Elliott Laboratories Inc.
www.elliotlabs.com
684 West Maude Avenue
Sunnyvale, CA 94085-3518
408-245-7800 Phone
408-245-3499 Fax

Electromagnetic Emissions Test Report per FCC Part 15, Subpart B Specifications Class B Digital Device and ICES-003 on the Handspring Model: Treo 600 (CDMA Version)

MANUFACTURER:	Handspring 189 Bernardo Avenue Mountain View, CA 94043
TEST SITE:	Elliott Laboratories, Inc. 684 W. Maude Avenue Sunnyvale, CA 94086
REPORT DATE:	July 1, 2003
FINAL TEST DATE:	June 27, 2003
AUTHORIZED SIGNATORY:	David W. Bare Chief Technical Officer

TABLE OF CONTENTS

SCOPE

The Federal Communications Commission (FCC) establishes rules and regulations regarding the electromagnetic emissions of all electronic devices. An electromagnetic emissions test has been performed on the Handspring model Treo 600 (CDMA Version) pursuant to Subpart B of Part 15 of FCC Rules for digital devices. Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in ANSI C63.4-1992 as outlined in Elliott Laboratories test procedures. The test data has been provided as an exhibit to this report for reference. Additionally the results are deemed satisfactory evidence of compliance with Industry Canada Interference-Causing Equipment Standard ICES-003 (Issue 3, Nov 22, 1997)

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

The test results recorded herein are based on a single type test of the Handspring model Treo 600 (CDMA Version) and therefore apply only to the tested sample. The sample was selected and prepared by David Waitt of Handspring

OBJECTIVE

The primary objective of the manufacturer is compliance with Subpart B of Part 15 of FCC Rules for the radiated and conducted emissions of digital devices. Since the subject device is intended for operation in a residential environment and is either a personal computer or a peripheral for a personal computer, a certification to Class B emissions limits is required.

Certification is a procedure where the manufacturer or a contracted laboratory makes measurements and submits the test data and technical information to the FCC. The FCC issues a grant of equipment authorization upon successful completion of their review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units that are subsequently manufactured.

Maintenance of FCC compliance is the responsibility of the manufacturer. Any modification of the product that may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing and/or I/O cable changes, etc.).

EMISSION TEST RESULTS

The following emissions tests were performed on the Handspring model Treo 600 (CDMA Version). The actual test results are contained in an appendix of this report.

LIMITS OF CONDUCTED INTERFERENCE VOLTAGE

The EUT tested complied with the limits detailed in FCC Rules Part 15 Section 15.107(a).

The following measurement was extracted from the data recorded during the conducted emissions scan and represents the highest amplitude emission relative to the specification limit. The actual test data and any correction factors are contained in an appendix of this report.

120V, 60Hz

Frequency	Level	Power	Class B		Detector	Comments
MHz	dBuV	Lead	Limit	Margin	QP/Ave	
2.303	31.6	Line 1	46	-14.4	QP	

Note 1: For frequencies below 30Mz, the limits of CISPR22 were used.
Note 2: Receiver settings were set to RBW= 9kHz and VBW= 30kHz for measurements below 30 MHz.

LIMITS OF RADIATED INTERFERENCE FIELD STRENGTH

The EUT tested complied with the limits detailed in FCC Rules Part 15 Section 15.109 (a) & (g).

The following measurement was extracted from the data recorded during the radiated electric field emissions scan and represents the highest amplitude emission relative to the specification limit. The actual test data and any correction factors are contained in an appendix of this report.

Below 1 GHz.

Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
54.198	26.9	V	30	-3.1	QP	263	2.5	

Note 1: For frequencies below 1 GHz, the limits of CISPR22 were used.
Note 2: Receiver settings were set to RBW= 120kHz and VBW= 300kHz for measurements below 1 GHz.

Above 1 GHz.

Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	

Note 1: For frequencies above 1 GHz, the limits of FCC were used.
Note 2: Receiver settings were set to RBW= 1MHz and VBW= 1MHz for measurements above 1GHz.
Note 3: No emission reported since all readings were 10-dB below the limit. Scan was performed up to 2 GHz.

MEASUREMENT UNCERTAINTIES

ISO Guide 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with NAMAS document NIS 81.

Measurement Type	Frequency Range (MHz)	Calculated Uncertainty (dB)
Conducted Emissions	0.15 to 30	± 2.4
Radiated Emissions	30 to 1000	± 3.6

EQUIPMENT UNDER TEST (EUT) DETAILS

GENERAL

The Handspring model Treo 600 (CDMA Version) is a personal digital assistant with a built-in cellular phone. Normally, the EUT would be placed on a tabletop during operation. The EUT was, therefore, treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the power supply for the EUT is 120/240 V, 50/60 Hz, 1 Amps.

The sample was received on June 24, 2003 and tested on June 26, 2003.

The EUT consisted of the following component(s):

Manufacturer	Model	Description	Serial Number
Handspring	Trio 600	Robin	N/A
Motorola	MU12-1052100-A1	Power Supply	N/A

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 6.5 cm wide by 1.5 cm deep by 13 cm high.

MODIFICATIONS

The EUT did not require modifications in order to comply with the emission specifications

SUPPORT EQUIPMENT

The following equipment was used as local support equipment for emissions testing:

Manufacturer	Model	Description	Serial Number	FCC ID
IBM	2635	Laptop	78-Gy734	AMO9611TBOON
IBM	02K6663	Power Supply	N/A	N/A

No remote support equipment was used during emissions testing.

EXTERNAL I/O CABLING

The I/O cabling configuration during emissions testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Docking Port(EUT)	Serial (Computer) and AC Mains	Multiconductor (Y-cabe)	Shielded	1.9

TEST SOFTWARE

The EUT was looping data traffic between itself and the local computer.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on June 26, 2003 at the Elliott Laboratories Chamber # 3 located on Fremont, 41039 Boyce Road, Fremont CA, 94538. The test site contains separate areas for radiated and conducted emissions testing. Pursuant to section 2.948 of the Rules, construction, calibration, and equipment data has been filed with the Commission.

The FCC recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement with the exception of predictable local TV, radio, and mobile communications traffic. The test site contains separate areas for radiated and conducted emissions testing. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent FCC requirements.

CONDUCTED EMISSIONS CONSIDERATIONS

Conducted emissions testing is performed in conformance with ANSI C63.4-1992. Measurements are made with the EUT connected to the public power network through a nominal, standardized RF impedance, which is provided by a line impedance stabilization network, known as a LISN. A LISN is inserted in series with each current-carrying conductor in the EUT power cord.

RADIATED EMISSIONS CONSIDERATIONS

The measurements were made in an anechoic chamber. The test site is maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4 guidelines.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers, allow both ease of measurement and high accuracy to be achieved. The receivershave Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz.

INSTRUMENT CONTROL COMPUTER

The receivers utilize either a Rohde & Schwarz EZM Spectrum Monitor/Controller or contain an internal Spectrum Monitor/Controller to view and convert the receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers.

The Spectrum Monitor provides a visual display of the signal being measured. In addition, the controller or a personal computer run automated data collection programs which control the receivers. This provides added accuracy since all site correction factors, such as cable loss and antenna factors are added automatically.

LINE IMPEDANCE STABILIZATION NETWORK (LISN)

Line conducted measurements utilize a fifty microhenry Line Impedance Stabilization Network as the monitoring point. The LISN used also contains a 250 uH CISPR adapter. This network provides for calibrated radio frequency noise measurements by the design of the internal low pass and high pass filters on the EUT and measurement ports, respectively.

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A biconical antenna is used to cover the range from 30 MHz to 300 MHz and a log periodic antenna is utilized from 300 MHz to 1000 MHz. Narrowband tuned dipole antennas are used over the entire 30 to 1000 MHz range for precision measurements of field strength. Above 1000 MHz, a horn antenna is used. The antenna calibration factors are included in site factors which are programmed into the test receivers.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height.

ANSI C63.4 specifies that the test height above ground for table mounted devices shall be 80 centimeters. Floor mounted equipment shall be placed on the ground plane if the device is normally used on a conductive floor or separated from the ground plane by insulating material from 3 to 12 mm if the device is normally used on a non-conductive floor. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An appendix of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

EUT AND CABLE PLACEMENT

The FCC requires that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.4, and the worst case orientation is used for final measurements.

CONDUCTED EMISSIONS

Conducted emissions are measured at the plug end of the power cord supplied with the EUT. Excess power cord length is wrapped in a bundle between 30 and 40 centimeters in length near the center of the cord. Preliminary measurements are made to determine the highest amplitude emission relative to the specification limit for all the modes of operation. Placement of system components and varying of cable positions are performed in each mode. A final peak mode scan is then performed in the position and mode for which the highest emission was noted on all current carrying conductors of the power cord.

RADIATED EMISSIONS

Radiated emissions measurements are performed in two phases as well. A preliminary scan of emissions is conducted in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed from 30 MHz up to the frequency required by the regulation specified on page 1. One or more of these is with the antenna polarized vertically while the one or more of these is with the antenna polarized horizontally. During the preliminary scans, the EUT is rotated through 360˚, the antenna height is varied and cable positions are varied to determine the highest emission relative to the limit.

A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth resulting in the highest emission is then maintained while varying the antenna height from one to four meters. The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain. Emissions having values close to the specification limit may also be measured with a tuned dipole antenna to determine compliance.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dBuV). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dBuV/m). The results are then converted to the linear forms of uV and uV/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

CONDUCTED EMISSIONS SPECIFICATION LIMITS,

Frequency Range (MHz)	Class B Limit (uV)	Class B Limit (dBuV)
0.450 to 30.000	250	48

RADIATED EMISSIONS SPECIFICATION LIMITS

Frequency Range (MHz)	Class B Limit (uV/m @ 3m)	Class B Limit (dBuV/m @ 3m)
30 to 88	100	40
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

Receiver readings are compared directly to the conducted emissions specification limit (decibel form) as follows:

$$R_r - B = C$$

and

$$C - S = M$$

where:

R_r = Receiver Reading in dBuV

B = Broadband Correction Factor*

C = Corrected Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

* Broadband Level - Per ANSI C63.4, 13 dB may be subtracted from the quasi-peak level if it is determined that the emission is broadband in nature. If the signal level in the average mode is six dB or more below the signal level in the peak mode, the emission is classified as broadband.

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements. A distance factor, when used for electric field measurements, is calculated by using the following formula:

$$F_d = 20*LOG_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dBuV/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dBuV/m

L_s = Specification Limit in dBuV/m

M = Margin in dB Relative to Spec

APPENDIX A: Reference Documents

Title 47 CFR, Part 2, Subpart I	"Marketing of Radiofrequency Devices"
Title 47 CFR, Part 2, Subpart J	"Equipment Authorization Procedures"
Title 47 CFR, Part 2, Subpart K	"Importation of Devices Capable of Causing Harmful Interference"
Title 47 CFR, Part 15, Subpart B	"Unintentional Radiators"
ANSI C63.4-1992	Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"
FCC/OST Bulletin # 61 (1993)	"The FCC Equipment Authorization Program for Radio Frequency Devices"
FCC/OST Bulletin # 62 (1993)	"Understanding the FCC Regulations Concerning Computing Devices"
Title 47 USC, Sections 501-504	Penalties for Non-compliance with FCC Rules
CISPR Pub. 22 (1997)	"Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment"

APPENDIX B: Test Equipment Calibration Data

1 Page

Conducted and Radiated Emissions, 26-Jun-03
Engineer: mfaustino

Manufacturer	Description	Model #	Assett #	Cal interval	Last Calibrated	Cal Due
Elliott Laboratories	RF Emissions Chamber	Chamber 5	1560	12	3/3/2003	3/3/2004
Rohde & Schwarz	EMI Test Receiver, 20Hz-7GHz	ESIB 7	1538	12	3/28/2003	3/28/2004
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	1401	12	2/24/2003	2/24/2004
Sunol Sciences	Biconilog, 30-3000MHz	JB3	1548	12	2/6/2003	2/6/2004
Thinking Assets	Weather Forecaster	Baro/Press/Humidity	648	12	4/16/2003	4/16/2004

Conducted Emissions, 26-Jun-03
Engineer: mfaustino

Manufacturer	Description	Model #	Assett #	Cal interval	Last Calibrated	Cal Due
EMCO	LISN, 10kHz-100MHz	3825/2	1292	12	4/24/2002	6/30/2003
EMCO	LISN, 10kHz-100MHz	3825/2	1293	12	6/2/2002	6/30/2003

APPENDIX C: Test Data Log Sheets

ELECTROMAGNETIC EMISSIONS

TEST LOG SHEETS

AND

MEASUREMENT DATA

T51698 14 Pages

Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Emissions Spec:	FCC	Class:	B
Immunity Spec:		Environment:	

EMC Test Data

For The

Handspring

Model

Robin

Date of Last Test: 6/26/2003

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Emissions Spec:	FCC	Class:	B
Immunity Spec:	Enter immunity spec on cover	Environment:	

EUT INFORMATION

General Description

The EUT is a personal digital assistant with a built-in CDMA celllular phone. Normally, the EUT would be hand-held during operation. The EUT was, however, treated as table-top equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 120/240 V, 50/60 Hz, ??? Amps.

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
Handspring	Robin	PDA/ Cellular Phone	N/A	O8FBW

Other EUT Details

EUT Enclosure

The EUT enclosure is primarily constructed of molded plastic. It measures approximately 6 cm wide by 1.5 cm deep by 13 cm high.

Modification History

Mod. #	Test	Date	Modification
1			
2			
3			

Modifications applied are assumed to be used on subsequent tests unless otherwise stated as a further modification.

Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Emissions Spec:	FCC	Class:	B
Immunity Spec:	Enter immunity spec on cover	Environment:	

Test Configuration #1

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Epson	P110A	printer	AGR1320291	ANBKMFBP110A
IBM	2635-3AV	laptop	78-GY734 97/11	AN09611TBOON

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
none				

Interface Cabling and Ports

		Cable(s)		
Port	Connected To	Description	Shielded or Unshielded	Length(m)
Docking Port(EUT)	Serial (Computer) and AC Mains	Multiconductor (Y-cabe)	Shielded	2.5
Parallel(Computer)	Printer	Multiconductor	Shielded	3

EUT Operation During Emissions

The EUT was looping data traffic between itself and the local computer.

Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Radiated Emissions

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 6/26/2003
Test Engineer: Marissa Faustino
Test Location: Chamber #3
Config. Used: 1
Config Change: none
EUT Voltage: 120V/60Hz

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated emissions testing.

On the OATS, the measurement antenna was located 10 meters from the EUT for the measurement range 30 - 1000 MHz and 3m from the EUT for the frequency range 1 - 10 GHz.

Note, **preliminary** testing indicates that the emissions were maximized by orientation of the EUT and elevation of the measurement antenna. **Maximized** testing indicated that the emissions were maximized by orientation of the EUT, elevation of the measurement antenna, and manipulation of the EUT's interface cables.

Note, for testing above 1 GHz, the FCC specifies the limit as an average measurement. In addition, the FCC states that the peak reading of any emission above 1 GHz, can not exceed the average limit by more than 20 dB.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 33 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	RE, 30 -1000 MHz, Preliminary Scan	EN 55022 Class B	Eval	**+1.3dB @ 54.198MHz**
2	RE, 30 - 1000MHz, Maximized Emissions	EN 55022 Class B	Pass	-3.1dB @ 54.198MHz

Modifications Made During Testing:

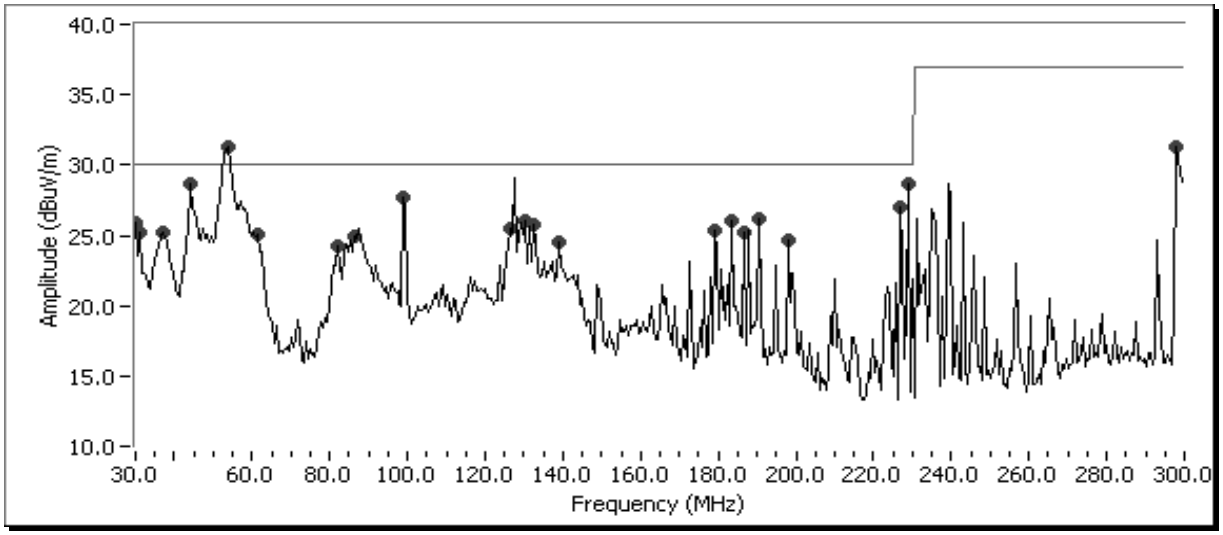
No modifications were made to the EUT during testing

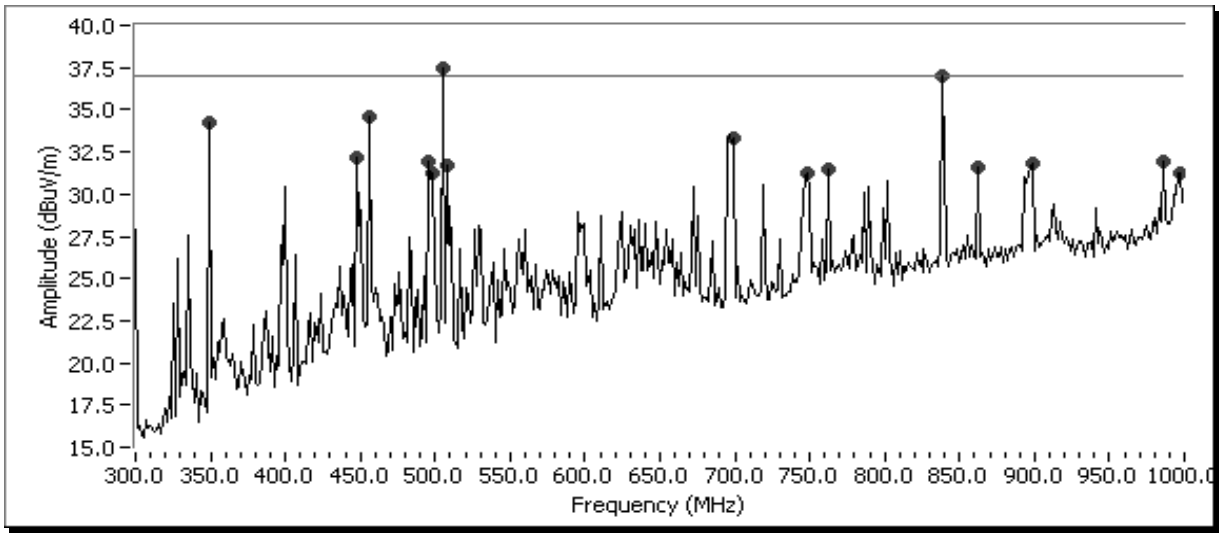
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #1: Preliminary Radiated Emissions, 30-1000 MHz





Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #1: Preliminary Radiated Emissions, 30-1000 MHz

Frequency	Level	Pol	EN 55022 Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
54.198	31.3	V	30.0	1.3	Peak	264	2.5	
505.157	37.5	H	37.0	0.5	Peak	187	1.5	
840.515	37.0	V	37.0	0.0	Peak	23	1.0	
43.275	28.7	V	30.0	-1.4	Peak	182	1.0	
228.752	28.6	H	30.0	-1.4	Peak	258	2.5	
98.626	27.7	V	30.0	-2.3	Peak	69	1.0	
454.735	34.6	264	37.0	-2.5	Peak	234	2.0	
348.883	34.3	H	37.0	-2.7	Peak	331	3.0	
226.450	27.0	V	30.0	-3.0	Peak	152	1.0	
697.586	33.4	H	37.0	-3.6	Peak	27	1.5	
190.460	26.1	V	30.0	-3.9	Peak	107	1.0	
130.640	26.0	V	30.0	-4.0	Peak	131	1.5	
183.522	26.0	V	30.0	-4.0	Peak	48	1.0	
30.088	25.9	V	30.0	-4.1	Peak	289	1.0	
131.878	25.7	V	30.0	-4.3	Peak	51	1.0	
126.089	25.4	V	30.0	-4.6	Peak	75	1.0	
178.512	25.3	V	30.0	-4.7	Peak	176	1.0	
36.100	25.2	V	30.0	-4.8	Peak	207	3.5	
31.168	25.2	V	30.0	-4.8	Peak	250	1.0	
186.339	25.2	V	30.0	-4.9	Peak	87	1.0	
448.459	32.1	V	37.0	-4.9	Peak	294	2.0	
61.232	25.0	V	30.0	-5.0	Peak	103	2.0	
984.642	31.9	V	37.0	-5.1	Peak	143	2.0	
494.016	31.9	V	37.0	-5.1	Peak	96	4.0	
86.412	24.9	V	30.0	-5.1	Peak	123	1.5	
899.876	31.8	V	37.0	-5.2	Peak	271	2.0	
197.614	24.7	V	30.0	-5.3	Peak	80	4.0	
509.008	31.7	H	37.0	-5.3	Peak	126	1.0	
860.995	31.7	V	37.0	-5.4	Peak	276	2.5	
139.259	24.6	V	30.0	-5.4	Peak	109	2.0	
761.592	31.5	H	37.0	-5.5	Peak	254	1.0	
298.252	31.4	V	37.0	-5.7	Peak	301	1.0	
82.217	24.3	V	30.0	-5.7	Peak	219	1.5	
750.521	31.2	V	37.0	-5.8	Peak	97	4.0	
498.861	31.2	V	37.0	-5.8	Peak	96	4.0	
994.434	31.2	V	37.0	-5.8	Peak	303	1.5	

Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #2: Maximized Readings From Run #1

Frequency	Level	Pol	EN 55022 Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
54.198	26.9	V	30.0	-3.1	QP	263	2.5	
505.158	30.4	H	37.0	-6.6	QP	186	1.5	
43.275	17.4	V	30.0	-12.7	QP	269	1.0	
98.626	15.4	V	30.0	-14.6	QP	68	1.0	
840.498	20.4	V	37.0	-16.6	QP	360	1.0	
228.752	8.9	H	30.0	-21.1	QP	257	2.5	

Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Conducted Emissions - Power Ports

Test Specifics

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 6/26/2003
Test Engineer: Marissa Faustino
Test Location: Chamber #3

Config. Used: 1
Config Change: none
EUT Voltage: Refer to individual run

General Test Configuration

For tabletop equipment, the EUT was located on a wooden table, 40 cm from a vertical coupling plane and 80cm from the LISN. A second LISN was used for all local support equipment.

Ambient Conditions:

Temperature: 21 °C
Rel. Humidity: 33 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power, 230V/50Hz	EN 55022 Class B	Pass	-11.3dB @ 0.189MHz
2	CE, AC Power,120V/60Hz	EN 55022 Class B	Pass	-14.4dB @ 2.303MHz

Modifications Made During Testing:

No modifications were made to the EUT during testing

Deviations From The Standard

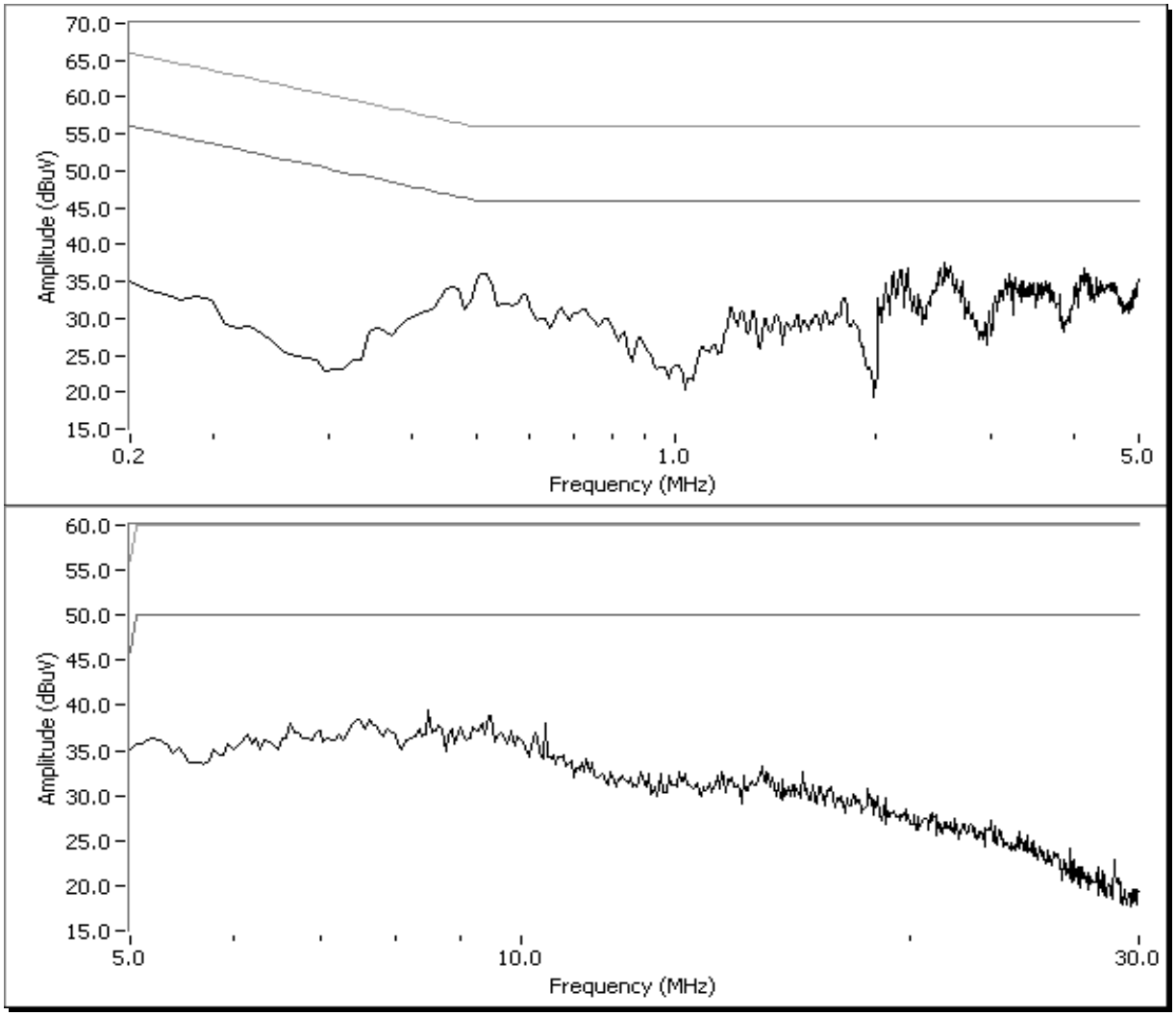
No deviations were made from the requirements of the standard.

EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

NEUTRAL

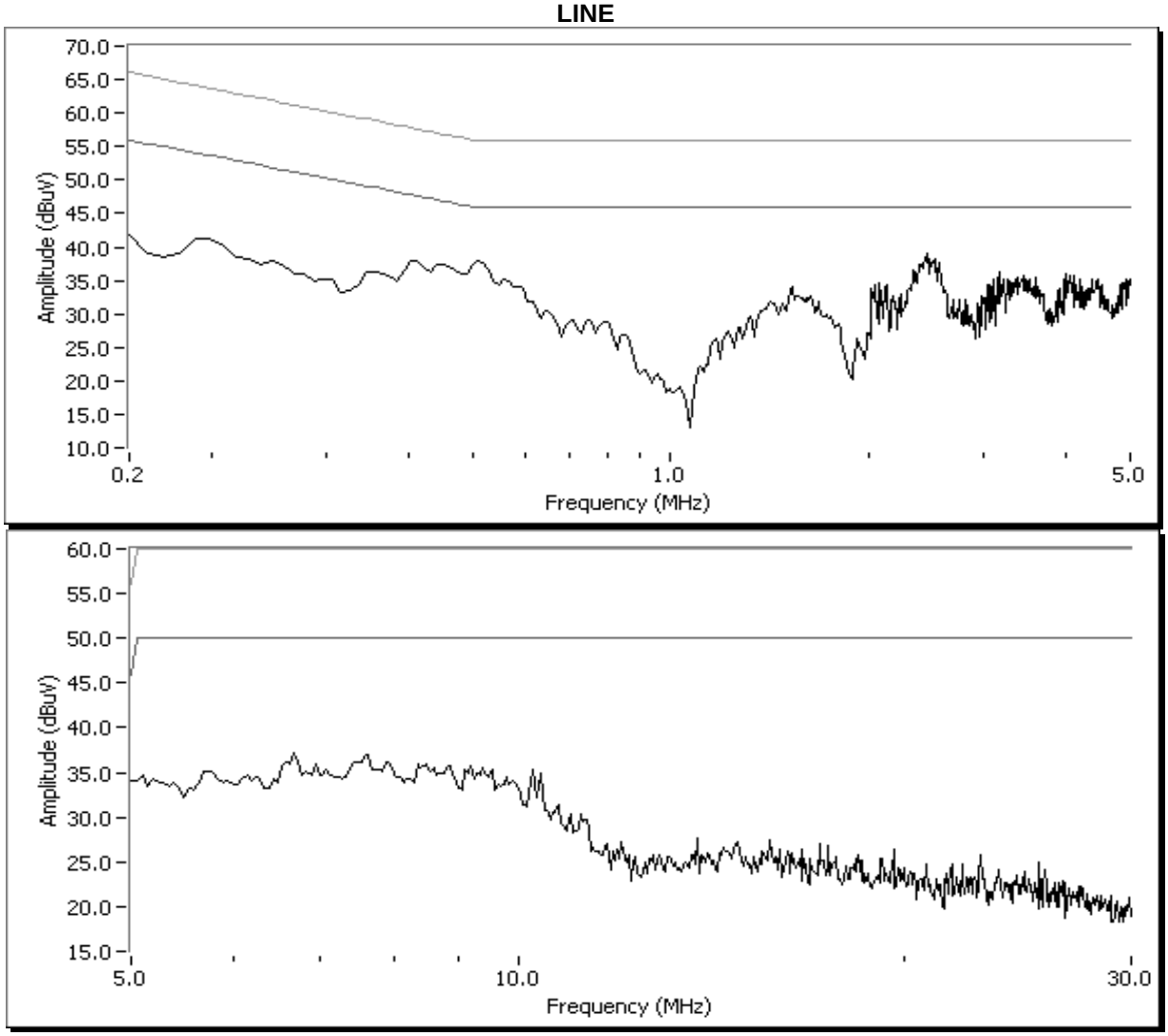


EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

LINE



Elliott

EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 230V/50Hz

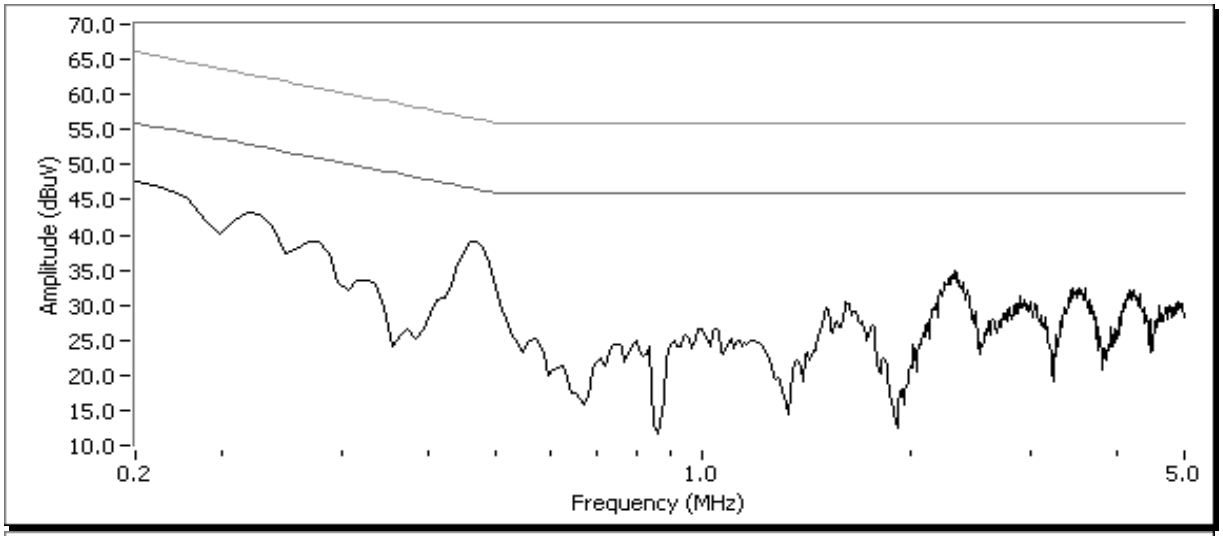
Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.189	42.8	Line 1	54.1	-11.3	QP	
0.509	33.9	Line 1	46.0	-12.1	QP	
2.236	33.5	Neutral	46.0	-12.5	QP	
2.505	33.5	Neutral	46.0	-12.5	QP	
8.497	33.9	Neutral	50.0	-16.1	QP	
6.700	31.6	Line 1	50.0	-18.4	QP	
2.505	26.3	Neutral	46.0	-19.8	AVG	
8.497	27.4	Neutral	50.0	-22.6	AVG	
0.189	31.4	Line 1	54.1	-22.7	AVG	
0.509	22.5	Line 1	46.0	-23.6	AVG	
2.236	22.0	Neutral	46.0	-24.0	AVG	
6.700	24.8	Line 1	50.0	-25.2	AVG	

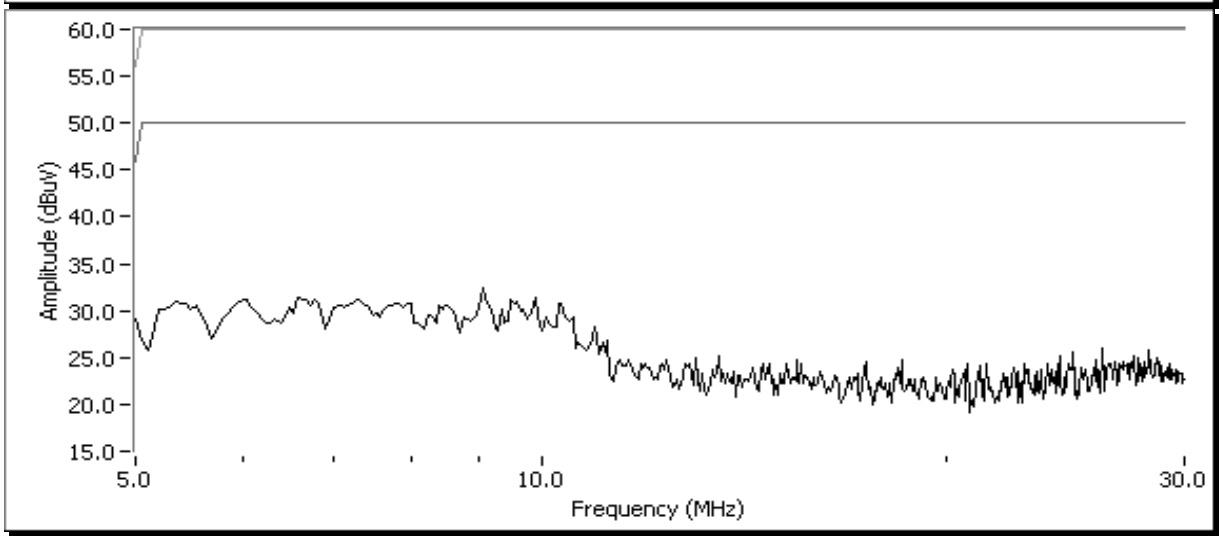
EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

LINE



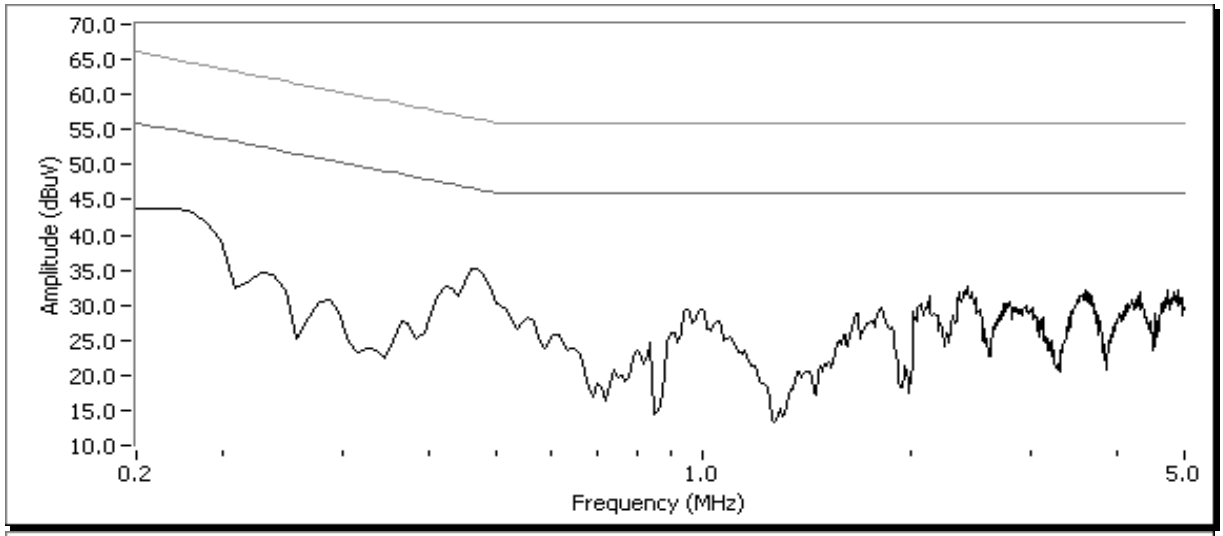


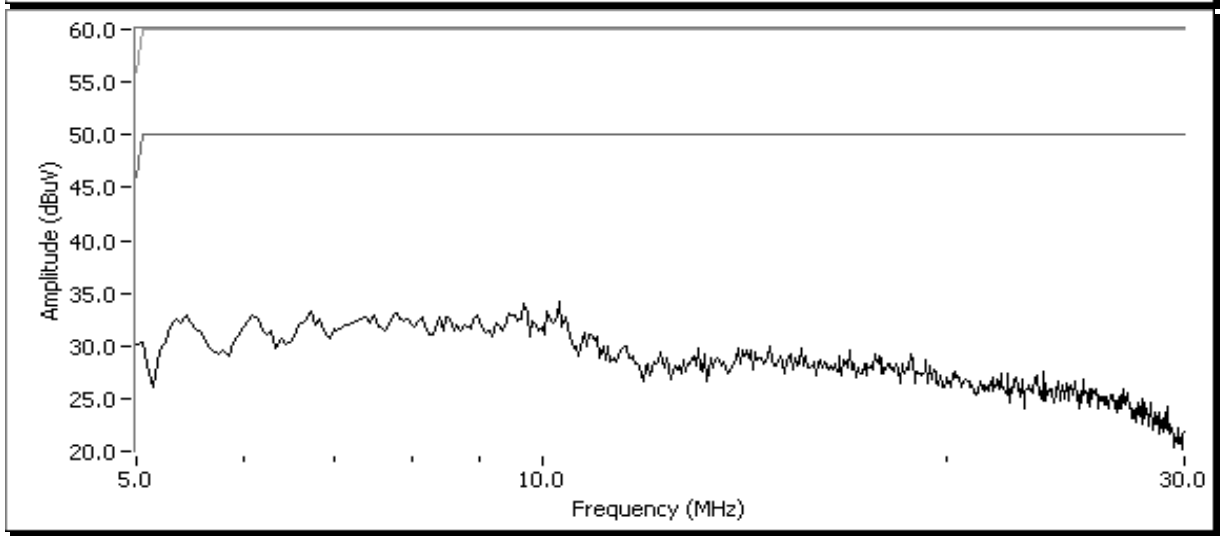
EMC Test Data

Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

NEUTRAL





Elliott

EMC Test Data

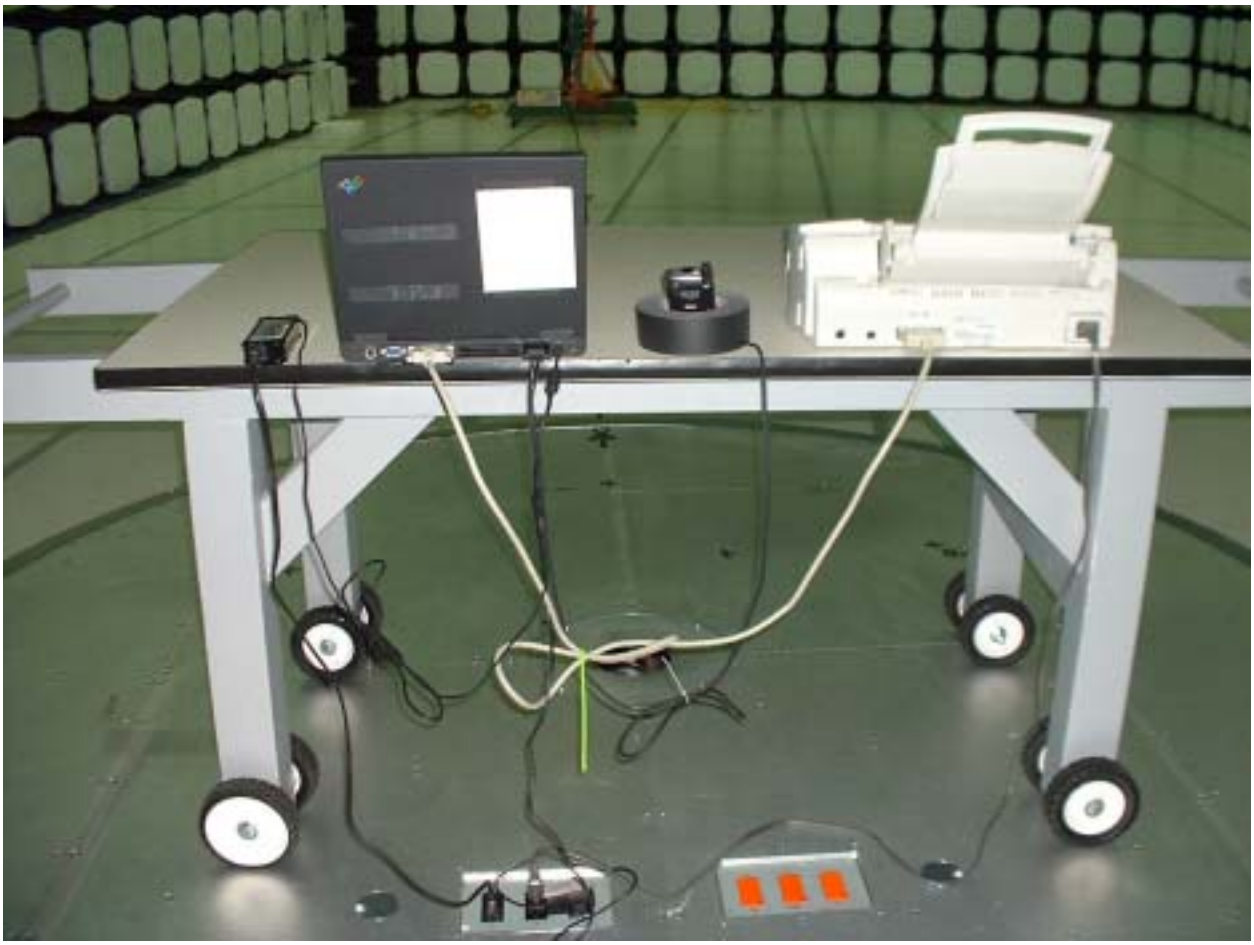
Client:	Handspring	Job Number:	J49635
Model:	Robin	T-Log Number:	T51698
		Account Manager:	Christine Vu
Contact:	David Waitt		
Spec:	FCC	Class:	B

Run #2: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz

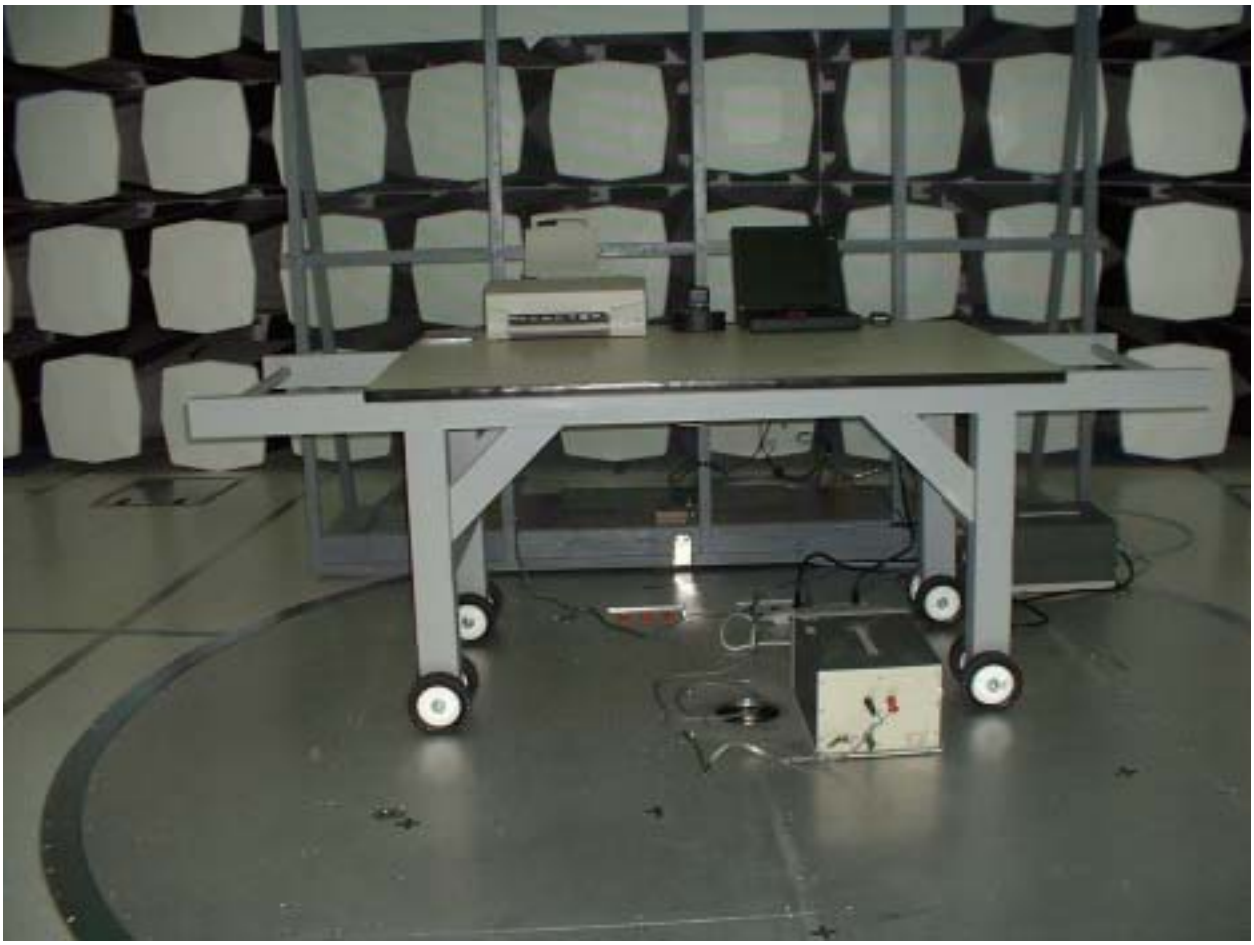
Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
2.303	31.6	Line 1	46.0	-14.4	QP	
10.300	29.3	Neutral	50.0	-20.7	QP	
0.179	33.2	Neutral	54.5	-21.4	QP	
2.303	24.3	Line 1	46.0	-21.7	AVG	
9.050	27.3	Line 1	50.0	-22.7	QP	
0.470	23.8	Line 1	46.5	-22.7	QP	
0.470	22.4	Neutral	46.5	-24.1	QP	
10.300	23.7	Neutral	50.0	-26.3	AVG	
9.050	21.5	Line 1	50.0	-28.5	AVG	
0.470	12.7	Line 1	46.5	-33.8	AVG	
0.470	11.1	Neutral	46.5	-35.4	AVG	
0.179	18.8	Neutral	54.5	-35.8	AVG	

APPENDIX D: Radiated Emissions Test Configuration Photographs

APPENDIX D: Radiated Emissions Test Configuration Photographs



APPENDIX E: Conducted Emissions Test Configuration Photographs



APPENDIX E: Conducted Emissions Test Configuration Photographs