

**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

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Date: January 4, 2000

Federal Communications Commission  
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Kenwood Communications Corporation  
Equipment: TKR-830  
FCC ID: ALH24673110  
FCC Rules: 22, 74, 90, 95  
CLASS II PERMISSIVE CHANGE

Gentlemen:

In support of a CLASS II PERMISSIVE CHANGE, attached please find the following in support of this application for the addition of Low Power setting (1 Watt) at the request of the client:

1. Application Form 731
2. Filing Fee Form 159
3. Copy of original Grant
4. Engineering Test Data Report

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours,



Morton Flom, P. Eng.

enclosure(s)  
cc: Applicant  
MF/cvr

LIST OF EXHIBITS  
(FCC **CERTIFICATION** (TRANSMITTERS) - REVISED 9/28/98)

APPLICANT: Kenwood Communications Corporation

FCC ID: ALH24673110

BY APPLICANT:

1. LETTER OF AUTHORIZATION
2. IDENTIFICATION DRAWINGS, 2.1033(c)(11)
  - LABEL
  - LOCATION OF LABEL
  - COMPLIANCE STATEMENT
  - LOCATION OF COMPLIANCE STATEMENT
3. PHOTOGRAPHS, 2.1033(c)(12)
4. DOCUMENTATION: 2.1033(c)
  - (3) USER MANUAL
  - (9) TUNE UP INFO
  - (10) SCHEMATIC DIAGRAM
  - (10) CIRCUIT DESCRIPTION
5. PART 90.203(e) & (g) ATTESTATION

BY M.F.A. INC.

- A. TESTIMONIAL & STATEMENT OF CERTIFICATION
- B. STATEMENT OF QUALIFICATIONS

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Sub-part  
2.1033(c):

EQUIPMENT IDENTIFICATION

FCC ID: ALH24673110

NAMEPLATE DRAWING

ATTACHED, EXHIBIT 1.

LOCATION

AS PER LABEL DRAWING(S)

DATE OF REPORT

January 4, 2000

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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PAGE NO. 1 of 17.

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

- a) TEST REPORT
- b) Laboratory: M. Flom Associates, Inc.  
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107  
(Canada: IC 2044) Chandler, AZ 85224
- c) Report Number: d0010009
- d) Client: Kenwood Communications Corporation  
P.O. Box 22745  
Long Beach, CA 90801-5745
- e) Identification: TKR-830  
FCC ID: ALH24673110  
Description: UHF REPEATER
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: January 4, 2000  
EUT Received:
- 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.

PAGE NO. 2 of 17.

EXPOSITORY STATEMENT  
PERMISSIVE CHANGE

APPLICANT: Kenwood Communications Corporation

FCC ID: ALH24673110

The applicant has made design changes/improvements to the originally FCC approved equipment.

Data contained herein confirms that a Permissive Change to the unit has been effected and that the performance of the unit is at or better than the levels originally reported to the commission.

A copy of the original grant of equipment approval is included for convenience.

The following changes/improvements have been made:

Addition of Low Power to existing equipment for which a Grant has already been obtained.

PAGE NO. 3 of 17.

LIST OF GENERAL INFORMATION REQUIRED FOR CERTIFICATION

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

22, 74, 90, 95

Sub-part 2.1033

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

Kenwood Communications Corporation  
2201 E. Dominguez St  
P.O. Box 22745  
Long Beach, CA 90801-5745

MANUFACTURER:

Kenwood Corporation  
14-6, Dogenzaka 1-Chome  
Shibuya-ku, Tokyo 150, Japan

(c)(2): FCC ID: ALH24673110

MODEL NO: TKR-830

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

PLEASE SEE ATTACHED EXHIBITS

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

(c)(5): FREQUENCY RANGE, MHz: 450 to 480

(c)(6): POWER RATING, Watts: 1 to 5  
 \_\_\_ Switchable \_\_\_ x Variable \_\_\_ N/A

(c)(7): MAXIMUM POWER RATING, Watts: 300

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 24<sup>th</sup> day of November, 1998.



*Peter Almy*  
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

*Peter Almy*

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
- 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)
- 97 - Amateur Radio Service
- 101 - Fixed Microwave Services

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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: Unwanted Emissions (Transmitter Conducted)

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 = 465, 450, 480

SPECTRUM SEARCHED, GHz = 0 to 10 x F<sub>c</sub>

ALL OTHER EMISSIONS = = 20 dB BELOW LIMIT

LIMIT(S), dBc

-(50+10xLOG P) = -50 (1 Watt)

-(50+10xLOG P) = -57 (5 Watts)

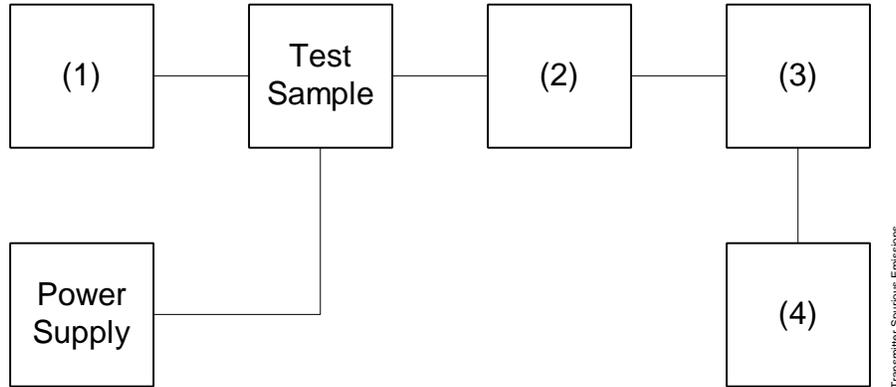
SUPERVISED BY:



Morton Flom, P. Eng.

TRANSMITTER SPURIOUS EMISSION

TEST A. OCCUPIED BANDWIDTH (IN-BAND SPURIOUS)  
 TEST B. OUT-OF-BAND SPURIOUS



Asset Description (as applicable)	s/n
(1) <u>AUDIO OSCILLATOR/GENERATOR</u>	
i00010 HP 204D	1105A04683
i00017 HP 8903A	2216A01753
i00012 HP 3312A	1432A11250
(2) <u>COAXIAL ATTENUATOR</u>	
i00122 Narda 766-10	7802
i00123 Narda 766-10	7802A
i00069 Bird 8329 (30 dB)	1006
i00113 Sierra 661A-3D	1059
(3) <u>FILTERS; NOTCH, HP, LP, BP</u>	
i00126 Eagle TNF-1	100-250
i00125 Eagle TNF-1	50-60
i00124 Eagle TNF-1	250-850
(4) <u>SPECTRUM ANALYZER</u>	
i00048 HP 8566B	2511A01467
i00029 HP 8563E	3213A00104

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
 g0010012: 2000-Jan-03 Mon 11:11:00  
 STATE: 1:Low Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
450.000000	899.995000	-37.5	-67.5	-17.5
465.000000	929.996667	-35.7	-65.7	-15.7
480.000000	959.996667	-33.2	-63.2	-13.2
450.000000	1350.008333	-46.7	-76.7	-26.7
465.000000	1395.456667	-50.5	-80.5	-30.5
480.000000	1439.991667	-47	-77	-27
450.000000	1800.048333	-49.8	-79.8	-29.8
465.000000	1859.685000	-49.2	-79.2	-29.2
480.000000	1920.011667	-49.7	-79.7	-29.7
450.000000	2249.983333	-48.8	-78.8	-28.8
465.000000	2325.280000	-48.7	-78.7	-28.7
480.000000	2399.995000	-49.5	-79.5	-29.5
450.000000	2699.623333	-48.2	-78.2	-28.2
465.000000	2790.071667	-48.8	-78.8	-28.8
480.000000	2879.715000	-48.5	-78.5	-28.5
450.000000	3150.328333	-50.7	-80.7	-30.7
465.000000	3254.818333	-50.8	-80.8	-30.8
480.000000	3360.365000	-50.2	-80.2	-30.2
450.000000	3600.123333	-51	-81	-31
465.000000	3719.955000	-50.3	-80.3	-30.3
480.000000	3839.641667	-51.5	-81.5	-31.5
450.000000	4049.981667	-51.7	-81.7	-31.7
465.000000	4185.048333	-51.2	-81.2	-31.2
480.000000	4319.541667	-50	-80	-30
450.000000	4500.033333	-51.5	-81.5	-31.5
465.000000	4649.906667	-51	-81	-31
480.000000	4799.866667	-50.3	-80.3	-30.3
450.000000	4949.801667	-50.5	-80.5	-30.5
465.000000	5114.606667	-50.8	-80.8	-30.8
480.000000	5280.028333	-51.2	-81.2	-31.2
450.000000	5400.170000	-50.5	-80.5	-30.5
465.000000	5579.911667	-50.7	-80.7	-30.7
480.000000	5759.508333	-51	-81	-31
450.000000	5849.526667	-51	-81	-31
465.000000	6044.961667	-50.5	-80.5	-30.5
480.000000	6240.456667	-51	-81	-31
450.000000	6300.296667	-50.3	-80.3	-30.3
465.000000	6510.120000	-50	-80	-30
480.000000	6719.978333	-48.8	-78.8	-28.8
450.000000	6749.766667	-49.5	-79.5	-29.5
465.000000	6974.561667	-48.5	-78.5	-28.5
480.000000	7199.756667	-49.8	-79.8	-29.8

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
 g0010011: 2000-Jan-03 Mon 10:58:00  
 STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
450.000000	900.003333	-33.6	-70.5	-13.6
465.000000	929.993333	-30.7	-67.6	-10.7
480.000000	960.001667	-27.7	-64.6	-7.7
450.000000	1349.983333	-37.9	-74.8	-17.9
465.000000	1395.395000	-39.1	-76	-19.1
480.000000	1439.601667	-38.6	-75.5	-18.6
450.000000	1800.335000	-38.9	-75.8	-18.9
465.000000	1860.490000	-39.1	-76	-19.1
480.000000	1919.965000	-39.1	-76	-19.1
450.000000	2250.425000	-38.4	-75.3	-18.4
465.000000	2324.973333	-38.2	-75.1	-18.2
480.000000	2399.928333	-38.9	-75.8	-18.9
450.000000	2700.380000	-38.4	-75.3	-18.4
465.000000	2790.140000	-38.6	-75.5	-18.6
480.000000	2879.890000	-37.4	-74.3	-17.4
450.000000	3149.751667	-38.6	-75.5	-18.6
465.000000	3254.738333	-39.2	-76.1	-19.2
480.000000	3360.316667	-39.1	-76	-19.1
450.000000	3600.416667	-39.9	-76.8	-19.9
465.000000	3720.140000	-40.6	-77.5	-20.6
480.000000	3840.330000	-40.2	-77.1	-20.2
450.000000	4049.901667	-40.2	-77.1	-20.2
465.000000	4184.956667	-39.6	-76.5	-19.6
480.000000	4319.630000	-39.2	-76.1	-19.2
450.000000	4500.318333	-39.6	-76.5	-19.6
465.000000	4649.541667	-38.2	-75.1	-18.2
480.000000	4799.650000	-40.4	-77.3	-20.4
450.000000	4949.608333	-40.7	-77.6	-20.7
465.000000	5115.450000	-40.2	-77.1	-20.2
480.000000	5279.893333	-38.7	-75.6	-18.7
450.000000	5399.600000	-39.9	-76.8	-19.9
465.000000	5580.011667	-40.1	-77	-20.1
480.000000	5760.366667	-40.9	-77.8	-20.9
450.000000	5849.716667	-40.6	-77.5	-20.6
465.000000	6045.251667	-40.6	-77.5	-20.6
480.000000	6239.806667	-40.4	-77.3	-20.4
450.000000	6299.620000	-40.1	-77	-20.1
465.000000	6510.178333	-39.6	-76.5	-19.6
480.000000	6719.658333	-38.1	-75	-18.1
450.000000	6749.890000	-39.2	-76.1	-19.2
465.000000	6974.538333	-38.9	-75.8	-18.9
480.000000	7200.118333	-38.9	-75.8	-18.9

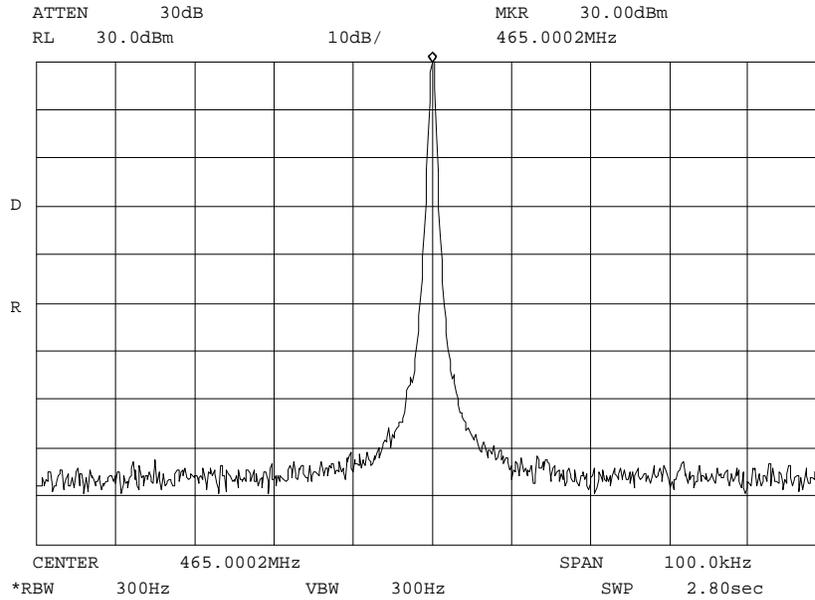
PAGE NO. 11 of 17.  
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
SPECIFICATION: 47 CFR 2.1049(c)(1)  
GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.11  
TEST EQUIPMENT: As per previous page

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  $\pm 2.5$  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

PAGE NO. 12 of 17.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0010003: 2000-Jan-03 Mon 10:32:00  
STATE: 1:Low Power



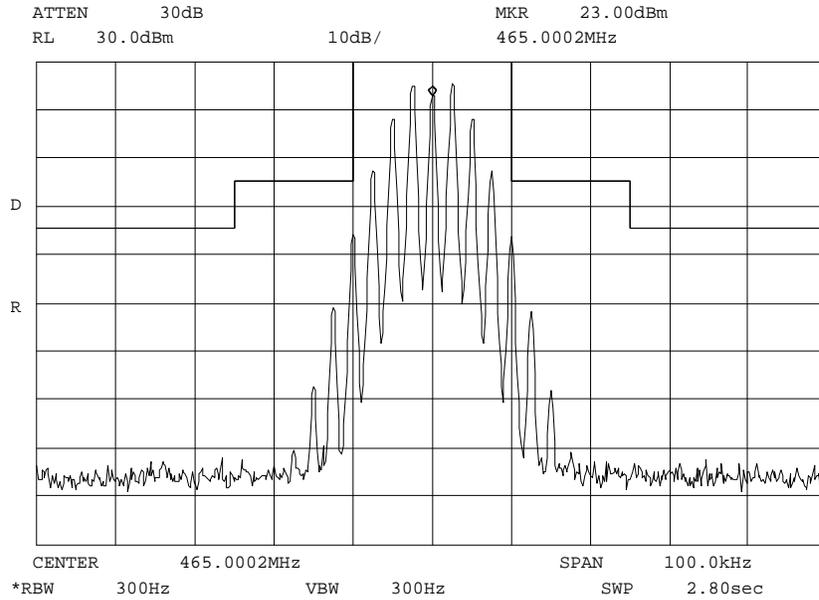
POWER: LOW  
MODULATION: NONE

SUPERVISED BY:

*Morton Flom P. Eng.*  
Morton Flom, P. Eng.

PAGE NO. 13 of 17.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0010005: 2000-Jan-03 Mon 10:34:00  
STATE: 1:Low Power



POWER:  
MODULATION:

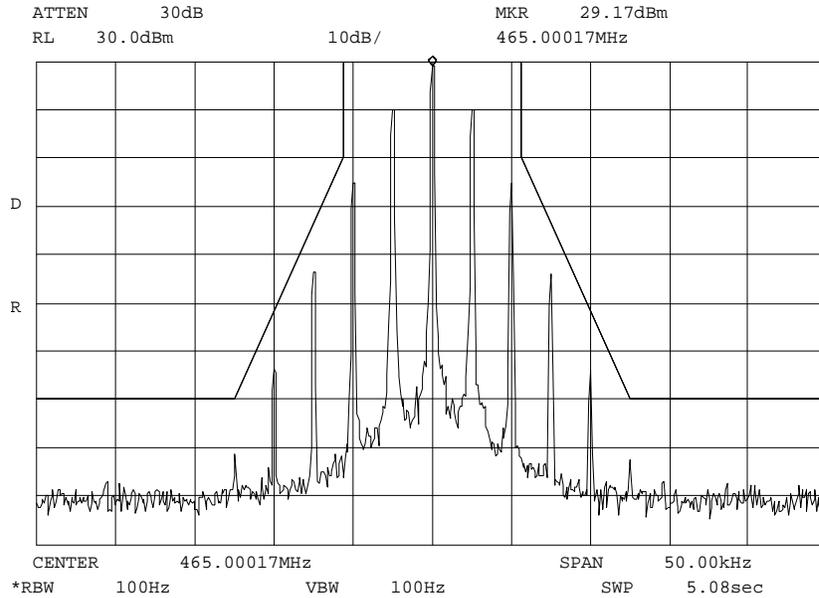
LOW  
VOICE: 2500 Hz SINE WAVE  
MASK: B, VHF/UHF 25kHz,  
w/LPF

SUPERVISED BY:

*Morton P. Eng*  
Morton Flom, P. Eng.

PAGE NO. 14 of 17.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0010006: 2000-Jan-03 Mon 10:37:00  
STATE: 1:Low Power



POWER:  
MODULATION:

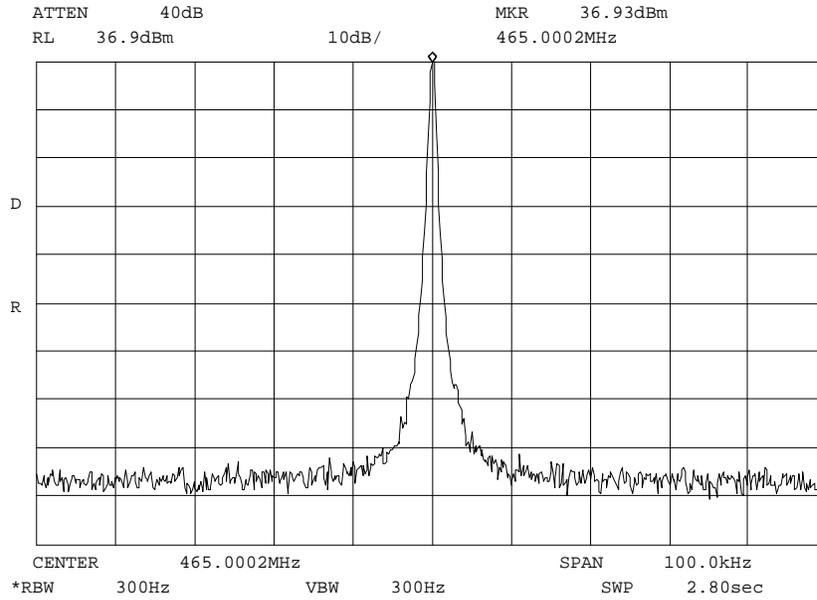
LOW  
VOICE: 2500 Hz SINE WAVE  
MASK: D, VHF/UHF 12.5kHz BW

SUPERVISED BY:

*Morton Flom P. Eng.*  
Morton Flom, P. Eng.

PAGE NO. 15 of 17.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0010007: 2000-Jan-03 Mon 10:43:00  
STATE: 2:High Power



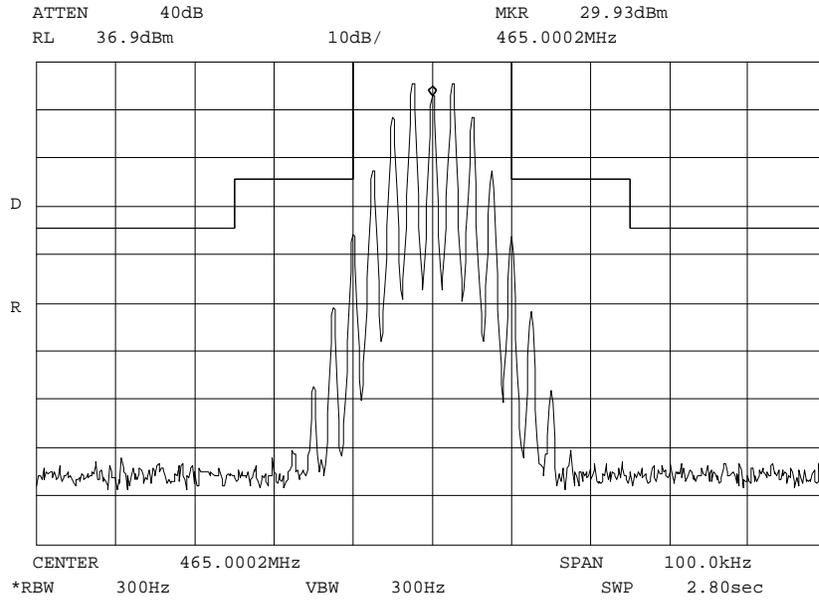
POWER: HIGH  
MODULATION: NONE

SUPERVISED BY:

*Morton Flom P. Eng.*  
Morton Flom, P. Eng.

PAGE NO. 16 of 17.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0010008: 2000-Jan-03 Mon 10:44:00  
STATE: 2:High Power



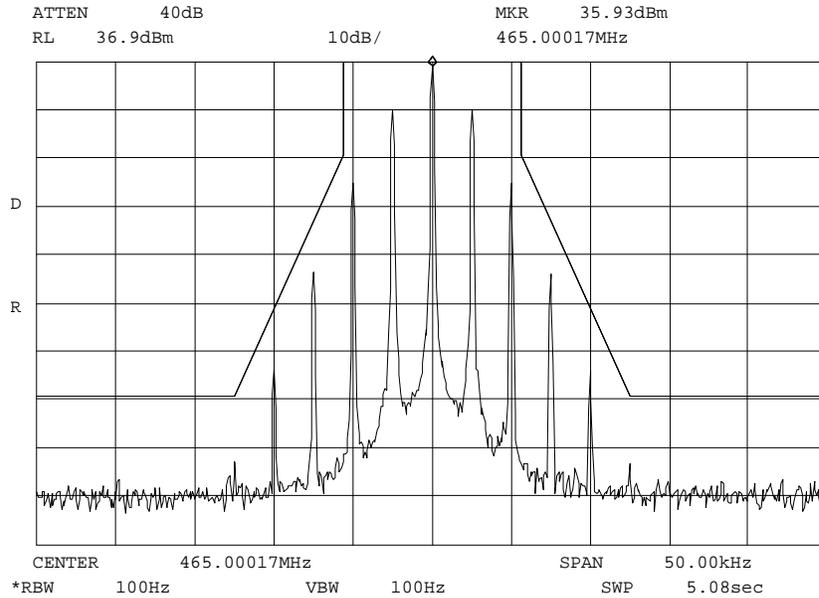
POWER:	HIGH
MODULATION:	VOICE: 2500 Hz SINE WAVE
	MASK: B, VHF/UHF 25kHz,
	w/LPF

SUPERVISED BY:

Morton Flom, P. Eng.

PAGE NO. 17 of 17.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0010009: 2000-Jan-03 Mon 10:48:00  
STATE: 2:High Power



POWER:  
MODULATION:

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

SUPERVISED BY:

*Morton Flom P. Eng.*  
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.