

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.

TABLE OF CONTENTS


RULE	DESCRIPTION	PAGE
	Test Report	1
2.1033(c)	General Information Required	2
2.1033(c) (14)	Rule Summary	4
	General Information	5
	Standard Test Conditions and Engineering Practices	6
2.1046	Carrier Output Power (Conducted)	7
2.1047(a)	Audio Frequency Response	9
2.1047(a)	Audio Low Pass Filter (Voice Input)	9
2.1047(a)	Audio Frequency Response	12
2.1047(b)	Modulation Limiting	14
	Oscilloscope Presentation Of Tones	19
2.1053(a)	Field Strength of Spurious Radiation	56
2.1055(a) (1)	Frequency Stability (Temperature Variation)	67
2.1055(b) (1)	Frequency Stability (Voltage Variation)	70

PAGE NO.

1 of 71.

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

TEST REPORT

- a)
- b) Laboratory: M. Flom Associates, Inc.  
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107  
(Canada: IC 2044) Chandler, AZ 85224
- c) Report Number: d98c0002
- d) Client: Nokia Mobile Phones  
9605 Scranton Rd., Suite 105  
San Diego, CA 92121
- e) Identification: 6185, Type NSD-3AX  
FCC ID: GMLNSD-3AX  
Description: Dual Band, Tri-Mode Cellular Telephone Phone
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: December 1, 1998  
EUT Received: October 5, 1998
- h, j, k): As indicated in individual tests.
- i) Sampling method: No sampling procedure used.
- l) Uncertainty: In accordance with MFA internal quality manual.
- m) Supervised by:   
Morton Flom, P. Eng.
- n) Results: The results presented in this report relate only to the item tested.
- o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

PAGE NO.

2 of 71.

LIST OF GENERAL INFORMATION REQUIRED FOR CERTIFICATIONIN ACCORDANCE WITH FCC RULES AND REGULATIONS,  
VOLUME II, PART 2 AND TO

22H, 24, Confidentiality

Sub-part 2.1033

(c) (1): NAME AND ADDRESS OF APPLICANT:Nokia Mobile Phones, Inc.  
6200 Courtney Campbell Causeway, Suite 900  
P.O. Box 30730  
Tampa, Florida 33630-3730VENDOR:Nokia Mobile Phones  
9605 Scranton Rd., Suite 105  
San Diego, CA 92121(c) (2): FCC ID: GMLNSD-3AX  
MODEL NO: 6185, Type NSD-3AX(c) (3): INSTRUCTION MANUAL(S):

PLEASE SEE ATTACHED EXHIBITS

(c) (4): TYPE OF EMISSION: 40K0F1D (Analogue),  
40K0F8W (Analogue),  
1M25F9W (CDMA),  
1M25F9W (PCS)(c) (5): FREQUENCY RANGE, MHz: 824 to 849  
1850 to 1910(c) (6): POWER RATING, Watts:  
(i) Analogue: 0.35  
Watts, Measured  
(ii) CDMA: 0.25 Watts  
Measured  
(iii) PCS: 0.175 Watts  
(EIRP)  
(iv) MFR Specs: 0.6  
Watts  
  x   Switchable        Variable        N/A(c) (7): MAXIMUM POWER RATING, Watts: 7

PAGE NO.

3 of 71.

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.

4 of 71.

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)
- \_\_\_ 101 - Fixed Microwave Services

PAGE NO.

5 of 71.

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:
  - x   (a) VOICE
  - x   (b) WIDEBAND DATA
  - x   (c) SAT
  - x   (d) ST
  - x   (e) SAT + VOICE
  - x   (f) SAT + DTMF
  - x   (g) CDMA
  - (h) TDMA
  - (i) NAMPS VOICE
  - (j) NAMPS DSAT
  - (k) NAMPS ST
  - (l) NAMPS VOICE + DSAT

PAGE NO.

6 of 71.

STANDARD TEST CONDITIONS  
and  
ENGINEERING PRACTICES

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

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

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

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

PAGE NO. 7 of 71.

NAME OF TEST: Carrier Output Power (Conducted)

SPECIFICATION: 47 CFR 2.1046(a)

GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996

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	R. F. POWER, WATTS	
		Lo	Hi
AMPS MODE:			
824.040	991	0.003311	0.257
836.400	380	0.003467	0.275
848.970	799	0.002754	0.213
CDMA MODE:			
824.185	991	0.000316	0.501
836.400	380	0.000301	0.550
848.897	799	0.000204	0.467
CDMA MODE:			
1879.98	N/A	0.000204	0.204
1850.04	N/A	0.000204	0.128
1909.92	N/A	0.000204	0.199

*Morton Flom P. Eng.*

SUPERVISED BY:

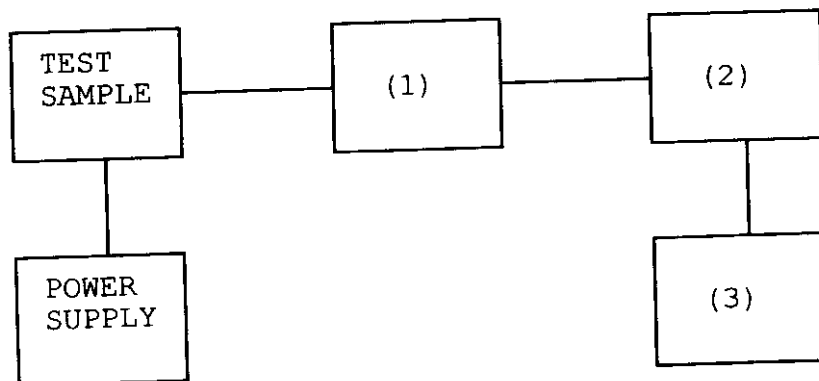
Morton Flom, P. Eng.

PAGE NO.

8 of 71.

TRANSMITTER POWER CONDUCTED MEASUREMENTS

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



Asset Description

s/n

(1) COAXIAL ATTENUATOR

_____	i00122 Narda 766-10	7802
_____	i00123 Narda 766-10	7802A
_____	i00069 Bird 8329 (30 dB)	1006
<u>  x  </u>	i00113 Sierra 661A-3D	1059

(2) POWER METERS

_____	i00014 HP 435A	1733A05836
<u>  x  </u>	i00039 HP 436A	2709A26776
<u>  x  </u>	i00020 HP 8901A POWER MODE	2105A01087

(3) FREQUENCY COUNTER

_____	i00042 HP 5383A	1628A00959
<u>  x  </u>	i00019 HP 5334B	2704A00347
<u>  x  </u>	i00020 HP 8901A FREQUENCY MODE	2105A01087

PAGE NO. 9 of 71.  
NAME OF TEST: Audio Low Pass Filter (Voice Input)  
SPECIFICATION: 47 CFR 2.1047(a)  
GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996  
TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

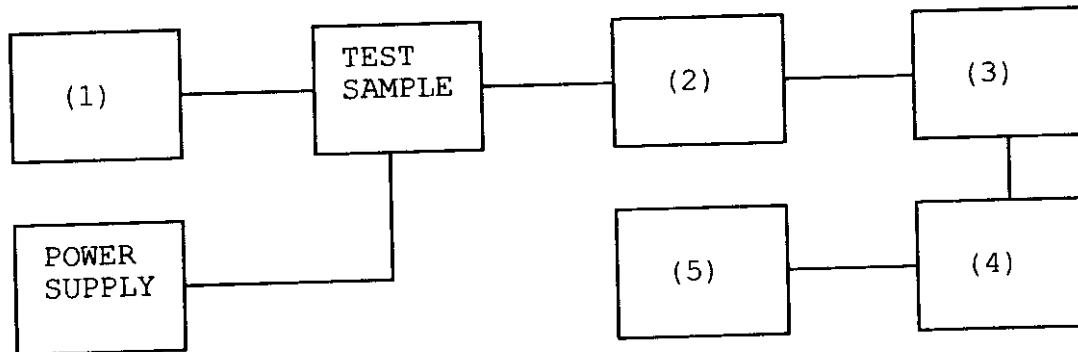
1. The EUT and test equipment were set up such that the audio input was connected at the input to the modulation limiter, and the modulated stage.
2. The audio output was connected at the output to the modulated stage.
3. MEASUREMENT RESULTS: ATTACHED

PAGE NO.

10 of 71.

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

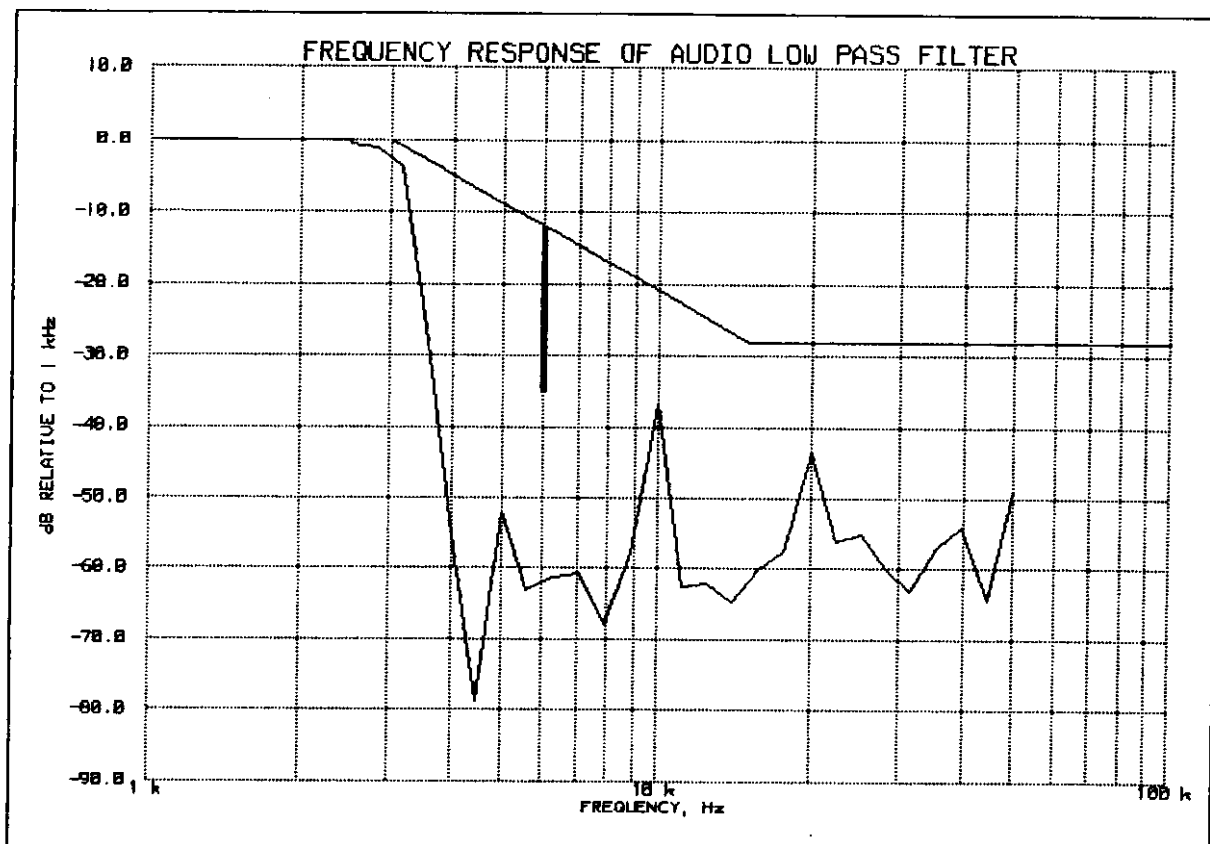


Asset	Description	s/n
(1)	<u>LINE IMPEDANCE STABILIZATION NETWORK</u>	
	i00010 HP 204D	1105A04683
<u>x</u>	i00017 HP 8903A	2216A01753
<u>x</u>	i00118 HP 33120A	US36002064
(2)	<u>COAXIAL ATTENUATOR</u>	
	i00122 NARDA 766-10	7802
	i00123 NARDA 766-10	7802A
<u>x</u>	i00113 SIERRA 661A-3D	1059
	i00069 BIRD 8329 (30 dB)	10066
(3)	<u>MODULATION ANALYZER</u>	
<u>x</u>	i00020 HP 8901A	2105A01087
(4)	<u>AUDIO ANALYZER</u>	
<u>x</u>	i00017 HP 8903A	2216A01753
(5)	<u>SCOPE</u>	
	i00058 HP 1741A	2215A09356
	i00071 Tektronix 935	1935-B011343

FREQUENCY RESPONSE OF AUDIO LOW PASS FILTER

NOKIA, 6185

5 OCT 1998, 10:04



PEAK AUDIO FREQUENCY, Hz: 2500

PAGE NO. 12 of 71.  
NAME OF TEST: Audio Frequency Response  
SPECIFICATION: 47 CFR 2.1047(a)  
GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996  
TEST EQUIPMENT: As per attached page

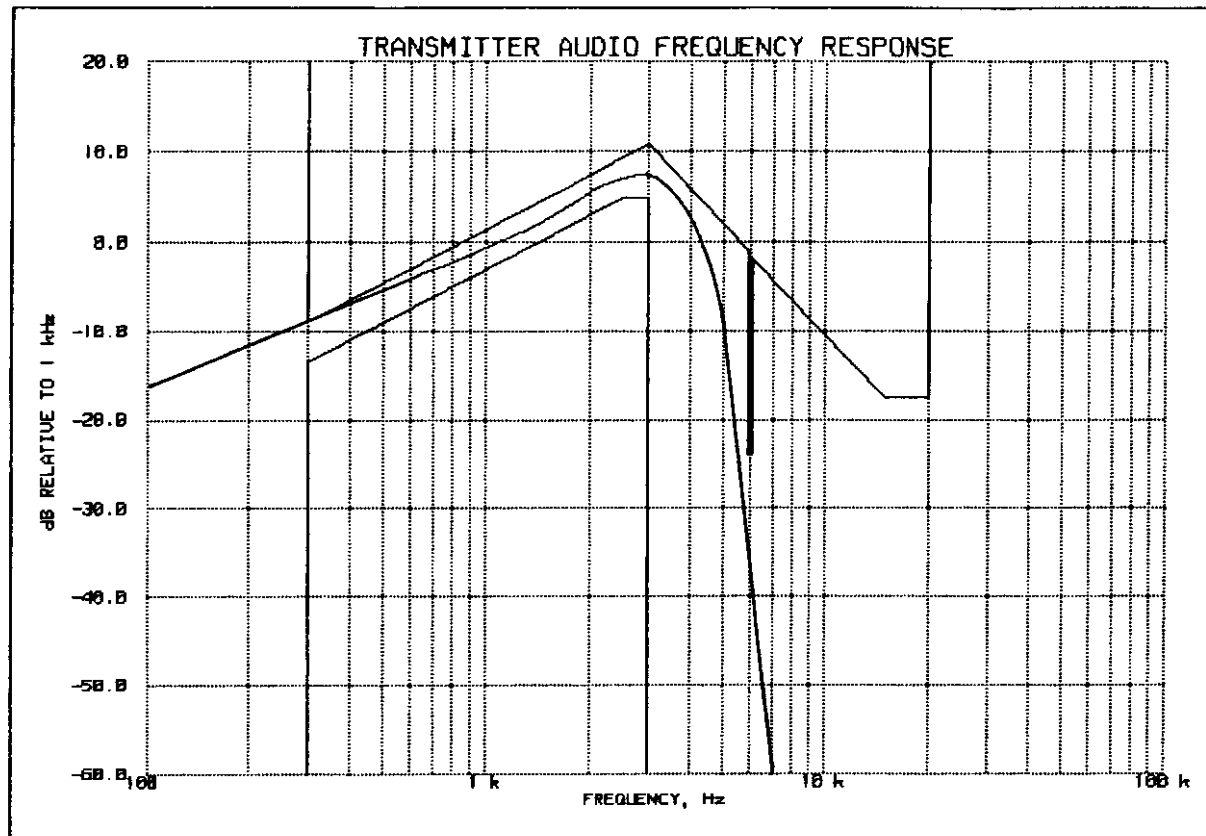
MEASUREMENT PROCEDURE

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

## TRANSMITTER AUDIO FREQUENCY RESPONSE

NOKIA, 6185

5 OCT 1998, 10:16



PEAK AUDIO FREQUENCY, Hz: 2820

## TABLE VALUES:

FREQUENCY, LEVEL, Hz      dB	FREQUENCY, LEVEL, Hz      dB	FREQUENCY, LEVEL, Hz      dB
300      -8.3	30000   -10.0	
20000   -10.0	50000   -10.0	

PAGE NO. 14 of 71.  
NAME OF TEST: Modulation Limiting  
SPECIFICATION: 47 CFR 2.1047(b)  
GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996  
TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

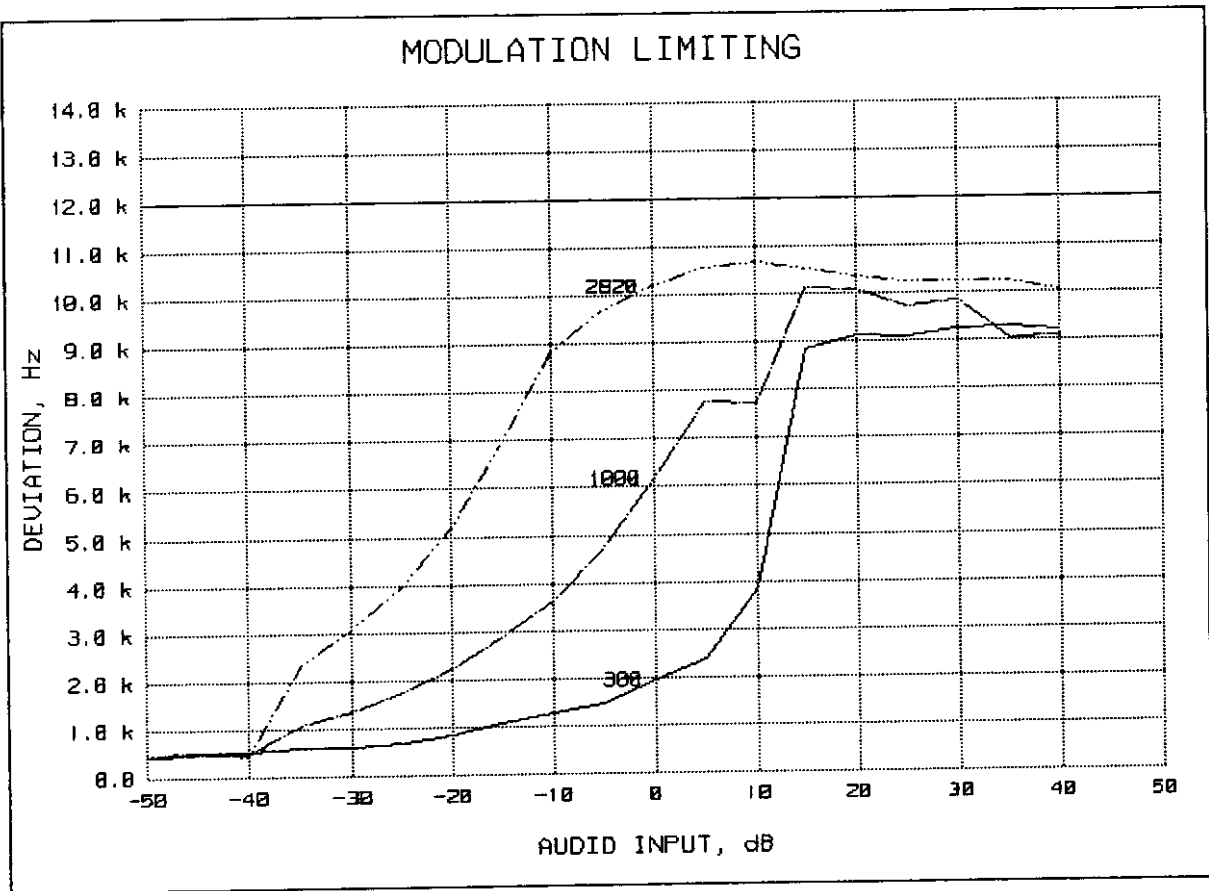
1. The audio signal generator was connected to the audio input circuit/microphone of the EUT as for Frequency Response of the Audio Modulating Circuit.
2. The modulation response was measured for each of three tones (one of which was the frequency of maximum response), and the input voltage was varied 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 15 of 71.  
 MODULATION LIMITING  
 NOKIA, 6185  
 1998-OCT-05, 10:23



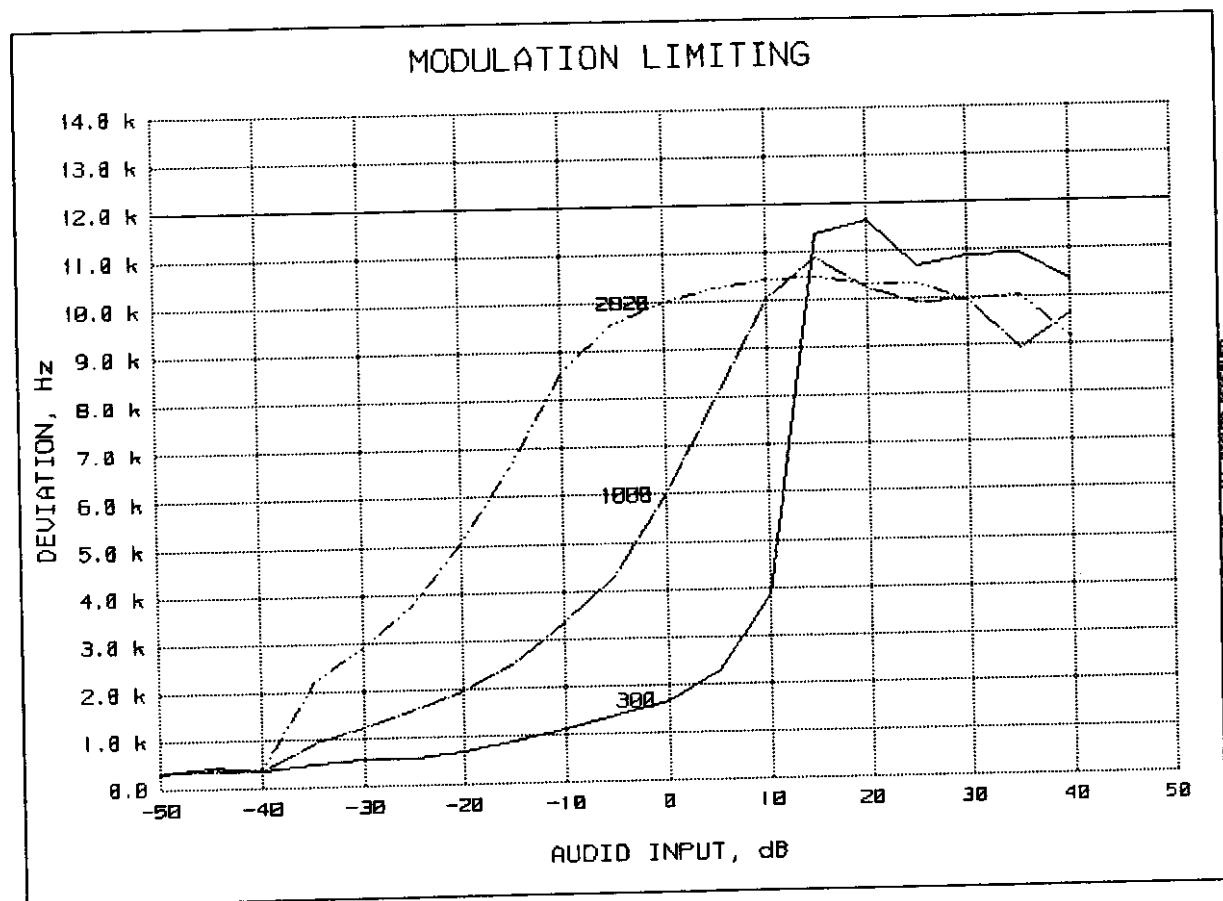
COMMENT	= VOICE ONLY
REFERENCE DEVIATION, kHz	= 6
REFERENCE MODULATION, Hz	= 1000
PEAKS	= POSITIVE
AUDIO AMPLITUDE, mV	= 49.44

PAGE 16 of 71.

MODULATION LIMITING

NOKIA, 6185

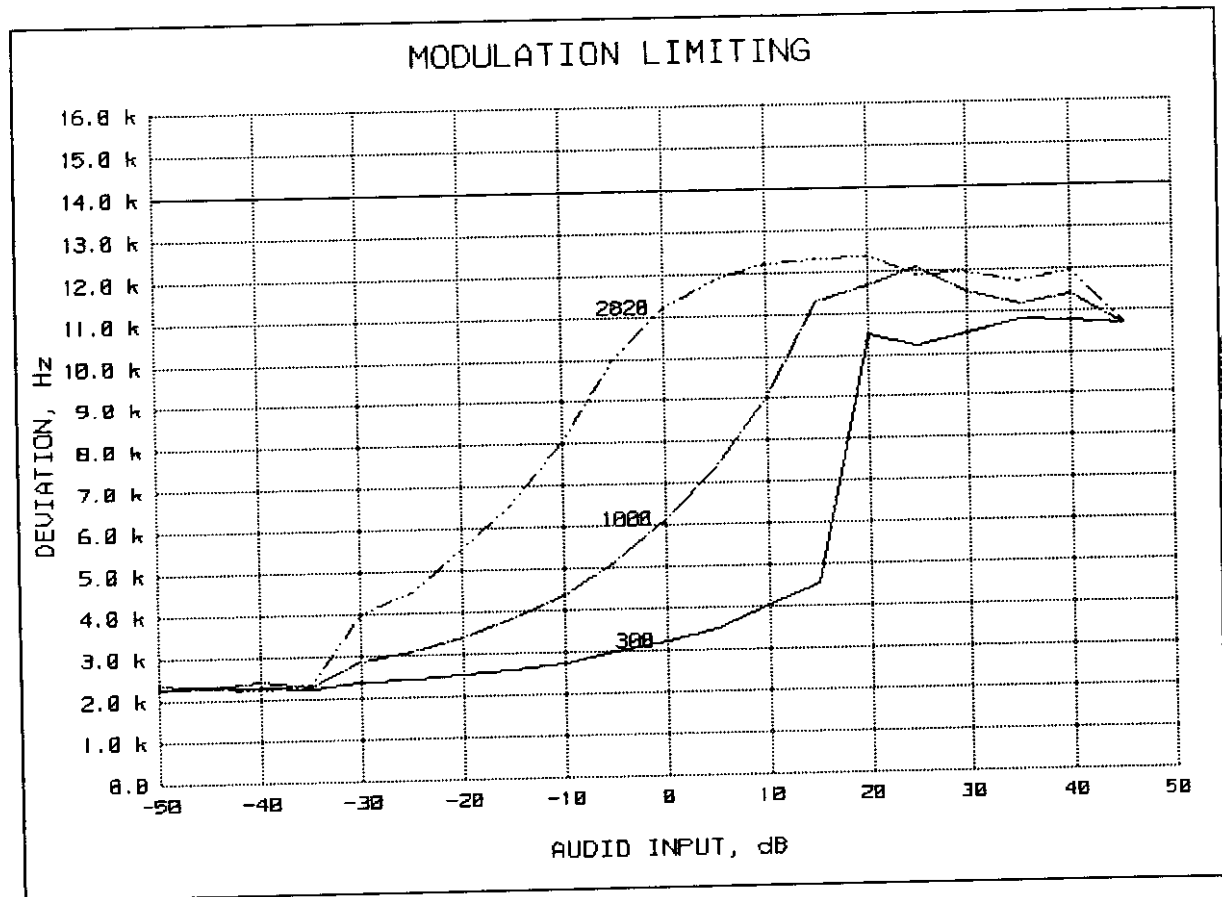
1998-OCT-05, 10:23



COMMENT	= VOICE ONLY
REFERENCE DEVIATION, kHz	= 6
REFERENCE MODULATION, Hz	= 1000
PEAKS	= NEGATIVE
AUDIO AMPLITUDE, mV	= 49.44

PAGE 17 of 71.

MODULATION LIMITING  
 NOKIA, 6185  
 1998-OCT-05, 10:28



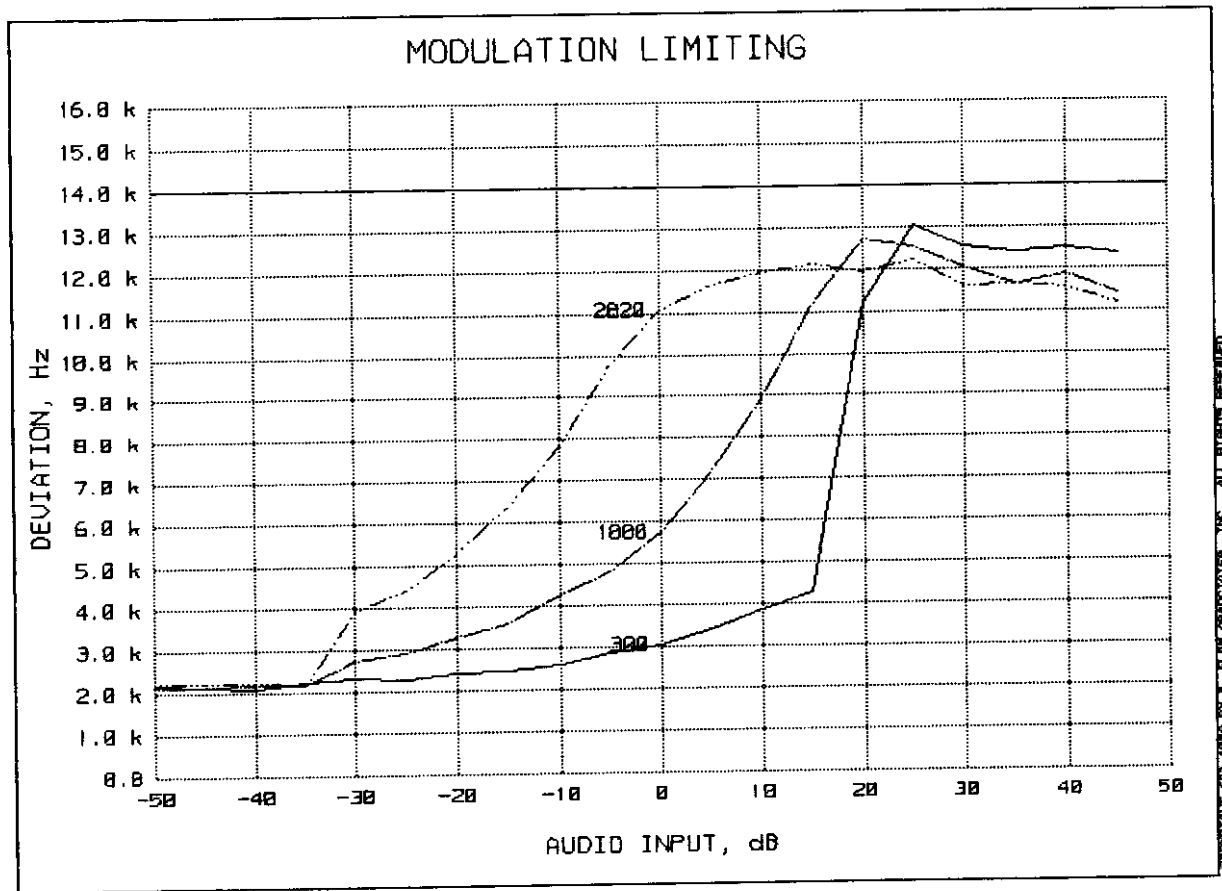
COMMENT	= VOICE + SAT
REFERENCE DEVIATION, kHz	= 6
REFERENCE MODULATION, Hz	= 1000
PEAKS	= POSITIVE
AUDIO AMPLITUDE, mV	= 22.6

PAGE 18 of 71.

MODULATION LIMITING

NOKIA, 6185

1998-OCT-05, 10:28



COMMENT	= VOICE + SAT
REFERENCE DEVIATION, kHz	= 6
REFERENCE MODULATION, Hz	= 1000
PEAKS	= NEGATIVE
AUDIO AMPLITUDE, mV	= 22.6

PAGE NO. 19 of 71.  
NAME OF TEST: Measurement Of Maximum Deviation  
SPECIFICATION:  
  
GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996  
  
TEST EQUIPMENT: As per attached page

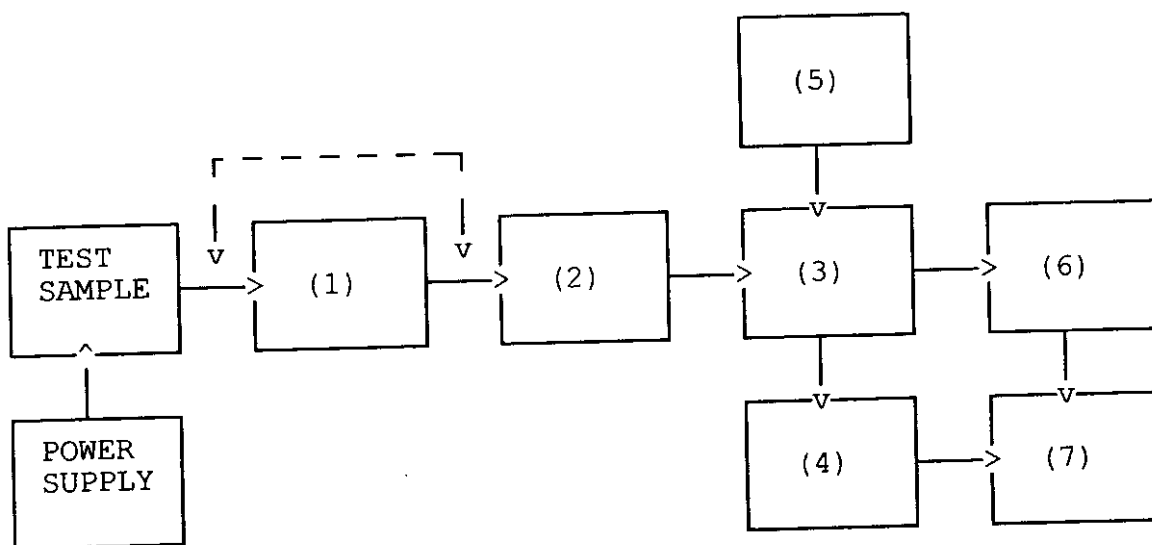
MEASUREMENT PROCEDURE

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

PAGE NO.

20 of 71.

## Measurement Of Maximum Deviation



Asset	Description	s/n
(1)	<u>AUDIO OSCILLATOR/GENERATOR</u>	
	i00010 HP 204D	1105A04683
x	i00017 HP 8903A	2216A01753
(2)	<u>COAXIAL ATTENUATOR</u>	
x	i00122 Narda 766-10	7802
x	i00123 Narda 766-10	7802A
	i00113 Sierra 661A-3D	1059
(3)	<u>FILTERS; NOTCH, HP, LP, BP</u>	
x	i00126 Eagle TNF-1	100-250
x	i00125 Eagle TNF-1	50-60
x	i00124 Eagle TNF-1	250-850
(4)	<u>SPECTRUM ANALYZER</u>	
x	i00048 HP 8566B	2511A01467
	i00029 HP 8563E	3213A00104
(5)	<u>SCOPE</u>	
x	i00030 HP 54502A	2927A00209

PAGE NO.

21 of 71.

MEASUREMENT SUMMARY:      Measurement Of Maximum Deviation

MODULATION		DEVIATION, kHz
(a)	Voice	10.8
(b)	Wideband Data	8.8
(c)	SAT	2.0
(d)	ST	7.7
(e)	SAT + VOICE	12.1
(f)	SAT + DTMF	7.4
(g)	CDMA	N/A
(h)	TDMA	N/A
(i)	NAMPS VOICE	N/A
(j)	NAMPS DSAT	N/A
(k)	NAMPS ST	N/A
(l)	NAMPS VOICE	N/A

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PAGE NO. 22 of 71.  
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
SPECIFICATION: 47 CFR 2.1049(c)(1)  
GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996  
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 71.

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	10.8	$\geq 10.8 \text{ \& } \leq 13.2$	-29
WIDEBAND DATA	8.8	$\geq 7.2 \text{ \& } \leq 8.8$	-32
SAT + VOICE	2.0	N/A	-32
SAT + DTMF	7.4	N/A	-17
CDMA	N/A	N/A	-18
TDMA	N/A	N/A	N/A
NAMPS	N/A	N/A	N/A

SUPERVISED BY:

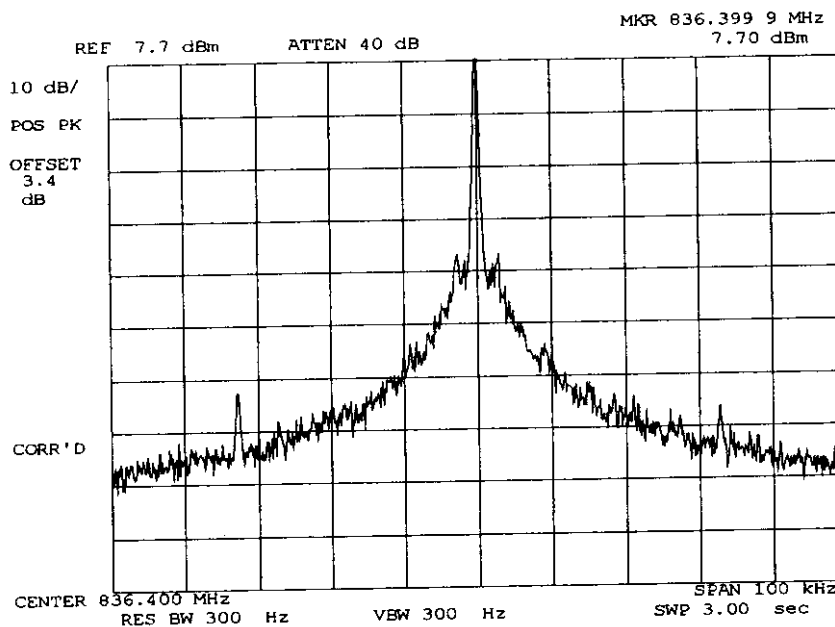


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PAGE NO.

24 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0318: 1998-Oct-09 Fri 13:33:00  
STATE: 1:Low Power



POWER:  
MODULATION:

LOW  
NONE

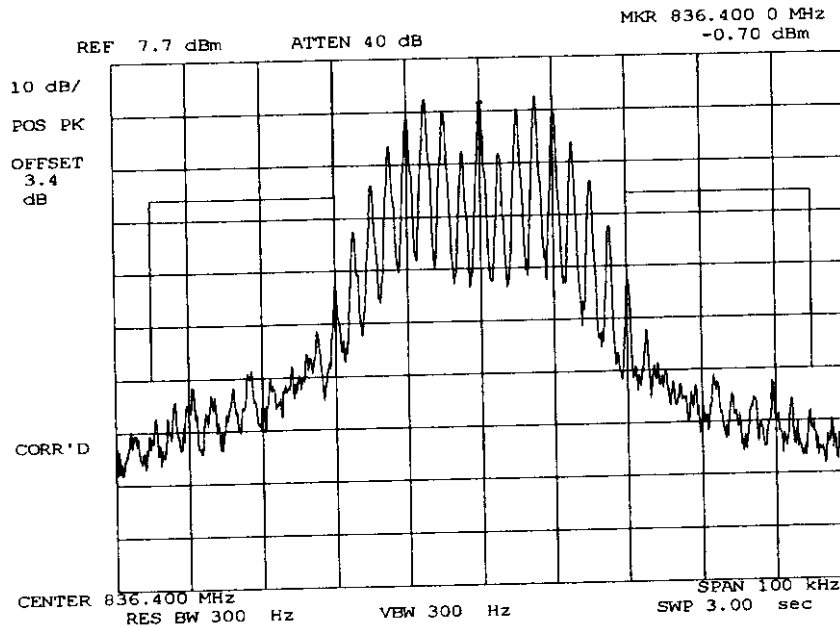
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PAGE NO.

25 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0324: 1998-Oct-09 Fri 13:39:00  
STATE: 1:Low Power



POWER:  
MODULATION:

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

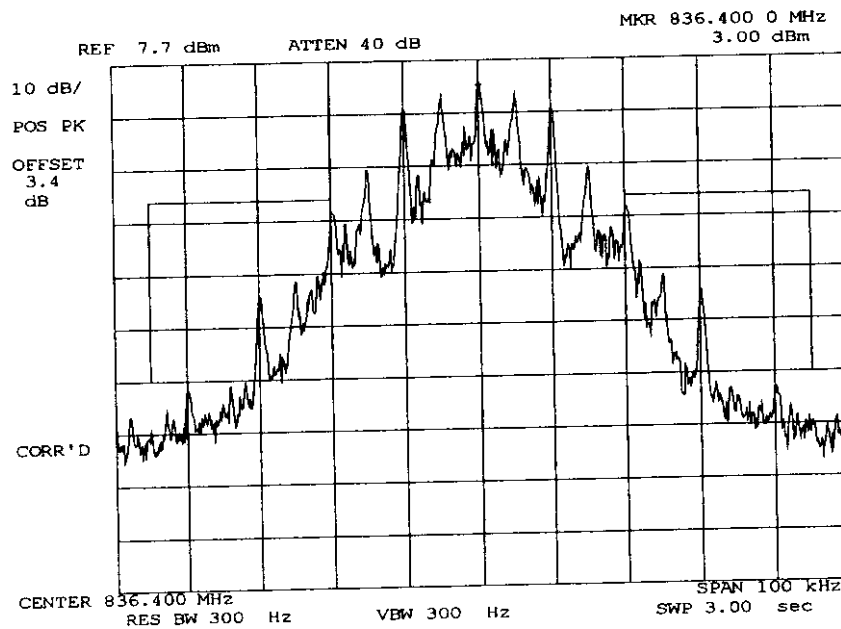
SUPERVISED BY:

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

PAGE NO.

26 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0328: 1998-Oct-09 Fri 13:45:00  
STATE: 1:Low Power



POWER:  
MODULATION:

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

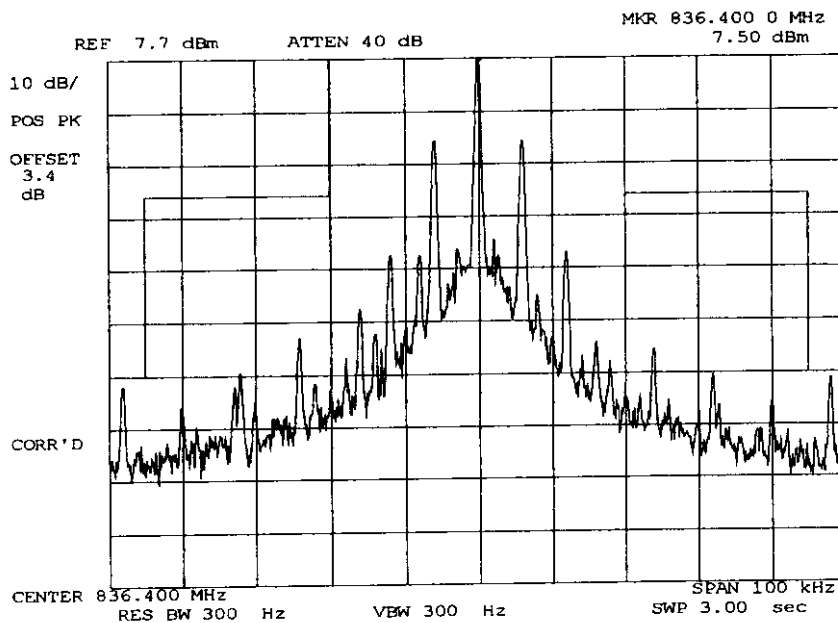
SUPERVISED BY:

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

PAGE NO.

27 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0320: 1998-Oct-09 Fri 13:36:00  
STATE: 1:Low Power



POWER:  
MODULATION:

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

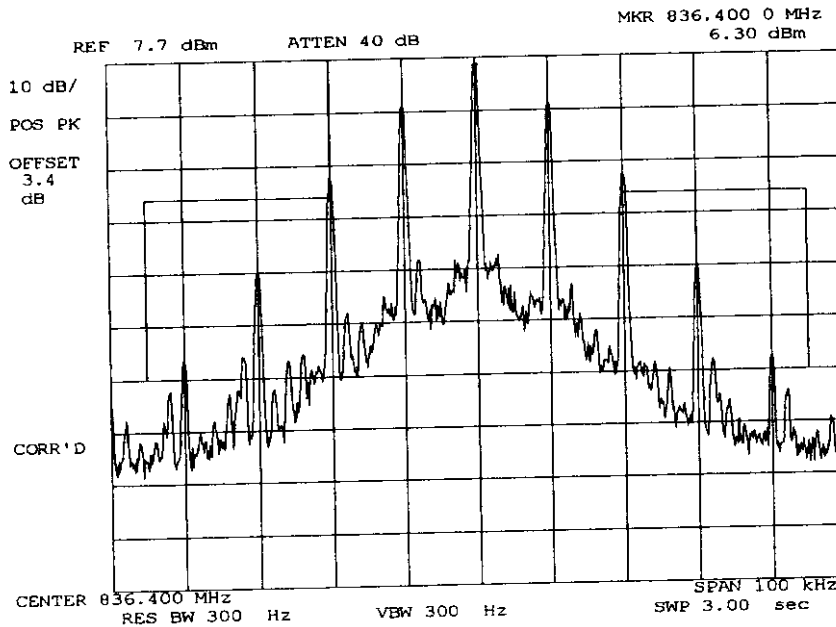
SUPERVISED BY:

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

PAGE NO.

28 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0325: 1998-Oct-09 Fri 13:41:00  
STATE: 1:Low Power



POWER:  
MODULATION:

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

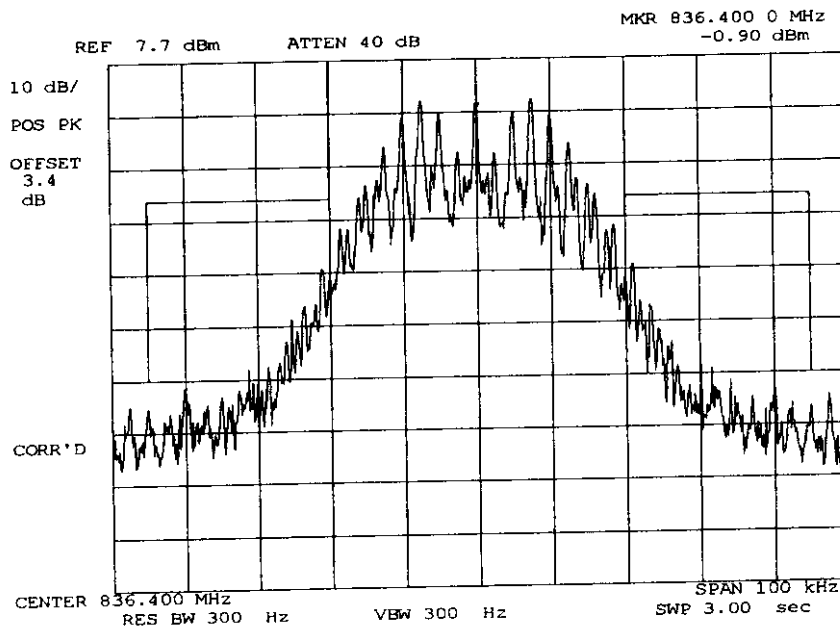
SUPERVISED BY:

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

PAGE NO.

29 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0321: 1998-Oct-09 Fri 13:37:00  
STATE: 1:Low Power



POWER:  
MODULATION:

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

SUPERVISED BY:

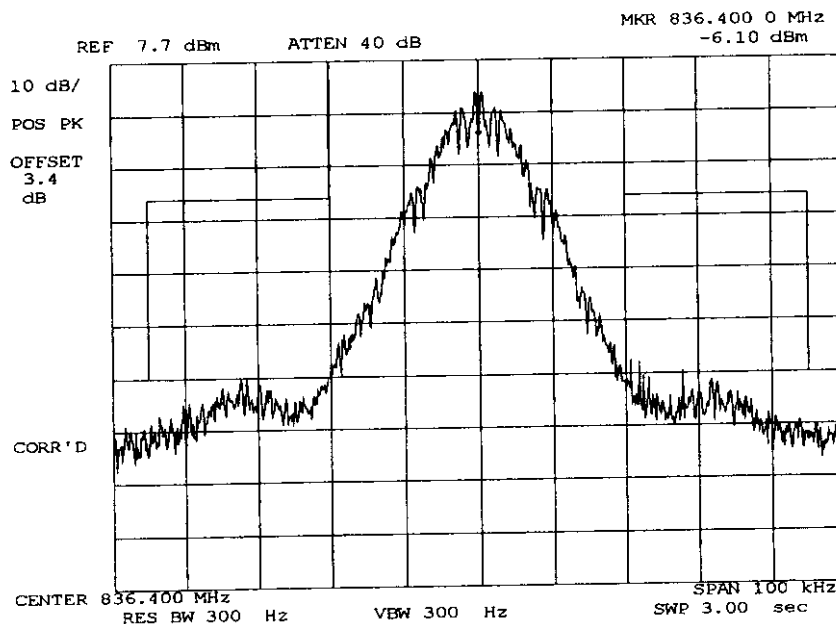
*Morton Flom P. Eng.*

Morton Flom, P. Eng.

PAGE NO.

30 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0329: 1998-Oct-09 Fri 13:50:00  
STATE: 1:Low Power



POWER:  
MODULATION:

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

SUPERVISED BY:

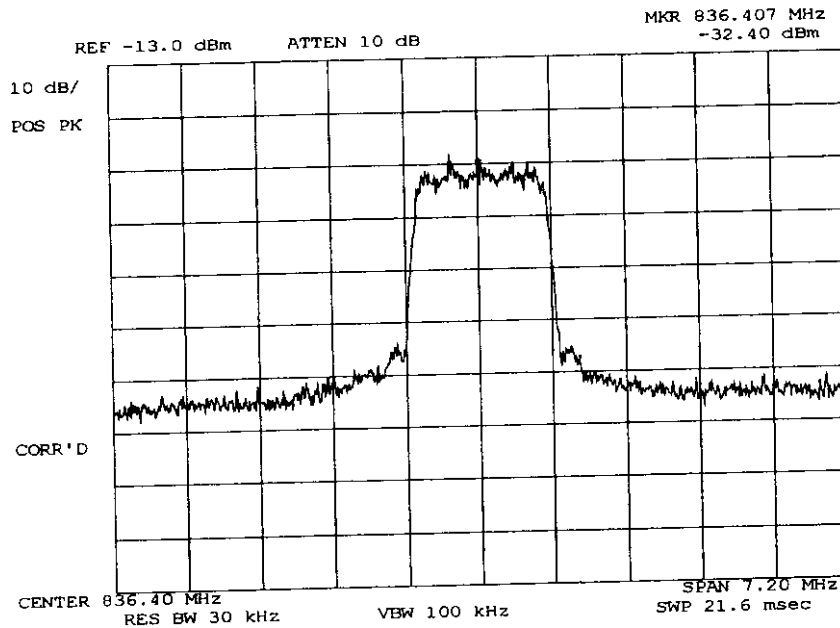
*Morton Flom P. Eng.*

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PAGE NO.

31 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0272: 1998-Oct-06 Tue 11:23:00  
STATE: 1:Low Power



POWER:  
MODULATION:

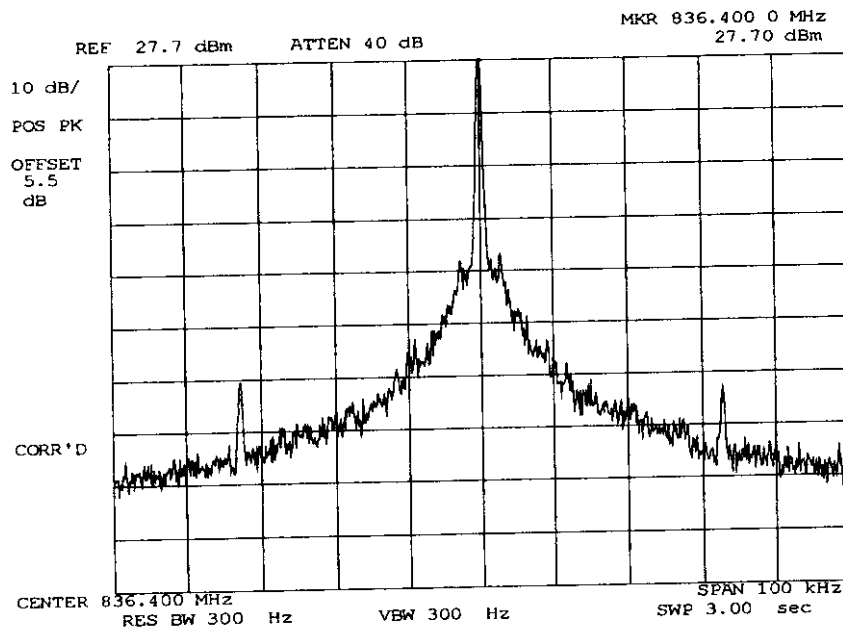
LOW  
CDMA

SUPERVISED BY:

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

PAGE NO. 32 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0317: 1998-Oct-09 Fri 13:32:00  
STATE: 2:High Power



POWER: HIGH  
MODULATION: NONE

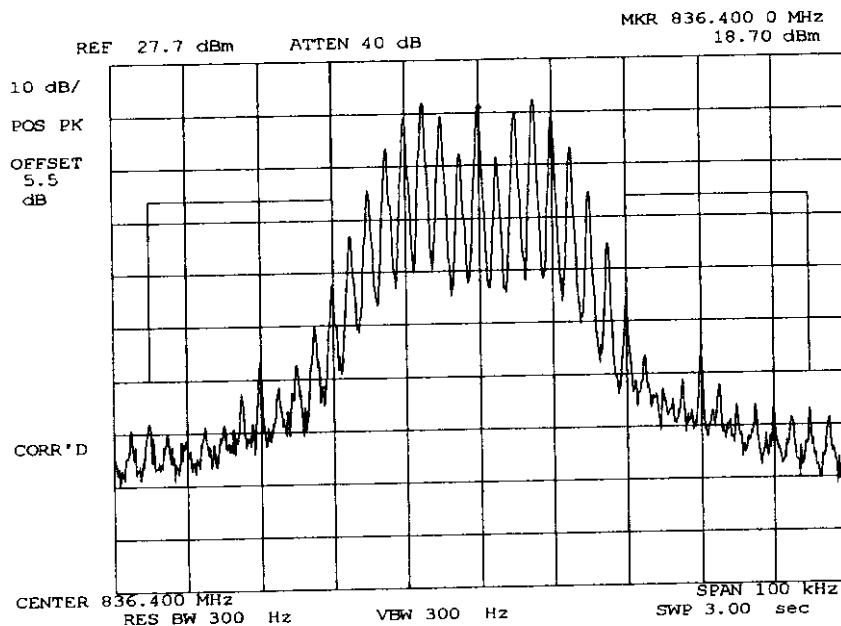
SUPERVISED BY:

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PAGE NO.

33 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0323: 1998-Oct-09 Fri 13:39:00  
STATE: 2:High Power



POWER:  
MODULATION:

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

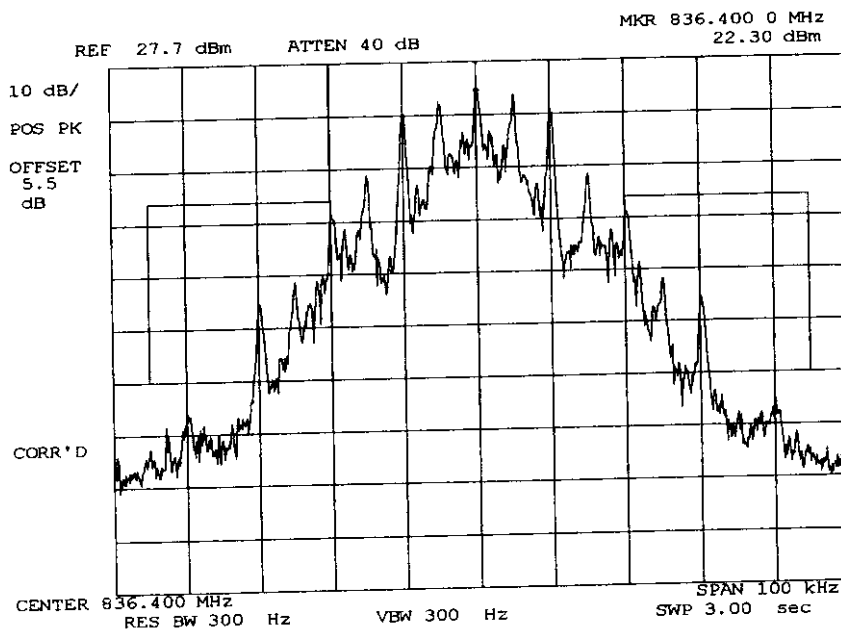
SUPERVISED BY:

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PAGE NO.

34 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g98a0327: 1998-Oct-09 Fri 13:44:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

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

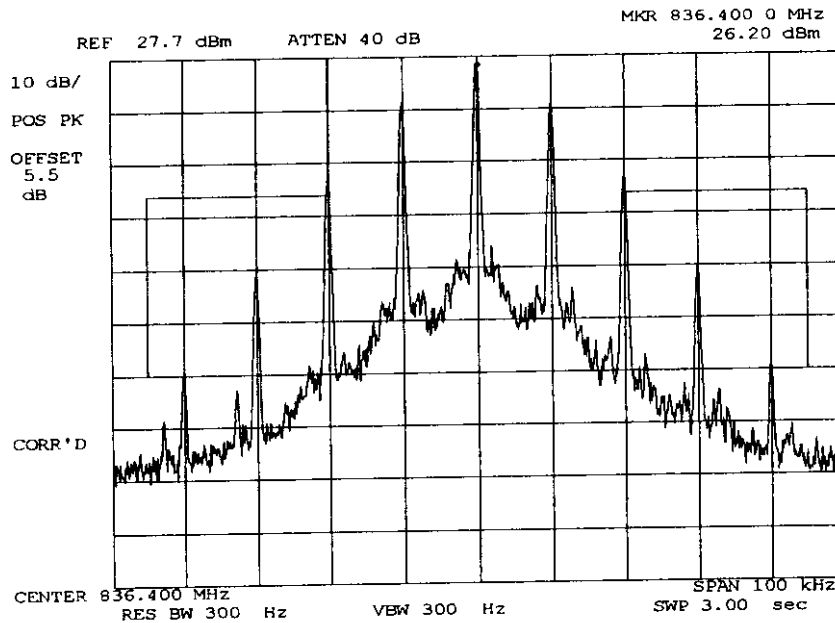
SUPERVISED BY:

Morton Flom, P. Eng.

PAGE NO.

35 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0326: 1998-Oct-09 Fri 13:42:00  
STATE: 2:High Power



POWER:  
MODULATION:

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

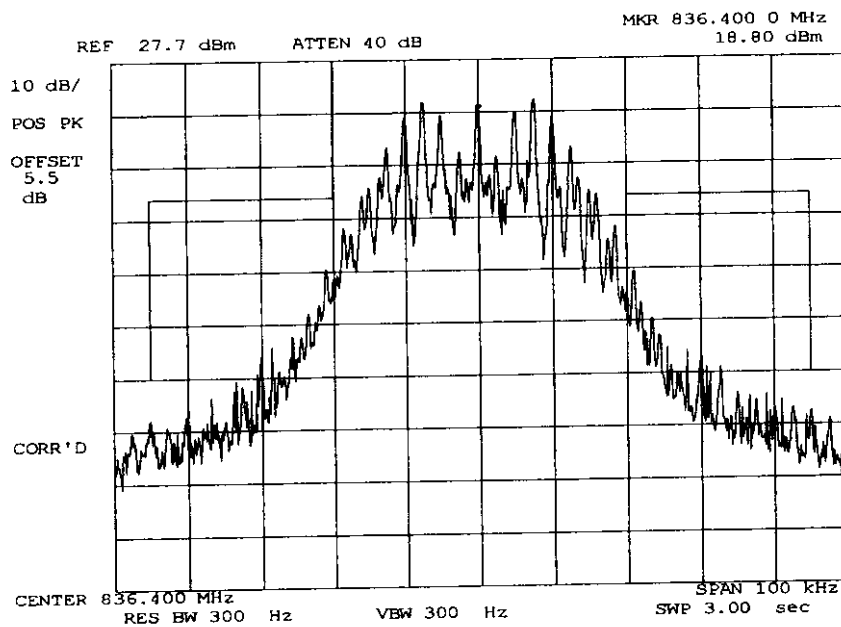
SUPERVISED BY:

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PAGE NO.

36 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0322: 1998-Oct-09 Fri 13:38:00  
STATE: 2:High Power



POWER:  
MODULATION:

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

SUPERVISED BY:

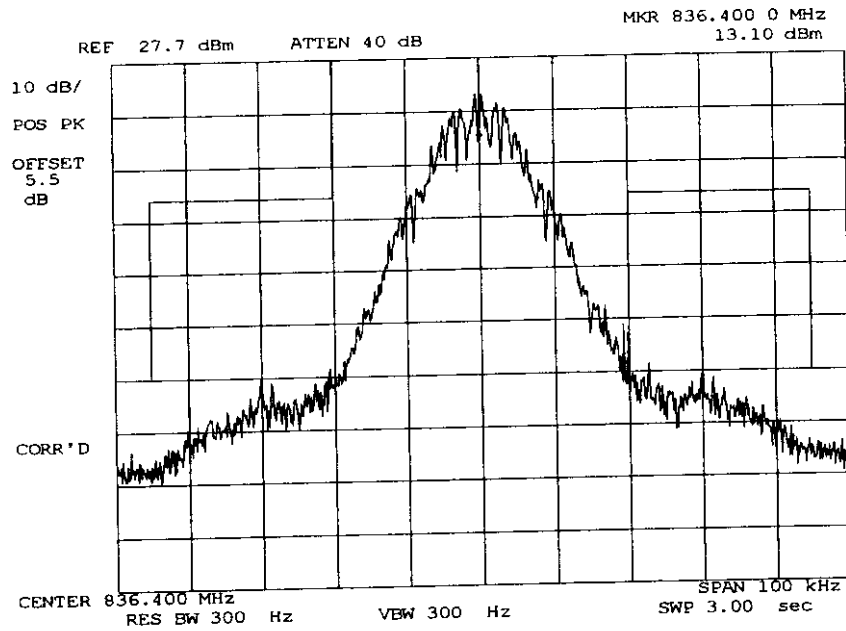


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PAGE NO.

37 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0330: 1998-Oct-09 Fri 14:05:00  
STATE: 2:High Power



POWER:  
MODULATION:

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

SUPERVISED BY:

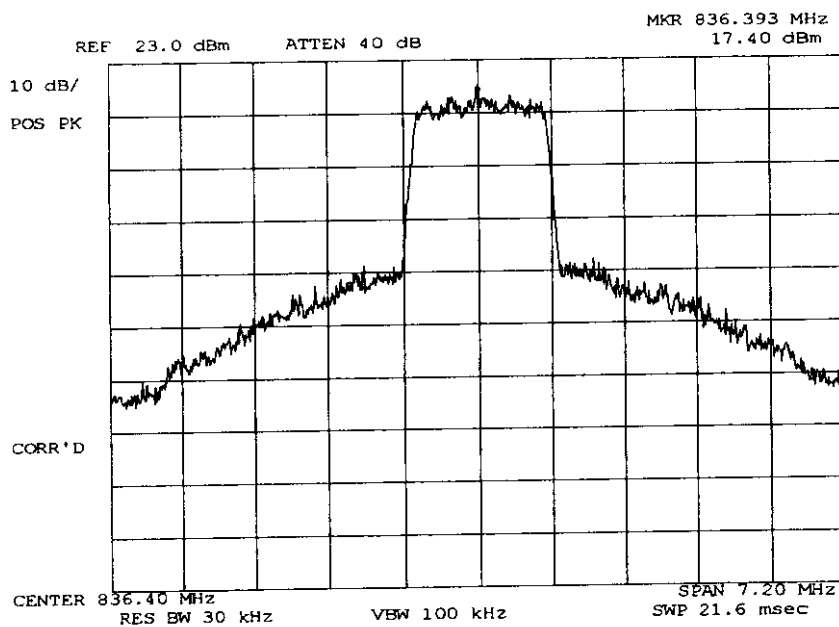


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PAGE NO.

38 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0271: 1998-Oct-06 Tue 11:16:00  
STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
CDMA

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PAGE NO. 39 of 71.

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

SPECIFICATION: 47 CFR 22.917

GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996

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

PAGE NO. 40 of 71.

MEASUREMENT SUMMARY: Emission Requirements -  
Worst Case Modulation

WORST CASE MODULATION = VOICE + \_SAT

EMISSION, MHz/HARM.	LIMIT, dBc	SPURIOUS EMISSIONS, dBc	
		Lo	Hi
F <sub>0</sub> + (F <sub>0</sub> + 20 kHz) to F <sub>0</sub> + 45 kHz	≤-26	≤-58	≤-65
F <sub>0</sub> + (F <sub>0</sub> + 45 kHz) to F <sub>0</sub> + 90 kHz	≤-45 (≤-13 dBm)	≤-67	≤-72
2 <sup>nd</sup> to 10 <sup>th</sup>	≤-51 (≤-13 dBm)	≤-58	≤-73

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	≤-88.2	≤-86.9

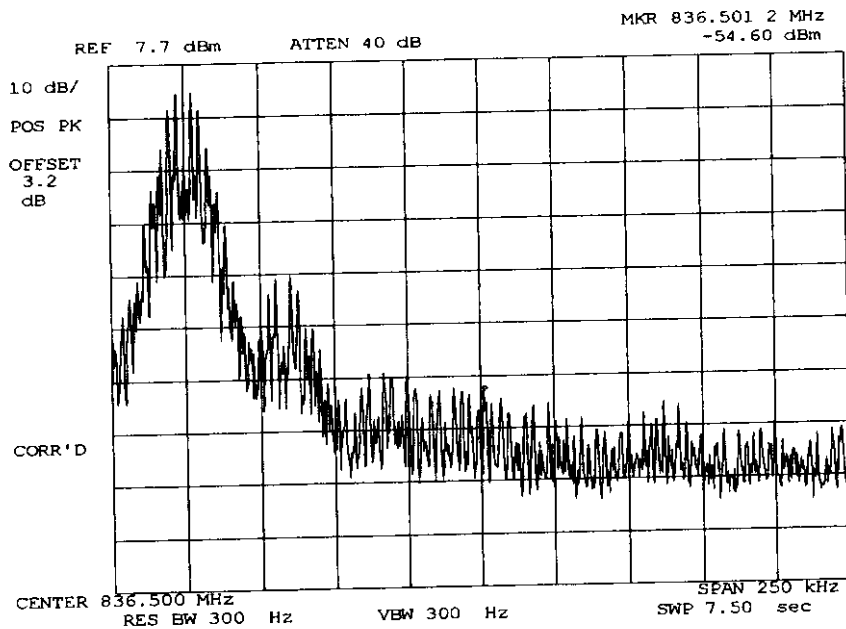
MEASUREMENT RESULTS = ATTACHED PLOTS

SUPERVISED BY:

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41 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0274: 1998-Oct-06 Tue 11:48:00  
STATE: 1:Low Power



POWER:  
MODULATION:

LOW  
SAT+VOICE  
OFFSET OCCUPIED BANDWIDTH

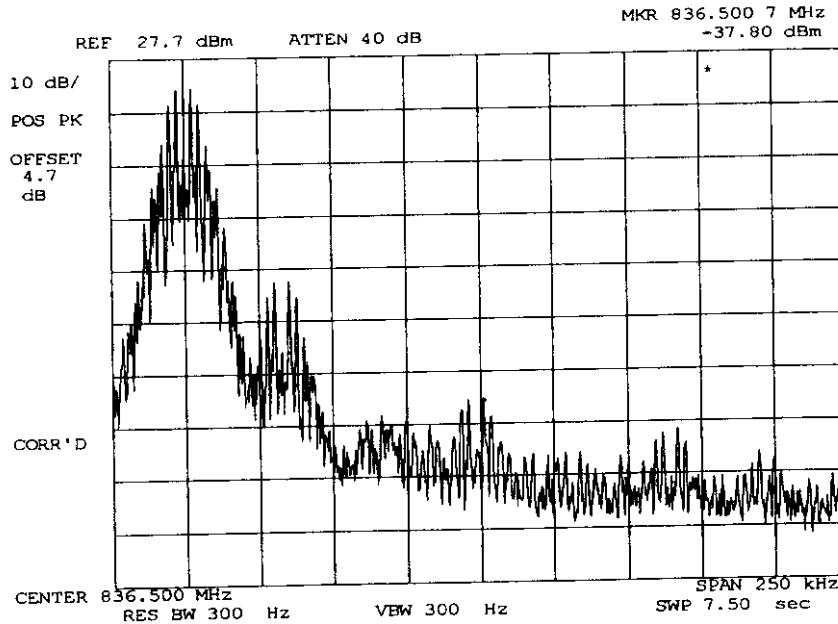
SUPERVISED BY:

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Morton Flom, P. Eng.

PAGE NO.

42 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g98a0273: 1998-Oct-06 Tue 11:47:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

HIGH  
 SAT+VOICE  
 OFFSET OCCUPIED BANDWIDTH

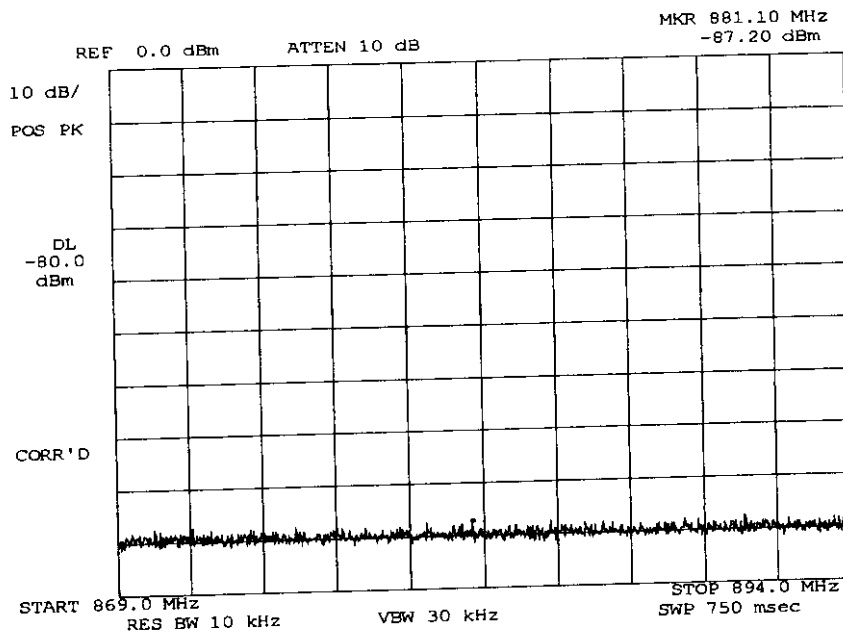
SUPERVISED BY:

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43 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0279: 1998-Oct-06 Tue 12:08:00  
STATE: 1:Low Power



POWER:  
MODULATION:

LOW  
ANY  
TX SPURS IN RX CRITICAL  
BAND

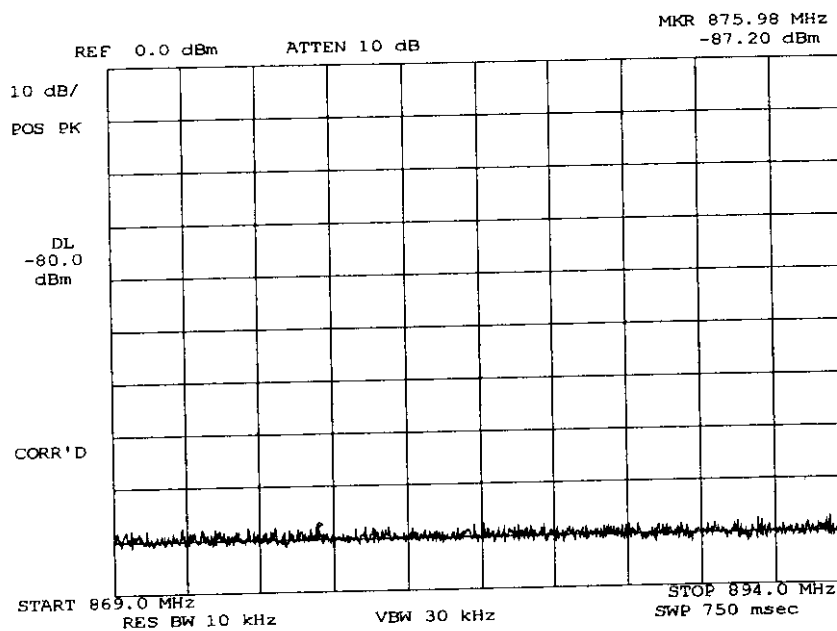
SUPERVISED BY:

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Morton Flom, P. Eng.

PAGE NO.           

44 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0276: 1998-Oct-06 Tue 11:53:00  
STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
ANY  
TX SPURS IN RX CRITICAL  
BAND

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PAGE NO.

45 of 71.

MEASUREMENT SUMMARY:Emission Requirements -  
Wideband Data (F9D, 10 kb/s)

EMISSION, MHz/HARM.	LIMIT, dBc	SPURIOUS EMISSIONS, dBc	
		Lo	Hi
Fo + (Fo + 20 kHz) to Fo + 45 kHz	≤-26	≤-58	≤-73
Fo + (Fo + 45 kHz) to Fo + 90 kHz	≤-45	≤-63	≤-69
Fo + (Fo + 90 kHz) to 2 <sup>nd</sup> Harmonic	≤-60 (≤-13 dBm)	≤-55.9	≤-67.2
2 <sup>nd</sup> to 10 <sup>th</sup>	≤-51 (≤-13 dBm)	≤-87.2	≤-86.7

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	≤-88.2	≤-86.9

MEASUREMENT RESULTS

= ATTACHED PLOTS

SUPERVISED BY:

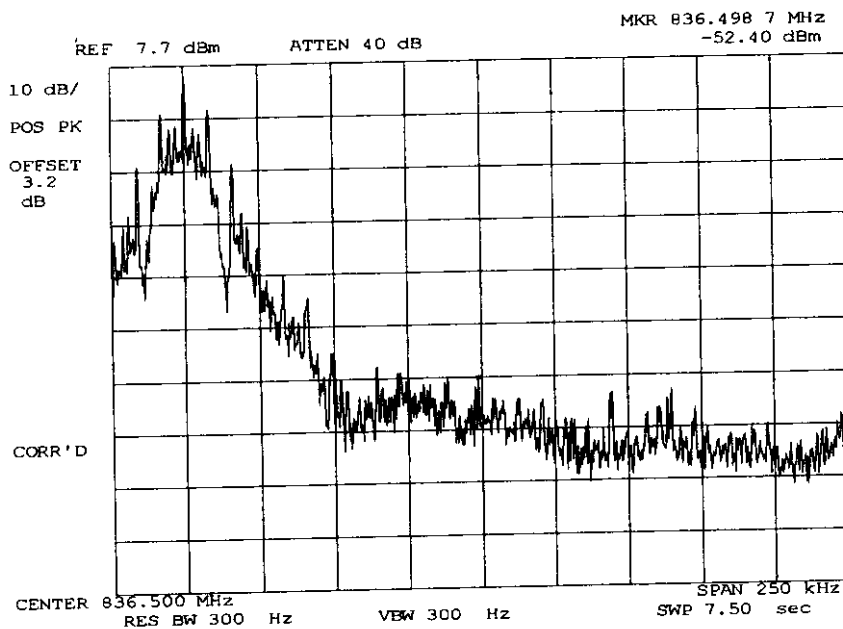


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PAGE NO.

46 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0278: 1998-Oct-06 Tue 12:06:00  
STATE: 1:Low Power



POWER:  
MODULATION:

LOW  
WBD  
OFFSET OCCUPIED BANDWIDTH

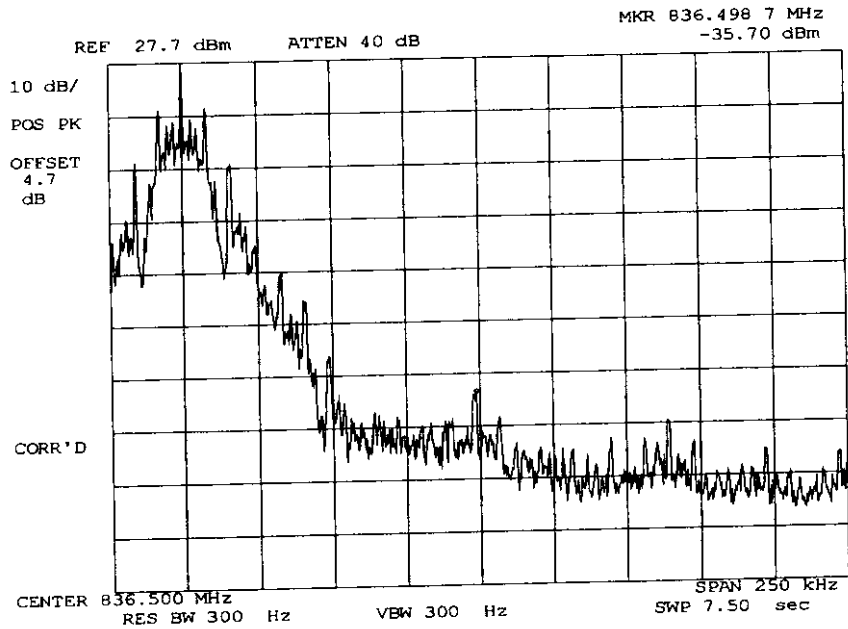
SUPERVISED BY:

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PAGE NO.

47 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0277: 1998-Oct-06 Tue 11:57:00  
STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
WBD  
OFFSET OCCUPIED BANDWIDTH

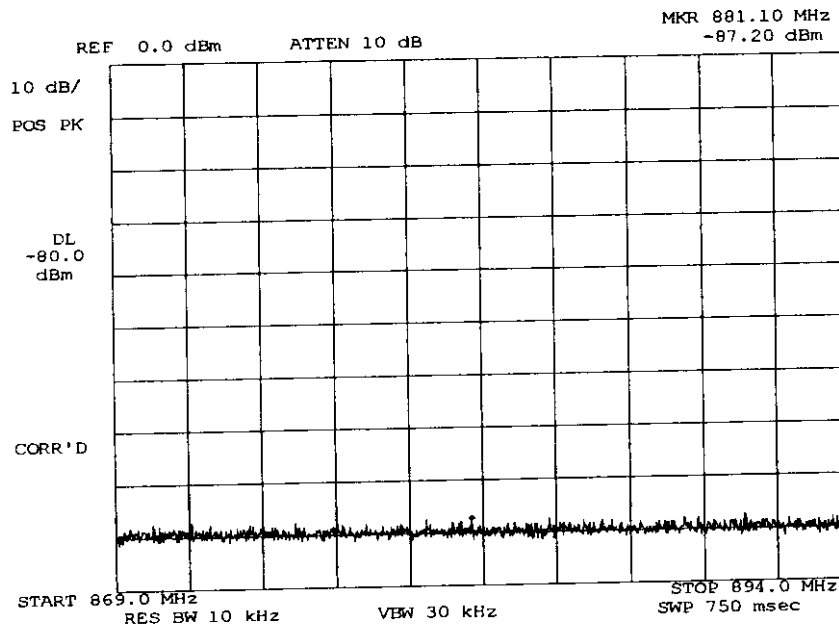
SUPERVISED BY:

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PAGE NO. \_\_\_\_\_

48 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0279: 1998-Oct-06 Tue 12:08:00  
STATE: 1:Low Power



POWER:  
MODULATION:

LOW  
ANY  
TX SPURS IN RX CRITICAL  
BAND

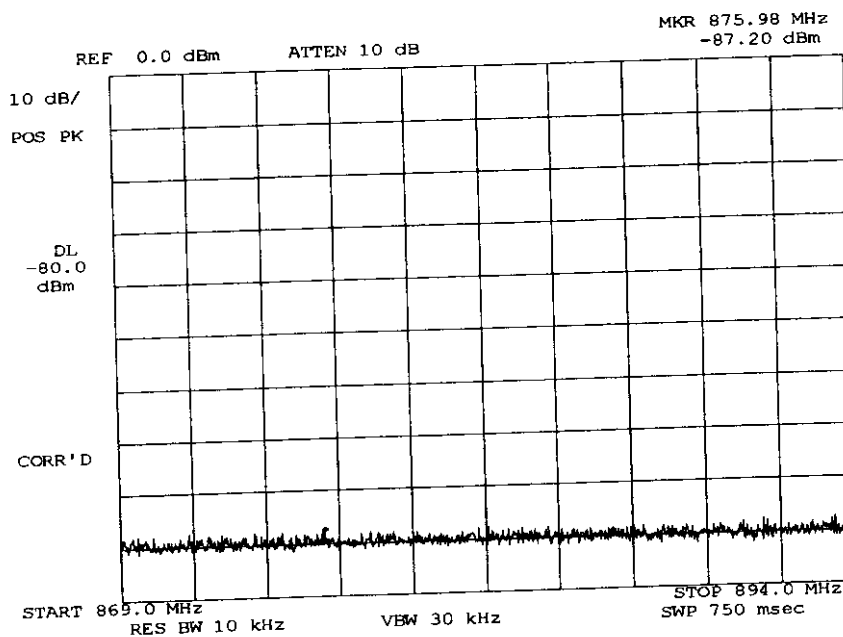
SUPERVISED BY:

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PAGE NO.

49 of 71.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98a0276: 1998-Oct-06 Tue 11:53:00  
STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
ANY  
TX SPURS IN RX CRITICAL  
BAND

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Morton Flom, P. Eng.

PAGE NO. 50 of 71.  
NAME OF TEST: Spurious Emissions at Antenna Terminals  
SPECIFICATION: 47 CFR 2.1051, 22.917  
GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996  
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

NAME OF TEST: Unwanted Emissions (Transmitter Conducted)

g98a0260: 1998-Oct-06 Tue 10:28:00

STATE: 1:Low Power (AMPS MODE)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
836.400000	1672.775000	-48.2	-55.9	-35.2
836.400000	2508.855000	-52.4	-60.1	-39.4
836.400000	3345.795000	-52.4	-60.1	-39.4
836.400000	4181.924000	-53	-60.7	-40
836.400000	5018.549000	-51.8	-59.5	-38.8
836.400000	5854.355000	-46	-53.7	-33
836.400000	6691.226000	-46.4	-54.1	-33.4
836.400000	7527.525000	-47.2	-54.9	-34.2
836.400000	8364.433000	-46	-53.7	-33
836.400000	9199.901000	-46.4	-54.1	-33.4
836.400000	10036.581000	-47.1	-54.8	-34.1
836.400000	10872.932000	-46.7	-54.4	-33.7
836.400000	11709.646000	-45.8	-53.5	-32.8
836.400000	12546.326000	-40.8	-48.5	-27.8

PAGE NO.

52 of 71.

NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
g98a0291: 1998-Oct-06 Tue 14:50:00  
STATE: 1:Low Power (CDMA MODE)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
836.400000	1672.948000	-52.3	-56.8	-39.3
836.400000	2508.784000	-54.4	-58.9	-41.4
836.400000	3345.782000	-56	-60.5	-43
836.400000	4181.679000	-55.5	-60	-42.5
836.400000	5018.804000	-56.4	-60.9	-43.4
836.400000	5854.601000	-49.6	-54.1	-36.6
836.400000	6691.609000	-49.6	-54.1	-36.6
836.400000	7528.045000	-49.3	-53.8	-36.3
836.400000	8364.081000	-49.3	-53.8	-36.3
836.400000	9200.349000	-49.8	-54.3	-36.8
836.400000	10036.766000	-49.5	-54	-36.5
836.400000	10873.370000	-49	-53.5	-36
836.400000	11709.776000	-48.2	-52.7	-35.2
836.400000	12545.884000	-45.5	-50	-32.5

PAGE NO.

53 of 71.

NAME OF TEST: Unwanted Emissions (Transmitter Conducted)

g98a0259: 1998-Oct-06 Tue 10:20:00

STATE: 2:High Power (AMPS MODE)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
836.400000	1672.814000	-39.5	-67.2	-26.5
836.400000	2509.171000	-51	-78.7	-38
836.400000	3345.776000	-51.7	-79.4	-38.7
836.400000	4182.448000	-51.2	-78.9	-38.2
836.400000	5018.552000	-50.6	-78.3	-37.6
836.400000	5854.846000	-45.2	-72.9	-32.2
836.400000	6690.719000	-45.2	-72.9	-32.2
836.400000	7527.720000	-45.5	-73.2	-32.5
836.400000	8363.804000	-45.4	-73.1	-32.4
836.400000	9200.782000	-45.2	-72.9	-32.2
836.400000	10036.942000	-45.7	-73.4	-32.7
836.400000	10872.926000	-43.8	-71.5	-30.8
836.400000	11709.670000	-44.2	-71.9	-31.2
836.400000	12545.794000	-40.9	-68.6	-27.9

NAME OF TEST: Unwanted Emissions (Transmitter Conducted)

g98a0261: 1998-Oct-06 Tue 10:32:00

STATE: 2:High Power (AMPS MODE, 2<sup>nd</sup> TUNED FREQUENCY)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
824.040000	1648.101000	-34.3	-62	-21.3
824.040000	2472.553000	-47.2	-74.9	-34.2
824.040000	3295.829000	-50.4	-78.1	-37.4
824.040000	4120.295000	-50.8	-78.5	-37.8
824.040000	4944.409000	-50.8	-78.5	-37.8
824.040000	5768.733000	-51.2	-78.9	-38.2
824.040000	6592.625000	-45.1	-72.8	-32.1
824.040000	7416.288000	-45.8	-73.5	-32.8
824.040000	8240.627000	-45.4	-73.1	-32.4
824.040000	9064.286000	-45	-72.7	-32
824.040000	9888.272000	-45.6	-73.3	-32.6
824.040000	10712.964000	-45.3	-73	-32.3
824.040000	11536.137000	-44.4	-72.1	-31.4
824.040000	12360.301000	-45.6	-73.3	-32.6

PAGE NO.

55 of 71.

NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
g98a0290: 1998-Oct-06 Tue 14:43:00  
STATE: 2:High Power (CDMA MODE)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
836.400000	1672.459000	-50.8	-73.8	-37.8
836.400000	2509.596000	-55.4	-78.4	-42.4
836.400000	3345.473000	-55.3	-78.3	-42.3
836.400000	4182.248000	-55.3	-78.3	-42.3
836.400000	5018.869000	-55.8	-78.8	-42.8
836.400000	5854.327000	-51.1	-74.1	-38.1
836.400000	6691.284000	-49.3	-72.3	-36.3
836.400000	7527.143000	-50.3	-73.3	-37.3
836.400000	8363.721000	-49	-72	-36
836.400000	9200.632000	-49.8	-72.8	-36.8
836.400000	10036.986000	-49.4	-72.4	-36.4
836.400000	10872.846000	-50.1	-73.1	-37.1
836.400000	11709.322000	-49.7	-72.7	-36.7
836.400000	12545.698000	-45.8	-68.8	-32.8

PAGE NO. 56 of 71.

NAME OF TEST: Field Strength of Spurious Radiation

SPECIFICATION: 47 CFR 2.1053(a)

GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996

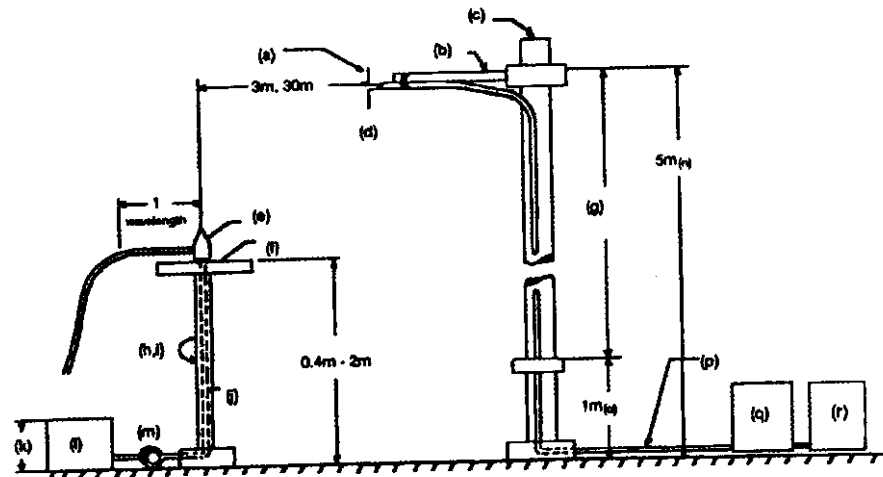
TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. A description of the measurement facilities was filed with the FCC and was found to be in compliance with the requirements of Section 15.38, by letter from the FCC dated March 3, 1997, FILE 31040/SIT. All pertinent changes will be reported to the Commission by up-date prior to March 2000.
2. At first, in order to locate all spurious frequencies and approximate amplitudes, and to determine proper equipment functioning, the test sample was set up at a distance of three meters from the test instrument. Valid spurious signals were determined by switching the power on and off.
3. In the field, the test sample was placed on a wooden turntable above ground at three (or thirty) meters away from the search antenna. Excess power leads were coiled near the power supply.  
  
The cables were oriented in order to obtain the maximum response. At each emission frequency, the turntable was rotated and the search antennas were raised and lowered vertically.
4. The emission was observed with both a vertically polarized and a horizontally polarized search antenna and the worst case was used.
6. The field strength of each emission within 20 dB of the limit was recorded and corrected with the appropriate cable and transducer factors.
7. The worst case for all channels is shown.
8. Measurement results: ATTACHED FOR WORST CASE

PAGE NO.

57 of 71.

RADIATED TEST SETUP

## NOTES:

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

Asset	Description	s/n	Cycle	Last Cal
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Per AWSI C63.4-1992, 10.1.4

TRANSDUCER

—	i00065	EMCO 3109B 100Hz-50MHz	2336	12 mo.	
—	i00033	Singer 94593-1 10kHz-32MHz	0219	12 mo.	
x	i00088	EMCO 3109-B 25MHz-300MHz	2336	12 mo.	Oct-98
x	i00089	Aprcl 2001 200MHz-1GHz	001500	12 mo.	Oct-98
x	i00103	EMCO 3115 1GHz-18GHz	9208-3925	12 mo.	Oct-98
—	i00085	EMCO 3116 10GHz-40GHz	2076	12 mo.	

AMPLIFIER

—	i00028	HP 8449A	2749A00121	12 mo.	Mar-98
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SPECTRUM ANALYZER

—	i00029	HP 8563E	3213A00104	12 mo.	
x	i00033	HP 85462A	3625A00357	12 mo.	Dec-97
—	i00048	HP 8566B	2511AD1467	6 mo.	Mar-98

PAGE NO.

58 of 71.

MEASUREMENT RESULTS: FIELD STRENGTH OF SPURIOUS RADIATION

Measurement Distance, m = 3

Spectrum Searched, GHz = 0 to 10

TUNED, MHz	CHANNEL NUMBER	EMISSION MHz/HARM.	LEVEL, dBc	
			Lo	Hi
824.040	991	2 <sup>nd</sup> - 10 <sup>th</sup>	-53.7	-62
836.400	380	2 <sup>nd</sup> - 10 <sup>th</sup>	-53.7	-62
848.970	799	2 <sup>nd</sup> - 10 <sup>th</sup>	-53.7	-62

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.

SUPERVISED BY:



Morton Flom, P. Eng.

PAGE NO.

59 of 71.

NAME OF TEST: Field Strength of Spurious Radiation  
 g98a0294: 1998-Oct-06 Tue 16:15:00  
 STATE: 1:Low Power (PCS MODE)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	MARGIN, dB
1850.040000	3702.750000	9.04	40.58	302.69	-45.6	-32.4
1879.980000	3759.866666	46.17	10.73	699.84	-38.3	-25.1
1909.920000	3817.666666	46.67	10.9	755.96	-37.7	-24.4
1850.040000	5553.500001	45	15.14	1016.25	-35.1	-21.9
1879.980000	5639.799999	43.83	15.3	904.69	-36.1	-22.9
1909.920000	5726.499999	42.83	15.47	822.24	-36.9	-23.7
1850.040000	7404.666668	42.5	19.18	1213.39	-33.5	-20.3
1879.980000	7519.733332	43	19.48	1330.45	-32.7	-19.5
1909.920000	7635.333332	43	19.65	1356.75	-32.6	-19.4
1850.040000	9255.833335	44.5	22.03	2120.8	-28.7	-15.5
1879.980000	9399.666665	43.5	22.09	1903.27	-29.6	-16.4
1909.920000	9544.166665	45.17	22.21	2338.84	-27.8	-14.6
1850.040000	11107.000002	44.67	23.9	2682.25	-26.7	-13.4
1879.980000	11279.599998	44.33	23.95	2594.18	-26.9	-13.7
1909.920000	11452.999998	42	24.02	1999.86	-29.2	-16
1850.040000	12958.166669	45.33	24.67	3162.28	-25.2	-12
1879.980000	13159.533331	43.5	25.14	2703.96	-26.6	-13.4
1909.920000	13361.833331	44.17	25.7	3115.3	-25.4	-12.1
1850.040000	14809.333336	43.67	25.69	2937.65	-25.9	-12.6
1879.980000	15039.466664	43.33	25.52	2770.13	-26.4	-13.2
1909.920000	15270.666664	43.83	25.03	2773.32	-26.4	-13.1
1850.040000	16660.500003	44.5	26.99	3754.05	-23.7	-10.5
1879.980000	16919.399997	43.67	28.38	4004.05	-23.2	-10
1909.920000	17179.499997	43.33	29.9	4586.7	-22	-8.8

PAGE NO.

60 of 71.

NAME OF TEST: Field Strength of Spurious Radiation  
 g98a0304: 1998-Oct-07 Wed 16:02:00  
 STATE: 1:Low Power (AMPS MODE)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
824.160000	1648.320000	33.83	31.65	1879.32	-31.85	-16.7
836.400000	1672.800000	33.83	31.81	1914.26	-31.75	-16.6
848.850000	1697.700000	33.83	31.96	1947.6	-31.55	-16.2
836.400000	2509.200000	47.33	5.99	463.45	-44.05	-28.9
848.850000	2546.550000	45.33	6.18	376.27	-45.85	-30.5
824.160000	3296.640000	47	9.32	654.64	-41.05	-25.9
836.400000	3345.600000	44.17	9.48	481.39	-43.75	-28.6
848.850000	3395.400000	46	9.64	605.34	-41.75	-26.4
824.160000	4120.800000	44.67	11.34	631.68	-41.35	-26.2
836.400000	4182.000000	45	11.32	654.64	-41.05	-25.9
848.850000	4244.250000	44.17	11.3	593.61	-41.95	-26.5
824.160000	4944.960000	44.67	13.17	779.83	-39.55	-24.4
836.400000	5018.400000	43.17	13.46	678.42	-40.75	-25.6
848.850000	5093.100000	43.17	13.71	698.23	-40.45	-25.1
824.160000	5769.120000	44.5	15.57	1008.09	-37.35	-22.1
836.400000	5854.800000	44	15.73	969.39	-37.65	-22.5
848.850000	5941.950000	42.5	15.89	830.81	-38.95	-23.6
824.160000	6593.280000	43.33	16.76	1010.42	-37.25	-22.1
836.400000	6691.200000	43.83	17.07	1109.17	-36.45	-21.3
848.850000	6790.800000	42	17.37	930.04	-38.05	-22.6
824.160000	7417.440000	43.83	19.22	1420.69	-34.35	-19.2
836.400000	7527.600000	44.17	19.49	1524.05	-33.75	-18.5
848.850000	7639.650000	42.83	19.66	1331.99	-34.85	-19.5
824.160000	8241.600000	45	20.6	1905.46	-31.75	-16.6
836.400000	8364.000000	45	20.81	1952.09	-31.55	-16.4
848.850000	8488.500000	44.67	21.02	1925.31	-31.65	-16.3

PAGE NO.

61 of 71.

NAME OF TEST: Field Strength of Spurious Radiation  
 g98a0306: 1998-Oct-08 Thu 12:16:00  
 STATE: 1:Low Power (CDMA MODE)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
824.040000	1648.080000	35.33	31.65	2233.57	-30.35	-15.2
836.400000	1672.800000	34.17	31.81	1990.67	-31.35	-16.2
848.970000	1697.940000	33.83	31.97	1949.84	-31.55	-16.4
824.040000	2472.120000	44.67	5.83	334.97	-46.85	-31.7
836.400000	2509.200000	44.83	5.99	347.54	-46.55	-31.4
848.970000	2546.910000	46.17	6.18	414.48	-45.05	-29.9
824.040000	3296.160000	45.33	9.32	540.13	-42.75	-27.6
836.400000	3345.600000	44	9.48	472.06	-43.85	-28.7
848.970000	3395.880000	45.67	9.65	583.45	-42.05	-26.9
824.040000	4120.200000	46	11.34	736.21	-40.05	-24.9
836.400000	4182.000000	44.83	11.32	641.95	-41.25	-26.1
848.970000	4244.850000	44	11.3	582.1	-42.05	-26.9
824.040000	4944.240000	44.17	13.17	736.21	-40.05	-24.9
836.400000	5018.400000	43	13.46	665.27	-40.95	-25.7
848.970000	5093.820000	43.17	13.72	699.04	-40.45	-25.3
824.040000	5768.280000	42.83	15.55	829.85	-38.95	-23.8
836.400000	5854.800000	42.67	15.73	831.76	-38.95	-23.8
848.970000	5942.790000	42.33	15.9	815.64	-39.15	-24
824.040000	6592.320000	42.83	16.76	953.89	-37.75	-22.6
836.400000	6691.200000	41.83	17.07	881.05	-38.45	-23.3
848.970000	6791.760000	42.83	17.37	1023.29	-37.15	-22
824.040000	7416.360000	43	19.21	1289.73	-35.15	-20
836.400000	7527.600000	41.83	19.49	1164.13	-36.05	-20.9
848.970000	7640.730000	42.67	19.66	1307.68	-35.05	-19.9
824.040000	8240.400000	43.17	20.6	1543.48	-33.65	-18.4
836.400000	8364.000000	43.33	20.81	1610.65	-33.25	-18.1
848.970000	8489.700000	42.5	21.03	1501.41	-33.85	-18.7

PAGE NO.

62 of 71.

NAME OF TEST: Field Strength of Spurious Radiation

g98a0301: 1998-Oct-07 Wed 10:28:00

STATE: 2:High Power (PCS MODE)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	EIRP, dBm	MARGIN, dB
1850.040000	3702.466666	60.33	10.58	3511.56	-24.3	-11.1
1879.980000	3760.066666	54.33	10.73	1790.61	-30.2	-16.9
1909.920000	3817.666666	58.5	10.9	2951.21	-25.8	-12.6
1850.040000	5553.699999	45.5	15.14	1076.47	-34.6	-21.4
1879.980000	5640.099999	47.83	15.31	1435.49	-32.1	-18.9
1909.920000	5726.499999	54	15.47	2975.09	-25.8	-12.5
1850.040000	7404.933332	32.33	19.18	376.27	-43.7	-30.5
1879.980000	7520.133332	34	19.48	472.06	-41.7	-28.5
1909.920000	7635.333332	32.83	19.65	420.73	-42.7	-29.5
1850.040000	9256.166665	33.33	22.03	586.14	-39.9	-26.6
1879.980000	9400.166665	33.5	22.09	601.87	-39.6	-26.4
1909.920000	9543.366665	34.67	22.21	698.23	-38.3	-25.1
1850.040000	11107.399998	33.33	23.9	726.94	-38	-24.8
1879.980000	11280.199998	33	23.95	703.88	-38.3	-25.1
1909.920000	11452.999998	33.17	24.02	723.6	-38	-24.8
1850.040000	12958.633331	32.83	24.67	749.89	-37.7	-24.5
1879.980000	13160.233331	32.67	25.14	777.14	-37.4	-24.2
1909.920000	13361.833331	33.5	25.7	912.01	-36	-22.8
1850.040000	14809.866664	33	25.69	860	-36.5	-23.3
1879.980000	15040.266664	33.33	25.52	875.99	-36.4	-23.2
1909.920000	15270.666664	32.83	25.03	781.63	-37.4	-24.1
1850.040000	16661.099997	32.5	26.99	942.97	-35.7	-22.5
1879.980000	16920.299997	32.33	28.39	1086.43	-34.5	-21.3
1909.920000	17179.499997	32	29.9	1244.51	-33.3	-20.1

PAGE NO.

63 of 71.

NAME OF TEST: Field Strength of Spurious Radiation  
 g98a0303: 1998-Oct-07 Wed 14:05:00  
 STATE: 2:High Power (AMPS MODE)

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
824.160000	1648.320000	36.5	31.65	2555.64	-29.25	-13.9
836.400000	1673.000000	35.83	31.81	2409.91	-29.75	-14.4
848.850000	1697.700000	35.17	31.96	2272.48	-30.25	-14.9
824.160000	2472.580000	62.17	5.83	2511.89	-29.35	-14
836.400000	2509.500000	67	5.99	4461.7	-24.35	-9
848.850000	2546.550000	51.33	6.18	750.76	-39.85	-24.5
824.160000	3296.740000	45.83	9.32	572.14	-42.25	-26.9
836.400000	3346.000000	44.33	9.48	490.34	-43.55	-28.2
848.850000	3395.400000	46.33	9.64	628.78	-41.45	-26
824.160000	4120.900000	44.67	11.34	631.68	-41.35	-26
836.400000	4182.500000	45	11.32	654.64	-41.05	-25.7
848.850000	4244.250000	43.67	11.3	560.4	-42.45	-27
824.160000	4944.960000	44.17	13.17	736.21	-40.05	-24.7
836.400000	5019.000000	43	13.46	665.27	-40.95	-25.5
848.850000	5093.100000	43.5	13.71	725.27	-40.15	-24.8
824.160000	5769.220000	44	15.57	951.7	-37.85	-22.4
836.400000	5855.500000	43	15.73	863.97	-38.65	-23.3
848.850000	5941.950000	42.83	15.89	862.98	-38.65	-23.3
824.160000	6593.380000	42.17	16.76	884.1	-38.45	-23.1
836.400000	6692.000000	42.67	17.07	970.51	-37.65	-22.3
848.850000	6790.800000	41.67	17.37	895.36	-38.35	-23
824.160000	7417.540000	42.17	19.22	1173.55	-35.95	-20.6
836.400000	7528.500000	40.67	19.49	1018.59	-37.25	-21.8
848.850000	7639.650000	44.17	19.66	1554.18	-33.55	-18.2
824.160000	8241.700000	42.83	20.6	1484.23	-33.95	-18.6
836.400000	8365.000000	43	20.81	1550.6	-33.55	-18.2
848.850000	8488.500000	44.33	21.02	1851.4	-32.05	-16.7

PAGE NO.

64 of 71.

NAME OF TEST: Field Strength of Spurious Radiation  
 g98a0305: 1998-Oct-08 Thu 10:26:00  
 STATE: 2:High Power (CDMA MODE)

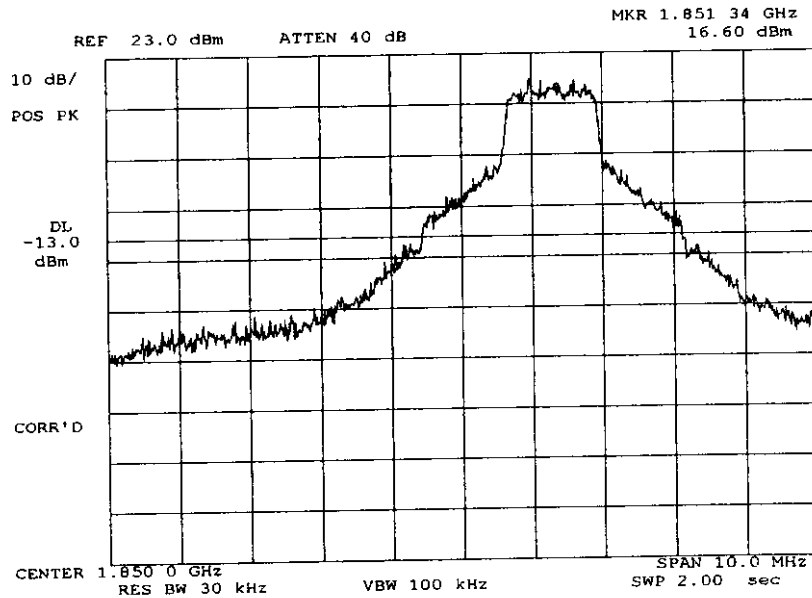
FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
824.040000	1648.200000	42.83	31.65	5296.63	-22.85	-7.7
836.400000	1672.800000	43.17	31.81	5610.48	-22.35	-7.2
848.970000	1697.940000	41.5	31.97	4715.2	-23.95	-8.7
824.040000	2472.360000	64	5.83	3100.99	-27.55	-12.4
836.400000	2509.200000	49.5	5.99	594.98	-41.85	-26.7
848.970000	2546.910000	45.67	6.18	391.29	-45.55	-30.4
824.040000	3296.520000	48.17	9.32	749.03	-39.85	-24.7
836.400000	3345.600000	44.67	9.48	509.92	-43.25	-28.1
848.970000	3395.880000	47.17	9.65	693.43	-40.55	-25.4
824.040000	4120.680000	45.17	11.34	669.11	-40.85	-25.7
836.400000	4182.000000	44.83	11.32	641.95	-41.25	-26.1
848.970000	4244.850000	44.83	11.3	640.47	-41.25	-26.1
824.040000	4944.840000	44.17	13.17	736.21	-40.05	-24.9
836.400000	5018.400000	43.33	13.46	691.03	-40.55	-25.4
848.970000	5093.820000	44.67	13.72	830.81	-38.95	-23.8
824.040000	5769.000000	43.67	15.56	915.17	-38.15	-23
836.400000	5854.800000	43.17	15.73	881.05	-38.45	-23.3
848.970000	5942.790000	44.17	15.9	1008.09	-37.35	-22.1
824.040000	6593.160000	43.17	16.76	991.97	-37.45	-22.3
836.400000	6691.200000	43	17.07	1008.09	-37.35	-22.1
848.970000	6791.760000	42.67	17.37	1004.62	-37.35	-22.2
824.040000	7417.320000	42.67	19.22	1243.08	-35.45	-20.3
836.400000	7527.600000	42	19.49	1187.13	-35.85	-20.7
848.970000	7640.730000	44	19.66	1524.05	-33.75	-18.5
824.040000	8241.480000	42.83	20.6	1484.23	-33.95	-18.8
836.400000	8364.000000	44	20.81	1739.8	-32.55	-17.4
848.970000	8489.700000	43.83	21.03	1749.85	-32.55	-17.3

As per Rule Part 24

PAGE NO.

65 of 71.

NAME OF TEST: Emission at Band Edges (Conducted)  
 g98a0285: 1998-Oct-06 Tue 14:01:00  
 STATE: 2:High Power (PCS MODE)



POWER:  
 MODULATION:

HIGH  
 CDMA  
 BAND EDGE CH 25

SUPERVISED BY:

Morton Flom, P. Eng.

As per Rule Part 24

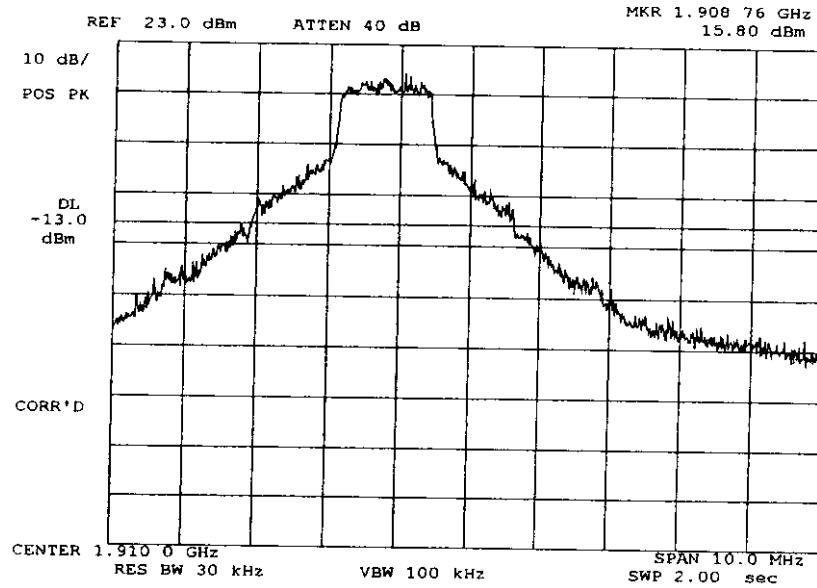
PAGE NO.

66 of 71.

NAME OF TEST: Emission at Band Edges (Conducted)

g98a0286: 1998-Oct-06 Tue 14:03:00

STATE: 2:High Power (PCS MODE)



POWER:

MODULATION:

HIGH

CDMA

BAND EDGE CH 1175

SUPERVISED BY:

*M. Flom P. Eng.*

Morton Flom, P. Eng.

PAGE NO. 67 of 71.  
NAME OF TEST: Frequency Stability (Temperature Variation)  
SPECIFICATION: 47 CFR 2.1055(a)(1)  
GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996  
TEST CONDITIONS: As Indicated  
TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

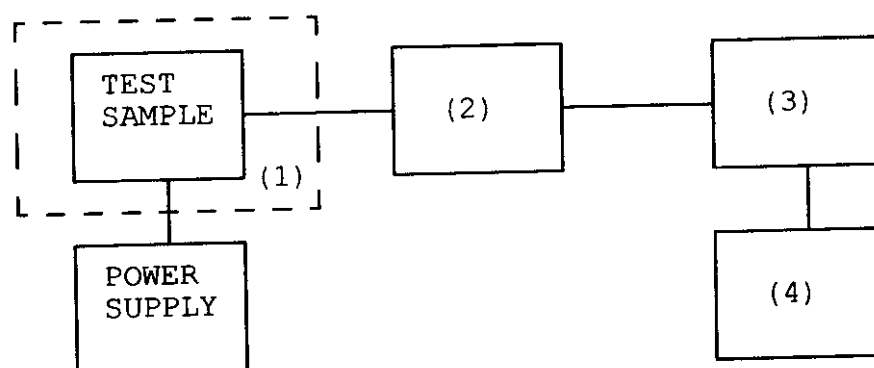
1. The EUT and test equipment were set up as shown on the following page.
2. With all power removed, the temperature was decreased to  $-30^{\circ}\text{C}$  and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
3. With power OFF,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

PAGE NO.

68 of 71.

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	s/n
(1)	<u>TEMPERATURE, HUMIDITY, VIBRATION</u>	
<u>x</u>	i00027 Tenny Temp. Chamber	9083-765-234
—	i00 Weber Humidity Chamber	
—	i00 L.A.B. RVH 18-100	
(2)	<u>COAXIAL ATTENUATOR</u>	
<u>x</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
<u>x</u>	i00039 HP 436A POWER METER	2709A26776
<u>x</u>	i00020 HP 8901A POWER MODE	2105A01087
(4)	<u>FREQUENCY COUNTER</u>	
—	i00042 HP 5383A	1628A00959
—	i00019 HP 5334B	2704A00347
<u>x</u>	i00020 HP 8901A	2105A01087

PAGE NO.

69 of 71.

NAME OF TEST:

Frequency Stability (Temperature Variation)

°C	FREQUENCY, MHz	CHANGE, Hz	CHANGE, ppm
-30	836.399860	40.0	0.0
-20	836.399760	-60.0	-0.1
-10	836.399860	40.0	0.0
0	836.399800	-20.0	-0.0
10	836.399860	40.0	0.0
20	836.399870	50.0	0.1
25	836.399820	0.0	0.0
30	836.399830	10.0	0.0
40	836.399950	130.0	0.2
50	836.400220	220.0	0.3

SUPERVISED BY:



Morton Flom, P. Eng.

PAGE NO. 70 of 71.

NAME OF TEST: Frequency Stability (Voltage Variation)

SPECIFICATION: 47 CFR 2.1055 (b) (1)

GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The EUT was placed in a temperature chamber at 25 $\pm$ 5°C and connected as for "Frequency Stability - Temperature Variation" test.
2. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
3. The variation in frequency was measured for the worst case.

RESULTS: Frequency Stability (Voltage Variation)

g98a0302: 1998-Oct-07 Wed 14:33:33 STATE: 0:General

LIMIT, ppm =2.5 LIMIT, Hz =2091 BATTERY END POINT (Voltage) =3.2

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
85	3.23	836.400000	0	0.00
100	3.8	836.400000	0	0.00
115	4.37	836.400000	0	0.00
84	3.2	836.400000	0	0.00

SUPERVISED BY:

Morton Flom, P. Eng.

PAGE NO. 71 of 71.  
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 = 1M40F9W

NECESSARY BANDWIDTH:

NECESSARY BANDWIDTH ( $B_N$ ), kHz = 1400  
(measured at the 99.75% power bandwidth)

MODULATION = 1M25F9W

NECESSARY BANDWIDTH:

NECESSARY BANDWIDTH ( $B_N$ ), kHz = 1250  
(measured at the 99.75% power bandwidth)

SUPERVISED BY:



Morton Flom, P. Eng.

TESTIMONIAL  
AND  
STATEMENT OF CERTIFICATION

THIS IS TO CERTIFY THAT:

1. THAT the application was prepared either by, or under the direct supervision of, the undersigned.
2. THAT the technical data supplied with the application was taken under my direction and supervision.
3. THAT the data was obtained on representative units, randomly selected.
4. THAT, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

CERTIFYING ENGINEER:



Morton Flom, P. Eng.

## STATEMENT OF QUALIFICATIONS

### EDUCATION:

1. B. ENG. in ENGINEERING PHYSICS, 1949, McGill University, Montreal, Canada.
2. Post Graduate Studies, McGill University & Sir George Williams University, Montreal.

### PROFESSIONAL AFFILIATIONS:

1. ARIZONA SOCIETY OF PROFESSIONAL ENGINEERS (NSPE), #026 031 821.
2. ORDER OF ENGINEERS (QUEBEC) 1949. #4534.
3. ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOPHYSICISTS & GEOLOGISTS OF ALBERTA #5916.
4. REGISTERED ENGINEERING CONSULTANT - GOVERNMENT OF CANADA, DEPARTMENT OF COMMUNICATIONS. Radio Equipment Approvals.
5. IEEE, Lifetime Member No. 0417204 (member since 1947).

### EXPERIENCE:

1. Research/Development/Senior Project Engineer, R.C.A. LIMITED (4 years).
2. Owner/Chief Engineer of Electronics. Design/Manufacturing & Cable TV Companies (10 years).
3. CONSULTING ENGINEER (over 25 years).

  
MORTON FLOM, P. Eng.

## 5.5 Results of SAR for 1g.

### Appendix: 10

The plots in Appendix 10 are a graphical representation of the SAR values over the whole area being scanned.

Appendix 10, page 10 (nr:10), has sketch of the phone added on the plot for clarifying the position of the phone with respect to the measured SAR values.

The size of the area being scanned is sufficiently large to ensure that all possible regions of peak SAR are measured. This is indicated by the fact that the position of peak SAR is in the measured area, and the value of SAR reduces asymptotically in the x- and y- directions as the probe is moved towards the border of the measured area.

### Analog mode AMPS

meas nr:	Phone position	Frequency MHz / channel	Power [dBm]	SAR (1g) [mW/g]
1	90°	824 / 991	25.5	1.24
2	90°	836 / 383	25.5	1.49
3	90°	849 / 799	25.5	1.53
FCC ID: GMLNSD-3AX MEASURED: 16.11.1998 / NMP		FCC limit		1.60 [mW/g] (ANSI/IEEE)

### CDMA Cellular

meas nr:	Phone position	Frequency MHz / channel	Power [dBm]	SAR (1g) [mW/g]
4	90°	824 / 991	24.0	0.92
5	90°	836 / 383	24.0	1.02
6	90°	849 / 799	24.0	1.07
FCC ID: GMLNSD-3AX MEASURED: 16.11.1998 / NMP		FCC limit		1.60 [mW/g] (ANSI/IEEE)

*Jari Telo*  
1998-11-16

**CDMA PCS**

meas nr:	Phone position	Frequency MHz / channel	Power [dBm]	SAR (1g) [mW/g]
7	90°	1850 / 2	22.5	1.14
8	90°	1880 / 1000	22.5	1.20
9	90°	1909 / 1998	22.5	1.00
<b>FCC ID: GMLNSD-3AX</b> MEASURED: 16.11.1998 / NMP		FCC limit		1.60 [mW/g] (ANSI/IEEE)

*Jari Telen*  
1998-11-16