



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

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January 22, 2014

Sirius XM Satellite Radio
1500 Eckington Place NE
Washington, DC 20002

Dear Beejay Jolayemi,

Enclosed is the EMC Wireless test report for compliance testing of the Sirius XM Satellite Radio, DTR-0200-SA-SIRIUS Low Band Repeater. The Sirius XM Satellite Radio DTR-0200-SA-SIRIUS Low Band Repeater was tested to the requirements of the FCC Certification rules under Title 47 of the Code of Federal Regulations (CFR), Part 25 for Satellite Communications.

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: (\Sirius XM Satellite Radio\EMC39300-FCC25 Rev. 10)

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**Electromagnetic Compatibility Criteria
Test Report**

For the

**Sirius XM Satellite Radio
Model DTR-0200-SA-SIRIUS Low Band Repeater**

Tested under

**FCC Certification Rules
Title 47 of the CFR, Part 25 for Satellite Communications**

MET Report: EMC39300-FCC25 Rev. 10

January 14, 2014

Prepared For:

**Sirius XM Satellite Radio
1500 Eckington Place NE
Washington, DC 20002**

**Prepared By:
MET Laboratories, Inc.
914 W. Patapsco Ave.
Baltimore, MD 21230**



Electromagnetic Compatibility Criteria Test Report

For the

**Sirius XM Satellite Radio
Model DTR-0200-SA-SIRIUS Low Band Repeater**

**FCC Certification Rules
Title 47 of the CFR, Part 25 for Satellite Communications**

Len Knight
Electromagnetic Compatibility Lab

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 25 of the FCC Rules under normal use and maintenance.

Director
Electromagnetic Compatibility Lab



Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	November 1, 2013	Initial Issue.
1	November 5, 2013	Revised to reflect engineer corrections.
2	November 8, 2013	Revised to reflect customer corrections.
3	November 12, 2013	Editorial correction.
4	November 14, 2013	Editorial correction.
5	December 3, 2013	Revised to reflect customer corrections.
6	December 24, 2013	Revised to add additional testing.
7	January 14, 2014	Revised to reflect engineer corrections.
8	January 14, 2014	Additional corrections per client
9	January 14, 2014	Additional revisions per client
10	January 22, 2014	Additional revisions per client



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List of Terms and Abbreviations

AC	Alternating Current
ACF	Antenna Correction Factor
Cal	Calibration
<i>d</i>	Measurement Distance
dB	Decibels
dB μ A	Decibels above one microamp
dB μ V	Decibels above one microvolt
dB μ A/m	Decibels above one microamp per meter
dB μ V/m	Decibels above one microvolt per meter
DC	Direct Current
E	Electric Field
DSL	Digital Subscriber Line
ESD	Electrostatic Discharge
EUT	Equipment Under Test
<i>f</i>	Frequency
FCC	Federal Communications Commission
GRP	Ground Reference Plane
H	Magnetic Field
HCP	Horizontal Coupling Plane
Hz	Hertz
IEC	International Electrotechnical Commission
kHz	kilohertz
kPa	kilopascal
kV	kilovolt
LISN	Line Impedance Stabilization Network
MHz	Megahertz
μ H	microhenry
μ	microfarad
μ s	microseconds
NEBS	Network Equipment-Building System
PRF	Pulse Repetition Frequency
RF	Radio Frequency
RMS	Root-Mean-Square
TWT	Traveling Wave Tube
V/m	Volts per meter
VCP	Vertical Coupling Plane



I. Executive Summary



A. Purpose of Test

An EMC evaluation to determine compliance of the Sirius XM Satellite Radio model DTR-0200-SA-SIRIUS Low Band Repeater with the requirements of Part 25 was performed. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the Sirius XM Satellite Radio model DTR-0200-SA-SIRIUS Low Band Repeater. Sirius XM Satellite Radio should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the DTR-0200-SA-SIRIUS Low Band Repeater has been permanently discontinued.

B. Requirements Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 25, in accordance with Sirius XM Satellite Radio, quote number 1SIR2704R2. All tests were conducted using measurement procedure EIA/TIA-603.

FCC Reference	Description	Compliance
§25.144(e)(7)(ii), §25.214(d)(1)	Peak to Average Ratio	Compliant
§25.202(h)(1)	Spurious at Antennas	Compliant
§25.214(d)(1)	Radiated RF Output Power	Compliant
§25.202(f)	Occupied Bandwidth	Compliant
§2.1051	Band Edge	Compliant
§15.202(d)	Temperature Stability	Compliant
§2.1053	Cabinet Spurious Radiation	Compliant

Table 1. Requirements Summary of EMC Part 25 Compliance Testing



II. Equipment Configuration



A. Overview

MET Laboratories, Inc. was contracted by Sirius XM Satellite Radio to perform testing on the DTR-0200-SA-SIRIUS Low Band Repeater, under Sirius XM Satellite Radio’s PO number 310154.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Sirius XM Satellite Radio, DTR-0200-SA-SIRIUS Low Band Repeater.

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

Model(s) Tested:	DTR-0200-SA-SIRIUS Low Band Repeater	
Model(s) Covered:	DTR-0200-SA-SIRIUS Low Band Repeater	
EUT Specifications:	Primary Power: 208 VAC	
	Type of Modulations:	DE-QPSK
	EUT Frequency Ranges:	2326.250MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35° C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Evaluated by:	Len Knight	
Date(s):	January 14, 2014	

Table 2. EUT Summary Table



B. References

CFR 47, Part 25	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 25: Satellite Communications
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
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories

Table 3. Standard References

C. Test Site

All testing was performed at MET Laboratories, Inc., 914 W. Patapsco Ave., 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 semi-anechoic chamber. In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

D. Description of Test Sample

The DTR-0200-SA-SIRIUS Low Band Repeater is a one-way terrestrial repeater that receives the Sirius signal content from a commercial Ku band satellite, modulates this content onto a CODFM waveform and broadcasts the resulting signal in the SDARS band. It is used to supplement the SiriusXM satellites to deliver the SiriusXM signal in areas where the SiriusXM satellites may not have adequate coverage.

E. Equipment Configuration

Name / Description	Model Number	Serial Number
Cabinet	Alcatel	CA0V6885
SPU	3EM04001AA	CA0UM882
HPA	3EM04002AA	CA0V2111
Software / Firmware	--	--
Main Controller Ap	--	V77
VSAT	--	V2.6

Table 4. Equipment Configuration

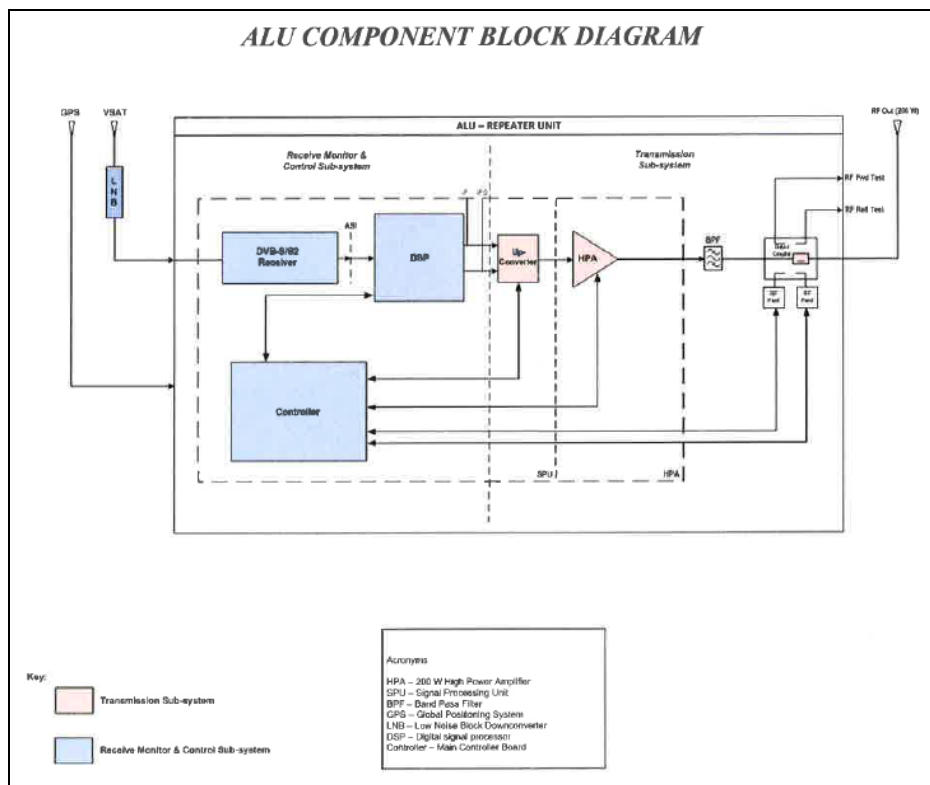


Figure 1. Block Diagram of Equipment Configuration



F. Mode of Operation

The DTR-0200-SA-SIRIUS Low Band Repeater will be configured as it would be when deployed in service. It will receive the SiriusXM content from the Ku band satellite, receive synchronization from GPS and will operate in standard configuration, but with transmitter output going to a dummy load (instead of a transmit antenna). There is only one normal mode of operation: receive process and transmit.

G. Modifications

a) Modifications to EUT

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the Test Standard.

H. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Sirius XM Satellite Radio upon completion of testing.



III. Electromagnetic Compatibility Criteria for Intentional Radiators



Electromagnetic Compatibility Criteria for Satellite Communications

§25.214(d)(1) RF Output Power

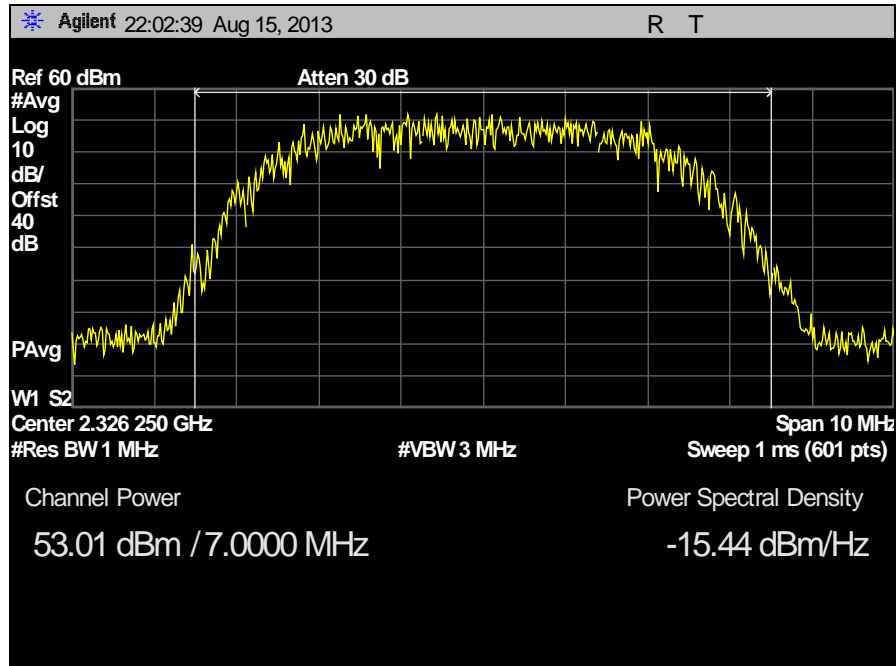
Test Requirement(s): §25.214(d)(1): *Power limit for SDARS terrestrial repeaters.* (1) SDARS terrestrial repeaters must be operated at a power level less than or equal to 12-kW average EIRP, with a maximum peak-to-average power ratio of 13 dB.

Test Procedures: The EUT was connected directly to a spectrum analyzer using appropriate attenuation, and the RF Output Power was recorded.

Test Results: The measured radiated RF output power of the EUT was equal to what it was set to transmit on at 2.326250 GHz (i.e., 53 dBm (200 W)).

Test Engineer(s): Ben Taylor

Test Date(s): 08/16/13



Plot 1. Radiated RF Output Power, 2326.250 MHz



Electromagnetic Compatibility Criteria for Satellite Communications

§25.144(e)(7)(ii), §25.214(d)(1) Peak to Average Ratio

Test Requirement(s): §25.144(e)(7)(ii): In addition to the procedures set forth in subpart J of part 2 of this chapter, power measurements for SDARS repeater transmitters may be made in accordance with a Commission-approved average power technique. Peak-to-average power ratio (PAPR) measurements for SDARS repeater transmitters should be made using either an instrument with complementary cumulative distribution function (CCDF) capabilities to determine that the PAPR will not exceed 13 dB for more than 0.1 percent of the time or another Commission approved procedure. The measurement must be performed using a signal corresponding to the highest PAPR expected during periods of continuous transmission.

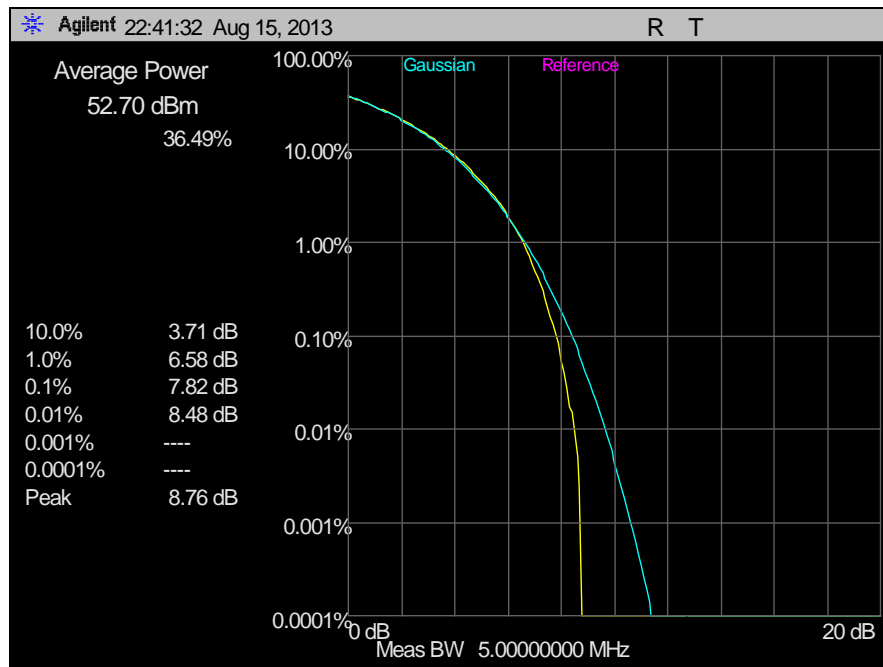
§25.214(d)(1): *Power limit for SDARS terrestrial repeaters.* (1) SDARS terrestrial repeaters must be operated at a power level less than or equal to 12-kW average EIRP, with a maximum peak-to-average power ratio of 13 dB.

Test Procedures: The EUT was connected to a spectrum analyzer using appropriate attenuation, and the CCDF measurement function was used to measure the Peak to Average Power Ratio.

Test Results: The EUT is compliant with the requirements of this section.

Test Engineer(s): Ben Taylor

Test Date(s): 08/16/13



Plot 2. CCDF Plot



Electromagnetic Compatibility Criteria for Satellite Communications

§25.202(h)(1) Spurious at Antennas

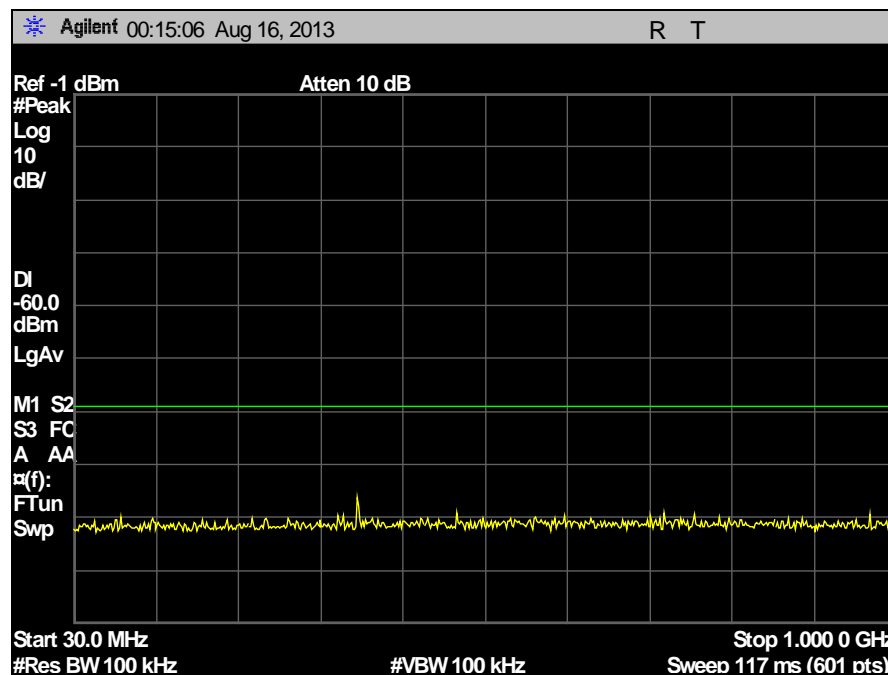
Test Requirement(s): §25.202(h): *Out-of-band emission limitations for SDARS terrestrial repeaters.* (1) Any SDARS terrestrial repeater operating at a power level greater than 2-watt average EIRP is required to attenuate its out-of-band emissions below the transmitter power P by a factor of not less than $90 + 10 \log (P)$ dB in a 1-megahertz bandwidth outside the 2320-2345 MHz band, where P is average transmitter output power in watts.

Test Procedures: The EUT was connected to a spectrum analyzer using appropriate attenuation, and Spurious Emissions at the antenna port plots were recorded. A more stringent limit of -67 dBm was used in some plots. The correct limit is based on $90+10\log(P)$ dB; -60 dBm.

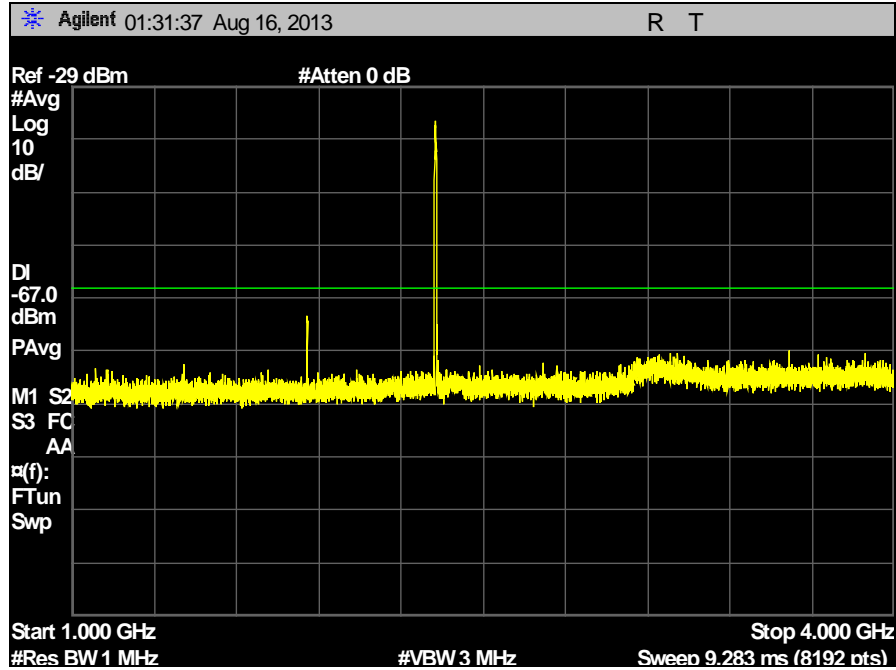
Test Results: The EUT is compliant with the requirements of this section.

Test Engineer(s): Ben Taylor

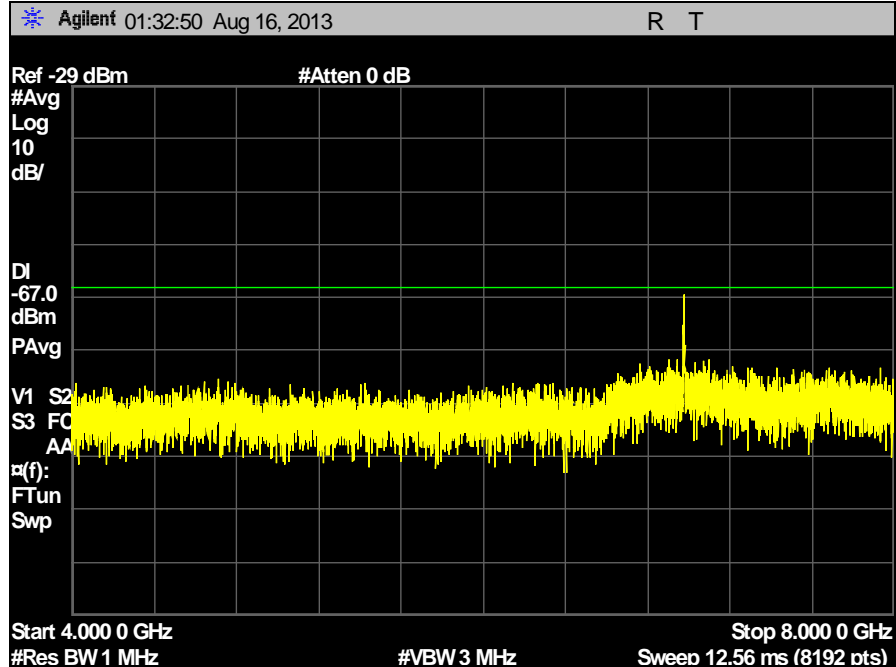
Test Date(s): 08/16/13



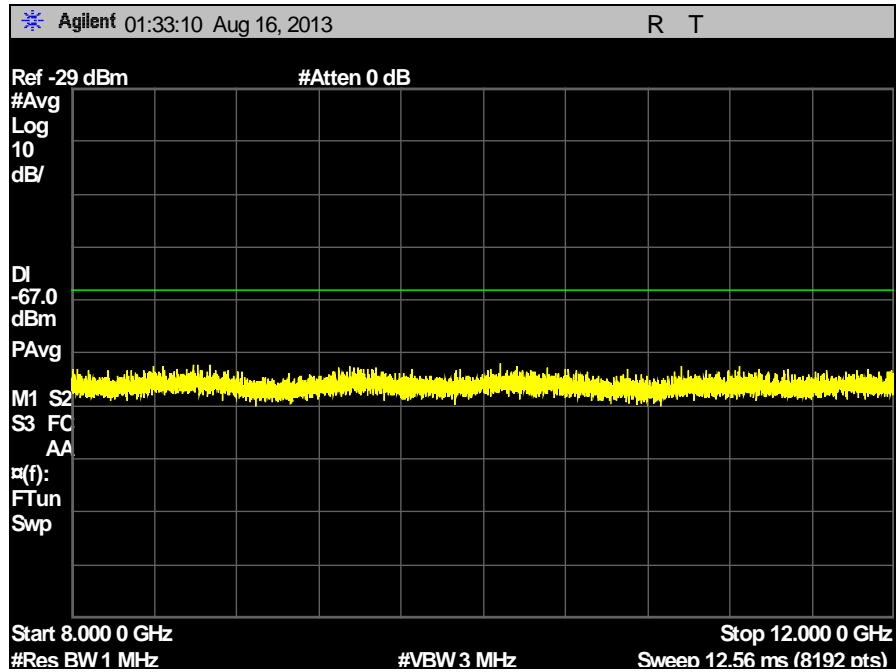
Plot 3. Spurious at Antennas, 30 MHz – 1 GHz, Direct



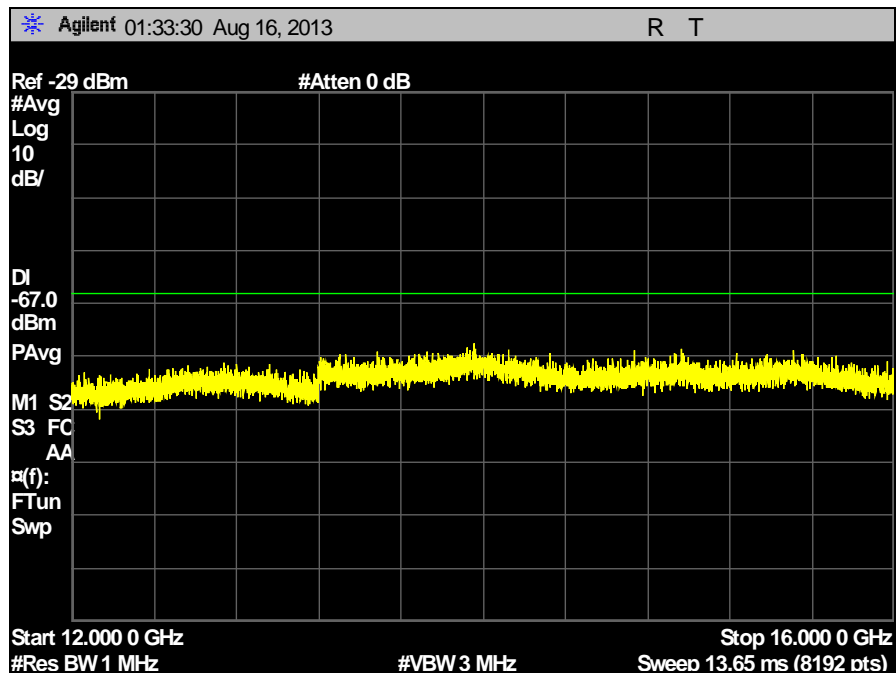
Plot 4. Spurious at Antennas, 1 GHz – 4 GHz



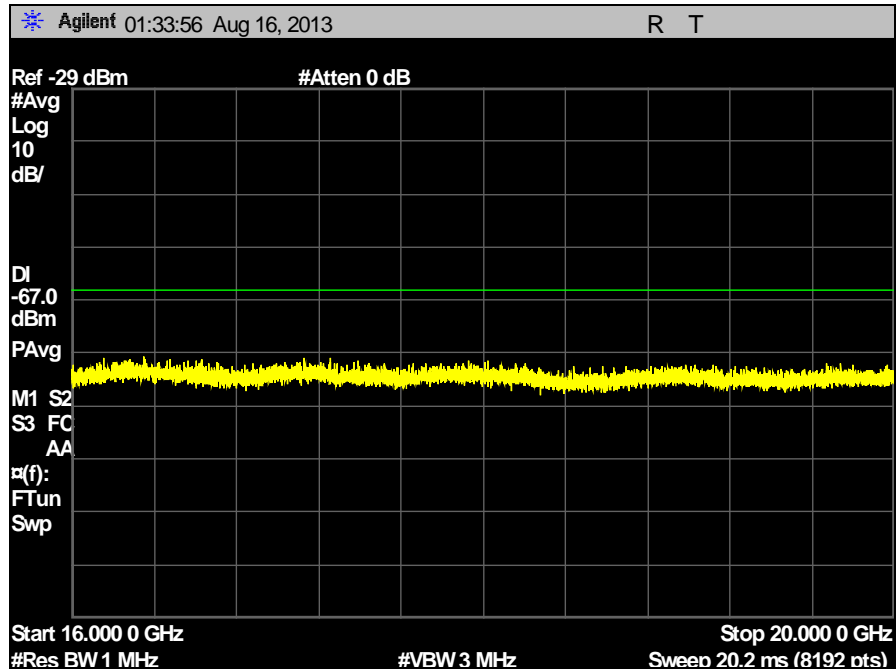
Plot 5. Spurious at Antennas, 4 GHz – 8 GHz



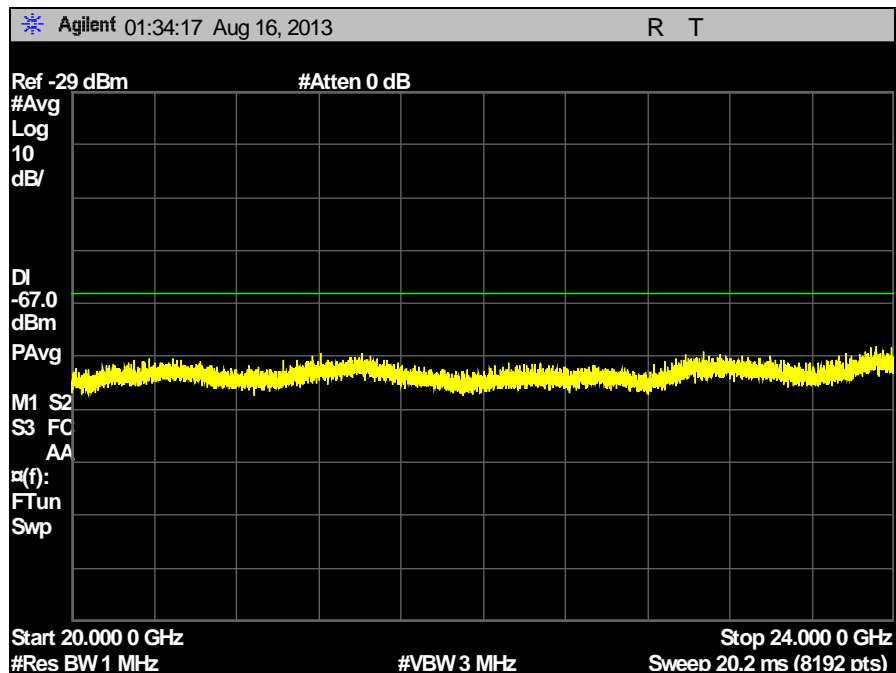
Plot 6. Spurious at Antennas, 8 GHz – 12 GHz



Plot 7. Spurious at Antennas, 12 GHz – 16 GHz



Plot 8. Spurious at Antennas, 16 GHz – 20 GHz



Plot 9. Spurious at Antennas, 20 GHz – 24 GHz



Electromagnetic Compatibility Criteria for Satellite Communications

§2.1049 Occupied Bandwidth

Test Requirement(s): §2.1049

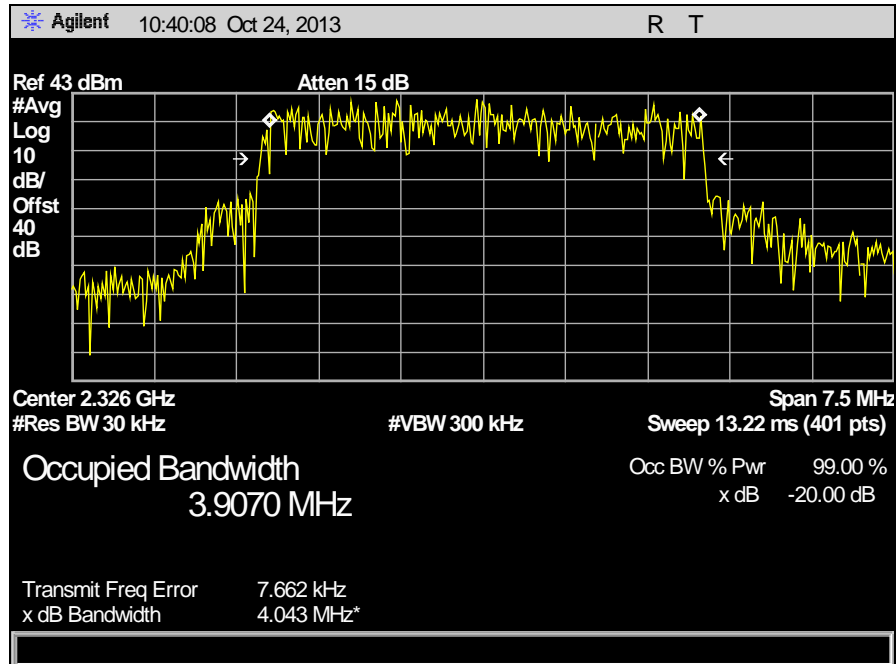
Test Procedures: As required by 47 CFR 2.1049, *occupied bandwidth measurements* were made at the RF output terminals using a Spectrum Analyzer.

A laptop was connected to EUT to control the RF power output and frequency channel. The EUT was connected to a Spectrum Analyzer via attenuator. The measured highest Average Power was set relative to zero dB reference. The RBW of the Spectrum Analyzer was set to at least 1% of the channel bandwidth. The EUT power was adjusted at the maximum output power level. Measurements were carried out at the low, mid and high channels of the TX band.

Test Results: The EUT is compliant with the requirements of this section.

Test Engineer(s): Ben Taylor

Test Date(s): 10/31/13



Plot 10. Occupied Bandwidth, Test Results



Electromagnetic Compatibility Criteria for Satellite Communications

§2.1051 Band Edge

Test Requirement(s): Sirius XM has performed testing at an alternate location to satisfy all Band Edge Test Requirements.

Test Procedures: Sirius XM has performed band edge measurements at an alternate facility, and is documented separately. Please reference additional documentation through Sirius XM for details regarding Band Edge Test Procedures.

Test Results: Sirius XM will provide test results performed at an alternate facility showing compliance.

Test Engineer(s): Ben Taylor

Test Date(s): 12/20/13



Electromagnetic Compatibility Criteria for Satellite Communications

§25.202(d) Frequency Stability

Test Requirement(s): §25.202(d) **Frequency Tolerance, Earth Stations** – The carrier frequency of each earth station transmitter authorized in these services shall be maintained within 0.001 percent of the reference frequency.

Test Procedures: The resolution bandwidth of the spectrum analyzer was set to 1 kHz and the trace was set to max hold. The EUT was set to transmit on four channels. At nominal input voltage and at 20°C, the center frequency of each channel was measured using a frequency counter. At 20°C, the input voltage was varied between 85% and 115% of nominal and the measurement was repeated. The temperature was increased and decreased in increments of no more than 10°C and the center frequency measurement was repeated. For each case, the measured center frequency was compared to the reference frequency taken at 20°C and 208vac. The 1st trace of the Spectrum Analyzer was used as a reference at 20°C. A 2nd trace was used to show the drift of the carrier at extreme conditions. A delta marker was used to find the drift at a given extreme condition.

Test Results: The EUT is compliant with the requirements of this section.

Test Engineer(s): Ben Taylor

Test Date(s): 10/31/13

Temperature (deg C)	Frequency (MHz)	Drift (%)	Limit (%)
-30	2326.25398	0.00017	0.001%
-20	2326.25398	0.00017	0.001%
-10	2326.25398	0.00017	0.001%
0	2326.25398	0.00017	0.001%
10	2326.25398	0.00017	0.001%
20	2326.25398	0.00017	0.001%
30	2326.25399	0.00017	0.001%
40	2326.25398	0.00017	0.001%
50	2326.25398	0.00017	0.001%

Voltage (VAC)	Frequency (MHz)	Drift (%)	Limit (%)
177	2326.25397	0.00017	0.001%
208	2326.25398	0.00017	0.001%
239	2326.25398	0.00017	0.001%

Table 5. Frequency Stability, Test Results



Electromagnetic Compatibility Criteria for Satellite Communications

§2.1053 Cabinet Spurious Radiation

Test Requirement(s): §2.1053

Test Procedures: The EUT was placed on an 80cm non-metallic support, on the turntable inside a semi-anechoic chamber. A biconilog receiving antenna on an antenna mast was positioned at a distance of 1 meter for measurements in the 30-1000MHz range. For all measurements above 1000MHz, a horn antenna was used at a distance of 0.5 meters and hand measurements were recorded inside the chamber with a spectrum analyzer. Measurements were recorded with both polarizations, using calibrated antennas and spectrum analyzers; no emissions of concern were observed.

Below 1 GHz limit calculation:

Field strength limit in dBuV/m = $-60+2.15-20\log(1)+104.8 = 46.95$ dBuV/m @ 1m
This is equivalent to a -60.1 dBm/m limit line. Measurements were made with a 100 kHz RBW and a conservative estimate of 10 dB has been added to the limit for comparison with a 1 MHz RBW as required in the standard. Therefore, the limit is -70.1 dBm/m.

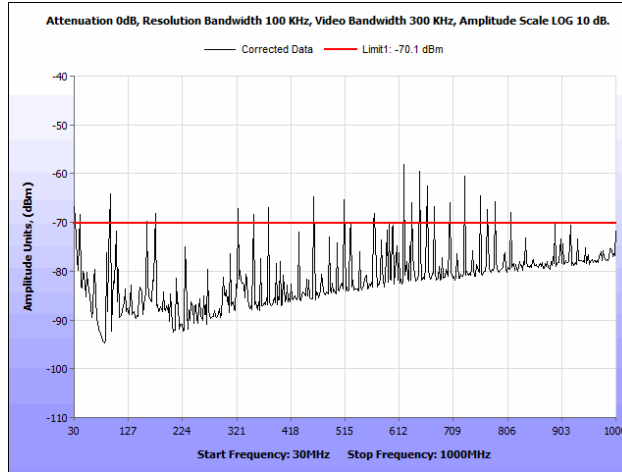
Above 1 GHz limit calculation:

Field strength limit in dBuV/m = $-60+2.15-20\log(0.5)+104.8 = 52.9$ dBuV/m @ 0.5m
This is equivalent to a -54.1 dBm/m limit line. Measurements were made with a 100 kHz RBW and a conservative estimate of 10 dB has been added to the limit for comparison with a 1 MHz RBW as required in the standard. Therefore, the limit is -64.1 dBm/m.

Test Results: The EUT is compliant with the requirements of this section. Measurements were taken above 6GHz, and no emissions of concern were observed.

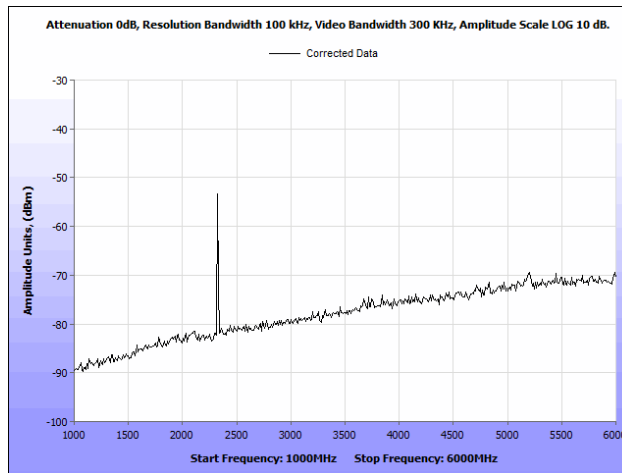
Test Engineer(s): Ben Taylor

Test Date(s): 12/20/13



Plot 11. Cabinet Spurious Radiation, Tx on -70.1 dBm, 30 MHz – 1 GHz

Note: Emissions appearing to be in excess of the limit are exclusively digital and not transmitter-related, i.e. not applicable to the -70.1 dBm/m limit.



Plot 12. Cabinet Spurious Radiation, 1 GHz – 6 GHz

Note: Hand measurements were recorded in both polarities inside the chamber at a distance of 0.5 meters. Only noise floor was observed above 6GHz.



IV. Test Equipment



Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:200.

Test Equipment					
MET Asset #	Nomenclature	Manufacturer	Model	Last Cal Date	Cal Due Date
1T4205	ATTENUATOR	WEINSCHEL CORP	53-40-33	SEE NOTE	
1T4771	PSA SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4446A	02/15/2013	08/15/2014
2T5826	ENVIRONMENTAL CHAMBER (H5)	THERMOTRON	CONTROLLER THCM4-40-40	06/17/2013	06/17/2014
3T1522	3 PHASE AUTOTRANSFORMER	SUPERIOR ELECTRIC	POWERSTATION	SEE NOTE	
1T4377	TRUE RMS MULTIMETER	FLUKE	189	07/25/2013	01/25/2015
1T4829	SPECTRUM ANALYZER	AGILENT	E4407B	05/14/2013	11/14/2014
1T4502	COMB GENERATOR	COM-POWER	CGC-255	08/21/2012	02/21/2014
1T4797	LISN	COM-POWER	LI-150A	07/22/2013	07/22/2014
1T4796	LISN	COM-POWER	LI-150A	07/22/2013	07/22/2014
1T4795	LISN	COM-POWER	LI-150A	07/21/2013	07/21/2014
1T4300A	SEMI-ANECHOIC CHAMBER # 1 (FCC)	EMC TEST SYSTEMS	NONE	07/24/2012	07/24/2015
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	07/16/2012	07/16/2014
1T4818	COMB GENERATOR	COM-POWER	CGO-520	SEE NOTE	
1T4751	ANTENNA - BILOG	SUNOL SCIENCES	JB6	01/08/2013	07/08/2014

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.



V. Certification & User's Manual Information



Certification 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 proviso 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.

§ 2.907 Certification.

- (a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.
- (b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

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.



§ 2.948 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.



I. 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 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 interference when the equipment is operated in a residential 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. 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.



End of Report