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Technical Report No. 06-061

"EMI Evaluation of the XM Satellite Radio, Inc. SkyFi2 to FCC Class B Conducted and Radiated Emission Requirements And Intentional Radiator Requirements"

Date Performed: 8/17/2006 – 9/5/2006

Customer: XM Satellite Radio, Inc.
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Deerfield Beach, FL 33442

Company Official responsible for product(s) tested:
Terry Helstrom, Engineer

Test Performed and Reported By:
Ray Aina, Test Engineer
FAU EMI R&D Laboratory

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Director, FAU EMI R&D Laboratory

Date of Test Report: 05 September 2006

ACCREDITED
2129.01

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1. INTRODUCTION

The XM Satellite Radio, SkyFi2 receiver was evaluated for compliance to the FCC Class B requirements and the results apply only to the specific items of equipment, configurations and procedures supplied to the Florida Atlantic University EMI Research Lab by XM Satellite Radio, Inc., as reported in this document.

2. OBJECTIVE

Test Specifications

This evaluation was performed to verify conformance of the XM Satellite Radio, Inc. SkyFi2 receiver to U.S. Federal Communications Commission (FCC) Code of Federal Regulations (CFR), Title 47 - Telecommunication, Part 15 - Radio Frequency Devices,

- Subpart B - Unintentional Radiators, Section 15.107(a) Conducted limits, and Section 15.109(a) Radiated Class B Emission limits.
- Subpart C – Paragraph 15.239 (a) (b) (c) – Operation in the band 88 MHz to 108 MHz

Mode of Operation

- During FCC Part 15 Subpart C, Paragraph 15.239 (b)(c) radiated emissions tests, the EUT was configured to transmit a continuous FM signal with normal modulation at 88.1 MHz and 107.9 MHz using the XM Satellite Radio's FM Coupler attached to a standard FM aerial antenna attached to a large ground plane.
- During FCC Part 15 Subpart C, Paragraph 15.239(b)(c), the EUT was also configured to transmit a continuous FM signal with normal modulation at 88.7MHz and 107.1MHz in three representative vehicles, using the XM Satellite Radio's FM Coupler attached to the vehicle's in-glass FM antennas, in accordance with the intentional radiator limits described in 15.239(b).
- During FCC Part 15 Subpart B, Paragraph 15.107(a) conducted emissions tests, the EUT was configured to receive an XM Satellite Radio signal, with the EUT in the SkyFi2 home cradle with the XM Home AC adaptor.
- During FCC Part 15 Subpart B, Paragraph 15.109(a), the EUT was configured to receive an XM Satellite Radio signal, with the EUT in three different modes:
    - In a SkyFi2 car cradle, using only an XM Satellite Radio car antenna.
    - In a SkyFi2 car cradle, using an FM Direct Adaptor and car antenna.
    - In a SkyFi2 home cradle, using only an XM Satellite Radio home antenna.

3. CONCLUSION

The XM Satellite Radio, Inc. SkyFi2 receiver met the FCC Class B conducted and radiated emission requirements, as well as the intentional radiation limits, as described in the following pages.

4. TEST PROCEDURES AND RESULTS

4.1 GENERAL TEST PROCEDURES

The measurement techniques identified in the measurement procedure of ANSI C63.4-2003 *"American National Standard of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"* were followed as close as practical during this evaluation. Complete details and specific procedures used are discussed in the respective test result sections.

4.2 CONDUCTED EMISSIONS – Section 15.107(a)

4.2.1 Test Setup – Conducted Emissions

The XM Satellite Radio, Inc. SkyFi2 reciever; was powered by an I.T.E Power Supply Model No. SMPS5V2A-XMRT. The 120VAC/ DC 5V switching power supply was then installed in the FAU EMI Research facilities conducted emissions shielded enclosure on a wooden test table 80 centimeters above the ground plane floor and 40 centimeters from the rear wall. The I.T.E Power Supply was then plugged into an EMCO Model No.3825/2R Serial No. 1095, 50 Ω, 50 μH Line Impedance Stabilization Network (LISN). Photographs 1 and 2 in the document 'SkyFi2_Report_of_Measurements_test_set_up_photos.doc' depict the conducted emissions test setup.

Conducted power line emissions were measured on both the phase and neutral lines with reference to earth ground, over the specified 150 kHz to 30 MHz range on a Hewlett Packard HP 8566B Spectrum Analyzer operated in the peak detection mode with a bandwidth of 9 kHz obtained through the HP 85650A Quasi Peak Adapter.

4.2.2 Test Data – Conducted Emissions

The EUT was tested for the peak-detected emissions on phase and neutral lines while the SkyFi2 unit was receiving a live XM broadcast.

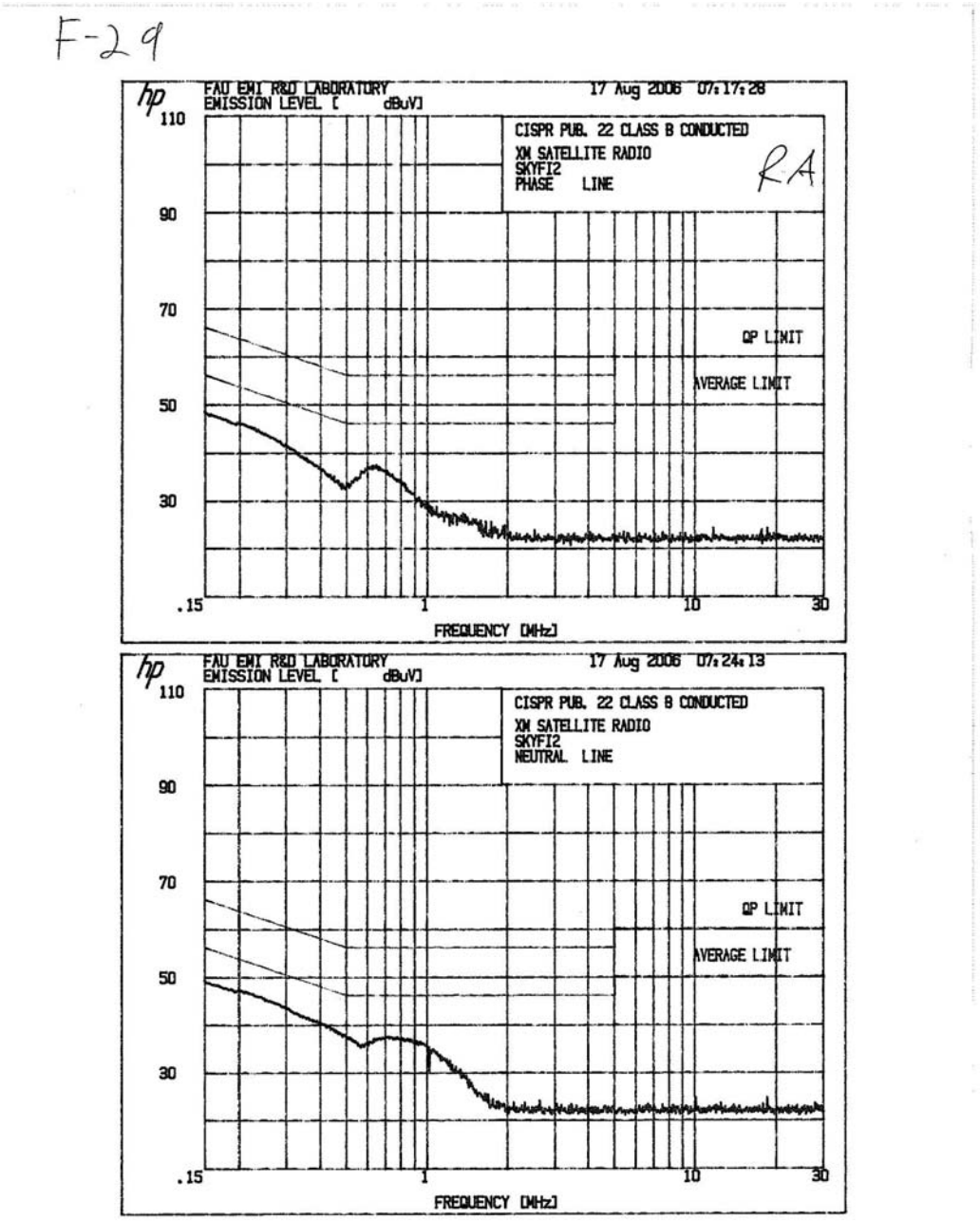


FIGURE 1: Phase and Neutral Conducted Emissions 150 kHz-30 MHz

4.3 RADIATED EMISSIONS – Section 15.109(a)

4.3.1 General Test Setup

The XM Satellite Radio, Inc SkyFi2 receiver was set up on a wooden table 80 centimeters above the ground plane turntable of the FCC listed Semi-Anechoic test site.

An EMCO 3104 Broadband Biconical antenna was installed on an EMCO pneumatically controlled Antenna Mast at a distance of 3 meters from the system. The 30 to 200 MHz frequency range was automatically scanned on the HP 8566B Spectrum Analyzer operated in the peak detector mode with a bandwidth of 120 kHz obtained through the HP 85650A Quasi Peak Adapter. It should be noted that the RES BW and VBW of the spectrum analyzer must be set to 1 MHz for the Quasi Peak Adaptor to provide 120 kHz bandwidth correctly. Hence, in the figures RES BW and VBW are still indicated as 1 MHz. The turntable was incrementally rotated through 360 degrees and at the same time the receiving antenna was scanned in height from 1 to 4 meters in both the horizontal and vertical polarizations. An EMCO 3146 Log Periodic antenna was then installed and the above procedure was repeated for the 200 to 1000 MHz ranges.

The FCC Class B limit lines have been corrected for the appropriate antenna factors, cable loss, and amplifier gain based on the following equation:

E (dBμV/m) = SA reading (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) - Amp Gain (dB)

The SkyFi2 unit was tested in three configurations under Section 15.109(a)

- Home Cradle with Speaker attached
- Car Cradle using FM Direct Adaptor
- Car Cradle using XM antenna only

4.3.2 Radiated Emissions - Home Cradle

4.3.2.1 Test Setup – Home Cradle

In the home cradle setup, the EUT was placed in the SkyFi2 home cradle, with an XM home antenna and I.T.E 5V AC power adaptor. External speakers were connected to the audio output connector on the home cradle with the unit receiving a live XM broadcast signal. Diagram 1 below, and Photograph 3 in the document 'SkyFi2_Report_of_Measurements_test_set_up_photos.doc' depicts the radiated emissions home cradle test setup.

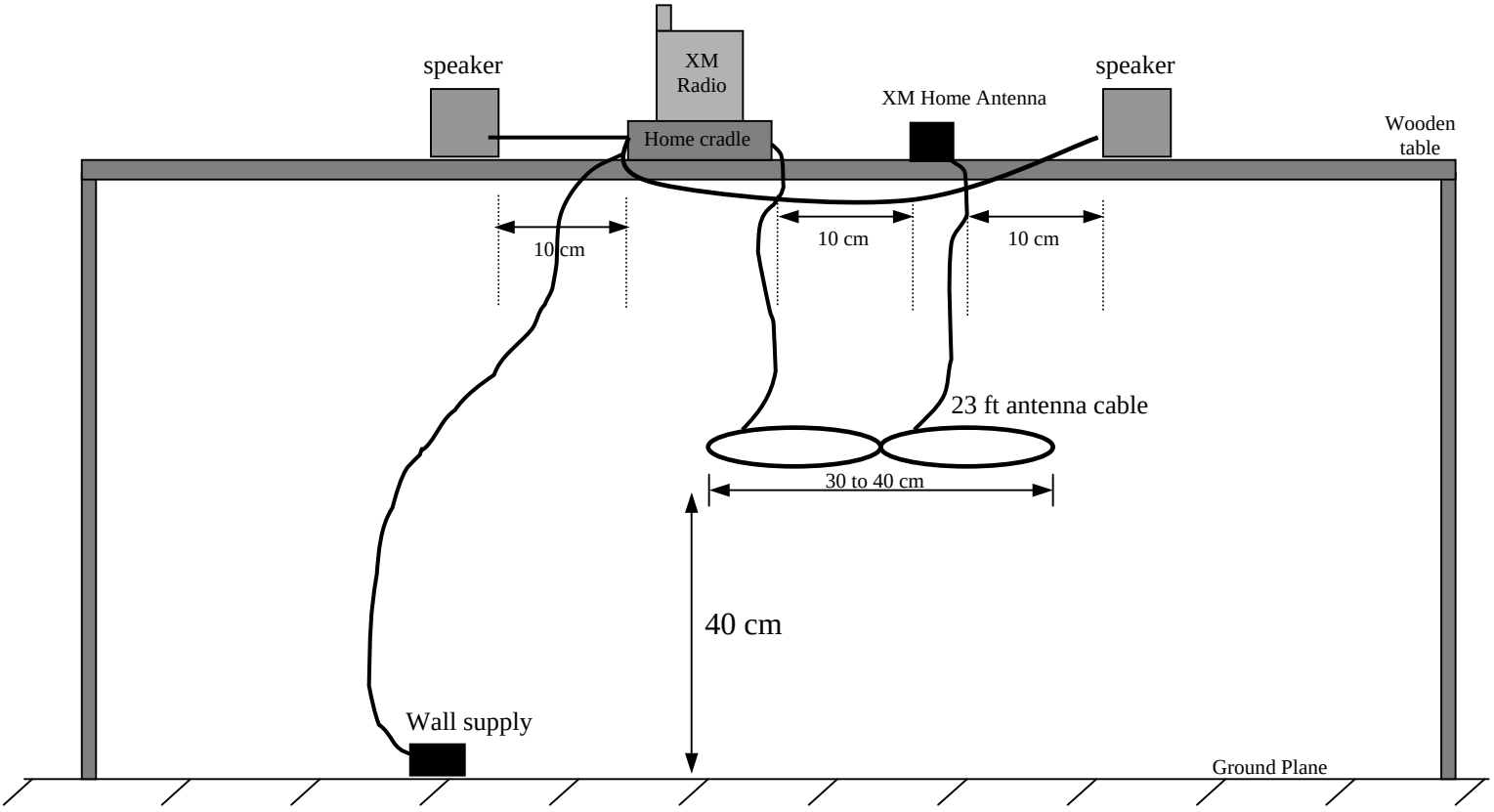


Diagram 1: Home Cradle Radiated Emissions Setup

4.3.2.2 Test Data – Home Cradle

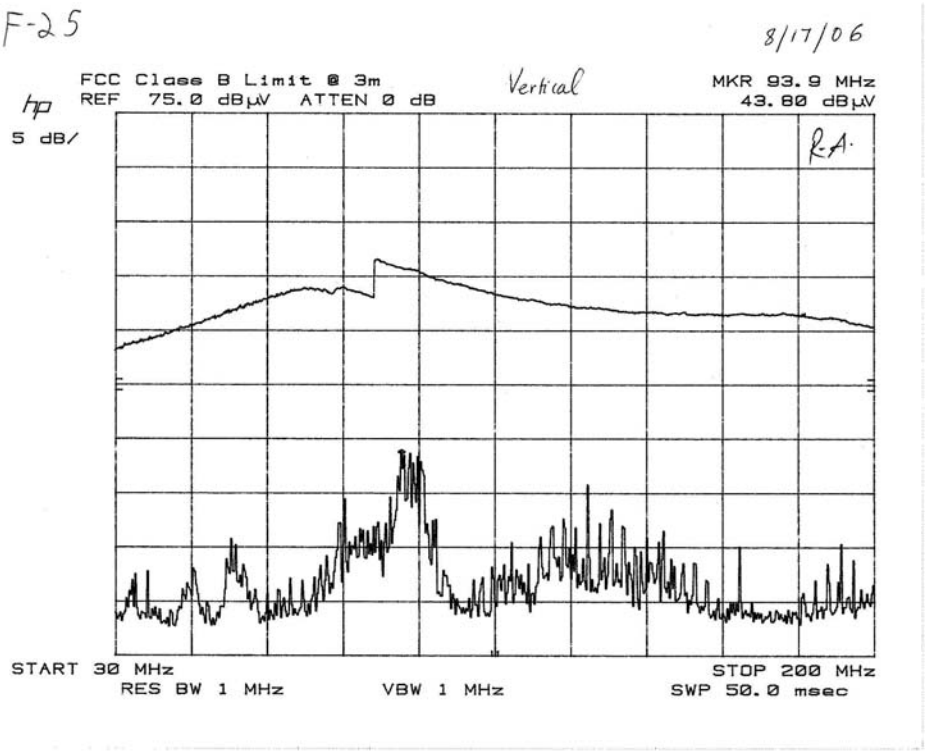


FIGURE 2: Radiated Emission 30 – 200 MHz Vertical Polarization

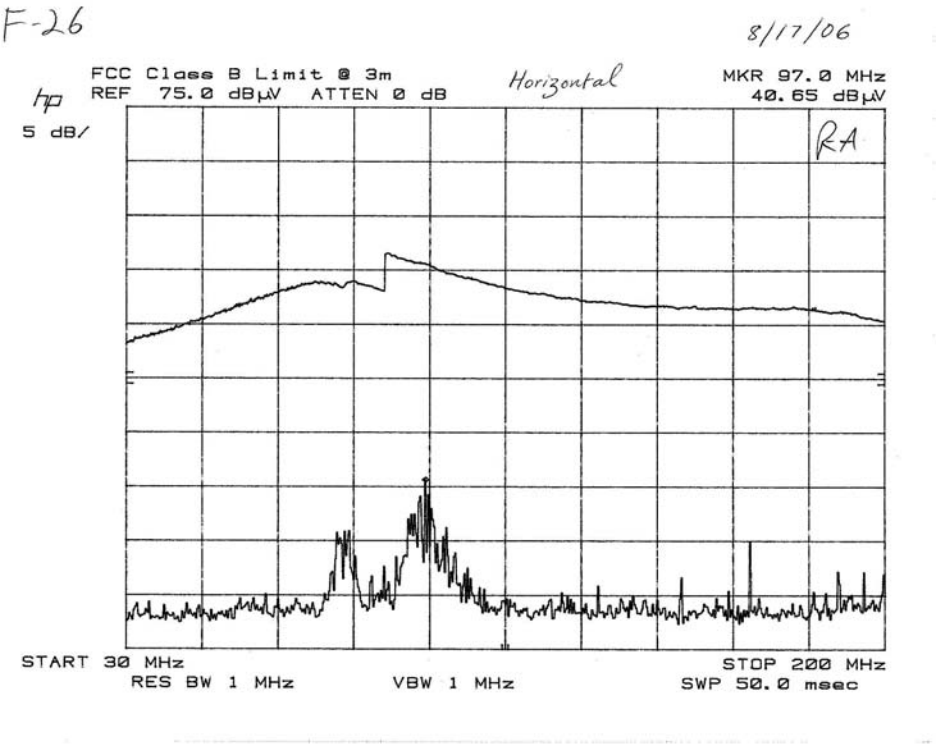


FIGURE 3: Radiated Emission 30 – 200 MHz Horizontal Polarization

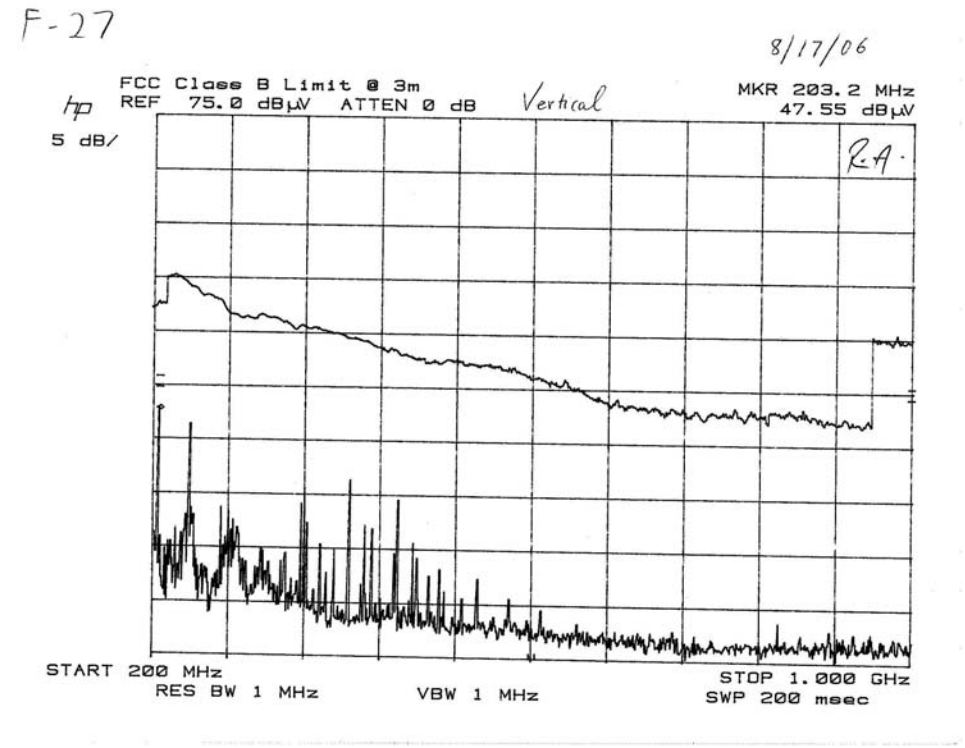


FIGURE 4: Radiated Emission 200MHz – 1 GHz Vertical Polarization

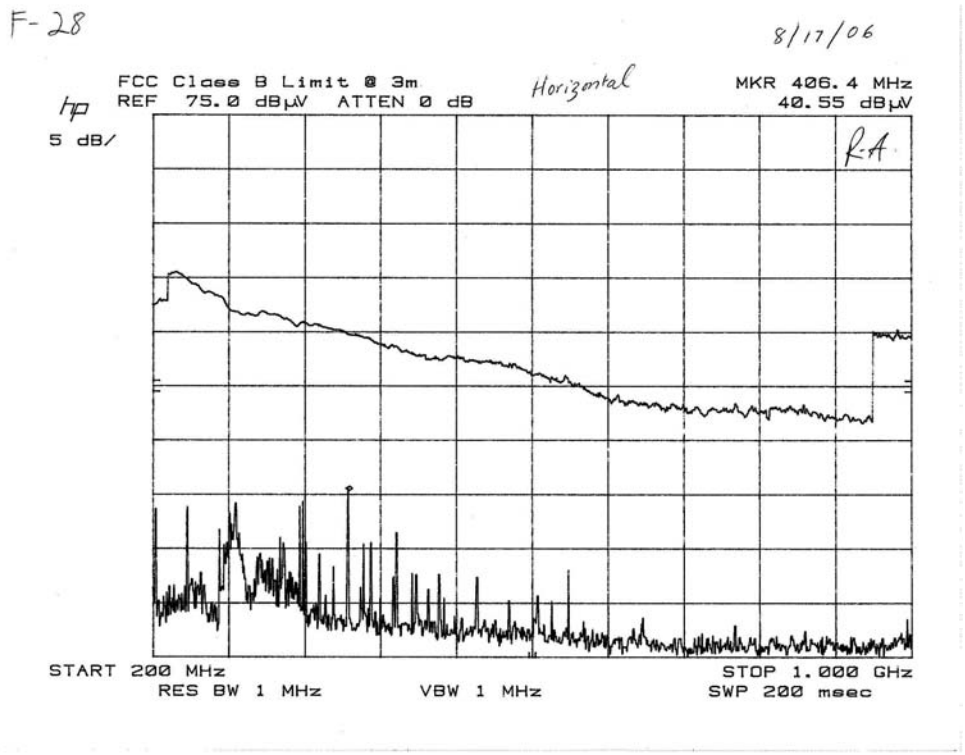


FIGURE 5: Radiated Emission 200 – 1000 MHz Vertical Polarization

4.3.3 Radiated Emissions - FM Direct Adapter

4.3.3.1 Test Setup – FM Direct Adapter

In the FM Direct Adaptor setup, the EUT was placed in the SkyFi2 car cradle, with an XM FM Direct Adapter, XM car antenna and XM 5V cigarette adaptor (CLA) power supply. The FM Direct Adapter FM OUT cable was terminated with 75 ohms to simulate an FM radio's FM input jack. The FM Direct Adaptor FM IN cable was attached to an FM aerial antenna on a ground plane to simulate a vehicle's FM antenna. The ground plane is connected to the negative supply of the vehicle battery. Diagram 2 below, and Photograph 4 in the document 'SkyFi2_Report_of_Measurements_test_set_up_photos.doc' depicts the radiated emissions FM Direct test setup.

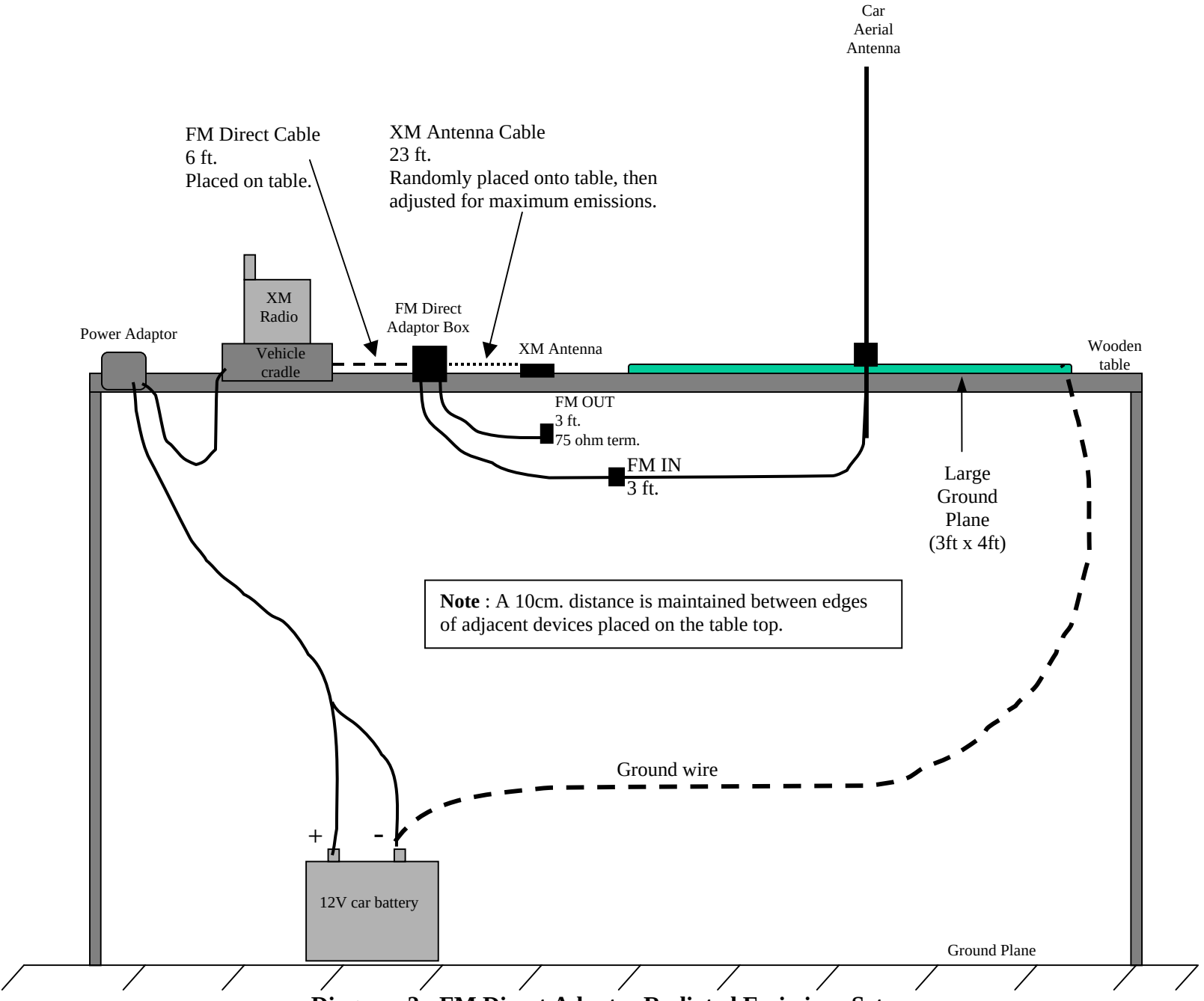


Diagram 2 : FM Direct Adapter Radiated Emissions Setup

4.3.3.2 Test Data – FM Direct Adapter with no audio cable

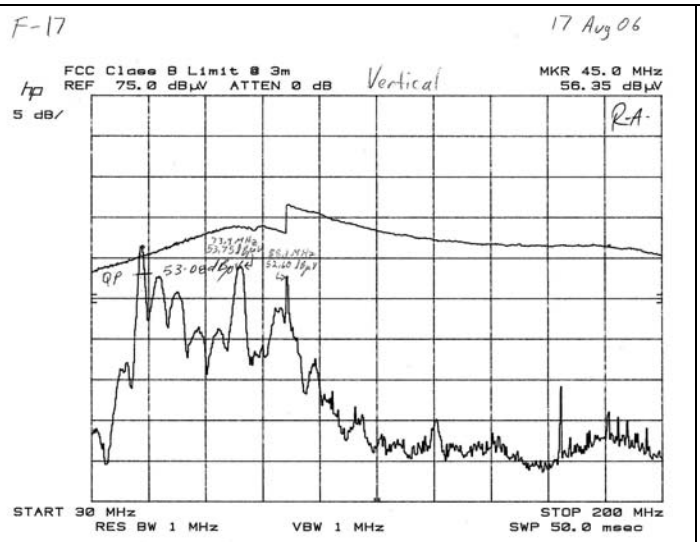


Figure 6 30MHz to 200MHz Vertical (FM programmed to 88.1MHz)

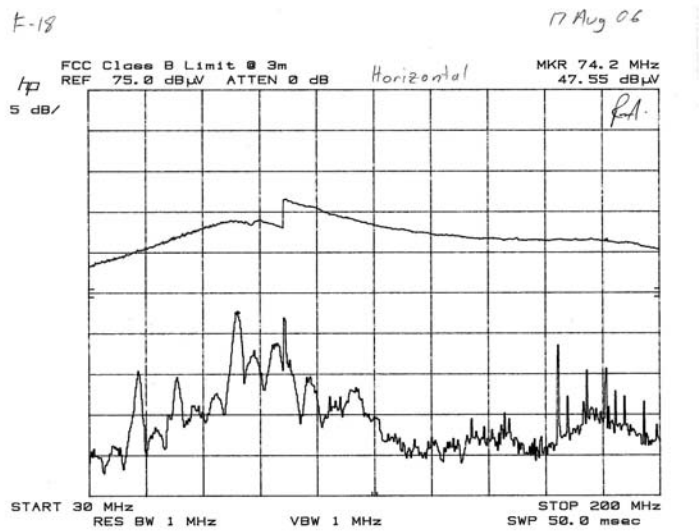


Figure 7 30MHz to 200MHz Horizontal (FM programmed to 88.1MHz

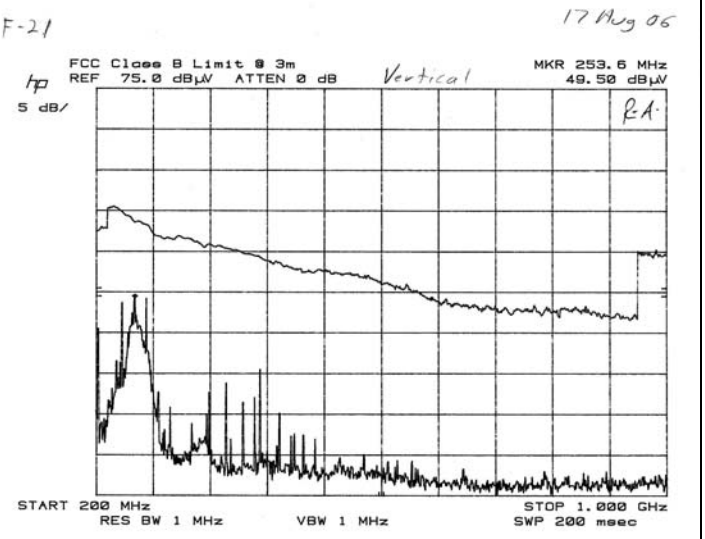


Figure 8 200MHz to 1GHz Vertical (FM programmed to 88.1MHz)

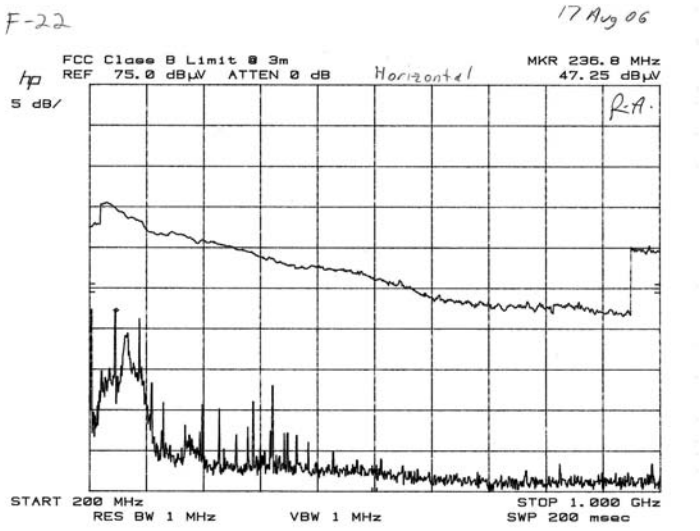


Figure 9 200MHz to 1GHz Horizontal (FM programmed to 88.1MHz)

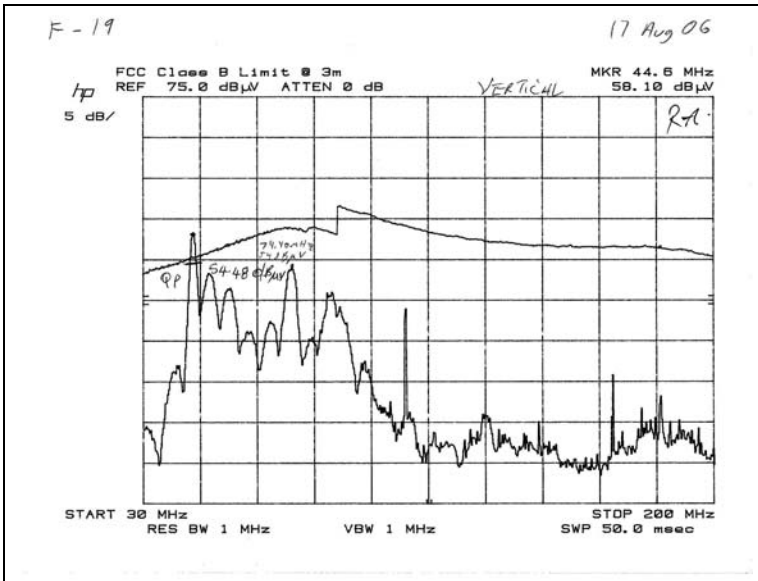


Figure 10 30MHz to 200MHz Vertical (FM programmed to 107.9MHz)

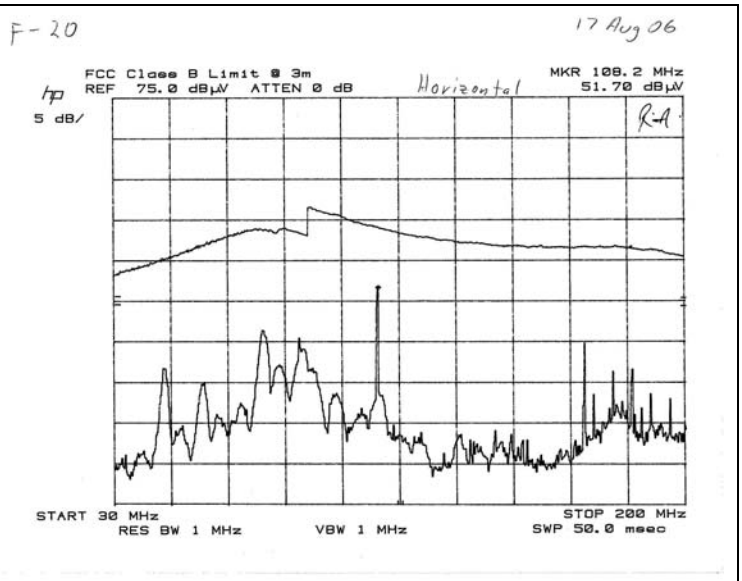


Figure 11 30MHz to 200MHz Horizontal (FM programmed to 107.9MHz)

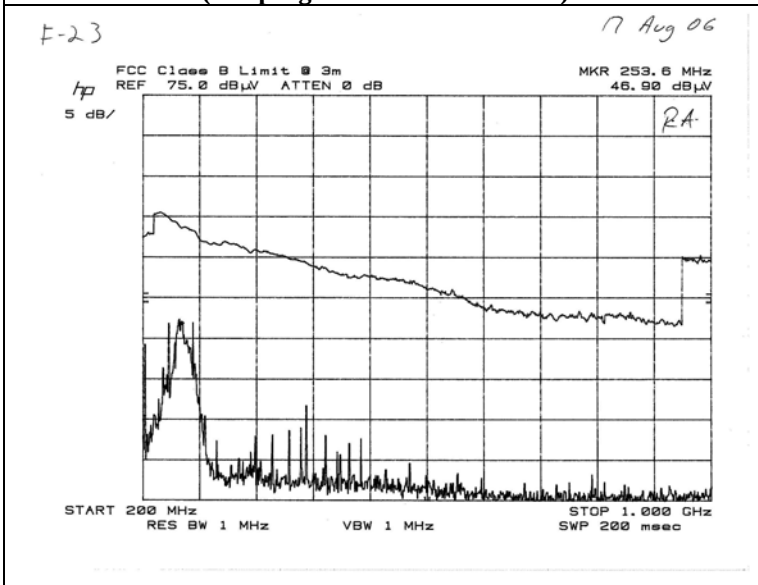


Figure 12 200MHz to 1GHz Vertical (FM programmed to 107.9MHz

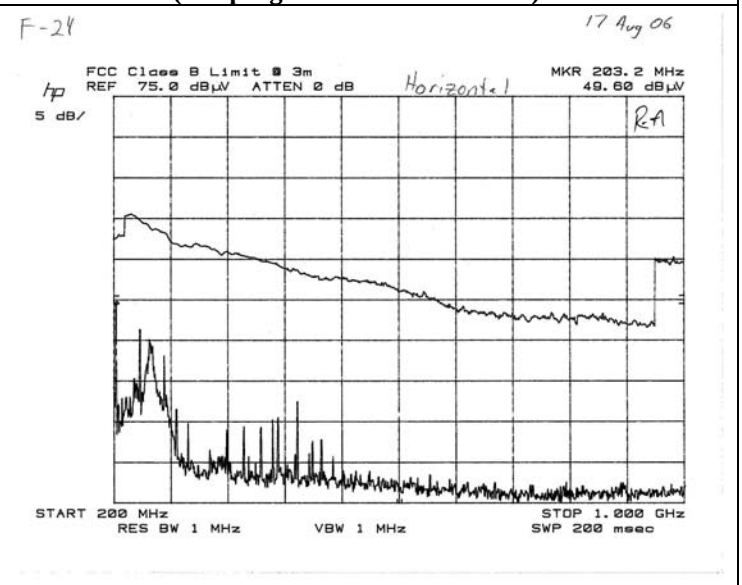


Figure 13 200MHz to 1GHz Horizontal (FM programmed to 107.9MHz)

4.3.3.3 Test Data – FM Direct Adapter with audio cable

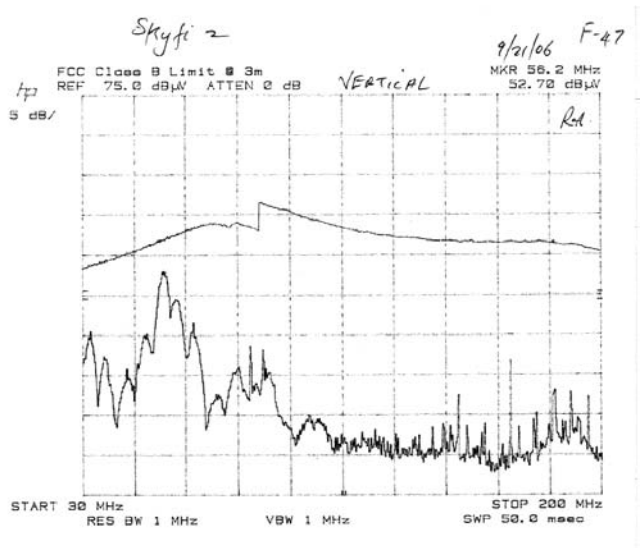


Figure 14 30 MHz to 200 MHZ Vertical
FM Programmed to 88.1 MHz

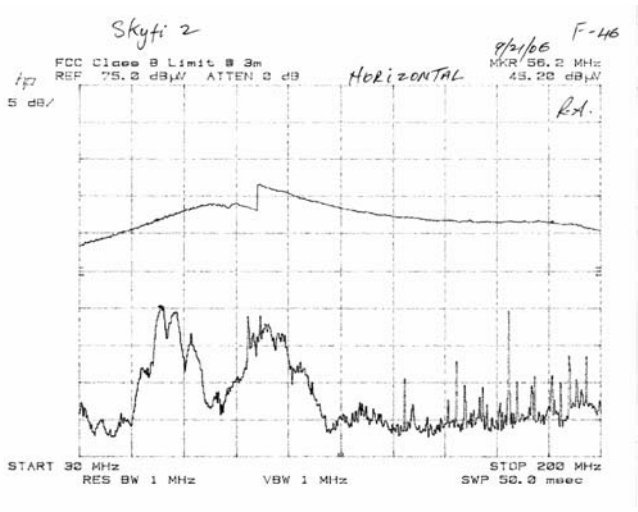


Figure 15 30 MHz to 200 MHZ Horizontal
FM Programmed to 88.1 MHz

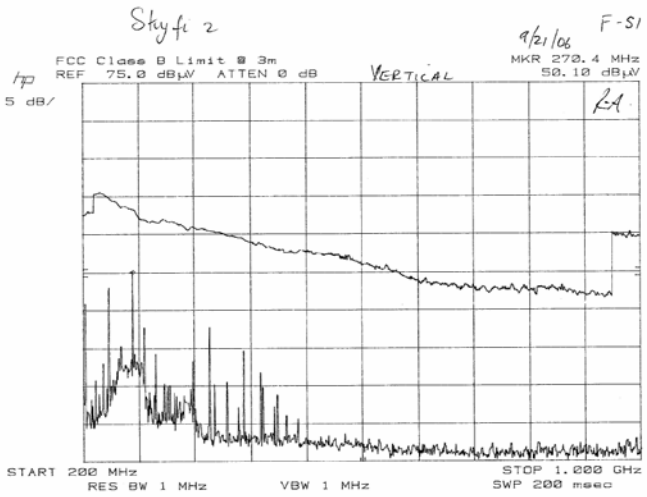


Figure 16 200 MHz to 1000 MHZ Vertical
FM Programmed to 88.1 MHz

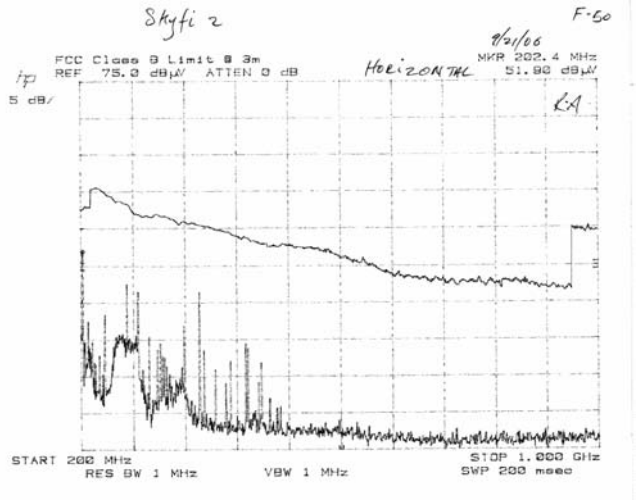


Figure 17 200 MHz to 1000 MHZ Horizontal
FM Programmed to 88.1 MHz

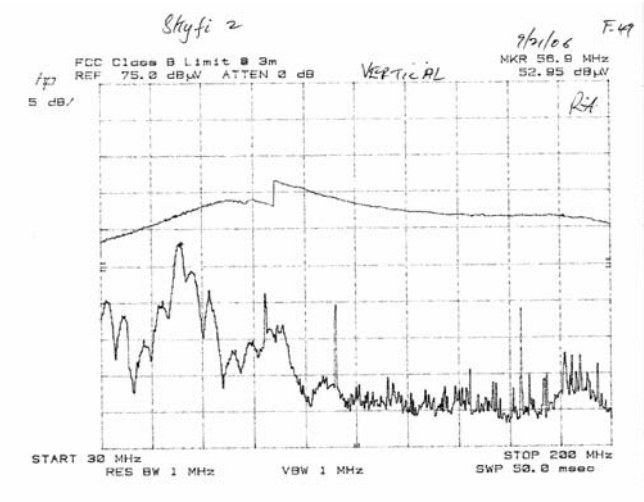


Figure 18 30 MHz to 200 MHZ Vertical
FM Programmed to 107.9 MHz

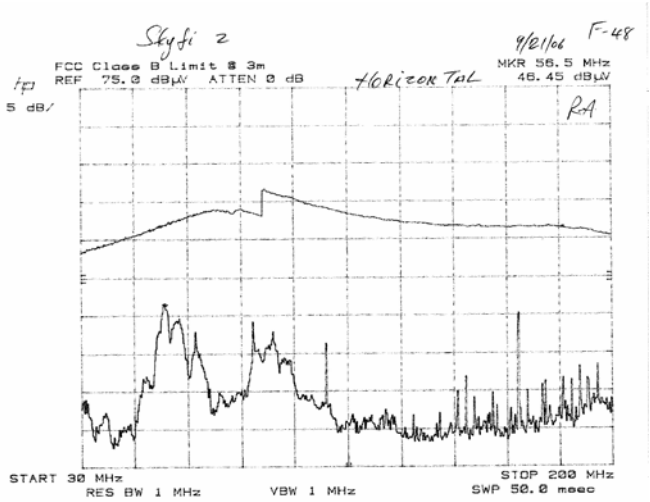


Figure 19 30 MHz to 200 MHZ Horizontal
FM Programmed to 107.9 MHz

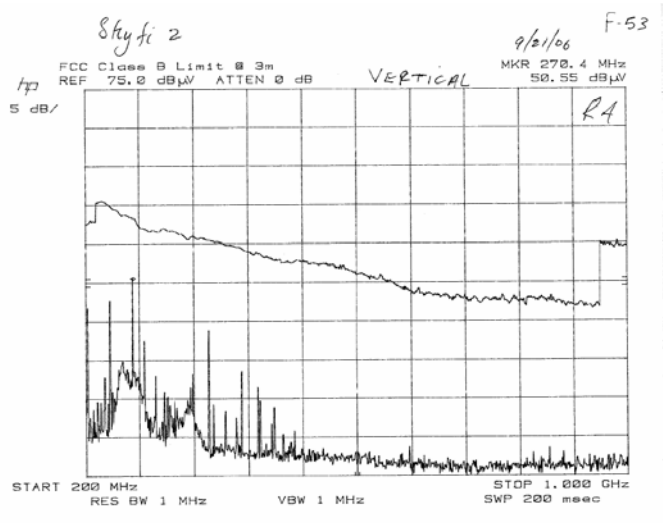


Figure 20 200 MHz to 1000 MHZ Vertical
FM Programmed to 107.9 MHz

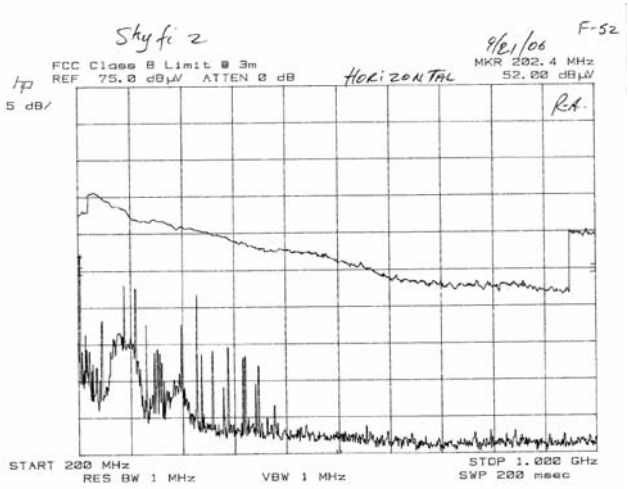


Figure 21 200 MHz to 1000 MHZ Horizontal
FM Programmed to 107.9 MHz

4.3.4 Radiated Emissions – Car Cradle and XM Antenna only

4.3.4.1 Test Setup – Car Cradle and XM Antenna only

In this test setup, the EUT was placed into a SkyFi2 car cradle with an XM antenna and 5V Cigarette adaptor (CLA) power supply connected to the radio. Diagram 3 below, and Photograph 5 in the document 'SkyFi2_Report_of_Measurements_test_set_up_photos.doc' depicts the radiated emissions car cradle with XM antenna only test setup.

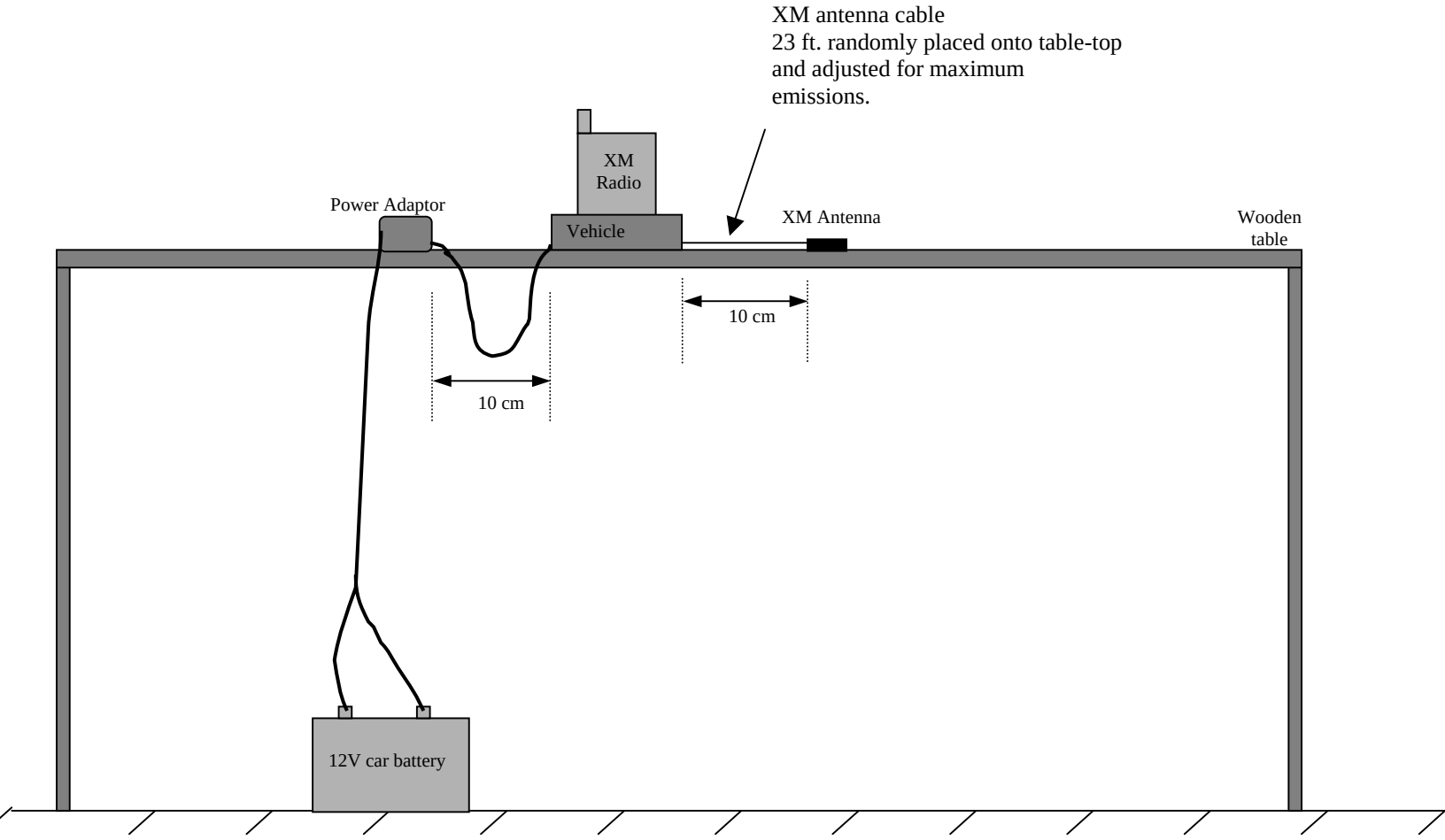


Diagram 3: XM Antenna Only - Radiated Emissions Setup

4.3.4.2 Test Data – Car Cradle and XM antenna only; no audio cable

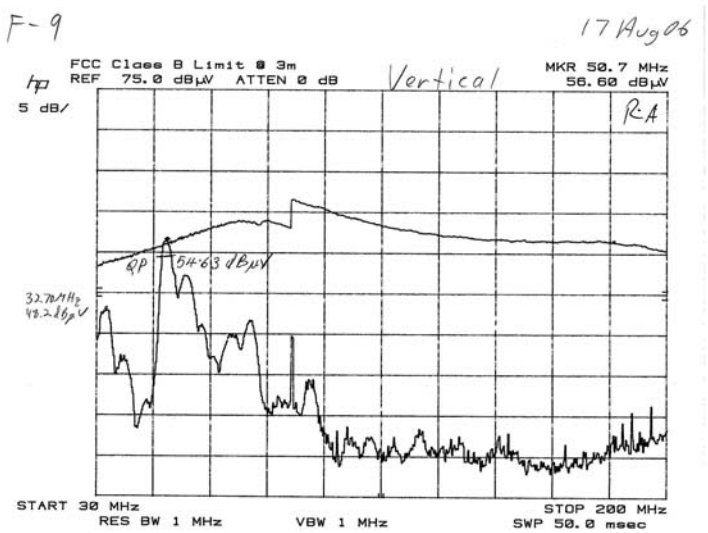


Figure 22 30MHz to 200MHz Vertical (FM programmed to 88.1MHz)

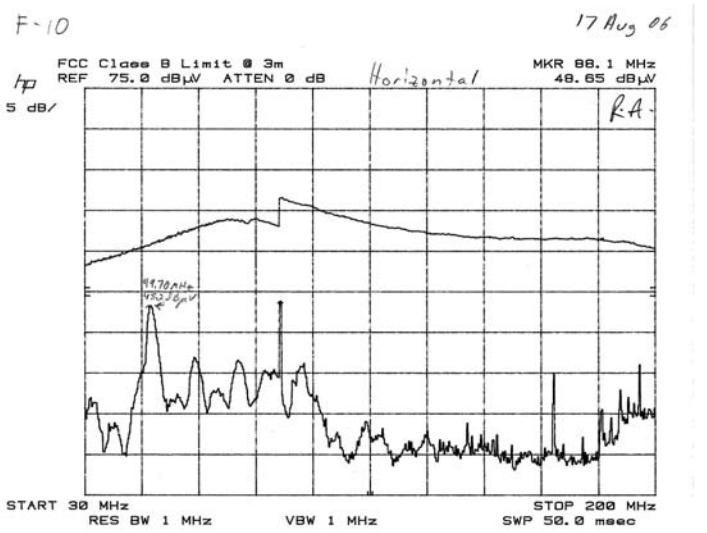


Figure 23 30MHz to 200MHz Horizontal (FM programmed to 88.1MHz)

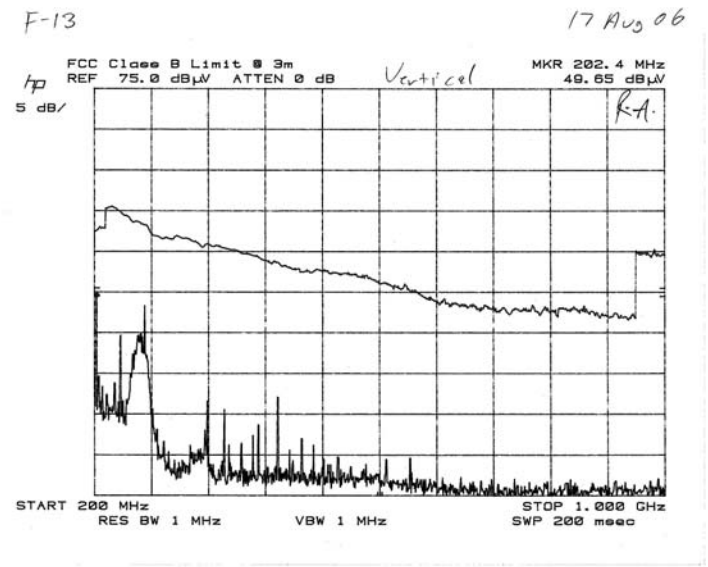


Figure 24 200MHz to 1GHz Vertical (FM programmed to 88.1MHz)

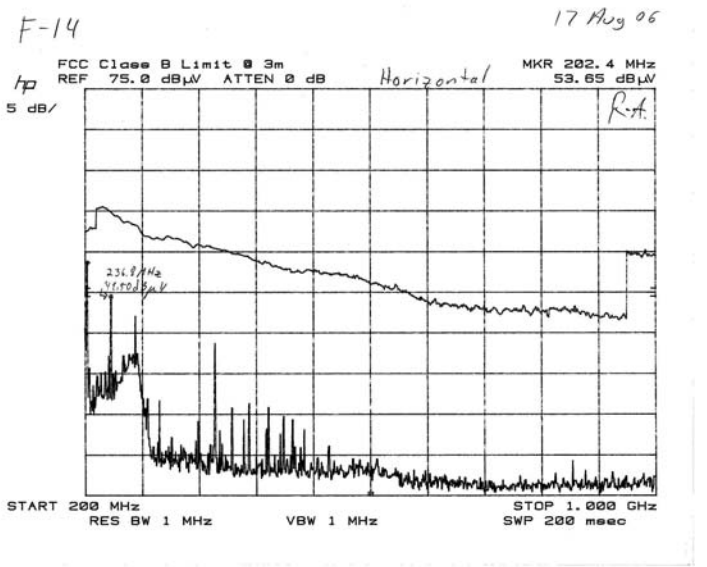


Figure 25 200MHz to 1GHz Horizontal (FM programmed to 88.1MHz)

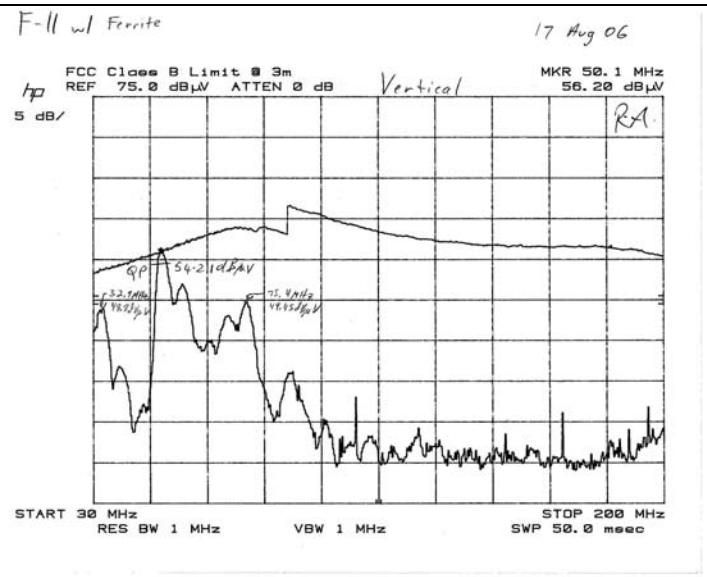


Figure 26 30MHz to 200MHz Vertical
(FM programmed to 107.9MHz)

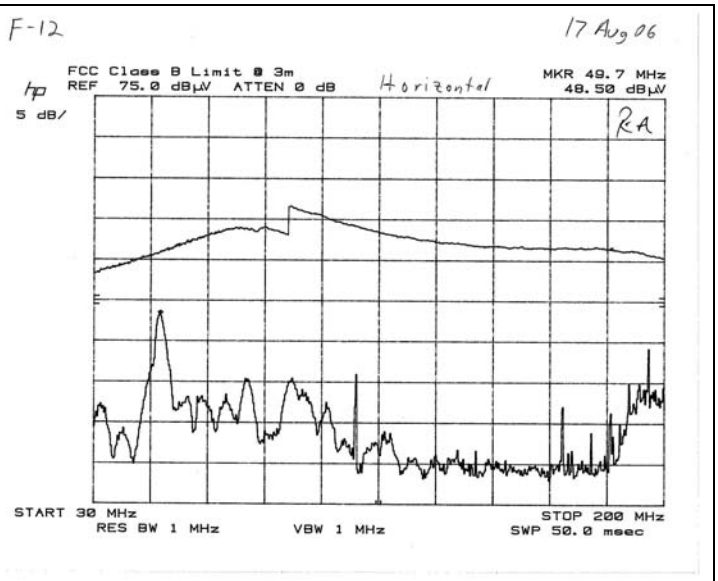


Figure 27 30MHz to 200MHz Horizontal
(FM programmed to 107.9MHz)

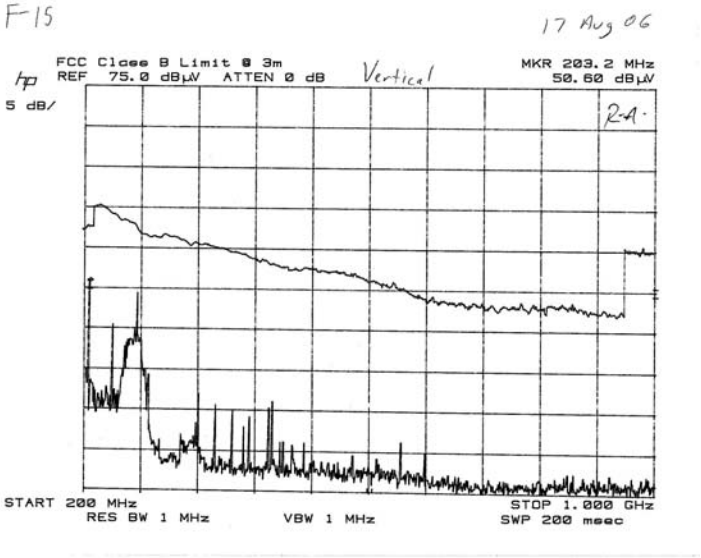


Figure 28 200MHz to 1GHz Vertical
(FM programmed to 107.9MHz)

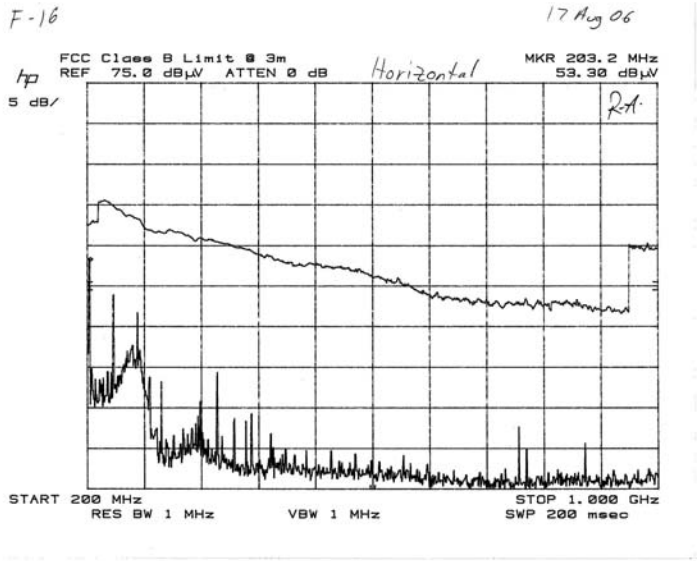


Figure 29 200MHz to 1GHz Horizontal
(FM programmed to 107.9MHz)

4.3.4.3 Test Data – Car Cradle and XM antenna only with audio cable

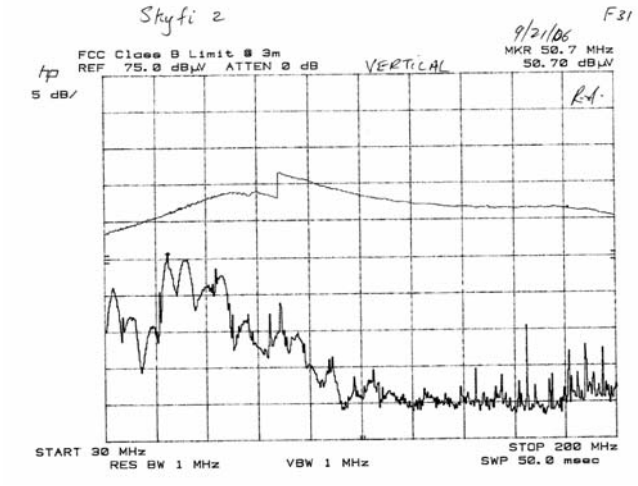


Figure 30 30MHz to 200MHz Vertical (FM programmed to 88.1 MHz)

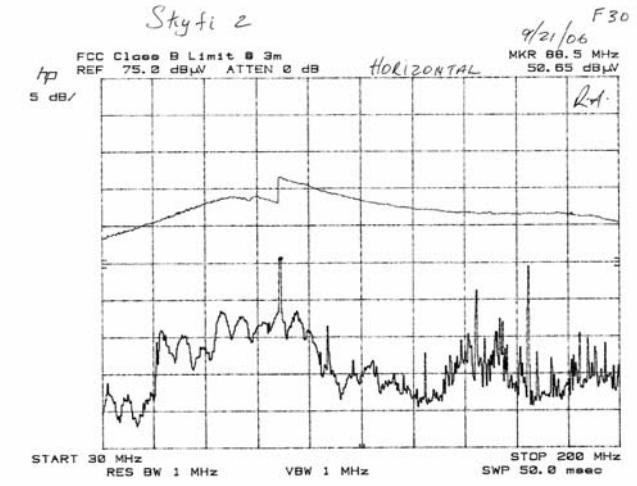


Figure 31 30MHz to 200MHz Horizontal (FM programmed to 88.1 MHz)

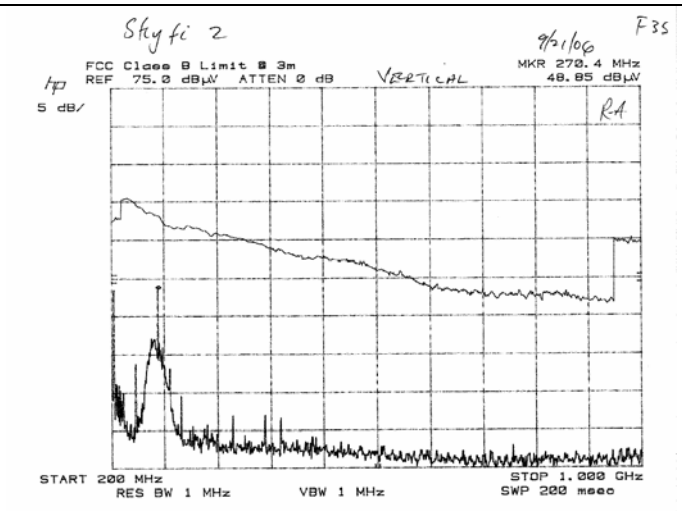


Figure 32 200MHz to 1GHz Vertical (FM programmed to 88.1 MHz)

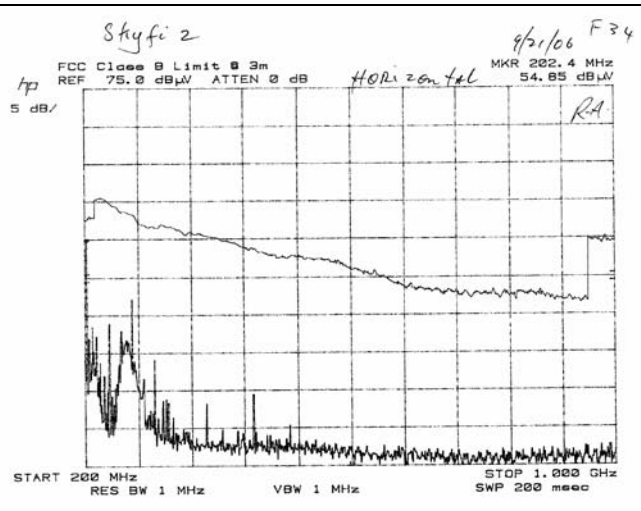


Figure 33 200MHz to 1GHz Horizontal (FM programmed to 88.1 MHz)

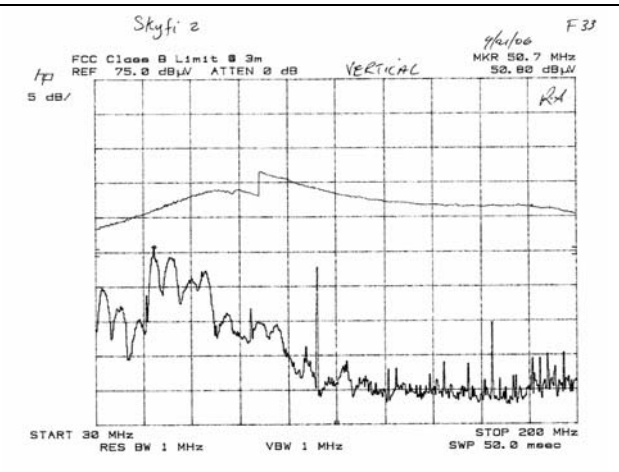


Figure 34 30MHz to 200MHz Vertical (FM programmed to 107.9MHz)

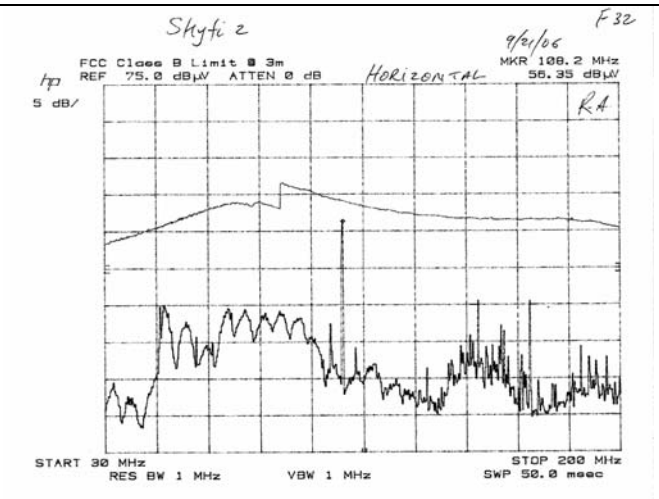


Figure 35 30MHz to 200MHz Horizontal (FM programmed to 107.9MHz)

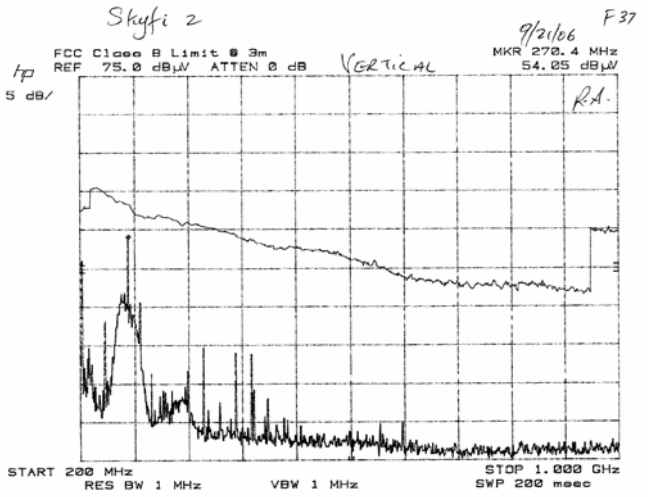


Figure 36 200MHz to 1GHz Vertical (FM programmed to 107.9MHz)

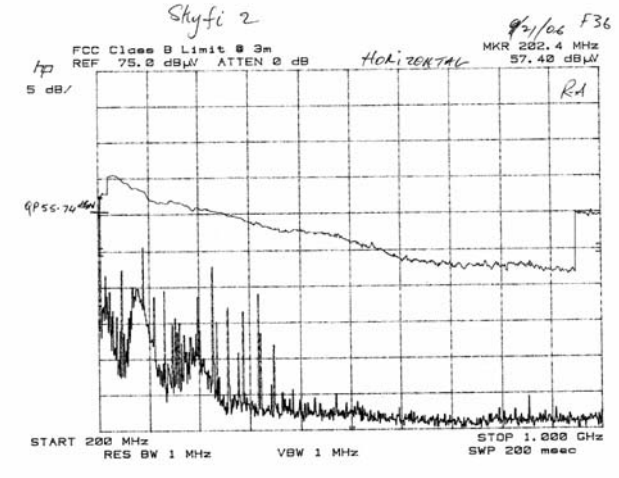


Figure 37 200MHz to 1GHz Horizontal (FM programmed to 107.9MHz)

4.4 INTENTIONAL RADIATOR – Section 15.239 Operation in the Band 88 MHz to 108 MHz

4.4.1 Test Setup – Using FM Aerial antenna

The XM Satellite Radio, Inc SkyFi2 receiver was set up on a wooden table 80 centimeters above the ground plane turntable of the FCC listed Semi-Anechoic test site.

An EMCO 3104 Broadband Biconical antenna was installed on an EMCO pneumatically controlled Antenna Mast at a distance of 3 meters from the system. The 30 to 200 MHz frequency range was automatically scanned on the HP 8566B Spectrum Analyzer operated in the peak detector mode with a bandwidth of 120 kHz obtained through the HP 85650A Quasi Peak Adapter. It should be noted that the RES BW and VBW of the spectrum analyzer must be set to 1 MHz for the Quasi Peak Adaptor to provide 120 kHz bandwidth correctly. Hence, in the figures RES BW and VBW are still indicated as 1 MHz. The turntable was incrementally rotated through 360 degrees and at the same time the receiving antenna was scanned in height from 1 to 4 meters in both the horizontal and vertical polarizations. An EMCO 3146 Log Periodic antenna was then installed and the above procedure was repeated for the 200 to 1000 MHz ranges.

The FCC Class B limit lines have been corrected for the appropriate antenna factors, cable loss, and amplifier gain based on the following equation:

E (dBµV/m) = SA reading (dBµV) + Antenna Factor (dB/m) + Cable Loss (dB) - Amp Gain (dB)

In this test setup, the EUT was placed into a SkyFi2 car cradle with an XM FM Coupler attached to the RF jack of the car cradle. An XM car antenna is attached to the FM Coupler's RF jack. A 5V cigarette lighter adaptor (CLA) power supply is connected to the radio, and powered by a car battery which is placed on the floor.

It should be noted that the limit line indicated in Figures 39-54 are for FCC Class B unintentional radiators. However, the allowable field strength for Intentional radiation as per Section 15.239 is 250 µV/m or 47.96 dBµV/m, which is 4.45 dB higher than the unintentional FCC Class B (43.5 dBµV/m) limit in this frequency range. As an example, the measured value at 108 MHz on Figure 43 was 1.15 dB (44.65 dBµV/m) above the FCC Class B unintentional limit, but it was 3.35 dB below the intentional Class B limit of 47.96 dBµV/m.

Photograph 6, representing the setup as described above, is in the separate document entitled, 'SkFi2_Report_of_Measurements test set up photos.doc.'

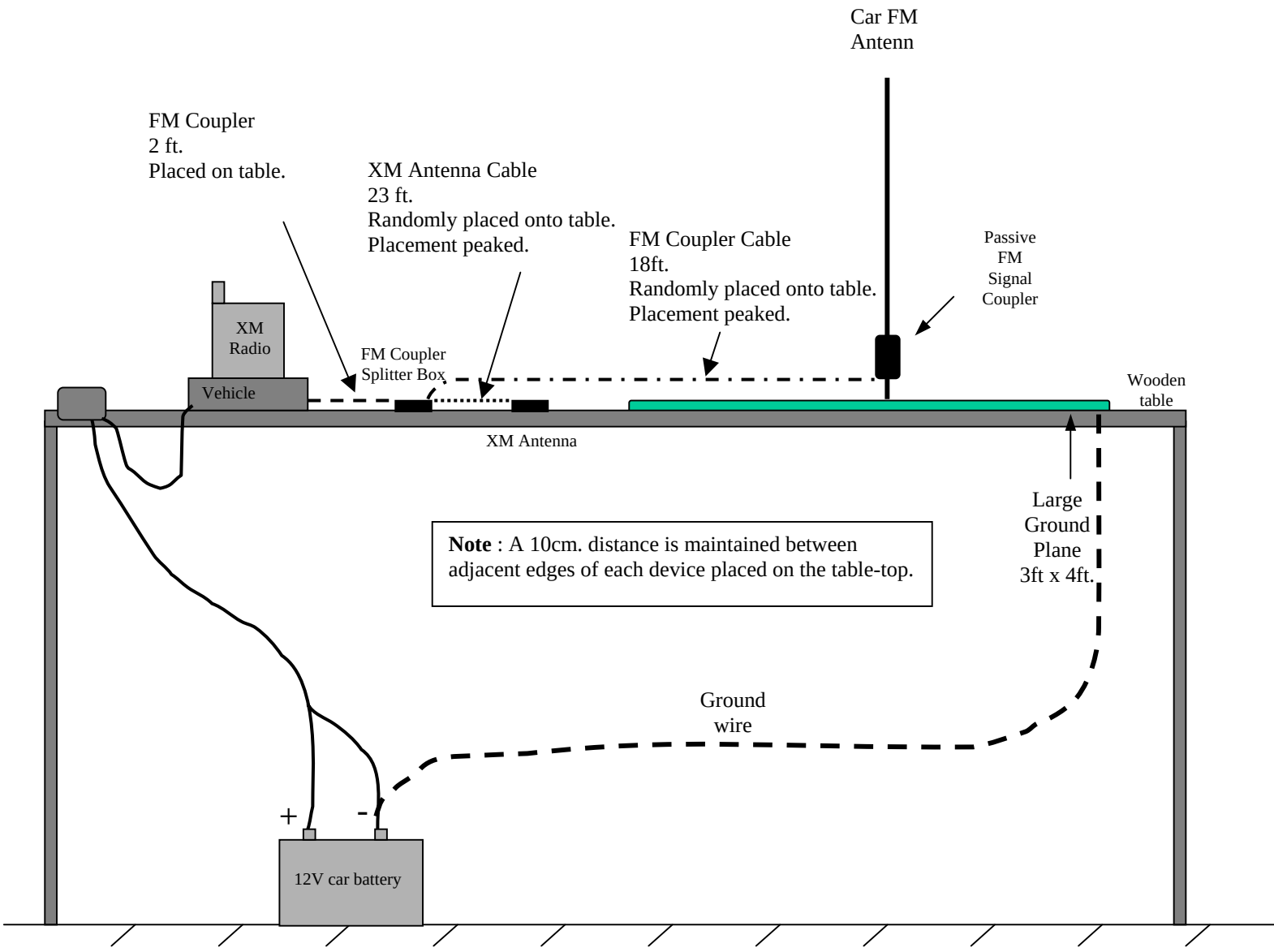


Diagram 4: Intentional Radiator – FM Aerial Setup

4.4.2 Test Data – FM Aerial Antenna; No audio cable

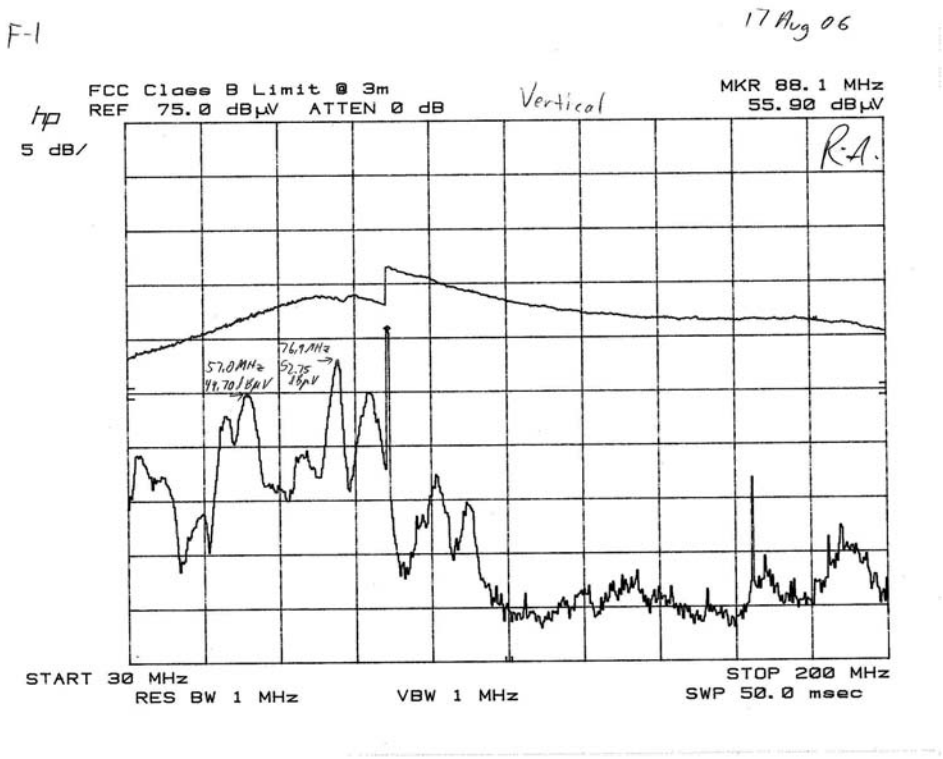


Figure 38 30MHz to 200MHz Vertical
(FM programmed to 88.1MHz)

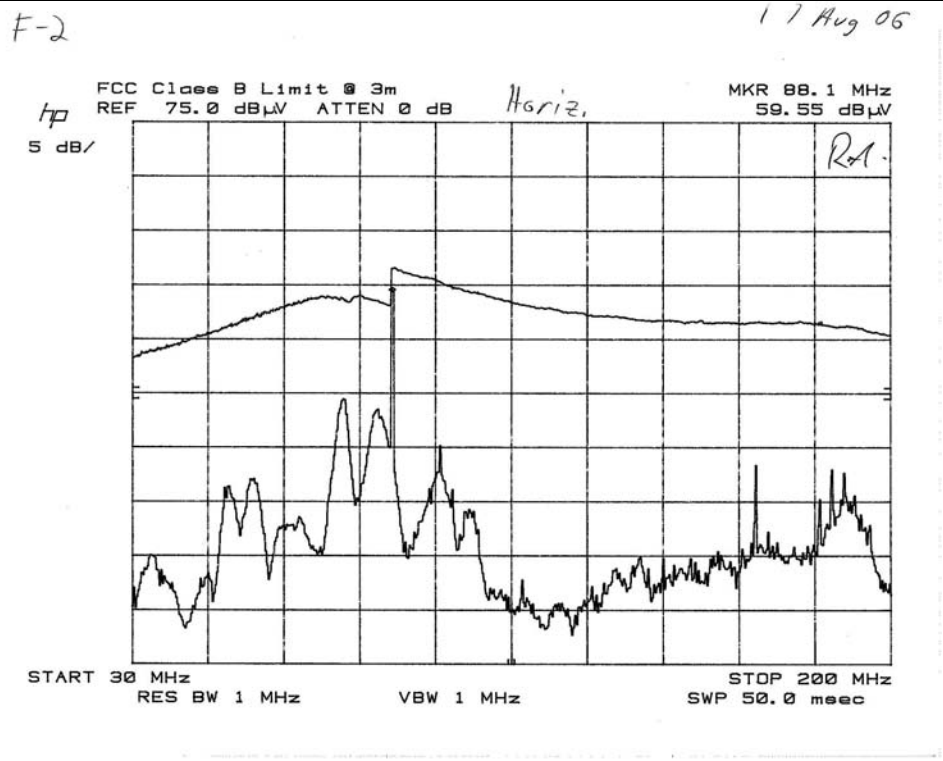
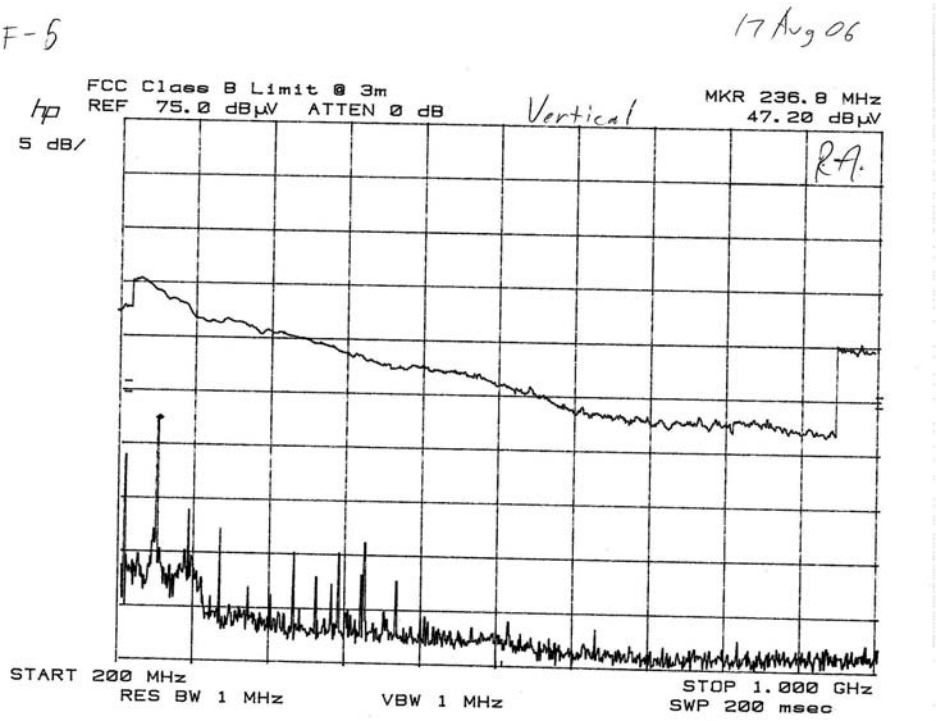


Figure 39 30MHz to 200MHz Horizontal
(FM programmed to 88.1MHz)

Figure 40 200MHz to 1GHZ Vertical (FM



pr ogrammed to 88.1MHz)

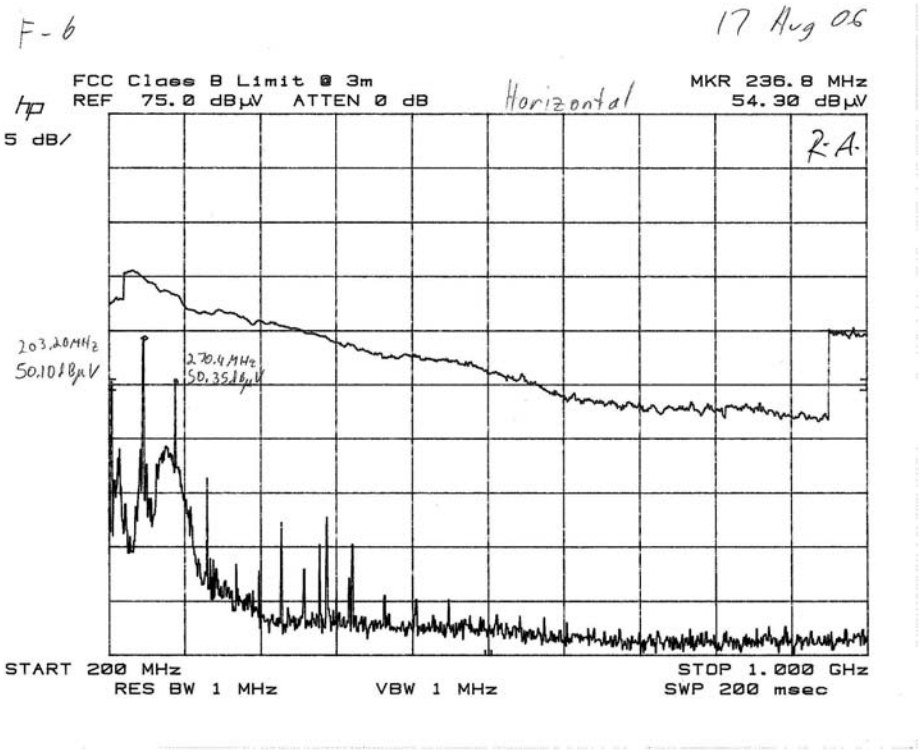


Figure 41 200MHz to 1GHz Horizontal (FM programmed to 88.1MHz)

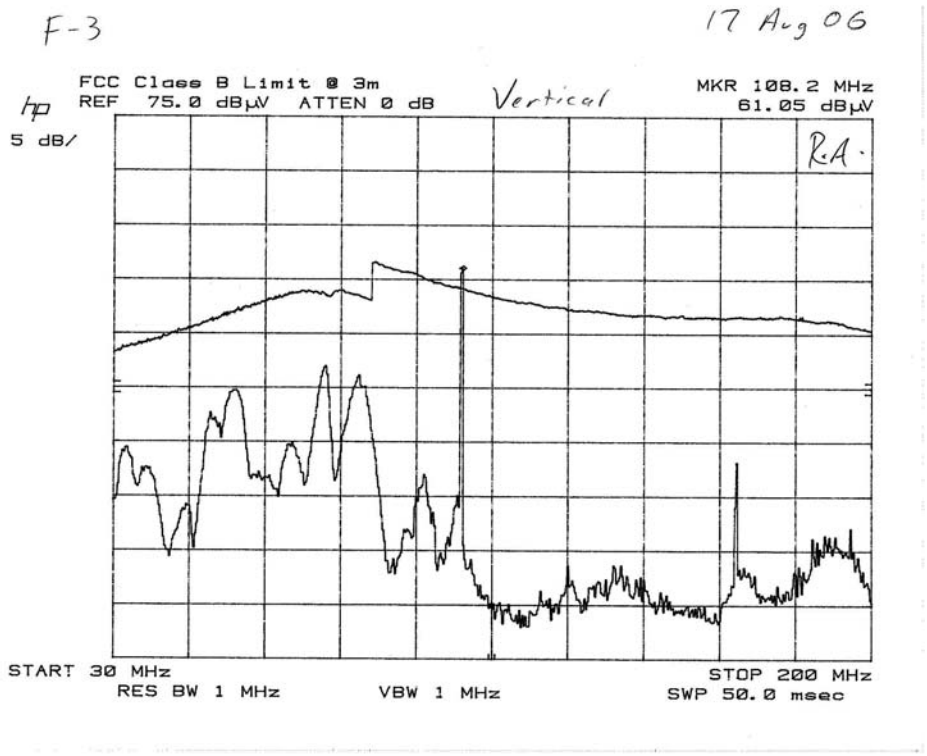


Figure 42 30MHz to 200MHz Vertical
(FM programmed to 107.9MHz)

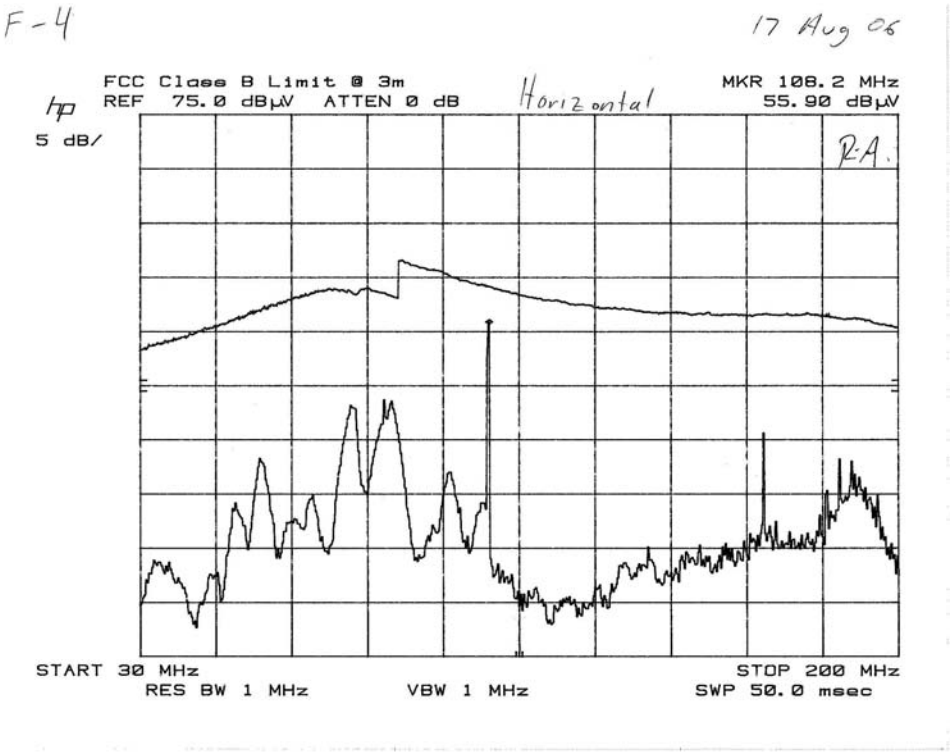


Figure 43 30MHz to 200MHz Horizontal
(FM programmed to 107.9MHz)

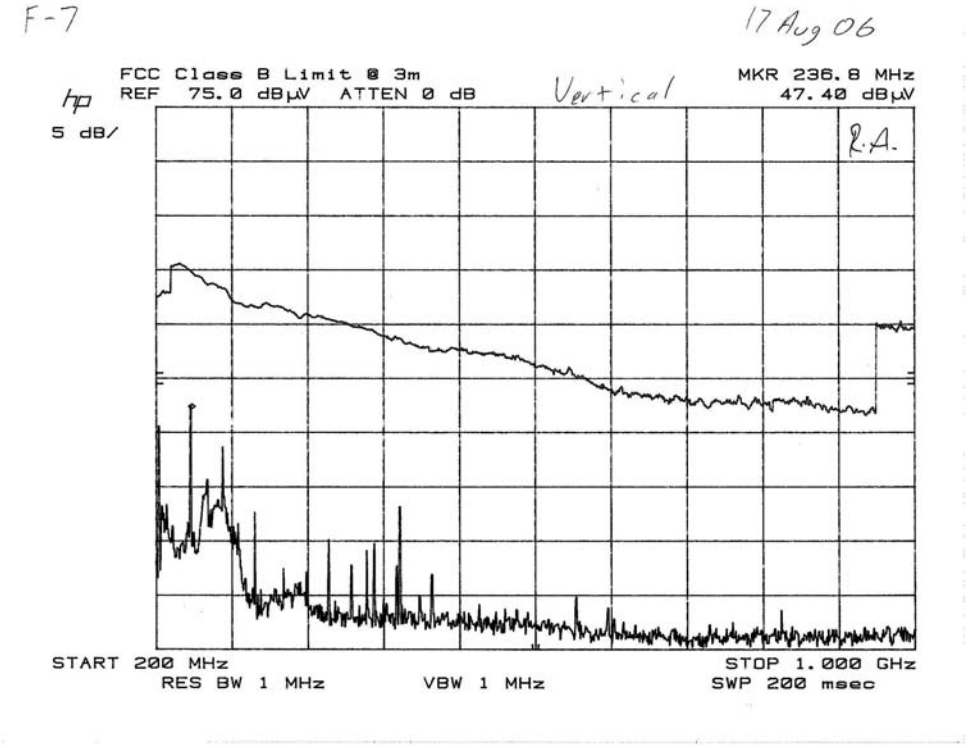


Figure 44 200MHz to 1GHz Vertical
(FM programmed to 107.9MHz)

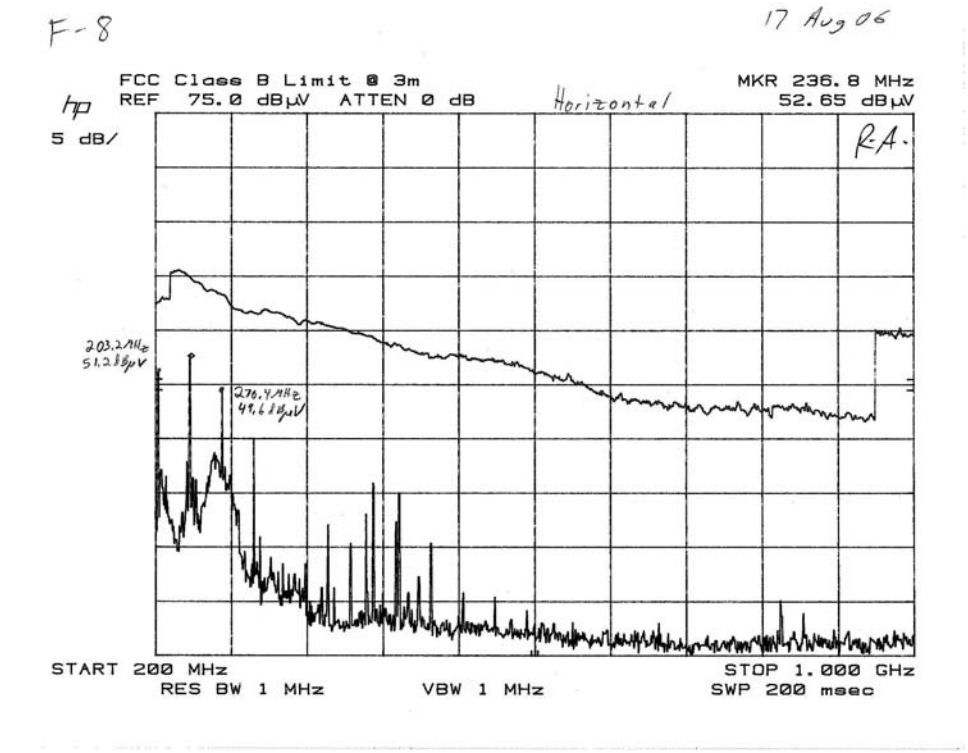


Figure 45 200MHz to 1GHz Horizontal
(FM programmed to 107.9MHz)

4.4.3 Test Data – FM Aerial Antenna; With audio cable

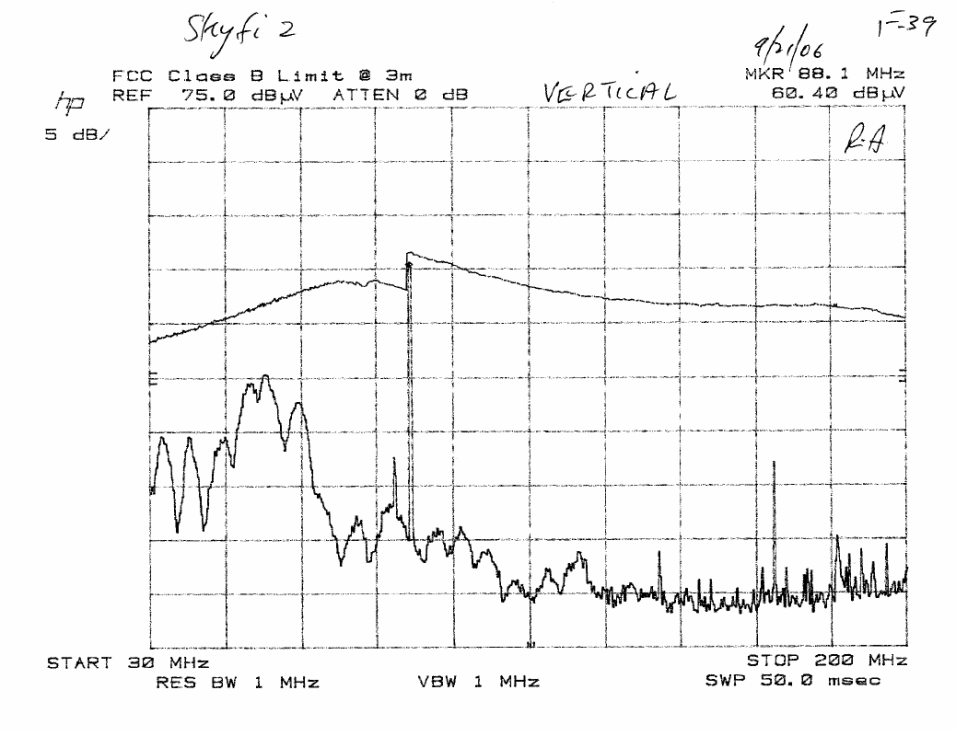


Figure 46 30MHz to 200MHz Vertical
(FM programmed to 88.1MHz)

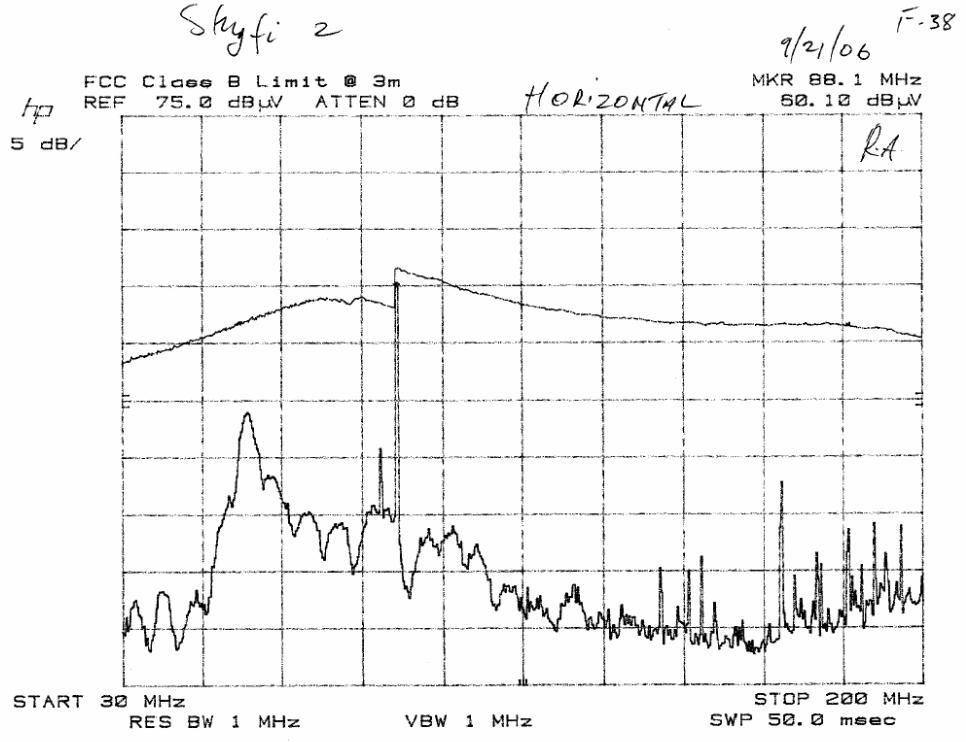


Figure 47 30MHz to 200MHz Horizontal
(FM programmed to 88.1MHz)

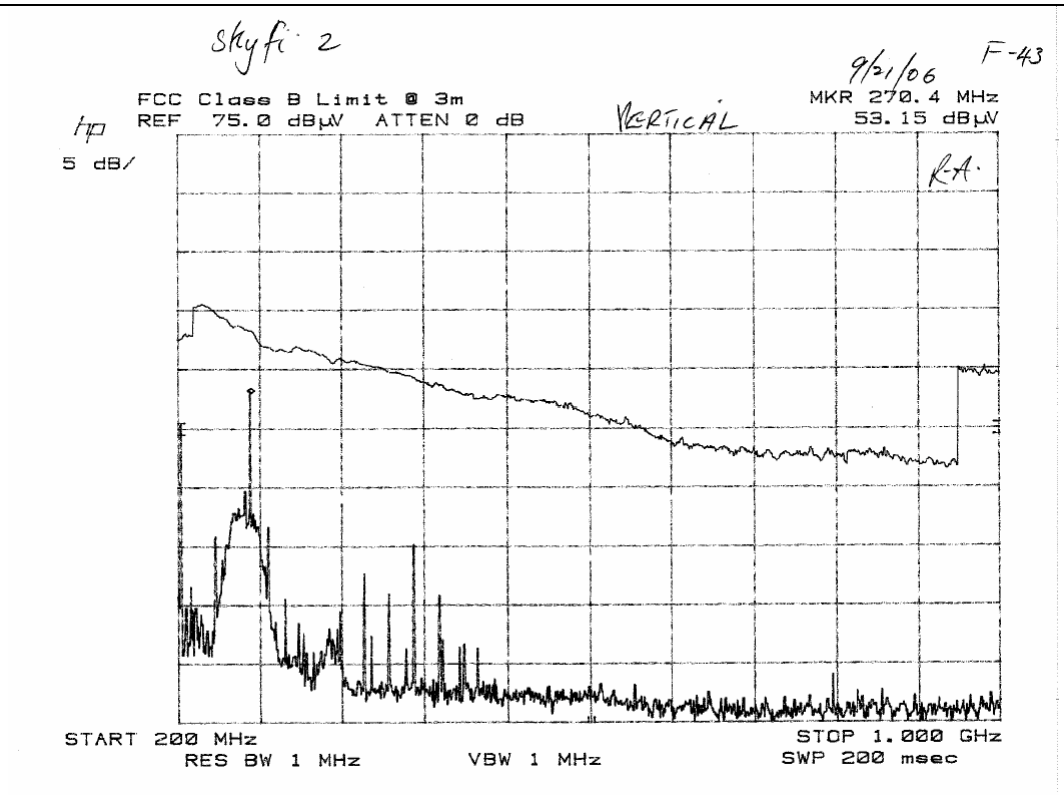


Figure 48 200MHz to 1000MHz Vertical
(FM programmed to 88.1MHz)

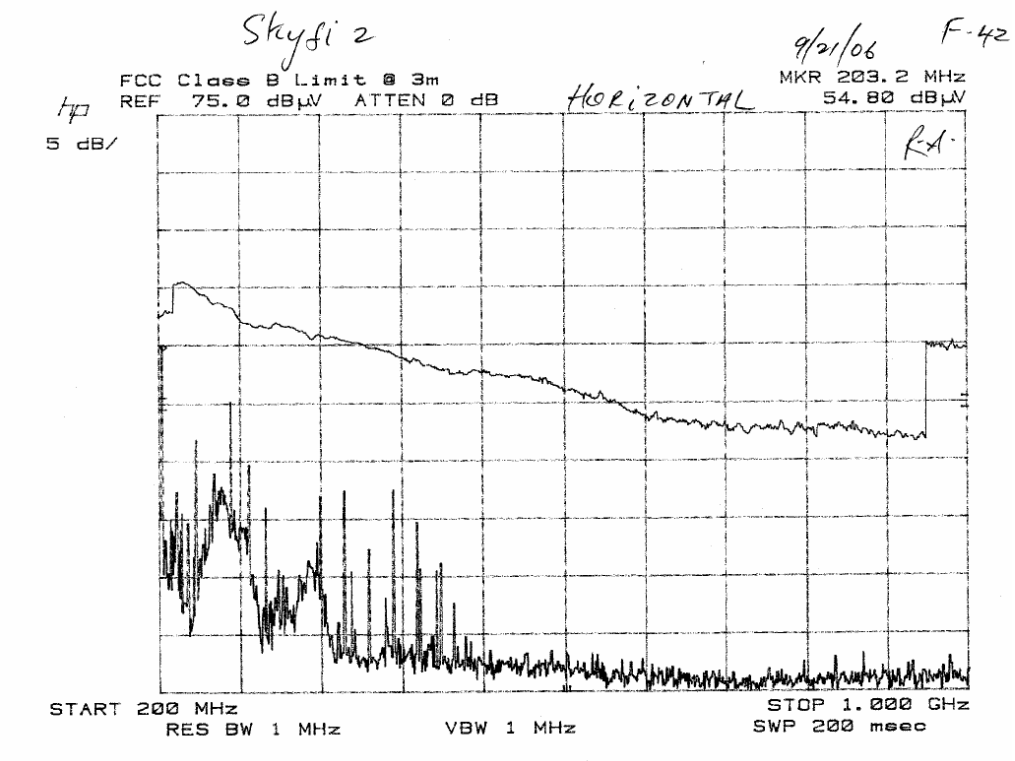


Figure 49 200MHz to 1000MHz Vertical
(FM programmed to 88.1MHz)

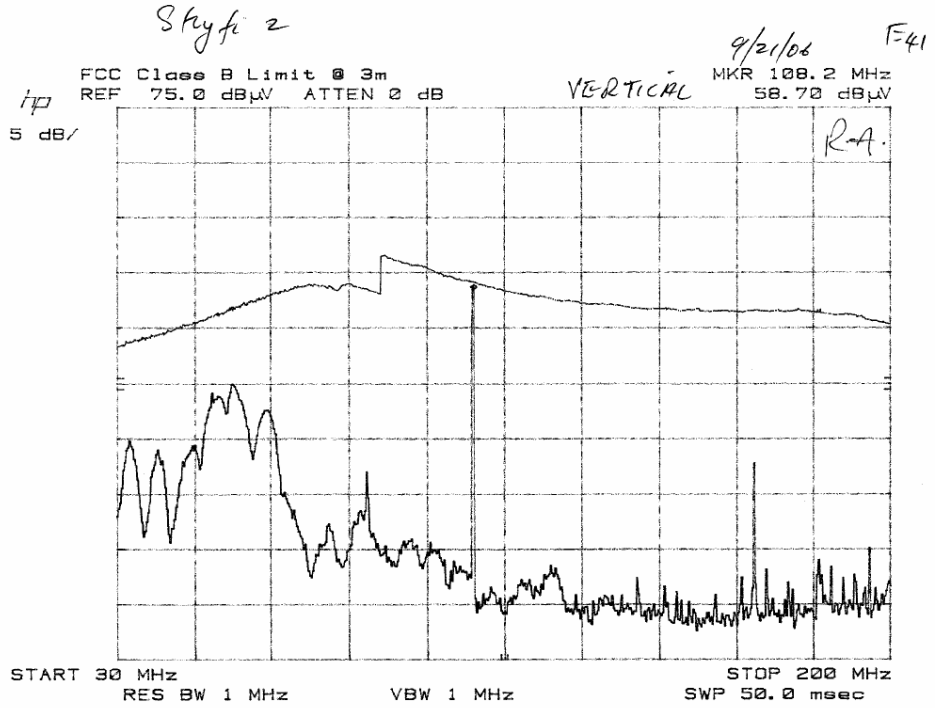


Figure 50 30MHz to 200MHz Vertical
(FM programmed to 107.9 MHz)

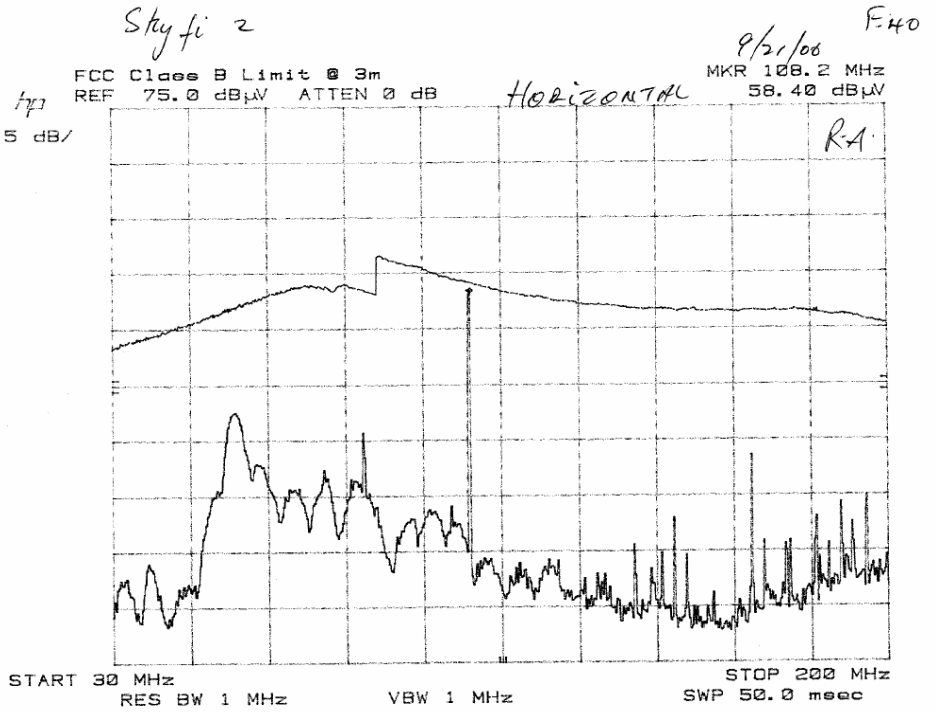


Figure 51 30MHz to 200MHz Horizontal
(FM programmed to 107.9MHz)

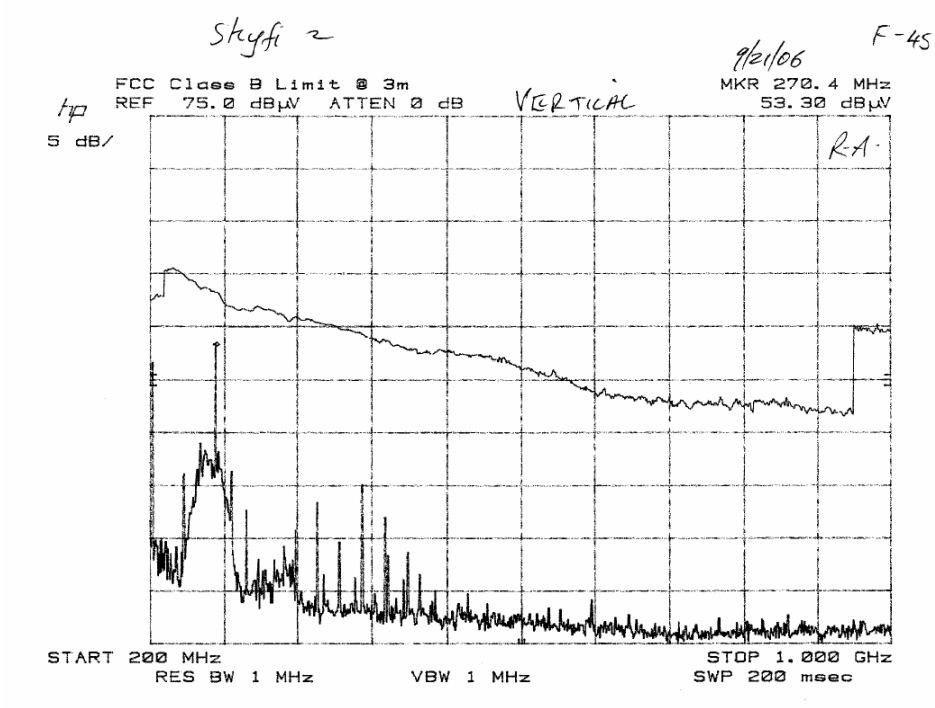


Figure 52 200MHz to 1000MHz Vertical
(FM programmed to 107.9MHz)

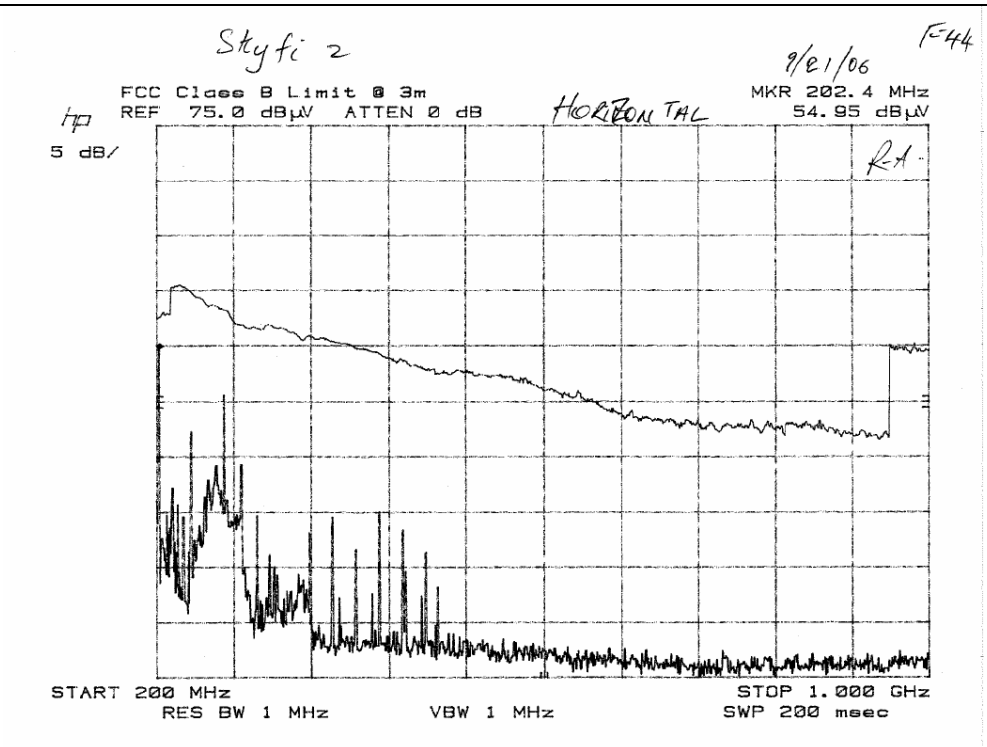


Figure 53 200 MHz to 1000 MHz Horizontal
(FM programmed to 107.9 MHz)

4.5 Tabular Data of Voltage Measurements

The following table shows voltage measurements for any emission that was within 10dB of the limit for all plots that were taken in the 3 meter chamber. Where noted, the QP measurement or intentional radiator limit is used.

Plot ID	Peak Frequency (MHz)	Peak Voltage (dBµV)	Correction Factor (dB)	Corrected Peak Voltage (dBµV/m)	FCC Limit dBµV/m	Margin to Limit dB
Fig 42	107.9	61.05	-16.40	44.65	48[1]	3.35
Fig 22	50.7	54.63	-16.69	37.94[2]	40	2.06
Fig 26	50.1	54.21	-16.52	37.69[2]	40	2.31
Fig 26	32.9	48.80	-13.80	35.00	40	5.00
Fig 25	202.4	53.65	-14.51	39.14	43.5	4.36
Fig 29	203.2	53.30	-14.51	38.79	43.5	4.71
Fig 6	45.0	53.08	-15.08	38.00[2]	40	2.00
Fig 10	44.4	54.48	-15.08	39.40[2]	40	0.60
Fig 10	74.4	54.00	-18.98	35.02	40	4.98
Fig 33	202.4	54.85	-14.51	40.34	43.5	3.16
Fig 37	202.4	55.74	-14.51	41.23[2]	43.5	2.27
Fig 36	270.4	54.05	-12.55	41.50	46	4.50
Fig 49	203.2	54.80	-14.51	40.29	43.5	3.21
Fig 53	202.4	54.95	-14.51	40.44	43.5	3.06
Fig 52	270.4	53.30	-12.55	40.75	43.5	2.75
Fig 18	56.9	52.95	-17.74	35.21	40	4.79

Note 1 : The intentional radiator limit is used for these frequency points.
Note 2 : A quasi-peak detector measurement is used for these data points, and the Q.P. value is shown in the table.

Table 1: Measurements from FAU 3-m chamber

4.6 Radiated Emissions – Section 15.239 – Measured On-Vehicle

Per FCC instructions, the FM fundamental power measurements using the FM Coupler device were measured on three different vehicles which utilize embedded FM antennas in the vehicle's glass.

The test vehicles that were used during the test include:

- Toyota Avalon
- Cadillac Escalade
- Nissan Maxima

4.6.1 Test Setup – In Vehicle Measurements

TEST PROCEDURE

1. The satellite radio receiver and FM Coupler were installed in each vehicle per the installation guidelines provided to the user and tuned to one of the two-test FM frequencies.
2. The RBW and VBW of the spectrum analyzer were set to 120 kHz and 300 kHz, respectively. A peak detector was utilized.
3. For tests where the receiving antenna is in Vertical polarization, the receive antenna is initially placed at one meter from the ground. For Horizontal polarization, the receive antenna is initially placed at three meters from the ground.
4. While monitoring the power of the fundamental FM emission, the receive antenna base is moved horizontally along one of the vehicles sides, at 3 meters from the vehicle. The position that produces the highest emission is found.
5. At the position found in step (4) above, the antenna is moved vertically from 1 meter to 4 meters. The highest FM emission is found and recorded.
6. The above procedure is repeated for each of the four sides of the vehicle.
7. The above procedure is repeated for each of two FM frequencies (88.7 MHz and 107.1 MHz).
8. The cable loss, amplifier gain, and antenna factors are used to determine the absolute field strength from each peak power measurement as shown in the table below.

Test Frequency (MHz)	Vertical Polarization V-Factor	Horizontal Polarization H-Factor
88.7	-19.2 dB/m	-18.8 dB/m
107.1	-21.0 dB/m	-18.7 dB/m

Table 2: Calibration Factors for In-Vehicle Measurements

Diagram 5: In-Vehicle Measurement Method

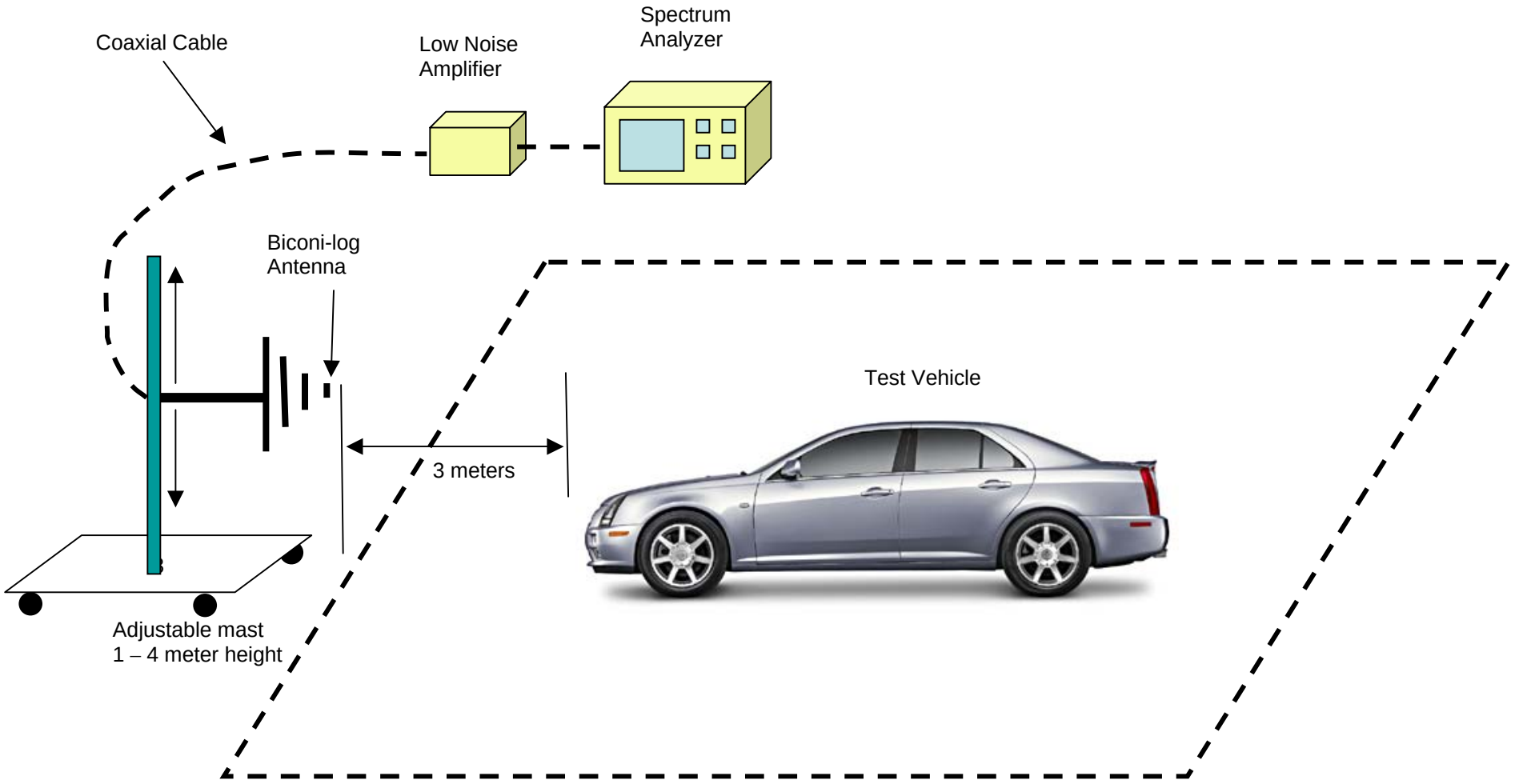
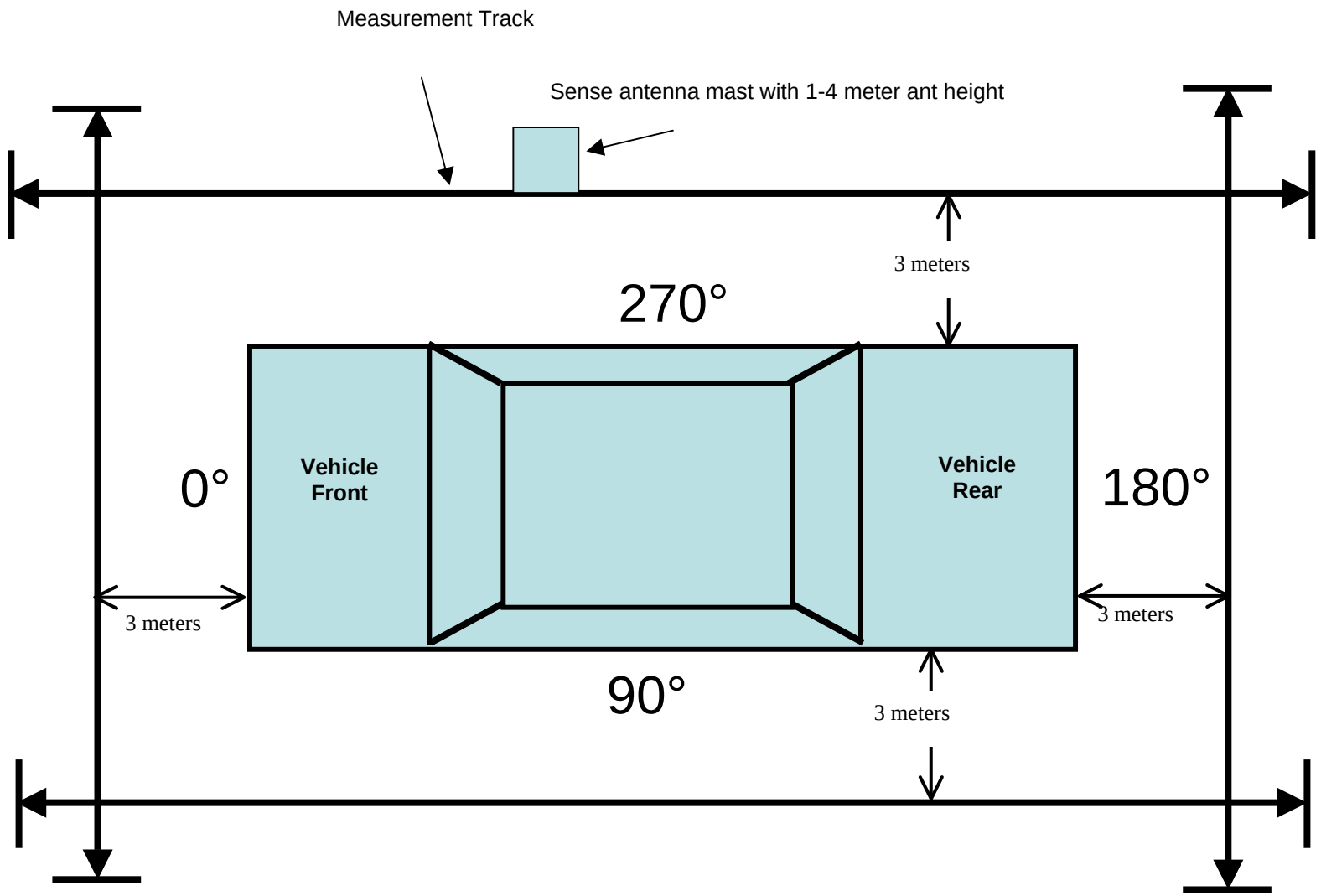


Diagram 6: In Vehicle Measurement Method



4.6.2 Test Data – In-Vehicle Measurements

Product Description	Freq (MHz)	V-factor (dB/m)	FAU OATS reading VERTICAL				Meas. Peak	E-field Peak	Limit	Margin
			0 deg	90 deg	180 deg	270 deg	(dBµV)	(dBµV/m)	(dBµV/m)	(dB)
Toyota Avalon	88.7	-19.20	54.8	51.6	58.6	53.5	58.6	39.4	48	8.6
	107.1	-21.00	53.0	50.2	57.6	51.7	57.6	36.6	48	11.4
Cadillac Escalade	88.7	-19.20	47.4	53.3	56.7	51.8	56.7	37.5	48	10.5
	107.1	-21.00	46.4	51.1	57.0	55.4	57.0	36.0	48	12.0
Nissan Maxima	88.7	-19.20	46.1	42.8	44.9	43.5	46.1	26.9	48	21.1
	107.1	-21.00	50.8	47.3	49.7	46.5	50.8	29.8	48	18.2

Table 3: Vertical Polarization results from In-Vehicle Measurements

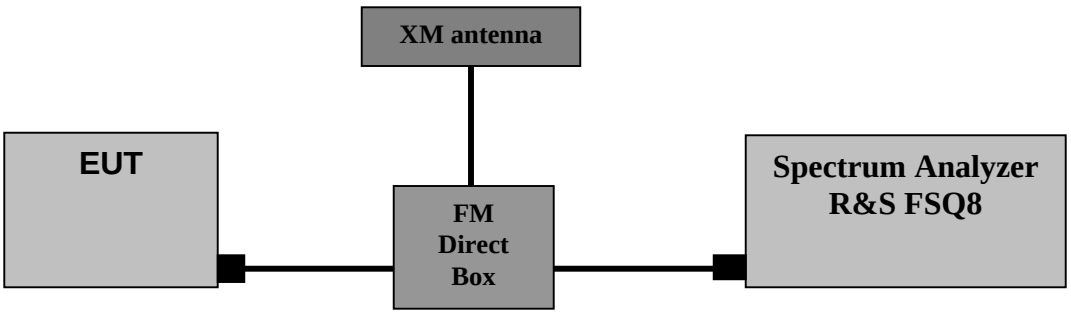
Product Description	Freq (MHz)	H-Factor (dB/m)	FAU OATS reading HORIZONTAL				Meas. Peak	E-field Peak	Limit	Margin
			0 deg	90 deg	180 deg	270 deg	(dBµV)	(dBµV/m)	(dBµV/m)	(dB)
Toyota Avalon	88.7	-18.8	49.8	55.8	45.0	57.3	57.3	38.5	48	9.5
	107.1	-18.7	48.6	55.2	50.8	57.3	57.3	38.6	48	9.4
Cadillac Escalade	88.7	-18.8	47	45.2	46.8	49.5	49.5	30.7	48	17.3
	107.1	-18.7	48.9	49.7	49.5	51.8	51.8	33.1	48	14.9
Nissan Maxima	88.7	-18.8	43.9	46.2	44.1	47.8	47.8	29.0	48	19.0
	107.1	-18.7	51.4	52.7	50.3	50.2	52.7	34.0	48	14.0

Table 4: Horizontal Polarization results from In-Vehicle Measurements

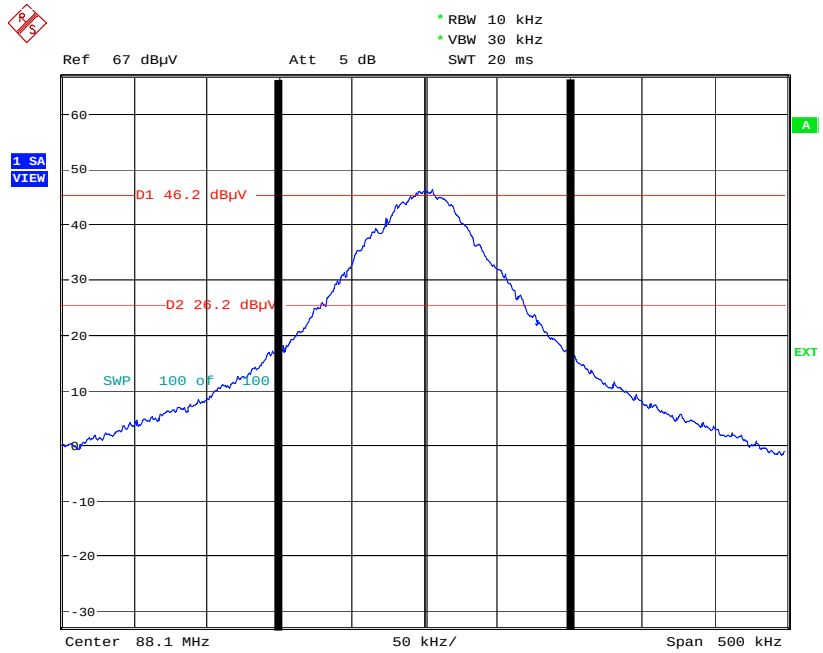
4.7 Occupied Bandwidth – Section 15.239(a)

4.7.1 Test Setup – Occupied Bandwidth

The occupied bandwidth test was performed using an FM direct adaptor to maximize the power into the spectrum analyzer. The unit was programmed to the minimum and maximum FM frequencies (88.1 MHz and 107.9 MHz) while receiving live over-the-air signal. *It was verified that the unit could not be programmed outside of this frequency range.* The FM audio level was maximized to find the highest occupied bandwidth. Photograph 13, representing the setup as described above, are in the separate document entitled, 'SkFi2_Report_of_Measurements test set up photos.doc.'

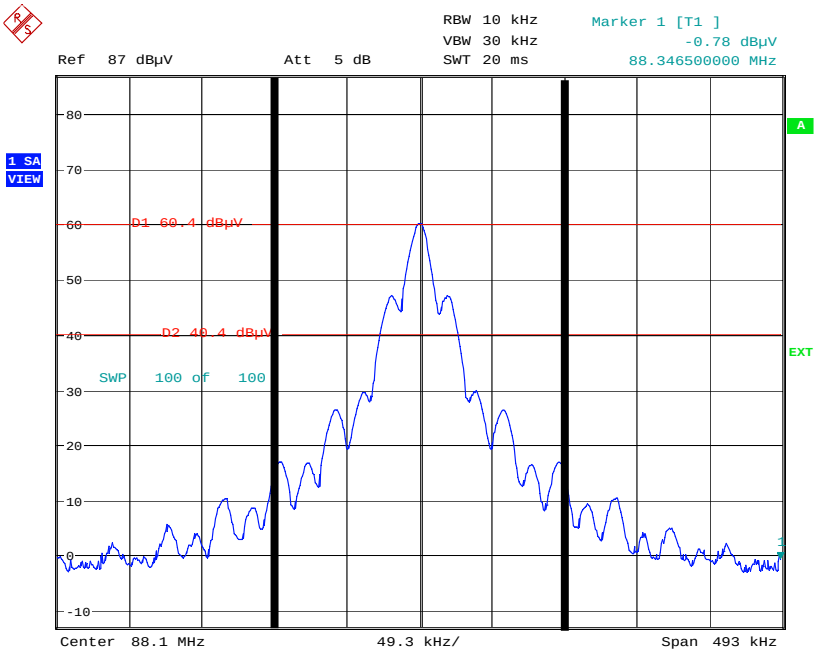


4.7.2 Test Data – Occupied Bandwidth



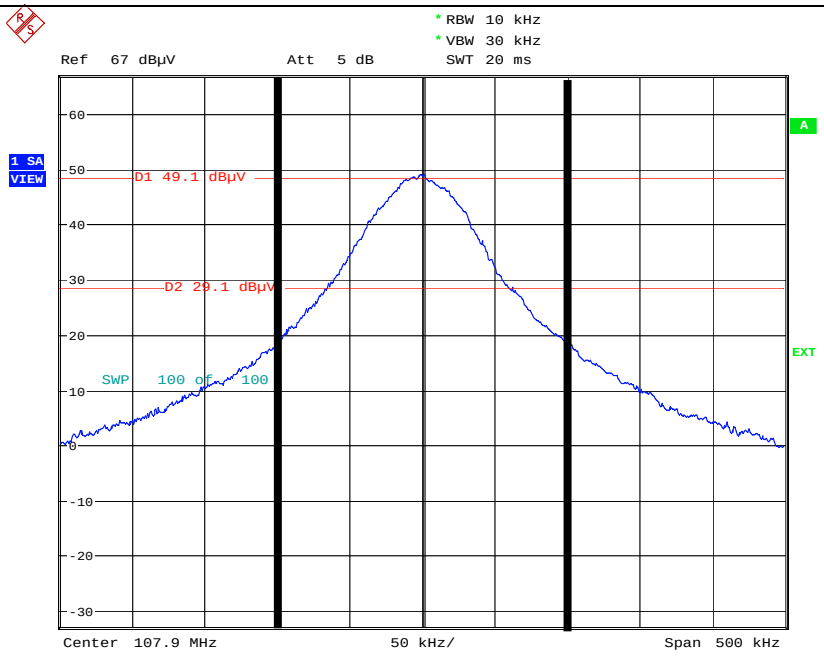
Date: 5.SEP.2006 08:11:58

Figure 55 88.1MHz With Modulation



Date: 6.SEP.2006 06:44:45

Figure 56 88.1MHz No Modulation



Date: 5.SEP.2006 08:13:39

Figure 57 107.9MHz With Modulation

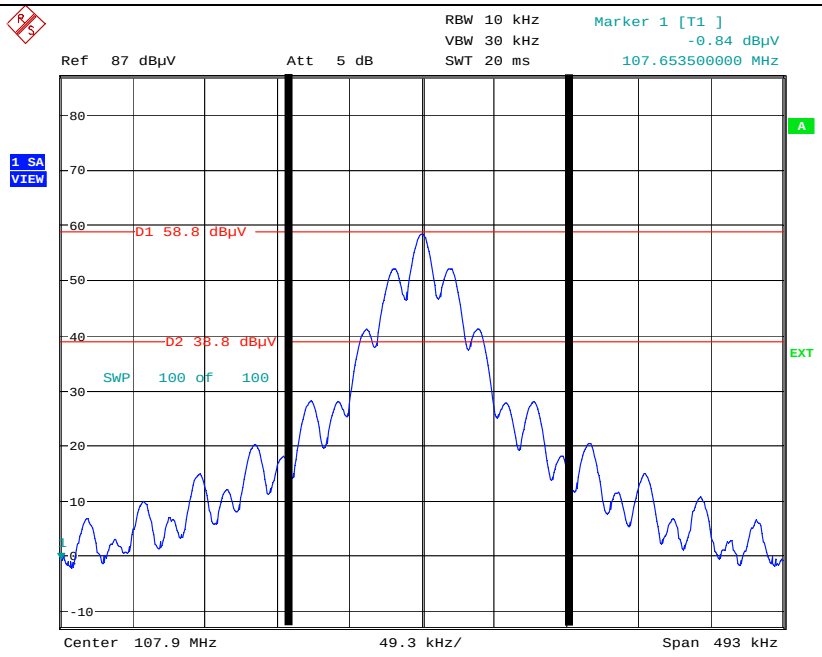


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Figure 58 107.9MHz No Modulation

4.8 TEST EQUIPMENT

FAU EMI LAB

FAU EMI R&D LABORATORY TEST EQUIPMENT						
Equipment Type	**Manufacturer**	**Description**	**Model**	**Serial No.**	**Calibration Date**	**Calibration Interval (Years)**
Spectrum Analyzer	Hewlett Packard	RF Section	8566B	2403A06381	Aug-22-06	2
Spectrum Analyzer	Hewlett Packard	Display	85662A	2407A06381	Aug-22-06	2
Spectrum Analyzer	Hewlett Packard	Quasi Peak Adapter	85650A	2430A00559	Aug-22-06	2
RF Preselector	Hewlett Packard	Preselector	85685A	2510A00151	Feb-8-06	2
LISN	EMCO	LISN	3825/2R	1095	March-10-06	2

IN-VEHICLE TEST SETUP

Equipment Type	**Manufacturer**	**Model**	**Cal Date**	**Due Date**
Spectrum Analyzer	Rhode & Schwarz	FSIQ7	3/28/2006	3/28/2007
Low Noise Amplifier	Sonoma	Inst310	6/9/2006	6/9/2007
Biconilog Antenna	ETS-Lindgren	3142C	6/5/2006	6/5/2007

OCCUPIED BANDWIDTH TEST SETUP

Equipment Type	**Manufacturer**	**Model**	**Cal Date**	**Due Date**
Spectrum Analyzer	R&S	FSQ8	3/28/2006	3/28/2007

TEST FACILITY

FAU EMI Research and Development Laboratory
Department of Electrical Engineering
Florida Atlantic University
Boca Raton, Florida 33431
(561) 361-4390

A2LA Certificate Number: 2129.01
FCC Registration: 90599
Industry of Canada: IC46405-4076

Description:	The 3-m semi-anechoic chamber and Power Line Conducted Spurious Voltage test setup is constructed and calibrated to meet the FCC requirements of Section 2.948, as well as Industry Canada RSS 212 Issue 1.
Site Filing:	A site description is on file with the Federal Communications Commission, 7435 Oakland Mills Road, Columbia, MD 21046, and with the Industry Canada, Certification and Engineering Bureau, 3701 Carling Ave., Building 94, P.O. Box 11490, Station "H", Ottawa Ontario, K2H 8S2.
Instrument Tolerance:	All measuring equipment is in accordance with ANSI C63.4 and CISPR 22 requirements.

End Report