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Electromagnetic Emissions Test Report and Verification of Compliance per FCC Part 15, Subpart B Specifications for a Class B Digital Device and ICES-003 Class B on the PalmOne, Inc. Model: TREO 650 (CDMA)

MANUFACTURER:	PalmOne, Inc. 400 N. McCarthy Blvd. Milpitas, CA 95035-5112
TEST SITE:	Elliott Laboratories, Inc. 41039 Boyce Road Fremont, CA 94538
REPORT DATE:	September 8, 2004
FINAL TEST DATE:	July 22, 2004
AUTHORIZED SIGNATORY:	Juan Martinez Senior EMC Engineer

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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 PalmOne, Inc. model TREO 650 (CDMA) 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 appendix 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)

The digital device above has been tested in a simulated typical installation to demonstrate compliance with the relevant FCC performance and procedural standards.

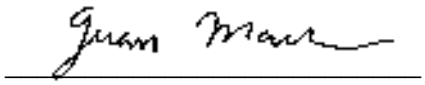
Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

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 PalmOne, Inc. model TREO 650 (CDMA) and therefore apply only to the tested sample. The sample was selected and prepared by David Waitt of PalmOne, Inc..

VALIDATING SIGNATURES

The tested sample of the cable location and Class B digital device submitted to and tested by Elliott Laboratories complied with the requirements of subpart B of Part 15 of the Federal Communications Commissions Rules as specified in this report.



Juan Martinez
Senior EMC Engineer
Elliott Laboratories, Inc.

The official of the company responsible for marketing the device tested.

_____
Signature

_____
Printed Name
PalmOne, Inc.

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 any environment including residential areas, equipment verification is required.

Equipment verification is a procedure where the manufacturer or a contracted laboratory makes measurements and takes necessary steps to ensure that the equipment complies with the appropriate technical standards. Submittal of a sample unit or test data to the FCC is not required unless specifically requested by the Commission. Once equipment verification has been obtained, a label indicating compliance must be attached to all identical units subsequently manufactured. Specific cautionary information must also be included in the operator's manual. These FCC labeling requirements are included as an appendix to this report.

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 PalmOne, Inc. model TREO 650 (CDMA). 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.

0.15 – 30.00MHz, 120V/ 60Hz, NETBIT

Frequency	Level	Power	Class B		Detector	Comments
MHz	dBuV	Lead	Limit	Margin	QP/Ave	
0.632	50.9	Line 1	56.0	-5.1	QP	-

LIMITS OF RADIATED INTERFERENCE FIELD STRENGTH

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

30 – 1000 MHz, NETBIT

Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	Degrees	Meters	
133.213	24.4	V	30.0	-5.6	QP	348	1.0	-

1000 – 2000 MHz, NETBIT

Frequency	Level	Pol	Class B		Detector	Azimuth	Height	Comments
MHz	dBuV/m	v/h	Limit	Margin	Pk/QP/Avg	Degrees	Meters	
1001.360	37.9	H	54.0	-16.1	Avg	198	1.0	-

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 PalmOne, Inc. model TREO 650 (CDMA) is a wireless phone, which is designed to place wireless calls. 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 EUT is 120/240 V, 50/60 Hz, 1 Amps.

The sample was received on July 22, 2004 and tested on July 22, 2004. The EUT consisted of the following component(s):

Manufacturer/Model/Description	Serial Number
PalmOne TREO 650 (CDMA) Wireless Phone	-
PalmOne DSC-51F-52P US Power Supply	14-0028-02

ENCLOSURE

The EUT enclosure is primarily constructed of plastic. It measures approximately 6 cm wide by 12 cm deep by 2 cm high.

MODIFICATIONS

The EUT did not require modifications during testing in order to comply with emissions specifications.

SUPPORT EQUIPMENT

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

Manufacturer	Model	Description	Serial Number	FCC ID
Dell	PP01L	Laptop computer	-	DoC
Dell	-	AC Adaptor for Laptop	-	-
AIWA	HP-X222	stereo dynamic headphones	-	-

No remote support equipment was used during testing.

EUT INTERFACE PORTS

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

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
USB Hotsync Port	Laptop USB Port	USB Cable	Shielded	???
Charging Port	External AC/DC Adapter	DC Power Leads	Unshielded	1.0

Additional Interface Cabling and Ports

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
Laptop Headphone Port	Aiwa Stereo Headphones	Integral Audio Leads	Unshielded	1.0
Laptop DC Input	External AC-DC Charger	DC power leads and AC power cord	Unshielded	3.0

EUT OPERATION

During emissions testing, the CPU was busy running scrolling H's as specified by the FCC.

TEST SITE

GENERAL INFORMATION

Final test measurements were taken on July 22, 2004 at the Elliott Laboratories Chamber #3 located at 41039 Boyce Road, Fremont, California. 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 FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment. 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 receivers have 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 that 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 that results 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 that have 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 and radiated emissions given below are taken from the first edition of CISPR Pub. 22 (1997), "Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment." 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 limits are based on the use of an average or quasi-peak detector as indicated.

CONDUCTED EMISSIONS SPECIFICATION LIMITS,

Frequency Range (MHz)	Average Limit (dBuV)	Quasi Peak Limit (dBuV)
0.150 to 0.500	Linear decrease on logarithmic frequency axis between 56.0 and 46.0	Linear decrease on logarithmic frequency axis between 66.0 and 56.0
0.500 to 5.000	46.0	56.0
5.000 to 30.000	50.0	60.0

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

RADIATED EMISSIONS SPECIFICATION LIMITS

Note: The limits for radiated emissions above 1000 MHz are based on the use of an average detector. In addition, limits based on the use of a peak detector are specifed as 20 dB above the limits based on the use of an average detector.

Frequency (MHz)	Average Limit (uV/m @ 3m)	Average Limit (dBuV/m @ 3m)
above 1000	500	54.0

SAMPLE CALCULATIONS - CONDUCTED EMISSIONS

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

$$R_r - S = M$$

where:

R_r = Receiver Reading in dBuV

S = Specification Limit in dBuV

M = Margin to Specification in +/- dB

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: Test Equipment Calibration Data

1 Page

Radiated Emissions & Conducted Emissions, 22-Jul-04
Engineer: Elijah Garcia

Manufacturer	Description	Model #	Asset #	Cal Due
EMCO	LISN, 10kHz-100MHz	3825/2	1292	25-Jun-05
EMCO	LISN, 10kHz-100MHz	3825/2	1293	25-Jun-05
Com-Power	Pre Amplifier, 30-1000MHz	PA-103	1543	26-Nov-04
Rohde& Schwarz	Pulse Limiter	ESH3 Z2	1594	04-May-05
Rohde & Schwarz	EMI Test Receiver, 20Hz-7GHz	ESIB7	1630	05-Jan-05
Sunol Sciences	Biconilog, 30-3000MHz	JB3	1657	24-Feb-05

APPENDIX B: Test Data Log Sheets

ELECTROMAGNETIC EMISSIONS

TEST LOG SHEETS

AND

MEASUREMENT DATA

T56460 12 Pages

Elliott

EMC Test Data

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Emissions Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-
Immunity Spec:	N/A	Environment:	-

EMC Test Data

For The

Palm

Model

Ace CDMA

Date of Last Test: 8/11/2004

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Emissions Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-
Immunity Spec:	N/A	Environment:	-

EUT INFORMATION

General Description

The EUT is a Phone PDA which is designed to provide cellular phone, wireless Internet or network, and personal orginazer features. Normally, the EUT would be placed on a table top during operation. The EUT was, therefore, 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, .2

Equipment Under Test

Manufacturer	Model	Description	Serial Number	FCC ID
PalmOne	ACE CDMA	PDA phone	N/A	TBD
PalmOne	DSC-51F-52P US	Power Supply	14-0028-02	N/A

Other EUT Details

EUT Enclosure

The EUT enclosure is primarily constructed of plastic. It measures approximately 6 cm wide by 2.3 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.

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Emissions Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-
Immunity Spec:	N/A	Environment:	-

Test Configuration #2

Local Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
Dell	PP01L	Laptop computer	-	DoC
Dell	-	AC Adaptor for Laptop	-	-
Aiwa	HP-X222	Stereo Dynamic Headphones	-	-

Remote Support Equipment

Manufacturer	Model	Description	Serial Number	FCC ID
None	-	-	-	-

EUT Interface Cabling and Ports

		Cable(s)		
Port	Connected To	Description	Shielded or Unshielded	Length(m)
USB Hotsync Port	Laptop USB Port	USB Cable	Shielded	???
Charging Port	External AC/DC Adapter	DC Power Leads	Unshielded	1.0

Additional Interface Cabling and Ports

		Cable(s)		
Port	Connected To	Description	Shielded or Unshielded	Length(m)
Laptop Headphone Port	Aiwa Stereo Headphones	Integral Audio Leads	Unshielded	1.0
Laptop DC Input	External AC-DC Charger	DC power leads and AC power cord	Unshielded	3.0

EUT Operation During Emissions

During emissions testing, the CPU was busy running scrolling H's as specified by the FCC.

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-

Radiated Emissions

(Elliott Laboratories Fremont Facility, Semi-Anechoic Chamber)

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: 7/22/2004
Test Engineer: Elijah Garcia
Test Location: Fremont Chamber #3
Config. Used: 2
Config Change: none
EUT Voltage: 120V/60Hz

General Test Configuration

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

Unless otherwise specified, 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 - 2 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: 22.1 °C
Rel. Humidity: 58 %

Summary of Results

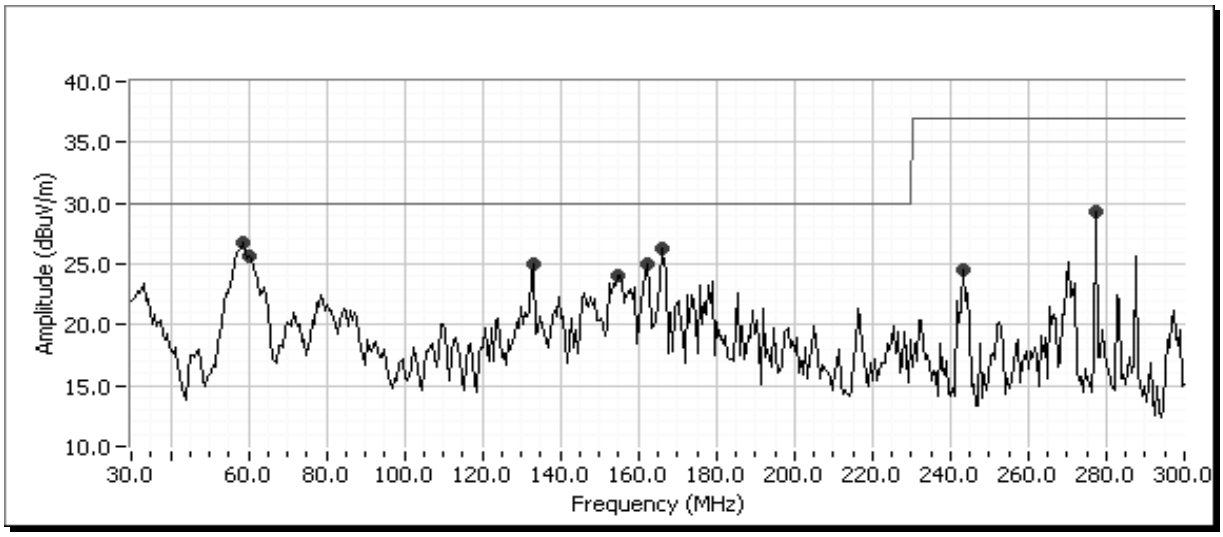
Run #	Test Performed	Limit	Result	Margin
1	RE, 30 - 1000 MHz, Preliminary Scan	EN 55022 Class B	Eval	-5.6dB @ 133.213MHz
2	RE, 30 - 1000 MHz, Maximized	EN 55022 Class B	Eval	-5.6dB @ 133.213MHz
3	RE, 1000 - 2000 MHz, Maximized Emissions	FCC Class B	Pass	-12.8dB @ 1.134GHz

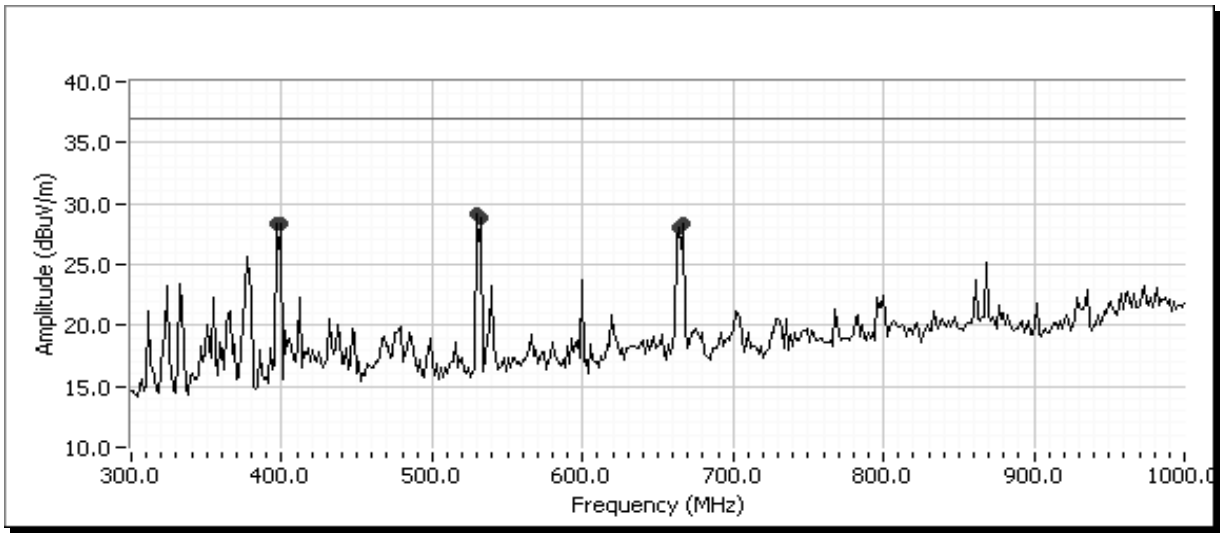
Modifications Made During Testing

No modifications were made to the EUT during testing

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz
Ace CDMA W/ Netbit NA Adapter





Elliott

EMC Test Data

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-

Run #1: Preliminary Radiated Emissions, 30 - 1000 MHz
Ace CDMA W/ Netbit NA Adapter

Frequency	Level	Pol	EN 55022 Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Preliminary peak readings captured during pre-scan								
242.856	24.5	V	37.0	-12.5	Peak	20	1.0	
57.960	26.7	V	30.0	-3.3	Peak	63	1.5	
60.599	25.7	V	30.0	-4.3	Peak	77	1.0	
162.718	25.0	V	30.0	-5.0	Peak	171	2.0	
155.204	24.1	V	30.0	-5.9	Peak	178	1.0	
277.372	29.4	H	37.0	-7.6	Peak	184	3.0	
165.747	26.4	V	30.0	-3.7	Peak	226	1.0	
133.213	25.1	V	30.0	-4.9	Peak	348	1.0	
664.307	28.1	H	37.0	-8.9	Peak	66	1.0	
665.998	28.3	H	37.0	-8.7	Peak	66	1.0	
530.032	29.2	H	37.0	-7.8	Peak	228	1.5	
531.891	28.8	H	37.0	-8.2	Peak	244	1.0	
398.910	28.4	H	37.0	-8.6	Peak	250	1.5	
398.350	28.4	H	37.0	-8.6	Peak	252	1.5	
Preliminary quasi-peak readings (no manipulation of EUT interface cables)								
133.213	24.4	V	30.0	-5.6	QP	348	1.0	
165.747	24.2	V	30.0	-5.8	QP	225	1.0	
60.599	23.3	V	30.0	-6.7	QP	77	1.0	
530.032	28.6	H	37.0	-8.4	QP	228	1.5	
57.960	21.0	V	30.0	-9.0	QP	63	1.5	
665.998	27.4	H	37.0	-9.6	QP	66	1.0	
162.718	19.5	V	30.0	-10.5	QP	170	2.0	
155.204	19.3	V	30.0	-10.7	QP	178	1.0	
398.350	25.2	H	37.0	-11.8	QP	251	1.5	
398.910	25.2	H	37.0	-11.8	QP	251	1.5	
531.891	25.2	H	37.0	-11.8	QP	244	1.0	
664.307	24.5	H	37.0	-12.5	QP	66	1.0	
242.856	23.6	V	37.0	-13.4	QP	20	1.0	
277.372	10.5	H	37.0	-26.5	QP	184	3.0	

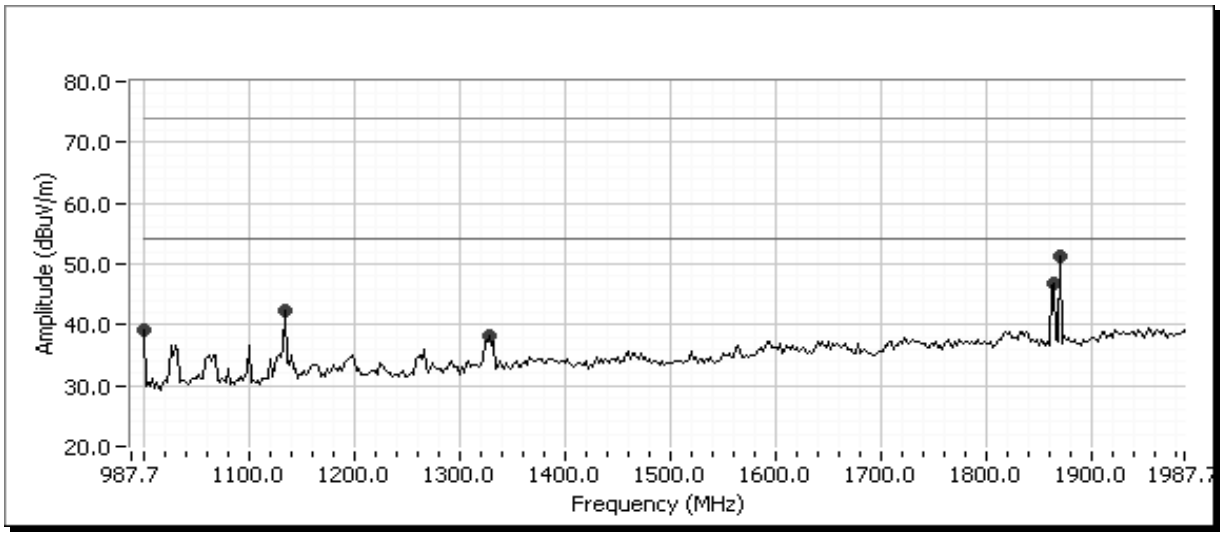
Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-

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	
Maximized quasi-peak readings (includes manipulation of EUT interface cables)								
133.213	24.4	V	30.0	-5.6	QP	348	1.0	
165.747	24.2	V	30.0	-5.8	QP	225	1.0	
60.599	23.3	V	30.0	-6.7	QP	77	1.0	
530.032	28.8	H	37.0	-8.2	QP	228	1.5	
57.960	21.0	V	30.0	-9.0	QP	63	1.5	
665.998	27.4	H	37.0	-9.6	QP	66	1.0	

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-

Run #3: Maximized Readings, 1000 - 2000 MHz
Measurements made at 3m per FCC requirements.



Frequency	Level	Pol	FCC Class B		Detector	Azimuth	Height	Comments
MHz	dBµV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
Preliminary peak readings captured during pre-scan (peak readings vs. average limit)								
1324.809	38.0	V	54.0	-16.0	Peak	118	1.0	
1134.893	42.4	H	54.0	-11.6	Peak	188	1.0	
1001.360	39.1	H	54.0	-14.9	Peak	198	1.0	
1869.740	51.4	H	54.0	-2.6	Peak	269	4.0	ambient spike
1863.727	46.7	V	54.0	-7.3	Peak	292	3.0	ambient spike
Final peak and average readings								
1001.360	37.9	H	54.0	-16.1	Avg	198	1.0	
1001.360	43.4	H	74.0	-30.6	Pk	198	1.0	
1134.893	41.3	H	54.0	-12.8	Avg	188	1.0	
1134.893	46.6	H	74.0	-27.4	Pk	188	1.0	
1324.809	31.2	V	54.0	-22.8	Avg	118	1.0	
1324.809	47.5	V	74.0	-26.6	Pk	118	1.0	

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-

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: 7/22/2004
Test Engineer: Elijah Garcia
Test Location: Fremont Chamber #3
Config. Used: 2
Config Change: none
EUT Voltage: 120V/60Hz

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: 22.1 °C
Rel. Humidity: 58 %

Summary of Results

Run #	Test Performed	Limit	Result	Margin
1	CE, AC Power,120V/60Hz	EN 55022 Class B	Pass	-5.1dB @ 632KHz

Modifications Made During Testing:

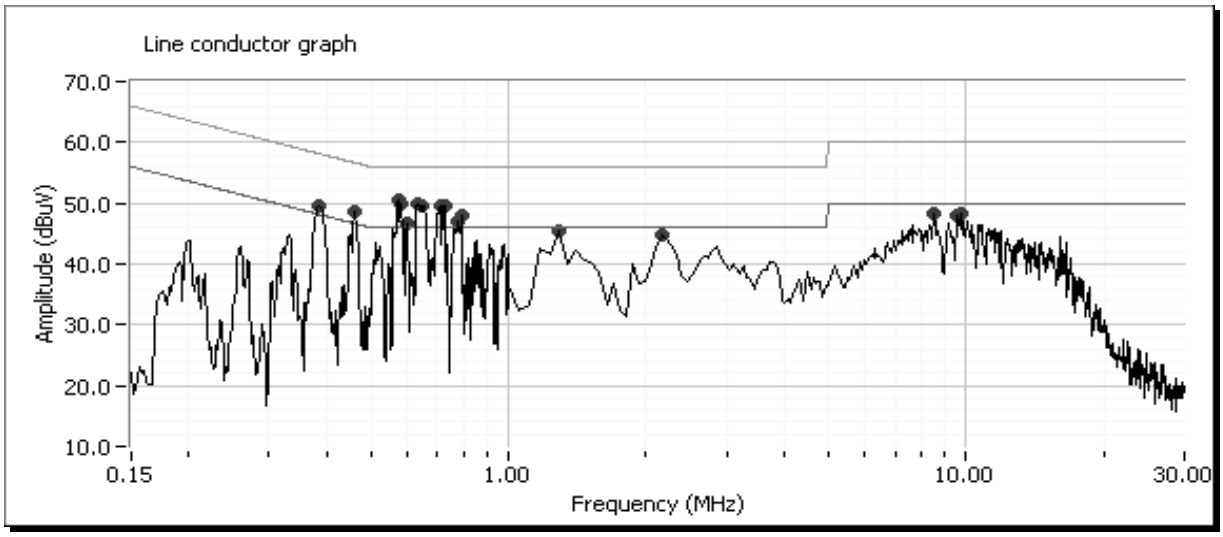
No modifications were made to the EUT during testing

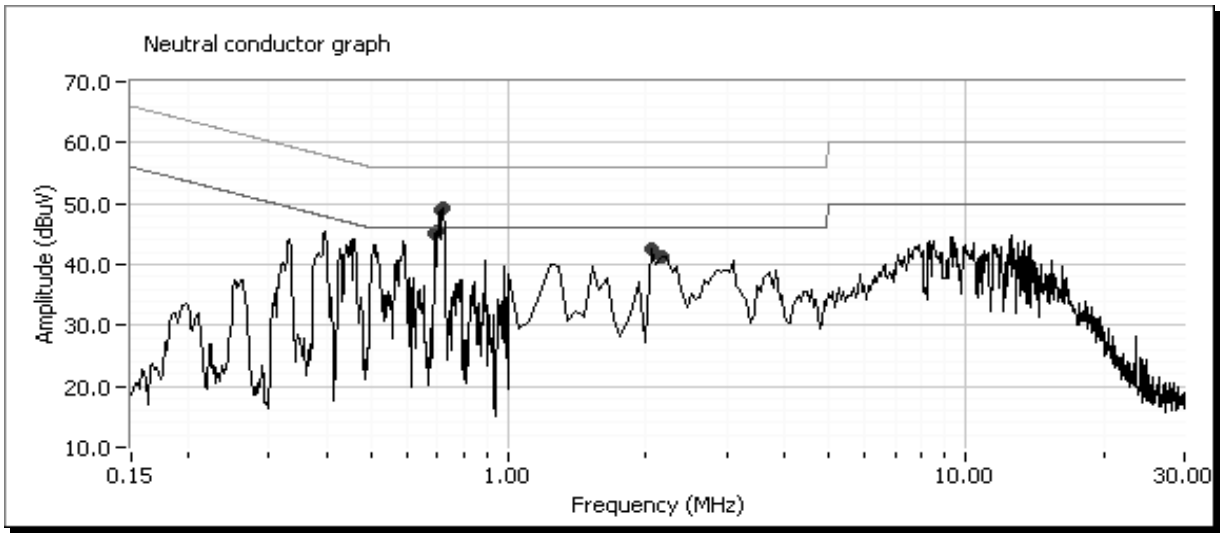
Deviations From The Standard

No deviations were made from the requirements of the standard.

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Ace CDMA W/ Netbit NA Adapter





Elliott

EMC Test Data

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Ace CDMA W/ Netbit NA Adapter

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.574	49.0	Line 1	56.0	-7.0	QP	
0.574	37.6	Line 1	46.0	-8.4	Average	
0.580	48.1	Line 1	56.0	-7.9	QP	
0.580	37.4	Line 1	46.0	-8.6	Average	
0.632	50.9	Line 1	56.0	-5.1	QP	
0.632	37.3	Line 1	46.0	-8.7	Average	
0.651	50.3	Line 1	56.0	-5.7	QP	
0.651	38.0	Line 1	46.0	-8.0	Average	
0.724	46.5	Line 1	56.0	-9.5	QP	
0.724	32.4	Line 1	46.0	-13.6	Average	
0.709	48.4	Line 1	56.0	-7.6	QP	
0.709	36.7	Line 1	46.0	-9.3	Average	
0.461	48.2	Line 1	56.7	-8.5	QP	
0.461	36.6	Line 1	46.7	-10.1	Average	
0.791	43.9	Line 1	56.0	-12.1	QP	
0.791	28.3	Line 1	46.0	-17.7	Average	
0.385	48.2	Line 1	58.2	-9.9	QP	
0.385	39.4	Line 1	48.2	-8.8	Average	
0.776	47.0	Line 1	56.0	-9.0	QP	
0.776	33.8	Line 1	46.0	-12.2	Average	
0.598	40.9	Line 1	56.0	-15.1	QP	
0.598	27.6	Line 1	46.0	-18.4	Average	
1.301	43.2	Line 1	56.0	-12.8	QP	
1.301	28.0	Line 1	46.0	-18.0	Average	
2.135	40.1	Line 1	56.0	-15.9	QP	
2.135	29.4	Line 1	46.0	-16.6	Average	
8.474	41.7	Line 1	60.0	-18.4	QP	
8.474	32.3	Line 1	50.0	-17.7	Average	
9.754	42.5	Line 1	60.0	-17.5	QP	
9.754	33.0	Line 1	50.0	-17.0	Average	
9.563	42.7	Line 1	60.0	-17.3	QP	
9.563	33.2	Line 1	50.0	-16.8	Average	

Client:	Palm	Job Number:	J55849
Model:	Ace CDMA	T-Log Number:	T56460
		Account Manager:	-
Contact:	David Waitt		
Spec:	FCC 22 & 24,RSS-129 & 133	Class:	-

Run #1: AC Power Port Conducted Emissions, 0.15 - 30MHz, 120V/60Hz
Ace CDMA W/ Netbit NA Adapter

Frequency	Level	AC	EN55022 B		Detector	Comments
MHz	dBµV	Line	Limit	Margin	QP/Ave	
0.691	44.7	neutral	56.0	-11.3	QP	
0.691	29.5	neutral	46.0	-16.5	Average	
0.697	45.8	neutral	56.0	-10.2	QP	
0.697	31.4	neutral	46.0	-14.6	Average	
0.710	45.5	neutral	56.0	-10.5	QP	
0.710	32.3	neutral	46.0	-13.8	Average	
0.721	44.4	neutral	56.0	-11.6	QP	
0.721	29.0	neutral	46.0	-17.0	Average	
2.137	36.8	neutral	56.0	-19.2	QP	
2.137	25.4	neutral	46.0	-20.6	Average	
2.102	33.9	neutral	56.0	-22.1	QP	
2.102	21.1	neutral	46.0	-24.9	Average	

APPENDIX C: Radiated Emissions Test Configuration Photographs

APPENDIX C: Radiated Emissions Test Configuration Photographs

APPENDIX D: Conducted Emissions Test Configuration Photographs

APPENDIX D: Conducted Emissions Test Configuration Photographs

APPENDIX E: 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 (1985)	"Limits and Methods of Measurements of Radio Interference Characteristics of Information Technology Equipment"

APPENDIX F: FCC Labeling and User Information

The following information has been provided to clarify equipment labeling requirements and the information which must be included in the operator's manual. These requirements are found in the FCC Rules for radio frequency devices, Part 15.

LABEL

Digital Device Label

Each digital device which has been verified as complying with the Class B limits shall have permanently attached in a conspicuous location for the user to observe, a label with the following statement:

> This device complies with Part 15 of FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Label Location

The FCC has defined *conspicuous location* as any location readily visible to the user of the device without the use of tools.

Label Attachment

The FCC has defined *permanently attached* as a label that can normally be expected to remain fastened to the equipment during the equipment's expected useful life. A paper gum label will generally not meet this condition.

FCC Labeling and User Information

OPERATOR'S MANUAL

The following warning or similar statement shall be provided in a conspicuous location in the operator's manual such that the user of the equipment is aware of its interference potential. Additional information about corrective measures may also be provided to the user at the manufacturer's option.

> **NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try and correct the interference by one or more of the following measures:
> - Reorient or relocate the receiving antenna.
> - Increase the separation between the equipment and the receiver.
> - Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
> - Consult the dealer or an experienced radio/TV technician for help.

Accessories

Where special accessories, such as shielded cables, are required in order to meet FCC emission limits, appropriate instructions regarding the need to use such accessories must be contained on the first page of text concerned with the installation of the device in the operator's manual.

Modifications

The operator's manual must caution the user that changes or modifications not expressly approved by you, the manufacturer, could void their right to operate the equipment.

Binding

The FCC has indicated that the radio interference statement be bound in the same manner as the operator's manual. Thus, a loose-leaf insert page in a bound or center-spine stapled manual would not meet this condition.

APPENDIX G: Industry Canada Information

For ICES-003 (digital apparatus), the product must be labeled with a notice indicating compliance, e.g.

"This Class B digital apparatus complies with Canadian ICES-003."

If it is not feasible to fix a label to the product, the notice may be included in the user manual.

The label or notice may be in English, French or both, based on the intended market, company marketing policies, and any other applicable provincial or federal regulations.