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

a) TEST REPORT

b) Laboratory: (FCC: 31040/SIT) (Canada: IC 2044)	M. Flom Associates, Inc. 3356 N. San Marcos Place, Suite 107 Chandler, AZ 85225
c) Report Number:	d9950033
d) Client:	Nokia Mobile Phones 9605 Scranton Rd., Suite 105 San Diego, CA 92121
e) Identification:	6180, Type NSD-3GX FCC ID: GMLNSD-3GX
Description:	Cellular Telephone
f) EUT Condition:	Not required unless specified in individual tests.
g) Report Date:	May 18, 1999
EUT Received:	February 16, 1999
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.

LIST OF GENERAL INFORMATION REQUIRED FOR CERTIFICATION

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

22H, 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 33630-3730

MANUFACTURER:

Nokia Mobile Phones Manufacturing (USA) Inc.
5650 Alliance Gateway
Fort Worth, Texas 76178

(c)(2): FCC ID: GMLNSD-3GX

MODEL NO: 6180, Type NSD-3GX

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

PLEASE SEE ATTACHED EXHIBITS

(c)(4): TYPE OF EMISSION: 40K0F1D, 40K0F8W, 1M25F9W

(c)(5): FREQUENCY RANGE, MHz: 824.04 to 848.97 AMPS
824.73 to 848.19 CDMA

(c)(6): POWER RATING, Watts:
___ Switchable x Variable ___ N/A

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

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 = 3.8

(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

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.

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

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

American Association for Laboratory Accreditation

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

M. FLOM ASSOCIATES, INC.
Electronic Testing Laboratory
3356 North San Marcos Place, Suite 107
Chandler, AZ 85224-1571
Morton Flom Phone: 602 926 3100

ELECTRICAL (EMC)

Valid to: December 31, 2000 Certificate Number: 1008-01

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

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

5301 Buckeystown Pike, Suite 350 • Frederick, MD 21704-8307 • Phone: 301 644 3288 • Fax: 301 662 2974

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

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

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
_x_ 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
___ 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

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

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.

GUIDES:

This device was tested using the following Guide(s):

TIA/EIA/IS-95A-1995

PAGE NO. 8 of 62.

NAME OF TEST: Carrier Output Power (Conducted)

SPECIFICATION: 47 CFR 2.1046(a)

GUIDE: As indicated on page 7

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 ±3%.

MEASUREMENT RESULTS

NOMINAL, MHz	dbm		R. F. POWER, WATTS	
	Low	High	Low	High
AMPS MODE:				
824.04	7.6	25.2	0.006	0.33
836.40	7.7	25.2	0.006	0.33
848.97	7.8	25.2	0.006	0.33
CDMA MODE:				
825.73	-52.0	24.5	0.00006	0.28
836.40	-51.0	24.5	0.00006	0.28
848.19	-53.0	24.5	0.00006	0.28

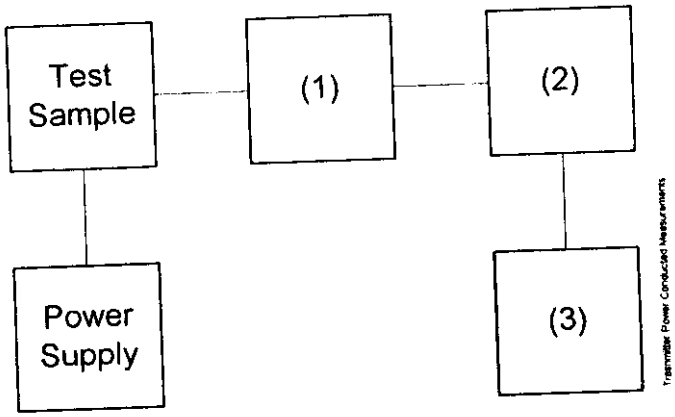
M. Flom P. Eng.

Morton Flom, P. Eng.

SUPERVISED BY:

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
x	i00113	Sierra 661A-3D	1059
(2)		POWER METERS	
___	i00014	HP 435A	1733A05836
x	i00039	HP 436A	2709A26776
x	i00020	HP 8901A POWER MODE	2105A01087
(3)		FREQUENCY COUNTER	
___	i00042	HP 5383A	1628A00959
x	i00019	HP 5334B	2704A00347
x	i00020	HP 8901A FREQUENCY MODE	2105A01087

NAME OF TEST: R. F. Power Output (Radiated)

SPECIFICATION: 47 CFR 2.1046(a)

GUIDE: As indicated on page 7

TEST EQUIPMENT: As per attached page

MEASUREMENT 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 $P_t=((E \times R)^2/49.2)$ watts, where R = 3m.

2. Measurement accuracy is ±1.5 dB.

MEASUREMENT RESULTS

Low Power AMPS MODE g9950166: 1999-May-19 Wed 08:45:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV/m	CF, dB	uV/m @ 3m	ERP, dBm	ERP, Watts
824.040000	824.040000	72.48	29.98	132739.45	5.1	0.003
836.400000	836.400000	74.19	30.01	162181.01	6.9	0.005
848.970000	848.970000	73.20	30.04	145211.16	5.9	0.004

High Power AMPS MODE g9950165: 1999-May-19 Wed 08:15:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV/m	CF, dB	uV/m @ 3m	ERP, dBm	ERP, Watts
824.040000	824.040000	91.73	29.98	1217586.99	24.4	0.269
836.400000	836.400000	92.33	30.01	1309181.92	25.0	0.316
848.970000	848.970000	91.4	30.04	1180320.64	24.1	0.257

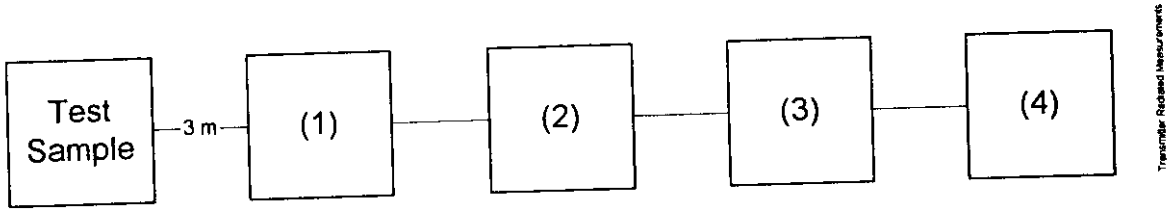
Low Power CDMA MODE g9950168: 1999-May-19 Wed 09:33:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV/m	CF, dB	uV/m @ 3m	ERP, dBm	ERP, Watts
824.730000	824.730000	7.55	31.17	86.30	-58.7	0.000001
836.400000	836.400000	9.01	31.21	102.57	-57.2	0.000002
848.190000	848.190000	8.93	31.24	101.98	-57.3	0.000002

High Power CDMA MODE g9950167: 1999-May-19 Wed 09:31:00

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV/m	CF, dB	uV/m @ 3m	ERP, dBm	ERP, Watts
824.730000	824.730000	89.56	31.17	1087677.14	23.4	0.219
836.400000	836.400000	90.9	31.21	1274970.10	24.8	0.295
848.190000	848.190000	89.34	31.24	1069054.88	23.3	0.209

TRANSMITTER RADIATED MEASUREMENTS



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

PAGE NO. 12 of 62.

NAME OF TEST: Audio Frequency Response

SPECIFICATION: 47 CFR 2.1047(a)

GUIDE: As indicated on page 7

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.

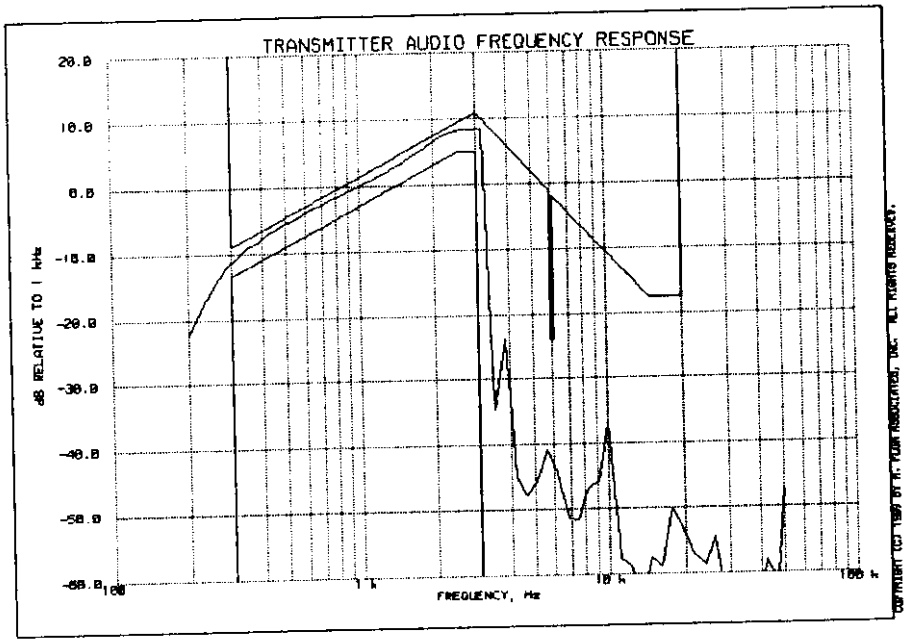
4. With input levels held constant and below limiting at all frequencies, the audio signal generator was varied from 100 Hz to 50 kHz.

5. The response in dB relative to 1 kHz was then measured, using the HP 8901A Modulation Analyzer.

6. MEASUREMENT RESULTS: ATTACHED

PAGE NO. 13 of 62.

NAME OF TEST: Audio Frequency Response
g9920103: 1999-Feb-17 Wed 10:31:00
STATE: 0:General



SUPERVISED BY:

Morton Flom, P. Eng.

PAGE NO. 14 of 62.

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

SPECIFICATION: 47 CFR 2.1047(a)

GUIDE: As indicated on page 7

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

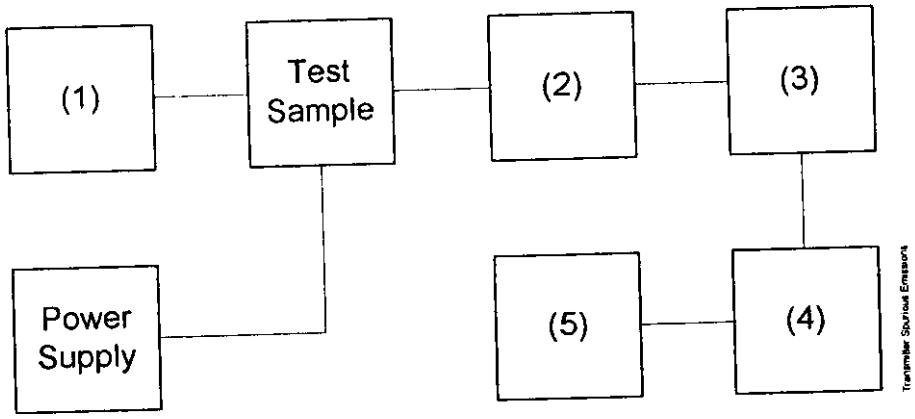
1. The EUT and test equipment were set up such that the audio input was connected at the input to the modulation limiter, and the modulated stage.

2. The audio output was connected at the output to the modulated stage.

3. MEASUREMENT RESULTS: ATTACHED

TRANSMITTER SPURIOUS EMISSION

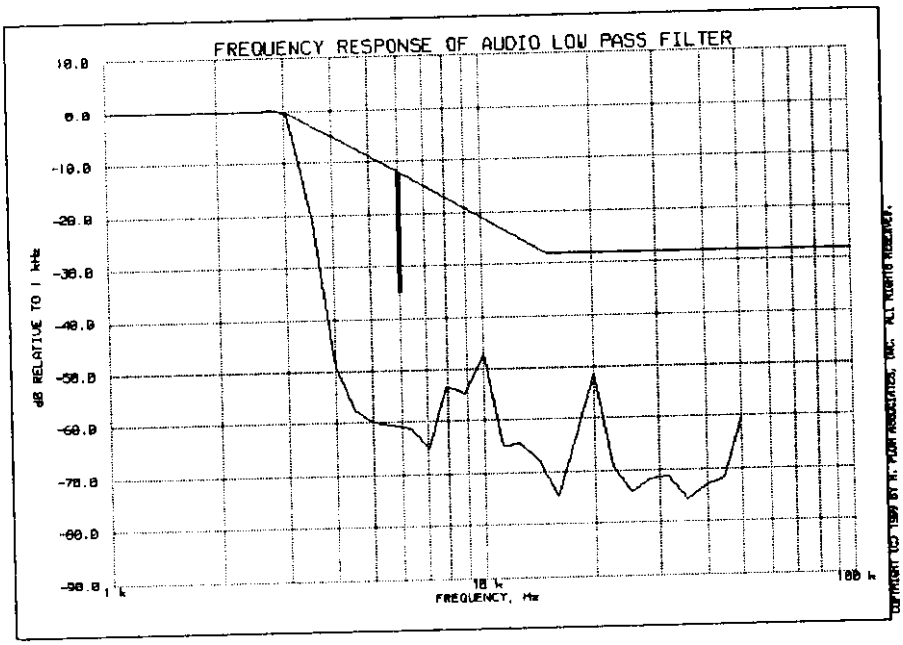
TEST A. OCCUPIED BANDWIDTH (IN-BAND SPURIOUS)
TEST B. OUT-OF-BAND SPURIOUS



	Asset	Description	s/n
		(1) AUDIO OSCILLATOR/GENERATOR	
	i00010	HP 204D	1105A04683
___	i00017	HP 8903A	2216A01753
x	i00012	HP 3312A	1432A11250
		(2) COAXIAL ATTENUATOR	
	i00122	Narda 766-10	7802
___	i00123	Narda 766-10	7802A
x	i00069	Bird 8329 (30 dB)	1006
x	i00113	Sierra 661A-3D	1059
		(3) FILTERS; NOTCH, HP, LP, BP	
x	i00126	Eagle TNF-1	100-250
x	i00125	Eagle TNF-1	50-60
x	i00124	Eagle TNF-1	250-850
		(4) SPECTRUM ANALYZER	
x	i00048	HP 8566B	2511A01467
___	i00029	HP 8563E	3213A00104
		(5) SCOPE	
	i00058	HP 1741A	2251A09356
___	i00030	HP 54502A	2927A00209
___	i00071	Tektronix 935	1935-B011343

PAGE NO. 16 of 62.

NAME OF TEST: Audio Low Pass Filter (Voice Input)
g9920102: 1999-Feb-17 Wed 10:25:00
STATE: 0:General



SUPERVISED BY:

Morton Flom, P. Eng.

NAME OF TEST: Modulation Limiting

SPECIFICATION: 47 CFR 2.1047(b)

GUIDE: As indicated on page 7

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:

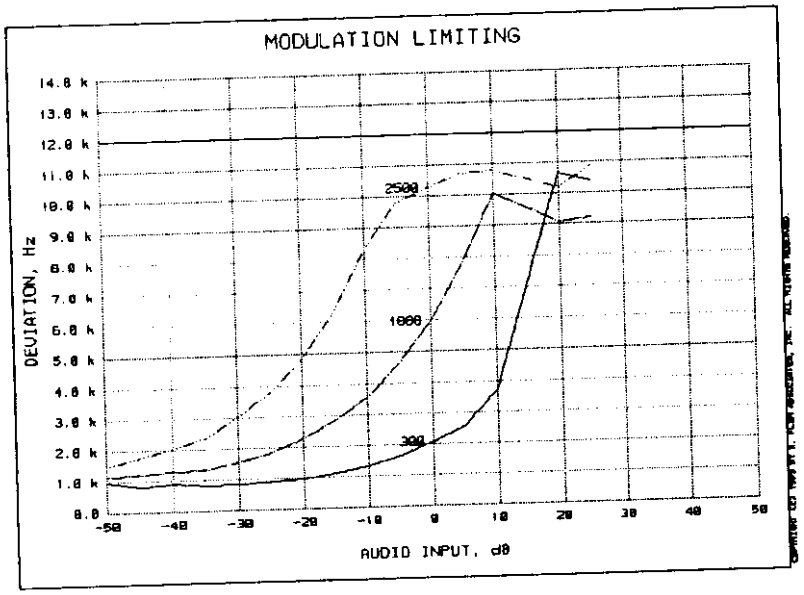
COMPANDER ON:

x VOICE

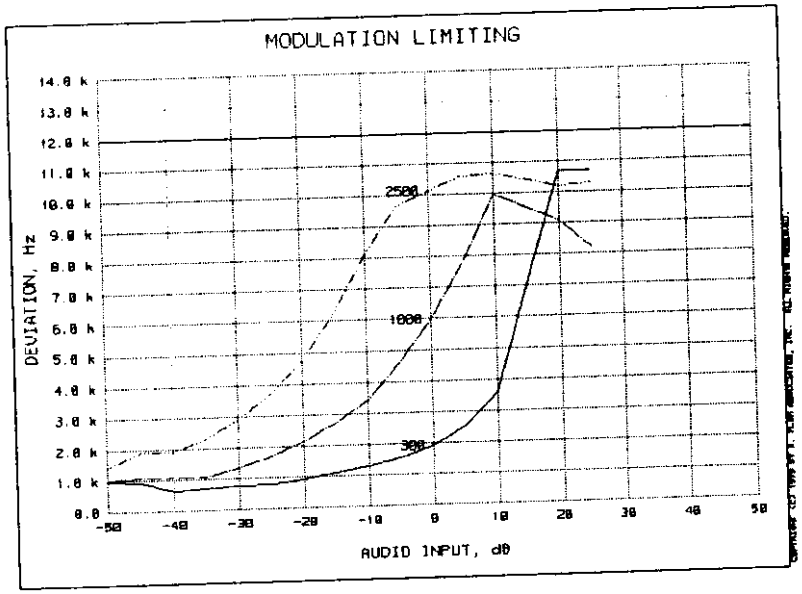
x VOICE + SAT

NAME OF TEST: Modulation Limiting
g9920118: 1999-Feb-17 Wed 12:03:00
STATE: 0:General

Positive Peaks:



Negative Peaks:

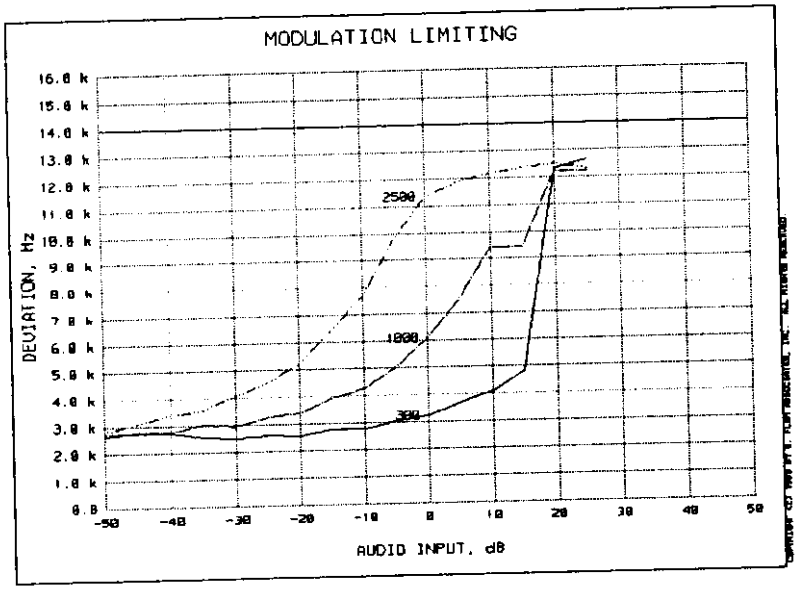


SUPERVISED BY:

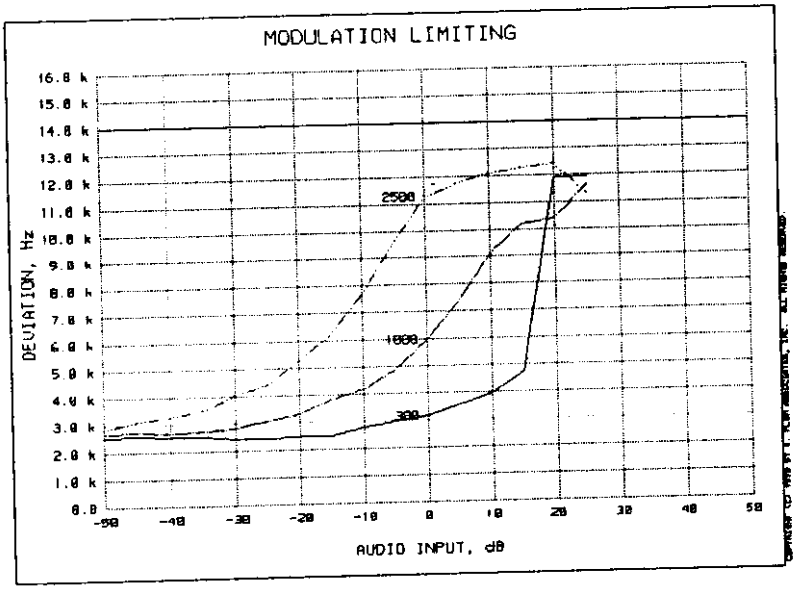
Morton Flom, P. Eng.

NAME OF TEST: Modulation Limiting
g9920120: 1999-Feb-17 Wed 12:25:00
STATE: 0:General

Positive Peaks:



Negative Peaks:



SUPERVISED BY:

Morton Flom, P. Eng.

PAGE NO. 20 of 62.

NAME OF TEST: Measurement Of Maximum Deviation

SPECIFICATION:

GUIDE: As indicated on page 7

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.

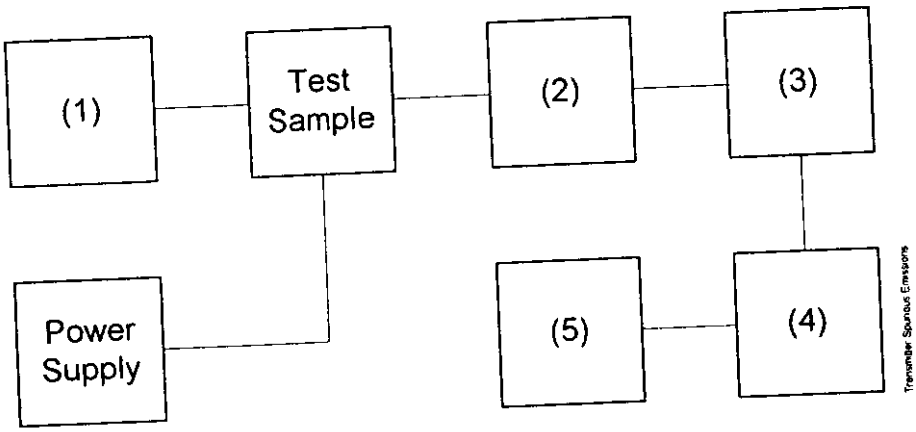
2. The EUT was modulated by an HP 8903 Audio Analyzer and/or internally generated signals.

3. Maximum deviation measurements were recorded for the various configurations.

4. MEASUREMENT RESULTS: ATTACHED SUMMARY FOR DEVIATION

Measurement Of Maximum Deviation

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



	Asset	Description	s/n
		(1) AUDIO OSCILLATOR/GENERATOR	
	i00010	HP 204D	1105A04683
___	i00017	HP 8903A	2216A01753
x	i00012	HP 3312A	1432A11250
		(2) COAXIAL ATTENUATOR	
	i00122	Narda 766-10	7802
___	i00123	Narda 766-10	7802A
x	i00069	Bird 8329 (30 dB)	1006
x	i00113	Sierra 661A-3D	1059
		(3) FILTERS; NOTCH, HP, LP, BP	
x	i00126	Eagle TNF-1	100-250
x	i00125	Eagle TNF-1	50-60
x	i00124	Eagle TNF-1	250-850
		(4) SPECTRUM ANALYZER	
x	i00048	HP 8566B	2511A01467
___	i00029	HP 8563E	3213A00104
		(5) SCOPE	
	i00058	HP 1741A	2251A09356
___	i00030	HP 54502A	2927A00209
___	i00071	Tektronix 935	1935-B011343

MEASUREMENT SUMMARY: Measurement Of Maximum Deviation

MODULATION	LIMIT, kHz	DEVIATION, MHz
(a) Voice	≥ 10.8 & ≤ 13.2	10.8
(b) Wideband Data	≥ 7.2 & ≤ 8.8	8.6
(c) SAT	≥ 1.8 & ≤ 2.2	2.2
(d) ST	≥ 7.2 & ≤ 8.8	7.9
(e) SAT + VOICE	N/A	11.2
(f) SAT + DTMF	N/A	9.1
(i) NAMPS VOICE	N/A	N/A
(j) NAMPS DSAT	N/A	N/A
(k) NAMPS ST	N/A	N/A
(l) NAMPS VOICE	N/A	N/A

SUPERVISED BY:

Morton Flom, P. Eng.

NAME OF TEST: Emission Masks (Occupied Bandwidth)

SPECIFICATION: 47 CFR 2.1049(c)(1), 22

GUIDE: As indicated on page 7

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

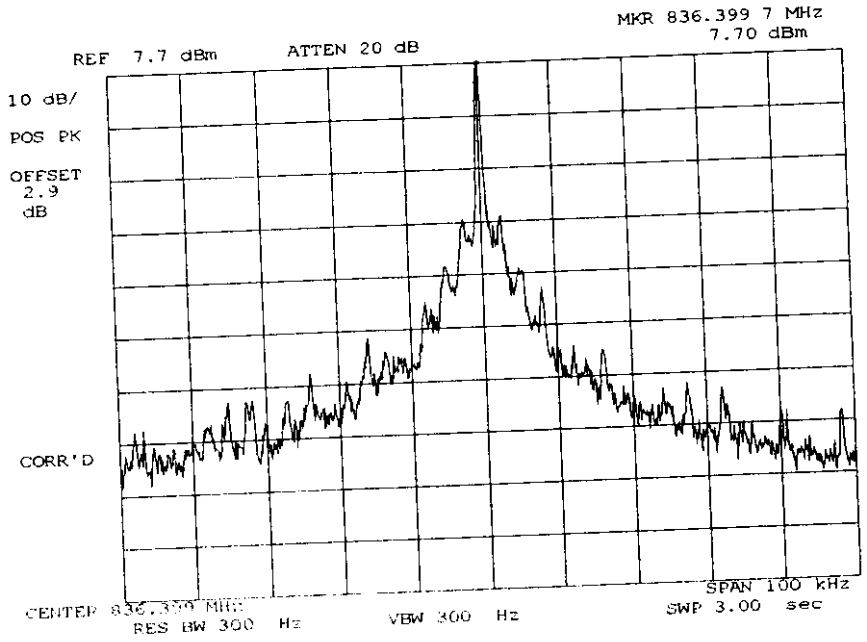
MEASUREMENT SUMMARY: Emission Masks (Occupied Bandwidth)

MODULATION	MEASURED DEVIATION ±kHz (HP 8901A)	LIMIT ±kHz	B/W @-26 dB PLOTS, kHz
NONE	0.0	0.0	0.0
VOICE	10.5	≥ 10.8 & ≤ 13.2	-32
WIDEBAND DATA	8.6	≥ 7.2 & ≤ 8.8	-30
SAT + VOICE	2.2	N/A	-27
SAT + DTMF	7.9	N/A	-20
CDMA	N/A	N/A	-50
TDMA	N/A	N/A	N/A
NAMPS	N/A	N/A	N/A

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 25 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920143: 1999-Feb-17 Wed 14:51:00
STATE: 1:Low Power



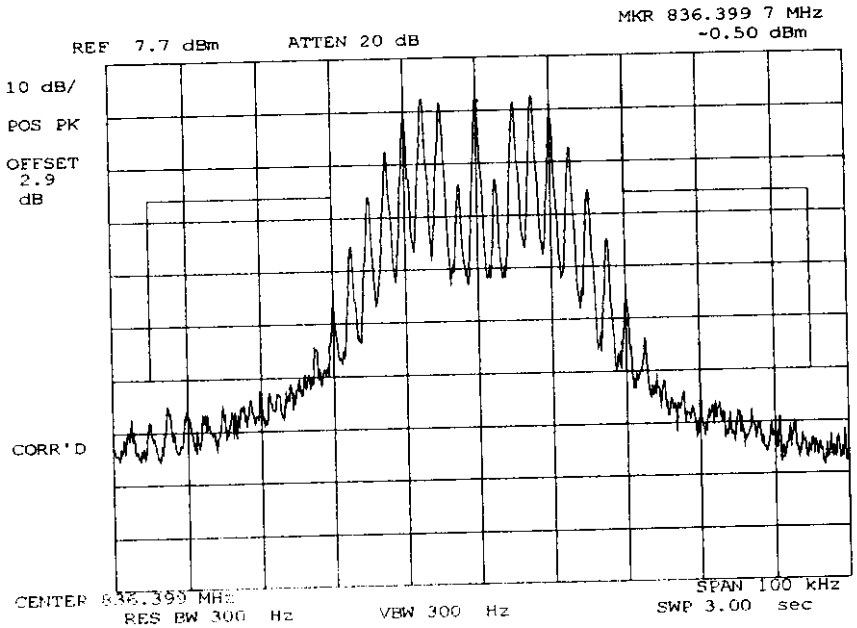
POWER: LOW
MODULATION: NONE

SUPERVISED BY:

Morton Flom, P. Eng.

PAGE NO. 26 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920145: 1999-Feb-17 Wed 14:59:00
STATE: 1:Low Power

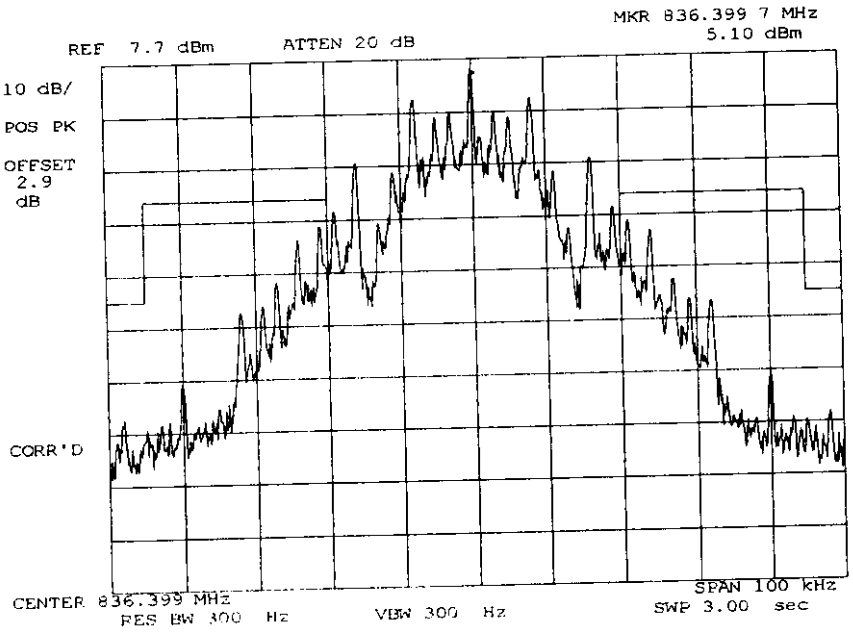


POWER: LOW
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: AMPS CELLULAR,
F3E/F3D w/LPF

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 27 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920179: 1999-Feb-18 Thu 09:56:00
STATE: 1:Low Power

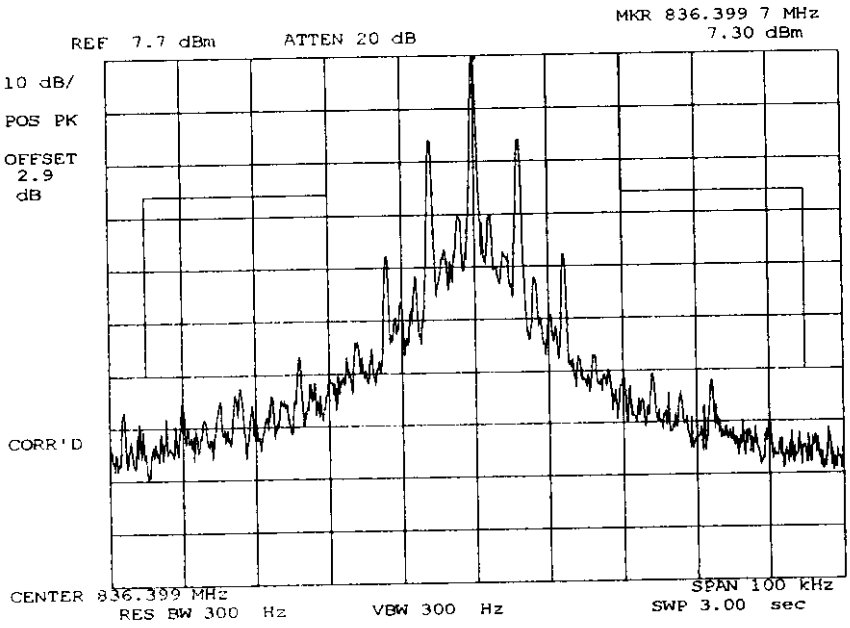


POWER: LOW
MODULATION: WBD
MASK: AMPS CELLULAR, F1D, DATA

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 28 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920149: 1999-Feb-17 Wed 15:08:00
STATE: 1:Low Power

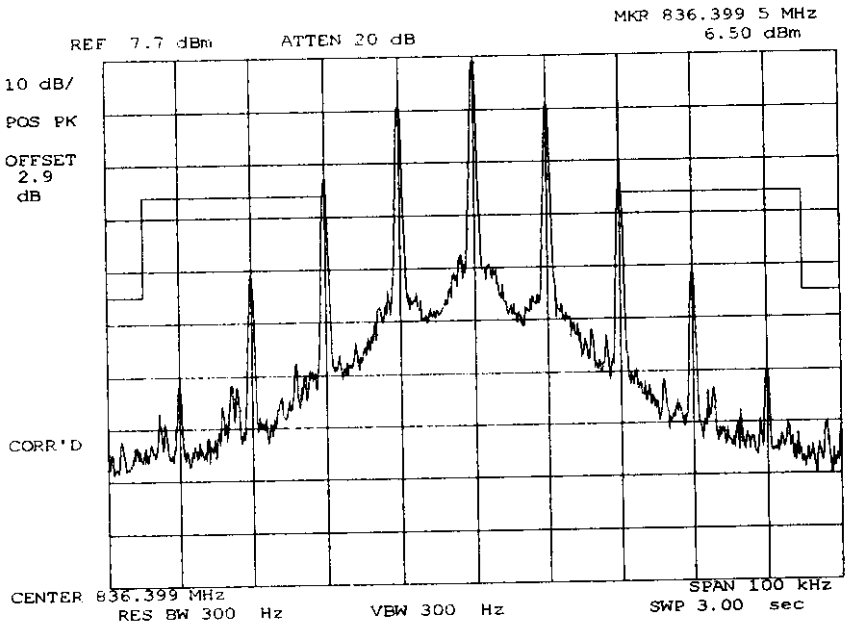


POWER: LOW
MODULATION: SAT
MASK: AMPS CELLULAR, F3E/F3D w/LPF

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 29 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920151: 1999-Feb-17 Wed 15:36:00
STATE: 1:Low Power

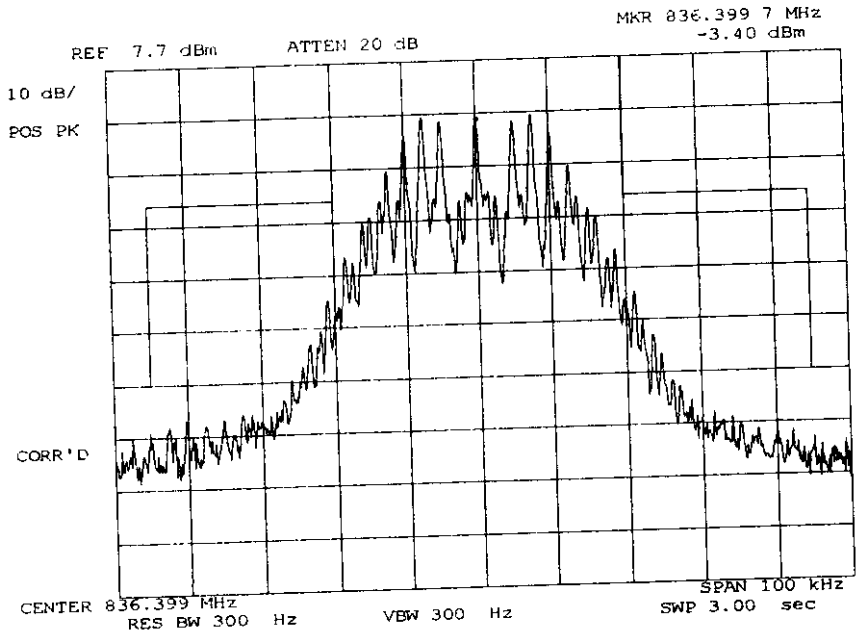


POWER: LOW
MODULATION: ST
MASK: AMPS CELLULAR, F1D, DATA

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 30 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920146: 1999-Feb-17 Wed 15:01:00
STATE: 1:Low Power

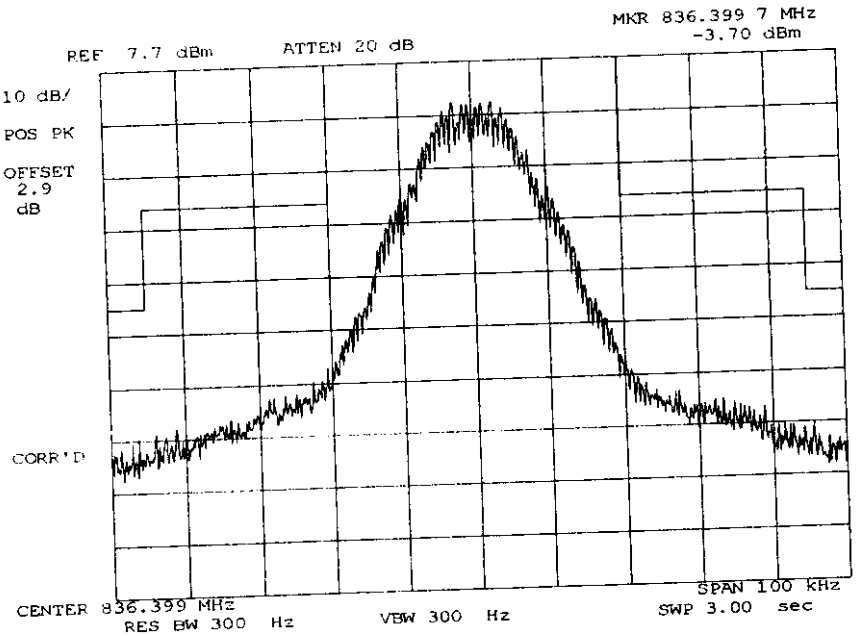


POWER: LOW
MODULATION: SAT+VOICE
MASK: AMPS CELLULAR, F3E/F3D w/LPF

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 31 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920153: 1999-Feb-17 Wed 15:49:00
STATE: 1:Low Power

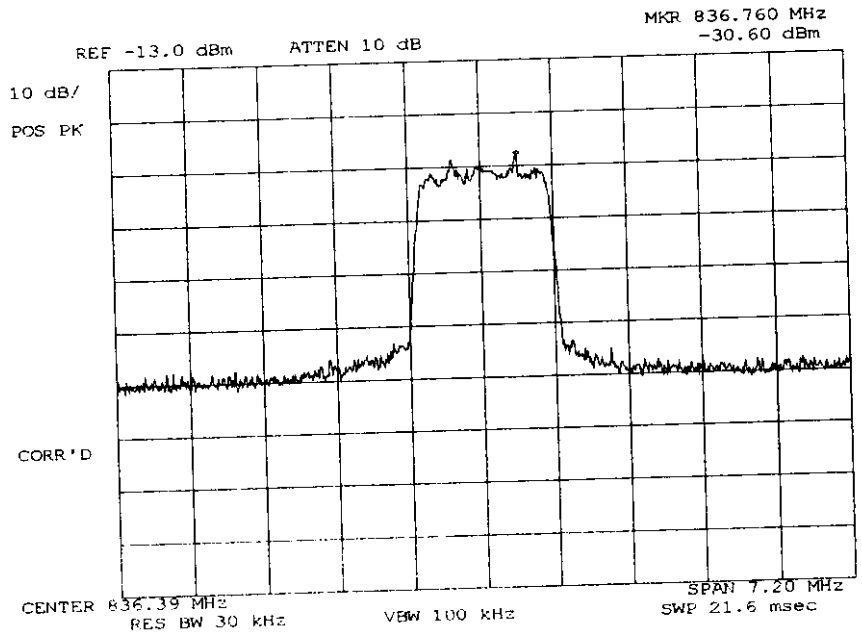


POWER: LOW
MODULATION: SAT+DTMF
MASK: AMPS CELLULAR, F1D, DATA

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 32 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920155: 1999-Feb-17 Wed 16:00:00
STATE: 1:Low Power

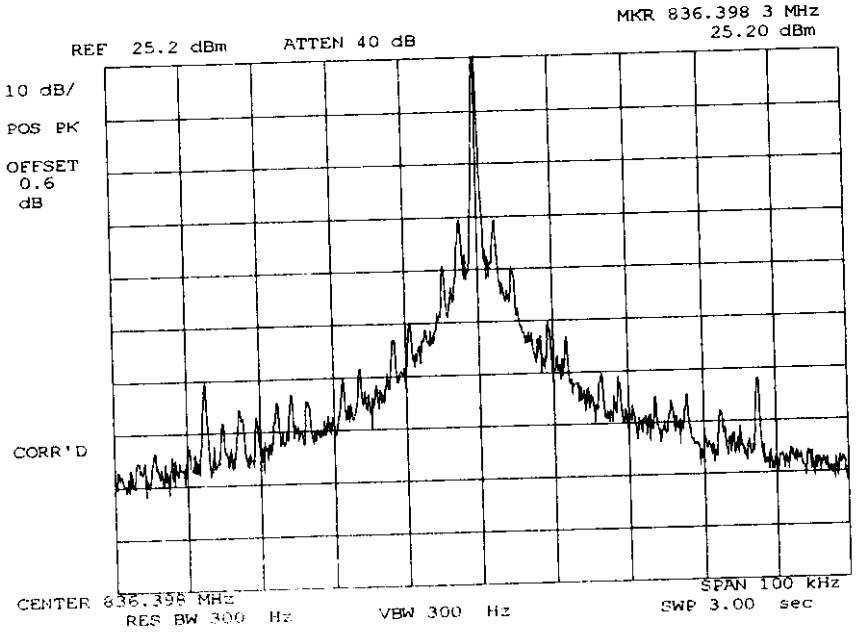


POWER: LOW
MODULATION: CDMA

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 33 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9950135: 1999-May-17 Mon 10:51:00
STATE: 2:High Power

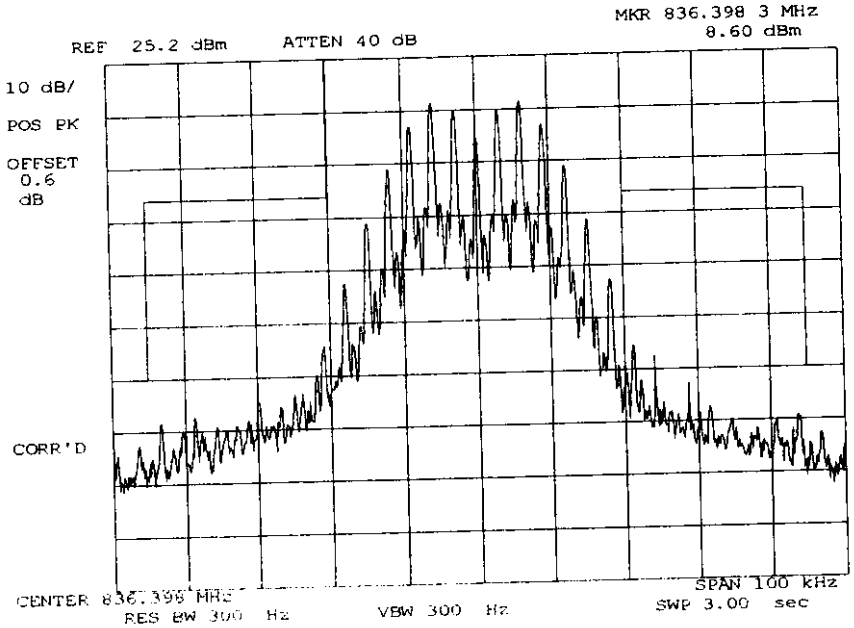


POWER: HIGH
MODULATION: NONE

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 34 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9950136: 1999-May-17 Mon 11:44:00
STATE: 2:High Power

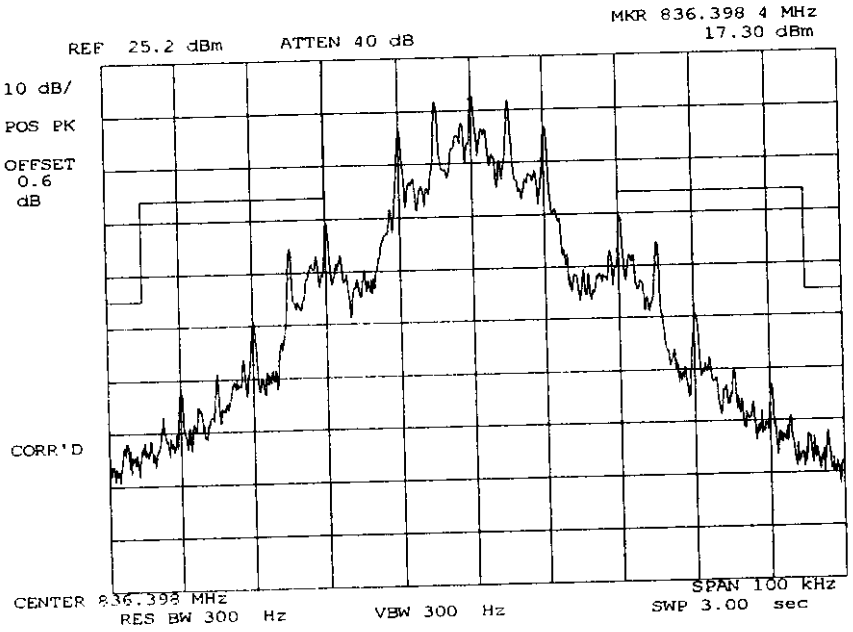


POWER: HIGH
MODULATION: VOICE: 2500 Hz SINE WAVE
MASK: AMPS CELLULAR,
F3E/F3D w/LPF

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 35 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9950137: 1999-May-17 Mon 11:54:00
STATE: 2:High Power

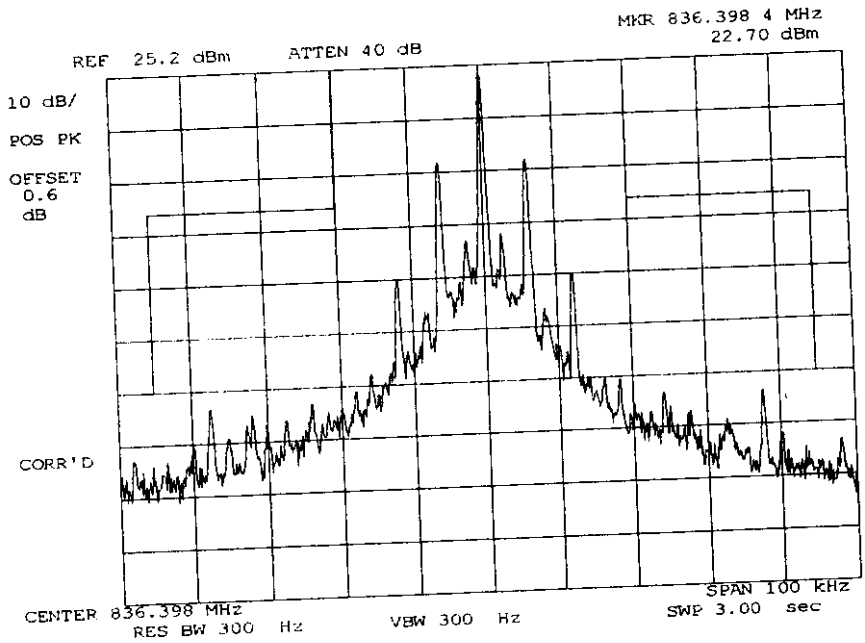


POWER: HIGH
MODULATION: WBD
MASK: AMPS CELLULAR, F1D, DATA

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 36 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9950138: 1999-May-17 Mon 11:57:00
STATE: 2:High Power

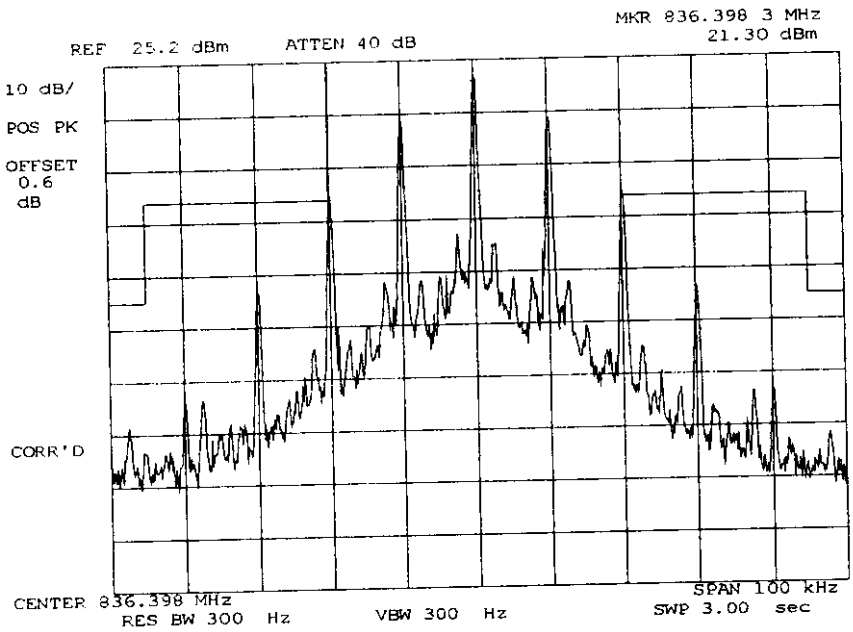


POWER: HIGH
MODULATION: SAT
MASK: AMPS CELLULAR, F3E/F3D w/LPF

SUPERVISED BY:

Morton Flom, P. Eng.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9950140: 1999-May-17 Mon 11:59:00
STATE: 2:High Power

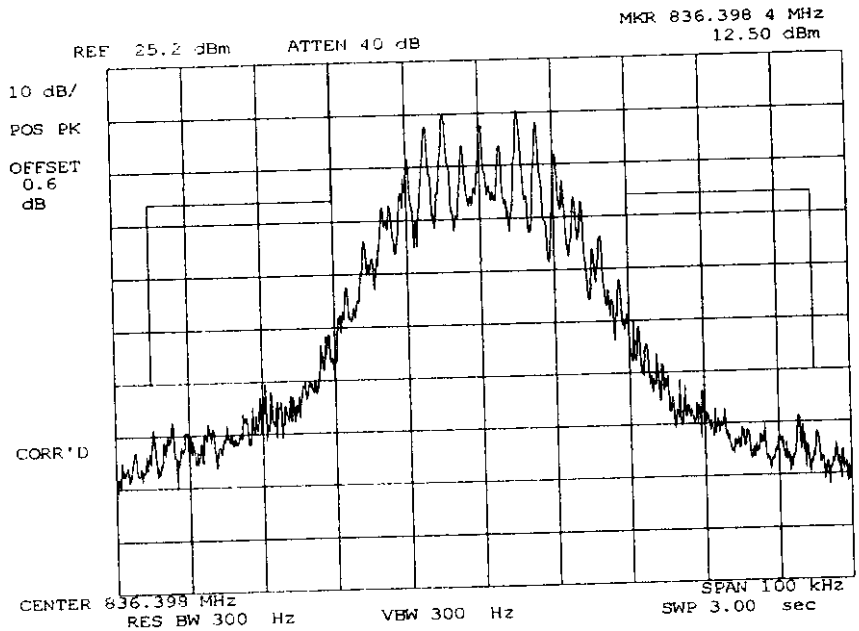


POWER: HIGH
MODULATION: ST
MASK: AMPS CELLULAR, F1D, DATA

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 38 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9950141: 1999-May-17 Mon 12:16:00
STATE: 2:High Power

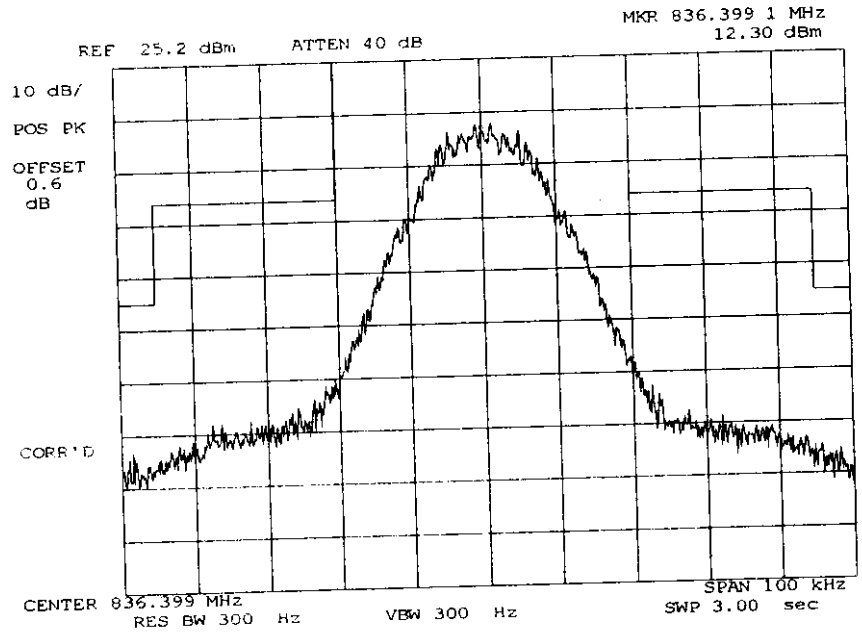


POWER: HIGH
MODULATION: SAT+VOICE
MASK: AMPS CELLULAR, F3E/F3D w/LPF

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 39 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9950142: 1999-May-17 Mon 14:05:00
STATE: 2:High Power

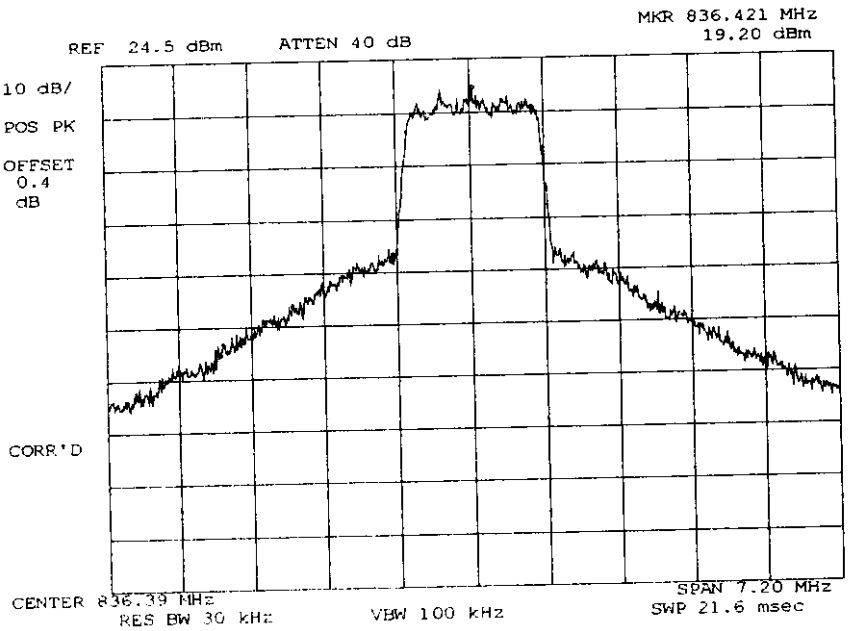


POWER: HIGH
MODULATION: SAT+DTMF
MASK: AMPS CELLULAR, F1D, DATA

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 40 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920156: 1999-Feb-17 Wed 16:01:00
STATE: 2:High Power

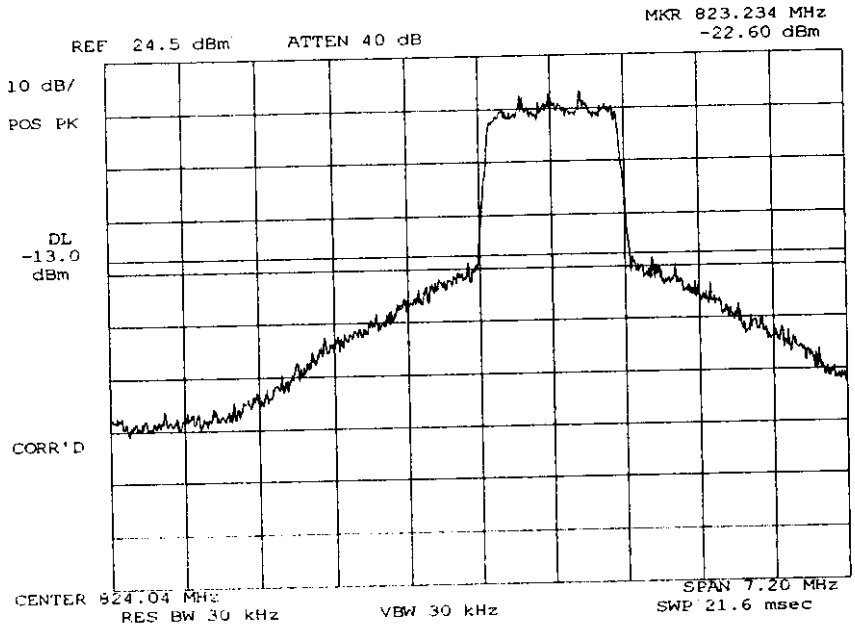


POWER: HIGH
MODULATION: CDMA

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 41 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920192: 1999-Feb-18 Thu 12:12:00
STATE: 2:High Power

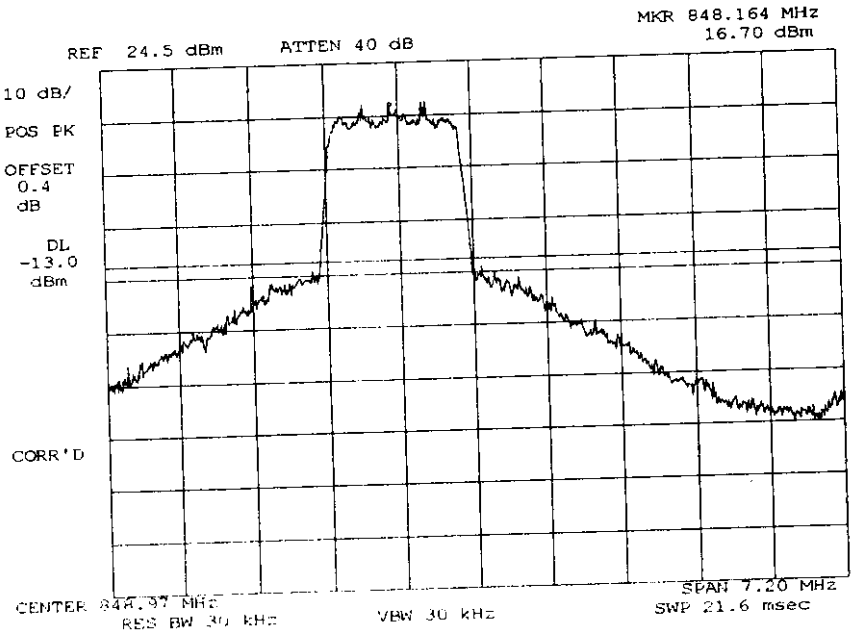


POWER: HIGH
MODULATION: CDMA
LOWER BAND EDGE CH 773

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 42 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920191: 1999-Feb-18 Thu 12:09:00
STATE: 2:High Power



POWER: HIGH
MODULATION: CDMA
UPPER BAND EDGE CH 773

SUPERVISED BY: Morton Flom, P. Eng.

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

SPECIFICATION: 47 CFR 22.917

GUIDE: As indicated on page 7

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^{th} 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

MEASUREMENT SUMMARY: Emission Requirements - Worst Case Modulation

WORST CASE MODULATION = VOICE +_SAT

EMISSION, MHz/HARM.	LIMIT, dBc	SPURIOUS EMISSIONS, dBc Lo	Hi
Fo + (F0 + 20 kHz) to F0 + 45 kHz	≤-26	≤-49	≤-48
Fo + (F0 + 45 kHz) to F0 + 90 kHz	≤-45 (≤-13 dBm)	≤-72	≤-67
2nd to 10th	≤-51 (≤-13 dBm)	≤-70	≤-67.8

MEASUREMENT RESULTS = ATTACHED OFFSET PLOTS

EMISSION IN THE RECEIVER CRITICAL BAND

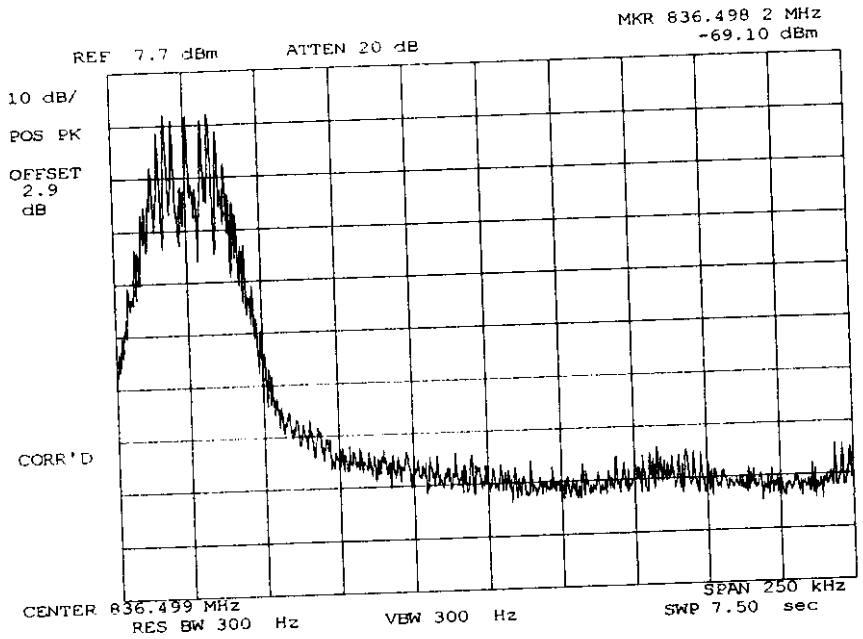
EMISSION, MHz/HARM.	LIMIT, dBm	SPURIOUS EMISSIONS, dBm Lo	Hi
869 to 894	≤-80	≤-87	≤-87

MEASUREMENT RESULTS = ATTACHED PLOTS

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 45 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920161: 1999-Feb-17 Wed 16:32:00
STATE: 1:Low Power

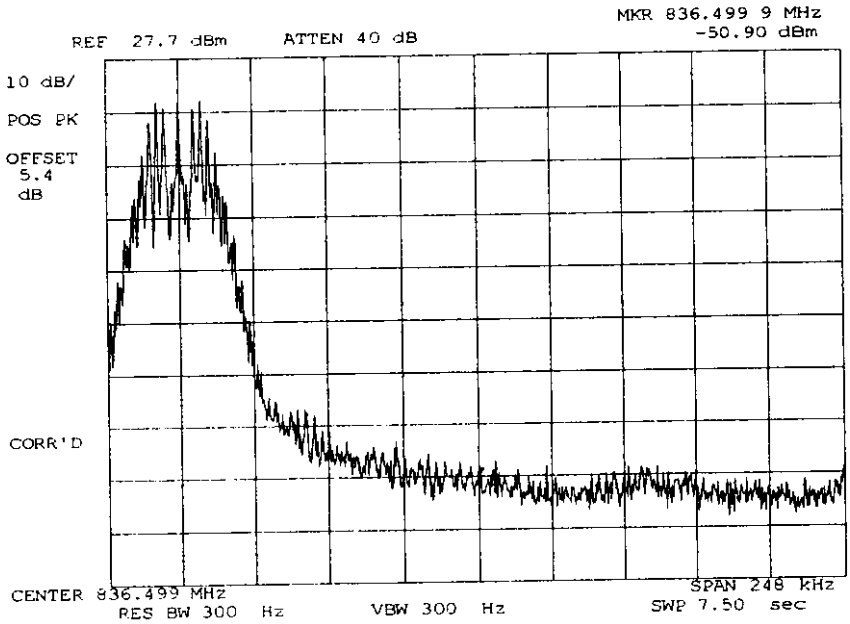


POWER: LOW
MODULATION: SAT+VOICE
OFFSET OCCUPIED BANDWIDTH

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 46 of 62.

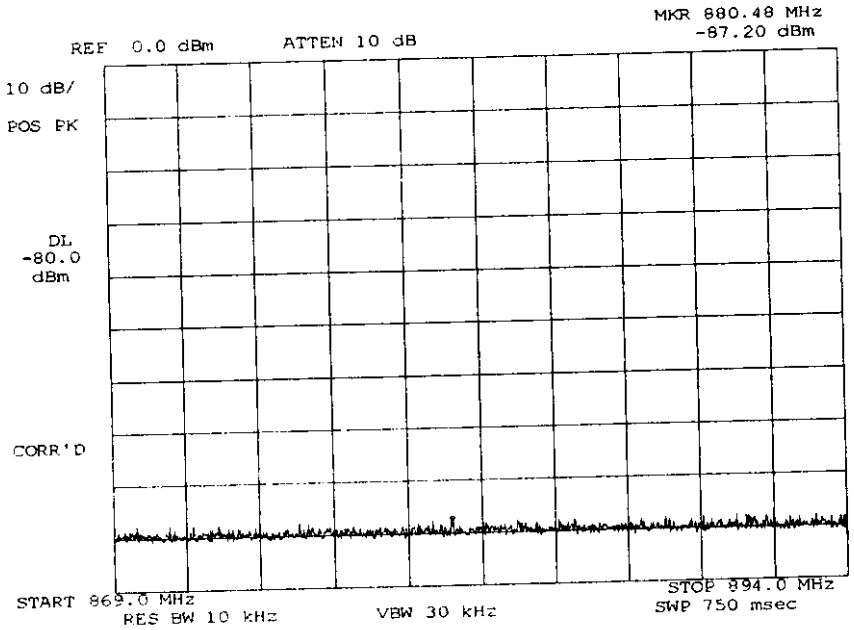
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920160: 1999-Feb-17 Wed 16:27:00
STATE: 2:High Power



POWER: HIGH
MODULATION: SAT+VOICE
OFFSET OCCUPIED BANDWIDTH

SUPERVISED BY: Morton Flom, P. Eng.

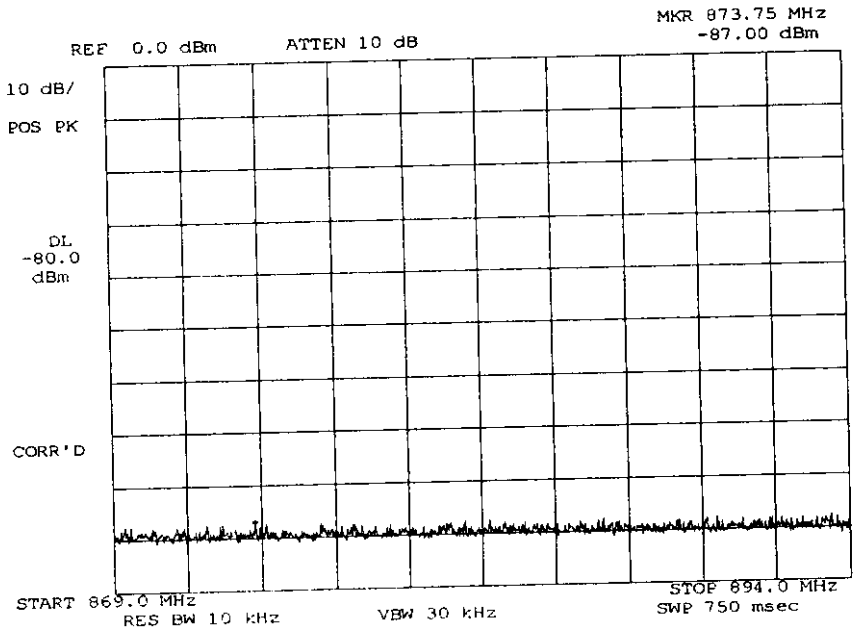
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920195: 1999-Feb-18 Thu 14:18:00
STATE: 1:Low Power



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

SUPERVISED BY: Morton Flom, P. Eng.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920163: 1999-Feb-17 Wed 16:40:00
STATE: 2:High Power



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

SUPERVISED BY: Morton Flom, P. Eng.

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

EMISSION, MHz/HARM.	LIMIT, dBc	SPURIOUS EMISSIONS, dBc Lo	Hi
Fo + (F0 + 20 kHz) to F0 + 45 kHz	≤-26	≤-31	≤-32
Fo + (F0 + 45 kHz) to F0 + 90 kHz	≤-45	≤-67	≤-69
Fo + (F0 + 90 kHz) to 2nd Harmonic	≤-60 (≤-13 dBm)	≤-65.7	≤-71
2nd to 10th	≤-51 (≤-13 dBm)	≤-70	≤-67.8

MEASUREMENT RESULTS = ATTACHED OFFSET PLOTS

EMISSION IN THE RECEIVER CRITICAL BAND

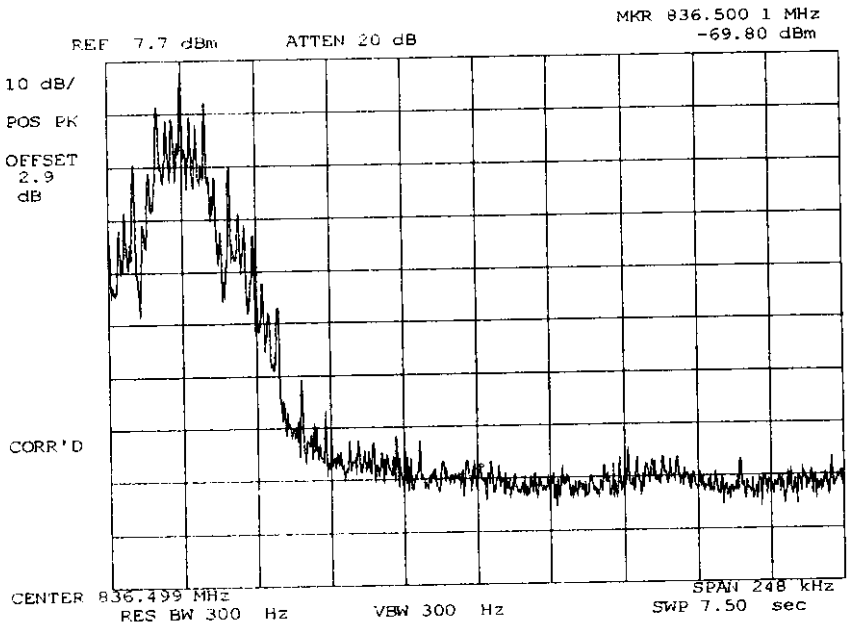
EMISSION, MHz/HARM.	LIMIT, dBm	SPURIOUS EMISSIONS, dBm Lo	Hi
869 to 894	≤-80	≤-87	≤-87

MEASUREMENT RESULTS = ATTACHED PLOTS

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 50 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920180: 1999-Feb-18 Thu 09:58:00
STATE: 1:Low Power

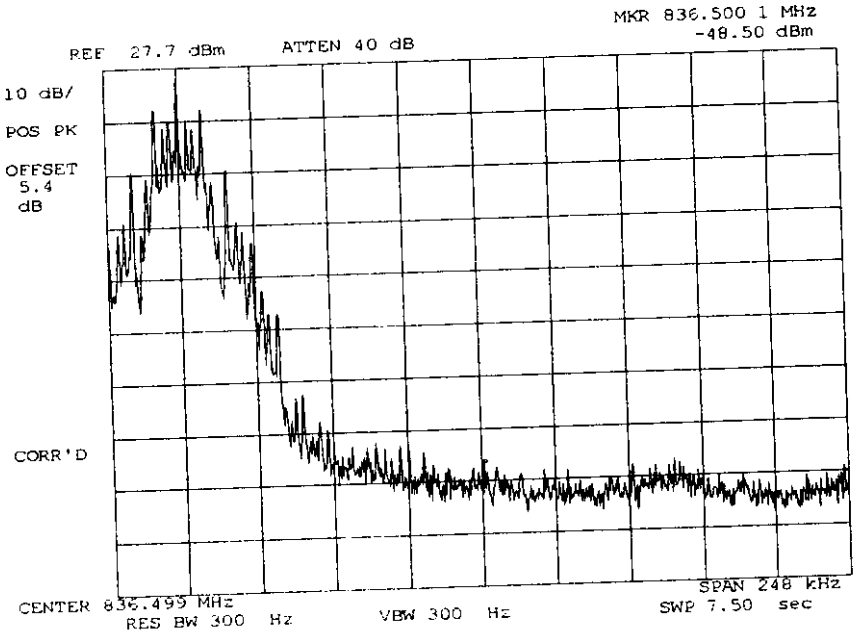


POWER: LOW
MODULATION: WBD
OFFSET OCCUPIED BANDWIDTH

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 51 of 62.

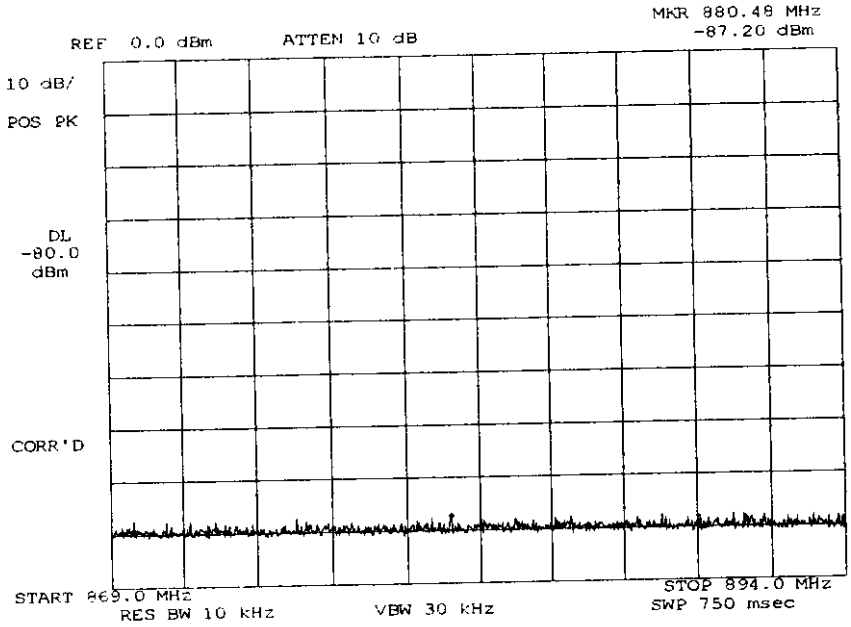
NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920181: 1999-Feb-18 Thu 09:59:00
STATE: 2:High Power



POWER: HIGH
MODULATION: WBD
OFFSET OCCUPIED BANDWIDTH

SUPERVISED BY: Morton Flom, P. Eng.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920195: 1999-Feb-18 Thu 14:18:00
STATE: 1:Low Power

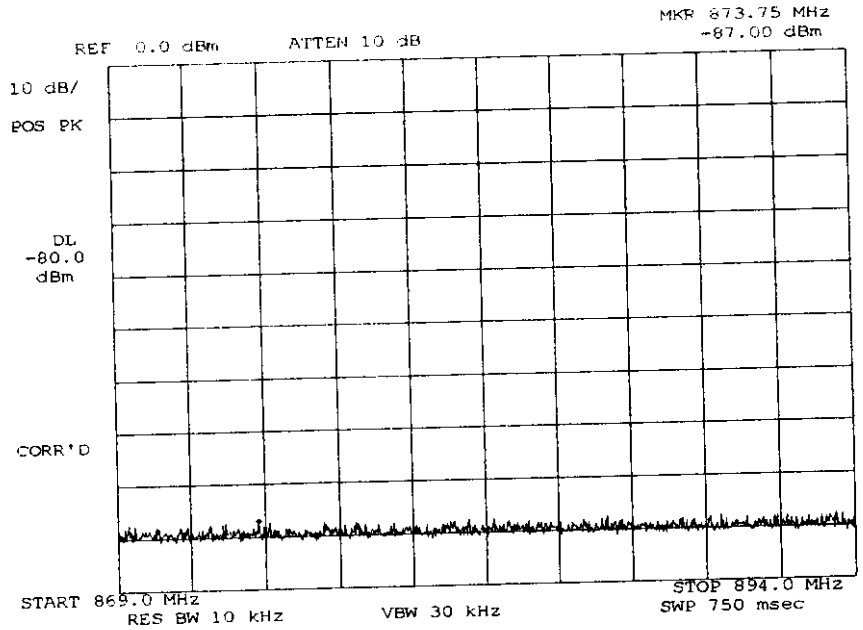


POWER: LOW
MODULATION: ANY
TX SPURS IN RX CRITICAL BAND

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 53 of 62.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g9920163: 1999-Feb-17 Wed 16:40:00
STATE: 2:High Power



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

SUPERVISED BY: Morton Flom, P. Eng.

PAGE NO. 54 of 62.

NAME OF TEST: Field Strength of Spurious Radiation

SPECIFICATION: 47 CFR 2.1053(a)

GUIDE: As indicated on page 7

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.

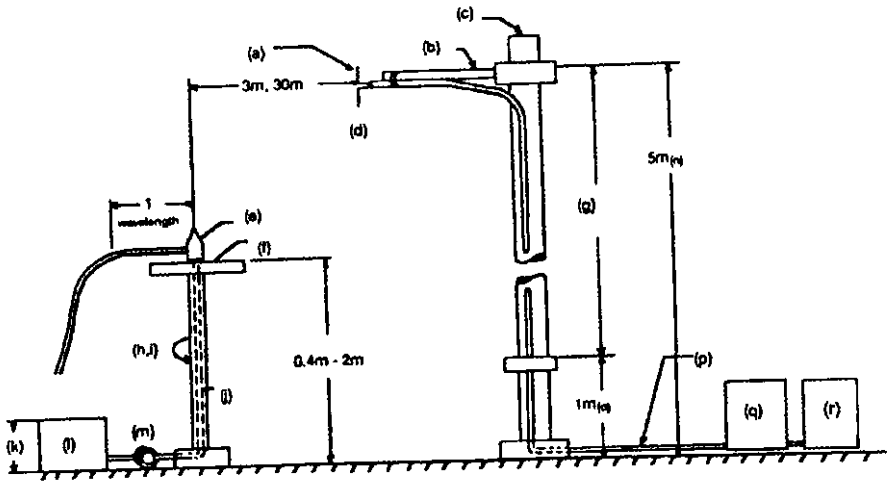
4. The emission was observed with both a vertically polarized and a horizontally polarized search antenna and the worst case was used.

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

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 (Per ANSI C63.4-1992, 10.1.4)	Last Cal
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	Aprel 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-99
SPECTRUM ANALYZER					
___	i00029	HP 8563E	3213A00104	12 mo.	Aug-98
x	i00033	HP 85462A	3625A00357	12 mo.	Dec-98
___	i00048	HP 8566B	2511AD1467	6 mo.	Dec-98

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^{nd} - 10^{th}	>50	>60
836.400	380	2^{nd} - 10^{th}	>50	>60
848.970	799	2^{nd} - 10^{th}	>50	>60

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.

NAME OF TEST: Field Strength of Spurious Radiation
g9920138: 1999-Feb-17 Wed 10:19:00
STATE: 1:Low Power AMPS MODE

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
836.400000	1672.783650	40.83	1.45	130.02	-55.05	-42.1
836.400000	2509.183650	40	5.61	190.77	-51.75	-38.8
836.400000	3345.583650	39	8.55	238.51	-49.85	-36.9
836.400000	4181.983650	39.67	10.66	328.47	-47.05	-34.1
836.400000	5018.383650	37.5	12.95	333.04	-46.95	-34
836.400000	5854.783650	38.33	15.07	467.74	-43.95	-31
836.400000	6691.183650	38.67	18.23	699.84	-40.45	-27.5
836.400000	7527.583650	35.33	19.6	557.83	-42.45	-29.5
836.400000	8364.000317	37.83	20.04	782.53	-39.55	-26.5

NAME OF TEST: Field Strength of Spurious Radiation
g9920139: 1999-Feb-17 Wed 09:49:00
STATE: 2:High Power AMPS MODE

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
836.400000	1672.780000	25.72	31.45	721.94	-40.25	-27.2
836.400000	2509.200000	13.33	35.61	279.9	-48.45	-35.5
836.400000	3345.600000	16.62	38.55	573.46	-42.25	-29.2
836.400000	4182.000317	46.67	10.66	735.36	-40.05	-27.1
836.400000	5017.950317	43.83	12.95	690.24	-40.55	-27.6
836.400000	5854.783650	39.5	15.07	535.18	-42.85	-29.8
836.400000	6691.200317	37.83	18.23	635.33	-41.35	-28.3
836.400000	7527.600317	36.5	19.6	638.26	-41.25	-28.3
836.400000	8364.000317	37.83	20.04	782.53	-39.55	-26.5

NAME OF TEST: Field Strength of Spurious Radiation
g9920164: 1999-Feb-17 Wed 16:10:00
STATE: 1:Low Power CDMA MODE

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
836.400000	1672.800000	41.17	1.45	135.21	-54.75	-41.8
836.400000	2509.200000	40.17	5.61	194.54	-51.55	-38.6
836.400000	3345.600000	38.83	8.55	233.88	-49.95	-37
836.400000	4182.000000	39.33	10.66	315.86	-47.35	-34.4
836.400000	5018.400000	36.5	12.95	296.82	-47.95	-35
836.400000	5854.800000	37.83	15.07	441.57	-44.45	-31.5
836.400000	6691.200000	36.67	18.23	555.9	-42.45	-29.5
836.400000	7527.600000	37.67	19.6	730.3	-40.15	-27.1
836.400000	8364.000000	38.33	20.04	828.9	-39.05	-26

NAME OF TEST: Field Strength of Spurious Radiation
g9920157: 1999-Feb-17 Wed 14:52:00
STATE: 2:High Power CDMA MODE

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
836.400000	1672.800000	62.5	1.45	1575.8	-33.45	-20.5
836.400000	2509.200000	44.67	5.61	326.59	-47.05	-34.1
836.400000	3345.600000	38.17	8.55	216.77	-50.65	-37.7
836.400000	4182.000000	44.17	10.66	551.44	-42.55	-29.6
836.400000	5018.400000	39.83	12.95	435.51	-44.55	-31.6
836.400000	5854.800000	36.5	15.07	378.88	-45.85	-32.8
836.400000	6691.200000	38.17	18.23	660.69	-40.95	-28
836.400000	7527.600000	36.83	19.6	662.98	-40.95	-28
836.400000	8364.000000	39	20.04	895.36	-38.35	-25.4

PAGE NO. 59 of 62.

NAME OF TEST: Frequency Stability (Temperature Variation)

SPECIFICATION: 47 CFR 2.1055(a)(1)

GUIDE: As indicated on page 7

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.

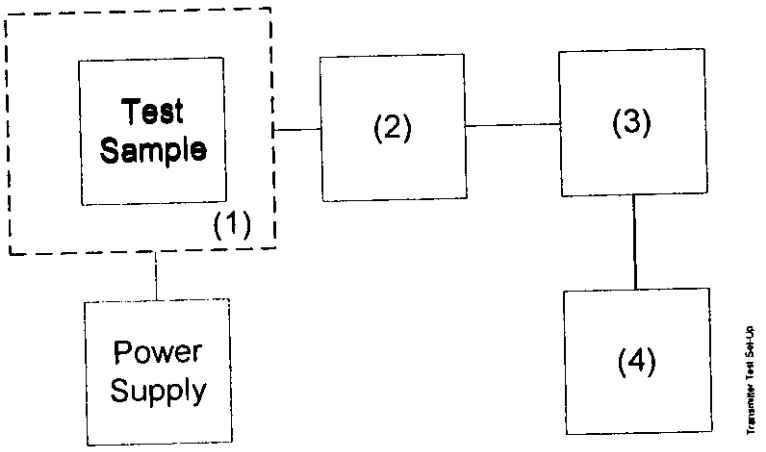
3. With power OFF, the temperature was raised in 10°C steps. The sample was permitted to stabilize at each step for at least one-half hour. Power was applied and the maximum frequency change was noted within one minute.

4. The temperature tests were performed for the worst case.

5. MEASUREMENT RESULTS: ATTACHED

TRANSMITTER TEST SET-UP

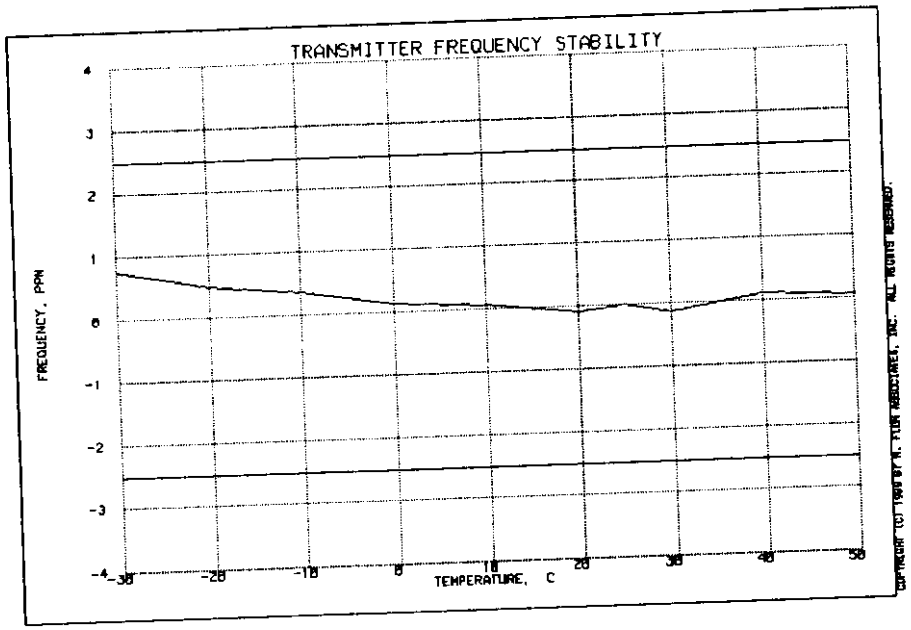
TEST A. OPERATIONAL STABILITY
TEST B. CARRIER FREQUENCY STABILITY
TEST C. OPERATIONAL PERFORMANCE STABILITY
TEST D. HUMIDITY
TEST E. VIBRATION
TEST F. ENVIRONMENTAL TEMPERATURE
TEST G. FREQUENCY STABILITY: TEMPERATURE VARIATION
TEST H. FREQUENCY STABILITY: VOLTAGE VARIATION



	Asset	Description	s/n
(1)		TEMPERATURE, HUMIDITY, VIBRATION	
x	i00027	Tenny 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
x	i00113	SIERRA 661A-3D	1059
___	i00069	BIRD 8329 (30 dB)	10066
(3)		R.F. POWER	
___	i00014	HP 435A POWER METER	1733A05839
x	i00039	HP 436A POWER METER	2709A26776
x	i00020	HP 8901A POWER MODE	2105A01087
(4)		FREQUENCY COUNTER	
___	i00042	HP 5383A	1628A00959
x	i00019	HP 5334B	2704A00347
x	i00020	HP 8901A	2105A01087

PAGE NO. 61 of 62.

NAME OF TEST: Frequency Stability (Temperature Variation)
g9920132: 1999-Feb-18 Thu 14:49:00
STATE: 0:General



SUPERVISED BY:

Morton Flom, P. Eng.

PAGE NO. 62 of 62.

NAME OF TEST: Frequency Stability (Voltage Variation)

SPECIFICATION: 47 CFR 2.1055 (b)(1)

GUIDE: As indicated on page 7

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

1. The EUT was placed in a temperature chamber at 25±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)

g9920183: 1999-Feb-18 Thu 11:06:40
STATE: 0:General

LIMIT, ppm = 2.5
LIMIT, Hz = 2091
BATTERY END POINT (Voltage) = 3.3

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
85	3.31	836.400020	20	0.02
100	3.9	836.400000	0	0.00
115	4.48	836.400020	20	0.02
85	3.3	836.399870	-130	-0.16

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 Goerge Williams University, Montreal.

PROFESSIONAL AFFILIATIONS:

1. ARIZONA SOCIETY OF PROFESSIONAL ENGINEERS (NSPE), #026 031 821.

2. ORDER OF ENGINEERS (QUEBEC) 1949. #45 34.

3. ASSOCIATION OF PROFESSIONAL ENGINEERS, GEOPHYSICISTS & GEOLOGISTS OF ALBERIA #5916.

4. REGISTERED ENGINEERING CONSULTANT - GOVERNMENT OF CANADA, DEPARTMENT OF COMMUNICATIONS. Radio Equipment approvals.

5. IEEE, Lifetime member no. 041/204 (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).

M. Flom P. Eng

MORTON FLOM, P. Eng.