

Exhibit 12

Minstrel S

Novatel Wireless Technologies Ltd.

FCC ID: NBZNRM6834

**With a Novatel NRM6832 CDPD Transmitter
(FCC ID: NBZNRM6832 Test Data)**

Test data/Report for

- | | |
|--------------------------------|---|
| 2.1049(c)(1) and 2.1047 | : Modulation Emission
Mask/s (Occupied
Bandwidth) |
| 2.1051(2.991) | : Spurious Emissions at
Antenna Terminal |
| 2.1055(2.995) | : Frequency Stability |

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

- a) TEST REPORT
- b) Laboratory: M. Flom Associates, Inc.
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107
(Canada: IC 2044) Chandler, AZ 85224
- c) Report Number: d98c0011
- d) Client: Novatel Wireless Technologies Ltd.
6715 - 8th St., N.E., Suite 200
Calgary, AB T2E 7H7 Canada
- e) Identification: NRM-6832
FCC ID: NBZNRM-6832
Description: CDPD Modem Module
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: December 7, 1998
EUT Received: November 23, 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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Sub-part

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

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

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

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GENERAL INFORMATION

1. Prior to testing, the deviation for audio modulation and each of the respective SAT + ST tones were set as close as possible to the required limit.
2. Except for audio modulation, which was applied externally, Wideband Data SAT, ST and all other tones and operational modes were provided by a test control unit incorporating appropriate software. Worst case repetition rate for Wideband Data was 10 kb/s.
3. Spurious radiation was measured at three (3) meters.
4. The two cellular frequency bands are available to the user automatically. Please refer to the manual contained in the documentation.
5. The normal modes of modulation are:
 - ☐ (a) VOICE
 - ☐ (b) WIDEBAND DATA
 - ☐ (c) SAT
 - ☐ (d) ST
 - ☐ (e) SAT + VOICE
 - ☐ (f) SAT + DTMF
 - ☐ (g) CDMA
 - ☐ (h) TDMA
 - ☐ (i) NAMPS VOICE
 - ☐ (j) NAMPS DSAT
 - ☐ (k) NAMPS ST
 - ☐ (l) NAMPS VOICE + DSAT
 - ☒ (m) GMSK

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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: Emission Masks (Occupied Bandwidth)

SPECIFICATION: 47 CFR 2.1049(c) (1)

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

TEST EQUIPMENT: As per previous page

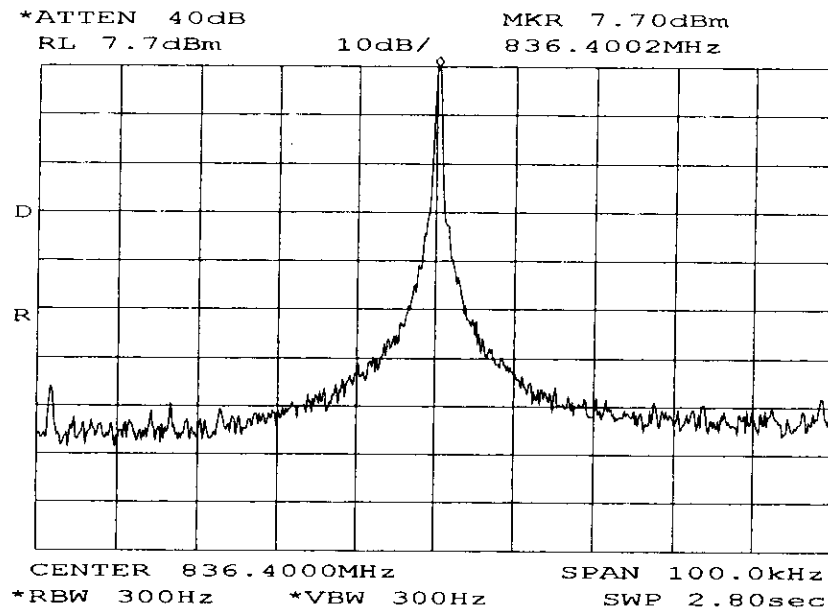
MEASUREMENT PROCEDURE

1. The EUT and test equipment were set up as shown on the following page, with the Spectrum Analyzer connected.
2. For EUTs supporting audio modulation, the audio signal generator was adjusted to the frequency of maximum response and with output level set for ± 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)
g98b0363: 1998-Nov-23 Mon 12:35:00
STATE: 1:Low Power



POWER:
MODULATION:

LOW
NONE

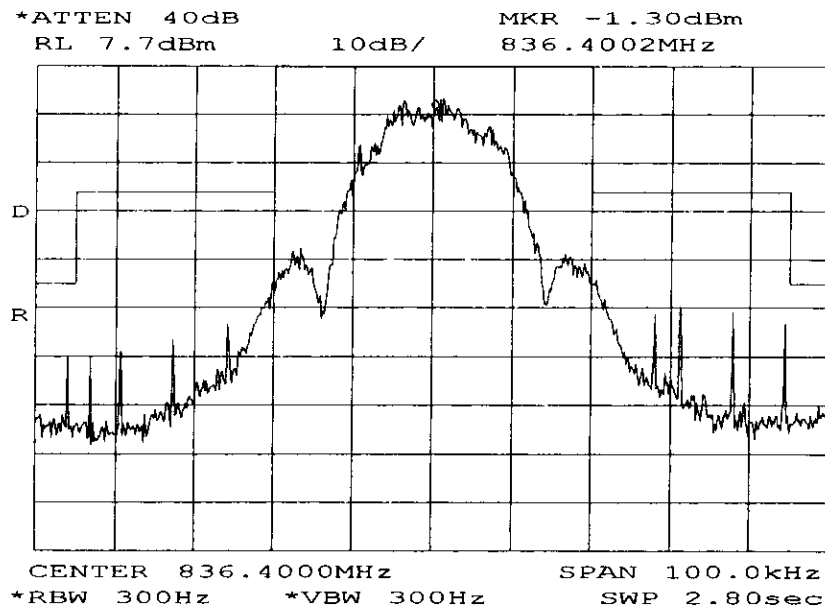
SUPERVISED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98b0368: 1998-Nov-23 Mon 12:41:00
STATE: 1:Low Power



POWER:
MODULATION:

LOW
DATA GMSK
MASK: AMPS CELLULAR, F1D,
DATA

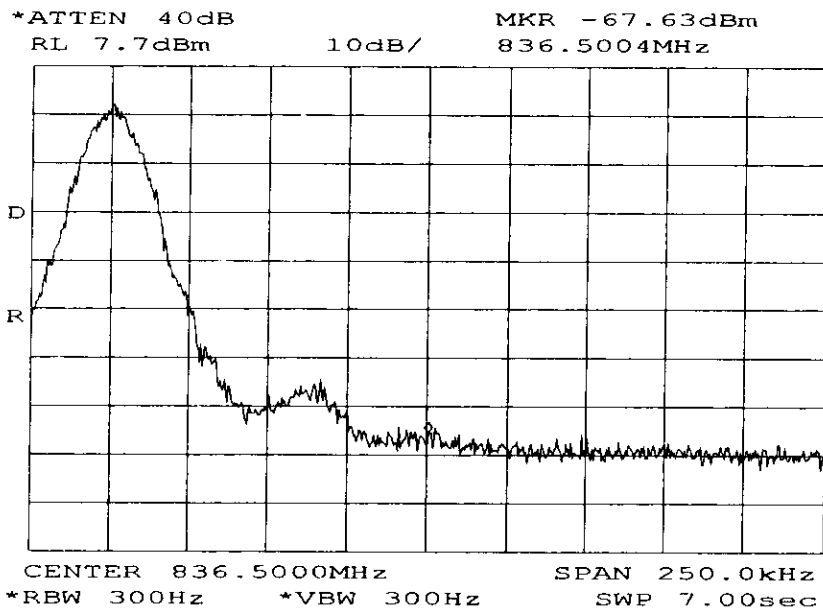
SUPERVISED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98b0371: 1998-Nov-23 Mon 12:49:00
STATE: 1:Low Power



POWER:
MODULATION:

LOW
DATA GMSK
OFFSET OCCUPIED BANDWIDH

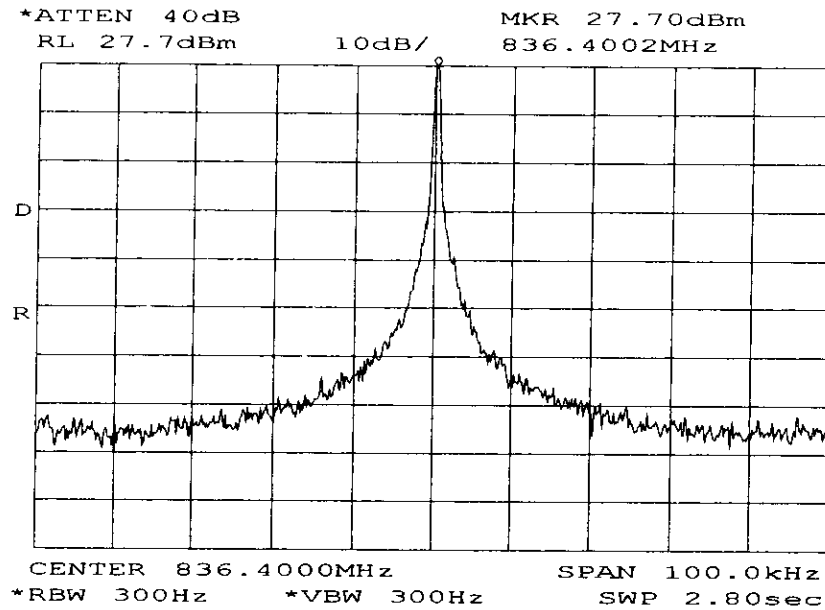
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Morton Flom, P. Eng.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98b0362: 1998-Nov-23 Mon 12:31:00
STATE: 2:High Power



POWER:
MODULATION:

HIGH
NONE

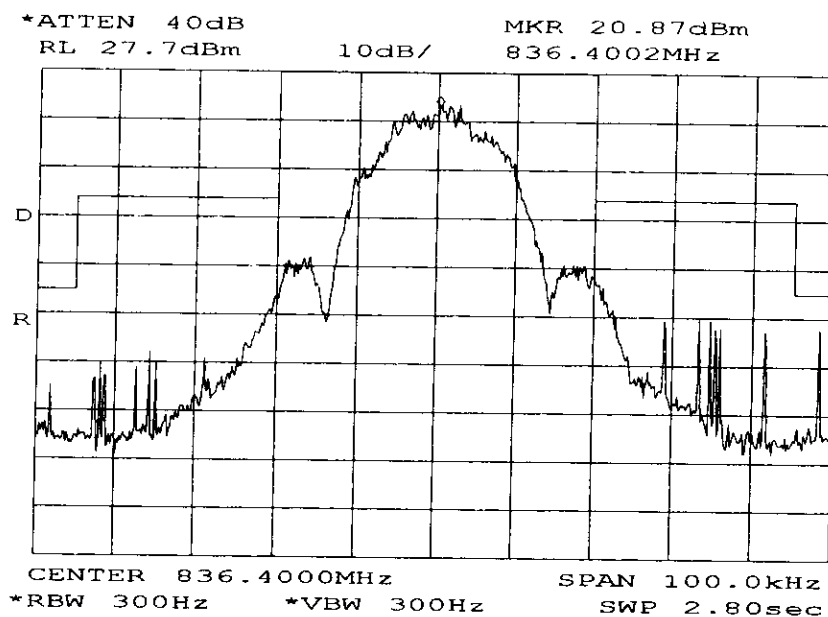
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Morton Flom, P. Eng.

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98b0369: 1998-Nov-23 Mon 12:42:00
STATE: 2:High Power



POWER:
MODULATION:

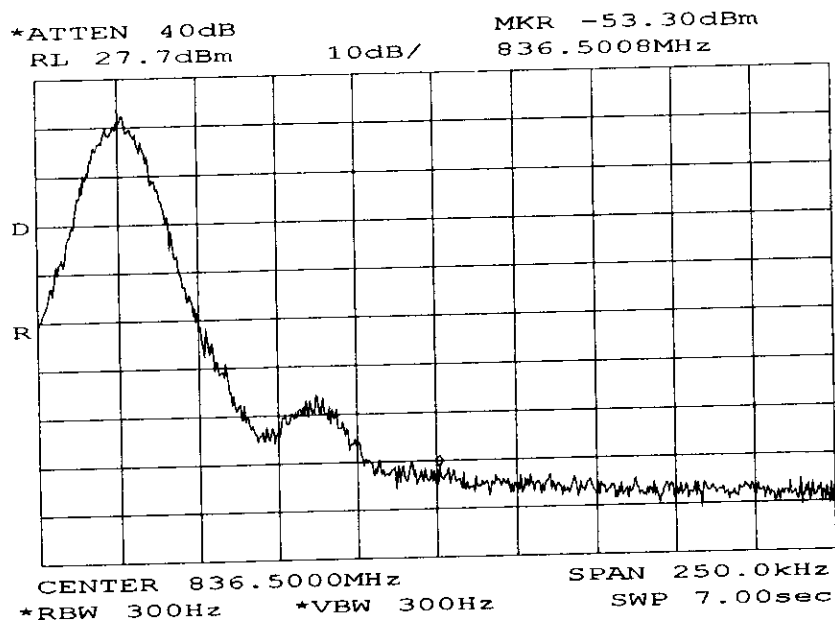
HIGH
DATA GMSK
MASK: AMPS CELLULAR, F1D,
DATA

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98b0370: 1998-Nov-23 Mon 12:48:00
STATE: 2:High Power



POWER:
MODULATION:

HIGH
DATA GMSK
OFFSET OCCUPIED BANDWIDTH

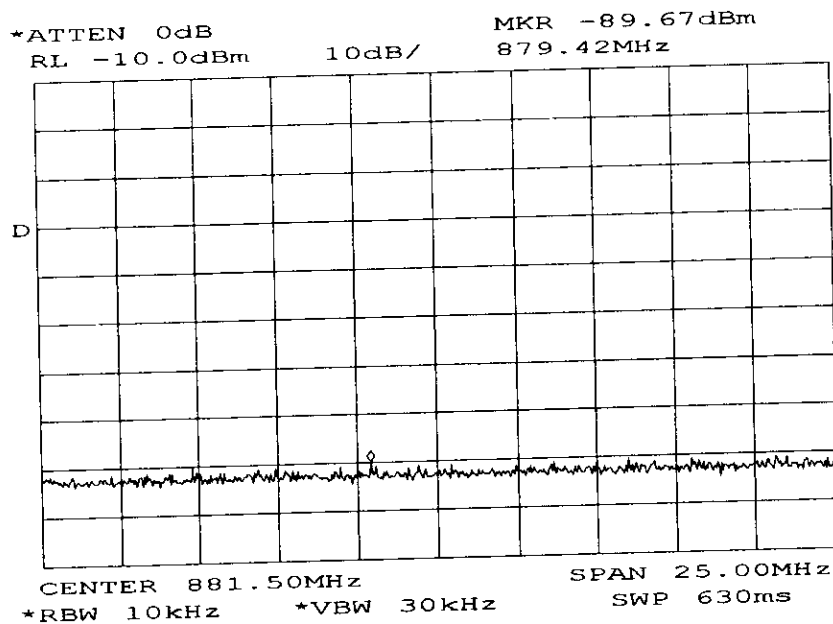
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NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98b0372: 1998-Nov-23 Mon 13:22:00
STATE: 1:Low Power



POWER:
MODULATION:

LOW
DATA GMSK
TX SPURS IN RX CRITICAL
BAND

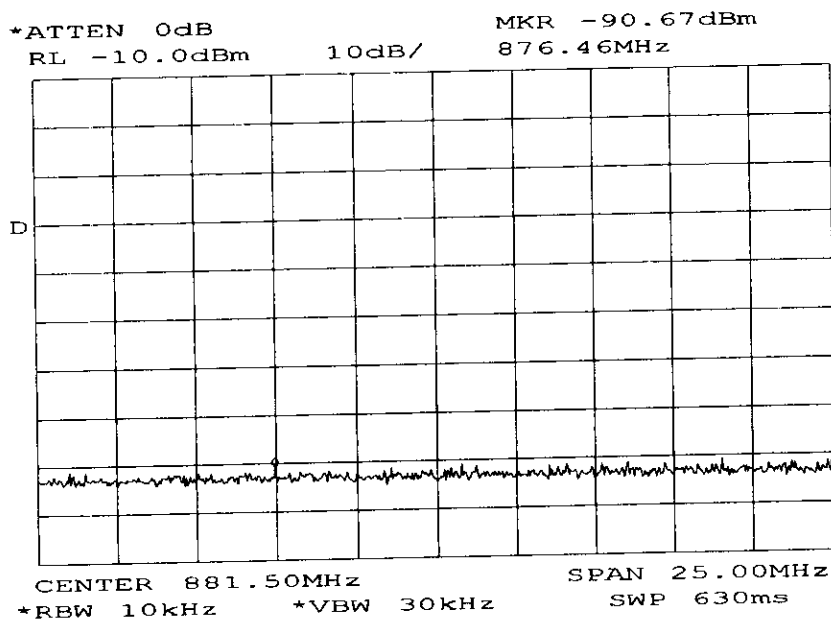
SUPERVISED BY:

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

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NAME OF TEST: Emission Masks (Occupied Bandwidth)
g98b0373: 1998-Nov-23 Mon 13:30:00
STATE: 2:High Power



POWER:
MODULATION:

HIGH
DATA GMSK
TX SPURS IN RX CRITICAL
BAND

SUPERVISED BY:

Morton Flom, P. Eng.

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NAME OF TEST: Spurious Emissions at Antenna Terminals
SPECIFICATION: 47 CFR 2.1051, 22.917
GUIDE: EIA/IS-19-B-1988
TIA/EIA/IS-137-A-1996
TEST EQUIPMENT: As per attached page

MEASUREMENT PROCEDURE

1. The EUT was connected to a coaxial attenuator and then to a Spectrum Analyzer.
2. A notch filter was introduced to reduce or eliminate spurious emission which could be generated internally in the spectrum analyzer.
3. Measurements were made over the range from 45 kHz to 10 GHz for the worst case modulation so both the highest and lowest R.F. power settings.
4. All other emissions were 20 dB or more below the limit.
5. Spectrum analyzer bandwidth was set to section 22.917(h) as applicable.
6. MEASUREMENT RESULTS: ATTACHED

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
 g98b0375: 1998-Nov-23 Mon 14:06:00
 STATE: 1:Low Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
836.400000	1672.708333	-36.6	-44.3	-23.6
836.400000	2509.590000	-47.8	-55.5	-34.8
836.400000	3345.670000	-49.5	-57.2	-36.5
836.400000	4181.966667	-50.5	-58.2	-37.5
836.400000	5018.471667	-50.3	-58	-37.3
836.400000	5854.573333	-50.5	-58.2	-37.5
836.400000	6690.735000	-48.5	-56.2	-35.5
836.400000	7527.783333	-48.5	-56.2	-35.5
836.400000	8364.113333	-48.6	-56.3	-35.6
836.400000	9200.481667	-48.5	-56.2	-35.5
836.400000	10036.348333	-49.5	-57.2	-36.5
836.400000	10873.493333	-46.1	-53.8	-33.1
836.400000	11709.381667	-48.8	-56.5	-35.8
836.400000	12545.863333	-49.1	-56.8	-36.1

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
 g98c0003: 1998-Dec-01 Tue 15:04:00
 STATE: 1:Low Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
824.04000	1648.076667	-37.8	-45.5	-24.8
824.04000	2471.975000	-65.7	-73.4	-52.7
824.04000	3296.073333	-68.3	-76	-55.3
824.04000	4119.735000	-67.7	-75.4	-54.7
824.04000	4944.456667	-68.7	-76.4	-55.7
824.04000	5768.043333	-68	-75.7	-55
824.04000	6591.938333	-67.5	-75.2	-54.5
824.04000	7416.110000	-67.5	-75.2	-54.5
824.04000	8240.623333	-67.8	-75.5	-54.8
824.04000	9064.698333	-66.8	-74.5	-53.8
824.04000	9888.918333	-67.7	-75.4	-54.7
824.04000	10712.440000	-67.5	-75.2	-54.5
824.04000	11536.906667	-67.2	-74.9	-54.2
824.04000	12360.736667	-66.8	-74.5	-53.8

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
 g98c0001: 1998-Dec-01 Tue 14:44:00
 STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
848.97000	1697.940000	-28.1	-55.8	-15.1
848.97000	2546.915000	-46	-73.7	-33
848.97000	3395.531667	-47.8	-75.5	-34.8
848.97000	4244.490000	-47.6	-75.3	-34.6
848.97000	5093.578333	-48.5	-76.2	-35.5
848.97000	5943.148333	-48	-75.7	-35
848.97000	6791.931667	-47.5	-75.2	-34.5
848.97000	7640.768333	-46.3	-74	-33.3
848.97000	8489.295000	-48	-75.7	-35
848.97000	9338.280000	-47.1	-74.8	-34.1
848.97000	10188.075000	-47.3	-75	-34.3
848.97000	11036.350000	-47.5	-75.2	-34.5
848.97000	11885.923333	-47	-74.7	-34
848.97000	12734.668333	-46.5	-74.2	-33.5

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NAME OF TEST: Unwanted Emissions (Transmitter Conducted)
 g98c0004: 1998-Dec-01 Tue 15:09:00
 STATE: 2:High Power

FREQUENCY TUNED, MHz	FREQUENCY EMISSION, MHz	LEVEL, dBm	LEVEL, dBc	MARGIN, dB
824.04000	1648.076667	-28.8	-56.5	-15.8
824.04000	2471.806667	-47	-74.7	-34
824.04000	3295.861667	-47.5	-75.2	-34.5
824.04000	4120.546667	-48.8	-76.5	-35.8
824.04000	4944.265000	-48.3	-76	-35.3
824.04000	5767.901667	-48.6	-76.3	-35.6
824.04000	6591.838333	-47.5	-75.2	-34.5
824.04000	7415.863333	-47.1	-74.8	-34.1
824.04000	8240.328333	-46.6	-74.3	-33.6
824.04000	9064.245000	-47.3	-75	-34.3
824.04000	9888.886667	-47.6	-75.3	-34.6
824.04000	10712.021667	-46.6	-74.3	-33.6
824.04000	11536.118333	-47.8	-75.5	-34.8
824.04000	12360.445000	-47.5	-75.2	-34.5

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NAME OF TEST: Frequency Stability (Temperature Variation)

SPECIFICATION: 47 CFR 2.1055(a)(1)

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

TEST CONDITIONS: As Indicated

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

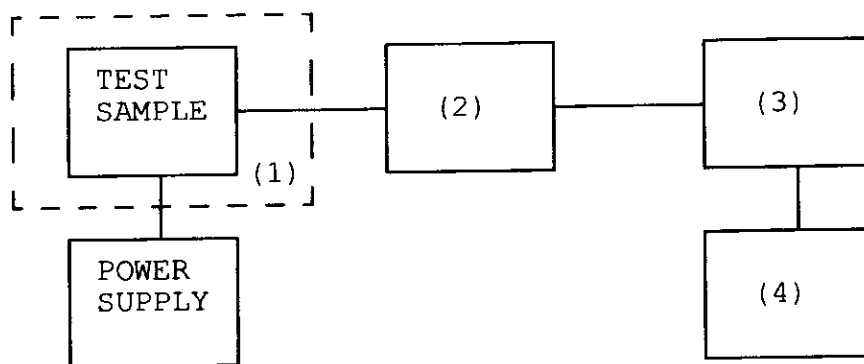
1. The EUT and test equipment were set up as shown on the following page.
2. With all power removed, the temperature was decreased to -30°C and permitted to stabilize for three hours. Power was applied and the maximum change in frequency was noted within one minute.
3. With power OFF, the temperature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

<u>x</u>	i00122	NARDA 766-10	7802
---	i00123	NARDA 766-10	7802A
---	i00113	SIERRA 661A-3D	1059
---	i00069	BIRD 8329 (30 dB)	10066

(3) R.F. POWER

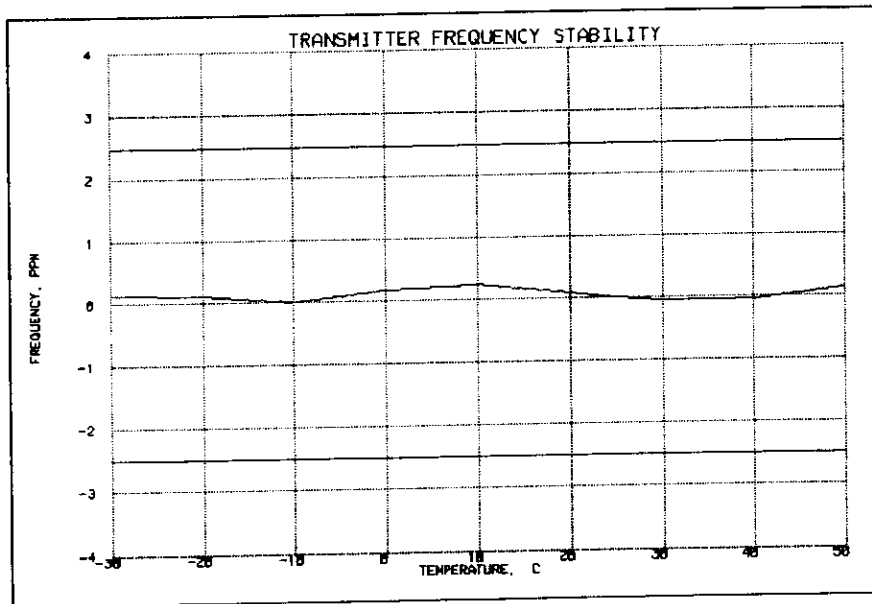
---	i00014	HP 435A POWER METER	1733A05839
<u>x</u>	i00039	HP 436A POWER METER	2709A26776
<u>x</u>	i00020	HP 8901A POWER MODE	2105A01087

(4) FREQUENCY COUNTER

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

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NAME OF TEST: Frequency Stability (Temperature Variation)
g98b0333: 1998-Nov-24 Tue 12:44:00
STATE: 0:General



SUPERVISED BY:

Morton Flom, P. Eng.

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NAME OF TEST: Frequency Stability (Voltage Variation)

SPECIFICATION: 47 CFR 2.1055 (b) (1)

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

TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

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

RESULTS: Frequency Stability (Voltage Variation)

g98b0380: 1998-Nov-24 Tue 12:43:42

STATE: 0:General

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

% of STV	Voltage	Frequency, MHz	Change, Hz	Change, ppm
85	3.06	836.400000	0	0.00
100	3.6	836.400000	0	0.00
115	4.14	836.400010	10	0.01
85	3.2	836.399930	-70	-0.08

M. Flom P. Eng.

Morton Flom, P. Eng.

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