



**FCC CFR47 PART 95 SUBPART A
CERTIFICATION TEST REPORT**

FOR

UHF FM TRANSCEIVER

MODEL NUMBER: MC1000

FCC ID: B4HMC1000

REPORT NUMBER: 06U10748-1, REVISION C

ISSUE DATE: MARCH 26, 2007

Prepared for
**PORTA PHONE CO.
145 DEAN KNAUSS DRIVE
NARRAGANSETT, RI 02882, USA**

Prepared by
**COMPLIANCE CERTIFICATION SERVICES
47173 BENICIA STREET
FREMONT, CA 94538, USA
TEL: (510) 771-1000
FAX: (510) 661-0888**



NVLAP LAB CODE 200065-0

Revision History

Rev.	Date	Revisions	Revised By
---	01/02/07	Initial Issue	Thu
B	01/24/07	Updated Information Section 5.2	Thu
C	03/26/07	Reduced Output Power to 1 Watt	Thu

TABLE OF CONTENTS

1. ATTESTATION OF TEST RESULTS.....	4
2. TEST METHODOLOGY	5
3. FACILITIES AND ACCREDITATION	5
4. CALIBRATION AND UNCERTAINTY.....	5
4.1. MEASURING INSTRUMENT CALIBRATION.....	5
4.2. MEASUREMENT UNCERTAINTY.....	5
5. EQUIPMENT UNDER TEST.....	6
5.1. DESCRIPTION OF EUT.....	6
5.2. MAXIMUM OUTPUT POWER.....	6
5.3. DESCRIPTION OF AVAILABLE ANTENNAS.....	6
5.4. SOFTWARE AND FIRMWARE.....	6
5.5. WORST-CASE CONFIGURATION AND MODE.....	6
5.6. DESCRIPTION OF TEST SETUP.....	7
6. TEST AND MEASUREMENT EQUIPMENT	9
7. LIMITS AND RESULTS	10
7.1. EMISSION BANDWIDTH.....	10
7.2. EMISSION MASK & UNWANTED EMISSIONS.....	12
7.2. MODULATION CHARACTERISTICS.....	15
7.3. RF POWER OUTPUT.....	19
7.4. FREQUENCY STABILITY.....	21
7.5. RADIATED SPURIOUS EMISSION.....	22
8. SETUP PHOTOS.....	25

1. ATTESTATION OF TEST RESULTS

COMPANY NAME: PORTA PHONE CO.
145 DEAN KNAUSS DRIVE
NARRAGANSETT, RI 02882, USA

EUT DESCRIPTION: UHF FM TRANSCEIVER

MODEL TESTED: MC1000

SERIAL NUMBER: 1824

DATE TESTED: DECEMBER 8 – 15, 2006 and MARCH 19 - 26, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 95 SUBPART A	NO NON-COMPLIANCE NOTED

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:

Tested By:



THU CHAN
EMC SUPERVISOR
COMPLIANCE CERTIFICATION SERVICES

CHIN PANG
EMC ENGINEER
COMPLIANCE CERTIFICATION SERVICES

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and FCC CFR 47 Part 95.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GMRS Transceiver, the operation frequency range is: 462.5625MHz – 462.7250MHz. The radio module is manufactured by Porta Phone Co.

5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency Range (MHz)	Modulation	Output Power (dBm)	Output Power (W)
462.5625 - 462.7250	F3E	29.89	0.97

5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes a Helical, ¼ Wave with SMA-J connector, gain = 0 dBi.

5.4. SOFTWARE AND FIRMWARE

The EUT driver is manually operating as portable device.
Emission Designator and necessary Bandwidth: 2M+2DK=(2x2500)+(2x1x2500)=10k0F3E

5.5. WORST-CASE CONFIGURATION AND MODE

Preliminary test was done on both EUT sitting on cradle mode and EUT stand-alone mode at three orthogonal positions, and in our opinion on the highest output power at fundamental comparison, the EUT sitting on the cradle mode was determined as the worst-case mode. Since the EUT already passed all test items with 2 W maximum output power, so with this lower output power about 1W, then the performed on this unit is just measure on related to the output power & spurious harmonic for both antenna port & radiated emissions.

5.6. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
DC Battery	KYD	TK-688A	BL06027	NA
Charger	KYD	tK-688A/760A	CH06N01	NA
Earphone	EARTEC	ET	NA	NA

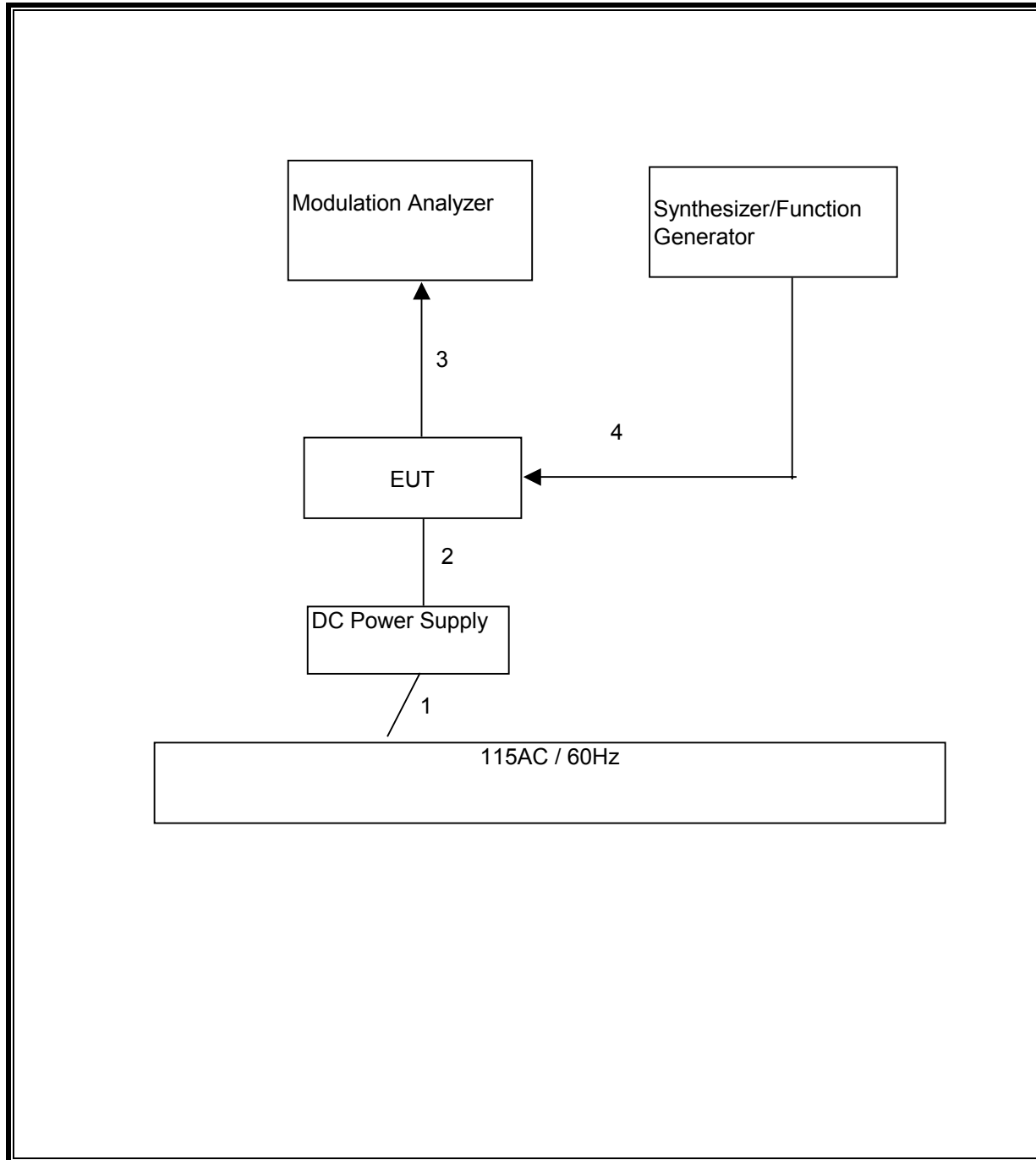
I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	AC	1	US 115V	Un-shielded	2m	N/A
2	DC	1	DC	Un-shielded	2m	N/A
3	Ant Port	1	Modulation	Un-shielded	2m	N/A
4	Jack	1	Function Generator	Un-shielded	2m	N/A

TEST SETUP

The EUT is connected to audio unit with all test support equipment.

SETUP DIAGRAM FOR TESTS



6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Modulation Analyzer	Agilent / HP	8901B	3438A05272	10/03/08
Function Generator	Agilent / HP	3325A	2652A24749	05/10/07
Spectrum Analyzer	Agilent / HP	E4407B	US41444322	08/04/07
DC Power Supply	XANTREX	XHR 60-18	204452	CNR
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A0022704	08/13/07
Preamplifier, 1300 MHz	Agilent / HP	8447D	2944A06550	09/01/07
SA RF Section, 1.5 GHz	Agilent / HP	85680A	2314A02604	06/17/07
SA Display Section 3	Agilent / HP	85662A	2314A04793	12/17/07
Quasi-Peak Adaptor	Agilent / HP	85650A	2521A01038	01/11/08
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	09/03/07
Quasi-Peak Adaptor	Agilent / HP	85650A	2521A01038	01/11/08
SA Display Section 2	Agilent / HP	85662A	2816A16696	04/07/08
SA RF Section, 1.5 GHz	Agilent / HP	85680B	2814A04227	01/07/08
Preamp 30-1000MHz	Sonoma Instrument	310N	185623	01/20/08
Antenna, Horn 1 ~ 18 GHz	ETS	3117	29301	04/22/07
Preamplifier, 1 ~ 26 GHz	Miteq	NSP2600-SP	924342	09/02/07
EMI Test Receiver	R & S	ESHS 20	827129/006	06/03/07
LISN, 10 kHz ~ 30 MHz	FCC	LISN-50/250-25-2	2023	08/30/07

7. LIMITS AND RESULTS

7.1. EMISSION BANDWIDTH

LIMIT

§ 95.633(a) the authorized bandwidth for emission type F3E is 20 kHz.

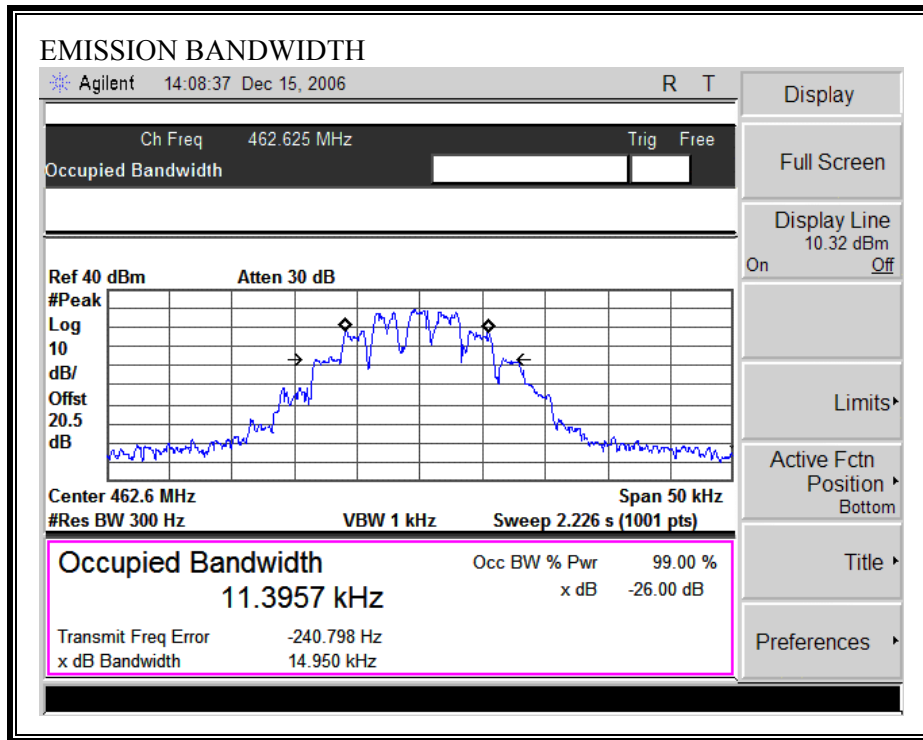
TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.11

RESULTS

No non-compliance noted:

EMISSION BANDWIDTH



7.2. EMISSION MASK & UNWANTED EMISSIONS

LIMIT

§ 95.635 (1) At least 25 dB (decibels) on any frequency removed from the center of 50% up to and including 100% of the authorized bandwidth.

(3) At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

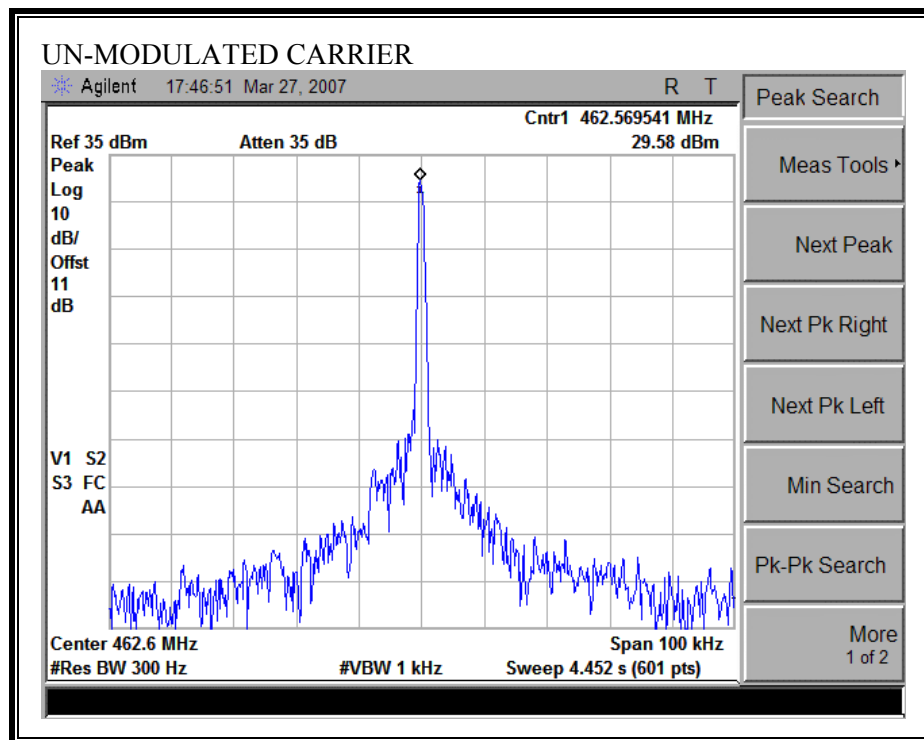
(7) At least $43 + 10 \log_{10}(T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

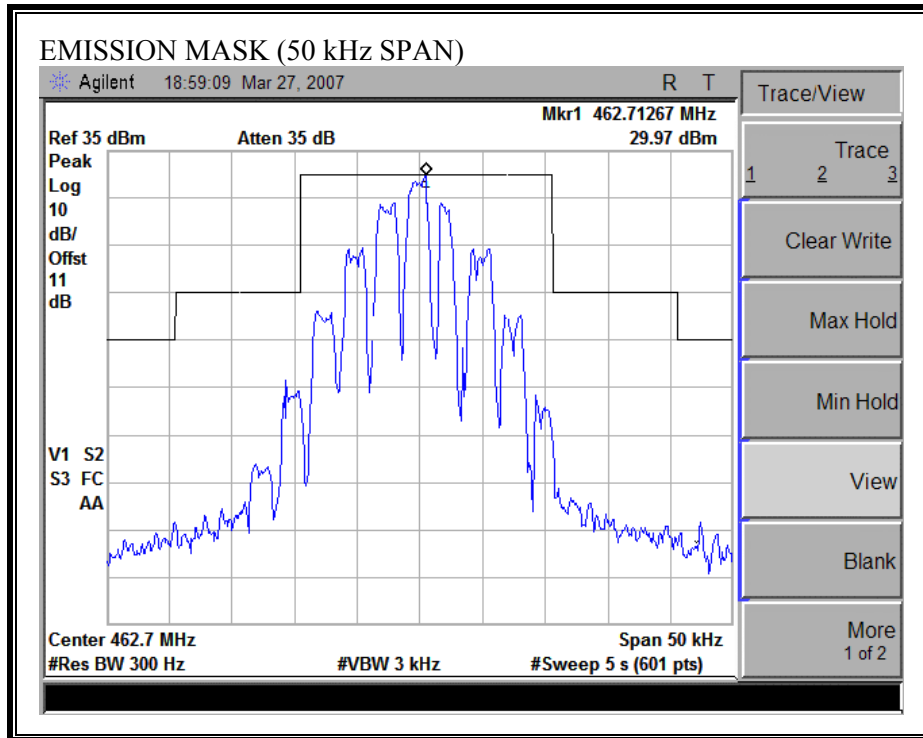
TEST PROCEDURE

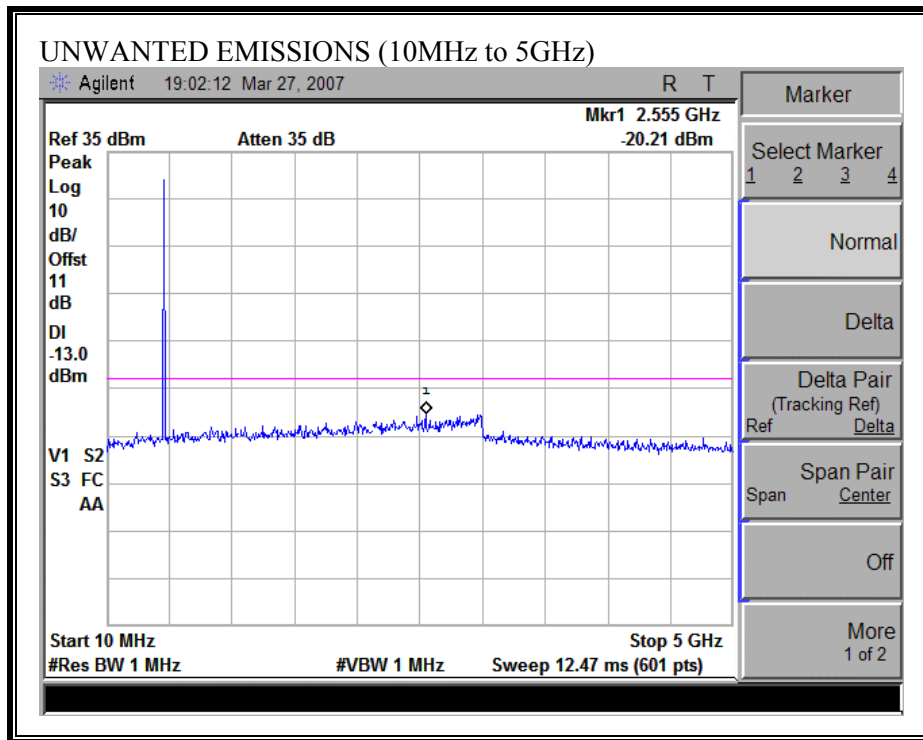
ANSI / TIA / EIA 603C Clause 2.2.11 & 2.2.13

RESULTS

No non-compliance noted:







7.2. MODULATION CHARACTERISTICS

LIMIT

§ 95.637 (a) A GMRS transmitter that transmits emission types F1D, G1D, or G3E must not exceed a peak frequency deviation of plus or minus 5 kHz. A GMRS transmitter that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 5 kHz. A FRS unit that transmits emission type F3E must not exceed a peak frequency deviation of plus or minus 2.5 kHz, and the audio frequency response must not exceed 3.125 kHz.

(b) Each GMRS transmitter, except a mobile station transmitter with a power output of 2.5 W or less, must automatically prevent a greater than normal audio level from causing overmodulation. The transmitter also must include audio frequency low pass filtering, unless it complies with the applicable paragraphs of § 95.631 (without filtering.) The filter must be between the modulation limiter and the modulated stage of the transmitter. At any frequency (f in kHz) between 3 and 20 kHz, the filter must have an attenuation of at least $60 \log_{10}(f/3)$ dB greater than the attenuation at 1 kHz. Above 20 kHz, it must have an attenuation of at least 50 dB greater than the attenuation at 1 kHz.

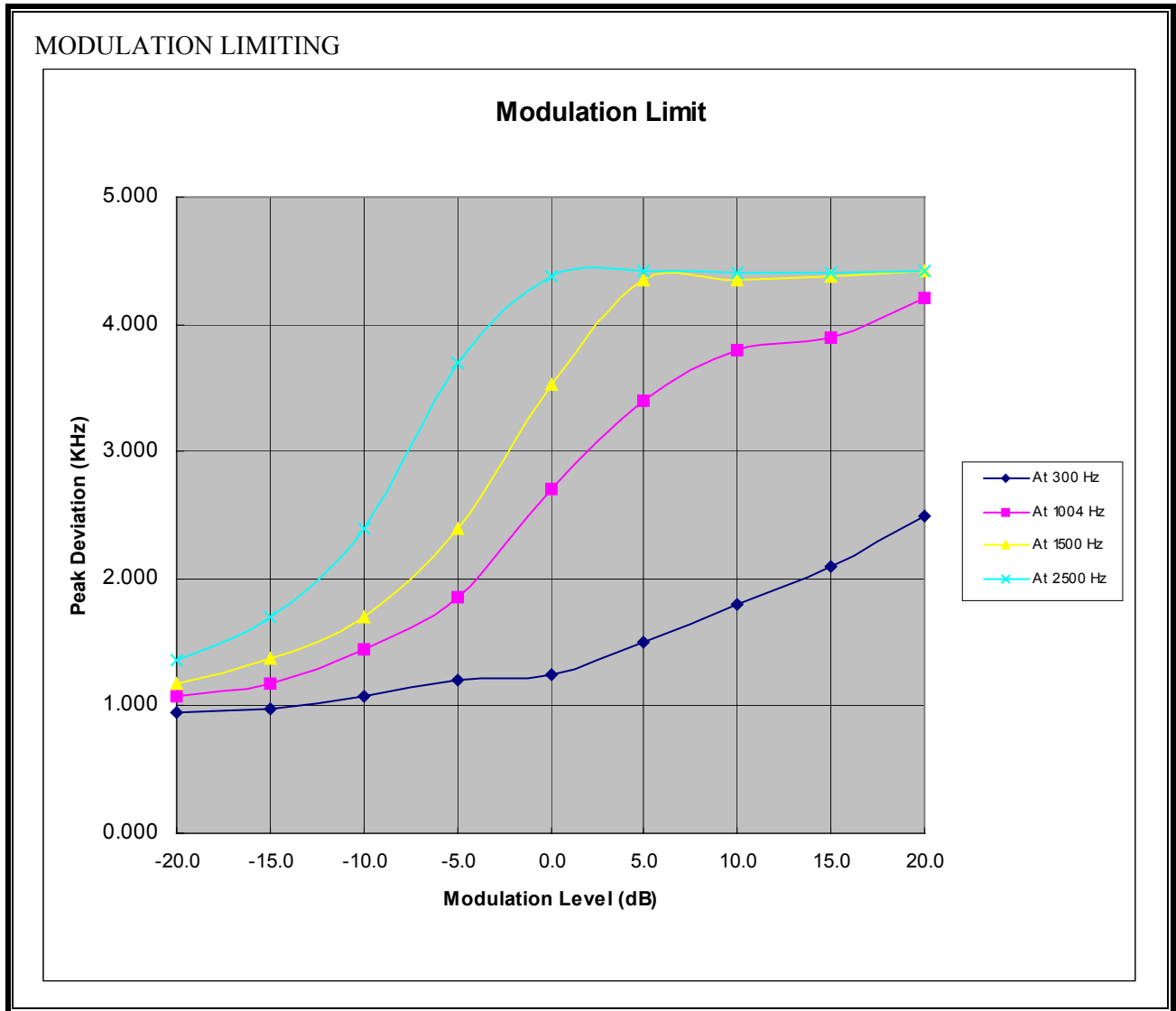
TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.3, 2.2.6 & 2.2.15

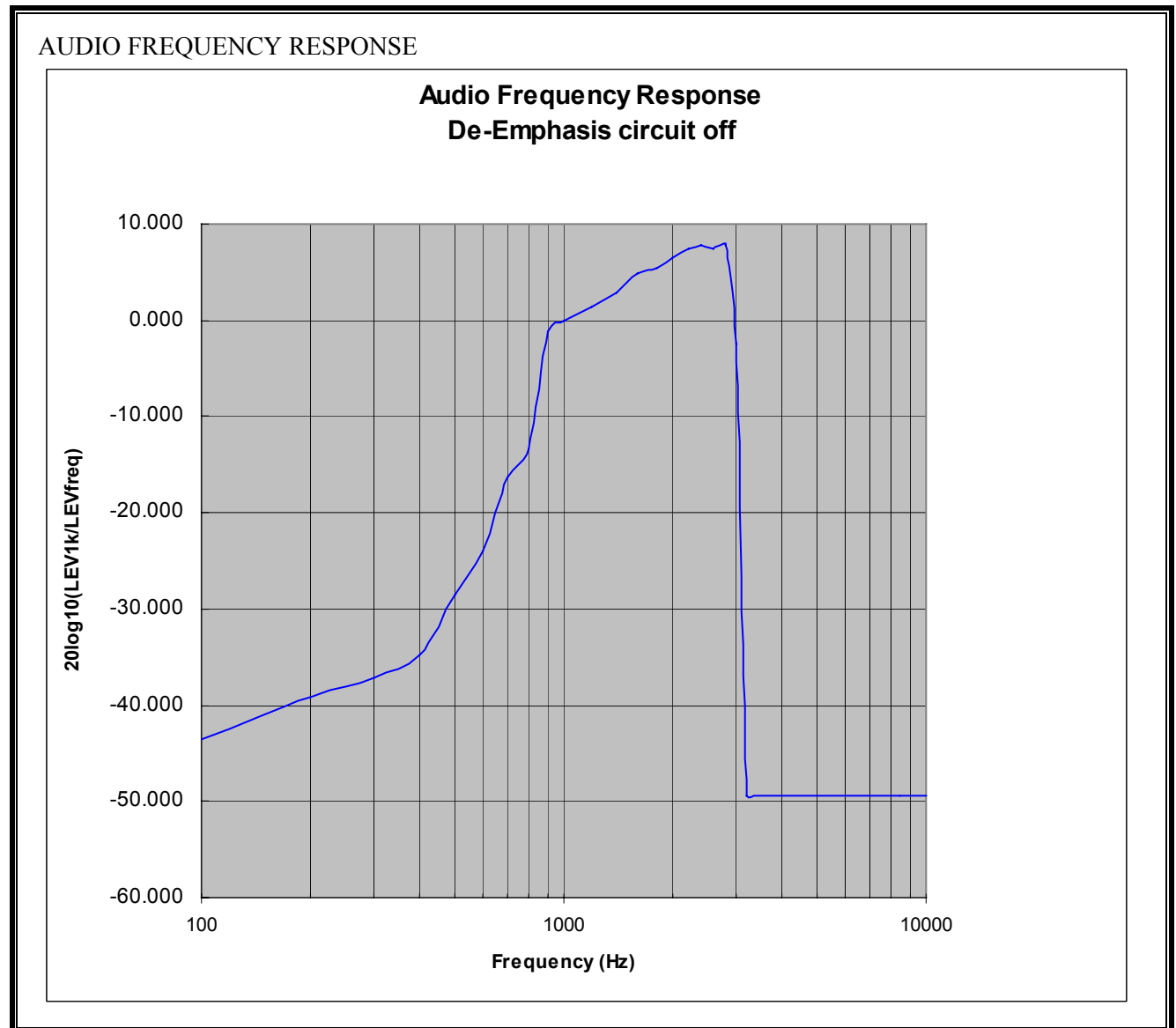
RESULTS

No non-compliance noted.

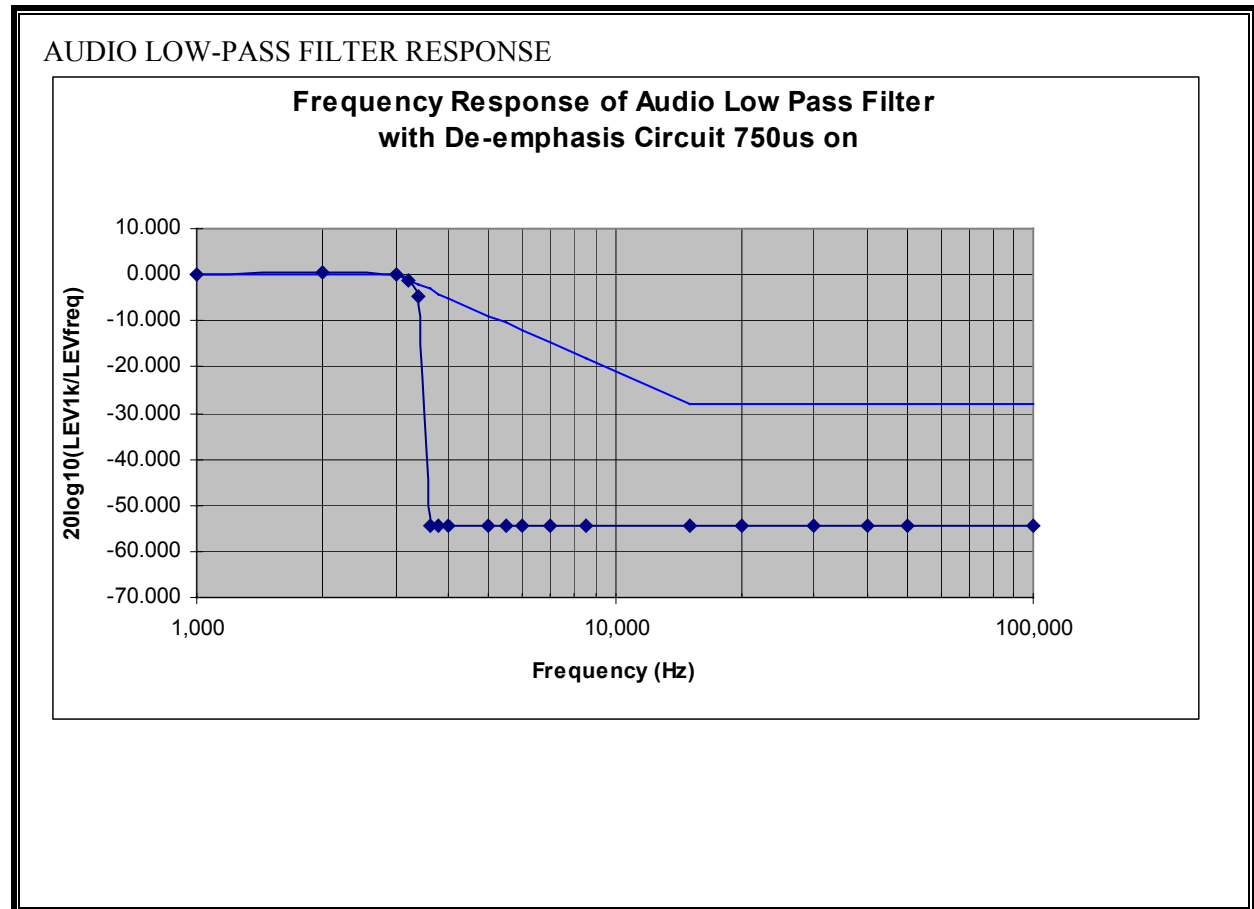
MODULATION LIMITING



AUDIO FRQUENCY RESPONSE



AUDIO LOW-PASS FILTER RESPONSE



7.3. RF POWER OUTPUT

LIMIT

§ 95.639 (a) No GMRS transmitter, under any condition of modulation, shall exceed:

(1) 50 W Carrier power (average TP during one unmodulated RF cycle) when transmitting emission type A1D, F1D, G1D, A3E, F3E or G3E. (1) 4 W Carrier power when transmitting emission type A1D or A3E.

TEST PROCEDURE

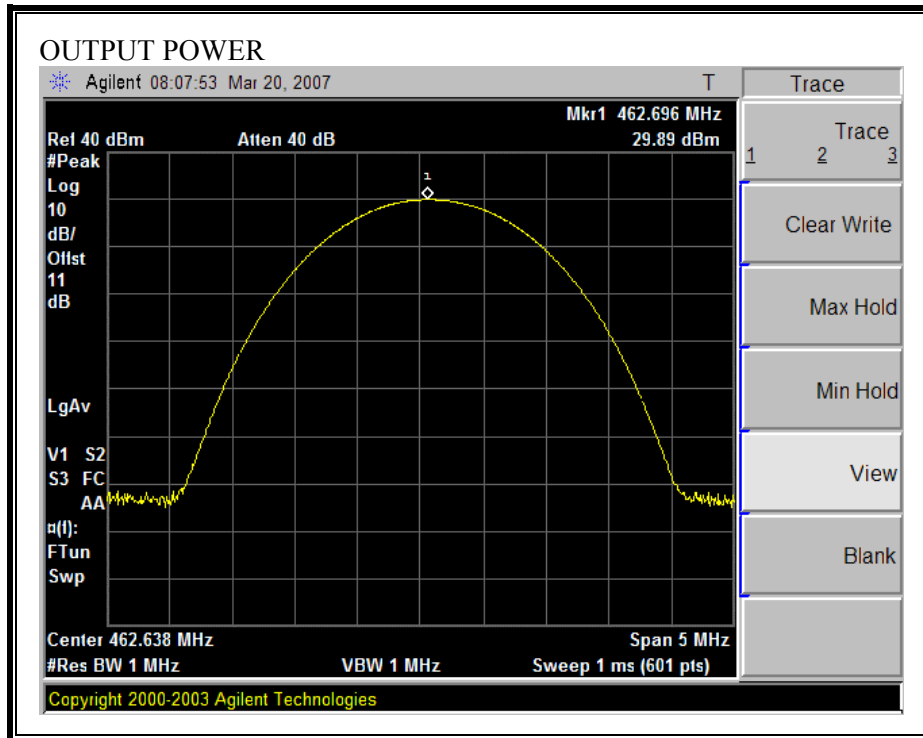
ANSI / TIA / EIA 603C Clause 2.2.1

RESULTS

No non-compliance noted.

Frequency (MHz)	Conducted Output Power (dBm)	Conducted Output Power (mW)
462.629	29.89	974.99

RF OUTPUT POWER



7.4. FREQUENCY STABILITY

LIMIT

§95.621 (b) Each GMRS transmitter for mobile station, small base station and control station operation must be maintained within a frequency tolerance of 0.0005%. Each GMRS transmitter for base station (except small base), mobile relay station or fixed station operation must be maintained within a frequency tolerance of 0.00025%.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.2

RESULTS

No non-compliance noted.

Reference Frequency: GMRS Mid Channel 462.63740MHz @ 25°C				
Limit: ± 5 ppm = 2313.187 Hz				
Power Supply (Vdc)	Environment Temperature (*C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
6.00	50	462.63588	1.643	± 5
6.00	40	462.63608	1.427	± 5
6.00	30	462.63698	0.454	± 5
6.00	25	462.63740	0	± 5
6.00	20	462.63790	-0.540	± 5
6.00	10	462.63808	-0.735	± 5
6.00	0	462.63875	-1.459	± 5
6.00	-10	462.63892	-1.643	± 5
6.00	-20	462.63893	-1.654	± 5
6.00	-30	462.63902	-1.751	± 5
5.3 (End Point)	25	462.63682	0.630	± 5

7.5. RADIATED SPURIOUS EMISSION

LIMIT

§ 95.635 (1) At least 25 dB (decibels) on any frequency removed from the center of 50% up to and including 100% of the authorized bandwidth.

(3) At least 35 dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth.

(7) At least $43 + 10 \log_{10}(T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%.

TEST PROCEDURE

ANSI / TIA / EIA 603C Clause 2.2.12

RESULTS

No non-compliance noted.

FUNDAMENTAL & SPURIOUS EMISSIONS 30-1000MHZ:

30 - 1000MHz Substitution Measurement										
Compliance Certification Services, Fremont 5m B-Chamber										
Company: Porta Phone										
Project #: 06U10748										
Date: 3-19-2007										
Test Engineer: William Zhuang										
Configuration: EUT alone and EUT with Cradle										
Mode: TX Continuously										
Test Equipment:										
Bilog Antenna		Cable		Pre-amplifier 8447D		Limit				
5m Chamber Sunol Bilog		5m Chamber Cable				ERP				
f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
EUT with Cradle (Worst Case)										
462.25	103.6	V	26.0	2.6	6.1	4.0	27.4			Fundamental
462.25	92.0	H	13.9	2.6	6.1	4.0	15.3			Fundamental
EUT Stand-alone										
462.25	98.0	V	20.4	2.6	6.1	4.0	21.8			Fundamental (X-Position)
462.25	103.8	H	25.7	2.6	6.1	4.0	27.1			Fundamental (X-Position)
462.25	103.3	V	25.7	2.6	6.1	4.0	27.1			Fundamental (Y-Position)
462.25	91.0	H	12.9	2.6	6.1	4.0	14.3			Fundamental (Y-Position)
462.25	100.0	V	22.4	2.6	6.1	4.0	23.8			Fundamental (Z-Position)
462.25	102.0	H	23.9	2.6	6.1	4.0	25.3			Fundamental (Z-Position)
EUT with Cradle (Worst Case):										
925.22	51.4	V	-18.0	3.7	6.8	4.7	-17.0	-13.0	-4.0	Harmonic
925.22	52.4	H	-17.2	3.7	6.8	4.7	-16.2	-13.0	-3.2	Harmonic

Rev. 3.13.7

SPURIOUS EMISSIONS ABOVE 1GHz:

High Frequency Substitution Measurement
 Compliance Certification Services, Fremont 5m B-Chamber

Company: Porta Phone
 Project #: 06U10748
 Date: 3-19-2007
 Test Engineer: William Zhuang
 Configuration: Tx On, Worst case: X position
 Mode: TX Continuously

Test Equipment:

EMCO Horn 1-18 GHz

T119; S/N: 29301 @3m

Horn > 18GHz

Limit

ERP

High Pass Filter

Hi Frequency Cables

(2 ft)
 (2~3 ft)
 (4~6 ft)
 (12 ft)

Pre-amplifier 1-26GHz

T34 HP 8449B

Pre-amplifier 26-40GHz

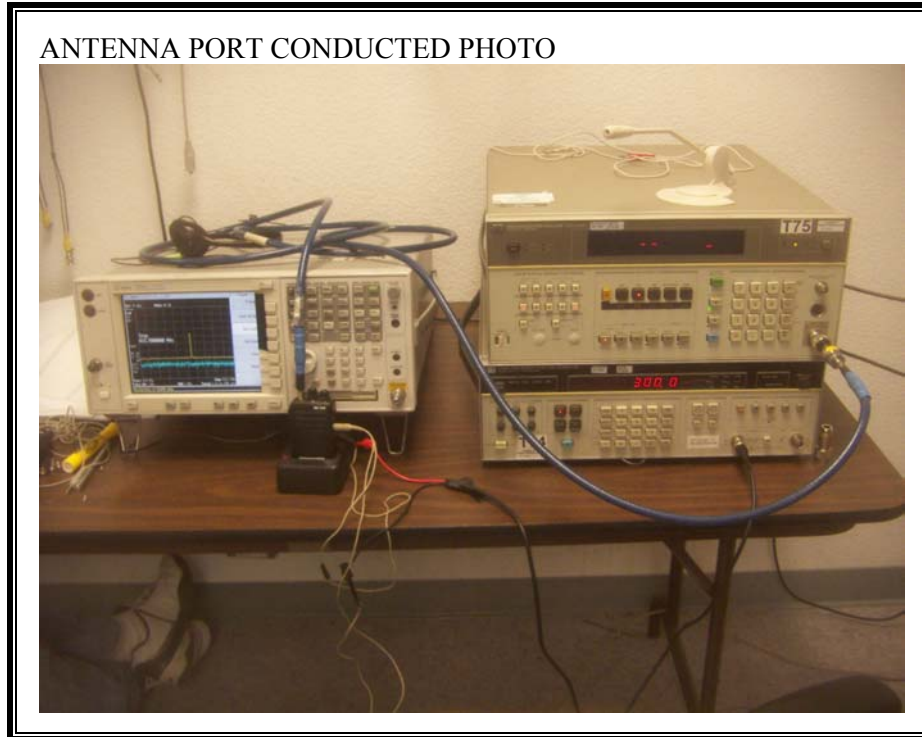
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
1.388	54.7	V	-46.8	3.8	3.4	1.2	-49.4	-13.0	-36.4	
1.388	60.8	H	-40.0	3.8	3.4	1.2	-42.6	-13.0	-29.6	
1.851	57.0	H	-41.1	4.4	4.4	2.2	-43.3	-13.0	-30.3	
1.851	52.4	V	-46.4	4.4	4.4	2.2	-48.6	-13.0	-35.6	

* No other emissions were detected

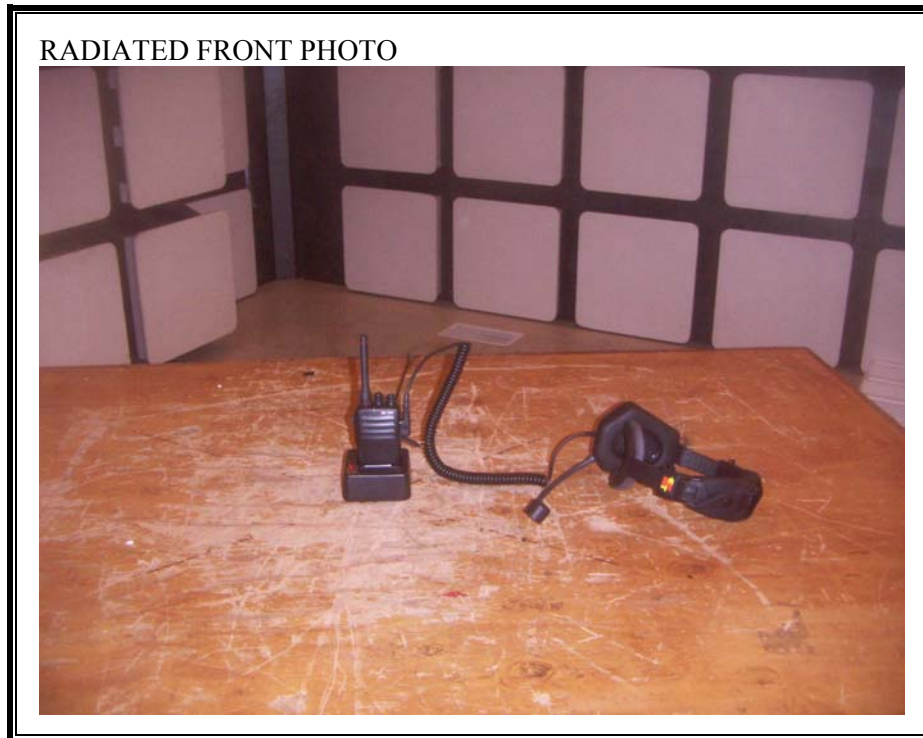
Rev. 5.1.6

8. SETUP PHOTOS

ANTENNA PORT CONDUCTED RF MEASUREMENT SETUP

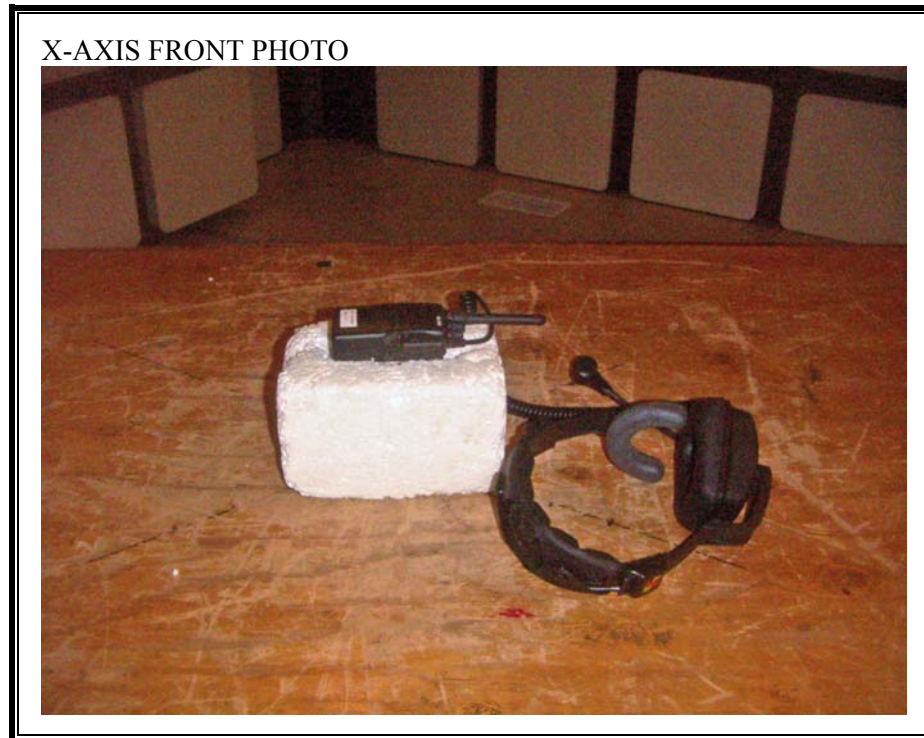


RADIATED RF MEASUREMENT SETUP FOR MOBILE CONFIGURATION





RADIATED RF MEASUREMENT SETUP FOR PORTABLE CONFIGURATION



X-AXIS BACK PHOTO



Y-AXIS FRONT PHOTO



Y-AXIS BACK PHOTO



Z-AXIS FRONT PHOTO



Z-AXIS BACK PHOTO





END OF REPORT