


PAGE NO. 1 of 28.

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

- a) TEST REPORT
- b) Laboratory: M. Flom Associates, Inc.
 (FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
 (Canada: IC 2044) Chandler, AZ 85224
- c) Report Number: d98a0056
- d) Client: Telex Communications, Inc.
 8601 E. Cornhusker Highway
 P.O. Box 5579
 Lincoln, NE 68505-5579
- e) Identification: UT-12
 FCC ID: B5DH210
 Description: UHF Handheld Wireless Transmitter
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: October 26, 1998
 EUT Received: October 19, 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.

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LIST OF GENERAL INFORMATION REQUIRED FOR CERTIFICATION

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

74H, 74.861

Sub-part 2.1033(c) (1): NAME AND ADDRESS OF APPLICANT:

Telex Communications, Inc.
8601 E. Cornhusker Highway
P.O. Box 5579
Lincoln, NE 68505-5579

VENDOR:

Applicant

(c) (2): FCC ID: B5DH210MODEL NO: UT-12(c) (3): INSTRUCTION MANUAL(S):

PLEASE SEE ATTACHED EXHIBITS

(c) (4): TYPE OF EMISSION: 181K0F3E(c) (5): FREQUENCY RANGE, MHz: 690 to 725(c) (6): POWER RATING, Watts: 0.015
Switchable Variable x N/A(c) (7): MAXIMUM POWER RATING, Watts: 0.250

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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 = 9

(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.

PAGE NO. 6 of 28.
NAME OF TEST: Carrier Output Power (Radiated)
SPECIFICATION: 47 CFR 2.1046(a)
GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.1
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 of a dipole 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

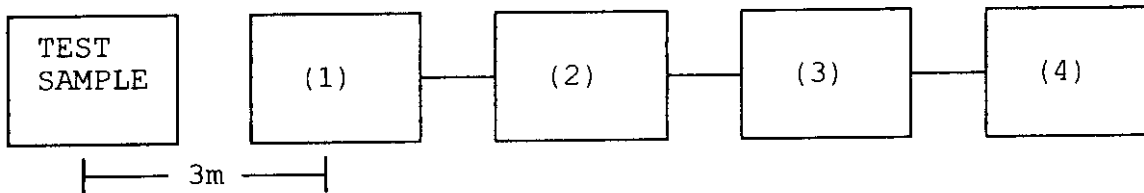
FREQUENCY OF CARRIER, MHz = 710.1

POWER SETTING	R. F. POWER, ERP, WATTS
High	0.015

SUPERVISED BY:

Morton Flom, P. Eng.

TRANSMITTER RADIATED MEASUREMENTS



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

PAGE NO. 8 of 28.
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	=	710.1
SPECTRUM SEARCHED, GHz	=	0 to 10 x F _c
MAXIMUM RESPONSE, Hz	=	7080
ALL OTHER EMISSIONS	=	≥ 20 dB BELOW LIMIT
LIMIT, dBc	=	N/A

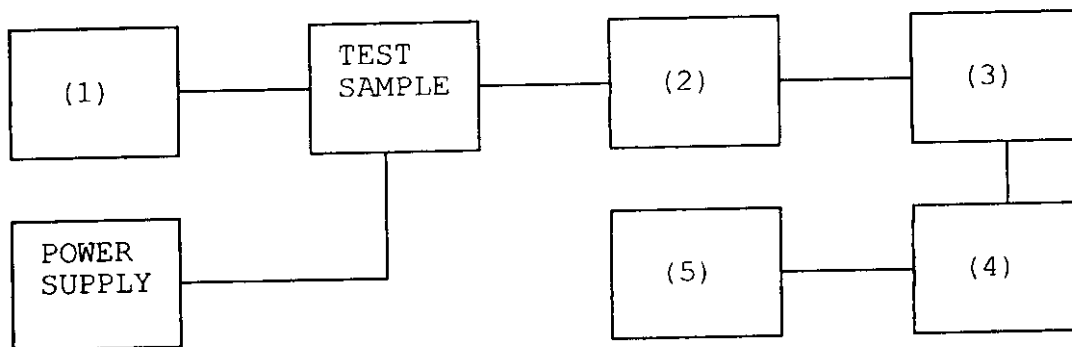
SUPERVISED BY:



Morton Flom, P. Eng.

TRANSMITTER SPURIOUS EMISSION

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



Asset Description

s/n

<u>(1) AUDIO OSCILLATOR/GENERATOR</u>		
—	i00010 HP 204D	1105A04683
—	i00017 HP 8903A	2216A01753
<u>x</u>	i00012 HP 3312A	1432A11250
 <u>(2) 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
 <u>(3) 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
 <u>(4) SPECTRUM ANALYZER</u>		
<u>x</u>	i00048 HP 8566B	2511A01467
—	i00029 HP 8563E	3213A00104
 <u>(5) SCOPE</u>		
—	i00058 HP 1741A	2251A09356
—	i00030 HP 54502A	2927A00209
—	i00071 Tektronix 935	1935-B011343

PAGE NO. 10 of 28.

NAME OF TEST: Unwanted Emissions (Transmitter Conducted)

STATE:

<u>FREQUENCY TUNED,</u> <u>MHz</u>	<u>FREQUENCY LEVEL, dBm</u>	<u>LEVEL, dBc</u>	<u>MARGIN, dB</u>
---------------------------------------	-----------------------------	-------------------	-------------------

EMISSION, MHz

EUT DOES NOT PROVIDE A STANDARD CONNECTOR

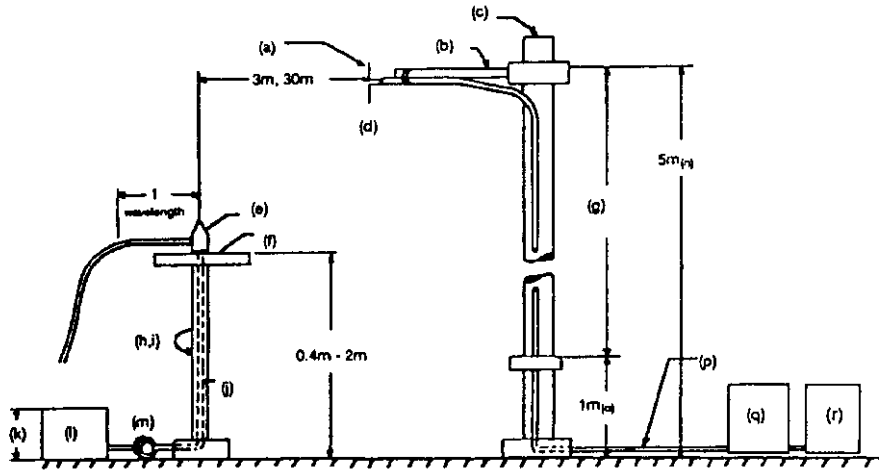
PAGE NO. 11 of 28.
NAME OF TEST: Field Strength of Spurious Radiation
SPECIFICATION: 47 CFR 2.1053(a)
GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.12
TEST EQUIPMENT: As per attached page

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 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	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	Apral 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.	
x	i00033	HP 85462A	3625A00357	12 mo.	Dec-97
___	i00048	HP 8566B	2511AD1467	6 mo.	Mar-98

PAGE NO.

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NAME OF TEST: Field Strength of Spurious Radiation

g98a0137: 1998-Oct-20 Tue 08:20:00

STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	METER, dBuV	CF, dB	uV/m @ 3m	ERP, dBm	MARGIN, dB
710.100000	1420.150000	43.48	30.28	4875.28	-23.65	-10.6
710.100000	2130.210000	38.18	34.34	4226.69	-24.85	-11.9
710.100000	2840.250000	34.3	37.59	3930.97	-25.45	-12.5
710.100000	3550.340000	33.8	40.12	4965.92	-23.45	-10.5
710.100000	4260.330000	19.91	41.29	1148.15	-36.15	-23.2
710.100000	4970.430000	16.87	43.28	1017.42	-37.25	-24.3
710.100000	5680.420000	13.35	45.39	864.97	-38.65	-25.7
710.100000	6390.520000	10.86	46.37	726.94	-40.15	-27.2
710.100000	7100.628330	40	18.3	822.24	-39.05	-26.1
710.100000	7100.628330	89.6	29.4		12.00	0

PAGE NO. 14 of 28.
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

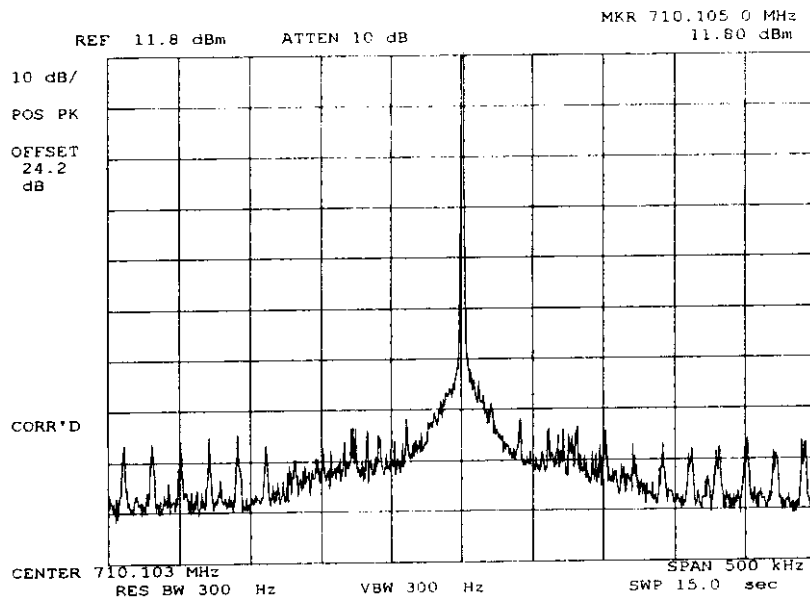
MEASUREMENT PROCEDURE

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 ± 6.0 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.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98a0144: 1998-Oct-20 Tue 12:13:00
STATE: 2:High Power



POWER:
MODULATION:

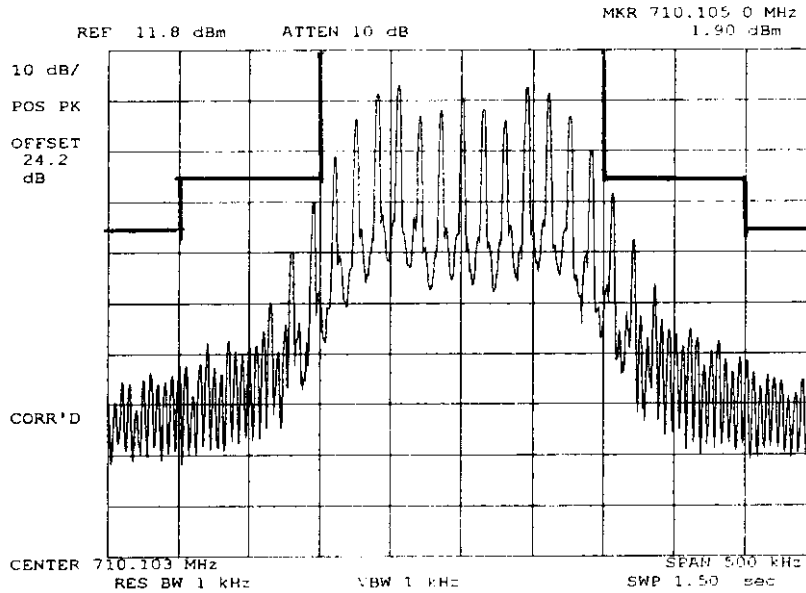
HIGH
NONE
LOOSE COUPLED

SUPERVISED BY:

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

PAGE NO. 16 of 28.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98a0145: 1998-Oct-20 Tue 12:20:00
STATE: 2:High Power



POWER:
MODULATION:

HIGH
15KHZ TONE 20DB ABOVE
REFERENCE
LOOSE COUPLED

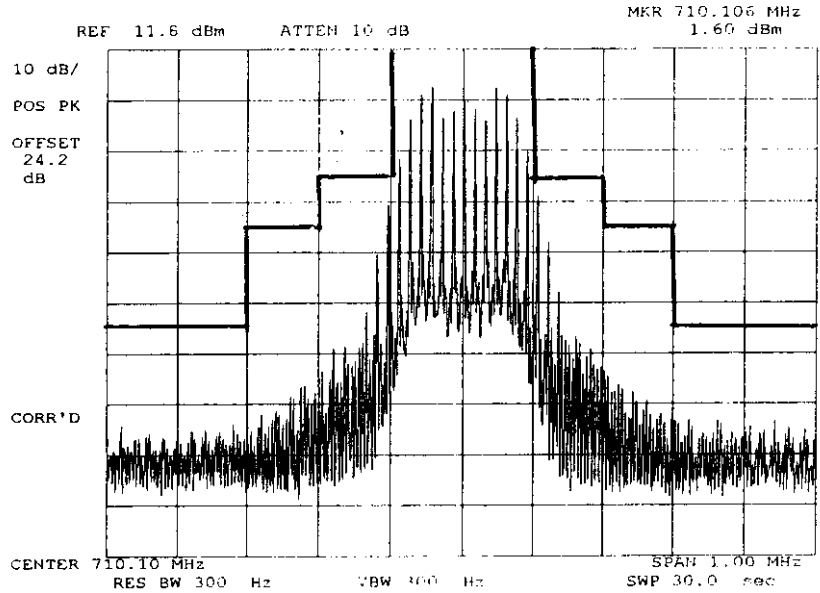
SUPERVISED BY:

Morton Flom P. Eng.

Morton Flom, P. Eng.

PAGE NO. 17 of 28.

NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98a0148: 1998-Oct-20 Tue 12:32:00
STATE: 2:High Power



POWER:
MODULATION:

HIGH
15KHZ TONE 20DB ABOVE
REFERENCE
LOOSE COUPLED

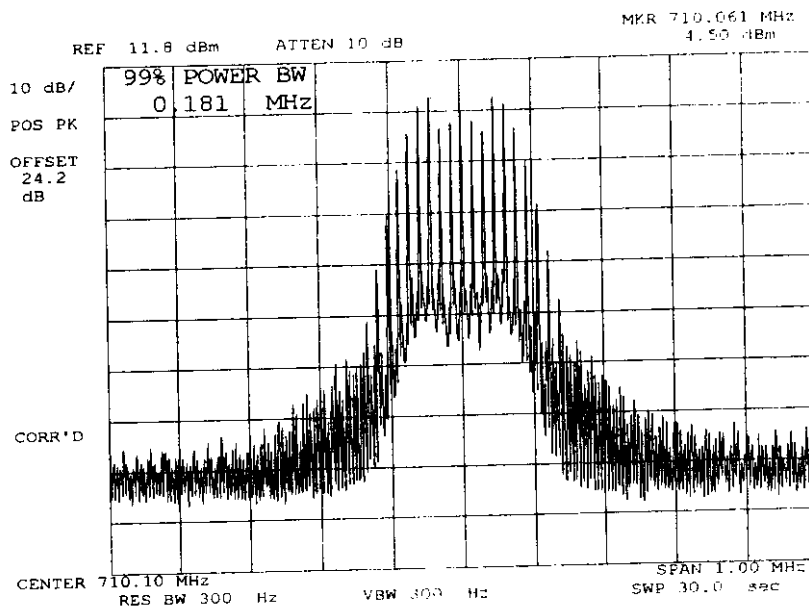
SUPERVISED BY:

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

PAGE NO.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98a0147: 1998-Oct-20 Tue 12:30:00
STATE: 2:High Power



POWER:
MODULATION:

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

SUPERVISED BY:

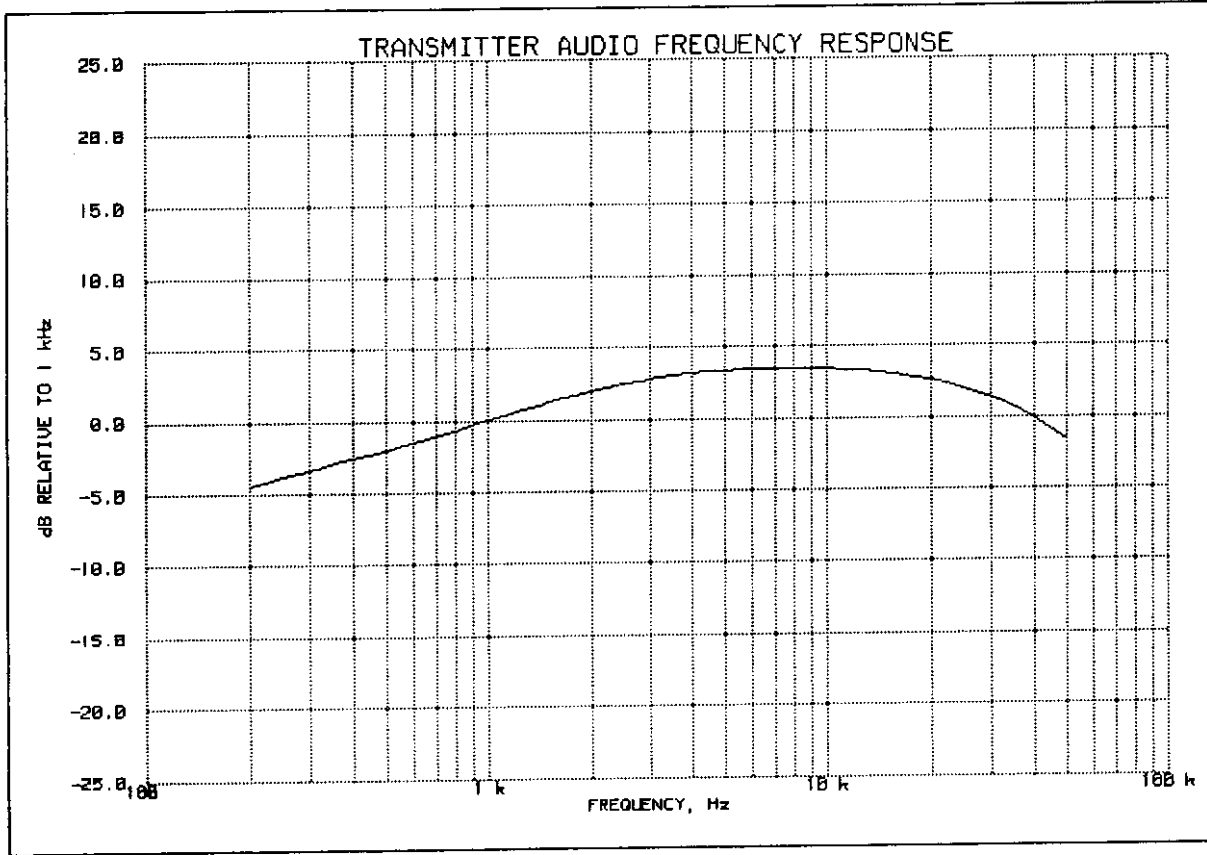
Morton Flom P. Eng.

Morton Flom, P. Eng.

PAGE NO. 19 of 28.
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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PEAK AUDIO FREQUENCY, Hz: 7080

TABLE VALUES:

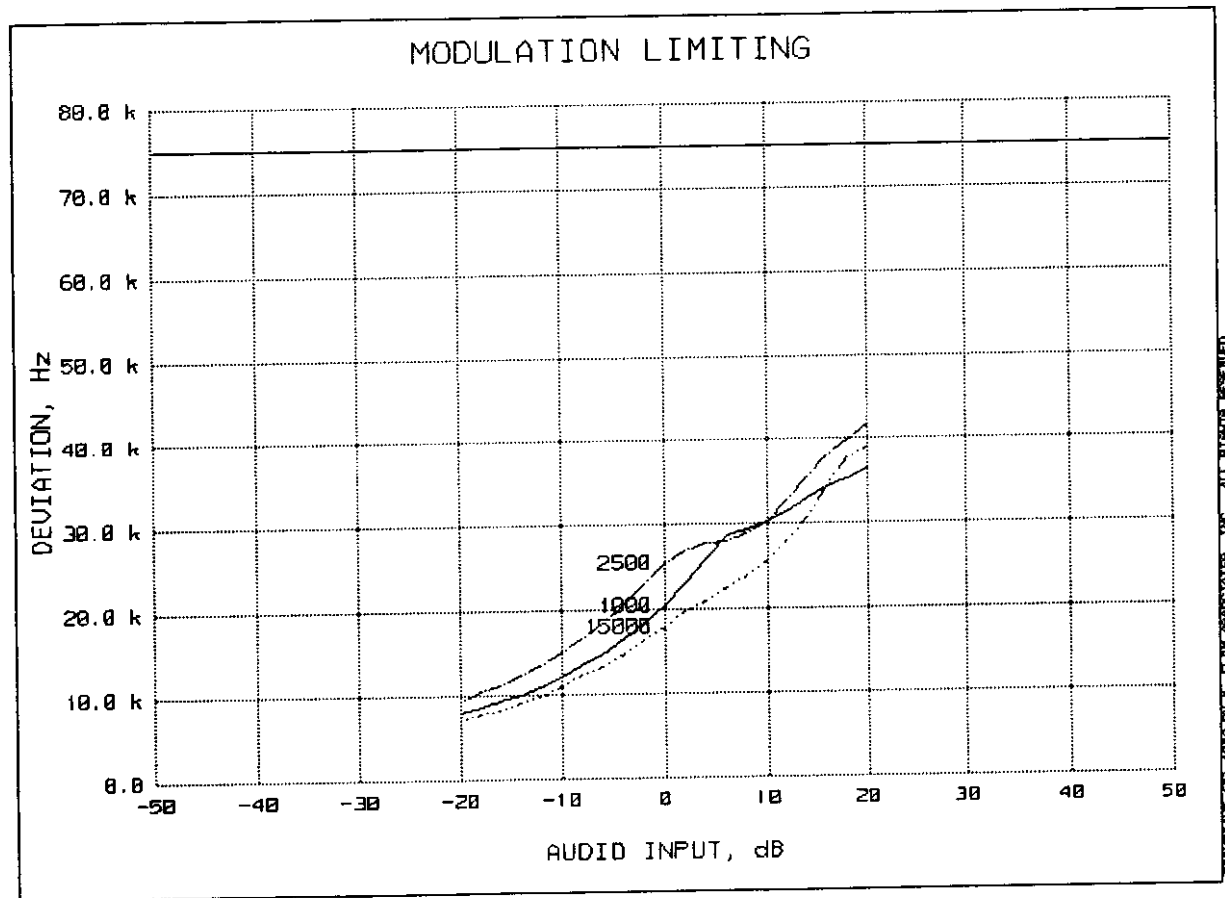
FREQUENCY, Hz	LEVEL, dB	FREQUENCY, Hz	LEVEL, dB	FREQUENCY, Hz	LEVEL, dB
300	-3.3	30000	1.3		
20000	2.5	50000	-1.6		

PAGE NO. 21 of 28.
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 (± 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

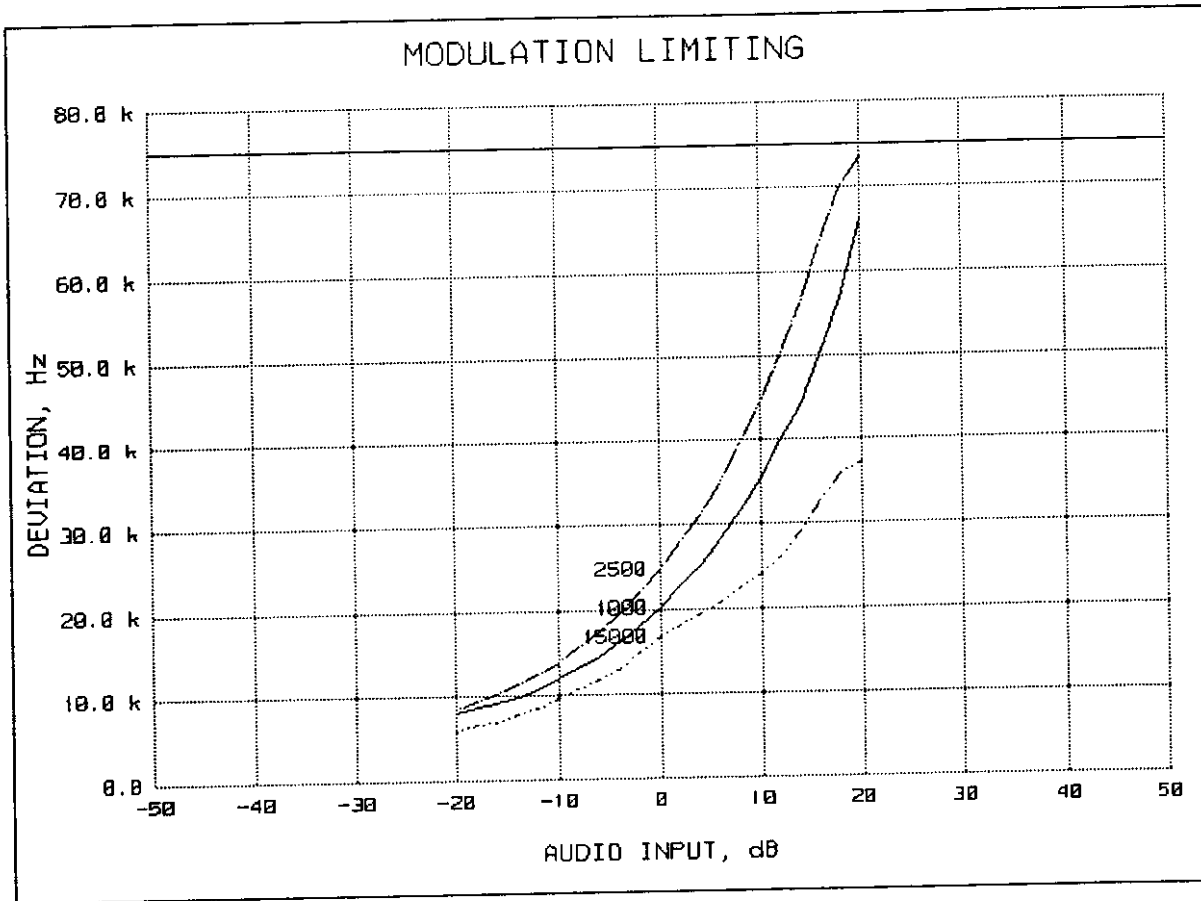
PAGE 22 of 28.
MODULATION LIMITING
TELEX, UT-12
1998-OCT-20, 11:37



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REFERENCE DEVIATION, kHz = 20
REFERENCE MODULATION, Hz = 1000
PEAKS = POSITIVE
AUDIO AMPLITUDE, mV = 10.33

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MODULATION LIMITING
TELEX, UT-12
1998-OCT-20, 11:37



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REFERENCE DEVIATION, kHz = 20
REFERENCE MODULATION, Hz = 1000
PEAKS = NEGATIVE
AUDIO AMPLITUDE, mV = 10.33

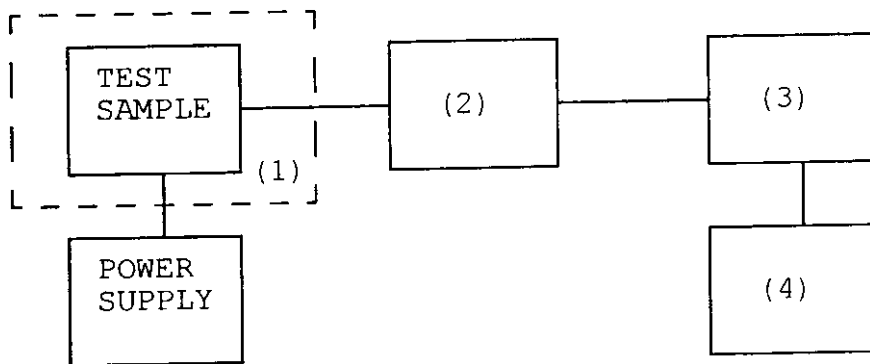
PAGE NO. 24 of 28.
NAME OF TEST: Frequency Stability (Temperature Variation)
SPECIFICATION: 47 CFR 2.1055(a)(1)
GUIDE: ANSI/TIA/EIA-603-1992, Paragraph 2.2.2
TEST CONDITIONS: As Indicated
TEST EQUIPMENT: As per attached page

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

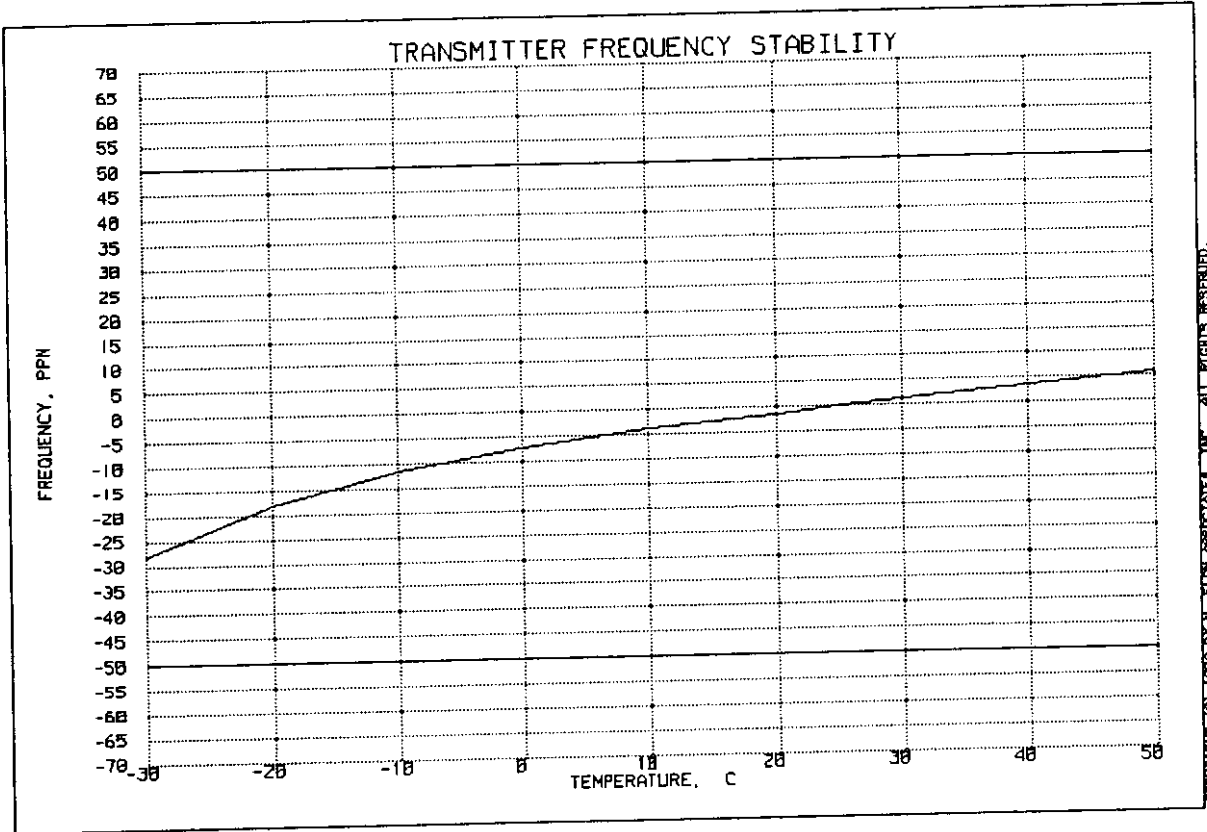
TRANSMITTER TEST SET-UP

- 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
<u>(1) TEMPERATURE, HUMIDITY, VIBRATION</u>		
<u>x</u>	i00027 Tenny Temp. Chamber	9083-765-234
<u> </u>	i00 Weber Humidity Chamber	
<u> </u>	i00 L.A.B. RVH 18-100	
<u>(2) COAXIAL ATTENUATOR</u>		
<u> </u>	i00122 NARDA 766-10	7802
<u> </u>	i00123 NARDA 766-10	7802A
<u>x</u>	i00113 SIERRA 661A-3D	1059
<u> </u>	i00069 BIRD 8329 (30 dB)	10066
<u>(3) R.F. POWER</u>		
<u> </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
<u>(4) FREQUENCY COUNTER</u>		
<u> </u>	i00042 HP 5383A	1628A00959
<u>x</u>	i00019 HP 5334B	2704A00347
<u>x</u>	i00020 HP 8901A	2105A01087

TRANSMITTER FREQUENCY STABILITY
TELEX, UT-12
20 OCT 1998, 13:29



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FREQUENCY OF CARRIER, MHz = 710.10523

LIMIT, ppm = 50

LIMIT, Hz = 35505

PAGE NO. 27 of 28.
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)
g98a0143: 1998-Oct-20 Tue 11:45:31
STATE: 0:General

LIMIT, ppm = 50
LIMIT, Hz = 35505
BATTERY END POINT (Voltage) = 7.4

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
85	7.65	710.086070	-17930	-25.25
100	9	710.104000	0	0.00
115	10.35	710.103480	-520	-0.73
82	7.4	710.073670	-30330	-42.71

Morton Flom, P. Eng.

SUPERVISED BY:

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NAME OF TEST: Necessary Bandwidth and Emission Bandwidth
SPECIFICATION: 47 CFR 2.202(g)

Rule 2.202(g)
 MAXIMUM MODULATION (M), kHz = 25000 (2m) + (2DK)
 MAXIMUM DEVIATION (D), kHz = 72000 (2x25K)+(2x1x72K)
 CONSTANT FACTOR (K) = 1
 NECESSARY BANDWIDTH (B_N), kHz = (2 x M) + (2 x D x K)
 = 192

Rule 74.861(i)(3), Limit = $\leq \pm 75$ kHz
 NECESSARY BANDWIDTH (B_N), kHz = 192
 TEMPERATURE VARIATION, kHz = 30
 VOLTAGE VARIATION, kHz = 35
 EMISSION BANDWIDTH (B_N), kHz = SUM OF ABOVE
 = 257

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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).


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