Exhibit 6: Test Report

TEST REPORT FROM:

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TEST OF: Data 2000

To Part 2 Subpart J and Part 22 Subpart H
of the FCC Rules and Regulations

Test Report Serial No: 73-6494

APPLICATION FOR TYPE ACCEPTANCE:

Cellular Modem

Mobile Station Transmitter

Applicant:

Uniden Engineering Services
216 John Street
P.O. Box 580
Lake City, SC 29560

Issue Date: July 20, 1998

Dates of Test: June 15 – July 16, 1998

CERTIFICATION OF ENGINEERING REPORT

This report has been prepared by Communication Certification Laboratory to verify compliance of the device described below with the requirements to Part 2 Subpart J and Part 22 Subpart H of the FCC Rules and Regulations. This report may be reproduced in full, partial reproduction may only be made with the written consent of the laboratory. The results in this report apply only to the sample tested.

- Applicant: Uniden Engineering Services
- Manufacturer: Uniden Engineering Services
- Model Number: Data 2000
- FCC ID: AMWUH302
- Brand Name: UNIDEN

On this 20th day of July 1998, I, individually, and for Communication Certification Laboratory, certify that the statements made in this engineering report are true, complete, and correct to the best of my knowledge, and are made in good faith.

COMMUNICATION CERTIFICATION LABORATORY

_____
Checked by: William S. Hurst, P.E.
Vice President

_____
Tested by: Roger J. Midgley
EMC Engineering Manager

SECTION 1. Measurement Requirements

1.1 Introduction

The following data is submitted for Type Acceptance of a cellular modem for Uniden Engineering Services, in accordance with Part 2, Subpart J and Part 22, Subpart H of FCC Rules and Regulations.

1.2 Measurements Required for Type Acceptance

§ 2.983 (e) Measurement Data

The measurement data that is required by § 2.985 through § 2.997 is included in Section 2 of this report. The data was measured in accordance with the procedures set out in § 2.999.

§ 2.985 § 22.913 RF Power Output

A mobile station transmitter must be capable of reducing power in steps of 4 dB on command from a land station. Each power level must be maintained within the range of +2 dB and -4 dB of its nominal level.

Due to wide frequency range which the modem may operate, measurements were performed on a channel near the bottom, on a channel near the middle and on a channel near the top of the spectrum.

Result:

The results of the RF output power testing are shown in section 2.1 and the test procedures are described in Appendix 1.

§ 2.987 § 22.915 Modulation Characteristics

The Data 2000 does not provide a voice transmission, it only provides data transmission; therefore, the requirements of this section do not apply.

Result:

The results of the modulation deviation testing are shown in

section 2.2 and the test procedures are described in Appendix 1.

§ 2.989 Occupied Bandwidth

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured under the following conditions as applicable:

(c) Radiotelephone transmitters equipped with a device to limit modulation or peak envelope power shall be modulated as follows. For single sideband and independent sideband transmitters, the input level of the modulation signal shall be 10 dB greater than that necessary to produce rated peak envelope power.

(1) Other than sideband or independent sideband transmitters – when modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. The input level shall be established at the frequency of maximum response of the audio modulation circuit.

Result:

The results of the occupied bandwidth testing are shown in Section 2.3 and the test procedures are described in Appendix 1.

§ 2.991 § 22.917 (d) § 22.917 (e) Spurious Emissions at Antenna Terminals

§ 22.917 (d) For F1D emissions, the mean power of emission must be attenuated below the mean power of the unmodulated carrier (p) as follows:

(1) On any frequency removed from the carrier frequency by more than 20 kHz but not more than 45 kHz: at least 26 dB.
(2) On any frequency removed from the carrier frequency by more than 45 kHz but not more than 90 kHz: at least 45 dB.
(3) On any frequency removed from the carrier frequency by more than 90 kHz, up to the first multiple of the carrier frequency: at least 60 dB or 43+10log P dB, whichever is the lesser attenuation.

§ 22.917 (e) Out of band emission

The mean power of emission must be attenuated below the mean power of the unmodulated carrier (P) on any frequency twice or

more than twice the fundamental frequency by: at least 43+10log P dB.

Due to the relatively wide range over which the output power can be varied, measurements were conducted at three different power levels (0 or 28 dBm, 4 or 20 dBm, and 10 or 8 dBm)

Result:

The frequency range from 30 MHz to the first multiple of the carrier frequency was investigated to measure any antenna-conducted emissions.

Shown in Tables 2 through 10 (Section 2.3) are the emission levels from 30 MHz to 90 kHz below the carrier frequency and from 90 kHz above the carrier frequency to the first multiple of the carrier frequency. Shown in Plots 1 through 3 are the emissions/occupied bandwidth from 90 kHz below the carrier frequency to 90 kHz above the carrier frequency. These plots show the Data 2000 tuned to the lower channel, the results with the Data 2000 tuned to the upper channel were the same.

§ 22.917 (f) Conducted Spurious Emissions (Mobile emission in base frequency range)

The mean power of emissions appearing in the base station frequency range from cellular mobile transmitters operated must be attenuated to a level not to exceed –80 dBm at the transmit antenna connector.

Result:

The frequency range from 869.04 MHz to 893.97 MHz was investigated to measure any antenna-conducted emissions within the base frequency range.

Shown in Table 1 (Section 2.3) are the emission levels from 869.04 MHz to 893.97 MHz.

§ 2.993 (§ 22.917) Field Strength of Spurious Radiation

Field strength measurements of radiated spurious emissions that may be radiated directly from the cabinet, control circuits, power leads, or intermediate circuit elements must not exceed 43 + 10log (mean output power in watts) below the unmodulated carrier.

The reference level for spurious radiation was taken at an

ideal dipole excited by the rated output power according to the following relationship:

$$E = \frac{\sqrt{(49.2)(Pt)}}{R}$$

Note: Reference Data for Radio Engineers, Pg. 676. International Telephone and Telephone Corporation, Fourth Edition.

Where E = electric Field Intensity in Volts/Meter
Pt = Transmitter Power in Watts
R = Measurements distance in Meters

At a maximum power of 0.617 Watts

$$E = \frac{\sqrt{(49.2)(0.617)}}{3} = 1.8\ Volts/Meter = 125.3\ dB\mu V/m$$

Paragraph 22.917 requires that spurious radiated emission be attenuated at least 43 + 10 log (mean output power in watts) below the unmodulated carrier. In this case, the rated power of 0.617 watts requires a minimum attenuation of 43 + 10 log 0.617 = 40.9 dB below the reference level of 125.3 $dB\mu V/m$ calculated above; therefore, the criteria is 84.4 $db\mu V/m$ (125.3 – 40.9).

Result:

The results of the radiated spurious emissions testing are shown in section 2.4 and the test procedures are described in Appendix 1.

§ 2.995 (§ 22.355) Frequency Stability

The carrier frequency of the transmitter shall be maintained within 2.5 Parts Per Million (PPM) from the assigned frequency over the ambient temperature range of -30^0 C to $+60^0$ C, and over

the supply voltage range of ±10 % from the nominal value at $+20^0$ C.

Result:

The results of the frequency stability testing are shown in section 2.5 and the test procedures are described in Appendix 1.

SECTION 2. Measurement Data

2.1 RF Power Output

Channel # 990 (824.03 MHz)

Power Level	Nominal ERP (dBW)	Nominal ERP (dBm)	Measured ERP (dBm)	Difference (dB)
0	-2	28.0	27.2	-0.8
1	-2	28.0	27.2	-0.8
2	-2	28.0	27.2	-0.8
3	-6	24.0	24.0	0.0
4	-10	20.0	20.1	0.1
5	-14	16.0	16.7	0.7
6	-18	12.0	13.2	1.2
7	-22	8.0	8.1	0.1
8	-22	8.0	8.1	0.1
9	-22	8.0	8.0	0.0
10	-22	8.0	8.0	0.0

Channel # 383 (836.49 MHz)

Power Level	Nominal ERP (dBW)	Nominal ERP (dBm)	Measured ERP (dBm)	Difference (dB)
0	-2	28.0	27.9	-0.1
1	-2	28.0	27.9	-0.1
2	-2	28.0	27.9	-0.1
3	-6	24.0	23.6	-0.4
4	-10	20.0	19.7	-0.3
5	-14	16.0	16.3	0.3
6	-18	12.0	12.7	0.7
7	-22	8.0	7.6	-0.4
8	-22	8.0	7.6	-0.4
9	-22	8.0	7.6	-0.4
10	-22	8.0	7.6	-0.4

Channel # 799 (848.97 MHz)

Power Level	Nominal ERP (dBW)	Nominal ERP (dBm)	Measured ERP (dBm)	Difference (dB)
0	-2	28.0	27.4	-0.6
1	-2	28.0	27.4	-0.6
2	-2	28.0	27.3	-0.7
3	-6	24.0	23.3	-0.7
4	-10	20.0	19.5	-0.5
5	-14	16.0	16.0	0.0
6	-18	12.0	12.6	0.6
7	-22	8.0	7.0	-1.0
8	-22	8.0	7.0	-1.0
9	-22	8.0	7.0	-1.0
10	-22	8.0	7.0	-1.0

2.2 Modulation Characteristics

Power Level	Signal	Deviation ± (kHz)
0	1/0 bit pattern	+ 5.25 - 5.73
3	1/0 bit pattern	+ 4.77 - 5.72
7	1/0 bit pattern	+ 4.77 - 5.47
0	GMSK Modulation	+ 6.13 - 6.13
3	GMSK Modulation	+ 6.14 - 6.25
7	GMSK Modulation	+ 5.80 - 5.83

2.3 Conducted Spurious Emissions / Occupied Bandwidth

The worst case emissions were with the M# transmitting wideband data. The data below represents the worst case configuration.

Table 1

Transmitting on Channel 990 (824.03 MHz) Power Level 0			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
869.04 – 893.97	885.6	-84.6	-80.0
Note: There were no emissions detected at power levels 3 and 7.			

Table 2

The emissions must be attenuated 43 + 10 log P dB where P = Mean power of the unmodulated carrier. The maximum power of the unmodulated carrier was measured to 525 mW (27.2 dBm), therefore, the emissions must be attenuated 43 + 10 log (0.525) = 40.2 dB. The criteria is 27.2 dBm – 40.2 dB = -13.0 dBm.

Transmitting on Channel 990 (824.03 MHz) Power Level 0			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
30 - 200	180.0	-66.6	-13.0
200 – 824.985	644.0	-52.2	-13.0
825.075 - 1000	914.0	-63.3	-13.0
1000 - 1500	1004.0	-64.2	-13.0
1500 - 2000	1648.0	-42.4	-13.0
2000 - 3000	2472.0	-42.9	-13.0
3000 - 4000	3296.0	-53.5	-13.0
4000 - 4500	4120.0	-74.9	-13.0
4500 - 5000	4944.0	-71.0	-13.0
5000 - 6000	5768.1	-65.9	-13.0
6000 - 7000	6592.0	-74.9 *	-13.0
7000 - 8000	7416.0	-70.1 *	-13.0
8000 - 9000	8240.1	-73.1 *	-13.0
* Noise Floor			

RBW = 30 kHz VBW = 100 kHz

Table 3

The emissions must be attenuated 43 + 10 log P dB where P = Mean power of the unmodulated carrier. The maximum power of the unmodulated carrier was measured to 102 mW (20.1 dBm), therefore, the emissions must be attenuated 43 + 10 log (0.102) = 33.1 dB. The criteria is 20.1 dBm – 33.1 dB = -13.0 dBm.

Transmitting on Channel 990 (824.03 MHz) Power Level 4			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
30 - 200	132.3	-68.5	-13.0
200 – 824.985	810.0	-72.3	-13.0
825.075 - 1000	838.0	-59.1	-13.0
1000 - 1500	1170.8	-70.5	-13.0
1500 - 2000	1648.0	-75.4	-13.0
2000 - 3000	2472.0	-69.0	-13.0
3000 - 4000	3296.0	-68.3	-13.0
4000 - 4500	4120.0	-79.5 *	-13.0
4500 - 5000	4944.0	-79.0 *	-13.0
5000 - 6000	5768.1	-76.1 *	-13.0
6000 - 7000	6592.0	-74.9 *	-13.0
7000 - 8000	7416.0	-70.1 *	-13.0
8000 - 9000	8240.1	-73.1 *	-13.0
* Noise Floor			

RBW = 30 kHz VBW = 100 kHz

Table 4

The emissions must be attenuated 43 + 10 log P dB where P = Mean power of the unmodulated carrier. The maximum power of the unmodulated carrier was measured to 6.31 mW (8.0 dBm), therefore, the emissions must be attenuated 43 + 10 log (0.00631) = 21.0 dB. The criteria is 8.0 dBm – 21.0 dB = -13.0 dBm.

Transmitting on Channel 990 (824.03 MHz) Power Level 10			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
30 - 200	141.2	-68.5	-13.0
200 – 824.985	810.0	-72.2	-13.0
825.075 - 1000	838.0	-65.3	-13.0
1000 - 1500	1190.2	-71.5	-13.0
1500 - 2000	1648.0	-76.4	-13.0
2000 - 3000	2472.0	-71.8	-13.0
3000 - 4000	3296.0	-78.6 *	-13.0
4000 - 4500	4120.0	-79.5 *	-13.0
4500 - 5000	4944.0	-79.0 *	-13.0
5000 - 6000	5768.1	-76.1 *	-13.0
6000 - 7000	6592.0	-74.9 *	-13.0
7000 - 8000	7416.0	-70.1 *	-13.0
8000 - 9000	8240.1	-73.1 *	-13.0
* Noise Floor			

RBW = 30 kHz VBW = 100 kHz

Table 5

The emissions must be attenuated 43 + 10 log P dB where P = Mean power of the unmodulated carrier. The maximum power of the unmodulated carrier was measured to 617 mW (27.9 dBm), therefore, the emissions must be attenuated 43 + 10 log (0.617) = 40.9 dB. The criteria is 27.9 dBm – 40.9 dB = -13.0 dBm.

Transmitting on Channel 383 (824.98 MHz) Power Level 0			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
30 - 200	180.0	-73.7	-13.0
200 – 834.945	810.0	-48.7	-13.0
835.035 - 1000	926.5	-62.6	-13.0
1000 - 1500	1016.5	-59.9	-13.0
1500 - 2000	1672.0	-39.1	-13.0
2000 - 3000	2509.5	-45.1	-13.0
3000 - 4000	3345.0	-61.3	-13.0
4000 - 4500	4182.5	-61.8	-13.0
4500 - 5500	5018.9	-73.2	-13.0
5500 - 6000	5855.5	-64.3	-13.0
6000 - 7000	6691.9	-73.5	-13.0
7000 - 8000	7528.4	-58.2	-13.0
8000 - 9000	8364.9	-65.3	-13.0
* Noise Floor			

RBW = 30 kHz VBW = 100 kHz

Table 6

The emissions must be attenuated 43 + 10 log P dB where P = Mean power of the unmodulated carrier. The maximum power of the unmodulated carrier was measured to 93.3 mW (19.7 dBm), therefore, the emissions must be attenuated 43 + 10 log (0.0933) = 32.7 dB. The criteria is 19.7 dBm – 32.7 dB = -13.0 dBm.

Transmitting on Channel 383 (824.98 MHz) Power Level 4			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
30 - 200	180.0	-72.3	-13.0
200 – 834.945	656.5	-57.0	-13.0
835.035 - 1000	926.5	-62.1	-13.0
1000 - 1500	1016.5	-60.2	-13.0
1500 - 2000	1672.0	-40.5	-13.0
2000 - 3000	2509.5	-52.2	-13.0
3000 - 4000	3345.0	-62.0	-13.0
4000 - 4500	4182.5	-58.7	-13.0
4500 - 5500	5018.9	-74.9	-13.0
5500 - 6000	5855.5	-65.3	-13.0
6000 - 7000	6691.9	-73.7	-13.0
7000 - 8000	7528.4	-62.5	-13.0
8000 - 9000	8364.9	-67.0	-13.0
* Noise Floor			

RBW = 30 kHz VBW = 100 kHz

Table 7

The emissions must be attenuated 43 + 10 log P dB where P = Mean power of the unmodulated carrier. The maximum power of the unmodulated carrier was measured to 5.75 mW (7.6 dBm), therefore, the emissions must be attenuated 43 + 10 log (0.00575) = 20.6 dB. The criteria is 7.6 dBm – 20.6 dB = -13.0 dBm.

Transmitting on Channel 383 (824.98 MHz) Power Level 10			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
30 - 200	67.2	-69.3	-13.0
200 – 834.945	656.5	-63.1	-13.0
835.035 - 1000	926.5	-65.9	-13.0
1000 - 1500	1016.5	-65.1	-13.0
1500 - 2000	1672.0	-43.5	-13.0
2000 - 3000	2509.5	-61.8	-13.0
3000 - 4000	3345.0	-61.7	-13.0
4000 - 4500	4182.5	-60.7	-13.0
4500 - 5500	5018.9	-75.5	-13.0
5500 - 6000	5855.5	-69.2	-13.0
6000 - 7000	6691.9	-73.7 *	-13.0
7000 - 8000	7528.4	-74.6 *	-13.0
8000 - 9000	8364.9	-72.7 *	-13.0
* Noise Floor			

RBW = 30 kHz VBW = 100 kHz

Table 8

The emissions must be attenuated 43 + 10 log P dB where P = Mean power of the unmodulated carrier. The maximum power of the unmodulated carrier was measured to 550 mW (27.4 dBm), therefore, the emissions must be attenuated 43 + 10 log (0.550) = 40.4 dB. The criteria is 27.4 dBm – 40.4 dB = -13.0 dBm.

Transmitting on Channel 799 (848.97 MHz) Power Level 0			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
30 - 200	67.2	-64.6	-13.0
200 – 844.935	758.9	-51.0	-13.0
845.025 - 1000	938.9	-60.1	-13.0
1000 - 1500	1028.9	-62.3	-13.0
1500 - 2000	1697.9	-40.8	-13.0
2000 - 3000	2546.9	-45.7	-13.0
3000 - 4000	3395.9	-72.6	-13.0
4000 - 4500	4244.9	-72.8	-13.0
4500 - 5500	5093.8	-78.0	-13.0
5500 - 6000	5942.7	-55.8	-13.0
6000 - 7000	6791.7	-74.8 *	-13.0
7000 - 8000	7640.7	-74.7 *	-13.0
8000 - 9000	8498.8	-74.1 *	-13.0
* Noise Floor			

RBW = 30 kHz VBW = 100 kHz

Table 9

The emissions must be attenuated 43 + 10 log P dB where P = Mean power of the unmodulated carrier. The maximum power of the unmodulated carrier was measured to 89.1 mW (19.5 dBm), therefore, the emissions must be attenuated 43 + 10 log (0.0891) = 32.5 dB. The criteria is 19.5 dBm – 32.5 dB = -13.0 dBm.

Transmitting on Channel 799 (848.97 MHz) Power Level 4			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
30 - 200	180.0	-70.8	-13.0
200 – 844.935	758.9	-50.9	-13.0
845.025 - 1000	938.9	-59.5	-13.0
1000 - 1500	1028.9	-62.1	-13.0
1500 - 2000	1697.9	-41.4	-13.0
2000 - 3000	2546.9	-45.1	-13.0
3000 - 4000	3395.9	-78.7 *	-13.0
4000 - 4500	4244.9	-71.9	-13.0
4500 - 5500	5093.8	-75.6	-13.0
5500 - 6000	5942.7	-55.7	-13.0
6000 - 7000	6791.7	-74.8 *	-13.0
7000 - 8000	7640.7	-74.7 *	-13.0
8000 - 9000	8498.8	-74.1 *	-13.0
* Noise Floor			

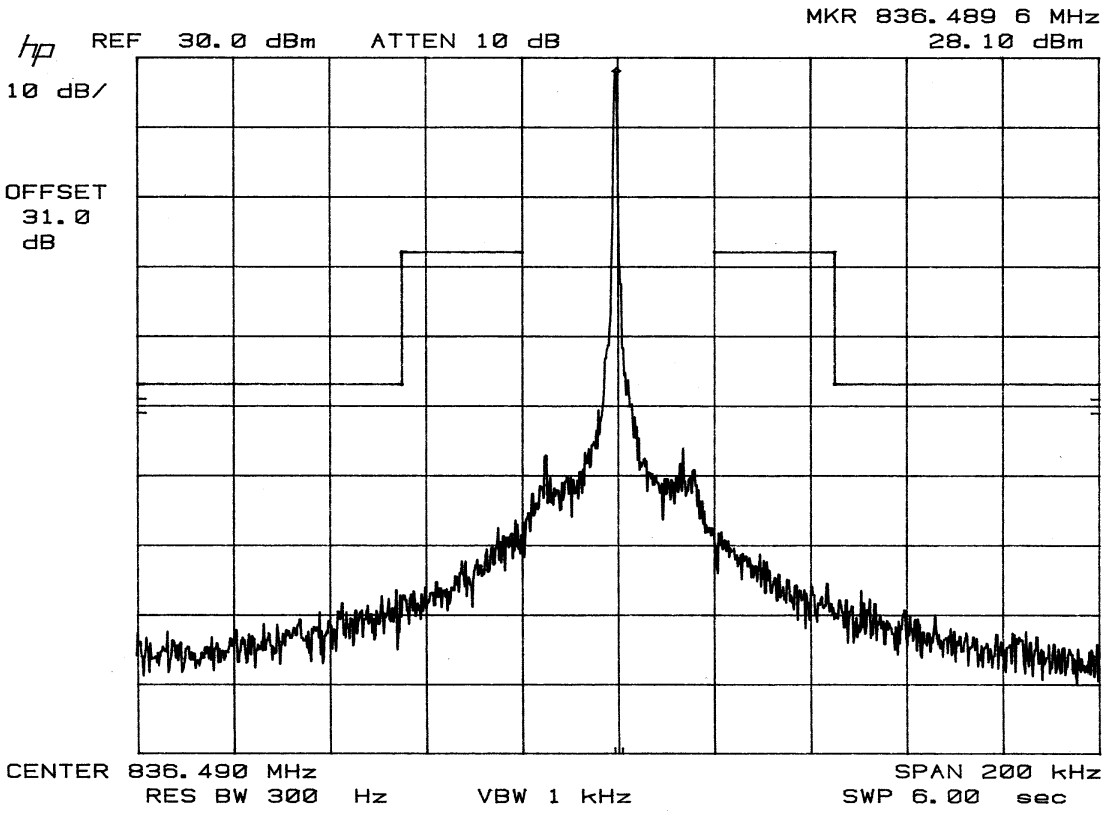
RBW = 30 kHz VBW = 100 kHz

Table 10

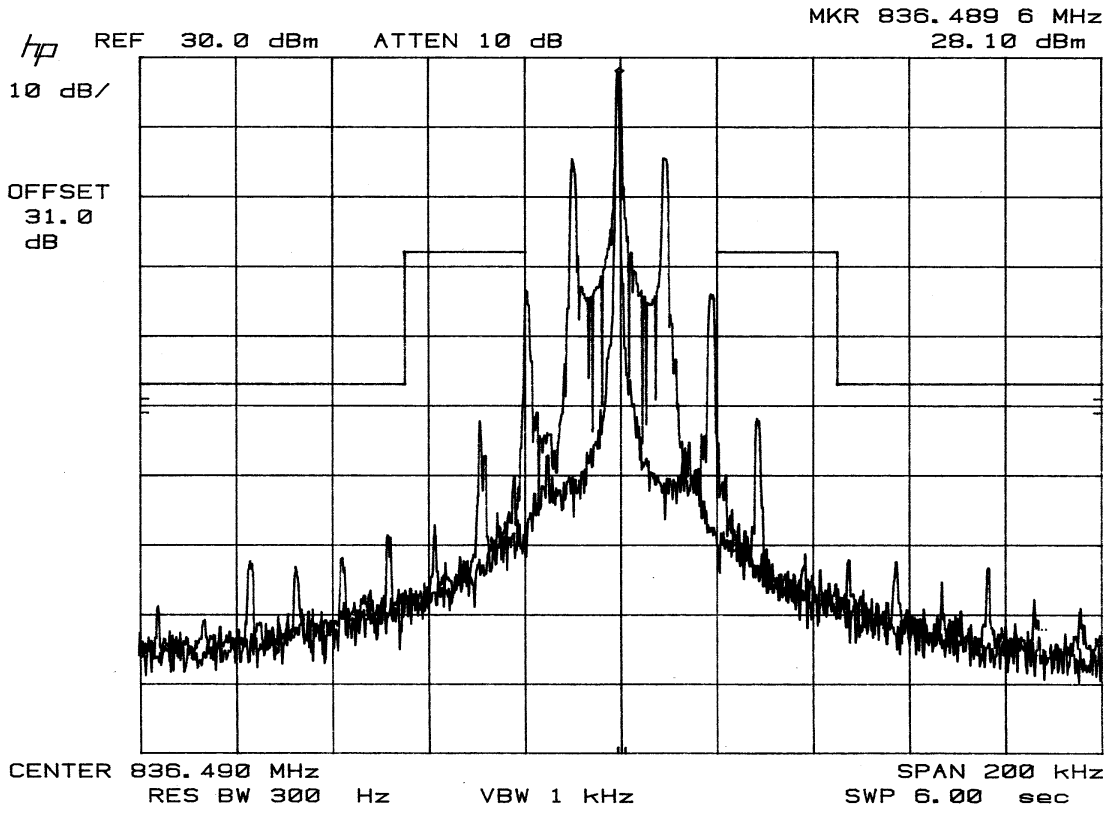
The emissions must be attenuated 43 + 10 log P dB where P = Mean power of the unmodulated carrier. The maximum power of the unmodulated carrier was measured to 5.01 mW (7.0 dBm), therefore, the emissions must be attenuated 43 + 10 log (0.00501) = 20.0 dB. The criteria is 7.0 dBm – 20.0 dB = -13.0 dBm.

Transmitting on Channel 799 (848.97 MHz) Power Level 10			
Frequency Range MHz	Frequency MHz	Corrected Level dBm	Criteria dBm
30 - 200	180.0	-76.2	-13.0
200 – 844.935	668.9	-66.0	-13.0
845.025 - 1000	938.9	-64.0	-13.0
1000 - 1500	1028.9	-67.6	-13.0
1500 - 2000	1697.9	-45.3	-13.0
2000 - 3000	2546.9	-53.0	-13.0
3000 - 4000	3395.9	-79.7 *	-13.0
4000 - 4500	4244.9	-72.5 *	-13.0
4500 - 5500	5093.8	-78.0 *	-13.0
5500 - 6000	5942.7	-72.5 *	-13.0
6000 - 7000	6791.7	-74.8 *	-13.0
7000 - 8000	7640.7	-74.7 *	-13.0
8000 - 9000	8498.8	-74.1 *	-13.0
* Noise Floor			

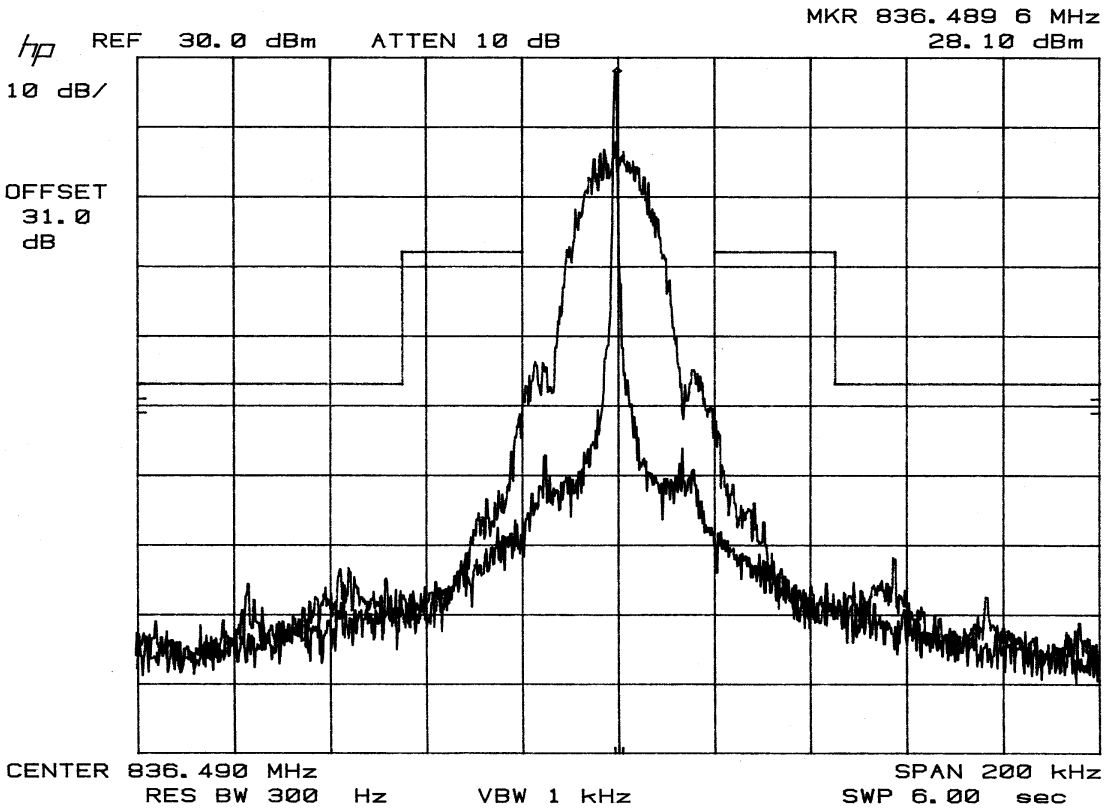
RBW = 30 kHz VBW = 100 kHz



Plot 1 Unmodulated Carrier



Plot 2 Carrier Modulated with 1/0 bit Pattern



Plot 3 Carrier Modulated with GMSK Pattern

2.4 Radiated Spurious Emissions

Transmitting on Channel 990 (824.03 MHz)					
Antenna Polarity	Frequency (MHz)	Uncorr. Level ($dB\mu V$)	Correction Factor (dB)	Field Strength ($dB\mu V/m$)	Criteria ($dB\mu V/m$)
V	1648.1	41.5	30.9	72.4	84.4
V	2472.1	27.6	33.9	61.5	84.4
V	3296.1	26.5	37.6	64.1	84.4
V	4120.2	10.8 *	41.1	51.9	84.4
V	4944.2	10.3 *	43.9	54.2	84.4
V	5768.2	10.9 *	47.1	58.0	84.4
V	6592.2	12.6 *	50.5	63.1	84.4
V	7416.3	13.0 *	54.8	67.8	84.4
V	8240.3	13.0 *	58.1	71.1	84.4
H	1648.1	36.4	30.9	67.3	84.4
H	2472.1	23.8	33.9	57.7	84.4
H	3296.1	24.7	37.6	62.3	84.4
H	4120.2	10.8 *	41.1	51.9	84.4
H	4944.2	10.3 *	43.9	54.2	84.4
H	5768.2	10.9 *	47.1	58.0	84.4
H	6592.2	12.6 *	50.5	63.1	84.4
H	7416.3	13.0 *	54.8	67.8	84.4
H	8240.3	13.0 *	58.1	71.1	84.4

Note 1: * Noise Floor Measurements

Note 2: All emissions from 30 MHz to the first harmonic were more than 20 dB below the limit.

Note 3: The radiated emissions were measured at power levels 0, 4 and 10. The worst case emissions were with the phone transmitting on power level 0; therefore, this data was used to determine compliance.

Transmitting on Channel 383 (836.49 MHz)					
Antenna Polarity	Frequency (MHz)	Uncorr. Level ($dB\mu V$)	Correction Factor (dB)	Field Strength ($dB\mu V/m$)	Criteria ($dB\mu V/m$)
V	1673.0	35.3	30.9	66.2	84.4
V	2509.5	30.9	34.0	64.9	84.4
V	3345.9	24.3	37.7	62.0	84.4
V	4182.5	11.6 *	41.2	52.8	84.4
V	5019.0	10.7 *	44.1	54.8	84.4
V	5855.4	13.7 *	47.4	61.1	84.4
V	6692.0	13.3 *	50.0	63.3	84.4
V	7528.4	12.6 *	55.3	67.9	84.4
V	8364.9	13.6 *	58.4	72.0	84.4
H	1673.0	33.2	30.9	64.1	84.4
H	2509.5	30.5	34.0	64.5	84.4
H	3345.9	20.2	37.7	57.9	84.4
H	4182.5	11.6 *	41.2	52.8	84.4
H	5019.0	10.7 *	44.1	54.8	84.4
H	5855.4	13.7 *	47.4	61.1	84.4
H	6692.0	13.3 *	50.0	63.3	84.4
H	7528.4	12.6 *	55.3	67.9	84.4
H	8364.9	13.6 *	58.4	72.0	84.4

Note 1: * Noise Floor Measurements

Note 2: All emissions from 30 MHz to the first harmonic were more than 20 dB below the limit.

Note 3: The radiated emissions were measured at power levels 0, 4 and 10. The worst case emissions were with the phone transmitting on power level 0; therefore, this data was used to determine compliance.

Transmitting on Channel 799 (848.97 MHz)					
Antenna Polarity	Frequency (MHz)	Uncorr. Level ($dB\mu V$)	Correction Factor (dB)	Field Strength ($dB\mu V/m$)	Criteria ($dB\mu V/m$)
V	1698.0	33.4	31.2	64.6	84.4
V	2546.9	33.0	34.3	67.3	84.4
V	3395.9	17.4	37.9	55.3	84.4
V	4244.9	10.4 *	41.2	51.6	84.4
V	5093.9	9.9 *	44.5	54.4	84.4
V	5942.8	12.1 *	47.8	59.9	84.4
V	6791.7	12.5 *	51.5	64.0	84.4
V	7640.7	12.9 *	55.9	68.8	84.4
V	8489.7	12.5 *	58.8	71.3	84.4
H	1698.0	32.2	31.2	63.4	84.4
H	2546.9	31.9	34.3	66.2	84.4
H	3395.9	15.8	37.9	53.7	84.4
H	4244.9	10.4 *	41.2	51.6	84.4
H	5093.9	9.9 *	44.5	54.4	84.4
H	5942.8	12.1 *	47.8	59.9	84.4
H	6791.7	12.5 *	51.5	64.0	84.4
H	7640.7	12.9 *	55.9	68.8	84.4
H	8489.7	12.5 *	58.8	71.3	84.4

Note 1: * Noise Floor Measurements

Note 2: All emissions from 30 MHz to the first harmonic were more than 20 dB below the limit.

Note 3: The radiated emissions were measured at power levels 0, 4 and 10. The worst case emissions were with the phone transmitting on power level 0; therefore, this data was used to determine compliance.

2.5 Frequency Stability

Channel # 383 (836.49 MHz)

Ambient Temperature (^{0} C)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (PPM)	Criteria (PPM)
-30	836.49	836.49174	2.08	2.5
-20	836.49	836.49116	1.39	2.5
-10	836.49	836.49058	0.69	2.5
0	836.49	836.49038	0.45	2.5
10	836.49	836.48996	-0.05	2.5
20	836.49	836.48978	-0.26	2.5
30	836.49	836.48964	-0.43	2.5
40	836.49	836.48960	-0.48	2.5
50	836.49	836.48946	-0.65	2.5
60	836.49	836.48926	-0.88	2.5

Voltage (AC)	Assigned Frequency (MHz)	Measured Frequency (MHz)	Deviation (PPM)	Criteria (PPM)
102.0	836.49	836.48980	-0.24	2.5
120.0	836.49	836.48978	-0.26	2.5
138.0	836.49	836.48976	-0.29	2.5

Sample Calculation

$$\text{Deviation (PPM)} = \frac{\text{FM - TF}}{\text{TF}} * 10^6$$

FM = Frequency Measured
TF = Intended Transmit Frequency

Appendix 1 - Test Equipment Used

Type	Manufacturer Model #	Serial #
Spectrum Analyzer	HP 8566B	2033A05515 2038A02726
Quasi-Peak Adaptor	HP 8565A	2043A00287
Biconical Antenna	EMCO 3108	2144
Log-Periodic Antenna	EMCO 3146	1213
Double Ridge Guide Antenna	EMCO 3115	2129
30 dB Attenuator	HP 8498A	1801A05362
Modulation Meter	HP 8901B	3019A02755
Rejection Filter	Microwave Filter Co., Inc. 6367	1190
Temperature Chamber	Tenney Engineering Inc. Tenney Jr.	11184-83
Power Supply	Lambda Electronics, Corp. LM E0-14	B66989
Digital Volt Meter	John Fluke Mfg. Co., Inc. 87	59790493

Appendix 2 - Description of Test Methods

§ 2.985 (a) RF Power Output § 2.989 Occupied Bandwidth

The EUT was directly connected to the spectrum analyzer via the antenna output port as shown in the block diagram below. The input port was terminated with a 50 Ω load. The peak transmit power and emission were measured as per sections 2.985, 2.989 and 2.991. The measurements were performed on two channels, as per 47 CFR 15.31(m), one near the bottom of the spectrum and one near the top of the spectrum.

The spectrum analyzer's resolution bandwidth and video bandwidth were set as follows:

Peak Transmit Power

For emission not more than 60 kHz removed from the carrier frequency.

RBW = 300 Hz
VBW = 1 kHz

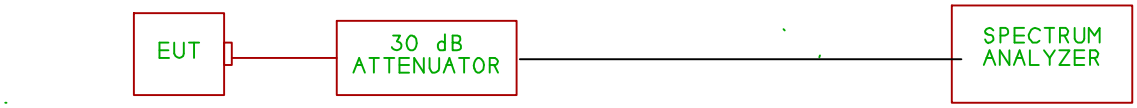
For emission more than 60 kHz removed from the carrier frequency.

RBW = 30 kHz
VBW = 100 kHz

Emission Bandwidth

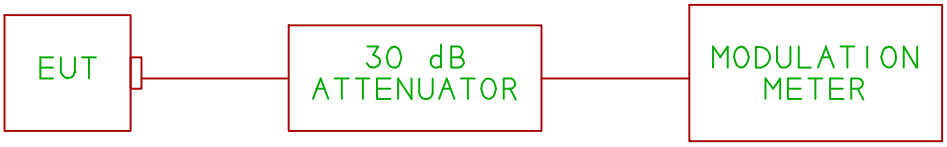
RBW = 300 Hz
VBW = 1 kHz

Test Configuration Block Diagram



§ 2.987 Modulation Characteristics

The modulation characteristics were measured using an HP modulation meter as shown in the diagram below. The EUT transmits digital data over the cellular network; therefore, only the 1/0 bit pattern was measured.



§ 2.991 Conducted Spurious Emissions at the Antenna Terminals

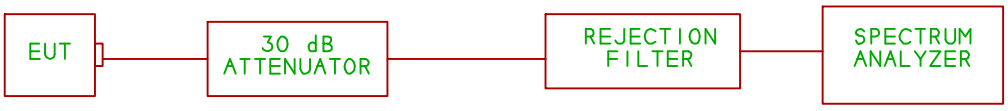
The spurious emission at the antenna terminals were measured as shown in the diagram below. The output of the transmitter was filtered through a rejection filter into the spectrum analyzer. This filtering provided 32 dB of attenuation at the carrier frequency and was necessary to increase the dynamic range of the spectrum analyzer. External attenuation was added as necessary to prevent overloading the spectrum analyzer. The carrier was modulated with the GMSK Modulation which was found to produce worst case emissions.

Due to the relatively wide range over which the output power can operate, measurements were conducted at three different power

levels (0, 3 and 7). The emission spectrum was examined up to the tenth harmonic of the carrier. Any emission that was 20 dB below the limit was not recorded.

Antenna Conducted Spurious Emissions

RBW = 100 kHz
VBW = 300 kHz



§ 2.993 Field Strength of Spurious Radiation

Field strength measurements of radiated spurious emission was performed at CCL's anechoic chamber located in Salt Lake City, Utah. The test configuration is shown on the following page.

The transmitter was placed on a rotatable wooden test table one meter in height. The transmitter output was terminated with a 50 Ω load. The emission spectrum was examined up to the tenth harmonic of the carrier. At each frequency, the transmitter was rotated through 360^0, and the antenna was raised from one to four meters in order to record the maximum emissions. Measurements were made in both the vertical and horizontal polarities of the antenna. Emissions that were more than 20 dB below the limit were not recorded.

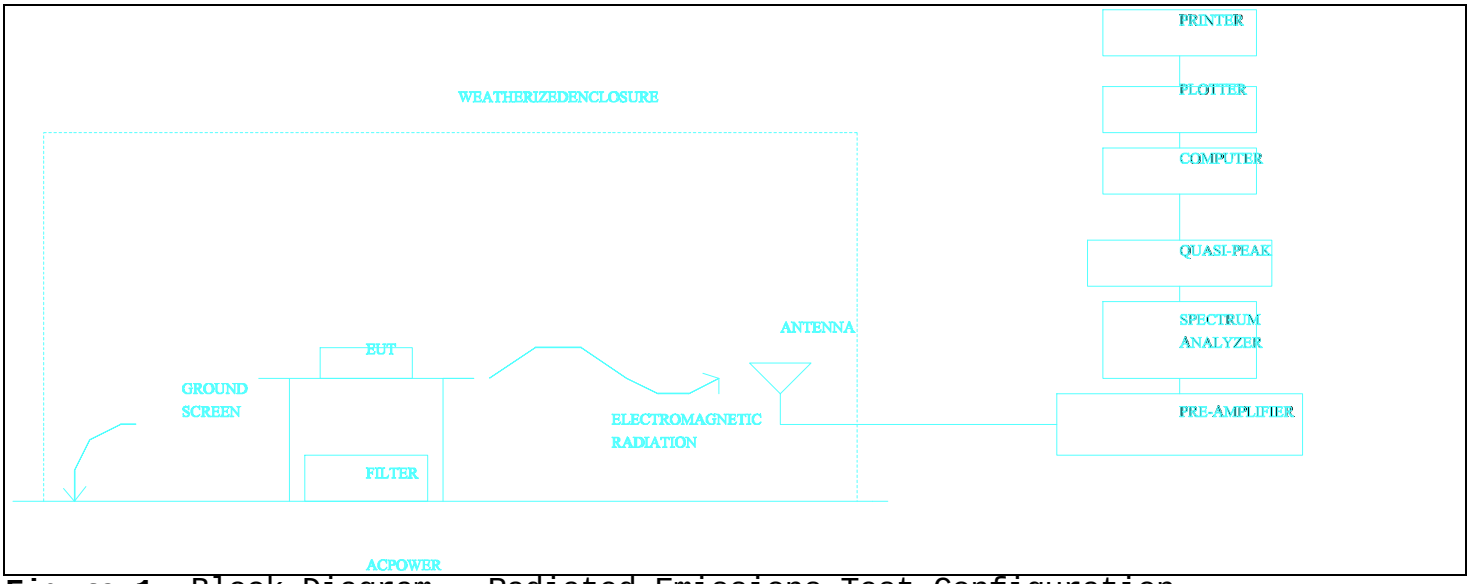


Figure 1 Block Diagram - Radiated Emissions Test Configuration

§ 2.995 Frequency Stability

The EUT was placed inside of the temperature chamber as shown in the diagram below. The ambient temperature of the chamber was varied from -20^0 to 50^0 C in 10^0 increments. At each temperature range the EUT was allowed to stabilize at that temperature for 30 minutes before the measurements were taken. The supply voltage was varied $\pm$10 percent at 20^0 and measurements were taken at each supply voltage level.

Due to relatively wide range over which the EUT can operate, measurements were conducted at three different channels (one near the bottom, one near the middle and one near the top of the spectrum).