

# THRU Lab & Engineering.

477-6, Hager-Ri, Yoju-Up, Yoju-Gun  
Kyunggi-Do, 469-803, Korea  
T820318835092F820318835169 email [thrukang@kornet.net](mailto:thrukang@kornet.net)

# THRU

## Test Report

Product Name: GMRS/FRS Combination

MODEL NO:GXT781

FCC ID:MMAGXT775

### Applicant:

Midland Radio Corporation.  
5900 Parretta Drive, Kansas City,  
MO64120

Date Receipt:05/19/2008

Date Tested: 05/22/2008

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FCC ID :MMAGXT775

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## GENERAL INFORMATION REQUIRED FOR CERTIFICATION

2.1033 (c) (1) (2) MidLand Radio Corporation. will manufacture  
the FCCID: MMAGXT775 GMRS/FRS COMBINATION TRANSCEIVER  
in quantity, for use under FCC RULES PART 95A&B.  
MidLand Radio Corporation.  
5900 Parretta Drive, Kansas City, MO64120

2.1033 (c) TECHNICAL DESCRIPTION

2.1033 (c) (3) Instruction book. A draft copy of the instruction  
manual is included as EXHIBIT 7.

2.1033 (c) (4) Type of Emission : 10K2F3E  
95.631  
Bn = 2M + 2DK  
M = 3000  
D = 2.147k  
Bn = 2(3000) + 2(2147) = 10.2k

2.1033 (c) (5) GMRS Frequency Range: GMRS Authorized Bandwidth:20.0kHz  
95.621  
1. 462.5500 13. 462.7000  
2. 462.5625 14. 462.7125  
3. 462.5750 15. 462.7250  
4. 462.5875 16. 467.5500  
5. 462.6000 17. 467.5750  
6. 462.6125 18. 467.6000  
7. 462.6250 19. 467.6250  
8. 462.6375 20. 467.6500  
9. 462.6500 21. 467.6750  
10. 462.6625 22. 467.7000  
11. 462.6750 23. 467.7250  
12. 462.6875

2.1033(c)(5) FRS Frequency Range: FRS Authorized Bandwidth:12.5kHz  
95.627  
1. 462.5625 8. 467.5625  
2. 462.5875 9. 467.5875  
3. 462.6125 10. 467.6125  
4. 462.6375 11. 467.6375  
5. 462.6625 12. 467.6625  
6. 462.6875 13. 467.6875  
7. 462.7125 14. 467.7125 MHz

2.10311c)(6)(7) RF power is measured by the substitution method as

2.1046(a) outlined in TIA/EIA - 603. With a nominal battery  
voltage of 6 V, and the transmitter properly  
adjusted the RF output measures:  
power supply : Alkaline batteries (1.5VDC) x 4

GMRS (HIGH) - 1.225 Watts  
GMRS (LOW) - 0.083 Watts  
FRS - 0.089 Watts

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2.1033(c)(6)(7) FRS Power Output shall not exceed 0.50 Watts effective

95.639 radiated power. There can be no provisions for

95.649 Increasing the power or varying the power.

2.1033(c)(8) DC Voltages and Current into Final Amplifier:  
FINAL AMPLIFIER ONLY

FOR GMRS HIGH POWER SETTING INPUT POWER: (6V)(1.25A)=7.50 Watts

FOR GMRS LOW POWER SETTING INPUT POWER: (6V)(0.54A)=3.24 Watts

FOR FRS POWER SETTING INPUT POWER: (6V)(0.51A)=3.06 Watts

2.1033(c)(9) Tune-up procedure. The tune-up procedure is included as EXHIBIT # 9.

2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 6 of this report. The block diagrams are included as EXHIBIT 5 of this report.

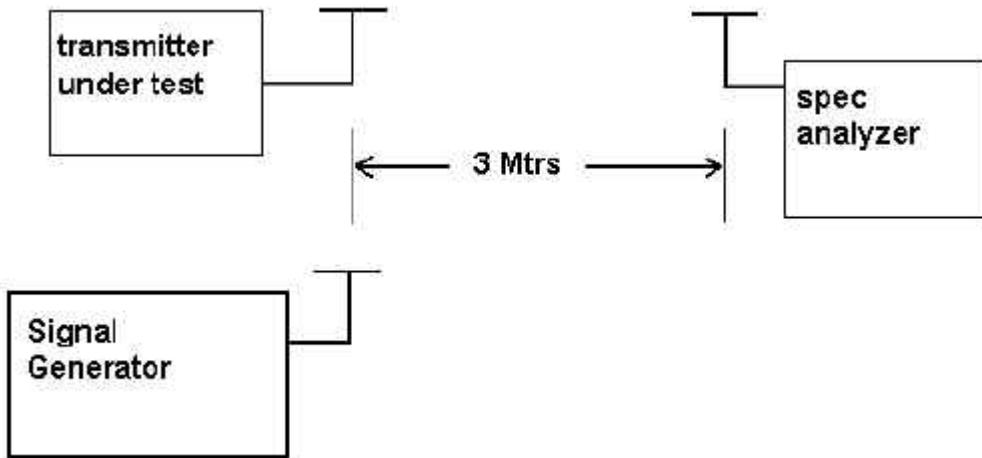
2.1033(c)(11) A photograph or a drawing of the equipment identification label is included as exhibit No. 1.

2.1033(c)(12) Photographs(8"X10") of the equipment of sufficient clarity to reveal equipment construction and layout, including meters, labels for controls, including any view under shields. See exhibits 3-4.

2.1033(c)(13) Digital modulation is not allowed.

2.1033(c)(14) The data required by 2.1046 through 2.1057 is submitted below.

2.1046(a) RF power output. The test procedure used was TIA/EIA-603.



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2.1053  
95.635 (b) (7)

## UNWANTED RADIATION

The tabulated Data shows the results of the radiated Field strength emissions test. The spectrum was Scanned from 30 MHz to at least the 10<sup>th</sup> harmonic of The fundamental.

**REQUIREMENTS: GMRS (HIGH) :  $43 + 10\log(1.2246) = 43.88\text{dB}$**   
**(LOW) :  $43 + 10\log(0.0828) = 32.18\text{dB}$**

GMRS-High				GMRS-Low			
frequency	dBc	Margin	dBm	frequency	dBc	Margin	dBm
462.7250				462.7250			
925.4500	63.76	19.88	-32.88	925.4500	57.06	24.88	-37.88
1388.1750	63.73	19.85	-32.85	1388.1750	55.23	23.05	-36.05
1850.9000	60.51	16.63	-29.63	1850.9000	52.61	20.43	-33.43
2313.6250	64.99	21.11	-34.11	2313.6250	55.59	23.41	-36.41
2776.3500	62.13	18.25	-31.25	2776.3500	47.33	15.15	-28.15
3239.0750	61.21	17.33	-30.33	3239.0750	48.81	16.63	-29.63
3701.8000	52.63	8.75	-21.75	3701.8000	51.13	18.95	-31.95
4164.5250	62.43	18.55	-31.55	4164.5250	49.13	16.95	-29.95
4627.2500	58.14	14.26	-27.26	4627.2500	50.84	18.66	-31.66

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 TIA/EIA STANDARD 603 using the substitution method. Measurements were made at the open field test site of ThruLab & ENGINEERING. located at 477-6, Hager-Ri, Yoju-Up, Yoju-Gun, Kyunggi-Do, 469-803, Korea

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2.1053  
95.635 (b) (7)

## UNWANTED RADIATION:

The tabulated Data shows the results of the radiated Field strength emissions test. The spectrum was Scanned from 30 MHz to at least the 10<sup>th</sup> harmonic of The fundamental.

**REQUIREMENTS: FRS: 43 + 10log(0.0885) = 32.47dB**

FRS			
frequency	dBc	Margin	dBm
467.5625			
935.1250	56.12	23.65	-36.65
1402.6875	55.22	22.75	-35.75
1870.2500	52.37	19.90	-32.90
2337.8125	53.67	21.20	-34.20
2805.3750	51.52	19.05	-32.05
3272.9375	50.92	18.45	-31.45
3740.5000	49.67	17.20	-30.20
4208.0625	51.52	19.05	-32.05
4675.6250	45.93	13.46	-26.46

**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 TIA/EIA STANDARD 603 using the substitution method. Measurements were made at the open field test site of ThruLab & ENGINEERING. located at 477-6, Hager-Ri, Yoju-Up, Yoju-Gun, Kyunggi-Do, 469-803, Korea

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## TEST EQUIPMENT LIST

No	Description	Manufacturer	Model No.	Serial No.	Due Cal.	Used
1	Test Receiver	Rohde & Schwarz	ESHS 10	862970/018	2009.05.13	<input type="checkbox"/>
2	Test Receiver	Rohde & Schwarz	ESVS 10	826008/014	2008.06.12	<input type="checkbox"/>
3	Spectrum Analyzer	Hewlett Packard	8566B	2311A02394	2008.06.13	<input checked="" type="checkbox"/>
4	Spectrum Display	Hewlett Packard	85662A	2542A12429	2008.06.13	<input checked="" type="checkbox"/>
5	Quasi-peak Adapter	Hewlett Packard	85650A	2521A00887	2008.06.13	<input type="checkbox"/>
6	RF Preselector	Hewlett Packard	85685A	2648A00504	2008.06.13	<input type="checkbox"/>
7	Preamplifier	Hewlett Packard	8447F	2805A02570	2009.05.28	<input type="checkbox"/>
8	Preamplifier	A.H. Systems	PAM-0118	164	2009.04.28	<input type="checkbox"/>
9	Biconical Antenna	Eaton Corp.	94455-1	0977	2008.07.01	<input type="checkbox"/>
10	Biconical Antenna	EMCO	3104C	9111-2468	2008.06.07	<input type="checkbox"/>
11	Log Periodic	EMCO	3146	2051	2010.05.11	<input checked="" type="checkbox"/>
12	Horn Antenna	A.H. Systems	SAS-571	414	2009.03.17	<input checked="" type="checkbox"/>
13	Loop Antenna	Rohde & Schwarz	HFH2-	826532/006	2009.01.31	<input type="checkbox"/>
14	Dipole Antenna	Rohde & Schwarz	VHAP	574	2008.12.12	<input type="checkbox"/>
15	Dipole Antenna	Rohde & Schwarz	VHAP	575	2008.12.12	<input type="checkbox"/>
16	Dipole Antenna	Rohde & Schwarz	UHAP	546	2008.12.12	<input type="checkbox"/>
17	Dipole Antenna	Rohde & Schwarz	UHAP	547	2008.12.12	<input type="checkbox"/>
18	Signal Generator	Hewlett Packard	8673D	2708A00448	2008.06.12	<input type="checkbox"/>
19	Spectrum Analyzer	Advantest Corp.	R3261C	61720208	2008.06.12	<input type="checkbox"/>
20	LISN	EMCO	3825/2	9111-1912	2008.12.12	<input type="checkbox"/>
21	LISN	Kyoritsu	KNW-242	8-923-2	2009.05.23	<input type="checkbox"/>
22	Modulation Analyzer	Hewlett Packard	8901B	3438A05094	2009.05.25	<input type="checkbox"/>
23	Waveform	Hewlett Packard	33120A	US34001190	2009.05.21	<input type="checkbox"/>
24	Audio analyzer	Hewlett Packard	8903B	3011A12915	2009.05.21	<input type="checkbox"/>
25	Digital Oscilloscope	Tektronix	TDS 340A	B012287	2008.06.13	<input type="checkbox"/>

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