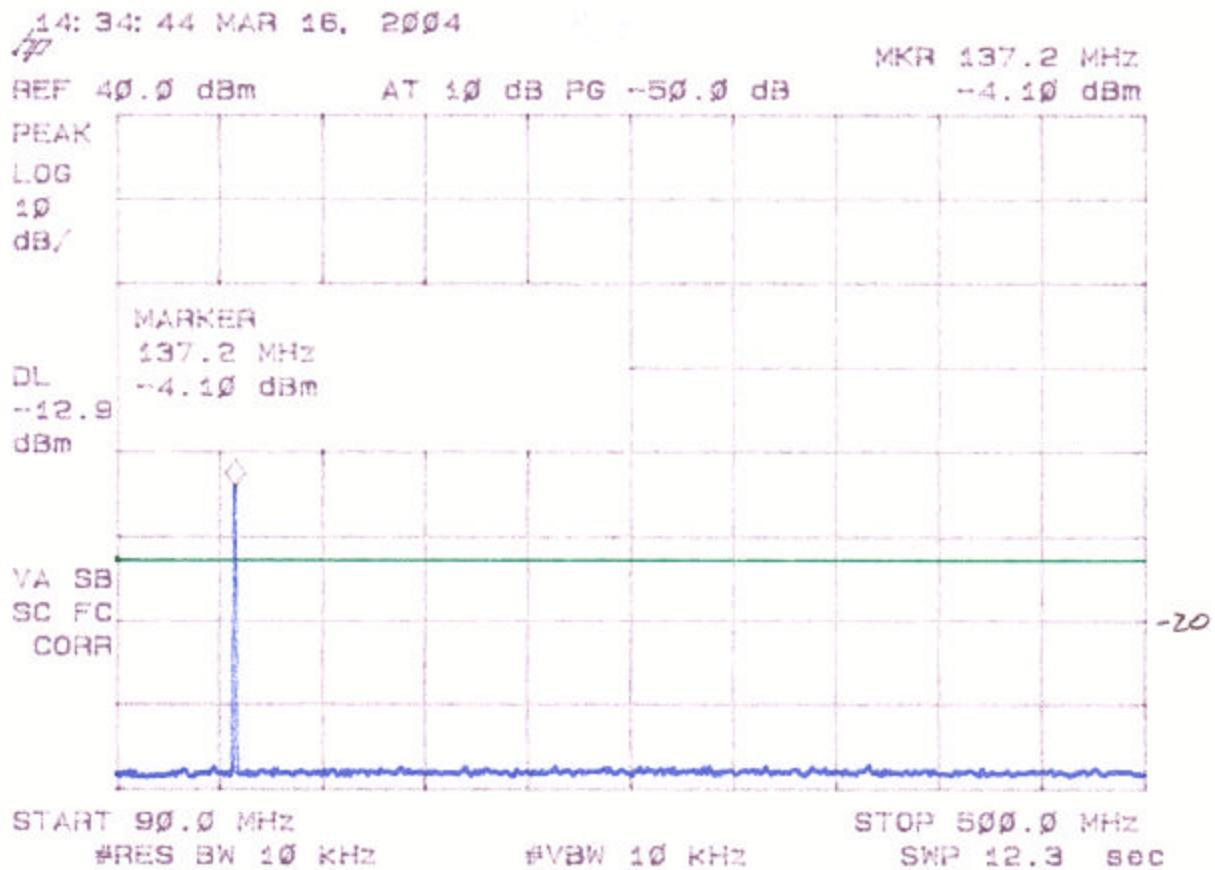
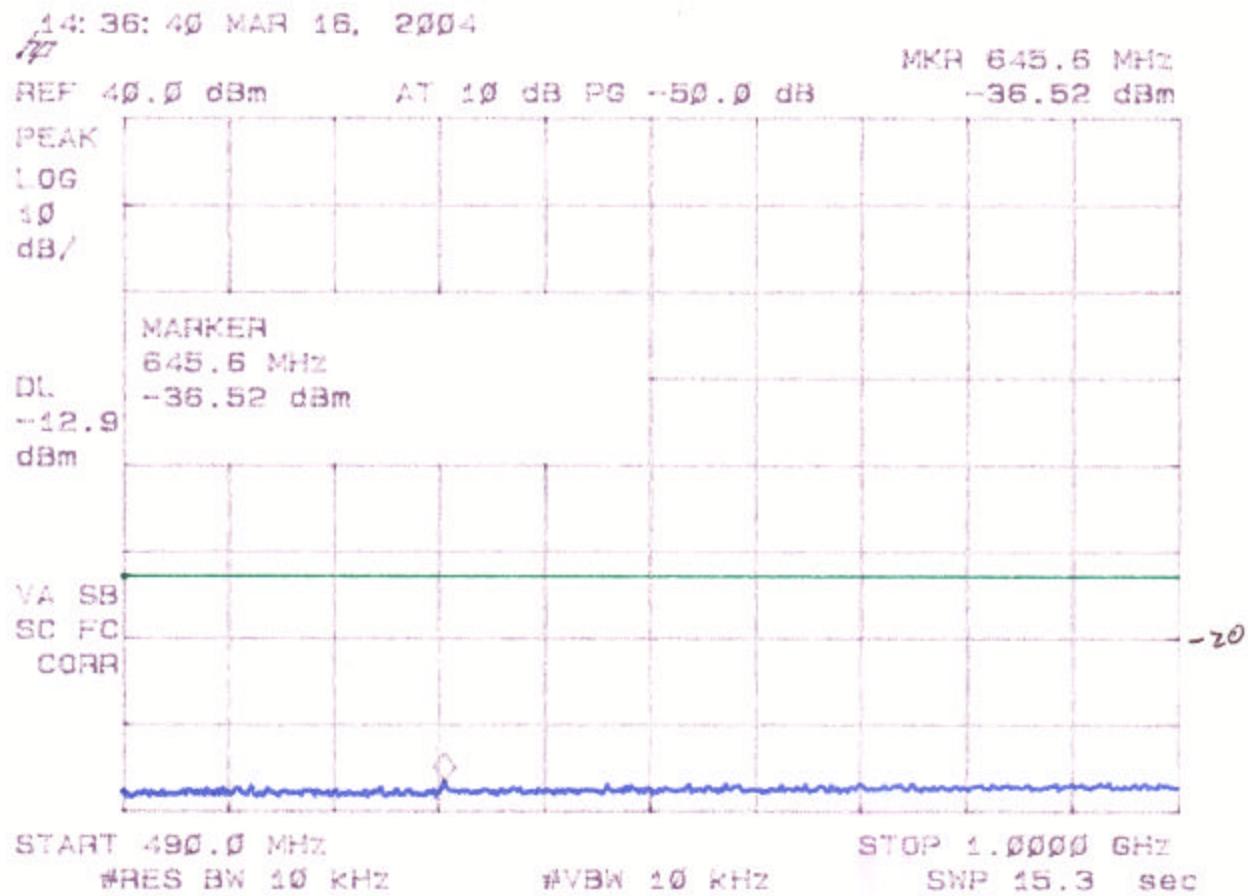


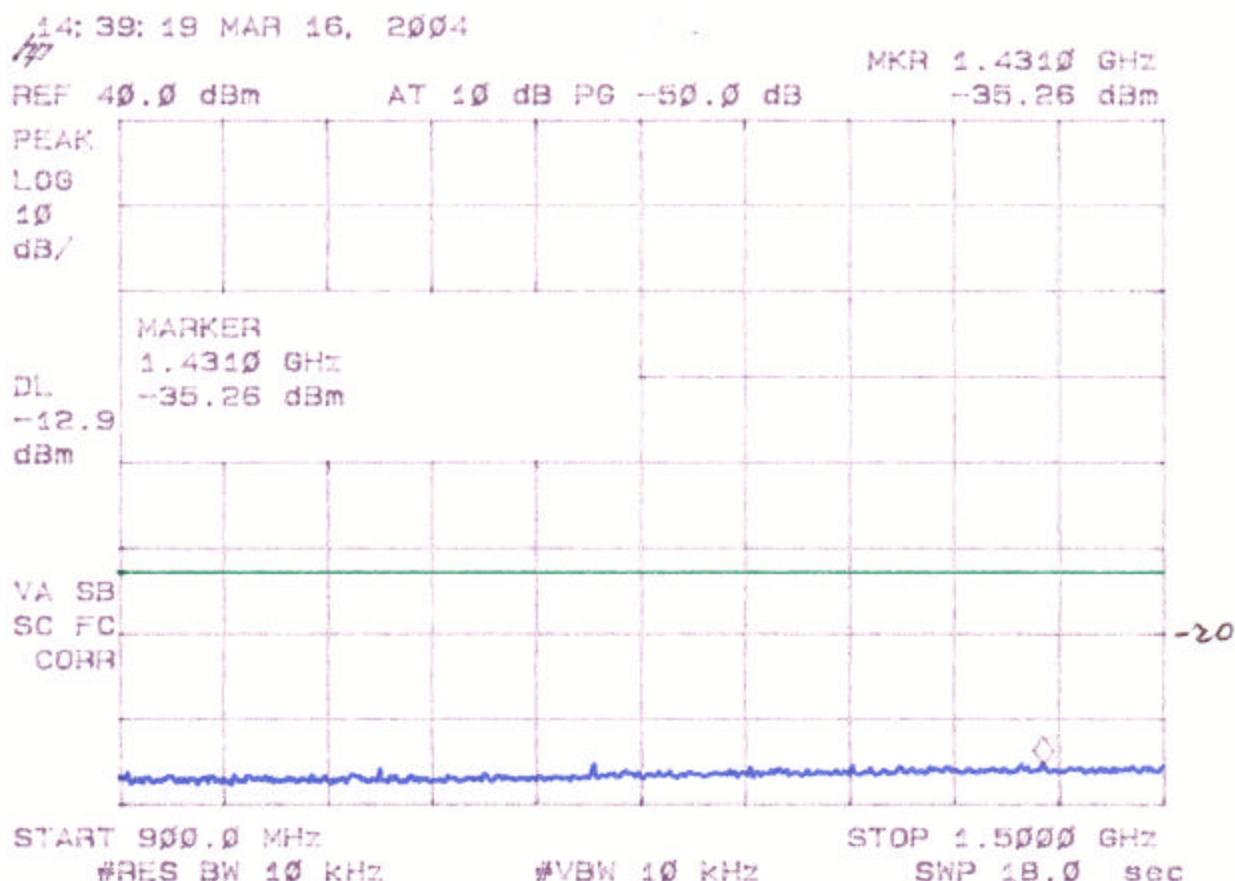
**Figure 5aa**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (12.5 kHz)**



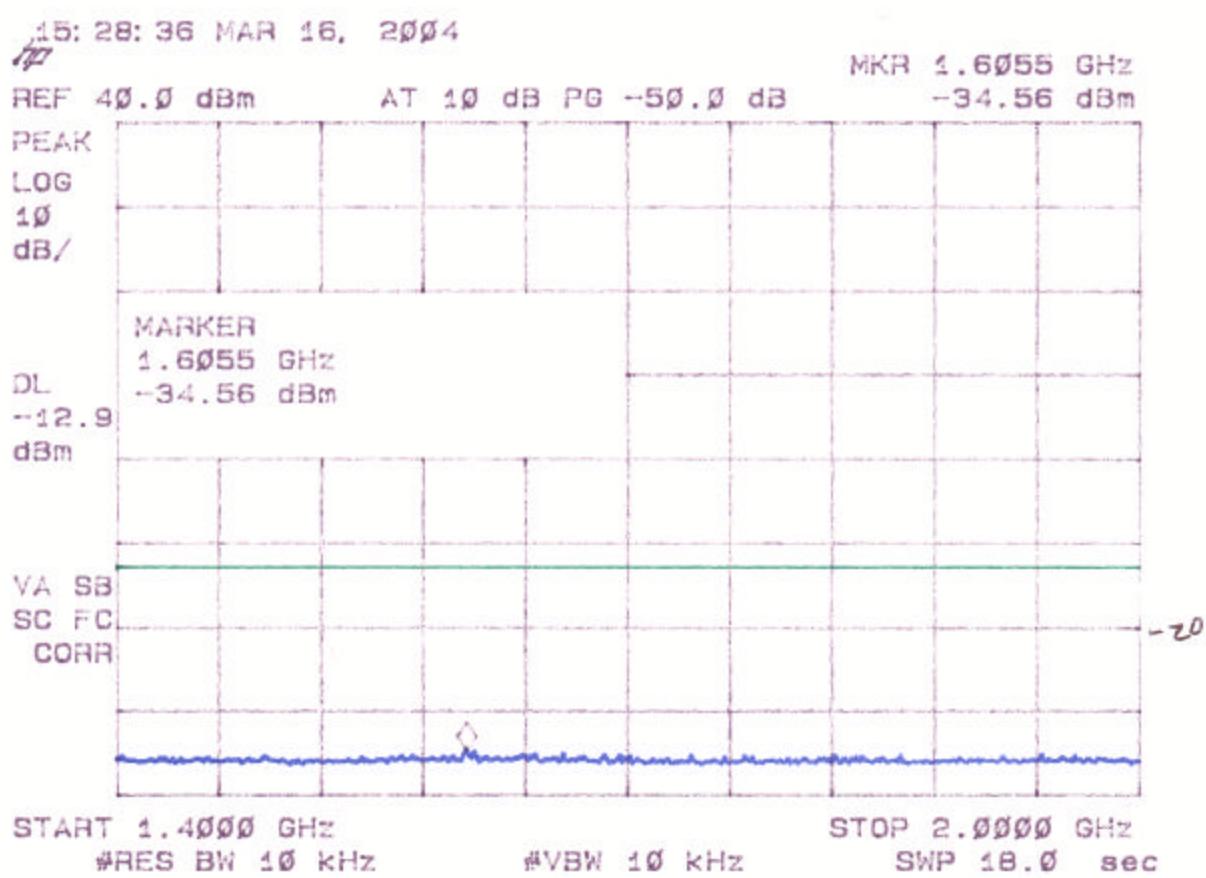
**Figure 5bb**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (12.5 kHz)**



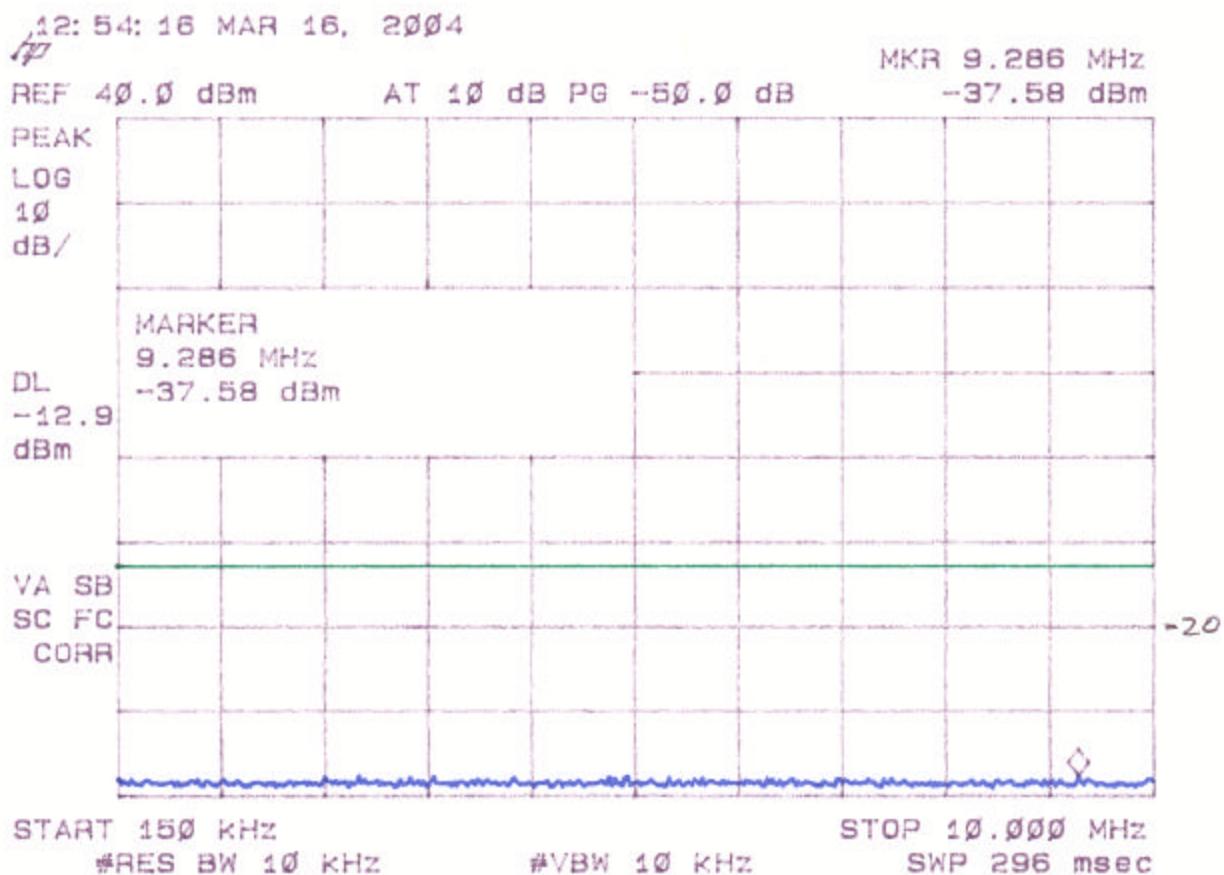
**Figure 5cc**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (12.5 kHz)**



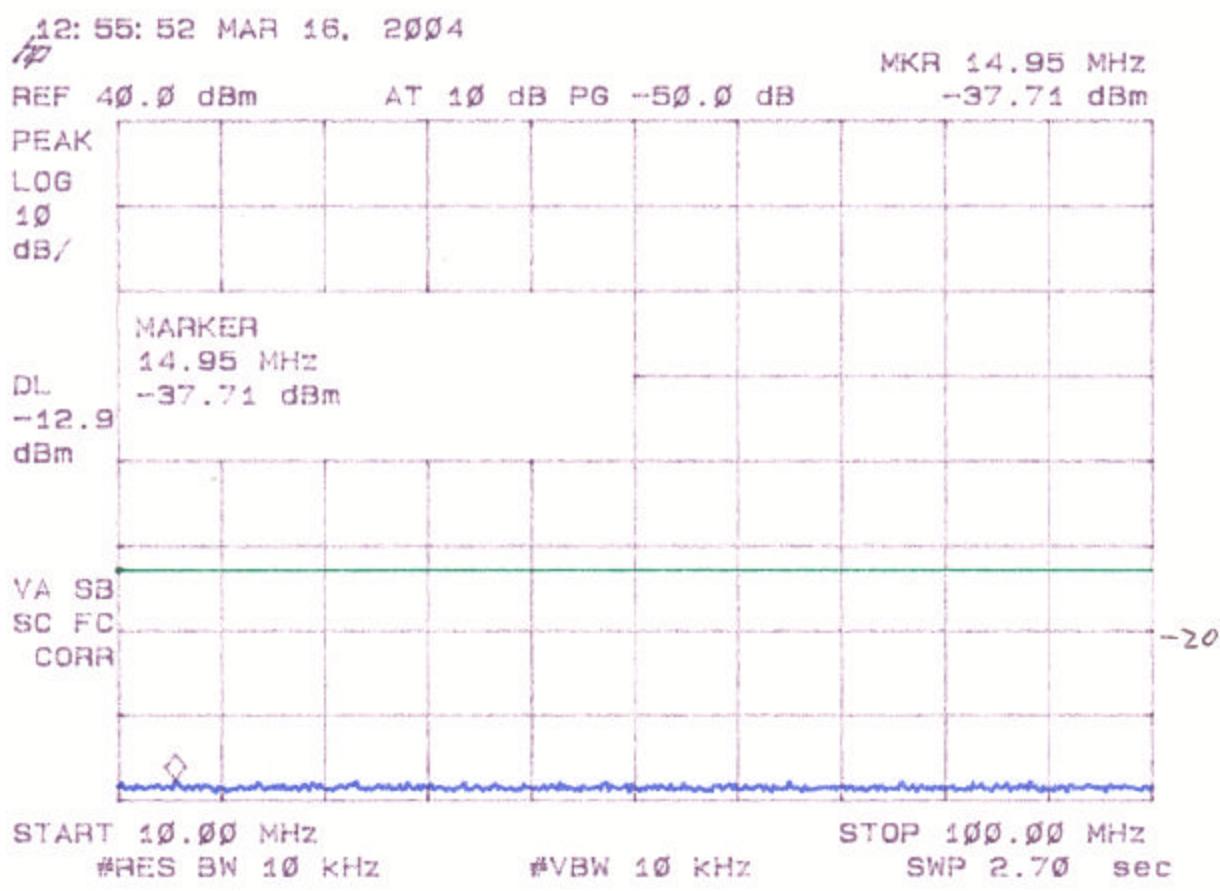
**Figure 5dd**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (12.5 kHz)**



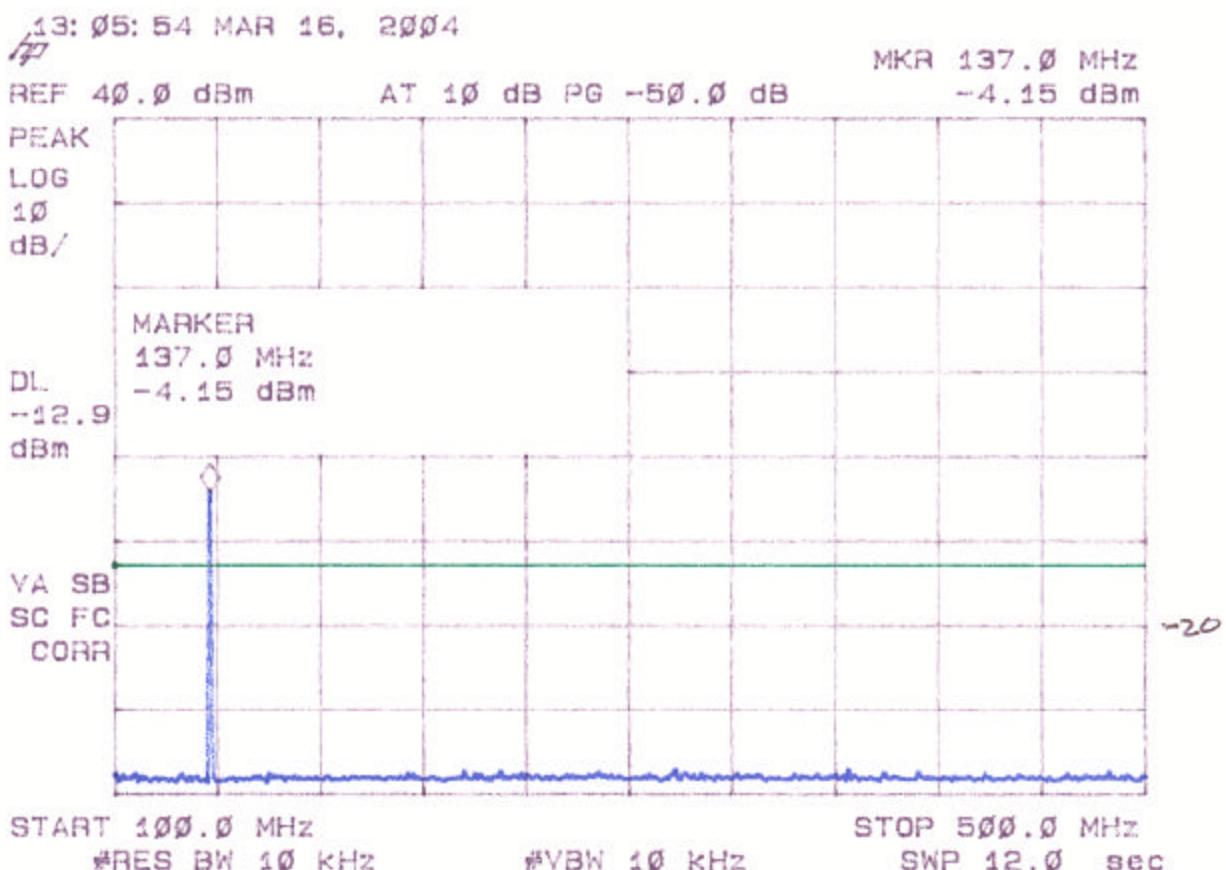
**Figure 5ee**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (25 kHz)**



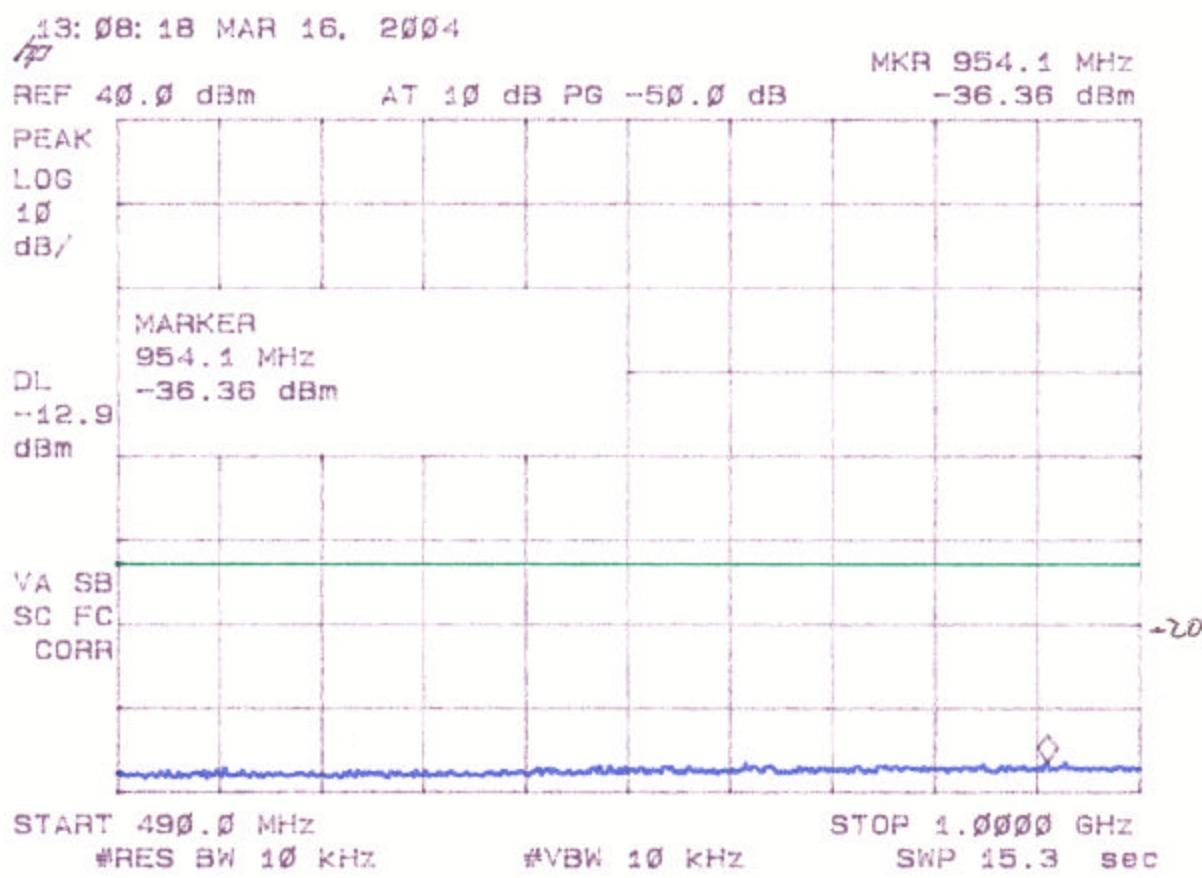
**Figure 5ff**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (25 kHz)**



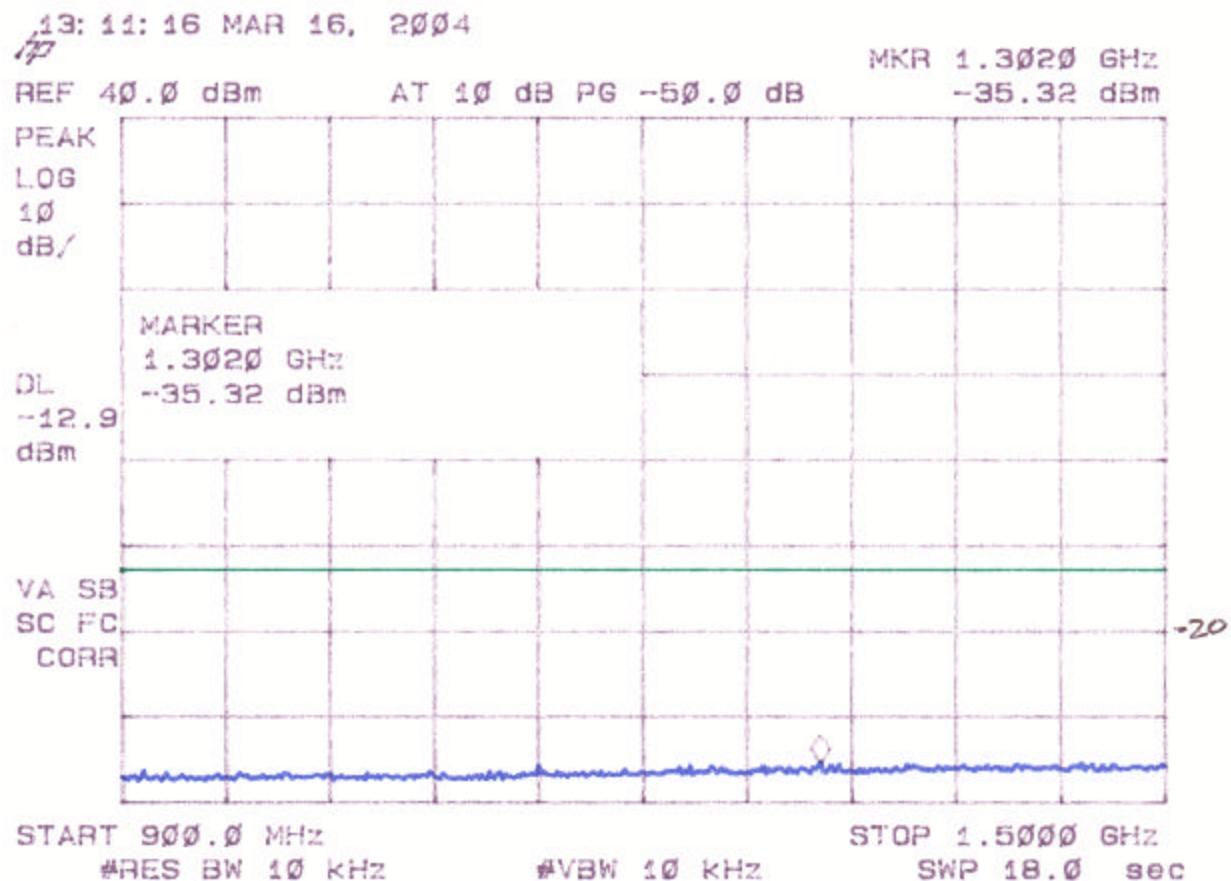
**Figure 5gg**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (25 kHz)**



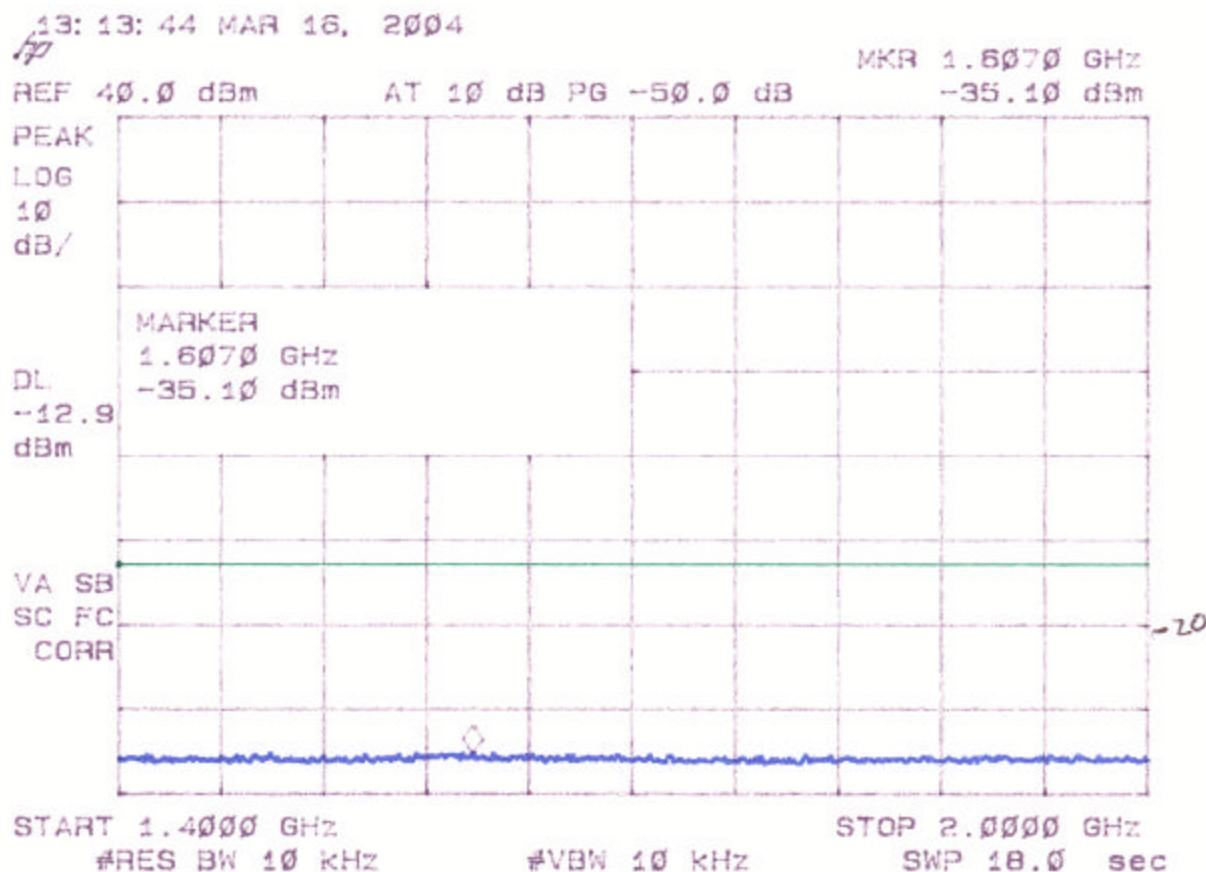
**Figure 5hh**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (25 kHz)**



**Figure 5ii**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (25 kHz)**



**Figure 5jj**  
**Spurious Emissions at Antenna Terminals**  
**Low Channel, Analog (25 kHz)**



## 2.10 Field Strength of Spurious Radiation (FCC Section 2.1053)

Spurious emissions were evaluated from 30 MHz to 1.8 GHz at an EUT to antenna distance of 3 meters. The EUT was tested modulated by its own internal sources. The EUT was placed on an open area test site and the spurious emissions tested with the antenna terminated with a 50 Ohm load as stipulated by EIT/TIA-603:2001 section 2.2.12. Measurements for 30 to 1000 MHz were made with the analyzer's bandwidth at 10 kHz and video bandwidth set to 300 kHz. The EUT's emissions were recreated with a signal generator and transmit antenna and the power recorded by the substitution method. Measurements above 1 GHz were made with the analyzer's resolution bandwidth set to 1 MHz.

FCC Minimum Standard

### FCC Part 22.359, 74.462, and 90.210 (25 kHz bandwidth only)

On any frequency removed from the center of the assigned channel by more than 250 percent at least:

$$\text{Low: } 43 + 10 \log (P_{\text{Watts}}) = 43 + 10 \log (6.15) = 50.9 \text{ dB}$$

$$\text{Middle: } 43 + 10 \log (P_{\text{Watts}}) = 43 + 10 \log (6.05) = 50.8 \text{ dB}$$

$$\text{High: } 43 + 10 \log (P_{\text{Watts}}) = 43 + 10 \log (6.05) = 50.8 \text{ dB}$$

### FCC Part 90.210 (12.5 kHz Bandwidth only)

On any frequency removed from the center of the authorized bandwidth by a displacement frequency ( $f_d$  in kHz) of more than 12.5 kHz at least:

$$\text{Low: } 50 + 10 \log (P_{\text{Watts}}) = 50 + 10 \log (6.15) = 57.9 \text{ dB}$$

$$\text{Middle: } 50 + 10 \log (P_{\text{Watts}}) = 50 + 10 \log (6.05) = 57.8 \text{ dB}$$

$$\text{High: } 50 + 10 \log (P_{\text{Watts}}) = 50 + 10 \log (6.05) = 57.8 \text{ dB}$$

**NOTE: In general, the worse case attenuation requirement shown above was applied.**

## FIELD STRENGTH OF SPURIOUS RADIATION

Table 4a

**Test Date:** March 23, 2004  
**UST Project:** 04-0043  
**Customer:** RELM Wireless Incorporated  
**Model:** DPHX51

## Substitution Method Results

## Low Channel

EUT Frequency (MHz)	EUT Measured Power (dBm)	Substitution Antenna (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Output Power (dBm)	Output Power Limit (dBm)	Margin (dB)
272.17	-65.42	-41.2	1.6	0.35	-39.95	-20.01	-19.94
408.28	-78.46	-50.5	1.6	0.45	-49.25	-20.01	-29.34
544.4	-86.42	-55.8	-0.4	0.55	-56.75	-20.01	-36.74
680.498	-86.41	-51.0	-0.9	0.63	-52.53	-20.01	-32.52

LIMITS (Part 22, 78, and 90) = -20.01 dBm

50+ 10 Log(6.15 (power in watts)) = 57.9 (dB) below the fundamental

6.15W = +37.89 dBm

37.89 dBm - 57.9dB = -20.01 dBm

## SAMPLE CALCULATIONS:

Substitution Antenna (dBm) + Antenna Gain (dBi) - Cable Loss (dB) = Output Power (dBm)

-41.2 (dBm) + 1.6 (dBi) - 0.35 (dB) = -39.93 (dBm)

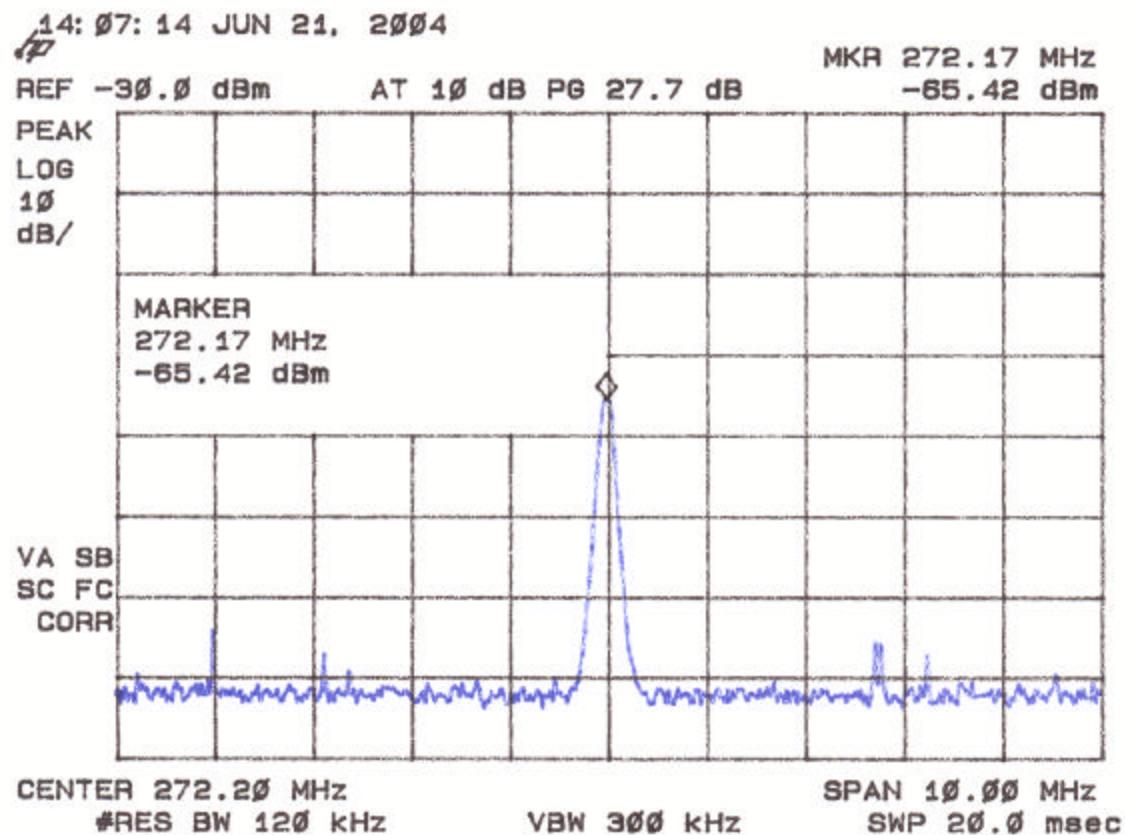
Tested by

Signature: David P. Blethen

Name: David Blethen

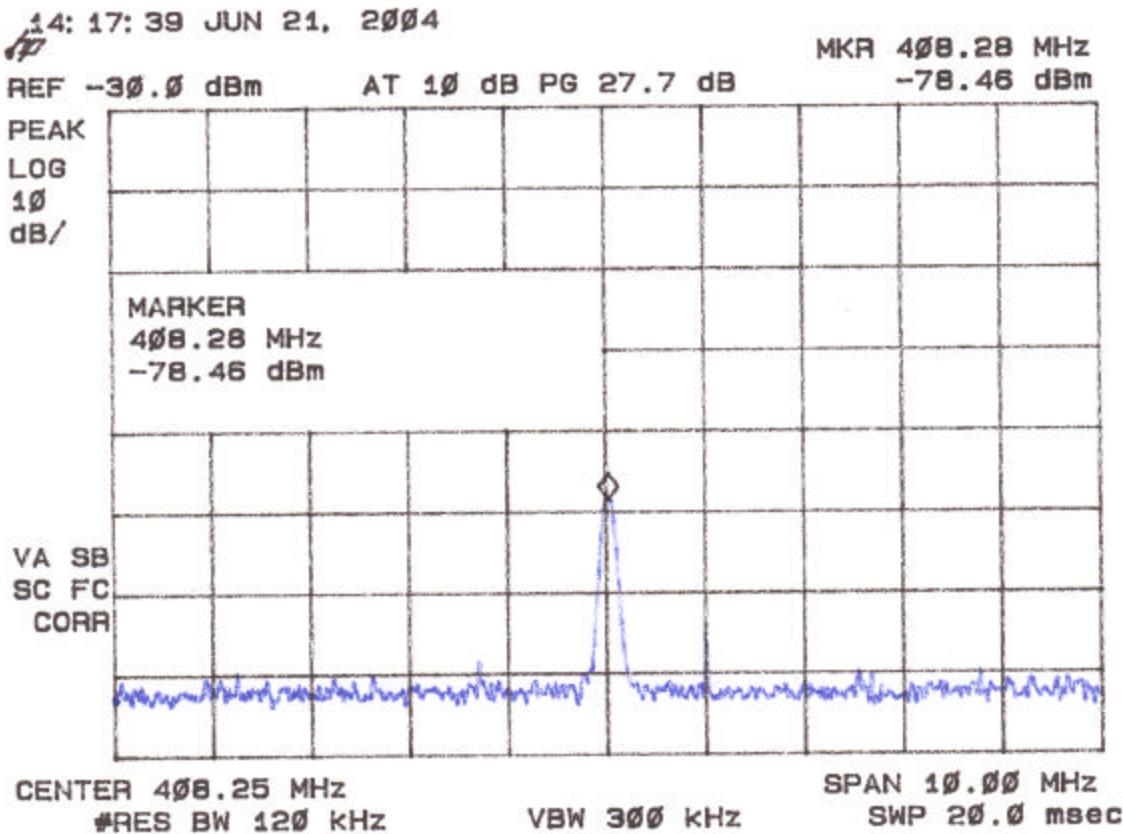
## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 6a – (Low Channel)



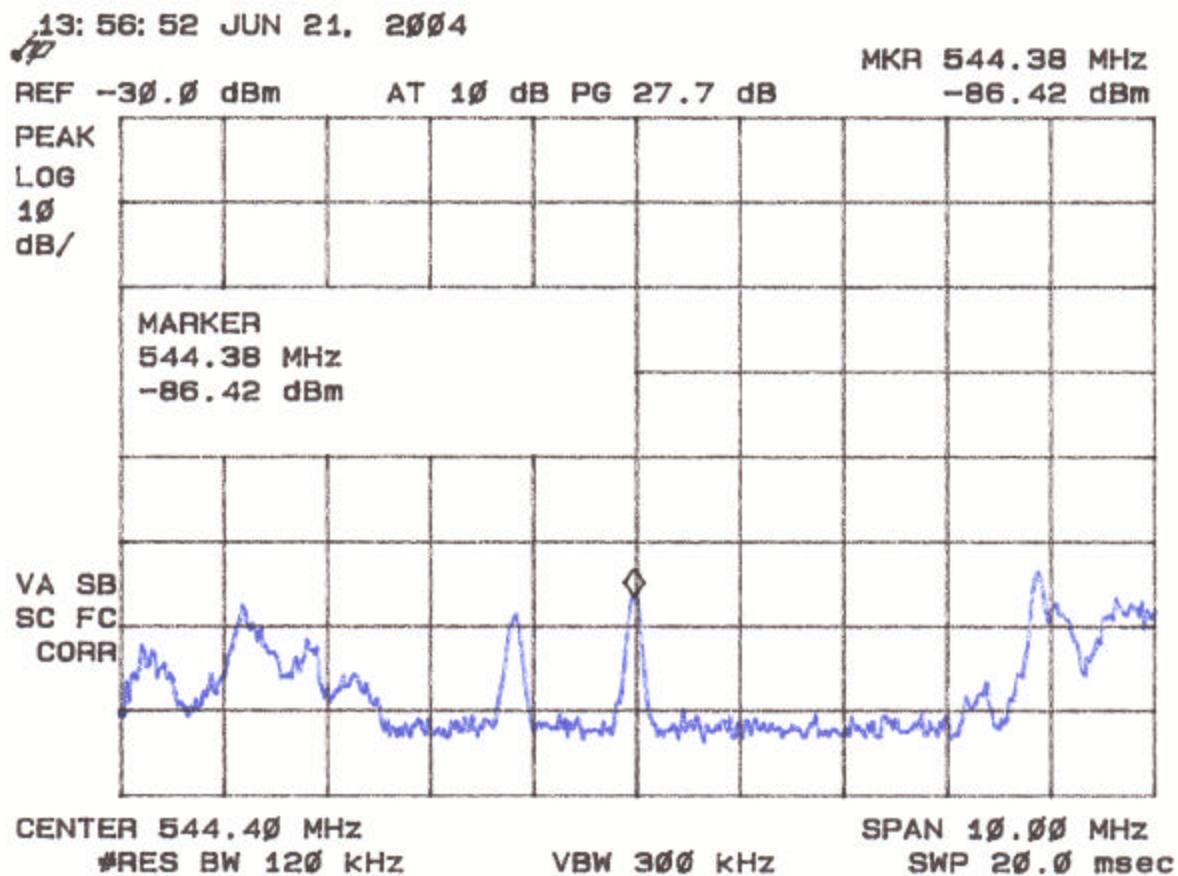
## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 6b – (Low Channel)

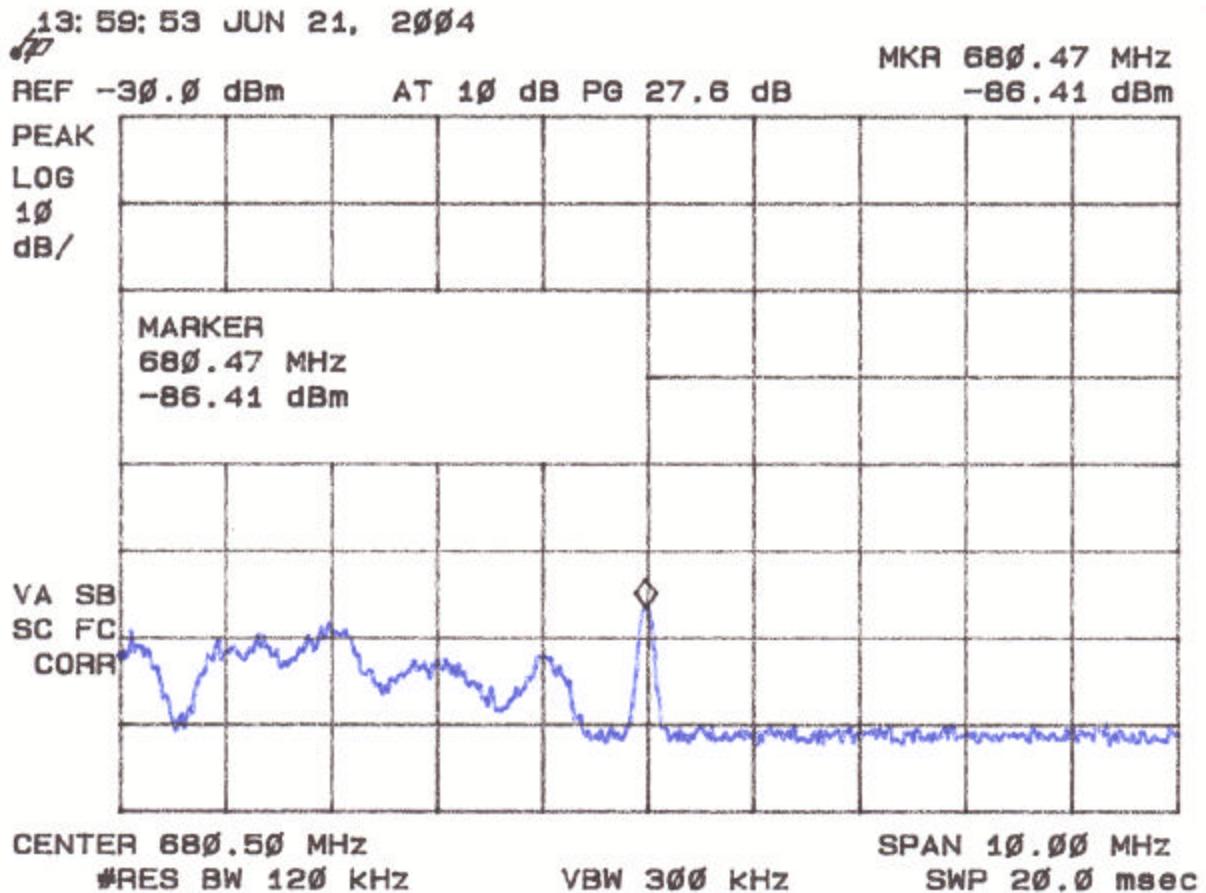


## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 6c – (Low Channel)



FIELD STRENGTH OF SPURIOUS RADIATION  
Figure 6d – (Low Channel)



## FIELD STRENGTH OF SPURIOUS RADIATION

Table 4b

**Test Date:** March 23, 2004  
**UST Project:** 04-0043  
**Customer:** RELM Wireless Incorporated  
**Model:** DPHX51

## Mid Channel

EUT Frequency (MHz)	EUT Measured Power (dBm)	Substitution Antenna (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Output power (dBm)	Output power limit (dBm)	Margin (dB)
310.18	-69.7	-41.5	1.5	0.38	-40.38	-19.98	-20.40
465.28	-75.35	-46.2	1.1	0.49	-45.59	-19.98	-25.61
620.3	-74.25	-45.9	-0.6	0.59	-47.09	-19.98	-27.11
775.5	-85.28	-49.7	-1.3	0.68	-51.68	-19.98	-31.7

LIMITS (Part 22, 78, and 90) = -19.98 dBm

50+ 10 Log(6.05 (power in watts)) = 57.8 (dB) below the fundamental

6.05W = +37.82 dBm

37.82 dBm - 57.8dB = -19.98 dBm

## SAMPLE CALCULATIONS:

Substitution Antenna (dBm) + Antenna Gain (dBi) - Cable Loss (dB) = Output Power (dBm)

-41.5 (dBm) + 1.5 (dBi) - 0.38 (dB) = -40.38 (dBm)

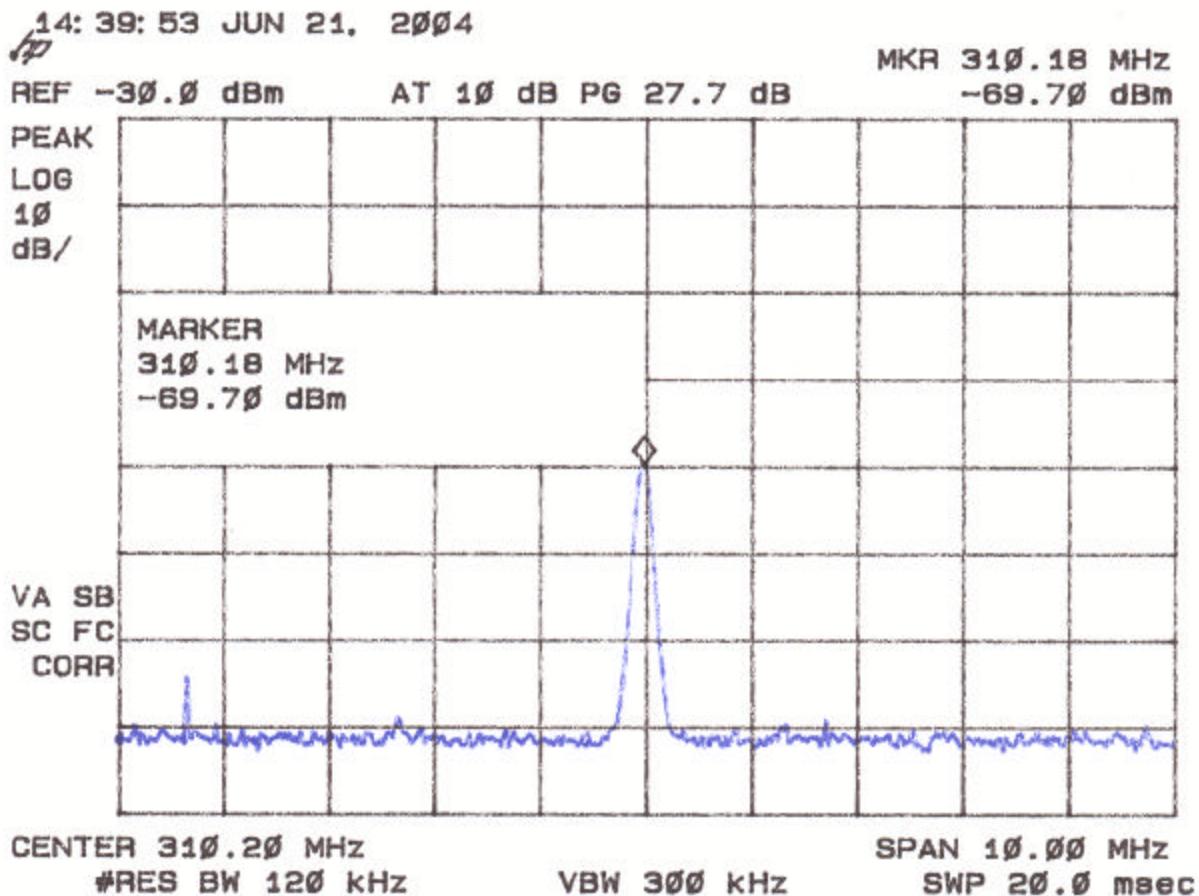
Tested by

Signature: David P. Blethen

Name: David Blethen

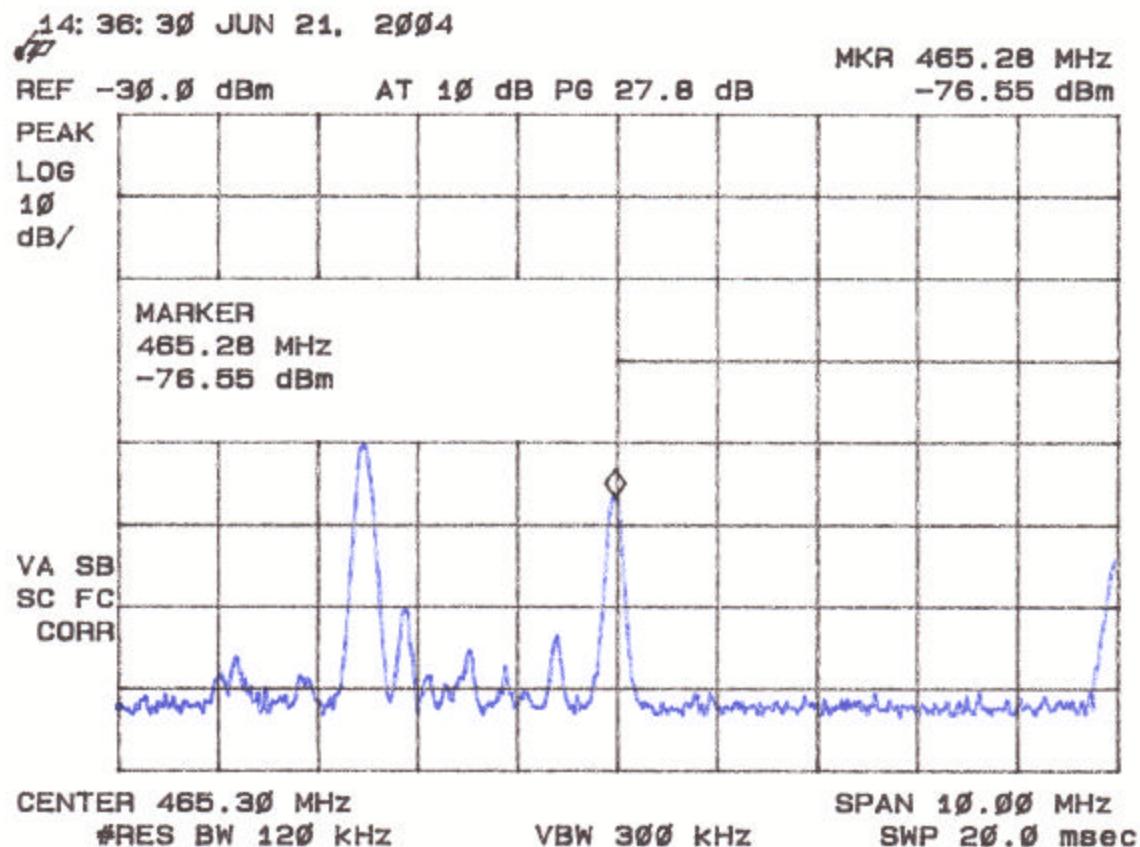
## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 7a – (Middle Channel)



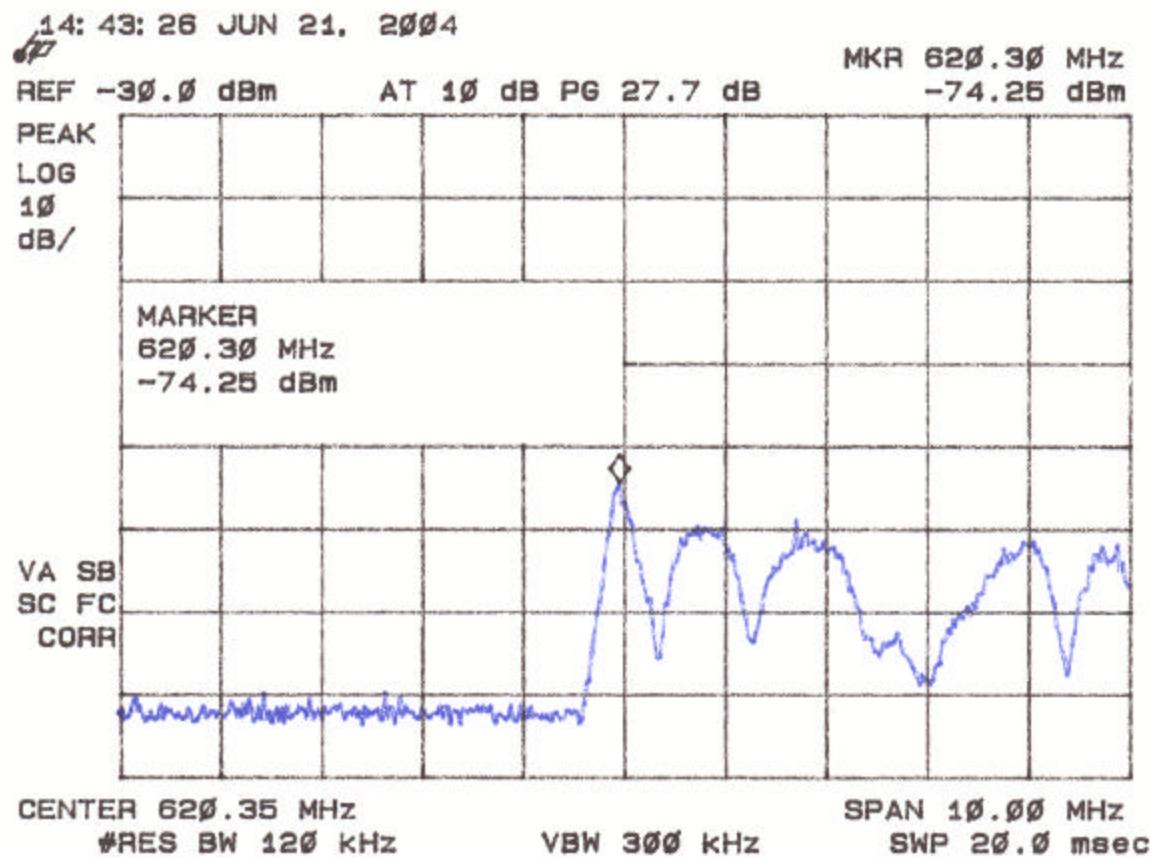
## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 7b – (Middle Channel)



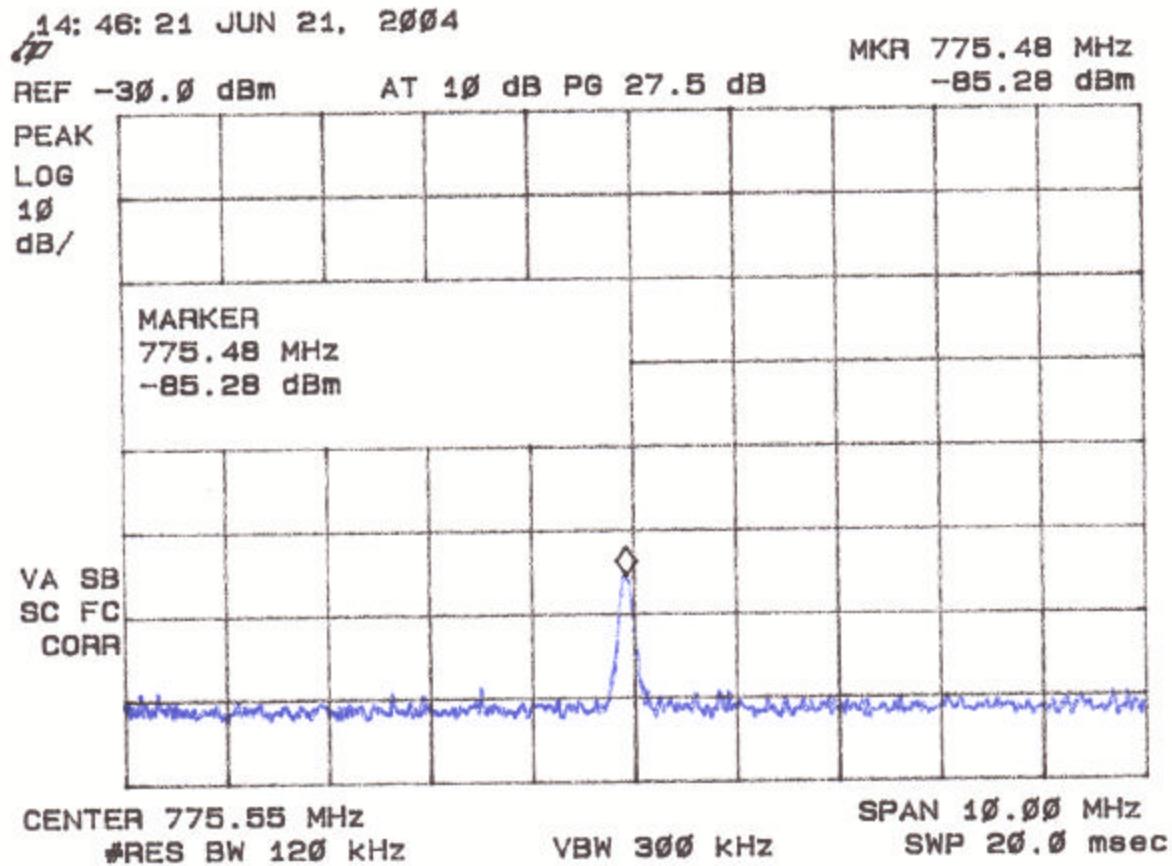
## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 7c – (Middle Channel)



## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 7d – (Middle Channel)



## FIELD STRENGTH OF SPURIOUS RADIATION

Table 4c

**Test Date:** March 23, 2004  
**UST Project:** 04-0043  
**Customer:** RELM Wireless Incorporated  
**Model:** DPHX51

## High Channel

EUT Frequency (MHz)	EUT Measured Power (dBm)	Substitution Antenna (dBm)	Antenna Gain (dBi)	Cable Loss (dB)	Output power (dBm)	Output power limit (dBm)	Margin (dB)
347.75	-72.99	-45.2	1.8	0.4	-43.8	-19.98	-23.82
521.08	-78.83	-49.7	-0.4	0.53	-50.03	-19.98	-30.65
695.55	-79.76	-47.2	-0.8	0.6	-48.6	-19.98	-28.6

LIMITS (Part 22, 78, and 90) = -19.98 dBm

50+ 10 Log(6.05 (power in watts)) = 57.8 (dB) below the fundamental

6.05W = +37.82 dBm

37.82 dBm – 57.8dB = -19.98 dBm

## SAMPLE CALCULATIONS:

Substitution Antenna (dBm) + Antenna Gain (dBi) – Cable Loss (dB) = Output Power (dBm)

-72.99 (dBm) + 1.8 (dBi) – 0.4 (dB) = -43.8 (dBm)

Tested by

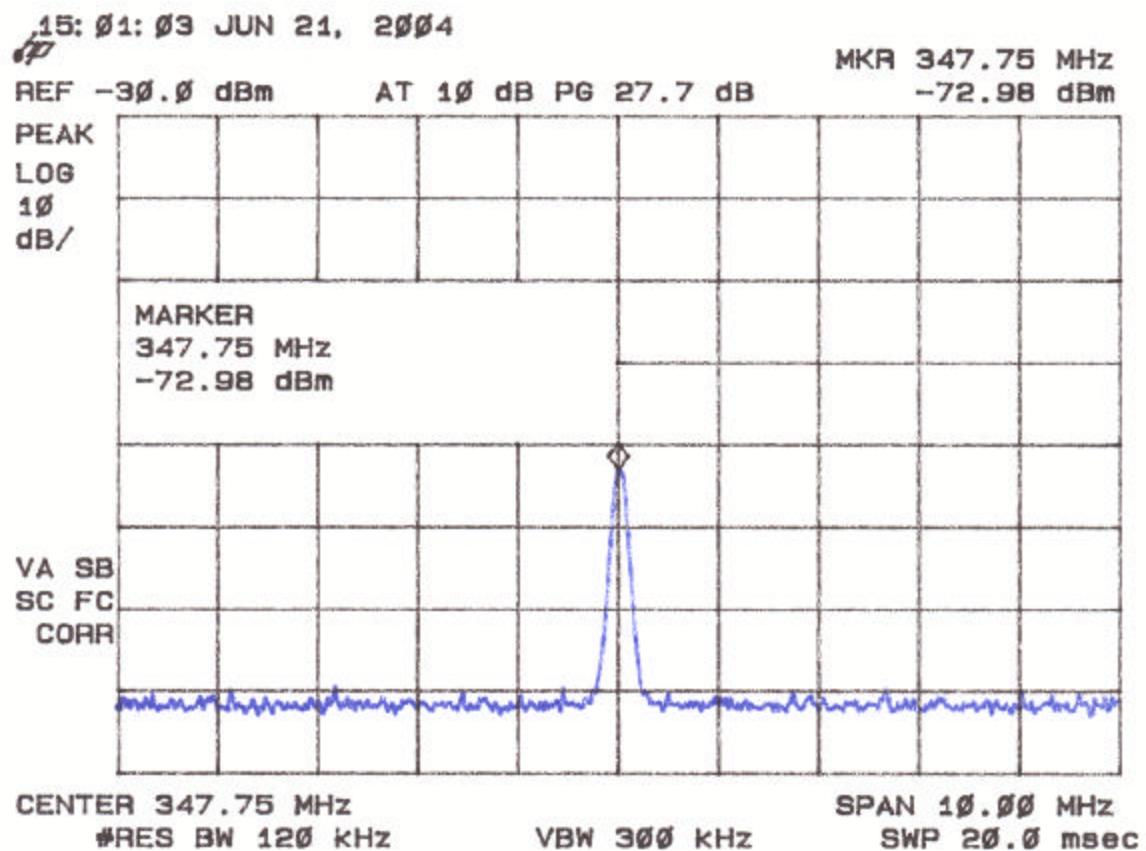
Signature:



Name: David Blethen

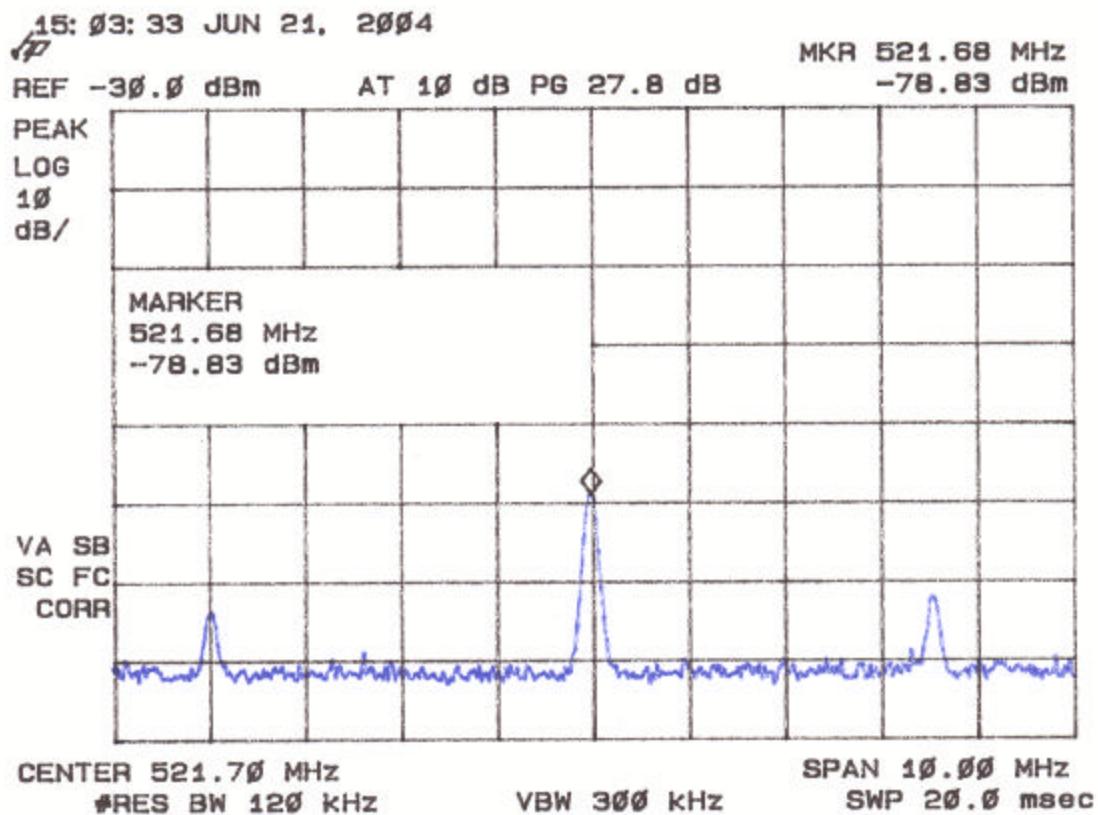
## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 8a – (High Channel)



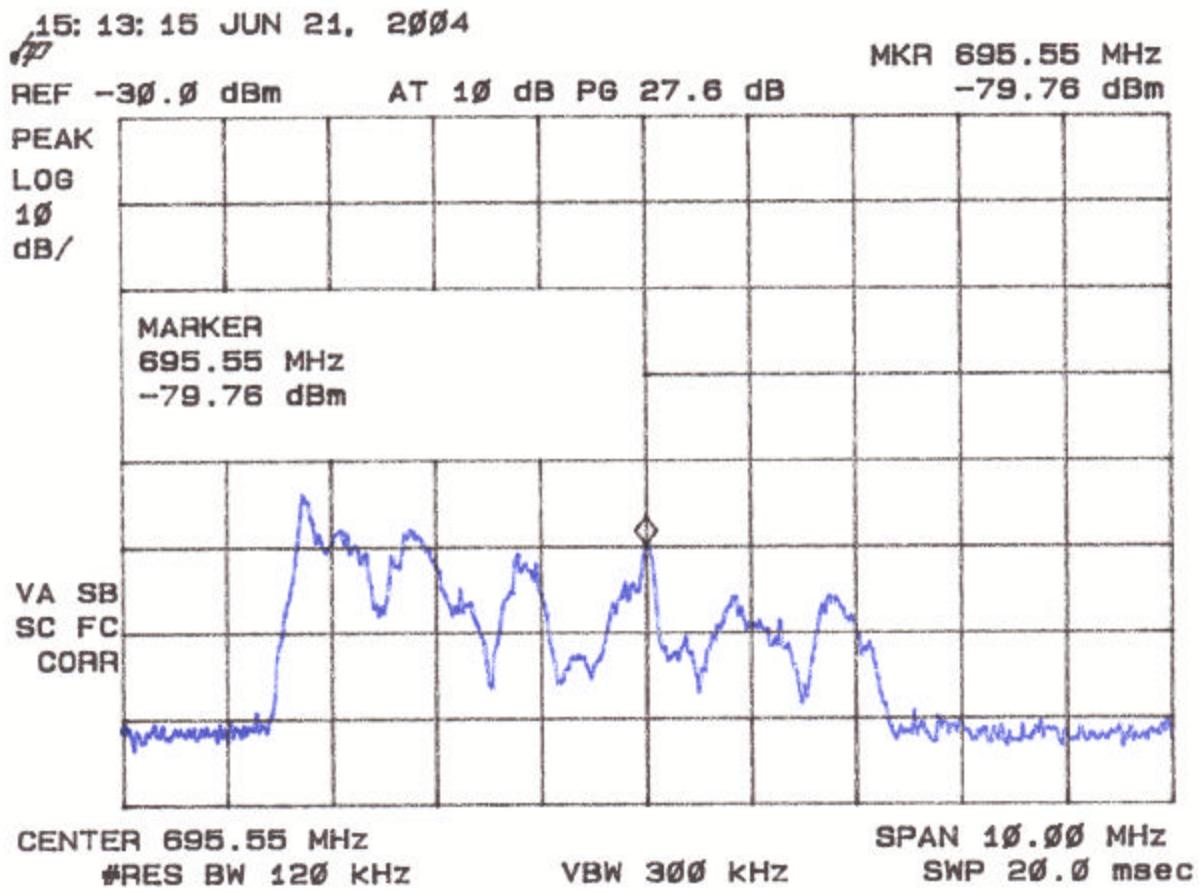
## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 8b – (High Channel)



## FIELD STRENGTH OF SPURIOUS RADIATION

Figure 8c – (High Channel)



**TABLE 5a. RADIATED EMISSIONS DATA  
CLASS B**

**Test Date:** March 23, 2004  
**UST Project:** 04-0043  
**Customer:** RELM Wireless Incorporated  
**Model:** DPHX51

**Measurements > 1 GHz**

FREQ. (GHz)	TEST DATA (dBm) @ 3m	AMP GAIN (dB)	ANT. FACTOR (dB)	CABLE LOSS (dB)	RESULTS (uV/m) @ 3m	FCC LIMITS (uV/m) @ 3m
No Emissions Detected Within This Range						

**Tested by**

**Signature:** 

**Name:** David Blethen

**TABLE 5b. RADIATED EMISSIONS DATA  
CLASS B**

**Test Date:** March 23, 2004  
**UST Project:** 04-0043  
**Customer:** RELM Wireless Incorporated  
**Model:** DPHX51

**Measurements > 1 GHz**

FREQ. (GHz)	TEST DATA (dBm) @ 3m	AMP GAIN (dB)	ANT. FACTOR (dB)	CABLE LOSS (dB)	RESULTS (uV/m) @ 3m	FCC LIMITS (uV/m) @ 3m
No Emissions Detected Within This Range						

**Tested by****Signature:** David P. Blethen**Name:** David Blethen

**TABLE 5c. RADIATED EMISSIONS DATA  
CLASS B**

**Test Date:** March 23, 2004  
**UST Project:** 04-0043  
**Customer:** RELM Wireless Incorporated  
**Model:** DPHX51

**Measurements > 1 GHz**

FREQ. (GHz)	TEST DATA (dBm) @ 3m	AMP GAIN (dB)	ANT. FACTOR (dB)	CABLE LOSS (dB)	RESULTS (uV/m) @ 3m	FCC LIMITS (uV/m) @ 3m
No Emissions Detected Within This Range						

**Tested by****Signature:** **Name:** David Blethen

**2.11 Frequency Stability (FCC Section 2.1055)**

**2.12 Transient Frequency Behavior (FCC Section 90.214)**

**Provided By Relm Wireless Incorporated in separate document  
(04-0043.Relm Tests.PDF)**