M. Flom Associates, Inc.
International Compliance Testing Laboratory
3356 N. San Marcos Place, Suite 107
Chandler, AZ 85225
toll-free: (866) 311-3268
fax: (480) 926-3598
http://www.mflom.com
info@mflom.com

Environmental Assessment

for

Mobiles/Fixed Base Station

for

FCC ID: FRW2000-VHFA
Model: VHF FM Transceiver

to

Federal Communications Commission

47 CFR 1.1310 (MPE)
Radiofrequency Radiation Exposure Limits

Date Of Report: August 21, 2005

On the Behalf of the Applicant:

Wulfsberg Electronics Division

At the Request of:

P.O. 19404

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

Attention of:

Main: (928) 708-1550; Fax: (928) 541-7627
Mary Beaumont, Principal RF Engineer
Direct (928) 708-1543
Email: mary.beaumont@wulfsberg.com

Supervised By:

David E. Lee, Quality Assurance Manager

Table of Contents

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

a)	**Test Report (Supplemental)**
b) Laboratory: (FCC: 31040/SIT) (Canada: IC 2044)	M. Flom Associates, Inc. 3356 N. San Marcos Place, Suite 107 Chandler, AZ 85225
c) Report Number:	d0580040
d) Client:	Wulfsberg Electronics Division 6400 Wilkinson Drive Prescott, AZ 86301-6164
e) Identification: Description:	FCC ID: FRW2000-VHFA P-2000VHFA Radio Mobile FM Transceiver
f) EUT Condition:	Not required unless specified in individual tests.
g) Report Date: EUT Received:	August 21, 2005 June 6th, 2005
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, Quality Assurance 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:	FRW2000-VHFA
Model Number:	P-2000VHFA VHF Radio
Description:	Mobile FM Transceiver
Type of Emission:	FM, Digital
Frequency Range, MHz:	137.000 to 174.000
Power Rating, Watts:	1 to 10

__X__ Switchable ____ Variable ____ N/A

Modulation:

____ AMPS
____ TDMA
____ CDMA
__X__ OTHER

Antenna:

____ Helical
____ Monopole
__X__ Whip
__X__ 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.

THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

ACCREDITED LABORATORY

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.

Presented this 16th day of June 2004.

President
For the Accreditation Council
Certificate Number 2152-01
Valid to August 31, 2006

For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

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**

UNITED STATES DEPARTMENT OF COMMERCE
National Institute of Standards and Technology
Gaithersburg, Maryland 20899-

September 15, 1999

Mr. Morton Flom
M. Flom Associates Inc.
3356 N. San Marcos Place, Suite 107
Chandler, AZ 85224

Dear Mr. Flom:

I am pleased to inform you that your laboratory has been validated by the Chinese Taipei Bureau of Standards, Metrology, and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Arrangement (APEC MRA). Your laboratory is now formally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office (TECRO) in the United States, covering equipment subject to Electro-Magnetic Compatibility (EMC) requirements. The names of all validated and nominated laboratories will be posted on the NIST website at http://ts.nist.gov/acs under the "Asia" category.

As of August 1, 1999, you may submit test data to BSMI to verify that the equipment to be imported into Chinese Taipei satisfies the applicable EMC requirements. **Your assigned BSMI number is SL2-IN-E-041R; you must use this number when sending test reports to BSMI.** Your designation will remain in force as long as your NVLAP and/or A2LA and/or BSMI accreditation remains valid for the CNS 13438.

Please note that BSMI requires that the entity making application for the approval of regulated equipment must make such application in person at their Taipei office. BSMI also requires the names of the authorized signatories who are authorized to sign the test reports. You can send this information via fax to C-Taipei CAB Response Manager at 301-975-5414. **I am also enclosing a copy of the cover sheet that, according to BSMI requirements, must accompany every test report.**

NIST

If you have any questions, please contact Robert Gladhill at 301-975-4273 or Joe Dhillon at 301-975-5521. We appreciate your continued interest in our international conformity assessment activities.

Sincerely,

Belinda L. Collins, Ph.D.
Director, Office of Standards Services

Enclosure

NIST

I am pleased to inform you that your laboratory has been validated by the Chinese Taipei Bureau of Standards, Metrology and Inspection (BSMI) under the Asia Pacific Economic Cooperation Mutual Recognition Agreement (APEC MRA). Your laboratory is now formally designated to act as a Conformity Assessment Body (CAB) under Appendix B, Phase I Procedures, of the APEC MRA between the American Institute in Taiwan (AIT) and the Taipei Economic and Cultural Representative Office (TECRO) in the United States, covering equipment subject to Electro-Magnetic Compatibility (EMC) requirements. The names of all validated and nominated laboratories will be posted on the NIST website at http://ts.nist.gov/mra under the 'Asia' category."

BSMI Number: **SL2-IN-E-041R**

Standard Test Conditions
and
Engineering Practices

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

In accordance with ANSI C63.4-1992/2000, section 6.1.9, 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.

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
FM4000 Software running on Laptop

Measurement Procedure:

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/m^2). 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^o to 360^o.

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: ¼ Wave Whip

Pre-test Calculations

$Power_{[W\ EIRP]} = P_{[conducted]} \times G_{[antenna]}$ = 10 x 2 (x50%) = 10
$Limit_{[mW/cm2]}$ = 1.0
$Limit_{[W/m2]} = 10 \times Limit_{[mW/cm2]}$ = 10.0
$R_{[m]} = [P_{[W\ EIRP]} / (4\pi \times Limit_{[W/m2]})]^{1/2}$ = 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.

Antenna Minimum Safe Distance: 65cm**.**

Antenna Gain: zero dBd referenced to a dipole.

The Federal Communications Commission has adopted a safety standard for human exposure to RF (Radio Frequency) energy which is below the OSHA (Occupational Safety and Health Act) limits.

Antenna Mounting: The antenna supplied by the manufacturer or radio dealer must not be mounted at a location such that during radio transmission, any person or persons can come closer than the above indicated minimum safe distance to the antenna i.e. **65cm**.

To comply with current FCC RF Exposure limits, the antenna must be installed at or exceeding the minimum safe distance shown above, and in accordance with the requirements of the antenna manufacturer or supplier.

Base Station Installation: The antenna should be fixed-mounted on an outdoor permanent structure. RF Exposure compliance must be addressed at the time of installation.

Antenna Substitution: Do not substitute any antenna for the one supplied or recommended by the manufacturer or radio dealer. You may be exposing person or persons to excess radio frequency radiation. You may contact your radio dealer or the manufacturer for further instructions.

Warning: Maintain a separation distance from the antenna to a person(s) of at least **65cm**.

You, as the qualified end-user of this radio device must control the exposure conditions of bystanders to ensure the minimum separation distance (above) is maintained between the antenna and nearby persons for satisfying RF Exposure compliance. The operation of this transmitter must satisfy the requirements of Occupational/Controlled Exposure Environment, for work-related use. Transmit only when person(s) are at least the minimum distance from the properly installed, externally mounted antenna.

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, Quality Assurance Manager

M. Flom Associates, Inc.
3356 North San Marcos Place, Suite 107
Chandler, Arizona 85225-7176
(480) 926-3100 phone, (480) 926-3598 fax