


PAGE NO.

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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 85225
- c) Report Number: d9940076
- d) Client: Bio-Medical Devices, Inc.  
320 Kalmus Drive  
Costa Mesa, CA 92626  
(714) 432-8001; FAX: -8008
- e) Identification: MOBILE UNIT 2020  
Description: FCC ID: OGQ-MOBILE2020  
Mobile Unit
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: April 27, 1999  
EUT Received: February 18, 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.

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

74H

Sub-part 2.1033

(c) (1): NAME AND ADDRESS OF APPLICANT:Bio-Medical Devices, Inc.  
320 Kalmus Drive  
Costa Mesa, CA 92626  
(714) 432-8001; FAX: -8008MANUFACTURER:

Applicant

(c) (2): FCC ID: OGQ-MOBILE2020MODEL NO: MOBILE UNIT 2020(c) (3): INSTRUCTION MANUAL(S):  
PLEASE SEE ATTACHED EXHIBITS(c) (4): TYPE OF EMISSION: 200K0F3E(c) (5): FREQUENCY RANGE, MHz: 174 to 216(c) (6): POWER RATING, Watts: 0.025 to 0.050  
x Switchable \_\_\_ Variable \_\_\_ N/A(c) (7): MAXIMUM POWER RATING, Watts: 0.050

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Subpart 2.1033 (continued)

(c) (8): VOLTAGES & CURRENTS IN ALL ELEMENTS IN FINAL R. F. STAGE,  
INCLUDING FINAL TRANSISTOR OR SOLID STATE DEVICE:

COLLECTOR CURRENT, A = per manual  
COLLECTOR VOLTAGE, Vdc = per manual  
SUPPLY VOLTAGE, Vdc = 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

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Sub-part

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

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

- \_\_\_ 21 - Domestic Public Fixed Radio Services
- \_\_\_ 22 - Public Mobile Services
- \_\_\_ 22 Subpart H - Cellular Radiotelephone Service
- \_\_\_ 22.901(d) - Alternative technologies and auxiliary services
- \_\_\_ 23 - International Fixed Public Radiocommunication services
- \_\_\_ 24 - Personal Communications Services
- x 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

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STANDARD TEST CONDITIONS  
and  
ENGINEERING PRACTICES

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

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

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

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

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NAME OF TEST: Carrier Output Power (Conducted)  
SPECIFICATION: 47 CFR 2.1046(a)  
GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.1  
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  
(Worst case)

FREQUENCY OF CARRIER, MHz = 192.1, 181, 197.8

POWER SETTING	R. F. POWER, WATTS
Low	0.025
High	0.050

SUPERVISED BY:

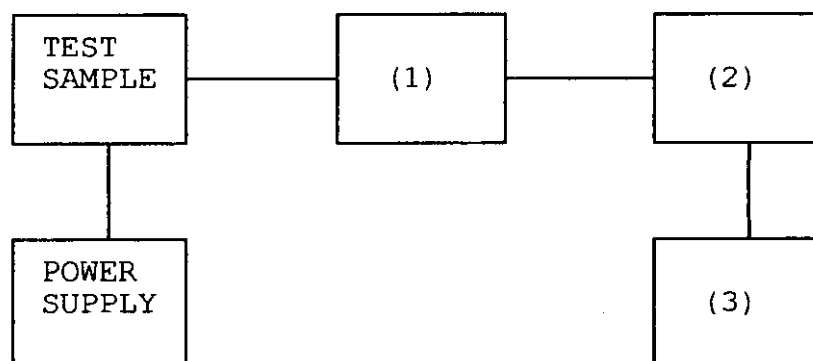
  
Morton Flom, P. Eng.

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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

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)

SPECIFICATION: 47 CFR 2.1051

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.13

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. The emissions were measured for the worst case as follows:
  - (a): within a band of frequencies defined by the carrier frequency plus and minus one channel.
  - (b): from the lowest frequency generated in the EUT and to at least the 10th harmonic of the carrier frequency, or 40 GHz, whichever is lower.
2. The magnitude of spurious emissions that are attenuated more than 20 dB below the permissible value need not be specified.
3. MEASUREMENT RESULTS: ATTACHED FOR WORST CASE

FREQUENCY OF CARRIER, MHz = 192.1, 181, 197.8

SPECTRUM SEARCHED, GHz = 0 to 10 x F<sub>c</sub>

MAXIMUM RESPONSE, Hz = 4300

ALL OTHER EMISSIONS = ≥ 20 dB BELOW LIMIT

LIMIT(S), dBc

-(43+10xLOG P) = -27 (0.025 Watts)

-(43+10xLOG P) = -30 (0.050 Watts)

SUPERVISED BY:

  
Morton Flom, P. Eng.



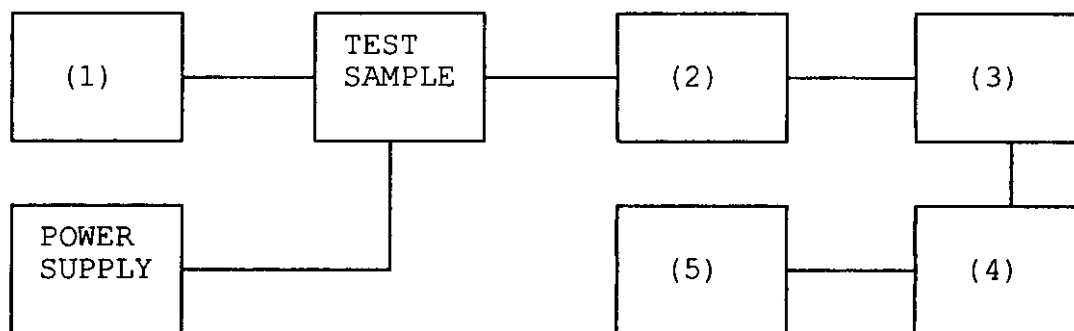
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TRANSMITTER SPURIOUS EMISSION

TEST A. OCCUPIED BANDWIDTH (IN-BAND SPURIOUS)

TEST B. OUT-OF-BAND SPURIOUS



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

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
 g9920313: 1999-Feb-25 Thu 15:00:00  
 STATE: 1:Low Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
181.000000	362.020000	-34.7	-48.7	-21.7
181.000000	543.135000	-23.1	-37.1	-10.1
181.000000	723.853000	-32	-46	-19
181.000000	905.211000	-34.1	-48.1	-21.1
181.000000	1086.390000	-39.7	-53.7	-26.7
181.000000	1266.749000	-43.4	-57.4	-30.4
181.000000	1448.313000	-35.1	-49.1	-22.1
181.000000	1629.266000	-56.6	-70.6	-43.6
181.000000	1809.912000	-34	-48	-21
181.000000	1990.910000	-36.8	-50.8	-23.8
181.000000	2171.931000	-38.5	-52.5	-25.5
181.000000	2352.596000	-46.8	-60.8	-33.8
181.000000	2533.924000	-64.5	-78.5	-51.5
181.000000	2714.691000	-68.3	-82.3	-55.3

NAME OF TEST: Unwanted Emissions (Transmitter Conducted)  
 g9920312: 1999-Feb-25 Thu 14:51:00  
 STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
181.000000	362.020000	-17.5	-34.5	-4.5
181.000000	542.948000	-17.5	-34.5	-4.5
181.000000	723.856000	-25.1	-42.1	-12.1
181.000000	905.217000	-25.9	-42.9	-12.9
181.000000	1086.110000	-36.7	-53.7	-23.7
181.000000	1266.860000	-30.6	-47.6	-17.6
181.000000	1447.788000	-34.8	-51.8	-21.8
181.000000	1628.758000	-32.8	-49.8	-19.8
181.000000	1810.398000	-41.5	-58.5	-28.5
181.000000	1990.950000	-32.5	-49.5	-19.5
181.000000	2171.933000	-38.6	-55.6	-25.6
181.000000	2353.497000	-44.3	-61.3	-31.3
181.000000	2533.617000	-56.9	-73.9	-43.9
181.000000	2714.799000	-61.4	-78.4	-48.4

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NAME OF TEST: Field Strength of Spurious Radiation

SPECIFICATION: 47 CFR 2.1053(a)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.12

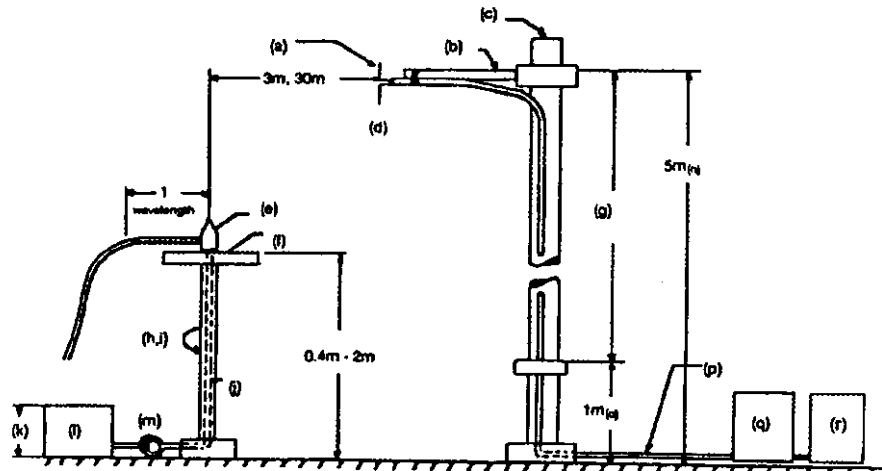
TEST EQUIPMENT: As per attached page

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 2.948, 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

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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
-------	-------------	-----	-------	----------

Per ANSI 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	Apriel 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
-----	--------	----------	------------	--------	--------

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

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NAME OF TEST: Field Strength of Spurious Radiation

ALL OTHER EMISSIONS =  $\geq$  20 dB BELOW LIMIT

EMISSION, MHz/HARMONIC	SPURIOUS LEVEL, dBc	
	Low	High
2nd to 10th	<-35	<-30

SUPERVISED BY:

  
Morton Flom, P. Eng.

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NAME OF TEST: Field Strength of Spurious Radiation  
 g9920198: 1999-Feb-18 Thu 11:23:00  
 STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
181.000000	362.013000	32.52P	21.94	528.45	-42.95	-29.9
192.100000	384.205000	32.08P	23.05	570.82	-42.25	-29.3
197.800000	395.593000	41.29P	23.59	1753.88	-32.45	-19.5
181.000000	543.008000	35.79P	25.84	1206.42	-35.75	-22.8
192.100000	576.313000	36.81P	27.09	1566.75	-33.45	-20.5
197.800000	593.393000	45.09P	27.7	4360.14	-24.55	-11.6
181.000000	724.020000	29.22P	29.56	868.96	-38.55	-25.6
192.100000	768.420000	44.54P	30.17	5438.76	-22.65	-9.7
197.800000	791.190000	42.58P	30.46	4487.45	-24.35	-11.4
181.000000	904.985000	38.58P	31.35	3136.9	-27.45	-14.5
192.100000	960.498000	37.33P	36.52	4926.06	-23.55	-10.6
197.800000	988.993000	30.22P	39.06	2910.72	-28.05	-15.1
181.000000	1086.038000	34.45P	27.46	1245.95	-35.45	-22.5
192.100000	1152.620000	40.09P	28.01	2540.97	-29.25	-16.3
197.800000	1186.750000	34.75P	28.29	1419.06	-34.35	-21.4
181.000000	1266.920000	38.19P	28.88	2256.84	-30.35	-17.3
192.100000	1344.640000	35.83P	29.44	1834.43	-32.15	-19.1
197.800000	1384.580000	21.4 P	29.71	359.34	-46.25	-33.3
181.000000	1448.038000	29.13P	30.12	917.28	-38.15	-25.2
192.100000	1536.850000	25.02P	30.67	608.84	-41.65	-28.7
197.800000	1582.350000	35.05P	30.94	1992.97	-31.35	-18.4
181.000000	1628.910000	23.91P	31.21	570.16	-42.25	-29.3
192.100000	1728.900000	35.76P	31.75	2374.11	-29.85	-16.9
197.800000	1780.150000	21.13P	32.03	454.99	-44.25	-31.2
181.000000	1810.010000	28.88P	32.18	1129.8	-36.35	-23.3
192.100000	1921.030000	29.23P	32.73	1253.14	-35.45	-22.4
197.800000	1977.950000	28.88P	33	1241.65	-35.45	-22.5

(P: Peak reading, A: Average reading)

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NAME OF TEST: Emission Masks (Occupied Bandwidth)

SPECIFICATION: 47 CFR 2.1049(c)(1)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.11

TEST EQUIPMENT: As per previous page

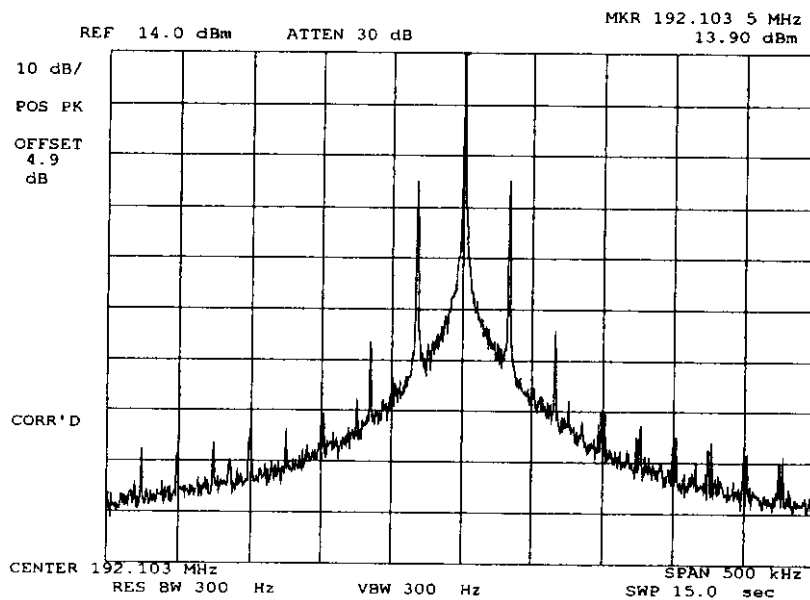
MEASUREMENT PROCEDURE

1. The EUT and test equipment were set up as shown on the following page, with the Spectrum Analyzer connected.
2. For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for  $\pm 2.5$  kHz deviation (or 50% modulation). With level constant, the signal level was increased 16 dB.
3. For EUTs supporting digital modulation, the digital modulation mode was operated to its maximum extent.
4. The Occupied Bandwidth was measured with the Spectrum Analyzer controls set as shown on the test results.
5. MEASUREMENT RESULTS: ATTACHED

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g9920295: 1999-Feb-24 Wed 08:55:00  
STATE: 1:Low Power



POWER:

LOW

MODULATION:

NONE

SUPERVISED BY:

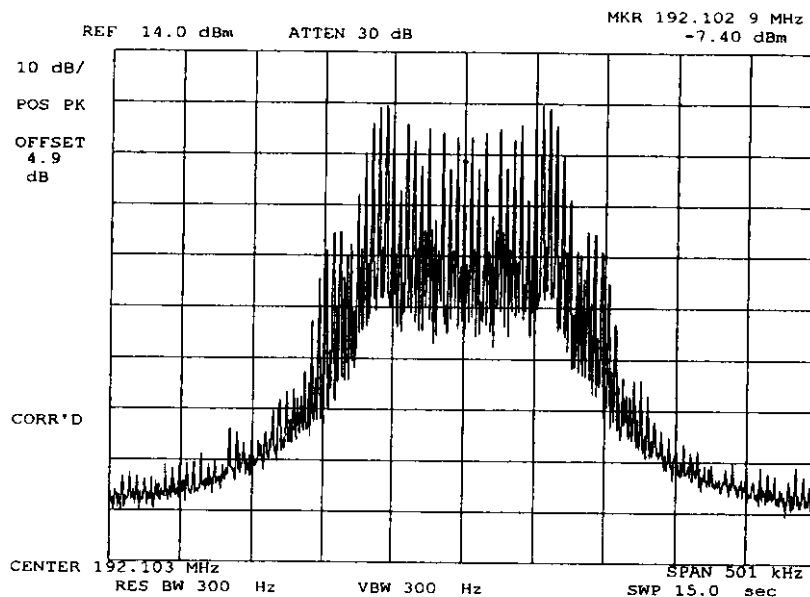
Morton Flom, P. Eng.



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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g9920319: 1999-Feb-26 Fri 08:11:00  
STATE: 1:Low Power



POWER:  
MODULATION:

LOW  
5 KHZ TONE 20 DB ABOVE  
REFERENCE

SUPERVISED BY:

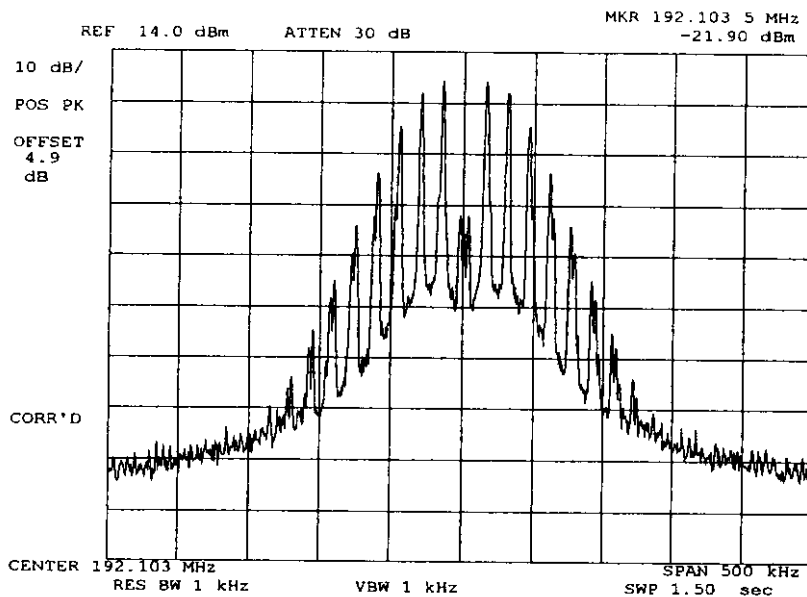
*M. Flom P. Eng*

Morton Flom, P. Eng.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g9920299: 1999-Feb-24 Wed 10:05:00  
STATE: 1:Low Power



POWER:  
MODULATION:

LOW  
15 KHZ TONE 20 DB ABOVE  
REFERENCE

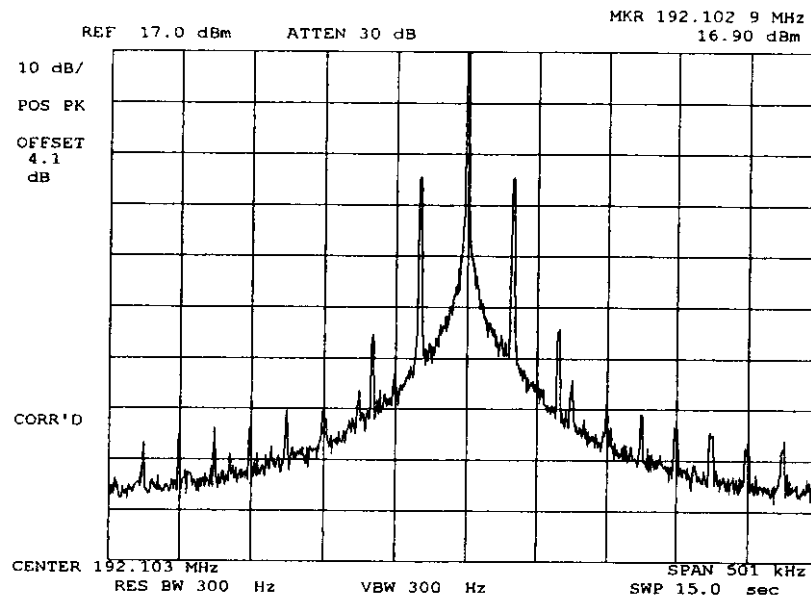
SUPERVISED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g9920316: 1999-Feb-26 Fri 08:02:00  
STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
NONE

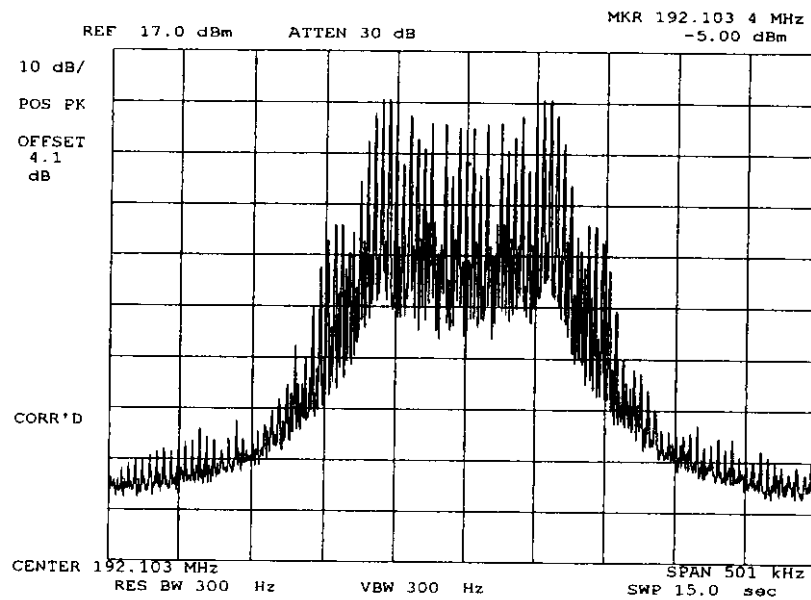
SUPERVISED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g9920318: 1999-Feb-26 Fri 08:07:00  
STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
5 KHZ TONE 20 DB ABOVE  
REFERENCE

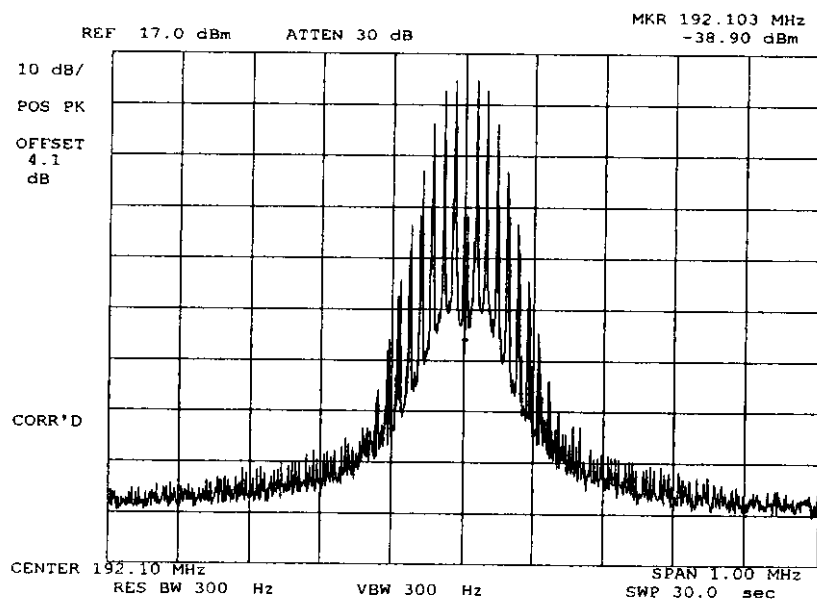
SUPERVISED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g9920320: 1999-Feb-26 Fri 08:15:00  
STATE: 2:High Power



POWER:  
MODULATION:

HIGH  
15 KHZ TONE 20 DB ABOVE  
REFERENCE

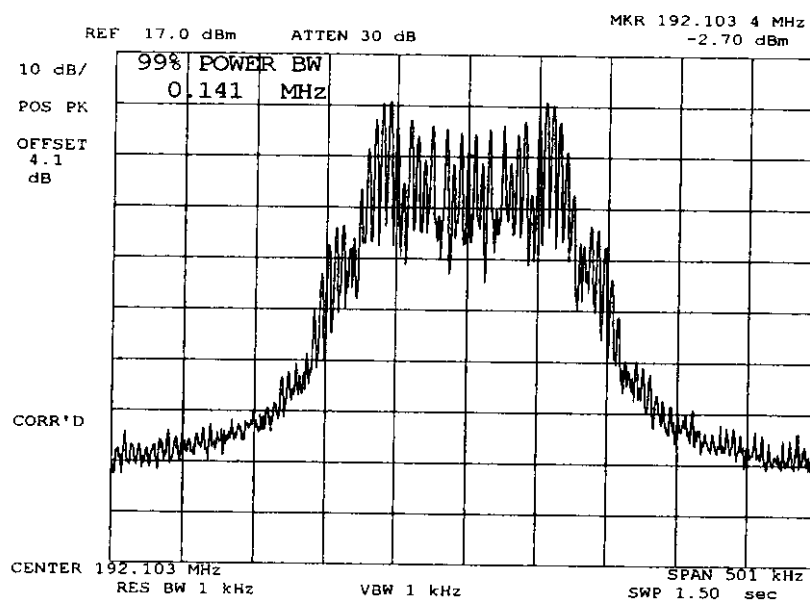
SUPERVISED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g9920322: 1999-Feb-26 Fri 08:19:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

HIGH  
 5 KHZ TONE 20 DB ABOVE  
 REFERENCE  
 99 % POWER BANDWIDTH

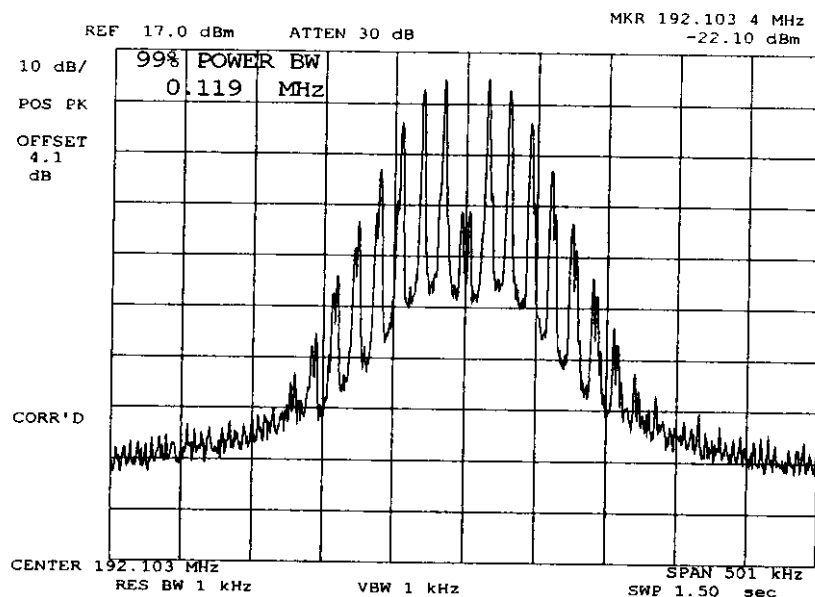
SUPERVISED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g9920321: 1999-Feb-26 Fri 08:18:00  
 STATE: 2:High Power



POWER:  
 MODULATION:

HIGH  
 15 KHZ TONE 20 DB ABOVE  
 REFERENCE  
 99 % POWER BANDWIDTH

SUPERVISED BY:

*Morton Flom P. Eng.*  
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NAME OF TEST: Audio Low Pass Filter (Voice Input)

SPECIFICATION: 47 CFR 2.1047(a)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.15

TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

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

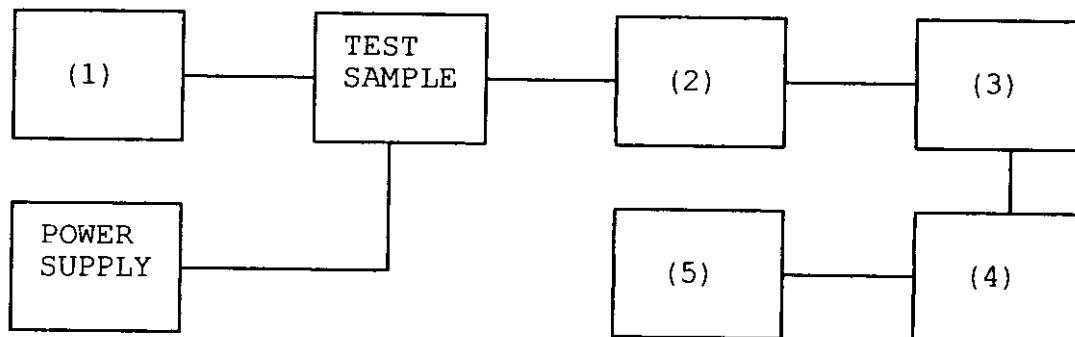


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TRANSMITTER TEST SET-UP

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

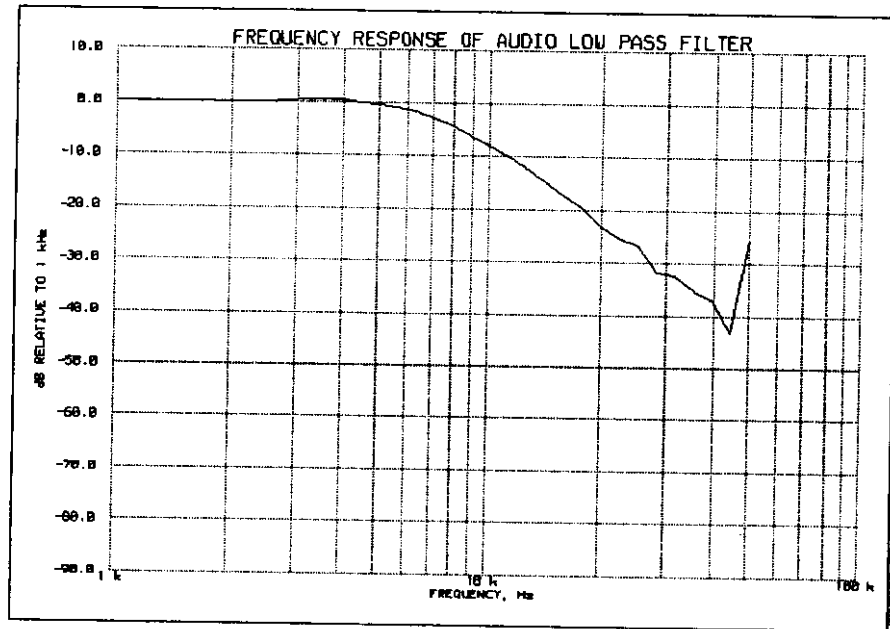


Asset	Description	s/n
(1)	<u>LINE IMPEDANCE STABILIZATION NETWORK</u>	
	i00010 HP 204D	1105A04683
x	i00017 HP 8903A	2216A01753
x	i00118 HP 33120A	US36002064
(2)	<u>COAXIAL ATTENUATOR</u>	
	i00122 NARDA 766-10	7802
	i00123 NARDA 766-10	7802A
x	i00113 SIERRA 661A-3D	1059
	i00069 BIRD 8329 (30 dB)	10066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

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NAME OF TEST: Audio Low Pass Filter (Voice Input)  
g9920212: 1999-Feb-22 Mon 14:42:00  
STATE: 0:General



SUPERVISED BY:

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PAGE NO. 27 of 35.  
NAME OF TEST: Audio Frequency Response  
SPECIFICATION: 47 CFR 2.1047(a)  
GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.6  
TEST EQUIPMENT: As per previous page

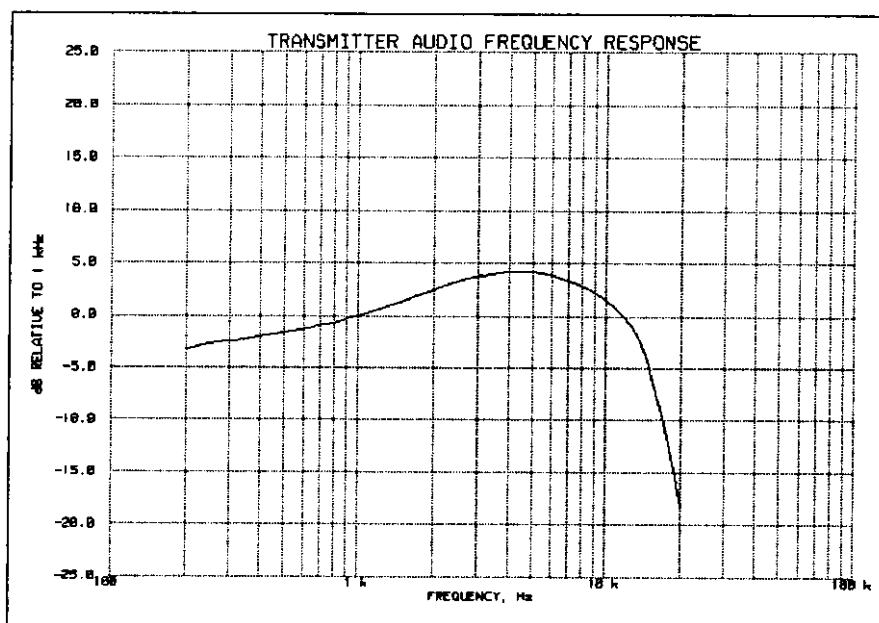
MEASUREMENT PROCEDURE

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

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NAME OF TEST: Audio Frequency Response  
 g9920245: 1999-Feb-25 Thu 10:01:00  
 STATE: 0:General



## Additional points:

FREQUENCY, Hz	LEVEL, dB
300	-1.88
20000	-33.31
30000	-60.23
50000	-75.96

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NAME OF TEST: Modulation Limiting

SPECIFICATION: 47 CFR 2.1047(b)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.3

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

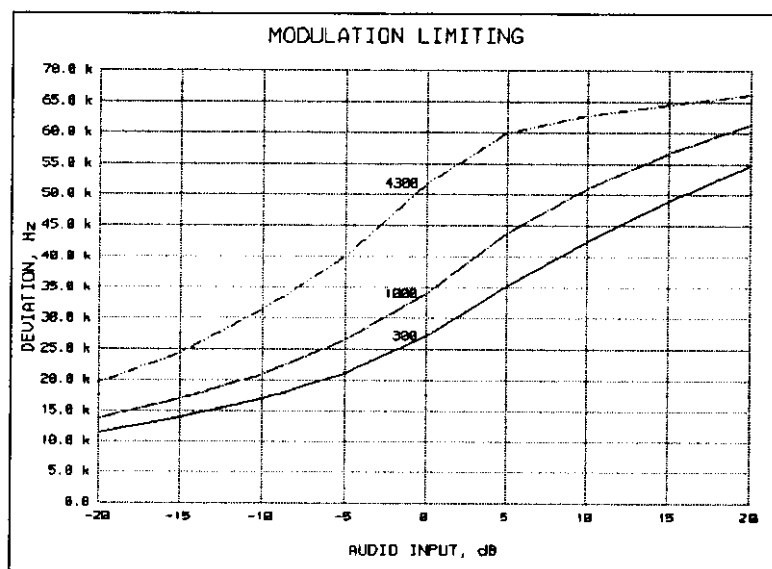
1. The signal generator was connected to the input of the EUT as for "Frequency Response of the Modulating Circuit."
2. The modulation response was measured for each of three frequencies (one of which was the frequency of maximum response), and the input voltage was varied and was observed on an HP 8901A Modulation Analyzer.
3. The input level was varied from 30% modulation ( $\pm 1.5$  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

PAGE NO.

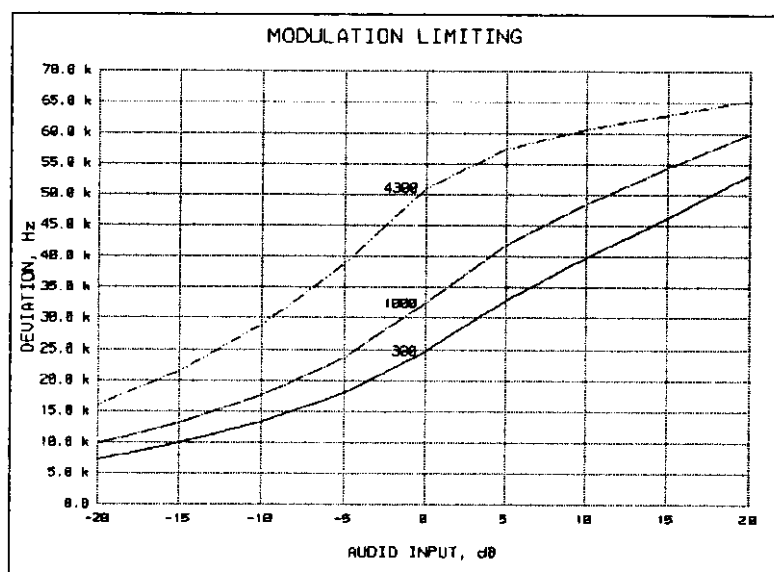
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NAME OF TEST: Modulation Limiting  
 g9920246: 1999-Feb-25 Thu 10:09:00  
 STATE: 0:General

Positive  
 Peaks:



Negative  
 Peaks:



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NAME OF TEST: Frequency Stability (Temperature Variation)

SPECIFICATION: 47 CFR 2.1055(a) (1)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

TEST CONDITIONS: As Indicated

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

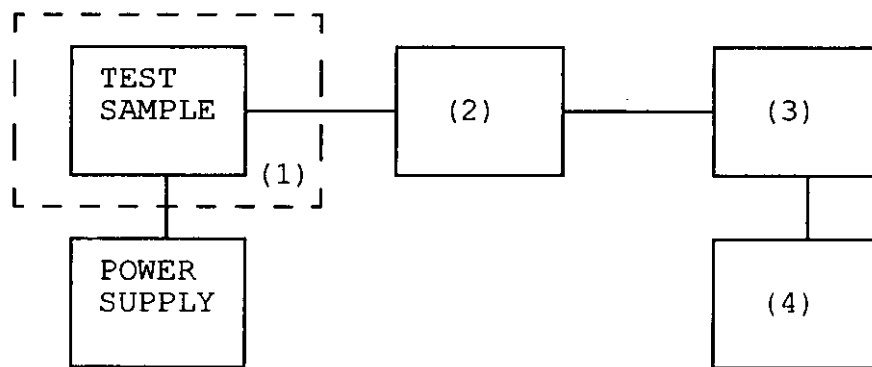
1. The EUT and test equipment were set up as shown on the following page.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
3. With power OFF, the temperature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

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TRANSMITTER TEST SET-UP

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



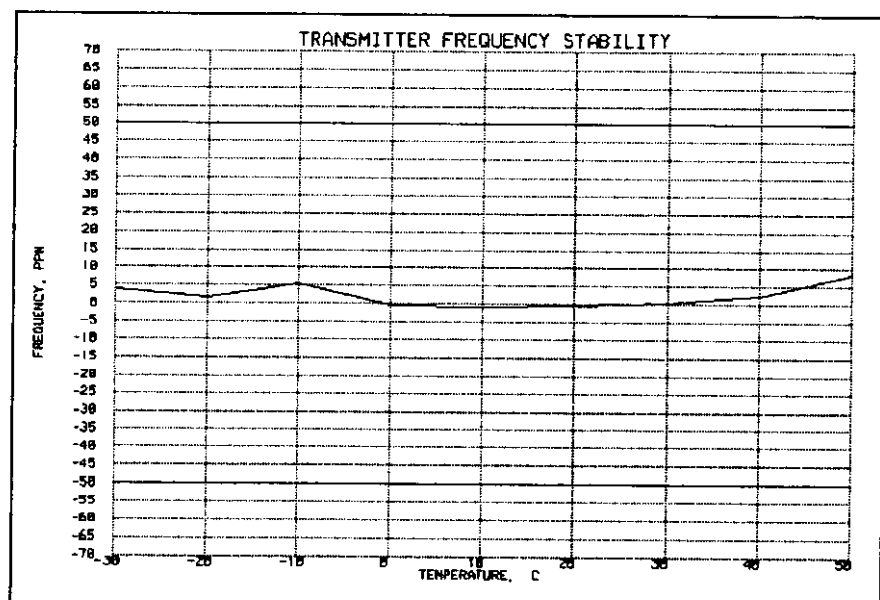
Asset	Description	s/n
(1)	TEMPERATURE, HUMIDITY, VIBRATION	
<u>x</u>	i00027 Tenny Temp. Chamber	9083-765-234
___	i00 Weber Humidity Chamber	
___	i00 L.A.B. RVH 18-100	
(2)	COAXIAL ATTENUATOR	
___	i00122 NARDA 766-10	7802
___	i00123 NARDA 766-10	7802A
<u>x</u>	i00113 SIERRA 661A-3D	1059
___	i00069 BIRD 8329 (30 dB)	10066
(3)	R.F. POWER	
___	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)	FREQUENCY COUNTER	
___	i00042 HP 5383A	1628A00959
<u>x</u>	i00019 HP 5334B	2704A00347
<u>x</u>	i00020 HP 8901A	2105A01087



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NAME OF TEST: Frequency Stability (Temperature Variation)  
g9920223: 1999-Feb-25 Thu 08:13:00  
STATE: 0:General



SUPERVISED BY:

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NAME OF TEST: Frequency Stability (Voltage Variation)

SPECIFICATION: 47 CFR 2.1055(b) (1)

GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2

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)  
 g9940168: 1999-Apr-28 Wed 12:04:19  
 STATE: 0:General

LIMIT, ppm = 50  
 LIMIT, Hz = 9605  
 BATTERY END POINT (Voltage) = 4.6

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
85	5.1	192.102000	0	0.00
100	6	192.102000	0	0.00
115	6.9	192.102000	0	0.00
77	4.6	192.102230	230	1.20

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NAME OF TEST: Necessary Bandwidth and Emission Bandwidth

SPECIFICATION: 47 CFR 2.202(g)

MODULATION =

NECESSARY BANDWIDTH CALCULATION:

MAXIMUM MODULATION (M), kHz	=	4.3
MAXIMUM DEVIATION (D), kHz	=	65
CONSTANT FACTOR (K)	=	1
NECESSARY BANDWIDTH (B <sub>N</sub> ), kHz	=	198.6
	=	200K0F3E

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