

## 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**

PAGE NO. 1 of 30.

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

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.

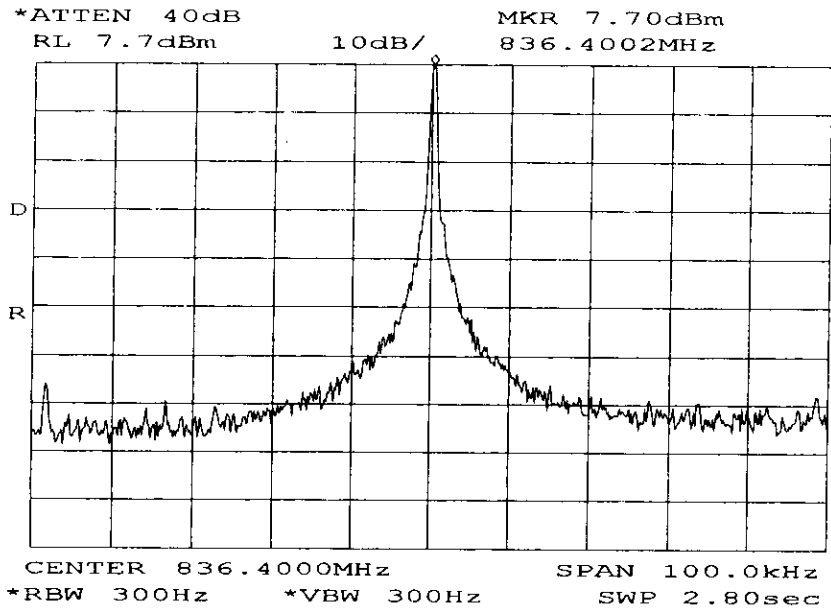
PAGE NO. 9 of 30.  
NAME OF TEST: Emission Masks (Occupied Bandwidth)  
SPECIFICATION: 47 CFR 2.1049(c) (1)  
GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996  
TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

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

PAGE NO. 10 of 30.

NAME OF TEST: Emission Masks (Occupied Bandwidth)  
 g98b0363: 1998-Nov-23 Mon 12:35:00  
 STATE: 1:Low Power



POWER:                      LOW  
 MODULATION:                      NONE

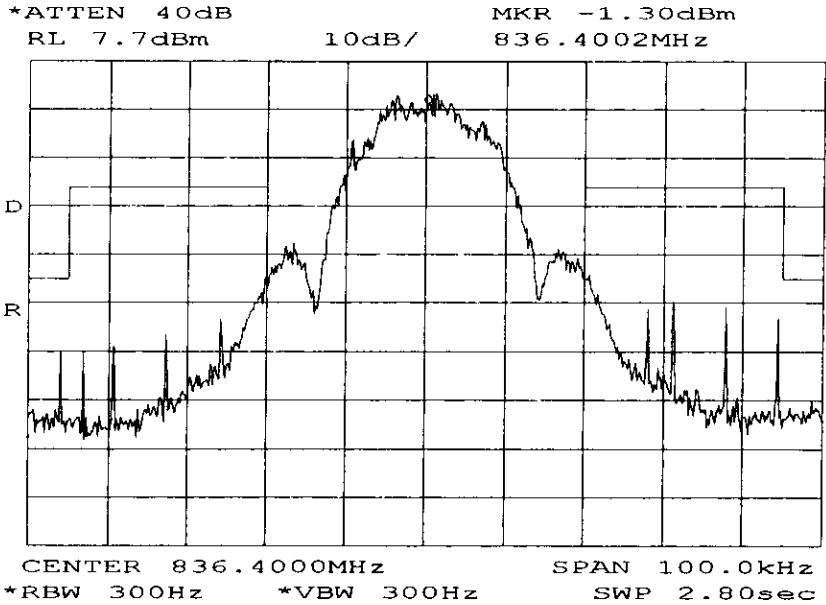
SUPERVISED BY:

*Morton 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

*Morton Flom P. Eng.*

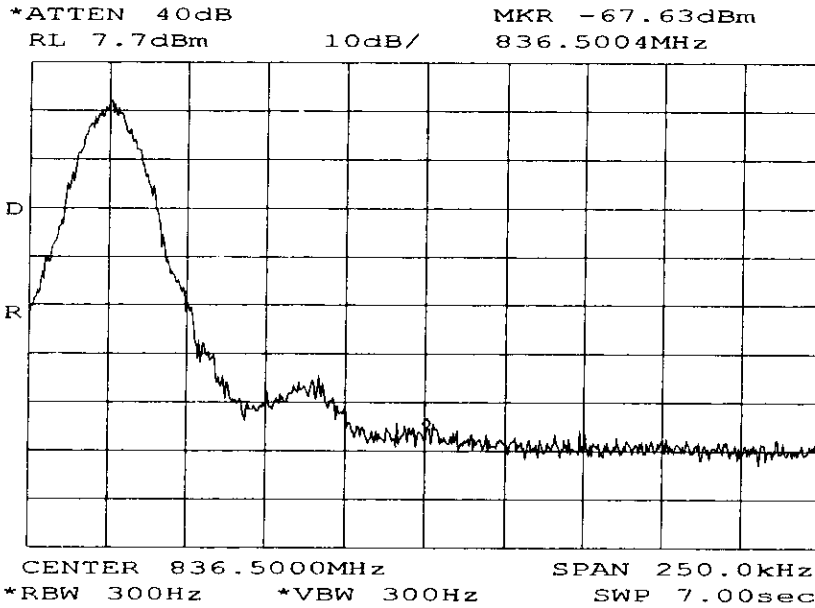
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Morton Flom, P. Eng.



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



POWER:	LOW
MODULATION:	DATA GMSK
	OFFSET OCCUPIED BANDWIDH

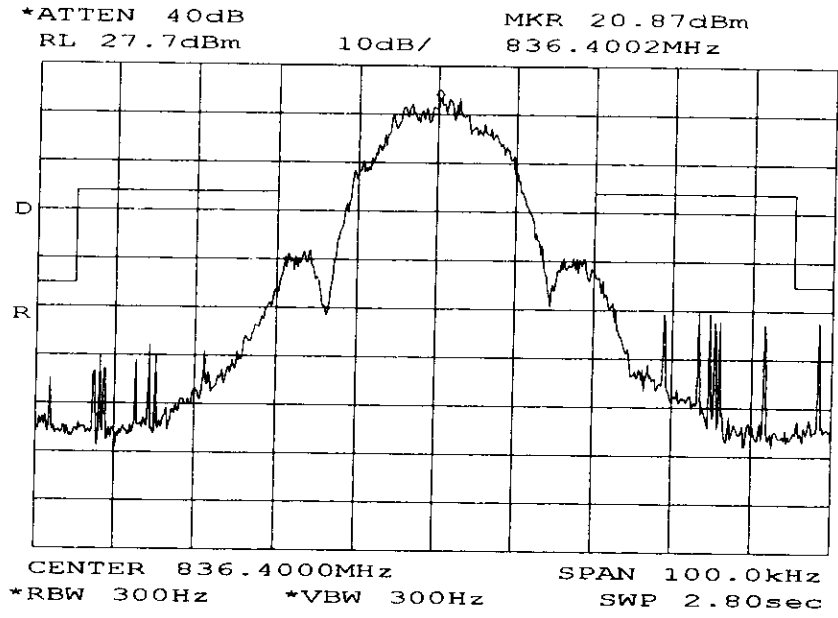
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NAME OF TEST: Emission Masks (Occupied Bandwidth)  
g98b0369: 1998-Nov-23 Mon 12:42:00  
STATE: 2:High Power



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

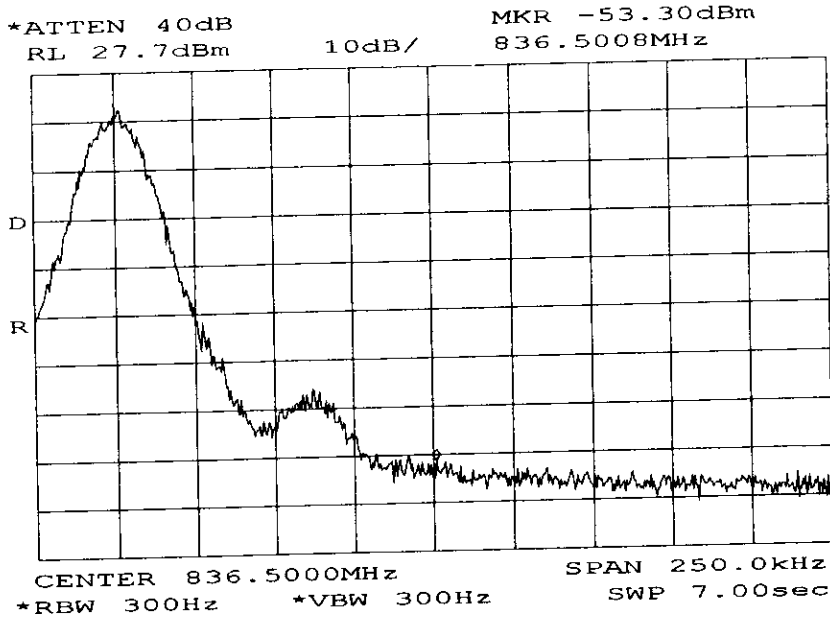
SUPERVISED BY:

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

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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:

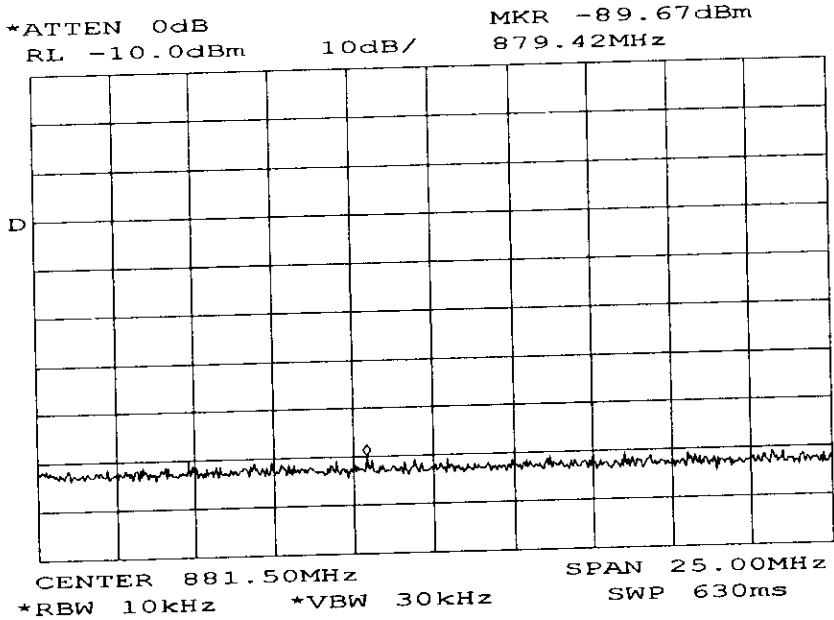
HIGH  
DATA GMSK  
OFFSET OCCUPIED BANDWIDH

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

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



POWER:	LOW
MODULATION:	DATA GMSK
	TX SPURS IN RX CRITICAL BAND

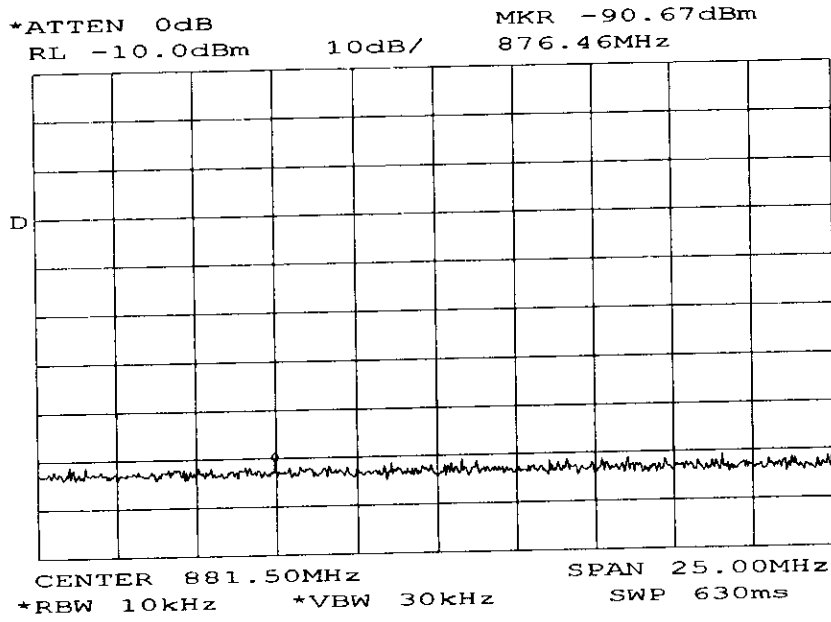
SUPERVISED BY:

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.*  
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

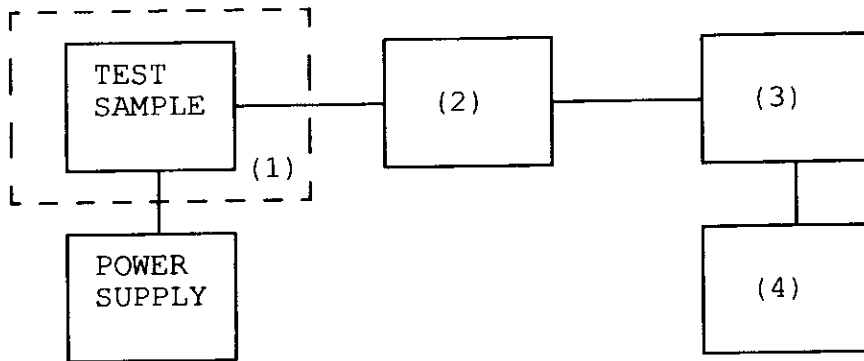
PAGE NO. 27 of 30.  
NAME OF TEST: Frequency Stability (Temperature Variation)  
SPECIFICATION: 47 CFR 2.1055(a)(1)  
GUIDE: EIA/IS-19-B-1988  
TIA/EIA/IS-137-A-1996  
TEST CONDITIONS: As Indicated  
TEST EQUIPMENT: As per previous page

MEASUREMENT PROCEDURE

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

TRANSMITTER TEST SET-UP

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



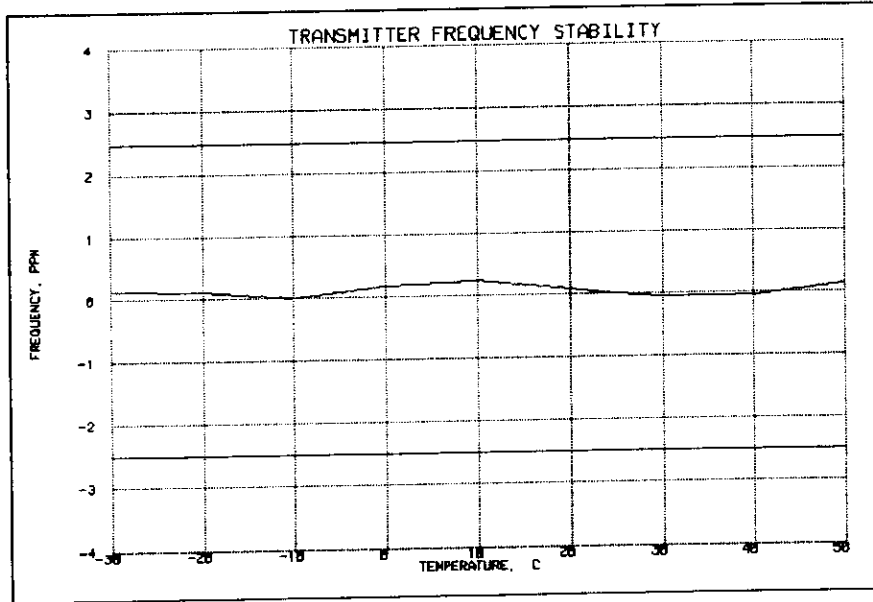
Asset Description s/n

(1)	<u>TEMPERATURE, HUMIDITY, VIBRATION</u>	
<u>x</u>	i00027 Tenny Temp. Chamber	9083-765-234
---	i00 Weber Humidity Chamber	
---	i00 L.A.B. RVH 18-100	
(2)	<u>COAXIAL ATTENUATOR</u>	
<u>x</u>	i00122 NARDA 766-10	7802
---	i00123 NARDA 766-10	7802A
---	i00113 SIERRA 661A-3D	1059
---	i00069 BIRD 8329 (30 dB)	10066
(3)	<u>R.F. POWER</u>	
---	i00014 HP 435A POWER METER	1733A05839
<u>x</u>	i00039 HP 436A POWER METER	2709A26776
<u>x</u>	i00020 HP 8901A POWER MODE	2105A01087
(4)	<u>FREQUENCY COUNTER</u>	
---	i00042 HP 5383A	1628A00959
---	i00019 HP 5334B	2704A00347
<u>x</u>	i00020 HP 8901A	2105A01087

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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.*

Morton Flom, P. Eng.

PAGE NO. 30 of 30.  
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±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)  
 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

*Morton Flom P. Eng.*

Morton Flom, P. Eng.

SUPERVISED BY: