



Engineering Solutions & Electromagnetic Compatibility Services

FCC Class II Permissive Change Report

Harris Corporation
221 Jefferson Ridge Parkway
Lynchburg, VA 24501
Daryl Popowitch
Phone: (434) 455-9527

Model: M7300 VHF 50W Mobile Radio

FCC ID: OWDTR-0055-E

September 14, 2011

| Standards Referenced for this Report | |
|--------------------------------------|---|
| Part 2: 2010 | Frequency Allocations and Radio Treaty Matters; General Rules and Regulations |
| Part 80: 2010 | Stations in the Maritime Services |
| TIA-EIA-603-C August 2004 | Land Mobile FM or PM Communications Equipment – Measurement and Performance Standards |

| Frequency Range (MHz) | Rated Transmit Power (W) (Conducted) | Measured Frequency Tolerance (ppm) | Emission Designator |
|-----------------------|--------------------------------------|------------------------------------|---------------------|
| 156 – 162 | 50* | 0.5 | 16K0F3E |

* coast station application, 25 W for ship stations

Report Prepared By: Daniel Baltzell

Document Number: 2011141

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These tests are accredited and meet the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board/ACLASS. Refer to certificate and scope of accreditation AT-1445.

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1 Test Result Summary

| Test | FCC Reference | Result |
|---|---------------------------------|----------|
| RF Power Output | 2.1046(a), 80.215 | Complies |
| Spurious Emissions at Antenna Terminals | 2.1051, 2.1057, 80.211(f)(3) | Complies |
| Field strength of spurious radiation | 2.1053(a), 2.1057, 80.211(f)(3) | Complies |
| Occupied Bandwidth | 2.1049(c)(1), 80.205, 80.211(f) | Complies |
| Modulation Characteristics | 2.1047(a)(b), 80.213 | Complies |

1.1 General Information

The following Class 2 Permissive Change Report is prepared on behalf of Harris Corporation in accordance with the Federal Communications Commission rules and regulations. The Equipment Under Test (EUT) was the M7300 VHF 50W Mobile Radio; FCC ID: OWDTR-0055-E.

The purpose of this Class 2 Permissive Change is to certify the maritime services in the 156-162 MHz band under Part 80. The justification for this addition via a Class II Permissive Change is that the original hardware could always support these frequencies and modes of operation.

All measurements contained in this application were conducted in accordance with the applicable sections of FCC Rules and Regulations CFR 47 Parts 2 and 80. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

1.2 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the parking lot of Rhein Tech Laboratories, Inc. 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report submitted to, and approved by, the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

1.3 Related Submittal(s)/Grant(s)

The original FCC certification was granted on 09/23/2009.

1.4 Grant Notes

The power is continuously variable from 1 W to 50 W.

2 Tested System Details

The test sample was received on September 8, 2011. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

Table 2-1: Equipment Under Test (EUT)

| Part | Manufacturer | Model | PN/SN | FCC ID | RTL Bar Code |
|----------------------------|--------------------|--------------|--------------|--------------|--------------|
| M7300 VHF 50W Mobile Radio | Harris Corporation | MAMW-SHMXX | A40123347592 | OWDTR-0055-E | 20271 |
| CH721 Control Unit | Harris Corporation | CU23218-0004 | 96008459 | N/A | 20270 |

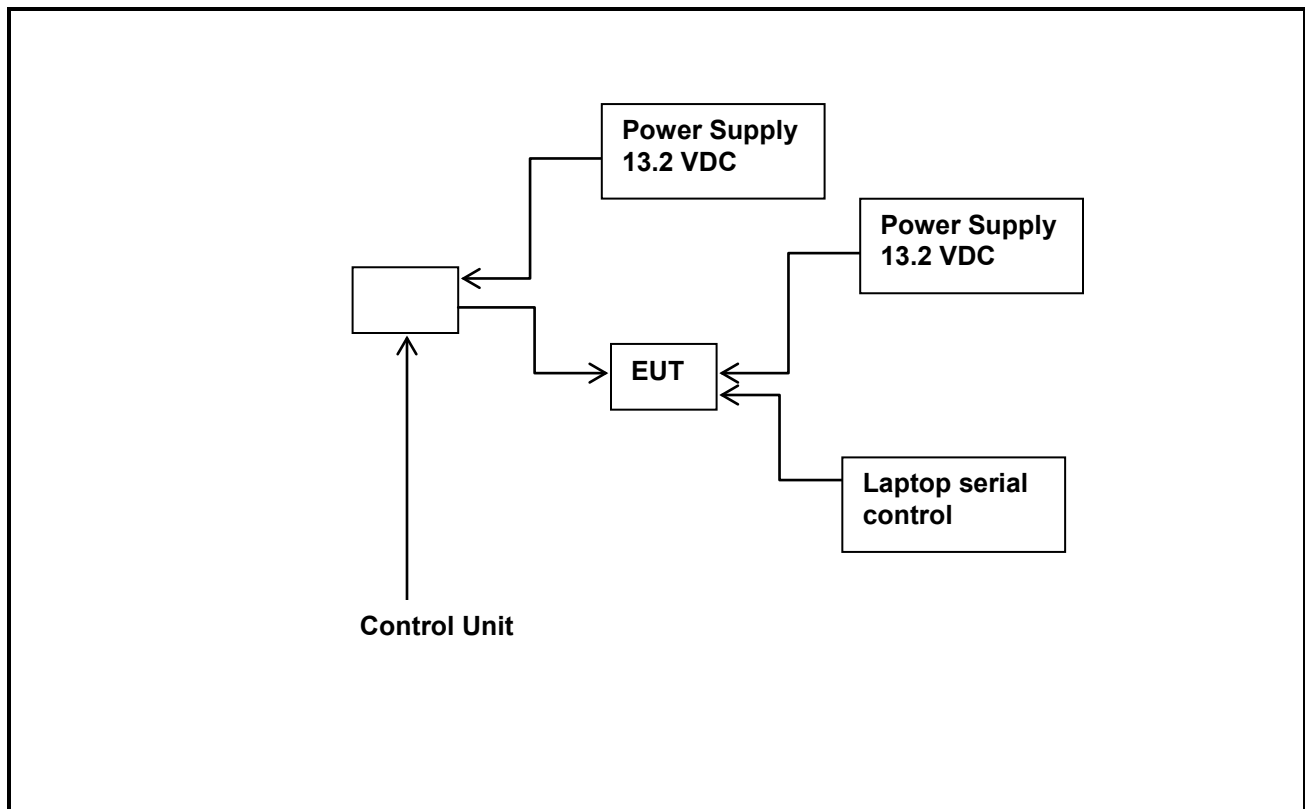


Figure 2-1: Configuration of Tested System

3 FCC Rules and Regulations Part 2.1046(a): RF Power Output: Conducted, Part 80.215 Transmitter Power

3.1 Test Procedure

ANSI/TIA-603-2004, section 2.2.1

The EUT was connected to a coaxial attenuator having a 50 Ω load impedance.

3.2 Test Data

Table 3-1: RF Power Output: Carrier Output Power

| Frequency (MHz) | Power (dBm) | Power (W) |
|-----------------|-------------|-----------|
| 156.8 | 44.4 | 27.5 |
| 156.8 | 47.2 | 52.5 |

Table 3-2: Test Equipment Used For Testing RF Power Output - Conducted

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|----------------------|----------|-------------------------------------|---------------|----------------------|
| 901184 | Agilent Technologies | E4416A | EPM-P Power Meter, single channel | GB41050573 | 1/11/12 |
| 901356 | Agilent Technologies | E9323A | Power Sensor | 31764-264 | 1/20/12 |
| 901338 | MCE Weinschel | 48-40-34 | Attenuator, 40 dB, DC-18 GHz, 100 W | BM0556 | 7/15/12 |

Test Personnel:

Daniel Baltzell
EMC Test Engineer



Signature

September 9, 2011
Date of Test

4 FCC Rules and Regulations Part 2.1051: Spurious Emissions at Antenna Terminals; Spurious Emissions at Antenna Terminals; Part 80.211 Emission Limitations

4.1 Test Procedure

ANSI/TIA-603-2004, Section 2.2.13

The transmitter is terminated with a $50\ \Omega$ load and interfaced with a spectrum analyzer.

4.2 Test Data

Frequency range of measurement per Part 2.1057: 9 kHz to $10 \times F_c$

Limits: $(43+10\log P(W))$

Plot 4-1: Spurious Emissions at Antenna Terminals – 156.8 MHz

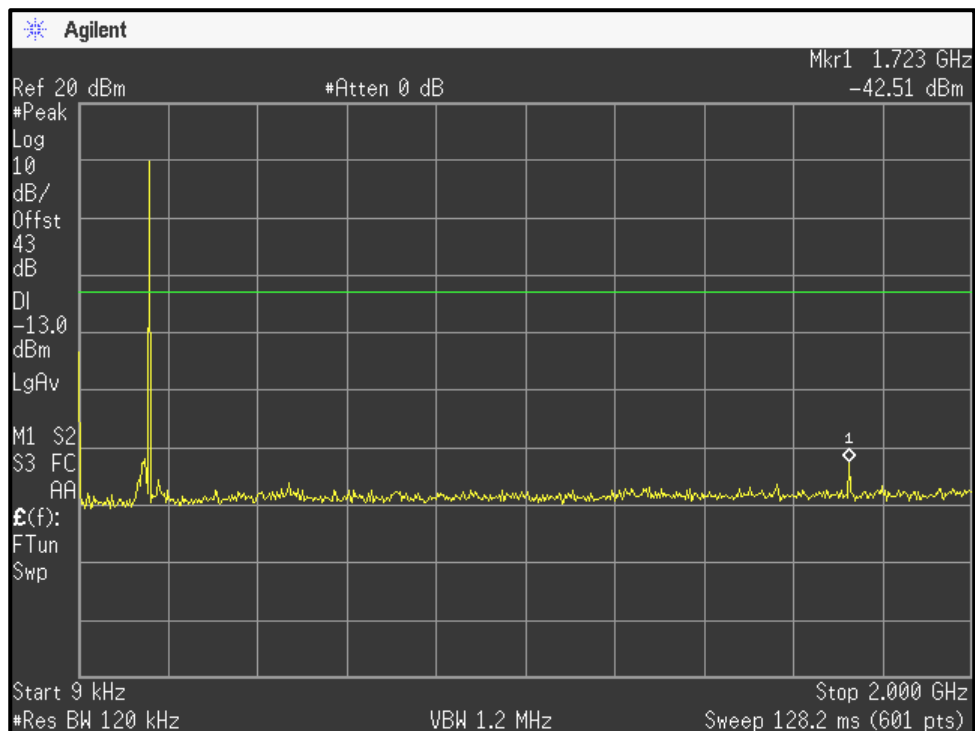


Table 4-1: Test Equipment Used For Testing Spurious Emissions

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|--------------------|----------------------|---------------|--|----------------------|-----------------------------|
| 901413 | Agilent Technologies | E4448A | Spectrum Analyzer | US44020346 | 12/29/12 |
| 901338 | MCE Weinschel | 48-40-34 | Attenuator, 40 dB, DC-18 GHz, 100 W | BM0556 | 7/15/12 |
| 901358 | Aeroflex/Weinschel | 47-3-34 | Attenuator, 3 dB0.1 - 18 GHz | BS0146 | 2/14/12 |
| 901129 | Par Electronics | 188-174 (25W) | VHF Notch Filters | N/A | 3/10/12 |

Test Personnel:

| | | |
|-------------------|---|--------------------|
| Daniel Baltzell |  | September 12, 2011 |
| EMC Test Engineer | Signature | Date of Test |

5 FCC Rules and Regulations Part 2.1051: Spurious Emissions at Antenna Terminals; Part 80.211 Emission Limitations

5.1 Test Procedure

ANSI/TIA-603-2004, section 2.2.12

The spurious emissions levels were measured (analog), and the device under test was replaced by a substitution antenna connected to a signal generator. This signal generator level was then corrected by subtracting the cable loss from the substitution antenna to the signal generator, and the gain of the antenna (dBi) was added to achieve the EIRP level, then converted from the corrected signal generator level (dBm) to dBc, and compared to the limit.

5.2 Test Data

Table 5-1: Field Strength of Spurious Radiation – 156.8 MHz

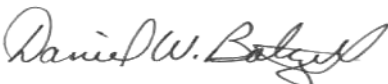
Conducted Power 47 dBm; 50W; Limit=43+10LogP=60 dBc

| Frequency (MHz) | Spectrum Analyzer Level (dBuV) | Signal Generator Level (dBm) | Cable Loss to Transmit Antenna (dB) | Substitution Antenna Gain (dBi) | Corrected Signal Generator Level (dBc) | Margin (dB) |
|-----------------|--------------------------------|------------------------------|-------------------------------------|---------------------------------|--|-------------|
| 313.6 | 32.2 | -88.9 | 0.6 | 1.5 | 135.0 | -75.0 |
| 470.4 | 33.0 | -81.1 | 0.6 | 1.6 | 127.1 | -67.1 |
| 627.2 | 35.9 | -77.7 | 0.7 | 1.2 | 124.2 | -64.2 |
| 784.0 | 39.4 | -73.7 | 0.8 | 1.1 | 120.4 | -60.4 |
| 940.8 | 35.1 | -77.8 | 0.8 | 1.5 | 124.1 | -64.1 |
| 1097.6 | 25.3 | -88.0 | 0.9 | 4.3 | 131.6 | -71.6 |
| 1254.4 | 26.0 | -86.0 | 1.0 | 5.0 | 129.0 | -69.0 |
| 1411.2 | 22.3 | -88.2 | 1.1 | 5.9 | 130.3 | -70.3 |
| 1568.0 | 21.1 | -88.4 | 1.2 | 6.7 | 129.9 | -69.9 |

Table 5-2: Test Equipment Used For Testing Field Strength of Spurious Radiation

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|-------------------------|---------------------------|---|---------------|----------------------|
| 900878 | Rhein Tech Laboratories | AM3-1197-0005 | 3 meter antenna mast, polarizing | OATS1 | N/A |
| 901516 | Insulated Wire Inc. | KPS-1503-2400-KPS | RF cable, 20' | NA | 10/19/11 |
| 901517 | Insulated Wire Inc. | KPS-1503-360-KPS | RF cable 36" | NA | 10/19/11 |
| 901242 | Rhein Tech Laboratories | WRT-000-0003 | Wood rotating table | N/A | N/A |
| 900791 | Chase | CBL6111B | Bilog Antenna (30 MHz – 2000 MHz) | N/A | 1/31/13 |
| 901236 | Insulated Wire Inc. | KPS-1503-360-KPS-09302008 | RF cable 36" | NA | 7/8/12 |
| 900928 | Hewlett Packard | 83752A | Synthesized Sweeper, (0.01 - 20 GHz) | 3610A00866 | 2/17/12 |
| 901158 | Compliance Design, Inc. | Roberts Dipole Antenna | Adjustable Elements Dipole (25 – 1000 MHz Antennas) | 00401 | 2/11/12 |

Test Personnel:

| | | |
|----------------------------------|---|-------------------------------------|
| Daniel Baltzell Test Engineer |  Signature | September 12, 2011 Date of Tests |
|----------------------------------|---|-------------------------------------|

6 FCC Rules and Regulations Part 2.1049(c)(1): Occupied Bandwidth; Part 80.205

Occupied Bandwidth

6.1 Test Procedure

ANSI/TIA-603-2004, section 2.2.11 and TIA/EIA-102.CAAA-2002 section 2.2.5

6.2 Test Data

Plot 6-1: Occupied Bandwidth – 156.8 MHz

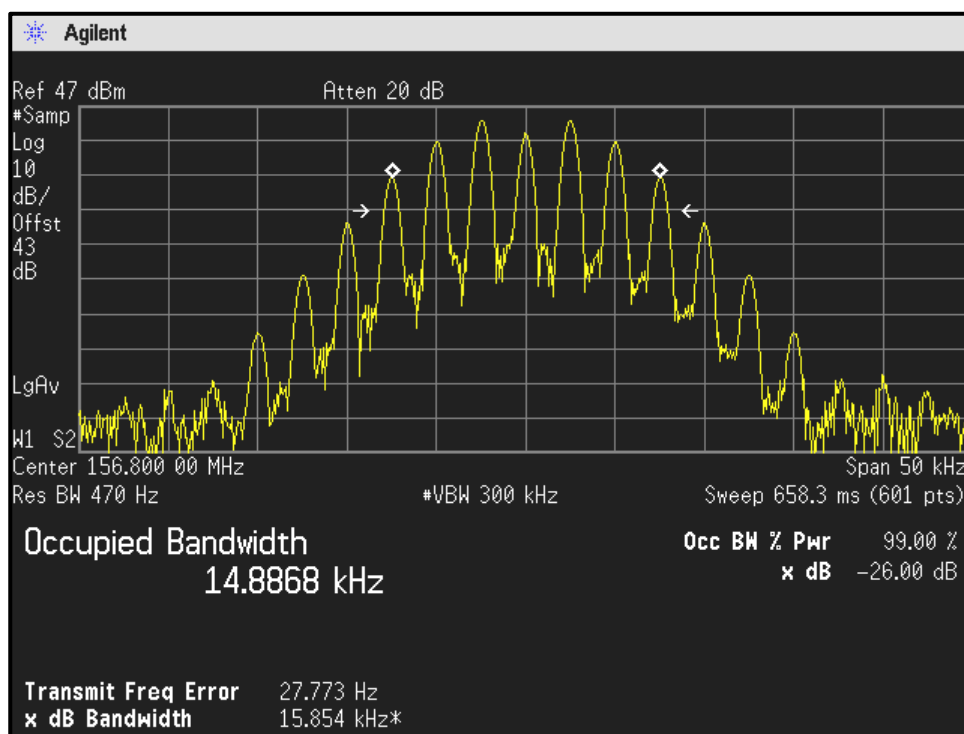
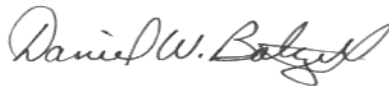


Table 6-1: Test Equipment Used For Testing Occupied Bandwidth

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|----------------------|----------|--------------------------------------|---------------|----------------------|
| 901413 | Agilent Technologies | E4448A | Spectrum Analyzer | US44020346 | 12/29/12 |
| 901358 | Aeroflex/Weinschel | 47-3-34 | Attenuator, 3 dB (0.1 - 18 GHz) | BS0146 | 2/4/12 |
| 901338 | Weinschel Corp. | 46-40-34 | Attenuator (DC-18GHz, 40 dB, 25W) | BM0556 | 7/15/12 |

Test Personnel:

Daniel Baltzell
Test Engineer



Signature

September 12, 2011
Date of Tests

7 FCC Part 2.1047: Modulation Characteristics; Part 80.213 Modulation Requirements

7.1 Test Procedures

7.1.1 Audio Frequency Response

ANSI/TIA/EIA-603-2004, section 2.2.6

The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic.

The input audio level at 1000 Hz was set to produce 20% of the rated system deviation. This point is shown as the 0 dB reference level, noted DEVref. The audio signal generator was varied from 100 Hz to 5 kHz with the input level held constant. The deviation in kHz was recorded using a modulation analyzer as DEVfreq. The response in dB relative to 1 kHz was calculated as follows:

Audio Frequency Response = 20 LOG (DEVfreq/DEVref)

7.1.2 Audio Low Pass Filter Response

ANSI/TIA/EIA-603-2004, 2.2.15

The Audio Low Pass Filter Response is the frequency response of the post limiter low pass filter circuit above 3000 Hz.

7.1.3 Modulation Limiting

ANSI/TIA/EIA-603-2004, section 2.2.3

The transmitter was adjusted for full rated system deviation. The audio input level was adjusted for 60% of rated system deviation at 1000 Hz. Using this level (0 dB) as a reference, the audio input level was varied from the reference +/-20 dB for modulation frequencies of 300 Hz, 1000 Hz, and 2500 Hz. The system deviation obtained as a function of the input level was recorded. Both positive and negative peak deviations were recorded.

Part 80.213 Modulation requirements

(a)(2) When phase or frequency modulation is used in the 156–162 MHz band, the peak modulation must be maintained between 75 and 100 percent. A frequency deviation of ± 5 kHz is defined as 100 percent peak modulation.

(b) Radiotelephone transmitters using A3E, F3E and G3E emission must have a modulation limiter to prevent any modulation over 100 percent. This requirement does not apply to survival craft transmitters, to transmitters that do not require a license, or to transmitters whose output power does not exceed 3 watts.

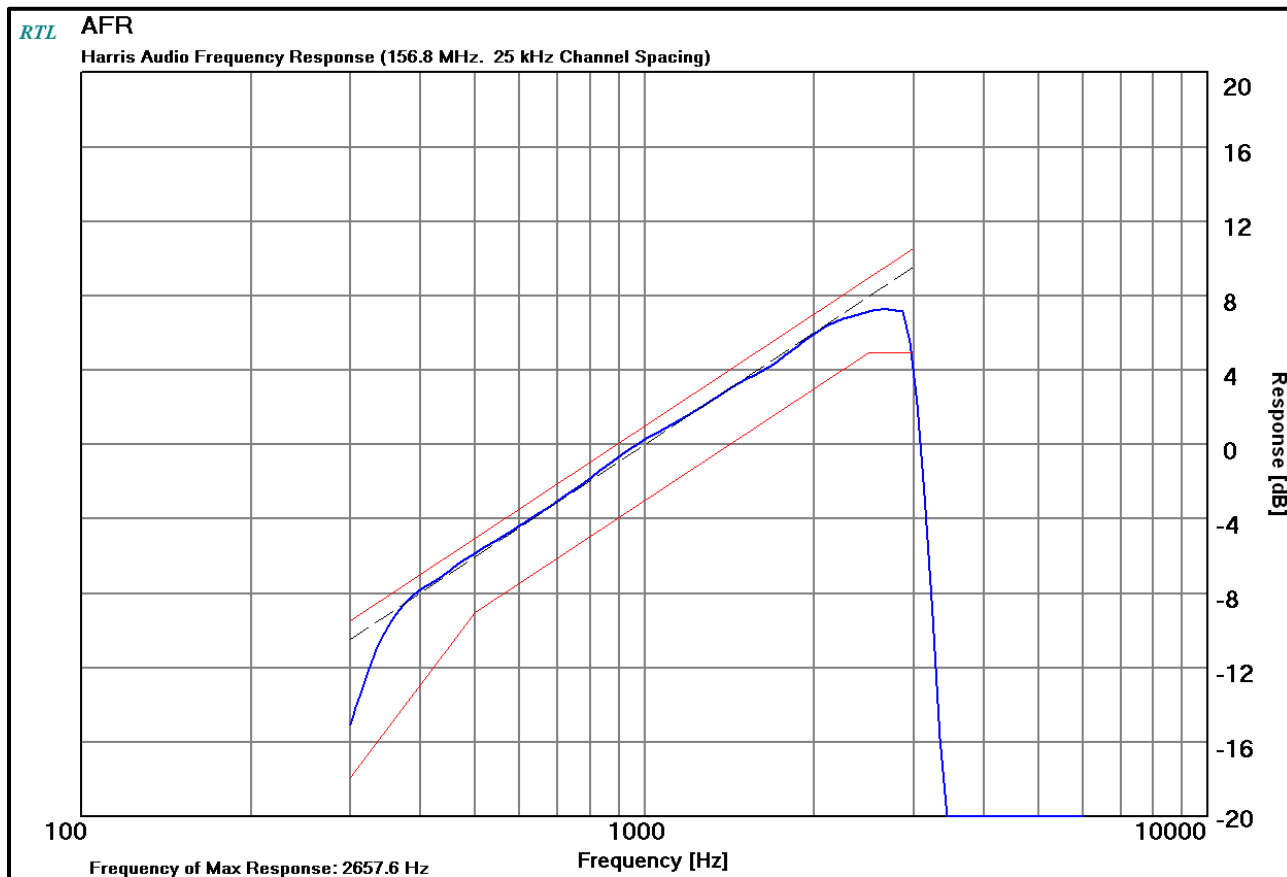
(d) Ship and coast station transmitters operating in the 156–162 MHz and 216–220 MHz bands must be capable of proper operation with a frequency deviation that does not exceed ± 5 kHz when using any emission authorized by §80.207.

(e) Coast station transmitters operating in the 156–162 MHz band must be equipped with an audio low-pass filter. The filter must be installed between the modulation limiter and the modulated radio frequency stage. At frequencies between 3 kHz and 20 kHz, it must have an attenuation greater than at 1 kHz by at least $60\log_{10}(f/3)$ dB where “f” is the audio frequency in kilohertz. At frequencies above 20 kHz, the attenuation must be at least 50 dB greater than at 1 kHz.

7.2 Test Data

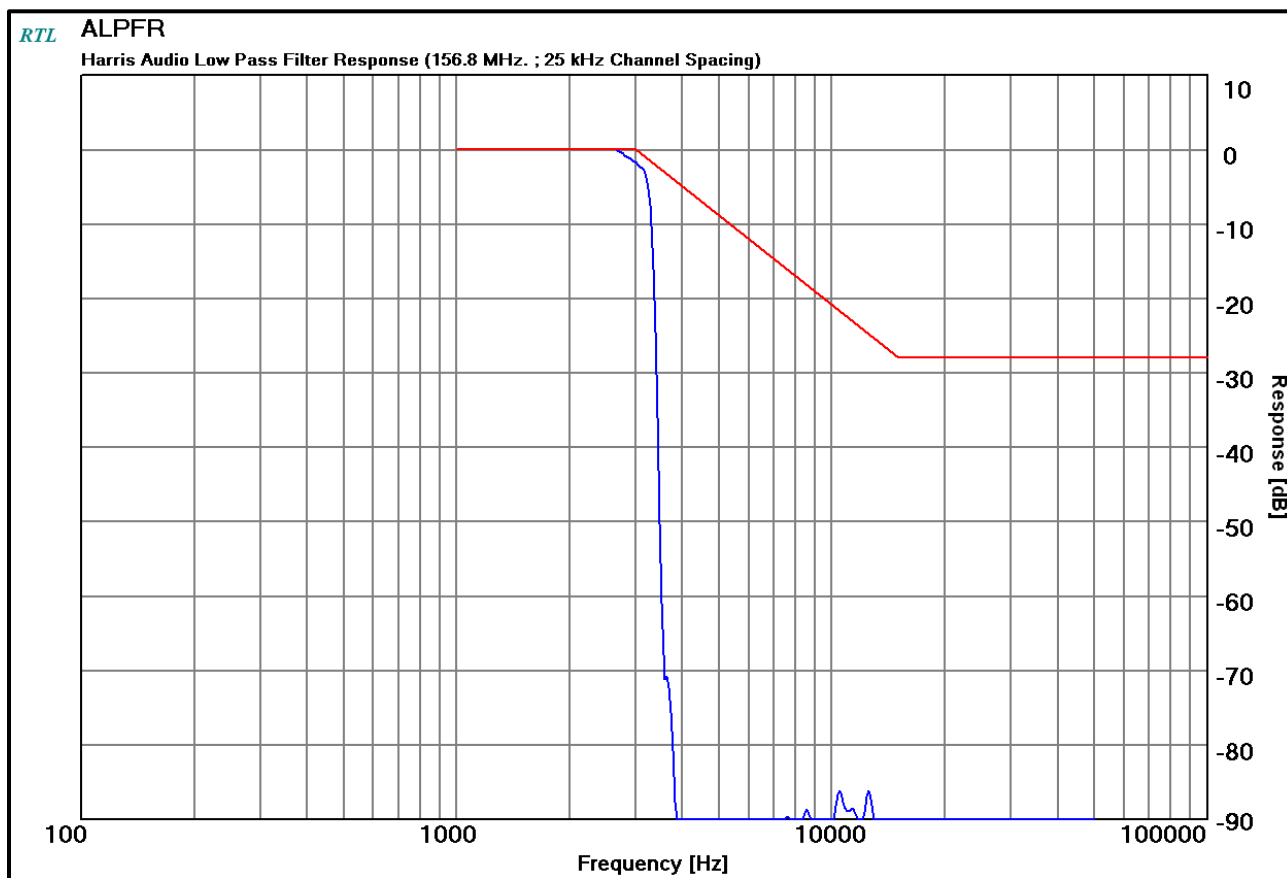
7.2.1 Audio Frequency Response

Plot 7-1: Modulation Characteristics - Audio Frequency Response 156.8 MHz; WB



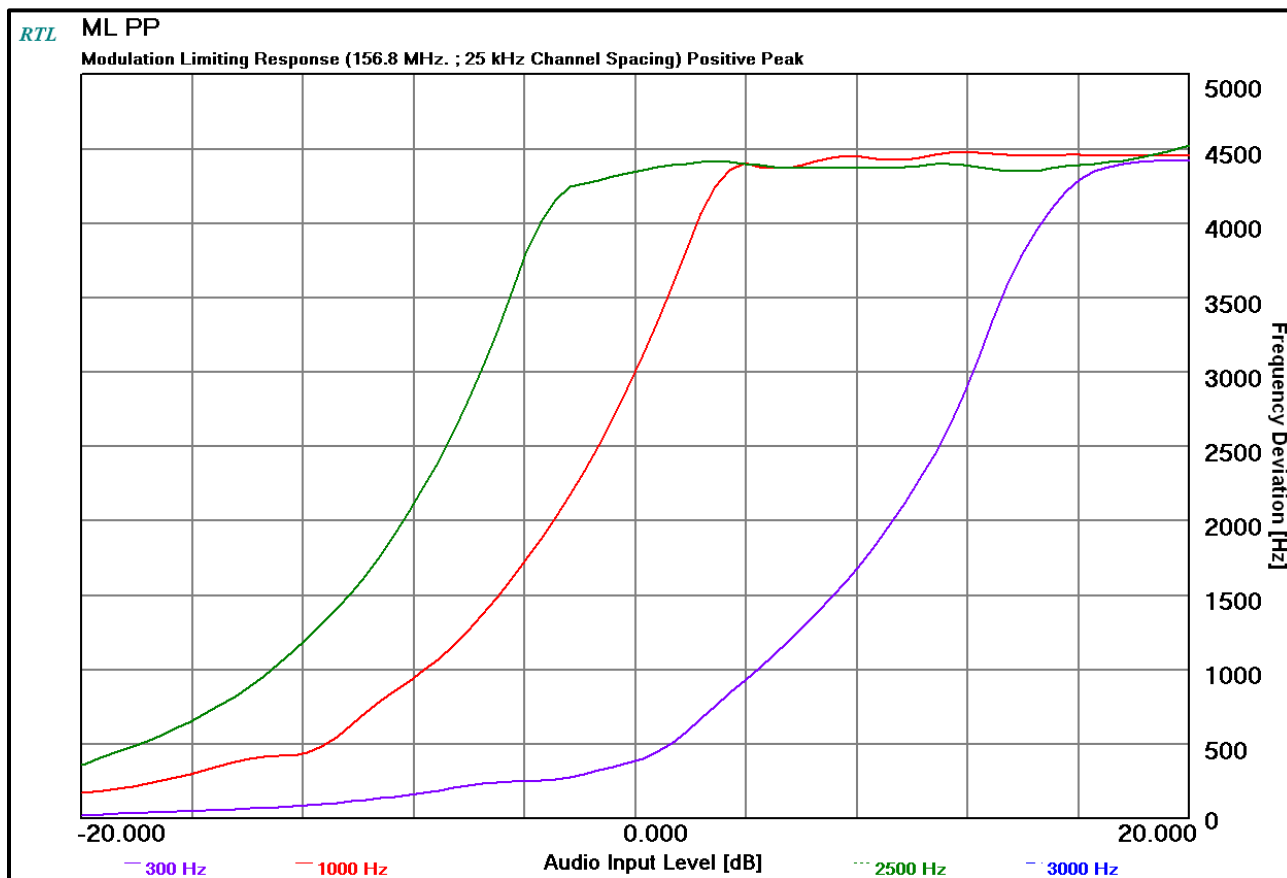
7.2.2 Audio Low Pass Filter Response

Plot 7-2: Modulation Characteristics – Audio Low Pass Filter – 156.8 MHz; WB



7.2.3 Modulation Limiting

Plot 7-3: Modulation Characteristics – Modulation Limiting – 156.8 MHz; WB; Positive Peak



Plot 7-4: Modulation Characteristics – Modulation Limiting – 156.8 MHz; WB; Negative Peak

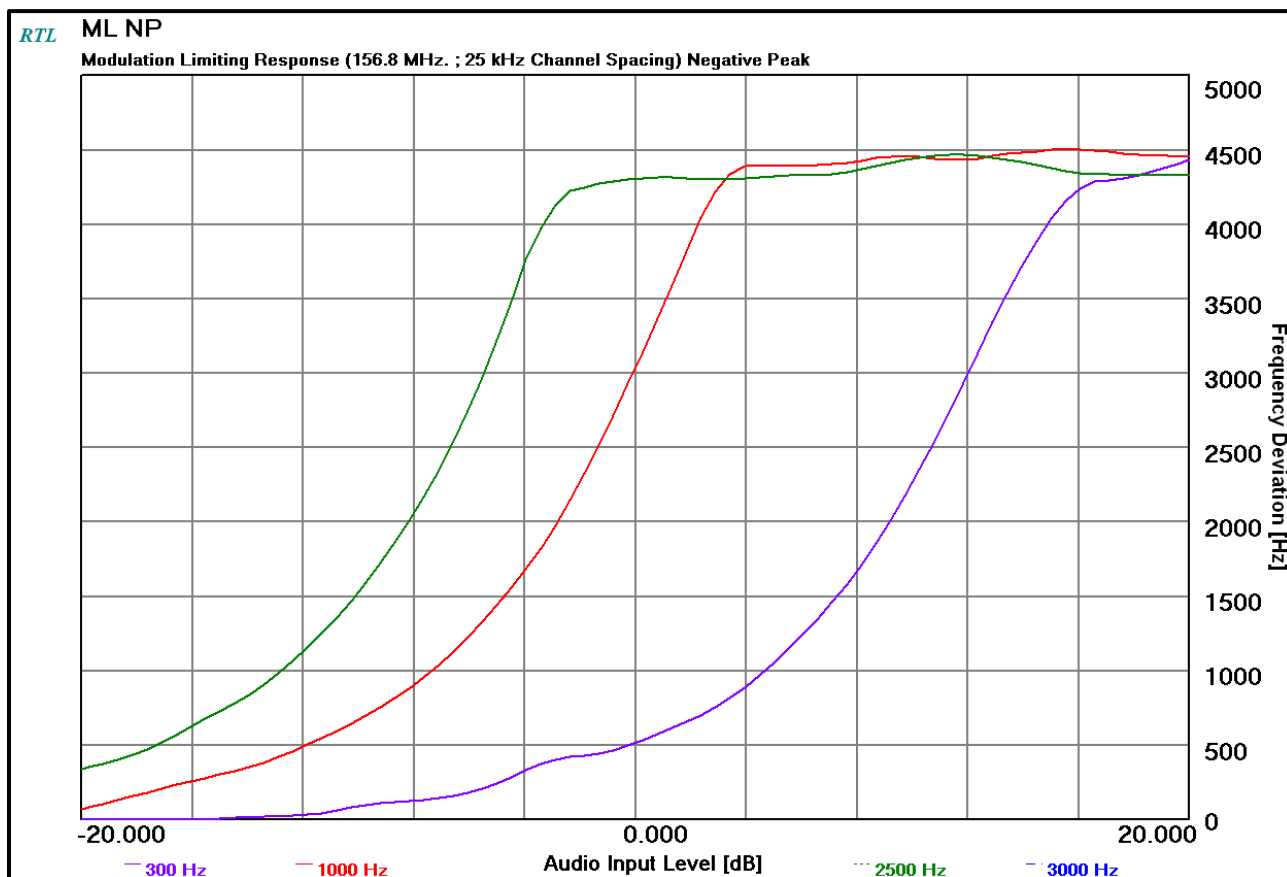


Table 7-1: Test Equipment Used For Testing Field Strength of Spurious Radiation

| RTL Asset # | Manufacturer | Model | Part Type | Serial Number | Calibration Due Date |
|-------------|-----------------|----------|--|---------------|----------------------|
| 901057 | Hewlett Packard | 3336B | Synthesizer/Level Generator | 2514A02585 | 3/4/12 |
| 901118 | Hewlett Packard | HP8901B | Modulation Analyzer (150 kHz – 1300 MHz) | 2406A00178 | 10/7/11 |
| 901054 | Hewlett Packard | HP 3586B | Selective Level Meter | 1928A01892 | 3/23/12 |

Test Personnel:

Daniel Baltzell
 Test Engineer

Signature

September 12, 2011
 Date of Tests

8 Conclusion

The data in this measurement report shows that the Harris Corporation Model M7300 VHF 50W Mobile Radio, FCC ID: OWDTR-0055-E, complies with all the applicable requirements for a Class II permissive change for FCC Parts 80 and 2.