



**NOTIFICATION TEST REPORT**

**FOR THE**

**RECEIVER, CRT-CM03R**

**FCC PART 15, SUBPART B**

**CLASS B COMPLIANCE**

**DATE OF ISSUE: APRIL 13, 1998**

**PREPARED FOR:**

ComRight Technology  
21 Bartlett Ave.  
Lexington, MA 02173

**PREPARED BY:**

Monika Lopez  
CKC Laboratories, Inc.  
5473A Clouds Rest  
Mariposa, CA 95338


W.O. No: 68,361


**Report No: FB98-058**

Date of test: April 1, 1998

**APPROVED BY:**

**DOCUMENTATION CONTROL:**

  
Tracy Phillips

  
Dennis Ward  
Director of Laboratories  
CKC Laboratories

This report contains a total of 29 pages and may be reproduced in full only. Partial reproduction may only be done with the written consent of CKC Laboratories, Inc.

Page 1 of 29  
Report No: FB98-058

**ADMINISTRATIVE INFORMATION**

**DATE OF TEST:** April 1, 1998

**PURPOSE OF TEST:** To demonstrate the compliance of the Receiver, CRT-CM03R, with the FCC Part 15, Subpart B requirements for Class B devices.

**MANUFACTURER:** ComRight Technology  
21 Bartlett Ave.  
Lexington, MA 02173

**REPRESENTATIVE:** Jamie Li

**TEST LOCATION:** CKC Laboratories, Inc.  
110 Olinda Place  
Brea, CA 92621

**TEST PERSONNEL:** Stu Yamamoto

**TEST METHOD:** ANSI C63.4 1992

**FREQUENCY RANGE TESTED:** 450 kHz - 1000 MHz

**EQUIPMENT UNDER TEST:**

**Receiver**

Manuf: ComRight Technology  
Model: CRT-CM03R  
Serial: 000001  
FCC ID: XXX-CRT03A

**Power Adapter**

Manuf: Woods Industries  
Model: DPX51322  
Serial:  
FCC ID:

## TABLE OF CONTENTS

|   |    |
|---|----|
| Administrative Information .....                                | 3  |
| Summary Of Results .....  | 4  |
| Equipment Under Test (EUT) Description .....                    | 4  |
| Measurement Uncertainty .....                                   | 4  |
| Peripheral Devices .....  | 4  |
| Report Of Measurements .....                                    | 5  |
| Table 1: Six Highest Radiated Emission Levels.....              | 5  |
| Table 2: Six Highest Conducted Emission Levels.....             | 6  |
| Table A : List Of Test Equipment.....                           | 7  |
| EUT Setup.....  | 8  |
| Test Instrumentation And Analyzer Settings.....                 | 9  |
| Table B : Analyzer Bandwidth Settings Per Frequency Range ..... | 9  |
| Spectrum Analyzer Detector Functions .....                      | 10 |
| Peak.....   | 10 |
| Quasi-Peak .....  | 10 |
| Average .....   | 10 |
| Test Methods.....   | 11 |
| Radiated Emissions Testing.....                                 | 11 |
| Conducted Emissions Testing.....                                | 12 |
| Sample Calculations.....  | 12 |
| Appendix A : Information About The Equipment Under Test.....    | 13 |
| I/O Ports .....   | 14 |
| Crystal Oscillators.....  | 14 |
| Printed Circuit Boards.....                                     | 14 |
| Required EUT Changes To Comply .....                            | 14 |
| Cable Information .....   | 15 |
| Equipment Configuration Block Diagram .....                     | 16 |
| Photograph Showing Radiated Emissions .....                     | 17 |
| Photograph Showing Radiated Emissions .....                     | 18 |
| Photograph Showing Conducted Emissions .....                    | 19 |
| Photograph Showing Conducted Emissions .....                    | 20 |
| Appendix B : Measurement Data Sheets .....                      | 21 |

## SUMMARY OF RESULTS

The ComRight Technology Receiver, CRT-CM03R, was tested in accordance with ANSI C63.4 1992 for compliance with the Class B requirements of Part 15, Subpart B of the FCC Rules.

As received, the above equipment was found to be fully compliant with the Class B limits of FCC Part 15, Subpart B for both radiated and conducted emissions.

## EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT is a receiver. It receives data from a transmitter which monitors temperature.

## MEASUREMENT UNCERTAINTY

Associated with data in this report is a  $\pm 4$ dB measurement uncertainty.

## PERIPHERAL DEVICES

The EUT was tested with the following peripheral devices:

### Printer

Manuf: HP  
Model: 2225C+  
Serial: 2843S28841  
FCC ID: DSI6XU2225

### Keyboard

Manuf: NMB  
Model: RT5158TW  
Serial: B2663101  
FCC ID:

### Mouse

Manuf: Logitech  
Model: M-CQ38  
Serial: LT554205822  
FCC ID: DZLM04

### Modem

Manuf: Hayes  
Model: 6802US  
Serial: A00768023303  
FCC ID: BFJ9D9 6802US

### Computer

Manuf: Intel  
Model: S100EDZ8FLC  
Serial: A05721230  
FCC ID: EJMBATTAHITI

### Transmitter

Manuf: ComRight Technology  
Model: CRT-CM03T  
Serial: 000001  
FCC ID: Pending

## REPORT OF MEASUREMENTS

The following Tables 1 and 2 report the six highest radiated and conducted emissions levels recorded during the tests performed on the Receiver, CRT-CM03R. The data sheets from which these tables were compiled are contained in Appendix B.

**Table 1: Six Highest Radiated Emission Levels**

| FREQUENCY<br>MHz | METER<br>READING<br>dB $\mu$ V | CORRECTION FACTORS |           |             |            | CORRECTED<br>READING<br>dB $\mu$ V/m | SPEC<br>LIMIT<br>dB $\mu$ V/m | MARGIN<br>dB | NOTES |
|------------------|--------------------------------|--------------------|-----------|-------------|------------|--------------------------------------|-------------------------------|--------------|-------|
|                  |                                | Ant<br>dB          | Amp<br>dB | Cable<br>dB | Dist<br>dB |                                      |                               |              |       |
| 36.240           | 65.0                           | -0.5               | -28.1     | 1.0         |            | 37.4                                 | 40.0                          | -2.6         | VDQ   |
| 52.217           | 54.3                           | 10.3               | -28.2     | 1.1         |            | 37.5                                 | 40.0                          | -2.5         | VQ    |
| 95.244           | 55.7                           | 10.7               | -28.1     | 1.7         |            | 40.0                                 | 43.5                          | -3.5         | VQ    |
| 110.023          | 53.7                           | 13.8               | -28.1     | 1.9         |            | 41.3                                 | 43.5                          | -2.2         | VQ    |
| 113.099          | 52.3                           | 14.4               | -28.1     | 1.9         |            | 40.5                                 | 43.5                          | -3.0         | VQ    |
| 113.679          | 52.9                           | 14.5               | -28.1     | 1.9         |            | 41.2                                 | 43.5                          | -2.3         | VQ    |

Test Method: ANSI C63.4 1992  
Spec Limit : FCC Class B  
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization  
V = Vertical Polarization  
N = No Polarization  
D = Dipole Reading  
Q = Quasi Peak Reading  
A = Average Reading

COMMENTS: The receiver is placed stand alone on the tabletop. The EUT is receiving temperature data from the transmitter. Connected to the receiver serial port is a computer which is acting as a terminal. Connected to the computer are two modems, a printer, a keyboard, and a mouse. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%.

Table 2: Six Highest Conducted Emission Levels

| FREQUENCY<br>MHz | METER<br>READING<br>dBμV | CORRECTION FACTORS |  |  |  | CORRECTED<br>READING<br>dBμV | SPEC<br>LIMIT<br>dBμV | MARGIN<br>dB | NOTES |
|------------------|--------------------------|--------------------|--|--|--|------------------------------|-----------------------|--------------|-------|
|                  |                          | Lisn<br>dB         |  |  |  |                              |                       |              |       |
| 0.463649         | 35.5                     | 0.0                |  |  |  | 35.5                         | 48.0                  | -12.5        | B     |
| 0.641849         | 38.1                     | 0.0                |  |  |  | 38.1                         | 48.0                  | -9.9         | W     |
| 25.828580        | 39.3                     | 0.0                |  |  |  | 39.3                         | 48.0                  | -8.7         | B     |
| 26.451180        | 37.0                     | 0.0                |  |  |  | 37.0                         | 48.0                  | -11.0        | B     |
| 28.916680        | 38.5                     | 0.0                |  |  |  | 38.5                         | 48.0                  | -9.5         | B     |
| 29.539280        | 42.9                     | 0.0                |  |  |  | 42.9                         | 48.0                  | -5.1         | B     |

Test Method: ANSI C63.4 1992  
Spec Limit : FCC Class B  
Test Distance: No Distance

NOTES: Q = Quasi Peak Reading  
A = Average Reading  
B = Black Lead  
W = White Lead

COMMENTS: The receiver is placed stand alone on the tabletop. The EUT is receiving temperature data from the transmitter. Connected to the receiver serial port is a computer which is acting as a terminal. Connected to the computer are two modems, a printer, a keyboard, and a mouse. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 20°C Humidity: 40%.

**TABLE A**

**LIST OF TEST EQUIPMENT**

**Brea VCCI Acceptance No. R-301 & C-314**

1. Spectrum Analyzer, Hewlett Packard, Model No. 8568A, S/N 2049A01287. Display 85680A S/N 2106A02109.
2. Preamp, Hewlett Packard, Model No. 8447D, S/N 1937A02548.
3. Quasi-Peak Adapter, Hewlett Packard, Model No. 85650A, S/N - 2030A00532.
4. Biconical Antenna, A & H Systems, Model No. SAS-200/540, S/N 220.
5. Log Periodic Antenna, A & H Systems, Model No. SAS-200/516, S/N 331.
6. LISN, Solar Electronics, Model No. 8028-50-TS-24-BNC, S/N Brea #1.
7. LISN, Solar Electronics, Model No. 50 uH, S/N Brea #2. Calibration date:
8. Brea site calibration date: May 8, 1997. Brea site calibration due date: May 8, 1998.
9. Test software, EMI Test 2.86.

## EUT SETUP

The equipment under test (EUT) and the peripherals listed were setup in a manner that represented their normal use. Any special conditions required for the EUT to operate normally are identified in the comments that accompany Table 1 for radiated emissions, and Table 2 for conducted emissions. Additionally, a complete description of the port and I/O cable is included on the information sheets contained in Appendix A.

During radiated emissions testing, the EUT was mounted on a nonconductive, rotating table 1 meter above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters. This configuration is typical for radiated emissions testing of table top devices.

I/O cables were connected to the EUT and peripherals in the manner required for normal operation of the system. Excess cabling was bundled in the center in a serpentine fashion using 30-40 centimeter lengths.

During conducted emissions testing, the EUT was located 80 centimeters above the conducting ground plane on the same nonconducting table as was used for radiated testing. The metal plane was grounded to the earth through the green wire safety ground. Power to the Power Adapter was provided via 3 meters of shielded power cable from a filter grounded to the metal plane to a LISN. The LISN was also grounded to the plane and attached to the LISN was a 4 ganged grounded outlet whose source was also shielded and 60 cm in length. All other objects were kept a minimum of 1 meter away from the EUT during the conducted test.



## TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Table A were used to collect both the radiated and conducted emissions data for the Receiver, CRT-CM03R. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. All antennas were located at a distance of 3 meters from the edge of the EUT. Conducted emissions tests required the use of the FCC type LISN's.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, a reference level of 100 dB $\mu$ V and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dB $\mu$ V, and a vertical scale of 10 dB per division.

TABLE B : ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE

| TEST                | BEGINNING FREQUENCY | ENDING FREQUENCY | BANDWIDTH SETTING |
|---------------------|---------------------|------------------|-------------------|
| CONDUCTED EMISSIONS | 450 kHz             | 30 MHz           | 9 kHz             |
| RADIATED EMISSIONS  | 30 MHz              | 1000 MHz         | 120 kHz           |

## **SPECTRUM ANALYZER DETECTOR FUNCTIONS**

The notes that accompany the measurements contained in Tables 1 and 2 indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in Table 1 or Table 2. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data for the Receiver, CRT-CM03R.

### **Peak**

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

### **Quasi-Peak**

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP 85650A Quasi-Peak Adapter for the HP 8568B Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

### **Average**

When the frequencies exceed 1 GHz, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

## TEST METHODS

The radiated and conducted emissions data of the Receiver, CRT-CM03R, was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the "Sample Calculations". The corrected data was then compared to the FCC Part 15, Subpart B, Class B emissions limits to determine compliance.

Preliminary and final measurements were taken in order to better ensure that all emissions from the EUT were found and maximized.

### Radiated Emissions Testing

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode with the I/O cables and line cords facing the antenna. The frequency range of 30 MHz - 88 MHz was then scanned with the biconical antenna located about 1.5 meter above the ground plane in the vertical configuration. During this scan, the turntable was rotated and all peaks which were at or near the limit were recorded. The frequency range of 100 - 300 MHz was scanned with the biconical antenna in the same manner, and the peaks recorded. Lastly, a scan of the FM band from 88 - 110 MHz was made, using a reduced resolution bandwidth and a reduced frequency span. The biconical antenna was changed to the horizontal polarity and the above steps were repeated. After changing to the log periodic antenna in the horizontal configuration, the frequency range of 300 - 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 - 1000 MHz was again scanned. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

For the final radiated scan, the equipment was again positioned with its I/O and power cables facing the antenna. A thorough scan of all frequencies was manually made using a small frequency span, rotating the turntable as needed. Comparison with the previously recorded measurements was then made.

Using the peak readings from both scans as a guide, the test engineer then maximized the readings with respect to the table rotation, antenna height and configuration of the peripherals and cables. Maximizing of the cables was achieved by monitoring the spectrum analyzer on a closed circuit television monitor while the EUT cables were being moved and rearranged on the EUT table for maximum emissions. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

### Conducted Emissions Testing

For conducted emissions testing, a 30 to 50 second sweep time was used for automated measurements in the frequency bands of 450 kHz to 1.705 MHz, 1.705 MHz to 3 MHz, and 3 MHz to 30 MHz. All readings within 20 dB of the limit were recorded. At frequencies where the recorded emissions were close to the limit, further investigation was performed manually at a slower sweep rate.

Tables 1 and 2 show the corrected values of the six highest readings obtained for the ComRight Technology Receiver, CRT-CM03R.

### **SAMPLE CALCULATIONS**

The basic spectrum analyzer reading was converted using correction factors as shown in the six highest emissions readings in Tables 1 and 2. For radiated emissions in dB $\mu$ V/m, the spectrum analyzer reading in dB $\mu$ V was corrected by using the following formula:

$$\begin{aligned} &\text{Meter reading (dB}\mu\text{V)} \\ &+ \text{Antenna Factor (dB)} \\ &+ \text{Cable Loss (dB)} \\ &- \text{Distance Correction (dB)} \\ &- \text{Pre-amplifier Gain (dB)} \\ &= \text{Corrected Reading (dB}\mu\text{V/m)} \end{aligned}$$

This reading was then compared to the applicable specification limit to determine compliance. For conducted emissions, no correction factors were needed when 50  $\mu$ H LISN's were used.

**APPENDIX A**  
**INFORMATION ABOUT THE EQUIPMENT UNDER TEST**

### INFORMATION ABOUT THE EQUIPMENT UNDER TEST

|                            |                            |
|----------------------------|----------------------------|
| Test Software:             | Central Monitoring Program |
| Power Supply Manufacturer: | Wood Industries            |
| Power Supply Part Number:  | DPX 351322                 |

The DC power cord is removable and is NOT shielded

Line voltage used during testing: 120V 60Hz to power adapter

### I/O PORTS

| Type   | # |
|--------|---|
| Serial | 1 |

### CRYSTAL OSCILLATORS

| Type    | Freq. In MHz |
|---------|--------------|
| Crystal | 3.6864       |

### PRINTED CIRCUIT BOARDS

| Function | Model & Rev | Clocks, MHz | Layers | Location   |
|----------|-------------|-------------|--------|------------|
| Receiver | CRT-CM03R02 | 3.6864      | 2      | In chassis |

### REQUIRED EUT CHANGES TO COMPLY:

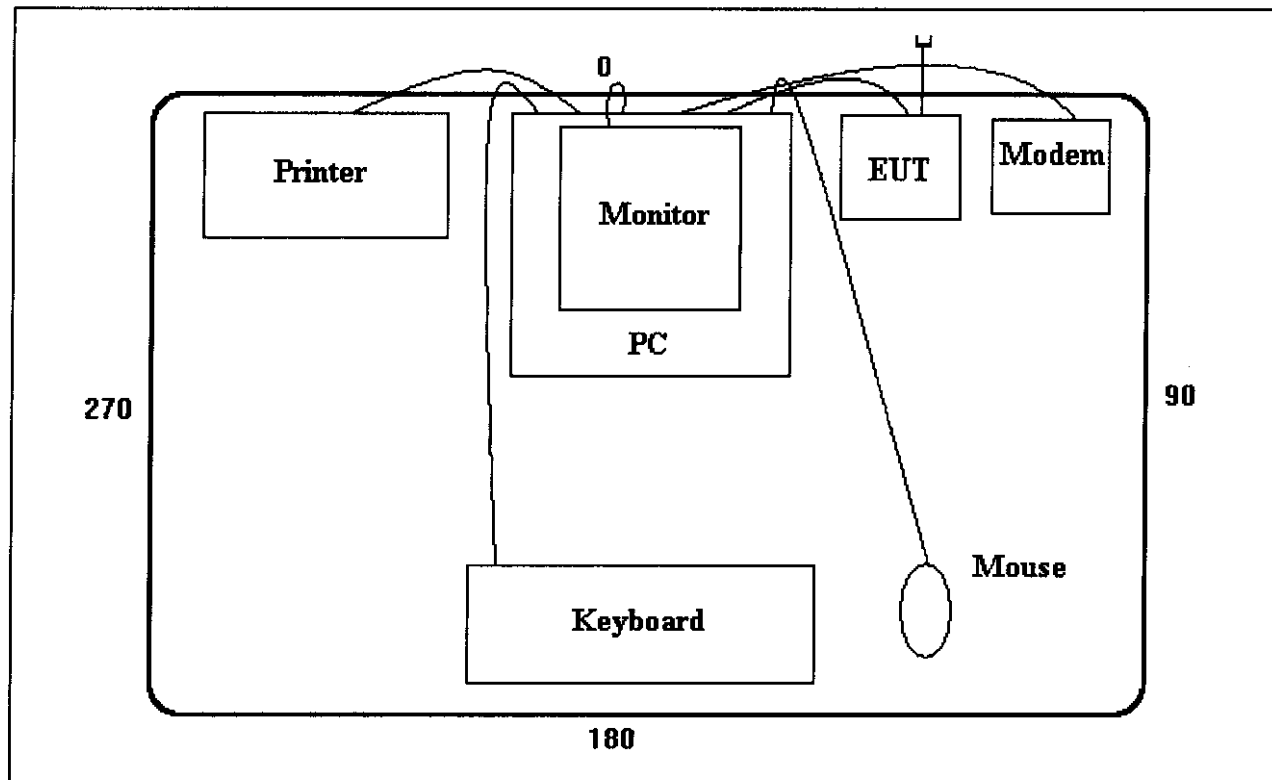
- Removed three wire filter from DC plus lead and replaced it with a 120 $\mu$ H inductor.
- Installed a 120 $\mu$ H inductor in DC minus lead.

### CABLE INFORMATION

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| Cable #: 1                        | Cable(s) of this type: 1          |
| Cable Type: Serial                | Shield Type: Aluminized Mylar     |
| Construction: Round               | Length In Meters: 2               |
| Connected To End (1): EUT         | Connected To End (2): PC          |
| Connector At End (1): DB 9        | Connector At End (2): DB 9        |
| Shield Grounded At (1): Connector | Shield Grounded At (2): Connector |
| Part Number:                      | Number of Conductors: 9           |
| Notes:                            |                                   |

Cable Routing For Worst Case Emissions:  
Cable length only allows routing as shown in photograph.

**EQUIPMENT CONFIGURATION BLOCK DIAGRAM**



Receiver CRT-CM03R

NOTES:



**APPENDIX B**  
**MEASUREMENT DATA SHEETS**

Test Location: CKC LABORATORIES INC • 110 N. OLINDA PL. • BREA, CA 92823 • 714-993-6112

Customer: **ComRight Technology**

Date: Apr-01-98

Specification: **FCC B RADIATED**

Time: 12:17

Test Type: **Maximized Emissions**

Sequence#: 1

Equipment: **Receiver**

Manufacturer: **ComRight Technology**

Tested By: **Stu Yamamoto**

Model: **CRT-CM03R**

S/N: **000001**

**Equipment Under Test (\* = EUT):**

| Function      | Manufacturer        | Model #   | S/N    |
|---------------|---------------------|-----------|--------|
| Receiver*     | ComRight Technology | CRT-CM03R | 000001 |
| Power Adapter | Woods Industries    | DPX351322 |        |

**Support Devices:**

| Function    | Manufacturer        | Model #     | S/N          |
|-------------|---------------------|-------------|--------------|
| Printer     | HP                  | 2225C+      | 2843S28841   |
| Keyboard    | NMB                 | RT5158TW    | B2663101     |
| Mouse       | Logitech            | M-CQ38      | LT554205822  |
| Modem       | Hayes               | 6802US      | A00768023303 |
| Computer    | Intel               | S100EDZ8FLC | A05721230    |
| Transmitter | ComRight Technology | CRT-CM03T   | 000001       |

**Test Conditions / Notes:**

The receiver is placed stand alone on the tabletop. The EUT is receiving temperature data from the transmitter. Connected to the receiver serial port is a computer which is acting as a terminal. Connected to the computer are two modems, a printer, a keyboard, and a mouse. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%.

**Measurement Data:**

Sorted by Margin

Test Distance: 3 Meters

| # | Freq<br>MHz | Rdng<br>dBμV | AMP CABLE BICON |      |       |    | Dist<br>dB | Corr<br>dBμV/m | Spec<br>dBμV/m | Margin<br>dB | Polar |
|---|-------------|--------------|-----------------|------|-------|----|------------|----------------|----------------|--------------|-------|
|   |             |              | dB              | dB   | dB    | dB |            |                |                |              |       |
| 1 | 110.023     | 53.7         | -28.1           | +1.9 | +13.8 |    | +0.0       | 41.3           | 43.5           | -2.2         | Vert  |
|   | Quasi Peak  |              | +0.0            |      |       |    |            |                |                |              |       |
| 2 | 113.679     | 52.9         | -28.1           | +1.9 | +14.5 |    | +0.0       | 41.2           | 43.5           | -2.3         | Vert  |
|   | Quasi Peak  |              | +0.0            |      |       |    |            |                |                |              |       |
| 3 | 52.217      | 54.3         | -28.2           | +1.1 | +10.3 |    | +0.0       | 37.5           | 40.0           | -2.5         | Vert  |
|   | Quasi Peak  |              | +0.0            |      |       |    |            |                |                |              |       |
| 4 | 36.240      | 65.0         | -28.1           | +1.0 | +0.0  |    | +0.0       | 37.4           | 40.0           | -2.6         | Vert  |
|   | Dipole QP   |              | -0.5            |      |       |    |            |                |                |              |       |
| 5 | 109.991     | 53.1         | -28.1           | +1.9 | +13.8 |    | +0.0       | 40.7           | 43.5           | -2.8         | Horiz |
|   | Quasi Peak  |              | +0.0            |      |       |    |            |                |                |              |       |
| 6 | 113.099     | 52.3         | -28.1           | +1.9 | +14.4 |    | +0.0       | 40.5           | 43.5           | -3.0         | Vert  |
|   | Quasi Peak  |              | +0.0            |      |       |    |            |                |                |              |       |
| 7 | 95.244      | 55.7         | -28.1           | +1.7 | +10.7 |    | +0.0       | 40.0           | 43.5           | -3.5         | Vert  |
|   | Quasi Peak  |              | +0.0            |      |       |    |            |                |                |              |       |

|    |            |      |       |      |       |      |      |      |      |       |
|----|------------|------|-------|------|-------|------|------|------|------|-------|
| 8  | 51.606     | 53.0 | -28.2 | +1.1 | +10.5 | +0.0 | 36.3 | 40.0 | -3.7 | Vert  |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 9  | 36.856     | 63.5 | -28.1 | +1.0 | +0.0  | +0.0 | 36.1 | 40.0 | -3.9 | Vert  |
|    | Dipole QP  |      | -0.3  |      |       |      |      |      |      |       |
| 10 | 117.979    | 50.5 | -28.1 | +1.9 | +15.3 | +0.0 | 39.6 | 43.5 | -3.9 | Vert  |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 11 | 48.535     | 51.6 | -28.2 | +1.1 | +11.6 | +0.0 | 36.1 | 40.0 | -3.9 | Vert  |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 12 | 111.234    | 51.7 | -28.1 | +1.9 | +14.1 | +0.0 | 39.6 | 43.5 | -3.9 | Vert  |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 13 | 117.365    | 50.5 | -28.1 | +1.9 | +15.2 | +0.0 | 39.5 | 43.5 | -4.0 | Vert  |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 14 | 98.929     | 54.2 | -28.1 | +1.8 | +11.6 | +0.0 | 39.5 | 43.5 | -4.0 | Vert  |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 15 | 116.744    | 50.1 | -28.1 | +1.9 | +15.1 | +0.0 | 39.0 | 43.5 | -4.5 | Vert  |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 16 | 110.602    | 51.2 | -28.1 | +1.9 | +14.0 | +0.0 | 39.0 | 43.5 | -4.5 | Vert  |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 17 | 31.326     | 64.3 | -28.1 | +0.9 | +0.0  | +0.0 | 35.4 | 40.0 | -4.6 | Vert  |
|    | Dipole QP  |      | -1.7  |      |       |      |      |      |      |       |
| 18 | 113.681    | 50.5 | -28.1 | +1.9 | +14.5 | +0.0 | 38.8 | 43.5 | -4.7 | Horiz |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 19 | 114.289    | 55.5 | -28.1 | +1.9 | +0.0  | +0.0 | 38.6 | 43.5 | -4.9 | Vert  |
|    | Dipole QP  |      | +9.3  |      |       |      |      |      |      |       |
| 20 | 109.410    | 51.0 | -28.1 | +1.9 | +13.7 | +0.0 | 38.5 | 43.5 | -5.0 | Vert  |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 21 | 109.405    | 50.5 | -28.1 | +1.9 | +13.7 | +0.0 | 38.0 | 43.5 | -5.5 | Horiz |
|    | Quasi Peak |      | +0.0  |      |       |      |      |      |      |       |
| 22 | 35.630     | 61.4 | -28.1 | +1.0 | +0.0  | +0.0 | 33.7 | 40.0 | -6.3 | Vert  |
|    | Dipole QP  |      | -0.6  |      |       |      |      |      |      |       |
| 23 | 37.470     | 60.9 | -28.1 | +1.0 | +0.0  | +0.0 | 33.6 | 40.0 | -6.4 | Vert  |
|    | Dipole QP  |      | -0.2  |      |       |      |      |      |      |       |
| 24 | 36.254     | 60.4 | -28.1 | +1.0 | +0.0  | +0.0 | 32.8 | 40.0 | -7.2 | Horiz |
|    | Dipole QP  |      | -0.5  |      |       |      |      |      |      |       |
| 25 | 54.065     | 56.7 | -28.2 | +1.1 | +0.0  | +0.0 | 32.6 | 40.0 | -7.4 | Vert  |
|    | Dipole QP  |      | +3.0  |      |       |      |      |      |      |       |
| 26 | 54.683     | 56.5 | -28.2 | +1.1 | +0.0  | +0.0 | 32.5 | 40.0 | -7.5 | Vert  |
|    | Dipole QP  |      | +3.1  |      |       |      |      |      |      |       |
| 27 | 36.854     | 57.7 | -28.1 | +1.0 | +0.0  | +0.0 | 30.3 | 40.0 | -9.7 | Horiz |
|    | Dipole QP  |      | -0.3  |      |       |      |      |      |      |       |
| 28 | 35.632     | 57.8 | -28.1 | +1.0 | +0.0  | +0.0 | 30.1 | 40.0 | -9.9 | Horiz |
|    | Dipole QP  |      | -0.6  |      |       |      |      |      |      |       |
| 29 | 31.330     | 59.0 | -28.1 | +0.9 | +0.0  | +0.0 | 30.1 | 40.0 | -9.9 | Horiz |
|    | Dipole     |      | -1.7  |      |       |      |      |      |      |       |

Test Location: CKC LABORATORIES INC • 110 N. OLINDA PL. • BREA, CA 92823 • 714-993-6112

Customer: **ComRight Technology**  
 Specification: **FCC B COND**  
 Test Type: **Conducted Emissions**  
 Equipment: **Receiver**  
 Manufacturer: **ComRight Technology**  
 Model: **CRT-CM03R**  
 S/N: **000001**

Date: Apr-01-98  
 Time: 12:20  
 Sequence#: 2  
 Tested By: Stu Yamamoto

**Equipment Under Test (\* = EUT):**

| Function      | Manufacturer        | Model #   | S/N    |
|---------------|---------------------|-----------|--------|
| Receiver*     | ComRight Technology | CRT-CM03R | 000001 |
| Power Adapter | Woods Industries    | DPX351322 |        |

**Support Devices:**

| Function    | Manufacturer        | Model #     | S/N          |
|-------------|---------------------|-------------|--------------|
| Printer     | HP                  | 2225C+      | 2843S28841   |
| Keyboard    | NMB                 | RT5158TW    | B2663101     |
| Mouse       | Logitech            | M-CQ38      | LT554205822  |
| Modem       | Hayes               | 6802US      | A00768023303 |
| Computer    | Intel               | S100EDZ8FLC | A05721230    |
| Transmitter | ComRight Technology | CRT-CM03T   | 000001       |

**Test Conditions / Notes:**

The receiver is placed stand alone on the tabletop. The EUT is receiving temperature data from the transmitter. Connected to the receiver serial port is a computer which is acting as a terminal. Connected to the computer are two modems, a printer, a keyboard, and a mouse. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 20°C Humidity: 40%.

**Measurement Data:**

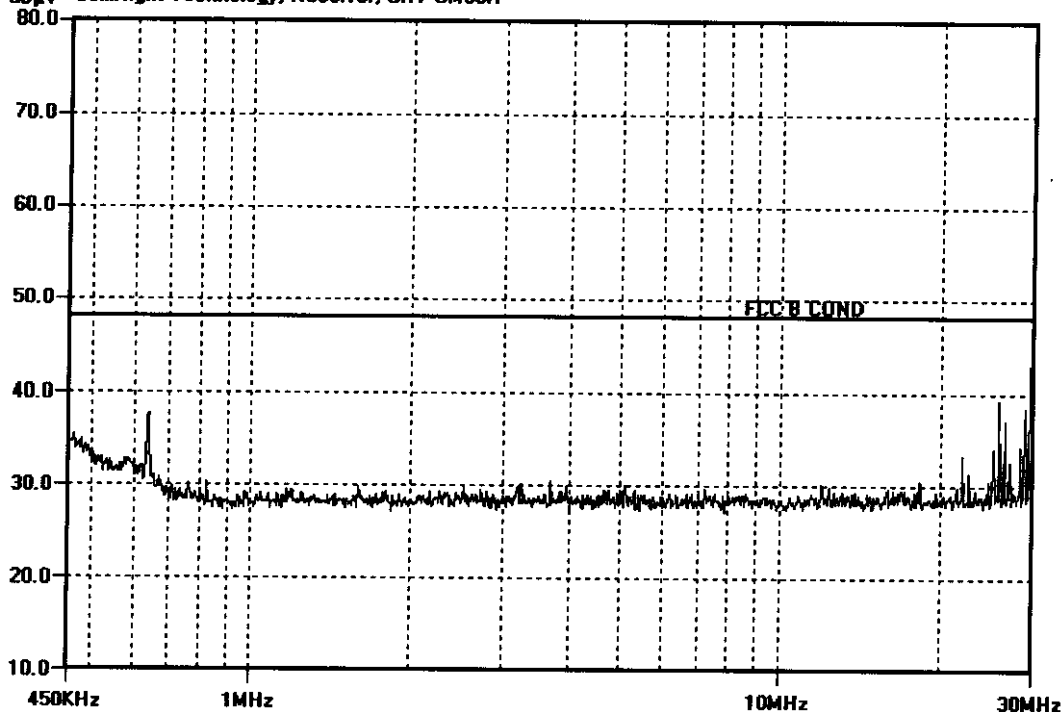
Sorted by Margin

Test Lead: Black

| # | Freq     | Rdng<br>dBμV | dB | dB | dB | dB | Dist<br>dB | Corr<br>dBμV/m | Spec<br>dBμV/m | Margin<br>dB | Polar |
|---|----------|--------------|----|----|----|----|------------|----------------|----------------|--------------|-------|
| 1 | 29.539M  | 42.9         |    |    |    |    | +0.0       | 42.9           | 48.0           | -5.1         | Black |
| 2 | 25.829M  | 39.3         |    |    |    |    | +0.0       | 39.3           | 48.0           | -8.7         | Black |
| 3 | 28.917M  | 38.5         |    |    |    |    | +0.0       | 38.5           | 48.0           | -9.5         | Black |
| 4 | 639.574k | 37.7         |    |    |    |    | +0.0       | 37.7           | 48.0           | -10.3        | Black |
| 5 | 26.451M  | 37.0         |    |    |    |    | +0.0       | 37.0           | 48.0           | -11.0        | Black |
| 6 | 463.649k | 35.5         |    |    |    |    | +0.0       | 35.5           | 48.0           | -12.5        | Black |
| 7 | 452.654k | 35.0         |    |    |    |    | +0.0       | 35.0           | 48.0           | -13.0        | Black |

|    |          |      |      |      |      |       |       |
|----|----------|------|------|------|------|-------|-------|
| 8  | 478.815k | 34.9 | +0.0 | 34.9 | 48.0 | -13.1 | Black |
| 9  | 28.294M  | 34.3 | +0.0 | 34.3 | 48.0 | -13.7 | Black |
| 10 | 484.882k | 34.3 | +0.0 | 34.3 | 48.0 | -13.7 | Black |
| 11 | 25.206M  | 34.1 | +0.0 | 34.1 | 48.0 | -13.9 | Black |
| 12 | 493.981k | 34.0 | +0.0 | 34.0 | 48.0 | -14.0 | Black |
| 13 | 502.322k | 33.7 | +0.0 | 33.7 | 48.0 | -14.3 | Black |
| 14 | 22.118M  | 33.3 | +0.0 | 33.3 | 48.0 | -14.7 | Black |
| 15 | 515.213k | 33.0 | +0.0 | 33.0 | 48.0 | -15.0 | Black |

CKC LABORATORIES INC Date: Wed Apr-01-1998 Time: 12:19:41 WO#: 68361  
FCC B COND Test Lead: Black Sequence#: 2  
ComRight Technology, Receiver, CRT-CM03R



Test Location: CKC LABORATORIES INC • 110 N. OLINDA PL. • BREA, CA 92823 • 714-993-6112

Customer: **ComRight Technology**  
Specification: **FCC B COND**  
Test Type: **Conducted Emissions**  
Equipment: **Receiver**  
Manufacturer: **ComRight Technology**  
Model: **CRT-CM03R**  
S/N: **000001**

Date: Apr-01-98  
Time: 12:21  
Sequence#: 3  
Tested By: Stu Yamamoto

**Equipment Under Test (\* = EUT):**

| Function      | Manufacturer        | Model #   | S/N    |
|---------------|---------------------|-----------|--------|
| Receiver*     | ComRight Technology | CRT-CM03R | 000001 |
| Power Adapter | Woods Industries    | DPX351322 |        |

**Support Devices:**

| Function    | Manufacturer        | Model #     | S/N          |
|-------------|---------------------|-------------|--------------|
| Printer     | HP                  | 2225C+      | 2843S28841   |
| Keyboard    | NMB                 | RT5158TW    | B2663101     |
| Mouse       | Logitech            | M-CQ38      | LT554205822  |
| Modem       | Hayes               | 6802US      | A00768023303 |
| Computer    | Intel               | S100EDZ8FLC | A05721230    |
| Transmitter | ComRight Technology | CRT-CM03T   | 000001       |

**Test Conditions / Notes:**

The receiver is placed stand alone on the tabletop. The EUT is receiving temperature data from the transmitter. Connected to the receiver serial port is a computer which is acting as a terminal. Connected to the computer are two modems, a printer, a keyboard, and a mouse. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 20°C Humidity: 40%.

**Measurement Data:**

Sorted by Margin

Test Lead: White

| # | Freq     | Rdng<br>dBμV | dB | dB | dB | dB | Dist<br>dB | Corr<br>dBμV/m | Spec<br>dBμV/m | Margin<br>dB | Polar |
|---|----------|--------------|----|----|----|----|------------|----------------|----------------|--------------|-------|
| 1 | 29.514M  | 41.2         |    |    |    |    | +0.0       | 41.2           | 48.0           | -6.8         | White |
| 2 | 641.849k | 38.1         |    |    |    |    | +0.0       | 38.1           | 48.0           | -9.9         | White |
| 3 | 25.829M  | 37.2         |    |    |    |    | +0.0       | 37.2           | 48.0           | -10.8        | White |
| 4 | 28.892M  | 37.0         |    |    |    |    | +0.0       | 37.0           | 48.0           | -11.0        | White |
| 5 | 638.815k | 35.7         |    |    |    |    | +0.0       | 35.7           | 48.0           | -12.3        | White |
| 6 | 460.237k | 35.4         |    |    |    |    | +0.0       | 35.4           | 48.0           | -12.6        | White |
| 7 | 26.426M  | 35.3         |    |    |    |    | +0.0       | 35.3           | 48.0           | -12.7        | White |

|    |          |      |      |      |      |       |       |
|----|----------|------|------|------|------|-------|-------|
| 8  | 451.517k | 34.8 | +0.0 | 34.8 | 48.0 | -13.2 | White |
| 9  | 481.090k | 34.2 | +0.0 | 34.2 | 48.0 | -13.8 | White |
| 10 | 468.199k | 34.2 | +0.0 | 34.2 | 48.0 | -13.8 | White |
| 11 | 487.915k | 34.0 | +0.0 | 34.0 | 48.0 | -14.0 | White |
| 12 | 516.730k | 33.0 | +0.0 | 33.0 | 48.0 | -15.0 | White |
| 13 | 591.043k | 32.8 | +0.0 | 32.8 | 48.0 | -15.2 | White |
| 14 | 28.269M  | 32.7 | +0.0 | 32.7 | 48.0 | -15.3 | White |
| 15 | 22.118M  | 32.7 | +0.0 | 32.7 | 48.0 | -15.3 | White |



CKC LABORATORIES INC Date: Wed Apr-01-1998 Time: 12:21:15 WO#: 68361  
FCC B COND Test Lead: White Sequence#: 3  
ComRight Technology, Receiver, CRT-CM03R

