

*FCC PART 15, SUBPART B and C
TEST REPORT*
for

EmulationEngine

MODEL: RCX-EE11ABG3

Prepared for

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DATE: AUGUST 26, 2003

| | REPORT BODY | APPENDICES | | | | | TOTAL |
|-------|----------------|------------|---|---|----|-----|-------|
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| PAGES | 21 | 2 | 2 | 2 | 20 | 113 | 160 |

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Compatible Electronics Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Compatible Electronics personnel according to the measurement procedures described in the test specifications given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced without the written permission of Compatible Electronics, unless done so in full.

This report must not be used to claim product endorsement by NVLAP, NIST, or any other agency of the U.S. Government.

Device Tested: EmulationEngine
Model: RCX-EE11ABG3
S/N: N/A

Product Description: See Expository Statement.

Modifications: The EUT was not modified during the testing.

Manufacturer: Communication Machinery Corporation
402 East Gutierrez Street
Santa Barbara, California 93101

Test Dates: March 15, 16, 17, 26, 29, 30, and 31, 2004

Test Specifications: EMI requirements
Limits: CFR Title 47, Part 15, Subpart B, **Class A**; CFR Title 47, Part 15, Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

Test Procedure: ANSI C63.4: 2001

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

| TEST | DESCRIPTION | RESULTS |
|------|---|--|
| 1 | Conducted RF Emissions, 150 kHz – 30 MHz | Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and the limits of Subpart C, section 15.207 |
| 2 | Spurious Radiated RF Emissions, 30 MHz – 1000 MHz | Complies with the Class A limits CFR Title 47, Part 15, Subpart B; and the limits of CFR Title 47, Part 15, Subpart C, section 15.209 |
| 3 | Spurious Radiated RF Emissions, 10 kHz – 30 MHz and 1000 MHz – 40000 MHz | Complies with the Class B limits of CFR Title 47, Part 15, Subpart B; and CFR Title 47, Part 15, Subpart C, section 15.247(c) |
| 4 | Fundamental and Emissions produced by the intentional radiator in non-restricted bands, 10 kHz – 40 GHz | Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(c) |
| 5 | Emissions produced by the intentional radiator in restricted bands, 10 kHz – 40 GHz | Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.205, 15.209, and section 15.247 (c) |
| 6 | 6 dB Bandwidth | Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(a)(2) |
| 8 | Peak Power Output | Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(b)(3) |
| 9 | RF Conducted Antenna Test | Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247(c) |
| 10 | Peak Power Spectral Density Conducted from the Intentional Radiator to the Antenna | Complies with the relevant requirements of CFR Title 47, Part 15, Subpart C, section 15.247 (d) |

1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the EmulationEngine Model: RCX-EE11ABG3. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 2001. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the specification limits defined by CFR Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test for radiated emissions from 30 MHz to 1000 MHz, the EUT was within the Class A specification limits defined in CFR Title 47, Part 15, Subpart B.

Note: The 2.4 GHz and 5.8 GHz bands are applicable to this test report; another band of operation (5.15 GHz – 5.35 GHz) is documented in the Compatible Electronics, Inc. report number **B40331D2**.

2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests of the testing described herein were performed at the test facility of Compatible Electronics at the following locations:

- 1) 114 Olinda Drive, Brea, California 92823
- 2) 102 Olinda Drive, Brea, California 92823

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The calibration is traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Communication Machinery Corporation

Omar Tarzi Senior Test Engineer

Compatible Electronics, Inc.

Kyle Fujimoto Test Engineer
Scott McCutchan Lab Manager

2.4 Date Test Sample was Received

The test sample was received on July 23, 2003.

2.5 Disposition of the Test Sample

The sample has not been returned to Strix Systems, Inc. as of August 26, 2003.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

| | |
|------|--------------------------------------|
| RF | Radio Frequency |
| EMI | Electromagnetic Interference |
| EUT | Equipment Under Test |
| P/N | Part Number |
| S/N | Serial Number |
| HP | Hewlett Packard |
| ITE | Information Technology Equipment |
| CML | Corrected Meter Limit |
| LISN | Line Impedance Stabilization Network |
| dBc | dB Relative to the Carrier Power |

3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

| SPEC | TITLE |
|---------------------------------|--|
| FCC Title 47, Part 15 Subpart C | FCC Rules - Radio frequency devices (including digital devices) – Intentional Radiators |
| ANSI C63.4 2001 | Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz |
| FCC Title 47, Part 15 Subpart B | FCC Rules - Radio frequency devices (including digital devices) – Unintentional Radiators |

4. DESCRIPTION OF TEST CONFIGURATION

4.1 Description of Test Configuration - EMI

Setup and operation of the equipment under test.

Specifics of the EUT and Peripherals Tested

For the digital portion of the test - The EmulationEngine Model: RCX-11ABG3 (EUT) was connected to an AC Adapter and Ethernet Hub #1 via its power and Ethernet port, respectively. The EUT was transmitting and receiving Ethernet data through 64 virtual stations.

The 64 virtual stations were set up as follows: The Smartbits Data Generator Port #1, EUT, and a laptop for command and control were connected to Ethernet Hub #1. The laptop was also directly connected to the Smartbits Data Generator through another Ethernet port on the Smartbits Data Generator. The Smartbits Data Generator Port #2 and the Linksys Access Point were connected to Ethernet Hub #2. All pieces of equipment were plugged into the AC public mains via AC adapters except for the Smartbits Data Generator, which plugged directly into the AC public mains.

Note: The Smartbits Data Generator, Ethernet Hub #1, Ethernet Hub #2, laptop, and Linksys Access Point were all located inside the building, approximately 50 feet away from the test site.

For the intentional radiator portion of the test - The EmulationEngine Model: RCX-11ABG3 (EUT) was set up as mentioned above for the digital portion of the test, except different access points were used depending on which mode (802.11 a, 802.11 b, or 802.11 g) needed to be investigated. The laptop was also used to program the access points so that the EUT could switch channels and data rates.

The final radiated as well as the conducted data was taken in the mode above. Please see Appendix E for the data sheets.

4.1.1 **Cable Construction and Termination**

Cable 1 This is a 50 foot unshielded cable connecting the EUT to Ethernet Hub #1. It has an RJ-45 connector at each end.

Cable 2 This is a 10 foot unshielded cable connecting Ethernet Hub #1 to the Smartbits Data Generator. It has an RJ-45 connector at each end.

Cable 3 This is a 6 foot unshielded cable connecting Ethernet Hub #1 to the laptop. It has an RJ-45 connector at each end.

Cable 4 This is a 10 foot unshielded cable connecting the laptop to the Smartbits Data Generator. It has an RJ-45 connector at each end.

Cable 5 This is a 6 foot unshielded cable connecting the Smartbits Data Generator to Ethernet Hub #2. It has an RJ-45 connector at each end.

Cable 6 This is a 6 foot unshielded cable connecting Ethernet Hub #2 to the access point. It has an RJ-45 connector at each end. (Note: Access Point will vary depending on the mode tested)

Cable 7 This is a 6 foot unshielded cable connecting the EUT to the AC Adapter. It has a 1/8 inch power connector at the EUT end and is hard wired into the AC Adapter.

Cable 8 This is a 6 foot unshielded cable connecting the access point to the AC Adapter. It has a 1/8 inch power connector at the access point end and is hard wired into the AC Adapter. (Note: Access Point will vary depending on the mode tested)

Cable 9 This is a 6 foot unshielded cable connecting Ethernet Hub #2 to the AC Adapter. It has a 1/8 inch power connector at the Ethernet Hub #2 end and is hard wired into the AC Adapter.

Cable 10 This is a 6 foot unshielded cable connecting Ethernet Hub #1 to the AC Adapter. It has a 1/8 inch power connector at the Ethernet Hub #1 end and is hard wired into the AC Adapter.

Cable 11 This is a 6 foot unshielded cable connecting the laptop to the AC Adapter. It has a 1/8 inch power connector at the laptop end and is hard wired into the AC Adapter.

5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

5.1 EUT and Accessory List

| EQUIPMENT | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | FCC ID |
|--|-------------------------------------|---------------------|---------------|---|
| EmulationEngine (EUT) | COMMUNICATION MACHINERY CORPORATION | RCX-EE11ABG3 | N/A | RCX-EE11ABG3 |
| AC ADAPTER (EUT) | N/A | AM-121000 | N/A | N/A |
| LINKSYS ACCESS POINT (for 802.11 b and digital portion only) | LINKSYS | WAP51AB | MCG102B03982 | PKW-WAP51AB |
| AC ADAPTER FOR LINKSYS ACCESS POINT | LINKSYS | MS15-050250-A1D | N/A | N/A |
| SMARTBITS DATA GENERATOR | SPIRENT COMMUNICATIONS | SMB-0200 | 2992 | N/A |
| ETHERNET HUB #1 | N/A | N/A | N/A | N/A |
| ETHERNET HUB #2 | LINKSYS | NH1005.V2 | N/A | N/A |
| AC ADAPTER FOR HUB #1 | RADIO SHACK | Catalog #: 273-1764 | N/A | N/A |
| AC ADAPTER FOR HUB #2 | LINKSYS | AD 7.5/7 | N/A | N/A |
| LAPTOP | COMPAQ | U98.003.C.00 | N/A | N/A |
| ACCESS POINT (for 802.11 g Mode only) | D-LINK | DWL-2000AP | 0080C81671A3 | KA25212G |
| ACCESS POINT (for 802.11 a Mode only) | D-LINK | DWL-7000AD | H2DN136000778 | KA2202020012-1 & KA22002090029-1 |
| AC ADAPTER FOR D-LINK DWL-2000AP ACCESS POINT | BOTHHAND ENTERPRISES, INC. | MI-10805 | R00031221051D | N/A |
| AC ADAPTER FOR D-LINK DWL-7000AP ACCESS POINT | FSP GROUP, INC. | FSP013-1AD201 | H00093600 | N/A |

5.2 **EMI Test Equipment for Brea Facility – Part 1**

| EQUIPMENT TYPE | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | CAL. DATE | CAL. DUE DATE |
|---|------------------------|--------------|---------------|------------------|---------------|
| Radiated Emissions Manual Test – Radiated | Compatible Electronics | N/A | N/A | N/A | N/A |
| Conducted Emissions Test Program | Compatible Electronics | N/A | N/A | N/A | N/A |
| Spectrum Analyzer – Main Section | Hewlett Packard | 8566B | 3638A08768 | June 25, 2003 | June 25, 2003 |
| Spectrum Analyzer – Display Section | Hewlett Packard | 85662A | 3701A22262 | June 25, 2003 | June 25, 2003 |
| Quasi-Peak Adapter | Hewlett Packard | 85650A | 2811A01363 | June 24, 2003 | June 24, 2003 |
| Preamplifier | Com Power | PA-102 | 1017 | January 6, 2004 | Jan. 6, 2005 |
| Biconical Antenna | Com Power | AB-100 | 1548 | October 8, 2003 | Oct. 8, 2004 |
| Log Periodic Antenna | Com Power | AL-100 | 16089 | October 8, 2003 | Oct. 8, 2004 |
| Computer | Hewlett Packard | D5251A 888 | US74458128 | N/A | N/A |
| Monitor | Hewlett Packard | D5258A | DK74889705 | N/A | N/A |
| LISN | Com Power | LI-215 | 12078 | November 22,2003 | Nov. 22, 2004 |
| LISN | Com Power | LI-215 | 12082 | November 22,2003 | Nov. 22, 2004 |
| RF Attenuator | Weinschel Corporation | 2 | BJ6396 | August 7, 2003 | Aug. 7, 2004 |

5.3 **EMI Test Equipment for Brea Facility – Part 2**

| EQUIPMENT TYPE | MANUFACTURER | MODEL NUMBER | SERIAL NUMBER | CAL. DATE | CAL. DUE DATE |
|--------------------------------|---------------------------|--------------|---------------|-------------------|---------------|
| EMI Receiver | Rohde & Schwarz | ESIB40 | 100172 | July 22, 2003 | July 22, 2004 |
| RF Peak Power Meter / Analyzer | Boonton Electronics Corp. | 4500A-01-30 | 1282 | February 23, 2004 | Feb. 23, 2005 |
| Peak Power Sensor | Boonton Electronics Corp. | 57318 | 3723 | February 23, 2004 | Feb. 23, 2005 |
| Horn Antenna | Antenna Research | DRG-118/A | 1053 | January 16, 2004 | Jan. 16, 2005 |
| Horn Antenna | Com Power | AH826 | 0071957 | November 5, 2003 | Nov. 5, 2004 |
| Horn Antenna | Com Power | MWH-2640/B | 1011 | November 5, 2003 | Nov. 5, 2004 |
| Microwave Preamplifier | Com Power | PA-122 | 25195 | August 19, 2003 | Aug. 19, 2004 |
| Microwave Preamplifier | Com Power | PA-840 | 711013 | March 12, 2004 | Mar. 12, 2005 |
| Loop Antenna | Com Power | AB-100 | 25310 | June 4, 2003 | June 4, 2004 |

6. TEST SITE DESCRIPTION

6.1 Test Facility Description

Please refer to section 2.1 and 7.1 of this report for EMI test location.

6.2 EUT Mounting, Bonding and Grounding

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

7. CHARACTERISTICS OF THE TRANSMITTER

7.1 Antenna Gain

The 802.11 b/g antenna has a gain of 0 dBi.



8. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests. Test results are also included in this section.

8.1 RF Emissions

8.1.1 Conducted Emissions Test

The spectrum analyzer was used as a measuring meter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the spectrum analyzer input stage, and the offset was adjusted accordingly to read the actual data measured. The LISN output was measured using the spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for this test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 2001. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The conducted emissions from the EUT were maximized for operating mode as well as cable placement. The final data was collected under program control by the Compatible Electronics conducted emissions software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave. The final qualification data is located in Appendix E.

Test Results:

The EUT complies with the limits of CFR Title 47, Part 15, Subpart C, Section 15.207 for conducted emissions.

8.1.2 Radiated Emissions (Spurious and Harmonics) Test

The spectrum analyzer was used as a measuring meter along with the quasi-peak adapter. Amplifiers were used to increase the sensitivity of the instrument. The Com Power Preamplifier Model: PA-102 was used for frequencies from 30 MHz to 1 GHz, the Com-Power Microwave Preamplifier Model: PA-122 was used for frequencies from 1 GHz to 18 GHz, and the Com Power Microwave Preamplifier Model: PA-840 was used for frequencies from 18 GHz to 40 GHz. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps.

The quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets.

The frequencies above 1 GHz were averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the spectrum analyzer to keep the amplitude reading calibrated.

The measurement bandwidths and transducers used for the radiated emissions test were:

| FREQUENCY RANGE | EFFECTIVE MEASUREMENT BANDWIDTH | TRANSDUCER |
|-------------------|---------------------------------|----------------------|
| 10 kHz to 150 kHz | 200 Hz | Active Loop Antenna |
| 150 kHz to 30 MHz | 9 kHz | Active Loop Antenna |
| 30 MHz to 300 MHz | 120 kHz | Biconical Antenna |
| 300 MHz to 1 GHz | 120 kHz | Log Periodic Antenna |
| 1 GHz to 40 GHz | 1 MHz | Horn Antenna |

The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT by the Radiated Emission Manual Test software. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength). The gunsight method was used when measuring with the horn antenna in order to ensure accurate results.

Radiated Emissions (Spurious and Harmonics) Test (con't)

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance and also at a 10 meter test distance between 30 MHz and 1000 MHz.



8.2 6 dB Bandwidth

The 6 dB bandwidth was measured using the EMI Receiver. The bandwidth was measured using a direct connection from the RF out on the EUT. The resolution bandwidth was 100 kHz and the video bandwidth was 300 kHz.

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (a)(2).

8.3 Peak Output Power

The Peak Output Power was taken using the power meter and power sensor. The EUT was directly connected to the power sensor, which was directly connected to the power meter. The Peak Output Power was then taken.

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (b)(3).

8.4 Emissions Produced by the Intentional Radiator in Non-Restricted Bands

For 802.11 b and 802.11 g Modes: This test was performed using the EMI Receiver. The emissions were measured using a direct connection from the RF out on the EUT into the input of the EMI Receiver. The resolution bandwidth was 100 kHz, and the video bandwidth 300 kHz. The spans were wide enough to include all the harmonics and emissions that were produced by the intentional radiator.

For 802.11 a Mode: This test was performed as described in section 8.1.2, except the RBW was 100 kHz and the VBW was 300 kHz. Any non-restricted band emission measured was compared to the fundamental of the intentional radiator to see if the emission was at least 20 dBc.

Test Results:

This test complies with the relevant requirements of CFR Title 47, Part 15, Subpart C section 15.247 (c).

8.5**RF Band Edges**

For 802.11 b and 802.11 g modes: The RF band edges were taken at the start of the restricted bands (2390 MHz and 2483.5 MHz). The readings taken were also averaged manually by narrowing the video filter down to 10 Hz and putting the sweep time on AUTO on the spectrum analyzer to keep the amplitude reading calibrated. Data sheets are included in Appendix E, which compares the reading from the spectrum analyzer to the spec limit.

For 802.11 a Mode: The RF band edges were taken at the band edges of the 5725 MHz to 5850 MHz band. The readings at the band edges were compared to the fundamental to see the reading was attenuated by at least 20 dBc. The data sheets are included in Appendix E.

Test Results:

For 802.11 b and 802.11 g modes: The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (c). The RF power at the restricted bands closest to the band edges at 2390 MHz and 2483.5 MHz meet the limits of section 15.209.

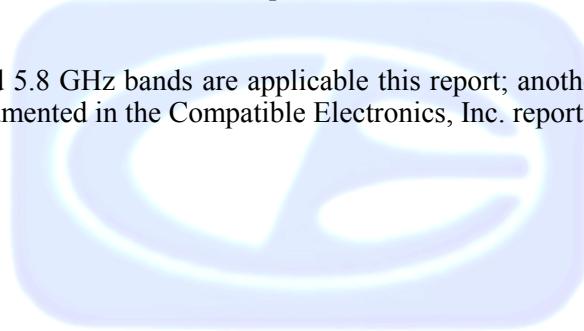
For 802.11 a mode: The EUT complies with the relevant requirements of FCC Title 47, Part 15, Subpart C, section 15.247 (c). The RF power at the band edges (5725 MHz and 5850 MHz) is attenuated at least 20 dBc.

9. CONCLUSIONS

The EmulationEngine meets all of the specification limits defined in FCC Title 47, Part 15, Subpart B; and Subpart C, sections 15.205, 15.207, 15.209, and 15.247.

Note: For the unintentional radiator portion of the test for radiated emissions from 30 MHz to 1000 MHz, the EUT was within the Class A specification limits defined in CFR Title 47, Part 15, Subpart B.

Note: The 2.4 and 5.8 GHz bands are applicable this report; another band of operation (5.15 GHz – 5.35 GHz) is documented in the Compatible Electronics, Inc. report number **B40331D2**.



APPENDIX A

LABORATORY RECOGNITIONS

Brea Division
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Lake Forest Division
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Lake Forest, CA 92630
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LABORATORY RECOGNITIONS

Compatible Electronics has the following agency accreditations:

National Voluntary Laboratory Accreditation Program - Lab Code: 200528-0

Voluntary Control Council for Interference - Registration Numbers: R-983, C-1026, R-984 and C-1027

Bureau of Standards and Metrology Inspection - Reference Number: SL2-IN-E-1031

Conformity Assessment Body for the EMC Directive Under the US/EU MRA Appointed by NIST

Compatible Electronics is recognized or on file with the following agencies:

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)

APPENDIX B

MODIFICATIONS TO THE EUT

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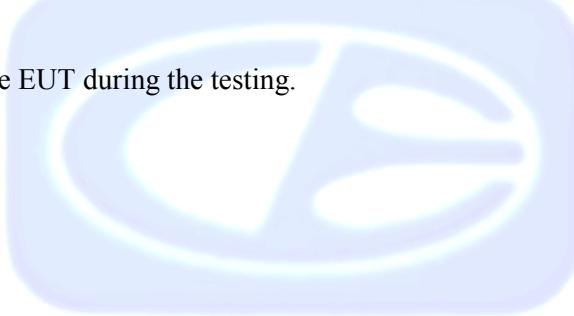
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(949) 587-0400

MODIFICATIONS TO THE EUT

The modifications listed below were made to the EUT to pass FCC Subpart B and Subpart C specifications.

All the rework described below was implemented during the test in a method that could be reproduced in all the units by the manufacturer.

No modifications were made to the EUT during the testing.



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20621 Pascal Way
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APPENDIX C

ADDITIONAL MODELS COVERED UNDER THIS REPORT

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20621 Pascal Way
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ADDITIONAL MODELS COVERED UNDER THIS REPORT

USED FOR THE PRIMARY TEST

EmulationEngine
Model: RCX-EE11ABG3
S/N: N/A

There were no additional models covered under this report.



APPENDIX D

DIAGRAMS, CHARTS, AND PHOTOS

Brea Division
114 Olinda Drive
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20621 Pascal Way
Lake Forest, CA 92630
(949) 587-0400

FIGURE 1: CONDUCTED EMISSIONS TEST SETUP

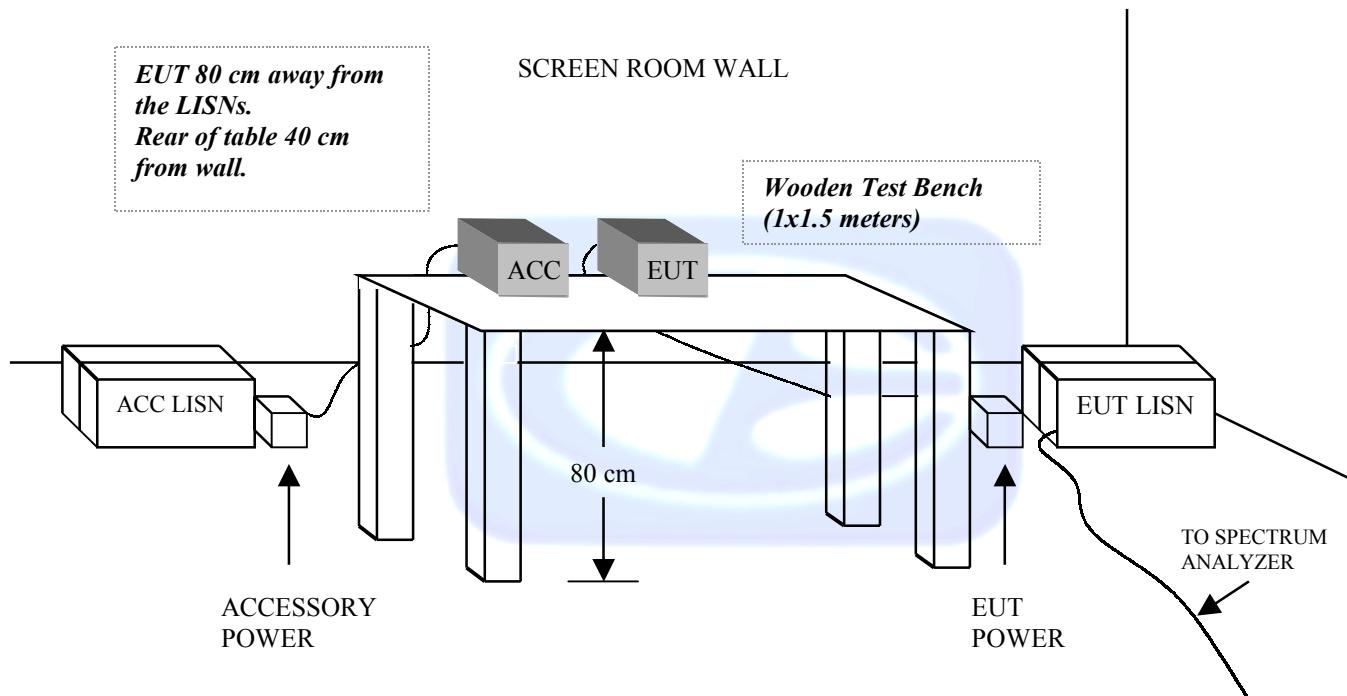
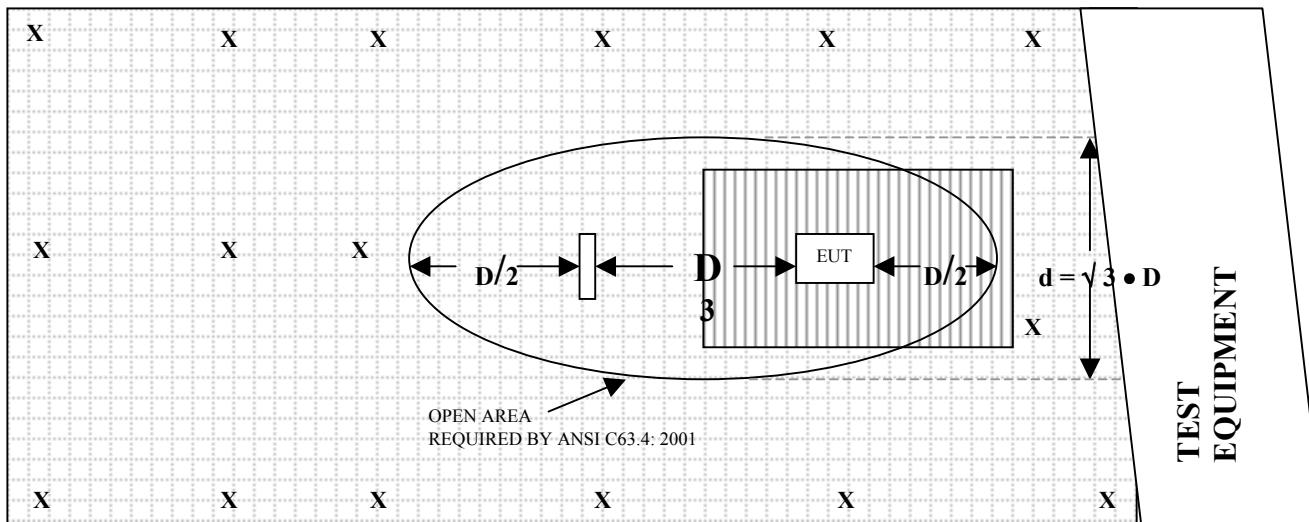
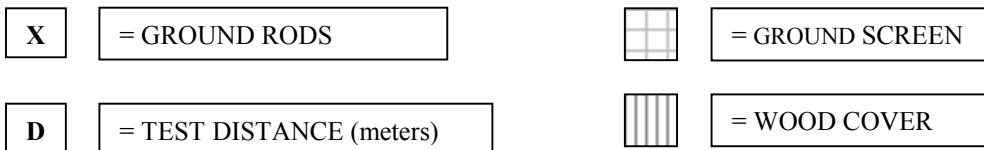


FIGURE 2: PLOT MAP AND LAYOUT OF 3 METER RADIATED SITE

OPEN LAND > 15 METERS



OPEN LAND > 15 METERS



COM-POWER AB-100
BICONICAL ANTENNA
S/N: 1548
CALIBRATION DATE: OCTOBER 8, 2003

| FREQUENCY (MHz) | FACTOR (dB) | FREQUENCY (MHz) | FACTOR (dB) |
|--------------------|----------------|--------------------|----------------|
| 30 | 13.1 | 120 | 9.9 |
| 35 | 12.9 | 125 | 11.4 |
| 40 | 14.6 | 140 | 12.0 |
| 45 | 12.8 | 150 | 13.0 |
| 50 | 12.9 | 160 | 13.9 |
| 60 | 9.3 | 175 | 14.2 |
| 70 | 8.2 | 180 | 14.3 |
| 80 | 8.0 | 200 | 14.9 |
| 90 | 8.1 | 250 | 16.6 |
| 100 | 8.8 | 300 | 19.7 |

COM-POWER AL-100**LOG PERIODIC ANTENNA****S/N: 16089****CALIBRATION DATE: OCTOBER 8, 2003**

| FREQUENCY (MHz) | FACTOR (dB) | FREQUENCY (MHz) | FACTOR (dB) |
|----------------------------|------------------------|----------------------------|------------------------|
| 300 | 12.8 | 700 | 20.0 |
| 400 | 14.4 | 800 | 21.2 |
| 500 | 16.0 | 900 | 20.8 |
| 600 | 17.7 | 1000 | 21.7 |

COM-POWER PA-102

PREAMPLIFIER

S/N: 1017

CALIBRATION DATE: JANUARY 6, 2004

| FREQUENCY (MHz) | FACTOR (dB) | FREQUENCY (MHz) | FACTOR (dB) |
|--------------------|----------------|--------------------|----------------|
| 30 | 37.8 | 300 | 37.6 |
| 40 | 37.5 | 350 | 37.5 |
| 50 | 37.7 | 400 | 37.5 |
| 60 | 37.5 | 450 | 37.0 |
| 70 | 37.5 | 500 | 37.1 |
| 80 | 37.5 | 550 | 37.3 |
| 90 | 37.5 | 600 | 37.1 |
| 100 | 37.5 | 650 | 37.4 |
| 125 | 37.8 | 700 | 37.1 |
| 150 | 37.5 | 750 | 37.1 |
| 175 | 37.5 | 800 | 36.8 |
| 200 | 37.6 | 850 | 36.2 |
| 225 | 37.6 | 900 | 36.7 |
| 250 | 37.5 | 950 | 36.2 |
| 275 | 37.6 | 1000 | 35.3 |

COM-POWER PA-122
MICROWAVE PREAMPLIFIER
S/N: 25195
CALIBRATION DATE: AUGUST 19, 2003

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|--------------------|----------------|--------------------|----------------|
| 1.0 | 30.8 | 6.0 | 33.3 |
| 1.1 | 30.9 | 6.5 | 32.7 |
| 1.2 | 30.9 | 7.0 | 31.8 |
| 1.3 | 30.4 | 7.5 | 31.6 |
| 1.4 | 30.7 | 8.0 | 30.3 |
| 1.5 | 31.0 | 8.5 | 29.0 |
| 1.6 | 31.2 | 9.0 | 29.0 |
| 1.7 | 30.3 | 9.5 | 29.5 |
| 1.8 | 28.9 | 10.0 | 30.9 |
| 1.9 | 31.2 | 11.0 | 30.2 |
| 2.0 | 30.9 | 12.0 | 28.7 |
| 2.5 | 30.4 | 13.0 | 30.3 |
| 3.0 | 31.7 | 14.0 | 28.7 |
| 3.5 | 32.6 | 15.0 | 29.5 |
| 4.0 | 32.6 | 16.0 | 31.1 |
| 4.5 | 32.2 | 17.0 | 30.1 |
| 5.0 | 31.1 | 18.0 | 28.6 |
| 5.5 | 30.6 | | |

COM-POWER PA-840

MICROWAVE PREAMPLIFIER

S/N: 711013

CALIBRATION DATE: MARCH 12, 2004

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|-----------------|-------------|-----------------|-------------|
| 18.0 | 26.7 | 29.5 | 27.1 |
| 18.5 | 26.0 | 30.0 | 27.2 |
| 19.0 | 25.5 | 30.5 | 28.1 |
| 19.5 | 25.1 | 31.0 | 27.2 |
| 20.0 | 24.5 | 31.5 | 29.1 |
| 20.5 | 24.3 | 32.0 | 27.1 |
| 21.0 | 23.9 | 32.5 | 26.9 |
| 21.5 | 23.7 | 33.0 | 27.1 |
| 22.0 | 23.8 | 33.5 | 26.8 |
| 22.5 | 24.0 | 34.0 | 26.5 |
| 23.0 | 24.1 | 34.5 | 26.4 |
| 23.5 | 24.8 | 35.0 | 25.8 |
| 24.0 | 25.2 | 35.5 | 24.7 |
| 24.5 | 25.7 | 36.0 | 24.6 |
| 25.0 | 26.2 | 36.5 | 25.6 |
| 25.5 | 26.5 | 37.0 | 25.5 |
| 26.0 | 27.0 | 37.5 | 26.1 |
| 26.5 | 27.0 | 38.0 | 25.9 |
| 27.0 | 26.8 | 38.5 | 23.9 |
| 27.5 | 24.3 | 39.0 | 22.8 |
| 28.0 | 26.7 | 39.5 | 21.3 |
| 28.5 | 27.2 | 40.0 | 23.4 |
| 29.0 | 27.3 | | |

ANTENNA RESEARCH DRG-118/A

HORN ANTENNA

S/N: 1053

CALIBRATION DATE: JANUARY 16, 2004

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|--------------------|----------------|--------------------|----------------|
| 1.0 | 24.4 | 10.0 | 38.7 |
| 1.5 | 25.2 | 10.5 | 39.0 |
| 2.0 | 28.2 | 11.0 | 38.9 |
| 2.5 | 28.5 | 11.5 | 41.3 |
| 3.0 | 30.1 | 12.0 | 40.5 |
| 3.5 | 31.0 | 12.5 | 40.0 |
| 4.0 | 31.2 | 13.0 | 40.2 |
| 4.5 | 31.9 | 13.5 | 40.5 |
| 5.0 | 33.2 | 14.0 | 41.6 |
| 5.5 | 33.7 | 14.5 | 44.8 |
| 6.0 | 34.3 | 15.0 | 41.4 |
| 6.5 | 35.0 | 15.5 | 39.2 |
| 7.0 | 36.7 | 16.0 | 39.4 |
| 7.5 | 37.3 | 16.5 | 40.9 |
| 8.0 | 37.1 | 17.0 | 42.6 |
| 8.5 | 37.3 | 17.5 | 45.1 |
| 9.0 | 37.7 | 18.0 | 41.7 |
| 9.5 | 38.6 | | |

COM-POWER AL-130
LOOP ANTENNA
S/N: 25310
CALIBRATION DATE: JUNE 4, 2003

| FREQUENCY (MHz) | MAGNETIC (dB/m) | ELECTRIC (dB/m) |
|----------------------------|----------------------------|----------------------------|
| 0.009 | -41.2 | 10.3 |
| 0.01 | -41.3 | 10.2 |
| 0.02 | -42.3 | 9.2 |
| 0.05 | -42.5 | 9.0 |
| 0.07 | -42.3 | 9.2 |
| 0.1 | -42.5 | 9.0 |
| 0.2 | -44.6 | 6.9 |
| 0.3 | -42.1 | 9.4 |
| 0.5 | -42.4 | 9.1 |
| 0.7 | -42.1 | 9.4 |
| 1 | -41.5 | 10.0 |
| 2 | -41.0 | 10.5 |
| 3 | -41.3 | 10.2 |
| 4 | -41.3 | 10.2 |
| 5 | -40.9 | 10.6 |
| 10 | -41.6 | 9.9 |
| 15 | -42.1 | 9.4 |
| 20 | -42.2 | 9.3 |
| 25 | -42.7 | 8.8 |
| 30 | -44.3 | 7.2 |

COM-POWER AH826
HORN ANTENNA
S/N: 0071957
CALIBRATION DATE: NOVEMBER 05, 2003

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|-----------------|-------------|-----------------|-------------|
| 18.0 | 33.3 | 22.5 | 32.9 |
| 18.5 | 32.9 | 23.0 | 33.0 |
| 19.0 | 32.7 | 23.5 | 33.6 |
| 19.5 | 32.6 | 24.0 | 33.6 |
| 20.0 | 32.7 | 24.5 | 33.5 |
| 20.5 | 33.0 | 25.0 | 33.5 |
| 21.0 | 33.0 | 25.5 | 33.7 |
| 21.5 | 33.2 | 26.0 | 34.1 |
| 22.0 | 32.9 | 26.5 | 34.5 |

COM-POWER MWH-2640/B
HORN ANTENNA
S/N: 1011
CALIBRATION DATE: NOVEMBER 05, 2003

| FREQUENCY (GHz) | FACTOR (dB) | FREQUENCY (GHz) | FACTOR (dB) |
|-----------------|-------------|-----------------|-------------|
| 26.5 | 36.0 | 33.5 | 36.0 |
| 27.0 | 36.0 | 34.0 | 36.8 |
| 27.5 | 35.6 | 34.5 | 37.3 |
| 28.0 | 35.9 | 35.0 | 37.7 |
| 28.5 | 35.8 | 35.5 | 37.8 |
| 29.0 | 36.0 | 36.0 | 38.2 |
| 29.5 | 35.9 | 36.5 | 38.3 |
| 30.0 | 36.4 | 37.0 | 38.2 |
| 30.5 | 36.4 | 37.5 | 38.6 |
| 31.0 | 36.8 | 38.0 | 38.6 |
| 31.5 | 36.5 | 38.5 | 39.1 |
| 32.0 | 36.5 | 39.0 | 38.8 |
| 32.5 | 36.2 | 39.5 | 39.0 |
| 33.0 | 36.4 | 40.0 | 39.5 |

**FRONT VIEW**

COMMUNICATION MACHINERY CORPORATION
EmulationEngine

MODEL: RCX-EE11ABG3

FCC SUBPART B and C – RADIATED EMISSIONS – 03-15-04, 3-16-04, and 3-17-04

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

Brea Division
114 Olinda Drive
Brea, CA 92823
(714) 579-0500

Agoura Division
2337 Troutdale Drive
Agoura, CA 91301
(818) 597-0600

Silverado Division
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Silverado, CA 92676
(949) 589-0700

Lake Forest Division
20621 Pascal Way
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(949) 587-0400



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FCC SUBPART B and E - CONDUCTED EMISSIONS – 03-26-04

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