EXHIBIT D

CKC TEST REPORT

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CKC LABORATORIES, INC. Testing the Future

ACCREDITED

CERTIFICATION TEST REPORT

FOR THE

TRANSMITTER, CRT-CM03T

FCC PART 15, SUBPART C

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: **FC98-007**

Date of test: April 1, 1998

DOCUMENTATION CONTROL:

Tracy Phillips

APPROVED BY:

Dennis Ward
Director of Laboratories
CKC Laboratories

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	April 1, 1998
PURPOSE OF TEST:	To demonstrate the compliance of the Transmitter, CRT-CM03T, with the FCC Part 15, Subpart C 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 - 2000 MHz

EQUIPMENT UNDER TEST:

Transmitter

Manuf:	ComRight Technology
Model:	CRT-CM03T
Serial:	000001
FCC ID:	XXX-CRT03B

Power Adapter

Manuf:	Woods Industries
Model:	DPX351322
Serial:	
FCC ID:	

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SUMMARY OF RESULTS

The ComRight Technology Transmitter, CRT-CM03T, was tested in accordance with ANSI C63.4 (1992) for compliance with Part 15, Subpart C of the FCC Rules.

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

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT is a transmitter. It collects data such as temperature and sends it to a receiver which is connected to a PC.

MEASUREMENT UNCERTAINTY

Associated with data in this report is a ±4dB measurement uncertainty.

PERIPHERAL DEVICES

The EUT was not tested with peripheral devices.

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REPORT OF MEASUREMENTS

The following tables report the highest emissions levels recorded during the tests performed on the Transmitter, CRT-CM03T. The data sheets from which these tables were compiled are contained in Appendix B.

Table 1: Fundamental Emission Level l

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
418.014	86.1	15.8	-28.1	4.0		77.8	79.8	-2.0	HA

Test Method: ANSI C63.4 1992
Spec Limit : 15.231(b) Fundamental
Test Distance: 3 Meters

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

-28.1
19.8
-8.3
+86.1
77.8

COMMENTS: The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%. Maximum duty cycle for EUT is approximately 7.33% or -22.7dB. Maximum allowed correction is -20dB. Measurement of fundamental frequency.

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Table 2: Six Highest ~~Spurious~~ Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
835.837	44.7	22.3	-27.1	6.0		45.9	59.8	-13.9	V
835.849	51.9	22.3	-27.1	6.0		53.1	59.8	-6.7	H
1253.753	58.5	25.1	-39.6	4.5		48.5	59.8	-11.3	H
1253.769	56.5	25.1	-39.6	4.5		46.5	59.8	-13.3	V
1671.689	58.1	25.7	-38.8	5.4		50.4	59.8	-9.4	H
1671.689	55.5	25.7	-38.8	5.4		47.8	59.8	-12.0	V

Test Method: ANSI C63.4 1992
Spec Limit : 15.231 (b) Spurious Emissions
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 transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%. Measurement of spurious emission levels.

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Table 3: Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
31.326	64.3	-1.7	-28.1	0.9		35.4	40.0	-4.6	VDQ
35.016	46.5	17.9	-28.1	1.0		37.3	40.0	-2.7	VQ
38.702	47.4	16.4	-28.1	1.0		36.7	40.0	-3.3	VQ
42.390	48.9	14.5	-28.1	1.0		36.3	40.0	-3.7	VQ
77.411	55.3	7.4	-28.0	1.5		36.2	40.0	-3.8	HQ
81.093	54.2	7.6	-28.0	1.5		35.3	40.0	-4.7	HQ

Test Method: ANSI C63.4 1992
Spec Limit : FCC 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 transmitter is placed stand alone on the tabletop. The EUT is transmitting ambient temperature data. The EUT has the power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%.

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Table 4: Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB	dB	dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.637299	39.0	0.0				39.0	48.0	-9.0	B
18.407200	39.0	0.0				39.0	48.0	-9.0	B
20.250100	40.0	0.0				40.0	48.0	-8.0	B
22.117890	38.5	0.0				38.5	48.0	-9.5	B
23.960790	40.3	0.0				40.3	48.0	-7.7	B
27.671480	38.4	0.0				38.4	48.0	-9.6	B

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

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

COMMENTS: The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 20°C Humidity: 40%.

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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. High Frequency Preamp, Hewlett Packard, Model No. 83017A, S/N 3123A00532.
4. Quasi-Peak Adapter, Hewlett Packard, Model No. 85650A, S/N - 2030A00532.
5. Biconical Antenna, A & H Systems, Model No. SAS-200/540, S/N 220.
6. Log Periodic Antenna, A & H Systems, Model No. SAS-200/516, S/N 331.
7. Horn Antenna, Emco, Model No. 3115, S/N 4683.
8. LISN, Solar Electronics, Model No. 8028-50-TS-24-BNC, S/N Brea #1.
9. LISN, Solar Electronics, Model No. 50 uH, S/N Brea #2.
10. Brea site calibration date: May 8, 1997. Brea site calibration due date: May 8, 1998.
11. Test software, EMI Test 2.86.

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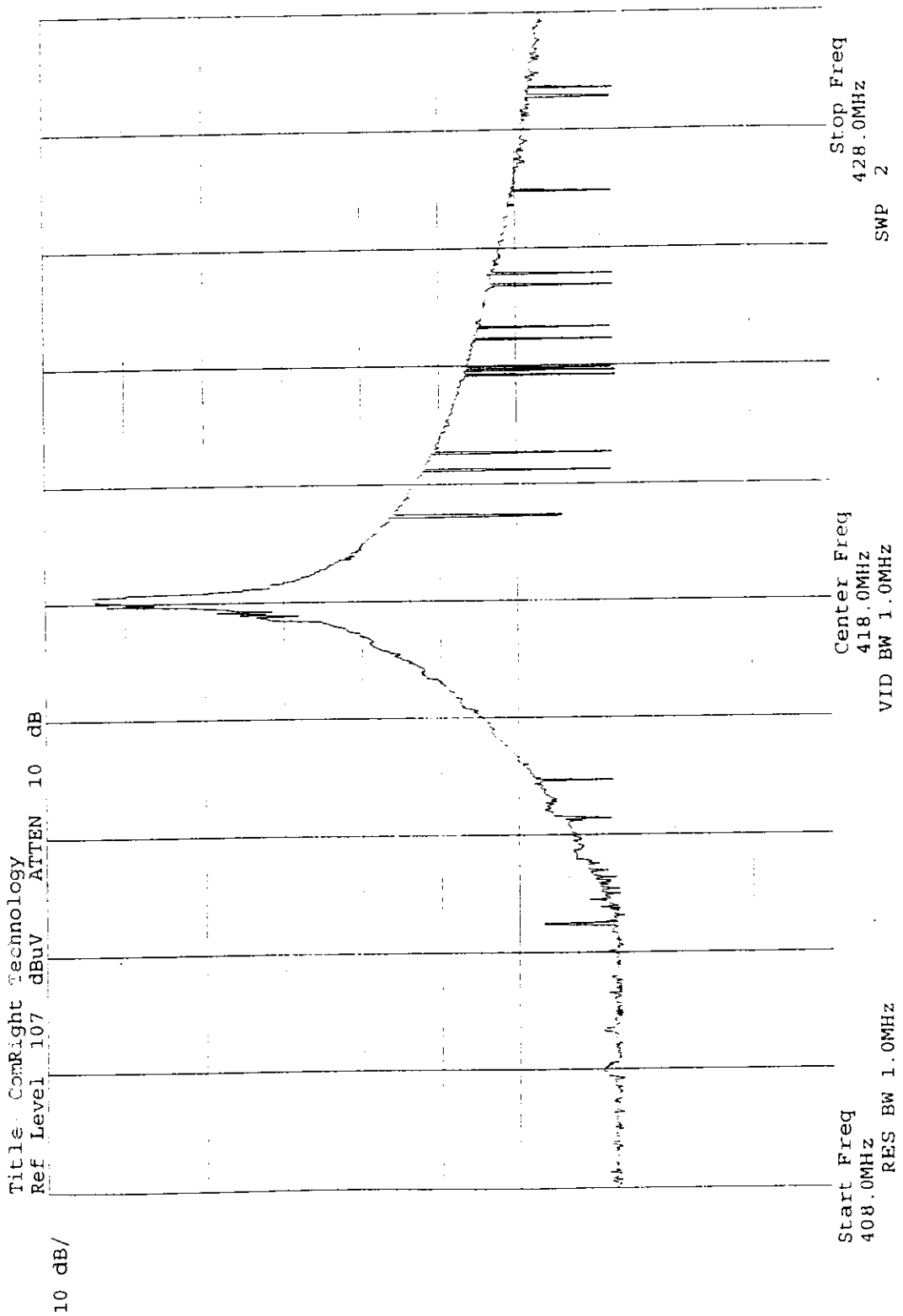
Occupied Bandwidth Plot Part 15.231(c)



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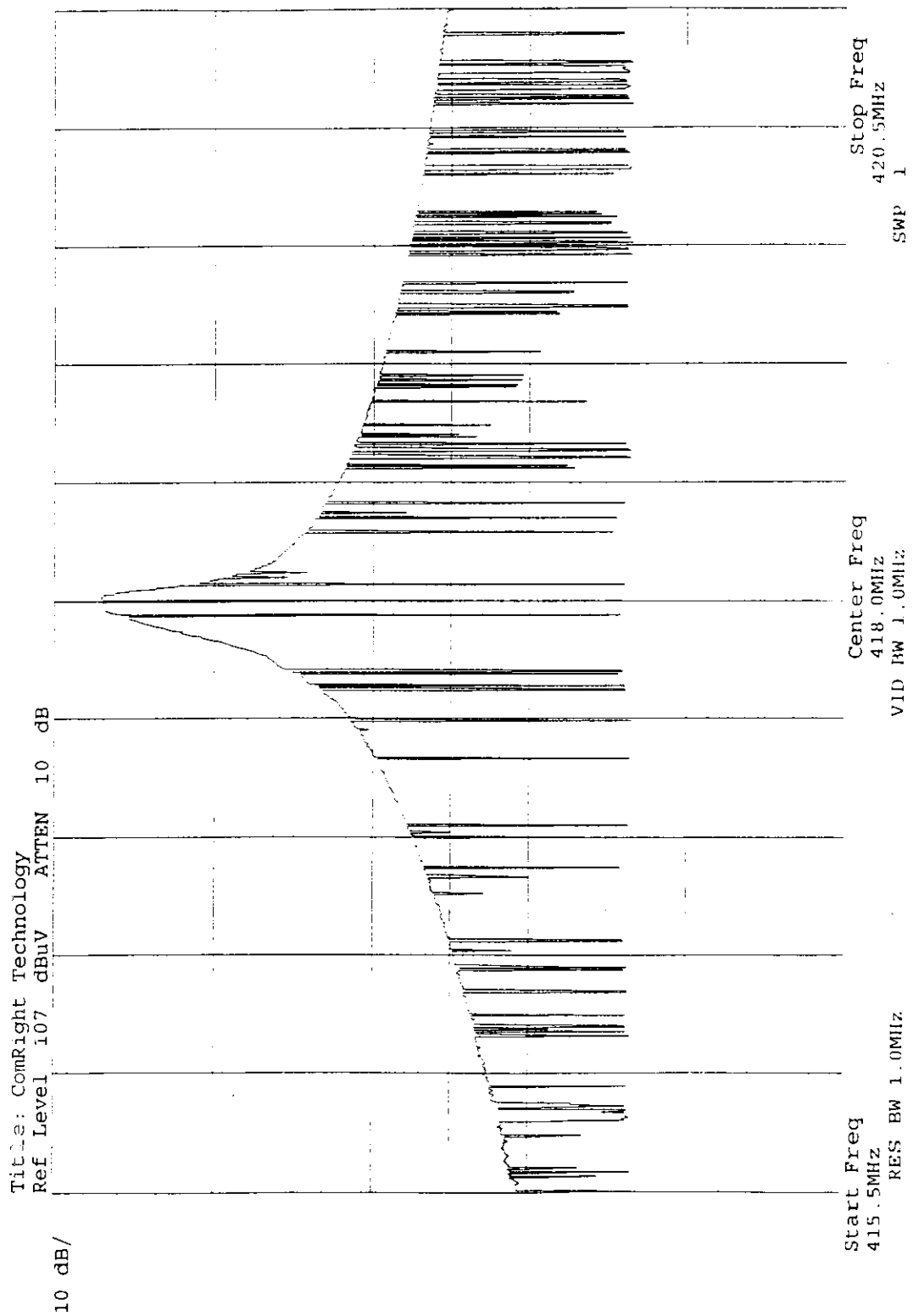
Occupied Bandwidth Plot Part 15.231(c)



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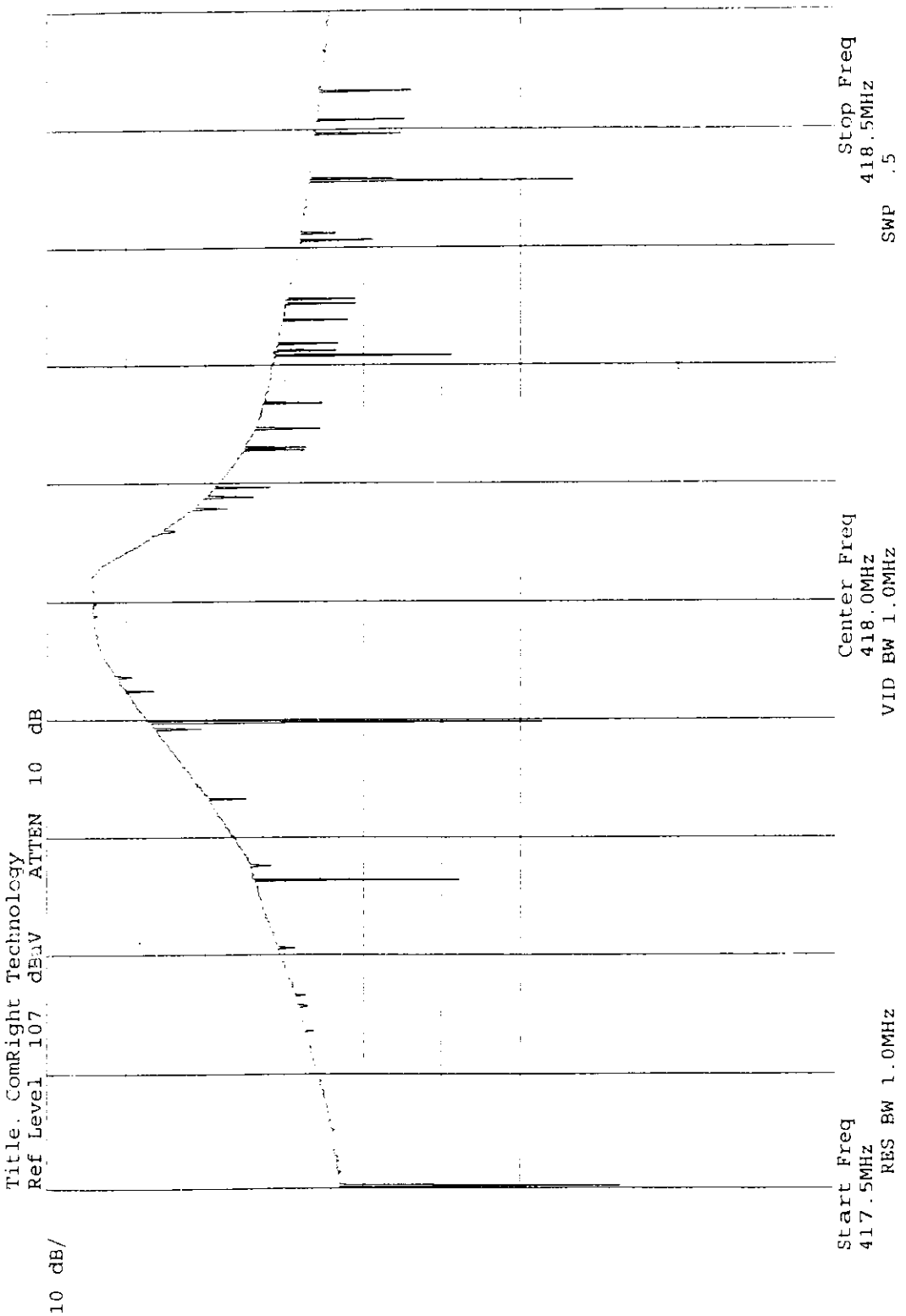
Occupied Bandwidth Plot Part 15.231(c)



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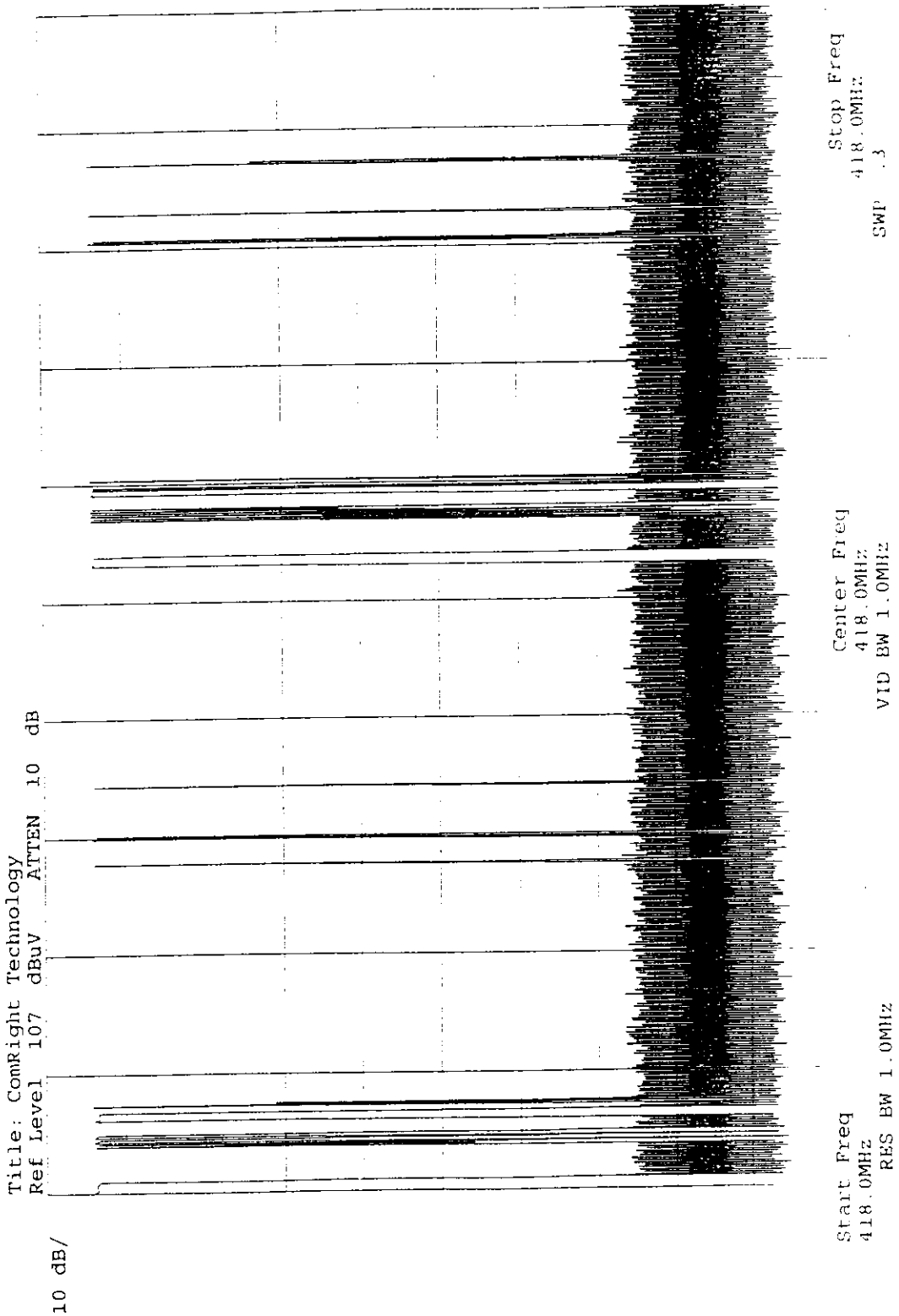
Pulse Train Plot Part 15.35(c)



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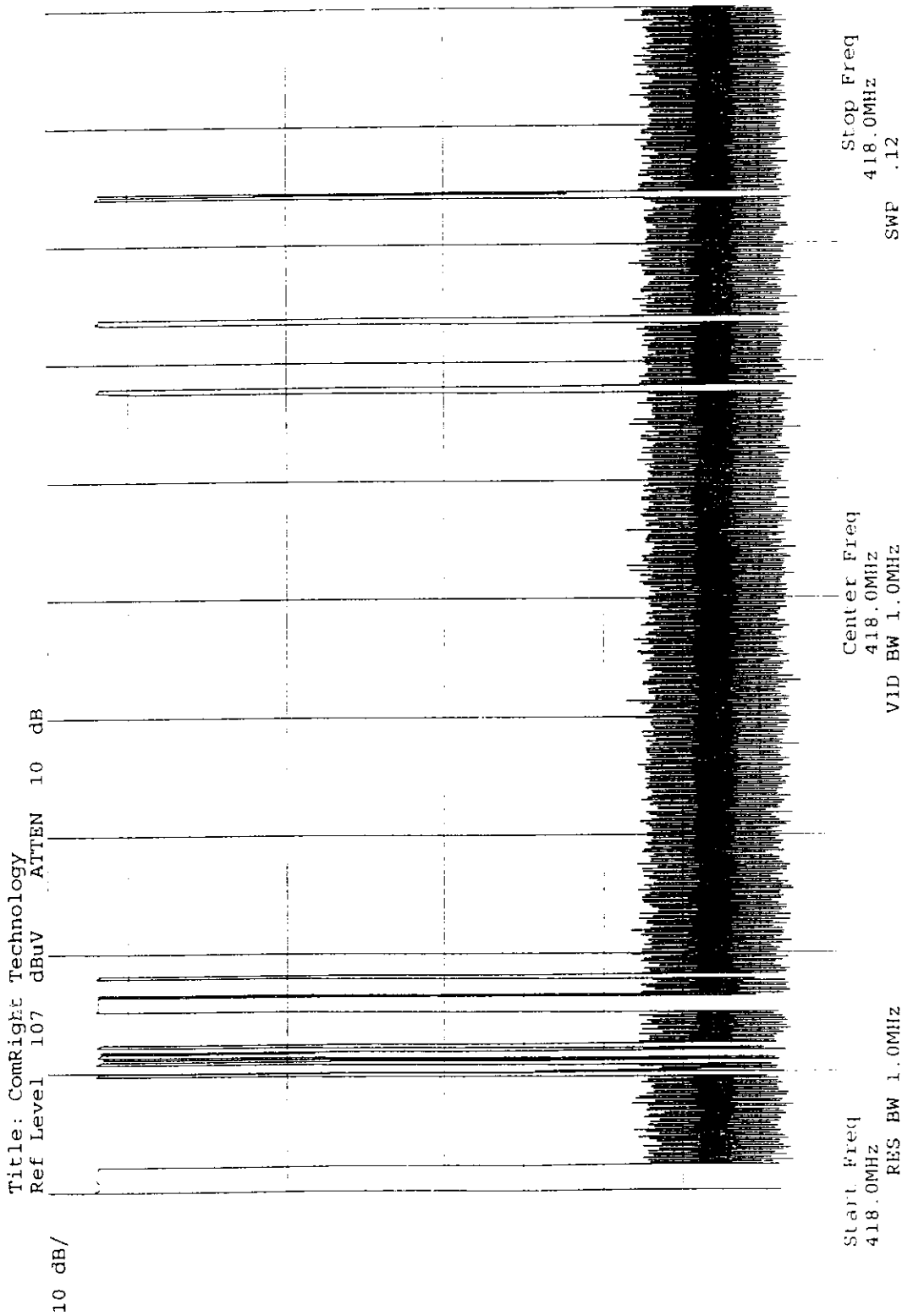
Pulse Train Plot Part 15.35(c)



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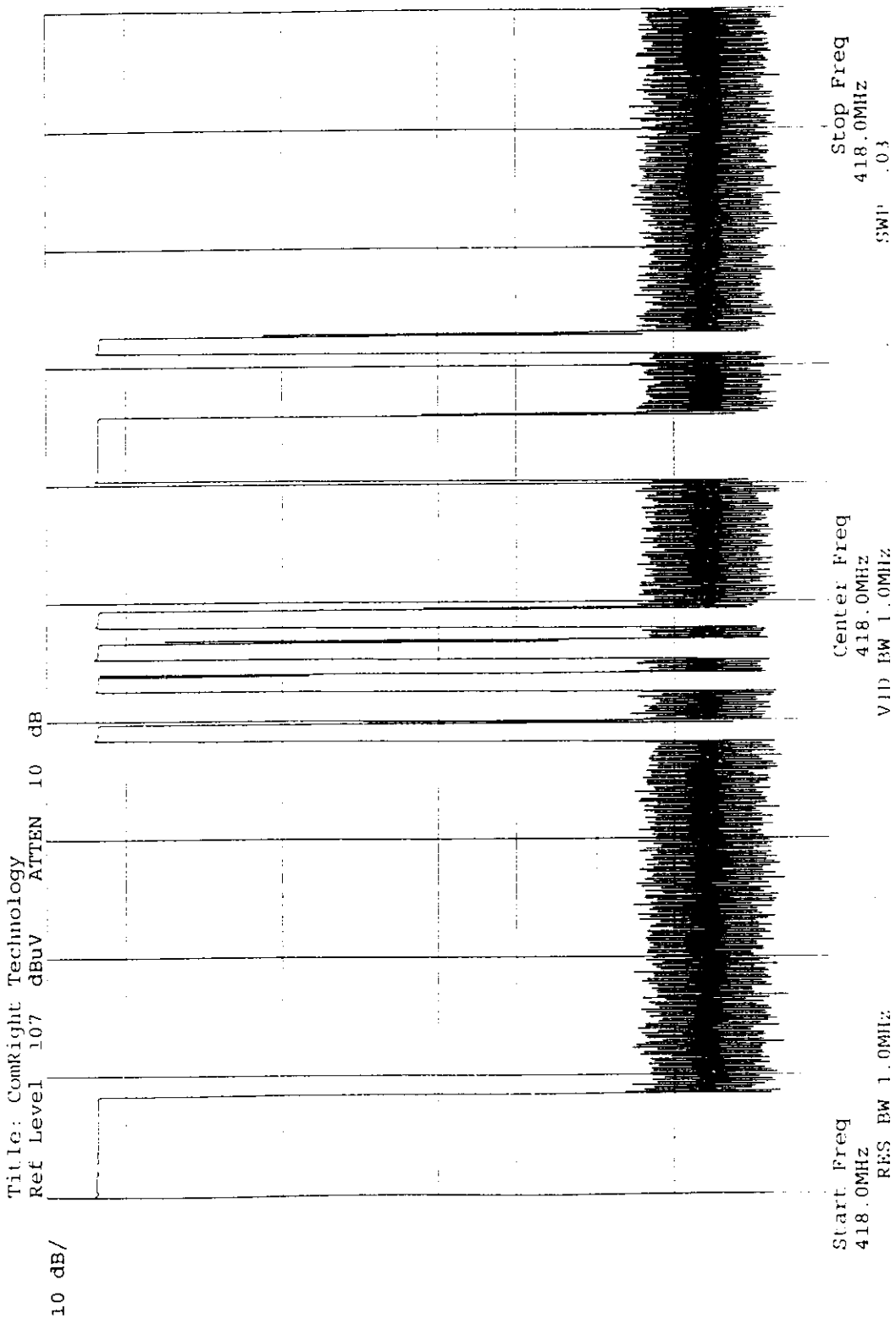
Pulse Train Plot Part 15.35(c)



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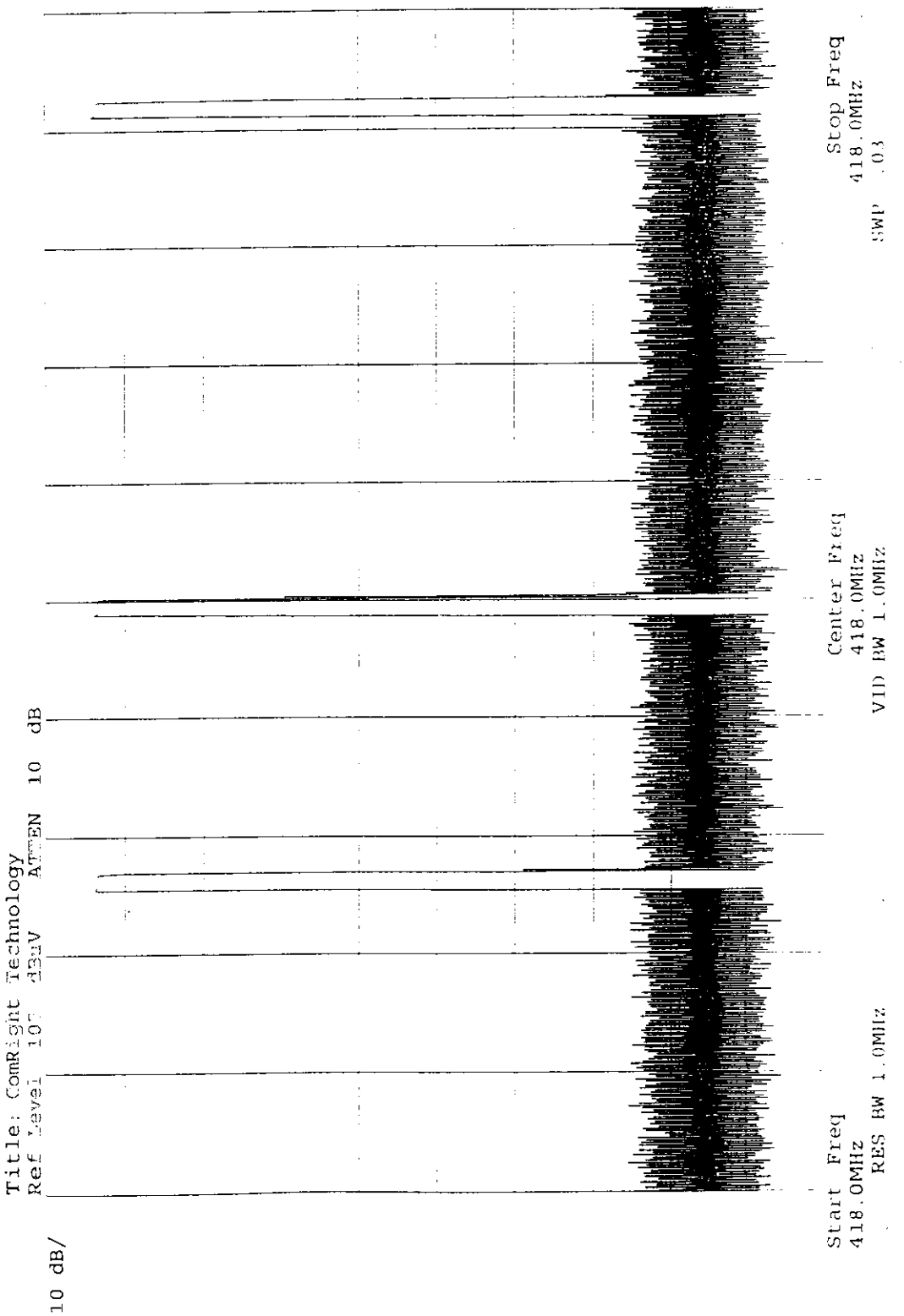
Pulse Train Plot Part 15.35(c)



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EUT SETUP

The equipment under test (EUT) was setup in a manner that represented its normal use. Any special conditions required for the EUT to operate normally are identified in the comments that accompany Tables 1 for fundamental emission level, Table 2 for spurious emissions, Table 3 for radiated emissions and Table 4 for conducted emissions.

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.

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 emissions data for the Transmitter, CRT-CM03T. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. For frequencies above 1000 MHz, the horn 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 dBμV 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 dBμV, 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	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	2000 MHz	1 MHz

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SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in Tables 1 - 4 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, Table 2, Table 3 or Table 4. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data for the Transmitter, CRT-CM03T.

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.

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TEST METHODS

The radiated and conducted emissions data of the Transmitter, CRT-CM03T, 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 C 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. The horn antenna was used to scan for frequencies above 1000 MHz. 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 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.

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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 - 4 show the corrected values of the six highest readings obtained for the ComRight Technology Transmitter, CRT-CM03T.

FCC Part 15.231(c) Occupied Bandwidth Measurements

In accordance with Part 15.231(c), the bandwidth of the emission was not wider than 0.25% of the center frequency (418 MHz).

Frequency Range of Transmitter: 418 MHz

In accordance with Part 15.231(b), the field strength of the emissions for periodic operation in the band above 70 MHz did not exceed the limits specified in 15.231(b) at 3 meters. For average emission measurements the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions were applied.

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SAMPLE CALCULATIONS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in Tables 1 - 4. For radiated emissions in dBμV/m, the spectrum analyzer reading in dBμV was corrected by using the following formula:

Meter reading (dBμV)
+ Antenna Factor (dB)
+ Cable Loss (dB)
- Distance Correction (dB)
- Pre-amplifier Gain (dB)

= Corrected Reading(dBμV/m)

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

A typical data sheet will display the following in column format:

#	Freq MHz	Rdng dBuV	Cable	Amp.	Bicon	Horn	Log	Dist	Corr dBuV/m	Spec	Margin	Polar

means reading number
Freq MHz is the frequency in MHz of the obtained reading.
Rdng dBuV is the reading obtained on the spectrum analyzer in dBμV.
Amp. is short for the preamplifier factor or gain in dB.
Bicon is the biconical antenna factor in dB.
Log is the log periodic antenna factor in dB.
Horn is the horn antenna factor in dB.
Cable is the cable loss in dB of the coaxial cable on the OATS.
Dist is the distance factor (in dB). It is used when testing at a different test distance than the one stated in the spec.
Corr dBμV/m is the corrected reading which is now in dBμV/m (field strength).
Spec is the specification limit (dB) stated in the agency's regulations.
Margin is the closeness to the specified limit in dB; + is over and - is under the limit.
Polar is the Polarity of the antenna with respect to earth.

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APPENDIX B

MEASUREMENT DATA SHEETS

5473A CLOUDS REST • MARIPOSA, CALIFORNIA 95338 • (209) 966-5240 • FAX (209) 966-4257

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

Customer:	**ComRight Technology**	Date:	Apr-01-98
Specification:	**15-231(b)**	Time:	12:14
Test Type:	**Maximized Emissions**	Sequence#:	1
Equipment:	**Transmitter**		
Manufacturer:	ComRight Technology	Tested By:	Stu Yamamoto
Model:	CRT-CM03T		
S/N:	000001		

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%. Measurement of spurious.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq	Rdng	BICON	CABLE		AMP	Dist	Corr	Spec	Margin	Polar
	MHz	dBµV	dB	dB	dB	dB	dB	dBµV/m	dBµV/m	dB	
1	835.849	51.9	-27.1	+6.0		+22.3	+0.0	53.1	59.8	-6.7	Horiz
2	835.837	44.7	-27.1	+6.0		+22.3	+0.0	45.9	59.8	-13.9	Vert

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

Customer: **ComRight Technology**
Specification: **15-231(b)**
Test Type: **Maximized Emissions**
Equipment: **Transmitter**
Manufacturer: ComRight Technology
Model: CRT-CM03T
S/N: 000001

Date: Apr-01-98
Time: 12:14
Sequence#: 1

Tested By: Stu Yamamoto

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%. Measurement of spurious.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Ampli dB	Cable dB	Cable dB	Horn dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	1671.689	58.1	-38.8	+4.8	+0.6	+25.7	+0.0	50.4	59.8	-9.4	Horiz
2	1253.753	58.5	-39.6	+4.1	+0.4	+25.1	+0.0	48.5	59.8	-11.3	Horiz
3	1671.689	55.5	-38.8	+4.8	+0.6	+25.7	+0.0	47.8	59.8	-12.0	Vert
4	1253.769	56.5	-39.6	+4.1	+0.4	+25.1	+0.0	46.5	59.8	-13.3	Vert

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

Customer: **ComRight Technology**
Specification: **FCC B RADIATED**
Test Type: **Maximized Emissions**
Equipment: **Transmitter**
Manufacturer: ComRight Technology
Model: CRT-CM03T
S/N: 000001

Date: Apr-01-98
Time: 12:12
Sequence#: 1

Tested By: Stu Yamamoto

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on the tabletop. The EUT is transmitting ambient temperature data. The EUT has the power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16° n C Humidity: 50%.

Measurement Data: Sorted by Margin — Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	AMP dB	CABLE dB	BICON dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	35.016	46.5	-28.1	+1.0	+17.9	+0.0	37.3	40.0	-2.7	Vert
	Quasi Peak		+0.0							
2	38.702	47.4	-28.1	+1.0	+16.4	+0.0	36.7	40.0	-3.3	Vert
	Quasi Peak		+0.0							
3	42.390	48.9	-28.1	+1.0	+14.5	+0.0	36.3	40.0	-3.7	Vert
	Quasi Peak		+0.0							
4	77.411	55.3	-28.0	+1.5	+7.4	+0.0	36.2	40.0	-3.8	Horiz
	Quasi Peak		+0.0							
5	31.326	64.3	-28.1	+0.9	+0.0	+0.0	35.4	40.0	-4.6	Vert
	Dipole QP		-1.7							
6	35.006	44.5	-28.1	+1.0	+17.9	+0.0	35.3	40.0	-4.7	Horiz
	Quasi Peak		+0.0							
7	81.093	54.2	-28.0	+1.5	+7.6	+0.0	35.3	40.0	-4.7	Horiz
	Quasi Peak		+0.0							
8	77.406	54.1	-28.0	+1.5	+7.4	+0.0	35.0	40.0	-5.0	Horiz
	Quasi Peak		+0.0							
9	77.406	54.0	-28.0	+1.5	+7.4	+0.0	34.9	40.0	-5.1	Vert
			+0.0							
10	81.098	53.6	-28.0	+1.5	+7.6	+0.0	34.7	40.0	-5.3	Vert
	Quasi Peak		+0.0							

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11	73.718	53.9	-28.1	+1.4	+7.3	+0.0	34.5	40.0	-5.5	Horiz
	Quasi Peak		+0.0							
12	66.356	53.8	-28.2	+1.3	+7.6	+0.0	34.5	40.0	-5.5	Vert
			+0.0							
13	84.776	52.3	-28.0	+1.5	+8.4	+0.0	34.2	40.0	-5.8	Horiz
	Quasi Peak		+0.0							
14	58.972	52.6	-28.2	+1.2	+8.5	+0.0	34.1	40.0	-5.9	Vert
			+0.0							
15	62.671	52.8	-28.2	+1.3	+7.9	+0.0	33.8	40.0	-6.2	Vert
			+0.0							
16	82.939	51.8	-28.0	+1.5	+8.0	+0.0	33.3	40.0	-6.7	Vert
			+0.0							
17	70.018	52.8	-28.2	+1.4	+7.3	+0.0	33.3	40.0	-6.7	Vert
			+0.0							
18	79.248	52.2	-28.0	+1.5	+7.4	+0.0	33.1	40.0	-6.9	Horiz
	Quasi Peak		+0.0							
19	73.734	52.5	-28.1	+1.4	+7.3	+0.0	33.1	40.0	-6.9	Vert
			+0.0							
20	84.787	50.9	-28.0	+1.5	+8.4	+0.0	32.8	40.0	-7.2	Vert
			+0.0							
21	38.698	43.2	-28.1	+1.0	+16.4	+0.0	32.5	40.0	-7.5	Horiz
	Quasi Peak		+0.0							
22	53.464	49.1	-28.2	+1.1	+10.0	+0.0	32.0	40.0	-8.0	Vert
			+0.0							
23	70.031	51.4	-28.2	+1.4	+7.3	+0.0	31.9	40.0	-8.1	Horiz
			+0.0							
24	84.787	49.7	-28.0	+1.5	+8.4	+0.0	31.6	40.0	-8.4	Vert
			+0.0							
25	46.071	46.0	-28.2	+1.1	+12.6	+0.0	31.5	40.0	-8.5	Vert
	Quasi Peak		+0.0							
26	66.358	50.1	-28.2	+1.3	+7.6	+0.0	30.8	40.0	-9.2	Horiz
			+0.0							
27	31.330	59.0	-28.1	+0.9	+0.0	+0.0	30.1	40.0	-9.9	Horiz
	Dipole		-1.7							
28	88.465	47.1	-28.0	+1.6	+9.1	+0.0	29.8	43.5	-13.7	Horiz
	Quasi Peak		+0.0							
29	86.638	43.7	-28.0	+1.6	+8.8	+0.0	26.1	40.0	-13.9	Vert
			+0.0							
30	108.735	39.3	-28.1	+1.9	+13.6	+0.0	26.7	43.5	-16.8	Vert
			+0.0							

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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: **Transmitter**
Manufacturer: ComRight Technology
Model: CRT-CM03T
S/N: 000001

Date: Apr-01-98
Time: 12:11
Sequence#: 3

Tested By: Stu Yamamoto

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. 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 dBµV	dB	dB	dB	dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	23.961M	40.3					+0.0	40.3	48.0	-7.7	Black
2	20.250M	40.0					+0.0	40.0	48.0	-8.0	Black
3	18.407M	39.0					+0.0	39.0	48.0	-9.0	Black
4	637.299k	39.0					+0.0	39.0	48.0	-9.0	Black
5	22.118M	38.5					+0.0	38.5	48.0	-9.5	Black
6	27.671M	38.4					+0.0	38.4	48.0	-9.6	Black
7	16.621M	35.4					+0.0	35.4	48.0	-12.6	Black
8	29.514M	35.0					+0.0	35.0	48.0	-13.0	Black
9	25.804M	34.6					+0.0	34.6	48.0	-13.4	Black
10	458.341k	34.5					+0.0	34.5	48.0	-13.5	Black

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11	464.408k	34.4	+0.0	34.4	48.0	-13.6	Black
12	509.905k	34.1	+0.0	34.1	48.0	-13.9	Black
13	471.991k	34.0	+0.0	34.0	48.0	-14.0	Black
14	490.948k	33.9	+0.0	33.9	48.0	-14.1	Black
15	14.773M	33.7	+0.0	33.7	48.0	-14.3	Black

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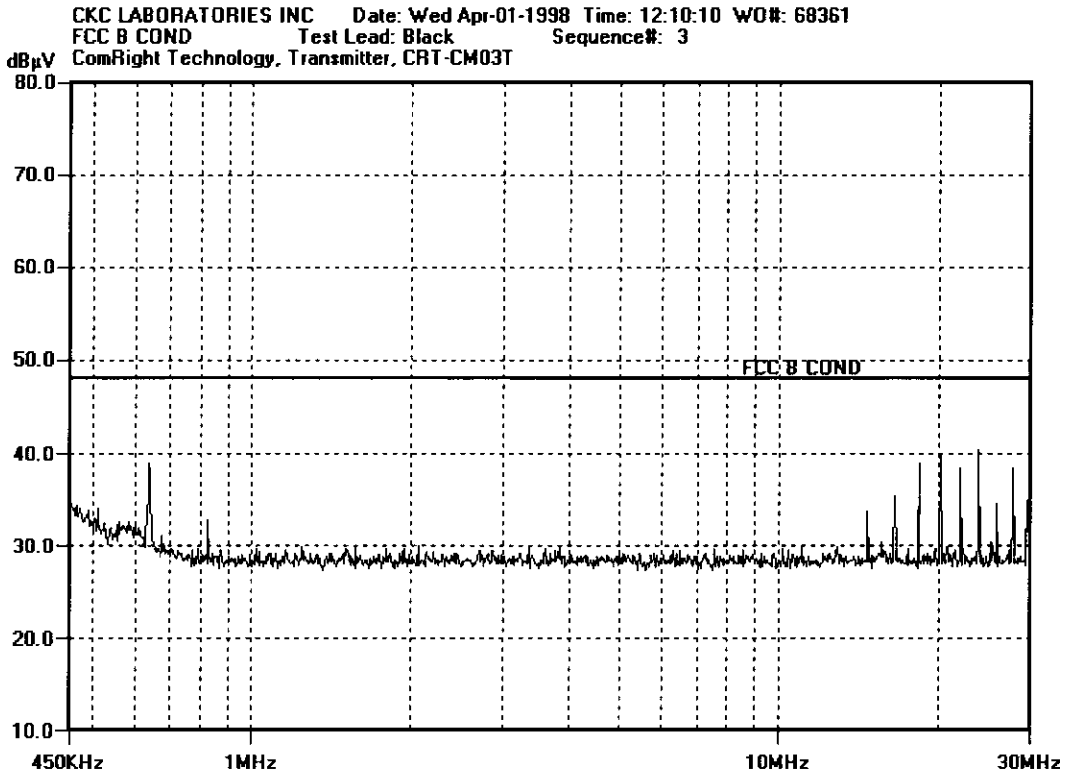

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Test Location: CKC LABORATORIES INC • 110 N. OLINDA PL. • BREA, CA 92823 • 714-993-6112

Customer: **ComRight Technology**
Specification: **FCC B COND**
Test Type: **Conducted Emissions**
Equipment: **Transmitter**
Manufacturer: ComRight Technology
Model: CRT-CM03T
S/N: 000001

Date: Apr-01-98
Time: 12:12
Sequence#: 4
Tested By: Stu Yamamoto

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. 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 dBµV	dB	dB	dB	dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	20.250M	38.8					+0.0	38.8	48.0	-9.2	White
2	18.407M	38.5					+0.0	38.5	48.0	-9.5	White
3	23.961M	37.4					+0.0	37.4	48.0	-10.6	White
4	22.118M	37.0					+0.0	37.0	48.0	-11.0	White
5	638.057k	36.7					+0.0	36.7	48.0	-11.3	White
6	27.647M	36.0					+0.0	36.0	48.0	-12.0	White
7	16.621M	35.2					+0.0	35.2	48.0	-12.8	White
8	466.682k	34.8					+0.0	34.8	48.0	-13.2	White
9	14.773M	34.4					+0.0	34.4	48.0	-13.6	White
10	457.583k	34.1					+0.0	34.1	48.0	-13.9	White

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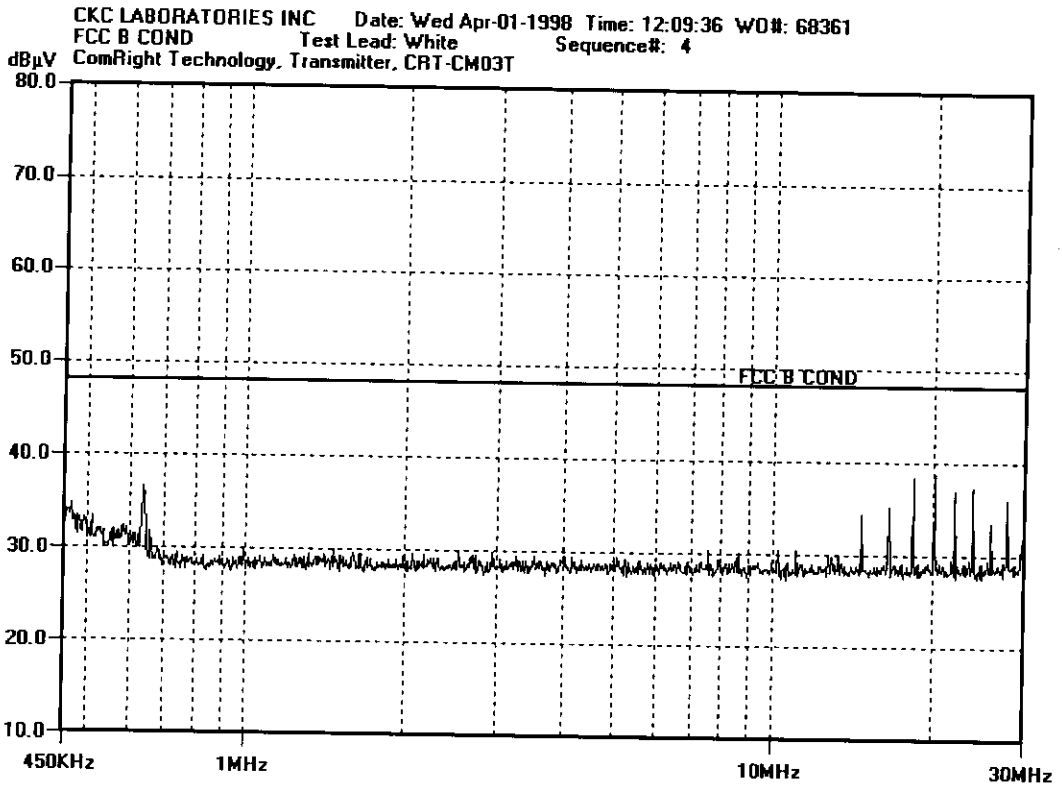

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ACCREDITED

CERTIFICATION TEST REPORT

FOR THE

TRANSMITTER, CRT-CM03T

FCC PART 15, SUBPART C

COMPLIANCE

DATE OF ISSUE: JULY 31, 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: **FC98-007**

Date of test: April 1, 1998 & July 31, 1998

DOCUMENTATION CONTROL:

Tracy Phillips

Tracy Phillips

APPROVED BY:

Dennis Ward

Dennis Ward
Director of Laboratories
CKC Laboratories

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	April 1, 1998 & July 31, 1998
PURPOSE OF TEST:	To demonstrate the compliance of the Transmitter, CRT-CM03T, with the FCC Part 15, Subpart C 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 - 5000 MHz

EQUIPMENT UNDER TEST:

Transmitter

Manuf:	ComRight Technology
Model:	CRT-CM03T
Serial:	000001
FCC ID:	XXX-CRT03B

Power Adapter

Manuf:	Woods Industries
Model:	DPX351322
Serial:	
FCC ID:	

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SUMMARY OF RESULTS

The ComRight Technology Transmitter, CRT-CM03T, was tested in accordance with ANSI C63.4 (1992) for compliance with Part 15, Subpart C of the FCC Rules.

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

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The EUT is a transmitter. It collects data such as temperature and sends it to a receiver which is connected to a PC.

MEASUREMENT UNCERTAINTY

Associated with data in this report is a ±4dB measurement uncertainty.

PERIPHERAL DEVICES

The EUT was not tested with peripheral devices.

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REPORT OF MEASUREMENTS

The following tables report the highest emissions levels recorded during the tests performed on the Transmitter, CRT-CM03T. The data sheets from which these tables were compiled are contained in Appendix B.

Table 1: Fundamental Emission Level I

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
418.031	78.9	15.8	-28.1	4.0		70.6	71.7	-1.1	HA

Test Method: ANSI C63.4 1992
Spec Limit : 15.231(e) Fundamental
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 transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%. Maximum duty cycle for EUT is approximately 7.33% or -22.7dB. Maximum allowed correction is -20dB. Measurement of fundamental frequency. ComRight Technology implemented a 7 dB pad on the output of the EUT.

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Table 2: Six Highest Spurious Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
418.031	78.9	15.8	-28.1	4.0		70.6	71.7	-1.1	HA
835.866	37.6	22.3	27.1	6.0		38.8	51.7	-12.9	V
835.878	44.8	22.3	-27.1	6.0		46.0	51.7	-5.7	H
1253.890	51.0	25.1	-39.6	4.5		41.0	51.7	-10.7	H
1671.701	51.2	25.7	-38.8	5.4		43.5	51.7	-8.2	H
1671.771	48.1	25.7	-38.8	5.4		40.4	51.7	-11.3	V

Test Method: ANSI C63.4 1992
Spec Limit : 15.231 (e) Spurious Emissions
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 transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%. Measurement of spurious emission levels. ComRight Technology implemented a 7 dB pad on the output of the EUT.

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Table 3: Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
31.326	64.3	-1.7	-28.1	0.9		35.4 ✓	40.0	-4.6	VDQ
35.016	46.5	17.9	-28.1	1.0		37.3 ✓	40.0	-2.7	VQ
38.702	47.4	16.4	-28.1	1.0		36.7 ✓	40.0	-3.3	VQ
42.390	48.9	14.5	-28.1	1.0		36.3 ✓	40.0	-3.7	VQ
77.411	55.3	7.4	-28.0	1.5		36.2 ✓	40.0	-3.8	HQ
81.093	54.2	7.6	-28.0	1.5		35.3 ✓	40.0	-4.7	HQ

Test Method: ANSI C63.4 1992
Spec Limit : FCC 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 transmitter is placed stand alone on the tabletop. The EUT is transmitting ambient temperature data. The EUT has the power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%.

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Table 4: Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB	dB	dB	dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
0.637299	39.0	0.0				39.0	48.0	-9.0	B
18.407200	39.0	0.0				39.0	48.0	-9.0	B
20.250100	40.0	0.0				40.0	48.0	-8.0	B
22.117890	38.5	0.0				38.5	48.0	-9.5	B
23.960790	40.3	0.0				40.3	48.0	-7.7	B
27.671480	38.4	0.0				38.4	48.0	-9.6	B

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

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

COMMENTS: The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 20°C Humidity: 40%.

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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. High Frequency Preamp, Hewlett Packard, Model No. 83017A, S/N 3123A00532.
4. Quasi-Peak Adapter, Hewlett Packard, Model No. 85650A, S/N - 2030A00532.
5. Biconical Antenna, A & H Systems, Model No. SAS-200/540, S/N 220.
6. Log Periodic Antenna, A & H Systems, Model No. SAS-200/516, S/N 331.
7. Horn Antenna, Emco, Model No. 3115, S/N 4683.
8. LISN, Solar Electronics, Model No. 8028-50-TS-24-BNC, S/N Brea #1.
9. LISN, Solar Electronics, Model No. 50 uH, S/N Brea #2.
10. Brea site calibration date: May 8, 1997. Brea site calibration due date: May 8, 1998.
11. Test software, EMI Test 2.86.

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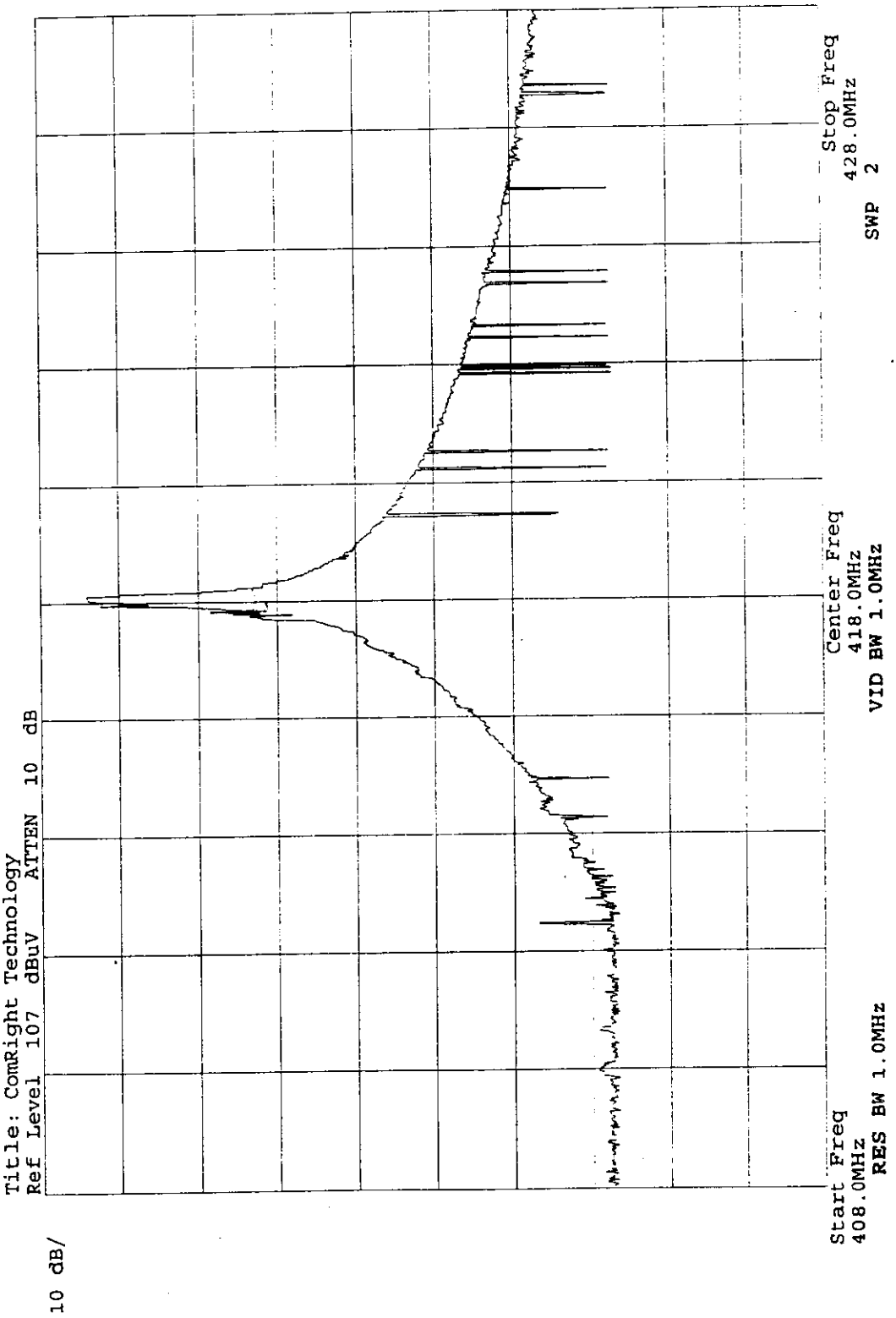
Occupied Bandwidth Plot Part 15.231(c)



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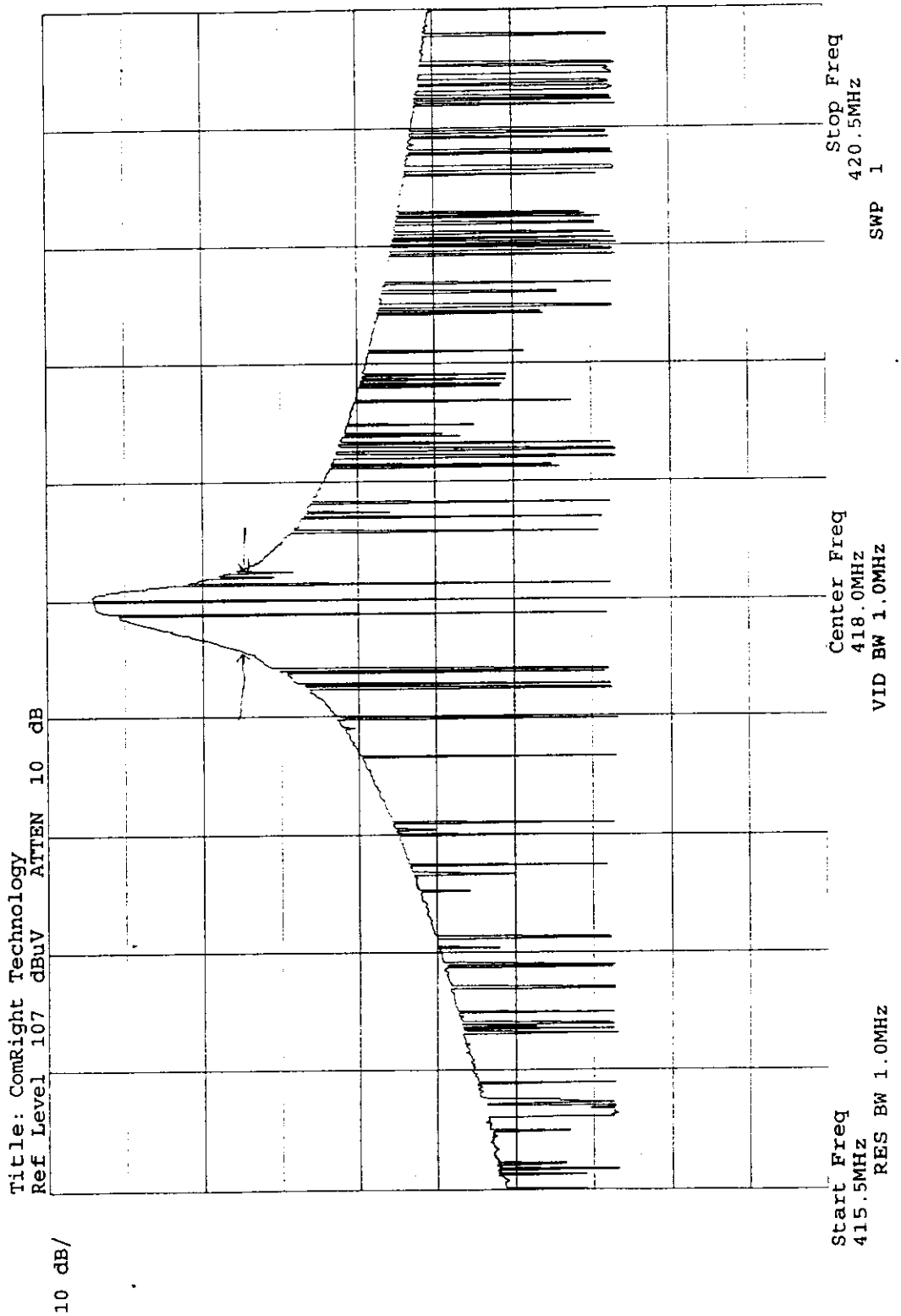
Occupied Bandwidth Plot Part 15.231(c)



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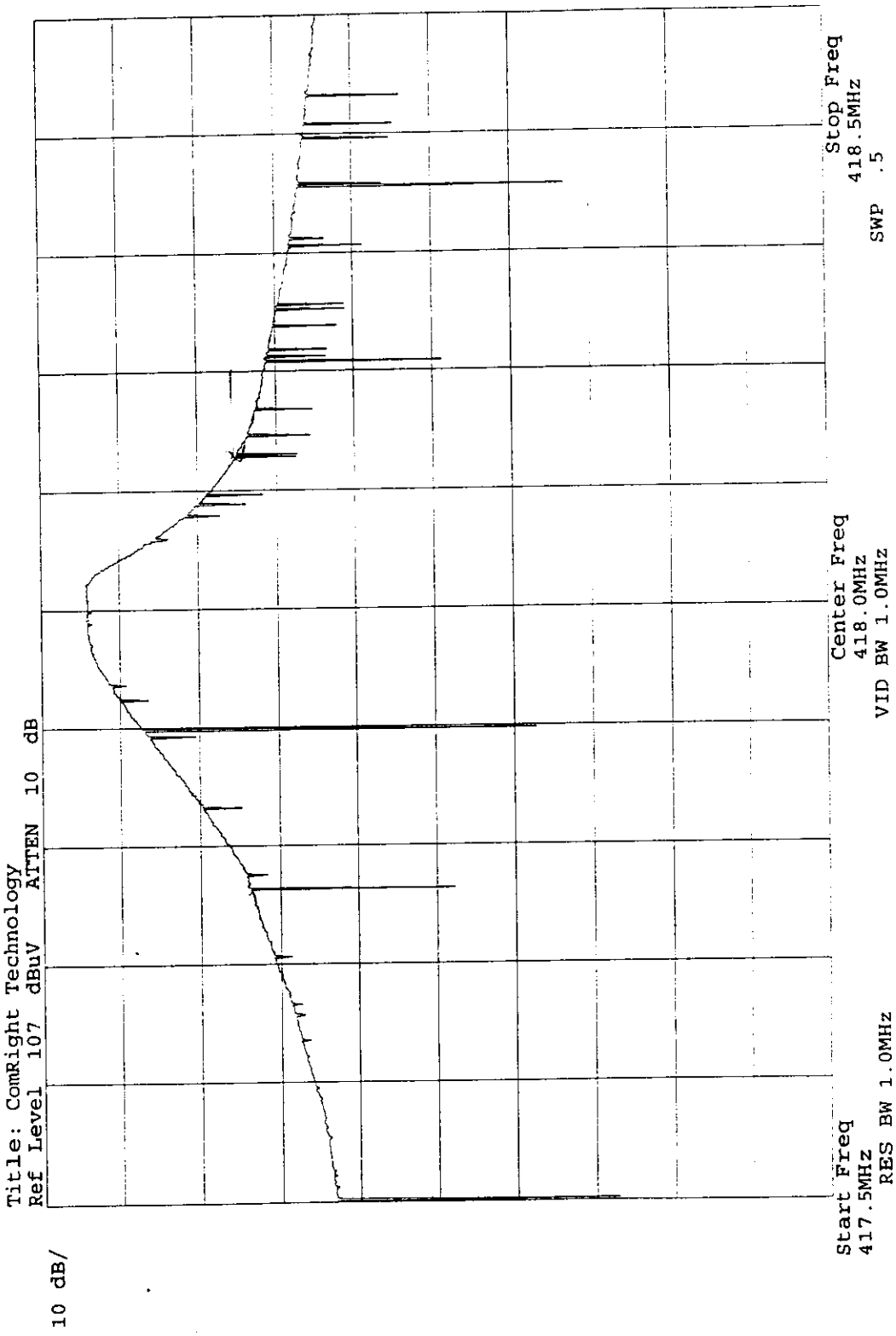
Occupied Bandwidth Plot Part 15.231(c)



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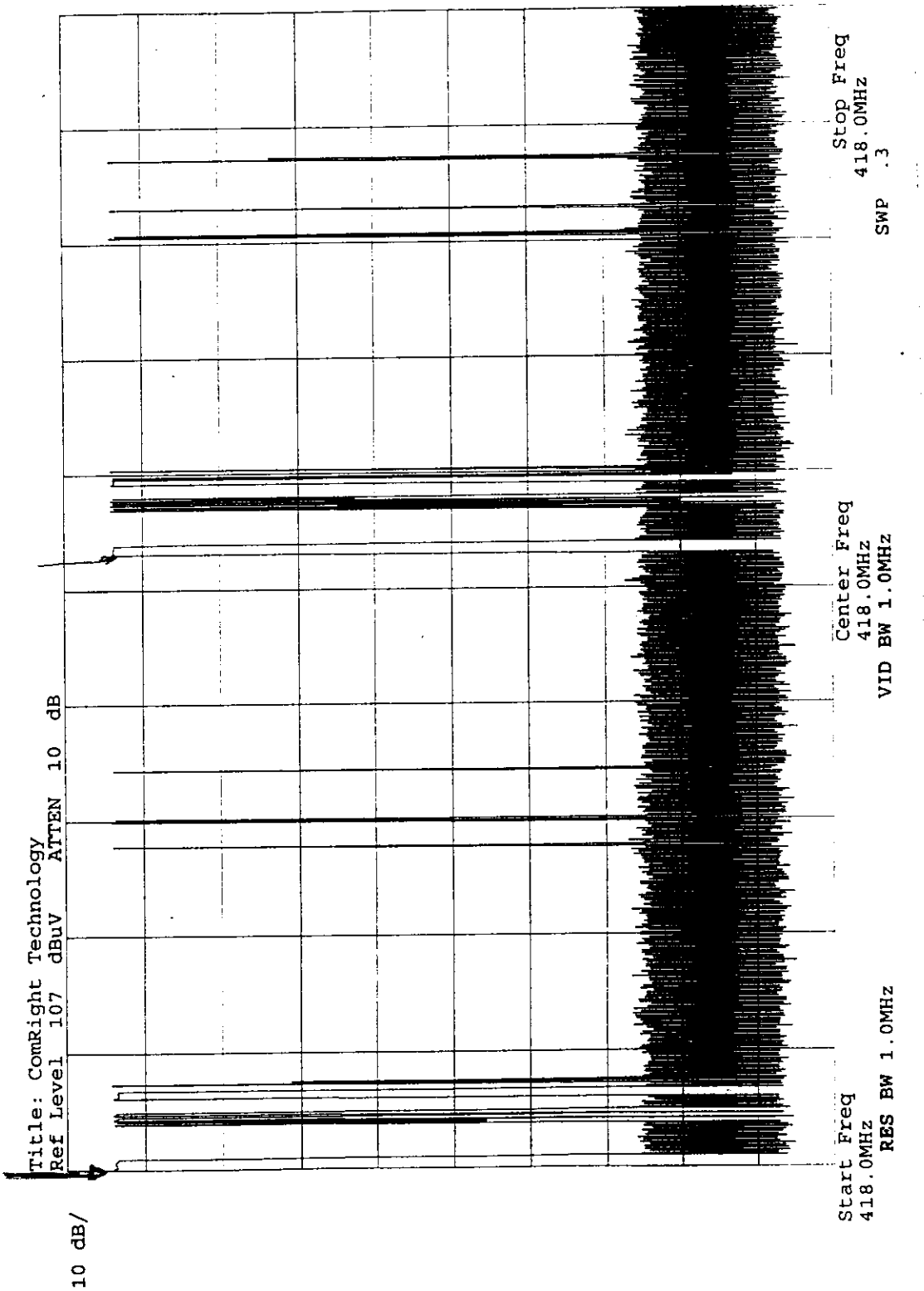
Pulse Train Plot Part 15.35(c)



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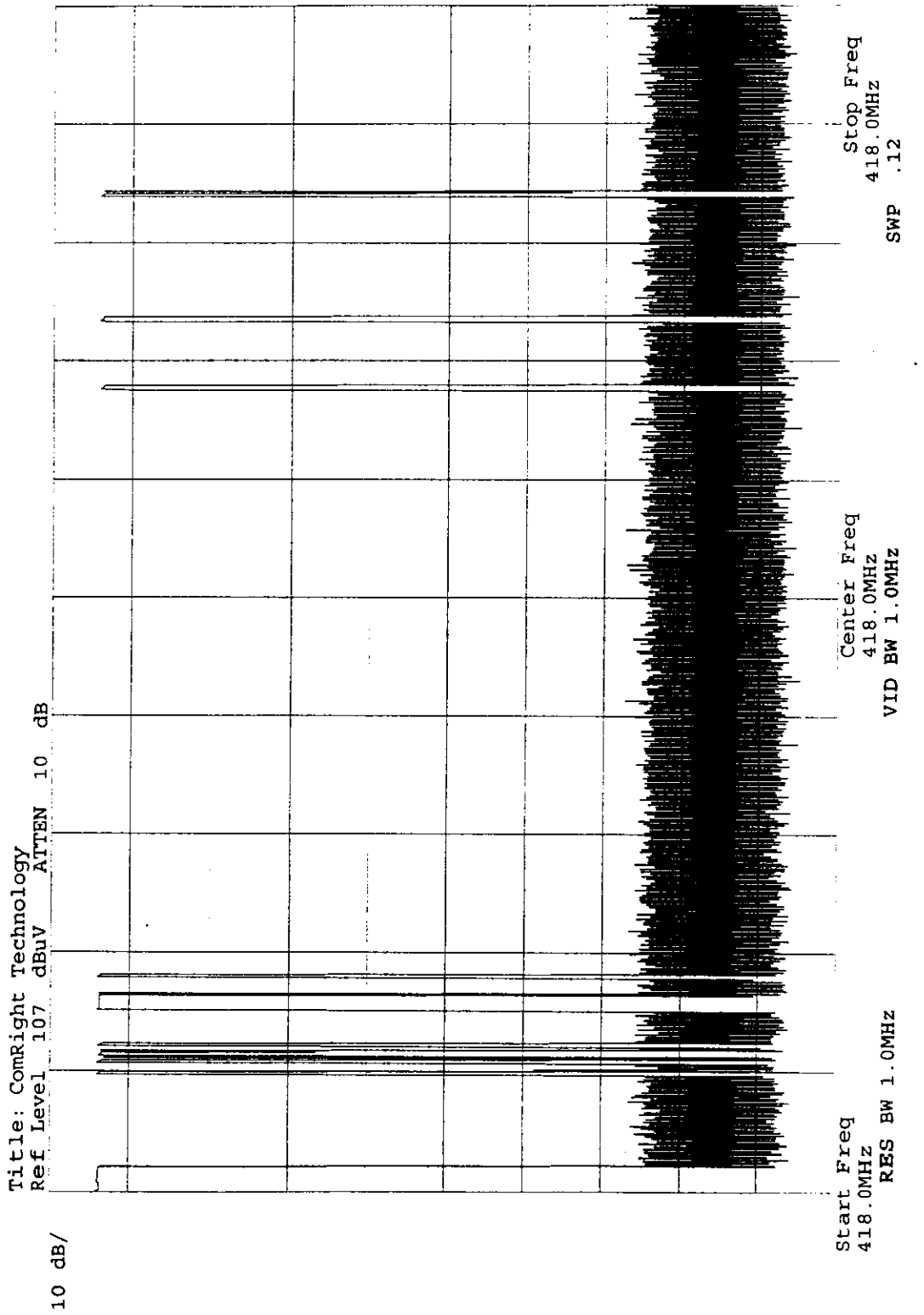
Pulse Train Plot Part 15.35(c)



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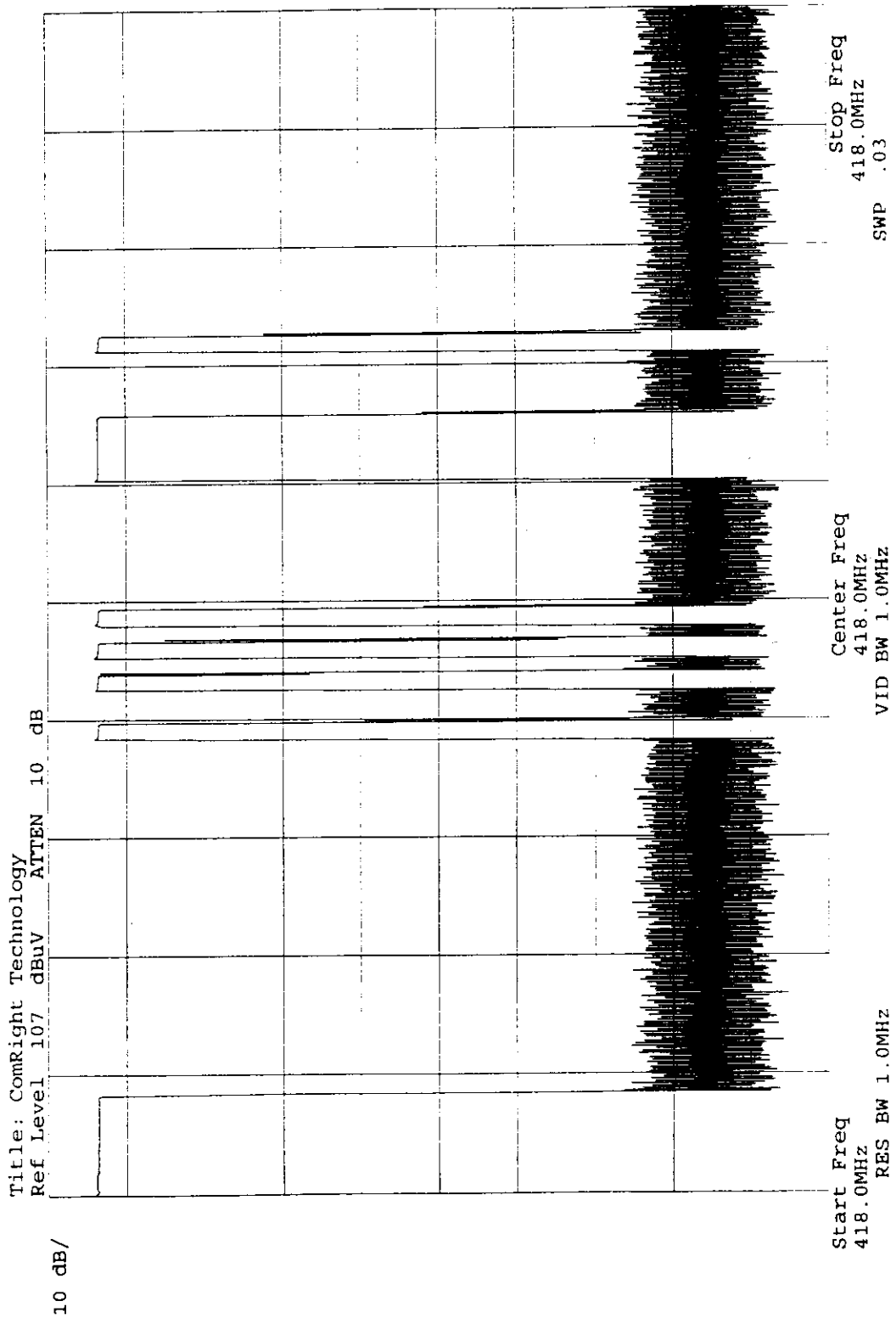
Pulse Train Plot Part 15.35(c)



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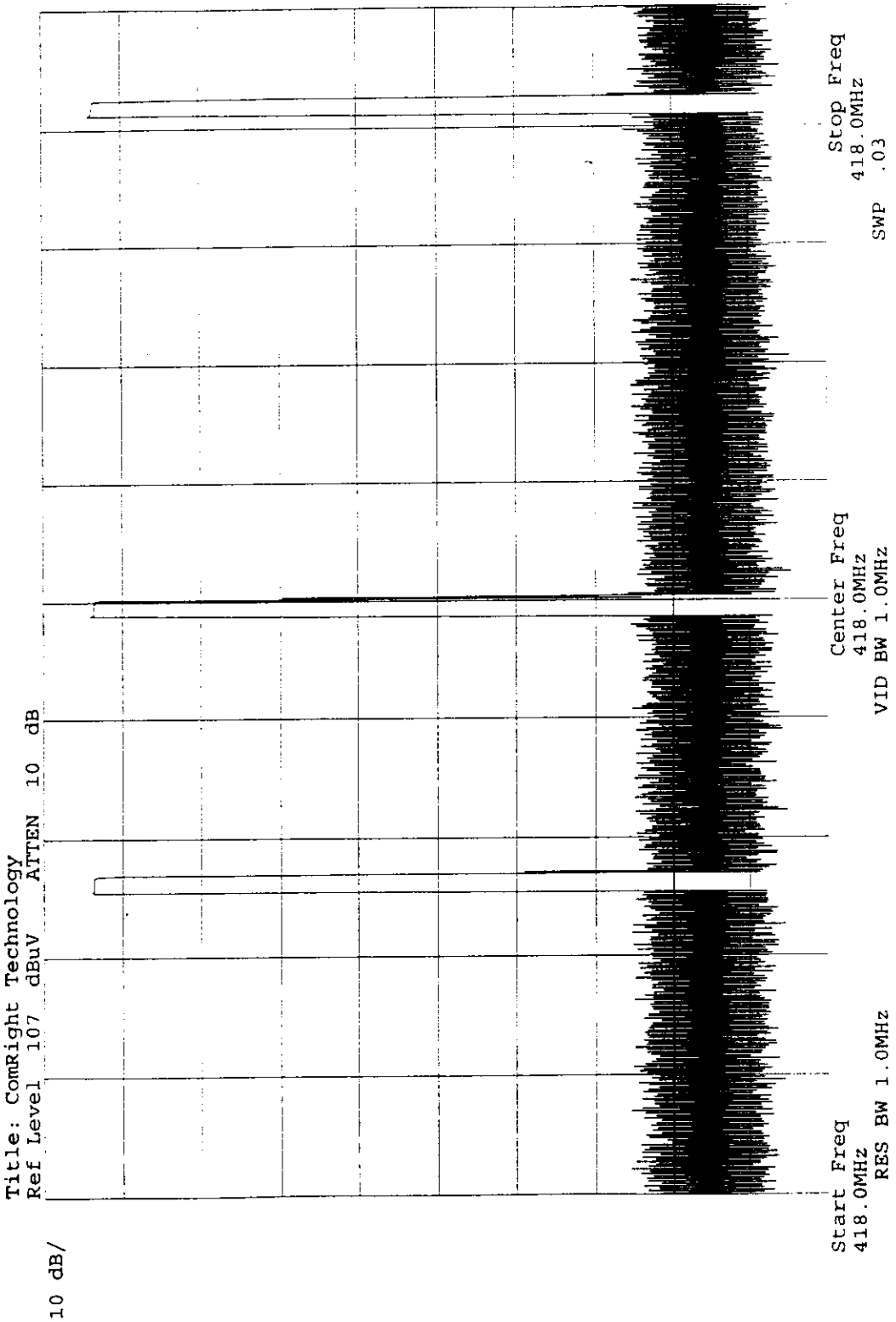
Pulse Train Plot Part 15.35(c)



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EUT SETUP

The equipment under test (EUT) was setup in a manner that represented its normal use. Any special conditions required for the EUT to operate normally are identified in the comments that accompany Tables 1 for fundamental emission level, Table 2 for spurious emissions, Table 3 for radiated emissions and Table 4 for conducted emissions.

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.

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 emissions data for the Transmitter, CRT-CM03T. For radiated measurements below 300 MHz, the biconical antenna was used. For frequencies from 300 to 1000 MHz, the log periodic antenna was used. For frequencies above 1000 MHz, the horn 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 dBμV 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 dBμV, 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	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	5000 MHz	1 MHz

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SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in Tables 1 - 4 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, Table 2, Table 3 or Table 4. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data for the Transmitter, CRT-CM03T.

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.

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TEST METHODS

The radiated and conducted emissions data of the Transmitter, CRT-CM03T, 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 C 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. The horn antenna was used to scan for frequencies above 1000 MHz. 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 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.

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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 - 4 show the corrected values of the six highest readings obtained for the ComRight Technology Transmitter, CRT-CM03T.

FCC Part 15.231(c) Occupied Bandwidth Measurements

In accordance with Part 15.231(c), the bandwidth of the emission was not wider than 0.25% of the center frequency (418 MHz).

Frequency Range of Transmitter: 418 MHz

In accordance with Part 15.231(e), the field strength of the emissions for periodic operation in the band above 70 MHz did not exceed the limits specified in 15.231(e) at 3 meters. For average emission measurements the provisions in 15.35 for averaging pulsed emissions and for limiting peak emissions were applied.

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SAMPLE CALCULATIONS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in Tables 1 - 4. For radiated emissions in dBμV/m, the spectrum analyzer reading in dBμV was corrected by using the following formula:

Meter reading (dBμV)
+ Antenna Factor (dB)
+ Cable Loss (dB)
- Distance Correction (dB)
- Pre-amplifier Gain (dB)

= Corrected Reading(dBμV/m)

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

A typical data sheet will display the following in column format:

#	Freq MHz	Rdng dBuV	Cable	Amp.	Bicon	Horn	Log	Dist	Corr dBuV/m	Spec	Margin	Polar

means reading number
Freq MHz is the frequency in MHz of the obtained reading.
Rdng dBuV is the reading obtained on the spectrum analyzer in dBμV.
Amp. is short for the preamplifier factor or gain in dB.
Bicon is the biconical antenna factor in dB.
Log is the log periodic antenna factor in dB.
Horn is the horn antenna factor in dB.
Cable is the cable loss in dB of the coaxial cable on the OATS.
Dist is the distance factor (in dB). It is used when testing at a different test distance than the one stated in the spec.
Corr dBμV/m is the corrected reading which is now in dBμV/m (field strength).
Spec is the specification limit (dB) stated in the agency's regulations.
Margin is the closeness to the specified limit in dB; + is over and - is under the limit.
Polar is the Polarity of the antenna with respect to earth.

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APPENDIX A

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

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INFORMATION ABOUT THE EQUIPMENT UNDER TEST	
Power Supply Manufacturer:	Wood Industries
Power Supply Part Number:	OPX 351322
The DC power cord is removable and is NOT shielded	
Line voltage used during testing: 120V 60Hz to power adapter	

CRYSTAL OSCILLATORS	
Type	Freq. In MHz
Crystal	1.8

PRINTED CIRCUIT BOARDS				
Function	Model & Rev	Clocks, MHz	Layers	Location
Transmitter	CRT-CM03T02	1.8 MHz	2	In chassis
Digital Temperature Module	QTM-01		2	Top of transmitter board

REQUIRED EUT CHANGES TO COMPLY:
• Removed three wire filter from DC plus lead and replaced it with a 120µH inductor.
• Installed a 120µH inductor in DC minus lead.
• ComRight Technology implemented a 7 dB pad on the output of the EUT.

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APPENDIX B

MEASUREMENT DATA SHEETS

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

Customer:	**ComRight Technology**	Date:	Jul-31-98
Specification:	**15-231-e**	Time:	19:13
Test Type:	**Maximized Emissions**	Sequence#:	1
Equipment:	**Transmitter**		
Manufacturer:	ComRight Technology	Tested By:	Stu Yamamoto
Model:	CRT-CM03T		
S/N:	000001		

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapters 120VAC 60Hz. Temperature: 23 Degrees Celsius; Humidity: 60%. Maximum duty cycle for EUT is approximately 7.33%, or -22.7dB. Maximum allowed correction is -20dB. Measurement of fundamental frequency. ComRight Technology implemented a 7 dB pad on the output of the EUT.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	AMP dB	CABLE dB	dB	LOG dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	418.031	78.9	-28.1	+4.0		+15.8	+0.0	70.6	71.7	-1.1	Horiz
	Average										
	20 dB correction factor due to duty cycle (<10%)										
^	418.031	98.9	-28.1	+4.0		+15.8	+0.0	90.6	71.7	+18.9	Horiz
3	418.024	76.9	-28.1	+4.0		+15.8	+0.0	68.6	71.7	-3.1	Vert
	Average										
	20 dB correction factor due to duty cycle (<10%)										
^	418.024	96.9	-28.1	+4.0		+15.8	+0.0	88.6	71.7	+16.9	Vert

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

Customer: **ComRight Technology**
Specification: **15-231-e**
Test Type: **Maximized Emissions**
Equipment: **Transmitter**
Manufacturer: ComRight Technology
Model: CRT-CM03T
S/N: 000001

Date: Jul-31-98
Time: 19:18
Sequence#: 2

Tested By: Stu Yamamoto

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapters 120VAC 60Hz. Temperature: 23 Degrees Celsius; Humidity: 60%. Measurement of spurious emissions. ComRight Technology implemented a 7 dB pad on the output of the EUT.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	BICON dB	CABLE dB	dB	AMP dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	835.878	44.8	-27.1	+6.0		+22.3	+0.0	46.0	51.7	-5.7	Horiz
2	835.866	37.6	-27.1	+6.0		+22.3	+0.0	38.8	51.7	-12.9	Vert

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

Customer:	**ComRight Technology**	Date:	Jul-31-98
Specification:	**15-231-e**	Time:	19:36
Test Type:	**Maximized Emissions**	Sequence#:	3
Equipment:	**Transmitter**		
Manufacturer:	ComRight Technology	Tested By:	Stu Yamamoto
Model:	CRT-CM03T		
S/N:	000001		

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapters 120VAC 60Hz. Temperature: 23 Degrees Celsius; Humidity: 60%. Measurement of spurious emissions. ComRight Technology implemented a 7 dB pad on the output of the EUT.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Ampli dB	Cable dB	Cable dB	Horn dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	1671.701	51.2	-38.8	+4.8	+0.6	+25.7	+0.0	43.5	51.7	-8.2	Horiz
2	1253.890	51.0	-39.6	+4.1	+0.4	+25.1	+0.0	41.0	51.7	-10.7	Horiz
3	1671.771	48.1	-38.8	+4.8	+0.6	+25.7	+0.0	40.4	51.7	-11.3	Vert
4	1253.781	50.4	-39.6	+4.1	+0.4	+25.1	+0.0	40.4	51.7	-11.3	Vert

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

Customer: **ComRight Technology**
Specification: **FCC B RADIATED**
Test Type: **Maximized Emissions**
Equipment: **Transmitter**
Manufacturer: ComRight Technology
Model: CRT-CM03T
S/N: 000001

Date: Apr-01-98
Time: 12:12
Sequence#: 1

Tested By: Stu Yamamoto

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on the tabletop. The EUT is transmitting ambient temperature data. The EUT has the power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16° Degrees Celsius; Humidity: 50%.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	AMP dB	CABLE dB	BICON dB	dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	35.016	46.5	-28.1	+1.0	+17.9		+0.0	37.3	40.0	-2.7	Vert
	Quasi Peak		+0.0								
2	38.702	47.4	-28.1	+1.0	+16.4		+0.0	36.7	40.0	-3.3	Vert
	Quasi Peak		+0.0								
3	42.390	48.9	-28.1	+1.0	+14.5		+0.0	36.3	40.0	-3.7	Vert
	Quasi Peak		+0.0								
4	77.411	55.3	-28.0	+1.5	+7.4		+0.0	36.2	40.0	-3.8	Horiz
	Quasi Peak		+0.0								
5	31.326	64.3	-28.1	+0.9	+0.0		+0.0	35.4	40.0	-4.6	Vert
	Dipole QP		-1.7								
6	35.006	44.5	-28.1	+1.0	+17.9		+0.0	35.3	40.0	-4.7	Horiz
	Quasi Peak		+0.0								
7	81.093	54.2	-28.0	+1.5	+7.6		+0.0	35.3	40.0	-4.7	Horiz
	Quasi Peak		+0.0								
8	77.406	54.1	-28.0	+1.5	+7.4		+0.0	35.0	40.0	-5.0	Horiz
	Quasi Peak		+0.0								
9	77.406	54.0	-28.0	+1.5	+7.4		+0.0	34.9	40.0	-5.1	Vert
			+0.0								
10	81.098	53.6	-28.0	+1.5	+7.6		+0.0	34.7	40.0	-5.3	Vert
	Quasi Peak		+0.0								

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11	73.718	53.9	-28.1	+1.4	+7.3	+0.0	34.5	40.0	-5.5	
	Quasi Peak		+0.0							
12	66.356	53.8	-28.2	+1.3	+7.6	+0.0	34.5	40.0	-5.5	
			+0.0							
13	84.776	52.3	-28.0	+1.5	+8.4	+0.0	34.2	40.0	-5.8	Horiz
	Quasi Peak		+0.0							
14	58.972	52.6	-28.2	+1.2	+8.5	+0.0	34.1	40.0	-5.9	Vert
			+0.0							
15	62.671	52.8	-28.2	+1.3	+7.9	+0.0	33.8	40.0	-6.2	
			+0.0							
16	82.939	51.8	-28.0	+1.5	+8.0	+0.0	33.3	40.0	-6.7	
			+0.0							
17	70.018	52.8	-28.2	+1.4	+7.3	+0.0	33.3	40.0	-6.7	
			+0.0							
18	79.248	52.2	-28.0	+1.5	+7.4	+0.0	33.1	40.0	-6.9	
	Quasi Peak		+0.0							
19	73.734	52.5	-28.1	+1.4	+7.3	+0.0	33.1	40.0	-6.9	
			+0.0							
20	84.787	50.9	-28.0	+1.5	+8.4	+0.0	32.8	40.0	-7.2	
			+0.0							
21	38.698	43.2	-28.1	+1.0	+16.4	+0.0	32.5	40.0	-7.5	
	Quasi Peak		+0.0							
22	53.464	49.1	-28.2	+1.1	+10.0	+0.0	32.0	40.0	-8.0	
			+0.0							
23	70.031	51.4	-28.2	+1.4	+7.3	+0.0	31.9	40.0	-8.1	
			+0.0							
24	84.787	49.7	-28.0	+1.5	+8.4	+0.0	31.6	40.0	-8.4	
			+0.0							
25	46.071	46.0	-28.2	+1.1	+12.6	+0.0	31.5	40.0	-8.5	
	Quasi Peak		+0.0							
26	66.358	50.1	-28.2	+1.3	+7.6	+0.0	30.8	40.0	-9.2	
			+0.0							
27	31.330	59.0	-28.1	+0.9	+0.0	+0.0	30.1	40.0	-9.9	
	Dipole		-1.7							
28	88.465	47.1	-28.0	+1.6	+9.1	+0.0	29.8	43.5	-13.7	
	Quasi Peak		+0.0							
29	86.638	43.7	-28.0	+1.6	+8.8	+0.0	26.1	40.0	-13.9	
			+0.0							
30	108.735	39.3	-28.1	+1.9	+13.6	+0.0	26.7	43.5	-16.8	
			+0.0							

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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 COND**	Time:	12:11
Test Type:	**Conducted Emissions**	Sequence#:	3
Equipment:	**Transmitter**		
Manufacturer:	ComRight Technology	Tested By:	Stu Yamamoto
Model:	CRT-CM03T		
S/N:	000001		

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. 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 dBµV	dB	dB	dB	dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	23.961M	40.3					+0.0	40.3	48.0	-7.7	Black
2	20.250M	40.0					+0.0	40.0	48.0	-8.0	Black
3	18.407M	39.0					+0.0	39.0	48.0	-9.0	Black
4	637.299k	39.0					+0.0	39.0	48.0	-9.0	Black
5	22.118M	38.5					+0.0	38.5	48.0	-9.5	Black
6	27.671M	38.4					+0.0	38.4	48.0	-9.6	Black
7	16.621M	35.4					+0.0	35.4	48.0	-12.6	Black
8	29.514M	35.0					+0.0	35.0	48.0	-13.0	Black
9	25.804M	34.6					+0.0	34.6	48.0	-13.4	Black
10	458.341k	34.5					+0.0	34.5	48.0	-13.5	Bl

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11	464.408k	34.4	+0.0	34.4	48.0	-13.6	Black
12	509.905k	34.1	+0.0	34.1	48.0	-13.9	Black
13	471.991k	34.0	+0.0	34.0	48.0	-14.0	Black
14	490.948k	33.9	+0.0	33.9	48.0	-14.1	Black
15	14.773M	33.7	+0.0	33.7	48.0	-14.3	Black

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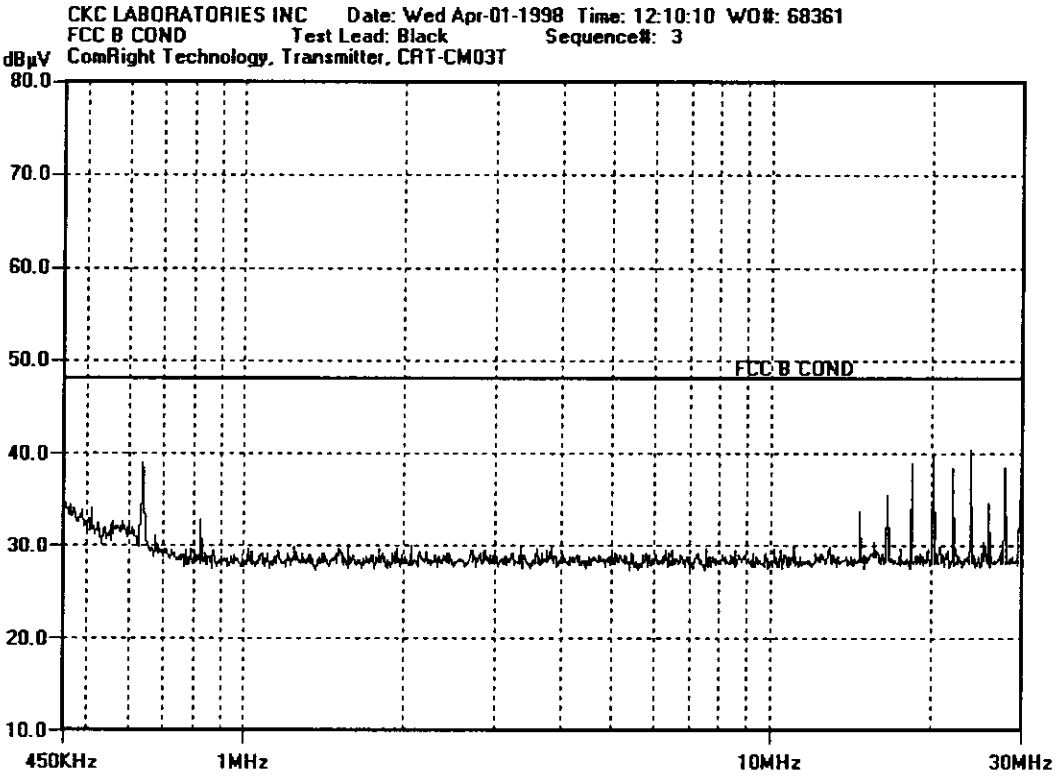

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Test Location: CKC LABORATORIES INC • 110 N. OLINDA PL. • BREA, CA 92823 • 714-993-611

Customer: **ComRight Technology**
Specification: **FCC B COND**
Test Type: **Conducted Emissions**
Equipment: **Transmitter**
Manufacturer: ComRight Technology
Model: CRT-CM03T
S/N: 000001

Date: Apr-01-98
Time: 12:12
Sequence#: 4

Tested By: Stu Yamamoto

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. 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 dBµV	dB	dB	dB	dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	20.250M	38.8					+0.0	38.8	48.0	-9.2	White
2	18.407M	38.5					+0.0	38.5	48.0	-9.5	White
3	23.961M	37.4					+0.0	37.4	48.0	-10.6	White
4	22.118M	37.0					+0.0	37.0	48.0	-11.0	White
5	638.057k	36.7					+0.0	36.7	48.0	-11.3	White
6	27.647M	36.0					+0.0	36.0	48.0	-12.0	White
7	16.621M	35.2					+0.0	35.2	48.0	-12.8	White
8	466.682k	34.8					+0.0	34.8	48.0	-13.2	White
9	14.773M	34.4					+0.0	34.4	48.0	-13.6	White
10	457.583k	34.1					+0.0	34.1	48.0	-13.9	White

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11	451.517k	33.8	+0.0	33.8	48.0	-14.2	White
12	25.804M	33.6	+0.0	33.6	48.0	-14.4	White
13	481.090k	33.4	+0.0	33.4	48.0	-14.6	White
14	471.232k	33.4	+0.0	33.4	48.0	-14.6	White
15	509.905k	33.3	+0.0	33.3	48.0	-14.7	White

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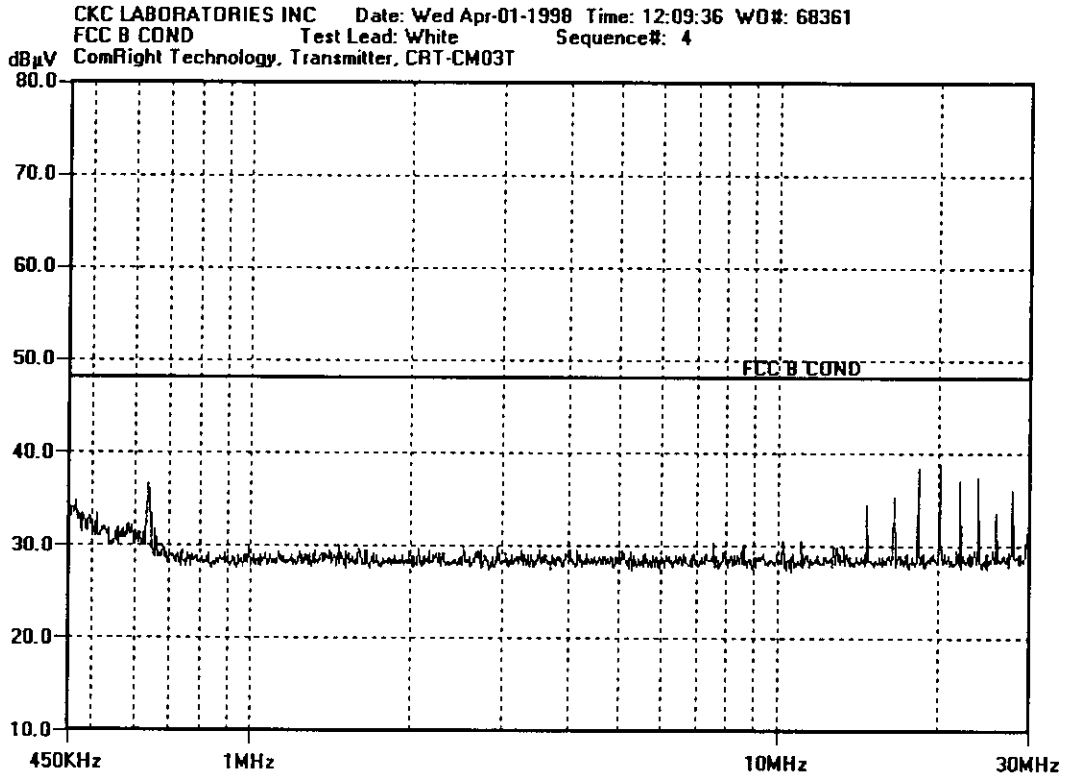

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REPORT OF MEASUREMENTS

The following tables report the highest emissions levels recorded during the tests performed on the Transmitter, CRT-CM03T. The data sheets from which these tables were compiled are contained in Appendix B.

Table 1: Fundamental Emission Level

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
418.031	78.9	15.8	-28.1	4.0		70.6	71.7	-1.1	HA

Test Method: ANSI C63.4 1992
Spec Limit : 15.231(e) Fundamental
Test Distance: 3 Meters

78.9
15.8
98.7
-28.1
70.6

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

COMMENTS: The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%. Maximum duty cycle for EUT is approximately 7.33% or -22.7dB. Maximum allowed correction is -20dB. Measurement of fundamental frequency.

Table 2: Six Highest Spurious Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
418.031	78.9	15.8	-28.1	4.0		70.6	71.7	-1.1	HA
835.866	37.6	22.3	27.1	6.0		38.8	51.7	-12.9	V
835.878	44.8	22.3	-27.1	6.0		46.0	51.7	-5.7	H
1253.890	51.0	25.1	-39.6	4.5		41.0	51.7	-10.7	H
1671.701	51.2	25.7	-38.8	5.4		43.5	51.7	-8.2	H
1671.771	48.1	25.7	-38.8	5.4		40.4	51.7	-11.3	V

Test Method: ANSI C63.4 1992
Spec Limit : 15.231 (e) Spurious Emissions
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 transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapter is 120VAC 60Hz. Temperature: 16°C Humidity: 50%. Measurement of spurious emission levels. ComRight Technology implemented a 7 dB pad on the output of the EUT.

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

Customer:	**ComRight Technology**	Date:	Jul-31-98
Specification:	**15-231-e**	Time:	19:13
Test Type:	**Maximized Emissions**	Sequence#:	1
Equipment:	**Transmitter**		
Manufacturer:	ComRight Technology	Tested By:	Stu Yamamoto
Model:	CRT-CM03T		
S/N:	000001		

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapters 120VAC 60Hz. Temperature: 23 Degrees Celsius; Humidity: 60%. Maximum duty cycle for EUT is approximately 7.33%, or -22.7dB. Maximum allowed correction is -20dB. Measurement of fundamental frequency. ComRight Technology implemented a 7 dB pad on the output of the EUT.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	AMP dB	CABLE dB	dB	LOG dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	418.031	78.9	-28.1	+4.0		+15.8	+0.0	70.6	71.7	-1.1	Horiz
	Average										
	20 dB correction factor due to duty cycle (<10%)										
^	418.031	98.9	-28.1	+4.0		+15.8	+0.0	90.6	71.7	+18.9	Horiz
3	418.024	76.9	-28.1	+4.0		+15.8	+0.0	68.6	71.7	-3.1	Vert
	Average										
	20 dB correction factor due to duty cycle (<10%)										
^	418.024	96.9	-28.1	+4.0		+15.8	+0.0	88.6	71.7	+16.9	Vert

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

Customer:	**ComRight Technology**	Date:	Jul-31-98
Specification:	**15-231-e**	Time:	19:18
Test Type:	**Maximized Emissions**	Sequence#:	2
Equipment:	**Transmitter**		
Manufacturer:	ComRight Technology	Tested By:	Stu Yamamoto
Model:	CRT-CM03T		
S/N:	000001		

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapters 120VAC 60Hz. Temperature: 23 Degrees Celsius; Humidity: 60%. Measurement of spurious emissions. ComRight Technology implemented a 7 dB pad on the output of the EUT.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	BICON dB	CABLE dB	dB	AMP dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	835.878	44.8	-27.1	+6.0		+22.3	+0.0	46.0	51.7	-5.7	Horiz
2	835.866	37.6	-27.1	+6.0		+22.3	+0.0	38.8	51.7	-12.9	Vert

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

Customer:	**ComRight Technology**	Date:	Jul-31-98
Specification:	**15-231-e**	Time:	19:36
Test Type:	**Maximized Emissions**	Sequence#:	3
Equipment:	**Transmitter**		
Manufacturer:	ComRight Technology	Tested By:	Stu Yamamoto
Model:	CRT-CM03T		
S/N:	000001		

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

Function	Manufacturer	Model #	S/N
Transmitter*	ComRight Technology	CRT-CM03T	000001
Power Adapter	Woods Industries	DPX351322	

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed stand alone on top of the tabletop. The EUT is transmitting ambient temperature data. The EUT has a power adapter connected. Voltage to power adapters 120VAC 60Hz. Temperature: 23 Degrees Celsius; Humidity: 60%. Measurement of spurious emissions. ComRight Technology implemented a 7 dB pad on the output of the EUT.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Ampli dB	Cable dB	Cable dB	Horn dB	Dist dB	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar
1	1671.701	51.2	-38.8	+4.8	+0.6	+25.7	+0.0	43.5	51.7	-8.2	Horiz
2	1253.890	51.0	-39.6	+4.1	+0.4	+25.1	+0.0	41.0	51.7	-10.7	Horiz
3	1671.771	48.1	-38.8	+4.8	+0.6	+25.7	+0.0	40.4	51.7	-11.3	Vert
4	1253.781	50.4	-39.6	+4.1	+0.4	+25.1	+0.0	40.4	51.7	-11.3	Vert