



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: May 29, 2007

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Communications Specialists, Inc.
Equipment: PT-90
FCC ID: CFXPT-90
FCC Rules: 90.259, 90.217(c)

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,

Hoosamuddin S. Bandukwala, Lab Director

enclosure(s)
cc: Applicant
HSB/je

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

FCC ID: CFXPT-90
MFA p0750013, d0750081



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- a) Application Form
- b) Test Report (if applicable)
- c) Filing Fees
- d) Copy of Original Grant
- e) Expository Statement and/or letter by Applicant
- f) Photos (if applicable)
- g) Label Drawing (if changes have been made)

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,

Hoosamuddin S. Bandukwala, Lab Director

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cc: Applicant
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Transmitter Certification

of

FCC ID: CFXPT-90
Model: PT-90

to

Federal Communications Commission

Rule Part(s) 90.259, 90.217(c)

Date of report: May 29, 2007

**On the Behalf of the
Applicant:**

Communications Specialists, Inc.

At the Request of:

Communications Specialists, Inc.
426 W. Taft Ave
Orange, CA 92665

Attention of:

Spence Porter, President
(800) 854-0547; (714) 998-3021
FAX: (800) 850-0547; (714) 974-3420

Supervised by:

Hoosamuddin S. Bandukwala, Lab Director

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

FCC ID: CFXPT-90
MFA p0750013, d0750081

List of Exhibits

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

Applicant: Communications Specialists, Inc.

FCC ID: CFXPT-90

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 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.

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90.217, 2.1046(a)	RF Power Output (Radiated)	7
90.217(c), 2.1051	Unwanted Emissions (Transmitter Conducted)	8
90.217(c), 2.1053(a)	Field Strength of Spurious Radiation	10
90.217(c), 90.259, 2.1049(c)(1)	Emission Masks (Occupied Bandwidth)	11
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Required information per ISO 17025-2005, paragraph 5.0:

a) **Test Report**

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

c) Report Number: d0750081

d) Client: Communications Specialists, Inc.
426 W. Taft Ave
Orange, CA 92665

e) Identification: PT-90
FCC ID: CFXPT-90

EUT Description:

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

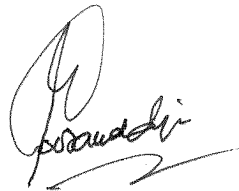
g) Report Date: May 29, 2007
EUT Received:

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:



Hoosamuddin S. Bandukwala, Lab Director

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
- x 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 Draft, 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.

A2LA

“A2LA has accredited Flom Test Labs, Inc. Chandler, AZ for technical competence in the field of Electrical Testing. The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO 17025:2005 ‘General Requirements for the Competence of Testing and Calibration Laboratories’ and any additional program requirements in the identified field of testing.”

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

Certificate Number: **2152.01**

List of General Information Required for Certification

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

90.259, 90.217(c)Sub-part 2.1033

(c)(1):

Name and Address of Applicant: Communications Specialists, Inc.
426 W. Taft Ave
Orange, CA 92665

Manufacturer: Communications Specialists, Inc.
426 W. Taft Ave
Orange, CA 92665

(c)(2): **FCC ID:** CFXPT-90

Model Number: PT-90

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

Please see attached exhibits

(c)(4): **Type of Emission:** N0N6K50

(c)(5): **Frequency Range, MHz:** 217.00625 to 219.99375

(c)(6): **Power Rating, Watts:** 5.5 mW
 ___ Switchable ___ Variable ___ N/A

FCC Grant Note:

(c)(7): **Maximum Power Rating, Watts:** 120 mW

DUT Results: Passes x Fails

The unit was tested with a monopole cable antenna with a gain of -3dBi.

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	=	.05A
Collector Voltage, Vdc	=	4.1 VDC
Supply Voltage, Vdc	=	3.2 - 4.1 VDC

(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 :**

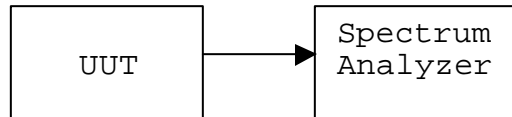
Follows

Name of Test: Carrier Output Power (Conducted)
Specification: 90.217, 2.1046(a)
Test Equipment: i00329, i00330

Test Procedure

The UUT was connected to a spectrum analyzer with the resolution and video bandwidths set to 1MHz. The MAX hold function was used to capture the trace and the peak value was measured. The cable and connector loss was input as an offset to ensure that the recorded values were correct.

Test Set-Up



Test Results

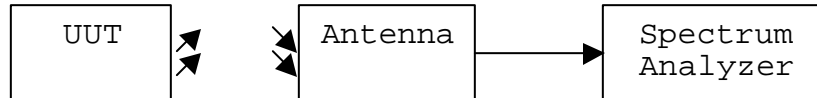
Frequency MHz	Recorded Level dBμV	Limit dBμV	Result
217.00625	112.1	128	Pass
219.99375	112.2	128	Pass

Name of Test: RF Power Output (Radiated)
Specification: 90.217, 2.1046(a)
Test Equipment: i00048, i00049, i00050, i00051, i00088

Test Procedure

The UUT was tested in an Open Area Test Site (OATS) set 3m from the receiving transducer. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Spurious Emissions. The peak fundamental reading was taken.

Test Setup



Test Results

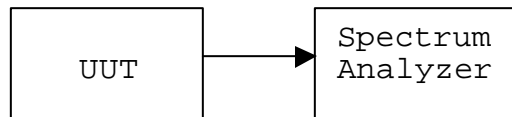
Frequency MHz	Recorded Level dB μ V/m	Correction Factor dB	Corrected Level dB μ V/m	Limit dB μ V/m	Result
217.00625	98.0	18.9	116.9	128	Pass
219.99375	98.4	18.9	117.3	128	Pass

Name of Test: Unwanted Emissions (Transmitter Conducted)
Specification: 90.217(c), 2.1051
Test Equipment: i00329, i00330

Test Procedure

The UUT was connected to a spectrum analyzer and the reference level was offset for the maximum signal level. A display line was placed -30 dBc and the conducted emissions were plotted to a frequency greater than the 10th harmonic. The highest emission for the high and low frequencies was recorded.

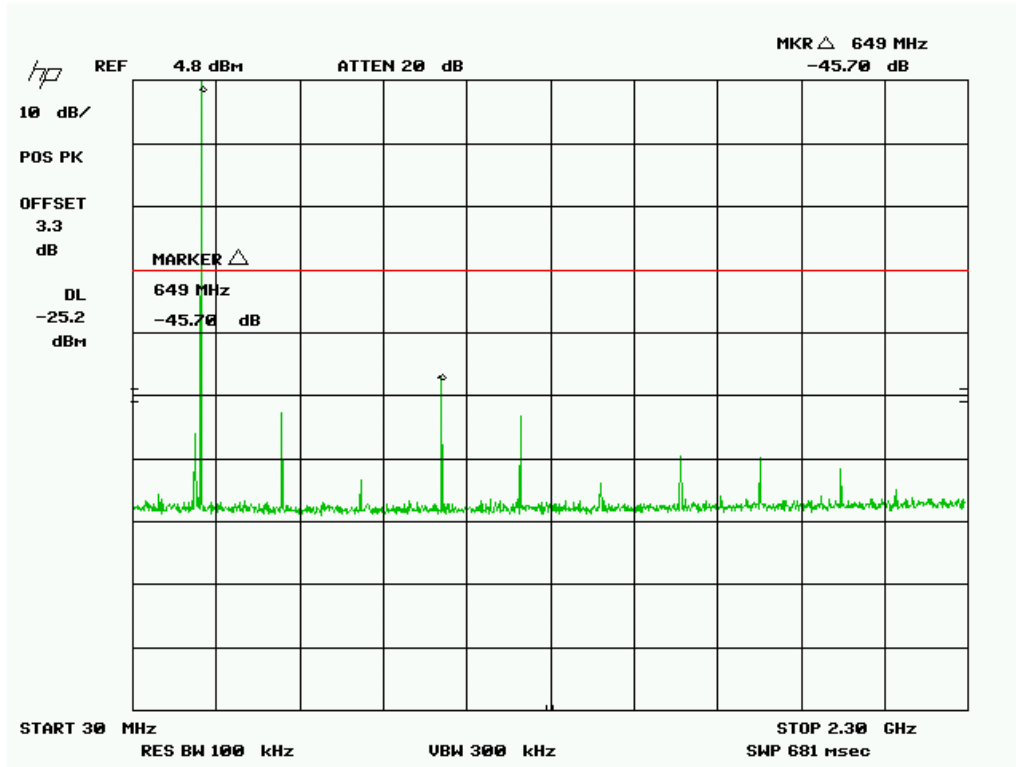
Test Set-Up



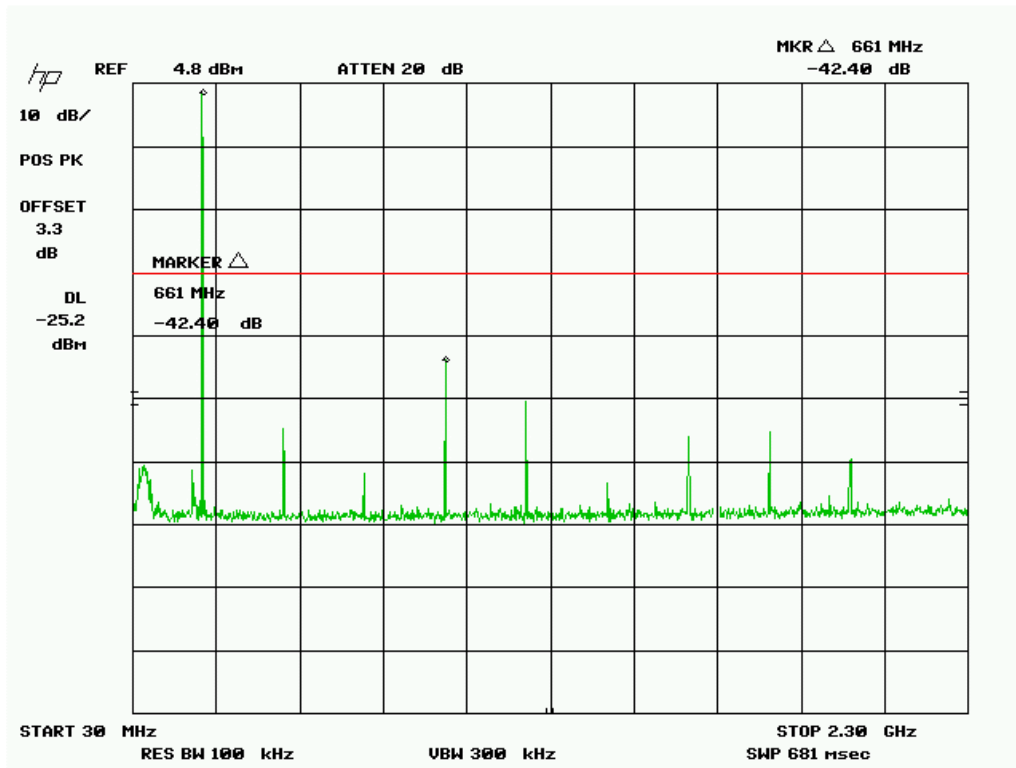
Test Results

Tuned Frequency MHz	Recorded Level dBc	Limit dBc	Result
217.00625	-45.7	-30	Pass
219.99375	-42.4	-30	Pass

217.00625 MHz Plot



219.99375 MHz Plot

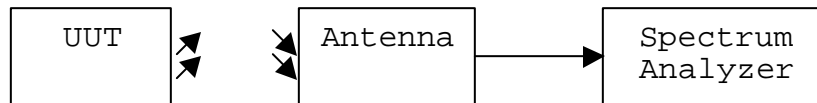


Name of Test: Field Strength of Spurious Radiation
Specification: 90.217(c), 2.1053(a)
Test Equipment: i00048, i00049, i00050, i00051, i00089, i00103

Test Procedure

The UUT was tested in an Open Area Test Site (OATS) set 3m from the receiving transducer. A spectrum analyzer was used to verify that the UUT met the requirements for Radiated Spurious Emissions. The spectrum to the 10th harmonic was investigated to ensure all emissions were greater than -30 dBc.

Test Setup



217.00625 Results

Frequency MHz	Recorded Level dB μ V/m	Correction Factor dB	Corrected Level dB μ V/m	Limit dB μ V/m	Result
434.025	44.7	21.6	66.3	86.9	Pass
651.075	40.8	25.9	66.7	86.9	Pass
868.049	3838	2836	67.4	86.9	Pass
1085.122	37.6	30.0	67.6	86.9	Pass
1302.139	38.0	31.2	69.2	86.9	Pass
1519.164	37.5	32.3	69.8	86.9	Pass
1736.197	38.1	33.7	71.8	86.9	Pass
1953.222	40.4	35.0	75.4	86.9	Pass
2170.247	38.5	36.1	74.6	86.9	Pass

219.99375 Results

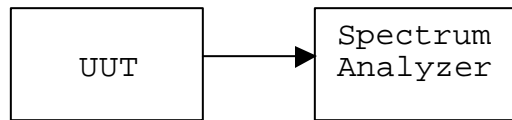
Frequency MHz	Recorded Level dB μ V/m	Correction Factor dB	Corrected Level dB μ V/m	Limit dB μ V/m	Result
439.975	35.1	21.7	56.8	87.3	Pass
659.962	28.3	26.0	54.3	87.3	Pass
879.883	34.6	28.5	63.1	87.3	Pass
1099.937	38.9	30.1	69.0	87.3	Pass
1316.925	38.1	31.3	69.4	87.3	Pass
1539.912	37.9	32.4	70.3	87.3	Pass
1759.900	38.3	33.9	72.2	87.3	Pass
1979.997	38.5	35.2	73.7	87.3	Pass
2199.937	38.8	36.1	74.9	87.3	Pass

Name of Test: Emission Masks (Occupied Bandwidth)
Specification: 90.217(c), 90.259, 2.1049(c)(1)
Test Equipment: i00029

Test Procedure

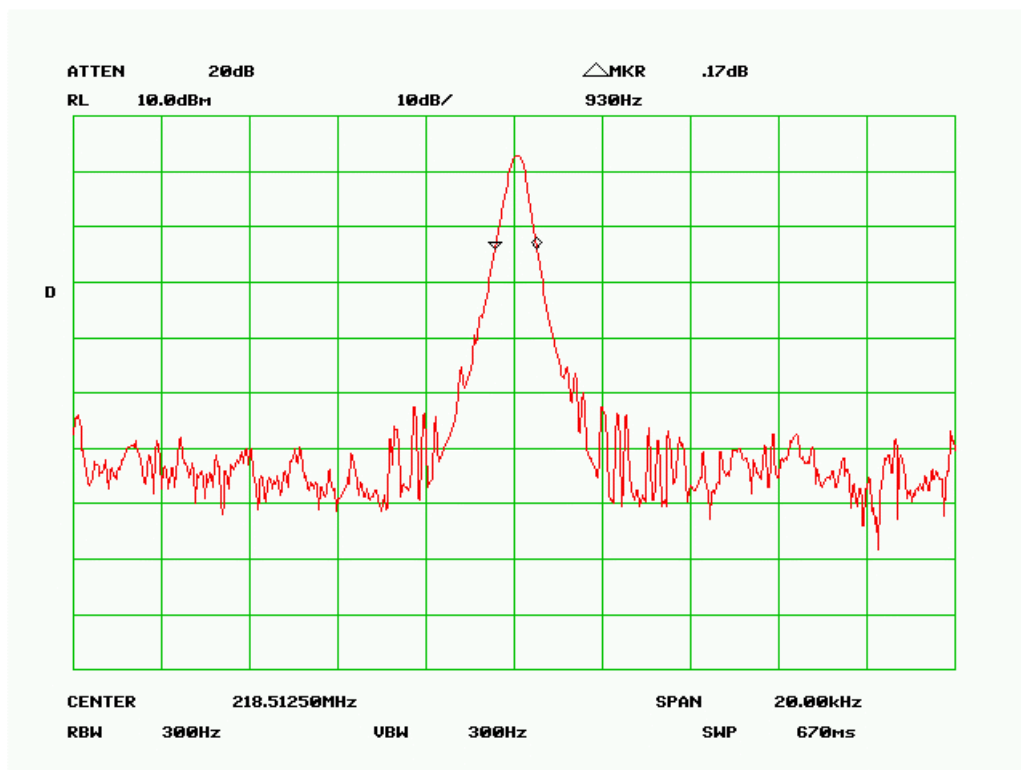
The UUT was connected to a spectrum analyzer. The occupied bandwidth and transmission masks were both examined and plotted to verify they meet the specifications.

Test Setup

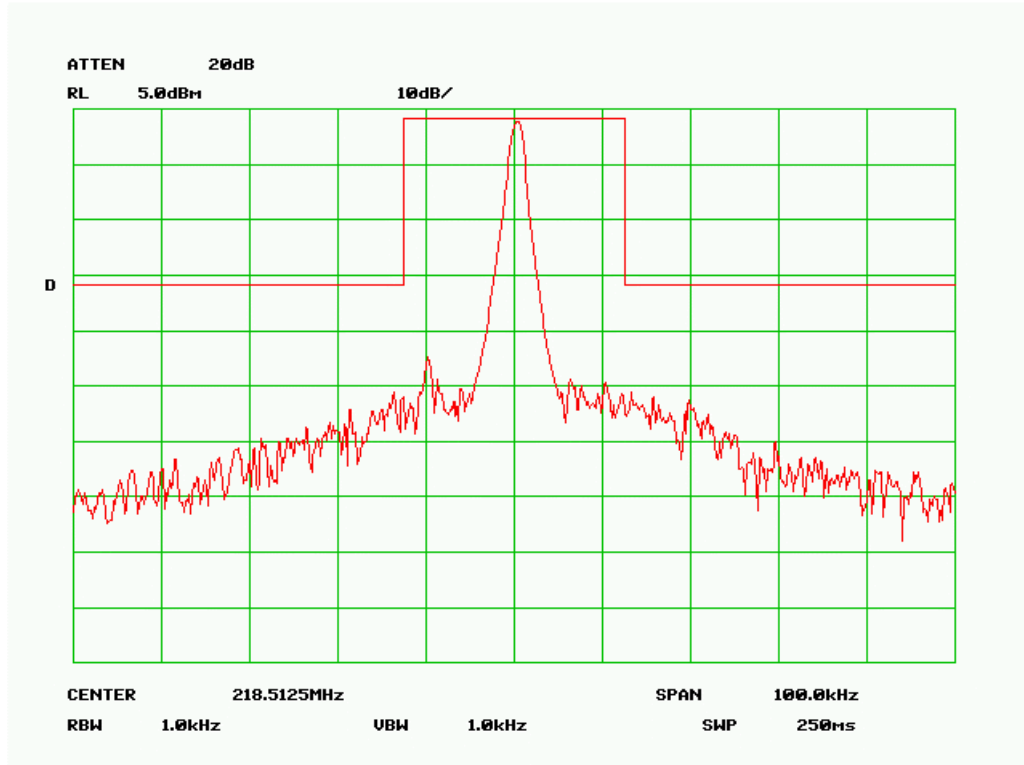


Test Results (occupied bandwidth)

Measured Bandwidth	Bandwidth Limit	Result
930 Hz	6.5 kHz	Pass



Test Plot (transmission mask)

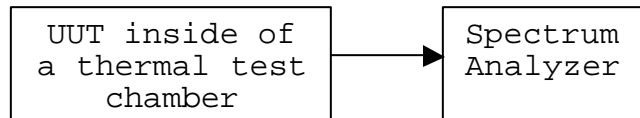


Name of Test: Frequency Stability (Temperature Variation)
Specification: 47 CFR 2.1055(a)(1)
Test Equipment: i00027, i00029

Test Procedure

The UUT was placed inside of a thermal test chamber and the RF output was connected to a spectrum analyzer. The temperature was set to 25°C and the spectrum analyzer was set so the TX was on the center frequency. The temperature was varied from -30°C to +50°C in 10°C increments with a 30-minute soak time at each level. The MAX hold function of the analyzer was used to capture the transmission and the ? marker function was utilized to measure the frequency stability.

Test Set-Up



Test Results

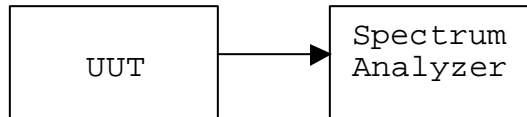
Measured Low Frequency MHz	Measured High Frequency MHz	Frequency Variation Hz	Frequency Variation PPM	Limit Hz	Limit PPM	Result
218.512490	218.512599	109	0.5	110	0.5	Pass

Name of Test: Frequency Stability (Voltage Variation)
Specification: 47 CFR 2.1055(d)(1)
Test Equipment: i00008, i00029

Test Procedure

The UUT was connected to a variable DC power supply and the input voltage was varied from 85% to 115% while the RF output was monitored with a spectrum analyzer. The MAX hold function of the analyzer was used to capture the transmission and the ? marker function was utilized to measure the frequency stability.

Test Set-Up



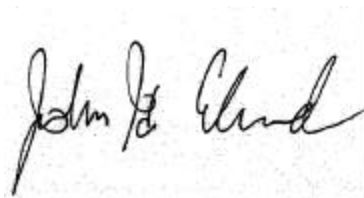
Test Results

Measured Low Frequency MHz	Measured High Frequency MHz	Frequency Variation Hz	Frequency Variation PPM	Limit Hz	Limit PPM	Result
218.512545	218.512545	0	0	110	0.5	Pass

Test Equipment Utilized

Asset#	Manufacturer	Model	Serial Number	Calibration Cycle	Calibration Due
i00008	Kenwood	PR19-3A	5080154	N/A	N/A
i00027	Tenney	Tenney Jr	9083-76J-234	12 mo.	9/12/2007
i00029	HP	8563E	3213A00104	12 mo.	3/9/2008
i00048	HP	85662A	2511AD1467	12 mo.	8/30/2007
i00049	HP	8566B	2511AD1467	12 mo.	8/30/2007
i00050	HP	85685A	2510A00185	12 mo.	7/25/2007
i00051	HP	85650A	2521A00647	12 mo.	7/25/2007
i00088	EMCO Biconical	3109B	2336	12 mo.	10/14/2007
i00089	Aprel Log Periodic	2001	001500	12 mo.	10/25/2007
i00103	EMCO Horn	3115	9028-3925	36 mo.	10/4/2009
i00329	HP	85662A	3144A20376	12 mo.	4/16/2008
i00330	HP	8566b	3138A07426	12 mo.	4/16/2008

In addition to the above listed equipment standard RF connectors and cables were utilized in testing. Their proper operation was verified prior to testing.

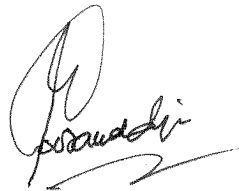


END OF TEST REPORT

**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:

Hoosamuddin S. Bandukwala, Lab Director