MFA M. Flom Associates, Inc. - Global Compliance Center
3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176
www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

Sub-part
2.1033(c):

EQUIPMENT IDENTIFICATION

FCC ID: K66VX-510U-1

NAMEPLATE DRAWING

ATTACHED, EXHIBIT 1.

LOCATION

AS PER LABEL DRAWING(S)

DATE OF REPORT

July 14, 1999

SUPERVISED BY:

Morton Flom, P. Eng.

THE APPLICANT HAS BEEN CAUTIONED AS TO THE FOLLOWING:

15.21 INFORMATION TO USER.

The users manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) SPECIAL ACCESSORIES.

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories, such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in this part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer, without additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in § 2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

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Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

a) TEST REPORT

b) Laboratory: (FCC: 31040/SIT) (Canada: IC 2044)	M. Flom Associates, Inc. 3356 N. San Marcos Place, Suite 107 Chandler, AZ 85225
c) Report Number:	d9970029
d) Client:	Yaesu U.S.A. 17210 Edwards Rd. Cerritos, CA 90703
e) Identification: Description:	VX-510U-1 FCC ID: K66VX-510U-1 UHF-FM Handheld Marine Transceiver
f) EUT Condition:	Not required unless specified in individual tests.
g) Report Date: EUT Received:	July 14, 1999 June 29, 1999
h, j, k):	As indicated in individual tests.
i) Sampling method:	No sampling procedure used.
l) Uncertainty:	In accordance with MFA internal quality manual.
m) Supervised by:	 Morton Flom, P. Eng.
n) Results:	The results presented in this report relate only to the item tested.
o) Reproduction:	This report must not be reproduced, except in full, without written permission from this laboratory.

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LIST OF GENERAL INFORMATION REQUIRED FOR CERTIFICATION

IN ACCORDANCE WITH FCC RULES AND REGULATIONS,
VOLUME II, PART 2 AND TO

80,

Sub-part 2.1033

(c)(1): NAME AND ADDRESS OF APPLICANT:

Yaesu Musen Co., Ltd.
20-2, Shimomaruko 1-chome
Ota-ku
Tokyo, Japan 146

MANUFACTURER:

Applicant

(c)(2): FCC ID: K66VX-510U-1

MODEL NO: VX-510U-1

(c)(3): INSTRUCTION MANUAL(S):

PLEASE SEE ATTACHED EXHIBITS

(c)(4): TYPE OF EMISSION: 16K0F3E, 11K0F3E

(c)(5): FREQUENCY RANGE, MHz: 457.525 to 467.825

(c)(6): POWER RATING, Watts: 1 to 4
_x_ Switchable ___ Variable ___ N/A

(c)(7): MAXIMUM POWER RATING, Watts: 4 25

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Subpart 2.1033 (continued)

(c)(8): VOLTAGES & CURRENTS IN ALL ELEMENTS IN FINAL R. F. STAGE, INCLUDING FINAL TRANSISTOR OR SOLID STATE DEVICE:

COLLECTOR CURRENT, A = per manual
COLLECTOR VOLTAGE, Vdc = per manual
SUPPLY VOLTAGE, Vdc = 7.2

(c)(9): TUNE-UP PROCEDURE:

PLEASE SEE ATTACHED EXHIBITS

(c)(10): CIRCUIT DIAGRAM/CIRCUIT DESCRIPTION: Including description of circuitry & devices provided for determining and stabilizing frequency, for suppression of spurious radiation, for limiting modulation and limiting power.

PLEASE SEE ATTACHED EXHIBITS

(c)(11): LABEL INFORMATION:

PLEASE SEE ATTACHED EXHIBITS

(c)(12): PHOTOGRAPHS:

PLEASE SEE ATTACHED EXHIBITS

(c)(13): DIGITAL MODULATION DESCRIPTION:

___ ATTACHED EXHIBITS
_x_ N/A

(c)(14): TEST AND MEASUREMENT DATA:

FOLLOWS

M. Flom Associates, Inc. is accredited by the American Association for Laboratory Association (A2LA) as shown in the scope below.

THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

M. FLOM ASSOCIATES, INC.
Chandler, AZ

for technical competence in the field of

Electrical (EMC) Testing

The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC Guide 25-1990 "General Requirements for the Competence of Calibration and Testing Laboratories" (equivalent to relevant requirements of the ISO 9000 series of standards) and any additional program requirements in the identified field of testing.

Presented this 24th day of November, 1998.

President
For the Accreditation Council
Certificate Number 1008.01
Valid to December 31, 2000

For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical (EMC) Scope of Accreditation

American Association for Laboratory Accreditation

SCOPE OF ACCREDITATION TO ISO/IEC GUIDE 25-1990 AND EN 45001

M. FLOM ASSOCIATES, INC.
Electronic Testing Laboratory
3356 North San Marcos Place, Suite 107
Chandler, AZ 85224-1571
Morton Flom Phone: 602 926 3100

ELECTRICAL (EMC)

Valid to: December 31, 2000 Certificate Number: 1008.01

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following electromagnetic compatibility tests:

Tests	Standard(s)
RF Emissions	FCC Part 15 (Subparts B and C) using ANSI C63.4-1992; CISPR 11; CISPR 13, CISPR 14; CISPR 22; EN 55011; EN 55013; EN 55014; EN 55022; EN 50081-1; EN 50081-2; FCC Part 18; ICES-003; AS/NZS 1044; AS/NZS 1053; AS/NZS 3548; AS/NZS 4251.1
RF Immunity	EN 50082-1; EN 50082-2; AS/NZS 4251.1
Radiated Susceptibility	EN 61000-4-3; ENV 50140; ENV 50204; IEC 1000-4-3; IEC 801-3
ESD	EN 61000-4-2; IEC 1000-4-2; IEC 801-2
EFT	EN 61000-4-4; IEC 1000-4-4; IEC 801-4
Surge	EN 61000-4-5; ENV 50142; IEC 1000-4-5; IEC 801-5
47 CFR (FCC)	2, 21, 22, 23, 24, 74, 80, 87, 90, 95, 97

5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8307 • Phone: 301 644 3200 • Fax: 301 662 2974

"This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this report have been determined in accordance with the laboratory's terms of accreditation unless stated otherwise in the report."

Should this report contain any data for tests for which we are not accredited, or which have been undertaken by a subcontractor that is not A2LA accredited, such data would not covered by this laboratory's A2LA accreditation.

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Sub-part 2.1033(c)(14): TEST AND MEASUREMENT DATA

All tests and measurement data shown were performed in accordance with FCC Rules and Regulations, Volume II; Part 2, Sub-part J, Sections 2.947, 2.1033(c), 2.1041, 2.1046, 2.1047, 2.1079, 2.1051, 2.1053, 2.1055, 2.1057 and the following individual Parts:

____ 21 - Domestic Public Fixed Radio Services
____ 22 - Public Mobile Services
____ 22 Subpart H - Cellular Radiotelephone Service
____ 22.901(d) - Alternative technologies and auxiliary services
____ 23 - International Fixed Public Radiocommunication services
____ 24 - Personal Communications Services
____ 74 Subpart H - Low Power Auxiliary Stations
_x_ 80 - Stations in the Maritime Services
____ 80 Subpart E - General Technical Standards
____ 80 Subpart F - Equipment Authorization for Compulsory Ships
____ 80 Subpart K - Private Coast Stations and Marine Utility Stations
____ 80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
____ 80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
____ 80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
____ 80 Subpart V - Emergency Position Indicating Radiobeacons (EPIRB'S)
____ 80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
____ 80 Subpart X - Voluntary Radio Installations
____ 87 - Aviation Services
____ 90 - Private Land Mobile Radio Services
____ 94 - Private Operational-Fixed Microwave Service
____ 95 Subpart A - General Mobile Radio Service (GMRS)
____ 95 Subpart C - Radio Control (R/C) Radio Service
____ 95 Subpart D - Citizens Band (CB) Radio Service
____ 95 Subpart E - Family Radio Service
____ 95 Subpart F - Interactive Video and Data Service (IVDS)
____ 101 - Fixed Microwave Services

STANDARD TEST CONDITIONS and ENGINEERING PRACTICES

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst case measurements.

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NAME OF TEST: Audio Frequency Response

SPECIFICATION: 47 CFR 2.1047(a)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.6

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. The EUT and test equipment were set up as shown on the following page.

2. The audio signal generator was connected to the audio input circuit/microphone of the EUT.

3. The audio signal input was adjusted to obtain 50% modulation at 1 kHz, and this point was taken as the 0 dB reference level.

4. With input levels held constant and below limiting at all frequencies, the audio signal generator was varied from 100 Hz to 50 kHz.

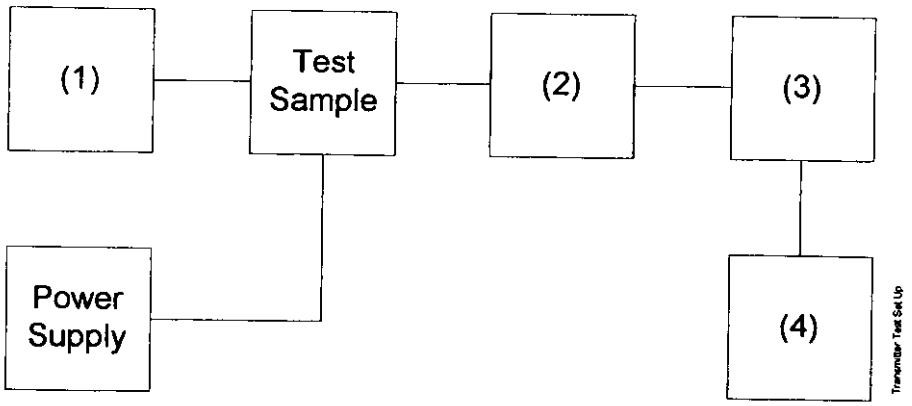
5. The response in dB relative to 1 kHz was then measured, using the HP 8901A Modulation Analyzer.

6. MEASUREMENT RESULTS: ATTACHED

PAGE NO. 10 of 43.

TRANSMITTER TEST SET-UP

TEST A. MODULATION CAPABILITY/DISTORTION
TEST B. AUDIO FREQUENCY RESPONSE
TEST C. HUM AND NOISE LEVEL
TEST D. RESPONSE OF LOW PASS FILTER
TEST E. MODULATION LIMITING



Transmitter Test Set Up

	Asset	Description	s/n
(1)		LINE IMPEDANCE STABILIZATION NETWORK	
___	i00010	HP 204D	1105A04683
_x_	i00017	HP 8903A	2216A01753
_x_	i00118	HP 33120A	US36002064
(2)		COAXIAL ATTENUATOR	
___	i00122	NARDA 766-10	7802
___	i00123	NARDA 766-10	7802A
_x_	i00113	SIERRA 661A-3D	1059
___	i00069	BIRD 8329 (30 dB)	10066
(3)		MODULATION ANALYZER	
_x_	i00020	HP 8901A	2105A01087
(4)		AUDIO ANALYZER	
_x_	i00017	HP 8903A	2216A01753

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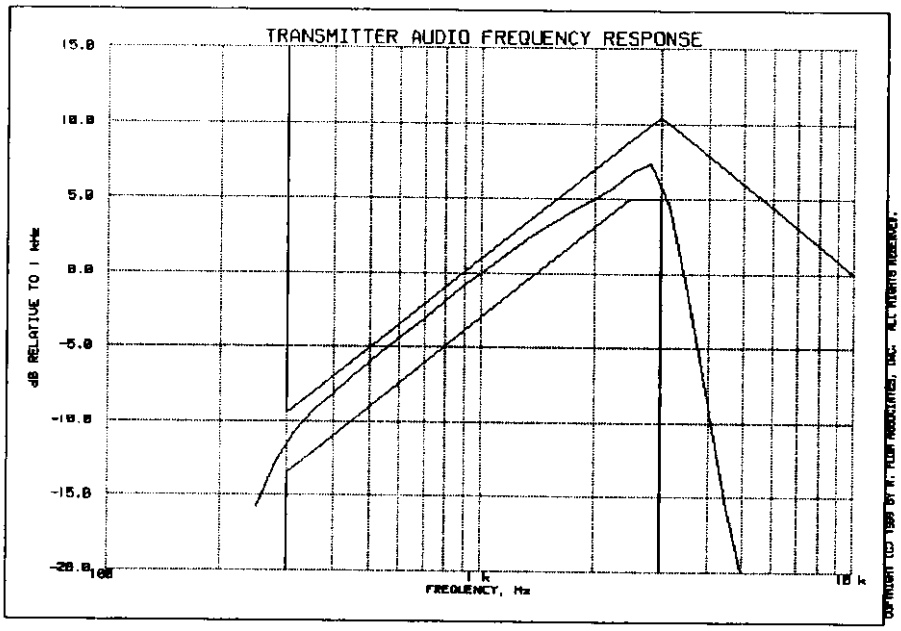
NAME OF TEST: Audio Frequency Response
g9970048: 1999-Jul-10 Sat 13:55:00
STATE: 0:General



Additional points:

FREQUENCY, Hz	LEVEL, dB
300	-11.51
20000	-27.19
30000	-26.94
50000	-26.88

SUPERVISED BY: Morton Flom, P. Eng.

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NAME OF TEST: Audio Low Pass Filter (Voice Input)

SPECIFICATION: 47 CFR 2.1047(a)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.15

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

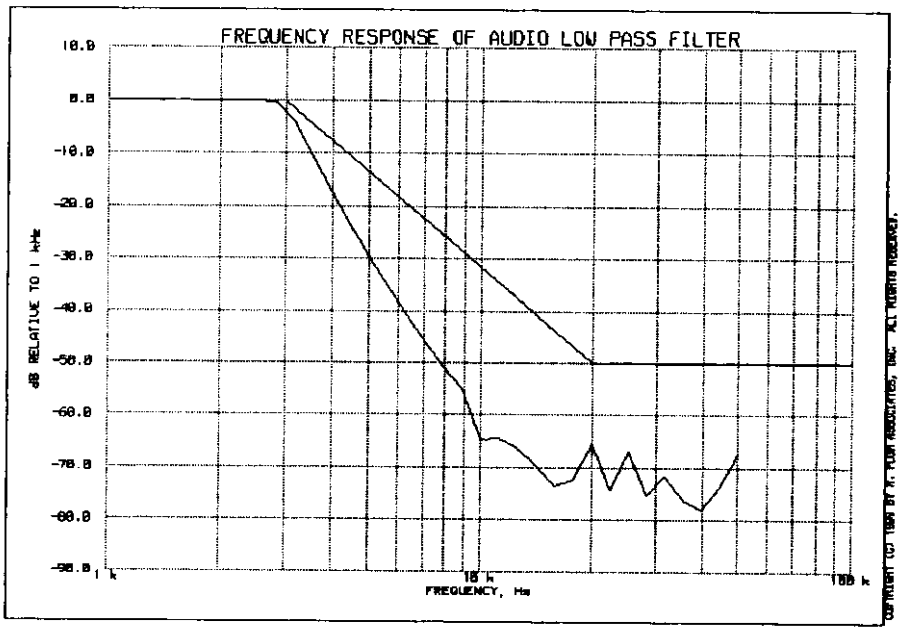
1. The EUT and test equipment were set up such that the audio input was connected at the input to the modulation limiter, and the modulated stage.

2. The audio output was connected at the output to the modulated stage.

3. MEASUREMENT RESULTS: ATTACHED

PAGE NO. 13 of 43.

NAME OF TEST: Audio Low Pass Filter (Voice Input)
g9970047: 1999-Jul-10 Sat 13:52:00
STATE: 0:General



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NAME OF TEST: Modulation Limiting

SPECIFICATION: 47 CFR 2.1047(b), 80.211, 80.213

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.3

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The signal generator was connected to the input of the EUT as for "Frequency Response of the Modulating Circuit."

2. The modulation response was measured for each of three frequencies (one of which was the frequency of maximum response), and the input voltage was varied and was observed on an HP 8901A Modulation Analyzer.

3. The input level was varied from 30% modulation (±1.5 kHz deviation) to at least 20 dB higher than the saturation point.

4. Measurements were performed for both negative and positive modulation and the respective results were recorded.

5. MEASUREMENT RESULTS: ATTACHED

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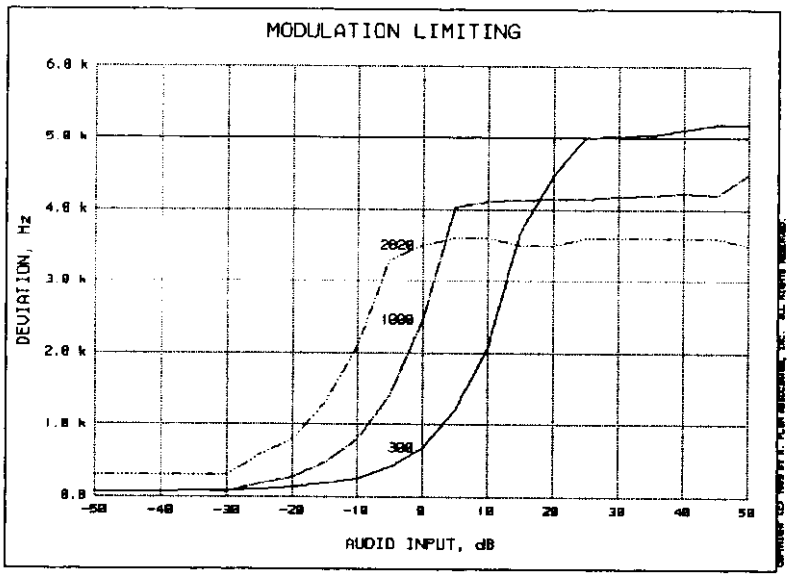
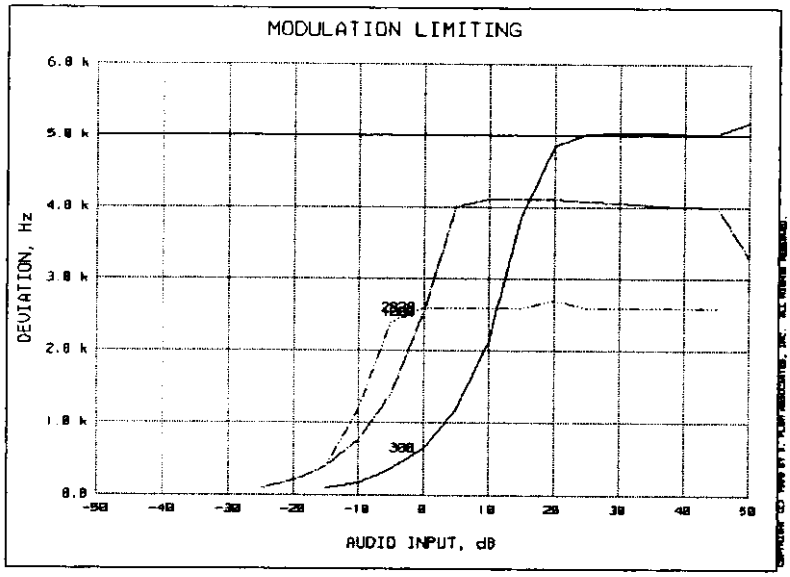
NAME OF TEST: Modulation Limiting
g9970049: 1999-Jul-10 Sat 13:58:00
STATE: 0:General

Positive Peaks:



Negative Peaks:



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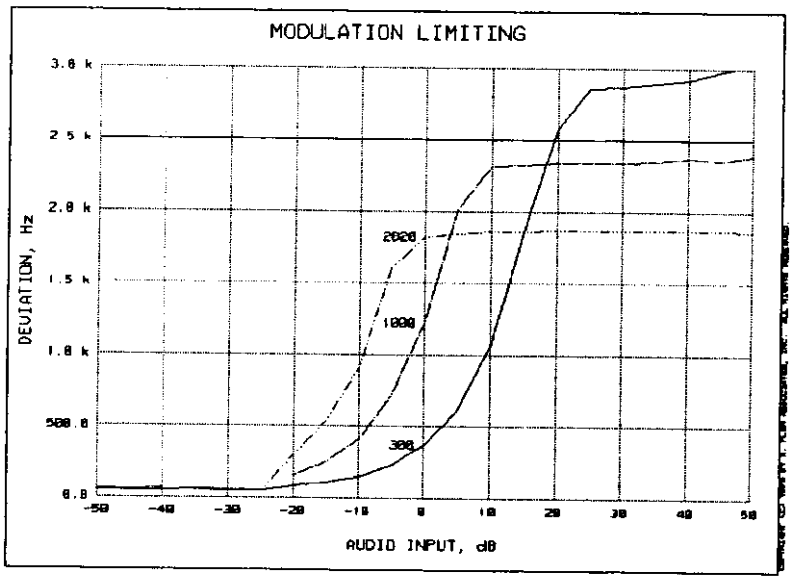
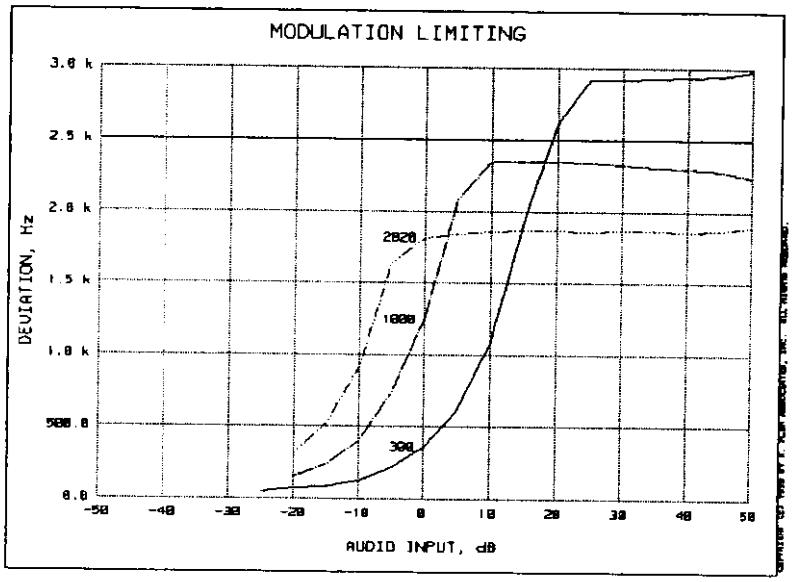
NAME OF TEST: Modulation Limiting
g9970052: 1999-Jul-10 Sat 14:23:00
STATE: 0:General

Positive Peaks:



Negative Peaks:



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NAME OF TEST: Emission Masks (Occupied Bandwidth)

SPECIFICATION: 47 CFR 2.1049(c)(1)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.11

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The EUT and test equipment were set up as shown on the following page, with the Spectrum Analyzer connected.

2. For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for ±2.5 kHz deviation (or 50% modulation). With level constant, the signal level was increased 16 dB.

3. For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.

4. The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.

5. MEASUREMENT RESULTS: ATTACHED

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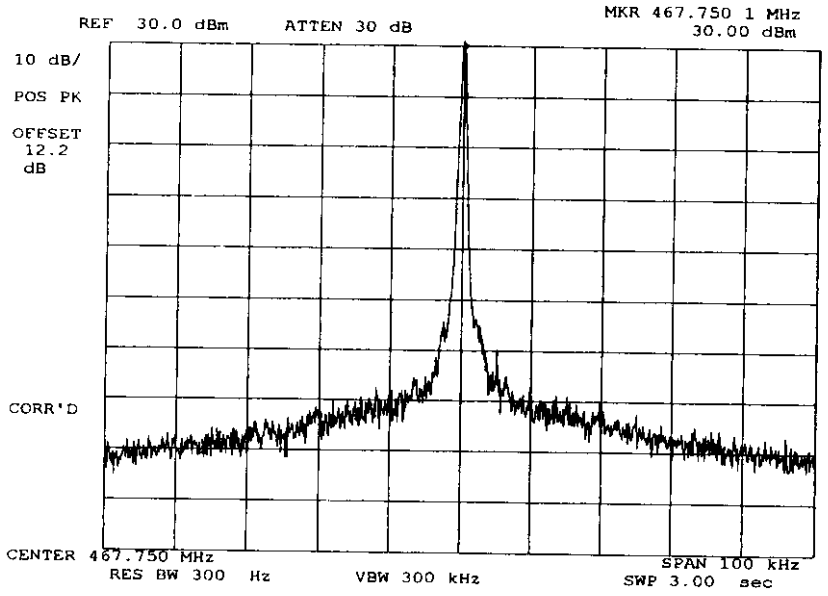
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970085: 1999-Jul-10 Sat 14:57:00
STATE: 1:Low Power



POWER: LOW
MODULATION: NONE

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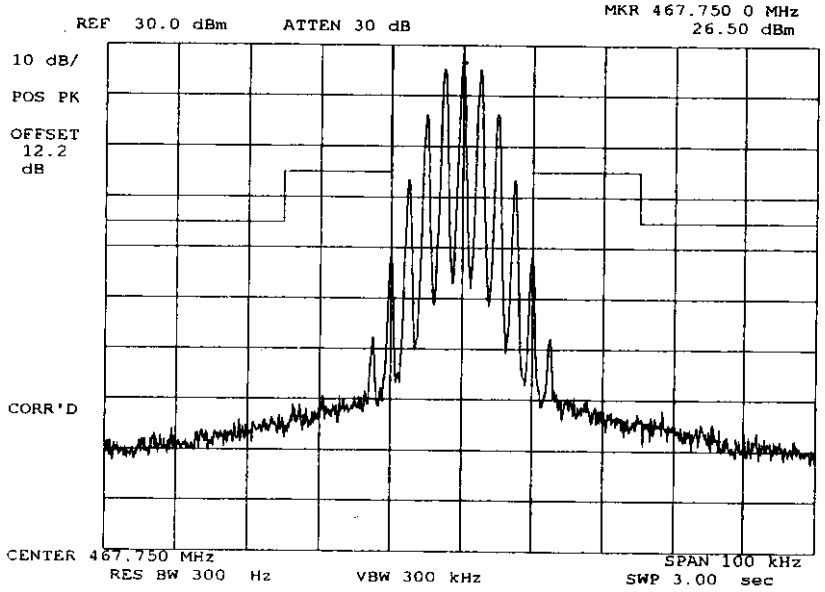
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970086: 1999-Jul-10 Sat 14:58:00
STATE: 1:Low Power



POWER: LOW
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: B, VHF/UHF 25kHz, w/LPF

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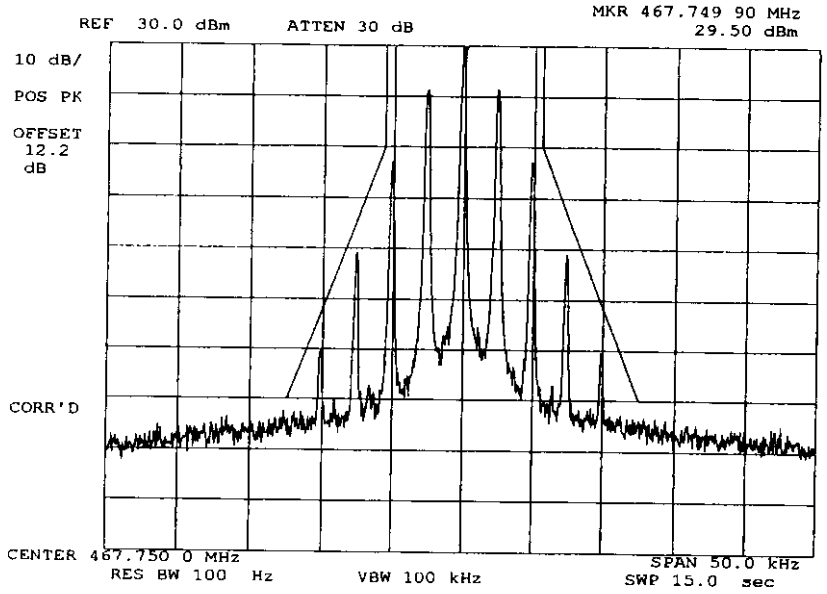
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970089: 1999-Jul-10 Sat 15:05:00
STATE: 1:Low Power



POWER: LOW
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: D, VHF/UHF 12.5kHz BW

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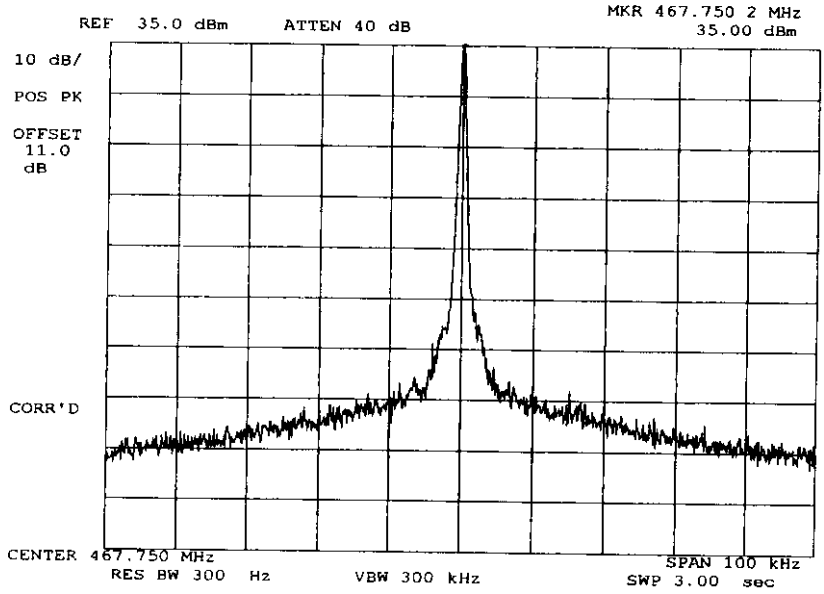
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970084: 1999-Jul-10 Sat 14:54:00
STATE: 2:High Power



POWER: HIGH
MODULATION: NONE

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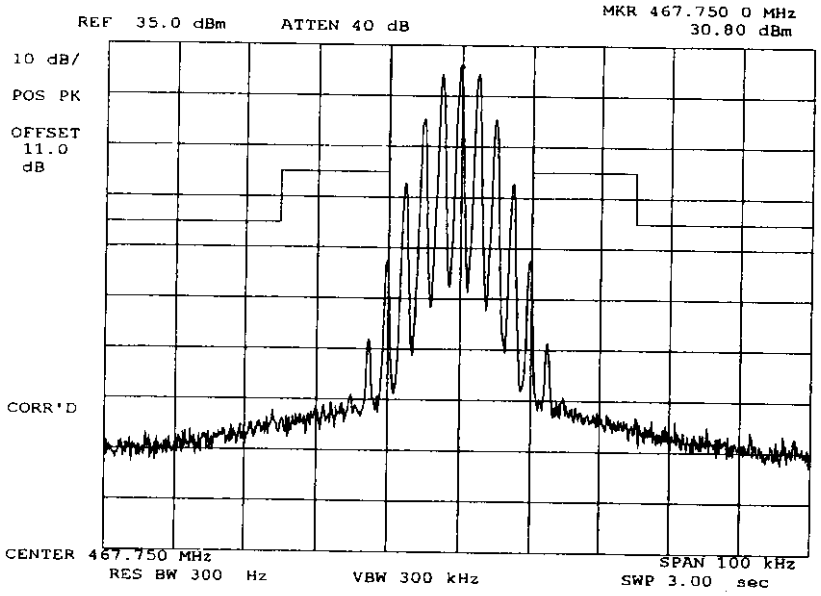
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970087: 1999-Jul-10 Sat 14:59:00
STATE: 2:High Power



POWER: HIGH
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: B, VHF/UHF 25kHz, w/LPF

SUPERVISED BY: Morton Flom, P. Eng.

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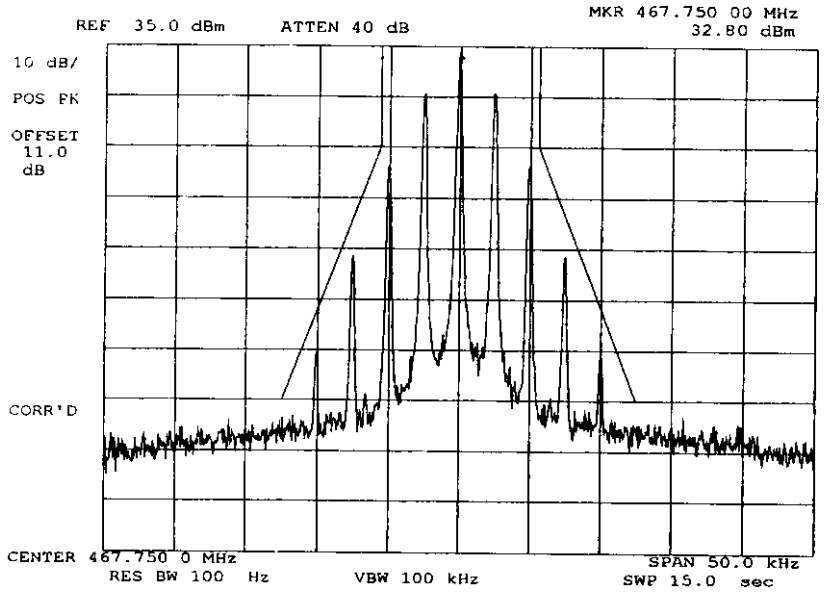
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970088: 1999-Jul-10 Sat 15:02:00
STATE: 2:High Power



POWER: HIGH
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: D, VHF/UHF 12.5kHz BW

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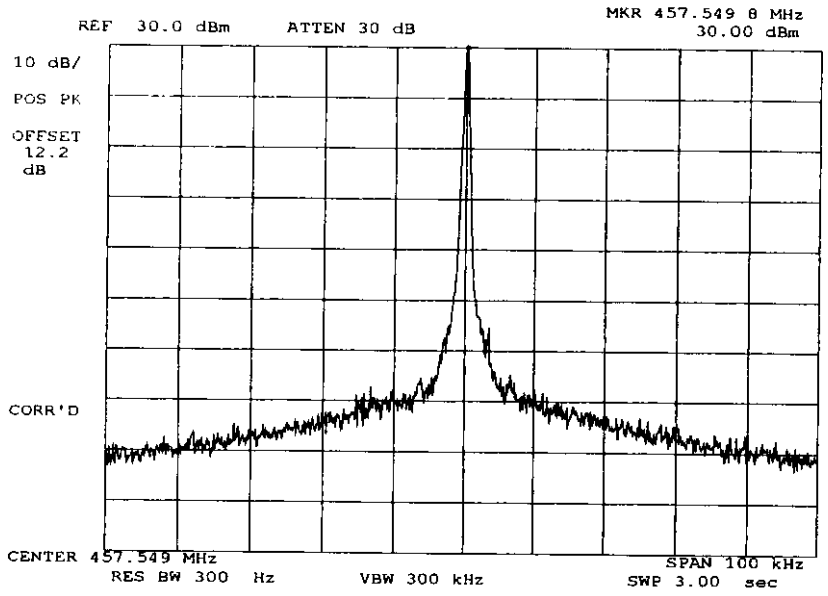
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970069: 1999-Jul-10 Sat 10:30:00
STATE: 1:Low Power



POWER: LOW
MODULATION: NONE

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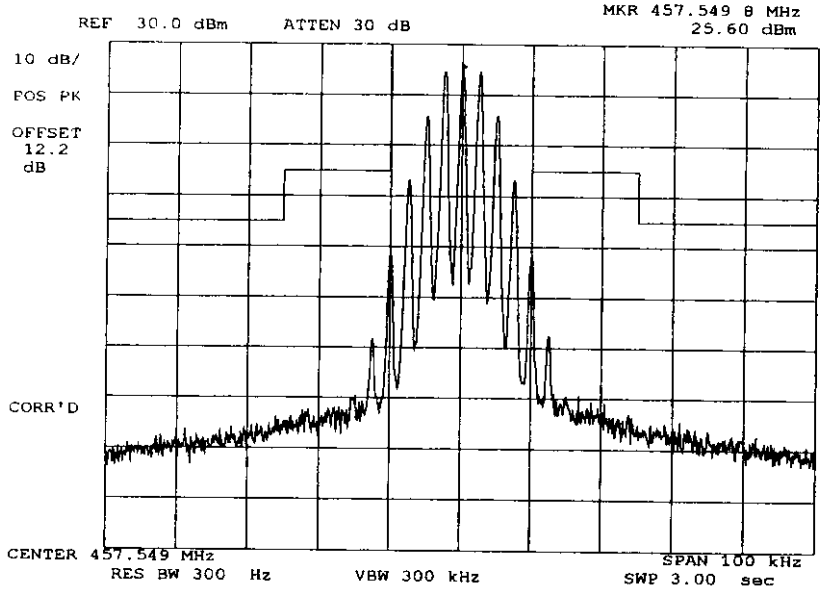
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970070: 1999-Jul-10 Sat 10:33:00
STATE: 1:Low Power



POWER: LOW
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: B, VHF/UHF 25kHz, w/LPF

SUPERVISED BY: Morton Flom, P. Eng.

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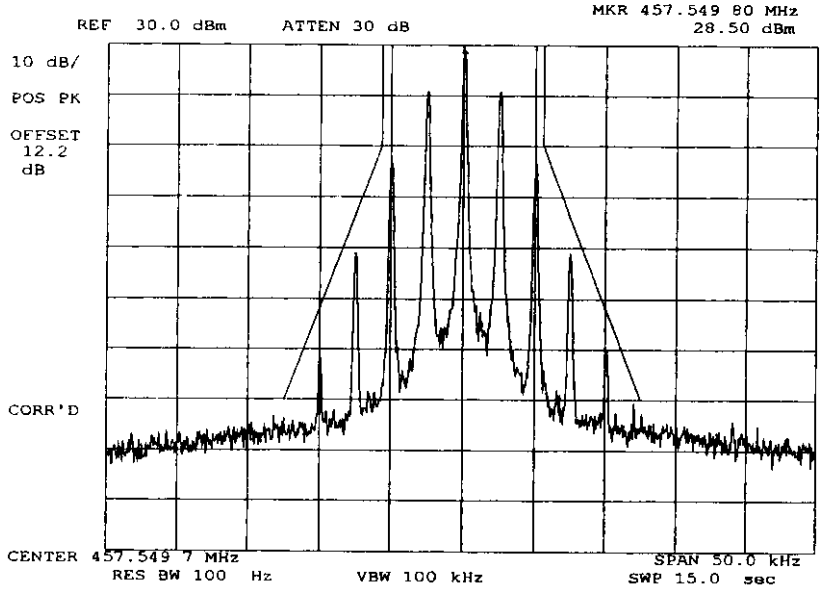
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970072: 1999-Jul-10 Sat 10:38:00
STATE: 1:Low Power



POWER: LOW
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: D, VHF/UHF 12.5kHz BW

SUPERVISED BY: Morton Flom, P. Eng.

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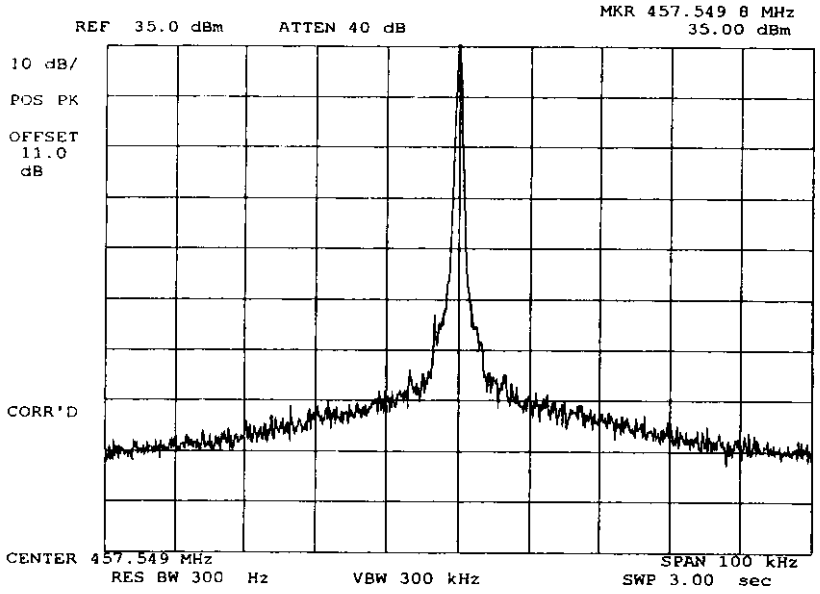
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970068: 1999-Jul-10 Sat 10:28:00
STATE: 2:High Power



POWER: HIGH
MODULATION: NONE

SUPERVISED BY: Morton Flom, P. Eng.

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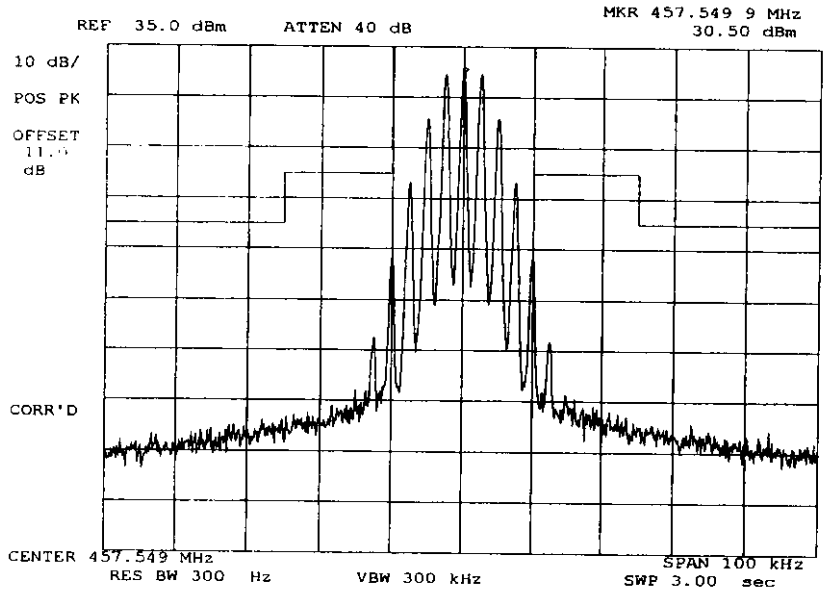
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970071: 1999-Jul-10 Sat 10:34:00
STATE: 2:High Power



POWER: HIGH
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: B, VHF/UHF 25kHz, w/LPF

SUPERVISED BY: Morton Flom, P. Eng.

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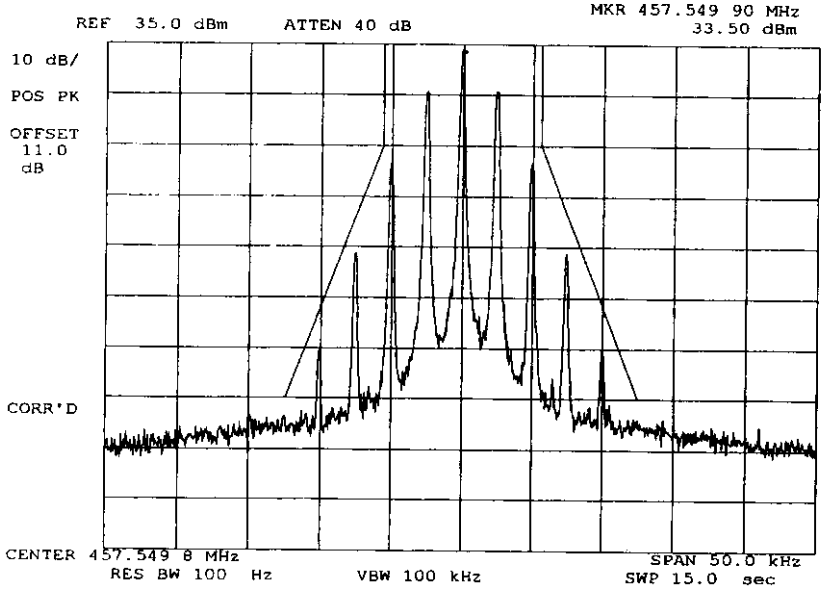
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9970073: 1999-Jul-10 Sat 10:41:00
STATE: 2:High Power



POWER: HIGH
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: D, VHF/UHF 12.5kHz BW

SUPERVISED BY: Morton Flom, P. Eng.

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NAME OF TEST: Spurious Emissions at Antenna Terminals

SPECIFICATION: 47 CFR 2.1051

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.13

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. The emissions were measured for the worst case as follows:
   (a): within a band of frequencies defined by the carrier frequency plus and minus one channel.
   (b): from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40 GHz, whichever is lower.

2. The magnitude of spurious emissions that are attenuated more than 20 dB below the permissible value need not be specified.

3. MEASUREMENT RESULTS: ATTACHED FOR WORST CASE

FREQUENCY OF CARRIER, MHz	=	457.525, 457.600, 467.750, 467.825
SPECTRUM SEARCHED, GHz	=	0 to 10 x F_c
MAXIMUM RESPONSE, Hz	=	2820
ALL OTHER EMISSIONS	=	≥ 20 dB BELOW LIMIT
LIMIT(S), dBc		
-(50+10xLOG P)	=	-50 (1 Watt)
-(50+10xLOG P)	=	-56 (4 Watts)

SUPERVISED BY: Morton Flom, P. Eng.

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
g9970074: 1999-Jul-10 Sat 11:22:00
STATE: 2:Low Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
457.525000	915.051000	-42.1	-77.1	-22.1
457.600000	915.196000	-39.9	-74.9	-19.9
457.525000	1372.583000	-36.4	-71.4	-16.4
457.600000	1372.805000	-42	-77	-22
457.525000	1830.118000	-43	-78	-23
457.600000	1830.823000	-43.4	-78.4	-23.4
457.525000	2287.615000	-39.9	-74.9	-19.9
457.600000	2287.992000	-40.8	-75.8	-20.8
457.525000	2745.612000	-44.1	-79.1	-24.1
457.600000	2746.042000	-45.1	-80.1	-25.1
457.525000	3202.504000	-44.7	-79.7	-24.7
457.600000	3202.795000	-45.4	-80.4	-25.4
457.525000	3660.029000	-45.7	-80.7	-25.7
457.600000	3661.290000	-45.1	-80.1	-25.1
457.525000	4117.427000	-45.3	-80.3	-25.3
457.600000	4118.113000	-44.3	-79.3	-24.3
457.525000	4575.576000	-43.2	-78.2	-23.2
457.600000	4575.789000	-44.9	-79.9	-24.9
457.525000	5033.072000	-45.2	-80.2	-25.2
457.600000	5033.961000	-44.1	-79.1	-24.1
457.525000	5490.260000	-44	-79	-24
457.600000	5491.532000	-45.5	-80.5	-25.5
457.525000	5948.205000	-39.8	-74.8	-19.8
457.600000	5948.829000	-38.3	-73.3	-18.3
457.525000	6405.594000	-39.4	-74.4	-19.4
457.600000	6406.327000	-38.5	-73.5	-18.5
457.525000	6863.006000	-39.5	-74.5	-19.5
457.600000	6864.466000	-39.2	-74.2	-19.2

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
g9970075: 1999-Jul-10 Sat 11:25:00
STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
457.525000	915.056000	-46.4	-76.4	-26.4
457.600000	915.202000	-42.6	-72.6	-22.6
457.525000	1372.576000	-45.5	-75.5	-25.5
457.600000	1372.802000	-47.5	-77.5	-27.5
457.525000	1830.106000	-46.6	-76.6	-26.6
457.600000	1830.398000	-46.1	-76.1	-26.1
457.525000	2287.609000	-40.7	-70.7	-20.7
457.600000	2287.993000	-40.4	-70.4	-20.4
457.525000	2744.687000	-52.9	-82.9	-32.9
457.600000	2745.606000	-53.1	-83.1	-33.1
457.525000	3202.421000	-53.1	-83.1	-33.1
457.600000	3203.537000	-53.2	-83.2	-33.2
457.525000	3660.553000	-54.1	-84.1	-34.1
457.600000	3660.750000	-53.5	-83.5	-33.5
457.600000	4118.211000	-52.6	-82.6	-32.6
457.525000	4118.216000	-53.5	-83.5	-33.5
457.525000	4574.956000	-52.8	-82.8	-32.8
457.600000	4576.184000	-53.6	-83.6	-33.6
457.525000	5032.687000	-53.4	-83.4	-33.4
457.600000	5033.703000	-53	-83	-33
457.525000	5490.605000	-53.5	-83.5	-33.5
457.600000	5491.203000	-53.5	-83.5	-33.5
457.525000	5947.639000	-47.9	-77.9	-27.9
457.600000	5948.697000	-47.3	-77.3	-27.3
457.525000	6405.287000	-48.1	-78.1	-28.1
457.600000	6406.868000	-48.3	-78.3	-28.3
457.525000	6862.718000	-47.6	-77.6	-27.6
457.600000	6863.983000	-48.1	-78.1	-28.1

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
g9970095: 1999-Jul-10 Sat 15:36:00
STATE: 2:Low Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
467.750000	935.497000	-42	-77	-22
467.825000	935.640000	-44.4	-79.4	-24.4
467.825000	1403.012000	-42.2	-77.2	-22.2
467.750000	1403.244000	-38.8	-73.8	-18.8
467.750000	1871.123000	-42.6	-77.6	-22.6
467.825000	1871.621000	-43.4	-78.4	-23.4
467.750000	2338.759000	-39.9	-74.9	-19.9
467.825000	2339.116000	-39.6	-74.6	-19.6
467.825000	2806.687000	-44.7	-79.7	-24.7
467.750000	2806.836000	-44.6	-79.6	-24.6
467.750000	3273.963000	-45.6	-80.6	-25.6
467.825000	3274.491000	-45.3	-80.3	-25.3
467.750000	3742.428000	-45.8	-80.8	-25.8
467.825000	3742.819000	-44.2	-79.2	-24.2
467.750000	4209.552000	-44.1	-79.1	-24.1
467.825000	4210.760000	-45	-80	-25
467.750000	4677.979000	-45	-80	-25
467.825000	4678.418000	-45.3	-80.3	-25.3
467.750000	5144.962000	-44.7	-79.7	-24.7
467.825000	5146.432000	-45	-80	-25
467.750000	5612.556000	-45.3	-80.3	-25.3
467.825000	5613.782000	-42.9	-77.9	-22.9
467.750000	6081.124000	-38.7	-73.7	-18.7
467.825000	6082.081000	-38.9	-73.9	-18.9
467.750000	6548.358000	-38.9	-73.9	-18.9
467.825000	6549.252000	-38.9	-73.9	-18.9
467.750000	7016.670000	-39.2	-74.2	-19.2
467.825000	7017.105000	-39.3	-74.3	-19.3

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
g9970096: 1999-Jul-10 Sat 15:41:00
STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
467.750000	935.485000	-49.7	-79.7	-29.7
467.825000	935.650000	-50.5	-80.5	-30.5
467.750000	1403.258000	-49.6	-79.6	-29.6
467.825000	1403.489000	-47	-77	-27
467.750000	1870.996000	-50.9	-80.9	-30.9
467.825000	1871.291000	-49.4	-79.4	-29.4
467.750000	2338.742000	-45	-75	-25
467.825000	2339.138000	-46	-76	-26
467.750000	2806.508000	-53.5	-83.5	-33.5
467.825000	2806.988000	-53.6	-83.6	-33.6
467.750000	3273.915000	-53.7	-83.7	-33.7
467.825000	3274.803000	-53.8	-83.8	-33.8
467.825000	3742.178000	-53	-83	-33
467.750000	3742.394000	-53	-83	-33
467.750000	4209.799000	-52.6	-82.6	-32.6
467.825000	4210.570000	-54.1	-84.1	-34.1
467.750000	4677.859000	-53.1	-83.1	-33.1
467.825000	4678.649000	-53.6	-83.6	-33.6
467.750000	5144.954000	-53.2	-83.2	-33.2
467.825000	5146.076000	-53.1	-83.1	-33.1
467.750000	5612.763000	-54	-84	-34
467.825000	5613.424000	-53.7	-83.7	-33.7
467.750000	6080.253000	-47.6	-77.6	-27.6
467.825000	6082.184000	-47.6	-77.6	-27.6
467.750000	6548.907000	-47.8	-77.8	-27.8
467.825000	6550.036000	-48.9	-78.9	-28.9
467.750000	7016.637000	-48.5	-78.5	-28.5
467.825000	7017.479000	-47.3	-77.3	-27.3

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NAME OF TEST: Field Strength of Spurious Radiation

SPECIFICATION: 47 CFR 2.1053(a)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.12

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. A description of the measurement facilities was filed with the FCC and was found to be in compliance with the requirements of Section 15.38, by letter from the FCC dated March 3, 1997, FILE 31040/SIT. All pertinent changes will be reported to the Commission by up-date prior to March 2000.

2. At first, in order to locate all spurious frequencies and approximate amplitudes, and to determine proper equipment functioning, the test sample was set up at a distance of three meters from the test instrument. Valid spurious signals were determined by switching the power on and off.

3. In the field, the test sample was placed on a wooden turntable above ground at three (or thirty) meters away from the search antenna. Excess power leads were coiled near the power supply.

   In order to obtain the maximum response at each spurious frequency, the turntable was rotated. Also, the search Antennas were raised and lowered vertically, and all cables were oriented. Excess power lead was coiled near the power supply.

4. A signal generator, connected with a non-radiating cable to a vertically polarized half-wave antenna (for each frequency involved) was substituted for the transmitter. The Search Antenna was raised and lowered to obtain maximum indicated.

5. The signal generator output was adjusted until a signal level indication equal to that from the transmitter was obtained.

6. Steps 4 and 5 were repeated, using a horizontally polarized half-wave antenna. The higher of the two observations was noted.

7. Power into the half-wave antenna was calculated from the characteristic impedance of the line, and the voltage output from the signal generator.

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NAME OF TEST: Field Strength of Spurious Radiation

SPECIFICATION: 47 CFR 2.1053(a)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.12

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE (CONT.)

8. The level of each spurious radiation with reference to the transmitter power in dB, was calculated from:

$$\text{SPURIOUS LEVEL, dB} = 10 \text{ LOG } \frac{\text{(Calculated Spurious Power) [From Para. 7].}}{\text{TX Power (Wattmeter)}}$$

9. The worst case for all channels is shown.

10. Measurement summary:

FREQUENCY OF CARRIER, MHz	=	457.525, 457.600, 467.750, 467.825
SPECTRUM SEARCHED, GHz	=	0 to 10 x F_C
ALL OTHER EMISSIONS	=	≥ 20 dB BELOW LIMIT
LIMIT, dBc		
-(50+10xLOG P)	=	-50 (1 Watt)
-(50+10xLOG P)	=	-56 (4 Watts)

11. Measurement results: ATTACHED

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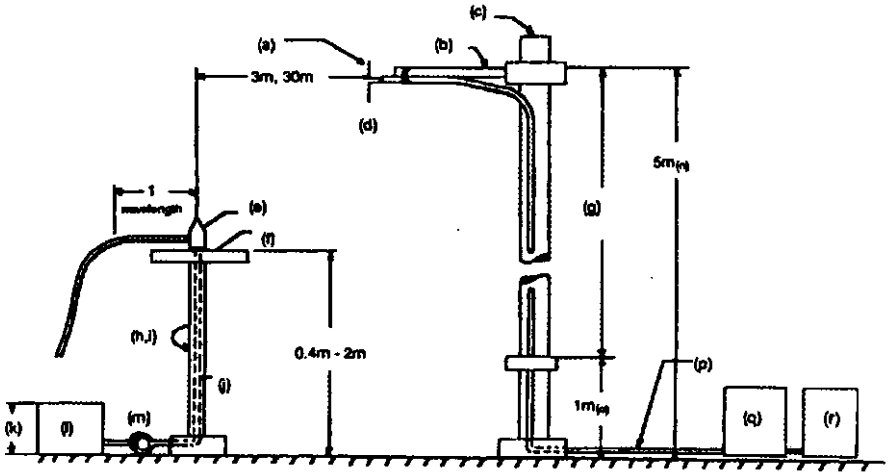
RADIATED TEST SETUP



NOTES:

(a) Search Antenna - Rotatable on boom
(b) Non-metallic boom
(c) Non-metallic mast
(d) Adjustable horizontally
(e) Equipment Under Test
(f) Turntable
(g) Boom adjustable in height.
(h) External control cables routed horizontally at least one wavelength.
(i) Rotatable
(j) Cables routed through hollow turntable center
(k) 30 cm or less
(l) External power source
(m) 10 cm diameter coil of excess cable
(n) 25 cm (V), 1 m-7 m (V, H)
(o) 25 cm from bottom end of 'V', 1m normally
(p) Calibrated Cable at least 10m in length
(q) Amplifier (optional)
(r) Spectrum Analyzer

	Asset	Description	s/n	Cycle (Per ANSI C63.4-1992, 10.1.4)	Last Cal
TRANSDUCER					
___	i00065	EMCO 3109B 100Hz-50MHz	2336	12 mo.	
___	i00033	Singer 94593-1 10kHz-32MHz	0219	12 mo.	
x	i00088	EMCO 3109-B 25MHz-300MHz	2336	12 mo.	Oct-98
x	i00089	Aprel 2001 200MHz-1GHz	001500	12 mo.	Oct-98
x	i00103	EMCO 3115 1GHz-18GHz	9208-3925	12 mo.	Oct-98
___	i00085	EMCO 3116 10GHz-40GHz	2076	12 mo.	
AMPLIFIER					
___	i00028	HP 8449A	2749A00121	12 mo.	Mar-99
SPECTRUM ANALYZER					
___	i00029	HP 8563E	3213A00104	12 mo.	Aug-98
x	i00033	HP 85462A	3625A00357	12 mo.	Dec-98
___	i00048	HP 8566B	2511AD1467	6 mo.	Dec-98

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NAME OF TEST: Field Strength of Spurious Radiation

ALL OTHER EMISSIONS = ≥ 20 dB BELOW LIMIT

EMISSION, MHz/HARMONIC	SPURIOUS LEVEL, dBc	
	Low	High
2nd to 10th	<-70	<-70

SUPERVISED BY: Morton Flom, P. Eng.

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NAME OF TEST: Frequency Stability (Temperature Variation)

SPECIFICATION: 47 CFR 2.1055(a)(1)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

TEST CONDITIONS: As Indicated

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The EUT and test equipment were set up as shown on the following page.

2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.

3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.

4. The temperature tests were performed for the worst case.

5. MEASUREMENT RESULTS: ATTACHED

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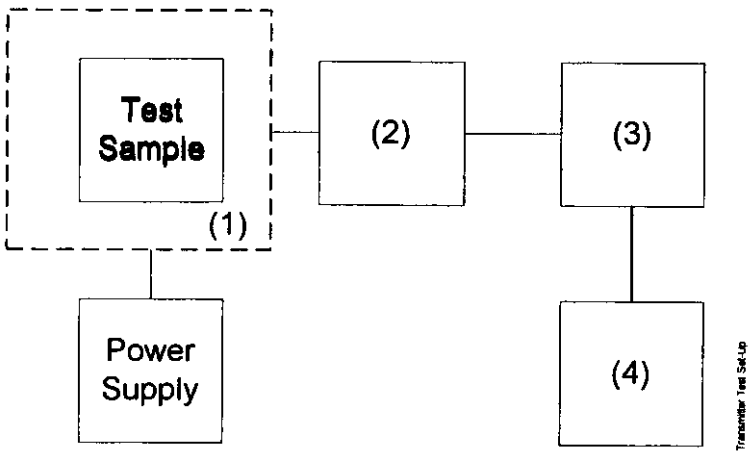
TRANSMITTER TEST SET-UP

TEST A. OPERATIONAL STABILITY
TEST B. CARRIER FREQUENCY STABILITY
TEST C. OPERATIONAL PERFORMANCE STABILITY
TEST D. HUMIDITY
TEST E. VIBRATION
TEST F. ENVIRONMENTAL TEMPERATURE
TEST G. FREQUENCY STABILITY: TEMPERATURE VARIATION
TEST H. FREQUENCY STABILITY: VOLTAGE VARIATION



Transmitter Test Set-Up

	Asset	Description	s/n
(1)		TEMPERATURE, HUMIDITY, VIBRATION	
x	i00027	Tenny Temp. Chamber	9083-765-234
___	i00	Weber Humidity Chamber	
___	i00	L.A.B. RVH 18-100	
(2)		COAXIAL ATTENUATOR	
___	i00122	NARDA 766-10	7802
___	i00123	NARDA 766-10	7802A
x	i00113	SIERRA 661A-3D	1059
___	i00069	BIRD 8329 (30 dB)	10066
(3)		R.F. POWER	
___	i00014	HP 435A POWER METER	1733A05839
x	i00039	HP 436A POWER METER	2709A26776
x	i00020	HP 8901A POWER MODE	2105A01087
(4)		FREQUENCY COUNTER	
___	i00042	HP 5383A	1628A00959
x	i00019	HP 5334B	2704A00347
x	i00020	HP 8901A	2105A01087

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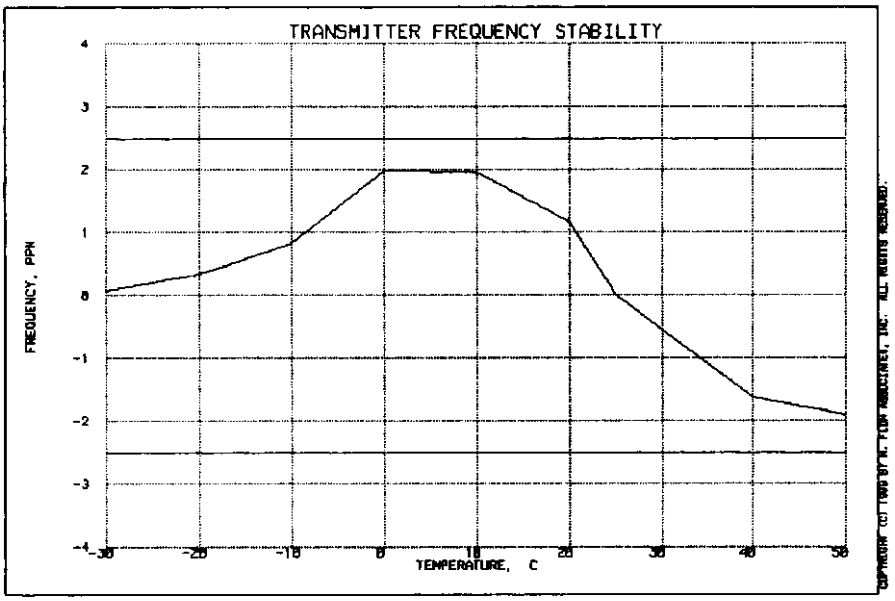
NAME OF TEST: Frequency Stability (Temperature Variation)
g9970061: 1999-Jul-12 Mon 09:49:00
STATE: 0:General



SUPERVISED BY: Morton Flom, P. Eng.

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NAME OF TEST: Frequency Stability (Voltage Variation)

SPECIFICATION: 47 CFR 2.1055(b)(1)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The EUT was placed in a temperature chamber at 25±5°C and connected as for "Frequency Stability - Temperature Variation" test.

2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.

3. The variation in frequency was measured for the worst case.

RESULTS: Frequency Stability (Voltage Variation)
g9970083: 1999-Jul-10 Sat 14:45:41
STATE: 0:General

LIMIT, ppm = 2.5
LIMIT, Hz = 1144
BATTERY END POINT (Voltage) = 6

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
85	6.12	457.525020	20	0.04
100	7.2	457.525000	0	0.00
115	8.28	457.524960	-40	-0.09
83	6	457.524960	-40	-0.09

SUPERVISED BY: Morton Flom, P. Eng.

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NAME OF TEST: Necessary Bandwidth and Emission Bandwidth

SPECIFICATION: 47 CFR 2.202(g)

MODULATION = 16K0F3E

NECESSARY BANDWIDTH CALCULATION:

MAXIMUM MODULATION (M), kHz	= 3
MAXIMUM DEVIATION (D), kHz	= 5
CONSTANT FACTOR (K)	= 1
NECESSARY BANDWIDTH (B_N), kHz	= (2 x M) + (2 x D x K)
	= 16.0

MODULATION = 11K0F3E

NECESSARY BANDWIDTH CALCULATION:

MAXIMUM MODULATION (M), kHz	= 3
MAXIMUM DEVIATION (D), kHz	= 2.5
CONSTANT FACTOR (K)	= 1
NECESSARY BANDWIDTH (B_N), kHz	= (2 x M) + (2 x D x K)
	= 11.0

SUPERVISED BY: Morton Flom, P. Eng.

TESTIMONIAL AND STATEMENT OF CERTIFICATION

THIS IS TO CERTIFY THAT:

1. THAT the application was prepared either by, or under the direct supervision of, the undersigned.

2. THAT the technical data supplied with the application was taken under my direction and supervision.

3. THAT the data was obtained on representative units, randomly selected.

4. THAT, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

CERTIFYING ENGINEER: Morton Flom, P. Eng.

STATEMENT OF QUALIFICATIONS

EDUCATION:

1. B. ENG. in ENGINEERING PHYSICS, 1949, McGill University, Montreal, Canada.

2. Post Graduate Studies, McGill University & Sir George Williams University, Montreal.

PROFESSIONAL AFFILIATIONS:

1. ARIZONA SOCIETY OF PROFESSIONAL ENGINEERS (NSPE), #026 031 821.

2. ORDER OF ENGINEERS (QUEBEC) 1949. #45 34.

3. ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOPHYSICISTS & GEOLOGISTS OF ALBERIA #5916.

4. REGISTERED ENGINEERING CONSULTANT - INDUSTRY CANADA, Certification & Engineering Bureau.

5. IEEE, Lifetime member no. 041/204 (Member since 1947).

EXPERIENCE:

1. Research/Development/Senior Project Engineer. R.C.A. LIMITED (4 years).

2. Owner/Chief Engineer of Electronics. Design/Manufacturing & Cable TV Companies (10 years)

3. CONSULTING ENGINEER (over 25 years).

M. Flom P. Eng

MORTON FLOM, P. Eng.