EMI Test Report

Tested in accordance with
Federal Communications Commission (FCC)
Personal Communications Services
CFR 47, Parts 15, Subpart B
and
Industry Canada (IC), ICES-003

Research In Motion Limited

REPORT NO.: RIM-0049-0307-10

PRODUCT MODEL NO.: RAN20CN
TYPE NAME: BlackBerry Wireless Handheld
FCC ID: L6ARAN20CN
IC: 2503A-RAN20CN

Date: 01 August 2003

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Report No. RIM-0049-0307-10 Test Date: July 21, 2003

Statement of Performance:

The BlackBerry Wireless Handheld, model RAN20CN ASY-06511-001 version 002, tested with the following accessories: Travel Charger model number PSM05R-050RT, part number ASY-06193-001, Audio Headset part number HDW-03458-001 and Docking/Charging Cradle part number ASY-04060-002 when configured and operated per RIM's operation instructions, performs within the requirements of the test standards.

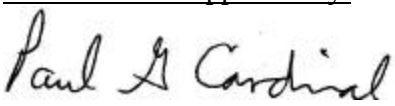
Declaration:

We hereby certify that:
The test data reported herein is an accurate record of the performance of the sample(s) tested.
The test equipment used was suitable for the tests performed and within manufacturer's published specifications and operating parameters.
The test methods were consistent with the methods described in the relevant standards.

Tested by:

Masud S. Attayi, P.Eng.
Senior Compliance Engineer Date: 01 August 2003

Reviewed and Approved by:



Paul G. Cardinal, Ph.D.
Manager, Compliance and Certification Date: 05 August 2003

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A) Scope

This report details the results of compliance tests which were performed in accordance with the requirements of:
FCC CFR 47 Part 15, Subpart B, Oct. 1, 2000, Class B Digital Devices, Unintentional Radiators
IC ICES-003, Nov. 22, 1997, Class B Digital Devices, Unintentional Radiators

B) Product Identification

The equipment under test (EUT) was tested at the Research In Motion (RIM) EMI test facility, located at:

305 Phillip Street
Waterloo, Ontario
Canada, N2L 3W8
Phone: 519 888 7465
Fax: 519 888 6906
Web Site: www.rim.net

The testing began on July 21, 2003 and completed on July 21, 2003. The sample equipment under test (EUT) included:

b) BlackBerry Wireless Handheld, model number RAN20CN, ASY-06511-001 version 2, PIN 2229380, BSN 1002190123, FCC ID L6ARAN20CN, IC: 2503A-RAN20CN.
2. Docking/Charging Cradle part number ASY-04060-002. The lead length was 1.9 metres.
3. AC Power Adapter, model number PSM05R-068R, part number ASY-04614-002 with a dc output voltage of 6.8 volts. The dc output lead length was 1.9 metres.
4. Travel Charger, model number PSM05R-050RT, part number ASY-06193-001 with an output voltage of 5.0 volts dc.
5. Headset model number HDW-03458-001. The lead length was 1.25 metres long.

The transmit frequency bands for the Handheld are: Cellular 824 to 849 MHz and PCS 1850 to 1910 MHz.

C) Support Equipment Used for the Testing of the EUT

1) Agilent Wireless Communication Test Set, model 8960, serial number GB41070272
2) PC System, Myraid, model EN-P3B-7, serial number CCC0004078
3) Monitor, ViewSonic, model number VCDTS23103-2M, serial number 24B022952648
4) Printer, H/P, model number C5884A, serial number US8251W0VQ

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D) Test Voltage

The ac input voltage was 120 volts, 60 Hz. This configuration was per manufacturer's specifications.

E) Test Results Chart

SPECIFICATION	Test Type	MEETS REQUIREMENTS	Performed By
FCC CFR 47 Part 15, Subpart B IC ICES-003	Class B	Yes	Masud Attayi

F) Modifications to EUT

No modifications were required on the EUT.

G) Summary of Results

a) CONDUCTED EMISSIONS

The conducted emissions were measured while using the test procedure outlined in CISPR Recommendation 22 through a 50 Ohm Line Impedance Stabilization Network (LISN), which was inserted in the power line to the equipment to provide the specified impedance for measurements. The EUT was placed on a nonconductive wooden table, 80 cm high that was positioned 40 cm from a vertical ground plane. The RF output of the network was connected to an EMI receiver system with characteristics that duplicate those of the receiver specified in CISPR Publication 16.
The following test configurations were measured:

- The Travel Charger was connected to the Handheld. The ac input to the Travel Charger was 120 volts, 60 Hz.
- The Handheld was connected to the Docking/Charging Cradle in battery charge mode. The Docking/Charging Cradle data cable was connected to the support PC and to the AC Adapter. The ac input to the AC Adapter was 120 volts, 60 Hz.

The EUT was configured and operated in idle mode.
The sample EUT's conducted emissions were compared with respect to the FCC CFR 47 Part 15, Subpart B and IC ICES-003, Class B limit. The sample EUT had a worse case test margin of 14.28 dB at 0.599 MHz.

Measurement Uncertainty ±2.0 dB

To view the test data/plots, see APPENDIX 1.

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b) RADIATED EMISSIONS

The radiated emissions from the EUT were measured using the methods outlined in CISPR Recommendation 22. The EUT was placed on a nonconductive wooden table, 80 cm high that was positioned on a remotely rotatable turntable. The test distance used between the EUT and the receiving antenna was three metres. The turntable was rotated to determine the azimuth of the peak emissions. At this point the emissions were maximized by elevating the antenna in the range of 1 to 4 metres. The maximum emission level was recorded. The frequency range measured was from 30 MHz to 1.0 GHz. Both the horizontal and vertical polarisations of the emissions were measured.
The measurements were done in a semi-anechoic chamber. The semi-anechoic chamber FCC registration number is **778487** and the Industry Canada file number is **IC4240**.
The EUT was configured and operated to produce the maximum radiated emissions while still keeping within RIM's specifications.
The following test configuration was measured:

- The Handheld was connected to the Travel Charger.
- The Handheld was connected to the support PC via the Docking/Charging Cradle for charging and data link.

The system's radiated emission levels in idle mode were compared with respect to the FCC CFR 47 Part 15, Subpart B and IC ICES-003, Class B limit.
The system **passed** with a worse case emission test margin of 2.53 dB at 100.646 MHz.

Sample Calculation:

Field Strength (dBµV/M) is calculated as follows:
FS = Measured Level (dBµV) + A.F. (dB/m) + Cable Loss (dB) - Preamp (dB) + Filter Loss (dB)

Measurement Uncertainty ±4.0 dB

To view the test data see APPENDIX 2.

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H) **Compliance Test Equipment Used**

UNIT	MANUFACTURER	MODEL / SERIAL NUMBER	CAL DUE DATE (YY MO DD)	USE
Preamplifier	Sonoma	310N/11909A 185831	03-10-02	Radiated Emissions
Preamplifier system	TDK	PA-02 080010	03-10-02	Radiated Emissions
EMC Analyzer	Agilent	E7405A US40240226	03-09-21	Radiated Emissions
Hybrid Log Antenna	TDK	HLP-3003C 017301	03-12-11	Radiated Emissions
Wireless Communication Test Set	Agilent	8960 6B41070272	03-11-26	Radiated Emissions
L.I.S.N.	Emco	3816/2 1120	03-08-29	Conducted Emissions
L.I.S.N.	Emco	3816/2 1118	03-08-29	Conducted Emissions
Impulse Limiter	Rohde & Schwarz	ESHS-Z2 836248/052	03-10-04	Conducted Emissions
EMI Receiver	Agilent	85462A 3942A00517	03-10-04	Conducted Emissions
RF Filter Section	Agilent	85460A 3704A00481	03-10-04	Conducted Emissions

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APPENDIX 1

CONDUCTED EMISSIONS TEST DATA/PLOTS

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Conducted Emissions Test Results

FCC CFR 47 Part 15, Subpart B, Class B July 21, 2003

Operating Mode: The Travel Charger was connected to the Handheld in battery charge mode. The ac input to the Travel Charger was 120 volts, 60 Hz.

Frequency (MHz)	Line	READING Quasi-Peak (dBµV)	Correction Factors for Impulse Limiter, LISN, Cable (dB)	QP Level (reading + Corr.Factor) (dBµV)	Limit (dBµV)	Margin (dB)
0.452	N	17.67	9.77	27.44	48.0	-20.56
0.494	H	16.60	9.77	26.37	48.0	-21.63
0.632	N	18.39	9.78	28.17	48.0	-19.83
0.661	N	20.6	9.80	30.16	48.0	-17.84
0.664	H	19.55	9.79	29.34	48.0	-18.66
2.561	H	20.16	9.89	30.05	48.0	-17.95

All other emission levels had a test margin of greater than 25 dB.

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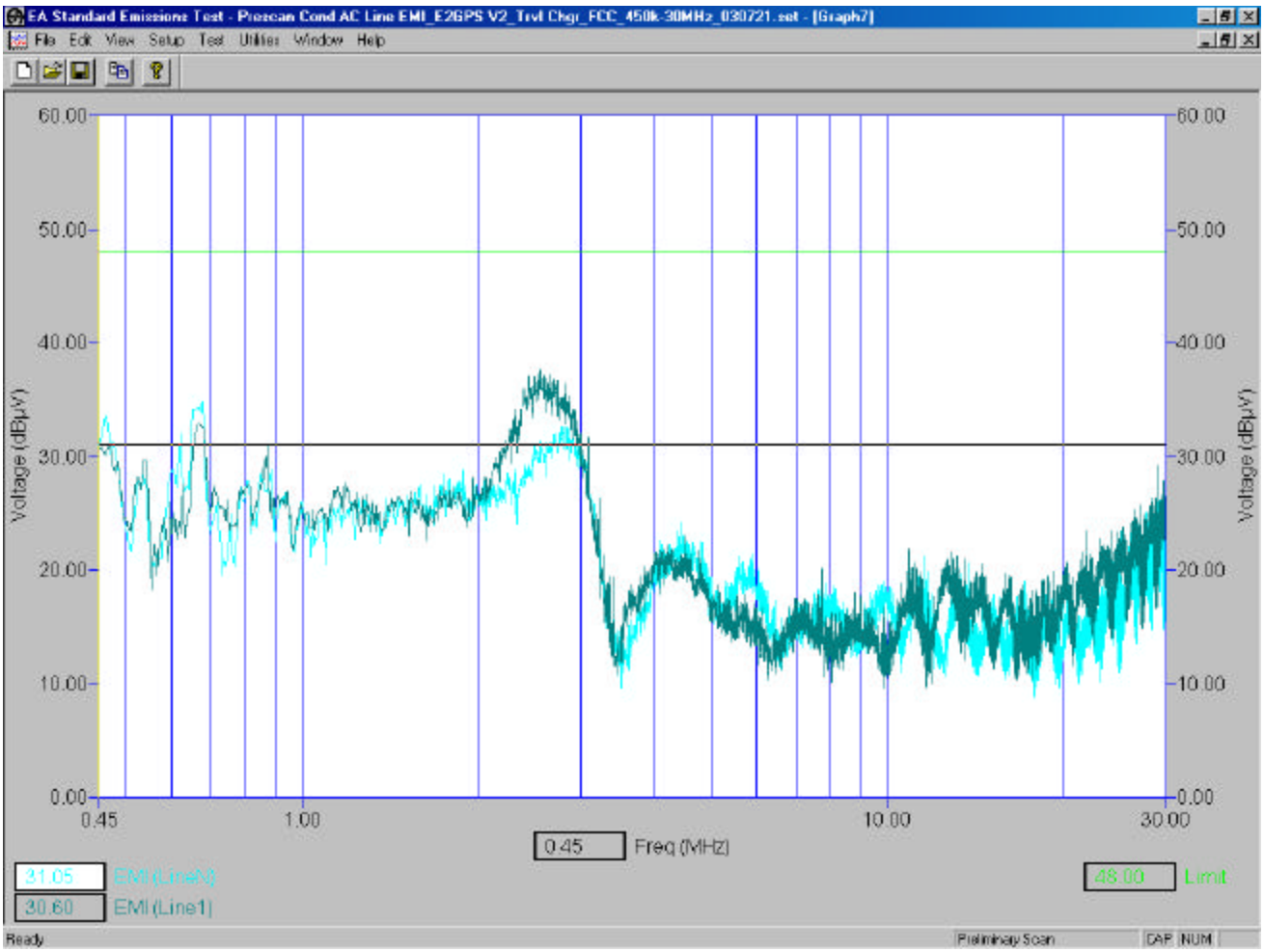
Conducted Emissions Test Graph



The Travel Charger was connected to the Handheld in battery charge mode. The ac input to the Travel Charger was 120 volts, 60 Hz.

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Conducted Emissions Test Results con't

FCC CFR 47 Part 15, Subpart B, Class B July 21, 2003

Operating Mode: The Handheld was connected to the Docking/Charging Cradle in battery charge mode. The Docking/Charging Cradle data cable was connected to the support PC and to the AC Adapter.
The ac input to the AC Adapter was 120 volts, 60 Hz.

Frequency (MHz)	Line	READING Quasi-Peak (dBµV)	Correction Factors for Impulse Limiter, LISN, Cable (dB)	QP Level (reading + Corr.Factor) (dBµV)	Limit (dBµV)	Margin (dB)
0.548	N	17.63	9.78	27.41	48.0	-20.59
0.566	H	21.47	9.78	31.25	48.0	-16.75
0.599	N	23.94	9.78	33.72	48.0	-14.28
0.642	N	21.81	9.79	31.60	48.0	-16.40
2.172	H	19.27	9.86	29.13	48.0	-18.87
2.271	H	20.56	9.86	30.42	48.0	-17.58
2.273	H	21.18	9.86	31.04	48.0	-16.96
2.356	H	18.08	9.87	27.95	48.0	-20.05
2.426	H	21.85	9.88	31.73	48.0	-16.27
2.440	N	14.81	9.88	24.69	48.0	-23.31

All other emission levels had a test margin of greater than 25 dB.

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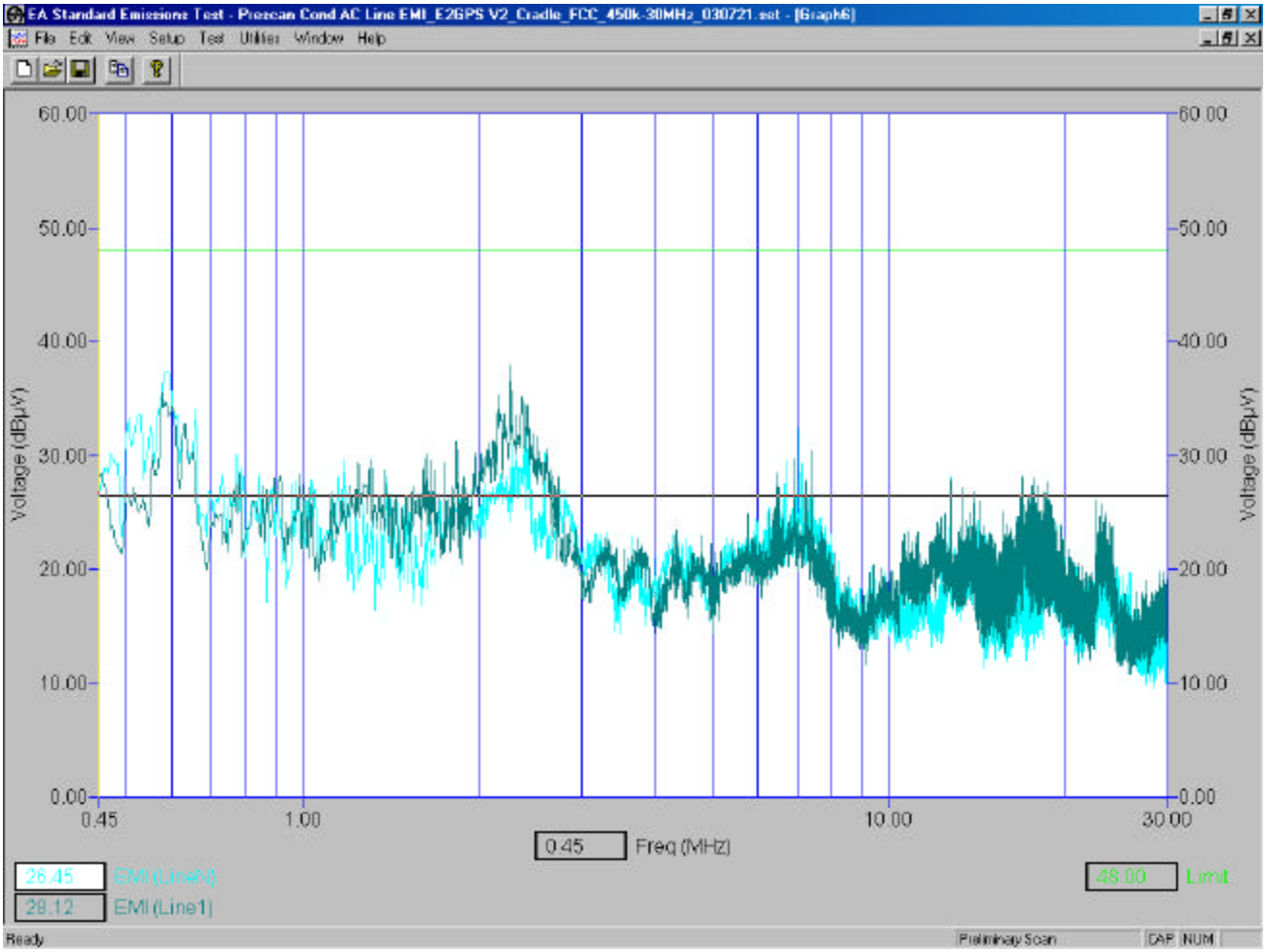
Conducted Emissions Test Graph



The Handheld was connected to the Docking/Charging Cradle in battery charge mode. The Docking/Charging Cradle data cable was connected to the support PC and to the AC Adapter.
The ac input to the AC Adapter was 120 volts, 60 Hz

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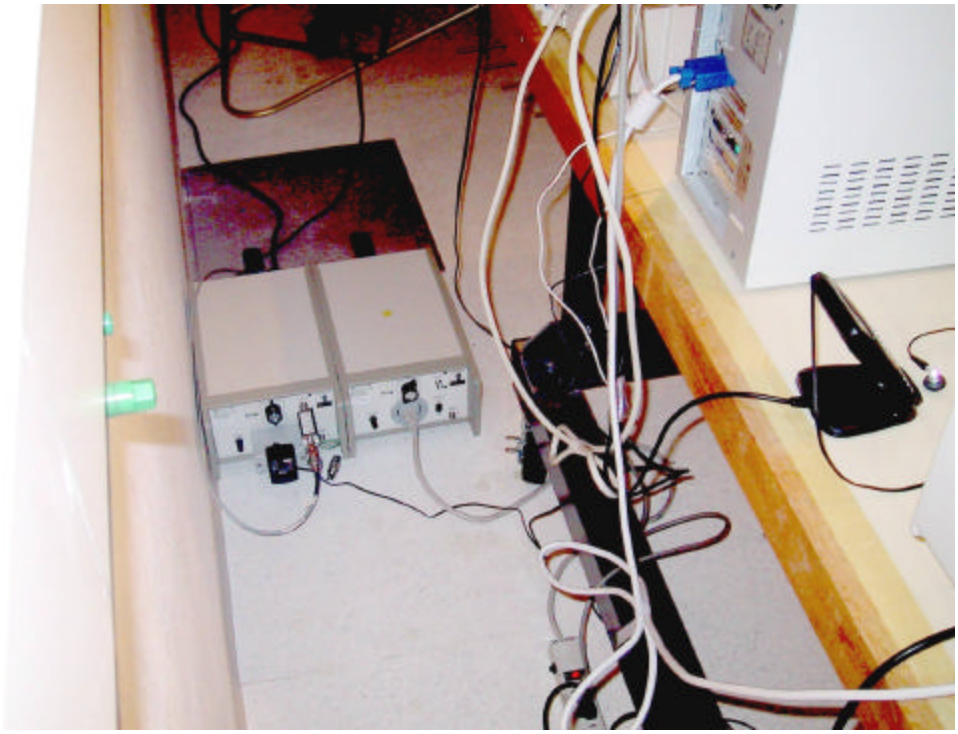
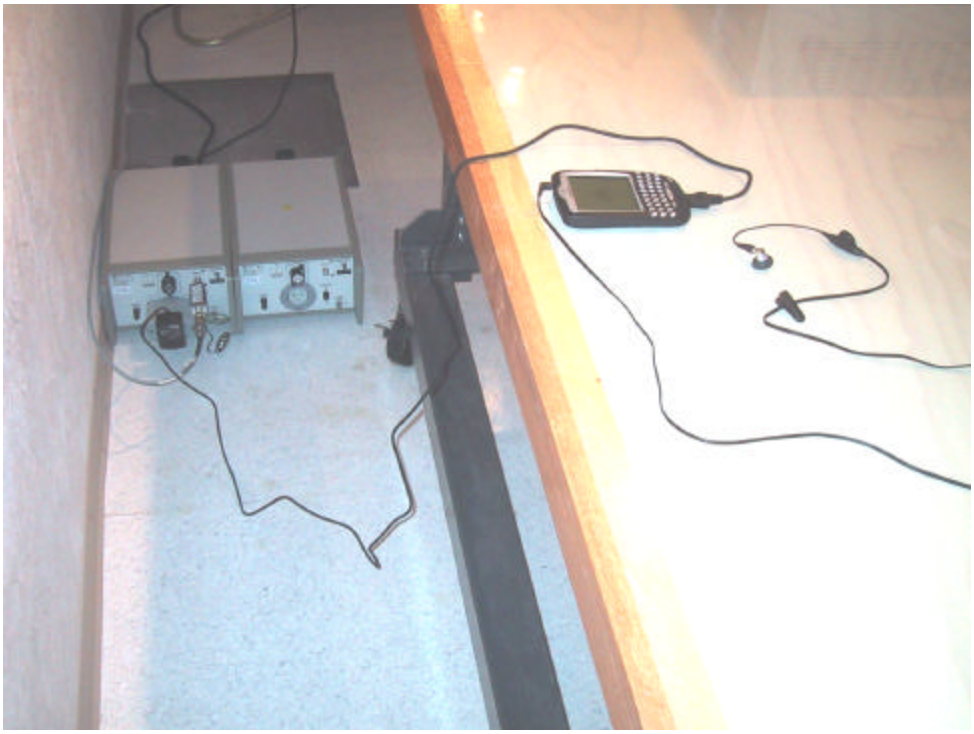
Conducted Emission Test-Setup Photos





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APPENDIX 2

RADIATED EMISSIONS TEST DATA

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Radiated Emissions Test Results

FCC CFR 47 Part 15, Subpart B, Class B July 21, 2003

Operating Mode: The Handheld was connected to the Travel Charger. The ac input to the Travel Charger was 120 volts, 60 Hz. The Handheld was operating in battery charging mode. The Headset was connected to the Handheld.

Test Distance was 3.0 metres.

Frequency (MHz)	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (Q.P. or Peak)	Measured Level (dBµV)	Correction Factors for preamp/antenna/cables/ filter (dB/m)	Field Strength Level (reading+corr.) (dBµV/m)	Limit @ 3.0 m (dBµV/m)	Test Margin (dB)
36.162	V	1.43	108	Q.P	45.04	-19.93	25.11	43.5	-14.89
71.451	V	1.49	187	Q.P.	38.00	-21.04	16.96	43.5	-23.04

All other emission levels had a test margin of greater than 25 dB.

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Radiated Emissions Test Results con't

FCC CFR 47 Part 15, Subpart B, Class B July 21, 2003

Operating Mode: The Handheld was connected to the support PC via the Docking/Charging Cradle for charging and data link. The ac input voltage to the support PC was 120 volts, 60 Hz.

Test Distance was 3.0 metres.

Frequency (MHz)	Antenna Pol. (V/H)	Antenna Height (metres)	Test Angle (Deg.)	Detector (Q.P. or Peak)	Measured Level (dBµV)	Correction Factors for preamp/antenna/cables/ filter (dB/m)	Field Strength Level (reading+corr.) (dBµV/m)	Limit @ 3.0 m (dBµV/m)	Test Margin (dB)
74.339	V	1.40	0	Q.P.	48.06	-20.82	27.24	40.0	-12.76
100.646	V	2.74	177	Q.P.	60.54	-19.57	40.97	43.5	-2.53
100.656	H	2.67	119	Q.P	57.81	-19.57	38.24	43.5	-5.26
123.841	H	1.55	91	Q.P.	45.44	-18.63	26.81	43.5	-16.69
600.988	H	1.84	254	Q.P.	42.95	-5.68	37.27	46.0	-8.73
601.003	V	1.93	177	Q.P.	40.41	-5.68	34.73	46.0	-11.27
604.069	V	1.94	176	Q.P.	40.52	-5.68	34.83	46.0	-11.17
604.120	H	1.01	190	Q.P.	45.74	-5.68	40.06	46.0	-5.94
901.146	V	1.38	346	Q.P.	35.77	-1.40	34.37	46.0	-11.63
901.154	H	1.97	282	Q.P.	33.29	-1.40	31.89	46.0	-14.11
905.608	H	1.90	282	Q.P.	32.96	-1.39	31.57	46.0	-14.43
905.873	V	1.38	0	Q.P.	35.38	-1.40	33.98	46.0	-12.02

All other emission levels had a test margin of greater than 25 dB.

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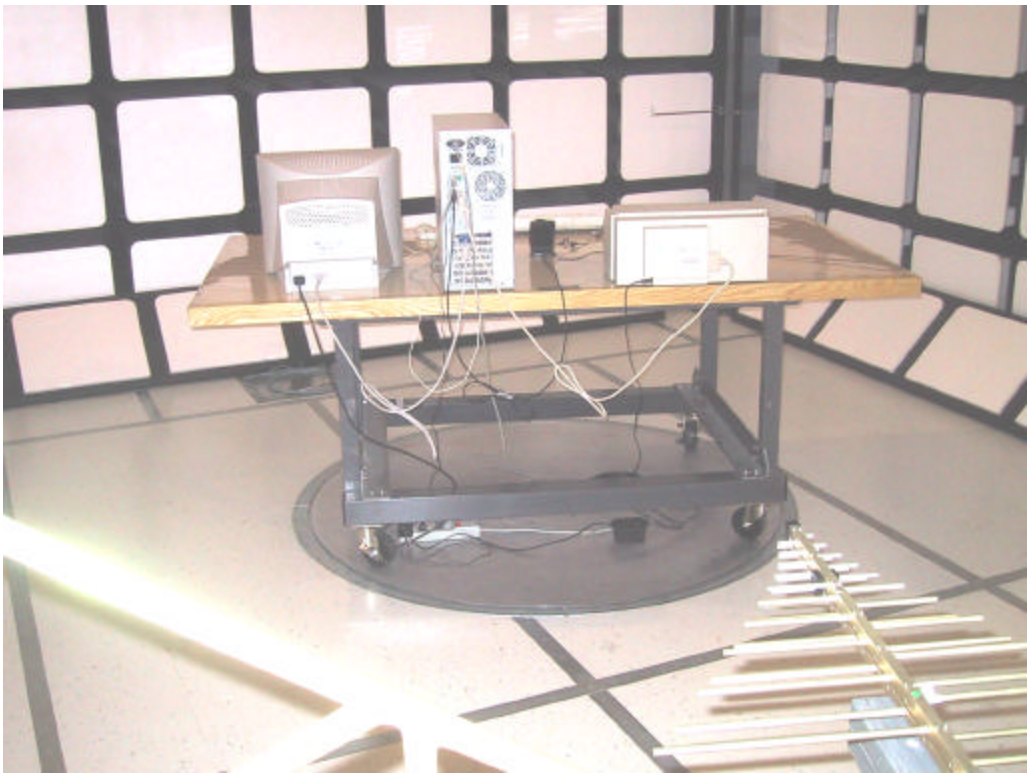
Radiated Emissions Test Photos



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