



Flom Test Labs
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Environmental Assessment

for

Mobiles/Fixed Base Station

for

FCC ID: FRWRT-5000A

Model: VHF FM Transceiver Section

to

Federal Communications Commission

47 CFR 1.1310 (MPE)

Radiofrequency Radiation Exposure Limits

Date Of Report: May 21, 2006

On the Behalf of the Applicant:

Wulfsberg Electronics Division

At the Request of:

Wulfsberg Electronics Division
6400 Wilkinson Drive
Prescott, AZ 86301-6164

Attention of:

Main: (928) 708-1550; Fax: (928) 541-7627
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Report Prepared By:


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FCC ID: FRWRT-5000A
MFAp0640009, d0650020A

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Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a) **Test Report (Supplemental)**

b) Laboratory: M. Flom Associates, Inc.
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d0650020A

d) Client: Wulfsberg Electronics Division
6400 Wilkinson Drive
Prescott, AZ 86301-6164

e) Identification: XTS-5000A VHF
Part of FCC ID: FRWRT-5000A
Description: Mobile FM Transceiver

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: May 21, 2006
EUT Received: April 8, 2006

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with MFA internal quality manual.

m) Supervised by:



David E. Lee, FCC/IC Compliance Manager

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

Identification of the Equipment Under Test (EUT)**Name and Address of Applicant:**

Wulfsberg Electronics Division
6400 Wilkinson Drive
Prescott, AZ 86301-6164

Manufacturer:

Wulfsberg Electronics Division
6400 Wilkinson Drive
Prescott, AZ 86301-6164

FCC ID: FRWRT-5000A (Part of)

Model Number: XTS-5000A VHF Radio

Description: Mobile FM Transceiver

Type of Emission: FM, Digital

Frequency Range, MHz: 136.000 to 174.000

Power Rating, Watts:
☒ Switchable ☐ Variable 1 / 10 ☐ N/A

Modulation:
☐ AMPS
☐ TDMA
☐ CDMA
☒ OTHER

Antenna:
☐ Helical
☐ Monopole
☒ Whip
☒ Other

Note: For RF Safety test antenna gain taken at the upper range of expected gain (i.e. 0 dBd) and RF Power set to highest nominal power across all channels.

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2003, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst-case measurements.



A2LA

"A2LA has accredited M. Flom Associates, Inc. Chandler, AZ for technical competence in the field of Electrical Testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 – 1999 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Certificate Number: 2152-01

Name of Test:	Environmental Assessment
Specification:	FCC: 47 CFR 1.1310
Measurement Guide:	ANSI/IEEE C95.1 1992
Test Equipment:	Maximum Permissible Exposure (MPE) measurement system, consisting of: Amplifier Systems FP6001 Electric Field probe kit Probe Monitor Software running on PC
Measurement Procedure:	<ol style="list-style-type: none">1. The following measurements were performed with a probe using ANSI/IEEE C95.1 as a guide.2. Prior to making any measurements, the measurements system was calibrated in accordance with the manufacturer's procedures.3. The EUT's radiating element (antenna) was placed on a 1 m tall table for ease of testing. For equipment normally operated on a metal surface, a ground plane was used.4. The remaining equipment necessary to operate the EUT was maintained at a distance from the measurement arrangement suitable to minimize interference with the measurements.5. The minimum safe distance was calculated from the formula Power Density = $EIRP / 4\pi R^2$ (Peak Watts/m²). The calculation is shown with the measurement data.6. With the EUT operating at maximum power, a search was initiated for worst case emissions with the probe raised and lowered over a range of 0.2 to 2 meters in height and over a horizontal plane of 0° to 360°.7. Average values were calculated for the whole body (0.2-2.0m), lower body (0.2-0.8m) and upper body (1.0-2.0m).
Results:	Attached.

Test Setup:

Maximum Permissible Exposure (MPE)



Name of Test: R.F. Radiation Exposure

FCC Rules: 1.1307, 1.1310, 1.1311, 2.1091

Description, EUT: See page 2 of Test Report

Limits: Controlled Exposure 47 CFR 1.1310 Table 1, (A)	0.3-3.0 MHz:	Limit [mW/cm ²] = 100
	3.0-30 MHz:	Limit [mW/cm ²] = (900/f ²)
	30-300 MHz:	Limit [mW/cm ²] = 1.0
	300-1500 MHz:	Limit [mW/cm ²] = f/300
	1500-100,000 MHz:	Limit [mW/cm ²] = 5.0

Test Frequencies, MHz	137.025	155.025	173.975
Power, Conducted, W	= 10.0		
Antenna Gain	= 0 dBd (3dBi)		
Antenna Model	Comant AT-5000		

Pre-test Calculations

$$\text{Power}_{[W \text{ EIRP}]} = P_{[\text{conducted}]} \times G_{[\text{antenna}]} = 10 \times 2 (\times 50\%) = 10$$

$$\text{Limit}_{[mW/cm^2]} = 1.0$$

$$\text{Limit}_{[W/m^2]} = 10 \times \text{Limit}_{[mW/cm^2]} = 10.0$$

$$R_{[m]} = [P_{[W \text{ EIRP}]} / (4\pi \times \text{Limit}_{[W/m^2]})]^{1/2} = 0.631$$

Results at tested distances	Probe Height, m	Power Density, mW/cm ²		
		Freq. 137.025MHz Distance 65cm	Freq. 155.025MHz Distance 65cm	Freq. 173.975MHz Distance 65cm
	2.0	0.350	0.300	0.270
	1.8	0.463	0.450	0.430
	1.6	0.680	0.633	0.610
	1.4	0.777	0.750	0.730
	1.2	0.923	0.880	0.850
	1.0	0.890	0.810	0.795
	0.8	0.744	0.710	0.690
	0.6	0.590	0.555	0.499
	0.4	0.380	0.324	0.301
	0.2	0.195	0.180	0.160

Power Density Calculations: The measured power density readings were summed and the results divided by the number of readings to calculate the average.

	MHz	MHz	MHz
Whole body average (0.2 - 0.8 m, mW/cm ²) =	0.599	0.559	0.533
Lower body average (0.2 - 0.8 m, mW/cm ²) =	0.477	0.442	0.413
Upper body average (1.0 - 2.0 m, mW/cm ²) =	0.681	0.637	0.614

(The following will be placed in the Instruction Manual)

Mandatory Safety Instructions to Installers & Users

Use only manufacturer or dealer supplied antenna.

As the unit is a composite device using a multi-band antenna the safety distances are stated in the Main RT-5000A documentation.

**Testimonial
and
Statement of Certification**

This is to certify that:

1. **That** the application was prepared either by, or under the direct supervision of, the undersigned.
2. **That** the technical data supplied with the application was taken under my direction and supervision.
3. **That** the data was obtained on representative units, randomly selected.
4. **That**, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.



Certifying Engineer:

David E. Lee, FCC/IC Compliance Manager