



**M. Flom Associates, Inc. - Global Compliance Center**

3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176

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Date: March 17, 2003

Federal Communications Commission  
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: EG & G Technical Services, Inc.  
Equipment: PICS-1  
FCC ID: QUZ126742  
FCC Rules: 15.249, Confidentiality

Gentlemen:

On behalf of the Applicant, enclosed please find Application Form 731, Engineering Test Report and all pertinent documentation, the whole for approval of the referenced equipment as shown.

Filing fees are attached.

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,

A handwritten signature in black ink, appearing to read 'M. Flom P. Eng.', with a horizontal line drawn underneath the signature.

Morton Flom, P. Eng.

enclosure(s)  
cc: Applicant  
MF/cva

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

APPLICANT: EG & G Technical Services, Inc.

FCC ID: QUZ126742

BY APPLICANT:

- |                                                                      |   |
|----------------------------------------------------------------------|---|
| 1. LETTER OF AUTHORIZATION                                           | x |
| 2. IDENTIFICATION DRAWINGS                                           |   |
| <input checked="" type="checkbox"/> LABEL                            |   |
| <input checked="" type="checkbox"/> LOCATION OF LABEL                |   |
| <input checked="" type="checkbox"/> COMPLIANCE STATEMENT             |   |
| <input checked="" type="checkbox"/> LOCATION OF COMPLIANCE STATEMENT |   |
| 3. DOCUMENTATION: 2.1033(b)                                          |   |
| (3) USER MANUAL                                                      | x |
| (4) OPERATIONAL DESCRIPTION                                          | x |
| (5) BLOCK DIAGRAM                                                    | x |
| (5) SCHEMATIC DIAGRAM                                                | x |
| (7) PHOTOGRAPHS                                                      | x |
| BLOCK DIAGRAM                                                        | x |
| PARTS LIST                                                           | x |
| 4. REQUEST FOR CONFIDENTIALITY                                       | x |

BY M.F.A. INC.

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



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T R A N S M I T T E R      C E R T I F I C A T I O N

of

FCC ID:  QUZ126742  
MODEL: PICS-R-1

to

FEDERAL COMMUNICATIONS COMMISSION

Rule Part(s) 15.249, Confidentiality

DATE OF REPORT: March 17, 2003

ON THE BEHALF OF THE APPLICANT:

EG & G Technical Services, Inc.

AT THE REQUEST OF:

P.O. Part of A322501712

EG & G Technical Services, Inc.  
2420 Comanche Rd., NE., STE D-2  
Albuquerque, NM 87107

Attention of:

Marie Stoffer  
(505) 998-0677 x 211; FAX: -0671  
email: mstoffer@egginc.com

SUPERVISED BY:

A handwritten signature in black ink that reads 'M. Flom P. Eng.' The signature is written in a cursive, flowing style.

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: M. Flom Associates, Inc.  
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107  
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d0330031

d) Client: EG & G Technical Services, Inc.  
2420 Comanche Rd., NE., STE D-2  
Albuquerque, NM 87107

e) Identification: PICS-1  
FCC ID: QUZ126742  
Description: Personal ID Credential System Reader

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: March 17, 2003  
EUT Received: March 7, 2003

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

15.249, Confidentiality

Sub-part 2.1033(c) (1): NAME AND ADDRESS OF APPLICANT:EG & G Technical Services, Inc.  
P.O. Box 9100  
Albuquerque, NM 87119-9100MANUFACTURER:

Applicant

(c) (2): FCC ID: QUZ126742MODEL NO: PICSR-1(c) (3): INSTRUCTION MANUAL(S):

PLEASE SEE ATTACHED EXHIBITS

(c) (4): TYPE OF EMISSION: 182K0F2D(c) (5): FREQUENCY RANGE, MHz: 902 to 928(c) (6): POWER RATING, Watts: 0.0005 to 0.004  
    Switchable       x   Variable      N/A(c) (7): MAXIMUM POWER RATING, Watts: 50 mv/m @ 3m15.203: ANTENNA REQUIREMENT:     The antenna is permanently attached to the EUT  
  x   The antenna uses a unique coupling  
     The EUT must be professionally installed  
     The antenna requirement does not applyPLEASE NOTE: 1) This device contains an R.F. module manufactured  
by Linx Technologies, FCC ID: OJM-TR-916-SC.2) This device operates with an Antenna Gain of  
14.5 dbi.

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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 = 0.8  
COLLECTOR VOLTAGE, Vdc = 5  
SUPPLY VOLTAGE, Vac = 120



(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

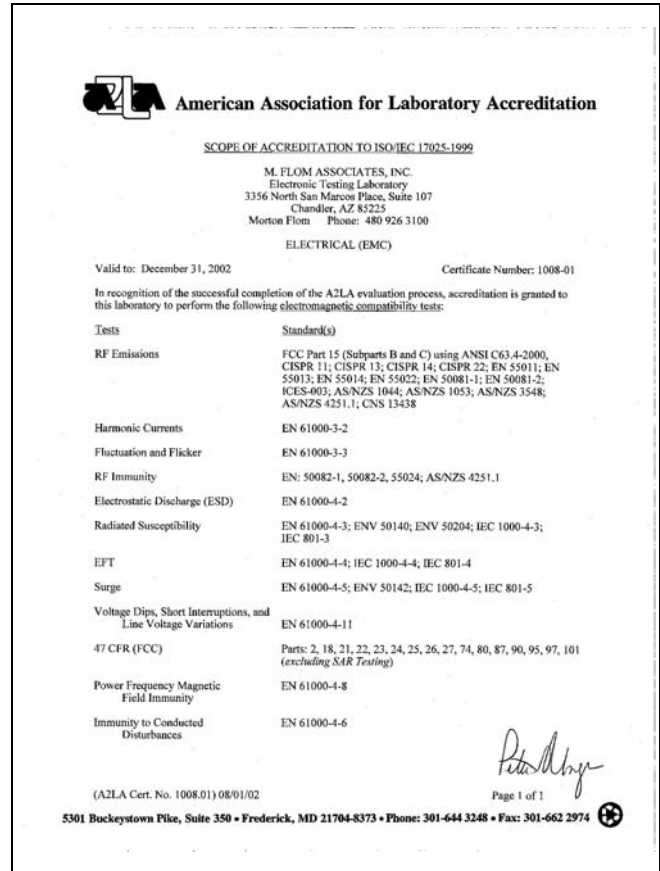
(c) (14): TEST AND MEASUREMENT DATA:

FOLLOWS

PAGE NO.

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



"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(b):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 2.1031, 2.1033, 2.1035, 2.1041, 2.1043, 2.1045, and the following individual Parts:

- \_\_\_\_\_ 15.209 Radiated emission limits; general requirements
- \_\_\_\_\_ 15.211 Tunnel radio systems
- \_\_\_\_\_ 15.213 Cable locating equipment
- \_\_\_\_\_ 15.214 Cordless telephones
- \_\_\_\_\_ 15.217 Operation in the band 160-190 kHz
- \_\_\_\_\_ 15.219 Operation in the band 510-1705 kHz
- \_\_\_\_\_ 15.221 Operation in the band 525-1705 kHz (leaky coax)
- \_\_\_\_\_ 15.223 Operation in the band 1.705-10 MHz
- \_\_\_\_\_ 15.225 Operation in the band 13.553-13.567 MHz
- \_\_\_\_\_ 15.227 Operation in the band 26-27.28 MHz (remote control)
- \_\_\_\_\_ 15.229 Operation in the band 40.66-40.70 MHz
- \_\_\_\_\_ 15.231 Periodic operation in the band 40.66-40.70 MHz and above 70 MHz
- \_\_\_\_\_ 15.233 Operation within the bands 43.71-44.49, 46.60-46.98 MHz 48.75-49.51 MHz and 49.66-50.0 MHz
- \_\_\_\_\_ 15.235 Operation within the band 49.82-49.90 MHz
- \_\_\_\_\_ 15.237 Operation within the bands 72.0-73.0 MHz, 74.6-74.8 MHz and 75.2-76.0 MHz (auditory assistance)
- \_\_\_\_\_ 15.239 Operation in band 88-108 MHz
- \_\_\_\_\_ 15.241 Operation in the band 174-216 MHz (biomedical)
- \_\_\_\_\_ 15.243 Operation in the band 890-940 MHz (materials)
- \_\_\_\_\_ 15.245 Operation within the bands 902-928 MHz, 2435-2465 MHz, 5785-5815 MHz, 10500-10550 MHz, and 24075-24175 MHz (filed disturbance sensors)
- \_\_\_\_\_ 15.247 Operation within bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz (spread spectrum)
- x \_\_\_\_\_ 15.249 Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz, and 24.0-24.25 GHz
- \_\_\_\_\_ 15.251 Operation within the bands 2.9-3.26 GHz, 3.267-3.332 GHz, 3.339-3.3458 GHz, and 3.358-3.6 GHz (vehicle identification systems)
- \_\_\_\_\_ 15.321 Specific requirements for asynchronous devices operating in the 1910-1920 MHz and 2390-2400 MHz bands (Unlicensed PCS)
- \_\_\_\_\_ 15.323 Specific requirements for isochronous devices operating in the 1920-1930 MHz sub-band (Unlicensed PCS)

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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 ANSIC63.4-1992/2000 Draft, 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 | = | 916.48                   |
| SPECTRUM SEARCHED, GHz    | = | 0 to $10 \times F_c$     |
| MAXIMUM RESPONSE, Hz      | = | N/A - Data Modulation    |
| ALL OTHER EMISSIONS       | = | $\geq 20$ dB BELOW LIMIT |

PERFORMED BY:



Morton Flom, P. Eng.

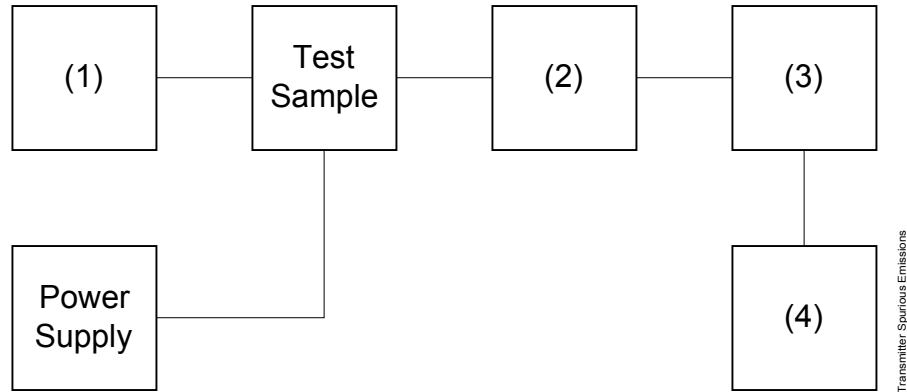
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TRANSMITTER SPURIOUS EMISSION

TEST A. OCCUPIED BANDWIDTH (IN-BAND SPURIOUS)

TEST B. OUT-OF-BAND SPURIOUS



| Asset Description<br>(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)

LIMIT, dBc

$$-(50+10 \times \text{LOG } P) = -26 \text{ (4mWatts)}$$

g0330056: 2003-Mar-10 Mon 10:30:00

STATE: 2:High Power

| FREQUENCY TUNED,<br>MHz | FREQUENCY<br>EMISSION, MHz | LEVEL,<br>dBm | LEVEL,<br>dBc | MARGIN,<br>dB |
|-------------------------|----------------------------|---------------|---------------|---------------|
| 916.480000              | 1832.882700                | -80.5         | -65.7         | -60.5         |
| 916.480000              | 2749.620100                | -86.2         | -71.4         | -66.2         |
| 916.480000              | 3665.743400                | -87.4         | -72.6         | -67.4         |
| 916.480000              | 4582.309700                | -86.7         | -71.9         | -66.7         |
| 916.480000              | 5498.861500                | -86.1         | -71.3         | -66.1         |
| 916.480000              | 6415.144400                | -80.5         | -65.7         | -60.5         |
| 916.480000              | 7331.678300                | -80.6         | -65.8         | -60.6         |
| 916.480000              | 8248.209200                | -81.2         | -66.4         | -61.2         |
| 916.480000              | 9164.695700                | -79.5         | -64.7         | -59.5         |
| 916.480000              | 10081.403300               | -80.1         | -65.3         | -60.1         |
| 916.480000              | 10998.009500               | -79.5         | -64.7         | -59.5         |
| 916.480000              | 11914.466000               | -79.6         | -64.8         | -59.6         |
| 916.480000              | 12830.692100               | -74.9         | -60.1         | -54.9         |
| 916.480000              | 13747.443500               | -74.8         | -60           | -54.8         |

PERFORMED BY:



Morton Flom, P. Eng.

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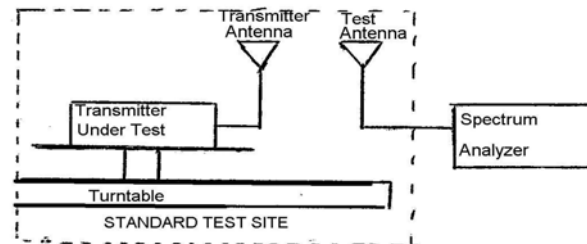
NAME OF TEST: ERP Carrier Power (Radiated)

SPECIFICATION: TIA/EIA 603A (Substitution Method)

2.2.17.1 Definition: The average radiated power of a licensed device is the equivalent power required, when delivered to a half-wave dipole or horn antenna, to produce at a distant point the same average received power as produced by the licensed device.

2.2.17.2 Method of Measurement:

a) Connect the equipment as illustrated. Place the transmitter to be tested on the turntable in the standard test site.



b) Raise and lower the test antenna from 1m to 6 m with the transmitter facing the antenna and record the highest received signal in dB as LVL.

c) Repeat step b) for seven additional readings at 45° interval positions of the turntable.

d) Replace the transmitter under test with a half-wave or horn vertically polarized antenna. The center of the antenna should be at the same location as the transmitter under test. Connect the antenna to a signal generator with a known output power and record the path loss in dB or LOSS.

e) Calculate the average radiated output power from the readings in step c) and d) by the following:

$$\text{average radiated power} = 10 \log_{10} \Sigma 10(LVL - LOSS)/10 \text{ (dBm)}$$

|                     | RESULTS                |                          |
|---------------------|------------------------|--------------------------|
|                     | 916.48 MHZ<br>LVL, dbm | Path Loss,<br>db         |
| 0°                  | -26.8                  | 1.8                      |
| 45°                 | -37.9                  | 1.8                      |
| 90°                 | -4.2                   | 1.8                      |
| 135°                | -25.0                  | 1.8                      |
| 180°                | -29.0                  | 1.8                      |
| 225°                | -23.6                  | 1.8                      |
| 270°                | -30.2                  | 1.8                      |
| 315°                | -23.5                  | 1.8                      |
| Av. Radiated Power: |                        | 916.48 MHZ<br>-26.83 dbm |

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NAME OF TEST: Field Strength of Spurious Radiation

SPECIFICATION: 47 CFR 2.1053(a)

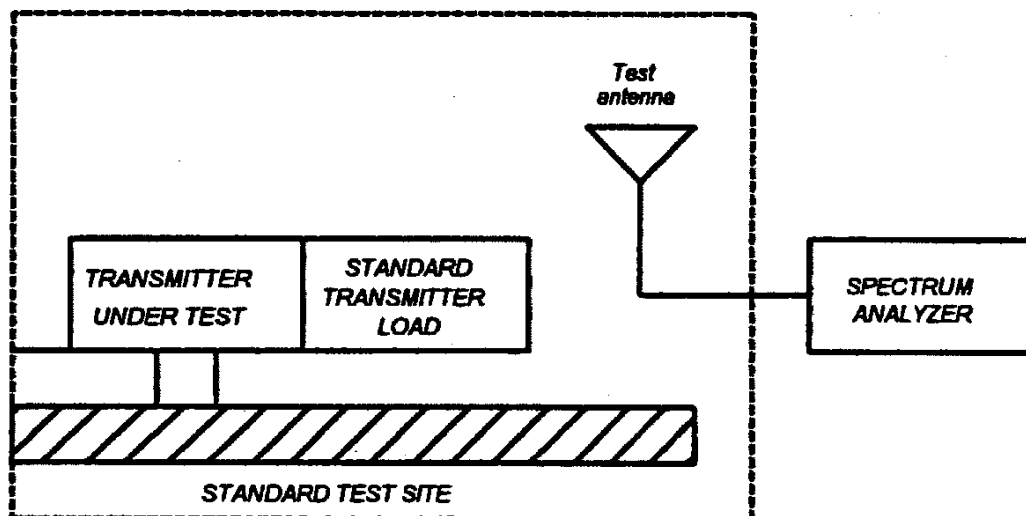
GUIDE: ANSI/TIA/EIA-603-1992/2001, Paragraph 1.2.12 and Table 16, 47 CFR 22.917

MEASUREMENT PROCEDURE

1.2.12.1 Definition: Radiated spurious emissions are emissions from the equipment when transmitting into a non-radiating load on a frequency or frequencies which are outside an occupied band sufficient to ensure transmission of information of required quality for the class of communications desired.

1.2.12.2 Method of Measurement

- A) Connect the equipment as illustrated
- B) Adjust the spectrum analyzer for the following settings:
  - 1) Resolution Bandwidth 100 kHz (<1 GHz), 1 MHz (> 1GHz).
  - 2) Video Bandwidth  $\geq 3$  times Resolution Bandwidth, or 30 kHz (22.917)
  - 3) Sweep Speed  $\leq 2000$  Hz/second
  - 4) Detector Mode = Mean or Average Power
- C) Place the transmitter to be tested on the turntable in the standard test site. The transmitter is transmitting into a non-radiating load which is placed on the turntable. The RF cable to this load should be of minimum length.





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NAME OF TEST: Field Strength of Spurious Radiation (Cont.)

- J) Feed the substitution antenna at the transmitter end with a signal generator connected to the antenna by means of a non-radiating cable. With the antennas at both ends horizontally polarized and with the signal generator tuned to a particular spurious frequency, raise and lower the test antenna to obtain a maximum reading at the spectrum analyzer. Adjust the level of the signal generator output until the previously recorded maximum reading for this set of conditions is obtained. This should be done carefully repeating the adjustment of the test antenna and generator output.
- K) Repeat step J) with both antennas vertically polarized for each spurious frequency.
- L) Calculate power in dBm into a reference ideal half-wave dipole antenna by reducing the readings obtained in steps J) and K) by the power loss in the cable between the generator and the antenna and further corrected for the gain of the substitution antenna used relative to an ideal half-wave dipole antenna.
- M) The levels recorded in step L) are absolute levels of radiated spurious emissions in dBm. The radiated spurious emissions in dB can be calculated by the following:

Radiated spurious emissions dB =  
 $10\log_{10}(\text{TX power in watts}/0.001) - \text{the levels in step l})$

NOTE: It is permissible that other antennas provided can be referenced to a dipole.

## Test Equipment:

| Asset Description<br>(as applicable)                  | s/n        | Cycle  | Last Cal |
|-------------------------------------------------------|------------|--------|----------|
| <small>Per ANSI C63.4-1992/2000 Draft, 10.1.4</small> |            |        |          |
| <u>TRANSDUCER</u>                                     |            |        |          |
| i00088 EMCO 3109-B 25MHz-300MHz                       | 2336       | 12 mo. | Sep-02   |
| i00065 EMCO 3301-B Active Monopole                    | 2635       | 12 mo. | Sep-02   |
| i00089 Aprel 2001 200MHz-1GHz                         | 001500     | 12 mo. | Sep-02   |
| i00103 EMCO 3115 1GHz-18GHz                           | 9208-3925  | 12 mo. | Sep-02   |
| <u>AMPLIFIER</u>                                      |            |        |          |
| i00028 HP 8449A                                       | 2749A00121 | 12 mo. | Mar-03   |
| <u>SPECTRUM ANALYZER</u>                              |            |        |          |
| i00029 HP 8563E                                       | 3213A00104 | 12 mo. | Jan-03   |
| i00033 HP 85462A                                      | 3625A00357 | 12 mo. | Jan-03   |
| i00048 HP 8566B                                       | 2511AD1467 | 6 mo.  | Jan-03   |

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TEST SETUP:

Radiated Emissions



PAGE NO. 15 of 27.

NAME OF TEST: Field Strength of Spurious Radiation  
 g0330059: 2003-Mar-10 Mon 11:19:00  
 STATE: 2:High Power

| FREQUENCY TUNED,<br>MHz | FREQUENCY<br>EMISSION, MHz | ERP, dBm | ERP, dbc |
|-------------------------|----------------------------|----------|----------|
| 916.480000              | 1832.927333                | -36.8    | ≤ -21.6  |
| 916.480000              | 2749.302333                | -26.4    | ≤ -21.6  |
| 916.480000              | 3666.004000                | -24.8    | ≤ -21.6  |
| 916.480000              | 4581.937333                | -24.1    | ≤ -21.6  |
| 916.480000              | 5499.112333                | -21.8    | ≤ -21.6  |
| 916.480000              | 6415.535666                | -23.4    | ≤ -21.6  |
| 916.480000              | 7332.195666                | -20.5    | ≤ -21.6  |
| 916.480000              | 8248.292333                | -19.4    | ≤ -21.6  |
| 916.480000              | 9164.917333                | -17.6    | ≤ -21.6  |

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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

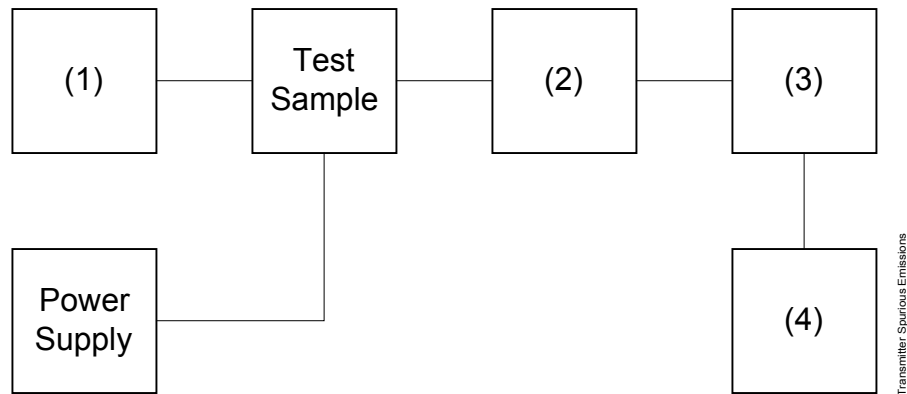
1. The EUT and test equipment were set up as shown on the following page, with the Spectrum Analyzer connected.
2. For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for  $\pm 2.5$  kHz deviation (or 50% modulation). 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.

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TRANSMITTER SPURIOUS EMISSION

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

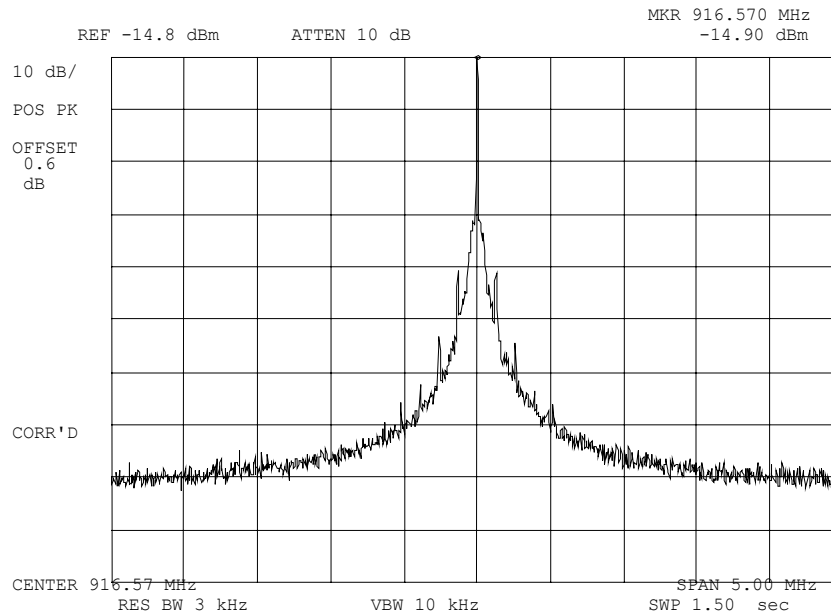


| Asset  | Description<br>(as applicable)    | s/n        |
|--------|-----------------------------------|------------|
| (1)    | <u>AUDIO OSCILLATOR/GENERATOR</u> |            |
| i00010 | HP 204D                           | 1105A04683 |
| i00017 | HP 8903A                          | 2216A01753 |
| 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: Emission Masks (Occupied Bandwidth)  
g0330052: 2003-Mar-10 Mon 10:18:00  
STATE: 2:High Power



POWER: HIGH  
MODULATION: NONE  
REFERENCE LEVEL

Am. Inst. P. Eng.

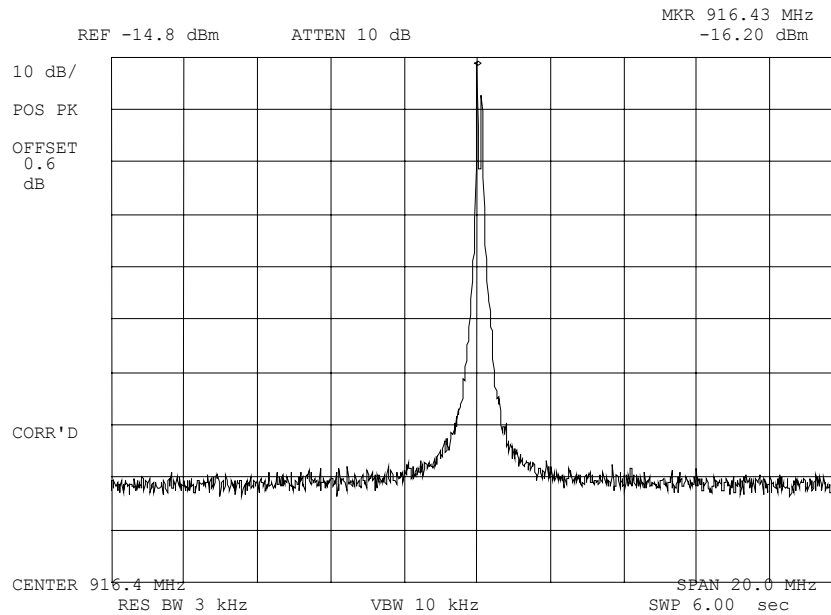
Morton Flom, P. Eng.

SUPERVISED BY:

PAGE NO.

19 of 27.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0330054: 2003-Mar-10 Mon 10:28:00  
STATE: 2:High Power



```
POWER:                HIGH
MODULATION:           FSK @ 19.2 K/BITS PER
                      SECOND
```

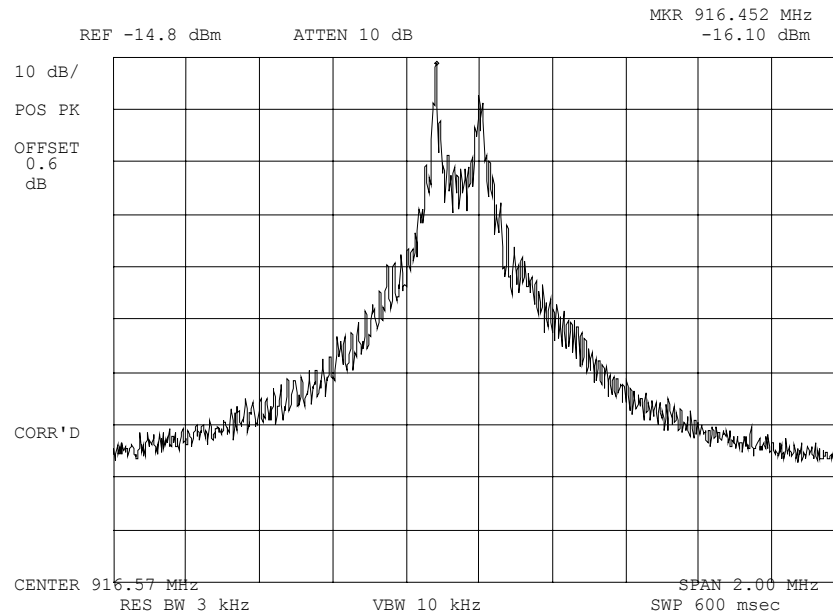
SUPERVISED BY:

M. Flom P. Eng.  
Morton Flom, P. Eng.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0330053: 2003-Mar-10 Mon 10:23:00  
STATE: 2:High Power



```
POWER:                HIGH
MODULATION:            FSK @ 19.2 K/BITS PER
                      SECOND
```

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Am. Inst. P. Eng.

Morton Flom, P. Eng.



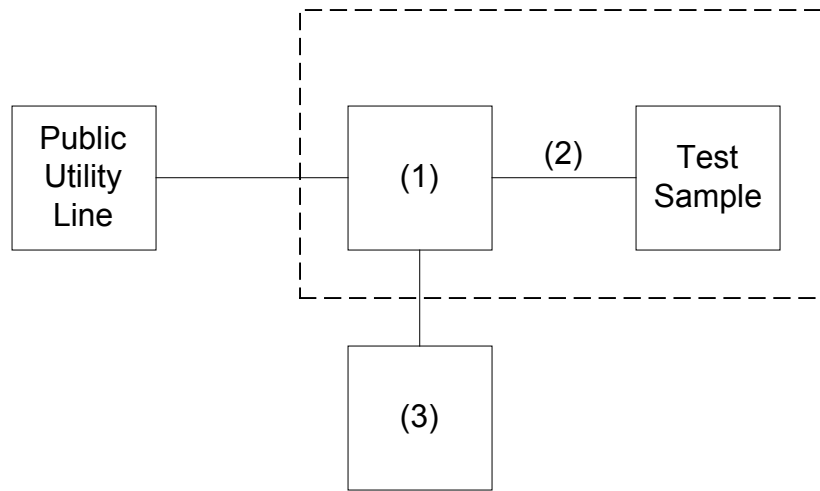
PAGE NO. 22 of 27.  
NAME OF TEST: A/C Powerline Conducted Emissions  
SPECIFICATION: FCC: 47 CFR 15.27  
GUIDE: IEEE Standard 213  
TEST CONDITIONS: S. T. & H.  
TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. A test sample was connected to the Public Utility lines through a LISN Ailtech Model 94641-1 (50  $\mu$ H).
2. A reference level of 250  $\mu$ V was set on the Spectrum Analyzer. The spectrum was searched over the range of 450 kHz to 30 MHz.
3. All other emissions were 20 dB or more below limit.
4.      The test sample used a charger.  
  x   The test sample does not use a charger.
5. Measurement Results: Attached.

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AC POWERLINE CONDUCTED MEASUREMENTS

| Asset                                                | Description                                 | s/n        | Cycle  | Last Cal |
|------------------------------------------------------|---------------------------------------------|------------|--------|----------|
| (as applicable)                                      |                                             |            |        |          |
| <small>Per ANSIC63.4-1992/2000 Draft, 10.1.4</small> |                                             |            |        |          |
| (1)                                                  | <u>LINE IMPEDANCE STABILIZATION NETWORK</u> |            |        |          |
| i00077                                               | Singer 91221-1 (5 $\mu$ H)                  | 0396       | 12 mo. |          |
| i00155                                               | Eaton 94641-1 (50 $\mu$ H)                  | 178        | 12 mo. | Sep-02   |
| i00167                                               | Ailtech 94641-1 (50 $\mu$ H)                | 0103       | 12 mo. |          |
| (2)                                                  | <u>SCREEN ROOM</u>                          |            |        |          |
| i00169                                               | Lindgren 22-2/2-0                           | 3861       | N/A    | none     |
| i00170                                               | Lindgren LG170                              | 4999       |        |          |
| (3)                                                  | <u>SPECTRUM ANALYZER</u>                    |            |        |          |
| i00029                                               | HP 8563E                                    | 3213A00104 | 12 mo. | Jan-03   |
| i00033                                               | HP 85462A                                   | 3625A00357 | 12 mo. | Jan-03   |
| i00048                                               | HP 8566B                                    | 2511AD1467 | 6 mo.  | Jan-03   |

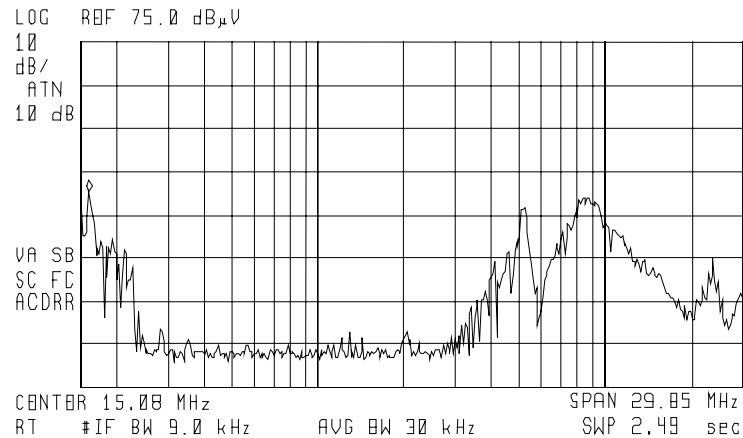
PAGE NO.

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NAME OF TEST: A/C Powerline Conducted Emissions  
g0330071: 2003-Mar-11 Tue 11:53:00  
STATE: 0:General



ACTV DET: PBAK  
MEAS DET: PBAK QP AVG  
MKR 160 kHz  
39.96 dBμV



L1 Grounded

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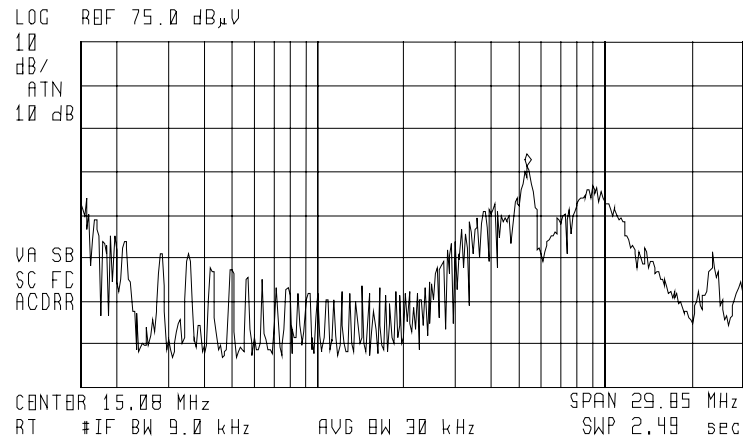
PAGE NO.

25 of 27.

NAME OF TEST: A/C Powerline Conducted Emissions  
g0330070: 2003-Mar-11 Tue 11:50:00  
STATE: 0:General



ACTV DET: PBAK  
MEAS DET: PBAK QP AVG  
MKR 5.36 MHz  
46.25 dBμV



L1 Ungrounded

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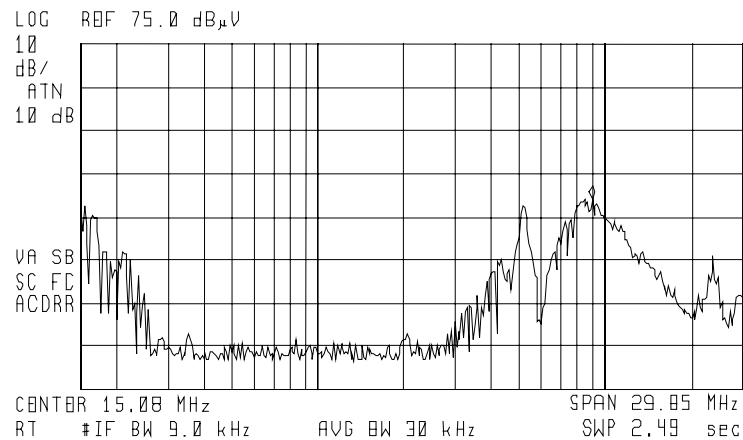
PAGE NO.

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NAME OF TEST: A/C Powerline Conducted Emissions  
g0330068: 2003-Mar-11 Tue 11:44:00  
STATE: 0:General



ACTV DET: PBAK  
MEAS DET: PBAK QP AVG  
MKR 8.94 MHz  
38.92 dBμV



L2 Grounded

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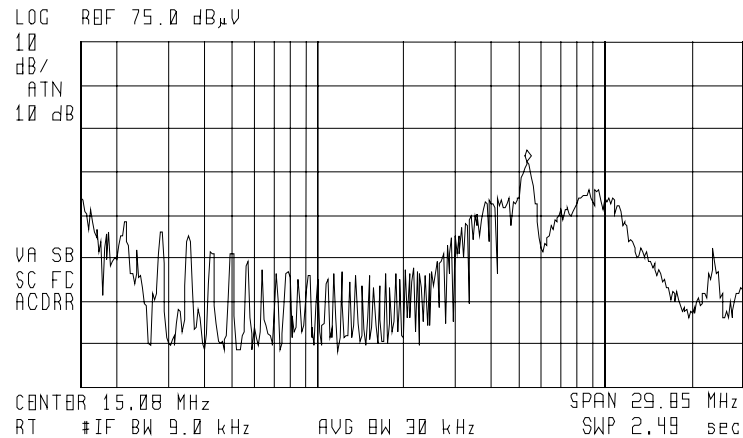
PAGE NO.

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NAME OF TEST: A/C Powerline Conducted Emissions  
 g0330069: 2003-Mar-11 Tue 11:46:00  
 STATE: 0:General



ACTV DET: PBAK  
 MEAS DET: PBAK QP AVG  
 MKR 5.36 MHz  
 47.23 dBμV



L2 Ungrounded

SUPERVISED BY:

Morton Flom, P. Eng.

RADIATED MEASUREMENTS  
FOR PART 15 TRANSMITTERS W/ INTEGRAL ANTENNAS

Radiated Measurements

| <u>RANGE OF MEASUREMENT</u> | <u>SPECIFICATION</u> | <u>RESOLUTION B/W</u> | <u>VIDEO B/A</u> |
|-----------------------------|----------------------|-----------------------|------------------|
| 30 to 1000 MHz              | CISPR                | ≥100 kHz              | ≥100 kHz         |
| >1000 MHz                   | FCC, 15.37(b)        | 1 MHz                 | ≥1 MHz           |
| (if averaging)              | FCC, 15.37(b)        | 1 MHz                 | 10 Hz            |

Measuring Equipment

a. ANTENNAS:

|                |                |
|----------------|----------------|
| EMCO 3109      | 20 - 300 MHz   |
| APREL AALP2001 | 200 - 1000 MHz |
| APREL AAB20200 | 20 - 200 MHz   |
| APREL AAH118   | 1 - 18 GHz     |

b. INSTRUMENTS:

|          |                                    |
|----------|------------------------------------|
| HP8566B  | Spectrum Analyzer                  |
| HP85685A | Preselector, w/ preamp below 2 GHz |
| HP85650A | Quasi Peak Adapter                 |
| HP8449   | Preamp, above 2 GHz                |

All test instrumentation is calibrated every January and every July. In addition, all test instrumentation is calibrated daily, or as required by the manufacturer. A Calibration Agreement is maintained with Hewlett Packard.

Occupied Bandwidth

Occupied Bandwidth is measured as a radiated signal without attenuators and/or filter. RBW, VBW and scan settings as shown were set to produce a meaningful result in accordance with ANSI C63.4, Section 13.1.7.

Part 15.21, Information to User

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

## § 15.205 Restricted Bands of Operation

(a) Except as shown in paragraph (b) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

| MHz               | MHz                 | MHz           | GHz         |
|-------------------|---------------------|---------------|-------------|
| 0.090-0.110       | 16.42-16.423        | 399.9-410     | 4.5-5.25    |
| 0.495-0.505       | 16.69475-16.69625   | 608-614       | 5.35-5.46   |
| 2.1735-2.1905     | 16.80425-16.80475   | 960-1240      | 7.25-7.75   |
| 4.125-4.128       | 25.5-25.67          | 1300-1427     | 8.025-8.5   |
| 4.17725-4.17775   | 37.5-38.25          | 1435-1626.5   | 9.0-9.2     |
| 4.20725-4.20775   | 73-74.6             | 1645.5-1646.5 | 9.3-9.5     |
| 6.215-6.218       | 74.8-75.2           | 1660-1710     | 10.6-12.7   |
| 6.26775-6.26825   | 108-121.94          | 1718.8-1722.2 | 13.25-13.4  |
| 6.31175-6.31225   | 123-138             | 2200-2300     | 14.47-14.5  |
| 8.291-8.294       | 149.9-150.05        | 2310-2390     | 15.35-16.2  |
| 8.362-8.366       | 156.52475-156.52525 | 2483.5-2500   | 17.7-21.4   |
| 8.37625-8.38675   | 156.7-156.9         | 2655-2900     | 22.01-23.12 |
| 8.41425-8.41475   | 162.0125-167.17     | 3260-3267     | 23.6-24.0   |
| 12.29-12.293      | 167.72-173.2        | 3332-3339     | 31.2-31.8   |
| 12.51975-12.52025 | 240-285             | 3345.8-3358   | 36.43-36.5  |
| 12.57675-12.57725 | 322-339.4           | 3600-4400     | (2)         |
| 13.36-13.41       |                     |               |             |

Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz. Above 38.6

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:

A handwritten signature in black ink, reading "M. Flom P. Eng.", with a horizontal line drawn underneath the signature.

Morton Flom, P. Eng.