

**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: November 14, 2001

Federal Communications Commission  
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Nokia Inc.  
Equipment: Model 6360, Type NPW-2NX  
FCC ID: GMLNPW-2NX  
FCC Rules: 22H, 24E, 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/cvr

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

APPLICANT:                      Nokia Inc.

FCC ID:                              GMLNPW-2NX

BY APPLICANT:

- |                                                                      |   |
|----------------------------------------------------------------------|---|
| 1. LETTER OF AUTHORIZATION                                           | X |
| 2. IDENTIFICATION DRAWINGS, 2.1033(c)(11)                            |   |
| <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. PHOTOGRAPHS, 2.1033(c)(12)                                        | X |
| 4. CONFIDENTIALITY REQUEST: 0.457 and 0.459                          | X |
| 5. DOCUMENTATION: 2.1033(c)                                          |   |
| (3) USER MANUAL                                                      | X |
| (9) TUNE UP INFO                                                     | X |
| (10) SCHEMATIC DIAGRAM                                               | X |
| (10) CIRCUIT DESCRIPTION                                             | X |
| BLOCK DIAGRAM                                                        | X |
| PARTS LIST                                                           | X |
| ACTIVE DEVICES                                                       | X |
| 6. ATTESTATION: ESN: Section 22.919                                  | X |
| 7. ATTESTATION: OET: Section 22.933                                  | X |
| 8. ATTESTATION: 47 CFR Section 22.921                                | X |
| 9. SAR REPORT By Nokia Finland                                       | 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: GMLNPW-2NX

MODEL: Model 6360, Type NPW-2NX

to

FEDERAL COMMUNICATIONS COMMISSION

Rule Part(s) 22H, 24E, Confidentiality

DATE OF REPORT: November 14, 2001

ON THE BEHALF OF THE APPLICANT:

Nokia Inc.

AT THE REQUEST OF:

P.O. T39-4325531

Nokia Mobile Phones  
6000 Connection Drive  
Irving, TX 75039

Attention of:

(972) 894-5000; Fax: -5698  
Michael J. Mobley, Lead Type Approvals  
(972) 894-4917; FAX: -5698  
Cellphone: (214) 668-9465  
michael.mobley@nokia.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: d01b0028
- d) Client: Nokia Mobile Phones  
6000 Connection Drive  
Irving, TX 75039
- e) Identification: Model 6360, Type NPW-2NX  
FCC ID: GMLNPW-2NX  
Description: Dual Band, Tri Mode Cellular Telephone
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: November 14, 2001  
EUT Received: September 24, 2001
- 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

22H, 24E, Confidentiality

Sub-part 2.1033

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

Nokia Inc.  
6000 Connection Drive  
Irving, TX 75039

MANUFACTURER:

Mexico

(c)(2): FCC ID: GMLNPW-2NX

MODEL NO: Model 6360, Type NPW-2NX

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

PLEASE SEE ATTACHED EXHIBITS

(c)(4): TYPE OF EMISSION: 40K0F1D, 40K0F8W, 30K0DXW

(c)(5): FREQUENCY RANGE, MHz: 824 to 849  
1850 to 1909

(c)(6): POWER RATING, Watts: 0.578 AMPS ERP  
0.561 TDMA800 ERP  
0.687 TDMA1900 EIRP  
     Switchable   x   Variable      N/A

FCC GRANT NOTE:

BC - The output power is continuously variable from the value listed in this entry to 5%-10% of the value listed.

(c)(7): MAXIMUM POWER RATING, Watts: 0.6

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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 = 3.6

(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:

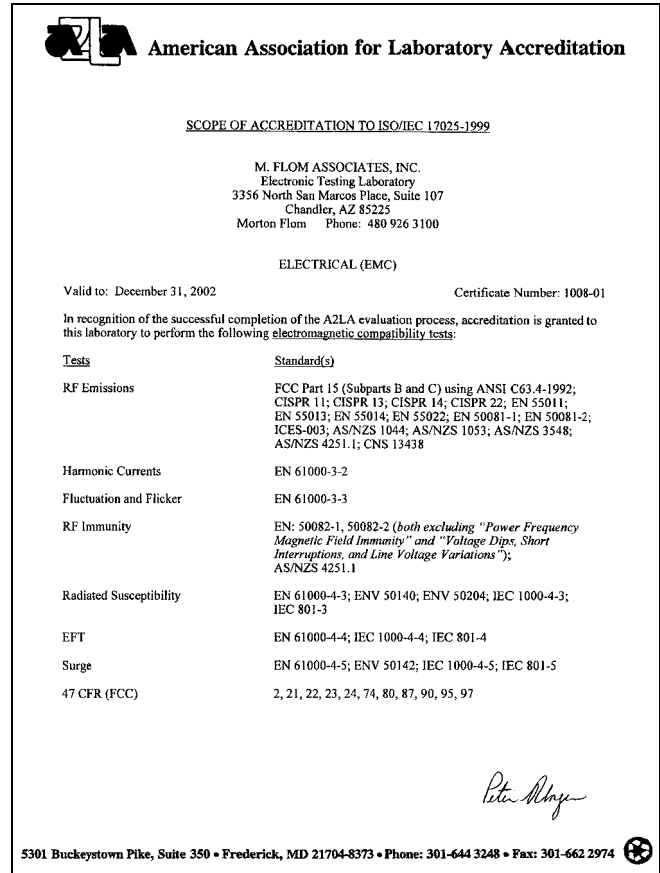
FOLLOWS



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(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
- x   22 Subpart H - Cellular Radiotelephone Service
- \_\_\_\_\_ 22.901(d) - Alternative technologies and auxiliary services
- \_\_\_\_\_ 23 - International Fixed Public Radiocommunication services
- x   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

GENERAL INFORMATION

1. Prior to testing, the deviation for audio modulation and each of the respective SAT + ST tones were set as close as possible to the required limit.
2. Except for audio modulation, which was applied externally, Wideband Data SAT, ST and all other tones and operational modes were provided by a test control unit incorporating appropriate software. Worst case repetition rate for Wideband Data was 10 kb/s.
3. Spurious radiation was measured at three (3) meters.
4. The two cellular frequency bands are available to the user automatically. Please refer to the manual contained in the documentation.
5. The normal modes of modulation are:
  - ☒ (a) VOICE
  - ☒ (b) WIDEBAND DATA
  - ☒ (c) SAT
  - ☒ (d) ST
  - ☒ (e) SAT + VOICE
  - ☒ (f) SAT + DTMF
  - ☐ (g) CDMA
  - ☒ (h) TDMA
  - ☐ (i) NAMPS VOICE
  - ☐ (j) NAMPS DSAT
  - ☐ (k) NAMPS ST
  - ☐ (l) NAMPS VOICE + DSAT

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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 C63.4-1992/2000, 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: Carrier Output Power (Conducted)

SPECIFICATION: 47 CFR 2.1046(a)

TEST EQUIPMENT: As per attached page

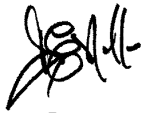
MEASUREMENT PROCEDURE

1. The EUT was connected to a resistive coaxial attenuator of normal load impedance, and the unmodulated output power was measured by means of an R. F. Power Meter.
2. Measurement accuracy is  $\pm 3\%$ .

MEASUREMENT RESULTS

| NOMINAL, MHZ   | CHANNEL | dBm   |
|----------------|---------|-------|
| AMPS MODE:     |         |       |
| 824.040        | 991     | 26.79 |
| 836.400        | 380     | 26.55 |
| 848.970        | 799     | 26.48 |
| TDMA800 MODE:  |         |       |
| 825.290        | 991     | 27.28 |
| 836.400        | 380     | 27.01 |
| 847.720        | 799     | 27.16 |
| TDMA1900 MODE: |         |       |
| 1850.04        | 02      | 27.00 |
| 1879.98        | 1000    | 27.32 |
| 1909.02        | 1998    | 27.16 |

PERFORMED BY:

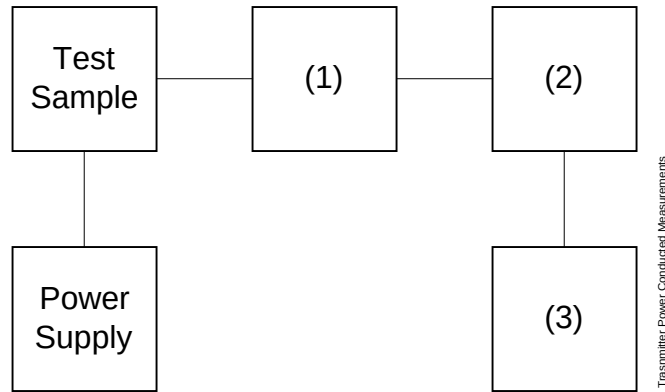
  
 Doug Noble, B.A.S. E.E.T.

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## TRANSMITTER POWER CONDUCTED MEASUREMENTS

TEST 1: R. F. POWER OUTPUT  
 TEST 2: FREQUENCY STABILITY



| Asset  | Description<br>(as applicable) | s/n        |
|--------|--------------------------------|------------|
| (1)    | <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       |
| (2)    | <u>POWER METERS</u>            |            |
| i00014 | HP 435A                        | 1733A05836 |
| i00039 | HP 436A                        | 2709A26776 |
| i00020 | HP 8901A POWER MODE            | 2105A01087 |
| (3)    | <u>FREQUENCY COUNTER</u>       |            |
| i00042 | HP 5383A                       | 1628A00959 |
| i00019 | HP 5334B                       | 2704A00347 |
| i00020 | HP 8901A FREQUENCY MODE        | 2105A01087 |

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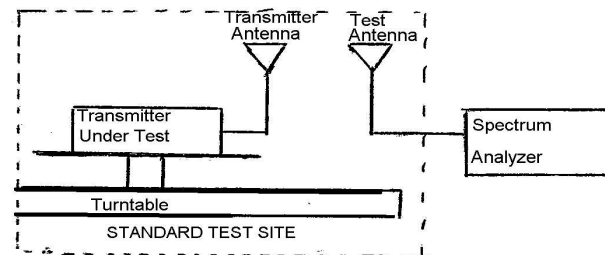
NAME OF TEST: ERP Carrier Power (Radiated)

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:

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

|                     | RESULTS    |            |            |             |            |
|---------------------|------------|------------|------------|-------------|------------|
|                     | 848.97 MHz | 836.40 MHz | Path Loss, | 1879.98 MHz | Path Loss, |
|                     | LVL, dbm   | LVL, dbm   | db         | LVL, dbm    | db         |
| 0°                  | 26.6       | 26.5       | 1.1        | 26.9        | 1.4        |
| 45°                 | 26.5       | 26.4       | 1.1        | 26.8        | 1.4        |
| 90°                 | 26.2       | 26.3       | 1.1        | 26.6        | 1.4        |
| 135°                | 26.0       | 26.1       | 1.1        | 26.2        | 1.4        |
| 180°                | 26.0       | 26.2       | 1.1        | 26.1        | 1.4        |
| 225°                | 26.3       | 26.1       | 1.1        | 26.1        | 1.4        |
| 270°                | 26.1       | 26.2       | 1.1        | 26.4        | 1.4        |
| 315°                | 26.1       | 26.2       | 1.1        | 26.8        | 1.4        |
|                     | 848.97 MHz | 836.40 MHz |            | 1879.98 MHz |            |
| Av. Radiated Power: | 27.3 dbm   | 27.4 dbm   |            | 27.9 dbm    |            |

PAGE NO. 11 of 72.  
NAME OF TEST: Audio Frequency Response  
SPECIFICATION: 47 CFR 2.1047(a)  
TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

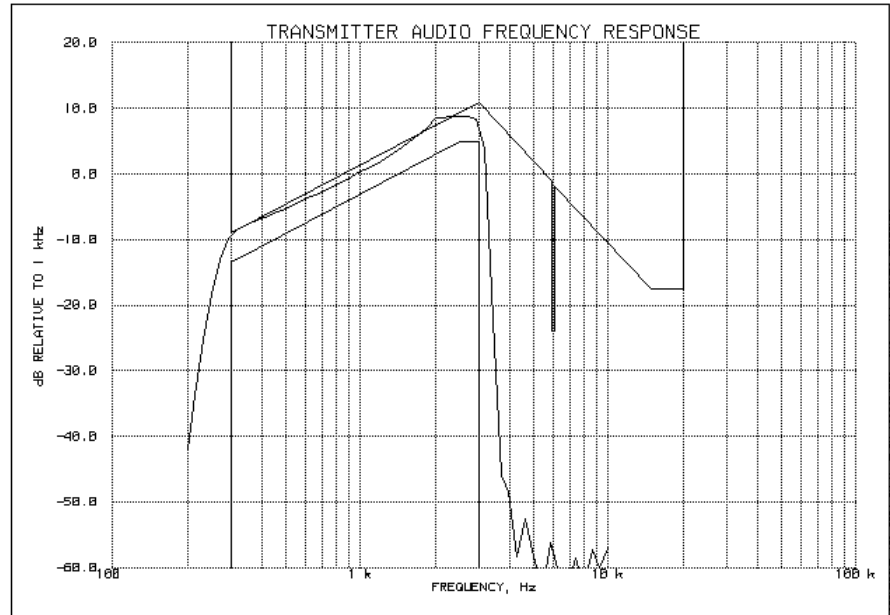
1. The EUT and test equipment were set up as shown on the following page.
2. The audio signal generator was connected to the audio input circuit/microphone of the EUT.
3. The audio signal input was adjusted to obtain 20% modulation at 1 kHz, and this point was taken as the 0 dB reference level.
4. With 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



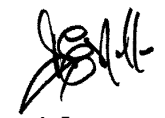
PAGE NO.

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NAME OF TEST: Audio Frequency Response  
g0190070: 2001-Sep-24 Mon 14:55:00  
STATE: 0:General



PERFORMED BY:

  
Doug Noble, B.A.S. E.E.T.

PAGE NO. 13 of 72.  
NAME OF TEST: Audio Low Pass Filter (Voice Input)  
SPECIFICATION: 47 CFR 2.1047(a)  
TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

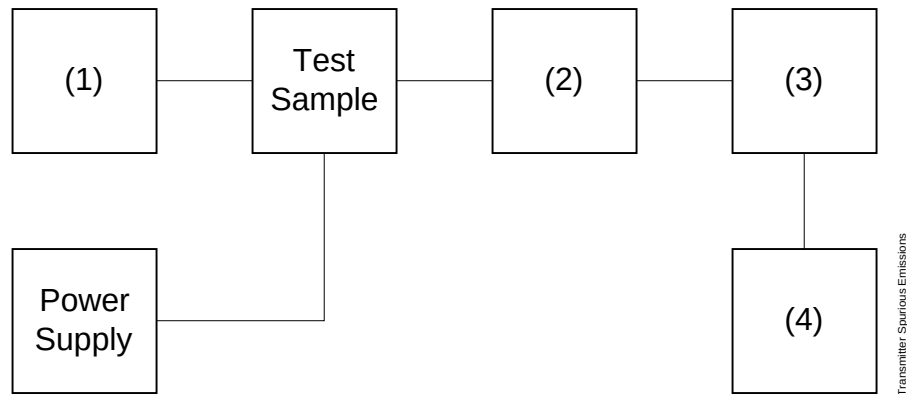
1. The EUT and test equipment were set up such that the audio input was connected at the input to the modulation limiter, and the modulated stage.
2. The audio output was connected at the output to the modulated stage.
3. MEASUREMENT RESULTS: ATTACHED

PAGE NO.

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TRANSMITTER SPURIOUS EMISSION

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

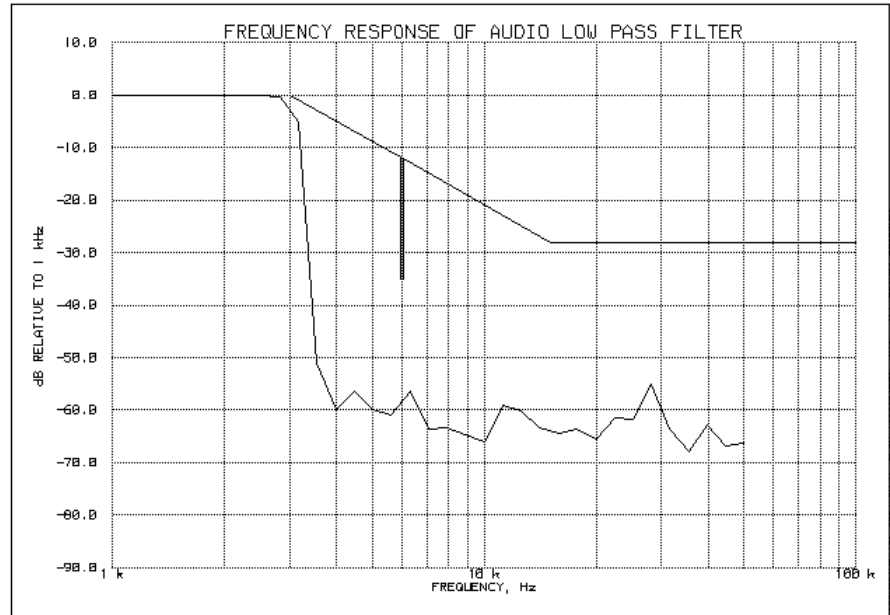


| Asset Description<br>(as applicable)  | s/n        |
|---------------------------------------|------------|
| (1) <u>AUDIO OSCILLATOR/GENERATOR</u> |            |
| i00010 HP 204D                        | 1105A04683 |
| i00017 HP 8903A                       | 2216A01753 |
| i00012 HP 3312A                       | 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 |

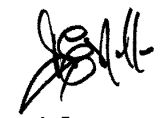
PAGE NO.

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NAME OF TEST: Audio Low Pass Filter (Voice Input)  
g0190071: 2001-Sep-24 Mon 15:14:00  
STATE: 0:General



PERFORMED BY:

  
Doug Noble, B.A.S. E.E.T.

PAGE NO. 16 of 72.  
NAME OF TEST: Modulation Limiting  
SPECIFICATION: 47 CFR 2.1047(b)  
TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The audio signal generator was connected to the audio input circuit/microphone of the EUT as for Frequency Response of the Audio Modulating Circuit.
2. The modulation response was measured for each of three tones (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 audio input level was varied from 30% modulation ( $\pm 3.6$  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 FOR:

COMPANDER ON:

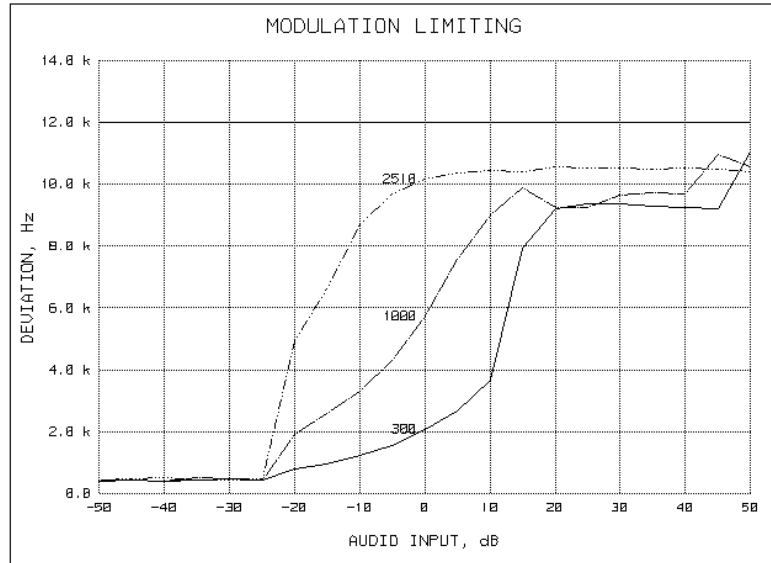
  x   VOICE  
  x   VOICE + SAT

PAGE NO.

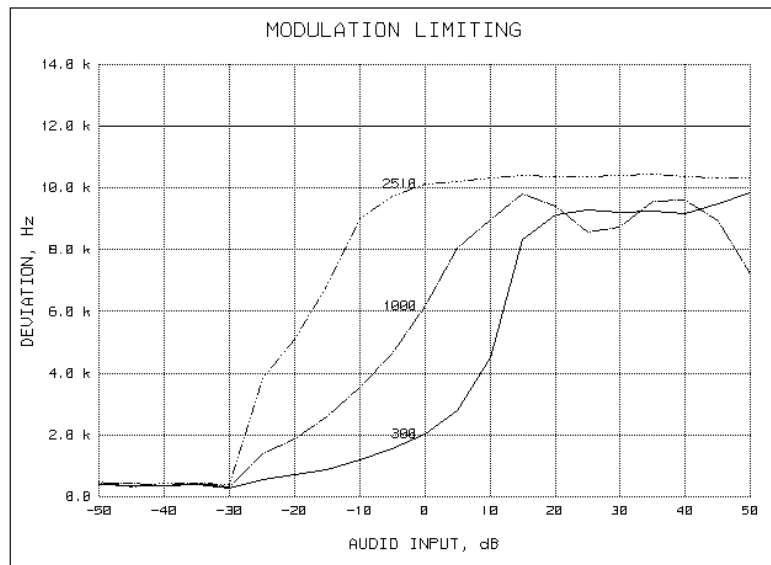
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NAME OF TEST: Modulation Limiting  
 g0190072: 2001-Sep-24 Mon 15:19:00  
 STATE: 0:General VOICE ONLY

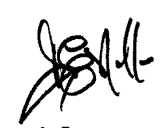
Positive  
Peaks:



Negative  
Peaks:



PERFORMED BY:

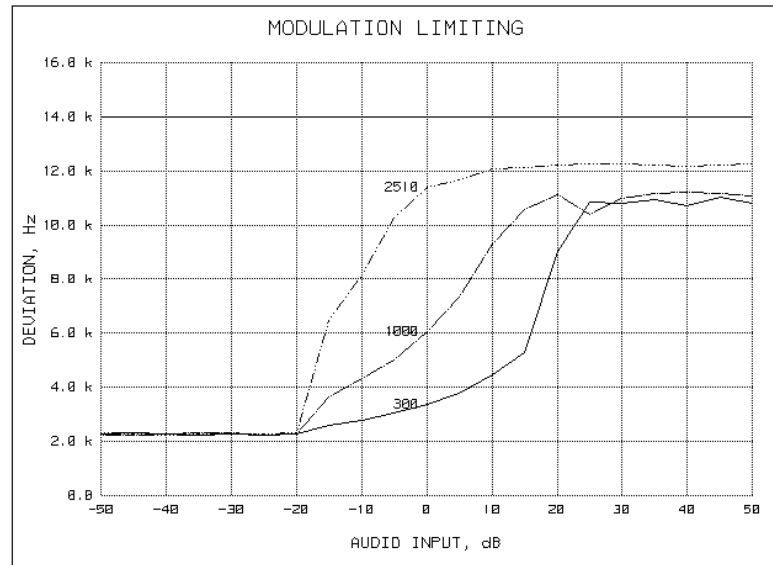
  
 Doug Noble, B.A.S. E.E.T.

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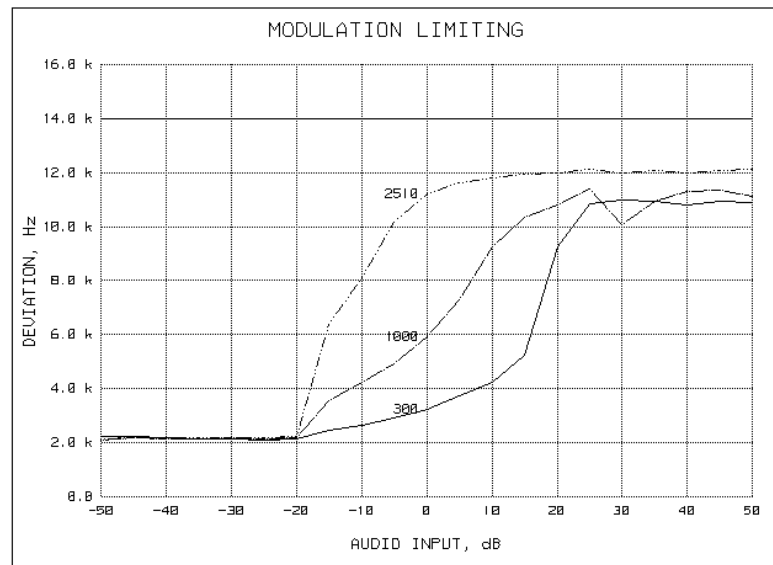
18 of 72.

NAME OF TEST: Modulation Limiting  
g0190073: 2001-Sep-24 Mon 15:24:00  
STATE: 0:General VOICE + SAT

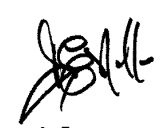
Positive  
Peaks:



Negative  
Peaks:



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NAME OF TEST: Measurement Of Maximum Deviation

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. The presentation of tones was obtained by attaching the HP 8903A Oscilloscope to the Modulation Output of the HP 8901 Modulation Analyzer.
2. The EUT was modulated by an HP 8903 Audio Analyzer and/or internally generated signals.
3. Maximum deviation measurements were recorded for the various configurations.
4. MEASUREMENT RESULTS: ATTACHED SUMMARY FOR DEVIATION

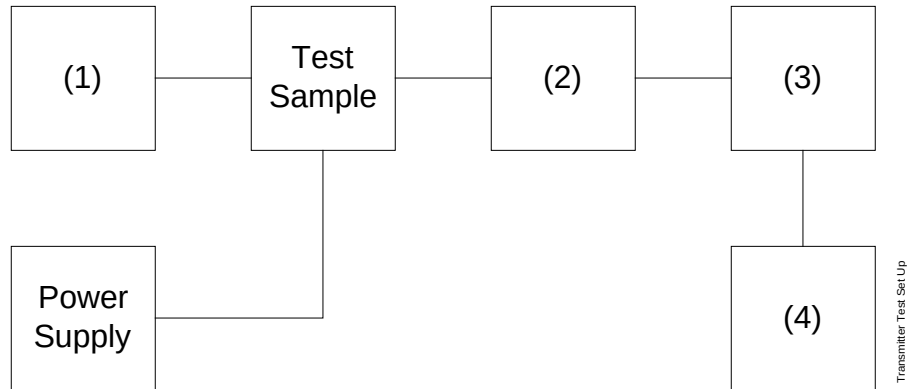


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TRANSMITTER TEST SET-UP

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



| Asset Description<br>(as applicable) | s/n        |
|--------------------------------------|------------|
| (1) <u>Audio Oscillator</u>          |            |
| i00010 HP 204D                       | 1105A04683 |
| i00017 HP 8903A                      | 2216A01753 |
| i00118 HP 33120A                     | US36002064 |
| (2) <u>COAXIAL ATTENUATOR</u>        |            |
| i00122 NARDA 766-10                  | 7802       |
| i00123 NARDA 766-10                  | 7802A      |
| i00113 SIERRA 661A-3D                | 1059       |
| i00069 BIRD 8329 (30 dB)             | 10066      |
| (3) <u>MODULATION ANALYZER</u>       |            |
| i00020 HP 8901A                      | 2105A01087 |
| (4) <u>AUDIO ANALYZER</u>            |            |
| i00017 HP 8903A                      | 2216A01753 |

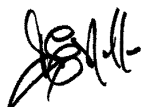
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MEASUREMENT SUMMARY: Measurement Of Maximum Deviation

| MODULATION        | LIMIT, kHz                        | DEVIATION, MHz |
|-------------------|-----------------------------------|----------------|
| (a) Voice         | $\geq 10.8 \text{ \& } \leq 13.2$ | 10.9           |
| (b) Wideband Data | $\geq 7.2 \text{ \& } \leq 8.8$   | 8.0            |
| (c) SAT           | $\geq 1.8 \text{ \& } \leq 2.2$   | 2.5            |
| (d) ST            | $\geq 7.2 \text{ \& } \leq 8.8$   | 8.4            |
| (e) SAT + VOICE   | N/A                               | 11.3           |
| (f) SAT + DTMF    | N/A                               | 11.1           |
| (i) NAMPS VOICE   | N/A                               | N/A            |
| (j) NAMPS DSAT    | N/A                               | N/A            |
| (k) NAMPS ST      | N/A                               | N/A            |
| (l) NAMPS VOICE   | N/A                               | N/A            |

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PAGE NO. 22 of 72.  
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
SPECIFICATION: 47 CFR 2.1049(c)(1), 22  
TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

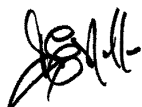
1. The EUT and test equipment were set up as shown on the following page, with the Spectrum Analyzer connected.
2. For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for  $\pm 2.5$  kHz deviation (or 50% modulation). 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. 23 of 72.

MEASUREMENT SUMMARY: Emission Masks (Occupied Bandwidth)

| MODULATION    | MEASURED DEVIATION<br>±kHz (HP 8901A) | LIMIT<br>±kHz             | B/W @-26 dB<br>PLOTS, kHz |
|---------------|---------------------------------------|---------------------------|---------------------------|
| NONE          | 0.0                                   | 0.0                       | 0.0                       |
| VOICE         | 10.9                                  | $\geq 10.8$ & $\leq 13.2$ | 26                        |
| WIDEBAND DATA | 8.0                                   | $\geq 7.2$ & $\leq 8.8$   | 30                        |
| SAT + VOICE   | 11.3                                  | N/A                       | 28                        |
| SAT + DTMF    | 11.1                                  | N/A                       | 22                        |
| CDMA          | N/A                                   | N/A                       | N/A                       |
| TDMA          | N/A                                   | N/A                       | 28                        |
| NAMPS         | N/A                                   | N/A                       | N/A                       |

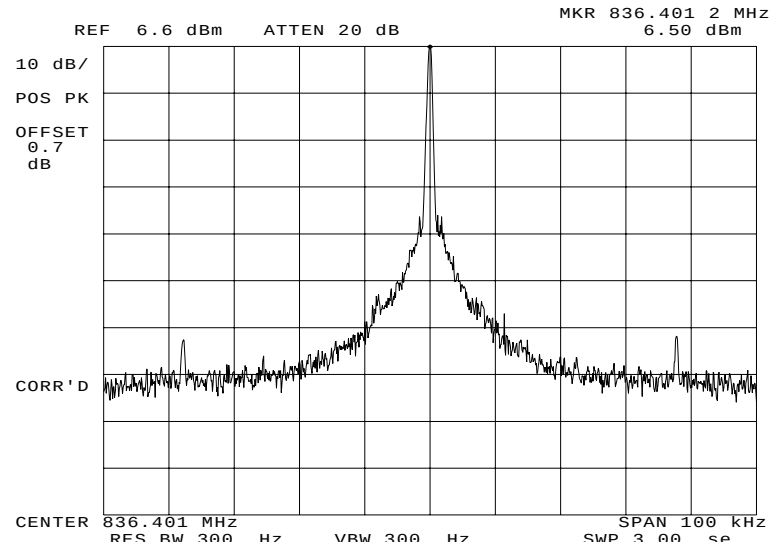
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0190097: 2001-Sep-25 Tue 10:19:00  
STATE: 1:Low Power



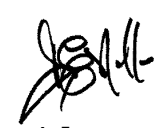
POWER:

LOW

MODULATION:

NONE

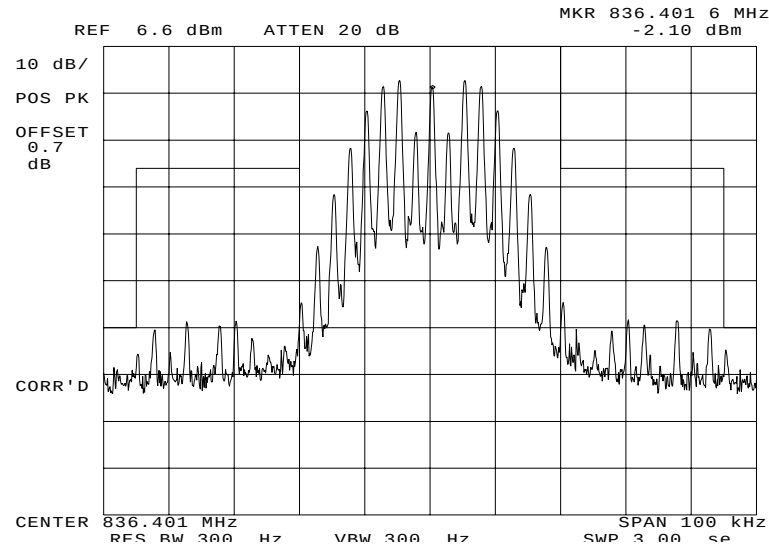
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190099: 2001-Sep-25 Tue 10:47:00  
 STATE: 1:Low Power



POWER:  
 MODULATION:

LOW  
 VOICE: 2500 Hz SINE WAVE  
 MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

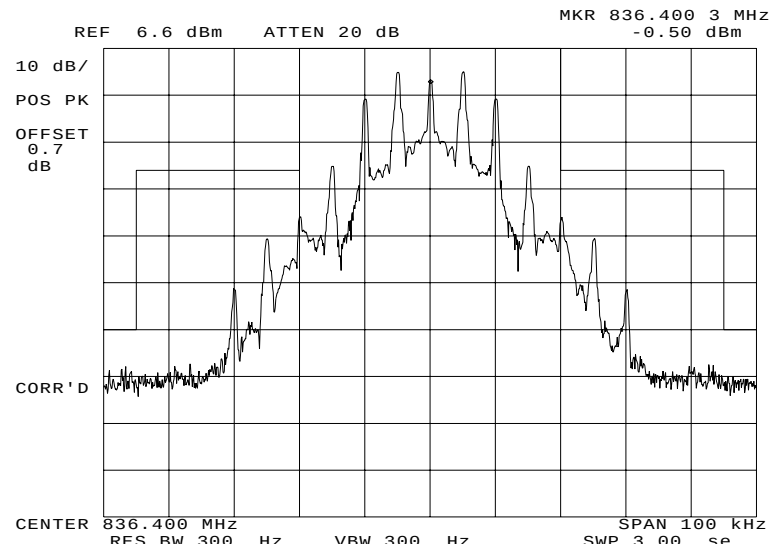
PERFORMED BY:

  
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190108: 2001-Sep-25 Tue 11:06:00  
 STATE: 1:Low Power



POWER:

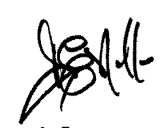
MODULATION:

LOW

WBD

MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

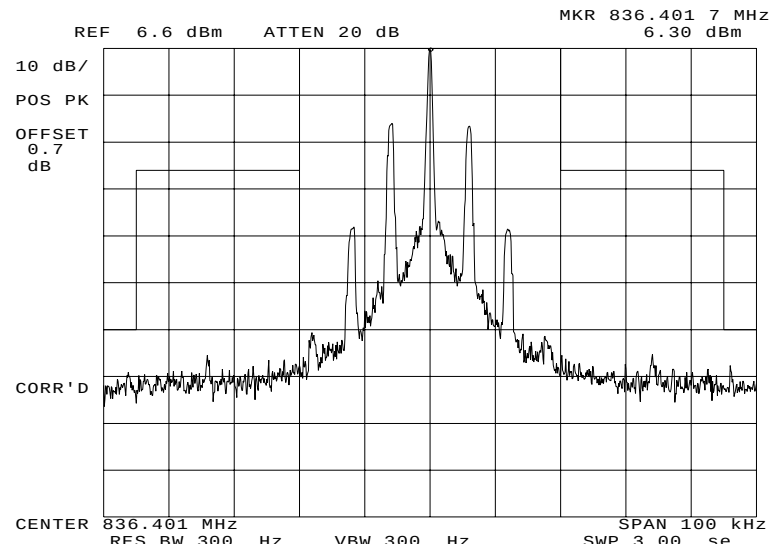
PERFORMED BY:

  
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190103: 2001-Sep-25 Tue 10:58:00  
 STATE: 1:Low Power



POWER:

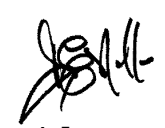
MODULATION:

LOW

SAT

MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

PERFORMED BY:

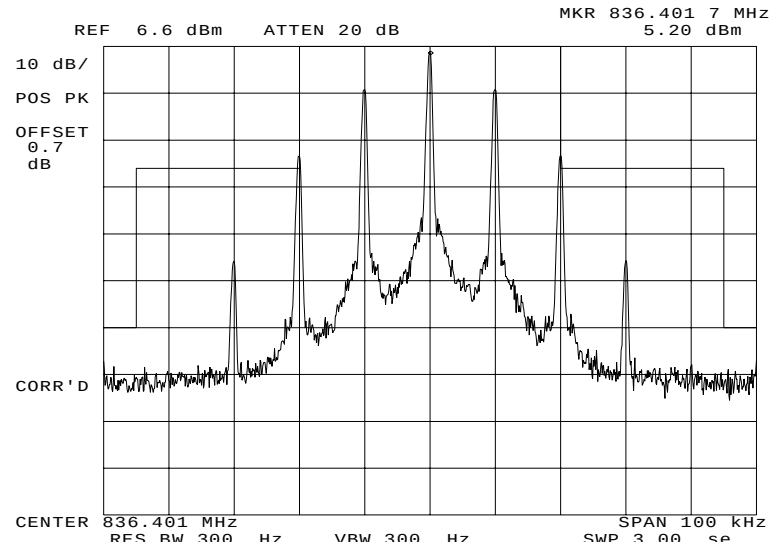
  
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190104: 2001-Sep-25 Tue 10:59:00  
 STATE: 1:Low Power



POWER:

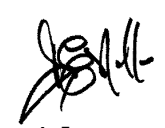
LOW

MODULATION:

ST

MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

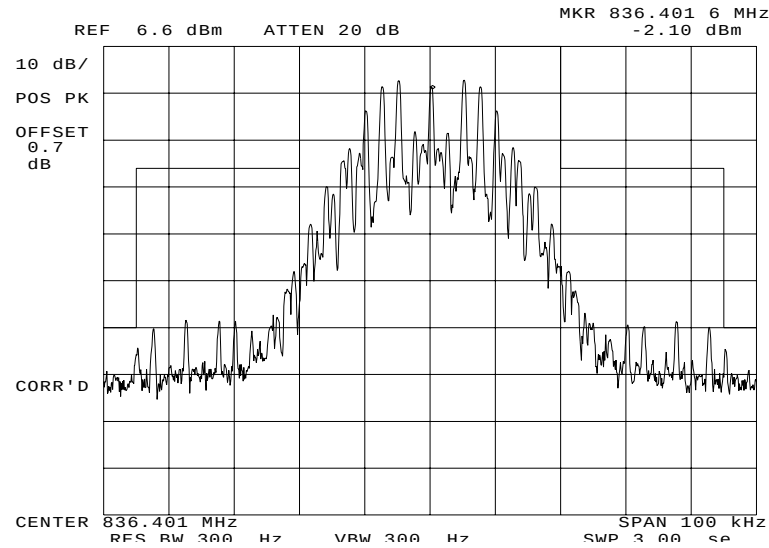
PERFORMED BY:

  
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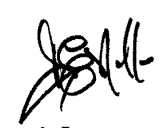
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190100: 2001-Sep-25 Tue 10:50:00  
 STATE: 1:Low Power



POWER:  
 MODULATION:

LOW  
 SAT+VOICE  
 MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

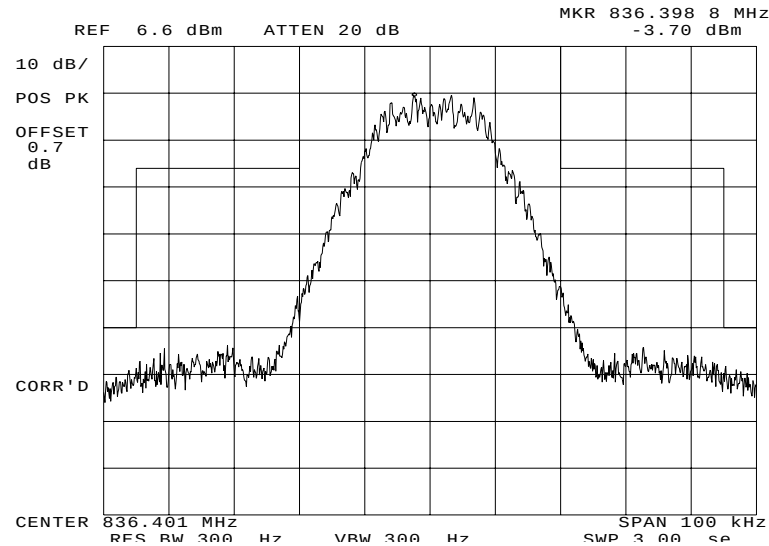
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190107: 2001-Sep-25 Tue 11:04:00  
 STATE: 1:Low Power



POWER:  
 MODULATION:

LOW  
 SAT+DTMF  
 MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

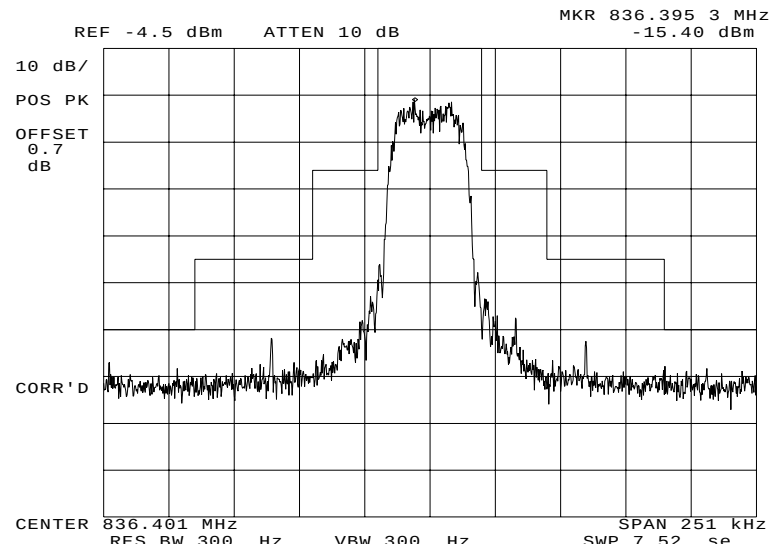
PERFORMED BY:

  
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0190119: 2001-Sep-25 Tue 11:40:00  
STATE: 1:Low Power



POWER:  
MODULATION:

LOW  
TDMA  
MASK: AMPS CELLULAR, F1D,  
DATA

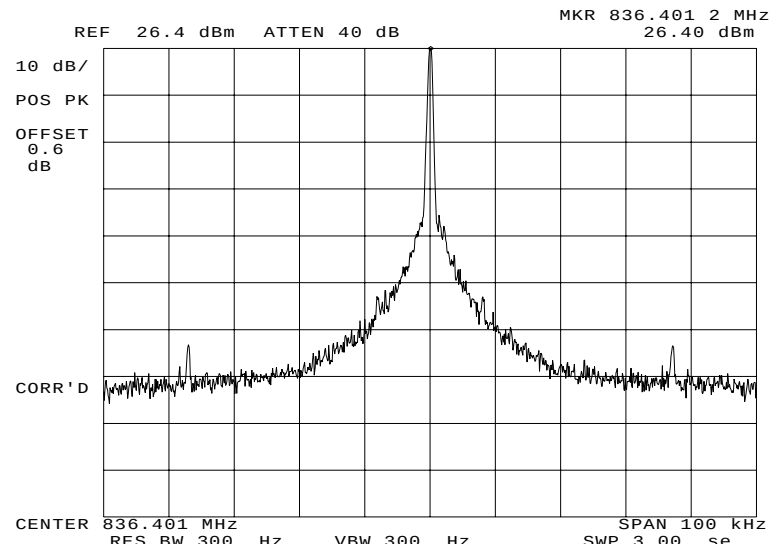
PERFORMED BY:

  
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0190096: 2001-Sep-25 Tue 10:16:00  
STATE: 2:High Power



POWER:

HIGH

MODULATION:

NONE

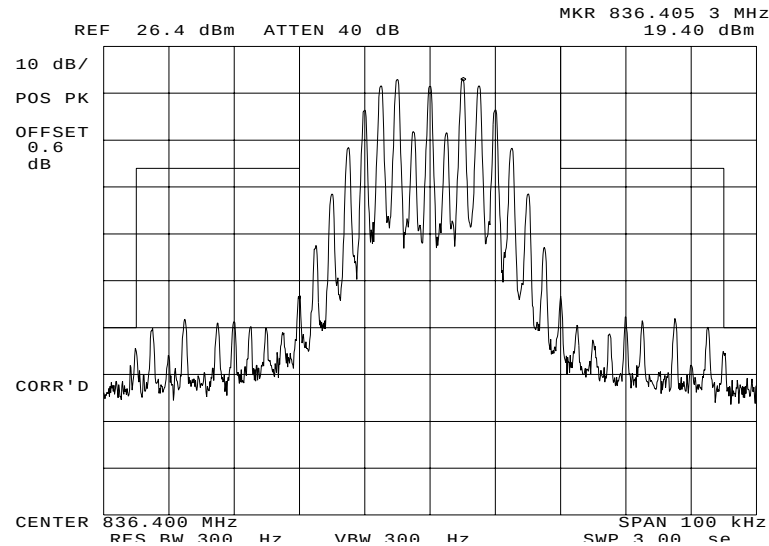
PERFORMED BY:

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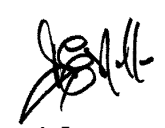
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190098: 2001-Sep-25 Tue 10:39:00  
 STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
VOICE: 2500 Hz SINE WAVE  
MASK: AMPS CELLULAR,  
F3E/F3D w/LPF

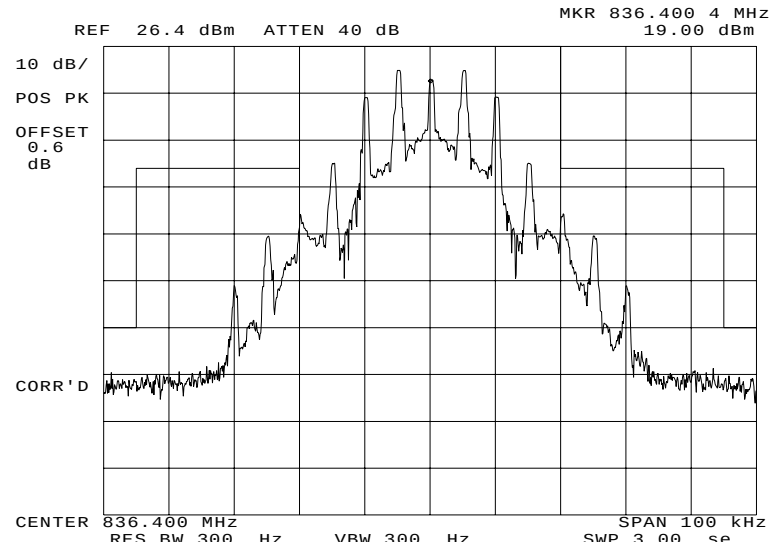
PERFORMED BY:

  
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190109: 2001-Sep-25 Tue 11:09:00  
 STATE: 2:High Power



POWER:

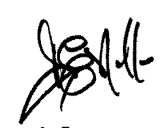
MODULATION:

HIGH

WBD

MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

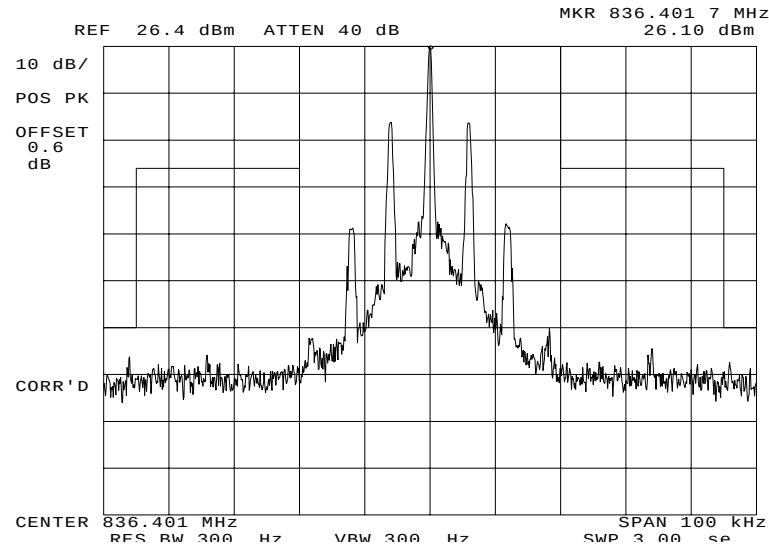
PERFORMED BY:

  
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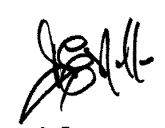
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190102: 2001-Sep-25 Tue 10:56:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

HIGH  
 SAT  
 MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

PERFORMED BY:

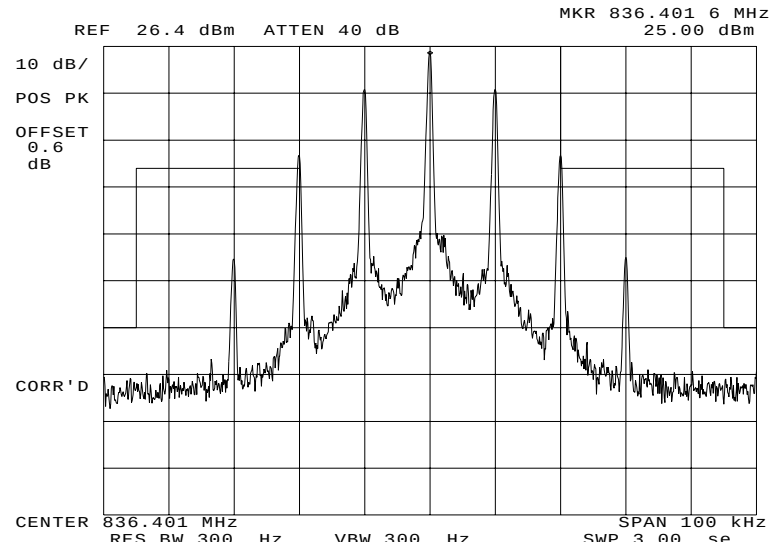
  
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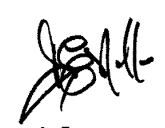
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190105: 2001-Sep-25 Tue 11:00:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

HIGH  
 ST  
 MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

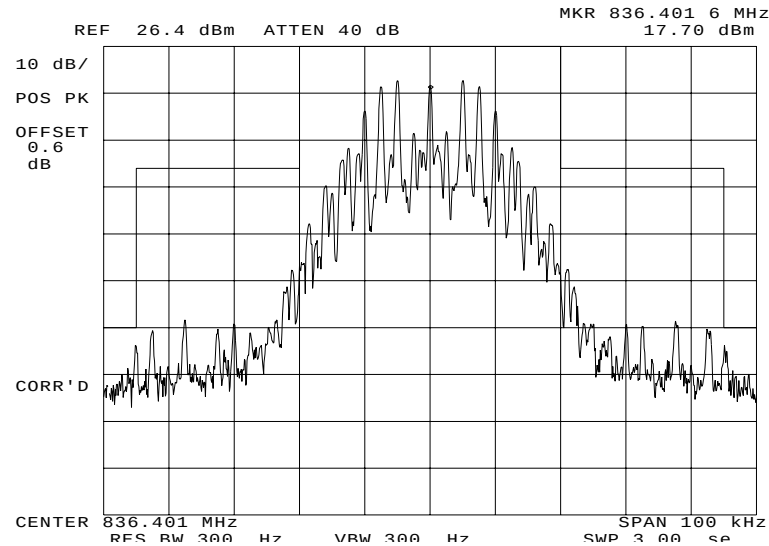
PERFORMED BY:

  
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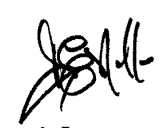
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190101: 2001-Sep-25 Tue 10:51:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

HIGH  
 SAT+VOICE  
 MASK: AMPS CELLULAR,  
 F3E/F3D w/LPF

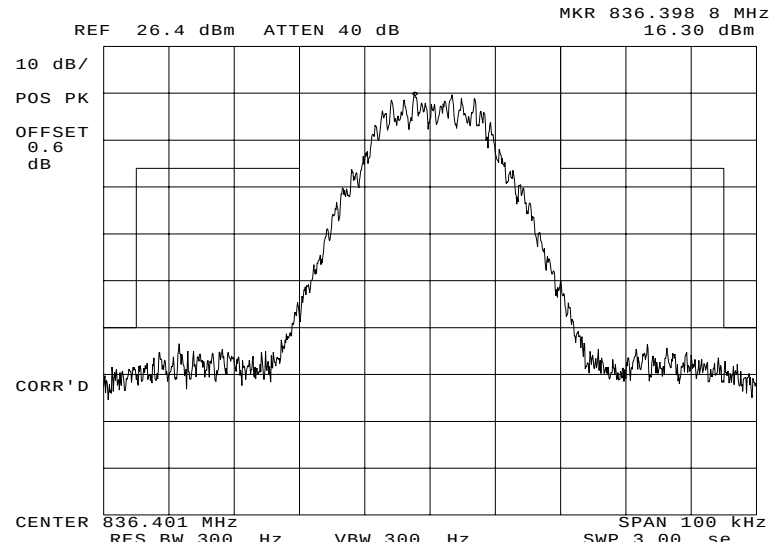
PERFORMED BY:

  
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190106: 2001-Sep-25 Tue 11:02:00  
 STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
SAT+DTMF  
MASK: AMPS CELLULAR,  
F3E/F3D w/LPF

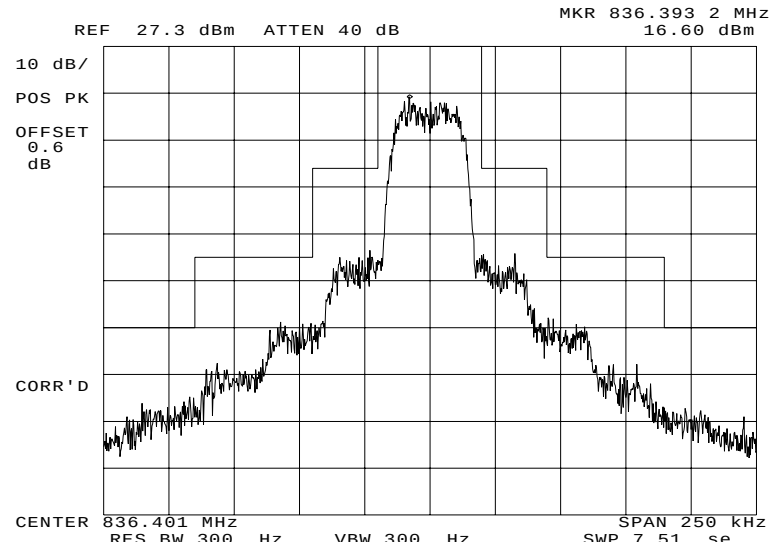
PERFORMED BY:

  
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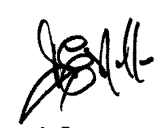
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190118: 2001-Sep-25 Tue 11:35:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

HIGH  
 TDMA  
 MASK: AMPS CELLULAR, F1D,  
 DATA

PERFORMED BY:

  
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NAME OF TEST: Transmitter Conducted Measurements

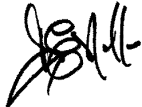
SPECIFICATION: 47 CFR 2.1051: Unwanted (spurious) Emissions  
2.1049(c), 24.238(b): Occupied Bandwidth  
24: Emissions at Band Edges

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. The EUT and test equipment were set up as shown on the following page with the Spectrum Analyzer connected.
2. The low and high channels for all RF powers within the designated frequency block(s) were measured.
3. MEASUREMENT RESULTS: ATTACHED

PERFORMED BY:

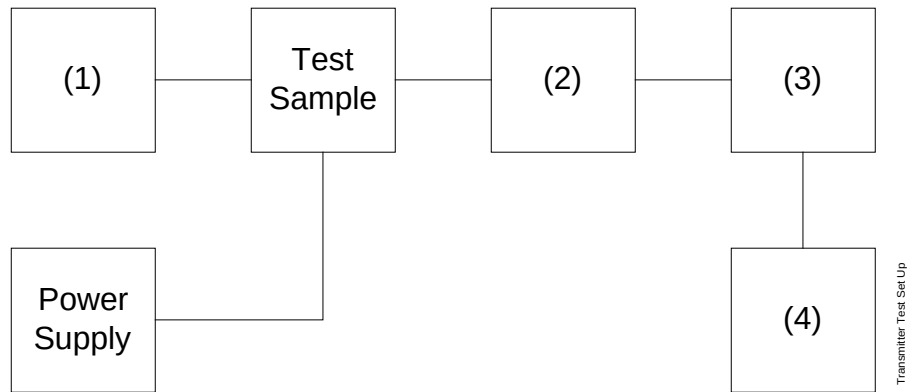
  
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TRANSMITTER SPURIOUS EMISSION

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

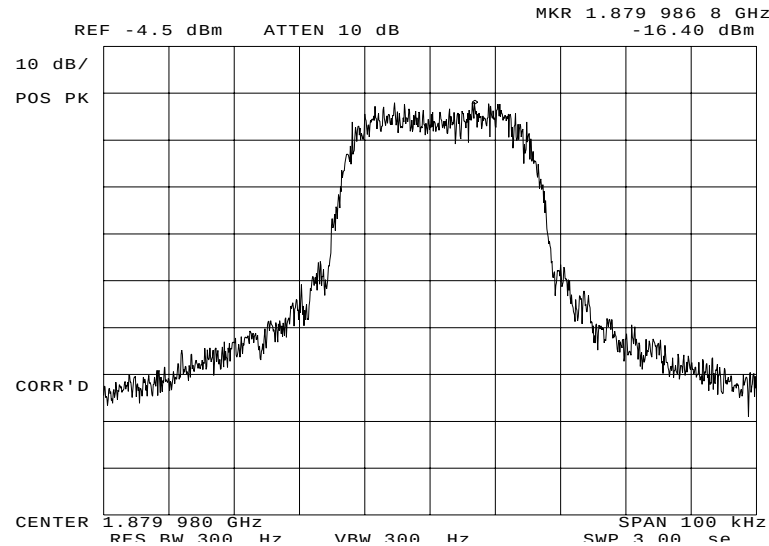


| Asset Description<br>(as applicable)  | s/n        |
|---------------------------------------|------------|
| (1) <u>AUDIO OSCILLATOR/GENERATOR</u> |            |
| i00010 HP 204D                        | 1105A04683 |
| i00017 HP 8903A                       | 2216A01753 |
| i00012 HP 3312A                       | 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)  
 g0190121: 2001-Sep-25 Tue 11:51:00  
 STATE: 1:Low Power



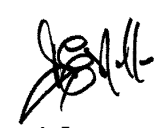
POWER:

LOW

MODULATION:

PCS TDMA

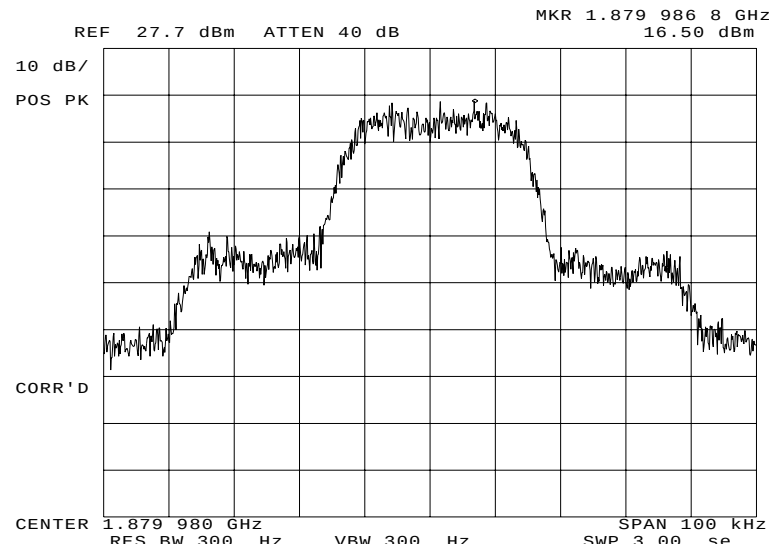
PERFORMED BY:

  
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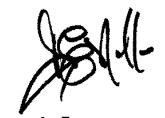
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g0190120: 2001-Sep-25 Tue 11:48:00  
STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
PCS TDMA

PERFORMED BY:

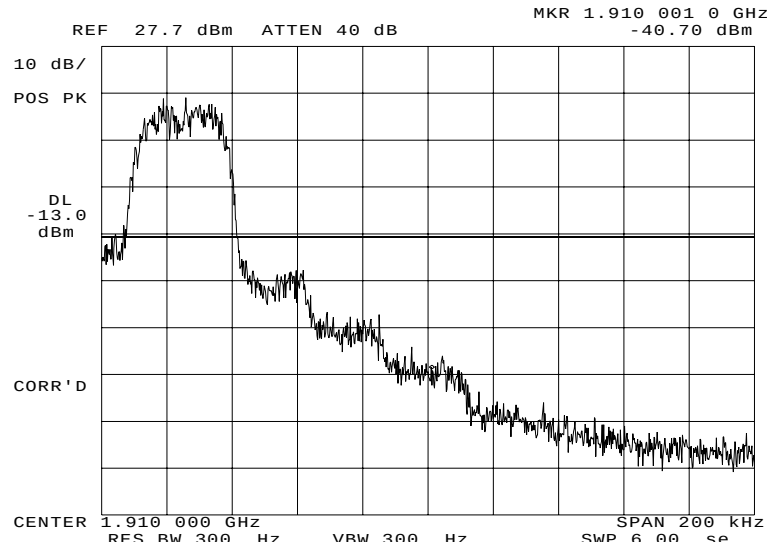
  
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190123: 2001-Sep-25 Tue 11:57:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

HIGH  
 PCS TDMA  
 UPPER BANDEDGE CHANNEL 1998

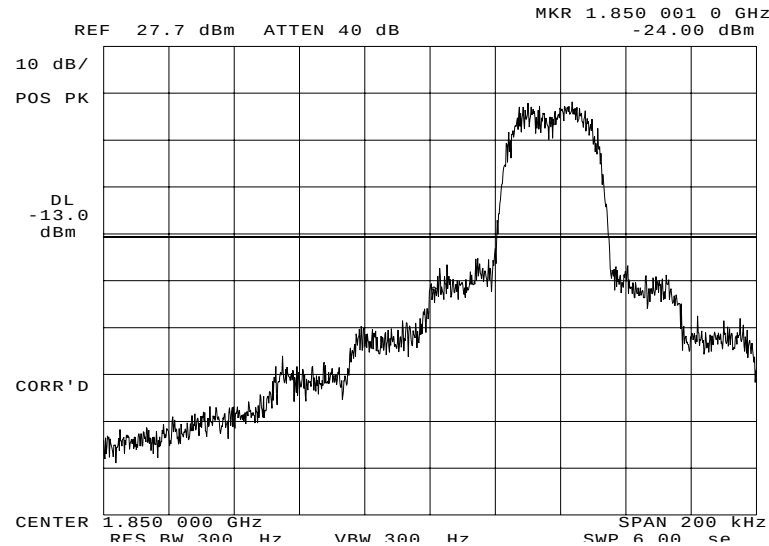
PERFORMED BY:

  
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190124: 2001-Sep-25 Tue 11:59:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

HIGH  
 PCS TDMA  
 LOWER BANDEDGE CHANNEL 02

PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Requirements -  
Worst Case Modulation & Wideband Data

SPECIFICATION: 47 CFR 22.917

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The EUT was connected to a coaxial attenuator and then to a spectrum analyzer. The unmodulated carrier was set for 0 dB reference level.
2. A notch filter was introduced to reduce or eliminate any spectrum analyzer internally generated spurious for measurements of the harmonics and the carrier level.
3. Spectrum analyzer bandwidth was set to section 22.917(h) as applicable.
4. Measurements were made on channels 380, 799 and 991. The equipment was first modulated for the Worst Case Modulation, then for Wideband Data (F8W, F1D).
5. All other spurious emissions over the range of 0 the beyond the 10<sup>th</sup> harmonic (10 GHz) were 20 dB or more below the limit
6. The data presented here is for the Worst Case.
7. MEASUREMENT RESULTS: ATTACHED

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MEASUREMENT SUMMARY: Emission Requirements -  
Worst Case Modulation

WORST CASE MODULATION = VOICE +\_SAT

| EMISSION,<br>MHz/HARM.                     | LIMIT, dBc                        | SPURIOUS EMISSIONS, dBc |            |
|--------------------------------------------|-----------------------------------|-------------------------|------------|
|                                            |                                   | Lo                      | Hi         |
| F0 + 20 kHz<br>to F0 + 45 kHz              | $\leq -26$                        | $\leq -59$              | $\leq -59$ |
| F0 + 45 kHz<br>to 2 <sup>nd</sup> Harmonic | $\leq -60$<br>or $43 + 10 \log P$ | $\leq -67$              | $\leq -69$ |
| 2 <sup>nd</sup> to 10 <sup>th</sup>        | $(\leq -13 \text{ dBm})$          | $\leq -63$              | $\leq -61$ |

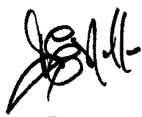
MEASUREMENT RESULTS = ATTACHED OFFSET PLOTS

## EMISSION IN THE RECEIVER CRITICAL BAND

| EMISSION,<br>MHz/HARM. | LIMIT, dBm | SPURIOUS EMISSIONS, dBm |            |
|------------------------|------------|-------------------------|------------|
|                        |            | Lo                      | Hi         |
| 869 to 894             | $\leq -80$ | $\leq -86$              | $\leq -86$ |

MEASUREMENT RESULTS = ATTACHED PLOTS

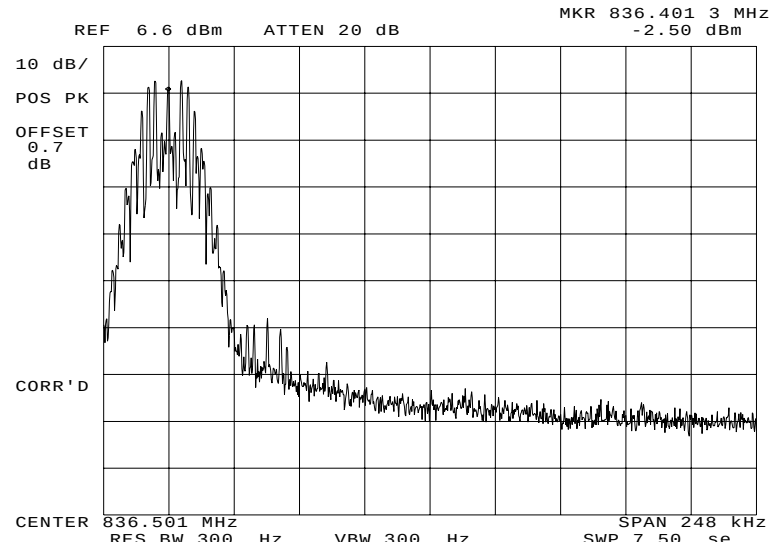
PERFORMED BY:

  
Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190116: 2001-Sep-25 Tue 11:24:00  
 STATE: 1:Low Power



POWER:  
 MODULATION:

LOW  
 SAT+VOICE  
 OFFSET OCCUPIED BANDWIDTH

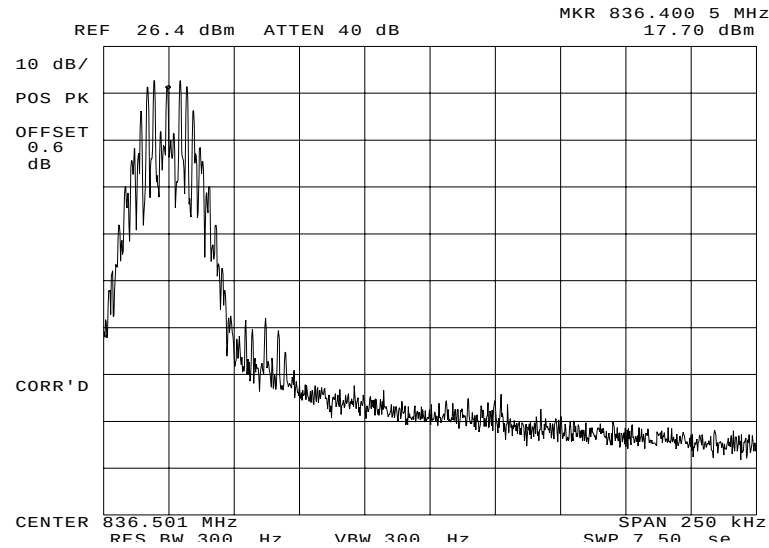
PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190114: 2001-Sep-25 Tue 11:21:00  
 STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
SAT+VOICE  
OFFSET OCCUPIED BANDWIDTH

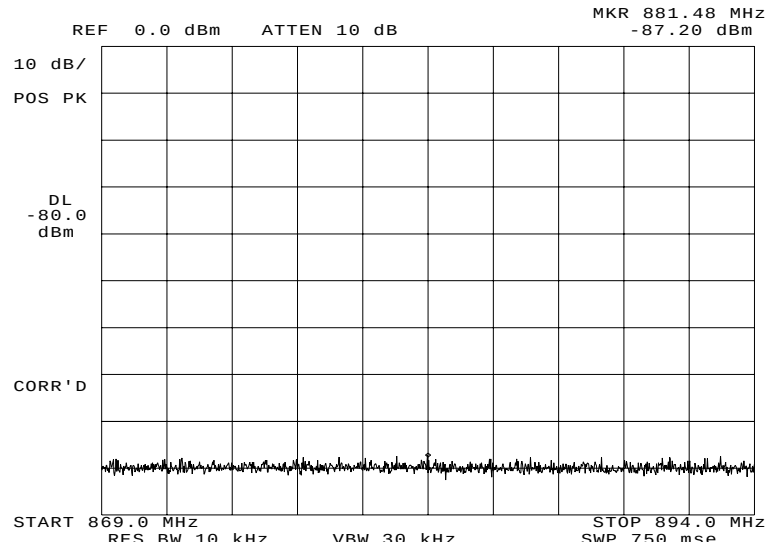
PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190117: 2001-Sep-25 Tue 11:25:00  
 STATE: 1:Low Power



POWER:

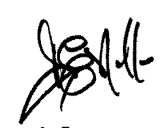
LOW

MODULATION:

ANY

TX SPURS IN RX CRITICAL

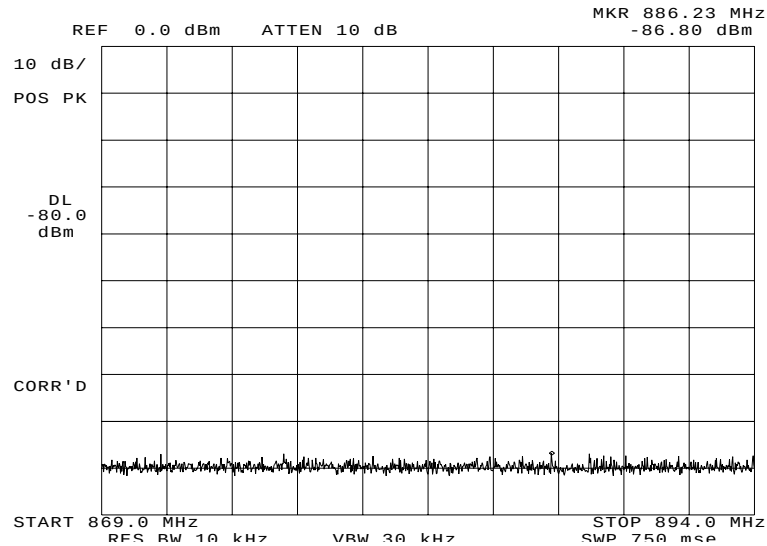
PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190115: 2001-Sep-25 Tue 11:22:00  
 STATE: 2:High Power



POWER:

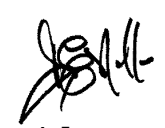
MODULATION:

HIGH

ANY

TX SPURS IN RX CRITICAL  
 BAND

PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.



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MEASUREMENT SUMMARY: Emission Requirements -  
Wideband Data (F1D, 10 kb/s)

| EMISSION,<br>MHz/HARM.                     | LIMIT, dBc           | SPURIOUS EMISSIONS, dBc |       |
|--------------------------------------------|----------------------|-------------------------|-------|
|                                            |                      | Lo                      | Hi    |
| F0 + 20 kHz<br>to F0 + 45 kHz              | ≤ -26                | ≤ -41                   | ≤ -37 |
| F0 + 45 kHz<br>to F0 + 90 kHz              | ≤ -45                | ≤ -69                   | ≤ -69 |
| F0 + 90 kHz<br>to 2 <sup>nd</sup> Harmonic | ≤ -60<br>(≤ -13 dBm) | ≤ -69                   | ≤ -68 |
| 2 <sup>nd</sup> to 10 <sup>th</sup>        | (≤ -13 dBm)          | ≤ -63                   | ≤ -61 |

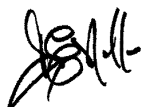
MEASUREMENT RESULTS = ATTACHED OFFSET PLOTS

## EMISSION IN THE RECEIVER CRITICAL BAND

| EMISSION,<br>MHz/HARM. | LIMIT, dBm | SPURIOUS EMISSIONS, dBm |       |
|------------------------|------------|-------------------------|-------|
|                        |            | Lo                      | Hi    |
| 869 to 894             | ≤ -80      | ≤ -86                   | ≤ -86 |

MEASUREMENT RESULTS = ATTACHED PLOTS

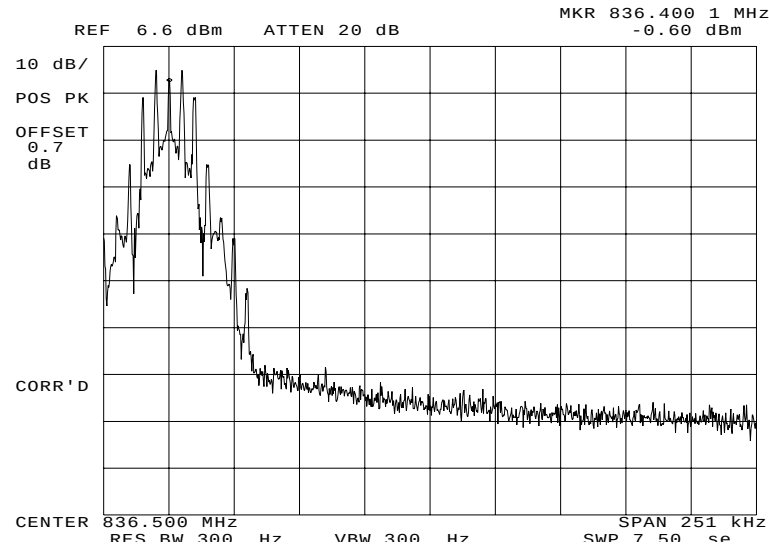
PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190111: 2001-Sep-25 Tue 11:15:00  
 STATE: 1:Low Power



POWER:

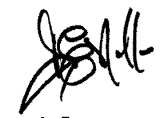
LOW

MODULATION:

WBD

OFFSET OCCUPIED BANDWIDTH

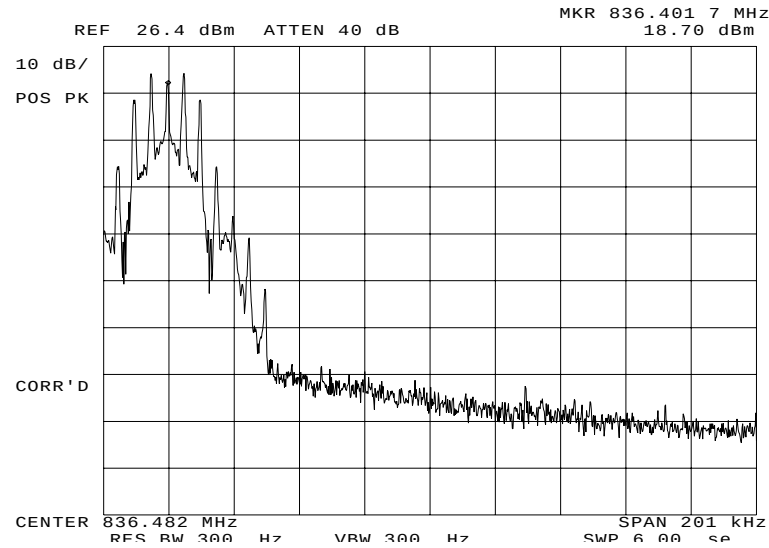
PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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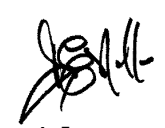
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190110: 2001-Sep-25 Tue 11:12:00  
 STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
WBD  
OFFSET OCCUPIED BANDWIDTH

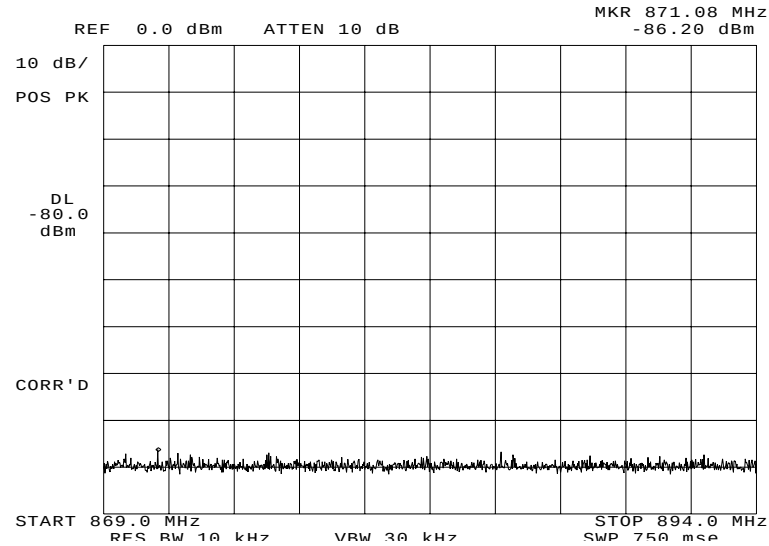
PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190112: 2001-Sep-25 Tue 11:18:00  
 STATE: 1:Low Power



POWER:

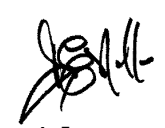
LOW

MODULATION:

ANY

TX SPURS IN RX CRITICAL  
 BAND

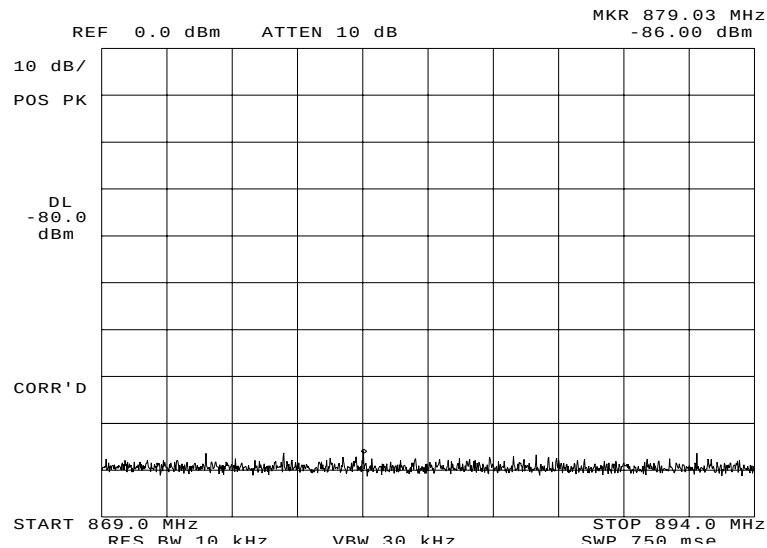
PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g0190113: 2001-Sep-25 Tue 11:19:00  
 STATE: 2:High Power



POWER:

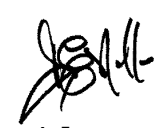
MODULATION:

HIGH

ANY

TX SPURS IN RX CRITICAL  
 BAND

PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Spurious Emissions at Antenna Terminals  
SPECIFICATION: 47 CFR 2.1051, 22.917  
TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. The EUT was connected to a coaxial attenuator and then to a Spectrum Analyzer.
2. A notch filter was introduced to reduce or eliminate spurious emission which could be generated internally in the spectrum analyzer.
3. Measurements were made over the range from 45 kHz to 10 GHz for the worst case modulation so both the highest and lowest R.F. power settings.
4. All other emissions were 20 dB or more below the limit.
5. Spectrum analyzer bandwidth was set to section 22.917(h) as applicable.
6. MEASUREMENT RESULTS: ATTACHED

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
 g0190136: 2001-Sep-26 Wed 09:52:00  
 STATE: 1:Low Power AMPS

| FREQUENCY TUNED,<br>MHz | FREQUENCY<br>EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 824.040000              | 1648.099000                | -63        | -69.6      | -43        |
| 836.400000              | 1672.811000                | -60.3      | -66.9      | -40.3      |
| 848.970000              | 1697.942000                | -64.5      | -71.1      | -44.5      |
| 824.040000              | 2471.712000                | -71.6      | -78.2      | -51.6      |
| 836.400000              | 2509.404000                | -74.5      | -81.1      | -54.5      |
| 848.970000              | 2546.645000                | -74        | -80.6      | -54        |
| 824.040000              | 3296.015000                | -75.4      | -82        | -55.4      |
| 836.400000              | 3345.249000                | -74.2      | -80.8      | -54.2      |
| 848.970000              | 3395.763000                | -75.1      | -81.7      | -55.1      |
| 824.040000              | 4119.976000                | -75.3      | -81.9      | -55.3      |
| 836.400000              | 4181.771000                | -75.8      | -82.4      | -55.8      |
| 848.970000              | 4244.796000                | -75.7      | -82.3      | -55.7      |
| 824.040000              | 4944.155000                | -75.6      | -82.2      | -55.6      |
| 836.400000              | 5018.287000                | -76.1      | -82.7      | -56.1      |
| 848.970000              | 5094.179000                | -75.7      | -82.3      | -55.7      |
| 824.040000              | 5768.390000                | -75.7      | -82.3      | -55.7      |
| 836.400000              | 5854.697000                | -68.5      | -75.1      | -48.5      |
| 848.970000              | 5942.392000                | -70.6      | -77.2      | -50.6      |
| 824.040000              | 6591.947000                | -68.7      | -75.3      | -48.7      |
| 836.400000              | 6691.101000                | -69.4      | -76        | -49.4      |
| 848.970000              | 6792.090000                | -69.9      | -76.5      | -49.9      |
| 824.040000              | 7416.262000                | -69.9      | -76.5      | -49.9      |
| 836.400000              | 7527.722000                | -68.9      | -75.5      | -48.9      |
| 848.970000              | 7640.633000                | -69.8      | -76.4      | -49.8      |
| 824.040000              | 8240.024000                | -68.1      | -74.7      | -48.1      |
| 836.400000              | 8363.832000                | -69        | -75.6      | -49        |
| 848.970000              | 8490.066000                | -70.1      | -76.7      | -50.1      |
| 824.040000              | 9064.861000                | -69.8      | -76.4      | -49.8      |
| 836.400000              | 9200.397000                | -69.7      | -76.3      | -49.7      |
| 848.970000              | 9339.166000                | -69.2      | -75.8      | -49.2      |
| 824.040000              | 9888.638000                | -69.4      | -76        | -49.4      |
| 836.400000              | 10036.778000               | -68.8      | -75.4      | -48.8      |
| 848.970000              | 10187.853000               | -69.2      | -75.8      | -49.2      |
| 824.040000              | 10712.251000               | -69.3      | -75.9      | -49.3      |
| 836.400000              | 10873.684000               | -69        | -75.6      | -49        |
| 848.970000              | 11036.964000               | -69.5      | -76.1      | -49.5      |
| 824.040000              | 11536.801000               | -68.4      | -75        | -48.4      |
| 836.400000              | 11709.339000               | -68.3      | -74.9      | -48.3      |
| 848.970000              | 11885.655000               | -69.2      | -75.8      | -49.2      |
| 824.040000              | 12360.900000               | -68.7      | -75.3      | -48.7      |
| 836.400000              | 12545.685000               | -63.4      | -70        | -43.4      |
| 848.970000              | 12734.724000               | -64.4      | -71        | -44.4      |

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
 g0190135: 2001-Sep-26 Wed 09:43:00  
 STATE: 2:High Power AMPS

| FREQUENCY TUNED,<br>MHz | FREQUENCY<br>EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 824.040000              | 1648.073000                | -41.7      | -68.1      | -21.7      |
| 836.400000              | 1672.815000                | -36.1      | -62.5      | -16.1      |
| 848.970000              | 1697.930000                | -39.6      | -66        | -19.6      |
| 824.040000              | 2472.161000                | -52.2      | -78.6      | -32.2      |
| 836.400000              | 2509.243000                | -54.1      | -80.5      | -34.1      |
| 848.970000              | 2547.262000                | -55        | -81.4      | -35        |
| 824.040000              | 3295.888000                | -55.7      | -82.1      | -35.7      |
| 836.400000              | 3345.426000                | -55.1      | -81.5      | -35.1      |
| 848.970000              | 3396.088000                | -55        | -81.4      | -35        |
| 824.040000              | 4119.888000                | -55.5      | -81.9      | -35.5      |
| 836.400000              | 4182.072000                | -55.9      | -82.3      | -35.9      |
| 848.970000              | 4244.364000                | -55.8      | -82.2      | -35.8      |
| 824.040000              | 4944.016000                | -54.6      | -81        | -34.6      |
| 836.400000              | 5018.741000                | -54.2      | -80.6      | -34.2      |
| 848.970000              | 5094.073000                | -54.9      | -81.3      | -34.9      |
| 824.040000              | 5768.553000                | -55.3      | -81.7      | -35.3      |
| 836.400000              | 5854.905000                | -49        | -75.4      | -29        |
| 848.970000              | 5942.747000                | -49.6      | -76        | -29.6      |
| 824.040000              | 6591.925000                | -49.5      | -75.9      | -29.5      |
| 836.400000              | 6691.167000                | -49.3      | -75.7      | -29.3      |
| 848.970000              | 6791.757000                | -48.9      | -75.3      | -28.9      |
| 824.040000              | 7416.840000                | -49.4      | -75.8      | -29.4      |
| 836.400000              | 7527.707000                | -49.6      | -76        | -29.6      |
| 848.970000              | 7640.717000                | -49.4      | -75.8      | -29.4      |
| 824.040000              | 8240.714000                | -48.7      | -75.1      | -28.7      |
| 836.400000              | 8363.940000                | -49.5      | -75.9      | -29.5      |
| 848.970000              | 8489.523000                | -49.7      | -76.1      | -29.7      |
| 824.040000              | 9064.910000                | -49.7      | -76.1      | -29.7      |
| 836.400000              | 9200.754000                | -49        | -75.4      | -29        |
| 848.970000              | 9338.524000                | -49.1      | -75.5      | -29.1      |
| 824.040000              | 9888.602000                | -49.4      | -75.8      | -29.4      |
| 836.400000              | 10036.706000               | -49.5      | -75.9      | -29.5      |
| 848.970000              | 10187.271000               | -48.7      | -75.1      | -28.7      |
| 824.040000              | 10712.837000               | -48.8      | -75.2      | -28.8      |
| 836.400000              | 10872.709000               | -49.8      | -76.2      | -29.8      |
| 848.970000              | 11036.471000               | -49.5      | -75.9      | -29.5      |
| 824.040000              | 11536.486000               | -49.7      | -76.1      | -29.7      |
| 836.400000              | 11709.721000               | -48.8      | -75.2      | -28.8      |
| 848.970000              | 11885.986000               | -47.9      | -74.3      | -27.9      |
| 824.040000              | 12360.308000               | -49.6      | -76        | -29.6      |
| 836.400000              | 12546.282000               | -44.7      | -71.1      | -24.7      |
| 848.970000              | 12734.412000               | -44        | -70.4      | -24        |



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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
 g0190138: 2001-Sep-26 Wed 10:15:00  
 STATE: 2:Low Power TDMA800

| FREQUENCY TUNED,<br>MHz | FREQUENCY<br>EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 824.040000              | 1648.556000                | -83.9      | -79.4      | -63.9      |
| 836.400000              | 1672.837000                | -80.3      | -75.8      | -60.3      |
| 848.970000              | 1697.935000                | -79.7      | -75.2      | -59.7      |
| 824.040000              | 2472.015000                | -82        | -77.5      | -62        |
| 836.400000              | 2508.892000                | -84.8      | -80.3      | -64.8      |
| 848.970000              | 2546.719000                | -85.4      | -80.9      | -65.4      |
| 824.040000              | 3296.395000                | -86        | -81.5      | -66        |
| 836.400000              | 3346.046000                | -84.3      | -79.8      | -64.3      |
| 848.970000              | 3395.898000                | -85.3      | -80.8      | -65.3      |
| 824.040000              | 4120.392000                | -85.5      | -81        | -65.5      |
| 836.400000              | 4181.991000                | -85.6      | -81.1      | -65.6      |
| 848.970000              | 4244.642000                | -84.9      | -80.4      | -64.9      |
| 824.040000              | 4944.561000                | -85.1      | -80.6      | -65.1      |
| 836.400000              | 5018.751000                | -84.4      | -79.9      | -64.4      |
| 848.970000              | 5093.625000                | -84.8      | -80.3      | -64.8      |
| 824.040000              | 5768.346000                | -85.6      | -81.1      | -65.6      |
| 836.400000              | 5854.796000                | -80        | -75.5      | -60        |
| 848.970000              | 5942.805000                | -79.5      | -75        | -59.5      |
| 824.040000              | 6592.690000                | -78.1      | -73.6      | -58.1      |
| 836.400000              | 6691.138000                | -78.7      | -74.2      | -58.7      |
| 848.970000              | 6791.490000                | -78.6      | -74.1      | -58.6      |
| 824.040000              | 7415.917000                | -79.2      | -74.7      | -59.2      |
| 836.400000              | 7527.973000                | -79.6      | -75.1      | -59.6      |
| 848.970000              | 7640.318000                | -80.4      | -75.9      | -60.4      |
| 824.040000              | 8240.783000                | -78.4      | -73.9      | -58.4      |
| 836.400000              | 8364.392000                | -79        | -74.5      | -59        |
| 848.970000              | 8489.238000                | -79.1      | -74.6      | -59.1      |
| 824.040000              | 9064.920000                | -79.3      | -74.8      | -59.3      |
| 836.400000              | 9200.282000                | -80.1      | -75.6      | -60.1      |
| 848.970000              | 9339.111000                | -80.1      | -75.6      | -60.1      |
| 824.040000              | 9888.100000                | -79.1      | -74.6      | -59.1      |
| 836.400000              | 10036.505000               | -78.2      | -73.7      | -58.2      |
| 848.970000              | 10187.469000               | -78.8      | -74.3      | -58.8      |
| 824.040000              | 10712.587000               | -80        | -75.5      | -60        |
| 836.400000              | 10872.830000               | -79.1      | -74.6      | -59.1      |
| 848.970000              | 11036.482000               | -79.1      | -74.6      | -59.1      |
| 824.040000              | 11536.311000               | -79.3      | -74.8      | -59.3      |
| 836.400000              | 11710.099000               | -79.1      | -74.6      | -59.1      |
| 848.970000              | 11885.696000               | -78.7      | -74.2      | -58.7      |
| 824.040000              | 12360.595000               | -78        | -73.5      | -58        |
| 836.400000              | 12546.082000               | -75.1      | -70.6      | -55.1      |
| 848.970000              | 12734.119000               | -74.9      | -70.4      | -54.9      |

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
 g0190137: 2001-Sep-26 Wed 10:13:00  
 STATE: 2:High Power TDMA800

| FREQUENCY TUNED,<br>MHz | FREQUENCY<br>EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 824.040000              | 1648.007000                | -52        | -79.3      | -32        |
| 836.400000              | 1672.335000                | -53.5      | -80.8      | -33.5      |
| 848.970000              | 1697.898000                | -49.4      | -76.7      | -29.4      |
| 824.040000              | 2471.796000                | -52.5      | -79.8      | -32.5      |
| 836.400000              | 2509.381000                | -54.7      | -82        | -34.7      |
| 848.970000              | 2547.292000                | -55        | -82.3      | -35        |
| 824.040000              | 3296.111000                | -54.8      | -82.1      | -34.8      |
| 836.400000              | 3345.417000                | -54.8      | -82.1      | -34.8      |
| 848.970000              | 3395.495000                | -55.2      | -82.5      | -35.2      |
| 824.040000              | 4119.859000                | -56        | -83.3      | -36        |
| 836.400000              | 4182.119000                | -55.4      | -82.7      | -35.4      |
| 848.970000              | 4244.615000                | -55.5      | -82.8      | -35.5      |
| 824.040000              | 4943.989000                | -54.8      | -82.1      | -34.8      |
| 836.400000              | 5018.454000                | -54.8      | -82.1      | -34.8      |
| 848.970000              | 5093.831000                | -55        | -82.3      | -35        |
| 824.040000              | 5768.752000                | -54.9      | -82.2      | -34.9      |
| 836.400000              | 5855.105000                | -50        | -77.3      | -30        |
| 848.970000              | 5942.448000                | -49.2      | -76.5      | -29.2      |
| 824.040000              | 6592.578000                | -49        | -76.3      | -29        |
| 836.400000              | 6690.800000                | -49.6      | -76.9      | -29.6      |
| 848.970000              | 6791.638000                | -48.9      | -76.2      | -28.9      |
| 824.040000              | 7416.765000                | -49.3      | -76.6      | -29.3      |
| 836.400000              | 7527.145000                | -50.2      | -77.5      | -30.2      |
| 848.970000              | 7640.366000                | -49.1      | -76.4      | -29.1      |
| 824.040000              | 8240.343000                | -49.4      | -76.7      | -29.4      |
| 836.400000              | 8363.900000                | -49        | -76.3      | -29        |
| 848.970000              | 8489.284000                | -50.1      | -77.4      | -30.1      |
| 824.040000              | 9064.311000                | -48.9      | -76.2      | -28.9      |
| 836.400000              | 9200.307000                | -49.9      | -77.2      | -29.9      |
| 848.970000              | 9339.050000                | -49.5      | -76.8      | -29.5      |
| 824.040000              | 9888.340000                | -49.2      | -76.5      | -29.2      |
| 836.400000              | 10036.524000               | -49.9      | -77.2      | -29.9      |
| 848.970000              | 10187.860000               | -49.6      | -76.9      | -29.6      |
| 824.040000              | 10712.053000               | -49.6      | -76.9      | -29.6      |
| 836.400000              | 10872.857000               | -49.5      | -76.8      | -29.5      |
| 848.970000              | 11036.664000               | -48.6      | -75.9      | -28.6      |
| 824.040000              | 11536.166000               | -49.4      | -76.7      | -29.4      |
| 836.400000              | 11709.186000               | -49.5      | -76.8      | -29.5      |
| 848.970000              | 11885.162000               | -48.9      | -76.2      | -28.9      |
| 824.040000              | 12360.564000               | -48.8      | -76.1      | -28.8      |
| 836.400000              | 12546.180000               | -44.7      | -72        | -24.7      |
| 848.970000              | 12734.723000               | -44.8      | -72.1      | -24.8      |

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
 g0190130: 2001-Sep-25 Tue 14:27:00  
 STATE: 2:Low Power TDMA1900

| FREQUENCY TUNED,<br>MHz | FREQUENCY<br>EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 1850.040000             | 3699.585000                | -54.1      | -81.4      | -41.1      |
| 1879.980000             | 3760.045000                | -56.1      | -83.4      | -43.1      |
| 1909.920000             | 3820.225000                | -55.4      | -82.7      | -42.4      |
| 1850.040000             | 5550.467000                | -55.6      | -82.9      | -42.6      |
| 1879.980000             | 5639.933000                | -54.8      | -82.1      | -41.8      |
| 1909.920000             | 5729.512000                | -54.8      | -82.1      | -41.8      |
| 1850.040000             | 7400.519000                | -49.9      | -77.2      | -36.9      |
| 1879.980000             | 7520.231000                | -49.6      | -76.9      | -36.6      |
| 1909.920000             | 7639.627000                | -49.7      | -77        | -36.7      |
| 1850.040000             | 9250.004000                | -49        | -76.3      | -36        |
| 1879.980000             | 9400.347000                | -49        | -76.3      | -36        |
| 1909.920000             | 9549.552000                | -47.9      | -75.2      | -34.9      |
| 1850.040000             | 11099.768000               | -49.7      | -77        | -36.7      |
| 1879.980000             | 11280.125000               | -49.3      | -76.6      | -36.3      |
| 1909.920000             | 11459.143000               | -49.4      | -76.7      | -36.4      |
| 1850.040000             | 12950.720000               | -44.5      | -71.8      | -31.5      |
| 1879.980000             | 13159.886000               | -44.6      | -71.9      | -31.6      |
| 1909.920000             | 13369.895000               | -44.9      | -72.2      | -31.9      |
| 1850.040000             | 14800.557000               | -43.4      | -70.7      | -30.4      |
| 1879.980000             | 15040.119000               | -43.2      | -70.5      | -30.2      |
| 1909.920000             | 15279.137000               | -43.2      | -70.5      | -30.2      |
| 1850.040000             | 16650.086000               | -42.4      | -69.7      | -29.4      |
| 1879.980000             | 16919.972000               | -43.8      | -71.1      | -30.8      |
| 1909.920000             | 17189.026000               | -43.6      | -70.9      | -30.6      |
| 1850.040000             | 18500.203000               | -42.5      | -69.8      | -29.5      |
| 1879.980000             | 18800.258000               | -37.8      | -65.1      | -24.8      |
| 1909.920000             | 19098.809000               | -38.2      | -65.5      | -25.2      |
| 1850.040000             | 20350.882000               | -34.6      | -61.9      | -21.6      |
| 1879.980000             | 20679.859000               | -36.4      | -63.7      | -23.4      |
| 1909.920000             | 21009.491000               | -35.9      | -63.2      | -22.9      |

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)

g0190139: 2001-Sep-26 Wed 10:42:00

STATE: 2:High Power TDMA1900

| FREQUENCY TUNED,<br>MHz | FREQUENCY<br>EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 1850.040000             | 3699.851000                | -55.6      | -83.3      | -35.6      |
| 1879.980000             | 3760.316000                | -56.3      | -84        | -36.3      |
| 1909.920000             | 3819.649000                | -56.5      | -84.2      | -36.5      |
| 1850.040000             | 5549.727000                | -56        | -83.7      | -36        |
| 1879.980000             | 5639.469000                | -55.5      | -83.2      | -35.5      |
| 1909.920000             | 5729.804000                | -55.2      | -82.9      | -35.2      |
| 1850.040000             | 7400.175000                | -49.6      | -77.3      | -29.6      |
| 1879.980000             | 7520.324000                | -50.6      | -78.3      | -30.6      |
| 1909.920000             | 7639.955000                | -49.9      | -77.6      | -29.9      |
| 1850.040000             | 9250.159000                | -50.2      | -77.9      | -30.2      |
| 1879.980000             | 9399.610000                | -48.9      | -76.6      | -28.9      |
| 1909.920000             | 9549.730000                | -50.1      | -77.8      | -30.1      |
| 1850.040000             | 11099.915000               | -50.3      | -78        | -30.3      |
| 1879.980000             | 11279.477000               | -49.8      | -77.5      | -29.8      |
| 1909.920000             | 11459.661000               | -49.8      | -77.5      | -29.8      |
| 1850.040000             | 12950.614000               | -45.4      | -73.1      | -25.4      |
| 1879.980000             | 13160.035000               | -45.5      | -73.2      | -25.5      |
| 1909.920000             | 13368.962000               | -45.2      | -72.9      | -25.2      |
| 1850.040000             | 14800.203000               | -44.6      | -72.3      | -24.6      |
| 1879.980000             | 15039.968000               | -43.9      | -71.6      | -23.9      |
| 1909.920000             | 15279.269000               | -44.6      | -72.3      | -24.6      |
| 1850.040000             | 16650.198000               | -44.4      | -72.1      | -24.4      |
| 1879.980000             | 16919.939000               | -44        | -71.7      | -24        |
| 1909.920000             | 17188.944000               | -43.9      | -71.6      | -23.9      |
| 1850.040000             | 18500.400000               | -43.7      | -71.4      | -23.7      |
| 1879.980000             | 18799.837000               | -38.5      | -66.2      | -18.5      |
| 1909.920000             | 19099.629000               | -38.3      | -66        | -18.3      |
| 1850.040000             | 20350.731000               | -37.1      | -64.8      | -17.1      |
| 1879.980000             | 20680.126000               | -36.7      | -64.4      | -16.7      |
| 1909.920000             | 21009.170000               | -37.2      | -64.9      | -17.2      |

PERFORMED BY:

  
 Doug Noble, B.A.S. E.E.T.

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NAME OF TEST: Field Strength of Spurious Radiation

SPECIFICATION: 47 CFR 2.1053(a)

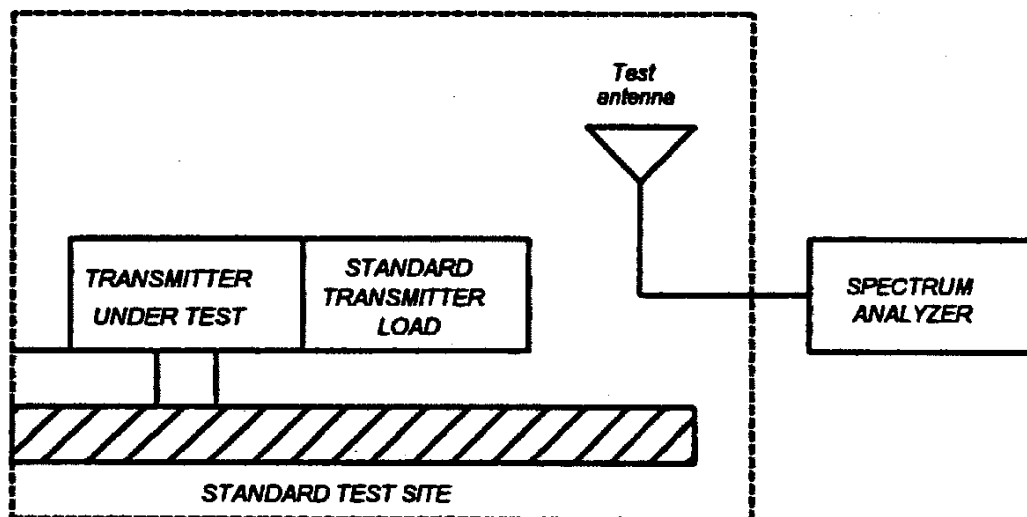
GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 1.2.12

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

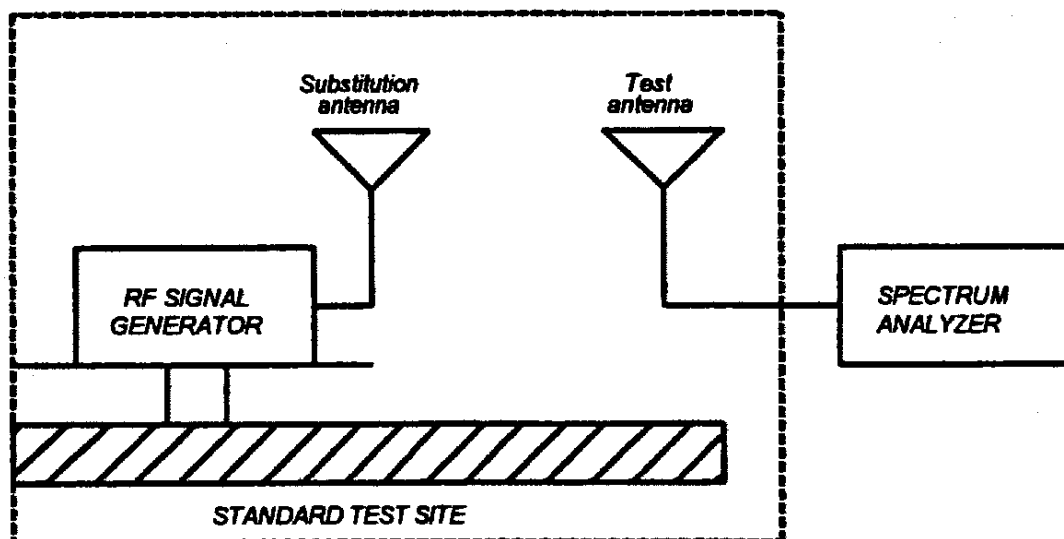
- A) Connect the equipment as illustrated
- B) Adjust the spectrum analyzer for the following settings:
  - 1) Resolution Bandwidth  $\leq 3$  kHz.
  - 2) Video Bandwidth  $\geq 10$  kHz
  - 3) Sweep Speed  $\leq 2000$  Hz/second
  - 4) Detector Mode = Positive Peak
- C) Place the transmitter to be tested 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.)

- D) For each spurious measurement the test antenna should be adjusted to the correct length for the frequency involved. This length may be determined from a calibration ruler supplied with the equipment. Measurements shall be made from the lowest radio frequency generated in the equipment to the tenth harmonic of the carrier, except for the region close to the carrier equal to  $\pm$  the test bandwidth (see section 1.3.4.4).
- E) For each spurious frequency, raise and lower the test antenna from 1 m to 4 m to obtain a maximum reading on the spectrum analyzer with the test antenna at horizontal polarity. Repeat this procedure to obtain the highest possible reading. Record this maximum reading.
- F) Repeat step E) for each spurious frequency with the test antenna polarized vertically.



- G) Reconnect the equipment as illustrated.
- H) Keep the spectrum analyzer adjusted as in step B).
- I) Remove the transmitter and replace it with a substitution antenna (the antenna should be half-wavelength for each frequency involved). The center of the substitution antenna should be approximately at the same location as the center of the transmitter. At lower frequencies, where the substitution antenna is very long, this will be impossible to achieve when the antenna is polarized vertically. In such case the lower end of the antenna should be 0.3 m above the ground.

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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 EMC0 3109-B 25MHz-300MHz                       | 2336       | 12 mo. | Sep-01   |
| i00065 EMC0 3301-B Active Monopole                    | 2635       | 12 mo. | Sep-01   |
| i00089 Aprel 2001 200MHz-1GHz                         | 001500     | 12 mo. | Sep-01   |
| i00103 EMC0 3115 1GHz-18GHz                           | 9208-3925  | 12 mo. | Sep-01   |
| <u>AMPLIFIER</u>                                      |            |        |          |
| i00028 HP 8449A                                       | 2749A00121 | 12 mo. | Mar-01   |
| <u>SPECTRUM ANALYZER</u>                              |            |        |          |
| i00029 HP 8563E                                       | 3213A00104 | 12 mo. | Aug-01   |
| i00033 HP 85462A                                      | 3625A00357 | 12 mo. | May-01   |
| i00048 HP 8566B                                       | 2511AD1467 | 6 mo.  | Nov-01   |

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NAME OF TEST:

Field Strength of Spurious Radiation

STATE: 2:High Power AMPS g0190134: 2001-Sep-26 Wed 08:01:00

| FREQUENCY<br>TUNED, MHz | FREQUENCY<br>EMISSION, MHz | METER,<br>dBuV | CF, dB | ERP, dBm | ERP, dbc |
|-------------------------|----------------------------|----------------|--------|----------|----------|
| 836.400000              | 1672.800833                | 55.67          | -0.38  | -42.1    | ≤-67     |
| 836.400000              | 2509.200833                | 53             | 3.06   | -41.3    | ≤-67     |
| 836.400000              | 3345.608333                | 43.17          | 5.7    | -48.5    | ≤-67     |
| 836.400000              | 4182.015833                | 40.67          | 7.53   | -49.2    | ≤-67     |
| 836.400000              | 5018.408333                | 34.83          | 9.26   | -53.3    | ≤-67     |
| 836.400000              | 5854.810833                | 34.5           | 10.78  | -52.1    | ≤-67     |
| 836.400000              | 6691.220666                | 36.33          | 12.2   | -48.8    | ≤-67     |
| 836.400000              | 7527.620166                | 33.83          | 13.5   | -50      | ≤-67     |
| 836.400000              | 8364.020166                | 33.67          | 14.55  | -49.2    | ≤-67     |

STATE: 2:High Power TDMA800 g0190140: 2001-Sep-26 Wed 09:31:00

| FREQUENCY<br>TUNED, MHz | FREQUENCY<br>EMISSION, MHz | METER,<br>dBuV | CF, dB | ERP, dBm | ERP, dbc |
|-------------------------|----------------------------|----------------|--------|----------|----------|
| 836.400000              | 1672.788333                | 56.67          | -0.38  | -41.1    | ≤-65.6   |
| 836.400000              | 2509.196667                | 57.5           | 3.06   | -36.8    | ≤-65.6   |
| 836.400000              | 3345.567500                | 45.5           | 5.7    | -46.2    | ≤-65.6   |
| 836.400000              | 4181.993333                | 41.5           | 7.53   | -48.3    | ≤-65.6   |
| 836.400000              | 5018.414167                | 38.67          | 9.26   | -49.4    | ≤-65.6   |
| 836.400000              | 5854.827500                | 37             | 10.78  | -49.6    | ≤-65.6   |
| 836.400000              | 6691.264167                | 38.33          | 12.2   | -46.8    | ≤-65.6   |
| 836.400000              | 7527.673333                | 38.33          | 13.5   | -45.5    | ≤-65.6   |
| 836.400000              | 8364.010833                | 36.33          | 14.55  | -46.5    | ≤-65.6   |

STATE: 2:High Power TDMA1900 g0190141: 2001-Sep-26 Wed 11:53:00

| FREQUENCY<br>TUNED, MHz | FREQUENCY<br>EMISSION, MHz | METER,<br>dBuV | CF, dB | EIRP,<br>dBm | EIRP,<br>dbc |
|-------------------------|----------------------------|----------------|--------|--------------|--------------|
| 1879.980000             | 3759.976667                | 57.67          | 6.61   | -30.9        | ≤-58.4       |
| 1879.980000             | 5640.040000                | 53             | 10.4   | -31.8        | ≤-58.4       |
| 1879.980000             | 7519.773333                | 45.83          | 13.49  | -35.9        | ≤-58.4       |
| 1879.980000             | 9399.913333                | 43.5           | 15.51  | -36.2        | ≤-58.4       |
| 1879.980000             | 11279.903333               | 44.33          | 17.4   | -33.5        | ≤-58.4       |
| 1879.980000             | 13159.900000               | 35.33          | 17.62  | -42.3        | ≤-58.4       |
| 1879.980000             | 15039.846667               | 36             | 18.19  | -41          | ≤-58.4       |
| 1879.980000             | 16919.806667               | 35.83          | 19.65  | -39.7        | ≤-58.4       |

PERFORMED BY:

  
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PAGE NO. 68 of 72.  
NAME OF TEST: Frequency Stability (Temperature Variation)  
SPECIFICATION: 47 CFR 2.1055(a)(1)  
TEST CONDITIONS: As Indicated  
TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

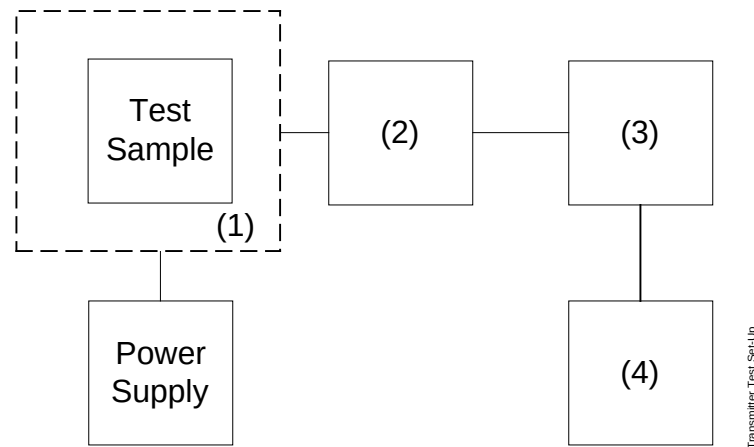
1. The EUT and test equipment were set up as shown on the following page.
2. With all power removed, the temperature was decreased to  $-30^{\circ}\text{C}$  and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
3. With power OFF, the temperature was raised in  $10^{\circ}\text{C}$  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



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

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NAME OF TEST: Frequency Stability (Temperature Variation)

TEMPERATURE EXTREMES @ NOMINAL VOLTAGE

| Temp., °C | BAND     | CHANNEL | MAX ERROR (Hz) |
|-----------|----------|---------|----------------|
| -30       | AMPS     | 384     | 343            |
| -20       | AMPS     | 384     | 347            |
| -10       | AMPS     | 384     | 346            |
| 0         | AMPS     | 384     | 338            |
| 10        | AMPS     | 384     | 334            |
| 20        | AMPS     | 384     | 333            |
| 30        | AMPS     | 384     | 330            |
| 40        | AMPS     | 384     | 326            |
| 50        | AMPS     | 384     | 335            |
| -30       | TDMA800  | 384     | 10             |
| -20       | TDMA800  | 384     | 8              |
| -10       | TDMA800  | 384     | 16             |
| 0         | TDMA800  | 384     | 7              |
| 10        | TDMA800  | 384     | 11             |
| 20        | TDMA800  | 384     | 16             |
| 30        | TDMA800  | 384     | 9              |
| 40        | TDMA800  | 384     | 8              |
| 50        | TDMA800  | 384     | 9              |
| -30       | TDMA1900 | 1000    | 15             |
| -20       | TDMA1900 | 1000    | 26             |
| -10       | TDMA1900 | 1000    | 21             |
| 0         | TDMA1900 | 1000    | 22             |
| 10        | TDMA1900 | 1000    | 25             |
| 20        | TDMA1900 | 1000    | 27             |
| 30        | TDMA1900 | 1000    | 14             |
| 40        | TDMA1900 | 1000    | 12             |
| 50        | TDMA1900 | 1000    | 26             |

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NAME OF TEST: Frequency Stability (Voltage Variation)

SPECIFICATION: 47 CFR 2.1055 (b)(1)

TEST EQUIPMENT: As per previous page

#### MEASUREMENT PROCEDURE

1. The EUT was placed in a temperature chamber at  $25\pm5^{\circ}\text{C}$  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.

Voltage Extremes @  $20^{\circ}\text{C}$

| Voltage          | BAND     | CHANNEL | MAX ERROR (Hz) |
|------------------|----------|---------|----------------|
| 3.8V (Nominal)   | AMPS     | 384     | 343            |
| 3.6V (End Point) | AMPS     | 384     | 349            |
| 4.37V (115%)     | AMPS     | 384     | 342            |
| 3.8V (Nominal)   | TDMA800  | 384     | 13             |
| 3.6V (End Point) | TDMA800  | 384     | 11             |
| 4.37V (115%)     | TDMA800  | 384     | 21             |
| 3.8V (Nominal)   | TDMA1900 | 1000    | 25             |
| 3.6V (End Point) | TDMA1900 | 1000    | 24             |
| 4.37V (115%)     | TDMA1900 | 1000    | 54             |

NOTE: 85% of nominal voltage was below battery end point, so only 3 voltages were examined.

PAGE NO. 72 of 72.

NAME OF TEST: Necessary Bandwidth and Emission Bandwidth

SPECIFICATION: 47 CFR 2.202(g)

MODULATION = 40K0F1D

NECESSARY BANDWIDTH:

NECESSARY BANDWIDTH ( $B_N$ ), kHz = 40.0  
(measured at the 99.75% power bandwidth)

MODULATION = 40K0F8W

NECESSARY BANDWIDTH:

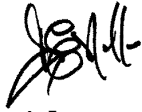
NECESSARY BANDWIDTH ( $B_N$ ), kHz = 40.0  
(measured at the 99.75% power bandwidth)

MODULATION = 30K0DXW

NECESSARY BANDWIDTH:

NECESSARY BANDWIDTH ( $B_N$ ), kHz = 30  
(measured at the 99.75% power bandwidth)

PERFORMED BY:

  
Doug Noble, B.A.S. E.E.T.

END OF TEST REPORT

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.