

INDEX OF TEST RESULTS

<u>Exhibit #</u>	<u>Description</u>
6A	1900MHz/Part 24/TDMA: RF Power Stability
6B	1900MHz/Part 24/TDMA: Modulation Characteristics
6C	1900MHz/Part 24/TDMA: Occupied bandwidth
6D	1900MHz/Part 24/TDMA: Spurious Emissions (conducted)
6E	1900MHz/Part 24/TDMA: Spurious Emissions (radiated)
6F	1900MHz/Part 24/TDMA: Frequency Stability

EXHIBIT 6A1

1900 MHz TDMA RF POWER OUTPUT

Para. 2.1033 (c)(6)(7), 2.1046 and 24.232 (a)(c)

The RF maximum power measured at the output terminal (antenna connector) was 20 dBm at 1960 MHz.

Note: The manufacturers rated voltage RBS is 110/220 VAC.

The measurements were made per using the following equipment:

Hewlett Packard Spectrum Analyzer Model 8563E
Hewlett Packard Universal Counter Model 53131A
Hewlett Packard AC Power Source Model 6813A
Gigatronics Universal Power Meter Model 8651A
Thermotron SM-8C Temperature Chamber

1900 MHz TDMA MODULATION CHARACTERISTICS

2.1047(c)(13)

The transceiver shall be capable of generating $\pi/4$ shifted differentially encoded quadrature phase shift keying signals. The transmitted signal is given by:

$$S(t) = \sum g(t-nT) \cos(\phi_n) \cos(\omega_c t) - \sum g(t-nT) \sin(\phi_n) \sin(\omega_c t)$$

where $g(t)$ is the pulse shaping function that corresponds to a square root raised cosine baseband filter with roll off factor of 0.35, ω_c is the radian carrier frequency, T is the symbol period, and ϕ_n is the absolute phase corresponding to the n th symbol interval. The symbol rate ($1/T$) is 24.3 k symbols /sec.}

The modulation accuracy requirement is specified by setting limits on the RMS difference between the actual transmitted signal waveform and the ideal signal waveform. The ideal waveform is derived mathematically from the specification of modulation shown above. The specified requirement is error vector magnitude.

For this measurement, frequency accuracy shall meet the requirements of Section 3.1 prior to measurement.

The average carrier frequency error is the difference between the average carrier frequency of the actual transmitted waveform and the average signal waveform carrier frequency.

The ideal modulation is defined above. The definition is such that, observing an ideal transmitter through an ideal root raised-cosine receiver filter at the correct sampling instants one symbol apart would result in the sequence of values given by:

$$S(k) = S(k-1)e^{j\{\pi/4 + B(k)\pi/2\}}$$

where $B(k) = 0, 1, 2, 3$ according to the following table:

X_k	Y_k	$B(k)$
0	0	0
0	1	1
1	1	2
1	0	3

In the forward channel, $S(k)$ forms part of a continuous data stream. In the reverse channel, the transit bursts from the mobile are truncated by power up and down ramping. In this case, $S(6)$ is the first sample that enters into demodulation, which yields the first two information bits by comparing $S(6)$ with $S(7)$. The last information bits lie in the comparison of $S(162)$ and $S(161)$.

The ideal transmit and receive filters in cascade form a raised cosine Nyquist filter having an impulse response going through zero at symbol period intervals, so there is no inter-symbol interference at the ideal sampling points. The ideal signal sampler therefore, take on one of the eight values defined above, at the output of the receive filter. This section defines how the output signal from a transmitter is to be evaluated against the ideal signal.

Let $Z(k)$ be the complex vectors produced by observing the real transmitter through an ideal measuring receive filter at instants k , one symbol period apart. With $S(k)$ defined as above, the transmitter is modeled as:

$$Z(k) = [C0 + C1 * [S(k)+E(k)]] * W^k$$

where:

$$k = n/24.3\text{KHz}$$

$$dr = jda$$

$W = e^{dr}$ accounts for both a frequency offset giving “da” radians per symbol phase rotation and an amplitude changes of “dr” nepers per symbol:

$C0$ is a constant origin offset representing quadrature modulator imbalance,
 $C1$ is a complex constant representing the arbitrary phase and output power of the transmitter, and
 $E(k)$ is the residual vector error on sample $S(k)$

The sum square vector error is then:

$$\sum_{k=\text{MIN}}^{\text{MAX}} |E(k)|^2 \quad \sum_{k=\text{MIN}}^{\text{MAX}} |[Z(k) * W - C0]/C1 - S(k)|^2$$

$C0$, $C1$ and W shall be chosen to minimize this expression and are then used to compute the individual vector errors $E(k)$ on each symbol. The symbol timing phase of the receiver output samples used to compute the vector error shall also be chosen to give the lowest value.

The values of MAX and MIN for the reverse channel (mobile station transmitter) are:

$$\begin{aligned} \text{MIN} &= 6 \\ \text{MAX} &= 162 \end{aligned}$$

The RMS vector error is then computed as the square root of the sum-square vector divided by the number of symbols in the slot, (157 in the reverse direction).

Method of Measurement

Connect the mobile station to the Standard Test Source and Modulation Accuracy Equipment. Modulate the Standard Test Source with pseudo-random Data Field bits. The mobile station shall transpond the Data Field bits using the TDMAON command. Use the Modulation Accuracy Measurement Equipment to measure the modulation accuracy of the mobile station.

Minimum Standard

The RMS vector error in any burst shall be less than 12.5%.

Exhibit 6C1

1900 MHz: OCCUPIED BANDWIDTH

Per 2.1049 (h) and 24.238 (a)(b)(c)(d) the exhibits presented show the modulation that has to exist in a 1900 MHz Cellular System.

All the exhibits listed below are plots where the modulation condition is Psuedorandom Data (48.6 kb/s switched), operating in the TDMA mode. All plots were taken while transmitting at Power Level 0. Any frequency span not covered in the exhibits below was found to be unaffected by the transmitter/modulation.

EXHIBIT

Lower Channel (Example, Channel 2)

Normal bursted operation; data rate 48.6 kb/s, Output power level 0.

6C2 1 MHz Resolution Bandwidth reference plot.
6C3 Emission Bandwidth
6C4 0.1 MHz span, Block Edge

Upper Channel (Example, Channel 1998)

Normal bursted operation; data rate 48.6 kb/s, Output power level 0.

6C5 1 MHz Resolution Bandwidth reference plot.
6C6 Emission Bandwidth
6C7 0.1 MHz span, Block Edge

The measurements were made using the following equipment:

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Hewlett Packard Universal Counter Model 53131A
Hewlett Packard AC Power Source Model 6813A
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Thermotron SM-8C Temperature Chamber

Exhibit 6C2

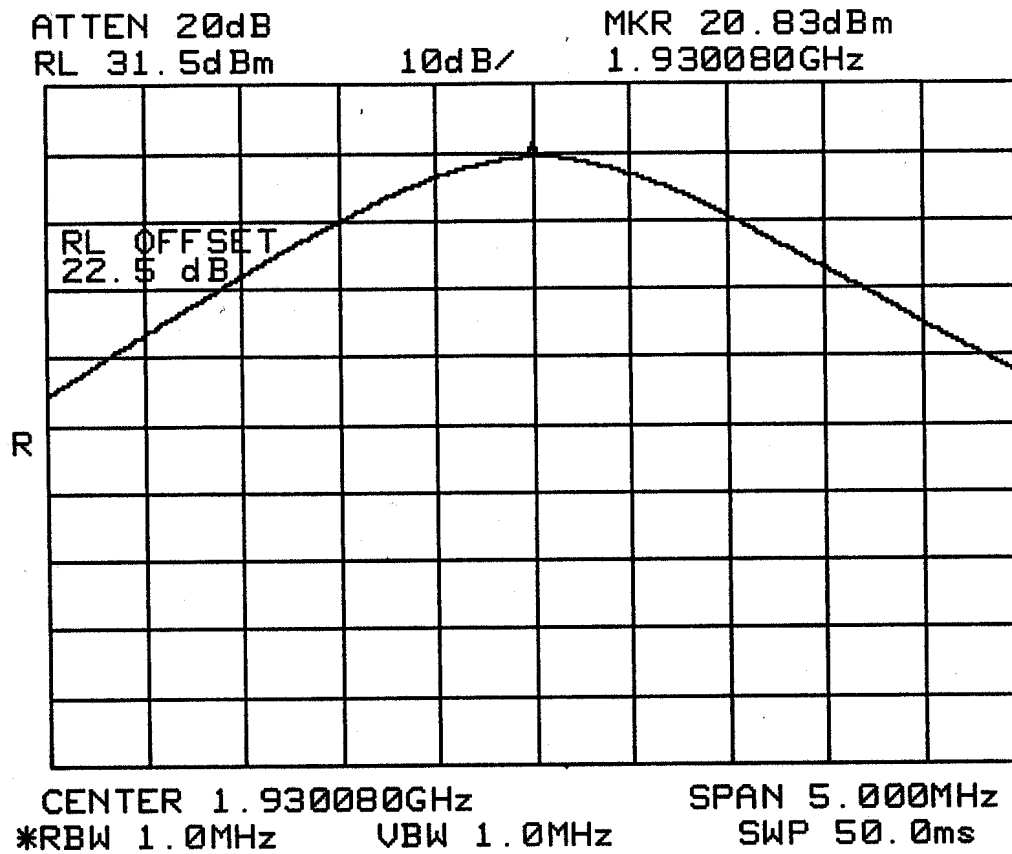


Exhibit 6C3

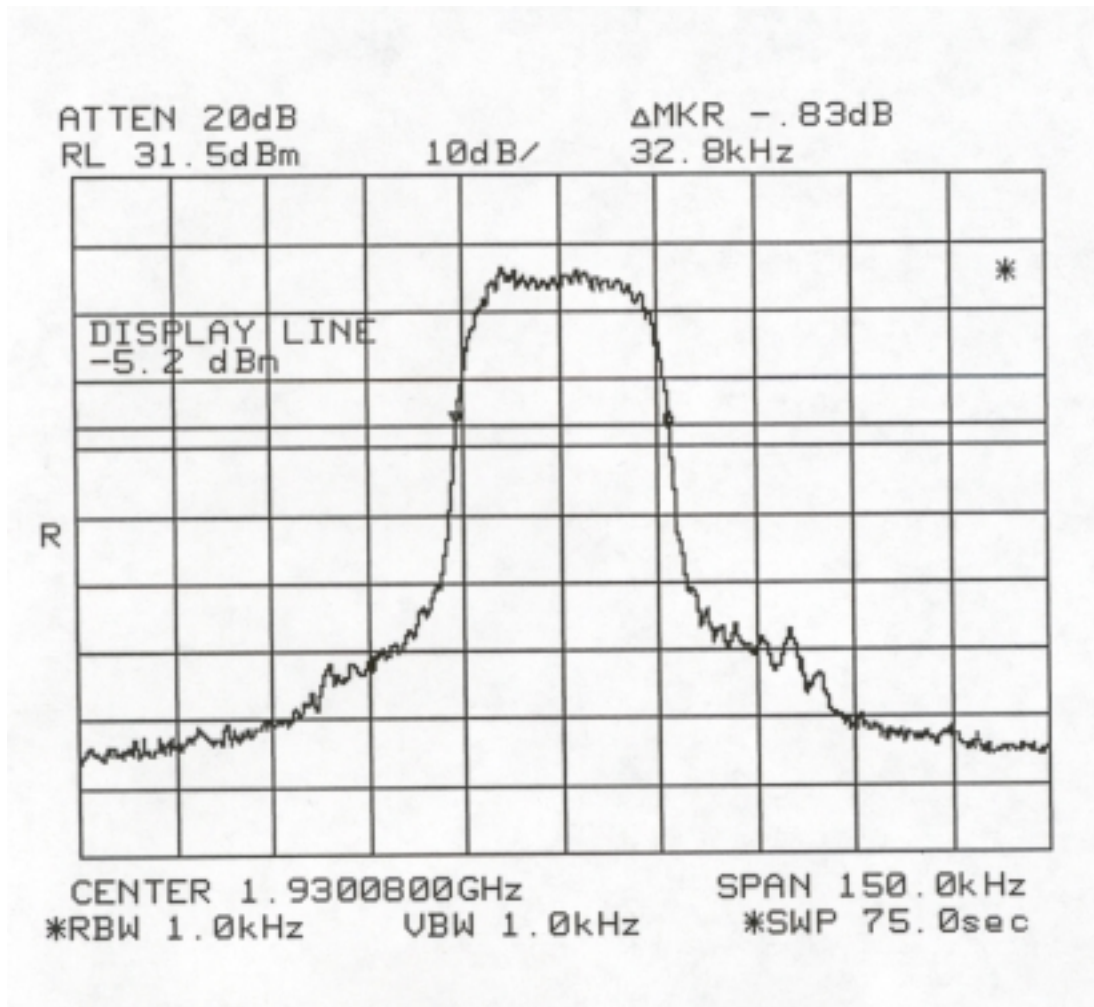


Exhibit 6C4

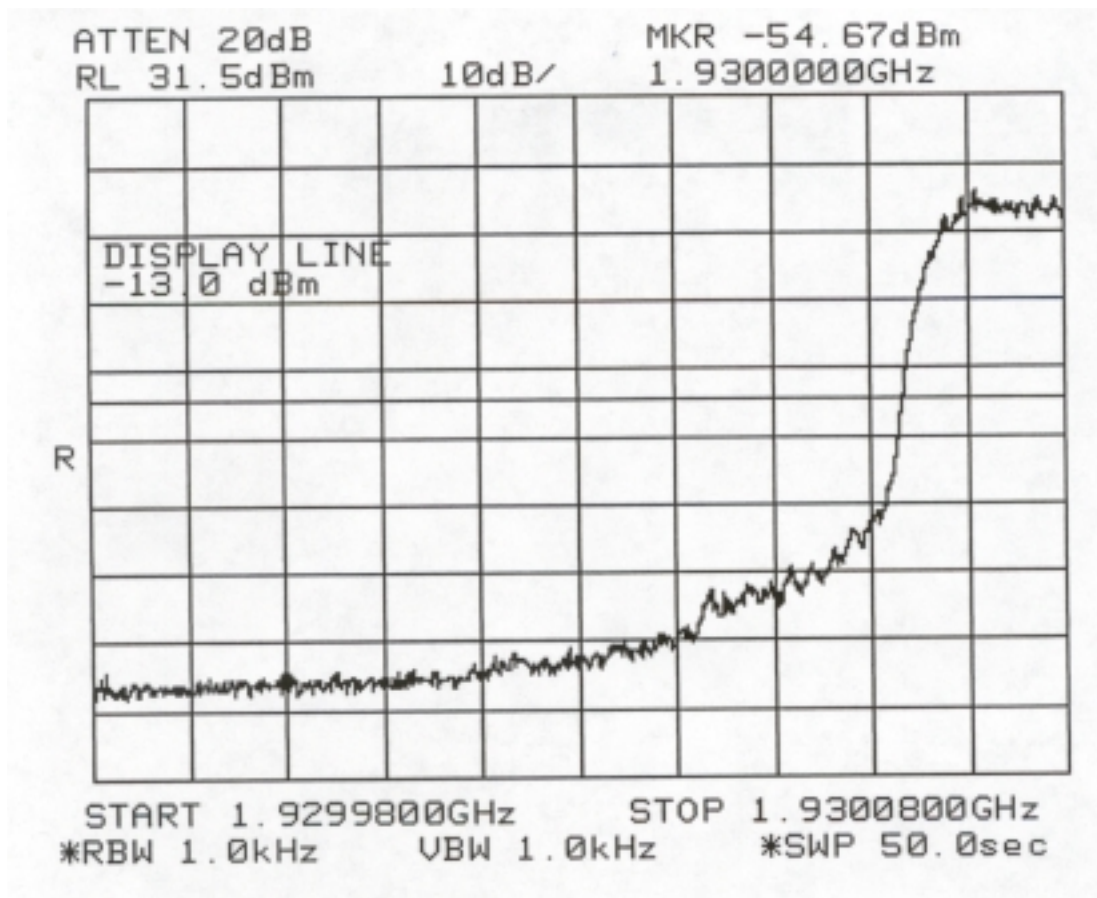


Exhibit 6C5

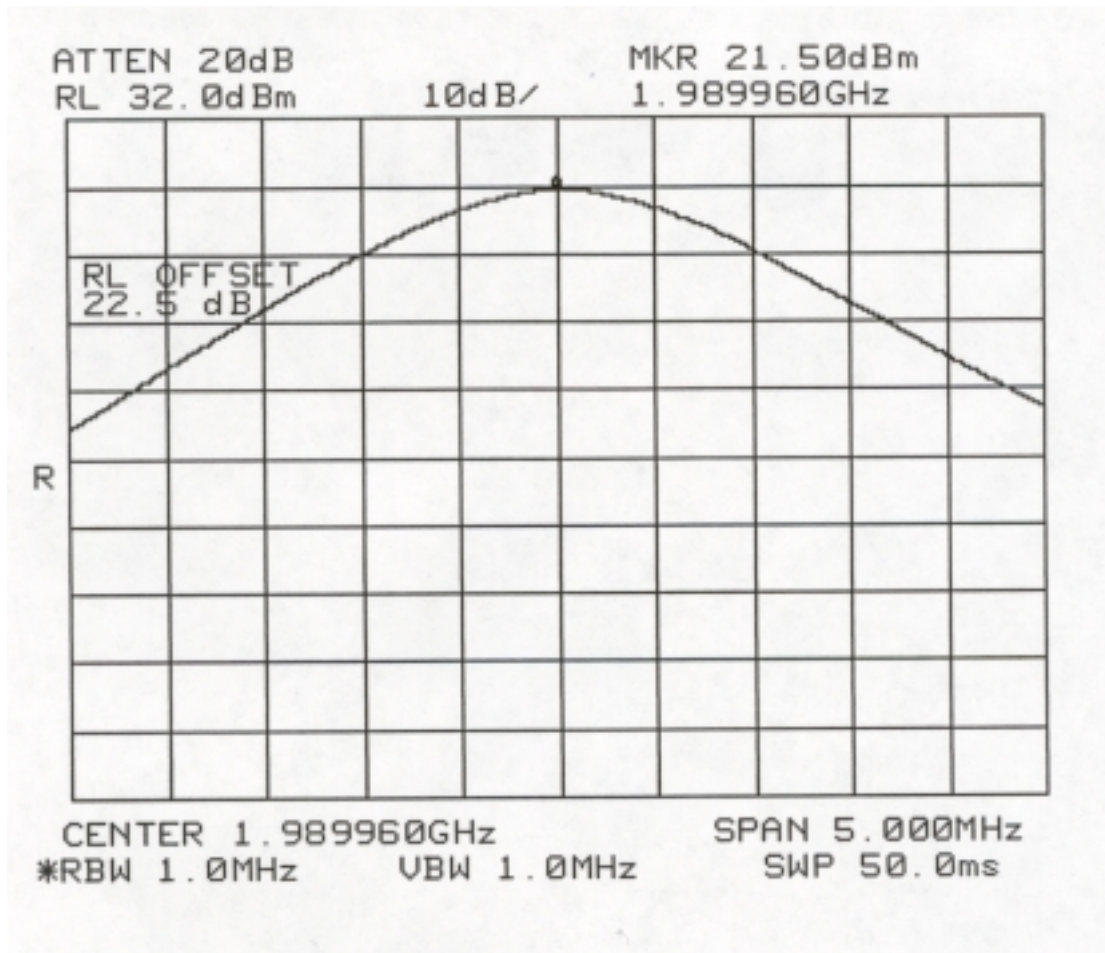


Exhibit 6C6

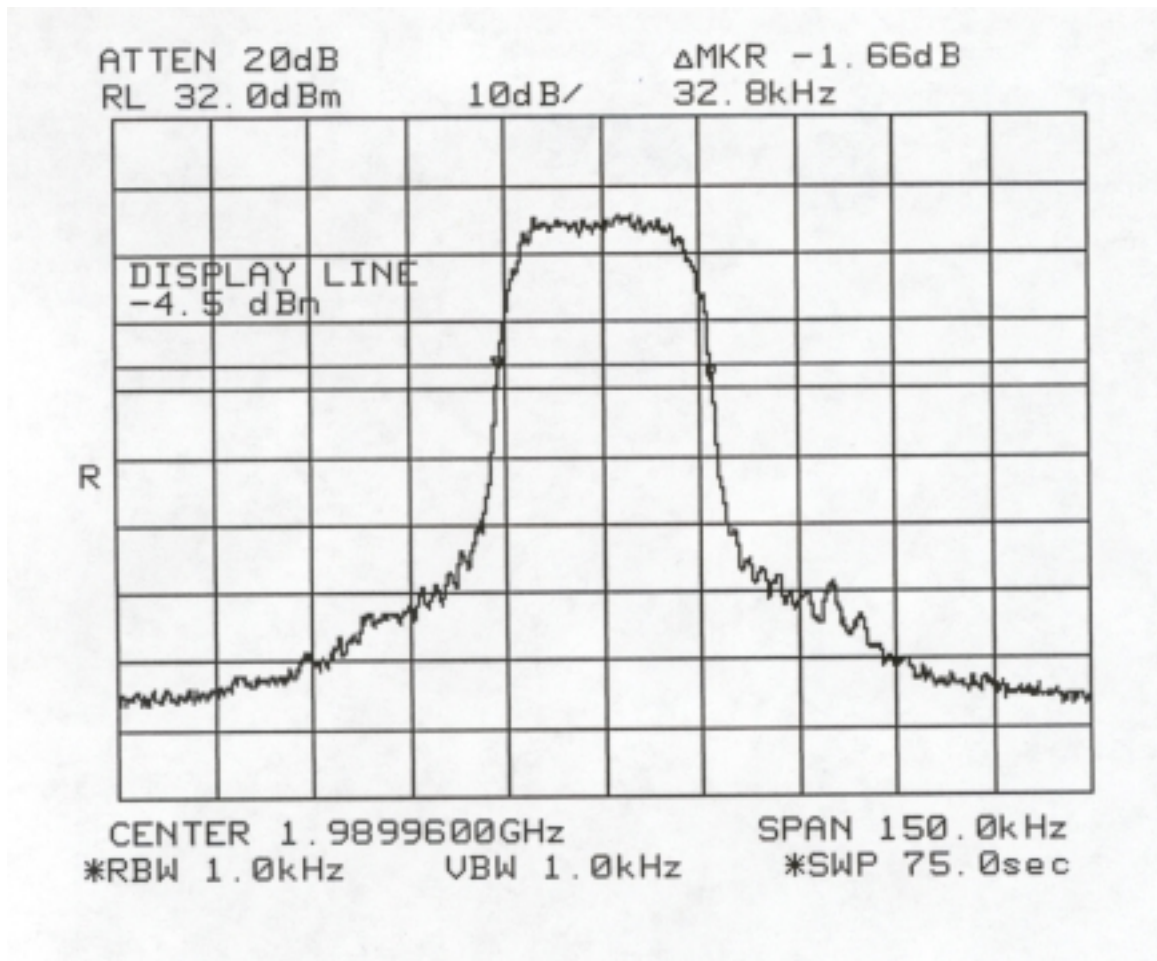


Exhibit 6C7

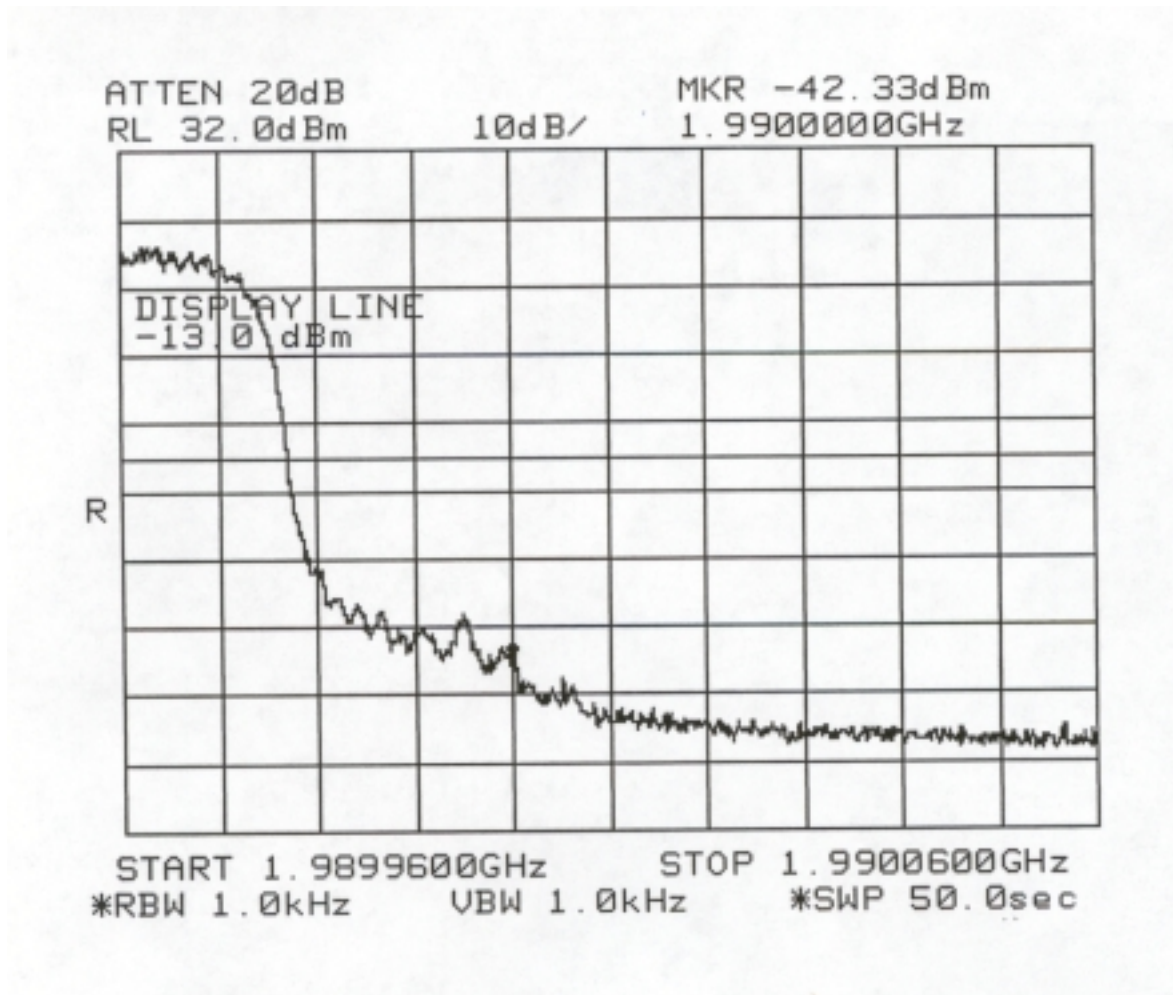


Exhibit 6D1

1900MHz SPURIOUS EMISSIONS (CONDUCTED)

Per 2.1051, 24.238 Spurious emissions at the antenna terminals (conducted) when properly loaded with an appropriate artificial antenna were measured.

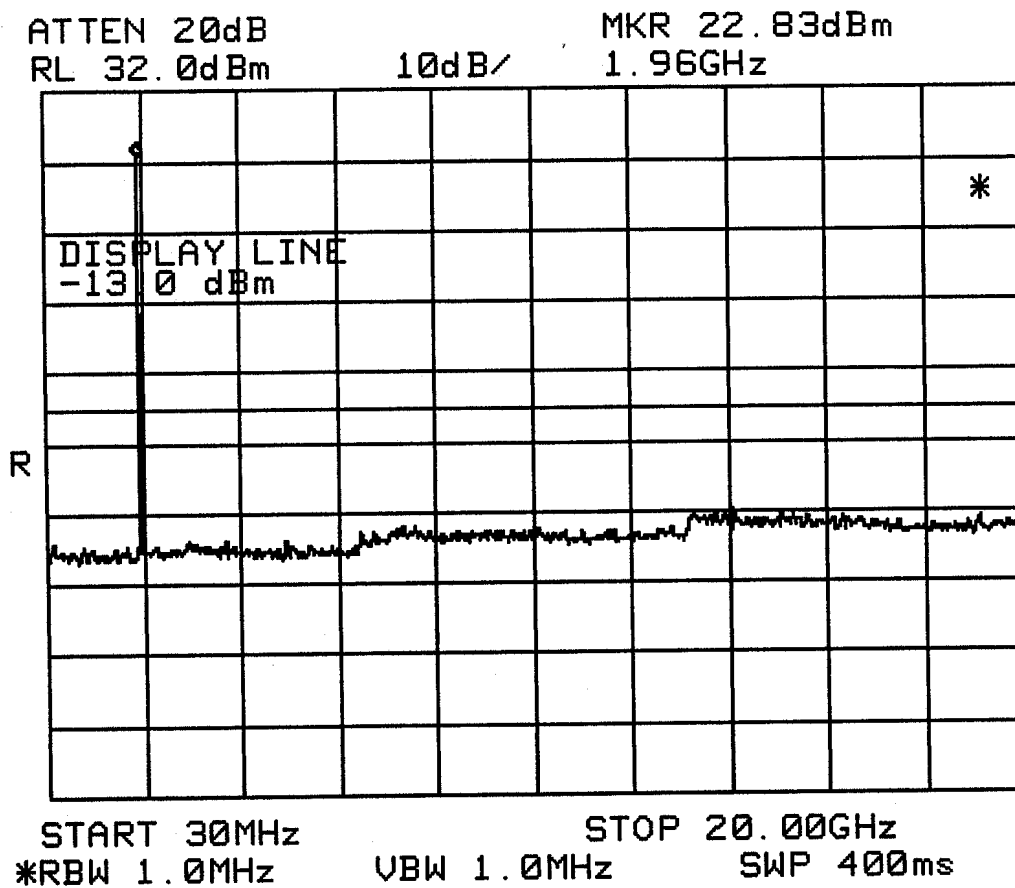
Note: The spectrum was examined through the 10th harmonic of the carrier.

<u>EXHIBIT #</u>	<u>FREQUENCY (MHz)</u>	<u>Output Power level</u>
6D2	1960 MHz	0 = Highest output (no attenuation)

The measurements were made using the following equipment:

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Hewlett Packard Universal Counter Model 53131A
Hewlett Packard AC Power Source Model 6813A
Gigatronics Universal Power Meter Model 8651A
Thermotron SM-8C Temperature Chamber

Exhibit 6D2



No spurious emissions found.

Exhibit 6E1

1900 MHz: SPURIOUS EMISSIONS (Radiated)

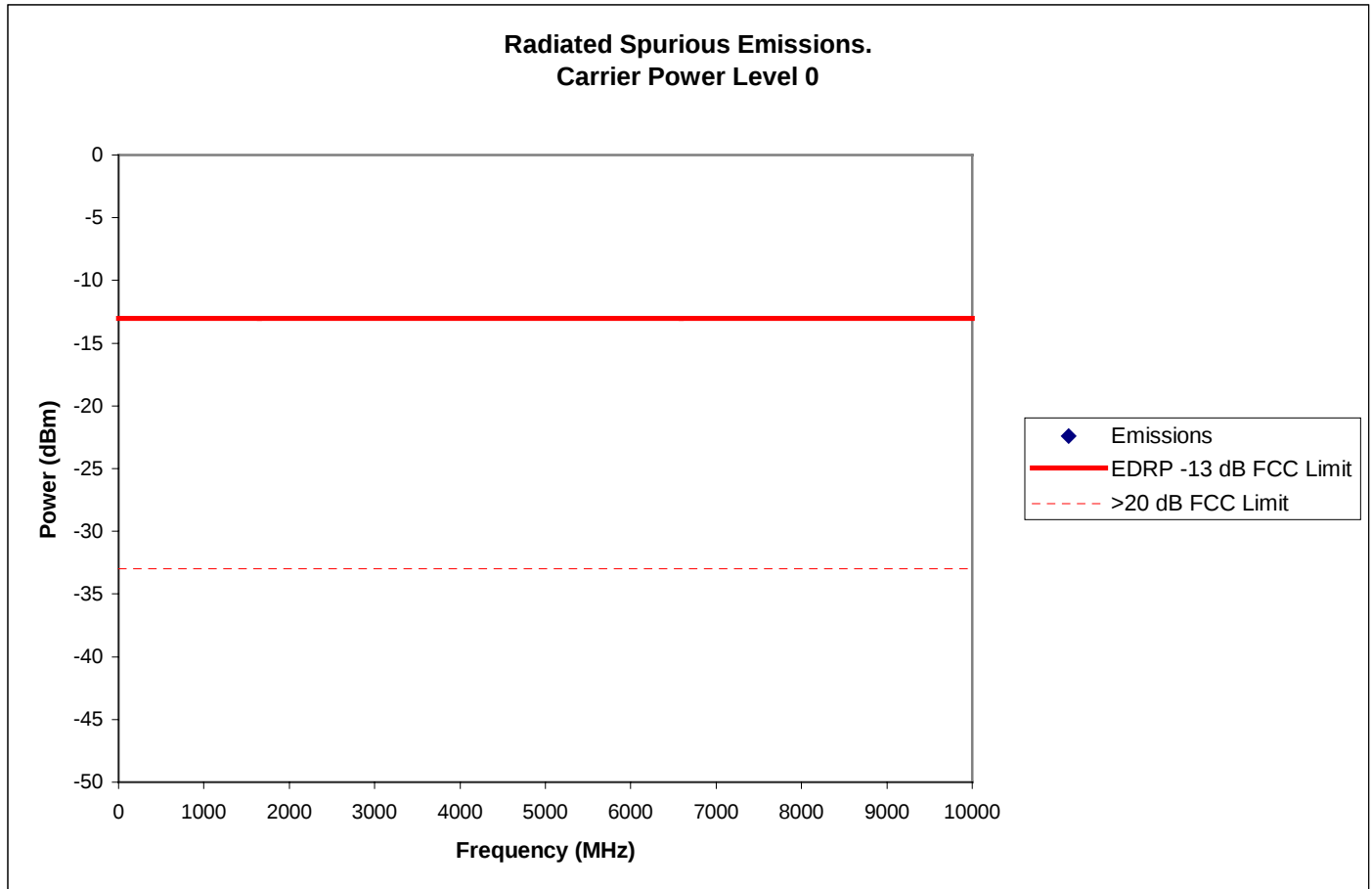
Per 2.1053 and 24.238 field strength of spurious radiation was measured at Underwriters Laboratories Inc. Research Triangle Park, NC site. UL report number 010173.

Note: The spectrum was examined through the 10th harmonic of the carrier. Peak radiated emissions were recorded.

<u>EXHIBIT</u>	<u>FREQUENCY</u>	<u>OUTPUT POWER LEVEL</u>
6E2	Low-Band	0 = Highest output (no attenuation)

The measurements were made using the following equipment:

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Thermotron SM-8C Temperature Chamber



No spurious emissions found within 20dB of limit

Exhibit 6F1

1900 MHz: FREQUENCY STABILITY

Per 2.1055 (a)(1),(b),(d)(2), 24.235

<u>EXHIBIT #</u>	<u>Voltage</u>	<u>Temperature</u>
6R2	-15 % to 115% of Nominal	+25 C
6R3	Nominal	-30 C to +50 C (10 C increments)

Note: The manufacturers Nominal rated voltage for the RBS is 120/240 VAC.

The measurements were made using the following equipment:

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Exhibit 6F2

