



M. Flom Associates, Inc. - Global Compliance Center

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

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Date: March 12, 2001

Federal Communications Commission
Via: Electronic Filing

Attention: Authorization & Evaluation Division

Applicant: Nokia Mobile Phones
Equipment: 3360
FCC ID: LJPNPW-1NB
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.' The signature is written in a cursive style with a horizontal line underneath the name.

Morton Flom, P. Eng.

enclosure(s)
cc: Applicant
MF/cvr

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

APPLICANT: Nokia Mobile Phones

FCC ID: LJPNPW-1NB

BY APPLICANT:

1. LETTER OF AUTHORIZATION
2. IDENTIFICATION DRAWINGS, 2.1033(c)(11)
 - LABEL
 - LOCATION OF LABEL
 - COMPLIANCE STATEMENT
 - LOCATION OF COMPLIANCE STATEMENT
3. PHOTOGRAPHS, 2.1033(c)(12)
4. CONFIDENTIALITY REQUEST: 0.457 and 0.459
5. DOCUMENTATION: 2.1033(c)
 - (3) USER MANUAL
 - (9) TUNE UP INFO
 - (10) SCHEMATIC DIAGRAM
 - (10) CIRCUIT DESCRIPTION
 - BLOCK DIAGRAM
 - PARTS LIST
 - ACTIVE DEVICES
6. ATTESTATION: ESN: Section 22.919
7. ATTESTATION: OET: Section 22.933

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: LJPNPW-1NB

MODEL: 3360

Serial Numbers of Units Tested: 235/13948562 and 235/13948594

to

FEDERAL COMMUNICATIONS COMMISSION

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

DATE OF REPORT: February 22, 2001

ON THE BEHALF OF THE APPLICANT:

Nokia Mobile Phones

AT THE REQUEST OF:

P.O. Kare Oksanen 2/19/2001

Nokia Mobile Phones
Elektroniikkatie 10
Fin-90570
Oulu, Finland

Attention of:

Markku Myrskog, Director, Product Creation Center
and/or Olli Kautio, Senior Engineering Manager,
Testing & Type Approvals
olli.kautio@nokia.com
and/or Kare Oksanen, R&D Type Approvals
kare.oksanen@nokia.com
011 358 105051; FAX: 011 358 10505 7222

Morton Flom, P. Eng.

SUPERVISED BY:

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: d0120010

d) Client: Nokia Mobile Phones
Elektroniikkatie 10
Fin-90570
Oulu, Finland

e) Identification: 3360
FCC ID: LJPNPW-1NB
Description: Dual Band, Tri Mode Cellular Telephone

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

g) Report Date: February 22, 2001
EUT Received: February 19, 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.

ACCESSORIES USED DURING TESTING:

| SPECIMEN # | TYPE | MANUFACTURER | SERIAL NO |
|------------|----------------------|--------------|--------------|
| s00919 | EUT | Nokia | 235/13948562 |
| s00920 | EUT | Nokia | 235/13948594 |
| s00913 | Battery BLC-2 | Nokia | |
| s00914 | Battery BMC-3 | Nokia | |
| s00915 | Battery BMC-2 | Nokia | |
| s00916 | Charger ACP-8U | Nokia | |
| s00917 | Desktop Stand DCV-10 | Nokia | |
| s00918 | Headset HDC-5 | Nokia | |

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LIST OF GENERAL INFORMATION REQUIRED FOR CERTIFICATIONIN 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 Mobile Phones
Elektroniikkatie 10
Fin-90570
Oulu, FinlandMANUFACTURER:Nokia Manufacturing Inc U.S.A.
5650 Alliance Gateway
Fort Worth, TX 76155

OR

Nokia tmc Ltd
Yangduck-Dong 973-6
Hwe won-Ku, Masan, Korea(c)(2): FCC ID: LJPNPW-1NBMODEL NO: 3360(c)(3): INSTRUCTION MANUAL(S):

PLEASE SEE ATTACHED EXHIBITS

(c)(4): TYPE OF EMISSION: 40K0F1D, 40K0FXW, 30K0DXW(c)(5): FREQUENCY RANGE, MHz: 824.04 to 848.97
1850.04 to 1909.92(c)(6): POWER RATING, Watts: 0.304 ERP AMPS
0.540 ERP TDMA-AMPS
0.45 EIRP PCS-TDMA
 Switchable Variable N/AFCC 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 Association (A2LA) as shown in the scope below.



THE AMERICAN
ASSOCIATION
FOR LABORATORY
ACCREDITATION

ACCREDITED LABORATORY

A2LA has accredited

M. FLOM ASSOCIATES, INC.

Chandler, AZ

for technical competence in the field of

Electrical (EMC) Testing

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

Presented this 24th day of November, 1998.



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

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



American Association for Laboratory Accreditation

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

M. FLOM ASSOCIATES, INC.
Electronic Testing Laboratory
3356 North San Marcos Place, Suite 107
Chandler, AZ 85225
Morton Flom Phone: 480 926 3100

ELECTRICAL (EMC)

Valid to: December 31, 2000

Certificate Number: 1008-01

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

| Tests | Standard(s) |
|-------------------------|--|
| RF Emissions | FCC Part 15 (Subparts B and C) using ANSI C63.4-1992; CISPR 11; CISPR 13; CISPR 14; CISPR 22; EN 55011; EN 55013; EN 55014; EN 55022; EN 50081-1; EN 50081-2; FCC Part 18; ICES-003; AS/NZS 1044; AS/NZS 1053; AS/NZS 3548; AS/NZS 4251.1; CNS 13439 |
| RF Immunity | EN 50082-1; EN 50082-2; AS/NZS 4251.1 |
| Radiated Susceptibility | EN 61000-4-3; ENV 50140; ENV 50204; IEC 1000-4-3; IEC 801-3 |
| ESD | EN 61000-4-2; IEC 1000-4-2; IEC 801-2 |
| EFT | EN 61000-4-4; IEC 1000-4-4; IEC 801-4 |
| Surge | EN 61000-4-5; ENV 50142; IEC 1000-4-5; IEC 801-5 |
| 47 CFR (FCC) | 2, 21, 22, 23, 24, 74, 80, 87, 90, 95, 97 |

Revised 2/2/2000

Pete Flom

5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8370 • Phone: 301 644 3248 • Fax: 301 662 2974



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

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

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Sub-part

2.1033(c)(14): TEST AND MEASUREMENT DATA

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

- ____ 21 - Domestic Public Fixed Radio Services
- ____ 22 - Public Mobile Services
- 22 Subpart H - Cellular Radiotelephone Service
- ____ 22.901(d) - Alternative technologies and auxiliary services
- ____ 23 - International Fixed Public Radiocommunication services
- 24 - Personal Communications Services
- ____ 74 Subpart H - Low Power Auxiliary Stations
- ____ 80 - Stations in the Maritime Services
- ____ 80 Subpart E - General Technical Standards
- ____ 80 Subpart F - Equipment Authorization for Compulsory Ships
- ____ 80 Subpart K - Private Coast Stations and Marine Utility Stations
- ____ 80 Subpart S - Compulsory Radiotelephone Installations for Small Passenger Boats
- ____ 80 Subpart T - Radiotelephone Installation Required for Vessels on the Great Lakes
- ____ 80 Subpart U - Radiotelephone Installations Required by the Bridge-to-Bridge Act
- ____ 80 Subpart V - Emergency Position Indicating Radiobeacons (EPIRB'S)
- ____ 80 Subpart W - Global Maritime Distress and Safety System (GMDSS)
- ____ 80 Subpart X - Voluntary Radio Installations
- ____ 87 - Aviation Services
- ____ 90 - Private Land Mobile Radio Services
- ____ 94 - Private Operational-Fixed Microwave Service
- ____ 95 Subpart A - General Mobile Radio Service (GMRS)
- ____ 95 Subpart C - Radio Control (R/C) Radio Service
- ____ 95 Subpart D - Citizens Band (CB) Radio Service
- ____ 95 Subpart E - Family Radio Service
- ____ 95 Subpart F - Interactive Video and Data Service (IVDS)
- ____ 97 - Amateur Radio Service
- ____ 101 - Fixed Microwave Services

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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.

PAGE NO. 8 of 74.NAME OF TEST: Carrier Output Power (Conducted)SPECIFICATION: 47 CFR 2.1046(a)TEST EQUIPMENT: As per attached pageMEASUREMENT 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 | R. F. POWER, WATTS Lo | WATTS Hi | dBm |
|-------------------|---------|--------------------------|-------------|------|
| AMPS MODE: | | | | |
| 824.040 | 991 | 0.004 | 0.431 | 26.3 |
| 836.400 | 380 | 0.004 | 0.446 | 26.5 |
| 848.970 | 799 | 0.003 | 0.394 | 26.0 |
| TDMA MODE: | | | | |
| 824.040 | 991 | 0.4 μ | 0.536 | 27.3 |
| 836.400 | 380 | 0.4 μ | 0.553 | 27.4 |
| 848.970 | 799 | 0.4 μ | 0.535 | 27.3 |
| PCS MODE: | | | | |
| 1850.04 | 2 | 0.5 μ | 0.500 | 27.0 |
| 1879.98 | 1000 | 0.4 μ | 0.565 | 27.5 |
| 1909.92 | 1998 | 0.3 μ | 0.550 | 27.4 |

PERFORMED BY:



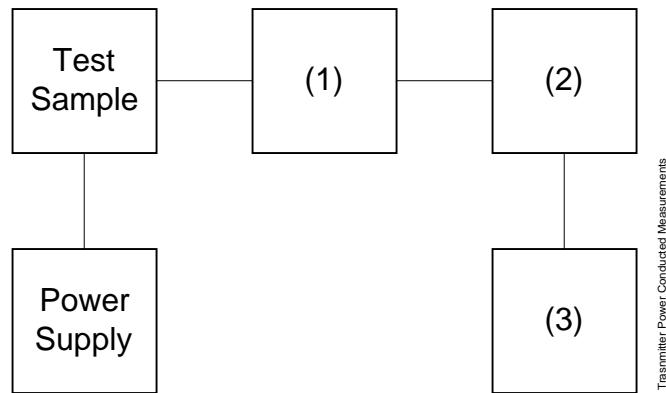
Doug Noble, B.A.S. E.E.T.

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TRANSMITTER POWER CONDUCTED MEASUREMENTS

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



| Asset Description (as applicable) | s/n |
|--------------------------------------|------------|
| (1) COAXIAL ATTENUATOR | |
| i00122 Narda 766-10 | 7802 |
| i00123 Narda 766-10 | 7802A |
| i00069 Bird 8329 (30 dB) | 1006 |
| i00113 Sierra 661A-3D | 1059 |
| (2) POWER METERS | |
| i00014 HP 435A | 1733A05836 |
| i00039 HP 436A | 2709A26776 |
| i00020 HP 8901A POWER MODE | 2105A01087 |
| (3) FREQUENCY COUNTER | |
| i00042 HP 5383A | 1628A00959 |
| i00019 HP 5334B | 2704A00347 |
| i00020 HP 8901A FREQUENCY MODE | 2105A01087 |

PAGE NO. 10 of 74.NAME OF TEST: R. F. Power Output (Radiated)SPECIFICATION: 47 CFR 2.1046(a)TEST EQUIPMENT: As per attached pageMEASUREMENT PROCEDURE (RADIATED)

1. The EUT was placed on an open-field site and its radiated field strength at a known distance was measured by means of a spectrum analyzer. Equivalent loading was calculated from the equation $P_t=((E \times R)^2/49.2)$ ERP watts, $P_t=((E \times R)^2/30)$ EIRP watts where $R = 3m$.
2. Measurement accuracy is ± 1.5 dB.

MEASUREMENT RESULTS

AMPS g0120057: 2001-Feb-20 Tue 08:57:00

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | METER, dBuV | CF, dB | ERP, Watts | ERP, dBm |
|-------------------------|----------------------------|----------------|-----------|---------------|-------------|
| 824.040000 | 824.040000 | 92.4 | 29.6 | 0.2899 | 24.6 |
| 836.400000 | 836.400000 | 92.6 | 29.6 | 0.30355 | 24.8 |
| 848.970000 | 848.970000 | 92.1 | 29.6 | 0.2705 | 24.3 |

AMPS-TDMA g0120059: 2001-Feb-20 Tue 11:07:00

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | METER, dBuV | CF, dB | ERP, Watts | ERP, dBm |
|-------------------------|----------------------------|----------------|-----------|---------------|-------------|
| 824.040000 | 824.068000 | 95.1 | 29.6 | 0.5398 | 27.3 |
| 836.400000 | 836.410000 | 95.1 | 29.6 | 0.5398 | 27.3 |
| 848.970000 | 848.993000 | 95.0 | 29.6 | 0.5275 | 27.2 |

PCS-TDMA g0120088: 2001-Feb-20 Tue 12:52:00

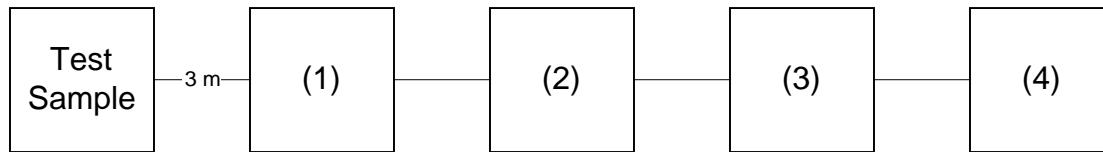
| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | METER, dBuV/m | CF, dB | EIRP, Watts | EIRP, dBm |
|-------------------------|----------------------------|------------------|-----------|----------------|--------------|
| 1850.040000 | 1850.055000 | 81.1 | 40.4 | 0.4238 | 26.3 |
| 1879.980000 | 1879.988000 | 80.6 | 40.6 | 0.3955 | 26.0 |
| 1909.920000 | 1909.920000 | 81.0 | 40.8 | 0.4541 | 26.6 |

SAMPLE CALCULATION:

$$\begin{aligned} \text{dBm} &= \log P_t/0.001 \\ \text{At } 824.4 \text{ MHz, Amps,} &= 10 \log 0.2899/0.001 \\ &= 24.6 \text{ dBm} \end{aligned}$$

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TRANSMITTER RADIATED MEASUREMENTS

Transmitter Radiated Measurements

| Asset Description (as applicable) | s/n |
|--|--|
| (1) <u>TRANSDUCER</u> i00091 Emco 3115 i00089 Aprel Log Periodic | 001469 001500 |
| (2) <u>HIGH PASS FILTER</u> i00 Narda μ PAD (In-Band Only) i00 Trilithic (Out-Of-Band Only) | |
| (3) <u>PREAMP</u> i00028 HP 8449 (+30 dB) | 2749A00121 |
| (4) <u>SPECTRUM ANALYZER</u> i00048 HP 8566B i00043 HP 8558B i00057 HP 8557A i00029 HP 8563E | 2511A01467 2004A02076 1531A00191 3213A00104 |

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NAME OF TEST: Audio Frequency Response

SPECIFICATION: 47 CFR 2.1047(a)

TEST EQUIPMENT: As per previous page

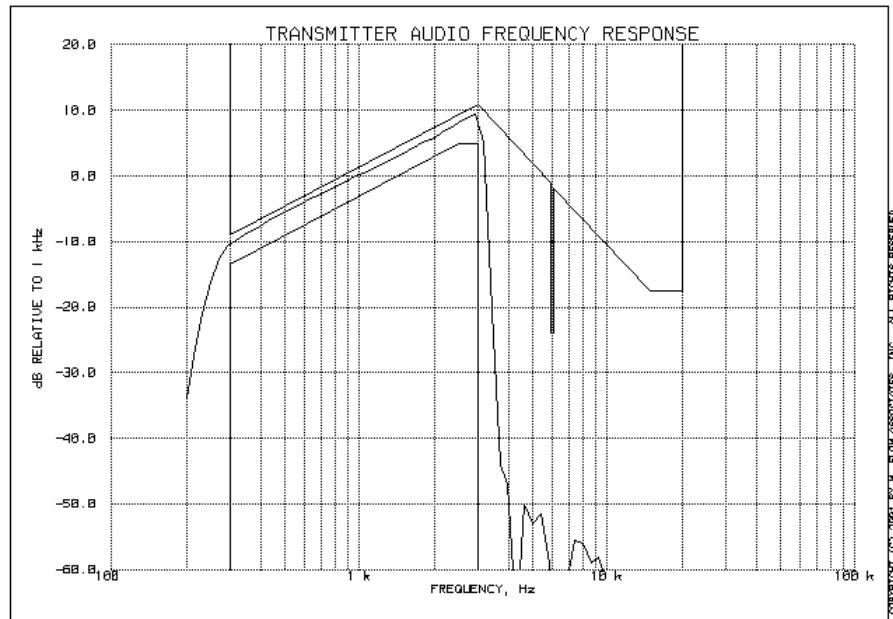
MEASUREMENT PROCEDURE

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

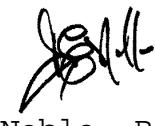
PAGE NO.

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NAME OF TEST: Audio Frequency Response
g0120036: 2001-Feb-19 Mon 10:36:00
STATE: 0:General



PERFORMED BY:



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

PAGE NO. 14 of 74.

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

SPECIFICATION: 47 CFR 2.1047(a)

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

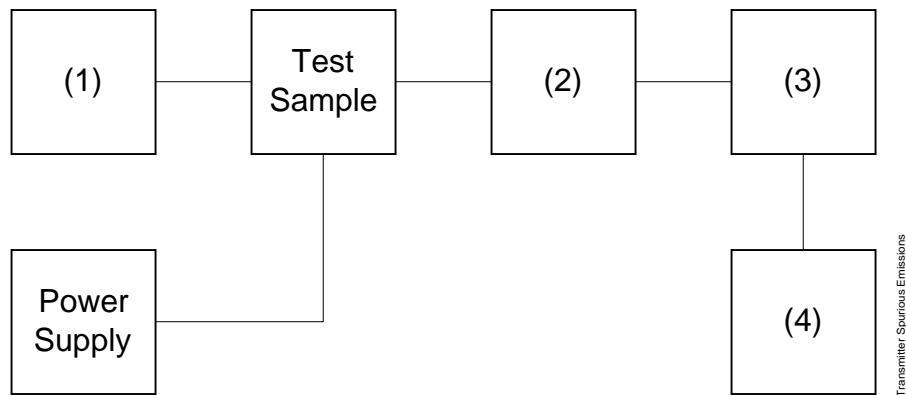
1. The EUT and test equipment were set up such that the audio input was connected at the input to the modulation limiter, and the modulated stage.
2. The audio output was connected at the output to the modulated stage.
3. MEASUREMENT RESULTS: ATTACHED

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TRANSMITTER SPURIOUS EMISSION

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

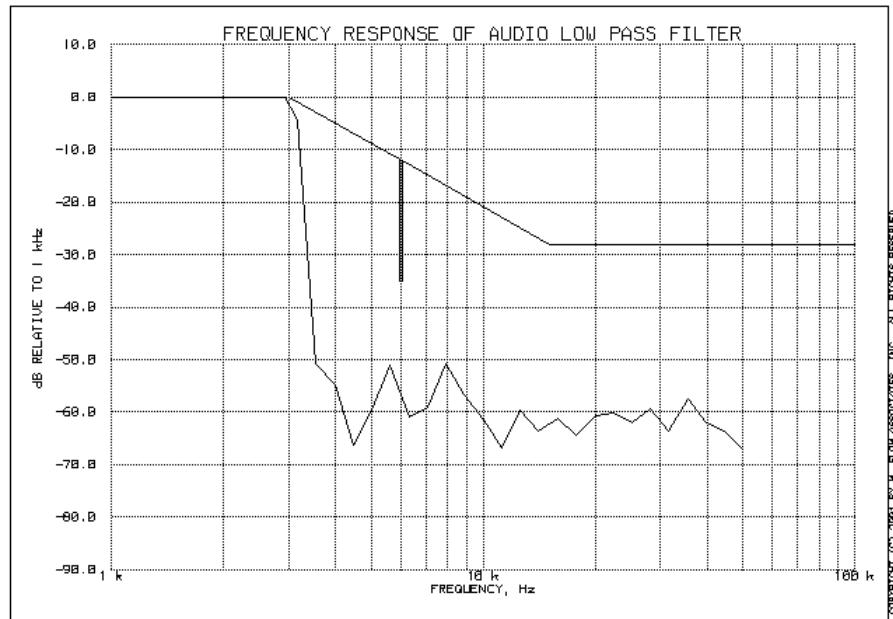


| Asset Description (as applicable) | s/n |
|---------------------------------------|------------|
| (1) <u>AUDIO OSCILLATOR/GENERATOR</u> | |
| i00010 HP 204D | 1105A04683 |
| i00017 HP 8903A | 2216A01753 |
| i00012 HP 3312A | 1432A11250 |
| (2) <u>COAXIAL ATTENUATOR</u> | |
| i00122 Narda 766-10 |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

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NAME OF TEST: Audio Low Pass Filter (Voice Input)
g0120029: 2001-Feb-19 Mon 09:43:00
STATE: 0:General



PERFORMED BY:



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

PAGE NO. 17 of 74.

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 (± 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:

VOICE
 VOICE + SAT

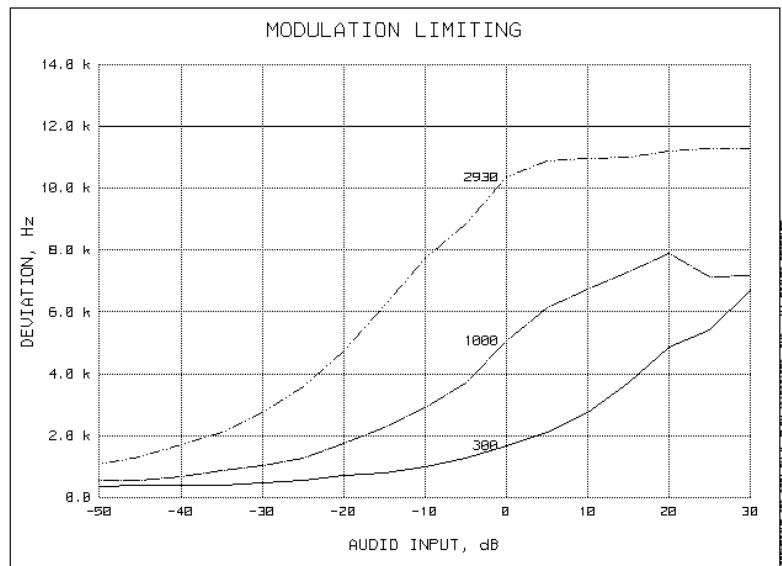
PAGE NO.

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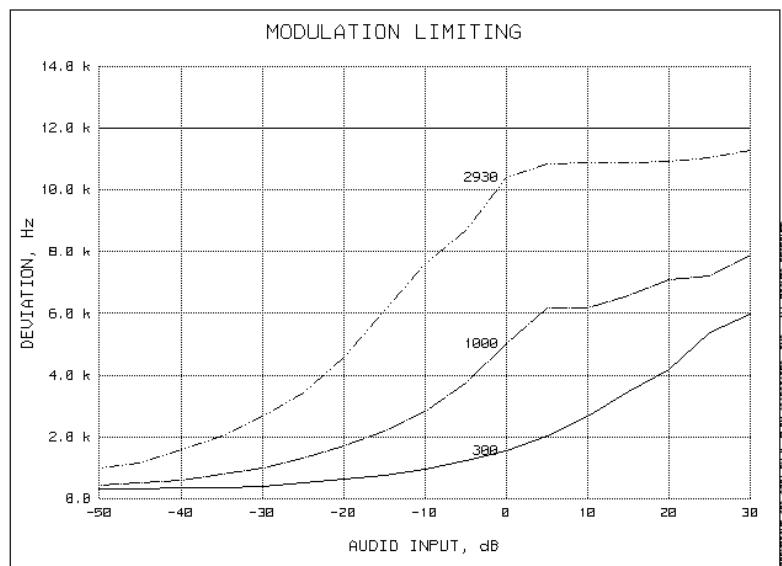
NAME OF TEST: Modulation Limiting
 g0120118: 2001-Feb-23 Fri 13:22:00

VOICE ONLY

Positive
Peaks:



Negative
Peaks:



SUPERVISED BY:



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

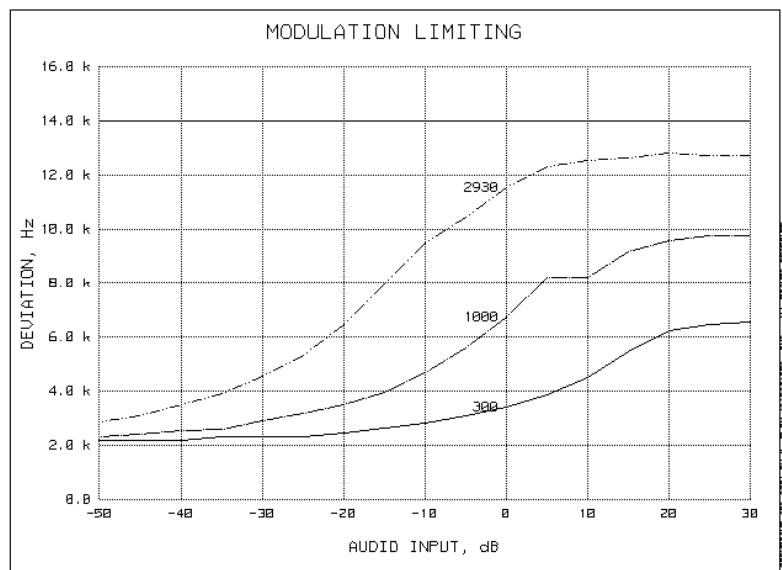
PAGE NO.

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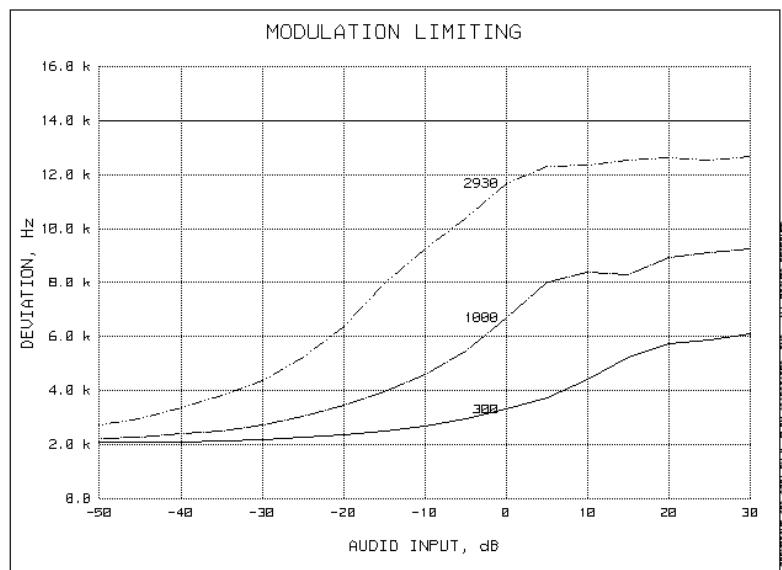
NAME OF TEST: Modulation Limiting
 g0120120: 2001-Feb-23 Fri 13:29:00

VOICE + SAT

Positive
Peaks:



Negative
Peaks:



SUPERVISED BY:



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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

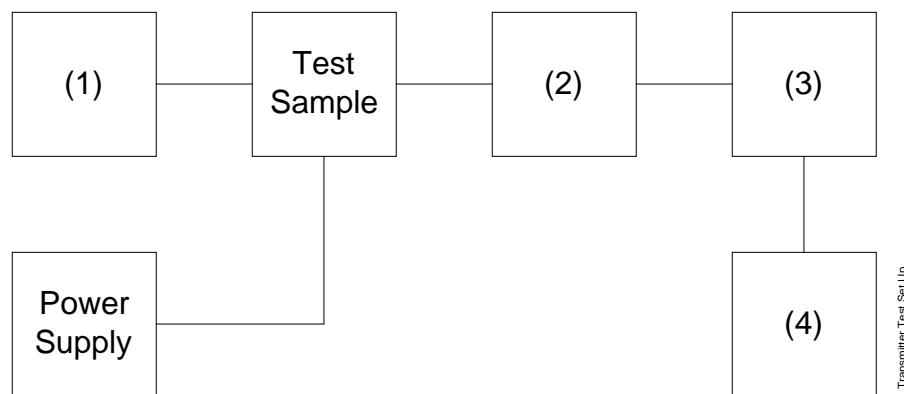
TEST A. MODULATION CAPABILITY/DISTORTION

TEST B. AUDIO FREQUENCY RESPONSE

TEST C. HUM AND NOISE LEVEL

TEST D. RESPONSE OF LOW PASS FILTER

TEST D. RESPONSE OF LOW FRS



Asset Description s/n
(as applicable)

(1) Audio Oscillator

| | | |
|--------|-----------|------------|
| i00010 | HP 204D | 1105A04683 |
| i00017 | HP 8903A | 2216A01753 |
| i00118 | HP 33120A | US36002064 |

| | | |
|------------------------|-------------------|-------|
| (2) COAXIAL ATTENUATOR | | |
| i00122 | NARDA 766-10 | 7802 |
| i00123 | NARDA 766-10 | 7802A |
| i00113 | SIERRA 661A-3D | 1059 |
| i00069 | BIRD 8329 (30 dB) | 10066 |

(3) MODULATION ANALYZER 2105A01087
i00020 HP 8901A

(4) AUDIO ANALYZER 2216A01753
i00017 HP 8903A

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MEASUREMENT SUMMARY: Measurement Of Maximum Deviation

| MODULATION | LIMIT, kHz | DEVIATION, MHz |
|-------------------|----------------------------------|----------------|
| (a) Voice | $\geq 10.8 \text{ & } \leq 13.2$ | 11.4 |
| (b) Wideband Data | $\geq 7.2 \text{ & } \leq 8.8$ | 8.1 |
| (c) SAT | $\geq 1.8 \text{ & } \leq 2.2$ | 2.1 |
| (d) ST | $\geq 7.2 \text{ & } \leq 8.8$ | 7.9 |
| (e) SAT + VOICE | N/A | 12.3 |
| (f) SAT + DTMF | N/A | 10.4 |
| (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 |

PERFORMED BY:


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

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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 ± 2.5 kHz deviation (or 50% modulation). With level constant, the signal level was increased 16 dB.
3. For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.
4. The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.
5. MEASUREMENT RESULTS: ATTACHED

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MEASUREMENT SUMMARY: Emission Masks (Occupied Bandwidth)

| MODULATION | MEASURED DEVIATION ±kHz (HP 8901A) | LIMIT ±kHz | B/W @-26 dB PLOTS, kHz |
|---------------|---------------------------------------|-----------------|---------------------------|
| NONE | 0.0 | 0.0 | 0.0 |
| VOICE | 11.4 | ≥ 10.8 & ≤ 13.2 | 26 |
| WIDEBAND DATA | 8.1 | ≥ 7.2 & ≤ 8.8 | 30 |
| SAT + VOICE | 12.3 | N/A | 28 |
| SAT + DTMF | 3.3 | N/A | 26 |
| CDMA | N/A | N/A | N/A |
| TDMA | N/A | N/A | 28 |
| NAMPS | N/A | N/A | N/A |

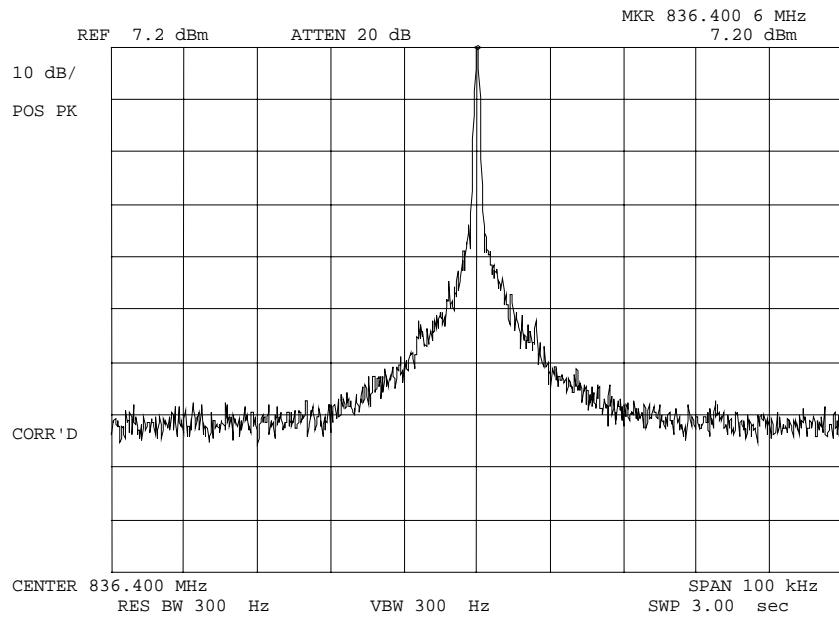
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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120061: 2001-Feb-19 Mon 12:01:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: NONE

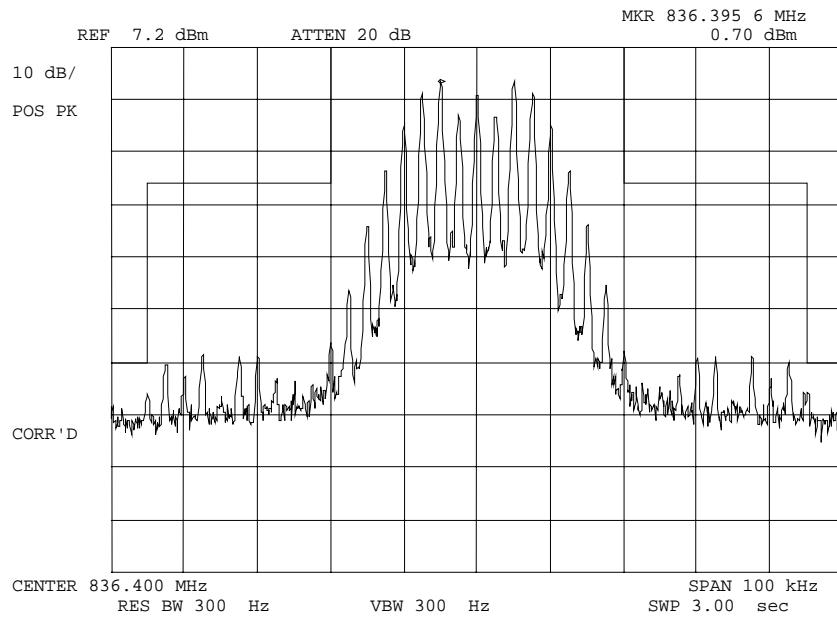
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120062: 2001-Feb-19 Mon 12:04:00
 STATE: 1:Low Power



POWER:
 MODULATION:

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

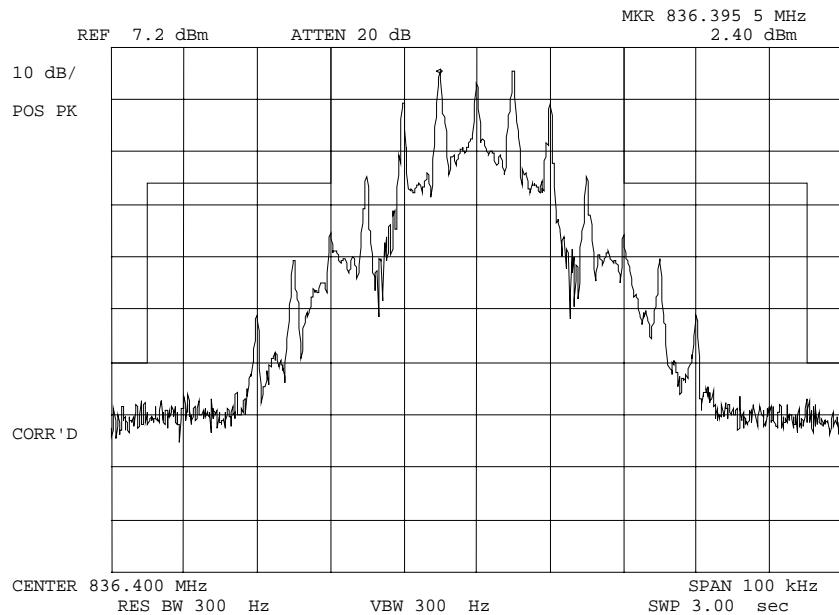
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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120073: 2001-Feb-19 Mon 13:42:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: WBD
 MASK: AMPS CELLULAR,
 F3E/F3D w/LPF

PERFORMED BY:

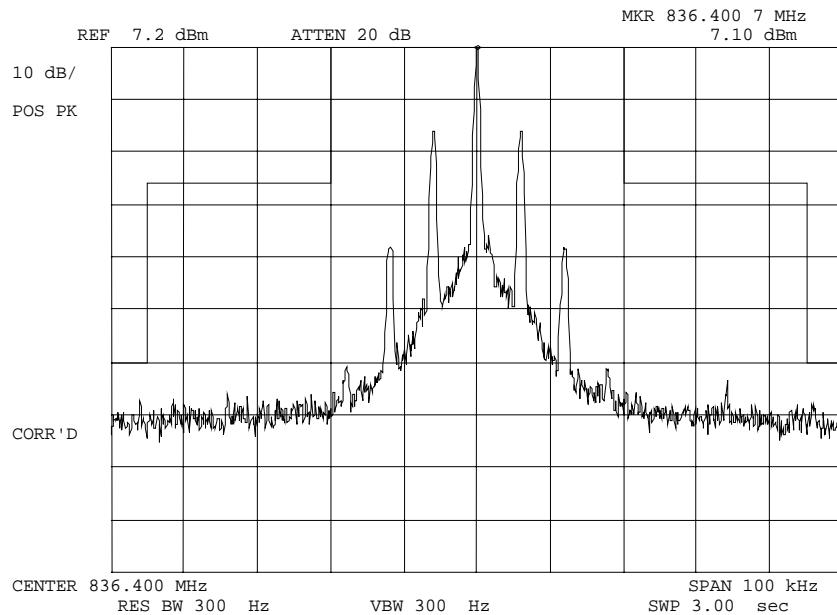


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120066: 2001-Feb-19 Mon 12:10:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: SAT
 MASK: AMPS CELLULAR,
 F3E/F3D w/LPF

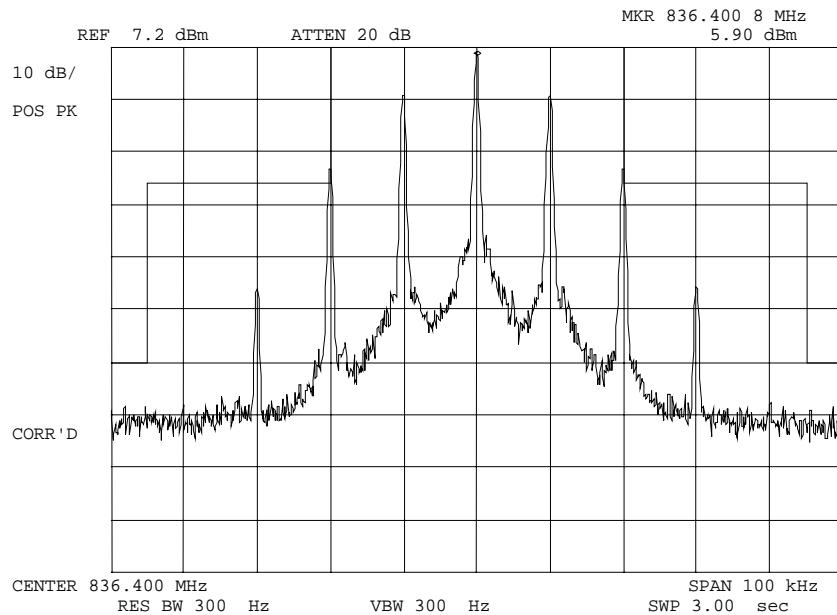
PERFORMED BY:

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120070: 2001-Feb-19 Mon 12:16:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: ST
 MASK: AMPS CELLULAR,
 F3E/F3D w/LPF

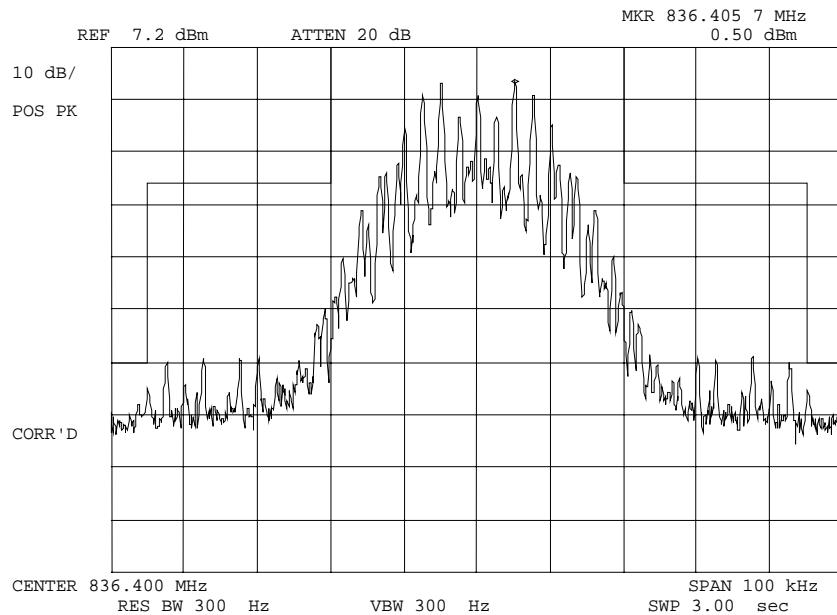
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120065: 2001-Feb-19 Mon 12:08:00
 STATE: 1:Low Power



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

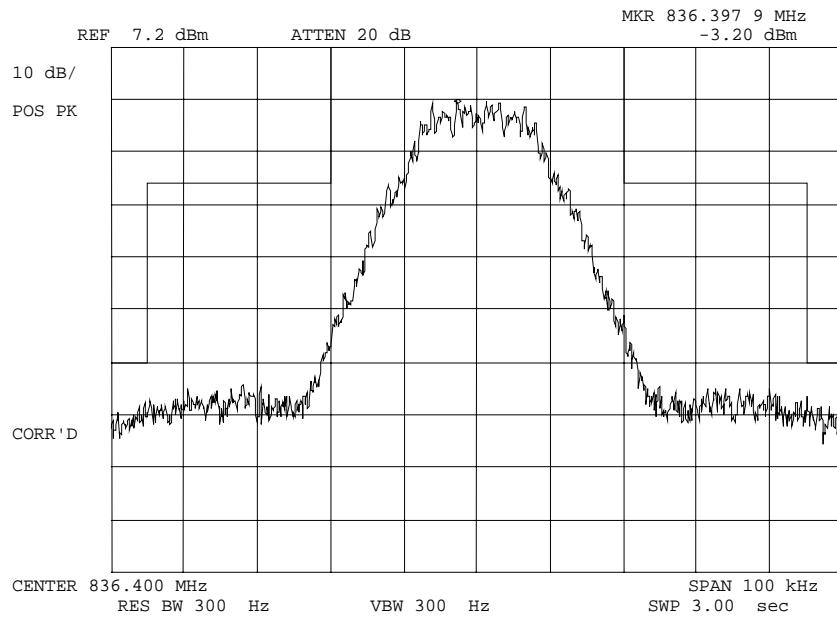
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120069: 2001-Feb-19 Mon 12:14:00
 STATE: 1:Low Power



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

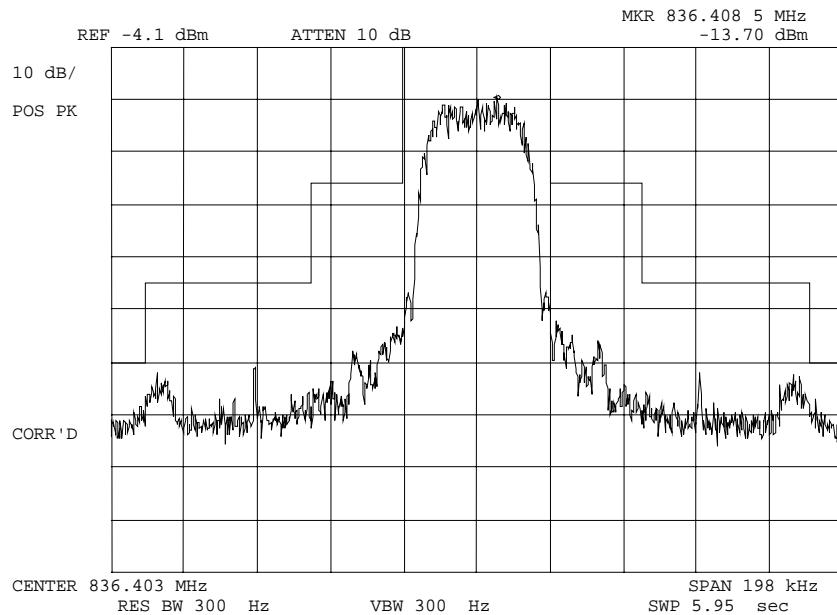
PERFORMED BY:

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120075: 2001-Feb-19 Mon 14:29:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: TDMA AMPS
 MASK: AMPS CELLULAR, F1D,
 DATA

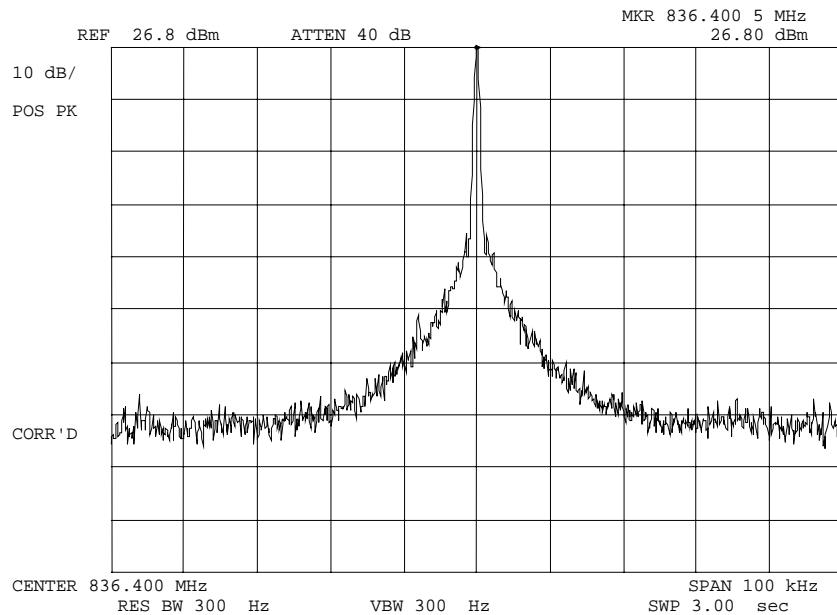
PERFORMED BY:


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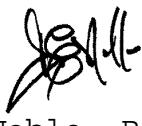
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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120060: 2001-Feb-19 Mon 12:00:00
 STATE: 2:High Power



POWER: HIGH
 MODULATION: NONE

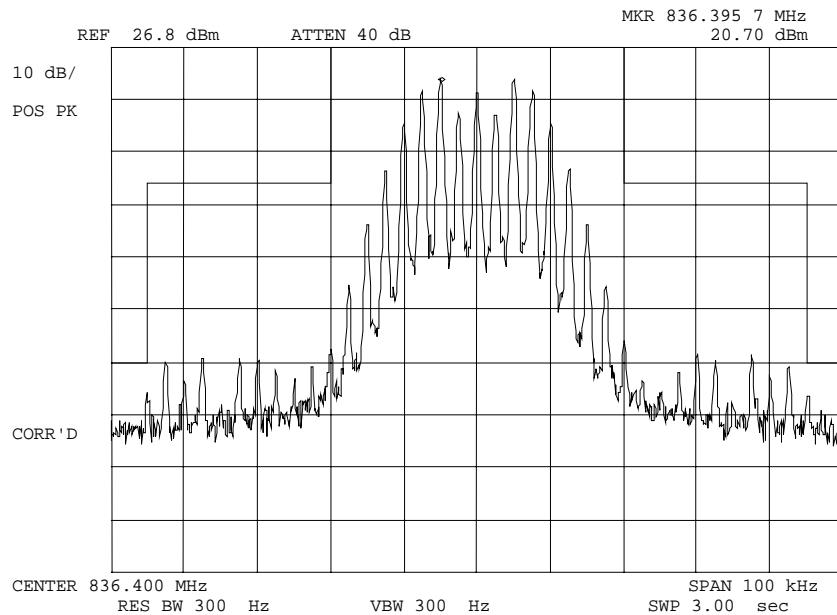
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120063: 2001-Feb-19 Mon 12:05:00
 STATE: 2:High Power



POWER:
 MODULATION:

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

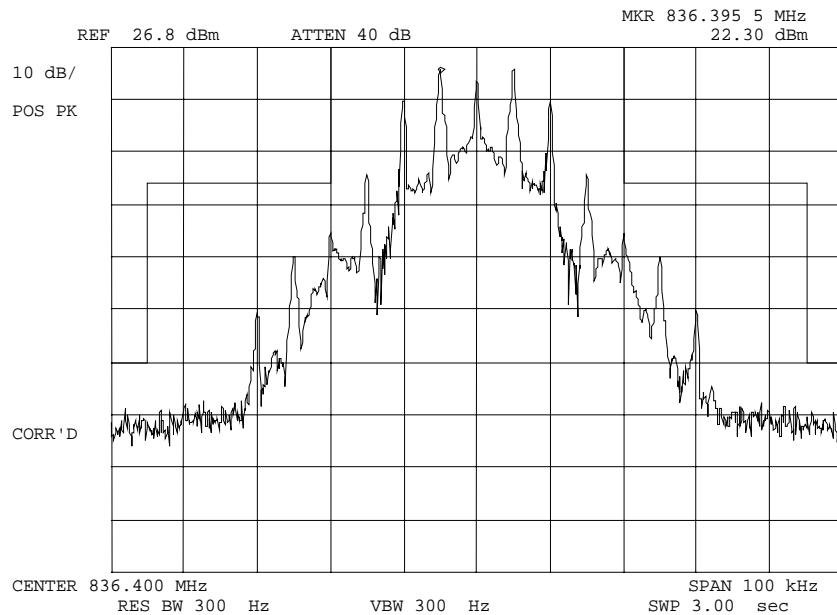
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120072: 2001-Feb-19 Mon 13:37:00
 STATE: 2:High Power



POWER: HIGH
 MODULATION: WBD
 MASK: AMPS CELLULAR,
 F3E/F3D w/LPF

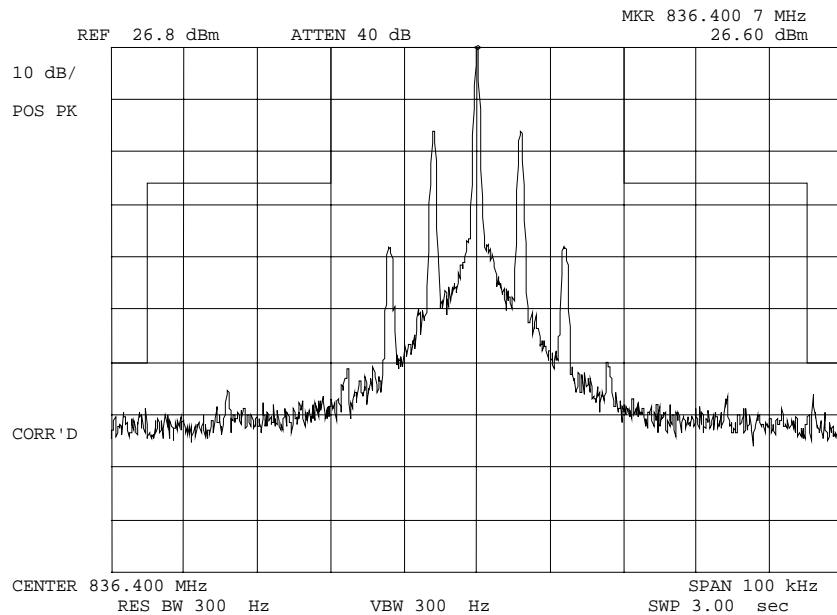
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120067: 2001-Feb-19 Mon 12:11:00
 STATE: 2:High Power



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

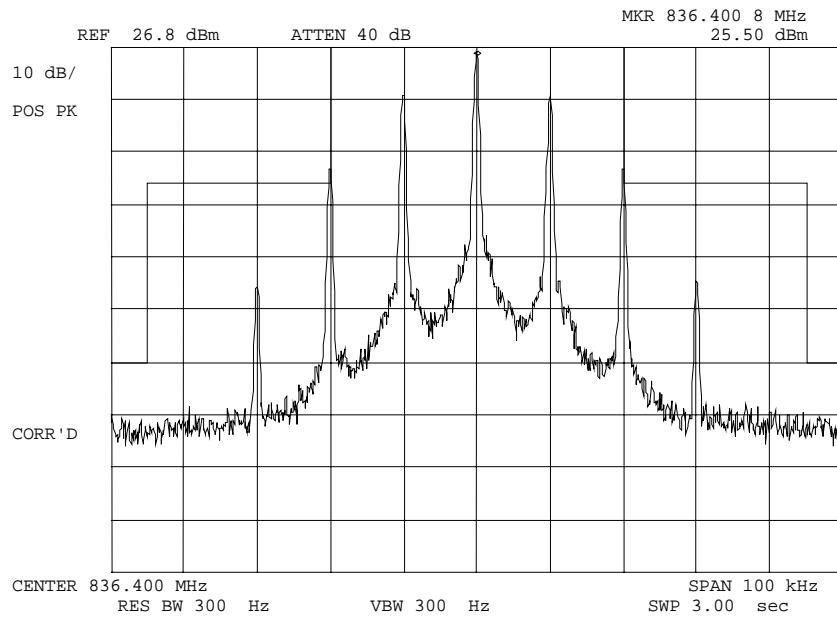
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120071: 2001-Feb-19 Mon 12:17:00
 STATE: 2:High Power



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

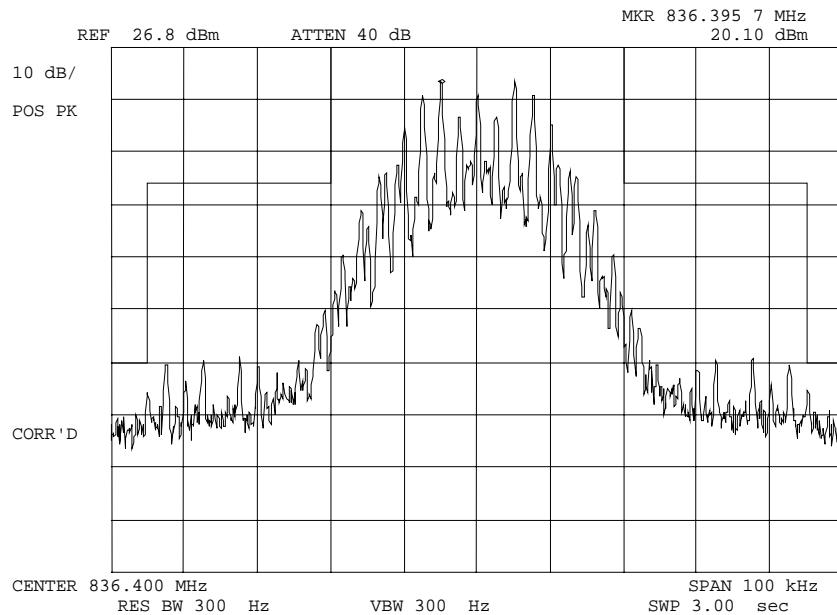
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120064: 2001-Feb-19 Mon 12:07:00
 STATE: 2:High Power



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

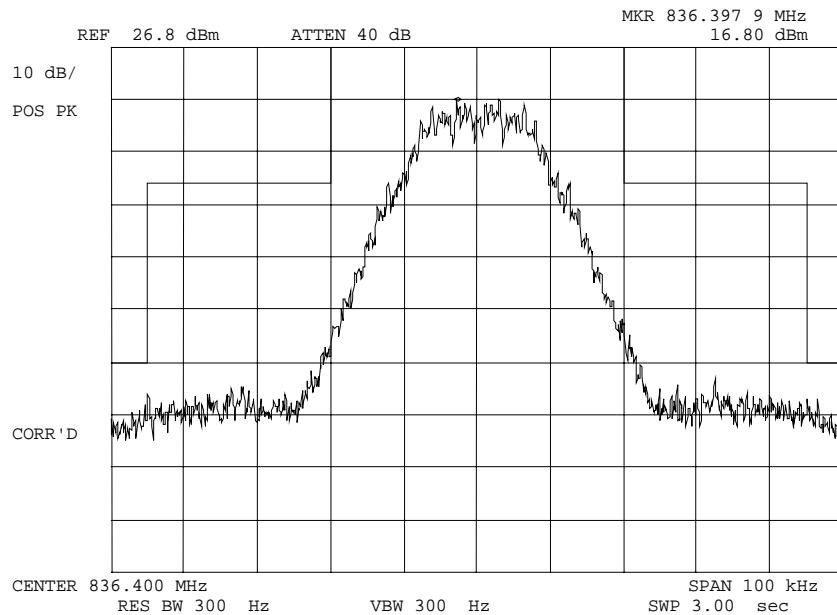
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120068: 2001-Feb-19 Mon 12:12:00
 STATE: 2:High Power



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

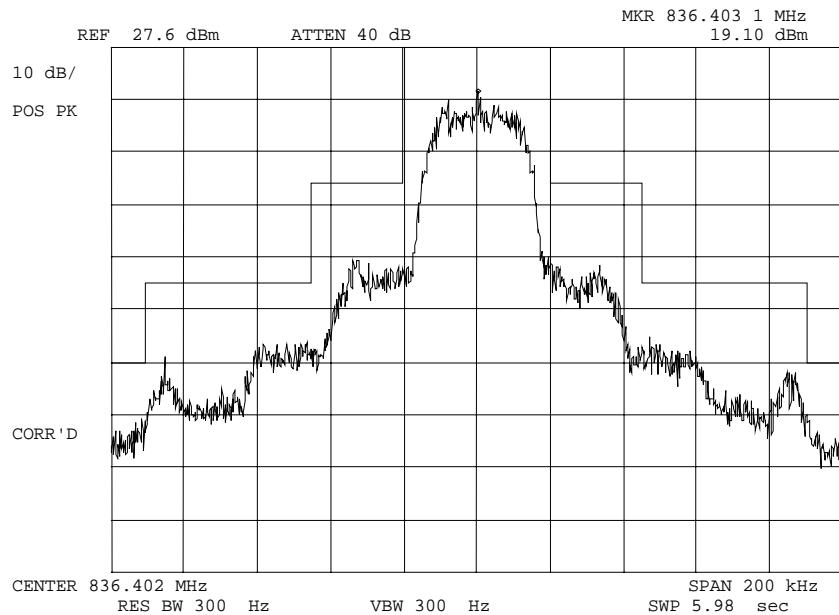
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120074: 2001-Feb-19 Mon 14:24:00
 STATE: 2:High Power



POWER: HIGH
 MODULATION: TDMA AMPS
 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:

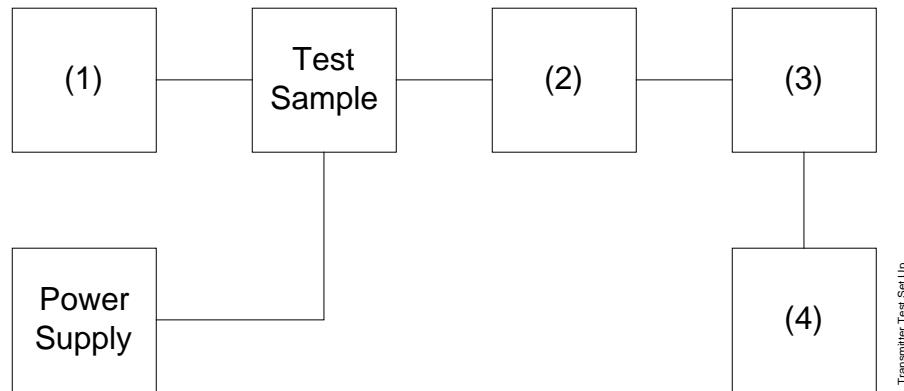

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TRANSMITTER SPURIOUS EMISSION

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

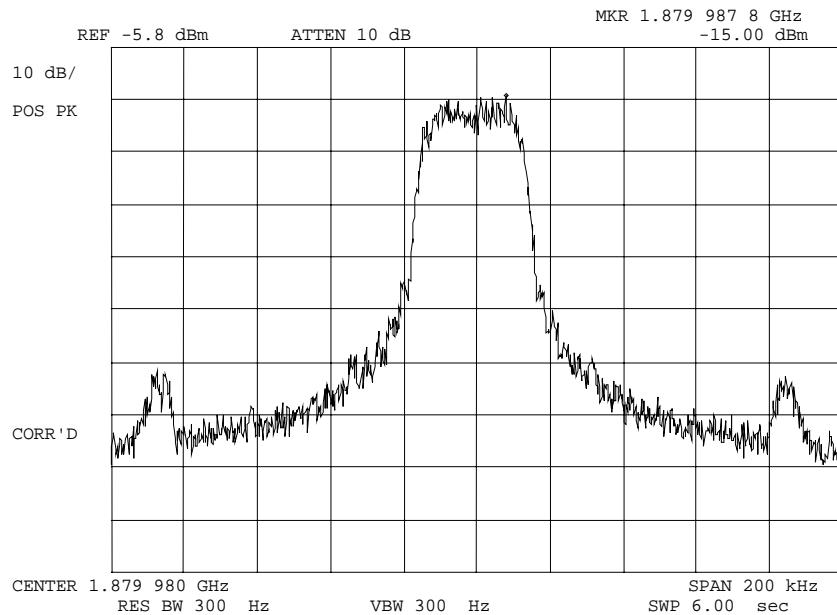


| Asset Description (as applicable) | s/n |
|---------------------------------------|------------|
| (1) <u>AUDIO OSCILLATOR/GENERATOR</u> | |
| i00010 HP 204D | 1105A04683 |
| i00017 HP 8903A | 2216A01753 |
| i00012 HP 3312A | 1432A11250 |
| (2) <u>COAXIAL ATTENUATOR</u> | |
| i00122 Narda 766-10 | 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)
 g0120077: 2001-Feb-19 Mon 14:57:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: TDMA PCS

PERFORMED BY:

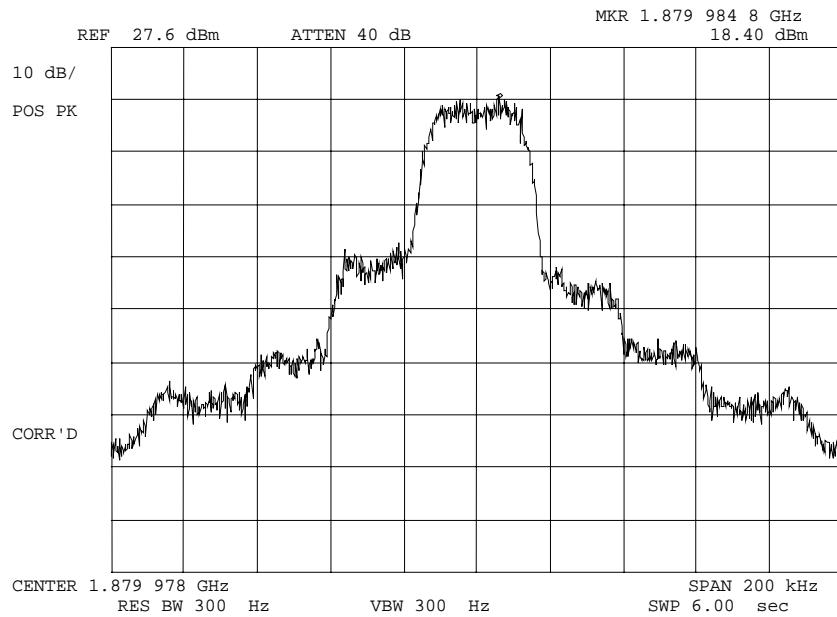


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120076: 2001-Feb-19 Mon 14:53:00
 STATE: 2:High Power



POWER: HIGH
 MODULATION: TDMA PCS

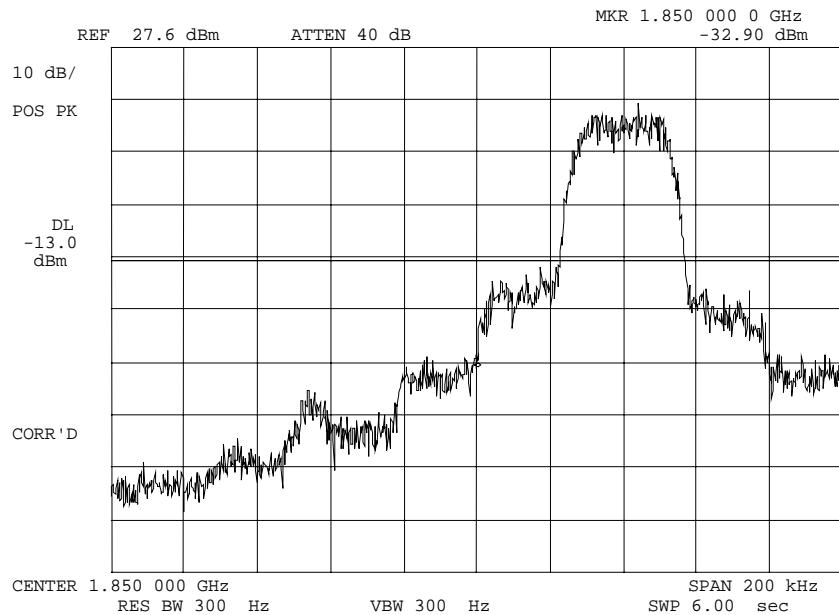
PERFORMED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120079: 2001-Feb-19 Mon 15:04:00
 STATE: 1:Low Power



POWER:

HIGH

MODULATION:

TDMA PCS

LOWER BANDEDGE

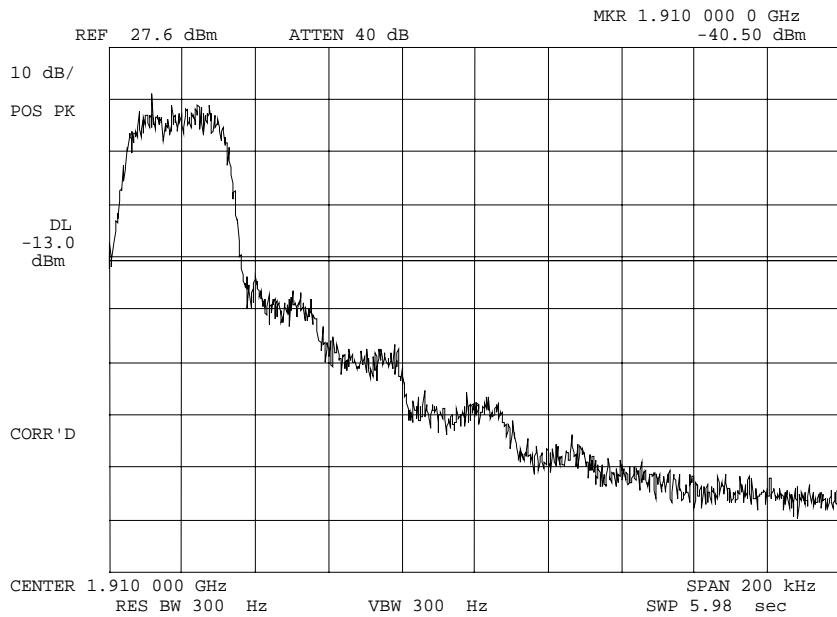
PERFORMED BY:

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120078: 2001-Feb-19 Mon 15:01:00
 STATE: 1:Low Power



POWER:

HIGH

MODULATION:

TDMA PCS

UPPER BANDEDGE

PERFORMED BY:


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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 10th 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, MHz/HARM. | LIMIT, dBc | SPURIOUS EMISSIONS, dBc | |
|--|--------------------------|-------------------------|------|
| | | Lo | Hi |
| F0 + 20 kHz to F0 + 45 kHz | ≤-26 | ≤-40 | ≤-39 |
| F0 + 45 kHz to 2 nd Harmonic | ≤-60 or 43 + 10 log P | ≤-64 | ≤-68 |
| 2 nd to 10 th | (≤-13 dBm) | ≤-59 | ≤-55 |

MEASUREMENT RESULTS = ATTACHED OFFSET PLOTS

EMISSION IN THE RECEIVER CRITICAL BAND

| EMISSION, MHz/HARM. | LIMIT, dBm | SPURIOUS EMISSIONS, dBm | |
|------------------------|------------|-------------------------|--------|
| | | Lo | Hi |
| 869 to 894 | ≤-80 | ≤-86.2 | ≤-84.6 |

MEASUREMENT RESULTS = ATTACHED PLOTS

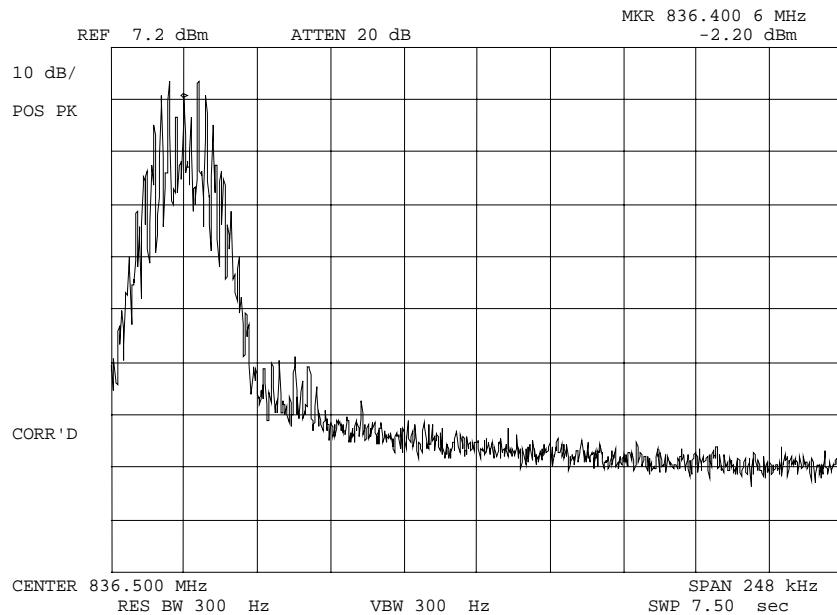
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120081: 2001-Feb-19 Mon 15:12:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: SAT+VOICE
 OFFSET OCCUPIED BANDWIDTH

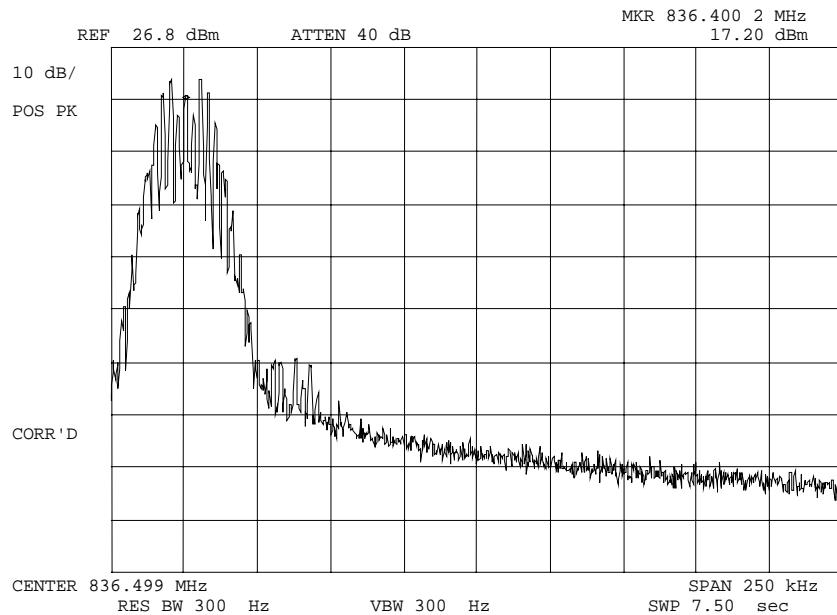
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120080: 2001-Feb-19 Mon 15:10:00
 STATE: 2:High Power



POWER: HIGH
 MODULATION: SAT+VOICE
 OFFSET OCCUPIED BANDWIDTH

PERFORMED BY:

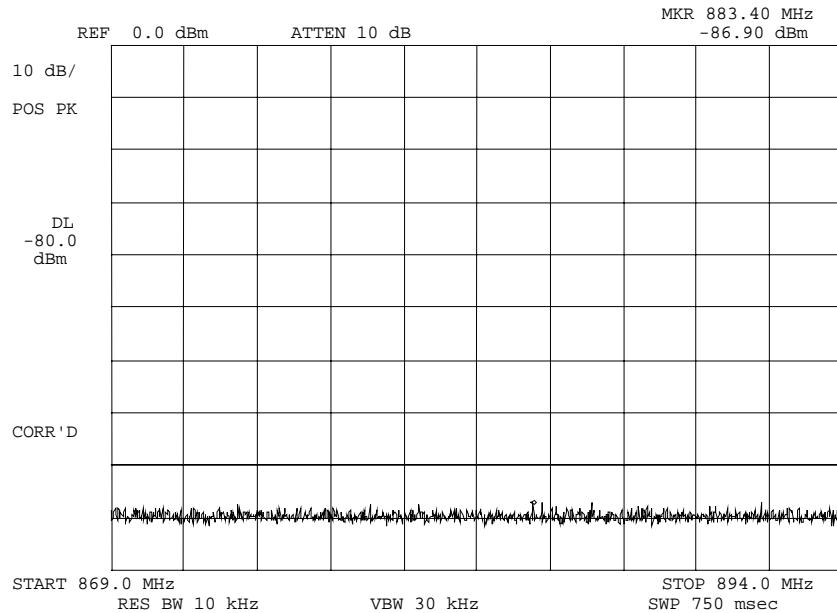


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120082: 2001-Feb-19 Mon 15:14:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: ANY
 TX SPURS IN RX CRITICAL
 BAND

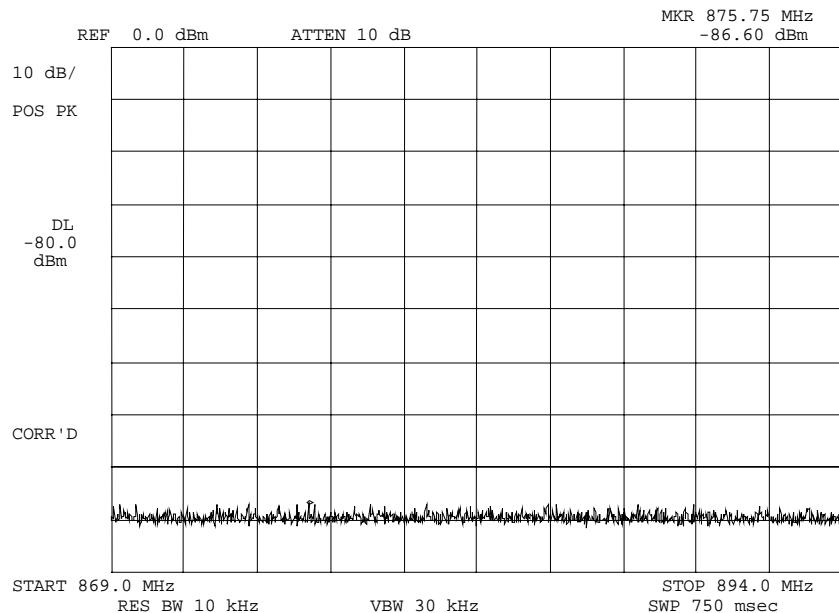
PERFORMED BY:


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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120083: 2001-Feb-19 Mon 15:15:00
 STATE: 2:High Power



POWER: HIGH
 MODULATION: 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, MHz/HARM. | LIMIT, dBc | SPURIOUS EMISSIONS, dBc | |
|--|--------------------|-------------------------|------|
| | | Lo | Hi |
| F0 + 20 kHz to F0 + 45 kHz | ≤-26 | ≤-37 | ≤-37 |
| F0 + 45 kHz to F0 + 90 kHz | ≤-45 | ≤-69 | ≤-70 |
| F0 + 90 kHz to 2 nd Harmonic | ≤-60 (≤-13 dBm) | ≤-57 | ≤-55 |
| 2 nd to 10 th | (≤-13 dBm) | ≤-59 | ≤-55 |

MEASUREMENT RESULTS = ATTACHED OFFSET PLOTS

EMISSION IN THE RECEIVER CRITICAL BAND

| EMISSION, MHz/HARM. | LIMIT, dBm | SPURIOUS EMISSIONS, dBm | |
|------------------------|------------|-------------------------|--------|
| | | Lo | Hi |
| 869 to 894 | ≤-80 | ≤-86.2 | ≤-84.6 |
| MEASUREMENT RESULTS | | = ATTACHED PLOTS | |

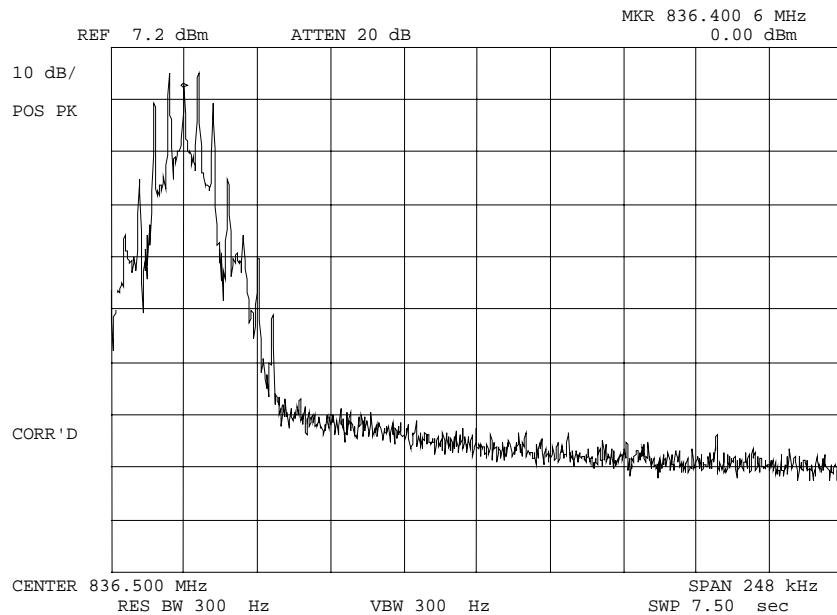
PERFORMED BY:


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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120085: 2001-Feb-19 Mon 15:26:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: WBD
 OFFSET OCCUPIED BANDWIDTH

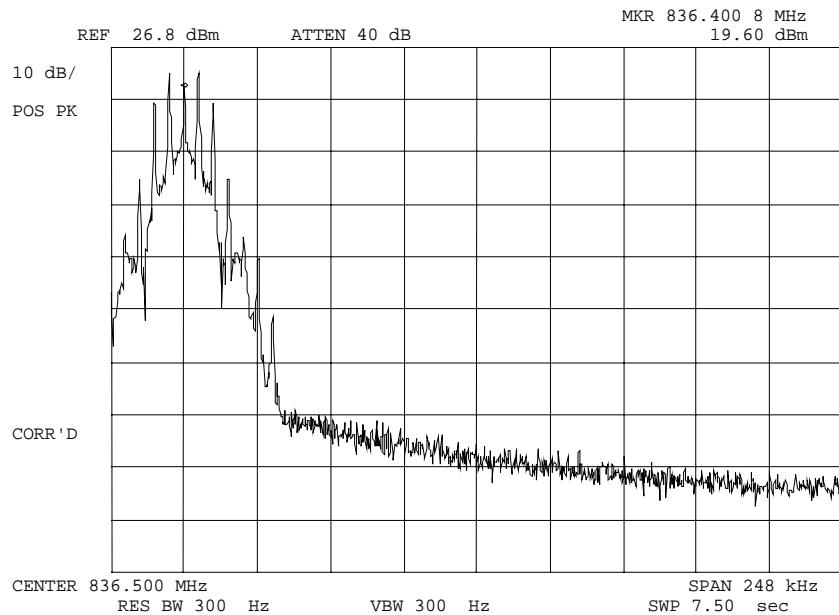
PERFORMED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120084: 2001-Feb-19 Mon 15:17:00
 STATE: 2:High Power



POWER: HIGH
 MODULATION: WBD
 OFFSET OCCUPIED BANDWIDTH

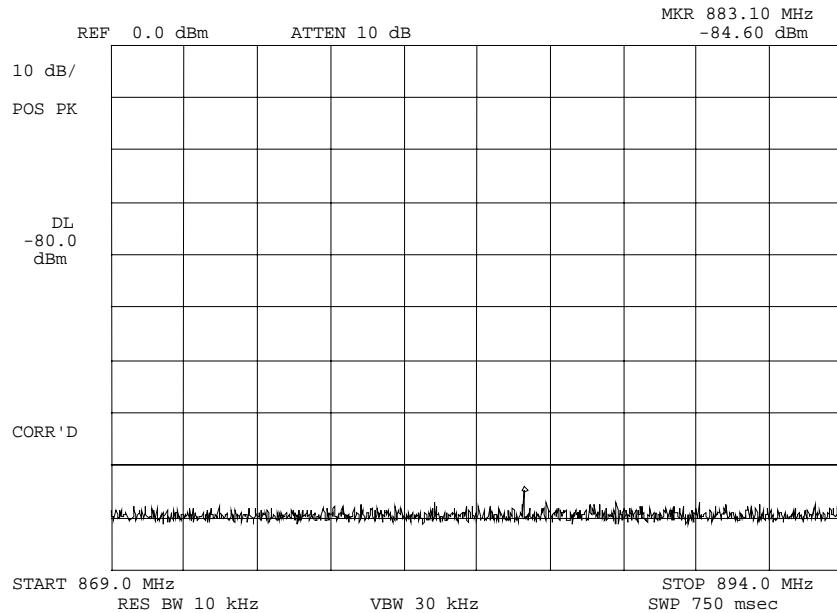
PERFORMED BY:


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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120086: 2001-Feb-19 Mon 15:28:00
 STATE: 1:Low Power



POWER: LOW
 MODULATION: ANY
 TX SPURS IN RX CRITICAL
 BAND

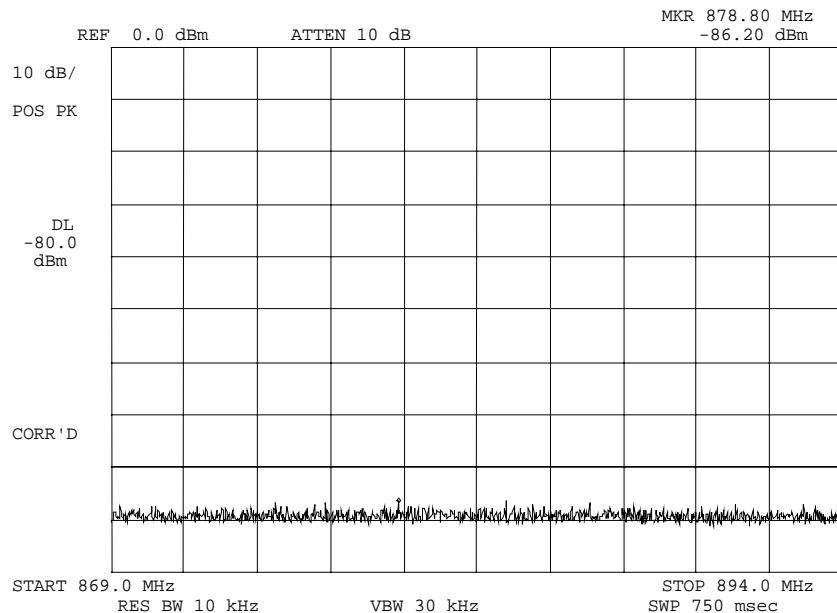
PERFORMED BY:


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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
 g0120087: 2001-Feb-19 Mon 15:33:00
 STATE: 2:High Power



POWER: HIGH
 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: 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)
 g0120093: 2001-Feb-19 Mon 16:15:00
 STATE: 1:Low Power AMPS MODE

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 824.040000 | 1648.071000 | -51.3 | -58.5 | -38.3 |
| 836.400000 | 1672.800000 | -62.4 | -69.6 | -49.4 |
| 848.970000 | 1697.946000 | -57.5 | -64.7 | -44.5 |
| 824.040000 | 2472.145000 | -57.7 | -64.9 | -44.7 |
| 836.400000 | 2509.232000 | -68.8 | -76 | -55.8 |
| 848.970000 | 2546.918000 | -67.2 | -74.4 | -54.2 |
| 824.040000 | 3295.857000 | -76 | -83.2 | -63 |
| 836.400000 | 3345.791000 | -75.1 | -82.3 | -62.1 |
| 848.970000 | 3395.688000 | -76.1 | -83.3 | -63.1 |
| 824.040000 | 4119.906000 | -76.4 | -83.6 | -63.4 |
| 836.400000 | 4181.626000 | -75.5 | -82.7 | -62.5 |
| 848.970000 | 4245.128000 | -75.8 | -83 | -62.8 |
| 824.040000 | 4944.105000 | -74.9 | -82.1 | -61.9 |
| 836.400000 | 5018.470000 | -75.3 | -82.5 | -62.3 |
| 848.970000 | 5093.480000 | -75.9 | -83.1 | -62.9 |
| 824.040000 | 5768.627000 | -75.5 | -82.7 | -62.5 |
| 836.400000 | 5854.596000 | -69.6 | -76.8 | -56.6 |
| 848.970000 | 5942.633000 | -70.3 | -77.5 | -57.3 |
| 824.040000 | 6592.545000 | -68.9 | -76.1 | -55.9 |
| 836.400000 | 6691.278000 | -69.6 | -76.8 | -56.6 |
| 848.970000 | 6791.363000 | -70.2 | -77.4 | -57.2 |
| 824.040000 | 7416.582000 | -70.4 | -77.6 | -57.4 |
| 836.400000 | 7527.560000 | -70.5 | -77.7 | -57.5 |
| 848.970000 | 7640.436000 | -69.3 | -76.5 | -56.3 |
| 824.040000 | 8239.947000 | -70.5 | -77.7 | -57.5 |
| 836.400000 | 8363.838000 | -70 | -77.2 | -57 |
| 848.970000 | 8489.232000 | -69.2 | -76.4 | -56.2 |
| 824.040000 | 9063.950000 | -69 | -76.2 | -56 |
| 836.400000 | 9200.243000 | -69.6 | -76.8 | -56.6 |
| 848.970000 | 9338.376000 | -69.9 | -77.1 | -56.9 |
| 824.040000 | 9888.763000 | -70.1 | -77.3 | -57.1 |
| 836.400000 | 10036.656000 | -70.2 | -77.4 | -57.2 |
| 848.970000 | 10187.804000 | -69.9 | -77.1 | -56.9 |
| 824.040000 | 10712.342000 | -69.5 | -76.7 | -56.5 |
| 836.400000 | 10873.687000 | -68.6 | -75.8 | -55.6 |
| 848.970000 | 11036.795000 | -70 | -77.2 | -57 |
| 824.040000 | 11536.322000 | -69 | -76.2 | -56 |
| 836.400000 | 11709.966000 | -69.4 | -76.6 | -56.4 |
| 848.970000 | 11885.663000 | -69.6 | -76.8 | -56.6 |
| 824.040000 | 12360.775000 | -69.7 | -76.9 | -56.7 |
| 836.400000 | 12546.371000 | -65.7 | -72.9 | -52.7 |
| 848.970000 | 12734.401000 | -65 | -72.2 | -52 |

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
 g0120092: 2001-Feb-19 Mon 16:16:00
 STATE: 2:High Power AMPS MODE

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 824.040000 | 1648.066000 | -32.1 | -58.9 | -19.1 |
| 836.400000 | 1672.794000 | -41.2 | -68 | -28.2 |
| 848.970000 | 1698.210000 | -32.3 | -59.1 | -19.3 |
| 824.040000 | 2472.143000 | -39.8 | -66.6 | -26.8 |
| 836.400000 | 2509.233000 | -39.1 | -65.9 | -26.1 |
| 848.970000 | 2546.897000 | -35.7 | -62.5 | -22.7 |
| 824.040000 | 3296.386000 | -56.8 | -83.6 | -43.8 |
| 836.400000 | 3345.271000 | -54.6 | -81.4 | -41.6 |
| 848.970000 | 3395.588000 | -56.2 | -83 | -43.2 |
| 824.040000 | 4120.598000 | -56 | -82.8 | -43 |
| 836.400000 | 4181.737000 | -55.8 | -82.6 | -42.8 |
| 848.970000 | 4245.063000 | -55.2 | -82 | -42.2 |
| 824.040000 | 4944.162000 | -55.5 | -82.3 | -42.5 |
| 836.400000 | 5018.088000 | -55.3 | -82.1 | -42.3 |
| 848.970000 | 5093.858000 | -55.5 | -82.3 | -42.5 |
| 824.040000 | 5768.467000 | -55.5 | -82.3 | -42.5 |
| 836.400000 | 5854.723000 | -50.2 | -77 | -37.2 |
| 848.970000 | 5943.252000 | -49.7 | -76.5 | -36.7 |
| 824.040000 | 6592.729000 | -49.8 | -76.6 | -36.8 |
| 836.400000 | 6691.282000 | -49.5 | -76.3 | -36.5 |
| 848.970000 | 6792.244000 | -49.8 | -76.6 | -36.8 |
| 824.040000 | 7416.678000 | -49.8 | -76.6 | -36.8 |
| 836.400000 | 7527.305000 | -49.1 | -75.9 | -36.1 |
| 848.970000 | 7640.486000 | -50.1 | -76.9 | -37.1 |
| 824.040000 | 8240.593000 | -49.3 | -76.1 | -36.3 |
| 836.400000 | 8364.309000 | -49.7 | -76.5 | -36.7 |
| 848.970000 | 8490.118000 | -49.2 | -76 | -36.2 |
| 824.040000 | 9064.423000 | -50.1 | -76.9 | -37.1 |
| 836.400000 | 9200.631000 | -50.4 | -77.2 | -37.4 |
| 848.970000 | 9338.266000 | -49.5 | -76.3 | -36.5 |
| 824.040000 | 9888.403000 | -49.9 | -76.7 | -36.9 |
| 836.400000 | 10036.450000 | -49.4 | -76.2 | -36.4 |
| 848.970000 | 10188.093000 | -50.3 | -77.1 | -37.3 |
| 824.040000 | 10712.608000 | -49 | -75.8 | -36 |
| 836.400000 | 10872.887000 | -49.3 | -76.1 | -36.3 |
| 848.970000 | 11036.901000 | -48 | -74.8 | -35 |
| 824.040000 | 11536.061000 | -50.1 | -76.9 | -37.1 |
| 836.400000 | 11709.140000 | -49.4 | -76.2 | -36.4 |
| 848.970000 | 11885.157000 | -50.1 | -76.9 | -37.1 |
| 824.040000 | 12360.654000 | -49.1 | -75.9 | -36.1 |
| 836.400000 | 12546.263000 | -45.4 | -72.2 | -32.4 |
| 848.970000 | 12734.715000 | -44.1 | -70.9 | -31.1 |

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
 g0120098: 2001-Feb-20 Tue 09:27:00
 STATE: 2:Low Power TDMA MODE

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 824.040000 | 1648.490000 | -61.4 | -57.3 | -48.4 |
| 836.400000 | 1672.811000 | -69.1 | -65 | -56.1 |
| 848.970000 | 1697.949000 | -66.3 | -62.2 | -53.3 |
| 824.040000 | 2472.167000 | -79.4 | -75.3 | -66.4 |
| 836.400000 | 2509.132000 | -85.4 | -81.3 | -72.4 |
| 848.970000 | 2546.905000 | -83.3 | -79.2 | -70.3 |
| 824.040000 | 3295.825000 | -86.2 | -82.1 | -73.2 |
| 836.400000 | 3345.351000 | -85.2 | -81.1 | -72.2 |
| 848.970000 | 3395.876000 | -85.7 | -81.6 | -72.7 |
| 824.040000 | 4120.601000 | -86.2 | -82.1 | -73.2 |
| 836.400000 | 4181.972000 | -86.3 | -82.2 | -73.3 |
| 848.970000 | 4245.193000 | -86 | -81.9 | -73 |
| 824.040000 | 4944.653000 | -85.1 | -81 | -72.1 |
| 836.400000 | 5018.090000 | -85.5 | -81.4 | -72.5 |
| 848.970000 | 5093.391000 | -85.4 | -81.3 | -72.4 |
| 824.040000 | 5768.232000 | -86.5 | -82.4 | -73.5 |
| 836.400000 | 5854.848000 | -79.6 | -75.5 | -66.6 |
| 848.970000 | 5942.311000 | -80.7 | -76.6 | -67.7 |
| 824.040000 | 6591.944000 | -79.8 | -75.7 | -66.8 |
| 836.400000 | 6690.868000 | -80 | -75.9 | -67 |
| 848.970000 | 6791.942000 | -80.4 | -76.3 | -67.4 |
| 824.040000 | 7416.713000 | -79.8 | -75.7 | -66.8 |
| 836.400000 | 7527.790000 | -80.1 | -76 | -67.1 |
| 848.970000 | 7641.196000 | -79.8 | -75.7 | -66.8 |
| 824.040000 | 8240.265000 | -80.8 | -76.7 | -67.8 |
| 836.400000 | 8364.382000 | -80.2 | -76.1 | -67.2 |
| 848.970000 | 8489.645000 | -80.3 | -76.2 | -67.3 |
| 824.040000 | 9064.831000 | -80.9 | -76.8 | -67.9 |
| 836.400000 | 9199.921000 | -80.3 | -76.2 | -67.3 |
| 848.970000 | 9338.846000 | -79.6 | -75.5 | -66.6 |
| 824.040000 | 9888.808000 | -79.1 | -75 | -66.1 |
| 836.400000 | 10037.046000 | -80.3 | -76.2 | -67.3 |
| 848.970000 | 10187.661000 | -79.2 | -75.1 | -66.2 |
| 824.040000 | 10713.008000 | -79.7 | -75.6 | -66.7 |
| 836.400000 | 10873.626000 | -79.5 | -75.4 | -66.5 |
| 848.970000 | 11036.262000 | -79.6 | -75.5 | -66.6 |
| 824.040000 | 11536.472000 | -80.2 | -76.1 | -67.2 |
| 836.400000 | 11709.496000 | -81.2 | -77.1 | -68.2 |
| 848.970000 | 11885.357000 | -80.1 | -76 | -67.1 |
| 824.040000 | 12360.927000 | -79.8 | -75.7 | -66.8 |
| 836.400000 | 12545.838000 | -75.3 | -71.2 | -62.3 |
| 848.970000 | 12734.442000 | -75.7 | -71.6 | -62.7 |

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
 g0120094: 2001-Feb-20 Tue 08:30:00
 STATE: 2:High Power TDMA MODE

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 824.040000 | 1648.086000 | -27.3 | -54.9 | -14.3 |
| 836.400000 | 1672.924000 | -54.4 | -82 | -41.4 |
| 848.970000 | 1697.939000 | -30.2 | -57.8 | -17.2 |
| 824.040000 | 2472.104000 | -32.4 | -60 | -19.4 |
| 836.400000 | 2509.050000 | -54.7 | -82.3 | -41.7 |
| 848.970000 | 2546.932000 | -34.8 | -62.4 | -21.8 |
| 824.040000 | 3296.491000 | -55.8 | -83.4 | -42.8 |
| 836.400000 | 3345.534000 | -55.9 | -83.5 | -42.9 |
| 848.970000 | 3395.462000 | -55.1 | -82.7 | -42.1 |
| 824.040000 | 4120.233000 | -56.6 | -84.2 | -43.6 |
| 836.400000 | 4182.421000 | -56.4 | -84 | -43.4 |
| 848.970000 | 4244.847000 | -56.4 | -84 | -43.4 |
| 824.040000 | 4944.706000 | -55.5 | -83.1 | -42.5 |
| 836.400000 | 5018.017000 | -55.4 | -83 | -42.4 |
| 848.970000 | 5094.130000 | -56.2 | -83.8 | -43.2 |
| 824.040000 | 5768.253000 | -56.5 | -84.1 | -43.5 |
| 836.400000 | 5854.748000 | -50.7 | -78.3 | -37.7 |
| 848.970000 | 5942.912000 | -50.3 | -77.9 | -37.3 |
| 824.040000 | 6592.799000 | -49.7 | -77.3 | -36.7 |
| 836.400000 | 6691.532000 | -49.3 | -76.9 | -36.3 |
| 848.970000 | 6791.361000 | -50.4 | -78 | -37.4 |
| 824.040000 | 7416.330000 | -50.2 | -77.8 | -37.2 |
| 836.400000 | 7528.092000 | -49.4 | -77 | -36.4 |
| 848.970000 | 7640.556000 | -49.8 | -77.4 | -36.8 |
| 824.040000 | 8240.560000 | -50.3 | -77.9 | -37.3 |
| 836.400000 | 8364.316000 | -50.5 | -78.1 | -37.5 |
| 848.970000 | 8490.092000 | -50.8 | -78.4 | -37.8 |
| 824.040000 | 9064.229000 | -51 | -78.6 | -38 |
| 836.400000 | 9200.515000 | -49.8 | -77.4 | -36.8 |
| 848.970000 | 9338.377000 | -50 | -77.6 | -37 |
| 824.040000 | 9888.414000 | -49.5 | -77.1 | -36.5 |
| 836.400000 | 10037.074000 | -51.1 | -78.7 | -38.1 |
| 848.970000 | 10187.856000 | -50.2 | -77.8 | -37.2 |
| 824.040000 | 10712.278000 | -49.9 | -77.5 | -36.9 |
| 836.400000 | 10873.249000 | -50.5 | -78.1 | -37.5 |
| 848.970000 | 11036.542000 | -50.6 | -78.2 | -37.6 |
| 824.040000 | 11536.806000 | -49.5 | -77.1 | -36.5 |
| 836.400000 | 11709.374000 | -50.8 | -78.4 | -37.8 |
| 848.970000 | 11885.318000 | -50.2 | -77.8 | -37.2 |
| 824.040000 | 12360.284000 | -50.4 | -78 | -37.4 |
| 836.400000 | 12546.458000 | -45.8 | -73.4 | -32.8 |
| 848.970000 | 12734.213000 | -45.5 | -73.1 | -32.5 |

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
 g0120097: 2001-Feb-20 Tue 09:05:00
 STATE: 2:Low Power PCS-TDMA MODE

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 1850.040000 | 3700.082000 | -84 | -78.2 | -71 |
| 1879.980000 | 3759.974000 | -82.4 | -76.6 | -69.4 |
| 1909.920000 | 3819.595000 | -86.6 | -80.8 | -73.6 |
| 1850.040000 | 5550.254000 | -86 | -80.2 | -73 |
| 1879.980000 | 5640.142000 | -84.3 | -78.5 | -71.3 |
| 1909.920000 | 5729.580000 | -86.6 | -80.8 | -73.6 |
| 1850.040000 | 7400.585000 | -79.1 | -73.3 | -66.1 |
| 1879.980000 | 7519.442000 | -80 | -74.2 | -67 |
| 1909.920000 | 7640.160000 | -80.8 | -75 | -67.8 |
| 1850.040000 | 9250.165000 | -80.3 | -74.5 | -67.3 |
| 1879.980000 | 9399.774000 | -80.2 | -74.4 | -67.2 |
| 1909.920000 | 9549.711000 | -80.4 | -74.6 | -67.4 |
| 1850.040000 | 11100.232000 | -80.3 | -74.5 | -67.3 |
| 1879.980000 | 11280.246000 | -80 | -74.2 | -67 |
| 1909.920000 | 11459.885000 | -80 | -74.2 | -67 |
| 1850.040000 | 12950.600000 | -75 | -69.2 | -62 |
| 1879.980000 | 13160.173000 | -75.3 | -69.5 | -62.3 |
| 1909.920000 | 13369.473000 | -75.7 | -69.9 | -62.7 |
| 1850.040000 | 14800.171000 | -74 | -68.2 | -61 |
| 1879.980000 | 15039.616000 | -74.7 | -68.9 | -61.7 |
| 1909.920000 | 15279.149000 | -73.6 | -67.8 | -60.6 |
| 1850.040000 | 16650.580000 | -72.6 | -66.8 | -59.6 |
| 1879.980000 | 16919.961000 | -73.5 | -67.7 | -60.5 |
| 1909.920000 | 17189.070000 | -74.1 | -68.3 | -61.1 |
| 1850.040000 | 18499.991000 | -74.4 | -68.6 | -61.4 |
| 1879.980000 | 18800.008000 | -68.6 | -62.8 | -55.6 |
| 1909.920000 | 19098.725000 | -68.4 | -62.6 | -55.4 |
| 1850.040000 | 20350.816000 | -67.1 | -61.3 | -54.1 |
| 1879.980000 | 20680.021000 | -67.3 | -61.5 | -54.3 |
| 1909.920000 | 21009.513000 | -67 | -61.2 | -54 |

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
 g0120096: 2001-Feb-20 Tue 09:02:00
 STATE: 2:High Power PCS-TDMA MODE

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | LEVEL, dBm | LEVEL, dBc | MARGIN, dB |
|-------------------------|----------------------------|------------|------------|------------|
| 1850.040000 | 3700.090000 | -51.4 | -79 | -38.4 |
| 1879.980000 | 3759.981000 | -48.8 | -76.4 | -35.8 |
| 1909.920000 | 3819.857000 | -49.2 | -76.8 | -36.2 |
| 1850.040000 | 5550.150000 | -55.1 | -82.7 | -42.1 |
| 1879.980000 | 5639.883000 | -55.5 | -83.1 | -42.5 |
| 1909.920000 | 5729.763000 | -49.4 | -77 | -36.4 |
| 1850.040000 | 7400.187000 | -50.9 | -78.5 | -37.9 |
| 1879.980000 | 7520.296000 | -50.6 | -78.2 | -37.6 |
| 1909.920000 | 7639.657000 | -50 | -77.6 | -37 |
| 1850.040000 | 9250.472000 | -50.8 | -78.4 | -37.8 |
| 1879.980000 | 9400.069000 | -50.5 | -78.1 | -37.5 |
| 1909.920000 | 9549.102000 | -50.5 | -78.1 | -37.5 |
| 1850.040000 | 11100.559000 | -49.7 | -77.3 | -36.7 |
| 1879.980000 | 11280.008000 | -49.7 | -77.3 | -36.7 |
| 1909.920000 | 11459.948000 | -50.8 | -78.4 | -37.8 |
| 1850.040000 | 12950.613000 | -46 | -73.6 | -33 |
| 1879.980000 | 13159.615000 | -46 | -73.6 | -33 |
| 1909.920000 | 13369.825000 | -45 | -72.6 | -32 |
| 1850.040000 | 14800.443000 | -45 | -72.6 | -32 |
| 1879.980000 | 15040.062000 | -45 | -72.6 | -32 |
| 1909.920000 | 15279.729000 | -45.1 | -72.7 | -32.1 |
| 1850.040000 | 16650.092000 | -44.8 | -72.4 | -31.8 |
| 1879.980000 | 16919.956000 | -44.1 | -71.7 | -31.1 |
| 1909.920000 | 17188.875000 | -43.2 | -70.8 | -30.2 |
| 1850.040000 | 18500.306000 | -43.6 | -71.2 | -30.6 |
| 1879.980000 | 18799.377000 | -38.4 | -66 | -25.4 |
| 1909.920000 | 19099.055000 | -39.7 | -67.3 | -26.7 |
| 1850.040000 | 20350.661000 | -36.6 | -64.2 | -23.6 |
| 1879.980000 | 20680.157000 | -37.6 | -65.2 | -24.6 |
| 1909.920000 | 21008.718000 | -36.9 | -64.5 | -23.9 |

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NAME OF TEST: Field Strength of Spurious Radiation

SPECIFICATION: 47 CFR 2.1053(a)

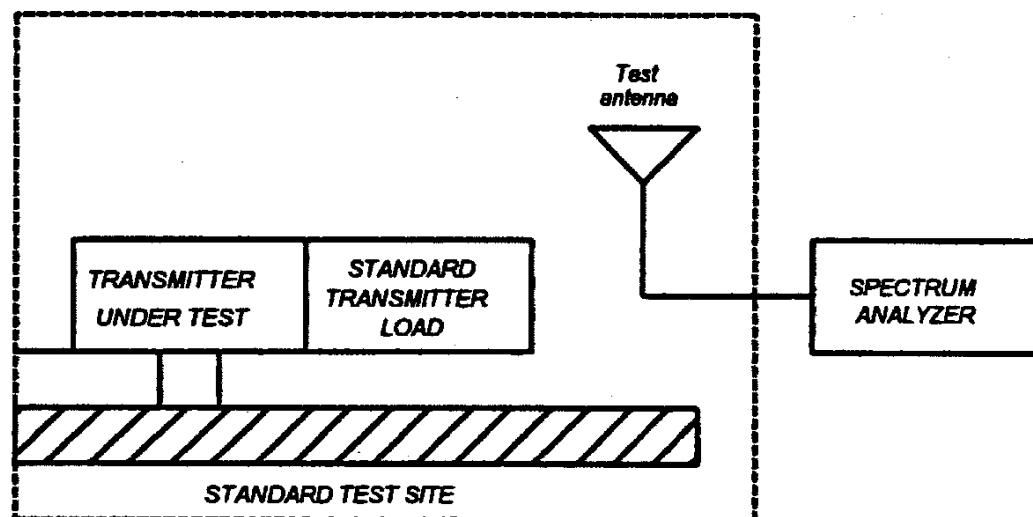
GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 1.2.12

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 ≤ 3 kHz.
 - 2) Video Bandwidth ≥ 10 kHz
 - 3) Sweep Speed ≤ 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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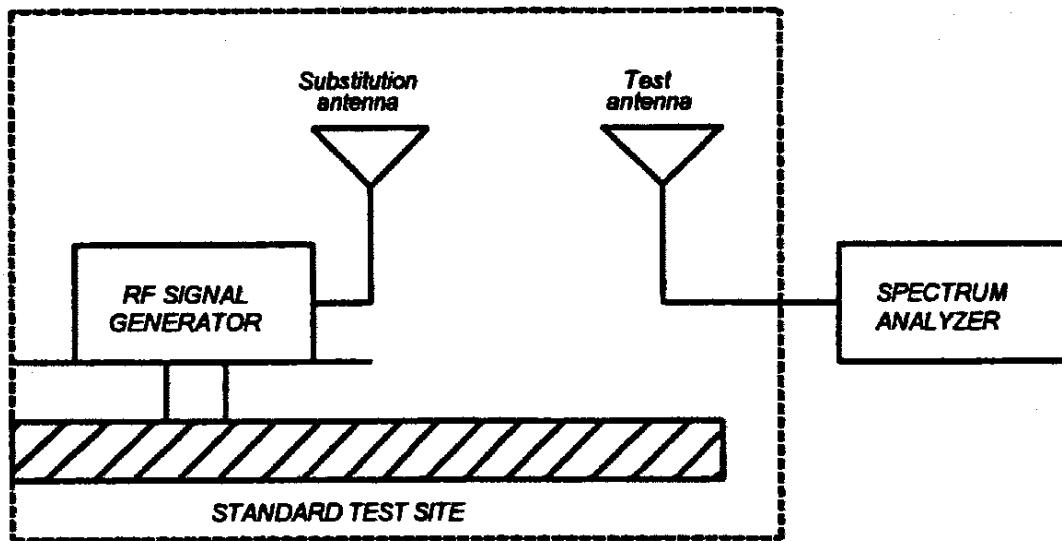
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NAME OF TEST: Field Strength of Spurious Radiation (Cont.)

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 =
 $10\log_{10}(\text{TX power in watts}/0.001) - \text{the levels in step 1}$

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

Test Equipment:

| Asset (as applicable) | Description | s/n | Cycle | Last Cal |
|--|-----------------------------|------------|--------|----------|
| Per ANSI C63.4-1992/2000 Draft, 10.1.4 | | | | |
| <u>TRANSDUCER</u> | | | | |
| i00088 | EMCO 3109-B 25MHz-300MHz | 2336 | 12 mo. | Sep-00 |
| i00065 | EMCO 3301-B Active Monopole | 2635 | 12 mo. | Sep-00 |
| i00089 | Aprel 2001 200MHz-1GHz | 001500 | 12 mo. | Sep-00 |
| i00103 | EMCO 3115 1GHz-18GHz | 9208-3925 | 12 mo. | Sep-00 |
| <u>AMPLIFIER</u> | | | | |
| i00028 | HP 8449A | 2749A00121 | 12 mo. | Mar-00 |
| <u>SPECTRUM ANALYZER</u> | | | | |
| i00029 | HP 8563E | 3213A00104 | 12 mo. | Aug-00 |
| i00033 | HP 85462A | 3625A00357 | 12 mo. | May-00 |
| i00048 | HP 8566B | 2511AD1467 | 6 mo. | Nov-00 |

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MEASUREMENT RESULTS: FIELD STRENGTH OF SPURIOUS RADIATION

Measurement Distance, m = 3

Spectrum Searched, GHz = 0 to 10

AMPS BAND

| TUNED, MHz | CHANNEL NUMBER | EMISSION MHz/HARM. | LEVEL, dBc | |
|---------------|-------------------|------------------------------------|------------|------|
| | | | Lo | Hi |
| 824.040 | 991 | 2 nd - 10 th | <-58 | <-58 |
| 836.400 | 380 | 2 nd - 10 th | <-58 | <-58 |
| 848.970 | 799 | 2 nd - 10 th | <-58 | <-58 |

AMPS-TDMA BAND

| TUNED, MHz | CHANNEL NUMBER | EMISSION MHz/HARM. | LEVEL, dBc | |
|---------------|-------------------|------------------------------------|------------|------|
| | | | Lo | Hi |
| 824.040 | 991 | 2 nd - 10 th | <-57 | <-54 |
| 836.400 | 380 | 2 nd - 10 th | <-57 | <-54 |
| 848.970 | 799 | 2 nd - 10 th | <-57 | <-54 |

PCS-TDMA BAND

| TUNED, MHz | CHANNEL NUMBER | EMISSION MHz/HARM. | LEVEL, dBc | |
|---------------|-------------------|------------------------------------|------------|------|
| | | | Lo | Hi |
| 1850.04 | 2 | 2 nd - 10 th | <-61 | <-64 |
| 1879.98 | 1000 | 2 nd - 10 th | <-61 | <-64 |
| 1909.92 | 1998 | 2 nd - 10 th | <-61 | <-64 |

NOTE:

For channels 380, 799 and 991, the field strength of spurious radiation over the above noted range measured 20 dB or more below the limit.

PERFORMED BY:


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

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NAME OF TEST:

Field Strength of Spurious Radiation

AMPS MODE g0120099: 2001-Feb-21 Wed 08:17:00

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | METER, dBuV | CF, dB | ERP, dBm | MARGIN, dB |
|-------------------------|----------------------------|----------------|--------|----------|---------------|
| 836.400000 | 1672.780000 | 47.83 | -0.38 | -49.9 | -37 |
| 836.400000 | 2509.187167 | 54.83 | 3.06 | -39.5 | -26.5 |
| 836.400000 | 3345.627167 | 40.83 | 5.7 | -50.8 | -37.9 |
| 836.400000 | 4181.975767 | 37.83 | 7.53 | -52 | -39 |
| 836.400000 | 5018.395767 | 35.17 | 9.26 | -52.9 | -40 |
| 836.400000 | 5854.804100 | 33.5 | 10.78 | -53.1 | -40.1 |
| 836.400000 | 6691.204100 | 34.17 | 12.2 | -51 | -38 |
| 836.400000 | 7527.600767 | 33 | 13.5 | -50.9 | -37.9 |
| 836.400000 | 8364.000767 | 32.83 | 14.55 | -50 | -37 |

TDMA MODE g0120100: 2001-Feb-21 Wed 09:50:00

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | METER, dBuV | CF, dB | ERP, dBm | MARGIN, dB |
|-------------------------|----------------------------|----------------|--------|----------|---------------|
| 836.400000 | 1672.832434 | 49.17 | -0.38 | -48.6 | -35.6 |
| 836.400000 | 2509.207434 | 60.33 | 3.06 | -34 | -21 |
| 836.400000 | 3345.652434 | 42.83 | 5.7 | -48.8 | -35.9 |
| 836.400000 | 4182.045767 | 34.83 | 7.53 | -55 | -42 |
| 836.400000 | 5018.427434 | 36.67 | 9.26 | -51.4 | -38.5 |
| 836.400000 | 5854.856601 | 34.5 | 10.78 | -52.1 | -39.1 |
| 836.400000 | 6691.254934 | 33.83 | 12.2 | -51.3 | -38.4 |
| 836.400000 | 7527.699934 | 36.33 | 13.5 | -47.5 | -34.6 |
| 836.400000 | 8364.047434 | 32 | 14.55 | -50.8 | -37.9 |

PCS-TDMA MODE g0120101: 2001-Feb-21 Wed 11:38:00

| FREQUENCY TUNED, MHz | FREQUENCY EMISSION, MHz | METER, dBuV/m | CF, dB | EIRP, dBm | MARGIN, dB |
|-------------------------|----------------------------|------------------|--------|--------------|---------------|
| 1879.980000 | 3759.993333 | 47.5 | 6.61 | -41.1 | -28.1 |
| 1879.980000 | 5639.968333 | 51.33 | 10.4 | -33.5 | -20.5 |
| 1879.980000 | 7519.985000 | 39.17 | 13.49 | -42.6 | -29.6 |
| 1879.980000 | 9399.935834 | 35.83 | 15.51 | -43.9 | -30.9 |
| 1879.980000 | 11279.915834 | 31.17 | 17.4 | -46.7 | -33.7 |
| 1879.980000 | 13159.895834 | 31.83 | 17.62 | -45.8 | -32.8 |
| 1879.980000 | 15039.875834 | 34.17 | 18.19 | -42.9 | -29.9 |
| 1879.980000 | 16919.855834 | 33 | 19.65 | -42.6 | -29.6 |

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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

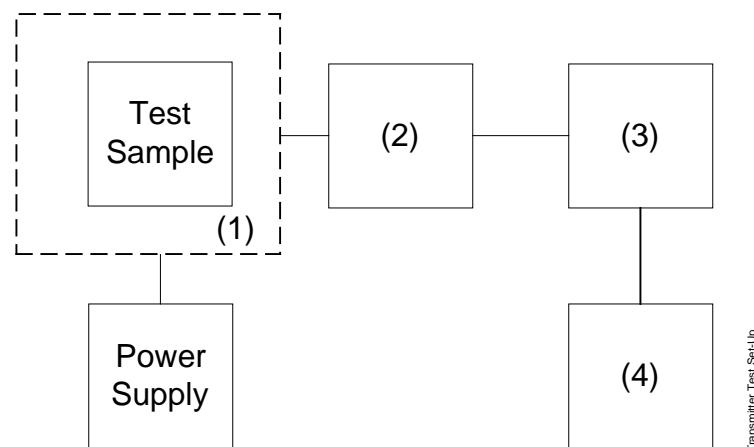
1. The EUT and test equipment were set up as shown on the following page.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.
4. The temperature tests were performed for the worst case.
5. MEASUREMENT RESULTS: ATTACHED

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TRANSMITTER TEST SET-UP

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



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

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NAME OF TEST: Frequency Stability (Temperature Variation)

FCC, AMPS MODE:

| °C | Change, Hz | Change, ppm |
|-----|------------|-------------|
| -30 | +293 | 0.35 |
| -20 | +254 | 0.30 |
| -10 | +257 | 0.31 |
| 0 | +283 | 0.34 |
| 10 | +248 | 0.30 |
| 20 | +313 | 0.37 |
| 25 | +279 | 0.33 |
| 30 | +311 | 0.37 |
| 40 | +323 | 0.39 |
| 50 | +332 | 0.40 |
| 60 | +321 | 0.38 |

FCC, TDMA MODE:

Subscriber equipment is synchronized to base station frequency. No variance in transmitter frequency stability observed under any variation of temperature and/or voltage.

PERFORMED BY:


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

PAGE NO. 73 of 74.

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.

AMPS MODE:

RESULTS: Frequency Stability (Voltage Variation)

BATTERY END POINT (Voltage) = 3.2

| % of STV | Voltage | Frequency, MHz | Change, Hz | Change, ppm |
|----------|---------|----------------|------------|-------------|
| 85 | 3.3 | 836.400283 | 283 | 0.34 |
| 100 | 3.9 | 836.400279 | 279 | 0.33 |
| 115 | 4.5 | 836.400299 | 299 | 0.36 |
| B.E.P. | 3.2 | 836.400277 | 277 | 0.33 |

TDMA MODE:

RESULTS: Frequency Stability (Voltage Variation)

BATTERY END POINT (Voltage) = 3.2

Subscriber equipment is synchronized to base station frequency. No variance in transmitter frequency stability observed under any variation of temperature and/or voltage.

PERFORMED BY:



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

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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 = 40K0FXW

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 = 30.0
(measured at the 99.75% power bandwidth)

PERFORMED BY:
END OF TEST REPORT


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

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.