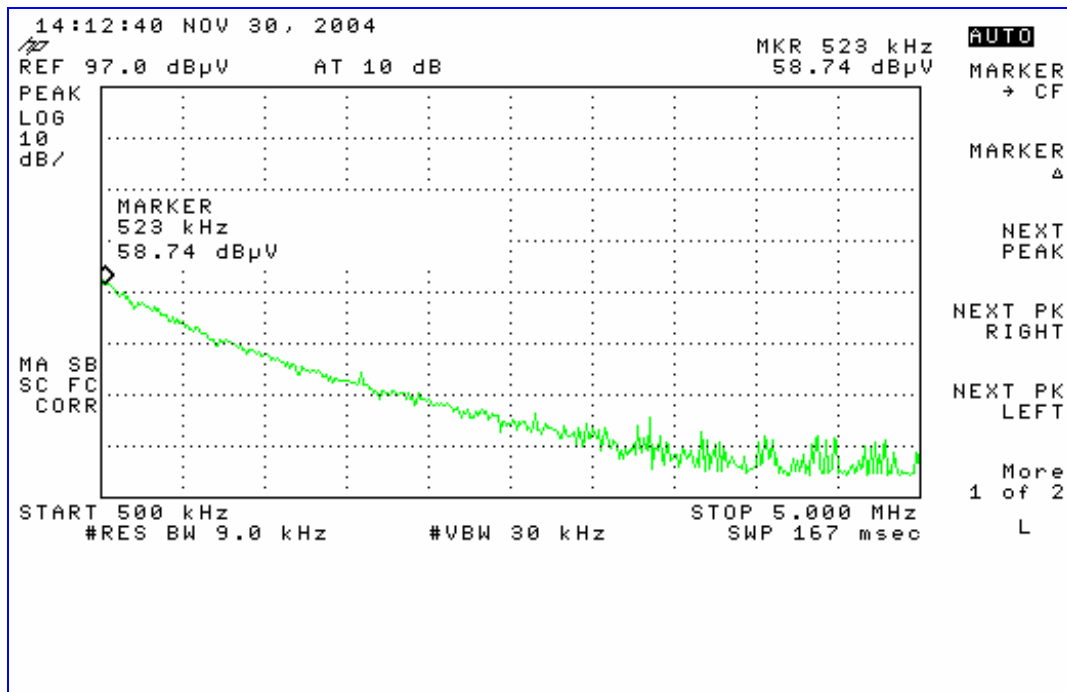
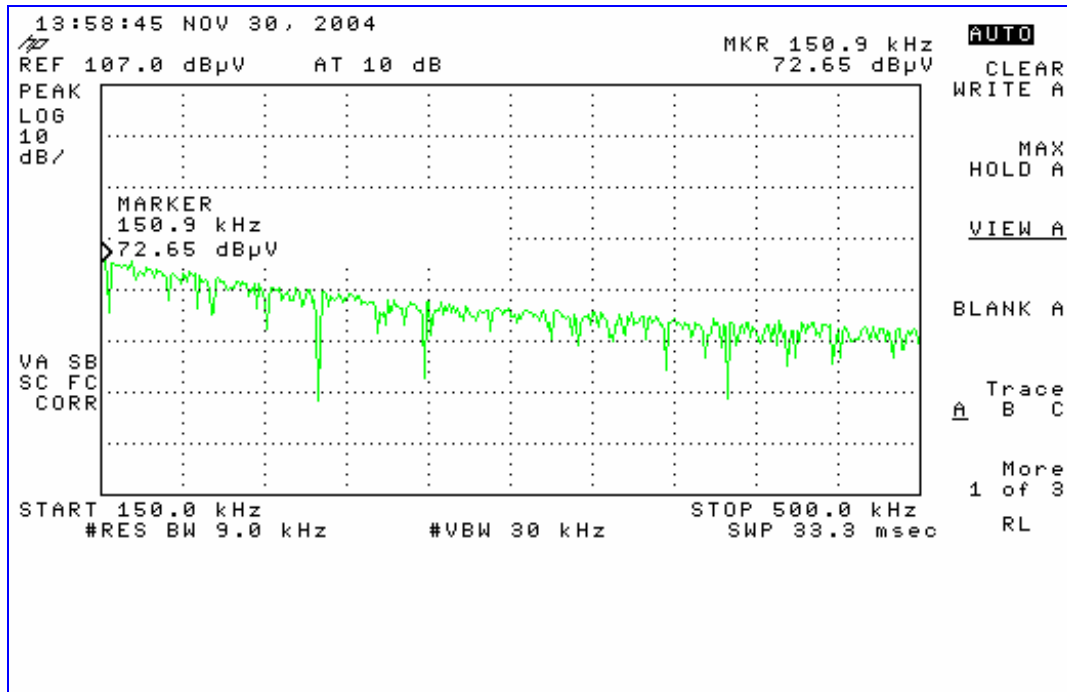
Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Neutral Line, (110 VAC 60 Hz)

| Frequency (MHz) | Quasi-Peak Amplitude (dBμV) | Quasi-Peak Limit (dBμV) | Quasi-Peak Margin (dBμV) | Average Amplitude (dBμV) | Average Limit (dBμV) | Average Margin (dBμV) |
|-----------------|-----------------------------|-------------------------|--------------------------|--------------------------|----------------------|-----------------------|
| 0.155 | 62.10 | 65.73 | -3.63 | 19.40 | 55.73 | -36.33 |
| 0.166 | 61.70 | 65.16 | -3.46 | 18.90 | 55.16 | -36.26 |
| 0.185 | 59.60 | 64.26 | -4.66 | 16.70 | 54.26 | -37.56 |
| 0.204 | 59.70 | 63.45 | -3.75 | 16.10 | 53.45 | -37.35 |
| 0.219 | 58.10 | 62.86 | -4.76 | 15.20 | 52.86 | -37.66 |
| 0.602 | 42.10 | 56.00 | -13.90 | -0.30 | 46.00 | -46.30 |

Table 5. Conducted Emissions - Voltage, Worst Case Emissions, AC Power, Neutral Line



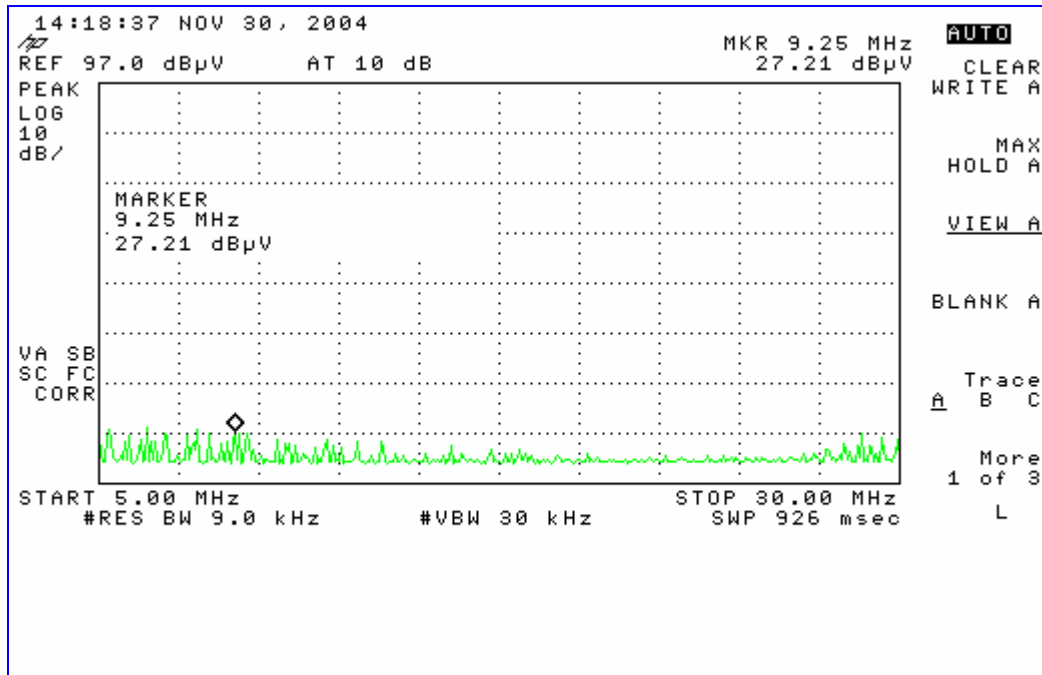
Conducted Emissions - Voltage, Worst Case Emissions, AC Power, (110 VAC 60 Hz)



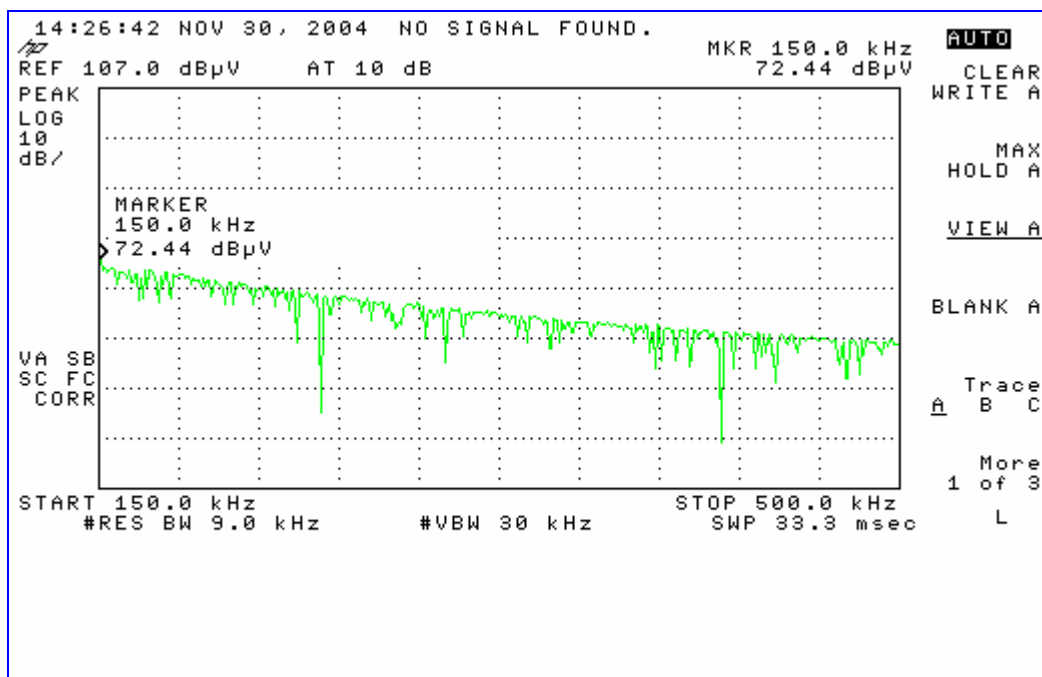
Conducted Emission Limits, Phase Line Plots



Conducted Emissions - Voltage, Worst Case Emissions, AC Power, (110 VAC 60 Hz)



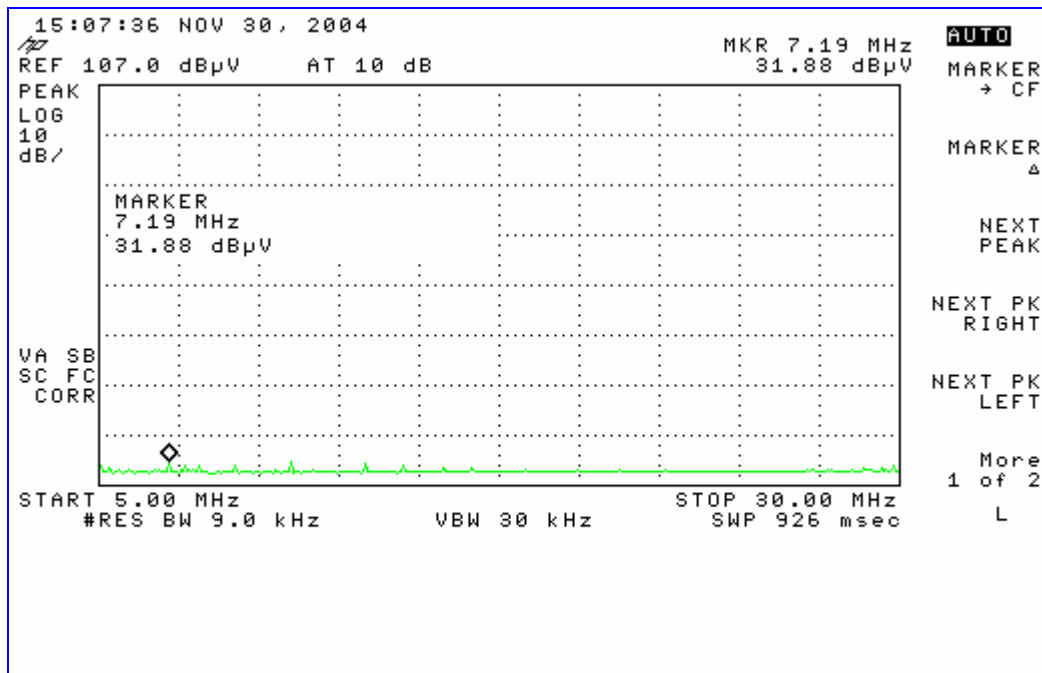
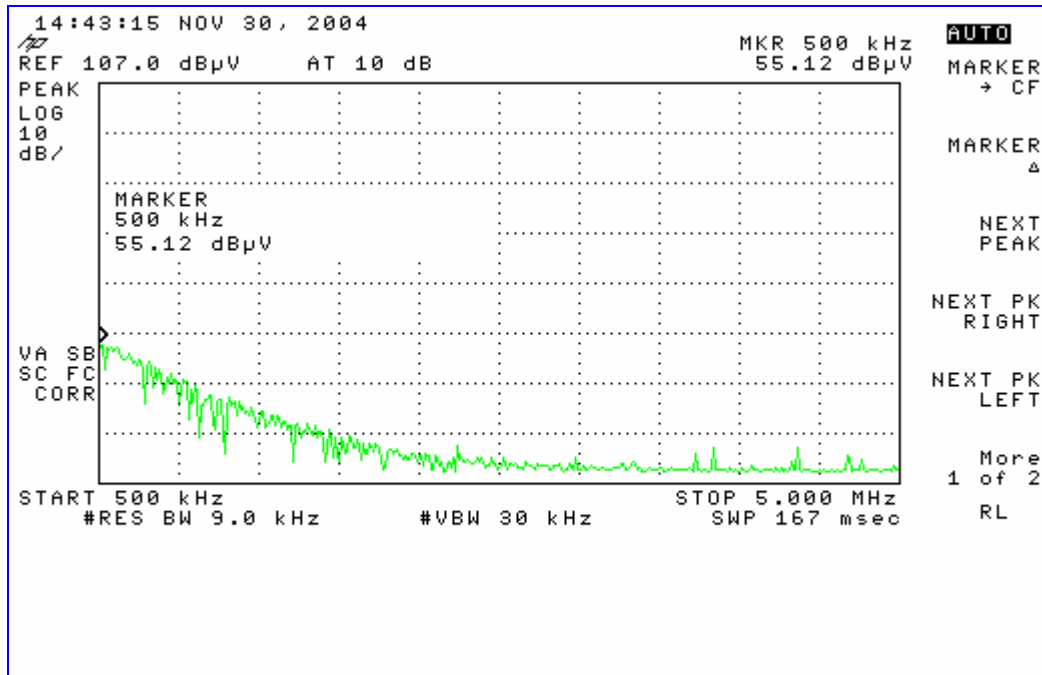
Conducted Emission Limits, Phase Line Plot



Conducted Emission Limits, Neutral Line Plot



Conducted Emissions - Voltage, Worst Case Emissions, AC Power, (110 VAC 60 Hz)



Conducted Emission Limits, Neutral Line Plots



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 6.

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 6.

| 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 6. Radiated Emissions Limits calculated from FCC Part 15, § 15.109 (a) (b)

Test Procedures: The EUT was installed placed on a 0.8 m 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 3 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. Measured emission below applicable limits..

Test Engineer(s): Chris G. Eckert

Test Date(s): 11/24/2004



Radiated Emissions Limits Test Results, Class B

| Frequency (MHz) | EUT Azimuth (Degrees) | Antenna Polarity (H/V) | Antenna Height (m) | Uncorrected Amplitude (dBuv) | Antenna Correction Factor (dB) (+) | Cable Loss (dB) (+) | Distance Correction Factor (dB) (-) | Corrected Amplitude (dBuv) | Limit (dBuv) | Margin (dB) |
|-----------------|-----------------------|------------------------|--------------------|------------------------------|------------------------------------|---------------------|-------------------------------------|----------------------------|--------------|-------------|
| 32.236 | 81 | H | 1.10 | 15.80 | 7.04 | 1.33 | 0.00 | 24.18 | 40.00 | -15.82 |
| 32.236 | 81 | V | 1.00 | 15.80 | 6.65 | 1.33 | 0.00 | 23.79 | 40.00 | -16.21 |
| 46.573 | 360 | H | 1.00 | 16.03 | 8.66 | 1.54 | 0.00 | 26.23 | 40.00 | -13.77 |
| 46.573 | 360 | V | 1.00 | 20.56 | 8.09 | 1.54 | 0.00 | 30.19 | 40.00 | -9.81 |
| 58.691 | 360 | H | 1.09 | 16.03 | 9.97 | 1.76 | 0.00 | 27.75 | 40.00 | -12.25 |
| 58.691 | 185 | V | 1.17 | 19.85 | 8.07 | 1.76 | 0.00 | 29.68 | 40.00 | -10.32 |
| 84.054 | 0 | H | 1.10 | 16.03 | 7.47 | 2.12 | 0.00 | 25.62 | 40.00 | -14.38 |
| 84.054 | 0 | V | 1.00 | 16.03 | 7.48 | 2.12 | 0.00 | 25.63 | 40.00 | -14.37 |
| 103.952 | 25 | H | 1.00 | 16.90 | 7.88 | 2.32 | 0.00 | 27.10 | 43.50 | -16.40 |
| 103.952 | 0 | V | 1.01 | 16.90 | 7.76 | 2.32 | 0.00 | 26.98 | 43.50 | -16.52 |
| 959.196 | 0 | H | 1.00 | 6.02 | 23.47 | 6.04 | 0.00 | 35.53 | 46.00 | -10.47 |
| 959.196 | 0 | V | 1.06 | 6.02 | 22.95 | 6.04 | 0.00 | 35.01 | 46.00 | -10.99 |

Table 7. Radiated Emissions Limits Test Results



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 17025:2000.

| Test Name: Radiated Emissions | | | Test Date(s): 11/24/2004 | | |
|-------------------------------|----------------|----------------------|--------------------------|---------------|--------------|
| MET Asset # | Nomenclature | Manufacturer | Model | Last Cal Date | Cal Due Date |
| 1T4303 | ANTENNA; BILOG | SCHAFNER - CHASE EMC | CBL6140A | 04/22/2004 | 04/22/2005 |
| 1T4409 | EMI Receiver | Rhode & Schwarz | ESP17 | 04/28/2004 | 04/28/2005 |

Table 8. Test Equipment



5.0 Compliance Information

The following text excerpts are from the Code of Federal Regulations, Title 47, Part 2 and 15.

§ 2.1073 Responsibilities

- (a) The responsible party, as defined in Section 2.909 of this part, must warrant that each unit of equipment marketed under a Declaration of Conformity is 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 the Declaration of Conformity within the variation that can be expected due to quantity production and testing on a statistical basis.
- (b) The responsible party, if different from the manufacturer, may upon receiving a written statement from the manufacturer that the equipment complies with the appropriate technical standard rely on the manufacturer or independent testing agency to determine compliance. However, the test records required in Section 2.1075 of this part shall be in the English language and shall be made available to the Commission upon a reasonable request in accordance with the provisions of Section 2.1076 of this part.
- (c) In the case of transfer of control of the equipment, as in the case of sale or merger of the responsible party, the new responsible party shall bear the responsibility of continued compliance of the equipment.
- (d) Equipment shall be retested to demonstrate continued compliance with the applicable technical standards if any modifications or changes that could adversely affect the emanation characteristics of the equipment are made by the responsible party. The responsible party bears responsibility for the continued compliance of subsequently produced equipment.
- (e) If any modifications or changes are made by anyone other than the responsible party for the Declaration of Conformity, the party making the modifications or changes, if located within the U.S., becomes the new responsible party. The new responsible party must comply with all the provisions for the Declaration of Conformity, including having test data on file demonstrating that the product continues to comply with all of the applicable technical standards.

§ 2.1074 Identification

Devices subject only to a Declaration of Conformity shall be uniquely identified by the responsible party. This identification shall not be of a format which could be confused with the FCC Identifier required on certified, notified, type accepted, or type approved equipment. The responsible party shall maintain adequate identification records to facilitate positive identification for each device.



§ 2.1077 Compliance information

- (a) If a product must be tested and authorized under a Declaration of Conformity, A COMPLIANCE INFORMATION STATEMENT SHALL BE SUPPLIED WITH THE PRODUCT AT THE TIME OF MARKETING OR IMPORTATION, containing the following information:
 - (1) Identification of the product, e.g., name and model number;
 - (2) A statement, similar to that contained in §15.19(a)(3) of this chapter, that the product complies with part 15 of this chapter; and
 - (3) The identification, by name, address, and telephone number, of the responsible party, as defined in §2.909. The responsible party for Declaration of Conformity must be located in the United States.
- (b) If a product is assembled from modular components that, by themselves, are authorized under a Declaration of Conformity and/or a grant of certification, and the assembled product is also subject to authorization under a Declaration of Conformity but, in accordance with the applicable regulations does not require additional testing, the product shall be supplied, at the time of marketing or importation, with a compliance information statement containing the following information:
 - (1) Identification of the assembled product, e.g., name and model number.
 - (2) Identification of the modular components used in the assembly. A modular component authorized under a Declaration of Conformity shall be identified as specified in paragraph (a)(1) of this section. A modular component authorized under a grant of certification shall be identified by name and model number (if applicable) along with the FCC Identifier number.
 - (3) A statement that the product complies with part 15 of this chapter.
 - (4) The identification, by name, address, and telephone number, of the responsible party who assembled the product from modular components, as defined in § 2.909. The responsible party for a Declaration of Conformity must be located within the United States.
 - (5) Copies of the compliance information statements for each modular components used in the system that is authorized under a Declaration of Conformity.
- (c) The compliance information statement shall be included in the user's manual or as a separate sheet.

§ 15.3 Definitions

- (a) **Peripheral Device** An input/output unit of a system that feeds data into and/or receives data from the central processing unit of a digital device. Peripherals to a digital device include any device that is connected external to the digital device, any device internal to the digital device that connects the digital device to an external device by wire or cable, and any circuit board designed for interchangeable mounting, internally or externally, that increases the operating or processing speed of a digital device, e.g., "turbo" cards and "enhancement" boards. Examples of peripheral devices include terminals, printers, external floppy disk drives and other data storage devices, video monitors, keyboards, interface boards, external memory expansion cards, and other input/output devices that may or may not contain digital circuitry. This definition does not include CPU boards, as defined in paragraph (bb) of this section, even though a CPU board may connect to an external keyboard or other components.
- (b) **CPU Board** A circuit board that contains a microprocessor, or frequency determining circuitry for the microprocessor, the primary function of which is to execute user-provided programming, but not including: (1) a circuit board that contains only a microprocessor intended to operate under the primary control or instruction of a microprocessor external to such a circuit board: or (2) a circuit board that is a dedicated controller for a storage or input/output device.



5.1 Label and User's Manual Information

§ 15.19 Labeling requirements

- (a) (4) Where a device is constructed in two or more sections connected by wires and marketed together, a statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When a device is so small or for such use this 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.
- (b) Products subject to authorization under the Declaration of Conformity shall be labeled as follows:
 - (1) The label shall be located in a conspicuous location on the device and shall contain the unique identification described in Section 2.1074 of this chapter and the following logo:
 - (i) If the product is authorized based on testing of the product or system:
 - (ii) If the product is authorized based on assembly using separately authorized components and the resulting product is not separately tested:
 - (2) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (b)(1) of this section on it, such as for a CPU board or a plug-in circuit board peripheral device, the text associated with the logo may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. However, the unique identification (trade name and model number) and the logo must be display on the device.
 - (3) The label shall not be a stick-on paper label. The label on these products shall be permanently affixed to the product and shall be readily visible to the purchaser at the time of purchase, as described in Section 2.925(d) of this chapter. "Permanently affixed" means that the label is etched, engraved, stamped, silk-screened, indelibly printed, or otherwise permanently marked on a permanently attached part of the equipment or on a nameplate of metal, plastic, or other material fastened to the equipment by welding, riveting, or a permanent adhesive. The label must be designed to last the expected lifetime of the equipment in the environment in which the equipment may be operated and must not be readily detachable.



**DECLARATION OF CONFORMITY LABELLING REQUIREMENTS
FOR PERSONAL COMPUTERS AND PERSONAL COMPUTER PERIPHERALS**

The labeling requirements below apply only to personal computers and personal computer peripherals that are self-authorized under the Declaration of Conformity procedure.

Required label formats

Label A is required if the device is authorized based on testing of the product or system. **Label B** is required if the device is authorized based on assembly using separately authorized components and the resulting device is not separately tested. Refer to new Sections 15.19(b)(1) - (b)(1)(i).

**Alternate label format for
small devices**

The FCC logo, trade name and model number must be shown on the product. The text shown in ***bold-face italics*** may be placed in a prominent location in the instruction manual or pamphlet supplied to the user. Refer to the new Section 15.19(b)(2).

Trade Name Model Number



**Tested to Comply
with FCC Standards**

FOR HOME OR OFFICE USE



Trade Name Model Number

***Tested To Comply
With FCC Standards
FOR HOME OR OFFICE USE***

Trade Name Model Number



**Assembled From
Tested Components
(Complete System Not Tested)**

FOR HOME OR OFFICE USE



Trade Name Model Number

***Assembled From
Tested Components
(Complete System Not Tested)
FOR HOME OR OFFICE USE***



§ 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.

§ 15.32 Test Procedures for CPU boards and computer power supplies

Power supplies and CPU boards used with personal computers and for which separate authorizations are required to be obtained shall be tested as follows:

(a) CPU boards shall be tested as follows:

(1) Testing for radiated Emissions shall be performed with the CPU board installed in a typical enclosure but with the enclosure's cover removed so that the internal circuitry is exposed at the top and on at least two sides. Additional components, including a power supply, peripheral devices, and subassemblies, shall be added, as needed, to result in a complete personal computer system. If the oscillator and the microprocessor circuits are contained on separate circuit boards, both boards, typical of the combination that would normally be employed, must be used in the test. Testing shall be in accordance with the procedures specified in Section 15.31 of this part. Under these test conditions, the system under test shall not exceed the radiated emission limits specified in Section 15.109 of this part by more than 3dB.

(2) Unless the test in paragraph (a)(1) of this section demonstrates compliance with the limits in Section 15.109 of this part, a second test shall be performed using the same configuration described above but with the cover installed on the enclosure. Testing shall be in accordance with the procedures specified in Section 15.31 of this part. Under these test conditions, the system under test shall not exceed the radiated emission limits specified in Section 15.109 of this part.

(3) The test demonstrating compliance with the AC power line conducted limits specified in Section 15.107 of this part shall be performed in accordance with the procedures specified in Section 15.31 using an enclosure, peripherals, power supply, and subassemblies that are typical of the type with which the CPU board under test would normally be employed.

(b) The power supply shall be tested installed in an enclosure that is typical of the type within which it would normally be installed. Additional components, including peripheral devices, a CPU board, and subassemblies, shall be added, as needed, to result in a complete personal computer system. Testing shall be in accordance with the procedures specified in Section 15.31 and must demonstrate compliance with all of the standards contained in this part.

§ 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 his own expense.

(b) For a Class B digital device or peripheral, the instructions furnished to 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 B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

(c) The provisions of paragraphs (a) and (b) of this section do not apply to digital devices exempted from the technical standards under the provisions of § 15.103.

(d) For systems incorporating several digital devices, the statement shown in paragraph (a) or (b) of this section needs to be contained only in the instruction manual for the main control unit.



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 [*] digital apparatus complies with Canadian ICES-003.

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

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