Engineering and Testing for EMC and Safety Compliance

Class II Permissive Change Test Report

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Model: OpenSky M-803 V-TAC
(Vehicular Tactical Network) 800 MHz Mobile Radio

FCC ID: BV8VTAC800
IC: 3670A-VTAC

November 1, 2006

Standards Referenced for This Report	
Part 2: 2006	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 15: 2006	§15.109: Radiated Emissions Limits
Part 90: 2006	Private Land Mobile Radio Services
ANSI TIA-603-C 2004	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards
RSS-119 Issue 7	Land Mobile and Fixed Radio Transmitters and Receivers Operating in the Frequency Range 27.41-960 MHz

Frequency Range (MHz)	Output Power (W) Conducted Max Measured	Frequency Tolerance Limit (ppm)	Emission Designator
806-824	24.55	1.5	17K6F7D (OTP)
851-869	24.55	1.5	17K6F7D (OTP/ORP)
806-824	24.55	1.5	17K6F7E (OTP)
851-869	24.55	1.5	17K6F7E (OTP/ORP)
806-821/851-866	24.55	1.5	16K0F3E (OCF SMR)
821-824/866-869	24.55	1.5	14K0F3E (OCF NPS)
806-824/851-869	24.55	1.5	8K4F1D/F1E (P25)

REPORT PREPARED BY TEST ENGINEER: DANIEL BALTZELL

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1 General Information

The following certification report is prepared on behalf of **M/A-COM, Inc**. in accordance with the Federal Communications Commission Rules and Regulations. The Equipment Under Test (EUT) was the **OpenSky M-803 V-TAC (Vehicular Tactical Network) 800 MHz Mobile Radio; FCC ID: BV8VTAC800**, **IC: 3670A-VTAC**. 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, Part 90, and ANSI/TIA/EIA 603-2002, Land Mobile FM or PM Communications Equipment Measurement and Performance Standards. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

Please note that portions of the EUT are subject to Part 15 DoC testing. A DoC report is on file for this product.

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 submitted to and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing.

1.2 Related Submittal(s)/Grant(s)

This is a Class II permissive change report for FCC ID: BV8VTAC800, originally certified May 26, 2005, with a Class II permissive change issued October 15, 2005.

1.3 Description of Change in Device

1. The HPA module became obsolete, requiring the use of a new device. The board assembly and artwork has changed with the use of a new HPA module.

2. A 13 dB attenuator will be used instead of a 10 dB attenuator. This does not result in a change in conducted power for the overall unit, as the VRB radio output power is turned up by 3 dB to improve its signal-to-noise performance to reduce interference.

1.4 Product Description

The M-803 Vehicular Tactical (V-TAC) unit is a voice and data radio designed for a mobile environment. It operates in the 800 MHz SMR and NPSPAC frequency bands. The rated RF output power is continuously variable between 0.25 – 24 W. The MAMROS0016 configuration, consisting of a trunk mount transceiver (VRM), vehicular repeater base (VRB), RF combiner, control head, and 13 db power attenuator, was tested. OpenSky digital and conventional modulation software was provided for testing.

Table 1-1: Product Description

Trade Name	OpenSky V-TAC (Vehicular Tactical Network) 800 MHz Mobile Radio
Use of Product	Voice and data communication
FCC Identifier	BV8VTAC800
Type Modulation	GFSK, FM
Bit Rate	9600, 19200 bps
Baud Rate	9600
RF Output	Continuously variable between 0.25 - 24W
Frequency Range	806-824 MHz and 851-869 MHz
Max. Number of Channels	830 normal, 830 talkaround
Antenna Gain	3 dBd
External Input	Audio and digital

The M-803 Vehicular Tactical Unit (V-TAC) consists of a Full Duplex Trunk Mount M-803 Mobile Radio Unit (MRU) with GPS, an M-803 Vehicular Repeater Base Unit (VRB), and an 800 MHz RF Combiner, see Figure 1.

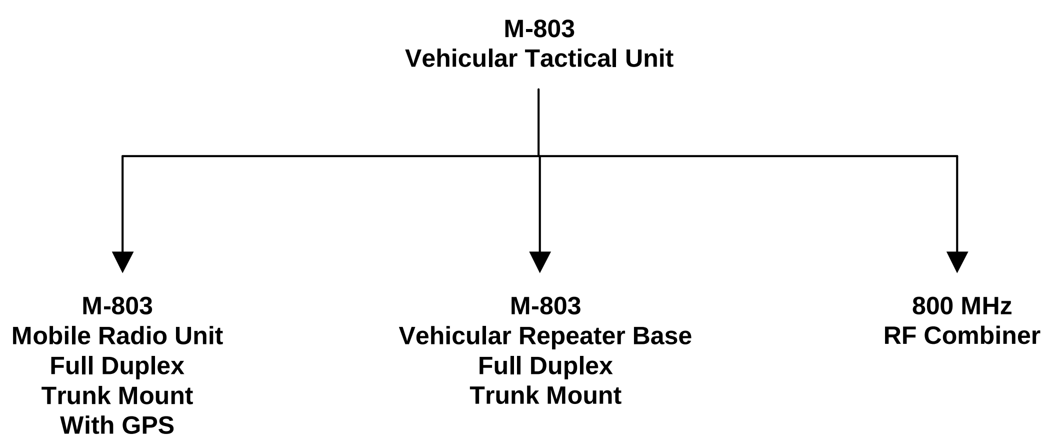

Figure 1-1: M-803 Vehicular Tactical Unit (VTAC) Major Components

2 Tested System Details

The EUT test sample was received on October 20, 2006. Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

The system consists of an 800 MHz transceiver (VRM), a repeater (VRB), an RF combiner, and is controlled by a control head/microphone. The system was tested in a duplex operating mode.

The EUT consists of two transceivers that can transmit simultaneously, which connect to a single antenna through a combiner. Since both transceivers can transmit simultaneously, simultaneous transmission was determined to be the worst case mode of operation for power measurements and spurious measurements. During these tests, the power from one of the transceivers was investigated with the other transceiver set to the channel which generated the highest power.

Table 2-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
800 MHz Transceiver	M/A-Com, Inc.	M-803 MAMROS0006	A400711B7E85	BV8M803M	17584
Vehicular Repeater Base	M/A-Com, Inc.	M-803 MAMROS0007	A400801B7BEE	BV8VTAC800	17583
Combiner	M/A-Com, Inc.	MAMROS0016	A400901C5041	N/A	17581
13 dB Attenuator	M/A-Com, Inc.	AT-007195	DC0619	N/A	17582
Control Head	M/A-Com, Inc.	MACDOS0003	A400A17CDA DC 0605	N/A	17580
Microphone	CES, Inc.	600L	N/A	N/A	16501

Table 2-2: Support Equipment

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
Notebook Computer	N/A	N/A	N/A	N/A	N/A
Power Supply	Alinco	DM-340MVT	002143	N/A	901028

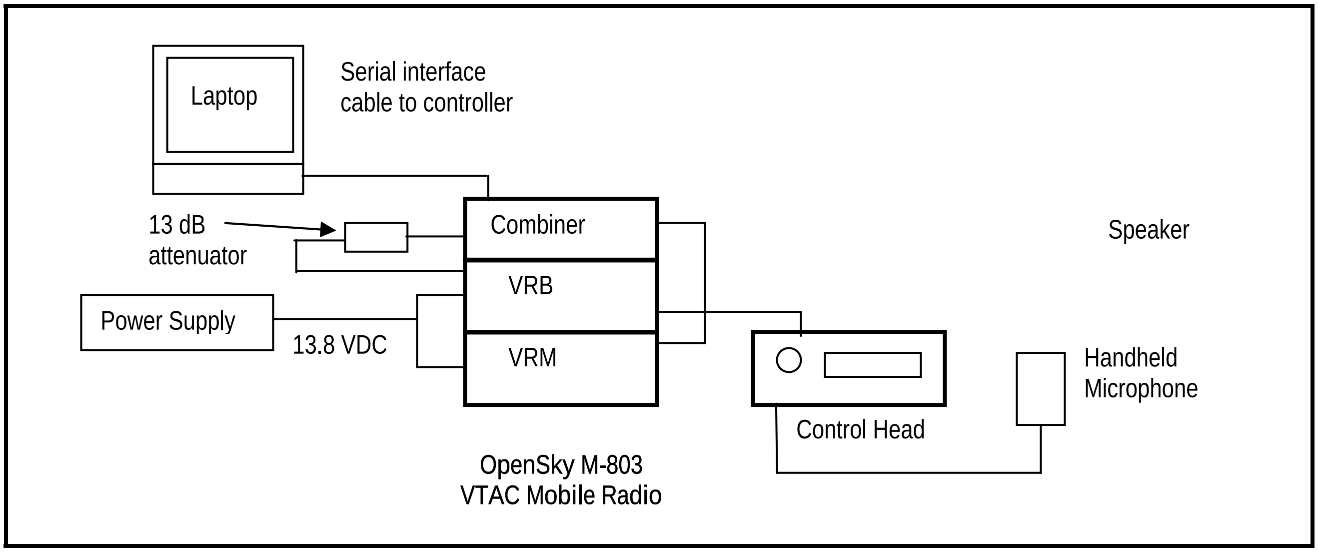

Figure 2-1: Configuration of Tested System

3 FCC Rules and Regulations Part 2 §2.1046(a): RF Power Output: Conducted; RSS-119 §6.2: Output Power Test

3.1 Test Procedure

ANSI TIA-603-C 2004, Section 2.2.1.

The EUT was connected to a coaxial attenuator having a 50 Ω load impedance. The EUT was tested with both the VRM and VRB units transmitting simultaneously on separate frequencies. The power measurements reported in Tables 3-1 and 3-2 are a combined power reading from the antenna RF port of the combiner without the 13 dB attenuator. The VRM was set to a power of 44 dBm (high power) and the VRB was set to a power of 44 dBm (high power).

3.2 Test Data

Table 3-1: RF Power Output (VRM/VRB Combined – VRB High Power): Carrier Output Power (Unmodulated)

Channel	Frequency (MHz)	RF Power Measured (Watt)*
001/001	806.0125/851.0125	23.9
600/600	820.9875/865.9875	20.9
830/830	823.9875/868.9875	17.4

*Measurement accuracy: +/- .02 dB (logarithmic mode)

Table 3-2: RF Power Output (Rated Power)

Rated Power (W)
24

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

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
901184/901356	Agilent	E4416A/E9323A	Power Meter/ Sensor	GB41050573/31764-264	09/21/07

TEST PERSONNEL:

Daniel Baltzell		October 21, 2006
Test Technician/Engineer	Signature	Date Of Test

4 FCC Rules and Regulations Part 2 §2.1051: Spurious Emissions at Antenna Terminals; RSS-119 §6.3: Unwanted Emissions

4.1 Test Procedure

ANSI TIA-603-C 2004, Section 2.2.13.

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer.

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

The system was tested with both the VRM and VRB transmitting on separate frequencies. The VRM was set to a power of 44 dBm (high power) and the VRB set to a power of 44 dBm (high power) for all tests.

4.2 Test Data

Frequency range of measurement per Part 2.1057: 9 kHz to 10 x Fc.

Limits: P(dBm) – (43 + 10xLOG P(W))

The worst case (unwanted emissions) channels are shown. The magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

VRM
Low Channel 1 (806.0125 MHz)
Limit = 43 + 10 Log P = 56.8 dBc
Conducted Power = 43.8 dBm = 23.9 W

Frequency (MHz)	Level Measured (dBm)	Corrected Level (dBc)	Margin (dB)
1612.0250	-108.4	150.3	-93.5
2418.0375	-102.3	139.7	-82.9
3224.0500	-92.2	132.2	-75.4
4030.0625	-106.2	148.3	-91.5
4836.0750	-108.2	146.0	-89.2
5642.0875	-109.1	115.3	-58.5
6448.1000	-105.0	143.1	-86.3
7254.1125	-104.2	137.7	-80.9
8060.1250	-104.4	144.1	-87.3

VRM
Mid Channel 600 (820.9875 MHz)
Limit = 43 + 10 Log P = 56.2 dBc
Conducted Power = 43.2 dBm = 20.9 W

Frequency (MHz)	Level Measured (dBm)	Corrected Level (dBc)	Margin (dB)
1641.9750	-105.9	146.4	-90.2
2462.9625	-108.6	149.3	-93.1
3283.9500	-86.5	125.9	-69.7
4104.9375	-111.0	152.1	-95.9
4925.9250	-109.0	149.2	-93.0
5746.9125	-111.6	145.8	-89.6
6567.9000	-104.8	143.7	-87.5
7388.8875	-105.5	141.7	-85.5
8209.8750	-105.4	140.5	-84.3

VRM
High Channel 830 (823.9875 MHz)
Limit = 43 + 10 Log P = 55.4 dBc
Conducted Power = 42.4 dBm = 17.4 W

Frequency (MHz)	Level Measured (dBm)	Corrected Level (dBc)	Margin (dB)
1647.9750	-87.5	128.4	-73.0
2471.9625	-67.9	109.3	-53.9
3295.9500	-64.0	103.4	-48.0
4119.9375	-79.4	121.0	-65.6
4943.9250	-90.4	131.4	-76.0
5767.9125	-97.1	133.3	-77.9
6591.9000	-102.3	140.3	-84.9
7415.8875	-92.5	132.2	-76.8
8239.8750	-104.8	140.8	-85.4

VRB
Low Channel 1 (851.0125 MHz)
Limit = 43 + 10 Log P = 56.8 dBc
Conducted Power = 43.8 dBm = 23.9 W

Frequency (MHz)	Level Measured (dBm)	Corrected Level (dBc)	Margin (dB)
1702.0250	-105.6	146.7	-89.9
2553.0375	-118.8	158.3	-101.5
3404.0500	-121	161.9	-105.1
4255.0625	-121.1	162.9	-106.1
5106.0750	-121.5	162.2	-105.4
5957.0875	-114.5	149.5	-92.7
6808.1000	-112.7	126.7	-69.9
7659.1125	-115.2	154.2	-97.4
8510.1250	-115	142.6	-85.8

VRB
Mid Channel 600 (865.9875 MHz)
Limit = 43 + 10 Log P = 56.2 dBc
Conducted Power = 43.2 dBm = 20.9 W

Frequency (MHz)	Level Measured (dBm)	Corrected Level (dBc)	Margin (dB)
1731.9750	-100	138.3	-82.1
2597.9625	-89.8	126.8	-70.6
3463.9500	-104.2	144.3	-88.1
4329.9375	-106.3	146.4	-90.2
5195.9250	-106.8	147.0	-90.8
6061.9125	-103.8	140.9	-84.7
6927.9000	-102.6	132.3	-76.1
7793.8875	-104.2	143.0	-86.8
8659.8750	-104.3	124.2	-68.0

VRB
High Channel 830 (868.9875 MHz)
Limit = 43 + 10 Log P = 55.4 dBc
Conducted Power = 42.4 dBm = 17.4 W

Frequency (MHz)	Level Measured (dBm)	Corrected Level (dBc)	Margin (dB)
1737.9750	-90.9	129.4	-74.0
2606.9625	-87	125.2	-69.8
3475.9500	-80.4	120.8	-65.4
4344.9375	-102.6	143.2	-87.8
5213.9250	-94.2	135.0	-79.6
6082.9125	-90.9	127.0	-71.6
6951.9000	-95.3	124.8	-69.4
7820.8875	-93.6	133.1	-77.7
8689.8750	-105	124.7	-69.3

Table 4-1: Test Equipment for Testing Conducted Spurious Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	9/13/07
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	9/13/07
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	9/13/07
900889	Hewlett Packard	85685A	RF Preselector (20 Hz-2 GHz)	3146A01309	4/12/07
901128	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	2/1/09
901132	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	2/1/09
901139	Weinschel Corp.	48-20-34 DC-18GHz	Attenuator, 100W 20dB	BK5859	1/13/09

TEST PERSONNEL:

Daniel Baltzell		October 21, 2006
Test Technician/Engineer	Signature	Date Of Test

5 FCC Rules and Regulations Part 2 §2.1053(a): Field Strength of Spurious Radiation; RSS-119 §6.3: Unwanted Emissions

5.1 Test Procedure

ANSI TIA-603-C 2004, Section 2.2.12.

Device with digital modulation: Modulated to its maximum extent using a pseudo random data sequence – 19,200 bps.

The spurious emissions levels were measured 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 was further corrected to a half-wave dipole.

5.2 Test Data

5.2.1 CFR 47 Part 90.210 Requirements

The worst-case emissions test data are shown. The magnitude of emissions attenuated more than 20 dB below the FCC limit need not be recorded.

The VRM power was set to a power setting of 44 dBm and the VRB was set to a power setting of 44 dBm. Both transmitters were transmitting simultaneously.

Table 5-1: Field Strength of Spurious Radiation Mid Channel 600 – 820.9875/865.9875 MHz; High Power

VRM
Freq = 820.9875 MHz
Limit = 43 + 10 Log P = 56.2 dBc
Conducted Power = 43.2 dBm = 20.9 W
Horizontal Polarity

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss* (dB)	Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
1641.9750	65.0	-33.5	0.8	7.4	70.1	-13.9
2462.9625	38.4	-43.5	0.5	9.2	78.0	-21.8
3283.9500	33.9	-41.9	0.4	7.5	78.0	-21.8
4104.9375	35.6	-33.6	0.3	7.6	69.5	-13.3
4925.9250	31.3	-29.7	0.7	8.4	65.2	-9.0
5746.9125	20.2	-33.1	0.6	8.6	68.3	-12.1

*This insertion loss corresponds to the cable connecting the RF Signal Generator to the ½ wave dipole antenna.

VRM
Freq = 820.9875 MHz
Limit = 43 + 10 Log P = 56.2 dBc
Conducted Power = 43.2 dBm = 20.9 W
Vertical Polarity

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss* (dB)	Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
1641.9750	67.3	-30.4	0.8	7.4	67.0	-10.8
2462.9625	41.0	-39.5	0.5	9.2	74.0	-17.8
3283.9500	38.4	-37.5	0.4	7.5	73.6	-17.4
4104.9375	36.1	-33.0	0.3	7.6	68.9	-12.7
4925.9250	27.7	-33.9	0.7	8.4	69.4	-13.2
5746.9125	18.8	-34.0	0.6	8.6	69.2	-13.0

*This insertion loss corresponds to the cable connecting the RF Signal Generator to the ½ wave dipole antenna.

VRB
Freq = 865.9875 MHz
Limit = 43 + 10 Log P = 56.2 dBc
Conducted Power = 43.2 dBm = 20.9 W
Horizontal Polarity

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss* (dB)	Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
1731.9750	53.4	-41.1	1.0	5.3	80.0	-23.8
2597.9625	29.6	-46.7	0.7	7.4	83.2	-27.0
3463.9500	32.2	-45.6	0.3	7.5	81.6	-25.4
4329.9375	18.2	-47.3	0.1	8.1	82.5	-26.3
5195.9250	16.8	-47.9	0.5	8.3	83.3	-27.1
6061.9125	12.5	-43.1	0.8	8.9	78.2	-22.0

*This insertion loss corresponds to the cable connecting the RF Signal Generator to the ½ wave dipole antenna.

VRB
Freq = 865.9875 MHz
Limit = 43 + 10 Log P = 56.2 dBc
Conducted Power = 43.2 dBm = 20.9 W
Vertical Polarity

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss* (dB)	Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
1731.9750	51.4	-42.2	1.0	5.3	81.1	-24.9
2597.9625	31.1	-44.0	0.7	7.4	80.5	-24.3
3463.9500	29.3	-47.2	0.3	7.5	83.2	-27.0
4329.9375	14.7	-51.1	0.1	8.1	86.3	-30.1
5195.9250	14.4	-51.0	0.5	8.3	86.4	-30.2
6061.9125	12.3	-43.3	0.8	8.9	78.4	-22.2

*This insertion loss corresponds to the cable connecting the RF Signal Generator to the ½ wave dipole antenna.

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

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due
901053	Schaffner-Chase	CBL6112	Antenna (25 MHz – 2 GHz)	2648	11/1/06
900814	Electro-Metrics	EM-6961 (RGA-60)	Double Ridge Guide Antenna (1 - 18 GHz)	2310	3/30/09
900905	Rhein Tech Labs	PR-1040	OATS 1 Preamplifier 40 dB (30 MHz – 2 GHz)	1006	3/15/07
901365	MITEQ	JS4-00102600-41-5P	Amplifier, 15 V, 0.1 - 26 GHz, 28 dB gain, power 5dB	1094152	3/24/07
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414	9/13/07
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	9/13/07
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	9/13/07
900889	Hewlett Packard	85685A	RF Preselector (20 Hz - 2 GHz)	3146A01309	4/12/07
900154	Compliance Design	Roberts Dipole	Adjustable Elements Dipole Antenna (30 - 1000 MHz)	N/A	12/21/06
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	5/20/07
900321	EMCO	3161-03	Horn Antenna (4.0 - 8.2 GHz)	9508-1020	5/20/07
900323	EMCO	3160-07	Horn Antenna (8.2 - 12.4 GHz)	9605-1054	5/20/07
901128	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	2/1/09
901132	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	2/1/09
901424	Insulated Wire Inc.	KPS-1503-360-KPS	RF cable 36"	NA	12/12/06
900928	Hewlett Packard	83752A	Synthesized Sweeper, 0.01 to 20 GHz	3610A00866	11/10/06

TEST PERSONNEL:

Daniel Baltzell		October 22, 2006
Test Technician/Engineer	Signature	Date Of Test

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

Type of Emission: F3E, F7D, F7E

Voice – SMR - 25 kHz channel separation
Calculation:
Max modulation(M) in kHz: 3.0
Max deviation (D) in kHz: 5.0
Constant factor (K): 1 (assumed)
Bn = 2xM+2xDK = 16.0 kHz
Emission designator: 16K0F3E

Voice – NPSPAC - 25 kHz channel separation
Calculation:
Max modulation(M) in kHz: 3.0
Max deviation (D) in kHz: 4.0
Constant factor (K): 1 (assumed)
Bn = 2xM+2xDK = 14.0 kHz
Emission designator: 14K0F3E

OTP/ORP – SMR - 19200 bps
Calculation:
Data rate in bps (R) = 19200
Peak deviation of carrier (D) = 4000 Hz
Bn = [R/$\log_2$(4) + 2 (D) (1)] = 17.6 kHz
Emission designator: 17K6F7D, 17K6F7E

OTP/ORP – NPSPAC - 19200 bps
Calculation:
Data rate in bps (R) = 19200
Peak deviation of carrier (D) = 4000 Hz
Bn = [R/$\log_2$(4) + 2 (D) (1)] = 17.6 kHz
Emission designator: 17K6F7D, 17K6F7E

P25 – SMR - 9600 bps
Calculation:
Data rate in bps (R) = 9600
Peak deviation of carrier (D) = 1800 Hz
Bn = [R/$\log_2$(4) + 2 (D) (1)] = 8.4 kHz
Emission designator: 8K4F1D, 8K4F1E

P25 – NPSPAC - 9600 bps
Calculation:
Data rate in bps (R) = 9600
Peak deviation of carrier (D) = 1800 Hz
Bn = [R/$\log_2$(4) + 2 (D) (1)] = 8.4 kHz
Emission designator: 8K4F1D, 8K4F1E

7 FCC Rules and Regulations Part 15 §15.109: Radiated Emissions Limits

7.1 Amendments to Emissions Test Methodology

7.1.1 Deviations from Test Methodology

There was no deviation from, additions to, or exclusions from, ANSI C63.4: 2003.

7.2 Radiated Emissions Measurements

7.2.1 Site and Test Description

Before final radiated emissions measurements were made on the OATS, the EUT was scanned indoors at both one and three meter distances. This was done in order to determine its emission spectrum signal. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emission measurements on the OATS, at each frequency, in order to ensure that maximum emission amplitudes were measured.

Final radiated emissions measurements were made on the OATS at a distance of 3 meters. The EUT was placed on a nonconductive turntable at a height of 1 m.

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emissions maximum levels. Measurements were taken using both horizontal and vertical antenna polarization. The spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the quasi-peak detection mode. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

7.2.2 Field Strength Calculations

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FI(dB\mu V/m) = SAR(dB\mu V) + SCF(dB/m)$$

FI = Field Intensity

SAR = Spectrum Analyzer Reading

SCF = Site Correction Factor

The Site Correction Factor (SCF) used in the above equation is determined empirically, and is expressed in the following equation:

$$SCF(dB/m) = -PG(dB) + AF(dB/m) + CL(dB)$$

SCF = Site Correction Factor

PG = Pre-Amplifier Gain

AF = Antenna Factor

CL = Cable Loss

The field intensity in microvolts per meter can then be determined according to the following equation:

$$FI(\mu V/m) = 10^{FI(dB\mu V/m)/20}$$

For example, assume a signal frequency of 125 MHz has a received level measured as 49.3 dBuV. The total Site Correction Factor (antenna factor plus cable loss minus preamplifier gain) for 125 MHz is –11.5 dB/m. The actual radiated field strength is calculated as follows:

$$49.3 dB\mu V - 11.5 dB/m = 37.8 dB\mu V/m$$

$$10^{37.8/20} = 10^{1.89} = 77.6 \mu V/m$$

7.2.3 Measurement Uncertainty

Rhein Tech Laboratories, Inc. has implemented procedures to minimize errors that occur from test instruments, calibration, procedures, and test setups. Test instrument and calibration errors are documented from the manufacturer or calibration lab. Other errors have been defined and calculated within the Rhein Tech Quality Manual, Section 6.1. Rhein Tech implements the following procedures to minimize errors that may occur: yearly as well as daily calibration methods, technician training, and emphasis to employees on avoiding error.

7.2.4 Test Limits

FCC Class B Radiated Emissions	
Frequency (MHz)	**At 3m (dBμV/m)**
30-88	40.0
88-216	43.5
216-960	46.0
> 1000	54

7.2.5 Radiated Emissions Data – Mode RX, Limit/Distance FCC B/3M

Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
49.156	Qp	V	0	1.0	37.5	-21.1	16.4	40.0	-23.6
57.600	Qp	V	270	1.0	47.7	-22.9	24.8	40.0	-15.2
86.403	Qp	H	270	2.0	59.8	-20.3	39.5	40.0	-0.5
100.014	Qp	V	40	1.0	40.5	-17.1	23.4	43.5	-20.1
230.051	Qp	H	30	1.4	41.9	-16.4	25.5	46.0	-20.5
300.038	Qp	H	120	1.0	51.5	-13.3	38.2	46.0	-7.8
316.699	Qp	H	130	1.0	45.2	-13.1	32.1	46.0	-13.9
500.068	Qp	V	240	1.0	49.9	-8.3	41.6	46.0	-4.4
700.097	Qp	V	270	1.0	45.0	-5.2	39.8	46.0	-6.2
821.000	Qp	H	0	1.0	44.6	-2.8	41.8	46.0	-4.2

TEST PERSONNEL:

Daniel Baltzell	Daniel W. Baltzell	October 22, 2006
Test Technician/Engineer	Signature	Date Of Test

8 Conclusion

The data in this measurement report shows that the **M/A-COM, Inc**. Model **OpenSky M-803 V-TAC Mobile Radio; FCC ID: BV8VTAC800,** complies with the applicable requirements of Parts 90 and 2 of the FCC Rules and Industry Canada RSS-119.