



M. Flom Associates, Inc.
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Date: November 16, 2005

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Raveon Technologies Corporation
Equipment: RF Data Modem
FCC ID: SRS-RV-M5-UC
FCC Rules: 22, 90, 90.210 and Confidentiality

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.

Filing fees are attached.

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,

David E. Lee, Quality Assurance Manager

enclosure(s)
cc: Applicant
DEL/del

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

FCC ID: SRS-RV-MS-UC
MFA p05a0010, d05b0029



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Transmitter Certification

of

FCC ID: SRS-RV-M5-UC

Model: RV-M5-UC

to

Federal Communications Commission

Rule Part(s) 22, 90, 90.210 and Confidentiality

Date of report: November 16, 2005

On the Behalf of the Applicant:

Raveon Technologies Corporation

At the Request of:

P.O. Deposit check #5265

Raveon Technologies Corporation
1750 Bella Laguna Court
Encinitas, CA 92024

Attention of:

John Sonnenberg
760-931-8001; fax: 760-931-8004
Email: js@raveontech.com

Supervised by:

David E. Lee, Quality Assurance Manager

The Applicant has been cautioned as to the following:

15.21 **Information to the 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.

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

- a) **Test Report**
- 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: d05b0029
- d) Client: Raveon Technologies Corporation
1750 Bella Laguna Court
Encinitas, CA 92024
- e) Identification: RV-M5-UC
FCC ID: SRS- RV-M5-UC
EUT Description: RF Data Modem
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: November 16, 2005
EUT Received: October-28, 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.

Sub-part

2.1033(c)(14):

Test and Measurement Data

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

- 21 - Domestic Public Fixed Radio Services
- 22 - Public Mobile Services
- 22 Subpart H - Cellular Radiotelephone Service
- 22.901(d) - Alternative technologies and auxiliary services
- 23 - International Fixed Public Radiocommunication services
- 24 - Personal Communications Services
- 74 Subpart H - Low Power Auxiliary Stations
- 80 - Stations in the Maritime Services
- 80 Subpart E - General Technical Standards
- 80 Subpart F - Equipment Authorization for Compulsory Ships
- 80 Subpart K - Private Coast Stations and Marine Utility Stations
- 80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
- 80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
- 80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
- 80 Subpart V - Emergency Position Indicating Radio Beacons (EPIRB'S)
- 80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
- 80 Subpart X - Voluntary Radio Installations
- 87 - Aviation Services
- 90 - Private Land Mobile Radio Services
- 94 - Private Operational-Fixed Microwave Service
- 95 Subpart A - General Mobile Radio Service (GMRS)
- 95 Subpart C - Radio Control (R/C) Radio Service
- 95 Subpart D - Citizens Band (CB) Radio Service
- 95 Subpart E - Family Radio Service
- 95 Subpart F - Interactive Video and Data Service (IVDS)
- 97 - Amateur Radio Service
- 101 - Fixed Microwave Services




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.

 <p style="text-align: center;">AZLA THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION</p> <p style="text-align: center;">ACCREDITED LABORATORY</p> <p>AZLA has accredited M. FLOM ASSOCIATES, INC. Chandler, AZ</p> <p>for technical competence in the field of Electrical Testing</p> <p><small>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.</small></p> <p><small>Presented this 14th day of June 2004</small></p> <div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: center;">  <small>President For the Accreditation Council Certificate Number: 2152-01 Valid to August 31, 2006</small> </div> </div> <p><small>For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.</small></p>	<h2 style="text-align: center; border-bottom: 1px solid black;">A2LA</h2> <p>“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.”</p> <hr/> <p style="text-align: center;">Certificate Number: 2152-01</p>
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List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to Parts 22, 90, 90.210 and Confidentiality

Sub-part 2.1033

(c)(1): **Name and Address of Applicant:**

Raveon Technologies Corporation
1750 Bella Laguna Court
Encinitas, CA 92024

Manufacturer:

Raveon Technologies Corporation
1750 Bella Laguna Court
Encinitas, CA 92024

(c)(2): **FCC ID:** SRS-RV-M5-UC

Model Number: RV-M5-UC

(c)(3): **Instruction Manual(s):**

Please see attached exhibits

(c)(4): **Type of Emission:** 11K0F1D

(c)(5): **Frequency Range, MHz:** 450 - 480

(c)(6): **Power Rating, Watts:** 2.0
 Switchable Variable N/A

FCC Grant Note: BF

(c)(7): **Maximum Power Rating, Watts:** 2.0

DUT Results: Passes X Fails

Information for Push-To-Talk Devices

Type and number of antenna to be used for this device:
End User Provided

Maximum antenna gain for antenna indicated above:
0dBd for Mobile use

Can this device sustain continuous operation with respect to its hardware capabilities and allowable operating functions?
No. 10% maximum Duty Cycle due to heat dissipation limitations

Other hardware or operating restrictions that could limit a person's RF Exposure:
None

Source-based time-averaging (see 2.1093 of rules) applicable to reduce the average output power:
No

If device has headset and belt-clip accessories that would allow body-worn operations, what is the minimum separation distance between the antenna and the user's body in this operating configuration?
N/A

Can device access wire-line services to make phone calls, either directly or through an operator?
No

Can specific operating instructions be given to users to eliminate any potential RF Exposure concerns for both front-of-the-face and body-worn operating configurations?
N/A

Other applicable information the applicant may provide that can serve as effective means for ensuring RF Exposure compliance:
60cm Antenna Distance for Mobile use.
RF Exposure Assessment for Base Station operation.
Information in Manual.

Subpart 2.1033 (continued)

(c)(8): Voltages & currents in all elements in final RF stage, including final transistor or solid-state device:

Collector Current, A	=	1.5
Collector Voltage, Vdc	=	7.2
Supply Voltage, Vdc	=	10.0

(c)(9): **Tune-Up Procedure:**

Please see attached exhibits

(c)(10): **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)(11): **Label Information:**

Please see attached exhibits

(c)(12): **Photographs:**

Please see attached exhibits

(c)(13): **Digital Modulation Description:**

Attached Exhibits
 N/A

(c)(14): **Test and Measurement Data:**

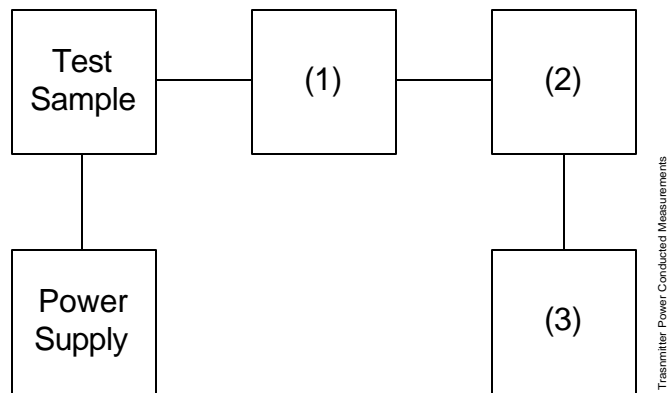
Follows

Name of Test: Carrier Output Power (Conducted)
Specification: 47 CFR 2.1046(a)
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.1

Measurement Procedure

- A) The EUT was connected to a resistive coaxial attenuator of normal load impedance, and the unmodulated output power was measured by means of an RF Power Meter.
- B) Measurement accuracy is $\pm 3\%$.

Transmitter Test Set-Up: RF Power Output



Asset	Description	s/n	Cycle	Last Cal
(1)	Coaxial Attenuator			
X	i00231/2 PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
	i00122/3 NARDA 766 (10 dB)	7802 or 7802A	NCR	
(2)	Power Meters			
X	i00020 HP 8901A Power Mode	2105A01087	12 mo.	Apr-05
(3)	Frequency Counter			
X	i00020 HP 8901A Frequency Mode	2105A01087	12 mo.	Apr-05

Name of Test: Carrier Output Power (Conducted)

Measurement Results
(Worst case)

Frequency of Carrier, MHz = 462.625, 450.000, 480.000
Ambient Temperature = 23°C ± 3°C

Power Setting	RF Power, dB	RF Power, Watts
High	33.0	2.0



Performed by: Fred Chastain, Test Technician

Name of Test: ERP Carrier Power (Radiated)

Specification: TIA/EIA 603A (Substitution Method)

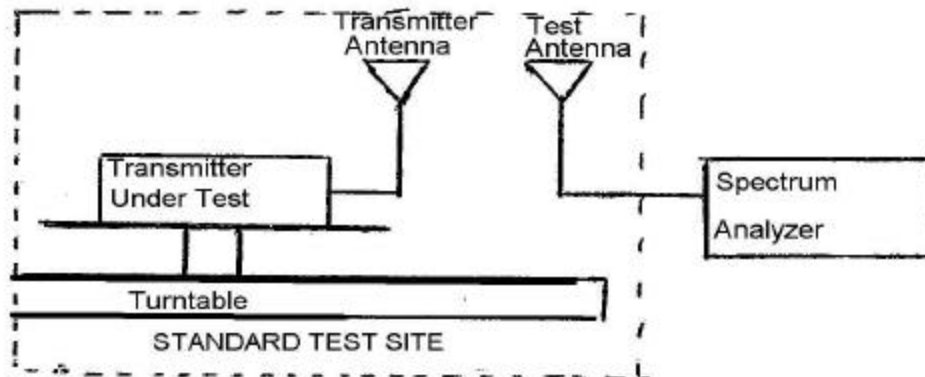
Measurement Procedure

Definition

The average radiated power of a licensed device is the equivalent power required, when delivered to a half-wave dipole or horn antenna, to produce at a distant point the same average received power as produced by the licensed device.

Method of Measurement:

- A) Connect the equipment as illustrated. Place the transmitter to be tested on the turntable in the standard test site.



- B) Raise and lower the test antenna from 1m to 6 m with the transmitter facing the antenna and record the highest received signal in dB as LVL.
- C) Repeat step B) for seven additional readings at 45° interval positions of the turntable.
- D) Replace the transmitter under test with a half-wave or horn vertically polarized antenna. The center of the antenna should be at the same location as the transmitter under test. Connect the antenna to a signal generator with a known output power and record the path loss in dB or LOSS.
- E) Calculate the average radiated output power from the readings in step C) and D) by the following:

$$\text{average radiated power} = 10 \log_{10} \bar{O} 10(\text{LVL} - \text{LOSS})/10 \text{ (dBm)}$$

Name of Test: ERP Carrier Power (Radiated)

Test Equipment

Asset	Description	s/n	Cycle	Last Cal	
Transducer					
	i00088	EMCO 3109-B 25MHz-300MHz	2336	24 mo.	Sep-05
X	i00089	Apriel 2001 200MHz-1GHz	001500	24 mo.	Sep-05
X	i00103	EMCO 3115 1GHz-18GHz	9208-3925	24 mo.	Jan-04
Amplifier					
X	i00028	HP 8449A	2749A00121	12 mo.	May-05
Spectrum Analyzer					
X	i00029	HP 8563E	3213A00104	12 mo.	May-05
X	i00033	HP 85462A	3625A00357	12 mo.	Sep-05
Substitution Generator					
X	i00067	HP 8920A Communication TS	3345U01242	12 mo.	Jun-05
	i00207	HP 8753D Network Analyzer	3410A08514	12 mo.	Jul-05

Name of Test: RF Power Output (Radiated)
Specification: 47 CFR 2.1046(a)
Test Equipment: As per attached page

Measurement Procedure (Radiated)

1. The EUT was placed on an open-field site and its radiated field strength at a known distance was measured by means of a spectrum analyzer. Equivalent loading was calculated from the equation $P_t = (E \times R)^2 / 49.2$ watts, where $R = 3m$.
2. Measurement accuracy is ± 1.5 dB.

Measurement Results

g05b0002: 2005-Nov-01 Tue 13:22:00
 State: 2:High Power

Ambient Temperature: 28°C \pm 3°C

OdBd Whip used as EUT antenna.

Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV/m	CF, dB	Calc, dBuV/m	Dist, m	ERP, dBm
450.000000	450.000000	121.35	18.35	139.70	3	32.70
462.625000	462.625000	120.78	18.50	139.28	3	32.28
480.000000	480.000000	120.55	18.52	139.07	3	32.07



Performed by:

Fred Chastain, Test Technician

Name of Test: Unwanted Emissions (Transmitter Conducted)

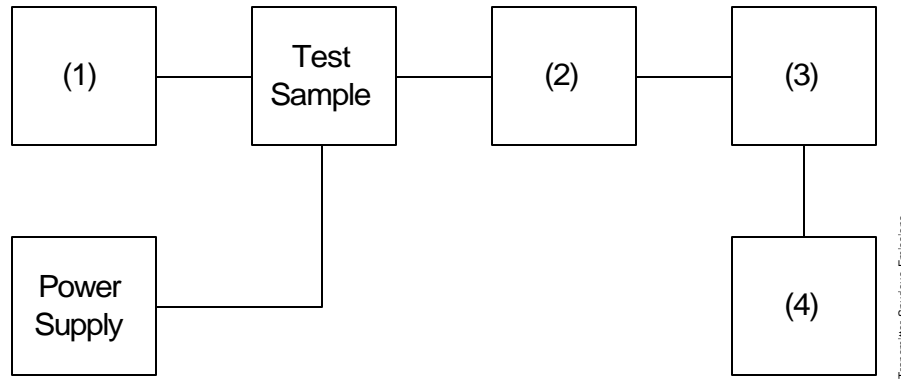
Specification: 47 CFR 2.1051

Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.13

Measurement Procedure

- A) The emissions were measured for the worst case as follows:
 - 1). within a band of frequencies defined by the carrier frequency plus and minus one channel.
 - 2). from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40 GHz, whichever is lower.
- B) The magnitude of spurious emissions that are attenuated more than 20 dB below the permissible value need not be specified.

Transmitter Test Set-Up: Spurious Emission



Asset	Description	s/n		
(1) Audio Oscillator/Generator				
X	i00017	HP 8903A Audio Analyzer	2216A01753	12 mo. Apr-05
	i00002	HP 3336B Synthesizer / Level Gen.	1931A01465	12 mo. Apr-05
(2) Coaxial Attenuator				
X	i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR
	i0012/3	NARDA 766 (10 dB)	7802 or 7802A	NCR
(3) Filters; Notch, HP, LP, BP				
	None required			
(4) Spectrum Analyzer				
X	i00048	HP 8566B Spectrum Analyzer	2511A01467	12 mo. Jun-05
	i00029	HP 8563E Spectrum Analyzer	3213A00104	12 mo. May-05

Name of Test: Unwanted Emissions (Transmitter Conducted)

Measurement Results

Frequency of carrier, MHz = 462.625, 450.000, 480.000
 Spectrum Searched, GHz = 0 to 10 x F_C

g05b0050: 2005-Nov-01 Tue 13:48:00
 STATE: 2:High Power

Ambient Temperature: 29°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	ERP, dBm	ERP, dBc
450.000000	900.000000	-53.00	-86.00
450.000000	1350.000000	-58.70	-91.70
450.000000	1800.000000	-45.50	-78.50
450.000000	2250.000000	-51.50	-84.50
450.000000	2700.000000	-57.10	-90.10
450.000000	3150.000000	-55.60	-88.60
450.000000	3600.000000	-53.90	-86.90
450.000000	4050.000000	-48.80	-81.80
450.000000	4500.000000	-49.80	-82.80
450.000000	4500.000000	-50.00	-83.00
462.625000	925.250000	-51.10	-84.10
462.625000	1387.875000	-55.20	-88.20
462.625000	1850.500000	-52.80	-85.80
462.625000	2313.125000	-52.90	-85.90
462.625000	2775.750000	-55.40	-88.40
462.625000	3238.375000	-60.50	-93.50
462.625000	3701.000000	-53.80	-86.80
462.625000	4163.625000	-53.10	-86.10
462.625000	4626.250000	-51.20	-84.20
462.625000	4626.250000	-53.60	-86.60
480.000000	960.000000	-46.90	-79.90
480.000000	1440.000000	-52.50	-85.50
480.000000	1920.000000	-54.80	-87.80
480.000000	2400.000000	-54.70	-87.70
480.000000	2880.000000	-60.10	-93.10
480.000000	3360.000000	-54.00	-87.00
480.000000	3840.000000	-54.90	-87.90
480.000000	4320.000000	-47.40	-80.40
480.000000	4800.000000	-52.10	-85.10
480.000000	4800.000000	-52.60	-85.60



Performed by:

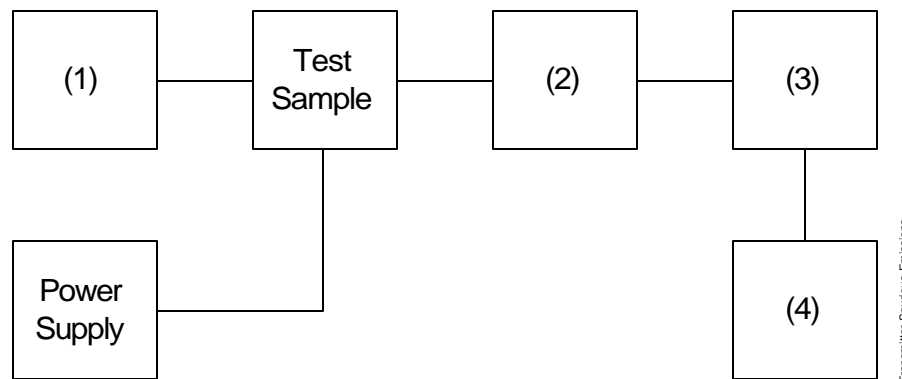
Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)
Specification: 47 CFR 2.1049(c)(1)
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.11

Measurement Procedure

- A) The EUT and test equipment were set up as shown below
- B) For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for $\pm 2.5/\pm 1.25$ kHz deviation (or 50% modulation). With level constant, the signal level was increased 16 dB.
- C) For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.
- D) The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

Transmitter Test Set-Up: Occupied Bandwidth



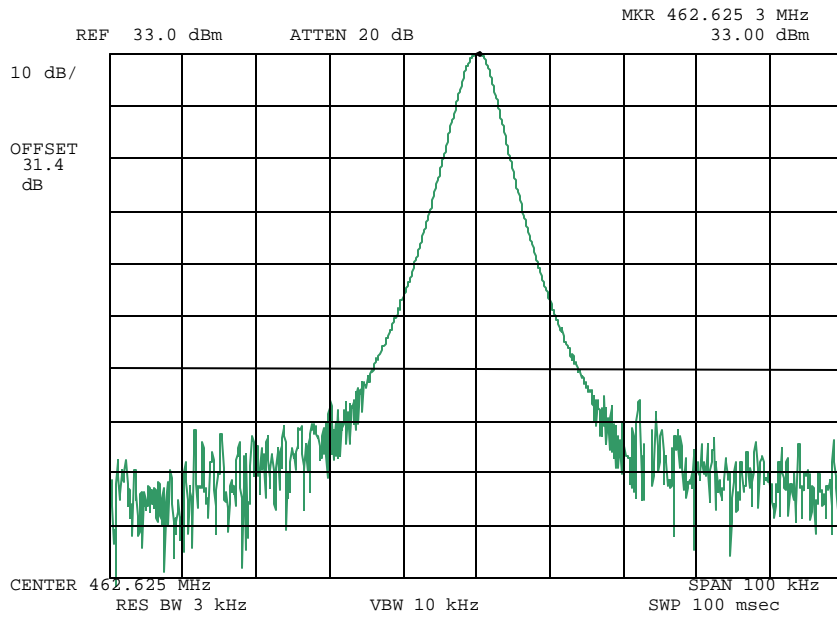
Asset	Description	s/n	Cycle	Last Cal	
(1) Audio Oscillator/Generator					
X	i00017	HP 8903A Modulation Meter	2216A01753	12 mo.	Apr-05
(2) Coaxial Attenuator					
X	i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
	i00123	NARDA 766 (10 dB)	7802A	NCR	
(3) Interface					
X	i00021	HP 8954A Transceiver Interface	2146A00159	NCR	
(4) Spectrum Analyzer					
X	i00048	HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Jun-05
	i00029	HP 8563E Spectrum Analyzer	3213A00104	12 mo.	May-05

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g05b0080: 2005-Nov-16 Wed 11:49:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
CW



Performed by:

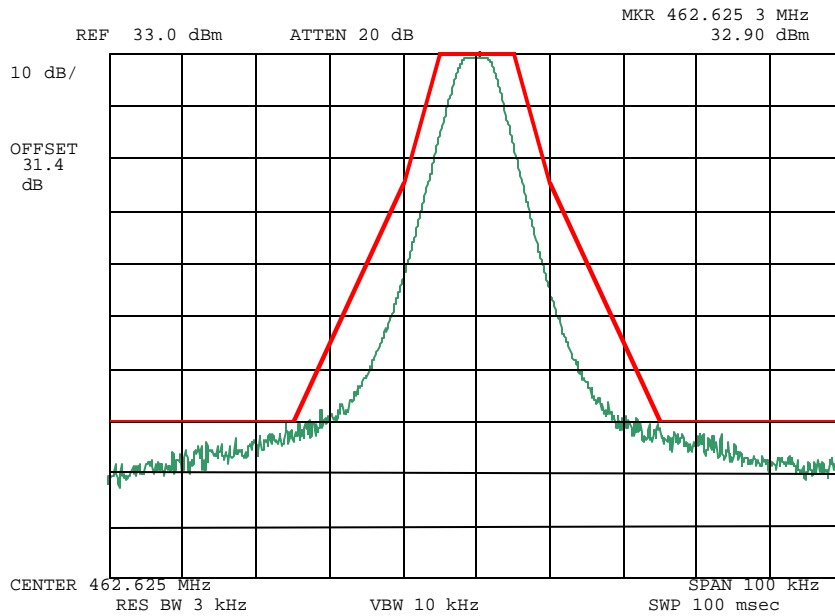
Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g05b0082: 2005-Nov-16 Wed 11:50:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
RANDOM DATA
MASK: G, UHF, NO LPF



Performed by:

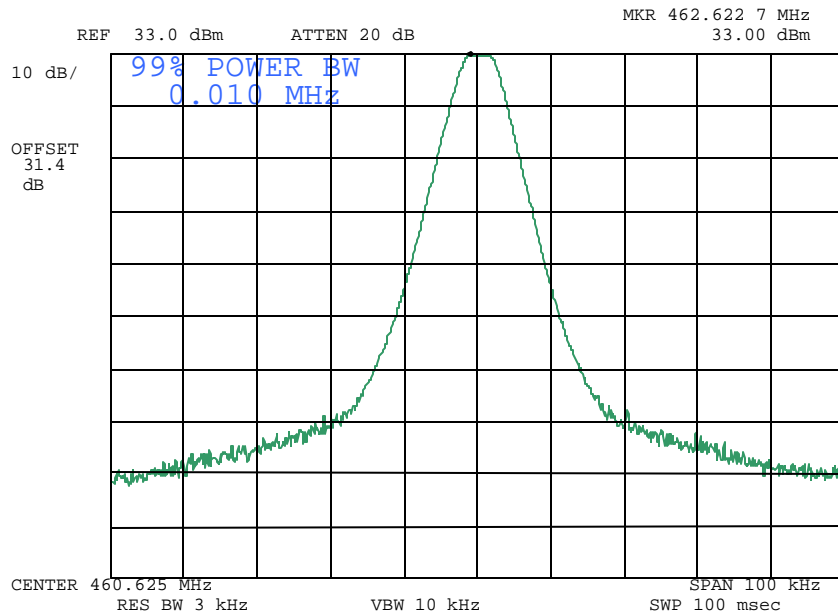
Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g05b0083: 2005-Nov-16 Wed 11:51:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
MID CHANNEL
462.625MHz



Performed by:

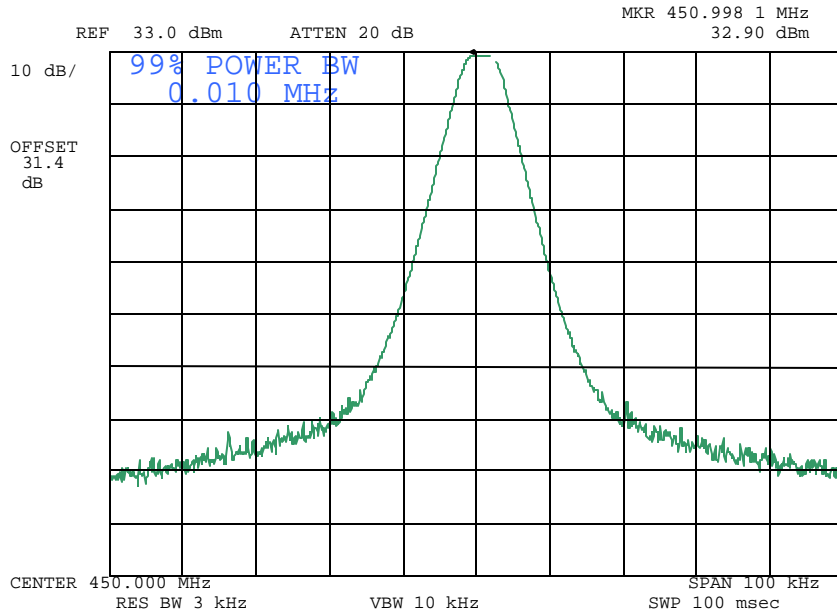
Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g05b0084: 2005-Nov-16 Wed 11:54:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
LOW CHANNEL
450.000MHz



Performed by:

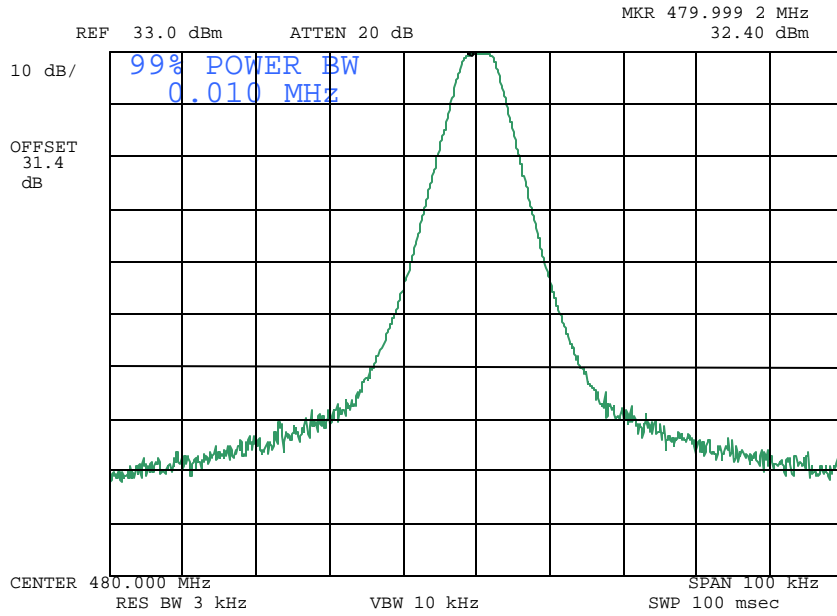
Fred Chastain, Test Technician

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g05b0087: 2005-Nov-16 Wed 11:58:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power:
Modulation:

HIGH
HIGH CHANNEL
480.000MHz



Performed by:

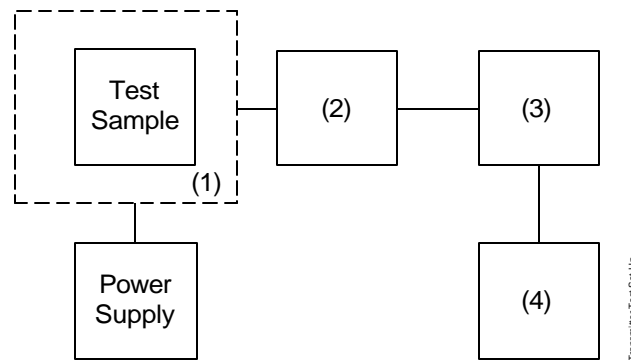
Fred Chastain, Test Technician

Name of Test: Frequency Stability (Temperature Variation)
Specification: 47 CFR 2.1055(a)(1)
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

Measurement Procedure

- A) The EUT and test equipment were set up as shown on the following page.
- B) With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
- C) With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
- D) The temperature tests were performed for the worst case.

Transmitter Test Set-Up: Temperature Variation

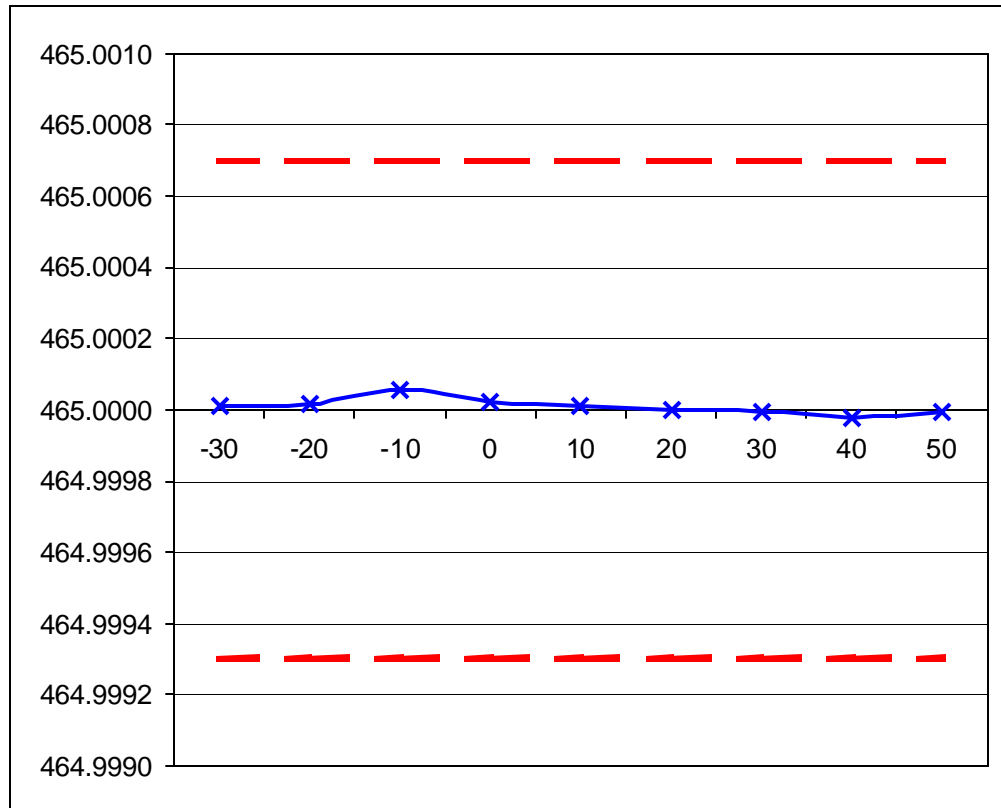


Asset	Description	s/n	Cycle	Last Cal
(1) Temperature, Humidity, Vibration				
X	i00027 Tenney Temp. Chamber	9083-765-234	NCR	
(2) Coaxial Attenuator				
X	i00231/2 PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
	i00122/3 NARDA 766 (10 dB)	7802 or 7802A	NCR	
(3) RF Power				
X	i00067 HP 8920A Communications TS	3345U01242	12 mo.	Jun-05
(4) Frequency Counter				
X	i00067 HP 8920A Communications TS	3345U01242	12 mo.	Jun-05

Name of Test: Frequency Stability (Temperature Variation)

Measurement Results

Room Temperature: 25°C



Vertical Axis = Frequency MHz
Horizontal Axis = Degrees Centigrade



Performed by:

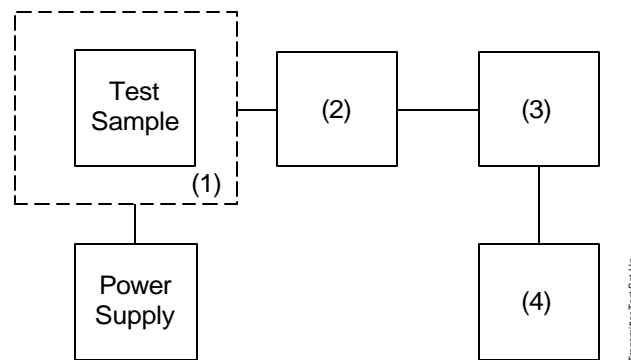
Fred Chastain, Test Technician

Name of Test: Frequency Stability (Voltage Variation)
Specification: 47 CFR 2.1055(d)(1)
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

Measurement Procedure

- A) The EUT was placed in a temperature chamber (if required) at 25±5°C and connected as shown below.
- B) The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
- C) The variation in frequency was measured for the worst case.

Transmitter Test Set-Up: Voltage Variation



Asset	Description	s/n	Cycle	Last Cal
(1) Temperature, Humidity, Vibration				
i00027	Tenney Temp. Chamber	9083-765-234	NCR	
(2) Coaxial Attenuator				
X i00231/2	PASTERNAK PE7021-30 (30 dB)	231 or 232	NCR	
i00122/3	NARDA 766 (10 dB)	7802 or 7802A	NCR	
(3) RF Power				
X i00020	HP 8901A Power Mode	2105A01087	12 mo.	Apr-05
(4) Frequency Counter				
X i00020	HP 8901A Frequency Mode	2105A01087	12 mo.	Apr-05

Results: Frequency Stability (Voltage Variation)

Ambient Temperature: 23°C ± 3°C

Limit, ppm = ±1.50
 Limit, Hz = 700
 Battery End Point (Voltage) = 7.50

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
115	11.50	465.000005	+5	>0.01
100	10.00	465.000002	+2	>0.01
85	8.50	465.000001	+1	>0.01
BEP	7.50	464.999999	-1	>0.01



Performed by:

Fred Chastain, Test Technician

Name of Test: Necessary Bandwidth and Emission Bandwidth

Specification: 47 CFR 2.202(g)

Modulation = FID 11K0FID

Necessary Bandwidth Calculation:

Maximum Modulation (M), kHz	=	3.25
Maximum Deviation (D), kHz	=	2.25
Constant Factor (K)	=	1
Necessary Bandwidth (B _N), kHz	=	(2 x M) + (2 x K x D)
	=	11.0



Calculated by:

David E. Lee, Quality Assurance Manager

END OF TEST REPORT

**Testimonial
and
Statement of Certification**

This is to Certify:

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