ENGINEERING TEST REPORT

VHF Marine Transceiver
Model No.: IC-M400BB
FCC ID: AFJ333800

Applicant:

ICOM Incorporated
1-1-32, Kamiminami, Hirano-ku
Osaka, Japan, 547-0003

Tested in Accordance With

Federal Communications Commission (FCC)
47 CFR, Part 2, Part 80 (Marine in 156.025-157.425 MHz)

UltraTech's File No.: ICOM-317_F80

This Test report is Issued under the Authority of Tri M. Luu, BASc. Vice President of Engineering UltraTech Group of Labs Date: November 20, 2012	
Report Prepared by: Dharmajit Solanki Issued Date: November 20, 2012	Tested by: Wayne Wu, EMI Technician Test Dates: November 14-15, 2012

The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.
This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.

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FCC	VCCI	Industry Canada / Industrie Canada	NVLAP	BSMI	Korea KCC-RRL
91038	1309	46390-2049	NVLAP Lab Code 200093-0	SL2-IN-E-1119R	CA2049

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EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Parts 2 and 80
Title:	Telecommunication - Code of Federal Regulations, 47CFR, Parts 2 and 80
Purpose of Test:	To obtain FCC Class II Permissive Change filing Authorization for Radio operating in the frequency bands, 156.025-157.425 MHz (Marine)
Test Procedures:	Both conducted and radiated emissions measurements were conducted in accordance with TIA/EIA Standard TIA/EIA-603 D (2010) – Land Mobile FM or PM Communications Equipment Measurement and performance Standards.
Categories of Station:	Ship station transceiver operating in 156.025-157.425 MHz band

1.2. RELATED SUBMITTAL(S)/GRANT(S)

None

1.3. NORMATIVE REFERENCES

Publication	Year	Title
FCC CFR Parts 0-19, 80-End	2011	Code of Federal Regulations – Telecommunication
ANSI C63.4	2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
TIA/EIA 603, Edition D	2010	Land Mobile FM or PM Communications Equipment Measurement and Performance Standards

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

APPLICANT	
Name:	Icom Incorporated
Address:	1-1-32, Kamiminami Hirano-ku, Osaka Japan, 547-0003
Contact Person:	Mr. Takayuki Watanabe Phone #: +81 6 6793 5302 Fax #: +81 6 6793 0013 Email Address: export@icom.co.jp

MANUFACTURER	
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Contact Person:	Mr. Takayuki Watanabe Phone #: +81 6 6793 5302 Fax #: +81 6 6793 0013 Email Address: export@icom.co.jp

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	ICOM Incorporated
Product Name:	VHF Marine Transceiver
Model Name or Number:	IC-M400BB
Serial Number:	00000036
Type of Equipment:	Non-broadcast Radio Communication Equipment
External Power Supply Requirement:	N/A
Transmitting/Receiving Antenna Type:	Non-integral
Primary User Functions of EUT:	Voice wireless communication for Marine in 156.025-157.425 MHz band.

2.3. EUT'S TECHNICAL SPECIFICATIONS

Transmitter	
Equipment Type:	Mobile
Intended Operating Environment:	Marine
Power Supply Requirement:	13.8 VDC
RF Output Power Rating:	25 Watts (High) and 1 Watt (Low)
Operating Frequency Range:	156.025-157.425 MHz (Marine)
RF Output Impedance:	50 Ohms
Channel Spacing:	25 kHz
Occupied Bandwidth (99%):	14.79 kHz
Emission Designation*:	16K0G3E, 16K0G2B (DSC CH70)
Antenna Connector Type:	UHF type connector

For an average case of commercial telephony, the Necessary Bandwidth is calculated as follows:

Channel Spacing = 25 KHz, D = 5 KHz max, K = 1, M = 3 KHz
B_n = 2M + 2DK = 2(3) + 2(5)(1) = **16 KHz**
Emission designation: 16K0G3E

Receiver	
Power Supply Requirement:	13.8 VDC
Operating Frequency Range:	156.05-163.275 MHz (Marine)
IF Frequencies	21.7 MHz (1st IF), 450 kHz (2nd IF)
Antenna Connector Type	UHF type connector

2.4. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	Antenna	1	UHF type	Shielded
2	CMD/MIC Jack	1	Plug-in Jack	Non Shielded
3	NMEA In/Out Leads	1	Plug-in Jack	Non Shielded
4	DC Power Cable	1	Plug-in Jack	Non Shielded
5	GND	1	Plug-in Jack	Shielded

2.5. ANCILLARY EQUIPMENT

None

EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	20 to 25°C
Humidity:	20 - 50%
Pressure:	99 to 102 kPa
Power input source:	13.8 VDC

3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TEST SIGNALS

Operating Modes:	The transmitter was operated in a continuous transmission mode with the carrier modulated as specified in the Test Data.
Special Test Software:	N/A
Special Hardware Used:	N/A
Transmitter Test Antenna:	The EUT is tested with the transmitter antenna port terminated to a 50 Ohms RF Load.

Transmitter Test Signals	
Frequency Band(s):	▪ 156.025 - 157.425 MHz
Test Frequency(ies): (Near lowest & near highest frequencies in the frequency range of operation.)	▪ 156.025 MHz & 157.425 MHz
Transmitter Wanted Output Test Signals: • Transmitter Power (measured maximum output power): • Normal Test Modulation: • Modulating signal source:	 25 Watts High, 1 Watt Low Variable reactance frequency modulation External

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 91038) and Industry Canada office (Industry Canada File No.: 2049A-3). Expiry Date: 2014-04-04.

4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Applicability (Yes/No)
80.215 & 2.1046	RF Power Output	Yes, same as original filing
1.1307, 1.1310, 2.1091 & 2.1093	RF Exposure Limit	Yes, same as original filing
80.209 & 2.1055	Frequency Stability	N/A*
80.213(e) & 2.1047(a)	Audio Frequency Response	N/A*
80.213 & 2.1047(b)	Modulation Limiting	N/A*
80.205, 80.211(f) & 2.1049	Emission Limitation / Emission Mask	N/A*
80.211(f)(3), 2.1051 & 2.1057	Emission Limits - Spurious Emissions at Antenna Terminal	N/A*
80.211(f)(3), 2.1053 & 2.1057	Emission Limits - Field Strength of Spurious Emissions	Yes, Verified and found lower than original filing
80.217	Suppression of Interference aboard ships	Yes (complies with FCC Part 15, Subpart B – Unintentional Radiators)

* Please refer to original filing as this C2PC will not affect these parameters.

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None

4.4. DEVIATION OF STANDARD TEST PROCEDURES

None

EXHIBIT 5. TEST DATA

5.1. RF POWER OUTPUT [§ 2.1046 & 80.215]

5.1.1. Limits

§ 80.215 - For 156-162 MHz Band:

Ship stations: 25W (1 & 2)

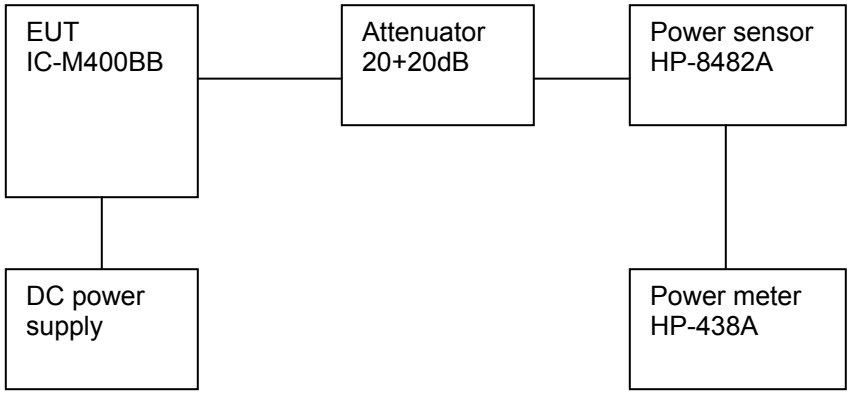
1. Reducible to 1 watt or less, except for transmitters limited to public correspondence channels and used in an automated system.
2. The frequencies 156.775 and 156.825 MHz are available for navigation-related port operations or ship movement only, and all precautions must be taken to avoid harmful interference to channel 16. Transmitter output power is limited to 1 watt for ship stations, and 10 watts for coast stations.

5.1.2. Method of Measurements

Refer to 8.1 (Conducted) and 8.2 (Radiated) in this test report for test procedures and test setup.

5.1.3. Test Arrangement

Power at RF Power Output Terminals



5.1.4. Test Data

Transmitter Channel Output	Fundamental Frequency (MHz)	Measured (Average) Conducted Power (Watts)	Power Rating (Watts)
Power Setting: High			
Lowest	156.025	23.02	25.0
Highest	157.425	23.02	25.0
DSC	156.525	22.59	25.0
Power Setting: Low			
Lowest	156.025	0.83	1.0
Highest	157.425	0.84	1.0

5.2. RF EXPOSURE REQUIREMENTS @ 1.1310 & 2.1091

5.2.1. Limits

1.1310: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation as specified in 1.1307(b).

LIMITS FOR MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density ( )	Average Time (minutes)
(A) Limits for Occupational/Control Exposures				
30-300	61.4	0.163	1.0	6
(B) Limits for General Population/Uncontrolled Exposure				
30-300	27.5	0.073	0.2	30

5.2.2. Method of Measurements

Calculation Method of RF Safety Distance:

$$S = \frac{PG}{4\pi \cdot r^2} = \frac{EIRP}{4\pi \cdot r^2}$$

Where, P: power input to the antenna in mW
EIRP: Equivalent (effective) isotropic radiated power.
S: power density mW/cm^2
G: numeric gain of antenna relative to isotropic radiator
r: distance to centre of radiation in cm

$$r = \sqrt{\frac{PG}{4\pi \cdot S}} = \sqrt{\frac{EIRP}{4\pi \cdot S}}$$

FCC radio frequency exposure limits may be exceeded at distances closer than r cm from the antenna of this device.

5.2.3. Evaluation of RF Exposure Compliance Requirements

MPE Limit for Occupational/Controlled Exposure, $\mathbf{S_{controlled}[mW/cm^2]}$ = 1.0

MPE Limit for General Population/Uncontrolled Exposure, $\mathbf{S_{uncontrolled}[mW/cm^2]}$ = 0.2

Maximum RF Power conducted, $\mathbf{P_{conducted}[dBm]}$ = 43.98

Maximum Antenna Gain, **G[dBi]** = 9

Maximum EIRP, $\mathbf{P_{EIRP}}$ = 52.98 dBm or 198582 mwatts

User-based time-average for PTT = 50%

Calculated RF Safety Distance for Occupational/Controlled Exposure, $\mathbf{r_{safety\_controlled}[cm]}$ = 89 cm

Calculated RF Safety Distance for General Population/Uncontrolled Exposure, $\mathbf{r_{safety\_uncontrolled}[cm]}$ = 199 cm

5.3. TRANSMITTER SPURIOUS/HARMONIC RADIATED EMISSIONS [§ 80.211(F)(3)]

5.3.1. Limits

§ 80.211 (f)(3) On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus 10log10 (mean power in watts) dB.

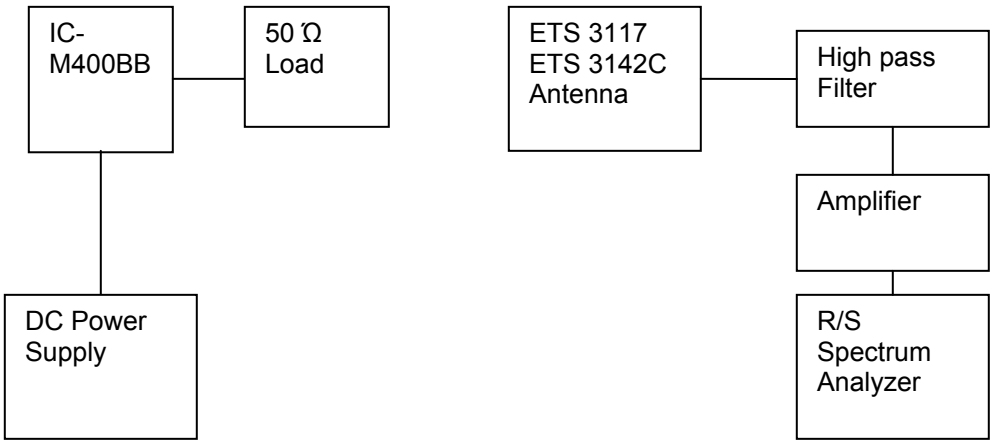
5.3.2. Method of Measurements

The spurious/harmonic ERP measurements are using substitution method specified in 8.2 of this report and its value in dBc is calculated as follows:

(1) If the transmitter's antenna is an integral part of the EUT, the ERP is measured using substitution method.
(2) If the transmitter's antenna is non-integral and diverse, the lowest ERP of the carrier with 0 dBi antenna gain is used for calculation of the spurious/harmonic emissions in dBc:
Lowest ERP of the carrier = EIRP – 2.15 dB = Pc + G - 2.15 dB = Pc dBm (conducted) + 0 dBi – 2.15 dB

5.3.3. Test Setup

Tx Radiated Emission:



5.3.4. Test Data

Remarks: The radiated emissions are performed with high power setting (25 Watts) at 3 meters distance to represents the worst-case test configuration.

5.3.4.1. Near Lowest Frequency (156.025 MHz)

Carrier Frequency (MHz): 156.025

Power $_{conducted}$ (dBm): 43.62

Limit (dBm): -13.0

Frequency (MHz)	E-Field (dBµV/m)	EMI Detector (Peak/QP)	Antenna Polarization (H/V)	ERP measured (dBm)	Limit (dBm)	Margin (dB)
156.025	--	--	--	--	--	--
156.025	--	--	--	--	--	--

All emissions found are more than 20 dB below the permissible limits.

5.3.4.2. Near Highest Frequency (157.425 MHz)

Carrier Frequency (MHz): 157.425

Power $_{conducted}$ (dBm): 43.62

Limit (dBm): -13.0

Frequency (MHz)	E-Field (dBµV/m)	EMI Detector (Peak/QP)	Antenna Polarization (H/V)	ERP measured (dBm)	Limit (dBm)	Margin (dB)
157.425	--	--	--	--	--	--
157.425	--	--	--	--	--	--

All emissions found are more than 20 dB below the permissible limits.

EXHIBIT 6. TEST EQUIPMENT LIST

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Cal. Due Date
Horn Antenna	ETS	3117	119425	1-18 GHz	02-Apr-13
Biconilog Antenna	ETS	3142C	26873	26-3000MHz	04-May-13
EMI Receiver	R/S	ESU 40	100037	20 Hz-40 GHz	19-Mar-13
Preamplifier	AH System	PAM-0118	225	20MHz-18GHz	16-Mar-13
Power Meter	Hewlett Packard	438A	3008A06729	100K--50G sensor dependent	24-Feb-13
Power Sensor	Hewlett Packard	8482A	US37295944	0.1 - 4GHz	17-Feb-13
Attenuator	Aeroflex/Weinschel	24-20-34	3J2364	DC-8.5 GHz	Cal. on use
Attenuator	Aeroflex/Weinschel	23-20-34	BH7876	DC-18 GHz	Cal. on use
Power supply	XANTREX	XKW 60-50	26509	0-60V 0-50A DC	Cal. on use

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

7.1. RADIATED EMISSION MEASUREMENT UNCERTAINTY

	Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):	**Measured**	**Limit**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 2.15**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.30**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):	**Measured**	**Limit**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 2.39**	**± 2.6**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 4.78**	**± 5.2**

	Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz):	**Measured**	**Limit**
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	**± 1.87**	**Under consideration**
U	**Expanded uncertainty U:** $U = 2u_c(y)$	**± 3.75**	**Under consideration**

EXHIBIT 8. MEASUREMENT METHODS

8.1. CONDUCTED POWER MEASUREMENTS

The following shall be applied to the combination(s) of the radio device and its intended antenna(e).

- I f the RF level is user adjustable, all measurements shall be made with the highest power level available to the user for that combination.
- The following method of measurement shall apply to both conducted and radiated measurements.
  - The radiated measurements are performed at the Ultratech Calibrated Open Field Test Site.
  - The measurement shall be performed using normal operation of the equipment with modulation.

- Test procedure shall be as follows:

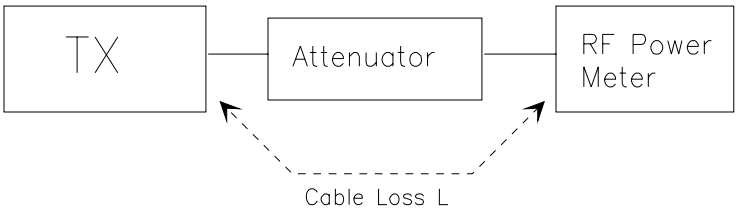
Step 1: Duty Cycle measurements if the transmitter's transmission is transient
- Using a EMI Receiver with the frequency span set to 0 Hz and the sweep time set at a suitable value to capture the envelope peaks and the duty cycle of the transmitter output signal;
- The duty cycle of the transmitter, x = Tx on / (Tx on + Tx off) with 0<x<1, is measure and recorded in the test report. For the purpose of testing, the equipment shall be operated with a duty cycle that is equal or more than 0.1.

Step 2: Calculation of Average EIRP. See Figure 1
- The average output power of the transmitter shall be determined using a wideband, calibrated RF average power meter with the power sensor with an integration period that exceeds the repetition period of the transmitter by a factor 5 or more. The observed value shall be recorded as "A" (in dBm);
- The e.i.r.p. shall be calculated from the above measured power output "A", the observed duty cycle x, and the applicable antenna assembly gain "G" in dBi, according to the formula:

EIRP = A + G + 10log(1/x)

{ X = 1 for continuous transmission => 10log(1/x) = 0 dB }

Figure 1.



8.2. RADIATED POWER MEASUREMENTS (ERP & EIRP) USING SUBSTITUTION METHOD

8.2.1. Maximizing RF Emission Level (E-Field)

- The measurements was performed with full rf output power and modulation.
- Test was performed at listed 3m open area test site (listed with FCC, IC, ITI, NVLAP, ACA & VCCI).
- The transmitter under test was placed at the specified height on a non-conducting turntable (80 cm height)
- The BICONILOG antenna (20 MHz to 1 GHz) or HORN antenna (1 GHz to 18 GHz) was used for measuring.
- Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

  Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
  E (dBuV/m) = Reading (dBuV) + Total Correction Factor (dB/m)

- Set the EMI Receiver #1 and #2 as follows:

Center Frequency:	test frequency
Resolution BW:	100 kHz
Video BW:	same
Detector Mode:	positive
Average:	off
Span:	3 x the signal bandwidth

- The test antenna was lowered or raised from 1 to 4 meters until the maximum signal level was detected.
- The transmitter was rotated through 360^{o} about a vertical axis until a higher maximum signal was received.
- The test antenna was lowered or raised again from 1 to 4 meters until a maximum was obtained. This level was recorded.
- The recorded reading was corrected to the true field strength level by adding the antenna factor, cable loss and subtracting the pre-amplifier gain.
- The above steps were repeated with both transmitters' antenna and test receiving antenna placed in vertical and horizontal polarization. Both readings with the antennas placed in vertical and horizontal polarization shall be recorded.
- Repeat for all different test signal frequencies

8.2.2. Measuring the EIRP of Spurious/Harmonic Emissions using Substitution Method

- Set the EMI Receiver (for measuring E-Field) and Receiver #2 (for measuring EIRP) as follows:

Center Frequency:	equal to the signal source
Resolution BW:	100 kHz
Video BW:	VBW > RBW
Detector Mode:	positive
Average:	off
Span:	3 x the signal bandwidth

- Load an appropriate correction factors file in EMI Receiver for correcting the field strength reading level

  Total Correction Factor recorded in the EMI Receiver = Cable Loss + Antenna Factor
  E (dBuV/m) = Reading (dBuV) + Total Correction Factor (dB/m)

- Select the frequency and E-field levels obtained in the Section 8.2.1 for ERP/EIRP measurements.
- Substitute the EUT by a signal generator and one of the following transmitting antenna (substitution antenna):
  DIPOLE antenna for frequency from 30-1000 MHz or
  HORN antenna for frequency above 1 GHz }.
- Mount the transmitting antenna at 1.5 meter high from the ground plane.
- Use one of the following antenna as a receiving antenna:
  DIPOLE antenna for frequency from 30-1000 MHz or
  HORN antenna for frequency above 1 GHz }.
- If the DIPOLE antenna is used, tune it's elements to the frequency as specified in the calibration manual.
- Adjust both transmitting and receiving antenna in a VERTICAL polarization.
- Tune the EMI Receivers to the test frequency.
- Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
- The transmitter was rotated through 360^{o} about a vertical axis until a higher maximum signal was received.
- Lower or raise the test antenna from 1 to 4 meters until the maximum signal level was detected.
- Adjust input signal to the substitution antenna until an equal or a known related level to that detected from the transmitter was obtained in the test receiver.
- Record the power level read from the Average Power Meter and calculate the ERP/EIRP as follows:

  P = P1 - L1 = (P2 + L2) – L1 = P3 + A + L2 - L1
  EIRP = P + G1 = P3 + L2 - L1 + A + G1
  ERP = EIRP – 2.15 dB
  Total Correction factor in EMI Receiver # 2 = L2 – L1 + G1

  Where: P: Actual RF Power fed into the substitution antenna port after corrected.
  P1: Power output from the signal generator
  P2: Power measured at attenuator A input
  P3: Power reading on the Average Power Meter
  EIRP: EIRP after correction
  ERP: ERP after correction

- Adjust both transmitting and receiving antenna in a HORIZONTAL polarization, then repeat step (k) to (o)
- Repeat step (d) to (o) for different test frequency
- Repeat steps (c) to (j) with the substitution antenna oriented in horizontal polarization.
- Actual gain of the EUT's antenna is the difference of the measured EIRP and measured RF power at the RF port. Correct the antenna gain if necessary.

Figure 2

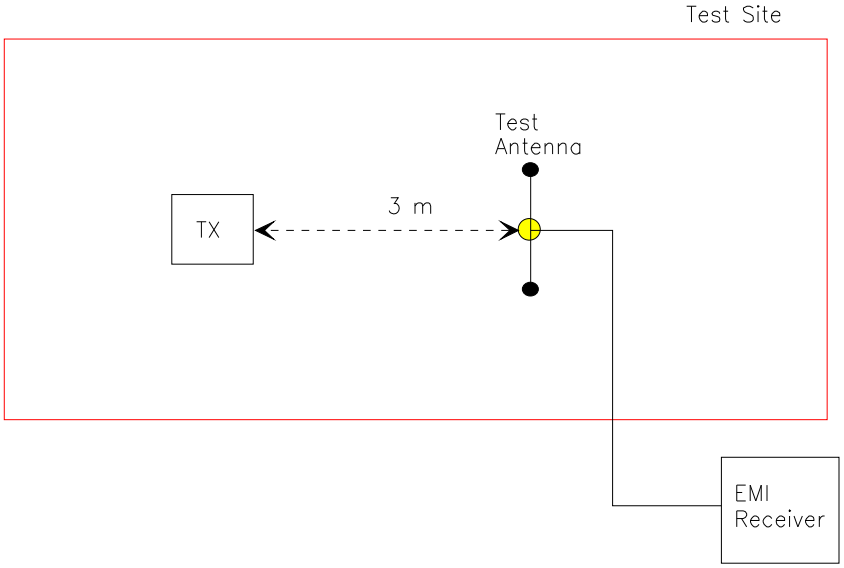
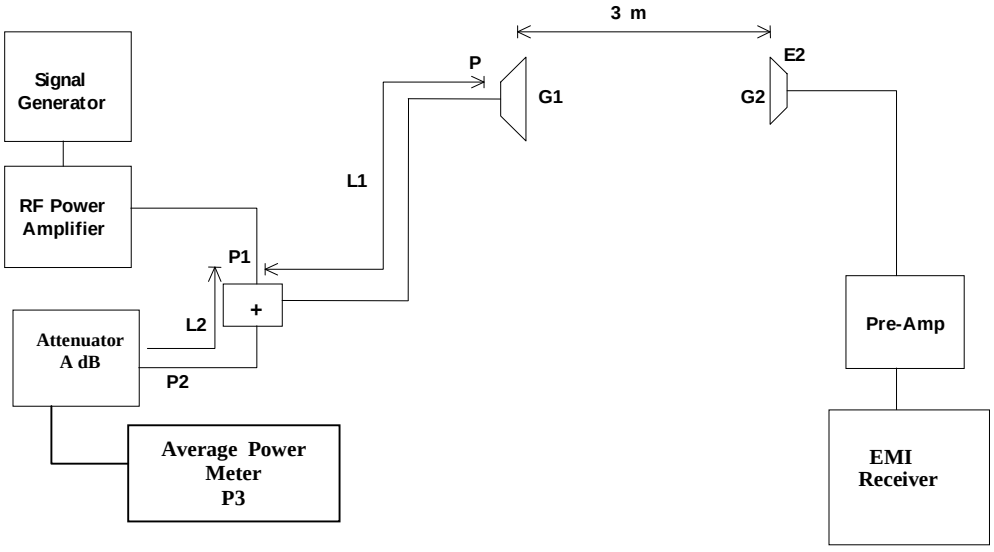


Figure 3



8.3. FREQUENCY STABILITY

Refer to § 2.1055.

(a) The frequency stability shall be measured with variation of ambient temperature as follows: From -30 to +50 centigrade except that specified in subparagraph (2) & (3) of this paragraph.

(b) Frequency measurements shall be made at extremes of the specified temperature range and at intervals of not more than 10 centigrade through the range. A period of time sufficient to stabilize all of the components of the oscillator circuit at each temperature level shall be allowed prior to frequency measurement. The short-term transient effects on the frequency of the transmitter due to keying (except for broadcast transmitters) and any heating element cycling normally occurring at each ambient temperature level also shall be shown. Only the portion or portions of the transmitter containing the frequency determining and stability circuitry need be subjected to the temperature variation test.

(d) The frequency stability supply shall be measured with variation of primary supply voltage as follows:

(1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.

(2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating end point which shall be specified by the manufacturer.

(3) The supply voltage shall be measured at the input to the cable normally provide with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

(e) When deemed necessary, the Commission may require tests of frequency stability under conditions in addition to those specifically set out in paragraphs (a), (b), (c) and (d) of this section. (For example, measurements showing the effect of proximity to large metal objects, or of various types of antennas, may be required for portable equipment).

8.4. EMISSION MASK

Voice or Digital Modulation Through a Voice Input Port @ 2.1049(c)(i):- The transmitter was modulated by a 2.5 KHz tone signal at an input level 16 dB greater than that required to produce 50% modulation (e.g.: ±2.5 KHz peak deviation at 1 KHz modulating frequency). The input level was established at the frequency of maximum response of the audio modulating circuit.

Digital Modulation Through a Data Input Port @ 2.1049(h):- Transmitters employing digital modulation techniques - when modulated by an input signal such that its amplitude and symbol rate represent the maximum rated conditions under which the equipment will be operated. The signal shall be applied through any filter networks, pseudo-random generators or other devices required in normal service. Additionally, the Emission Masks shall be shown for operation with any devices used for modifying the spectrum when such devices are operational at the discretion of the user.

The following EMI Receiver bandwidth shall be used for measurement of Emission Mask/Out-of-Band Emission Measurements:

For 25 kHz Channel Spacing: RBW = 300 Hz
For 12.5 kHz or 6.25 kHz Channel Spacings: RBW = 100 Hz

The all cases the Video Bandwidth shall be equal or greater than the measuring bandwidth.

8.5. SPURIOUS EMISSIONS (CONDUCTED)

With transmitter modulation characteristics described in Out-of-Band Emissions measurements @ 2.1049, the transmitter spurious and harmonic emissions were scanned. The spurious and harmonic emissions were measured with the EMI Receiver controls set as RBW = 30 kHz minimum , VBW ≥ RBW and SWEEP TIME = AUTO). The transmitter was operated at a full rated power output, and modulated as follows:

FCC 47 CFR 2.1057 - Frequency Spectrum to be investigated: The spectrum was investigated from the lowest radio generated in the equipment up to at least the 10^{th} harmonic of the carrier frequency or to the highest frequency practicable in the present state of the art of measuring techniques, whichever is lower. Particular attention should be paid to harmonics and subharmonics of the carrier frequency. Radiation at the frequencies of multiplier stages should be checked. The
amplitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be reported.

FCC 47 CFR 2.1051 - Spurious Emissions at Antenna Terminal: The radio frequency voltage or powers generated within the equipment and appearing on a spurious frequency shall be checked at the equipment output terminals when properly loaded with a suitable artificial antenna. Curves or equivalent data shall show the magnitude of the harmonic and other spurious emission that can be detected when the equipment is operated under the conditions specified in 2.1049 as appropriate. The magnitude of spurious emissions which are attenuated more than 20 dB below the permissible value need not be specified.