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FCC PART 90

TEST REPORT

APPLICANT	MIDLAND RADIO CORPORATION
	5900 PARRETTA DRIVE
	KANSAS CITY, MO 64120 USA
FCC ID	MMA911110B
MODEL NUMBER	91-1110B
PRODUCT DESCRIPTION	NON-BROADCAST TRANSMITTER
DATE SAMPLE RECEIVED	11/8/2007
DATE TESTED	11/15/2007
TESTED BY	Nam Nguyen
APPROVED BY	Mario de Aranzeta
TIMCO REPORT NO.	3543UT7TestReport.doc
TEST RESULTS	☒ PASS ☐ FAIL

ACCREDITED
Certificate # 0955-01

STATEMENT OF COMPLIANCE

This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report and demonstrate that the equipment complies with the appropriate standards.

I attest that the necessary measurements were made by me or under my supervision, at Timco Engineering, Inc. located at 849 N.W. State Road 45, Newberry, Florida 32669 USA.

Authorized by: Mario de Aranzeta

Signature: *Mario de Aranzeta*

Function: Engineer

Date: 11/16/07

GENERAL INFORMATION

DUT Specification

The test results relate only to the items tested.	
DUT Description	NON-BROADCAST TRANSMITTER
FCC ID	MMA911110B
Model Numbers	91-1110B
Serial Number	N/A
Operating Frequency	146 – 174 MHz
Modulation	FM
DUT Power Source	☐ 110–120Vac/50– 60Hz
	☒ DC Power
	☐ Battery Operated Exclusively
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☐ Fixed
	☒ Mobile
	☐ Portable
Test Facility	Timco Engineering, Inc. 849 NW State Road 45, Newberry, FL 32669
Test Condition	The temperature was 26ºC with a relative humidity of 50%.
Modification to the DUT	None
Test Exercise (e.g software description, test signal, etc.	The DUT was placed in continuous transmit mode of operation.
Applicable Standards	ANSI/TIA 603-C ,FCC CFR 47 Part 90

EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/20/07	3/19/10
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 5/11/07	5/10/10
Biconnical Antenna	Eaton	94455-1	1057	CAL 12/12/05	12/12/07
Biconnical Antenna	Eaton	94455-1	1096	CAL 8/17/06	8/17/08
Tan Tower Quasi-Peak Adapter	HP	85650A	3303AO1690	CAL 12/8/05	12/8/07
Tan Tower RF Preselector	HP	85685A	32211A01400	CAL 12/7/05	12/7/07
Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 12/7/05	12/7/07
LISN	Electro-Metrics	ANS-25/2	2604	CAL 8/27/06	8/27/08
Log-Periodic Antenna	Eaton	96005	1243	CAL 12/14/05	12/14/07

TEST PROCEDURES

Power Line Conducted Interference: The procedure used was ANSI/TIA 603-C:2004 using a 50uH LISN. Both lines were observed with the DUT transmitting. The bandwidth of the spectrum analyzer was 10 kHz with an appropriate sweep speed.

Bandwidth 20 dB: The measurements were made with the spectrum analyzer's resolution bandwidth (RBW) = 1 MHz and the video bandwidth (VBW) = 3 MHz and the span set as shown on plot.

Power Output: The RF power output was measured at the antenna feed point using a peak power meter.

Antenna Conducted Emissions: The RBW = 100 kHz, VBW = 300 kHz and the span set to 10.0 MHz and the spectrum was scanned from 30 MHz to the 10th harmonic of the fundamental. Above 1 GHz the resolution bandwidth was 1 MHz and the VBW = 3 MHz and the span to 50 MHz.

Radiation Interference: The test procedure used was ANSI/TIA 603-C:2004 using an Agilent spectrum receiver with preselector. The bandwidth (RBW) of the spectrum receiver was 100 kHz up to 1 GHz and 1 MHz above 1 GHz with an appropriate sweep speed. The VBW above 1 GHz was 3 MHz. The analyzer was calibrated in dB above a microvolt at the output of the antenna.

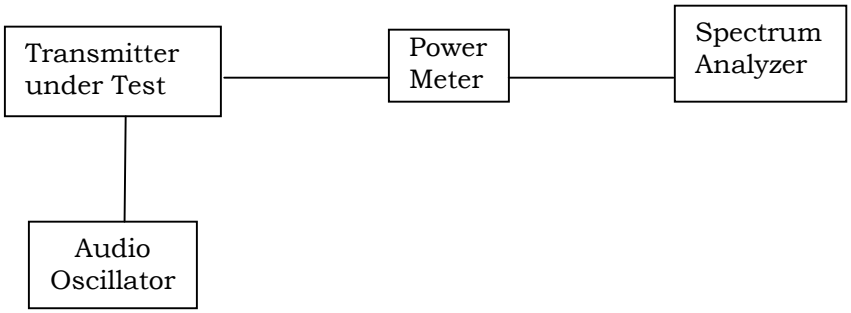
RF POWER OUTPUT

Rule Part No.: Part 2.1046(a), Part 90

Test Requirements:

Method of Measurement: RF power is measured by connecting a 50 ohm, resistive wattmeter to the RF output connector. Using a nominal battery voltage, and a properly adjusted transmitter the RF output was measured.

Test Setup Diagram:



Test Data:

OUTPUT POWER: HIGH – 110 Watts
LOW - 5 Watts

SPURIOUS EMISSIONS AT ANTENNA TERMINALS (CONDUCTED)

Rule Part No.: Part 2.1051(a)

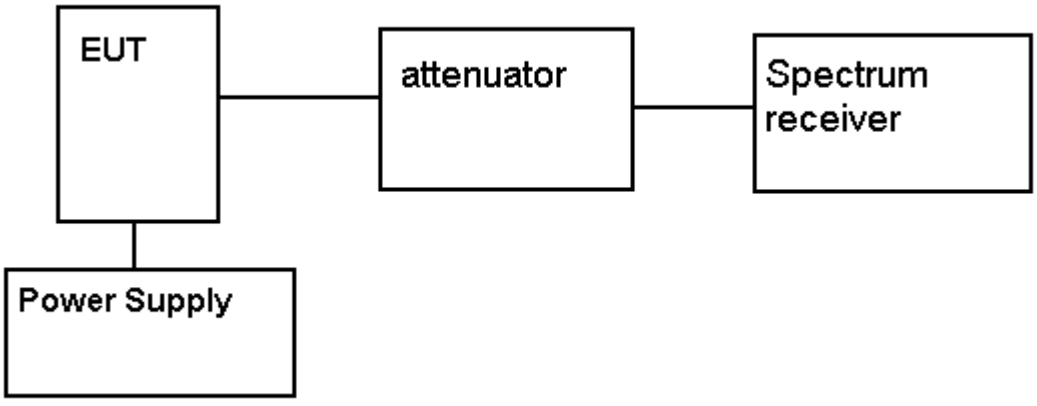
Requirements: For 25 kHz 43 + 10log(5) = 50.0 dB

Method of Measurement: The carrier was modulated 100% using a 2500 Hz tone. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental. The measurements were made in accordance with standard ANSI/TIA-603-C:2004.

Test Data:

EF	dB below carrier		EF	dB below carrier		EF	dB below carrier
146.03	0		161.50	0		173.98	0
292.05	75.7		323.00	90.1		347.95	97.7
438.08	107.1		484.50	100.9		521.93	102.2
584.10	107.8		646.00	107.3		695.90	107.1
730.13	109.3		807.50	109.2		869.88	107.6
876.15	108.7		969.00	109.2		1043.85	NE
1022.18	NE		1130.50	NE		1217.83	NE
1168.20	99.3		1292.00	NE		1391.80	NE
1314.23	NE		1453.50	NE		1565.78	NE
1460.25	NE		1615.00	NE		1739.75	NE

Method of Measuring Conducted Spurious Emissions



FIELD STRENGTH OF SPURIOUS EMISSIONS

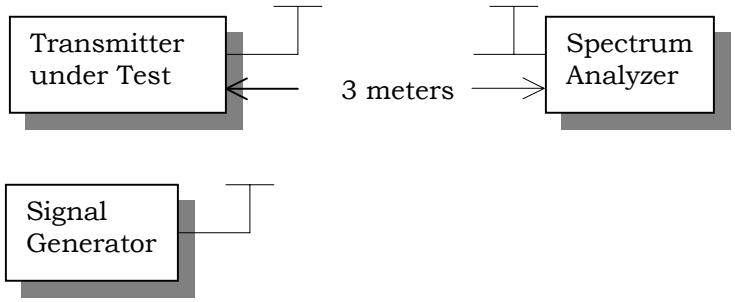
Rule Parts. No.: Part 2.1053

Requirements:

For 25 kHz 43 + 10log(5) = 50.0 dB

METHOD OF MEASUREMENT: The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 MHz to at least the tenth harmonic of the fundamental. This test was conducted per ANSI/TIA 603-C:2004 using the substitution method. Measurements were made at the test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

Test Setup Diagram:



Test Data:

TUNED FREQUENCY MHz	EMISSION FREQUENCY MHz	dBc		TUNED FREQUENCY MHz	EMISSION FREQUENCY MHz	dBc
146.03	146.03	0		161.5	161.5	0
	292.05	99.76			323.00	98.34
	584.10	87.74			646.00	92.78
	730.13	99.02			807.50	95.54
	876.15	99.23			969.00	90.06
	1022.18	96.05			1130.50	92.68
	1168.20	96.5			1292.00	94.78
	1314.23	93.24			1453.50	84.37
	1460.25	86.19			1615.00	89.20

TUNED FREQUENCY MHz	EMISSION FREQUENCY MHz	dBc
173.98	173.98	0
	347.95	97.54
	521.93	98.65
	695.90	100.46
	869.88	96.38
	1043.85	95.27
	1217.83	92.41
	1391.80	88.75
	1565.78	87.81
	1739.75	87.25