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

Date: June 30, 2005

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Telonics Inc.
Equipment: PT-210M
FCC ID: JYLPT210M
FCC Rules: 95(J)

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.

Michael Schafer, General Manager

cc: Applicant
MS/del

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

Transmitter Certification

of

Model: PT-210M
FCC ID: JYLPT210M

to

Federal Communications Commission

Rule Part(s) 95(J)

Date of report: June 30, 2005

On the Behalf of the Applicant:

Telonics Inc.

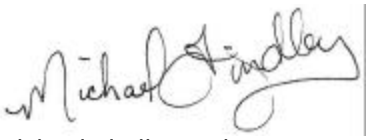
At the Request of:

P.O. 57270

Telonics Inc.
932 E. Impala Avenue
Mesa, AZ 85204-6699

Attention of:

David Beaty, Managing Director
email: dave@telonics.com
(480) 892-4444 ext. 122; FAX: -9139
and/or Timo Hansen, Electrical Engineer
email: timo@telonics.com
(480) 892-4444 ext. 135; FAX: -9139



Supervised By:

Michael Findley, Laboratory Manager

List of Exhibits

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

Applicant: Telonics Inc.

FCC ID: JYLPT210M

By Applicant:

1. Letter of Authorization

2. Confidentiality Request: 0.457 And 0.459

5. Identification Drawings, 2.1033(c)(11)
   - Label
   - Location of Label
   - Compliance Statement
   - Location of Compliance Statement

5. Photographs, 2.1033(c)(12)

6. Documentation: 2.1033(c)
   - (3) User Manual
   - (9) Tune Up Info
   - (10) Schematic Diagram
   - (10) Circuit Description
   - Block Diagram
   - Parts List
   - Active Devices

7. MPE Report

By M.F.A. Inc.:

A. Testimonial & Statement of Certification

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.

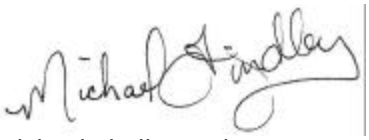
15.27(a) **Special Accessories**.

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.

Table of Contents

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

a)	**Test Report**
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:	d0560060
d) Client:	Telonics Inc. 932 E. Impala Avenue Mesa, AZ 85204-6699
e) Identification: EUT Description:	PT-210M Remote Sensor Transmitter
f) EUT Condition:	Not required unless specified in individual tests.
g) Report Date: EUT Received:	June 30, 2005 June 30, 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:	 Michael Findley, Laboratory 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)
X	95 Subpart J – MURS 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 C63.4-1992/2000, 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.

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

A2LA

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/mra 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 301-975-3414. **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 301-975-5528. 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**

Expository Statement

Applicant: Telonics Inc.

FCC ID: JYLPT210M

The EUT is a transmitter only sensor system.

The sensor inputs are keyed to voice messages, which are transmitted to any FM monitoring receiver on the same frequency. No external audio input is provided on the system and the level of the deviation is preset during manufacture. There is no Modulation Limiting circuitry as such and it is not possible to test the audio response on the completed unit.

To allow testing the unit was set up with a pre-programmed message by stringing all the words in the message vocabularies together into one transmit cycle so that the maximum deviation could be determined.

The audio response plot is provided by the applicant and was obtained during development testing.

A secondary mode allows data to be sent, instead of a voice message, to a special receiver. This data message is also generated internally and no data input is accessible by the user.

List of General Information Required for Certification

In Accordance with FCC Rules and Regulations,
Volume II, Part 2 and to Part 95(J)

Sub-part 2.1033

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

Telonics Inc.
932 E. Impala Avenue
Mesa, AZ 85204-6699

Manufacturer:

Telonics Inc.
932 E. Impala Avenue
Mesa, AZ 85204-6699

(c)(2): **FCC ID**: JYLPT210M

Model Number: PT-210M

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

Please see attached exhibits

(c)(4): **Type of Emission**: 11K0F3E, 11K0F1D

(c)(5): **Frequency Range, MHz**:

151.820000
151.880000
151.940000
154.570000
154.600000

(c)(6): **Power Rating, Watts**: 2.0

____ Switchable ____ Variable X N/A

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

DUT Results: Passes X Fails ____

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	=	0.5
Collector Voltage, Vdc	=	7.2
Supply Voltage, Vdc	=	12.0

(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
_x_ N/A

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

Follows

Name of Test: Carrier Output Power (Conducted)

Specification: 47 CFR 2.1046(a)

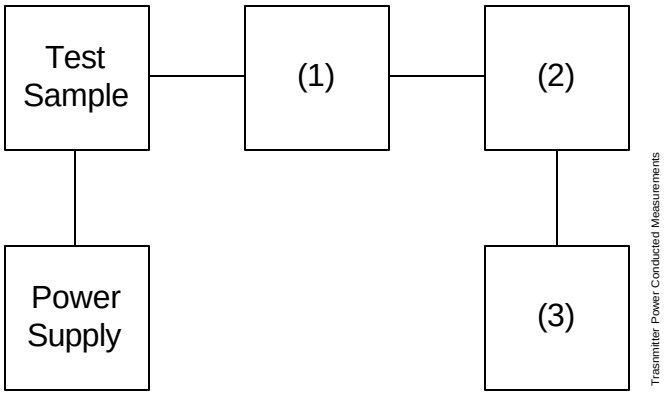
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.1

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 ±3%.

Transmitter Test Set-Up: RF Power Output



	Asset	Description	s/n	Cycle	Last Cal
(1)	**Coaxial Attenuator**				
X	i00231/2	PASTERNACK 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	=	151.820000 151.880000 151.940000 154.570000 154.600000
Ambient Temperature	=	23°C ± 3°C

Power Setting	RF Power, dBm	RF Power, Watts
High	33.0	1.995

Performed by: David E. Lee, Test Engineer

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

g0560301: 2005-Jun-30 Thu 10:53:00
State: 2:High Power Ambient Temperature: 23°C ± 3°C

EUT Antenna = 0dBi Whip

Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV/m	CF, dB	ERP, dBm	ERP, Watts (Max)
151.820000	151.841300	87.84	42.21	32.7	
151.880000	151.901300	88.10	42.21	32.9	
151.940000	151.961300	88.03	42.21	32.9	1.95
154.570000	154.591300	87.63	42.19	32.4	
154.600000	154.621300	87.49	42.19	32.3	

Performed by: David E. Lee, Test Engineer

Name of Test: Unwanted Emissions (Transmitter Conducted)

Specification: 47 CFR 2.1051

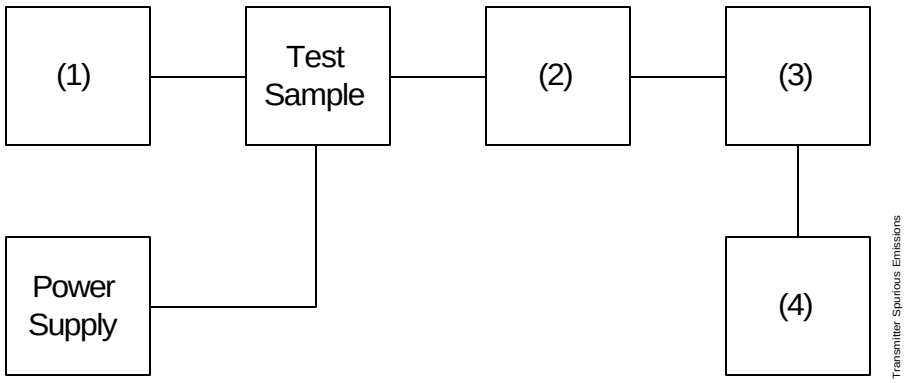
Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.13

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	PASTERNACK 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.	Oct-04
	i00029	HP 8563E Spectrum Analyzer	3213A00104	12 mo.	May-05

Name of Test: Unwanted Emissions (Transmitter Conducted)

Measurement Results
(Worst Case)

Frequency of carrier, MHz	=	151.820, 151.940
Spectrum Searched, GHz	=	0 to 10 x F_C
Limit(s), dBc		50 + 10 x Log(P) = -20dBm

g0560304: 2005-Jun-30 Thu 15:07:00
State: 2:High Power — Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV/m	CF, dB	ERP, dBm	ERP, dBc	Margin, dBm
151.820000	303.661300	52.55	20.5	-33.9	-69.3	-13.9
151.940000	303.901300	45.95	20.5	-40.5	-75.9	-20.5
151.820000	309.223800	48.98	20.5	-37.4	-72.8	-17.4
151.820000	455.481300	53.60	20.5	-32.8	-68.2	-12.8
151.940000	455.841300	53.57	20.5	-32.9	-68.3	-12.9
151.820000	463.823800	54.23	20.5	-32.2	-67.6	-12.2
151.820000	607.301300	44.00	20.5	-42.4	-77.8	-22.4
151.940000	607.781300	43.23	20.5	-43.2	-78.6	-23.2
151.820000	618.421300	41.67	20.5	-44.8	-80.2	-24.8
151.820000	759.121300	32.23	20.5	-54.2	-89.6	-34.2
151.940000	759.721300	31.09	20.5	-55.3	-90.7	-35.3
151.820000	773.031300	30.74	20.5	-55.7	-91.1	-35.7
151.820000	910.941300	27.57	20.5	-58.9	-94.3	-38.9
151.940000	911.661300	26.89	20.5	-59.5	-94.9	-39.5
151.820000	927.625000	28.78	20.5	-57.6	-93.0	-37.6
151.820000	1062.761300	31.81	20.5	-54.6	-90.0	-34.6
151.940000	1063.601300	31.18	20.5	-55.2	-90.6	-35.2
151.820000	1082.222500	31.13	20.5	-55.3	-90.7	-35.3
151.820000	1214.581300	35.72	20.5	-50.7	-86.1	-30.7
151.940000	1215.541300	36.10	20.5	-50.3	-85.7	-30.3
151.820000	1236.825000	37.00	20.5	-49.4	-84.8	-29.4
151.820000	1366.401300	29.94	20.5	-56.5	-91.9	-36.5
151.940000	1367.481300	29.99	20.5	-56.4	-91.8	-36.4
151.820000	1391.407500	28.80	20.5	-57.6	-93.0	-37.6
151.820000	1518.221300	37.73	20.5	-48.7	-84.1	-28.7
151.940000	1519.421300	34.16	20.5	-52.3	-87.7	-32.3
151.820000	1546.027500	32.93	20.5	-53.5	-88.9	-33.5

Performed by: David E. Lee, Test Engineer

Name of Test: Field Strength of Spurious Radiation

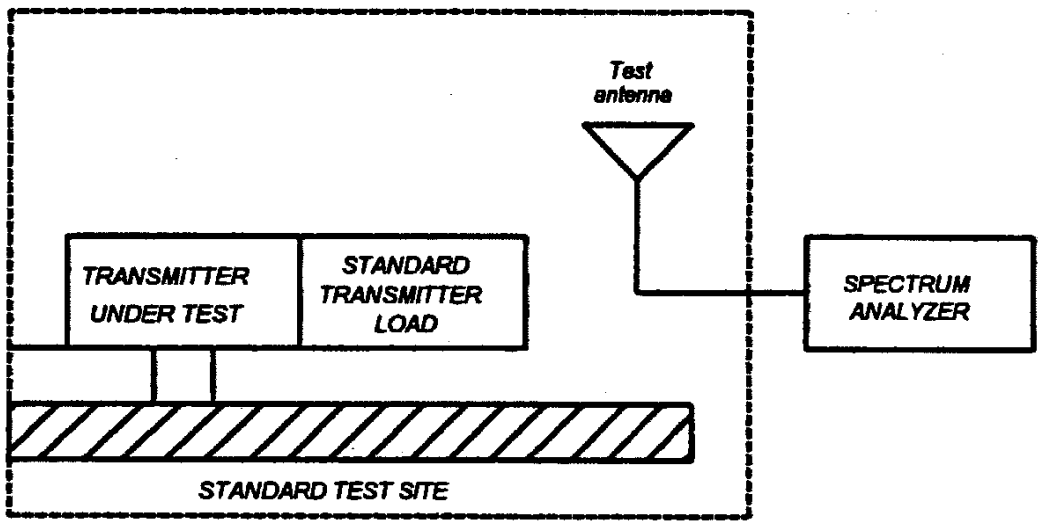
Specification: 47 CFR 2.1053(a)

Guide: ANSI/TIA/EIA-603-1992/2001, Paragraph 1.2.12 and Table 16, 47 CFR 22.917

Measurement Procedure

Definition:
Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

Method of Measurement:
A) Connect the equipment as illustrated
B) Adjust the spectrum analyzer for the following settings:
1) Resolution Bandwidth 100 kHz (<1 GHZ), 1 MHZ (> 1GHz).
2) Video Bandwidth = 3 times Resolution Bandwidth, or 30 kHz (22.917)
3) Sweep Speed ≤2000 Hz/second
4) Detector Mode = Mean or Average Power
C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load that is placed on the turntable. The RF cable to this load should be of minimum length.

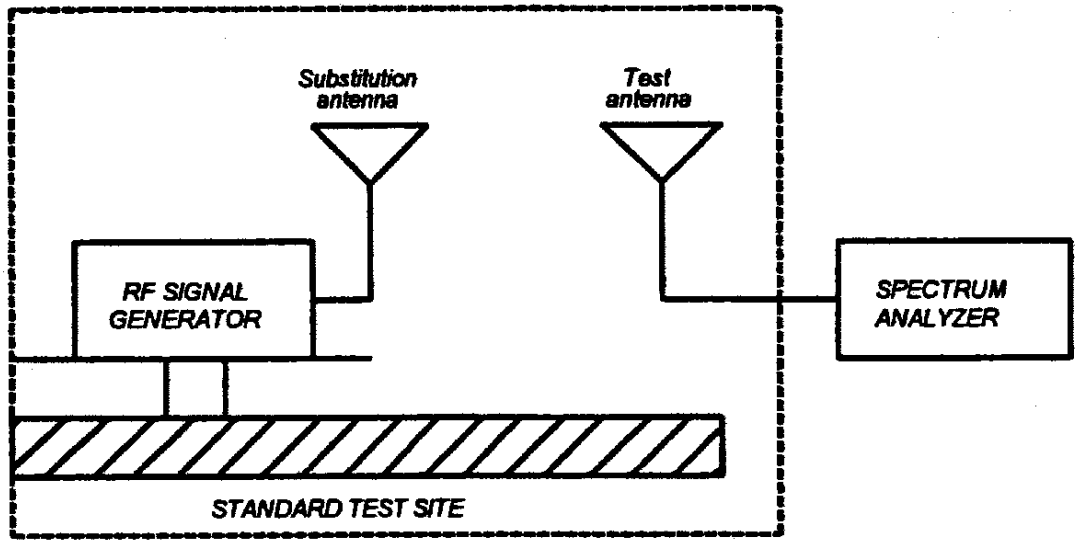


Name of Test: Field Strength of Spurious Radiation (Cont.)

D) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to ± the test bandwidth (see section 1.3.4.4).

E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.

F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.



G) Reconnect the equipment as illustrated.

H) Keep the spectrum analyzer adjusted as in step B).

I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

Name of Test: Field Strength of Spurious Radiation (Cont.)

J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.

K) Repeat step J) with both antennas vertically polarized for each spurious frequency.

L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.

M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB =

$10\log_{10}$(TX power in watts/0.001) – the levels in step l)

NOTE: It is permissible that other antennas provided can be referenced to a dipole.

Test Equipment

	Asset	Description	s/n	Cycle	Last Cal
Transducer					
	i00088	EMCO 3109-B 25MHz-300MHz	2336	24 mo.	Sep-03
X	i00089	Aprel 2001 200MHz-1GHz	001500	24 mo.	Sep-03
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-04
Substitution Generator					
X	i00067	HP 8920A Communication TS	3345U01242	12 mo.	May-05
	i00207	HP 8753D Network Analyzer	3410A08514	12 mo.	May-05

Microphone, Antenna Port, and Cabling

Microphone	N	Cable Length	-	Meters
Antenna Port Terminated	Y	Load	N	Antenna Gain 0dBi
All Ports Terminated by Load	Y	Peripheral	Y	

Name of Test: Field Strength of Spurious Radiation

Measurement Results

g0560301: 2005-Jun-30 Thu 10:53:00
State: 2:High Power Ambient Temperature: 35°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV/m	CF, dB	ERP, dBm	Limit, dBm	Margin, dB
151.820000	303.661300	59.48	15.37	-22.50	-20.00	-2.50
151.880000	303.781300	59.69	15.37	-22.30	-20.00	-2.30
151.940000	303.901300	58.83	15.37	-23.20	-20.00	-3.20
154.570000	309.161300	59.13	15.49	-22.80	-20.00	-2.80
154.600000	309.221300	57.94	15.49	-23.90	-20.00	-3.90
151.820000	455.481300	32.26	18.40	-46.70	-20.00	-26.70
151.880000	455.661300	34.73	18.40	-44.20	-20.00	-24.20
151.940000	455.841300	33.91	18.40	-45.10	-20.00	-25.10
154.570000	463.731300	39.53	18.51	-39.30	-20.00	-19.30
154.600000	463.821300	41.74	18.51	-37.10	-20.00	-17.10
154.570000	618.301300	37.52	25.09	-34.80	-20.00	-14.80
154.600000	618.421300	36.82	25.09	-35.50	-20.00	-15.50
151.820000	759.121300	23.54	25.65	-48.20	-20.00	-28.20
151.880000	759.421300	25.12	25.65	-46.60	-20.00	-26.60
151.940000	759.721300	21.60	25.65	-50.10	-20.00	-30.10
154.570000	772.871300	21.98	25.46	-49.90	-20.00	-29.90
154.600000	773.021300	22.28	25.46	-49.60	-20.00	-29.60
151.820000	910.941300	17.87	26.53	-53.00	-20.00	-33.00
151.880000	911.301300	16.69	26.54	-54.10	-20.00	-34.10
151.940000	911.661300	17.36	26.56	-53.50	-20.00	-33.50
154.570000	927.441300	19.37	27.15	-50.90	-20.00	-30.90
154.600000	927.621300	19.30	27.16	-50.90	-20.00	-30.90
151.820000	1062.761300	23.70	25.65	-48.00	-20.00	-28.00
151.880000	1063.181300	24.52	25.65	-47.20	-20.00	-27.20
151.940000	1063.601300	22.89	25.66	-48.80	-20.00	-28.80
154.570000	1082.011300	24.10	25.73	-47.50	-20.00	-27.50
154.600000	1082.221300	23.72	25.73	-47.90	-20.00	-27.90
151.820000	1214.581300	17.48	26.21	-53.70	-20.00	-33.70
151.880000	1215.061300	18.90	26.22	-52.30	-20.00	-32.30
151.940000	1215.541300	18.74	26.22	-52.40	-20.00	-32.40
154.570000	1236.581300	18.01	26.31	-53.10	-20.00	-33.10
154.600000	1236.821300	18.57	26.31	-52.50	-20.00	-32.50
151.820000	1366.401300	18.27	27.24	-51.90	-20.00	-31.90
151.880000	1366.941300	19.16	27.25	-51.00	-20.00	-31.00
151.940000	1367.481300	16.89	27.25	-53.20	-20.00	-33.20

Name of Test: Field Strength of Spurious Radiation

Measurement Results (Continued)

g0560301: 2005-Jun-30 Thu 10:53:00
State: 2:High Power Ambient Temperature: 35°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV/m	CF, dB	ERP, dBm	Limit, dBm	Margin, dB
154.570000	1391.151300	18.25	27.42	-51.70	-20.00	-31.70
154.600000	1391.421300	20.74	27.42	-49.20	-20.00	-29.20
151.820000	1518.221300	21.77	28.40	-47.20	-20.00	-27.20
151.880000	1518.821300	20.62	28.40	-48.40	-20.00	-28.40
151.940000	1519.421300	21.44	28.41	-47.50	-20.00	-27.50
154.570000	1545.721300	21.25	28.74	-47.40	-20.00	-27.40
154.600000	1546.021300	22.86	28.74	-45.80	-20.00	-25.80

Performed by: David E. Lee, Test Engineer

Name of Test: Field Strength of Spurious Radiation

Test Setup Photographs

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

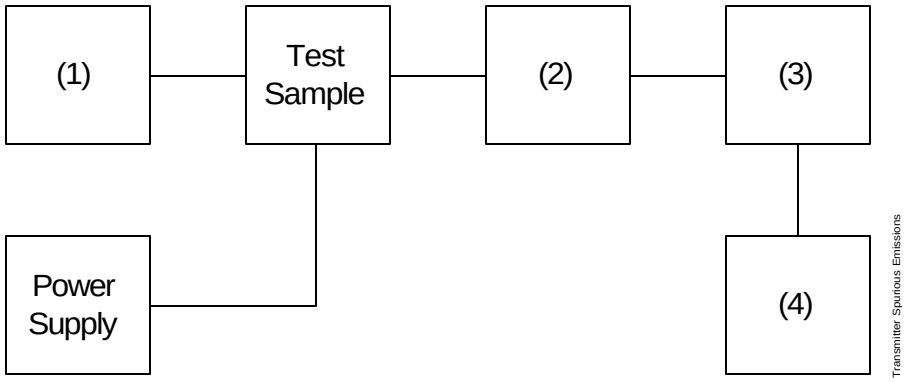
A) The EUT and test equipment were set up as shown below

B) For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for ±2.5/±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



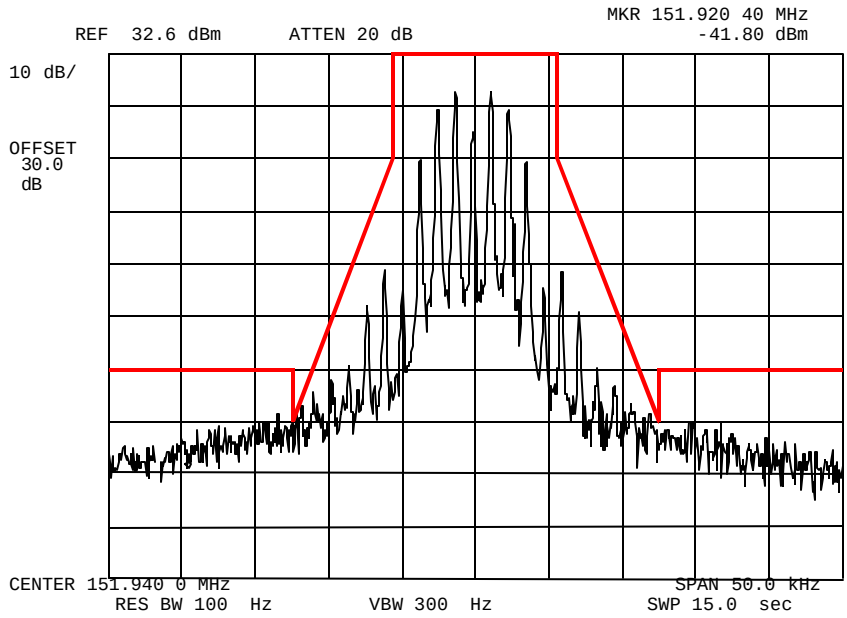
	Asset	Description	s/n	Cycle	Last Cal
(1) **Audio Oscillator/Generator**					
X	i00017	HP 8903A Modulation Meter	2216A01753	12 mo.	Apr-05
(2) **Coaxial Attenuator**					
X	i00231/2	PASTERNACK PE7021-30 (30 dB)	231 or 232	NCR	
	i00123	NARDA 766 (10 dB)	7802A	NCR	
(3) **Interface**					
X	i00021	HP 8954A Transceiver Interface	2146A00159	NCR	
(4) **Spectrum Analyzer**					
X	i00048	HP 8566B Spectrum Analyzer	2511A01467	12 mo.	Oct-04
	i00029	HP 8563E Spectrum Analyzer	3213A00104	12 mo.	May-05

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0560310: 2005-Jun-30 Thu 16:55:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: VOICE MESSAGE
MASK: D, VHF/UHF 12.5kHz BW

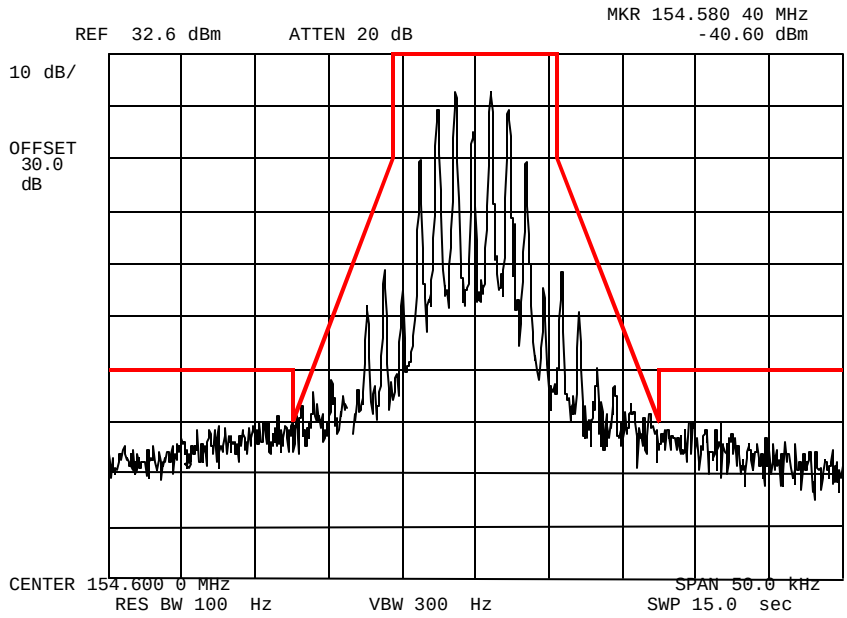
Performed by: David E. Lee, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0560311: 2005-Jun-30 Thu 16:57:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: VOICE MESSAGE
MASK: D, VHF/UHF 12.5kHz BW

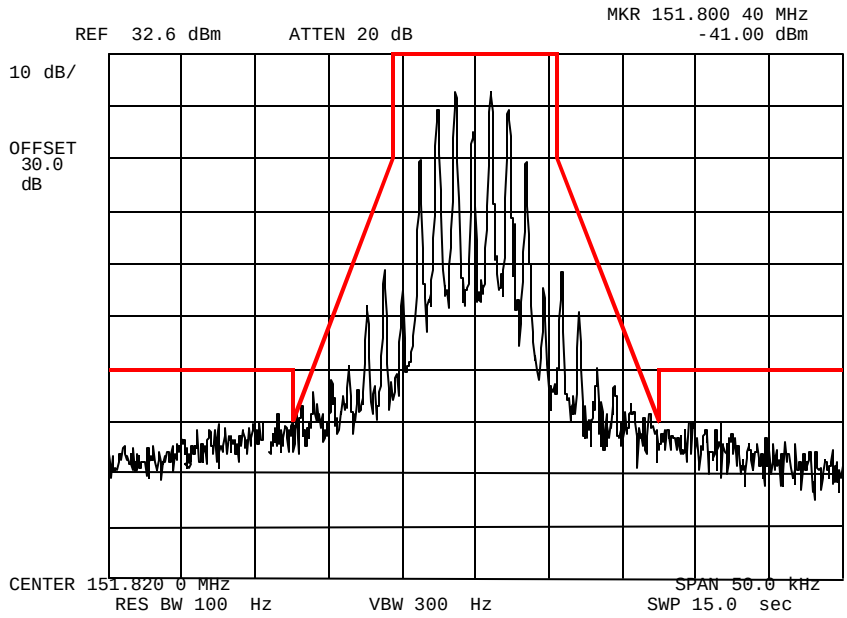
Performed by: David E. Lee, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0560312: 2005-Jun-30 Thu 16:57:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: VOICE MESSAGE
MASK: D, VHF/UHF 12.5kHz BW

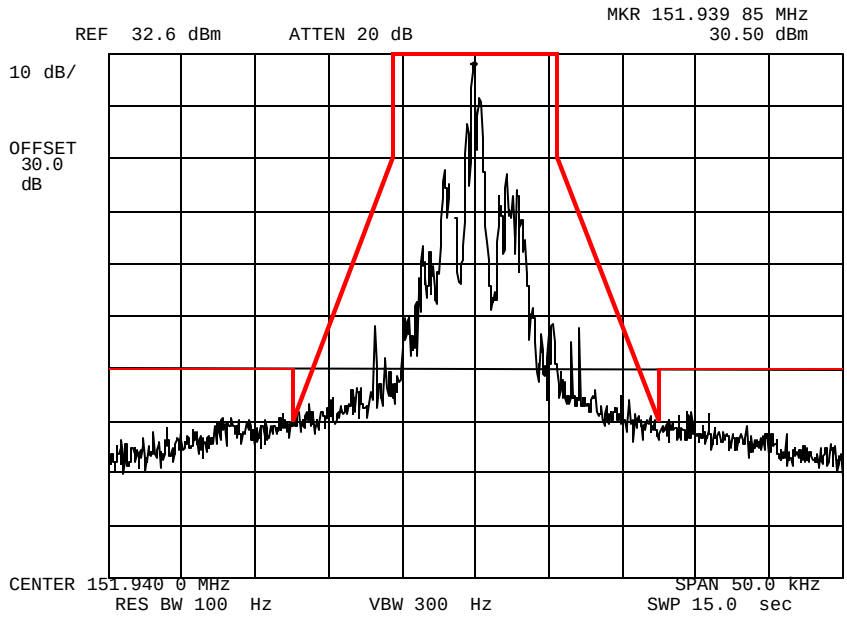
Performed by: David E. Lee, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0570001: 2005-Jul-01 Fri 09:32:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: DATA
MASK: D, VHF/UHF 12.5kHz BW

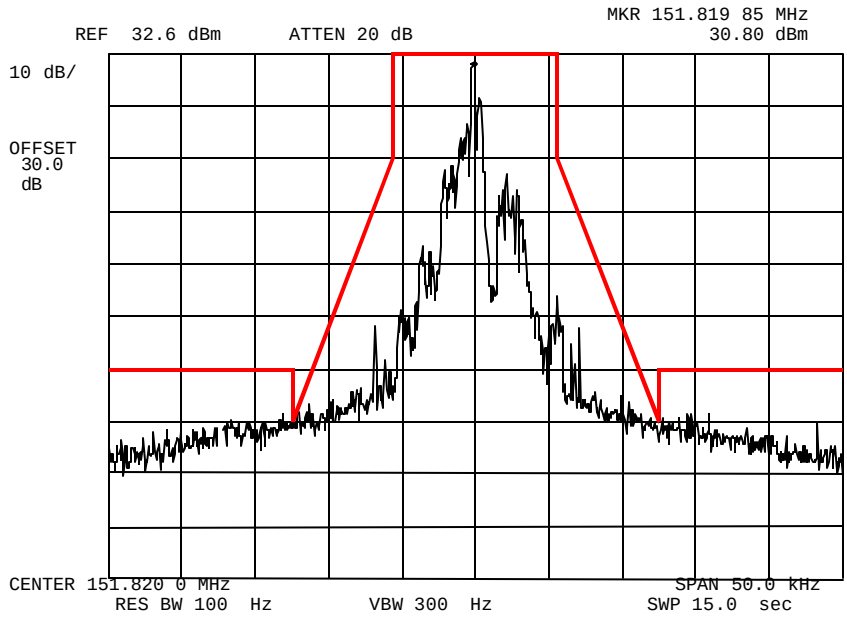
Performed by: David E. Lee, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0570002: 2005-Jul-01 Fri 09:32:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: DATA
MASK: D, VHF/UHF 12.5kHz BW

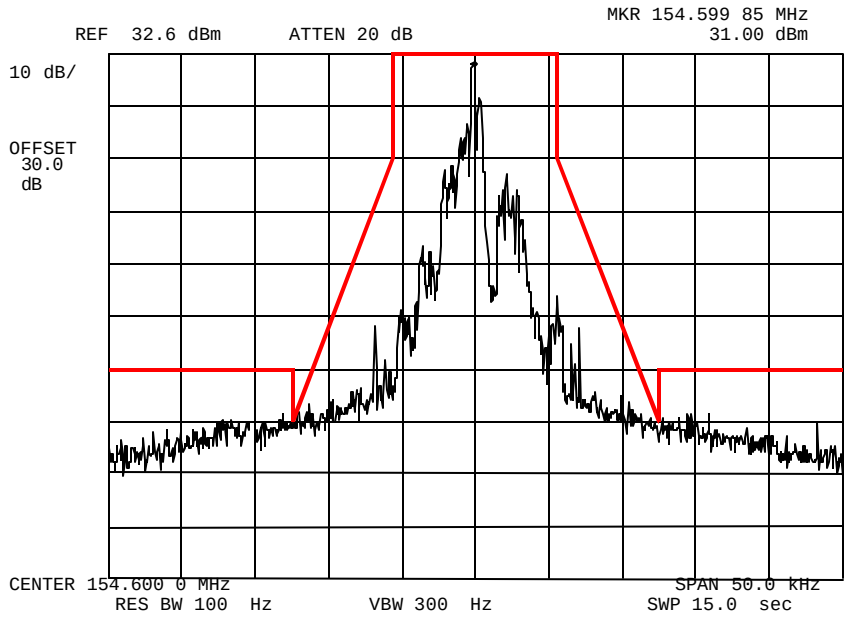
Performed by: David E. Lee, Test Engineer

Name of Test: Emission Masks (Occupied Bandwidth)

Measurement Results

g0570003: 2005-Jul-01 Fri 09:33:00
State: 2:High Power

Ambient Temperature: 23°C ± 3°C



Power: HIGH
Modulation: DATA
MASK: D, VHF/UHF 12.5kHz BW

Performed by: David E. Lee, Test Engineer

Name of Test: Audio Frequency Response

Specification: 47 CFR 2.1047(a)

Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.6

Measurement Procedure

A) The EUT and test equipment were set up as shown below.

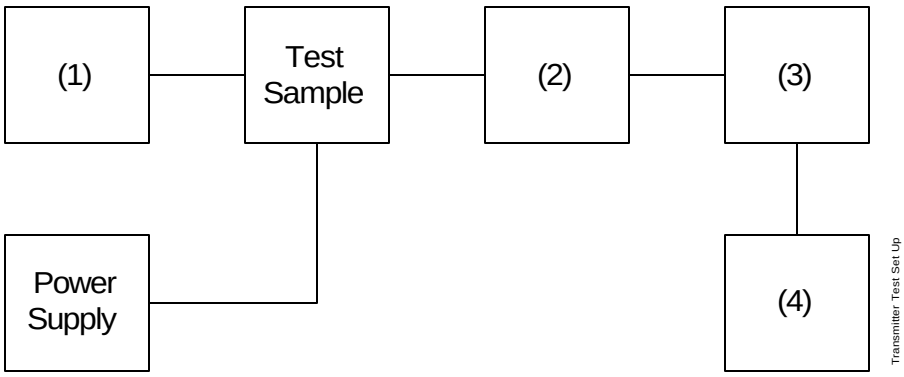
B) The audio signal generator was connected to the audio input circuit/microphone of the EUT.

C) The audio signal input was adjusted to obtain 20% modulation at 1 kHz, and this point was taken as the 0 dB reference level.

D) With input levels held constant and below limiting at all frequencies, the audio signal generator was varied from 100 Hz to 50 kHz.

E) The response in dB relative to 1 kHz was measured, using the HP 8901A Modulation Meter.

Transmitter Test Set-Up: Audio Frequency Response

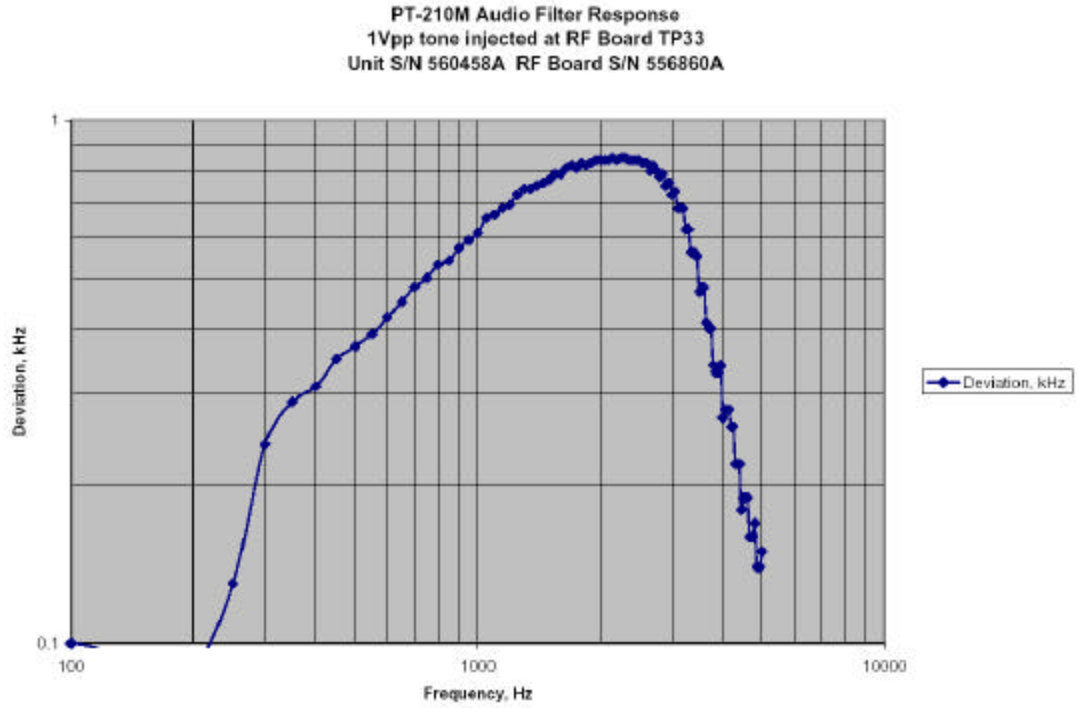


Transmitter Test Set Up

	Asset	Description	s/n	Cycle	Last Cal
(1) **Audio Oscillator**					
X	i00017	HP 8903A Audio Analyzer	2216A01753	12 mo.	Apr-05
(2) **Coaxial Attenuator**					
	i00122/3	NARDA 766-(10 dB)	7802 or 7802A	NCR	
X	i00231/2	PASTERNACK PE7021-30 (30 dB)	231 or 232	NCR	
(3) **Modulation Analyzer**					
X	i00020	HP 8901A Modulation Meter	2105A01087	12 mo.	Apr-05
(4) **Audio Analyzer**					
X	i00017	HP 8903A Audio Analyzer	2216A01753	12 mo.	Apr-05

Name of Test: Audio Frequency Response

Measurement Results



Applicant Supplied Data

Attested by: David E. Lee, Test Engineer

Name of Test: Modulation Limiting (Modified Method)

Specification: 47 CFR 2.1047(b)

Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.3

Measurement Procedure

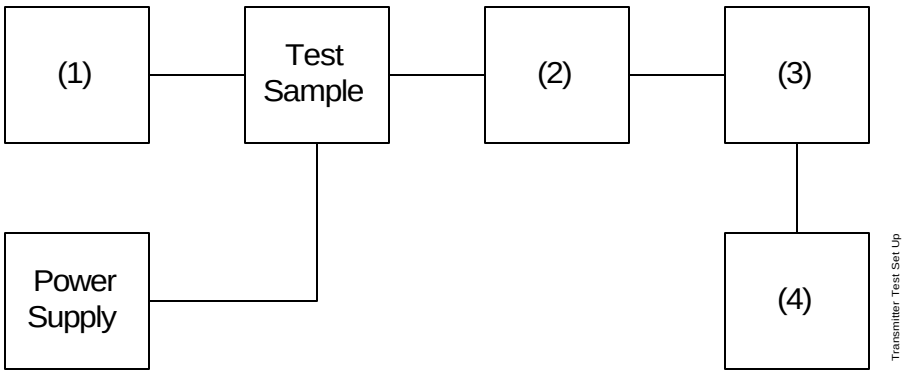
A) The internally stored message of the vocabulary contents was transmitted

B) The modulation response was measured on an HP 8901A Modulation Analyzer during the message period.

C) With the method used, the X-axis represents time rather than audio sweep level. The Y-axis shows the deviation excursion read by the Modulation Analyzer.

D) Measurements were performed for both negative and positive modulation and the respective results were recorded.

Transmitter Test Set-Up: Modulation Limiting



Transmitter Test Set Up

	Asset	Description	s/n		
(1) **Audio Oscillator**					
X	i00017	HP 8903A Audio Analyzer	2216A01753	12 mo.	Apr-05
(2) **Coaxial Attenuator**					
	i0012/23	NARDA 766-(10 dB)	7802 or 7802A	NCR	
X	i00231/2	PASTERNACK PE7021-30 (30 dB)	231 or 232	NCR	
(3) **Modulation Analyzer**					
X	i00020	HP 8901A Modulation Meter	2105A01087	12 mo.	Apr-05
(4) **Audio Analyzer**					
X	i00017	HP 8903A Audio Analyzer	2216A01753	12 mo.	Apr-05

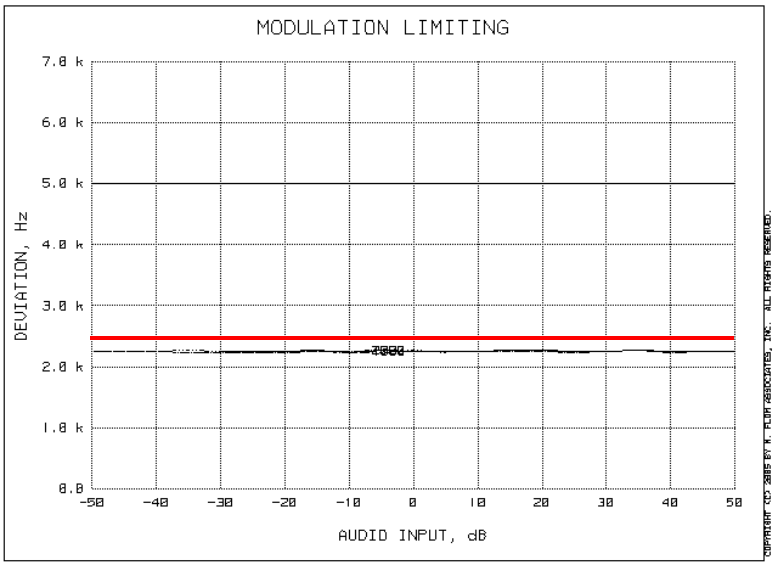
Name of Test: Modulation Limiting

Measurement Results

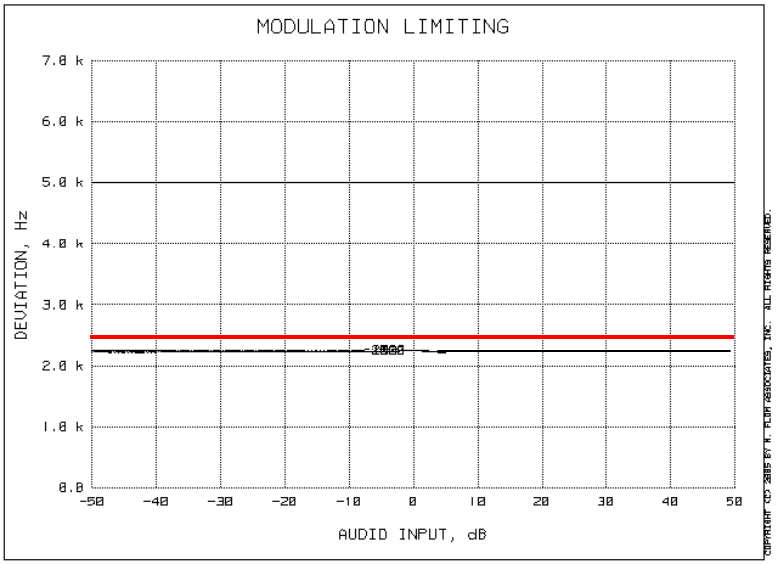
g0560303: 2005-Jun-30 Thu 17:05:00
State: 0:General

Ambient Temperature: 23°C ± 3°C

Positive Peaks: 2.37kHz



Negative Peaks: 2.35kHz



Performed by: David E. Lee, Test Engineer

Name of Test: Frequency Stability (Voltage and Temperature Variation)

Specification: 47 CFR 2.1055(a)(1) and 47 CFR 2.1055(d)(1)

Guide: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

Measurement Procedure

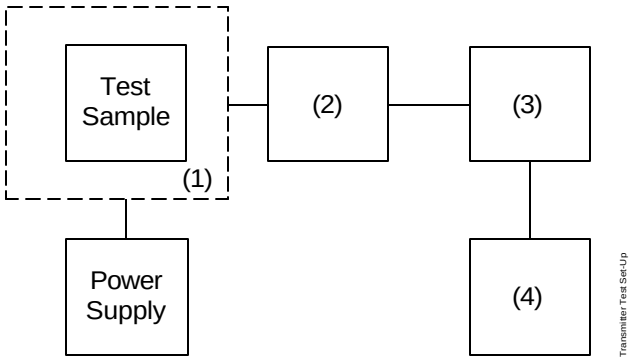
A) The EUT and test equipment were set up as shown on the following page.

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.

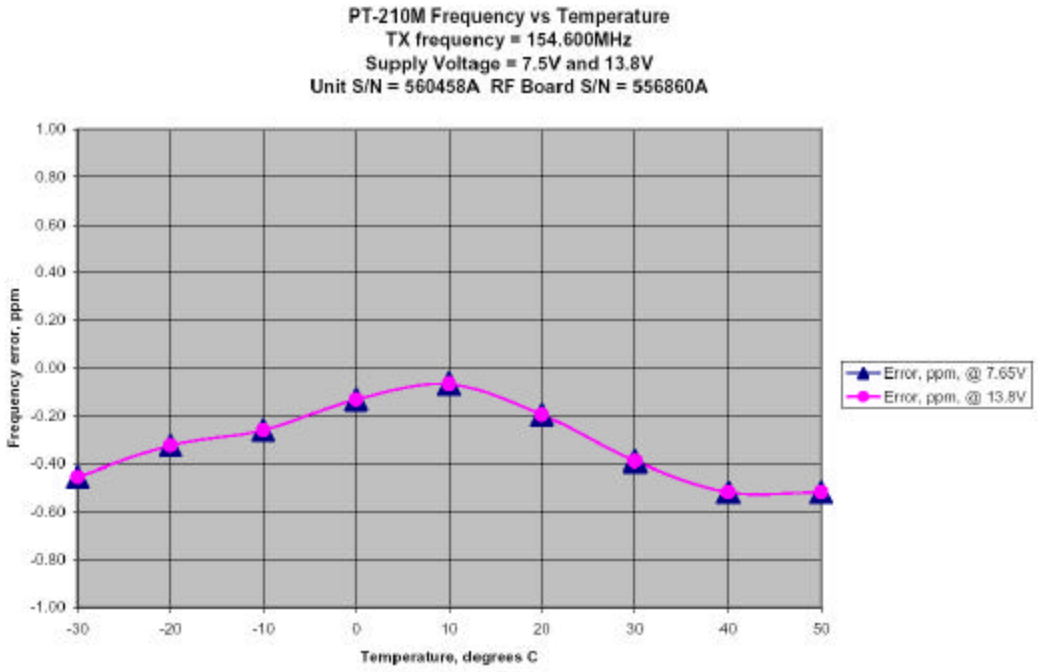
Transmitter Test Set-Up: Temperature Variation



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

Name of Test: Frequency Stability (Voltage and Temperature Variation)

Measurement Results



Applicant Supplied Data

Attested by: David E. Lee, Test Engineer

Name of Test: Necessary Bandwidth and Emission Bandwidth

Specification: 47 CFR 2.202(g)

Modulation = 11K0F3E

Necessary Bandwidth Calculation:

Maximum Modulation (M), kHz		2.5
Maximum Deviation (D), kHz	=	3.0
Constant Factor (K)	=	1
Necessary Bandwidth (B_N), kHz	=	(2 x M)+(2 x D x K)
	=	11.0

Modulation = 11K0F1D

Necessary Bandwidth Calculation:

Maximum Modulation (M), kHz		2.5
Maximum Deviation (D), kHz	=	3.0
Constant Factor (K)	=	1
Necessary Bandwidth (B_N), kHz	=	(2 x M)+(2 x D x K)
	=	11.0

Calculated by: David E. Lee, Test Engineer

END OF TEST REPORT

Testimonial
and
Statement of Certification

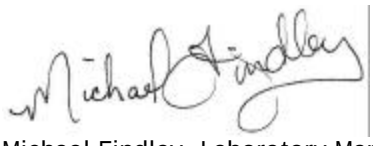
This is to Certify:

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: Michael Findley, Laboratory Manager

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