Engineering and Testing for EMC and Safety Compliance

Class II Permissive Change Report

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MODEL: PRISM HP TR-336
LPE 800 MHz Portable Radio (806-869 MHz)

FCC ID: AXATR-336-A

February 13, 2006

Standards Referenced for this Report	
Part 2: 2003	Frequency Allocations and Radio Treaty Matters; General Rules and Regulations
Part 15: 2003	Radio Frequency Devices - §15.109: Radiated Emissions Limits
Part 90: 2003	Private Land Portable 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 Portable 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 Portable and Fixed Radio Transmitters and Receivers 27.41 to 960.0 MHz

Frequency Range	Maximum Measured Output Power (W) Conducted	Frequency Tolerance	Emission Designator
806-824, 851-869 MHz	3.3	0.0015%	16K0F3E (WB Voice)
806-824, 851-869 MHz	3.2	0.0015%	14K0F3E (NPSPAC Voice)
806-824, 851-869 MHz	3.3	0.0015%	16K0F1D (2 level WB 9600)
806-824, 851-869 MHz	3.3	0.0015%	16K0F1E (2 level WB 9600)
806-824, 851-869 MHz	3.2	0.0015%	15K0F1D (2 level NPSPAC 9600)
806-824, 851-869 MHz	3.2	0.0015%	15K0F1E (2 level NPSPAC 9600)

REPORT PREPARED BY TEST ENGINEER: DAN BIGGS

Document Number: 2006015/QRTL06-129

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1 General Information

This Class II Permissive Change 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 **PRISM HP TR-336 LPE 800 MHz Portable Radio; FCC ID: AXATR-336-A**. 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 request for the FCC certification initially issued on February 6, 1996, required because the PA module became obsolete and was replaced with an alternate component. The results in this report are for the EUT tested with the alternate component.

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 attached test record. No modifications were made to the equipment during testing in order to achieve compliance with these standards. The test results relate only to the item that was tested.

Furthermore, there was no deviation from, additions to or exclusions from the above standards for Certification methodology.

Signature:  Date: February 21, 2006

Typed/Printed Name: Desmond A. Fraser Position: President

Signature:  Date: February 21, 2006

Typed/Printed Name: Daniel W. Biggs Position: Test Engineer

3 Tested System Details

Listed below are the identifiers and descriptions of all equipment, cables, and internal devices used with the EUT for this test, as applicable.

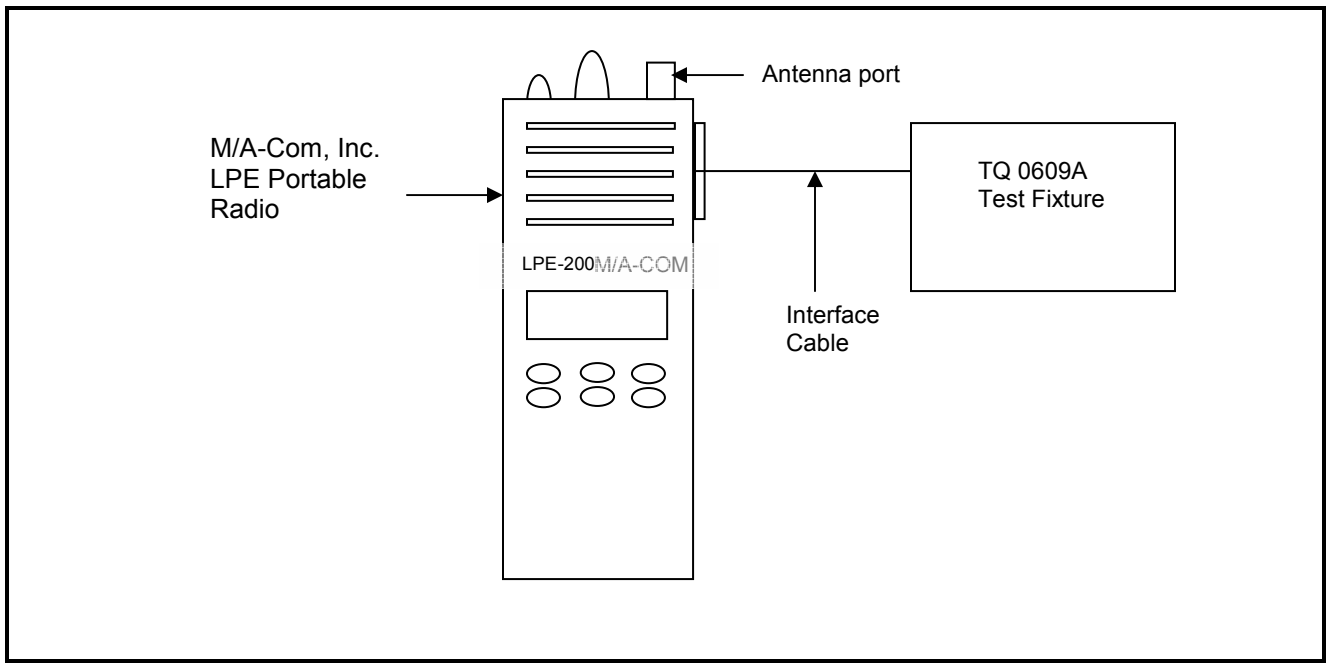
Table 3-1: Equipment Under Test (EUT)

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
LPE 800 MHz Portable Radio	M/A-Com, Inc.	PRISM HP TR-336	9806264	AXATR-336-A	17031

Table 3-2: Support Equipment

Part	Manufacturer	Model	PN/SN	FCC ID	RTL Bar Code
Test Fixture	M/A-Com, Inc.	TQ0609A	KRY 101 1639/1	N/A	17032
Power Supply Adapter	M/A-Com, Inc.	N/A	BKB 191 203/3	N/A	17035
Interface Cable	M/A-Com, Inc.	N/A	RPM 1132472/6	N/A	17033

Figure 3-1: Configuration of Tested System



4 FCC Rules and Regulations Part 2 §2.1033(C)(8) Voltages and Currents Through The Final Amplifying Stage

Nominal DC Voltage: 7.5 VDC
Current: 1.6 AMPS

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

5.1 Test Procedure

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

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

5.2 Test Data

Table 5-1: RF Power Output (High Power): Carrier Output Power (Unmodulated)

Channel	Frequency (MHz)	RF Power Measured (Watt)*
806000H	806.0	3.3
806000L	806.0	1.2
815500H	815.5	3.2
815500L	815.5	1.2
824000H	824.0	3.2
824000L	824.0	1.1
851000H	851.0	2.2
851000L	851.0	1.2
860500H	860.5	2.2
860500L	860.5	1.1
869000H	869.0	2.2
869000L	869.0	1.1

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

Table 5-2: RF Power Output (Rated Power)

Rated Power (W)
3.0

Table 5-3: 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
900819	Weinschel Corporation	BF0830	Attenuator 10 db	N/A	12/2/08

TEST PERSONNEL:

Dan Biggs		February 8, 2006
Test Engineer	Signature	Date Of Test

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

6.1 Test Procedure

ANSI/TIA/EIA-603-2002, Section 2.2.13

The transmitter is terminated with a 50 Ω load and interfaced with a spectrum analyzer. The transmitter is modulated with a 2,500 Hz sine wave at an input level 16 dB greater than that necessary to produce 50% of the rated system deviation at 1,000 Hz.

Digital Modulation: Modulated to its maximum extent using a pseudo random data sequence – 9600-bps.

6.2 Test Data

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

Limits: (43+10xLOG P(W))

The following channels (in MHz) were investigated: 806.0, 851.0, and 824.0, 851.0, 860.5, and 869.0 for both high and low powers. 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.

Table 6-1: Conducted Spurious Emissions Channel 1 – 806.0 MHz – High Power

(806.0 MHz); 25 kHz channel spacing; Conducted Power = 3.31 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1612	84.5	48.2	-36.3
2418	82.1	48.2	-33.9
3224	80.7	48.2	-32.5
4030	87.9	48.2	-39.7
4836	95.1	48.2	-46.9
5642	83.2	48.2	-35.0
6448	91.7	48.2	-43.5
7254	89.6	48.2	-41.4
8060	89.7	48.2	-41.5

Table 6-2: Conducted Spurious Emissions Channel 1 – 806.0 MHz – Low Power

(806.0 MHz); 25 kHz channel spacing; Conducted Power = 1.20 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1612	88.9	43.8	-40.7
2418	88.5	43.8	-40.3
3224	96.0	43.8	-47.8
4030	94.4	43.8	-46.2
4836	94.3	43.8	-46.1
5642	81.8	43.8	-33.6
6448	94.5	43.8	-46.3
7254	90.5	43.8	-42.3
8060	88.9	43.8	-40.7

Table 6-3: Conducted Spurious Emissions Channel 2 – 815.5 MHz – High Power

(815.5000 MHz); 25 kHz channel spacing; Conducted Power = 3.24 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1631	84.7	48.1	-36.5
2446.5	84.7	48.1	-36.5
3262	81.6	48.1	-33.4
4077.5	91.7	48.1	-43.5
4893	91.8	48.1	-43.6
5708.5	85.4	48.1	-37.2
6524	89.5	48.1	-41.3
7339.5	88.4	48.1	-40.2
8155	89.9	48.1	-41.7

Table 6-4: Conducted Spurious Emissions Channel 2 – 815.5 MHz – Low Power

(815.5000 MHz); 25 kHz channel spacing; Conducted Power = 1.20 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1631	91.2	43.8	-43.0
2446.5	88.2	43.8	-40.0
3262	92.1	43.8	-43.9
4077.5	91.3	43.8	-43.1
4893	92.0	43.8	-43.8
5708.5	89.5	43.8	-41.3
6524	90.5	43.8	-42.3
7339.5	89.8	43.8	-41.6
8155	91.4	43.8	-43.2

Table 6-5: Conducted Spurious Emissions Channel 3 – 824.0 MHz – High Power

(824.0 MHz); 25 kHz channel spacing; Conducted Power = 3.24 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1648	85.1	48.1	-36.9
2472	85.7	48.1	-37.5
3296	81.6	48.1	-33.4
4120	89.4	48.1	-41.2
4944	87.2	48.1	-39.0
5768	78.3	48.1	-30.1
6592	90.2	48.1	-42.0
7416	88.3	48.1	-40.1
8240	88.8	48.1	-40.6

Table 6-6: Conducted Spurious Emissions Channel 3 – 824.0 MHz – Low Power

(824.0 MHz); 25 kHz channel spacing; Conducted Power = 1.05 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1648	92.7	43.2	-44.5
2472	89.7	43.2	-41.5
3296	93.7	43.2	-45.5
4120	90.7	43.2	-42.5
4944	93.8	43.2	-45.6
5768	87.8	43.2	-39.6
6592	89.5	43.2	-41.3
7416	90.9	43.2	-42.7
8240	88.7	43.2	-40.5

Table 6-7: Conducted Spurious Emissions Channel 4 – 851.0 MHz – High Power

(851.0 MHz); 25 kHz channel spacing; Conducted Power = 2.24 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1702	82.0	46.5	-33.8
2553	62.8	46.5	-14.6
3404	77.4	46.5	-29.2
4255	68.7	46.5	-20.5
5106	87.3	46.5	-39.1
5957	84.4	46.5	-36.2
6808	78.9	46.5	-30.7
7659	89.3	46.5	-41.1
8510	86.3	46.5	-38.1

Table 6-8: Conducted Spurious Emissions Channel 4 – 851.0 MHz – Low Power

(851.0 MHz); 25 kHz channel spacing; Conducted Power = 1.15 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1702	85.6	43.6	-37.4
2553	68.4	43.6	-20.2
3404	77.9	43.6	-29.7
4255	65.9	43.6	-17.7
5106	88.1	43.6	-39.9
5957	88.8	43.6	-40.6
6808	75.3	43.6	-27.1
7659	89.0	43.6	-40.8
8510	87.4	43.6	-39.2

Table 6-9: Conducted Spurious Emissions Channel 5 – 860.5 MHz – High Power

(860.5 MHz); 25 kHz channel spacing; Conducted Power = 2.19 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1721	87.6	46.4	-39.4
2581.5	75.8	46.4	-27.6
3442	82.2	46.4	-34.0
4302.5	71.7	46.4	-23.5
5163	87.4	46.4	-39.2
6023.5	84.0	46.4	-35.8
6884	84.0	46.4	-35.8
7744.5	89.8	46.4	-41.6
8605	85.5	46.4	-37.3

Table 6-10: Conducted Spurious Emissions Channel 5 – 860.5 MHz – Low Power

(860.5 MHz); 25 kHz channel spacing; Conducted Power = 1.10 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1721	91.8	43.4	-43.6
2581.5	76.1	43.4	-27.9
3442	81.4	43.4	-33.2
4302.5	76.7	43.4	-28.5
5163	85.6	43.4	-37.4
6023.5	93.9	43.4	-45.7
6884	88.6	43.4	-40.4
7744.5	89.5	43.4	-41.3
8605	84.2	43.4	-36.0

Table 6-11: Conducted Spurious Emissions Channel 6 – 869.0 MHz – High Power

(869.0 MHz); 25 kHz channel spacing; Conducted Power = 2.19 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1738	81.2	46.4	-33.0
2607	58.9	46.4	-10.7
3476	75.8	46.4	-27.6
4345	58.2	46.4	-10.0
5214	78.7	46.4	-30.5
6083	84.4	46.4	-36.2
6952	88.1	46.4	-39.9
7821	86.1	46.4	-37.9
8690	80.6	46.4	-32.4

Table 6-12: Conducted Spurious Emissions Channel 6 – 869.0 MHz – Low Power

(869.0 MHz); 25 kHz channel spacing; Conducted Power = 1.12 W

Frequency (MHz)	Level (dBc)	Limit (dBc)	Margin(dB)
1738	85.1	43.5	-36.9
2607	64.3	43.5	-16.1
3476	74.6	43.5	-26.4
4345	64.1	43.5	-15.9
5214	82.2	43.5	-34.0
6083	93.5	43.5	-45.3
6952	87.8	43.5	-39.6
7821	87.5	43.5	-39.3
8690	82.5	43.5	-34.3

Table 6-13: Test Equipment Used For Testing Conducted Spurious Emissions

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	8/3/06
901132	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	5/13/06
901424	Insulated Wire Inc.	KPS-1503-360-KPS	RF cable 36"	NA	12/12/06
900928	Hewlett Packard	83752A	Synthesized Sweeper (0.01 - 20 GHz)	3610A00866	11/10/06

TEST PERSONNEL:

Daniel Biggs		February 9, 2006
Test Engineer	Signature	Date Of Test

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

7.1 Test Procedure

ANSI/TIA/EIA-603-2002, section 2.2.12

Analog Modulation: The transmitter is terminated with a 50 Ω load and is modulated with a 2,500 Hz sine wave at an input level 16 dB greater than that required to produce 50% of the rated system deviation at 1,000 Hz.

Digital Modulation: Modulated to its maximum extent using a pseudo random data sequence – 9600-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.

7.2 Test Data

7.2.1 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.

Table 7-1: Field Strength of Spurious Radiation Channel 2 – 815.5 MHz; Wide Band; High Power

Limit = 43 + 10 Log P = 48.1 dBc
Conducted Power = 35.1 dBm = 3.24 W

Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss* (dB)	Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
1631.0	50.5	-61.2	4.4	4.8	95.9	-47.8
2446.5	53.3	-35.3	4.8	6.6	68.6	-20.5
3262.0	45.5	-44.7	5.6	7.4	78.0	-29.9
4077.5	37.0	-46.6	5.9	7.2	80.4	-32.3
4893.0	38.7	-44.7	5.6	7.6	77.8	-29.7
5708.5	38.0	-44.6	7.6	8.4	78.9	-30.8
6524.0	35.8	-46.8	8.4	8.9	81.4	-33.3
7339.5	35.8	-43.9	8.8	8.5	79.3	-31.2
8155.0	35.6	-41.1	8.9	7.6	77.5	-29.4

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

Table 7-2: Field Strength of Spurious Radiation Channel 5 – 860.5 MHz; Wide Band; High Power

Limit = 43 + 10 Log P = 46.4 dBc
Conducted Power = 33.4 dBm = 2.19 W

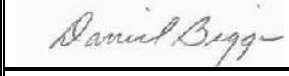
Frequency (MHz)	Spectrum Analyzer Level (dBuV)	Signal Generator Level (dBm)	Cable Loss* (dB)	Antenna Gain (dBd)	Corrected Signal Generator Level (dBc)	Margin (dB)
1721.0	49.7	-61.3	4.6	5.0	92.1	-45.7
2581.5	54.7	-33.6	5.0	7.0	66.2	-19.8
3442.0	44.3	-45.4	5.7	7.6	75.1	-28.7
4302.5	42.3	-44.2	6.1	7.6	77.5	-31.1
5163.0	36.7	-45.7	6.5	7.8	76.1	-29.7
6023.5	44.5	-37.8	7.7	8.7	70.1	-23.7
6884.0	38.5	-44.3	8.1	8.2	76.4	-30.0
7744.5	38.7	-40.5	9.1	8.0	71.7	-25.3
8605.0	39.0	-36.5	9.5	8.5	73.2	-26.8

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

Table 7-3: Test Equipment Used For Testing Field Strength Of Spurious Radiation

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901053	Schaffner-Chase	CBL6112	Antenna (25 MHz – 2 GHz)	2648	11/1/06
900932	Hewlett Packard	8449B OPT H02	Preamplifier (1 - 26.5 GHz)	3008A00505	8/3/06
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz - 40 GHz)	3943A01719	9/14/06
901281	Rhein Tech Laboratories	PR-1040 (10-2000 MHz)	Amplifier	1004	12/8/06
900928	Hewlett Packard	HP 83752A	Synthesized Sweeper (.01 - 20 GHz)	3610A00866	11/10/06
901426	Insulated Wire Inc.	KPS-1503-3600-KPS	RF Cable, 30'	NA	12/12/06
901425	Insulated Wire, Inc.	KPS-1503-2400-KPS	RF Cable, 20'	NA	12/12/06
901424	Insulated Wire Inc.	KPS-1503-360-KPS	RF Cable 36"	NA	12/12/06
901132	Par Electronics	806-902 (25W)	UHF Notch Filter	N/A	5/13/06
900927	Tektronix	ASG 100	Audio Signal Generator	B03274 V2.3	N/A

TEST PERSONNEL:

Daniel Biggs		February 10, 2006
Test Engineer	Signature	Date Of Test

8 FCC Rules and Regulations Part 2 §2.1049(c)(1): Occupied Bandwidth; RSS-119 §6.4: Emissions Masks

Occupied Bandwidth - Compliance with the Emission Masks

8.1 Test Procedure

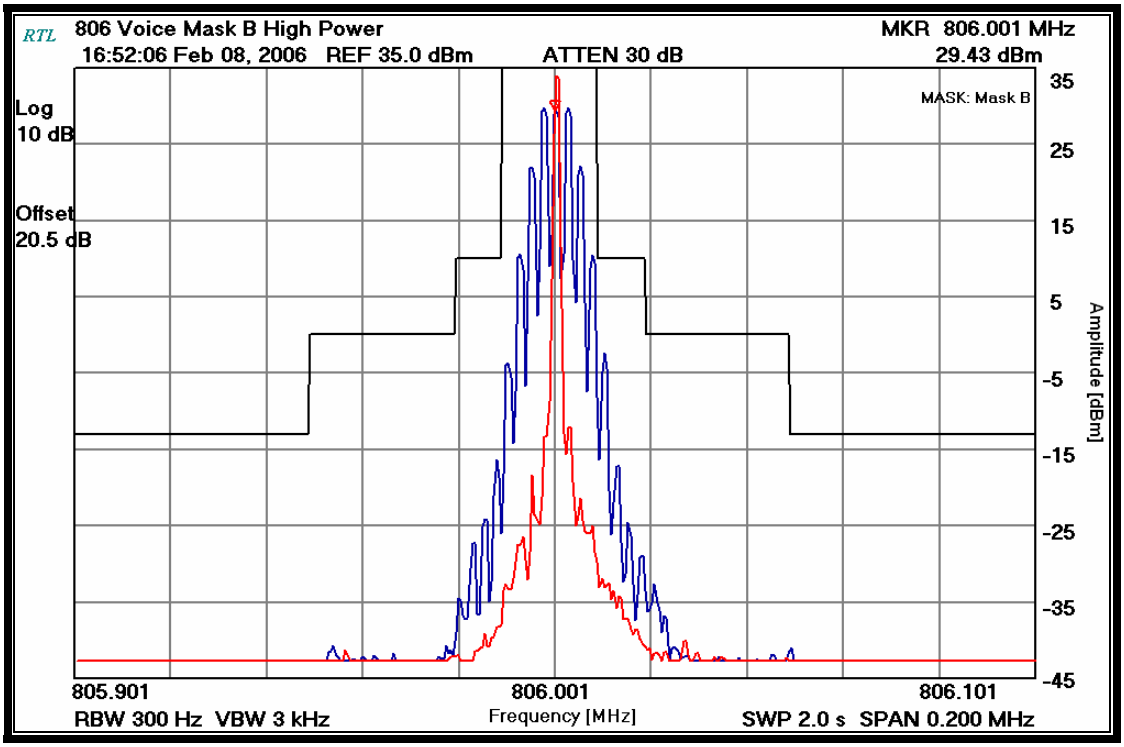
ANSI/TIA/EIA-603-2002, section 2.2.11 and TIA/EIA-102.CAAA-2002 section 2.2.5

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.

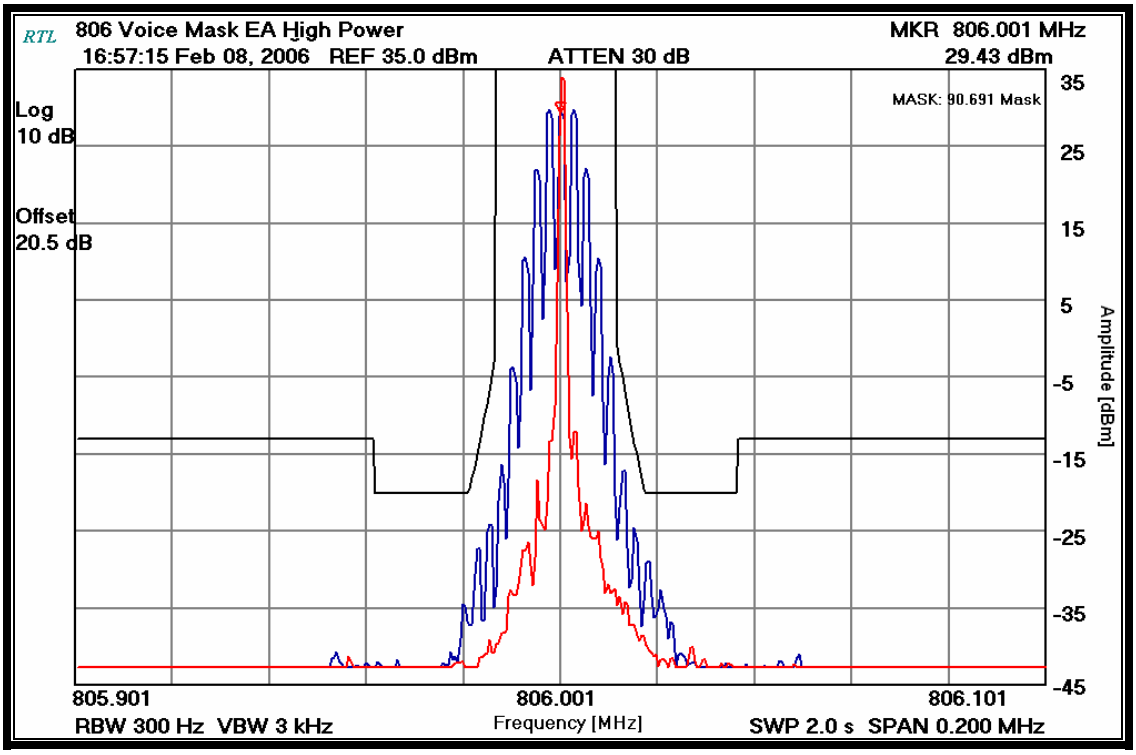
Device with digital modulation: Modulated to its maximum extent using a pseudo-random data sequence – 9600 bps.

8.2 Test Data

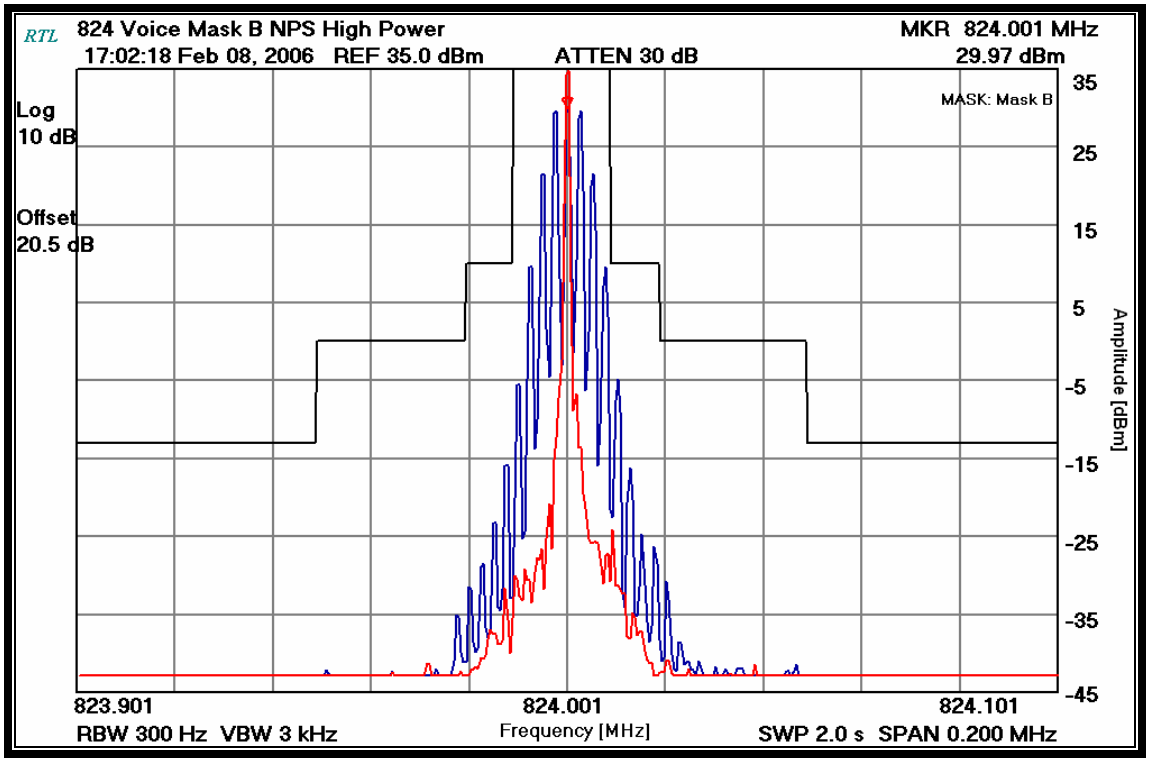
Plot 8-1: Occupied Bandwidth: 806000H; Wide Band; Audio Modulation: 2,500 Hz (Mask B)



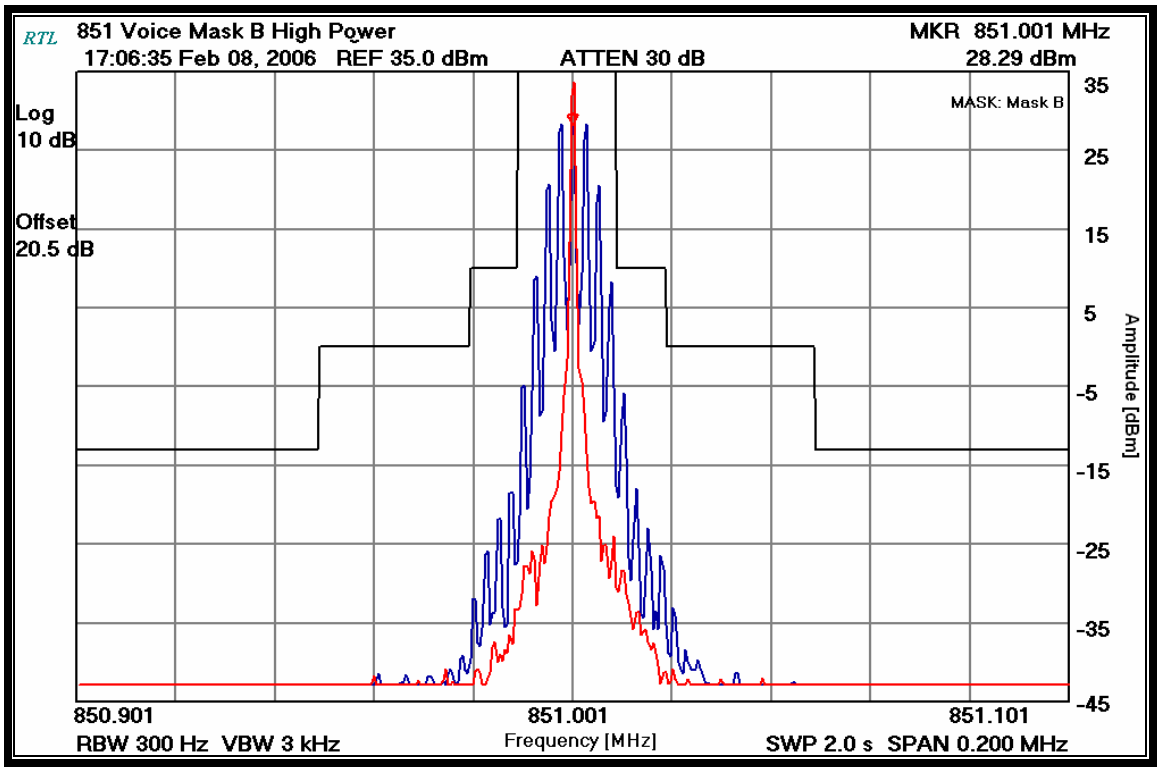
Plot 8-2: Occupied Bandwidth: 806000H; Wide Band; Audio Modulation: 2,500 Hz (Mask EA)



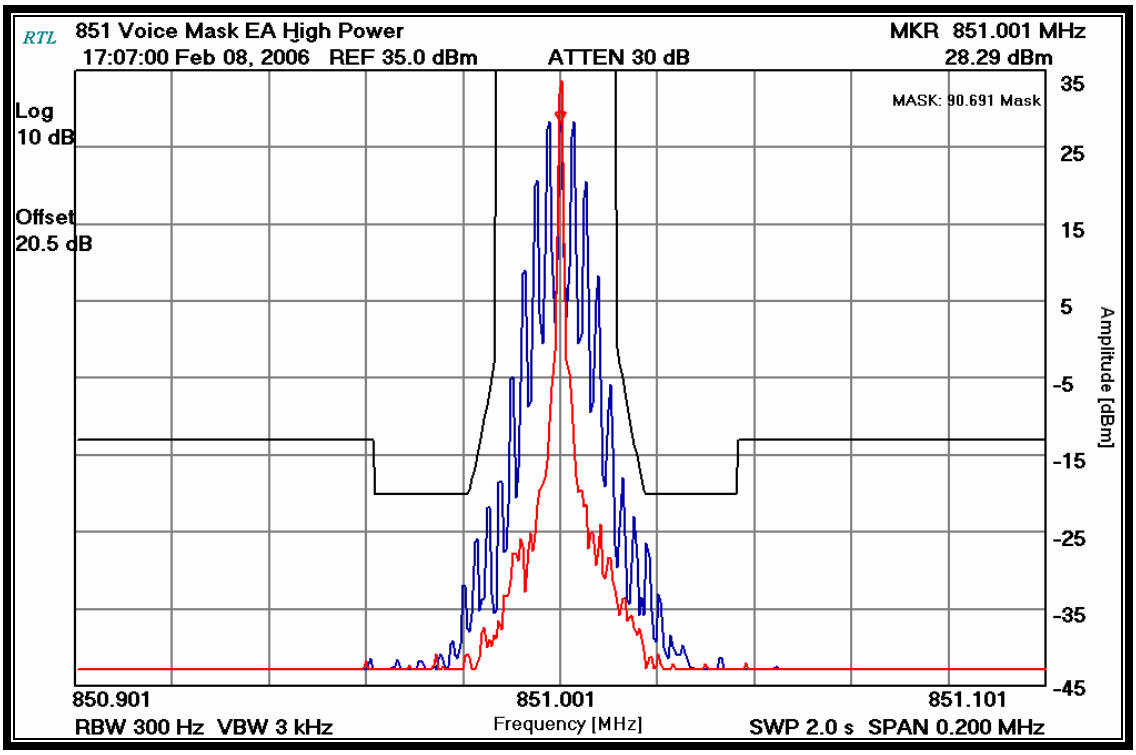
Plot 8-3: Occupied Bandwidth: 824000H; NPSPAC; Audio Modulation: 2,500 Hz (Mask B)



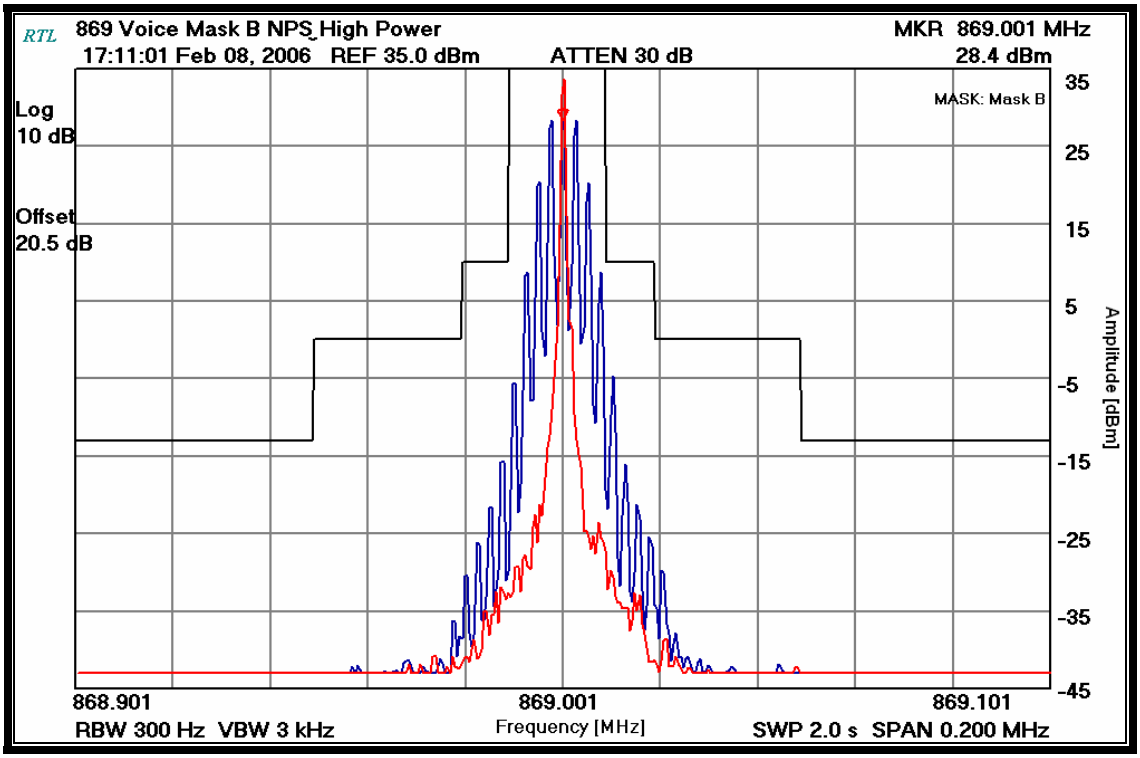
Plot 8-4: Occupied Bandwidth: 851000H; Wide Band; Audio Modulation: 2,500 Hz (Mask B)



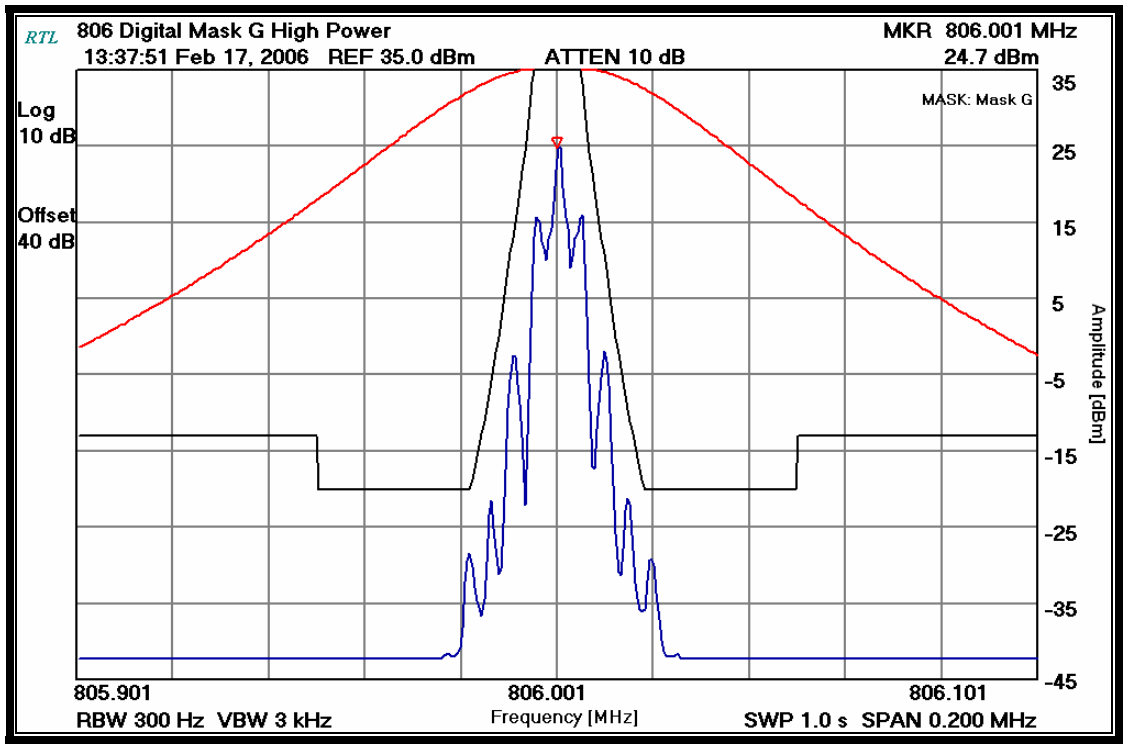
Plot 8-5: Occupied Bandwidth: 851000H; Wide Band; Audio Modulation: 2,500 Hz (Mask EA)



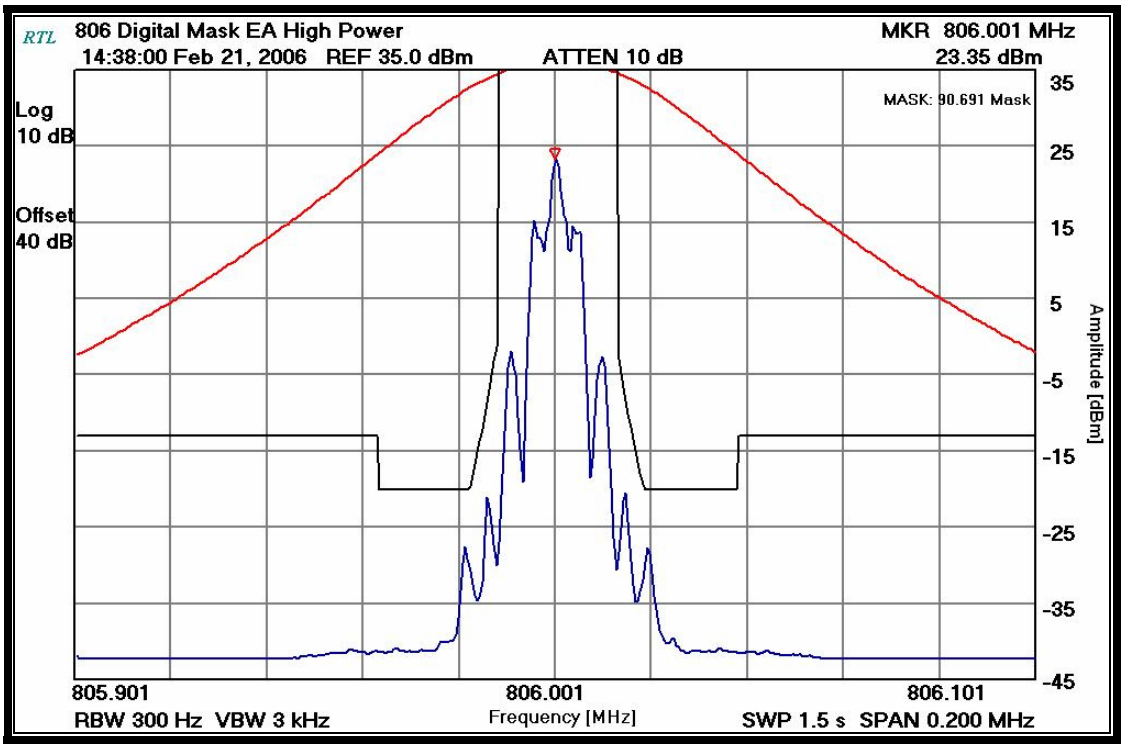
Plot 8-6: Occupied Bandwidth: 869000H; NPSPAC; Audio Modulation; (Mask B)



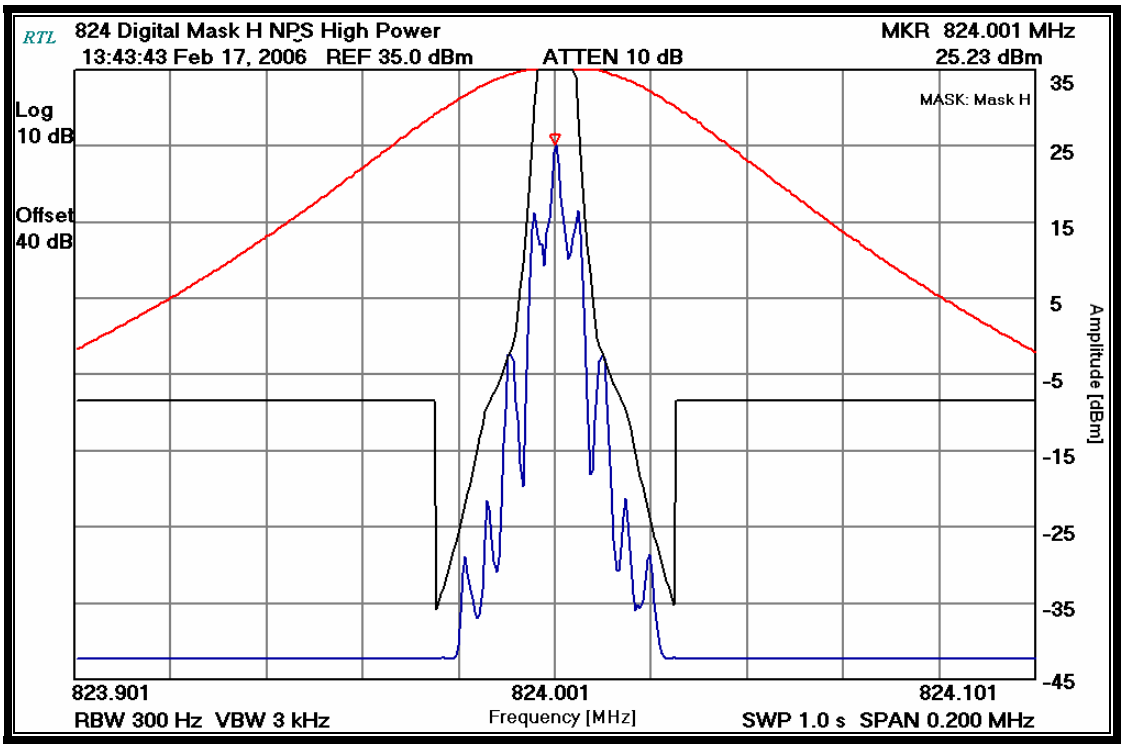
Plot 8-7: Occupied Bandwidth: 806000H; 2-level; Wide Band; 9600; (Mask G)



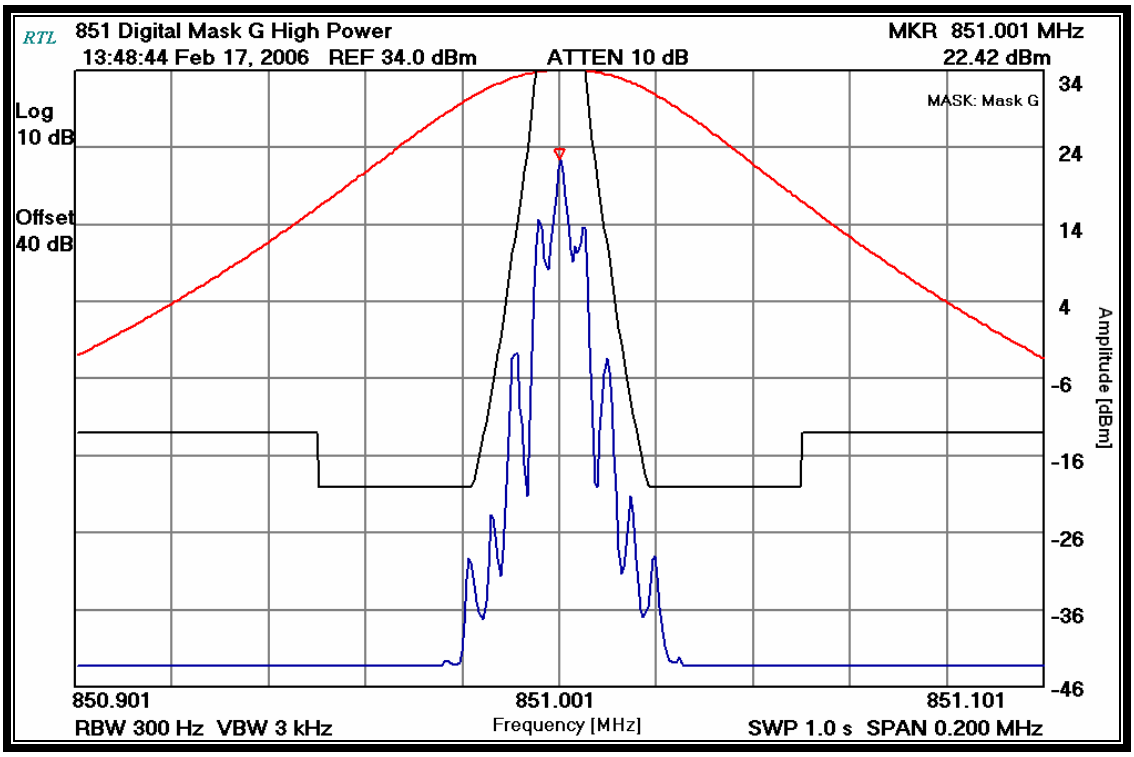
Plot 8-8: Occupied Bandwidth: 806000H; 2-level; Wide Band; 9600; (Mask EA)



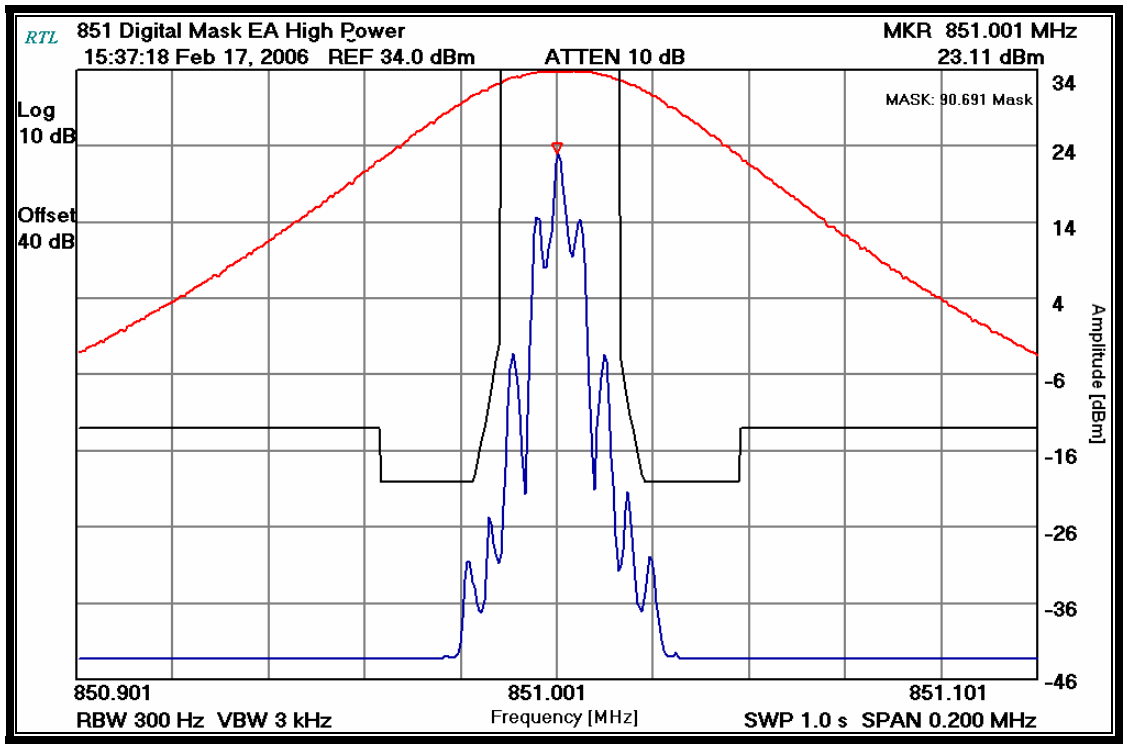
Plot 8-9: 99% Occupied Bandwidth: 824000H; 2-level; NPSPAC; 9600; (Mask H)



Plot 8-10: 99% Occupied Bandwidth: 851000H; 2-level; Wide Band; 9600; (Mask G)



Plot 8-11: 99% Occupied Bandwidth: 851000H; 2-level; Wide Band; 9600; (Mask EA)



Plot 8-12: 99% Occupied Bandwidth: 869000H; 2-level; NPSPAC; 9600; (Mask H)

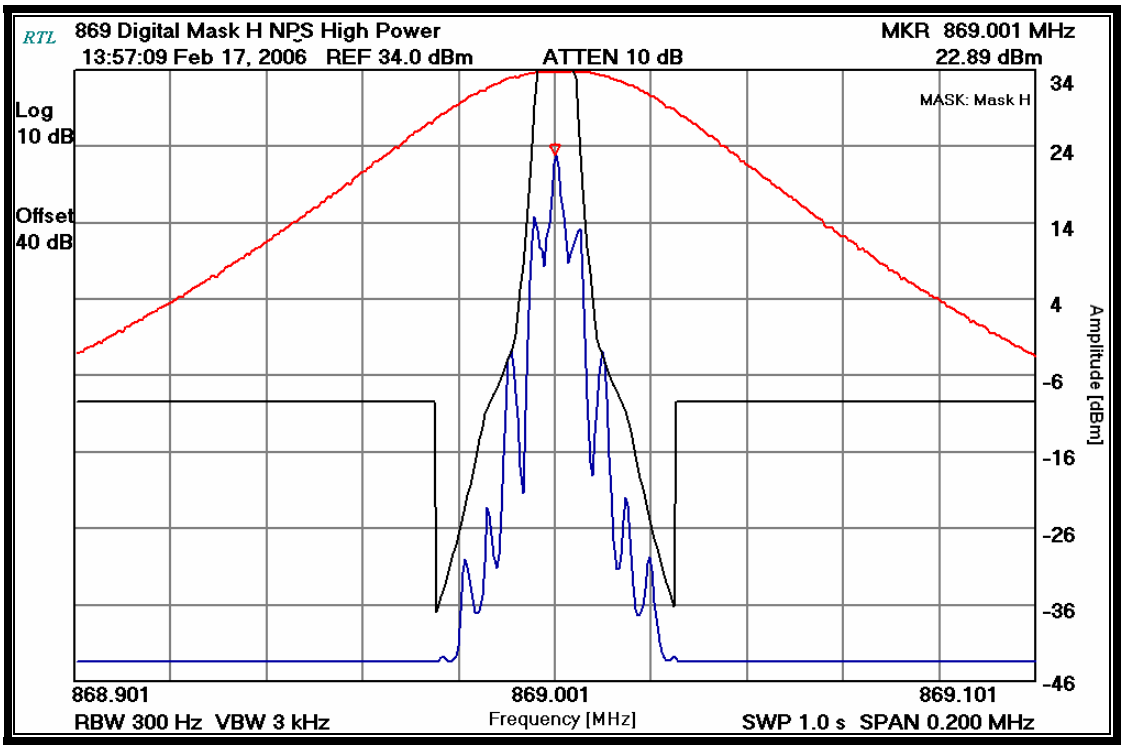


Table 8-1: Test Equipment Used For Testing Occupied Bandwidth

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Date
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz - 40 GHz)	3943A01719	9/14/06
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585	9/14/06
900819	Weinschel Corporation	BF0830	Attenuator 10 db	N/A	12/2/08

TEST PERSONNEL:

Daniel Biggs		February 8, 17 & 21, 2006
Test Engineer	Signature	Date Of Test

9 Conclusion

The data in this measurement report shows that the **M/A-COM, Inc**. Model **PRISM HP TR-336 LPE 800 MHz Portable Radio, FCC ID: AXATR-336-A,** complies with all the requirements of Parts 90, 15 and 2 of the FCC Rules, and Industry Canada RSS-119, Issue 6, 2000.