

**FCC PART 15 SUBPART B  
CLASS B TEST REPORT**

*for*

**PORTABLE COMPUTER**

**Model: GM-II**

Prepared for

ACME PORTABLE MACHINES, INC.  
14140 LIVE OAK AVENUE #D  
BALDWIN PARK, CALIFORNIA 91706

Prepared by: \_\_\_\_\_

KYLE FUJIMOTO

Approved by: \_\_\_\_\_

SCOTT McCUTCHAN

COMPATIBLE ELECTRONICS INC.  
114 OLINDA DRIVE  
BREA, CALIFORNIA 92823  
(714) 579-0500

DATE: NOVEMBER 27, 2001

	REPORT BODY	APPENDICES					TOTAL
		<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>	
PAGES	17	2	2	2	15	8	46

This report shall not be reproduced except in full, without the written approval of Compatible Electronics.

## TABLE OF CONTENTS

Section / Title	PAGE
<b>GENERAL REPORT SUMMARY</b>	<b>4</b>
<b>1. PURPOSE</b>	<b>5</b>
<b>2. ADMINISTRATIVE DATA</b>	<b>6</b>
2.1 Location of Testing	6
2.2 Traceability Statement	6
2.3 Cognizant Personnel	6
2.4 Date Test Sample was Received	6
2.5 Disposition of the Test Sample	6
2.6 Abbreviations and Acronyms	6
<b>3. APPLICABLE DOCUMENTS</b>	<b>7</b>
<b>4. DESCRIPTION OF TEST CONFIGURATION</b>	<b>8</b>
4.1 Description of Test Configuration - EMI	8
4.1.1 Cable Construction and Termination	9
<b>5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT</b>	<b>10</b>
5.1 Internal and External Components of the EUT List	10
5.2 Accessories List	11
5.3 EMI Test Equipment	12
<b>6. TEST SITE DESCRIPTION</b>	<b>13</b>
6.1 Test Facility Description	13
6.2 EUT Mounting, Bonding and Grounding	13
6.3 Facility Environmental Characteristics	13
<b>7. TEST PROCEDURES</b>	<b>14</b>
7.1 RF Emissions	14
7.1.1 Conducted Emissions Test	14
7.1.2 Radiated Emissions Test	15
<b>8. CONCLUSIONS</b>	<b>17</b>

**LIST OF APPENDICES**

<b>APPENDIX</b>	<b>TITLE</b>
A	Laboratory Recognitions
B	Modifications to the EUT
C	Additional Models Covered Under This Report
D	Diagrams, Charts, and Photos <ul style="list-style-type: none"> <li>• Test Setup Diagrams</li> <li>• Antenna and Amplifier Factors</li> <li>• Radiated and Conducted Emissions Photos</li> </ul>
E	Data Sheets

**LIST OF FIGURES**

<b>FIGURE</b>	<b>TITLE</b>
1	Conducted Emissions Test Setup
2	Plot Map And Layout of Radiated Site – 3 Meters
3	Plot Map And Layout of Radiated Site – 10 Meters

## 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 or any other agency of the U.S. Government.

Device Tested: Portable Computer  
Model: GM-II  
S/N: N/A

Product Description: The EUT is a portable computer.

Modifications: The EUT was not modified during the testing.

Manufacturer: ACME Portable Machines, Inc.  
14140 Live Oak Avenue #D  
Baldwin Park, California 91706

Test Date: November 19, 2001

Test Specifications: EMI requirements  
Limits: EN 55022: 1998 **Class B** and CFR Title 47, Part 15, Subpart B: 1997  
Test Procedure: ANSI C63.4: 1992.

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 <b>Class B</b> limits of EN 55022: 1998
2	Radiated RF Emissions, 30 MHz - 1000 MHz.	Complies with the <b>Class B</b> limits of EN 55022: 1998
3	Radiated RF Emissions, 1 GHz – 5 GHz.	Complies with the <b>Class B</b> limits of CFR Title 47, Part 15, Subpart B: 1997

## 1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the Portable Computer Model: GM-II. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 1992. 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 Class B specification limits defined by C.I.S.P.R. Publication 22 for Information Technology Equipment from 150 kHz to 1 GHz, and the Class B limits defined in CFR Title 47, Part 15, Subpart B from 1 GHz to 5 GHz. Under paragraph G of section 15.109 of the Code of Federal Regulations Title 47, Part 15 of the FCC rules, FCC accepts the international standards set forth in C.I.S.P.R. Publication 22.



## 2. ADMINISTRATIVE DATA

### 2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Compatible Electronics, 114 Olinda Drive, Brea, California.

### 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

ACME Portable Machines, Inc.

Martin Yen R & D Manager

Compatible Electronics Inc.

James Ross Test Engineer

Kyle Fujimoto Test Engineer

Scott McCutchan Lab Manager

### 2.4 Date Test Sample was Received

The test sample was received on November 19, 2001.

### 2.5 Disposition of the Test Sample

The test sample was returned to ACME Portable Machines, Inc. on November 21, 2001.

### 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
NVLAP	National Voluntary Laboratory Accreditation Program
CFR	Code of Federal Regulations

### 3. APPLICABLE DOCUMENTS

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

SPEC	TITLE
CFR Title 47, Part 15	FCC Rules – Radio frequency devices (including digital devices)
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
EN 55022: 1998	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
CISPR 22: 1997	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement

#### **4. DESCRIPTION OF TEST CONFIGURATION**

##### **4.1 Description of Test Configuration - EMI**

The Portable Computer Model: GM-II (EUT) was connected to two modems, monitor, printer, keyboard, and two USB mice via its serial, video, parallel, keyboard, and USB ports, respectively. The EUT was running an EMI program that tested all ports and read from the hard drive on a continuous basis. Also, an "H" pattern was displayed on both the EUT's LCD and the external monitor.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The cables were moved to maximize the emissions. The final conducted as well as radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix D.

#### **4.1.1 Cable Construction and Termination**

##### **Cable 1**

This is a 50 centimeter unshielded cable connecting the EUT to the keyboard. The cable has an RJ-45 connector at the EUT end and is hard wired into the keyboard.

##### **Cable 2**

This is a 1.8 meter foil shielded cable connecting the USB mouse #1 to the EUT. It has a USB Type "B" connector at the EUT end and is hard wired into the USB mouse #1. The shield of the cable was grounded to the chassis via the connector.

##### **Cable 3**

This is a 1.8 meter foil shielded cable connecting the USB mouse #2 to the EUT. It has a USB Type "B" connector at the EUT end and is hard wired into the USB mouse #2. The shield of the cable was grounded to the chassis via the connector.

##### **Cable 4**

This is a 1.5 meter braid and foil shielded cable connecting the EUT to modem #1. It has a D-9 pin metallic connector at the EUT end and a D-25 pin metallic connector at the modem #1 end. The cable was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connectors.

##### **Cable 5**

This is a 1 meter braid and foil shielded cable connecting the EUT to the monitor. It has a high density D-15 pin metallic connector at each end. The shield of the cable was grounded to the chassis via the connectors.

##### **Cable 6**

This is a 1.5 meter braid and foil shielded cable connecting the EUT to modem #2. It has a D-9 pin metallic connector at the EUT end and a D-25 pin metallic connector at the modem #2 end. The cable was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connectors.

##### **Cable 7**

This is a 1.3 meter braid and foil shielded cable connecting the EUT to the printer. It has a Centronics metallic type connector at the printer end and a D-25 pin metallic connector at the EUT end. The cable was bundled to a length of 1 meter. The shield of the cable was grounded to the chassis via the connectors.

## 5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT

### 5.1 Internal and External Components of the EUT List

Note: all items below are part of the EUT itself.

EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER	FCC ID
MOTHERBOARD	ACME PORTABLE MACHINES, INC.	BLS	N/A	NA
1 GHz CPU	INTEL	PENTIUM III	N/A	N/A
POWER SUPPLY	SEASONIC	SS-250U1	N/A	N/A
CD-ROM	NEC	CDR-2800C	99G44226111	N/A
FLOPPY DISK DRIVE	PANASONIC	JU-256A226PF2015	N/A	N/A
HARD DISK DRIVE	QUANTUM	AS30A011-03-B	N/A	N/A
KEYBOARD	ACME PORTABLE MACHINES, INC.	GM-II KEYBOARD	N/A	N/A
VGA CARD	ACME PORTABLE MACHINES, INC.	ACME-M3	N/A	N/A
LCD	NEC	NL10276BC28-24F	N/A	N/A
GM-II CHASSIS	ACME PORTABLE MACHINES, INC.	CKD-GM-II	N/A	N/A

## 5.2 Accessories List

Note: all items below were connected to the EUT for the testing, but are NOT part of the EUT itself.

<b>EQUIPMENT TYPE</b>	<b>MANU-FACTURER</b>	<b>MODEL</b>	<b>SERIAL NUMBER</b>	<b>FCC ID</b>
USB MOUSE	ACER	M-U48a	LZE11651378	NA
USB MOUSE	ACER	M-U48a	LZE11651387	N/A
PRINTER	CITIZEN	LSP-10	1184398-72	DLK66TLSP-10
MODEM	HAYES	231AA	A05631003823	BFJ9D9231AA
MODEM	HAYES	231AA	A07031003480	BFJ9D9231AA
MONITOR	TWE	PX-14S	901105357	1K6PX14S

### 5.3 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
Radiated Emissions Data Capture Program	Compatible Electronics, Inc.	2.0	N/A	N/A	N/A
Emissions Program	Compatible Electronics, Inc.	2.3 (SR19)	N/A	N/A	N/A
Spectrum Analyzer – Main Section	Hewlett Packard	8566B	2727A04757	November 9, 2001	1 Year
Spectrum Analyzer – Display Section	Hewlett Packard	85650A	2648A15455	November 9, 2001	1 Year
Preamplifier	Com Power	PA-102	1202	October 17, 2001	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650A	3303A01688	November 9, 2001	1 Year
RF Attenuator	Weinschel Corp.	2	BJ6394	August 1, 2001	1 Year
LISN	Com Power	LI-215	12090	November 9, 2001	1 Year
LISN	Com Power	LI-215	12076	November 8, 2001	1 Year
Biconical Antenna	Com Power	AB-900	15011	July 9, 2001	1 Year
Log Periodic Antenna	Com Power	AL-100	1012	July 9, 2001	1 Year
Antenna Mast	Com Power	AM-100	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A
Computer	Hewlett Packard	4530	US91912319	N/A	N/A
Printer	Hewlett Packard	C4568A	SG67N181BP	N/A	N/A
Monitor	Hewlett Packard	D5258A	TW74500641	N/A	N/A
Microwave Preamplifier	Com-Power	PA-122	25195	January 9, 2001	1 Year
Horn Antenna	Com-Power	AH-118	10073	January 5, 2001	1 Year

**6. TEST SITE DESCRIPTION**

**6.1 Test Facility Description**

Please refer to section 2.1 and 7.1.2 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 grounded only through the safety ground in its power cord.

**6.3 Facility Environmental Characteristics**

When applicable refer to the data sheets in Appendix E for the relative humidity, air temperature, and barometric pressure.

## 7. TEST PROCEDURES

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

### 7.1 RF Emissions

#### 7.1.1 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: 1992. 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 **Class B** limits of EN 55022: 1998 for conducted emissions.

## 7.1.2 Radiated Emissions Test

The spectrum analyzer was used as a measuring meter. A preamplifier was used to increase the sensitivity of the instrument. 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.

For the peak readings below 1000 MHz that were within 3 dB of the spec limit or higher, the quasi-peak adapter was used to quasi-peak the readings.

For the peak readings above 1000 MHz that were within 3 dB of the spec limit or higher, the readings were averaged manually by narrowing the video filter down to 10 Hz and slowing the sweep time to keep the amplitude reading calibrated.

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

<b>FREQUENCY RANGE (MHz)</b>	<b>TRANSDUCER</b>	<b>EFFECTIVE MEASUREMENT BANDWIDTH</b>
30 to 300	Biconical Antenna	120 kHz
300 to 1000	Log Periodic Antenna	120 kHz
1000 to 5000	Horn Antenna	1 MHz

The final data was taken with a frequency span of 1 MHz for frequencies below 1000 MHz. For frequencies above 1000 MHz, the final data was taken with a frequency span of 10 MHz. The frequency span was reduced during the preliminary investigations as deemed necessary to distinguish between emissions from the EUT and any ambients.

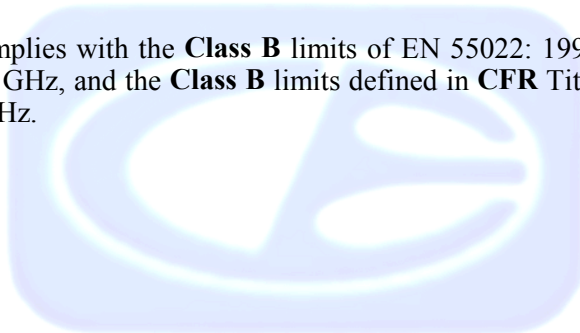
The open field test site of Compatible Electronics, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a 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. 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 to ensure accurate results.

### **Radiated Emissions 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 10 meter test distance to obtain final test data for frequencies from 30 MHz to 1 GHz and at a 3 meter test distance for frequencies above 1 GHz.

### **Test Results:**

The EUT complies with the **Class B** limits of EN 55022: 1998 for radiated emissions from 150 kHz to 1 GHz, and the **Class B** limits defined in **CFR** Title 47, Part 15, Subpart B from 1 GHz to 5 GHz.



**8. CONCLUSIONS**

The Portable Computer Model: GM-II meets all of the **Class B** specification limits defined by C.I.S.P.R. Publication 22 for Information Technology Equipment from 150 kHz to 1 GHz, and the **Class B** limits defined in CFR Title 47, Part 15, Subpart B from 1 GHz to 5 GHz. Under paragraph G of section 15.109 of the Code of Federal Regulations Title 47, Part 15 of the FCC rules, FCC accepts the international standards set forth in C.I.S.P.R. Publication 22.





**APPENDIX A**

***LABORATORY RECOGNITIONS***

## ***LABORATORY RECOGNITIONS***

**Compatible Electronics has the following agency accreditations:**

National Voluntary Laboratory Accreditation Program - Lab Code: 200063-0

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

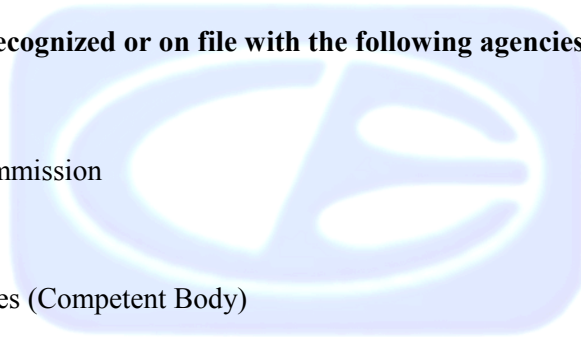
**Compatible Electronics is recognized or on file with the following agencies:**

Federal Communications Commission

Industry Canada

Radio-Frequency Technologies (Competent Body)

Technology International (Europe) Ltd.





**APPENDIX B**

***MODIFICATIONS TO THE EUT***

## **MODIFICATIONS TO THE EUT**

The modifications listed below were made to the EUT to pass EN 55022: 1998 Class B and FCC Class B 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.



**APPENDIX C**

***ADDITIONAL MODELS COVERED  
UNDER THIS REPORT***

## **ADDITIONAL MODELS COVERED UNDER THIS REPORT**

USED FOR THE PRIMARY TEST

Portable Computer  
Model: GM-II  
S/N: N/A

No additional models are covered under this report.

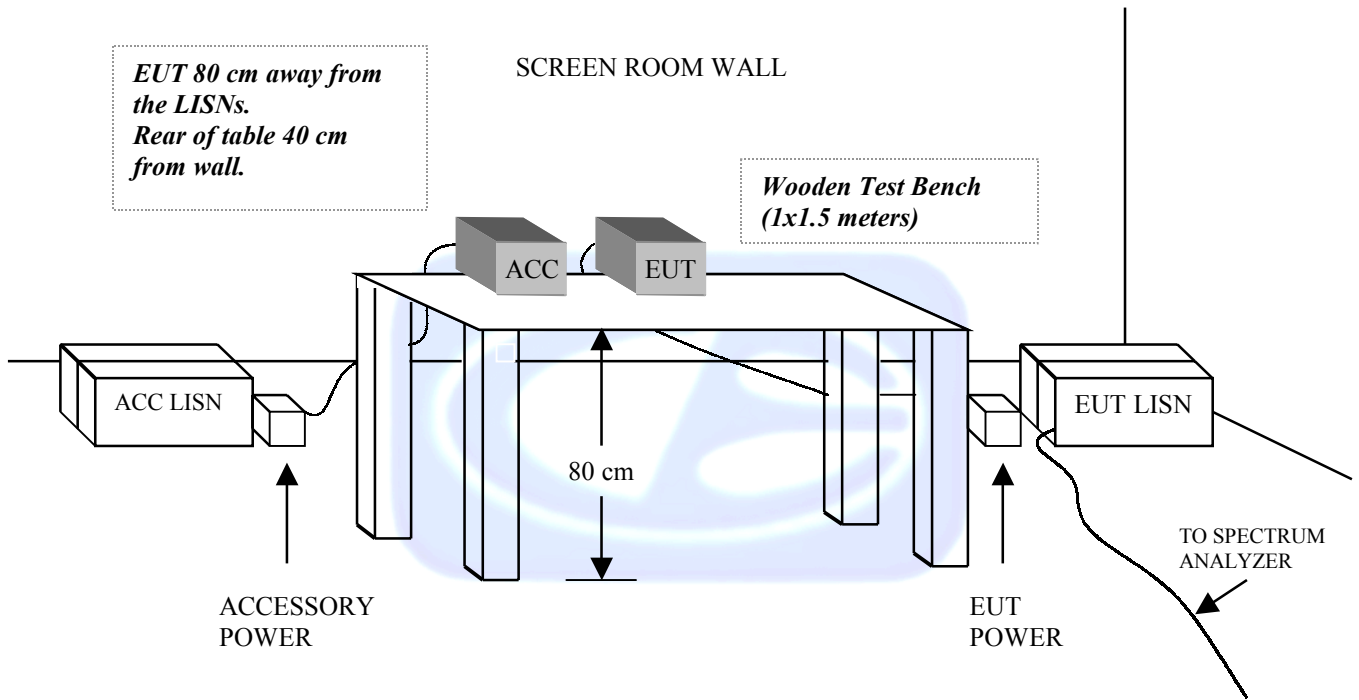




**APPENDIX D**

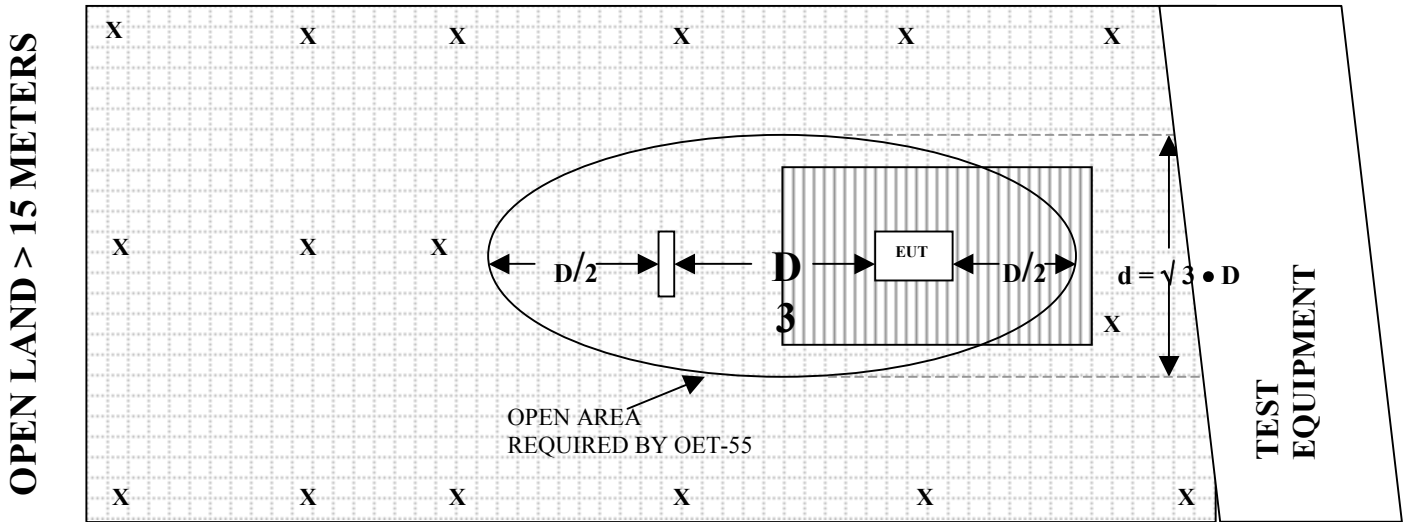
***DIAGRAMS, CHARTS, AND PHOTOS***

**FIGURE 1: CONDUCTED EMISSIONS TEST SETUP**



**FIGURE 2: PLOT MAP AND LAYOUT OF RADIATED SITE – 3 METERS**

**OPEN LAND > 15 METERS**

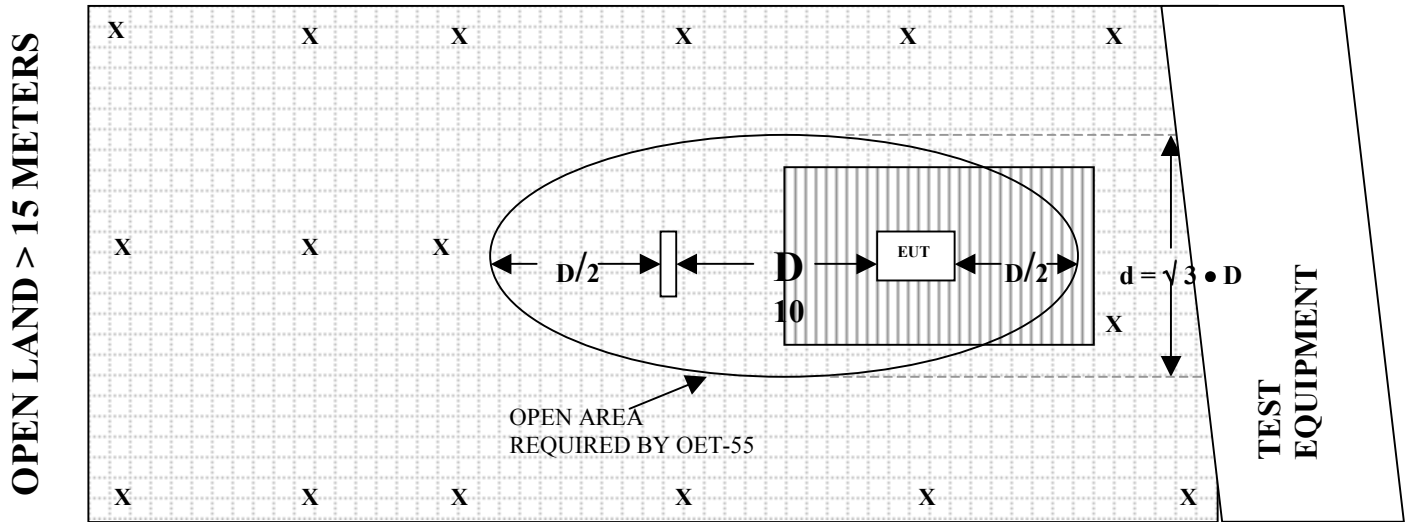


**OPEN LAND > 15 METERS**

- |   |                          |  |                 |
|---|--------------------------|--|-----------------|
| X | = GROUND RODS            |  | = GROUND SCREEN |
| D | = TEST DISTANCE (meters) |  | = WOOD COVER    |

**FIGURE 3: PLOT MAP AND LAYOUT OF RADIATED SITE – 10 METERS**

**OPEN LAND > 15 METERS**



**OPEN LAND > 15 METERS**

- |   |                          |  |                 |
|---|--------------------------|--|-----------------|
| X | = GROUND RODS            |  | = GROUND SCREEN |
| D | = TEST DISTANCE (meters) |  | = WOOD COVER    |

COM-POWER AB-900  
BICONICAL ANTENNA

S/N: 15011

CALIBRATION DATE: JULY 9, 2001

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
30	11.20	120	13.40
35	10.80	125	12.50
40	12.20	140	11.80
45	11.00	150	11.70
50	10.90	160	12.90
60	10.90	175	14.80
70	7.90	180	16.10
80	6.30	200	16.10
90	9.00	250	15.60
100	11.50	300	18.60

COM-POWER AL-100  
LOG PERIODIC ANTENNA

S/N: 1012

CALIBRATION DATE: JULY 9, 2001

<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (MHz)</b>	<b>FACTOR (dB)</b>
300	15.70	700	23.50
400	13.20	800	22.70
500	16.20	900	23.20
600	18.60	1000	25.30

## COM-POWER PA-102

## PREAMPLIFIER

S/N: 1202

CALIBRATION DATE: OCTOBER 17, 2001

FREQUENCY (MHz)	FACTOR (dB)	FREQUENCY (MHz)	FACTOR (dB)
30	35.8	300	35.7
40	36.0	350	35.4
50	36.1	400	35.5
60	36.0	450	35.4
70	35.9	500	34.9
80	35.5	550	35.4
90	35.4	600	35.1
100	36.0	650	35.3
125	36.0	700	34.6
150	35.8	750	34.8
175	35.5	800	34.5
200	35.7	850	34.9
225	35.9	900	33.8
250	35.6	950	33.4
275	35.5	1000	34.5

## COM-POWER AH-118

## HORN ANTENNA

S/N: 10073

CALIBRATION DATE: JANUARY 5, 2001

FREQUENCY (GHz)	FACTOR (dB)	FREQUENCY (GHz)	FACTOR (dB)
1.0	26.1	9.5	41.6
1.5	29.1	10.0	42.2
2.0	32.8	10.5	40.6
2.5	32.6	11.0	40.4
3.0	31.5	11.5	42.0
3.5	31.9	12.0	43.9
4.0	33.2	12.5	44.6
4.5	34.0	13.0	43.5
5.0	35.7	13.5	43.0
5.5	35.6	14.0	43.6
6.0	36.4	14.5	45.2
6.5	37.1	15.0	44.3
7.0	40.1	15.5	44.3
7.5	41.0	16.0	44.9
8.0	40.8	16.5	43.8
8.5	39.5	17.0	44.5
9.0	40.0	17.5	47.1
		18.0	48.5

**COM-POWER PA-122**  
**MICROWAVE PREAMPLIFIER**

S/N: 25195

CALIBRATION DATE: JANUARY 9, 2001

<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>	<b>FREQUENCY (GHz)</b>	<b>FACTOR (dB)</b>
1.0	33.1	8.0	31.9
1.1	33.0	8.5	31.9
1.2	33.2	9.0	31.3
1.3	33.0	9.5	30.7
1.4	32.4	10.0	31.6
1.5	32.3	11.0	30.6
1.6	32.1	12.0	28.5
1.7	32.0	13.0	31.5
1.8	31.8	14.0	33.2
1.9	32.2	15.0	31.5
2.0	32.6	16.0	30.2
2.5	31.9	17.0	31.6
3.0	31.7	18.0	31.7
3.5	31.7		
4.0	32.3		
4.5	31.5		
5.0	32.3		
5.5	34.2		
6.0	30.9		
6.5	32.0		
7.0	32.1		
7.5	33.0		



**FRONT VIEW**

ACME PORTABLE MACHINES, INC.  
PORTABLE COMPUTER

Model: GM-II

EN 55022 CLASS B (30 MHz TO 1000 MHz) - RADIATED EMISSIONS – 11-19-01

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



**REAR VIEW**

ACME PORTABLE MACHINES, INC.  
PORTABLE COMPUTER

Model: GM-II

EN 55022 CLASS B (30 MHz TO 1000 MHz) - RADIATED EMISSIONS – 11-19-01

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



**FRONT VIEW**

ACME PORTABLE MACHINES, INC.  
PORTABLE COMPUTER

Model: GM-II

FCC CLASS B (1 GHz to 5 GHz) - RADIATED EMISSIONS – 11-19-01

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



**REAR VIEW**

ACME PORTABLE MACHINES, INC.  
PORTABLE COMPUTER

Model: GM-II

FCC CLASS B (1 GHz to 5 GHz) - RADIATED EMISSIONS – 11-19-01

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



**FRONT VIEW**

ACME PORTABLE MACHINES, INC.  
PORTABLE COMPUTER

Model: GM-II

EN 55022 CLASS B - CONDUCTED EMISSIONS – 11-19-01

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



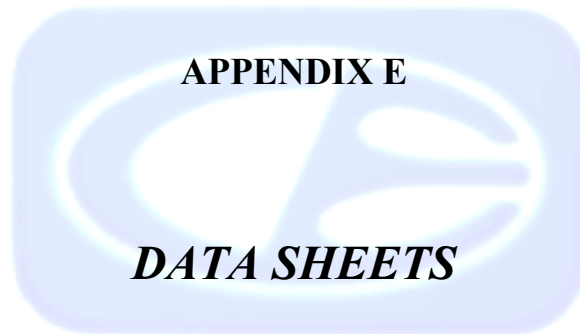
**REAR VIEW**

ACME PORTABLE MACHINES, INC.  
PORTABLE COMPUTER

Model: GM-II

EN 55022 CLASS B - CONDUCTED EMISSIONS – 11-19-01

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





Test Location : Compatible Electronics Page : 1/1  
 Customer : Acme Portable Machines, Inc. Date : 11/19/2001  
 Manufacturer : Acme Portable Machines, Inc. Time : 10:03:54  
 Eut name : Portable Computer Lab : A  
 Model : GM-II Test Distance : 10.0  
 Serial # : N/A  
 Specification : EN 55022 Class B  
 Distance correction factor ( $20 * \log(\text{test}/\text{spec})$ ) : 0.00  
 Test Mode : Tested by: James Ross  
 30 MHz to 1 GHz - Vertical and Horizontal Polarization

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor' d rdg = R dBuV	Li mit = L dBuV/m	Delta R-L dB
V	80.096	48.20	1.10	6.33	35.50	20.13	30.00	-9.87
V	115.100	47.40	1.40	12.97	36.00	25.77	30.00	-4.23
V	120.155	42.00	1.40	13.37	36.00	20.77	30.00	-9.23
V	140.099	47.70	1.59	11.80	35.87	25.21	30.00	-4.79
H	145.132	46.40	1.65	11.75	35.84	23.96	30.00	-6.04
V	155.119	44.30	1.72	12.32	35.73	22.61	30.00	-7.39
H	155.134	43.50	1.72	12.33	35.73	21.81	30.00	-8.19
V	170.104	44.40	1.78	14.20	35.56	24.82	30.00	-5.18
V	180.129	44.10	1.84	16.10	35.54	26.50	30.00	-3.50
V	197.649	41.70	1.98	16.10	35.68	24.10	30.00	-5.90
H	210.190	39.90	2.08	15.99	35.78	22.19	30.00	-7.81
V	398.152	42.40	3.19	13.24	35.50	23.33	37.00	-13.67
H	398.200	42.40	3.19	13.24	35.50	23.33	37.00	-13.67
V	401.991	42.50	3.22	13.27	35.50	23.49	37.00	-13.51
H	402.004	42.70	3.22	13.27	35.50	23.69	37.00	-13.31
H	455.266	43.00	3.61	14.94	35.34	26.21	37.00	-10.79



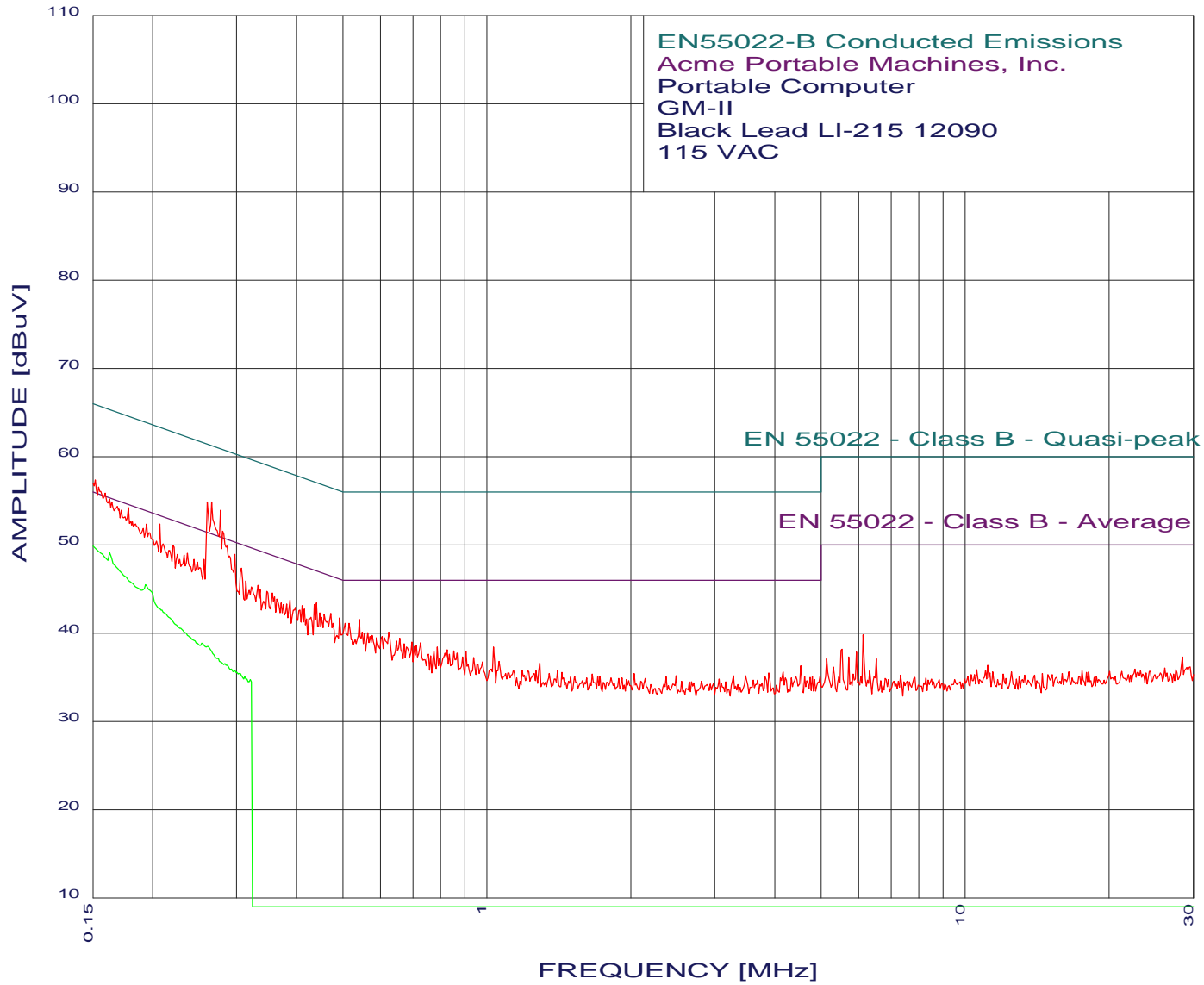
**COMPATIBLE  
ELECTRONICS**

Test Location : Compatible Electronics Page : 1/1  
 Customer : Acme Portable Machines, Inc. Date : 11/19/2001  
 Manufacturer : Acme Portable Machines, Inc. Time : 13:51:38  
 Eut name : Portable Computer Lab : A  
 Model : GM-II Test Distance : 3.0  
 Serial # : N/A  
 Specification : FCC Class B  
 Distance correction factor (20 \* log(test/spec) : 0.00  
 Test Mode : Tested by: James Ross  
 1 GHz to 5 GHz - Vertical and Horizontal Polarizations

Pol	Freq MHz	Rdng dBuV	Cable loss dB	Ant factor dB	Amp gain dB	Cor' d rdg = R dBuV	Li mi t = L dBuV/m	Del ta R-L dB
V	1064.820	47.50	2.70	27.40	34.20	43.40	54.00	-10.60
V	1069.620	47.00	2.70	27.40	34.19	42.91	54.00	-11.09
H	1197.480	44.30	2.80	27.20	34.20	40.10	54.00	-13.90
V	1198.700	46.80	2.80	27.20	34.20	42.60	54.00	-11.40
V	1334.700	45.70	3.07	27.91	34.03	42.65	54.00	-11.35
H	1470.120	48.70	3.20	29.20	33.83	47.27	54.00	-6.73
V	1470.160	50.70	3.20	29.20	33.83	49.27	54.00	-4.73
V	1729.220	53.80	3.66	28.80	33.30	52.96	54.00	-1.04
V	1729.392	37.69	3.66	28.80	33.30	36.85	54.00	-17.15(Avg)
H	1736.200	51.80	3.67	28.80	33.30	50.97	54.00	-3.03
V	1989.320	52.30	3.88	30.30	32.62	53.86	54.00	-0.14
V	1989.519	34.80	3.88	30.30	32.62	36.36	54.00	-17.64(Avg)
V	2260.550	51.00	4.22	30.57	32.21	53.59	54.00	-0.41
V	2263.275	35.81	4.22	30.58	32.20	38.41	54.00	-15.59(Avg)

EMISSION LEVEL [dBuV] PEAK  
Graph for Peak & Average

11/19/2001 15:39:40



COMPATIBLE  
ELECTRONICS



Acme Portable Machines, Inc.  
 Portable Computer  
 GM-II  
 Black Lead - 115 VAC  
 TEST ENGINEER : James Ross

-----  
 12 highest peaks above -50.00 dB of EN 55022 - Class B - Average limit line  
 Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.266	54.82	51.24	3.58*
2	0.260	54.82	51.42	3.40*
3	0.207	52.32	53.31	-0.99*
4	0.440	43.41	47.06	-3.65
5	1.032	38.40	46.00	-7.60
6	4.528	36.29	46.00	-9.71
7	6.123	39.78	50.00	-10.22
8	5.538	38.14	50.00	-11.86
9	5.933	37.87	50.00	-12.13
10	28.461	37.30	50.00	-12.70
11	5.715	37.25	50.00	-12.75
12	5.142	37.12	50.00	-12.88

-----  
 \* Please see the Average Readings on the Next Page and on the Plot



Acme Portable Machines, Inc.  
Portable Computer  
GM-II  
Black Lead - 115 VAC  
TEST ENGINEER : James Ross

-----  
2 highest peaks above -50.00 dB of EN 55022 - Class B - Average limit line

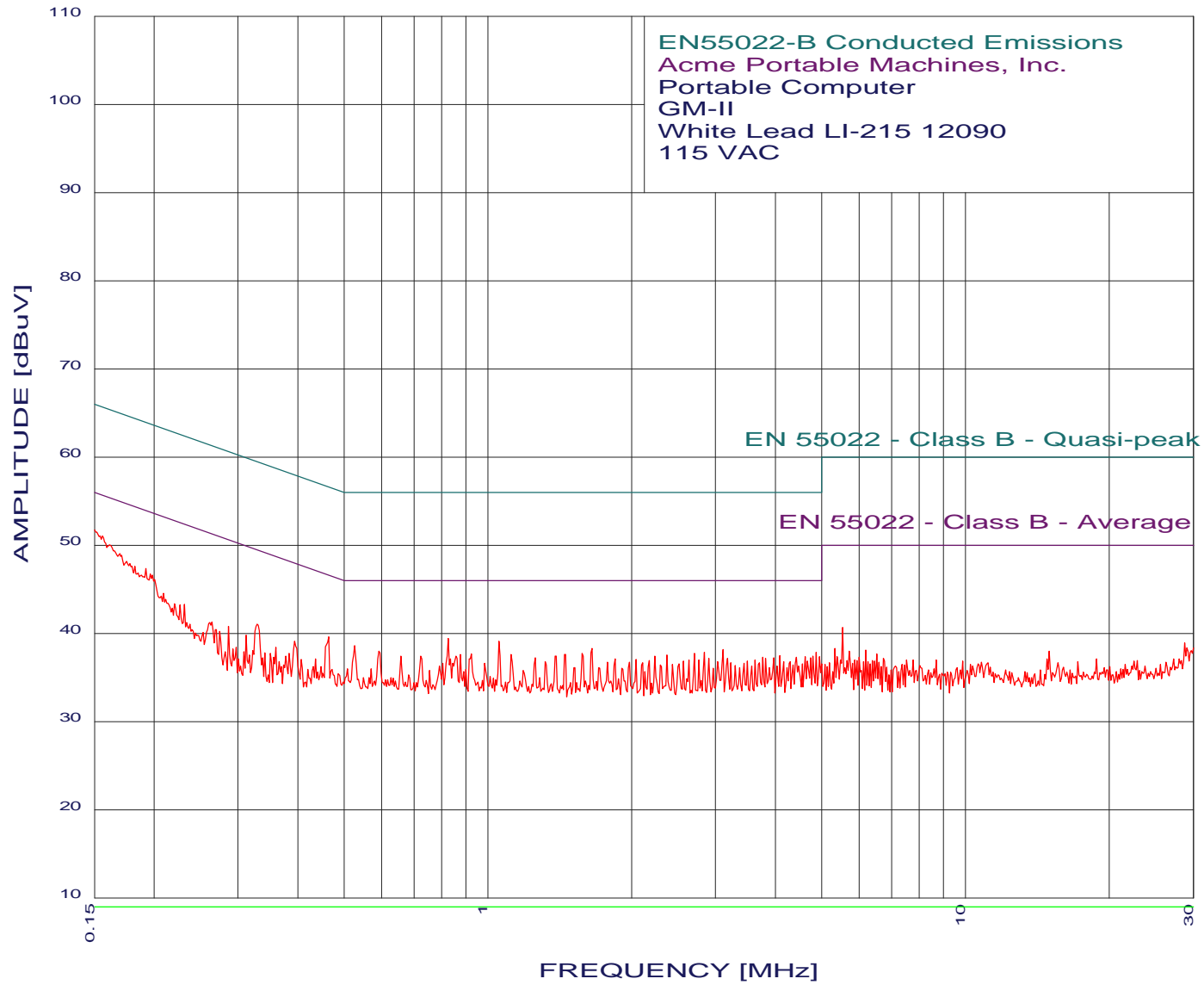
Peak criteria : 0.50 dB, Curve : Average

Peak#	Freq(MHz)	Amp(dBuV)	Limit(dB)	Delta(dB)
1	0.162	49.12	55.34	-6.22
2	0.194	45.45	53.88	-8.44

-----

EMISSION LEVEL [dBuV] PEAK  
Graph for Peak & Average

11/19/2001 15:47:37



COMPATIBLE  
ELECTRONICS



**COMPATIBLE  
ELECTRONICS**

11/19/2001 15:47:37

Acme Portable Machines, Inc.  
Portable Computer  
GM-II  
White Lead - 115 VAC  
TEST ENGINEER : James Ross

-----  
49 highest peaks above -50.00 dB of EN 55022 - Class B - Average limit line  
Peak criteria : 3.00 dB, Curve : Peak

Peak#	Freq(MHz)	Amp(dBuV)	limit(dB)	Delta(dB)
1	0.826	39.38	46.00	-6.62
2	1.055	39.09	46.00	-6.91
3	0.464	39.60	46.62	-7.02
4	0.527	38.59	46.00	-7.41
5	1.654	38.31	46.00	-7.69
6	3.107	38.16	46.00	-7.84
7	0.592	37.99	46.00	-8.01
8	2.840	37.85	46.00	-8.15
9	4.877	37.83	46.00	-8.17
10	2.707	37.75	46.00	-8.25
11	1.577	37.71	46.00	-8.29
12	0.924	37.69	46.00	-8.31
13	1.456	37.60	46.00	-8.40
14	1.118	37.59	46.00	-8.41
15	0.876	37.58	46.00	-8.42
16	2.371	37.54	46.00	-8.46
17	0.329	41.00	49.48	-8.48
18	4.092	37.50	46.00	-8.50
19	2.238	37.43	46.00	-8.57
20	4.799	37.43	46.00	-8.57
21	1.389	37.40	46.00	-8.60
22	0.658	37.39	46.00	-8.61
23	0.724	37.38	46.00	-8.62
24	4.954	37.34	46.00	-8.66
25	4.624	37.32	46.00	-8.68
26	4.432	37.31	46.00	-8.69
27	3.761	37.28	46.00	-8.72
28	1.256	37.20	46.00	-8.80
29	3.966	37.19	46.00	-8.81
30	3.175	37.16	46.00	-8.84
31	2.900	37.15	46.00	-8.85
32	1.849	37.12	46.00	-8.88
33	0.393	39.10	47.99	-8.89
34	2.044	37.02	46.00	-8.98
35	2.766	36.95	46.00	-9.05
36	2.637	36.95	46.00	-9.05
37	2.179	36.93	46.00	-9.07
38	3.492	36.87	46.00	-9.13
39	2.568	36.84	46.00	-9.16
40	4.294	36.80	46.00	-9.20
41	1.318	36.80	46.00	-9.20
42	1.781	36.72	46.00	-9.28
43	5.538	40.67	50.00	-9.33
44	3.226	36.67	46.00	-9.33
45	2.111	36.63	46.00	-9.37
46	0.984	36.59	46.00	-9.41
47	0.286	40.81	50.63	-9.82
48	0.312	39.81	49.92	-10.12
49	0.360	38.40	48.73	-10.33

-----