

TITLE: PLI Evaluation Report (RFI) FCC ID: OTI7051X Page 1 of 58  
DRAWING: Q705102W.DWG Issued: 15 Nov 1999  
BY: Greg Noll Approved: Lee Pulver

This drawing consists of pages issued or re-issued on dates shown in the following list.  
*Italic underlined words* indicate content changes or additions on revised pages.

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PLI223F11W.FRMx1  
Q705102W.DWG

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BY: Greg Noll

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Pulver Laboratories Inc. (PLI) File Number: 7051

Pulver Laboratories Inc. (PLI) Project Number: C4029

Product Names: EUT ) DataFast Handheld Duplicator  
(EUT = Equipment Under Test)

Model Numbers: D-101

Serial Numbers: 170B

Applicant: PubliCARD, Inc.  
75 Kings Highway Cutoff  
Fairfield, Connecticut 06430  
Telephone: 203.368.6800  
Facsimile: 203.368.1805

Location Certified: Greystone Peripherals, Inc.  
130-A Knowles Drive  
Los Gatos, California 95039  
Telephone: 408.866.4739  
Facsimile: 408.866.8328

Manufacturing Location: Greystone Peripherals, Inc.  
130-A Knowles Drive  
Los Gatos, California 95039  
Telephone: 408.866.4739  
Facsimile: 408.866.8328

Pulver Laboratories Inc. (PLI) Control Number: 7051X

### **Equipment Category**

Information Technology Equipment including Electrical Business Equipment

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### **Evaluated to the Following Standards**

#### **Federal Communications Commission (FCC, USA)**

Category Classification: Class B - Residential

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- American National Standards Institute C63.4-1992 entitled Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.
- Federal Communications Commission Rules and Regulations located in the Code of Federal Regulations, Title 47, Part 2 entitled Frequency Allocations and Radio Treaty Matters; General Rules and Regulations; and Part 15 entitled Radio Frequency Devices, March 1999 Edition.

### **Trademarks**

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## **1.0 Engineering Considerations**

### **1.1 General Engineering Considerations**

1.1.1 This report deals with conformance to the:

- Code of Federal Regulations, 47 CFR, Part 2 and Part 15, revised March 1999;
- American National Standards Institute standard number C63.4-1992 entitled Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz;
- EN55022 / CISPR 22 entitled Limits and methods of measurement of radio disturbance characteristics of information technology equipment, Second Edition 1993; and
- VFG Number 523 / 1969: "Technical Regulations of the German Federal Postal Office for High Frequency Equipment and Systems," Official Gazette of the Federal Ministers of Post and Telecommunications; Year 1969; Number 113; 28 August 1969.

1.1.2 This report also deals with conformance to Radio Frequency Interference Suppression of High Frequency Equipment for Industrial, Scientific, and Medical (ISM) and similar purposes for Canada and the countries listed in the Pulver Laboratories Certificate of Conformance associated with this report.

1.1.3 To assist the Federal Communications Commission in the continuing education of applicants and grantees, Pulver Laboratories has advised Greystone Peripherals, Inc. to purchase a copy of the Rules and Regulations located in the Code of Federal Regulations, Title 47, Part 2 entitled Frequency Allocations and Radio Treaty Matters; General Rules and Regulations; and Part 15 entitled Radio Frequency Devices, 1 October 1998 Edition.

1.1.4 The manufacturer has a contractual obligation to Pulver Laboratories to incorporate into production all modifications photographed and outlined in this report with associated documentation.

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1.1.5 The Pulver Laboratories Certificate of Conformance issued with this report allows the manufacturer to ship and sell product using the Pulver Laboratories Product Certification Label. This label can only be used if the manufacturer allows Pulver Laboratories to conduct a Follow Up Service at the manufacturing facilities and conduct an Electromagnetic Interference test of the finished product every six months.

## 1.2 Specific Engineering Considerations

1.2.1 Interconnecting low voltage computer cables lengths:

| Cable Description    | Length (feet) | Length (meters) |
|----------------------|---------------|-----------------|
| Printer              | 6.0           | 1.83            |
| Keyboard             | 6.5           | 1.98            |
| Monitor              | 4.0           | 1.22            |
| Mouse                | 6.0           | 1.83            |
| Modem                | 1.0           | 0.30            |
| Parallel Cable       | 6.0           | 1.83            |
| Serial Cable         | 6.0           | 1.83            |
| Data Ribbon Cable    | 0.5           | 0.15            |
| External Power Cable | 0.5           | 0.15            |

1.2.2 I / O Cables coiled and wrapped to maximum lengths of 30 to 40 cm, at least 40 cm from ground plane as recommended by ANSI 63.4-1992.

1.2.3 There is one possible Equipment Under Test (DataFast Handheld Duplicator, Model D-101) input power configuration:

1.2.3.1 One external wall adapter supplies the EUT with voltage.

1.2.4 There are **two** possible EUT test configurations:

1.2.4.1 **Test Configuration #1:** EUT parallel port to computer.  
Data transfer between devices.

1.2.4.2 **Test Configuration #2:** Serial port to computer for  
configuring EUT.

1.2.5 **Note:** RJ45 jack with 1-meter cable; no data transfer; software not available for this port yet.

1.2.6 The EUT duplicates software from a master disk to a target disk drive. The EUT operator selects these drives. For this particular test program, the master source drive was external to the EUT chassis and the target disk drive was internal to the EUT. The internal disk drive manufactured by Quantum, model Quantum Fireball, 3.5 Series.

### 1.3 **Product Description and Intended Use**

1.3.1 The Greystone Peripherals, Inc. DataFast Handheld Duplicator, **Model D-101 allows the operator to selectively copy program software and data from a master source drive to a target disk drive.** Target drives that are identical to the source drive may be "mirrored", or duplicated exactly, sector by sector. A 'Smart Copy' mode is used for faster copying, or for dissimilar drives using an FAT16, FAT32, or NTFAT file system. The D-101 is ideal for applications that require portability.

Prior to execution, copying jobs are set up according to the type (physical details) of the source and target disk, selective or complete copying, and mode of copying. Setup and execution of copy jobs is accomplished using a six button keypad and a 4-line by 20-character LCD display. A menu guides the operator easily through setup and copy jobs.

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#### 1.4 List of Photographs Contained in this Report

- FIGURE 1:** PLI Photograph Number 994320 illustrates the rear view of the Equipment Under Test with all peripherals attached in **Test Configuration #1**. The "open field" radiated and the "screen room" conducted Radio Frequency Interference / Electromagnetic Interference test programs utilized this equipment and cable configuration.
- FIGURE 2:** PLI Photograph Number 994321 illustrates the rear view of the Equipment Under Test with all peripherals attached in **Test Configuration #2**. The "open field" radiated and the "screen room" conducted Radio Frequency Interference / Electromagnetic Interference test programs utilized this equipment and cable configuration.
- FIGURE 3:** PLI Photograph Number 994325 illustrates the left rear oblique view of the Equipment Under Test with all peripherals attached in the "screen room" conducted Electromagnetic Interference **Test Configuration #1**.
- FIGURE 4:** PLI Photograph Number 994324 illustrates the left rear oblique view of the Equipment Under Test with all peripherals attached in the "screen room" conducted Electromagnetic Interference **Test Configuration #2**.
- FIGURE 5:** PLI Photograph Number 994330 illustrates the top view of the EUT with the top cover removed showing the placement of internal system components.
- FIGURE 6:** PLI Photograph Number 994338B illustrates the component side of the D-101 Control Printed Circuit Assembly, number S-101PCB-001.
- FIGURE 7:** PLI Photograph Number 994339B illustrates the circuit side of the D-101 Control Printed Circuit Assembly, number S-101PCB-001.

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**FIGURE 8:** PLI Photograph Number 994335B illustrates the component side of the LCD Printed Circuit Assembly, number MSC-C204DYLY-1N.

**FIGURE 9:** PLI Photograph Number 994337B illustrates the circuit side of the LCD Printed Circuit Assembly, number MSC-C204DYLY-1N.

- 1.5 Equipment used during measurements calibrated according to internationally acceptable laboratory procedures. Calibration data along with Certificates of conformance and traceability are on file at the testing facility. Each calibrated equipment item is individually labeled with date calibrated; due date for next calibration; initials of person who calibrated the equipment; and the name of the organization that performed the calibration service.

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| <b>Equipment Type</b> | <b>Manufacturer</b> | <b>Model Number</b> | <b>Frequency Range</b> |
|-----------------------|---------------------|---------------------|------------------------|
| Spectrum Analyzer     | Hewlett Packard     | 8568A               | 100 Hz - 1.5 GHz       |
| Quasi-peak            | Hewlett Packard     | 85650A              | 10 kHz - 1.00 GHz      |
| Biconical Antenna     | EMCO                | 3109                | 30 - 200 MHz           |
| Log Periodic Antenna  | EMCO                | 3146                | 200 - 1000 MHz         |
| Magnetic Loop Antenna | Electro-Metrics     | ALR-25M             | 10 kHz - 30 MHz        |
| Oscilloscope Camera   | Tektronix           | C-5C                |                        |
| Amplifier             | Hewlett Packard     | 8447D<br>Option 010 | 0.1 - 1300 MHz         |
| Attenuator            | Narda               | 757C<br>(35797)     | 3 dB (DC - 12.4 GHz)   |
| Attenuator            | Narda               | 757C<br>(36808)     | 6 dB (DC - 12.4 GHz)   |
| Attenuator            | Narda               | 757C<br>(40604)     | 10 dB (DC - 12.4 GHz)  |
| Attenuator            | Narda               | 757C<br>(40998)     | 20 dB (DC - 12.4 GHz)  |
| Close Field Antenna   | Electro-Metrics     | EFP-25              |                        |
| Oscilloscope          | Tektronix           | 2445                | up to 150 MHz          |

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| <b>Equipment Type</b>              | <b>Manufacturer</b>              | <b>Model Number</b>                                               | <b>Frequency Range</b>    |
|------------------------------------|----------------------------------|-------------------------------------------------------------------|---------------------------|
| Capacitor/<br>Inductor<br>Z Meter  | Sencore                          | 1 picofarad to 200,000 microfarads<br>1 micro Henry to 10 Henries |                           |
| L.I.S.N                            | Solar<br>Electronics Co.         | 8012-50-R-24 BNC                                                  | 50 - 60 Hz                |
| Equipment<br>Testing<br>Turn Table | EMCO                             | 1061-06                                                           |                           |
| Antenna<br>Positioning<br>Tower    | EMCO                             | 1050                                                              |                           |
| Radio<br>Interference<br>Receiver  | PRD<br>Electronics Inc.          | R-1040/URM-85                                                     | (two complete<br>systems) |
| Antenna Coupler                    | PRD<br>Electronics Inc.          | Cu-893/URM-85                                                     | 80 - 220 MHz              |
| Antenna Tripod                     | PRD<br>Electronics Inc.          | MT-2459/URM-85                                                    |                           |
| Frequency<br>Converter             | Empire Devices<br>Products Corp. | CV-1102/URM-85                                                    | 20 - 220 MHz              |
| Frequency<br>Converter             | PRD<br>Electronics Inc.          | CV-1104A/URM-85                                                   | 400 - 1000 MHz            |
| Frequency<br>Converter             | PRD<br>Electronics Inc.          | CV-1101A/URM-85                                                   | 0.15 - 30 MHz             |
| Frequency<br>Converter             | PRD<br>Electronics Inc.          | CV-1103/URM-85                                                    | 200 - 400 MHz             |

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| <b>Equipment Type</b>            | <b>Manufacturer</b>   | <b>Model Number</b> | <b>Frequency Range</b> |
|----------------------------------|-----------------------|---------------------|------------------------|
| Frequency Converter              | PRD Electronics Inc.  | CV-1102A/URM-85     | 20 - 220 MHz           |
| Antenna Coupler<br>(two systems) | PRD Electronics Inc.  | CU-890/URM-85       | 0.15 - 30 MHz          |
| Loop Antenna<br>(two systems)    | PRD Electronics Inc.  | AT-1026/URM-85      | 0.15 - 30 MHz          |
| Frequency Comb Generator         | Hewlett Packard       | 8406A               | 20 - 1200 MHz          |
| Tunable Band Pass Filter         | K & L Microwave Inc.  | 5BT-95/190-5/B      | 95 - 195 MHz           |
| Tunable Band Pass Filter         | K & L Microwave Inc.  | 5BT-48/95-5/B       | 50 - 95 MHz            |
| High Pass Filter                 | Solar Electronics Co. | 7801-5.0            | 5 kHz                  |
| Absorbing Clamp                  | Schaffner EMC Inc.    | MDS-21              | 30 - 1000 MHz          |
| Line Probe                       | EMCO                  | 3701                |                        |
| Antenna Set                      | EMCO                  | 3121C               | 30 - 1000 MHz          |
| L.I.S.N                          | Solar Electronics Co. | 8328-50-TS-50-N     |                        |
| Frequency Generator              |                       | TS-418B/U           | 400 - 1000 MHz         |
| Frequency Generator              |                       | TS-510A/U           | 10 - 420 MHz           |

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| <b>Equipment Type</b>  | <b>Manufacturer</b>  | <b>Model Number</b> | <b>Frequency Range</b> |
|------------------------|----------------------|---------------------|------------------------|
| Antenna Set            | Electro-Metrics      | TDA-25              | 30 - 200 MHz           |
| Antenna Set            | Electro-Metrics      | TDS-25-1            | 200 - 500 MHz          |
| Antenna Set            | Electro-Metrics      | TDS-25-2            | 500 - 1000 MHz         |
| Antenna (two sets)     | PRD Electronics Inc. | AT-1030/URM-85      | 400 - 1000 MHz         |
| Coupler Antenna        | PRD Electronics Inc. | CU-895/URM-85       | 20 - 1000 MHz          |
| Electronic Field Probe | PRD Electronics Inc. | MX-3411/URM-85      | 0.15 - 1000 MHz        |
| Fixed Attenuator       | PRD Electronics Inc. | CN-721/URM-85       | 0.15 - 1000 MHz        |
| Magnetic Field Probe   | PRD Electronics Inc. | MX-3412/URM-85      | 20 - 1000 MHz          |
| Coupler                | PRD Electronics Inc. | CU-896/URM-85       | 20 - 1000 MHz          |
| Coupler                | PRD Electronics Inc. | CU-897/URM-85       | 20 - 1000 MHz          |
| Ground Rod             | PRD Electronics Inc. | GP-117/URM-85       |                        |
| Coupler Antenna        | PRD Electronics Inc. | CU-894/URM-85       | 200 - 400 MHz          |
| Reflector Antenna      | PRD Electronics Inc. | AT-1027/URM-85      | 0.15 - 30 MHz          |

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| <b>Equipment Type</b> | <b>Manufacturer</b>           | <b>Model Number</b>                 | <b>Frequency Range</b> |
|-----------------------|-------------------------------|-------------------------------------|------------------------|
| Cable Assembly Set    | PRD Electronics Inc.          | MX-3410/URM-85                      |                        |
| Cord Assembly         | PRD Electronics Inc.          | CX-4305/U                           |                        |
| Mega Cycle Tape       | Disston Carlson               | TM6625-351-12-8                     | 17 - 1000 MHz          |
| Antenna Discone       | Empire Devices Products Corp. | AS-1158/URM-85                      | Broad Band             |
| Headset               | Empire Devices Products Corp. | H-113/U                             |                        |
| Mast Sections         | Empire Devices Products Corp. | AB-21/GR                            |                        |
| Antenna Tripod        |                               |                                     |                        |
| EMI Line Filter       | Stanford Applied Engineering  | D30B                                | 50 - 60 Hz 3 phase     |
| Digital Power Meter   | Fluke and Phillips            | FLUKE 39                            |                        |
| Multimeter            | Fluke and Phillips            | FLUKE 87 True RMS                   |                        |
| Feed Through Caps     | Solar Electronics Co.         | 6512-106 R 10 microfarad capacitors | 275V RMS, 60 Hz        |
| Multimeter            | Beckman Industrial Corp.      | Circuitmate DM15B                   | 250V RMS, 400 Hz       |
| RMS Multimeter        | Beckman Industrial Corp.      | Tech 310                            |                        |

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| <b>Equipment<br/>Type</b> | <b>Manufacturer</b>      | <b>Model<br/>Number</b> |
|---------------------------|--------------------------|-------------------------|
| Multimeter                | Fluke and Phillips       | FLUKE 85                |
| RMS Multimeter            | Fluke and Phillips       | FLUKE 87                |
| ELF Field<br>Monitor      | Walker<br>Magnetic Group | ELF 50D                 |
| RMS Multimeter            | Fluke and Phillips       | FLUKE 87                |

|          |                             |                         |                      |
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1.6 List of Exhibits accompanying the FCC submission to help describe and clarify the Equipment Under Test.

1.6.1 Schematics or detailed block diagrams.

1.6.2 Equipment manual for operator or user showing enough detail to operate the equipment.

1.6.3 Currently dated and originally signed FCC Application for Certification (Form 731) along with the FCC Certification fee.

1.6.4 Proposed identification label representative of the production label to be placed on the equipment upon grant of the application. Positioned on equipment as shown in block rough in Section 2.1 of this report.

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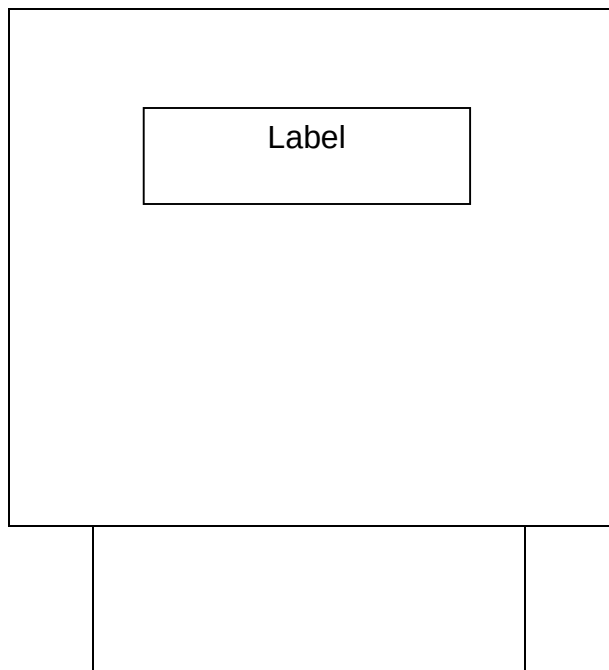
## **2.0 Mandatory Labeling and Operators' Manual Information and Shipping Documents**

### **2.1 FCC Label**

Illustration 1.0 on the next page illustrates the actual FCC label (three times the actual size) with the appropriate wording. Note the letters "EMI" on the label which abbreviate "Electromagnetic Interference". Organizations like the Federal Communications Commission and their respective limits are listed on the label.

Also notice the letters "NRTL", which abbreviate "Nationally Recognized Testing Laboratory" as recommended by OSHA and the National Electrical Code for the United States. For Pulver Laboratories product Certification labels used for safety Certification, the phrase "SAFETY" appears on the label. Safety Certifying organizations like Pulver Laboratories are listed on the label adjacent to the testing standards used during equipment evaluation.

A rough sketch of the label location is shown below.



Back Panel of EUT

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**Illustration 1.0**  
{three times the size of actual FCC Label}

**Label**

|                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------|
| <p>Greystone Peripherals, Inc.<br/>FCC ID: OTI7051X</p>                                                                                                                                                                                                                                                                                                                                                         |                                                              |
| <p>This device complies with Part 15 of the<br/>FCC Rules. Operation is subject to the<br/>following two conditions:(1)This device may<br/>not cause harmful interference, and (2)<br/>This device must accept any interference<br/>Received, including interference that may<br/>cause undesired operation. This Product<br/>Certified to meet the Standards in the<br/>Categories listed on this label by</p> |                                                              |
|                                                                                                                                                                                                                                                                                                                              | <p>PLI Pulver Laboratories NRTL<br/>Control Number 7051X</p> |
| <p>Information Technology Equipment<br/>EMI: FCC Part 15 Class B</p>                                                                                                                                                                                                                                                                                                                                            |                                                              |

## 2.2 Operators' Manual Information

2.2.1 The following information is inserted directly into the equipment user instruction manual to meet the requirements of product safety and Radio Frequency Interference (RFI) rules and regulations.

**CAUTION** - Connections between peripherals of the computer equipment must be made with low voltage shielded computer data cables.

### 2.2.2 Continuation of FCC label information:

Greystone Peripherals, Inc. may decide to use a smaller FCC label. In this instance, the following phrase must be added to the Operator's Manual:

"This device complies with Part 15 of the 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."

2.3 **FCC User Information** - The following statements are placed in the front of the operators' manual so that the user of the EUT is aware of its interference potential. Additional information about corrective measures may also be provided to the user at the manufacturer's option.

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**For a Class B Digital Device or Peripheral**

**FCC NOTICE  
INFORMATION FOR THE USER**

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 to correct the interference by one or more of the following measures:

- 1) Reorient or relocate the receiving antenna.
- 2) Increase the separation between the equipment and receiver.
- 3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- 4) Consult the dealer or an experienced radio/TV technician for help.

The user may find the following publication prepared by the Federal Communications Commission helpful:

"How to Identify and Resolve Radio-TV Interference Problems" (Stock Number 004-000-00345-4).

Available exclusively from the Superintendent of Documents, Government Printing Office, Washington, DC 20402 (telephone 202-512-1800).

**FCC WARNING**

Changes or modifications not expressly approved by the party responsible for compliance to Part 15 of the FCC Rules could void the user's authority to operate the equipment.

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**FIGURE 1:** PLI Photograph Number 994320 illustrates the rear view of the Equipment Under Test with all peripherals attached in **Test Configuration #1**. The "open field" radiated and the "screen room" conducted Radio Frequency Interference / Electromagnetic Interference test programs utilized this equipment and cable configuration.

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**FIGURE 2:** PLI Photograph Number 994321 illustrates the rear view of the Equipment Under Test with all peripherals attached in **Test Configuration #2**. The "open field" radiated and the "screen room" conducted Radio Frequency Interference / Electromagnetic Interference test programs utilized this equipment and cable configuration.

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**FIGURE 3:** PLI Photograph Number 994325 illustrates the left rear oblique view of the Equipment Under Test with all peripherals attached in the “screen room” conducted Electromagnetic Interference **Test Configuration #1.**

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**FIGURE 4:** PLI Photograph Number 994324 illustrates the left rear oblique view of the Equipment Under Test with all peripherals attached in the “screen room” conducted Electromagnetic Interference **Test Configuration #2.**

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**FIGURE 5:** PLI Photograph Number 994330 illustrates the top view of the EUT with the top cover removed showing the placement of internal system components.

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**FIGURE 6:** PLI Photograph Number 994338B illustrates the component side of the D-101 Control Printed Circuit Assembly, number S-101PCB-001.

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**FIGURE 7:** PLI Photograph Number 994339B illustrates the circuit side of the D-101 Control Printed Circuit Assembly, number S-101PCB-001.

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**FIGURE 8:** PLI Photograph Number 994335B illustrates the component side of the LCD Printed Circuit Assembly, number MSC-C204DYLY-1N.

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**FIGURE 9:** PLI Photograph Number 994337B illustrates the circuit side of the LCD Printed Circuit Assembly, number MSC-C204DYLY-1N.

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**Block Diagram of Equipment Under Test (EUT)  
Showing Clock Oscillators and Frequencies of Operation**

|                                  |                              |
|----------------------------------|------------------------------|
| Crystal Oscillator<br>28 MHz     | Crystal Oscillator<br>50 MHz |
| Crystal Oscillator<br>32.768 MHz |                              |

**Use this diagram to simplify locating the oscillators  
in the accompanying schematics.**

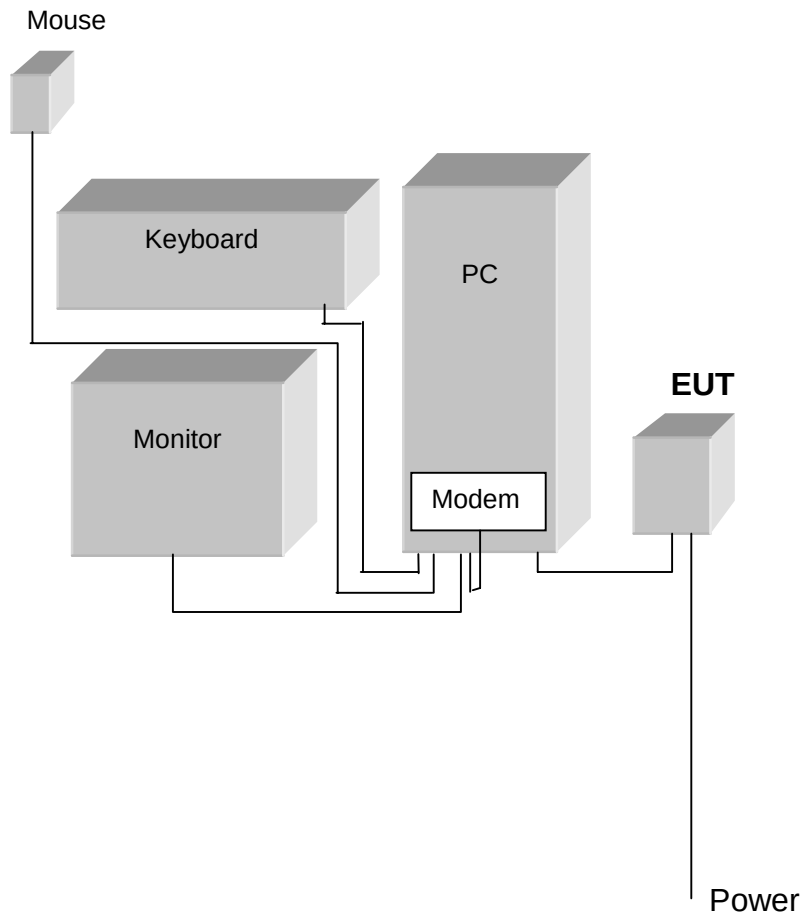
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### Equipment Under Test Orientation and Configuration - Test Configuration #1

#### Zero Degrees



#### 180 Degrees

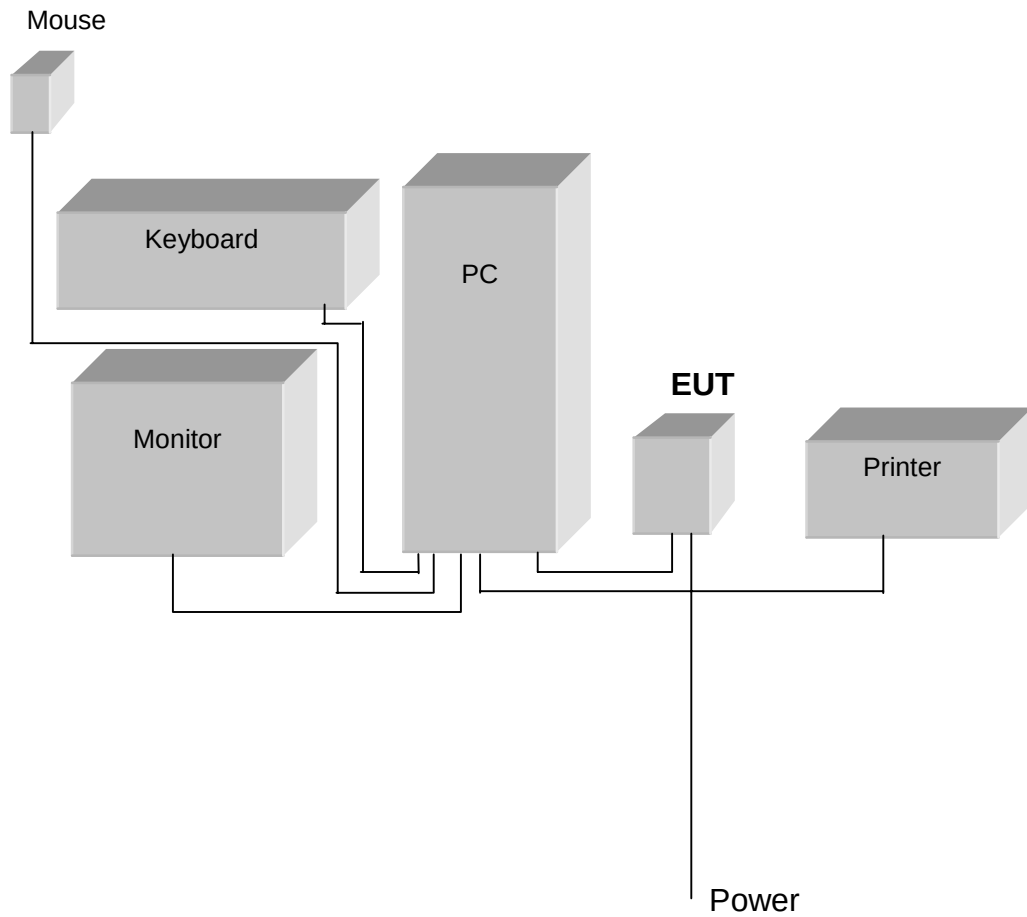
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## Equipment Under Test Orientation and Configuration - Test Configuration #2

### Zero Degrees



### 180 Degrees

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### 3.0 Radiated Electromagnetic Interference (EMI) - Test Configuration

- 3.1 PLI placed the Equipment Under Test (EUT) on an 80 centimeter high table located on a 12.70 millimeter (0.5 inch) thick, 1.83 meter (6.00 foot) diameter, remote controlled steel turntable positioned 3.00 meters away from a receiving antenna assembly. This steel gear driven turntable has a 2400 pound capacity. The grounded turntable top surface is flush with a grounded screen consisting of 6.35 millimeter (0.25 inch) squares forming a wire mesh. The automated 4.00 meter mast and antenna assembly connects to an RF amplifier attached to a spectrum analyzer with quasi-peak adapter.
- 3.2 The Equipment Under Test (EUT) was operated at its specified load condition for which it was designed. After 30 minutes of continuous operation the EUT reached normal operating temperature. Recorded EMI data in this report was accumulated during the normal load and operating temperature of the EUT.
- 3.3 The EUT and system configuration follows:

**Test Configuration #1:** The EUT was connected to a computer system via a parallel cable. Connected to the computer system were monitor, mouse, keyboard, and modem. A bootable D-101 software diskette was inserted into the floppy drive. The computer system and the EUT were powered on. The computer system booted into DOS and then automatically loaded the D-101 software. The software was accessed to allow continuous communication between the EUT and computer system.

**Test Configuration #2:** The EUT was connected to a computer system via a serial cable. Connected to the computer system were monitor, mouse, keyboard, and printer. A bootable D-101 software diskette was inserted into the floppy drive. The computer system and the EUT were powered on. The computer system booted into DOS and then automatically loaded the D-101 software. The software was not programmed to allow communication between the EUT and the computer via the serial cable so both remained in a powered on, but dormant state.

|          |                             |                  |                      |
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The following equipment list defines the system configurations:

**Test Configuration #1:**

|               |                               |
|---------------|-------------------------------|
| EUT           | :DataFast Handheld Duplicator |
| Model Number  | :D-101                        |
| Serial Number | :170B                         |
| FCC ID Number | :OTI7051X                     |
| Manufacturer  | :Greystone Peripherals, Inc.  |

|               |                                  |
|---------------|----------------------------------|
| Product       | :Compaq Presario Computer System |
| Model Number  | :3441                            |
| Serial Number | :6735BN29T938                    |
| FCC ID Number | :EJH3441                         |
| Manufacturer  | :Compaq Computer Corporation     |

|               |                        |
|---------------|------------------------|
| Product       | :Color Monitor         |
| Model Number  | :M1448L                |
| Serial Number | :4LCB56M003802         |
| FCC ID Number | :DK4M1448              |
| Manufacturer  | :GVC Technologies Inc. |

|               |               |
|---------------|---------------|
| Product       | :Mouse        |
| Model Number  | :PS/2 - Mouse |
| Serial Number | :20319879     |
| FCC ID Number | :EMJMU501     |
| Manufacturer  | :Packard Bell |

|               |                           |
|---------------|---------------------------|
| Product       | :Keyboard                 |
| Model Number  | :WB Series                |
| Serial Number | :50S1010411               |
| FCC ID Number | :CWTFRCE                  |
| Manufacturer  | :Alp Electric (USA), Inc. |

|               |                                    |
|---------------|------------------------------------|
| Product Name  | :Smart Modem 2400                  |
| Model Number  | :231AA                             |
| Serial Number | :AO3031003936                      |
| FCC ID Number | :BFJ9D9231AA                       |
| Manufacturer  | :Hayes MicroComputer Products Inc. |

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### **Test Configuration #2:**

Identical to Test Configuration #1, except instead of modem, a printer was connected to the computer system:

|               |              |
|---------------|--------------|
| Product Name  | :Printer     |
| Model Number  | :GE5251B     |
| Serial Number | :510A0112915 |
| FCC ID Number | :BDB9F2192   |
| Manufacturer  | :Okidata     |

- 3.4 The Equipment Under Test was evaluated per the American National Standards Institute standard number C63.4-1992 entitled Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz. To maximize Electromagnetic Interference signal strength, PLI rotated the System Under Test 360 degrees and then adjusted the receiving antenna height until the maximum signal appeared on the spectrum analyzer. The input/output interface cables between units of the system were always positioned to yield maximum field strength.

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#### 4.0 Radiated EMI – Results

- 4.1 The investigated frequency spectrum revealed radiated EMI signals. The highest interference in the horizontal polarization occurred when the front of the unit was facing 180 degrees clockwise with respect to the antenna. The highest interference in the vertical polarization occurred when the front of the unit was facing 180 degrees clockwise with respect to the antenna.
- 4.2 The "ACF" (Antenna Correction Factor) shown in the test data in this report includes compensation for the antenna factor; cable attenuation; the series RF attenuator; the RF amplifier; and pre-selector system losses. The spectrum analyzer data is shown as quasi-peak amplitudes.
- 4.3 The test facility is FCC registered; the procedures are CISPR registered, ICAN registered, VCCI registered, VDE approved, and BZT approved.

|                      |                                                                    |
|----------------------|--------------------------------------------------------------------|
| Type of Test         | Radiated Electromagnetic Interference                              |
| Specification        | FCC Class B                                                        |
| Date Data Collected  | 29 October 1999                                                    |
| Detection Technique  | Spectrum Analyzer with Quasi-peak Adapter                          |
| Resolution Bandwidth | 100 kHz                                                            |
| Video Bandwidth      | 100 kHz                                                            |
| Antennas             | 30 to 200 MHz High Field Biconical<br>200 to 1000 MHz Log-Periodic |

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**Test Configuration #1**

| <b>Frequency<br/>MHz</b> | <b>EMI<br/>Data<br/>dBµV/M</b> | <b>ACF</b> | <b>Field<br/>Strength<br/>dBµV/M</b> | <b>FCC<br/>Limit<br/>dBµV/M</b> | <b>Margin<br/>to Limit<br/>dBµV/M</b> |
|--------------------------|--------------------------------|------------|--------------------------------------|---------------------------------|---------------------------------------|
| Horizontal               |                                |            |                                      |                                 |                                       |
| 36.08                    | 29.70                          | -8.66      | 21.04                                | 40.00                           | -18.96                                |
| 42.50                    | 30.90                          | -9.23      | 21.67                                | 40.00                           | -18.33                                |
| 58.85                    | 30.20                          | -10.70     | 19.50                                | 40.00                           | -20.50                                |
| 66.40                    | 42.50                          | -11.69     | 30.81                                | 40.00                           | -9.19                                 |
| 79.28                    | 36.00                          | -13.85     | 22.15                                | 40.00                           | -17.85                                |
| 86.15                    | 32.90                          | -14.28     | 18.62                                | 40.00                           | -21.38                                |
| 110.00                   | 25.80                          | -10.96     | 14.84                                | 43.50                           | -28.66                                |
| 132.95                   | 37.40                          | -9.82      | 27.58                                | 43.50                           | -15.92                                |
| 148.58                   | 31.00                          | -9.44      | 21.56                                | 43.50                           | -21.94                                |
| 166.75                   | 26.70                          | -9.18      | 17.52                                | 43.50                           | -25.98                                |
| 170.00                   | 28.40                          | -10.17     | 18.23                                | 43.50                           | -25.27                                |
| 189.73                   | 25.20                          | -9.07      | 16.13                                | 43.50                           | -27.37                                |
| 250.03                   | 42.10                          | -8.08      | 34.02                                | 46.00                           | -11.98                                |
| 276.80                   | 34.60                          | -6.05      | 28.55                                | 46.00                           | -17.45                                |
| 332.15                   | 31.60                          | -6.04      | 25.56                                | 46.00                           | -20.44                                |
| 350.05                   | 30.90                          | -6.29      | 24.61                                | 46.00                           | -21.39                                |
| 431.83                   | 25.40                          | -2.27      | 23.13                                | 46.00                           | -22.87                                |
| 450.00                   | 44.30                          | -1.80      | 42.50                                | 46.00                           | -3.50                                 |
| 524.60                   | 31.40                          | -1.11      | 30.29                                | 46.00                           | -15.71                                |
| 550.00                   | 43.00                          | -1.01      | 41.99                                | 46.00                           | -4.01                                 |
| 600.03                   | 34.10                          | -0.58      | 33.52                                | 46.00                           | -12.48                                |
| 771.25                   | 38.20                          | 1.61       | 39.81                                | 46.00                           | -6.19                                 |
| 857.38                   | 22.10                          | 4.03       | 26.13                                | 46.00                           | -19.87                                |
| 933.35                   | 29.30                          | 5.54       | 34.84                                | 46.00                           | -11.16                                |

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**Test Configuration #1**

| Frequency<br>MHz | EMI<br>Data<br>dBµV/M | ACF    | Field<br>Strength<br>dBµV/M | FCC<br>Limit<br>dBµV/M | Margin<br>to Limit<br>dBµV/M |
|------------------|-----------------------|--------|-----------------------------|------------------------|------------------------------|
| Vertical         |                       |        |                             |                        |                              |
| 31.53            | 35.10                 | -8.35  | 26.75                       | 40.00                  | -13.25                       |
| 45.43            | 41.20                 | -9.58  | 31.62                       | 40.00                  | -8.38                        |
| 52.08            | 34.40                 | -10.26 | 24.14                       | 40.00                  | -15.86                       |
| * 66.38          | 51.00                 | -11.69 | 39.31                       | 40.00                  | -0.69                        |
| 71.60            | 43.50                 | -12.49 | 31.01                       | 40.00                  | -8.99                        |
| 84.35            | 33.40                 | -14.19 | 19.21                       | 40.00                  | -20.79                       |
| 113.68           | 40.50                 | -10.36 | 30.14                       | 43.50                  | -13.36                       |
| 124.33           | 31.50                 | -9.50  | 22.00                       | 43.50                  | -21.50                       |
| 132.90           | 41.50                 | -9.82  | 31.68                       | 43.50                  | -11.82                       |
| 159.30           | 29.60                 | -7.28  | 22.32                       | 43.50                  | -21.18                       |
| 166.68           | 29.40                 | -9.16  | 20.24                       | 43.50                  | -23.26                       |
| 197.40           | 23.80                 | -10.74 | 13.06                       | 43.50                  | -30.44                       |
| 217.60           | 32.50                 | -10.18 | 22.32                       | 46.00                  | -23.68                       |
| 265.70           | 28.90                 | -6.89  | 22.01                       | 46.00                  | -23.99                       |
| 332.25           | 27.50                 | -6.04  | 21.46                       | 46.00                  | -24.54                       |
| 350.00           | 45.20                 | -6.29  | 38.91                       | 46.00                  | -7.09                        |
| 450.03           | 35.90                 | -1.80  | 34.10                       | 46.00                  | -11.90                       |
| 493.75           | 32.40                 | -1.29  | 31.11                       | 46.00                  | -14.89                       |
| 550.03           | 38.50                 | -1.01  | 37.49                       | 46.00                  | -8.51                        |
| 585.25           | 36.10                 | -0.70  | 35.40                       | 46.00                  | -10.60                       |
| 639.25           | 30.10                 | -0.66  | 29.44                       | 46.00                  | -16.56                       |
| 741.53           | 24.70                 | 1.24   | 25.94                       | 46.00                  | -20.06                       |
| 799.63           | 27.90                 | 2.31   | 30.21                       | 46.00                  | -15.79                       |
| 950.00           | 30.30                 | 5.87   | 36.17                       | 46.00                  | -9.83                        |

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**Test Configuration #2**

| <b>Frequency<br/>MHz</b> | <b>EMI<br/>Data<br/>dBµV/M</b> | <b>ACF</b> | <b>Field<br/>Strength<br/>dBµV/M</b> | <b>FCC<br/>Limit<br/>dBµV/M</b> | <b>Margin<br/>to Limit<br/>dBµV/M</b> |
|--------------------------|--------------------------------|------------|--------------------------------------|---------------------------------|---------------------------------------|
| Horizontal               |                                |            |                                      |                                 |                                       |
| 34.88                    | 26.30                          | -8.58      | 17.72                                | 40.00                           | -22.28                                |
| 48.08                    | 28.70                          | -9.89      | 18.81                                | 40.00                           | -21.19                                |
| 66.40                    | 43.50                          | -11.69     | 31.81                                | 40.00                           | -8.19                                 |
| 75.58                    | 37.90                          | -13.20     | 24.70                                | 40.00                           | -15.30                                |
| 80.33                    | 37.00                          | -13.99     | 23.01                                | 40.00                           | -16.99                                |
| 114.60                   | 31.50                          | -10.21     | 21.29                                | 43.50                           | -22.21                                |
| 124.88                   | 27.20                          | -9.53      | 17.67                                | 43.50                           | -25.83                                |
| 132.95                   | 35.20                          | -9.82      | 25.38                                | 43.50                           | -18.12                                |
| 146.98                   | 28.90                          | -9.55      | 19.35                                | 43.50                           | -24.15                                |
| 166.65                   | 29.80                          | -9.15      | 20.65                                | 43.50                           | -22.85                                |
| 177.65                   | 37.70                          | -7.71      | 29.99                                | 43.50                           | -13.51                                |
| 195.53                   | 32.90                          | -10.33     | 22.57                                | 43.50                           | -20.93                                |
| 217.58                   | 37.90                          | -10.18     | 27.72                                | 46.00                           | -18.28                                |
| 252.73                   | 38.30                          | -7.87      | 30.43                                | 46.00                           | -15.57                                |
| 315.00                   | 34.20                          | -5.80      | 28.40                                | 46.00                           | -17.60                                |
| 366.53                   | 26.20                          | -5.24      | 20.96                                | 46.00                           | -25.04                                |
| 400.03                   | 30.50                          | -3.09      | 27.41                                | 46.00                           | -18.59                                |
| 450.03                   | 41.40                          | -1.80      | 39.60                                | 46.00                           | -6.40                                 |
| 523.78                   | 38.70                          | -1.12      | 37.58                                | 46.00                           | -8.42                                 |
| 577.73                   | 29.60                          | -0.77      | 28.83                                | 46.00                           | -17.17                                |
| 650.03                   | 28.40                          | -0.68      | 27.72                                | 46.00                           | -18.28                                |
| 733.35                   | 34.00                          | 1.37       | 35.37                                | 46.00                           | -10.63                                |
| 842.50                   | 22.00                          | 3.65       | 25.65                                | 46.00                           | -20.35                                |
| 946.45                   | 28.70                          | 5.80       | 34.50                                | 46.00                           | -11.50                                |

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**Test Configuration #2**

| Frequency<br>MHz | EMI<br>Data<br>dBµV/M | ACF    | Field<br>Strength<br>dBµV/M | FCC<br>Limit<br>dBµV/M | Margin<br>to Limit<br>dBµV/M |
|------------------|-----------------------|--------|-----------------------------|------------------------|------------------------------|
| Vertical         |                       |        |                             |                        |                              |
| 34.38            | 33.60                 | -8.55  | 25.05                       | 40.00                  | -14.95                       |
| 40.65            | 35.70                 | -9.02  | 26.68                       | 40.00                  | -13.32                       |
| 50.03            | 42.60                 | -10.12 | 32.48                       | 40.00                  | -7.52                        |
| 67.23            | 47.60                 | -11.81 | 35.79                       | 40.00                  | -4.21                        |
| 71.73            | 41.80                 | -12.51 | 29.29                       | 40.00                  | -10.71                       |
| 80.78            | 37.20                 | -14.02 | 23.18                       | 40.00                  | -16.82                       |
| 117.25           | 35.80                 | -9.77  | 26.03                       | 43.50                  | -17.47                       |
| 132.93           | 38.50                 | -9.82  | 28.68                       | 43.50                  | -14.82                       |
| 150.03           | 39.50                 | -9.34  | 30.16                       | 43.50                  | -13.34                       |
| 171.58           | 28.60                 | -9.66  | 18.94                       | 43.50                  | -24.56                       |
| 189.20           | 23.20                 | -8.95  | 14.25                       | 43.50                  | -29.25                       |
| 196.95           | 30.20                 | -10.64 | 19.56                       | 43.50                  | -23.94                       |
| 212.18           | 39.50                 | -10.52 | 28.98                       | 43.50                  | -14.52                       |
| 250.03           | 42.10                 | -8.08  | 34.02                       | 46.00                  | -11.98                       |
| 315.00           | 41.10                 | -5.80  | 35.30                       | 46.00                  | -10.70                       |
| 350.03           | 39.40                 | -6.29  | 33.11                       | 46.00                  | -12.89                       |
| 450.00           | 42.10                 | -1.80  | 40.30                       | 46.00                  | -5.70                        |
| 500.03           | 34.20                 | -1.22  | 32.98                       | 46.00                  | -13.02                       |
| 550.00           | 38.50                 | -1.01  | 37.49                       | 46.00                  | -8.51                        |
| 639.28           | 32.50                 | -0.66  | 31.84                       | 46.00                  | -14.16                       |
| 695.53           | 30.10                 | 1.71   | 31.81                       | 46.00                  | -14.19                       |
| 733.33           | 35.00                 | 1.37   | 36.37                       | 46.00                  | -9.63                        |
| 815.43           | 31.80                 | 2.80   | 34.60                       | 46.00                  | -11.40                       |
| 950.03           | 23.90                 | 5.87   | 29.77                       | 46.00                  | -16.23                       |

#### 4.4 Calculations and Notes Concerning Data Presentation

4.4.1 "ACF" means the Antenna Correction Factor for either Horizontal or Vertical antenna orientation.

4.4.2 "H" means Horizontal antenna orientation.

4.4.3 "V" means Vertical antenna orientation.

4.4.4 "\*" means the "Margin to Limit" Exceeds the "EN Limit" and/or Exceeds the "FCC Limit" or is within a -2 dB  $\mu$ V margin.

4.4.5 "A" designates an ambient signal.

4.4.6 "(-.-)" means the signal level as lower than the adjacent data or within the background ambients.

4.4.7 "EMI DATA" plus "ACF" equals "Field Strength".

4.4.8 "Field Strength" minus "EN Limit" and/or minus "FCC Limit" equals "Margin to Limit".

4.4.9 "Margin to Limit" negative numbers show Equipment Under Test "Field Strength" below the "EN Limit" and/or below the "FCC Limit". "Margin to Limit" positive numbers show Equipment Under Test "Field Strength" above the "EN Limit" and/or above the "FCC Limit".

4.5 The field strengths in this section were measured at 3.0 meters. None of the Electromagnetic Interference quasi-peaks are in excess of the FCC (Federal Communications Commission) Class B maximums, even when the field strength readings in the above table are reduced by 20 dB  $\mu$ V (to represent 30 meter test site measurements, since an antenna positioned at 30.0 meters receives one tenth of the field strength recorded at 3.0 meters).

4.6 **Conclusion** - The radiated Electromagnetic Interference of the Equipment Under Test meets the requirements for Federal Communications Commission (FCC) Class B devices.

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## 5.0 Conducted EMI - Test Configuration

- 5.1 Current input power leads of the Equipment Under Test were connected to a Line Impedance Stabilization Network (LISN), which isolate and couple the conducted interference from the power lines to a spectrum analyzer. The LISN and the Equipment Under Test were connected and positioned according to the Industry Canada and the Federal Communications Commission test recommendations. The Equipment Under Test was configured exactly as outlined in the Radiated Electromagnetic Interference Section of this report. The spectrum analyzer data is shown in the following table as quasi-peak amplitudes.
- 5.2 To increase data integrity and also meet the recommendations of the American National Standards Institute standard number C63.4-1992, all electrical devices comprising the system being tested with the Equipment Under Test were connected to the VAC mains using a second Line Impedance Stabilization Network.

## 6.0 Conducted EMI – Results

- 6.1 Investigation of the EUT revealed conducted interference levels as shown in the table below.

| Type of Test                         | Conducted Electromagnetic Interference    |
|--------------------------------------|-------------------------------------------|
| Specification                        | FCC Class B                               |
| Date Data Collected                  | 29 Oct 1999                               |
| Detection Technique                  | Spectrum Analyzer with Quasi-peak Adapter |
| Frequency Range                      | 0.150 to 30.0 MHz                         |
| Resolution Bandwidth                 | 10 kHz                                    |
| Video Bandwidth                      | 10 kHz                                    |
| Line Impedance Stabilization Network | 50 micro Henry; 50 ohm                    |

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### Test Configuration #1

| Frequency<br>MHz | Line<br>Data<br>dBμV | Neutral<br>Data<br>dBμV | FCC<br>Limit<br>dBμV | Margin to<br>Limit (Line)<br>dBμV | Margin to<br>Limit (Neutral)<br>dBμV |
|------------------|----------------------|-------------------------|----------------------|-----------------------------------|--------------------------------------|
| 0.50             | 26.80                | 27.10                   | 48.00                | -21.20                            | -20.90                               |
| 1.50             | -.-                  | 26.80                   | 48.00                | -.-                               | -21.20                               |
| 2.41             | -.-                  | 25.70                   | 48.00                | -.-                               | -22.30                               |
| 3.66             | 18.60                | -.-                     | 48.00                | -29.40                            | -.-                                  |
| 5.73             | -.-                  | 24.70                   | 48.00                | -.-                               | -23.30                               |
| 5.99             | 29.30                | -.-                     | 48.00                | -18.70                            | -.-                                  |
| 6.65             | 31.60                | 30.00                   | 48.00                | -16.40                            | -18.00                               |
| 7.57             | -.-                  | 29.30                   | 48.00                | -.-                               | -18.70                               |
| 7.90             | 29.90                | -.-                     | 48.00                | -18.10                            | -.-                                  |
| 8.06             | 30.50                | -.-                     | 48.00                | -17.50                            | -.-                                  |
| 10.39            | 22.10                | -.-                     | 48.00                | -25.90                            | -.-                                  |
| 13.81            | -.-                  | 21.10                   | 48.00                | -.-                               | -26.90                               |
| 13.96            | 18.70                | -.-                     | 48.00                | -29.30                            | -.-                                  |
| 16.05            | 28.30                | 28.40                   | 48.00                | -19.70                            | -19.60                               |
| 19.11            | -.-                  | 19.70                   | 48.00                | -.-                               | -28.30                               |
| 19.30            | 22.50                | -.-                     | 48.00                | -25.50                            | -.-                                  |
| 20.06            | 29.80                | 30.10                   | 48.00                | -18.20                            | -17.90                               |
| 22.51            | 18.70                | -.-                     | 48.00                | -29.30                            | -.-                                  |
| 24.07            | 29.90                | 30.30                   | 48.00                | -18.10                            | -17.70                               |
| 26.66            | -.-                  | 22.30                   | 48.00                | -.-                               | -25.70                               |
| 27.22            | 27.10                | 25.50                   | 48.00                | -20.90                            | -22.50                               |
| 28.64            | 37.50                | 38.10                   | 48.00                | -10.50                            | -9.90                                |
| 29.79            | 23.90                | -.-                     | 48.00                | -24.10                            | -.-                                  |
| 29.90            | -.-                  | 19.60                   | 48.00                | -.-                               | -28.40                               |

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### Test Configuration #2

| Frequency<br>MHz | Line<br>Data<br>dBμV | Neutral<br>Data<br>dBμV | FCC<br>Limit<br>dBμV | Margin to<br>Limit (Line)<br>dBμV | Margin to<br>Limit (Neutral)<br>dBμV |
|------------------|----------------------|-------------------------|----------------------|-----------------------------------|--------------------------------------|
| 0.50             | 28.30                | 28.90                   | 48.00                | -19.70                            | -19.10                               |
| 0.91             | -.-                  | 26.50                   | 48.00                | -.-                               | -21.50                               |
| 1.25             | 24.60                | -.-                     | 48.00                | -23.40                            | -.-                                  |
| 1.66             | -.-                  | 31.40                   | 48.00                | -.-                               | -16.60                               |
| 2.08             | 22.50                | -.-                     | 48.00                | -25.50                            | -.-                                  |
| 2.16             | -.-                  | 20.00                   | 48.00                | -.-                               | -28.00                               |
| 4.24             | -.-                  | 24.70                   | 48.00                | -.-                               | -23.30                               |
| 4.66             | 23.80                | -.-                     | 48.00                | -24.20                            | -.-                                  |
| 5.65             | -.-                  | 27.70                   | 48.00                | -.-                               | -20.30                               |
| 6.73             | 29.60                | -.-                     | 48.00                | -18.40                            | -.-                                  |
| 6.90             | -.-                  | 29.10                   | 48.00                | -.-                               | -18.90                               |
| 8.31             | -.-                  | 26.30                   | 48.00                | -.-                               | -21.70                               |
| 9.15             | 18.90                | -.-                     | 48.00                | -29.10                            | -.-                                  |
| 10.14            | -.-                  | 24.90                   | 48.00                | -.-                               | -23.10                               |
| 12.58            | 18.60                | -.-                     | 48.00                | -29.40                            | -.-                                  |
| 13.39            | -.-                  | 19.40                   | 48.00                | -.-                               | -28.60                               |
| 15.68            | 18.60                | -.-                     | 48.00                | -29.40                            | -.-                                  |
| 16.05            | 26.70                | 26.60                   | 48.00                | -21.30                            | -21.40                               |
| 19.39            | 19.50                | -.-                     | 48.00                | -28.50                            | -.-                                  |
| 20.06            | 32.60                | 31.80                   | 48.00                | -15.40                            | -16.20                               |
| 23.53            | -.-                  | 19.00                   | 48.00                | -.-                               | -29.00                               |
| 24.07            | 27.90                | 28.10                   | 48.00                | -20.10                            | -19.90                               |
| 27.35            | -.-                  | 21.60                   | 48.00                | -.-                               | -26.40                               |
| 29.78            | -.-                  | 19.60                   | 48.00                | -.-                               | -28.40                               |

## 6.2 Calculations and Notes Concerning Data Presentation

- 6.2.1 "\*" means the "Margin to Limit" Exceeds the "FCC Limit" and/or Exceeds the "EN Limit" or is within a -2 dB µV margin.
- 6.2.2 "(-.-)" means the signal level as lower than the adjacent data or within the background ambients.
- 6.2.3 "Line Data" minus "FCC Limit" and/or minus "EN Limit" equals "Margin to Limit" for the Line side of the input power cord.
- 6.2.4 "Neutral Data" minus "FCC Limit" and/or minus "EN Limit" equals "Margin to Limit" for the Neutral side of the input power cord.
- 6.2.5 "Margin to Limit" negative numbers show Equipment Under Test "Field Strength" **below** the "FCC Limit" and/or **below** the "EN Limit". "Margin to Limit" positive numbers show Equipment Under Test "Field Strength" **above** the "FCC Limit" and/or **above** the "EN Limit".
- 6.2.6 "A" means an Ambient signal.
- 6.2.7 The symbol "  $\Sigma$  " adjacent to a line of conducted Electromagnetic Interference data means that the "Field Strength" was recorded directly as a quasi-peak measurement, and then reduced by 13 dB µV. The data obtained in quasi-peak mode was 6 dB µV or higher than the level of the same emission measured with the spectrum analyzer detector function set to the average mode. The emission was considered broadband, since the quasi-peak mode bandwidth setting was identical to the average mode bandwidth setting. 100 samples were recorded represented by the following equation:

$$(1 / n) \sum_{i=1}^n x_i$$

- 6.3 **Conclusion** - The conducted Electromagnetic Interference of the Equipment Under Test meets the requirements for Federal Communications Commission (FCC) Class B devices.
- 6.4 Graphs of PEAK conducted Electromagnetic Interference for frequency ranges on Line and Neutral are shown on the following pages.

- 6.5 The recorded conducted data utilized a quasi-peak measurement procedure. Hence, any differences between the graphs and the data are merely the differences between peak and quasi-peak measurements.
- 6.6 There are 33 AM and 56 FM radio stations in the immediate San Jose, California, area which create large ambient signals. Typical radio stations are:
- 0.810 MHz KGO
  - 1.170 MHz KLOK
  - 1.370 MHz KEEN
  - 1.500 MHz KHTT
  - 1.590 MHz KLIV
- 6.7 The conducted Electromagnetic Interference graphs in this report show some of the large ambient signals for several of these radio stations.
- 6.8 The final Electromagnetic Interference conducted test and measurement equipment configuration was evaluated to assure that Data Compression or Intermodulation Distortion did not occur due to these large ambient signals.

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**FCC Conducted Photographs – Test Configuration #1**

**Line Lead  
0.15 to 30.00 MHz**

**Neutral Lead  
0.15 to 30.00 MHz**

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**FCC Conducted Photographs – Test Configuration #2**

**Line Lead  
0.15 to 30.00 MHz**

**Neutral Lead  
0.15 to 30.00 MHz**

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