



Engineering and Testing for EMC and Safety Compliance

Class II Permissive Change Report

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MODEL: M7100^{IP} 800 MHz Mobile Radio (806-824, 851-869 MHz)

FCC ID: OWDTR-0022-E

December 12, 2005

Standards Referenced for this Report	
Part 2: 2004	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 15: 2004	Radio frequency devices - §15.109: Radiated Emissions Limits
Part 90: 2004	Private Land Mobile Radio Services
ANSI C63.4-2003	American National Standard for Methods of Measurement of Radio Noise Emissions from Low -Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
ANSI/TIA/EIA603 - 2002	Land Mobile FM or PM Communications Equipment - Measurement and Performance Standards
ANSI/TIA/EIA – 102.CAAA; 2002	Digital C4FM/CQPSK Transceiver Measurement Methods
RSS-119; Issue 6; 2000	Land Mobile and Fixed Radio Transmitters and Receivers 27.41 to 960.0 MHz

Frequency Range (MHz)	Maximum Measured Output Power (W) Conducted	Measured Frequency Tolerance (ppm)	Emission Designator
806-824, 851-869	36.4	0.98	16K0F3E (WB Voice)
806-824, 851-869	36.4	0.98	12K8F3E (NPSPAC Voice)
806-824, 851-869	36.4	0.98	10K3F1D (2 level WB 9600)
806-824, 851-869	36.4	0.98	10K3F1E (2 level WB 9600)
806-824, 851-869	36.4	0.98	10K0F1D (2 level NPSPAC 9600)
806-824, 851-869	36.4	0.98	10K0F1E (2 level NPSPAC 9600)
806-824, 851-869	36.4	0.98	8K0F1D (4 Level)
806-824, 851-869	36.4	0.98	8K0F1E (4 Level)

REPORT PREPARED BY TEST ENGINEER: Dan Baltzell

Document Number: 2005186/ QRTL05-330

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1 General Information

The following Type Certification Report is prepared on behalf of **M/A-COM, Inc.** in accordance with the Federal Communications Commission and Industry Canada Rules and Regulations. The Equipment Under Test (EUT) was the **M7100^{IP} 800 MHz Mobile Radio; FCC ID: OWDTR-0022-E**. The test results reported in this document relate only to the item that was tested.

All measurements contained in this application were conducted in accordance with FCC Rules and Regulations CFR 47, Industry Canada RSS-119, and ANSI C63.4 Methods of Measurement of Radio Noise Emissions, 2003. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

1.1 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 dated March 3, 1994, submitted to and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.2 Related Submittal(s)/Grant(s)

This is a Class II Permissive Change report to show compliance of the NPSPAC modes in the new frequencies due to the 800 MHz re-banding.

2 Conformance Statement

We, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this report. No modifications were made to the equipment during testing in order to achieve compliance with these standards.

Furthermore, there was no deviation from, additions to or exclusions from the standards.

Signature: 

Date: December 12, 2005

Typed/Printed Name: Rick McMurray

Position: Vice President

Signature: 

Date: December 12, 2005

Typed/Printed Name: Daniel W. Baltzell

Position: Test Engineer

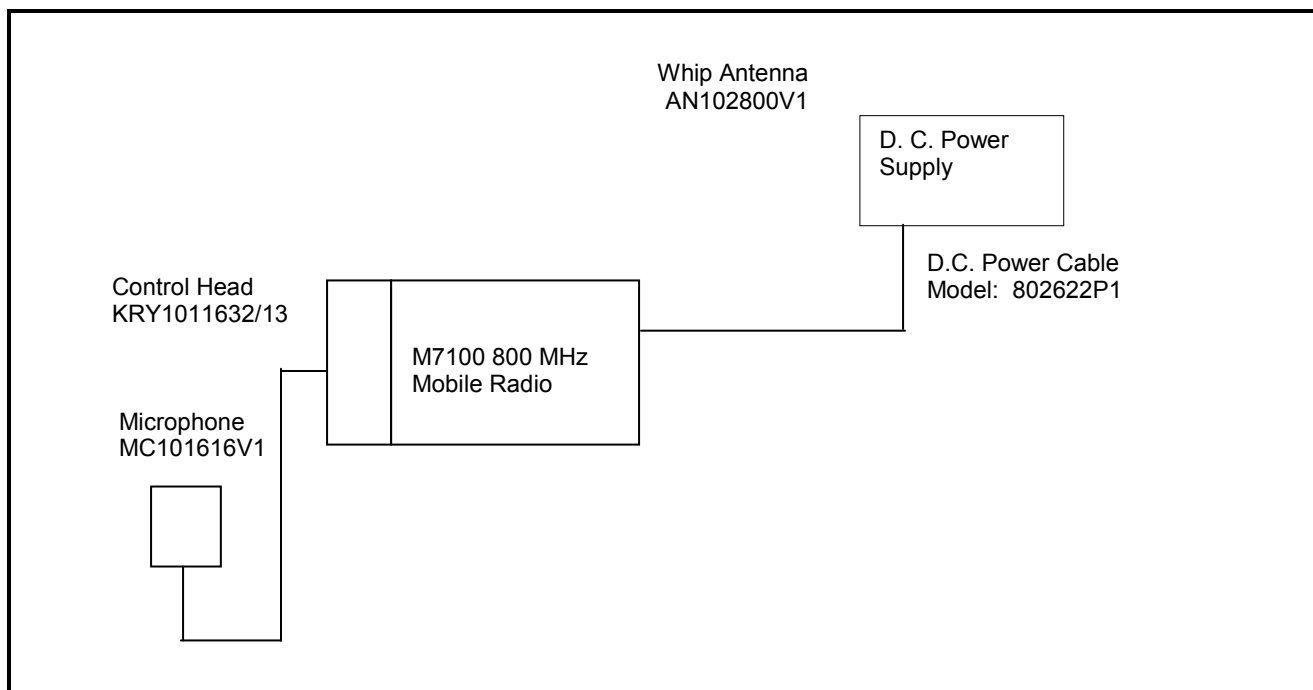
3 Tested System Details

The test sample was received on December 8, 2005. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

Table 3-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	PN/SN	FCC ID	Date Received	RTL Bar Code
M7100 800 MHz Mobile Radio	M/A-COM, Inc.	M7100 ^{IP}	9039917	OWDTR-0022-E	12/8/05	16944
Microphone	M/A-COM, Inc.	NA	344A4528P55	NA	4/30/03	15192
Power Cable	M/A-COM, Inc.	802622P1	19B802622P1	NA	NA	NA

Figure 3-1: Standard Configuration of Tested System



4 FCC Rules and Regulations Part 2 §2.1046(a): RF Power Output: Conducted

4.1 Test Procedure

ANSI/TIA/EIA-603-2002, section 2.2.1.

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

4.2 Test Data

The following channels (in MHz) were tested: 806, 822.9, 853.1, and 867.9.

Table 4-1: RF Power Output (High Power): Carrier Output Power (Unmodulated)

Frequency (MHz)	RF Power Measured (Watt)*
806.0	36.3
822.9	36.3
853.1	36.3
867.9	36.3

* Measurement accuracy: +/-0.02 dB (logarithmic mode)

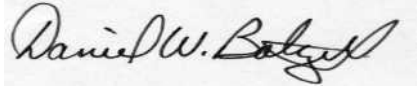
Table 4-2: RF Power Output (Rated Power)

Rated Power (W)
35

Table 4-3: 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	9/21/06
901356	Agilent Technologies	E9323A	Power Sensor	31764-264	9/21/06

Test Personnel:

Daniel Baltzell		December 8, 2005
Test Engineer	Signature	Date Of Test

5 FCC Rules and Regulations Part 2 §2.1049(c)(1): Occupied Bandwidth

Occupied Bandwidth - Compliance with the emission masks

5.1 Test Procedure

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

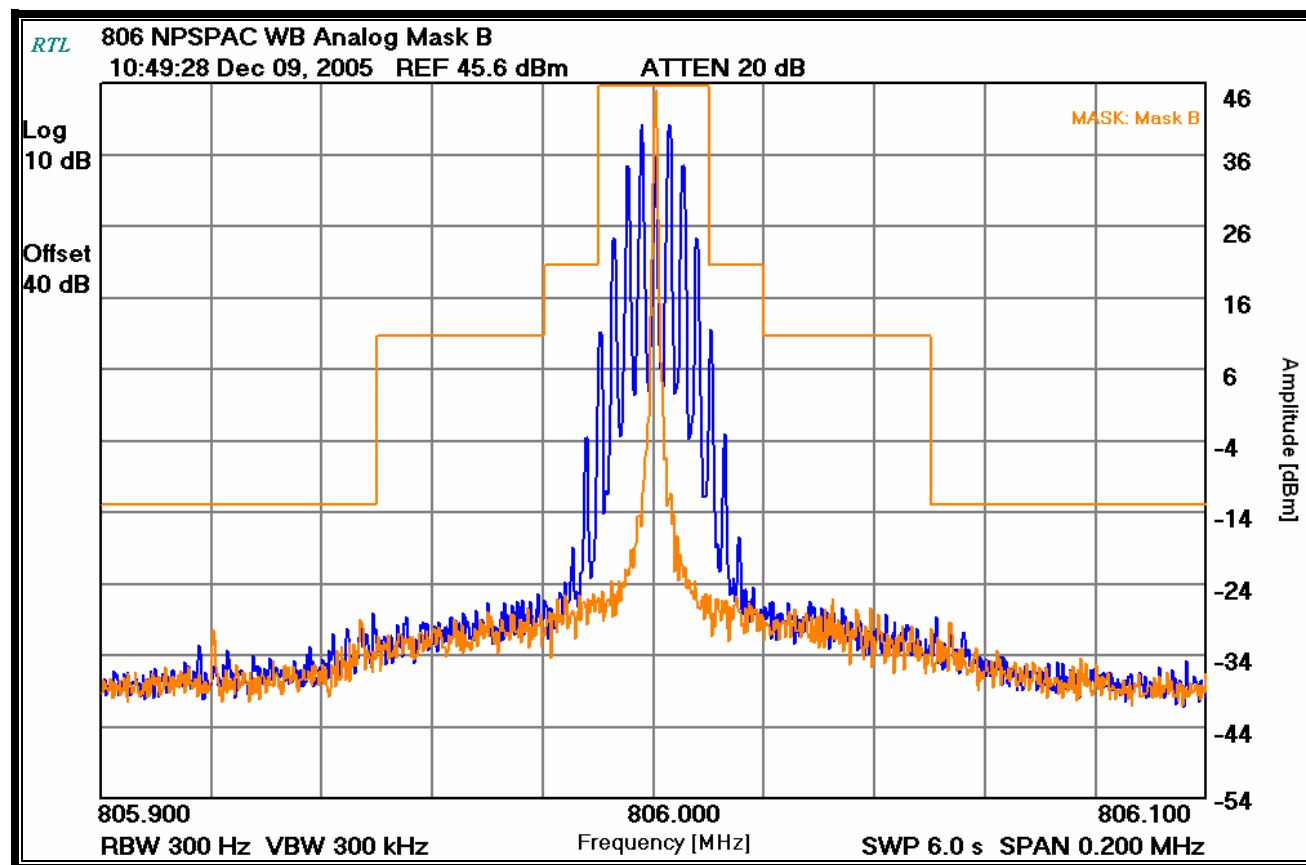
Device with audio modulation: Transmitter was modulated with a 2,500 Hz sine wave at an input level of 16 dB greater than that required to produce 50% of rated system deviation at 1,000 Hz.

Device with digital modulation: Modulated to its maximum extent using a pseudo random data sequence – 9600-bps.

5.2 Test Data

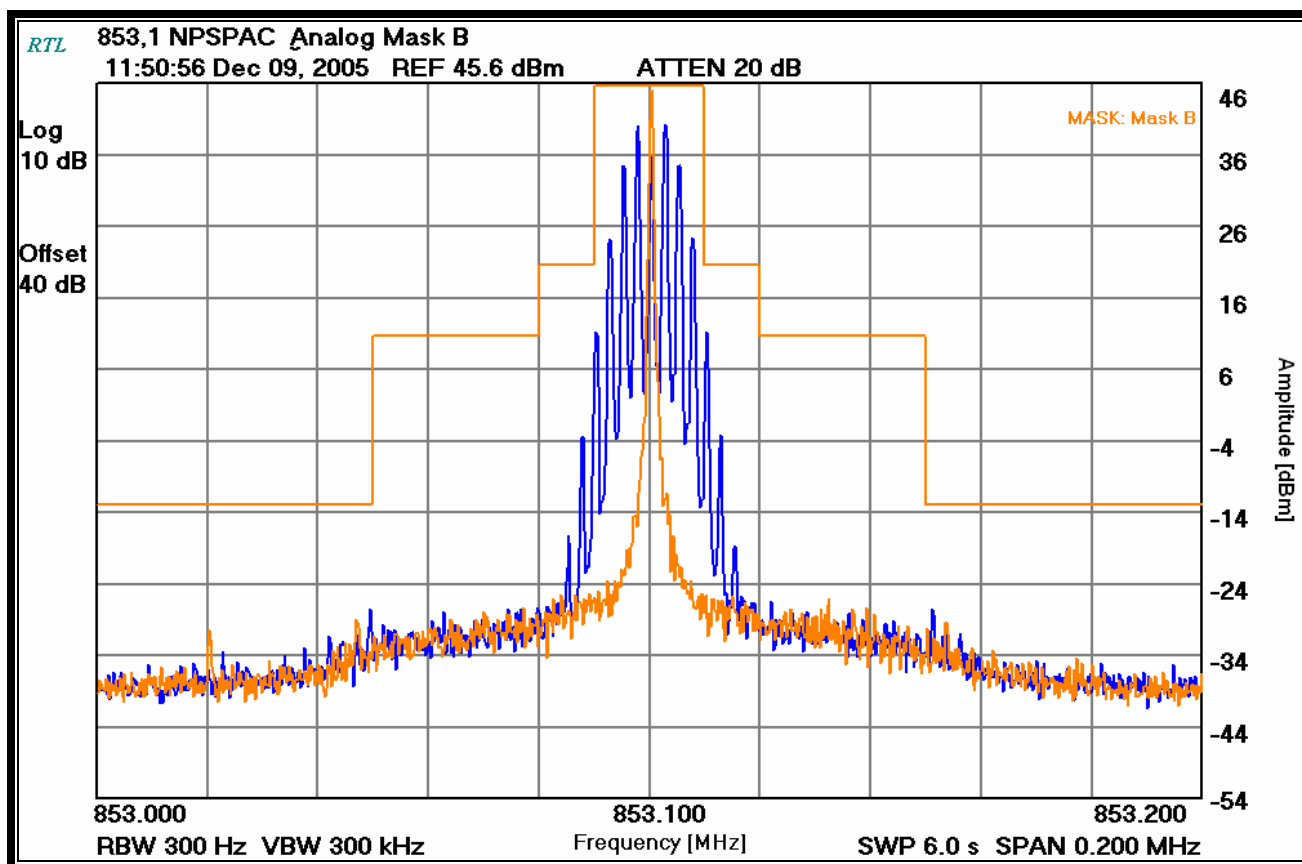
Plot 5-1: Occupied Bandwidth; NPSPAC; Audio Modulation: 2,500 Hz (Mask B)

MKR 806 MHz



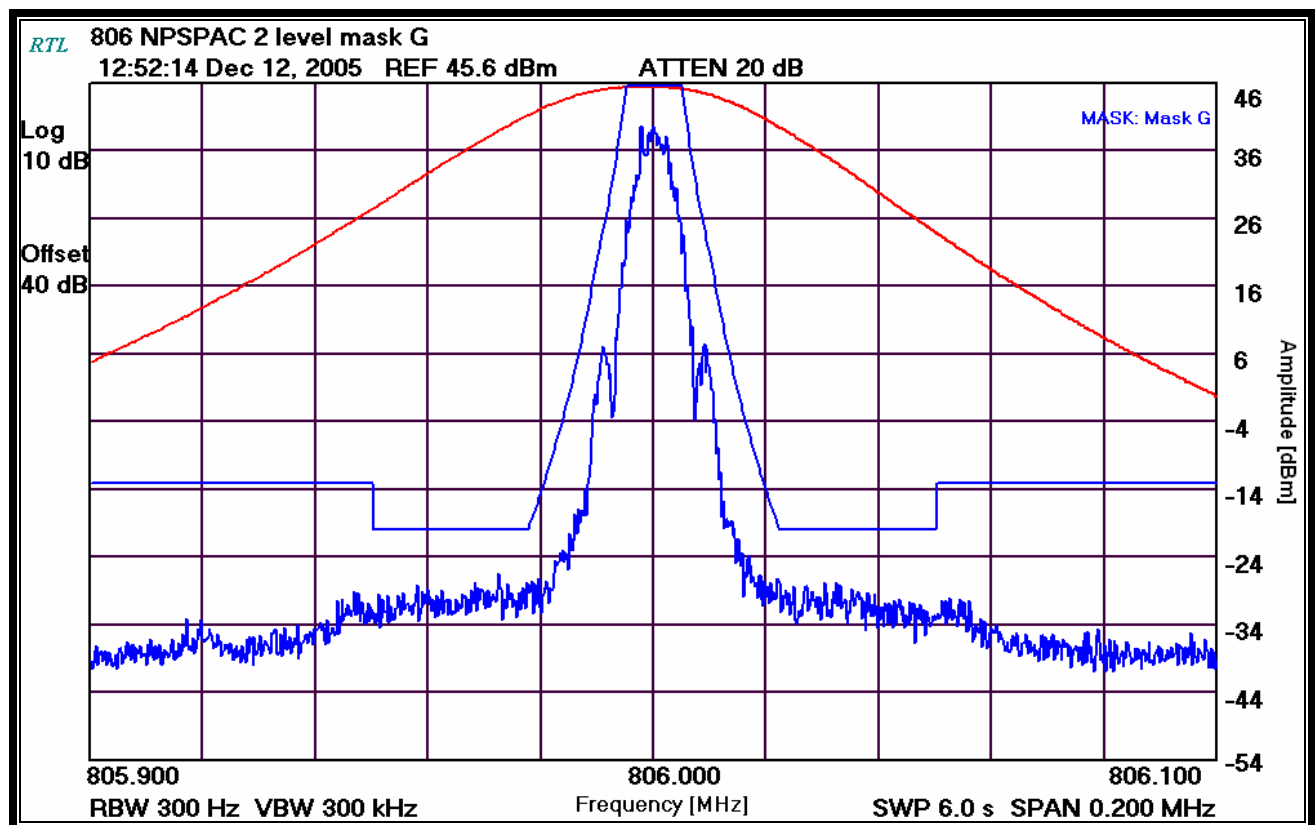
Plot 5-2: 99% Occupied Bandwidth - NPSPAC; Audio Modulation; (Mask B)

MKR 853.1 MHz



Plot 5-3: Occupied Bandwidth; NPSPAC; 2-level 9600 baud (Mask G)

MKR 806 MHz



Plot 5-4: Occupied Bandwidth; NPSPAC; 2-level 9600 baud (Mask G)

MKR 853.1 MHz

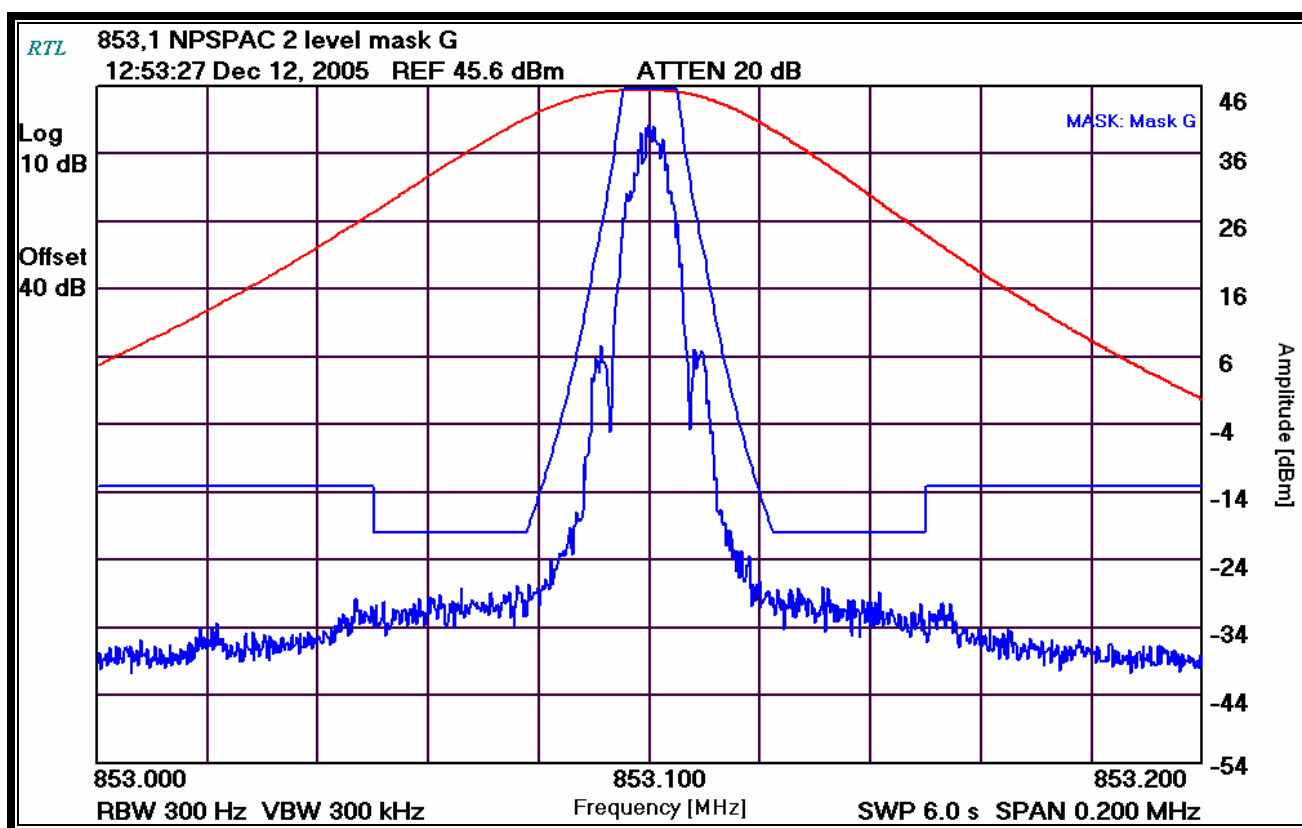
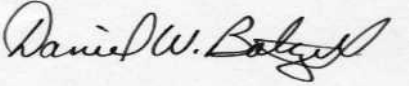


Table 5-1: Test Equipment Used For Testing (Occupied Bandwidth)

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	8/3/06
901118	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2406A00178	7/13/06
900927	Tektronix	ASG 100	Audio Signal Generator	B03274 V2.3	7/3/06

Test Personnel:

Daniel Baltzell		December 9 and 12, 2005
Test Engineer	Signature	Dates Of Test

6 FCC Rules and Regulations Part 2 §2.202: Necessary Bandwidth and Emission Bandwidth

Type of Emission: F3E, F1D, F1E

Necessary Bandwidth and Emission Bandwidth:

Voice – 25 kHz channel separation

Calculation:

Max modulation(M) in kHz: 3.0

Max deviation (D) in kHz: 5

Constant factor (K): 1 (assumed)

$B_n = 2 \times M + 2 \times DK = 16.0 \text{ kHz}$

Emission designator: 16K0F3E

Voice – NPSPAC

Calculation:

Max modulation(M) in kHz: 2.4

Max deviation (D) in kHz: 4

Constant factor (K): 1 (assumed)

$B_n = 2 \times M + 2 \times DK = 12.8 \text{ kHz}$

Emission designator: 12K8F3E

Digital voice and data – 25 kHz separation 9600 Baud

Measurement: 99.0% Occupied Bandwidth

$B_n = 10.33 \text{ kHz}$

Emission designator: 10K3F1D, 10K3F1E

Digital voice and data – NPSPAC 9600 Baud

Measurement: 99.0% Occupied Bandwidth

$B_n = 10.0 \text{ kHz}$

Emission designator: 10K0F1D, 10K0F1E

C4FM –

Measurement: 99.0% Occupied Bandwidth

$B_n = 8.0 \text{ kHz}$

Emission designator: 8K0F1D, 8K0F1E

7 Conclusion

The data in this measurement report shows that the **M/A-COM, Inc. Model M7100^{IP} 800 MHz Mobile Radio, FCC ID: OWDTR-0022-E**, complies with all the applicable requirements of Parts 90, 15 and 2 of the FCC Rules, and Industry Canada RSS-119, Issue 6, 2000.