



# Flom Test Labs

EMI, EMC, RF Testing Experts Since 1963

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

**Date:** April 21, 2008

**Applicant:** Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

**Attention of:** Charles E. Conner, Project Engineer  
(402) 467-5321; FAX: -3279  
E-mail: charlie.conner@us.telex.com  
Jim Andersen  
Email: jim.andersen@us.telex.com

**Equipment:** 776-800 MHz Rev-WT  
**FCC ID:** B5DB120  
**FCC Rules:** 74H

Gentlemen:

Enclosed please find your copy of the Engineering Test Report for which you are subject to the restrictions as listed on the attached summary.

As you know, the FCC, after a TCB issues a Grant, still has 30 days to review a submission and request added information. It is your decision whether or not to market the equipment subject to a possible recall before the end of the 30 days.

If your equipment is still retained by us, it will be returned to you 30 days after approval is achieved. Our invoice for services has been directed to your Accounts Payable Department.

Should you need any clarification, just fax or phone. Thank you again for this order - it has been a pleasure to be of service.

Sincerely yours,

John Erhard

enclosure(s)  
JE/mdw

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

p0810016, d0840029 Rev. 3.0



**Flom Test Labs**  
EMI, EMC, RF Testing Experts Since 1963

**Memo**

**Date:** April 21, 2008

**Applicant:** Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

**Equipment:** 776-800 MHz Rev-WT  
**FCC ID:** B5DB120

Please note that the enclosed Reports reflect the results of tests performed to the currently published Federal Communications Commissions Rules and Regulations.

Should the FCC's Examiners' interpretations request new and unpublished requirements, we will be pleased to provide them. We will invoice you accordingly, i.e. for the time spent on re-testing, providing the amended pages and/or Reports and for the time necessary to be spent on electronic filing. We will of course provide you with copies of any of the additions.

We regret any added expense to the Applicants, but of late the FCC continues to change their requirements without any prior written publication and/or notices.

As in the past, we will continue to provide all liaison with the FCC necessary for the successful conclusion of your project and the receipt of your Grant of Equipment Authorization.

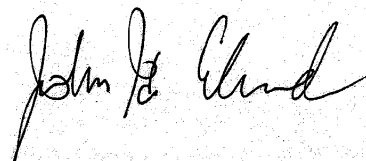
Sincerely yours,

John Erhard

## Summary of Restrictions

1. All submissions to the FCC are subject to **their** Examiner's interpretation.
2. Please allow from 60 to 90 days before hearing from the FCC with regard to any submission.
3. The FCC can set aside any action; modify or set aside any action, within 30 days. (FCC Rule 1.108, 1.113).
4. Under Rule 2.803, if device is not type accepted/certificated then it must **not** be sold, leased, offered for sale, imported, shipped or distributed or advertised for sale.
5. FCC can revoke its certificates at any time if the equipment does not meet or **continue** to meet their Rules. (Rule Parts 2.927, 2.939).
6. FCC can request a sample at any time (2.936).

M. Flom Associates, Inc.



John Erhard



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[info@flomlabs.com](mailto:info@flomlabs.com)

**Date:** April 21, 2008

Federal Communications Commission  
Via: Electronic Filing

**Attention:** Authorization & Evaluation Division

**Applicant:** Telex Communications, Inc.  
**Equipment:** 776-800 MHz Rev-WT  
**FCC ID:** B5DB120  
**FCC Rules:** 74H

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,

John Erhard

enclosure(s)  
cc: Applicant  
JE/mdw

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

p0810016, d0840029 Rev. 3.0



# Flom Test Labs

EMI, EMC, RF Testing Experts Since 1963

## Test Report

for

**Model:** 776-800 MHz Rev-WT

to

**Federal Communications Commission**

Rule Part(s) 74

Date of report: April 21, 2008

**On the Behalf of the Applicant:**

Telex Communications, Inc.

**At the Request of:**

Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

**Attention of:**

Charles E. Conner, Project Engineer  
(402) 467-5321; FAX: -3279  
E-mail: charlie.conner@us.telex.com  
Jim Andersen  
Email: jim.andersen@us.telex.com

Certifying Engineer:

A handwritten signature in black ink, appearing to read "John Erhard".

John Erhard

## Revision History

Revision	Date	Revised By	Reason for revision
1.0	April 21, 2008	M Wyman	Original Document
2.0	May 7, 2008	M.Wyman	TCB updates
3.0	June 18, 2008	M.Wyman	TCB updates



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Applicant: Telex Communications, Inc.

FCC ID: B5DB120

**By Applicant:**

1. Letter of Authorization
2. Confidentiality Request: 0.457 And 0.459
3. Part 90.203(e) & (g) Attestation
4. 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/SAR Report

**By F.T.L. :**

- 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.

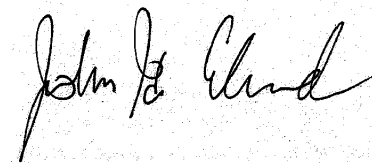


**Testimonial  
and  
Statement of Certification**

**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:



John Erhard

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Required information per ISO 17025-2005, paragraph 5.10.2:

a) **Test Report**

b) Laboratory: Flom Test Lab  
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107  
(Canada: IC 2044-A) Chandler, AZ 85225

c) Report Number: d0840029

d) Client: Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

e) Identification: 776-800 MHz Rev-WT

EUT Description: Belt Pack Transmitter

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

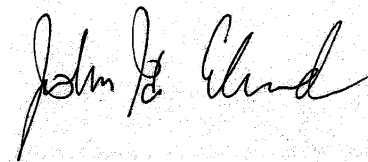
g) Report Date: April 21, 2008  
EUT Received:

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:



John Erhard

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.

Accessories used during testing:

Type	Quantity	Manufacturer	Model	Serial No.	FCC ID
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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:

- 15 – Radio Frequency Devices (unlicensed)
- 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 C63.4-2003, 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.

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](http://www.a2la.org) for current scope of accreditation.

Certificate number: 2152.01



**IC O.A.T.S. Number: 2044A-1**

## List of General Information Required for Certification

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

Sub-part 2.1033

(c)(1):

**Name and Address of Applicant:** Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

**Manufacturer:** Telex Communications, Inc.  
8601 E. Cornhusker Highway  
P.O. Box 5579  
Lincoln, NE 68505-5579

(c)(2): **FCC ID:** B5DB120

**Model Number:** Rev-WT

(c)(3): **Instruction Manual(s):** Please see attached exhibits

(c)(4): **Type of Emission:** 200KF3E

(c)(5): **Frequency Range, MHz:** 776 - 800

(c)(6): **Power Rating, Watts:** .04  
           \_\_\_ Switchable                    \_\_\_ Variable                    \_\_\_ N/A

**FCC Grant Note:** None

(c)(7): **Maximum Power Rating, Watts:** .250

**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	=	.500
Collector Voltage, Vdc	=	3.0
Supply Voltage,	=	3.0

(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:** RF Power Output (Radiated)  
**Specification:** 2.1046(a)  
**Test Equipment Utilized:** See Equipment list for details

**Test Date:** 4/21/08

### 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  $\pm 1.5$  dB.

### Measurement Results

State:

Ambient Temperature: 23°C  $\pm$  3°C

Amps Mode:

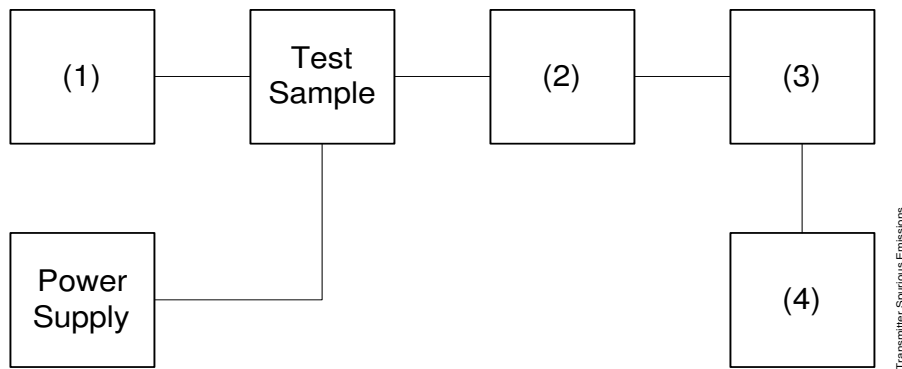
Frequency Tuned, MHz	Frequency Emission, MHz	Meter, dBuV/m	CF, dB	ERP, dBm	ERP, Watts
776.000	776.000	91.2	24.2	17.9	.060
788.000	788.000	91.3	24.3	18.2	.065
800.000	800.000	89.6	24.3	16.5	.045

**Name of Test:** Unwanted Emissions (Transmitter Conducted)  
**Specification:** 2.1051  
**Test Equipment Utilized:** See Equipment list for details **Test Date:** 4/22/08

**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**

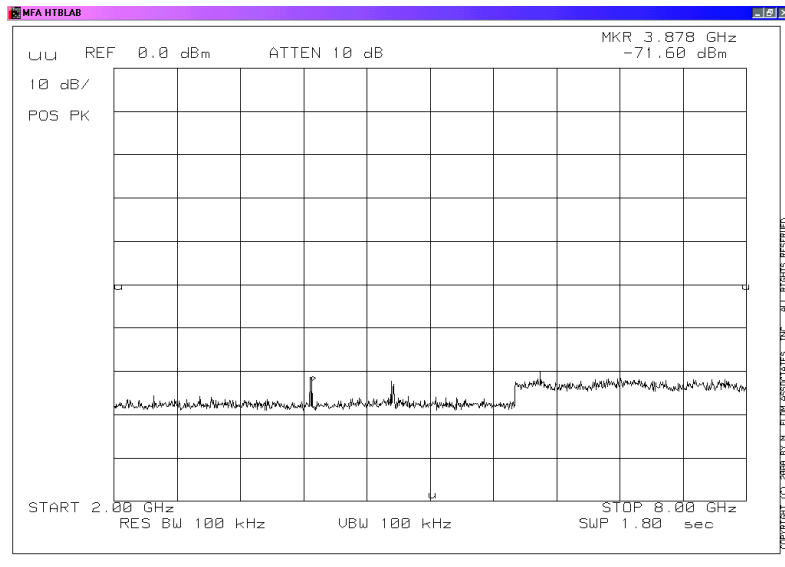
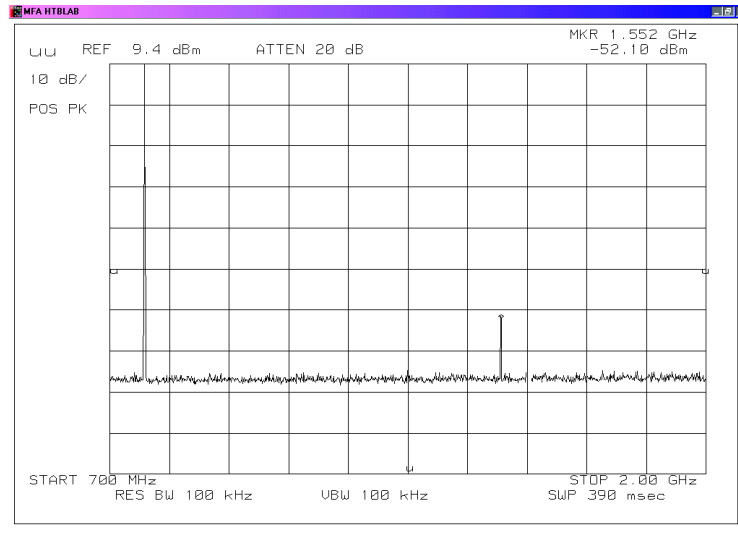


**Measurement Results**

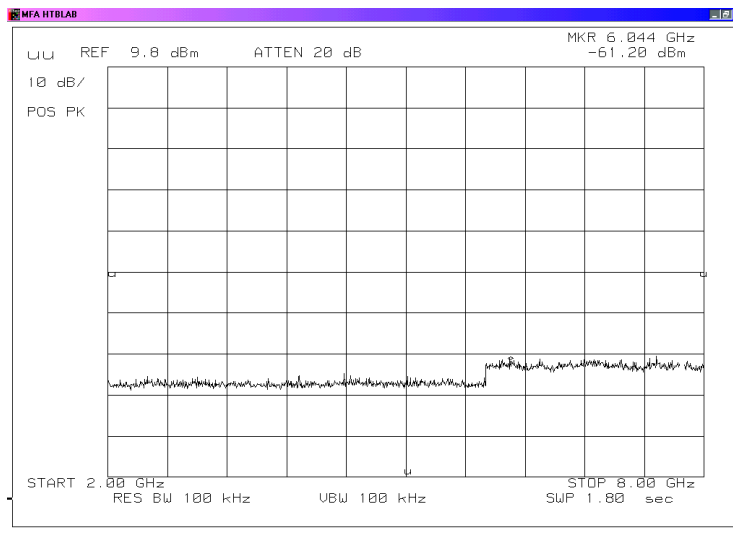
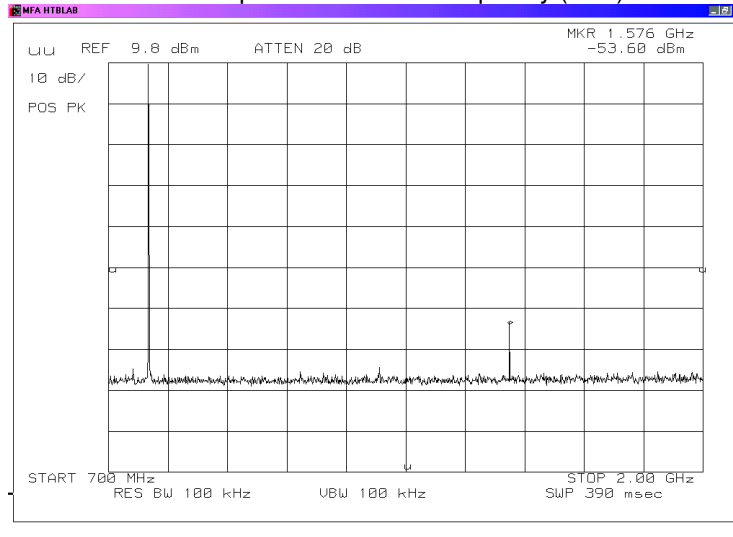
Graphical Results follow:

### Measurement Results

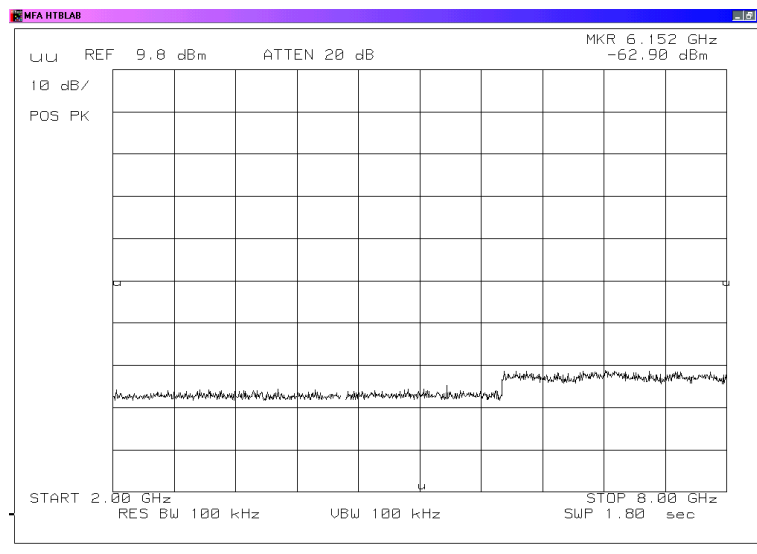
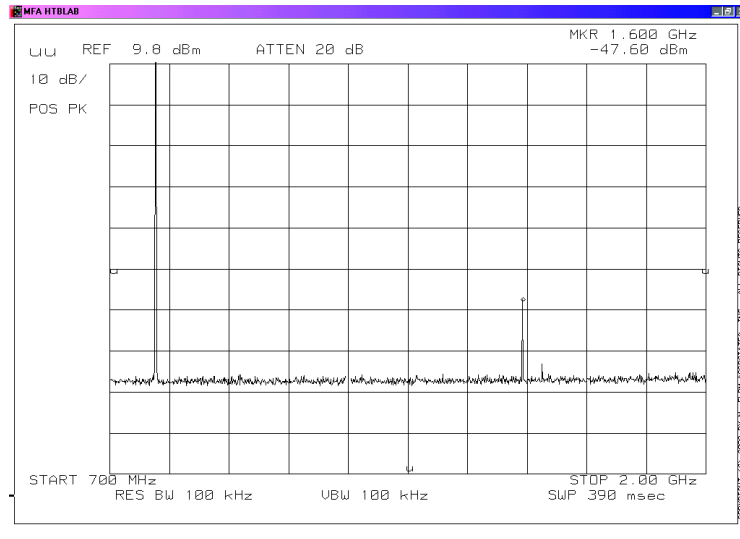
776 MHz panoramic of the frequency (10 fl)



788 MHz panoramic of the frequency (10 fl)



800 MHz panoramic of the frequency (10 fl)



*Michael D Wyman*

Performed by:

Michael Wyman

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

**Name of Test:** Field Strength of Spurious Radiation  
**Specification:** 2.1053(a)  
**Test Equipment Utilized:** See Equipment List for details

**Test Date:** 4/21/08

### 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  $\geq 3$  times Resolution Bandwidth, or 30 kHz (22.917)
  - 3) Sweep Speed  $\leq 2000$  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.
- 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  $\pm$  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.
- 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 =

$$10\log_{10}(\text{TX power in watts}/0.001) - \text{the levels in step I)}$$

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

**Name of Test:** Field Strength of Spurious Radiation

### Measurement Results

STATE: Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	EIRP, dBm	EIRP, dBc
776.000000	1551.940000	-12.5	-30.4
776.000000	2327.940000	-35.9	-53.9
776.000000	3103.940000	-48.4	-66.3
776.000000	3879.940000	-48.4	-66.3
776.000000	4655.940000	-46.9	-64.8
776.000000	5431.940000	-42.4	-60.3

Measurements were made to the 10<sup>th</sup> harmonic. There were no observable spurious past the 7<sup>th</sup> harmonic.

Frequency Tuned, MHz	Frequency Emission, MHz	EIRP, dBm	EIRP, dBc
788.000000	1576.000000	-12.0	-30.2
788.000000	2364.000000	-34.9	-53.1
788.000000	3152.000000	-49.2	-67.4
788.000000	3940.000000	-47.9	-66.1
788.000000	4728.000000	-45.7	-63.9
788.000000	5516.000000	-43.7	-61.9

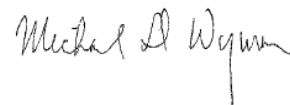
Measurements were made to the 10<sup>th</sup> harmonic. There were no observable spurious past the 7<sup>th</sup> harmonic.

**Name of Test:** Field Strength of Spurious Radiation  
**Measurement Results**

**STATE:** Ambient Temperature: 23°C ± 3°C

Frequency Tuned, MHz	Frequency Emission, MHz	EIRP, dBm	EIRP, dBc
800.000000	1600.030000	-15.9	-32.4
800.000000	2400.030000	-38.8	-55.0
800.000000	3200.030000	-47.9	-64.1
800.000000	4000.030000	-47.6	-63.8
800.000000	4800.030000	-45.5	-61.7
800.000000	5600.030000	-44.0	-60.2

Measurements were made to the 10<sup>th</sup> harmonic. There were no observable spurious past the 7<sup>th</sup> harmonic.



Performed by:

Michael Wyman



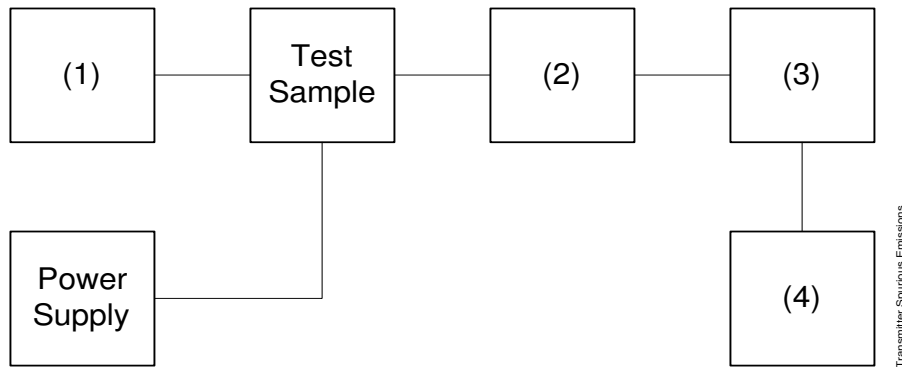
**Name of Test:** Emission Masks (Occupied Bandwidth)  
**Specification:** 2.1049(c)(1)  
**Test Equipment Utilized:** See Equipment List for details

**Test Date:** 4/20/08

**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 2500 Hz. 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**

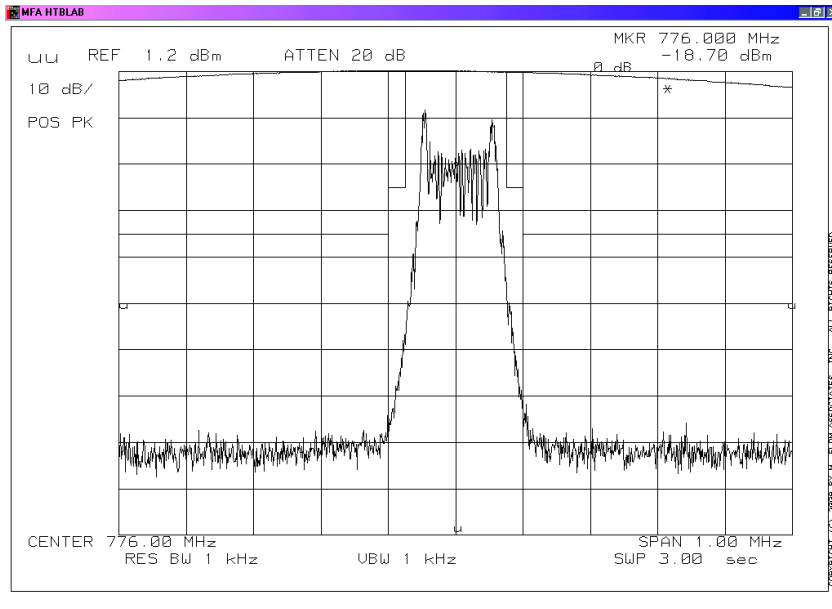


### Measurement Results

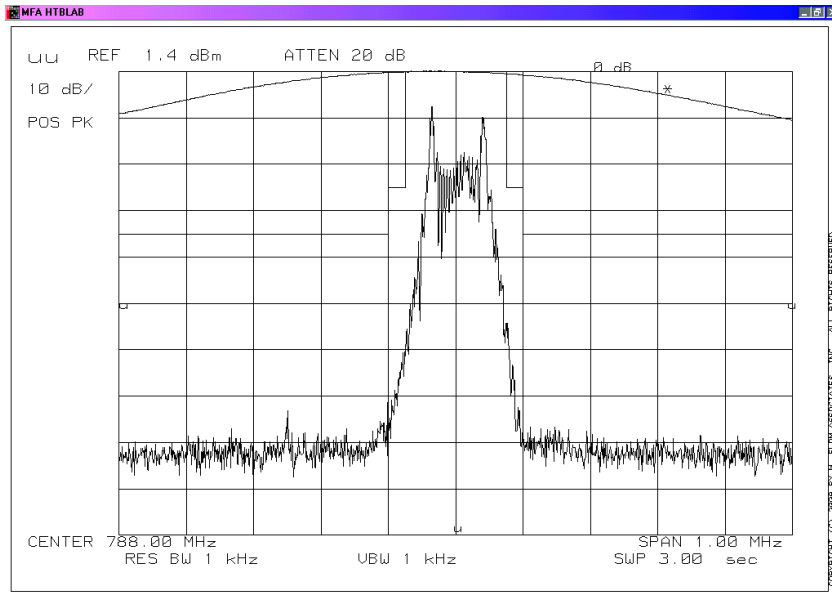
State:

Ambient Temperature: 23°C ± 3°C

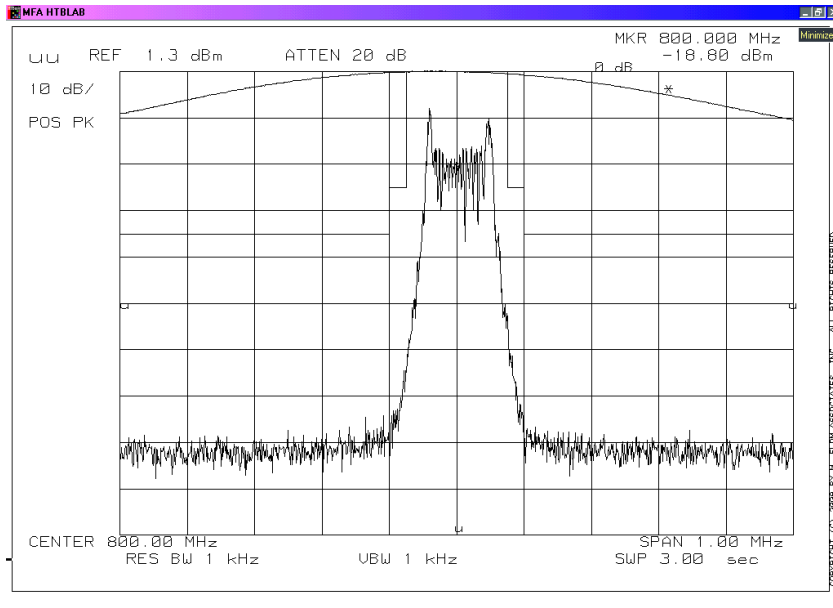
#### Lower Frequency Bandwidth



#### Mid Frequency Bandwidth



### High Frequency Bandwidth



*Michael D Wyman*

Performed by:

Michael Wyman

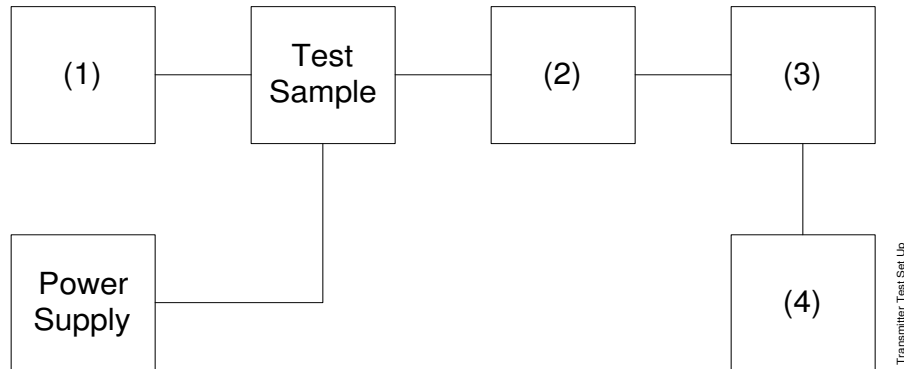
**Name of Test:** Audio Frequency Response  
**Specification:** 2.1047(a)  
**Test Equipment Utilized:**

**Test Date:**

**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**

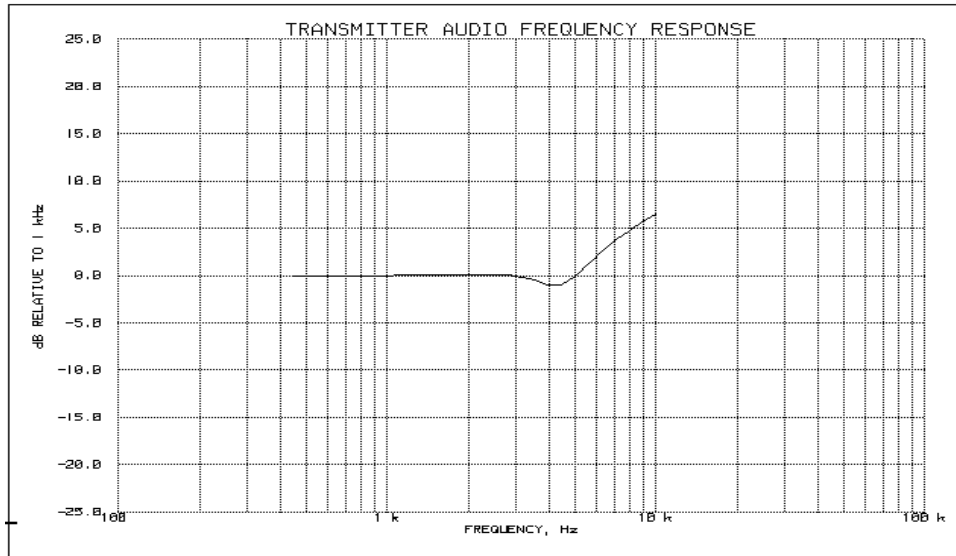


### Measurement Results

State:

Ambient Temperature: 23°C ± 3°C

Frequency of Maximum Audio Response, Hz = 1000Hz



R

Performed by:

Michael Wyman

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

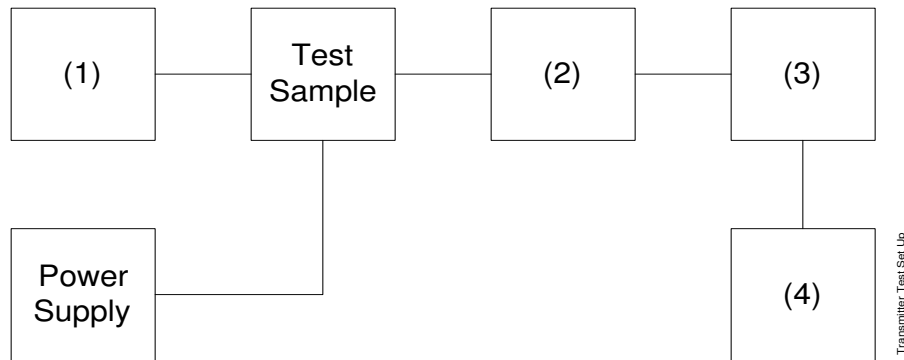
**Name of Test:** Modulation Limiting  
**Specification:** 2.1047(b)  
**Test Equipment Utilized:**

**Test Date:**

**Measurement Procedure**

- A) The signal generator was connected to the input of the EUT as shown below.
- B) The modulation response was measured for each of three frequencies (one of which was the frequency of maximum response), and the input voltage was varied and was observed on an HP 8901A Modulation Analyzer.
- C) The input level was varied from 30% modulation ( $\pm 1.5$  kHz deviation) to at least 20 dB higher than the saturation point.
- D) Measurements were performed for both negative and positive modulation and the respective results were recorded.

**Transmitter Test Set-Up: Modulation Limiting**

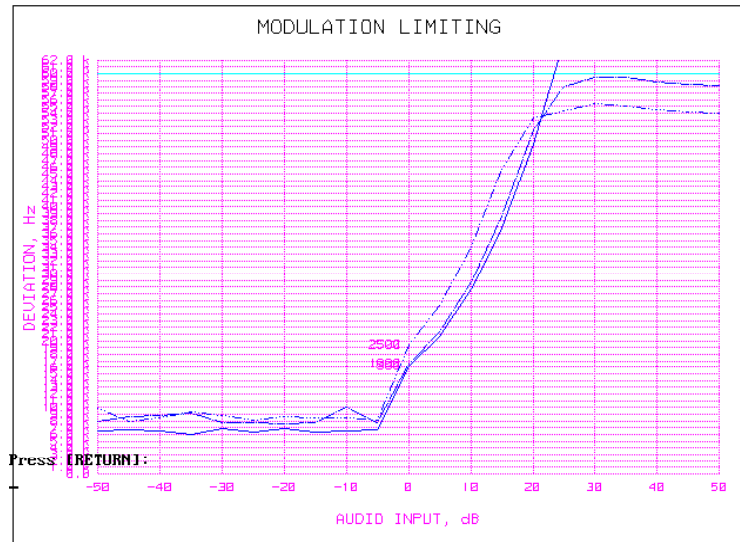


### Measurement Results

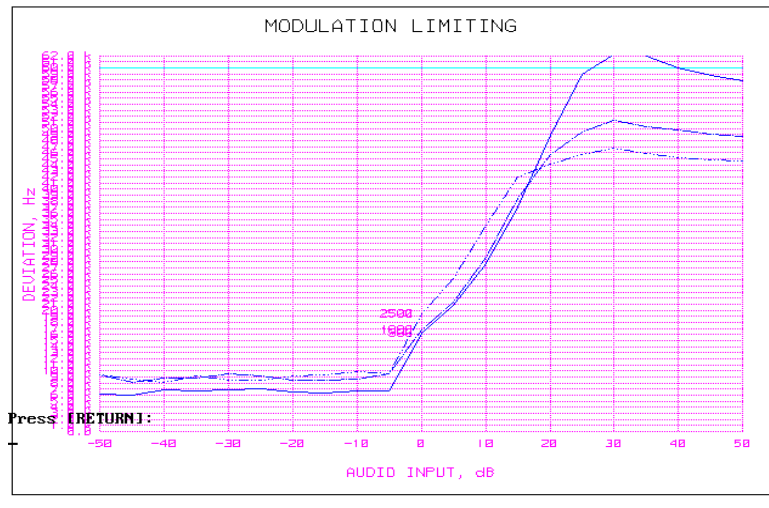
State:

Ambient Temperature: 23°C ± 3°C

Positive  
Peaks:



Negative  
Peaks:



*Michael D Wyman*

Performed by:

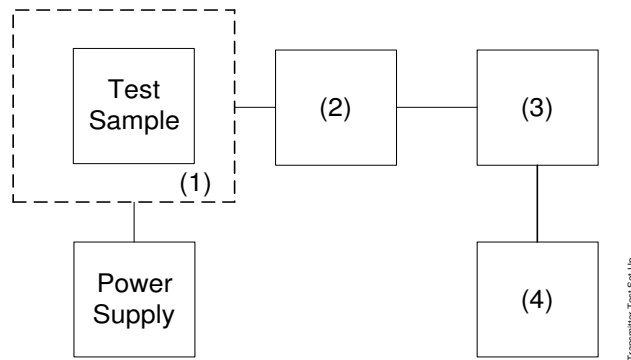
Michael Wyman

**Name of Test:** Frequency Stability (Temperature Variation)  
**Specification:** 2.1055(a)(1)  
**Test Equipment Utilized:** See Equipment List for details **Test Date:** 4/20/08

**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**

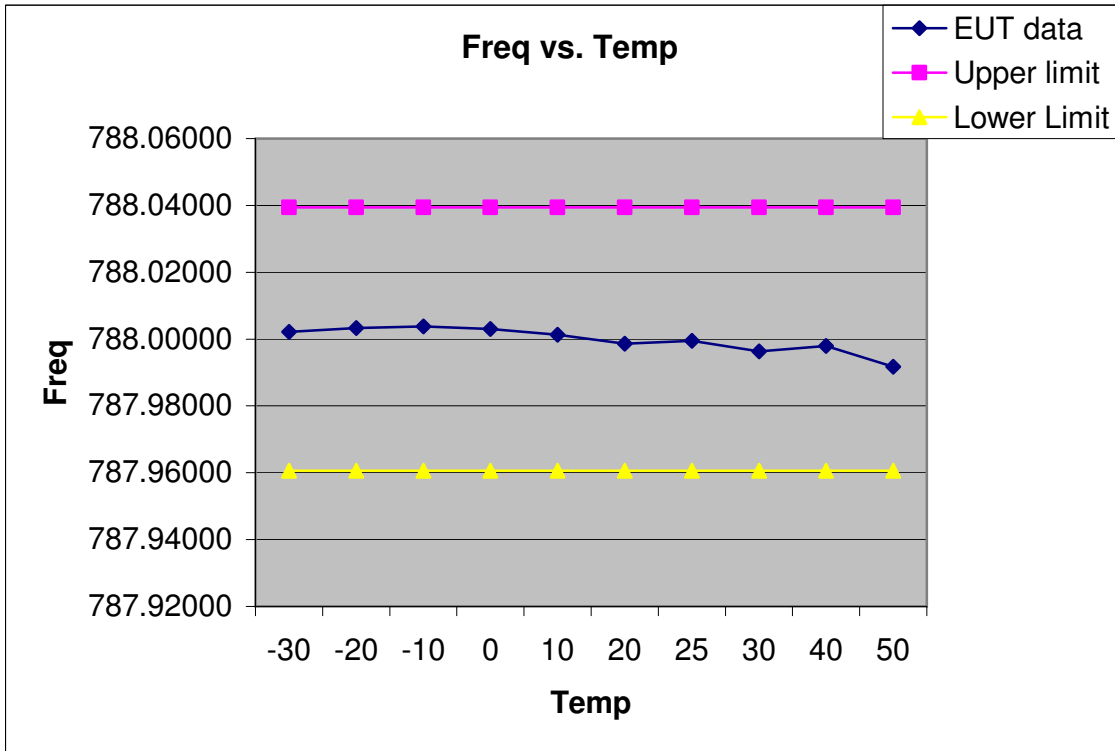




### Measurement Results

State:

Ambient Temperature: 23°C ± 3°C



Maximum deviation of frequency was 6.180KHz. The limit was 39.400KHz.

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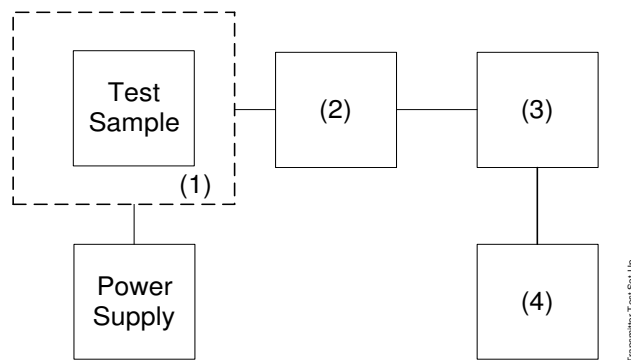
**Name of Test:** Frequency Stability (Voltage Variation)  
**Specification:** 2.1055(b)(1)  
**Test Equipment Utilized:** See Equipment List for details

**Test Date:** 4/21/08

**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**



**Measurement Results**

State: Ambient Temperature: 23°C ± 3°C

Battery End Point (Voltage) = 3.00

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
85%	2.55	787.99954	46	.5
100%	3.00	787.99952	48	.5
115%	3.45	787.99977	23	.01

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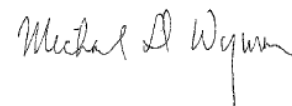
**Name of Test:** Necessary Bandwidth and Emission Bandwidth  
**Specification:** 2.202(g)  
**Test Equipment Utilized:** See Equipment List for Details **Test Date: June 18, 2008**

$$B_n = 2M + 2DK$$

$$\text{Modulation} = 2500\text{Hz}$$

**Necessary Bandwidth Calculation:**

Maximum Modulation (M), kHz	=	40KHz
Maximum Deviation (D), kHz	=	75KHz
Constant Factor (K)	=	1
Necessary Bandwidth (B <sub>N</sub> ), kHz	=	230K0F3E
	=	



Performed by:

Michael Wyman

### Test Equipment Utilized

Description	MFG	Model Number	FTL Asset Number	Last Cal Date	Cal Due Date
RF Pre-Amplifier	HP	8449	i00028	1/23/07	1/23/09
Spectrum Analyzer	HP	8563E	i00029	3/9/07	3/9/08
Spectrum Analyzer	HP	8566B	i00049	8/18/07	8/18/08
Horn Antenna	EMCO	3115	i00103	9/5/06	9/5/08
Horn Antenna	ARA	DRG-1181A	i00271	3/6/07	3/6/09
Power Meter	HP	E4418B	i00228	9/6/07	9/6/08
LISN	FCC	FCC-LISN-50-32-2-01	i00270	10/25/05	10/25/07
Power sensor	HP	8481A	i00317	9/6/07	9/6/08
Spectrum Analyzer	HP	8566B	i00329	4/16/07	4/16/08

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