

TIMCO ENGINEERING INC.

849 NW State Road 45

Newberry, Florida 32669

<http://www.timcoengr.com>

888.472.2424 F 352.472.2030 email: tei@timcoengr.com



Test Report

Product Name: WIRELESS TRANSMITTER

FCC ID: RS2SA10085

Applicant:

**XM SATELITE RADIO INC.
7777 GLADES ROAD
BOCA RATON FL 33434**

Date Receipt: MARCH 3, 2004

Date Tested: MARCH 4, 2004

APPLICANT: XM SATELITE RADIO INC.

FCC ID: RS2SA10085

REPORT #: X\XMRADIO\274UT4\274UT4TestReport.doc

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EXHIBITS INCLUDING:

CONFIDENTIALITY LETTER
BLOCK DIAGRAM
SCHEMATICS
INSTRUCTION MANUAL
LABEL SAMPLE
LABEL LOCATION
EXTERNAL PHOTOGRAPHS
INTERNAL PHOTOGRAPHS
OPERATIONAL DESCRIPTION
TEST SET UP PHOTOGRAPH

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EMC Equipment List

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/26/01	3/26/04
3-Meter OATS	TEI	N/A	N/A	Listed 1/13/03	1/13/06
Biconnical Antenna	Eaton	94455-1	1057	CAL 3/18/03	3/18/05
Biconnical Antenna	Eaton	94455-1	1096	CAL 10/1/01	10/1/03
Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/15/03	4/15/05
Blue Tower RF	HP	85685A	2926A00983	CAL 4/15/03	4/15/05
Preselector					
Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/15/03	4/15/05
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/9/01	10/9/03
LISN	Electro-Metrics	EM-7820	2682	CAL 3/12/03	3/12/05
Log-Periodic Antenna	Eaton	96005	1243	CAL 5/8/03	5/8/05

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TEST PROCEDURE

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: The test procedure used was ANSI STANDARD C63.4-1992 using a HEWLETT PACKARD spectrum analyzer with a preselector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The resolution bandwidth was 100KHz and the video bandwidth was 300 kHz. The ambient temperature of the UUT was 83° with a humidity of 36%.

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the spectrum analyzer meter reading.

Example:

Freq (MHz)	METER READING + ACF = FS
33	20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

ANSI STANDARD C63.4-1992 10.1.7 MEASUREMENT PROCEDURES: The unit under test was placed on a table 80 cm high and with dimensions of 1 m by 1.5 m. The table used for radiated measurements is capable of continuous rotation.

When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1 m to 4 m. The antenna was placed in both the horizontal and vertical planes.

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APPLICANT: XM SATELITE RADIO INC.

FCC ID: RS2SA10085

NAME OF TEST: RADIATION INTERFERENCE

RULES PART NO.: 15.239

REQUIREMENTS: CARRIER FREQUENCY WILL NOT EXCEEDS 48.0 dBuV/m AT 3M.
OUT-OF-BAND EMISSIONS SHALL NOT EXCEED:

30 - 88 MHz	40.0 dBuV/M MEASURED AT 3 METERS
88 - 216 MHz	43.5 dBuV/M
216 - 960 MHz	46.0 dBuV/M
ABOVE 960 MHz	54.0 dBuV/M

TEST DATA:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
88.5	88.50	26.7	V	0.80	10.77	38.27	9.73
88.5	88.50	36.0	H	0.80	9.96	46.76	1.24
88.5	177.00	10.4	V	0.92	15.00	26.32	17.18
88.5	177.00	12.0	H	0.92	13.98	26.90	16.60
107.5	107.50	25.9	V	0.80	11.10	37.80	10.20
107.5	107.50	29.3	H	0.80	10.15	40.25	7.75

SAMPLE CALCULATION: FSdBuV/m = MR (dBuV) + ACFdB.

TEST PROCEDURE: The procedure used was ANSI STANDARD C63.4-1992. The spectrum was scanned from 30 MHz to 1000 MHz. When an emission was found, the table was rotated to produce the maximum signal strength. The antenna was placed in both the horizontal and vertical planes and the worse case emissions were reported. The UUT was tested in 3 orthogonal planes.

TEST RESULTS: THE UNIT DOES MEET THE FCC REQUIREMENTS.

PERFORMED BY: JOE SCOGLIO

DATE: MARCH 4, 2004

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APPLICANT: XM SATELITE RADIO INC.

FCC ID: RS2SA10085

NAME OF TEST: Occupied Bandwidth

RULES PART NO.: 15.239

REQUIREMENTS: Emissions from the device shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88 - 108 MHz.

TEST DATA:

THE GRAPH ON THE FOLLOWING PAGE REPRESENTS THE EMISSIONS TAKEN FOR THIS DEVICE.

METHOD OF MEASUREMENT: The zero level was set without modulation. A small sample of the transmitter output was fed into the spectrum analyzer and the above photo was taken. The vertical scale is set to -10 dBm per division; the horizontal scale is set to 20 kHz per division.

TEST RESULTS: The unit DOES meet the FCC requirements.

PERFORMED BY: JOSEPH SCOGLIO **DATE:** MARCH 4, 2004

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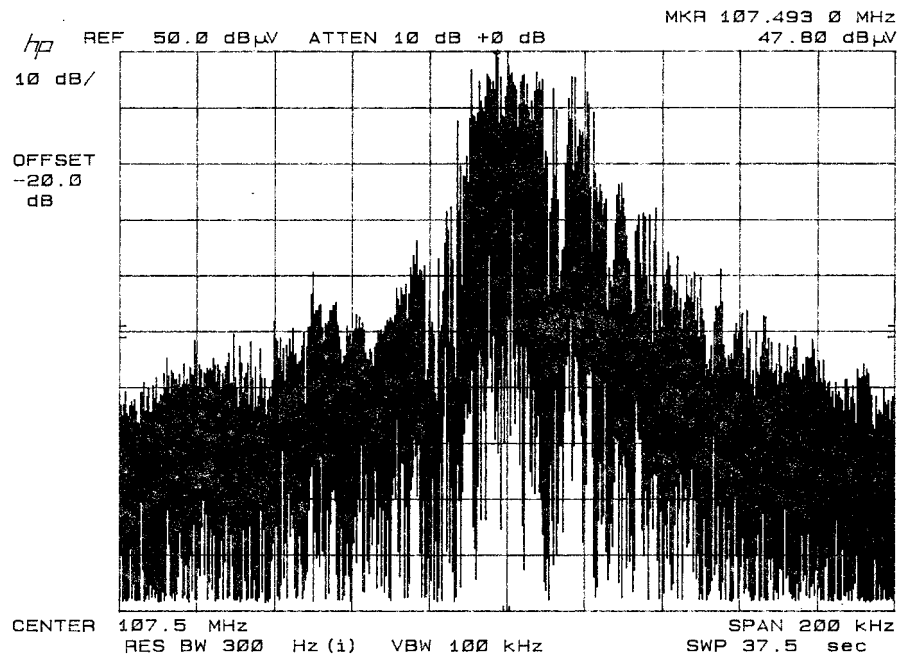
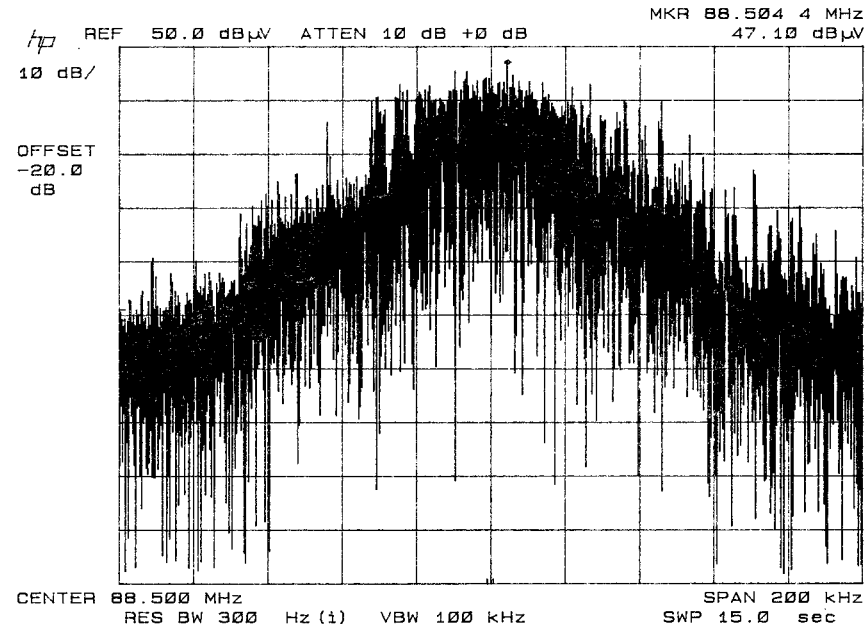
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OCCUPIED BANDWIDTH



APPLICANT: XM SATELITE RADIO INC.

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APPLICANT: XM SATELITE RADIO INC.

FCC ID: RS2SA10085

NAME OF TEST: POWER LINE CONDUCTED INTERFERENCE

RULES PART NO.: 15.107

REQUIREMENTS:	QUASI-PEAK	AVERAGE
.15 - 0.5 MHz	66-56 dBuV	56-46 dBuV
0.5 - 5.0	56	46
5.0 - 30.	60	50

TEST PROCEDURE: ANSI STANDARD C63.4-2001. The spectrum was scanned from .15 to 30 MHz.

TEST DATA:

THE GRAPHS ON THE FOLLOWING PAGE REPRESENT THE EMISSIONS TAKEN FOR POWER LINE CONDUCTED FOR THIS DEVICE.

TEST RESULTS: Both lines were observed. The measurements indicate that the unit DOES appear to meet the FCC requirements for this class of equipment.

PERFORMED BY: JOSEPH SCOGLIO **DATE:** MARCH 4, 2004

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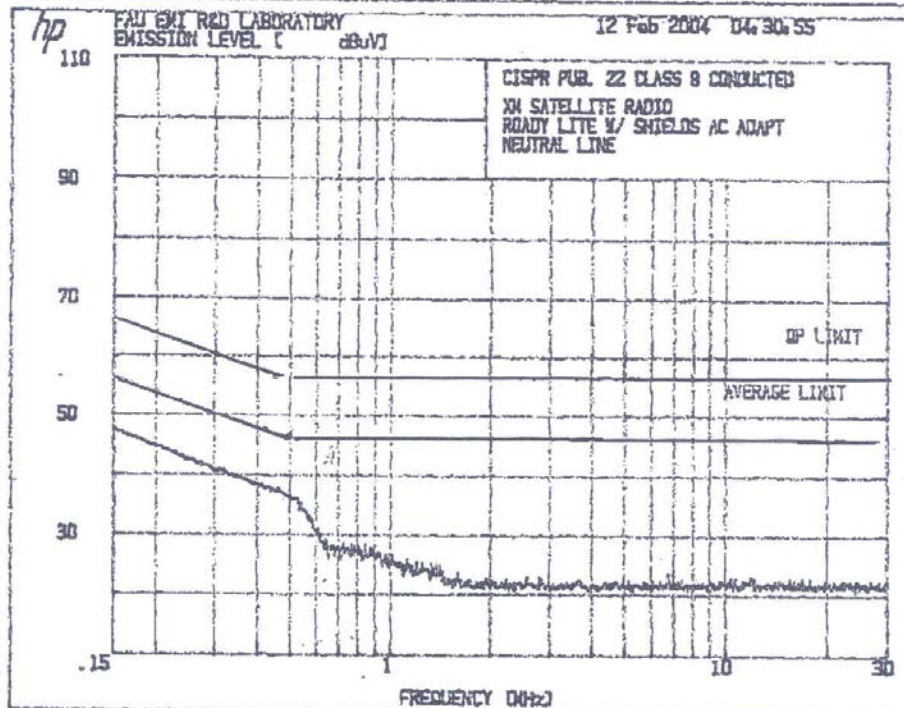
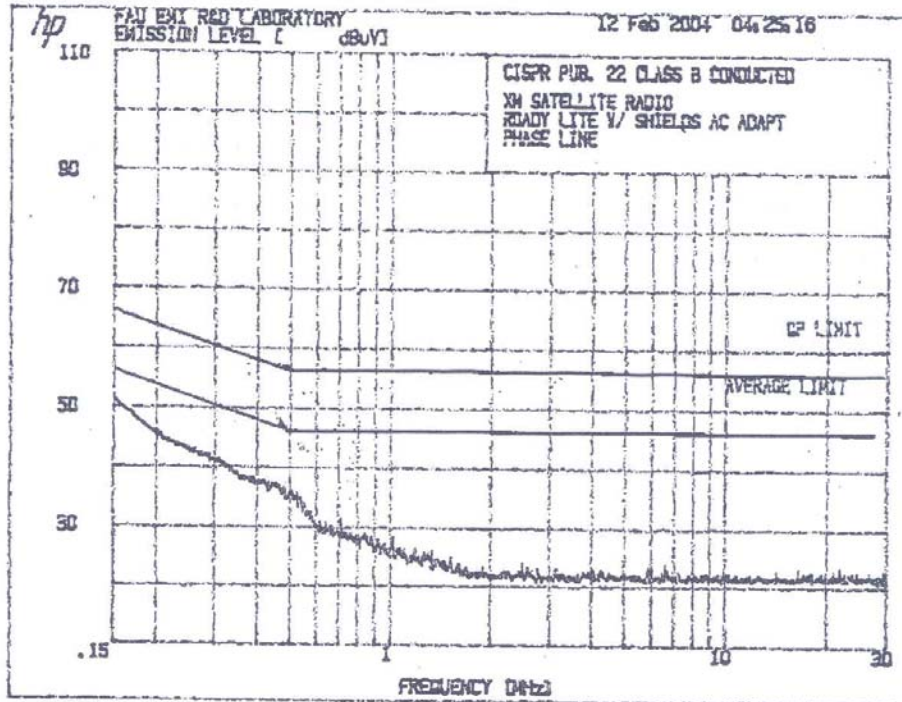
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POWER LINE CONDUCTED PLOTS



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