



MET Laboratories, Inc.

Safety Certification - EMI - Telecom Environmental Simulation

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

December 22, 2008

ClearCount Medical Solutions
101 Bellevue Rd. Ste. 300
Pittsburgh, PA 15229

Dear Steve Fleck,

Enclosed is the EMC test report for compliance testing of the ClearCount Medical Solutions, ClearCount SmartSponge PLUS System, tested to the requirements of Title 47 of the CFR, Part 15.225, Subpart C for Certification as an Intentional Radiator.

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.

Jennifer Warnell
Documentation Department

Reference: (\ClearCount Medical Solutions\ EMC24639-FCC225)

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DOC-EMC705 2/26/2004



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Electromagnetic Compatibility Criteria Test Report

For the

**ClearCount Medical Solutions
ClearCount SmartSponge PLUS System**

Tested under
The FCC Certification Rules Contained in Title 47 of the CFR, Part 15, Subpart C
For Certification as a Intentional Radiator

MET Report: EMC24639-FCC225

December 22, 2008

Prepared For:

**ClearCount Medical Solutions
101 Bellevue Rd. Ste. 300
Pittsburgh, PA 15229**

Prepared By:
MET Laboratories, Inc.
914 West Patapsco Avenue
Baltimore, MD 21230



Electromagnetic Compatibility Criteria Test Report

For the

**ClearCount Medical Solutions
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Tested under

**The FCC Certification Rules Contained in Title 47 of the CFR, Part 15, Subpart C
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MET Report: EMC24639-FCC225

A handwritten signature in blue ink, appearing to read "Liming Xu".

Liming Xu
Project Engineer, Electromagnetic Compatibility Lab

A handwritten signature in blue ink, appearing to read "Jennifer Warnell".

Jennifer Warnell
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 C for Certification as an Intentional Radiator, under normal use and maintenance.

A handwritten signature in black ink, appearing to read "Shawn McMillen".

Shawn McMillen,
Wireless Manager, Electromagnetic Compatibility Lab



Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	December 8, 2008	Initial Issue.
1	December 22, 2008	Corrections per test engineer.



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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
H	Magnetic Field
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. Testing Summary

Title 47 of the CFR, Part 15, Subpart C, Reference and Test Description	Results	Comments
Title 47 of the CFR, Part 15, Subpart C, §15.203	Antenna Requirement	Compliant
15.225(a) Field Strength emissions within the band 13.553 – 13.567 MHz	Compliant	Emissions within applicable limits.
15.225(b) Field Strength emissions within the band 13.410 – 13.553 MHz and 13.567 – 13.710 MHz	Compliant	Emissions within applicable limits.
15.225(c) Field Strength emissions within the band 13.110 – 13.410 MHz and 13.710 – 14.010 MHz	Compliant	Emissions within applicable limits.
15.225(d) Outside-Band Field Strength emissions per 15.209	Compliant	Emissions within applicable limits.
15.225(e) Frequency Tolerance of the Carrier	Compliant	Refer to FCC ID: PJMLRM2000.

Table 1. Summary of Test Results



2. Equipment Configuration

2.1 Overview

MET Laboratories, Inc. was contracted by ClearCount Medical Solutions to perform testing on the ClearCount SmartSponge PLUS System, under ClearCount Medical Solutions's purchase order number 1648.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the ClearCount Medical Solutions, ClearCount SmartSponge PLUS System.

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

Filing Status:	Original
Model(s) Tested:	ClearCount SmartSponge PLUS System
EUT Specifications:	Primary Power: 120/240 VAC, 50/60 Hz
	FCC ID: WWQCCMS001
	Equipment Code: DXX
	EUT TX Frequency Ranges: 13.56 MHz
Analysis:	The results obtained relate only to the item(s) tested.
Evaluated by:	Liming Xu
Report Date(s):	December 22, 2008

2.2 References

CFR 47, Part 15, Subpart C	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 15: General Rules and Regulations, Allocation, Assignment, and Use of Radio Frequencies
CFR 47, Part 15, Subpart B	Electromagnetic Compatibility: Criteria for Radio Frequency Devices
ANSI C63.4:2003	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI/NCSL Z540-1-1994	Calibration Laboratories and Measuring and Test Equipment - General Requirements
ANSI/ISO/IEC 17025:2000	General Requirements for the Competence of Testing and Calibration Laboratories



2.3 Test Site

All testing was performed at MET Laboratories, Inc., 914 West Patapsco Avenue, 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.

2.4 Description of Test Sample

The ClearCount SmartSponge PLUS System, Equipment Under Test (EUT), is an automatic surgical sponge counting and scanning device.

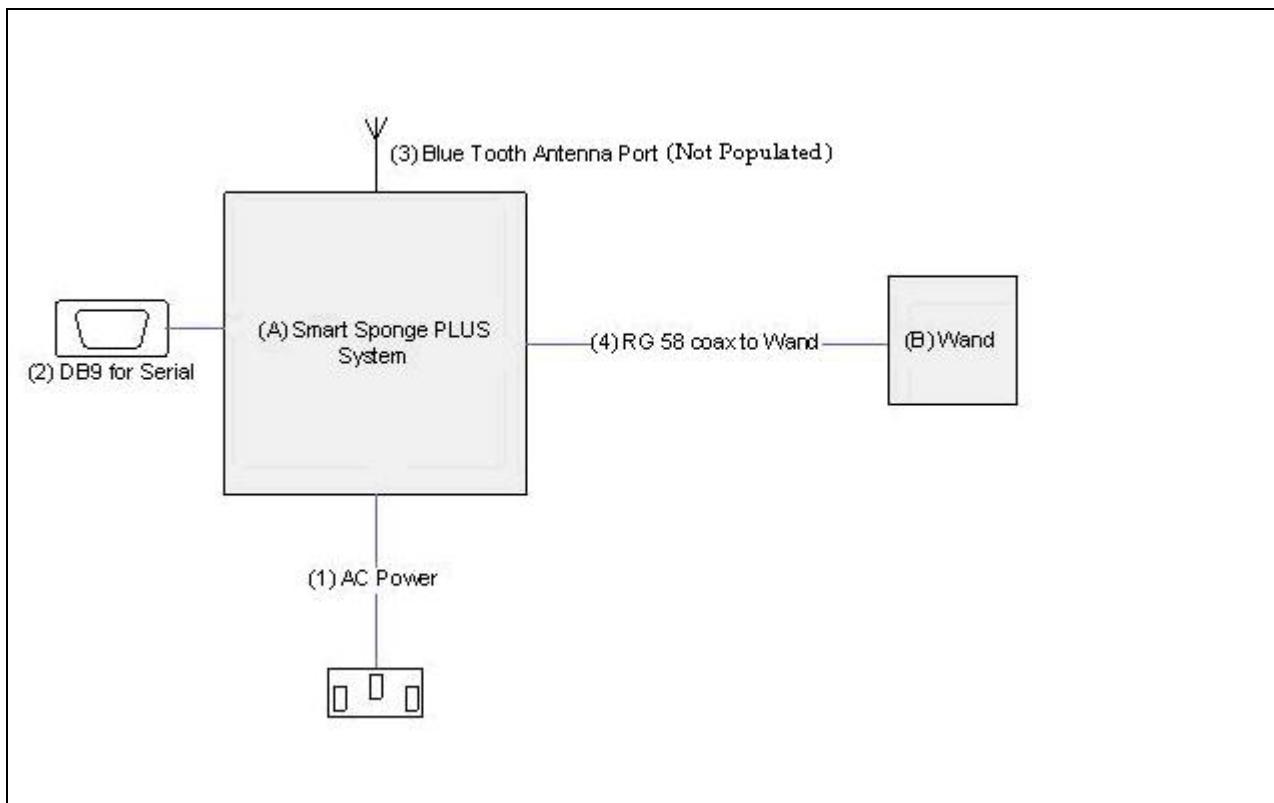


Figure 1. Block Diagram of Configuration



2.5 Equipment Configuration

The EUT is part of a system as shown in Figure 1, Block Diagram of Test Setup. All cards, etc., incorporated as part of the EUT is included in the following list.

Ref. ID	Slot #	Name / Description	Model Number	Part Number	Serial Number	Rev. #
A	N/A	CLEARCOUNT SMARTSPONGE PLUS SYSTEM	A02	100087	123	1
B	N/A	WAND	N/A	N/A	N/A	N/A

Table 2. Equipment Configuration

2.6 Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty	Length as tested (m)	Max Length (m)	Shielded? (Y/N)	Termination Box ID & Port Name
1	AC INPUT	3 CONDUCTOR, 18AWG	1	4.5	4.5	NO	POWER ENTRY MODULE
2	DEBUG PORT (NOT USER ACCESSIBLE)	DB9 CONNECTOR TO RECEIVE SERIAL CABLE	1	N/A	N/A	N/A	N/A
3	WIRELESS BLUE TOOTH ANTENNA (NOT POPULATED) (NOT USER ACCESSIBLE)	BLUE TOOTH ANTENNA CONNECTION PORT	1	N/A	N/A	N/A	N/A
4	WAND PORT	RG 58 COAX CABLE	1	4.5	4.5	NO	WAND

Table 3. Ports and Cabling Information

2.7 Mode of Operation

Count In & Count Out Modes: The device will detect and count packs of RFID tagged sponges placed on its "IN" scanner or in its "OUT" scanner. The appropriate quantity and type of sponge is displayed on the LCD.

Wand Mode: The Wand tethered to the SmartSponge PLUS System was activated and radiating as it would under normal operating conditions.



2.8 Monitoring Method

Count IN Mode: When a pack of sponges is placed on the IN scan tray, a proximity switch will be triggered and the screen will display "In Scan". The quantity of detected sponges will also be displayed. If that pack is placed on the IN scan tray again, the screen will continually indicate that the pack has already been scanned. This is a real time indication that the IN scan antenna is functioning properly.

Count OUT Mode: A "Bag Full" indicator will appear on the LCD showing that the device is currently reading 50+ sponges in the OUT bucket. If the bucket is filled with 50+ sponges, this indicator should remain on or occasionally flicker. This is an indication that the device is performing its intended function. If the indicator disappears for 5 seconds or more, the device is not performing its intended function.

Wand Mode: A green LED on the Wand handle will light when the Wand is detecting the RFID tag embedded in the SmartMat. In addition, a graphic of the SmartMat on the LCD display will flash indicating detection of the same embedded RFID tag. This is an indication that the device is performing its intended function. If LED turns off while the Wand is still within range of the SmartMat, the device is not performing its intended function.

2.9 Modifications

a) Modifications to EUT

Modifications made to the EUT for compliance to spurious emissions:

Two Passive Lowpass Filters, M/N J4617-15M-50-65A, were added in line with the out-scan and wand antenna.

b) Modifications to Test Standard

No modifications were made to the test standard.

2.10 Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to ClearCount Medical Solutions upon completion of testing.



3.0 Electromagnetic Compatibility Emission Criteria

3.1 § 15.203 Antenna Requirement

Test Requirement:

§ 15.203: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

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

Results:

The antenna is professionally installed and is therefore compliant with §15.203. The wand antenna can be changed by the user, but the wand has unique electronics included that must be recognized by the device software or the antenna installed to the connector will be ignored.

Test Engineer(s): Liming Xu

Test Date(s): 05/22/08



3.2. Field Strength of Fundamental Emission

Test Requirement(s): **15.225 (a)** The field strength of any emissions within the band 13.553 – 13.567 MHz shall not exceed 15,848 microvolts/meter at 30 meters.

Test Procedure: The EUT was set to transmit at its normal operating power. The method of testing and test conditions of ANSI C63.4: 2003 were used. The loop antenna was located 10 m from the EUT. Measurements were conducted with the loop antenna at coaxial (parallel) and planar (perpendicular) orientations while the EUT was rotated in order to maximize emissions. The measurements were made at 10 m and then extrapolated to 30m using the following correction factor. A quasi-peak detector was used.

$$40\log(10/30) = -19.08 \text{ dB}$$

Test Results: The EUT was found compliant with Part 15.225 (a) requirements of this section.

Test Engineer(s): Len Knight

Test Date(s): 11/13/08

Mode Tested	Measurement Distance (m)	Frequency (MHz)	Measured (dBuV)	Antenna Correction Factor (dB)	Field Strength (dBuV/m)	Distance Correction to 30m (dB)(-)	Corrected Field Strength @ 30m (dBuV/m)	Limit @ 30m	Margin (dB)
Outscan	10	13.56	55.84	34.5	90.34	19	71.34	84	12.66

Table 4. Fundamental Emissions Limits, Test Results, Out-Scan

Mode Tested	Measurement Distance (m)	Frequency (MHz)	Measured (dBuV)	Antenna Correction Factor (dB)	Field Strength (dBuV/m)	Distance Correction to 30m (dB)(-)	Corrected Field Strength @ 30m (dBuV/m)	Limit @ 30m	Margin (dB)
Inscan	10	13.56	30.8	34.5	65.3	19	46.3	84	37.7

Table 5. Fundamental Emissions Limits, Test Results, In-Scan

Mode Tested	Measurement Distance (m)	Frequency (MHz)	Measured (dBuV)	Antenna Correction Factor (dB)	Field Strength (dBuV/m)	Distance Correction to 30m (dB)(-)	Corrected Field Strength @ 30m (dBuV/m)	Limit @ 30m	Margin (dB)
Wand	10	13.56	54.53	34.5	89.03	19	70.03	84	13.97

Table 6. Fundamental Emissions Limits, Test Results, Wand



3.3. Field Strength of Emissions within the Band 13.110 – 14.010 MHz

Test Requirement(s): **15.225 (b)** Within the bands 13.410-13.553 MHz and 13.567-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

15.225 (c) Within the bands 13.110-13.410 MHz and 13.710-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

Test Procedures: The EUT was set to transmit at its normal operating power. The method of testing and test conditions of ANSI C63.4: 2003 were used. The loop antenna was located 10 m from the EUT. Measurements were conducted with the loop antenna at coaxial (parallel) and planar (perpendicular) orientations while the EUT was rotated in order to maximize emissions. The measurements were made at 10 m and then extrapolated to 30m using the following correction factor. A quasi-peak detector was used.

$$40\log(10/30) = -19.08 \text{ dB}$$

Test Results: The EUT was found compliant with Part 15.225 (b)(c) requirements of this section.

Test Engineer(s): Len Knight, Dusmantha Tennakoon

Test Date(s): 11/10/08 & 11/11/08



Mode Tested	Measurement Distance (m)	Frequency (MHz)	Measured (dBuV)	Antenna Correction Factor (dB)	Field Strength (dBuV/m)	Distance Correction to 30m (dB)(-)	Corrected Field Strength @ 30m (dBuV/m)	Limit @ 30m	Margin
Outscan	10	13.41	15.51	34.5	50.01	19	31.01	50.47	19.46
	10	13.5	23.26	34.5	57.76	19	38.76	50.47	11.71
	10	13.553	34.31	34.5	68.81	19	49.81	50.47	0.66
	10	13.555	46.13	34.5	80.63	19	61.63	84	22.37
	10	13.56	55.84	34.5	90.34	19	71.34	84	12.66
	10	13.566	45.01	34.5	79.51	19	60.51	84	23.49
	10	13.567	34.65	34.5	69.15	19	50.15	50.47	0.32
	10	13.569	34.01	34.5	68.51	19	49.51	50.47	0.96
	10	13.57	33.9	34.5	68.4	19	49.4	50.47	1.07
	10	13.71	15.42	34.5	49.92	19	30.92	40.5	9.58
	10	13.75	13.33	34.5	47.83	19	28.83	40.5	11.67
	10	14.01	4.03	34.5	38.53	19	19.53	29.5	9.97

Table 7. Fundamental Emissions Limits, Test Results, Out-Scan

Mode Tested	Measurement Distance (m)	Frequency (MHz)	Measured (dBuV)	Antenna Correction Factor (dB)	Field Strength (dBuV/m)	Distance Correction to 30m (dB)(-)	Corrected Field Strength @ 30m (dBuV/m)	Limit @ 30m	Margin
Inscan	10	13.5	3.774	34.5	38.274	19	19.274	50.47	31.196
	10	13.553	18.05	34.5	52.55	19	33.55	50.47	16.92
	10	13.555	22.99	34.5	57.49	19	38.49	84	45.51
	10	13.56	30.8	34.5	65.3	19	46.3	84	37.7
	10	13.566	22	34.5	56.5	19	37.5	50.47	12.97
	10	13.567	18.92	34.5	53.42	19	34.42	50.47	16.05
	10	13.569	15.01	34.5	49.51	19	30.51	50.47	19.96

Table 8. Fundamental Emissions Limits, Test Results, In-Scan



Mode Tested	Measurement Distance (m)	Frequency (MHz)	Measured (dBuV)	Antenna Correction Factor (dB)	Field Strength (dBuV/m)	Distance Correction to 30m (dB)(-)	Corrected Field Strength @ 30m (dBuV/m)	Limit @ 30m	Margin
Wand	10	13.41	7.669	34.5	42.169	19	23.169	50.47	27.301
	10	13.5	18.22	34.5	52.72	19	33.72	50.47	16.75
	10	13.553	34.55	34.5	69.05	19	50.05	50.47	0.42
	10	13.555	46.25	34.5	80.75	19	61.75	84	22.25
	10	13.56	54.53	34.5	89.03	19	70.03	84	13.97
	10	13.566	45.34	34.5	79.84	19	60.84	84	23.16
	10	13.567	34.59	34.5	69.09	19	50.09	50.47	0.38
	10	13.569	34.7	34.5	69.2	19	50.2	50.47	0.27
	10	13.57	34.74	34.5	69.24	19	50.24	50.47	0.23
	10	13.71	7.7	34.5	42.2	19	23.2	40.5	17.3
	10	13.75	6.33	34.5	40.83	19	21.83	40.5	18.67
	10	14.01	2.788	34.5	37.288	19	18.288	29.5	11.212

Table 9. Fundamental Emissions Limits, Test Results, Wand



3.4. Field Strength of Spurious Emissions

Test Requirement(s): **15.225 (d)** The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

Test Procedures: The EUT was placed inside a semi-anechoic chamber. The method of testing and test conditions of ANSI C63.4 were used. For testing above 30 MHz, an antenna was located 3 m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. Unless otherwise specified, measurements were made using a quasi-peak detector with a 120 kHz bandwidth.

For testing below 30 MHz, a loop antenna was used. The method of testing and test conditions of ANSI C63.4: 2003 were used. The loop antenna was located 3 m from the EUT. Measurements were conducted with the loop antenna at coaxial (parallel) and planar (perpendicular) orientations while the EUT was rotated in order to maximize emissions. The measurements were made at 3 m and then extrapolated to 30m using the following correction factor.

$$40\log(3/30) = -40 \text{ dB}$$

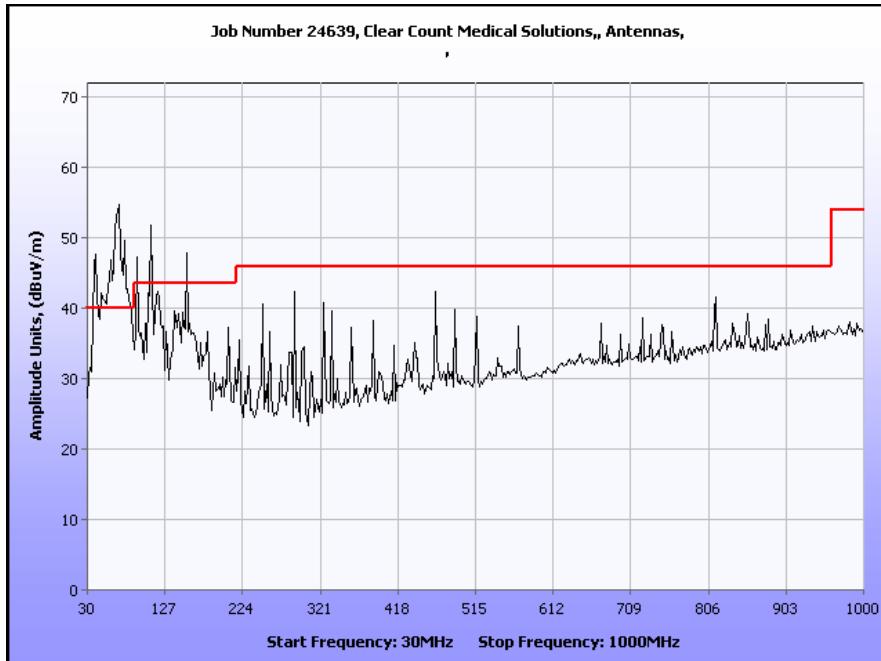
Frequency (MHz)	Field Strength (dB μ V/m)	
	§15.109 (b), Class A Limit (dB μ V) @ 10m	§15.109 (a), Class B Limit (dB μ V) @ 3m
30 - 88	39.00	40.00
88 - 216	43.50	43.50
216 - 960	46.40	46.00
Above 960	49.50	54.00

Table 10. Radiated Emissions Limits calculated from FCC Part 15, §15.109 (a) (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/m)	Limit (dBuV/m)	Margin (dB)
39.659	360	H	1.00	5.18	8.72	0.20	0.00	14.09	40.00	-25.91
39.659	0	V	1.00	20.10	7.60	0.20	0.00	27.90	40.00	-12.10
60.080	202	H	4.17	14.99	10.20	0.24	0.00	25.43	40.00	-14.57
*60.080	132	V	0.99	29.87	9.80	0.24	0.00	39.91	40.00	-0.09
68.627	70	H	1.87	10.41	9.69	0.23	0.00	20.33	40.00	-19.67
*68.627	123	V	0.99	28.02	8.81	0.23	0.00	37.06	40.00	-2.94
112.200	195	H	2.89	16.17	7.20	0.27	0.00	23.64	43.50	-19.86
112.200	-1	V	0.99	19.29	7.51	0.27	0.00	27.08	43.50	-16.42
154.840	200	H	1.89	30.58	8.10	0.42	0.00	39.10	43.50	-4.40
*154.840	-3	V	0.99	34.86	8.09	0.42	0.00	43.38	43.50	-0.12
288.007	31	H	1.59	19.21	12.98	1.41	0.00	33.60	46.00	-12.40
288.007	31	V	0.99	26.36	12.26	1.41	0.00	40.03	46.00	-5.97
464.500	63	H	2.46	22.07	16.97	2.17	0.00	41.21	46.00	-4.79
464.500	136	V	2.13	17.54	17.55	2.17	0.00	37.26	46.00	-8.74

Table 11. Spurious Emissions Limits, Test Results, Out-Scan

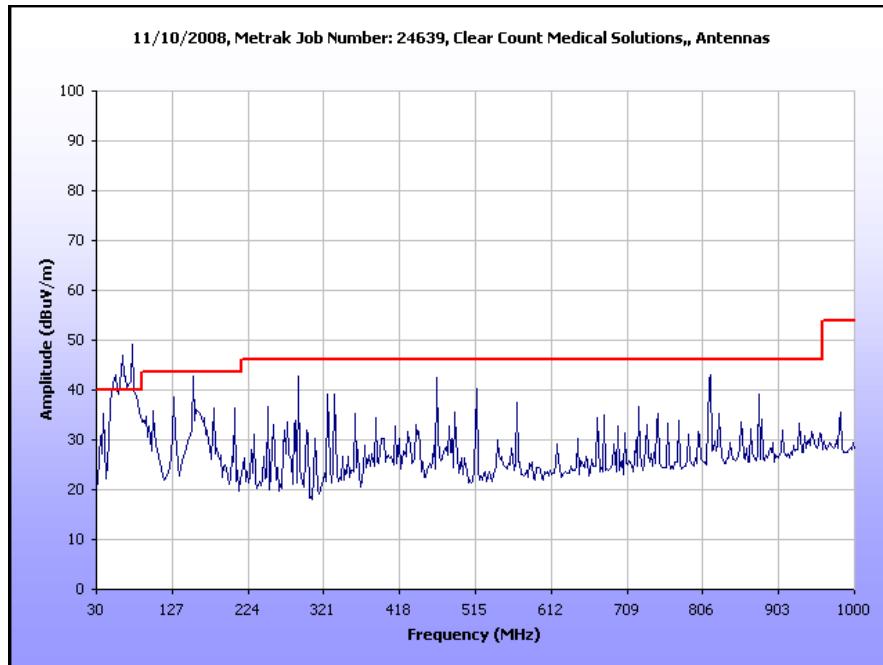
Note: * - At this frequency, the measured electric-field strength exhibits a margin of compliance that is less than 3 dB below the specification limit. We recommend that every emission measured, have at least a 3 dB margin to allow for deviations in the emission characteristics that may occur during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


Plot 1. Spurious Emissions Limits, Pre-Scan, Out-Scan, Two Filters

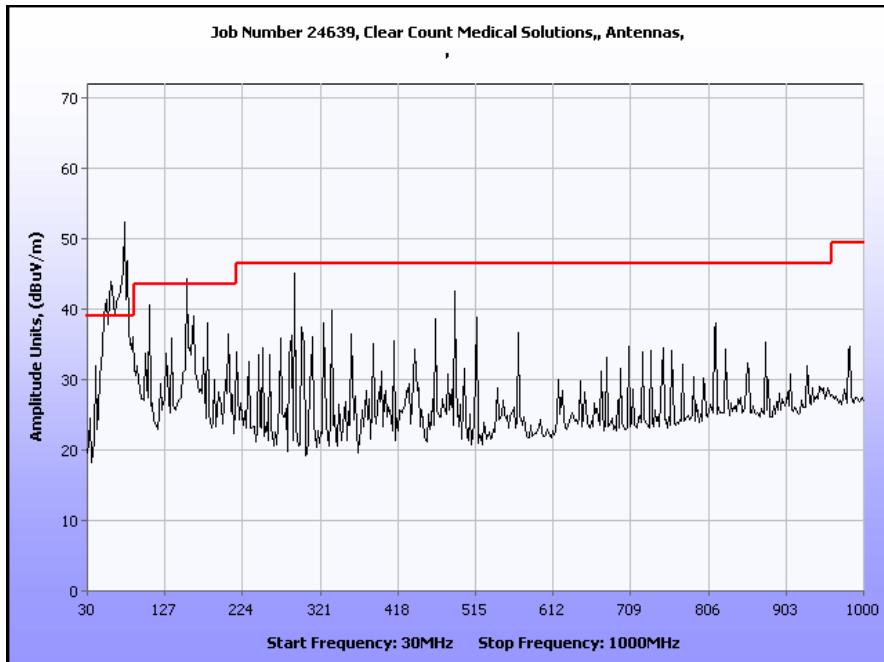
Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna HEIGHT (m)	Uncorrected Amplitude (dBuV)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
54.235	244	H	1.00	8.18	9.97	0.23	0.00	18.38	40.00	-21.62
54.235	38	V	1.00	25.78	10.04	0.23	0.00	36.05	40.00	-3.95
62.529	120	H	1.00	11.48	10.45	0.24	0.00	22.17	40.00	-17.83
*62.529	0	V	1.00	28.52	10.10	0.24	0.00	38.86	40.00	-1.14
68.603	308	H	1.99	9.44	9.85	0.23	0.00	19.52	40.00	-20.48
68.603	120	V	1.00	10.50	9.02	0.23	0.00	19.75	40.00	-20.25
162.725	333	H	2.02	19.26	8.20	0.41	0.00	27.87	43.50	-15.63
162.725	2	V	1.00	28.56	8.51	0.41	0.00	37.48	43.50	-6.02
258.042	240	H	1.00	20.04	13.02	1.32	0.00	34.38	46.00	-11.62
258.042	177	V	1.74	19.02	12.72	1.32	0.00	33.06	46.00	-12.94
813.585	280	H	1.00	16.84	21.57	3.07	0.00	41.48	46.00	-4.52
813.585	137	V	1.00	16.77	21.70	3.07	0.00	41.54	46.00	-4.46

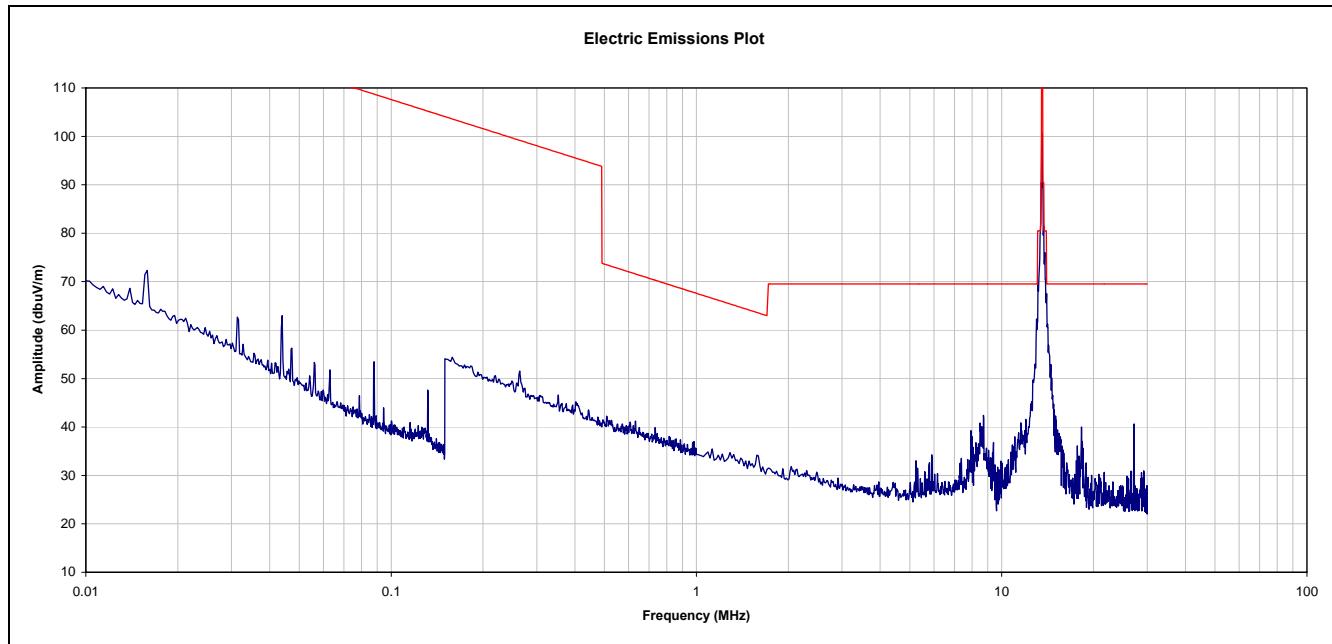
Table 12. Spurious Emissions Limits, Test Results, In-Scan

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

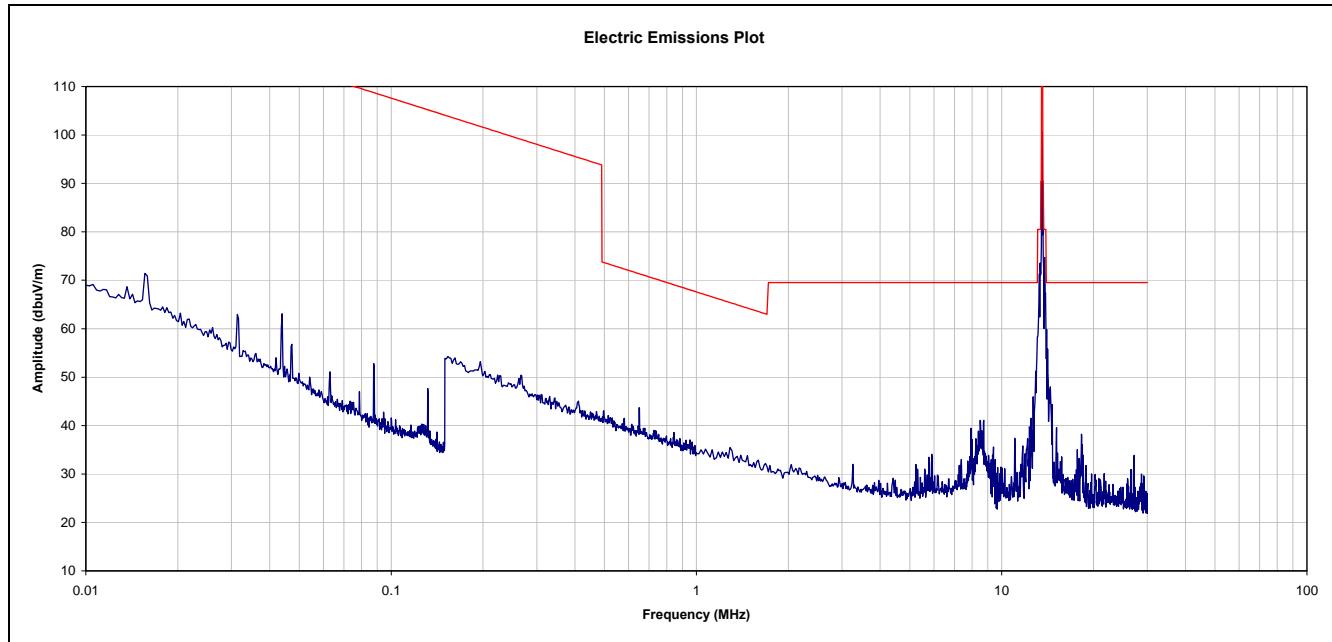

Plot 2. Spurious Emissions Limits, Pre-Scan, In-Scan

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/m)	Limit (dBuV/m)	Margin (dB)
121.409	189	H	1.82	13.80	7.43	0.31	0.00	21.54	43.50	-21.96
121.409	349	V	0.99	17.80	7.76	0.31	0.00	25.86	43.50	-17.64
126.068	180	H	3.40	15.32	7.50	0.32	0.00	23.14	43.50	-20.36
126.068	281	V	1.53	11.87	7.94	0.32	0.00	20.14	43.50	-23.36
128.984	201	H	2.30	24.03	7.50	0.34	0.00	31.87	43.50	-11.63
128.984	32	V	0.99	23.07	8.06	0.34	0.00	31.47	43.50	-12.03
503.657	170	H	2.19	8.80	17.15	2.27	0.00	28.22	46.00	-17.78
503.657	22	V	0.99	9.70	17.40	2.27	0.00	29.37	46.00	-16.63
707.657	196	H	1.78	8.75	20.40	2.63	0.00	31.78	46.00	-14.22
707.657	134	V	1.92	10.89	20.55	2.63	0.00	34.07	46.00	-11.93
894.930	330	H	2.54	5.21	22.50	3.05	0.00	30.75	46.00	-15.25
894.930	283	V	0.99	7.56	22.10	3.05	0.00	32.71	46.00	-13.29

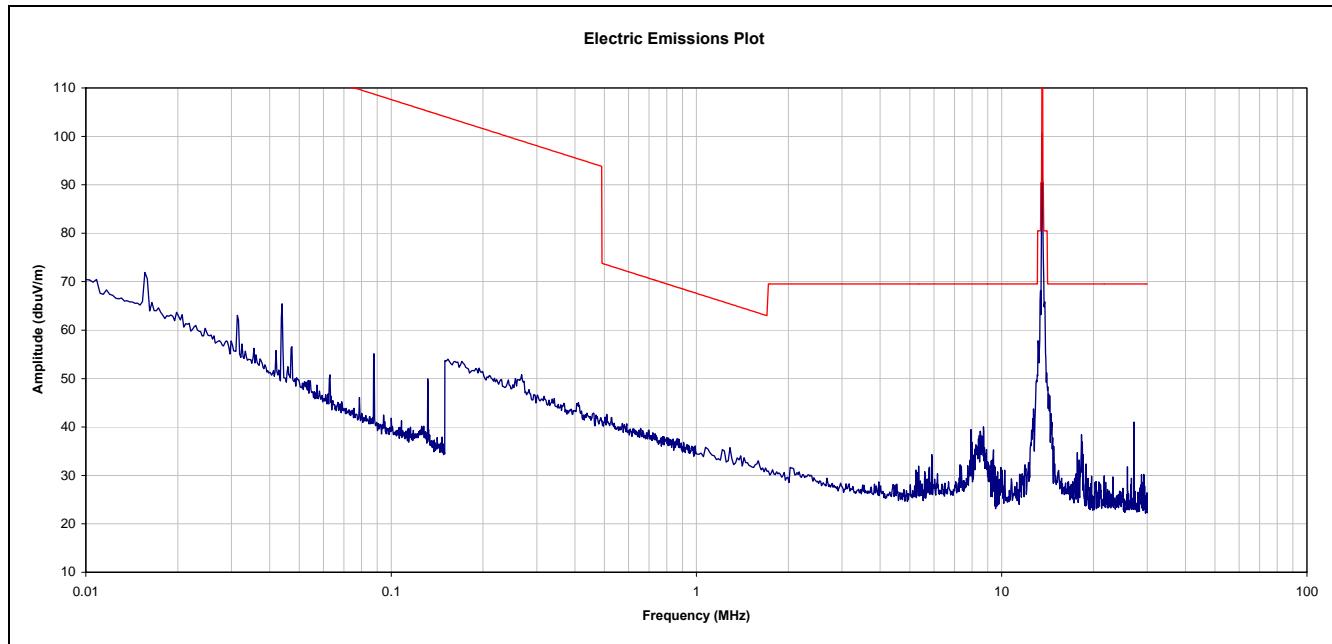
Table 13. Spurious Emissions Limits, Test Results, Wand

Plot 3. Spurious Emissions Limits, Pre-Scan, Wand



Plot 4. Pre-Scan, 10 kHz to 30 MHz, Out-Scan



Plot 5. Pre-Scan, 10 kHz to 30 MHz, In-Scan



Plot 6. Pre-Scan, 10 kHz to 30 MHz, Wand



3.5. Frequency Stability

Test Requirement(s): **15.225(e)** The frequency tolerance of the carrier signal shall be maintained within +/-0.01% of the operating frequency over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test Procedure: Measurements are in accordance with Part 2.1055. The EUT was placed in the Environmental Chamber and allowed to reach desired temperature. A spectrum analyzer was used to measure the frequency drift. The EUT was set to transmit in the operating frequency range. Frequency drift was investigated for every 10°C increment until the unit is stabilized then recorded the reading in tabular format with the temperature range of -20° to 50°C.

Test Results: Please refer to FCC ID: PJMLRM2000. See page 33 of 58 of the Test Report Exhibit for FCC ID: PJMLRM2000 for test results.



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.

MET Asset #	Nomenclature	Manufacturer	Model	Last Cal Date	Cal Due Date
1T4300	SEMI-ANECHOIC CHAMBER # 1	EMC TEST SYSTEMS	NONE	02/17/2006	01/17/2009
1T4303	ANTENNA; BILOG	SCHAFNER – CHASE EMC	CBL6140A	07/07/2008	07/07/2009
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	04/18/2008	04/18/2009
1T4272	ANTENNA; LOOP	EMCO	6512	03/07/2008	03/07/2009
1T4612	ESA-E SERIES SPECTRUM ANALYZER	AGILENT	E4407B	01/04/2008	01/04/2009
1T4632	THERMO/HYGROMETER	CONTROL COMPANY	S6-627-9	09/25/2007	09/25/2009



5.0. Compliance 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.

§ 2.948 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.

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



- (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.

§ 2.955 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.



6.0. 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 C — 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.

(b) For a Class B 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 B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful power line and ground at the power terminal. The lower limit applies at the band edges.



End of Report