Flom Test Lab
EMI, EMC, RF Testing Experts Since 1963

toll-free: (866) 311-3268
fax: (480) 926-3598
www.flomlabs.com
info@flomlabs.com

Date: March 24, 2009

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

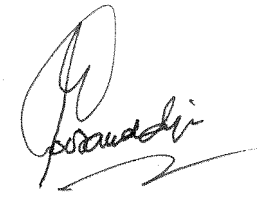
Applicant: Wireless On Water
Equipment: 434 MHz Transmitter
FCC ID: W9W-01
FCC Rules: 15.231

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,



Lab Director

Flom Test Lab
3356 N. San Marcos Place, Suite 107
Chandler, Arizona 85225-7176
(866) 311-3268 phone, (480) 926-3598 fax

List Of Exhibits

(FCC **Certification** (Transmitters) - Revised 9/28/98)

Applicant: Wireless On Water

FCC ID: W9W-01

By Applicant:

1. Letter Of Authorization

2. Identification Drawings
   - __ Id Label
   - __ Location Info
   - __ Attestation Statement(S)
   - __ Location of Compliance Statement

3. Documentation: 2.1033(B)
   - (3) User Manual(S)
   - (4) Operational Description
   - (5) Block Diagram
   - (5) Schematic Diagram
   - (7) External Photographs
   - Internal Photographs
   - Parts List
   - Active Devices

By F.T.L. Inc.

A. Testimonial & Statement of Certification

B. Statement of Qualifications

Flom Test Lab
EMI, EMC, RF Testing Experts Since 1963
toll-free: (866) 311-3268
fax: (480) 926-3598
www.flomlabs.com
info@flomlabs.com

Test Report

for

FCC ID: W9W-01

Model: 434 MHz Transmitter

to

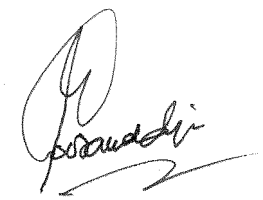
Federal Communications Commission

Rule Part(s)15.231

Date Of Report: March 24, 2009

On the Behalf of the Applicant: Wireless On Water
1090 Doris Road
Auburn Hills, MI 48326-2613

Attention of: Steve Fister
Ph: 520-360-0515
Fax: 248-340-9334
E-mail: sfister@ssconsultinginc.com



Supervised By: Lab Director

Flom Test Lab

Test Report Revision History

Revision	Date	Revised By	Reason for revision
1.0	March 24, 2009	M.Wyman	Original Document
2.0	May 5, 2009	J Erhard	Modify report adding details regarding radiated testing.

The applicant has been cautioned as to the following:

15.21 Information to User.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) Special Accessories.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

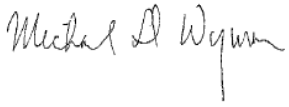
Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Flom Test Lab

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:

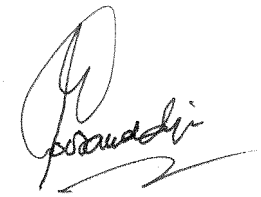
Flom Test Lab
3356 N. San Marcos Place, Suite 107
Chandler, Arizona 85225-7176
(866) 311-3268 phone, (480) 926-3598 fax

Flom Test Lab

Table Of Contents

Required information per ISO 17025-2005, paragraph 5.10.2:

a) **Test Report**

b) Laboratory: (FCC: 31040/SIT) (Canada: IC 2044A-1)	Flom Test Lab, Inc. 3356 N. San Marcos Place, Suite 107 Chandler, AZ 85225
c) Report Number:	d0930018
d) Client:	Wireless On Water
e) Identification:	434 MHz Transmitter; FCC ID: W9W-01
Description:	Transmitter
f) EUT Condition:	Not required unless specified in individual tests.
g) Report Date:	March 24, 2009
h, j, k):	As indicated in individual tests.
i) Sampling method:	No sampling procedure used.
l) Uncertainty:	In accordance with FTL internal quality manual.
m) Supervised by:	
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.

List Of General Information Required For Certification

In Accordance with FCC Rules and Regulations, Volume II, Part 2 and to 15.231

Sub-Part 2.1033
(c)(1):

Name and Address of Applicant: Wireless On Water

(c)(2): **FCC ID**: W9W-01

Model Number: 434 MHz Transmitter

(c)(3): **Instruction Manual(s)**: Please See Attached Exhibits

(c)(4): **Type of Emission**: FM

(c)(5): **FREQUENCY RANGE, MHz**: 433.940

(c)(6): **Power Rating, W**: Radiated power 800e-9 watts

____ Switchable ____ Variable _X_ N/A

(c)(7): **Maximum Power Rating, W**: 1.6e-6 watts

15.203: **Antenna Requirement**:

_X_ The antenna is permanently attached to the EUT
_____ The antenna uses a unique coupling
_____ The EUT must be professionally installed
_____ The antenna requirement does not apply

Subpart 2.1033 (continued)

(c)(8): **Circuit Diagram/Circuit Description**:
Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

Please See Attached Exhibits

(c)(9): **Label Information**:

Please See Attached Exhibits

(c)(10): **Photographs**:

Please See Attached Exhibits

(c)(11): **Digital Modulation Description**:

___ Attached Exhibits
_x_ N/A

(c)(12): **Test And Measurement Data**:

Follows

Sub-part 2.1033(b): **Test And Measurement Data**

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2 and the following individual Parts, 15.231.

Standard Test Conditions and Engineering Practices

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

In accordance with ANSI C63.4-2003 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.

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

A2LA

"A2LA has accredited Flom Test Labs, 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 17025:2005 'General Requirements for the Competence of Testing and Calibration Laboratories' and any additional program requirements in the identified field of testing."

Please refer to www.a2la.org for current scope of accreditation.

Certificate number: 2152.01

ACCREDITED
CERT NO: 2152-01

FCC OATS Reg. #933597

IC Reg. # 2044A-1

Test Results Summary

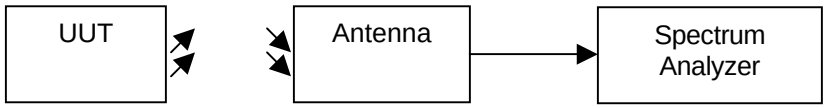
Specification	Test Name	Pass, Fail, N/A	Comments
15.231(b)(1)	Fundamental Field Strength	Pass	
15.231(b)(3)	Out of Band Spurious Emissions	Pass	
15.231(c)	Occupied Bandwidth	Pass	
RSS-210	99% Occupied Bandwidth	Pass	

Name of Test: Fundamental Field Strength
Specification: 15.231(b)(1) **Engineer: M.Wyman**
Test Equipment Utilized I00088, i00033 **Test Date: 3/24/09**

Test Procedure

The UUT was tested on an Open Area Test Site (OATS) at a distance of 3 meters from the receiving antenna, which was raised from 1 to 4 meters while the UUT was rotated 360°while in the X, Y, and Z-axis. A spectrum analyzer was used to verify that the UUT met the requirements for Fundamental Field Strength. The limit was calculated using the standard linearization formula; Limit = L1 + $[(F_o-F_1)(L2-L1)/(F2-F1)]$ where F_o is the frequency under test.

Test Setup



Fundamental Field Strength

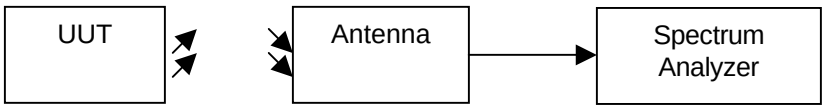
Tuned Freq (MHz)	Measured Level (dBuV/m)	Correction Factor (dB)	Corrected Level (dBuV/m)	Detector	Limit (dBuV/m)	Result
433.940	57.4	19.1	76.5	Peak	101.0	Pass
433.940	57.1	19.1	76.2	QP	81.0	Pass

Name of Test: Radiated Spurious Emissions
Specification: 15.231(b)(3), 15.209 **Engineer: M.Wyman**
Test Equipment Utilized I00088, i00271, i00033 **Test Date: 3/24/09**

Test Procedure

The UUT was tested on an Open Area Test Site (OATS) at a distance of 3 meters from the receiving antenna. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Emissions. The spectrum for each tuned frequency was examined to the 10th harmonic.

Test Setup



Radiated Emissions

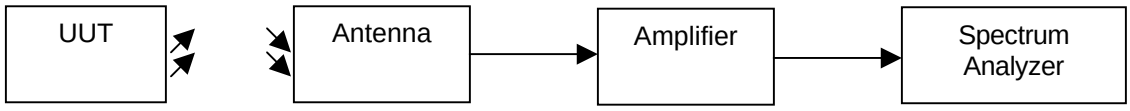
Emission Freq (MHz)	Measured Level (dBuV/m)	Correction Factor (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
1301.775	12.5	29.3	41.8	61.9	-20.1
1735.700	13.3	30.6	43.9	61.9	-18.0
2169.595	9.0	32.2	41.2	61.9	-20.7
2603.510	11.9	33.6	45.5	61.9	-16.4
3037.450	12.7	35.2	48.0	61.9	-14.0
3471.388	9.7	36.6	46.3	61.9	-15.7
3905.315	1.7	38.2	39.8	61.9	-22.1
4339.400	2.9	38.8	41.7	61.9	-20.2

Name of Test: Occupied Bandwidth
Specification: 15.231(c) **Engineer: M.Wyman**
Test Equipment Utilized I00033, i00088 **Test Date: 3/24/09**

Test Procedure

The UUT was tested on an Open Area Test Site (OATS) at a distance of 3 meter from the receiving antenna. The Span was set wide enough to capture the entire transmit spectrum and the resolution bandwidth was set to at least 1% of the span. The analyzer was set to max hold the 99% bandwidth was measured.

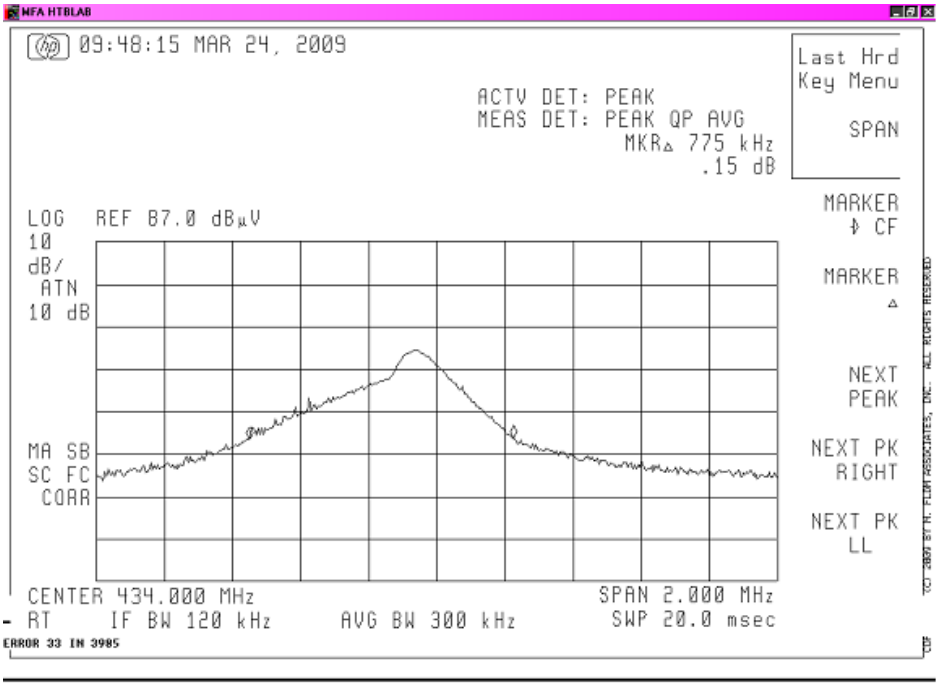
Test Setup



Occupied Bandwidth Summary

Frequency MHz	Recorded Measurement	Result
433.940	775KHz	Pass

Occupied Bandwidth Plot

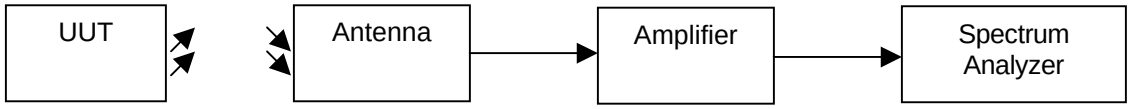


Name of Test: 99% Occupied Bandwidth
Specification: RSS 210 Industry Canada Only **Engineer: M.Wyman**
Test Equipment Utilized i00329 **Test Date: 03/24/09**

Test Procedure

The UUT was tested on an Open Area Test Site (OATS) at a distance of 3 meter from the receiving antenna. The Span was set wide enough to capture the entire transmit spectrum and the resolution bandwidth was set to at least 1% of the span. The analyzer was set to max hold the 99% bandwidth was measured.

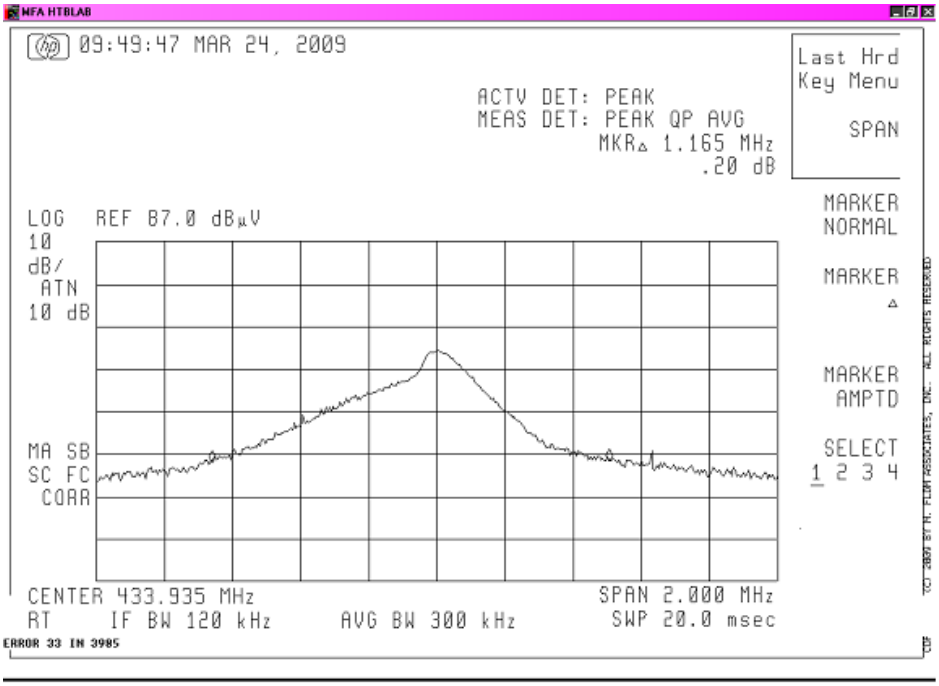
Test Setup



Occupied Bandwidth Summary

Frequency MHz	Recorded Measurement	Result
433.940MHz	1.165MHz	Pass

99% Occupied Bandwidth Plot



Test Equipment Utilized

Description	MFG	Model Number	FTL Asset Number	Last Cal Date	Cal Due Date
Power Supply	HP	6286A	i00005	NCR	NCR
Temperature Chamber	Tenney	Tenney Jr.	i00027	12/8/08	12/08/09
Monopole Antenna Set	Ailtech	DM-105A-T1, T2, T3	i00037, 39, 42, 48	Verified	Verified
Spectrum Analyzer	HP	8566B	i00049	8/22/08	8/22/09
Bi Con Antenna	EMCO	3109B	i00088	10/15/07	10/15/09
Log Periodic Antenna	Aprel	2001	i00089	10/22/07	10/22/09
Horn Antenna	Aprel	118T	I00271	10/15//07	10/07/09
Tunable Notch Filter	Eagle	TNF-1	i00124	NCR	NCR
Crystal Detector	HP	8472B	i00159	NCR	NCR
Power Meter	HP	E4418B	i00228	10/1/08	10/1/09
Signal Generator	R&S	SMT-03	i00266	NCR	NCR
Power sensor	HP	8482A	i00341	9/30/08	9/30/09
Digitizing Oscilloscope	HP	50402	i00318	Verified	Verified
Modulation Analyzer	HP	8901A	i00321	10/27/08	10/27/09
Audio Analyzer	HP	8903A	i00020	2/05/09	2//05/10
Spectrum Analyzer	Agilent	E4407B	i00331	11/3/08	11/3/09
Spectrum Analyzer	HP	8546A	I00033	10/14/08	10/14/09

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT