

# **UNDERWRITERS LABORATORIES INC.**

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Project: 99RT4117

File: MC1071

Report Number: 990155

March 09, 1999

## **Test Report**

**on**

## **Electromagnetic Compatibility Testing**

**Hunter Fan**  
**Memphis, TN USA**

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### **Test Report Details:**

|                        |                                                                                                    |
|------------------------|----------------------------------------------------------------------------------------------------|
| Tests Performed By:    | <b>Underwriters Laboratories Inc.<br/>12 Laboratory Drive<br/>Research Triangle Park, NC 27709</b> |
| Tests Performed For:   | <b>Hunter Fan<br/>2500 Frisco Avenue<br/>Memphis, TN 38114 USA</b>                                 |
| Applicant Contact:     | <b>Mr. E. Renz<br/>Regulatory Engineer<br/>(901) 743-1360</b>                                      |
| Test Report Number:    | <b>990155</b>                                                                                      |
| Test Report Date:      | <b>March 09, 1999</b>                                                                              |
| Product Type:          | <b>Ceiling Fan Controller</b>                                                                      |
| Model Number:          | <b>84555</b>                                                                                       |
| Sample Serial Number:  | <b>-</b>                                                                                           |
| Sample Tag Number:     | <b>S99LB083</b>                                                                                    |
| EUT Category:          | <b>Motor Operated/Thermal Equipment</b>                                                            |
| EUT Type:              | <b>Table Top</b>                                                                                   |
| Sample Receive Date:   | <b>February 15, 1999</b>                                                                           |
| Testing Start Date:    | <b>February 19, 1999</b>                                                                           |
| Date Testing Complete: | <b>February 19, 1999</b>                                                                           |

Underwriters Laboratories Inc. reports apply only to the specific samples tested under stated test conditions. All samples tested were in good operating condition throughout the entire test program. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. Underwriters Laboratories Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from Underwriters Laboratories Inc. issued reports. This report shall not be used to claim, constitute or imply product certification, approval, or endorsement by NVLAP or any agency of the US government.

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### Summary of Testing:

| Test<br># | Test Name<br>Test Requirement/Specification                                                                                      | Comply | Does<br>Not<br>Comply | See<br>Remark |
|-----------|----------------------------------------------------------------------------------------------------------------------------------|--------|-----------------------|---------------|
| 1         | Conducted Disturbance Emissions - Voltage<br>47 CFR Part 15, Subpart B / 47 CFR Part 15, Subpart B, Class B                      | X      | -                     |               |
| 2         | Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field<br>47 CFR Part 15, Subpart B / 47 CFR Part 15, Subpart B, Class B | X      | -                     |               |

### Remarks:

1) None

### Conclusion:

The tests listed in the Summary of Testing section of this report have been performed and the results recorded by Underwriters Laboratories Inc. in accordance with the procedures stated in each test requirement and specification. As a result, the subject product has been verified to comply or not comply as noted in the Summary of Testing with each test specification.

Project Engineer:

Reviewed By:

  
Jim Marley  
EMC Engineer

  
Wyatt Brannan  
EMC Engineer

## **Test Facilities:**

### **Test Location A) 10-Meter Anechoic Chamber (Industry Canada - IC 2953, NVLAP - 200246-0, VCCI - R-722)**

Constructed by Lindgren RF Enclosures, this room consists of a 17.9 by 12 by 8.3 m (inside clearance) shielded room lined with TDK absorber material. The walls, floor (conducting ground plane) and ceiling are constructed of double sided galvanized sheet steel supported by 19 mm thick particle board. The interior walls and ceiling are covered with 10 by 10 cm, 4.6 mm thick ferrite tiles and partially covered with polystyrene absorber cones. Removable floor tiles and cones covering the floor between the EUT and antenna are provided when RF immunity testing is performed.

Room is provided with a 4.0 m diameter embedded turntable and a 1.2 by 2.1 m and 2.4 by 2.4 m double knife edge doors for access. Also, the room is fed electrical EUT power via permanently installed filters and is provided with a permanently mounted video surveillance camera. A remotely controllable antenna mast is located in the room for positioning the measuring antenna from 1 to 4 m above the ground plane.

### **Test Location B) Compact Anechoic Chamber**

Constructed by Lindgren RF Enclosures, this room consists of a 6 by 3 by 2.9 m (inside clearance) shielded room lined with TDK absorber material. The walls, floor (conducting ground plane) and ceiling are constructed of double sided galvanized sheet steel supported by 19 mm thick particle board. The interior walls and ceiling are covered with 10 by 10 cm, 4.6 mm thick ferrite tiles and partially covered with polystyrene absorber cones. Removable floor tiles and cones covering the floor between the EUT and antenna are provided when RF immunity testing is performed.

Room is provided with a 1.5 m diameter embedded turntable and a 1.2 by 2.1 m double knife edge door for access. Also, the room is fed electrical EUT power via permanently installed filters and is provided with a permanently mounted video surveillance camera.

### **Test Location C) RF Shielded Room (VCCI - C-744, NVLAP - 200246-0)**

Constructed by Lindgren RF Enclosures, this room consists of a 7.3 by 4.3 by 2.7 m (inside clearance) shielded room. The walls, floor (conducting ground plane) and ceiling are constructed of double sided galvanized sheet steel supported by 19 mm thick particle board. Room is provided with a 1.2 by 2.1 m double knife edge door for access. Also, the room is fed electrical EUT power via permanently installed filters and is provided with a portable video surveillance camera.

### **Test Location D) Ground Reference Plane # 1 (VCCI - C-742, NVLAP - 200246-0)**

Horizontal floor ground reference plane constructed of double sided galvanized sheet steel supported by 19 mm particle board and measures 3.6 by 3.0 m. Located next to one vertical wall of the Control Room and is, therefore, provided with a 3.0 by 3.6 m vertical ground reference plane constructed of the same material. The horizontal and vertical planes are continuously bonded along their entire length. Power filters and LISNs, when required, are placed on top of and bonded to the horizontal floor ground reference plane.

### **Test Location E) Ground Reference Plane # 2 (VCCI - C-743, NVLAP - 200246-0)**

Horizontal floor ground reference plane constructed of double sided galvanized sheet steel supported by 19 mm particle board and measures 4.3 by 5.2 m. Located next to one vertical wall of the RFD Shielded Room and is, therefore, provided with a 4.3 by 2.8 m vertical ground reference plane constructed of the same material. The horizontal and vertical planes are continuously bonded along their entire length. Power filters and LISNs, when required, are placed on top of and bonded to the horizontal floor ground reference plane.

### **Test Location F) Ground Reference Plane # 3**

Horizontal floor ground reference plane constructed of double sided galvanized sheet steel supported by 19 mm particle board and measures 3.6 by 3.6 m. Power filters and LISNs, when required, are placed on top of and bonded to the horizontal floor ground reference plane.

### **Test location G) Magnetic Field Ground Reference Plane**

Horizontal floor ground reference plane constructed of 1.5 mm thick aluminum measuring 3.6 by 2.4 m.

### **Test Location H) Outdoor Ground Reference Plane**

Horizontal floor ground reference plane constructed of 1.5 mm thick aluminum measuring 3.6 by 3 m and located next to the outside wall of the EMC lab rear entrance.

### **Test Location I) Harmonic Current Test Area**

Located on Lab floor in front of Standard Source Impedance Power Supply.

### **Test Location X) Other**

If needed, as described in the Comments Section of Test Results.

### **EUT Information:**

#### **Equipment Used During Test:**

| Use* | Product Type   | Manufacturer | Model | Comments |
|------|----------------|--------------|-------|----------|
| EUT  | Fan Controller | Hunter       |       |          |
| EUT  | Remote         | Hunter       |       |          |
|      |                |              |       |          |

\* Use = EUT - Equipment Under Test, ACC - Accessory (Not Subjected to Test), or SIM - Simulator (Not Subjected to Test)

#### **Input/Output Ports:**

| Port # | Name      | Type* | Cable Max. >3m | Cable Shielded | Comments |
|--------|-----------|-------|----------------|----------------|----------|
| 0      | Enclosure | N/E   | No             | No             |          |
| 1      | AC Mains  | AC    | No             | No             |          |
| 2      | Fan Load  | I/O   | No             | No             |          |
| 3      | Lamp Load | I/O   | No             | No             |          |
|        |           |       |                |                |          |

\* AC = AC Power Port      DC = DC Power Port      N/E = Non-Electrical  
I/O = Signal Input or Output Port (Not Involved in Process Control)  
PMC = Process Measurement and Control Port

**EUT Internal Operating Frequencies:**

| Frequency (MHz)* | Description    |
|------------------|----------------|
| 0                | None provided. |
|                  |                |

\* List all frequencies intentionally generated in the product above 9kHz.

**Power Interface:**

| Mode # | Voltage (V) | Current (A) | Power (W) | Frequency (DC/AC-Hz) | Phases (#) | Comments |
|--------|-------------|-------------|-----------|----------------------|------------|----------|
| Rated  | 120         | -           | -         | 60                   | 1          |          |
| 1      | 120         | -           | -         | 60                   | 1          |          |
|        |             |             |           |                      |            |          |

**EUT Operation Modes:**

| Mode # | Description                                                                                                                                                                                                                                                                    |
|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | EUT lamp control and fan control were set to worst-case settings (lamp on and fan speed high). Worst-case settings were determined by performing an initial scan with lamp on and off and fan control set to different speeds. Data presented was recorded in worst-case mode. |
|        |                                                                                                                                                                                                                                                                                |

**EUT Configuration Modes:**

| Mode # | Description                                                                                   |
|--------|-----------------------------------------------------------------------------------------------|
| 1      | EUT on table with lamp and fan output wired to 100 W load. Remote control unit also on table. |
|        |                                                                                               |

## Test 1: Conducted Disturbance Emissions - Voltage

**Test Requirement:** 47 CFR Part 15, Subpart B

**Test Specification:** 47 CFR Part 15, Subpart B, Class B

### Test Procedure:

The test was performed in accordance with the Test Requirement and Specification and configured as noted in the Test Setup. The EUT was connected to the proper supply source via a Line Impedance Stabilization Network (LISN). The Measuring Receiver was connected to the Port under test via the LISN. A peak measurement was first made at the test point across the test frequency range over a one minute test period. Then, Quasi-Peak or Average measurements were taken and recorded under Discrete Data. This was repeated for each conductor of the test port except for equipment grounding.

### Test Details:

Conducted Disturbance Emission Limits For  
Mains Terminals of Class B Equipment

| Frequency<br>MHz | Quasi-Peak<br>Limit<br>$\mu\text{V}$ | Quasi-Peak<br>Limit<br>dB $\mu\text{V}$ |
|------------------|--------------------------------------|-----------------------------------------|
| 0.450 to 30      | 250                                  | 47                                      |

### Test Deviations:

None

**Test Setup:** Only the following ports were tested. See EUT Information for details.

| Test Item | Port # | Port Name | EUT Operation Mode | EUT Configuration | Power Interface |
|-----------|--------|-----------|--------------------|-------------------|-----------------|
| A         | 1      | AC Mains  | 1                  | 1                 | 1               |
|           |        |           |                    |                   |                 |

**Test 1 - Results:** Conducted Disturbance Emissions - Voltage

**Test Results Summary:**

| Test Item | Test Location | Humidity (%) | Temperature (°C) | Pressure (kPa) | Pass/Fail (P/F) | Date Completed | Comment # |
|-----------|---------------|--------------|------------------|----------------|-----------------|----------------|-----------|
| A         | D             | 42.0         | 21.5             | 99.7           | P               | 2/19/99        |           |
|           |               |              |                  |                |                 |                |           |

The EUT was considered to **Pass** the Requirements.

**Comments:**

| Comment # | Description |
|-----------|-------------|
|           |             |
|           |             |
|           |             |
|           |             |

**Test 1 - Test Equipment Used:**

Conducted Disturbance Emissions - Voltage

| Equipment ID | Description                             | Manufacturer      | Model Number  | Last Cal. | Next Cal. |
|--------------|-----------------------------------------|-------------------|---------------|-----------|-----------|
| ATA001       | Transient Limiter                       | Electro-Metrics   | EM-7600       | 7/1/98    | 7/31/99   |
| ATA012       | 24ft Cable, BNC - BNC                   | UL                | RG-223        | 8/4/98    | 8/31/99   |
| ATA027       | LISN, 150 kHz to 30 MHz                 | Solar Electronics | 9629-50-TS-25 | 4/7/98    | 4/30/99   |
| ATA028       | LISN, 150 kHz to 30 MHz                 | Solar Electronics | 9629-50-TS-25 | 4/7/98    | 4/30/99   |
| HI0020       | Humidity/Temperature/Pressure Indicator | Control Company   | 17040-30      | 8/5/98    | 8/31/99   |
| SA0004       | EMI Receiver                            | Advantest         | R3261C        | 8/12/98   | 8/31/99   |
| ZPS004       | 60Hz Patch Panel                        | Gus Berthold Inc. | UL-EMC-RTP-1  | N/A       | N/A       |
|              |                                         |                   |               |           |           |

The above equipment has been calibrated and is within the manufacturer's published limit of error. Calibration is traceable to the National Institute of Standards & Technology(NIST) and conforms to ANSI/NCSL Z540-1-1994.

### Test 1 - Discrete Data:

### Conducted Disturbance Emissions - Voltage

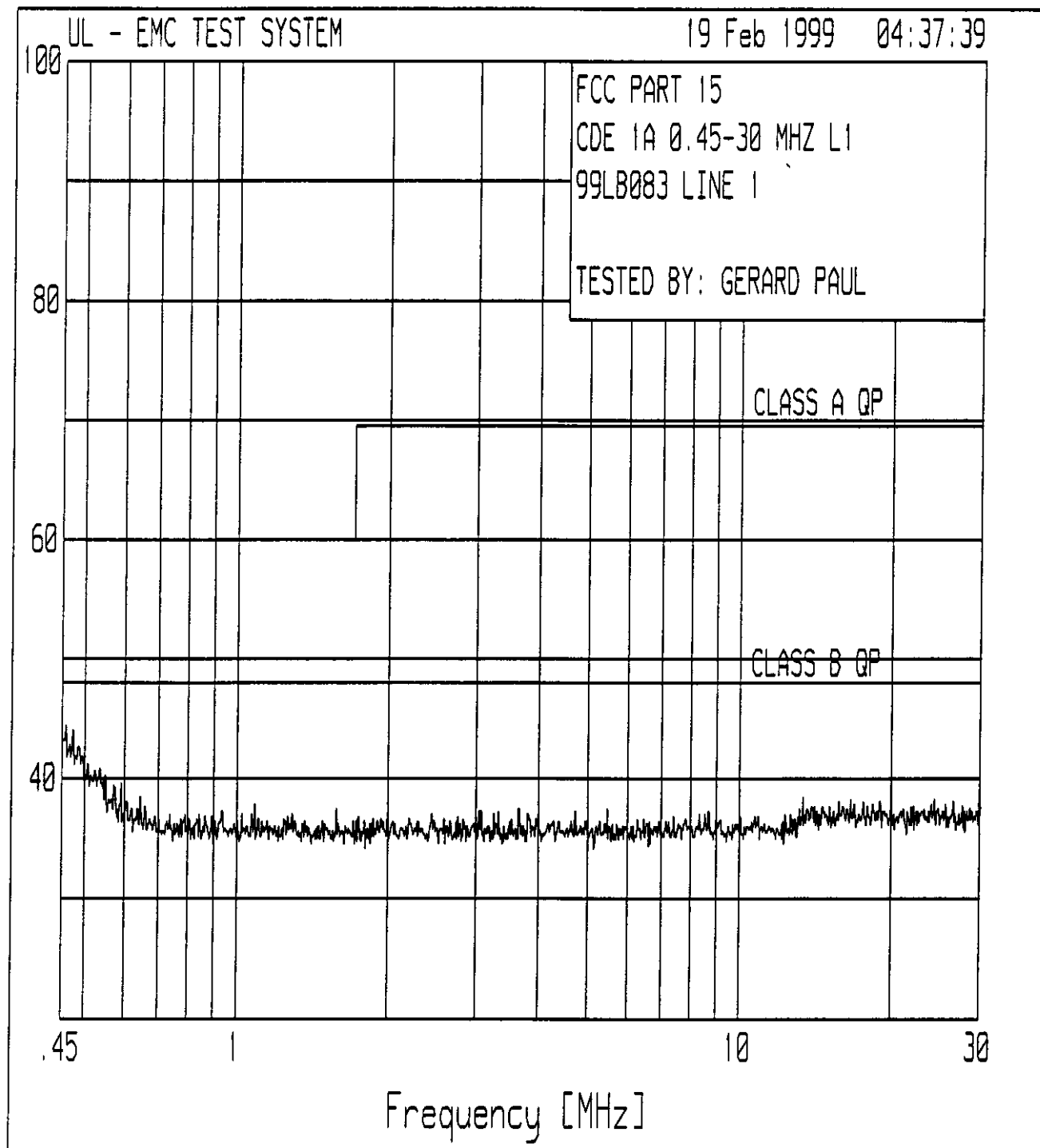
[illegible]

\* P = Peak, Q = Quasi-Peak, A = Average.

**Sample Calculation:** Corrected Value = Measured Value + Equipment Correction (LISN Factor + Cable Loss)

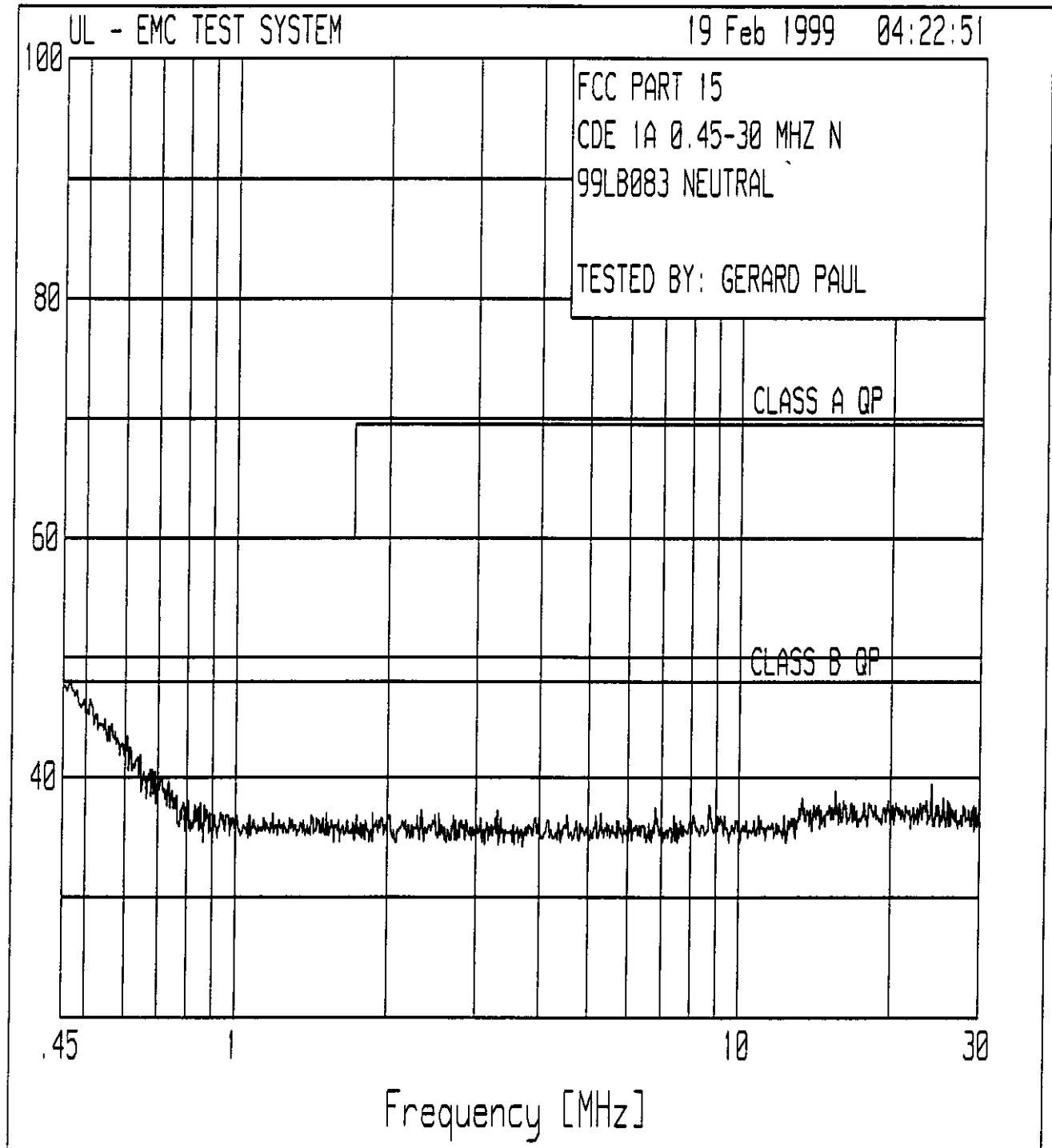
**Test 1 Item A - Peak Plot:**

Conducted Disturbance Emissions - Voltage



**Test 1 Item A - Peak Plot:**

Conducted Disturbance Emissions - Voltage



## **Test 2: Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field**

**Test Requirement:** 47 CFR Part 15, Subpart B

**Test Specification:** 47 CFR Part 15, Subpart B, Class B

### **Test Procedure:**

The test was performed in accordance with the Test Requirement and Specification and configured as noted in the Test Setup. The EUT was placed inside the anechoic chamber and connected to the proper power supply source. A peak measurement was first made by scanning the entire test frequency range and maximizing the EUT emissions by rotating the EUT and raising the antenna height from 1 to 4 meters above the ground reference plane. Then, a measurement was taken for all peak emissions to verify each were below the Test Limits. In each case, all cables and equipment were adjusted and EUT orientation and antenna height were varied for maximum emissions.

### **Test Details:**

Radiated Disturbance Limits for Class B Equipment  
at a measuring distance of 3m.

| Frequency Range<br>MHz | Quasi-Peak Limits<br>$\mu\text{V/m}$ | Quasi-Peak Limits<br>$\text{dB}\mu\text{V/m}$ |
|------------------------|--------------------------------------|-----------------------------------------------|
| 30 to 88               | 100                                  | 40                                            |
| 88 to 216              | 150                                  | 43.5                                          |
| 216 to 960             | 200                                  | 46                                            |
| Above 960              | 500                                  | 54                                            |

### **Test Deviations:**

None

**Test Setup:** Only the following ports were tested. See EUT Information for details.

| Test Item | Port # | Port Name | EUT Operation Mode | EUT Configuration | Power Interface |
|-----------|--------|-----------|--------------------|-------------------|-----------------|
| A         | 0      | Enclosure | 1                  | 1                 | 1               |
|           |        |           |                    |                   |                 |

**Test 2 - Results:** Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field

**Test Results Summary:**

| Test Item | Test Location | Humidity (%) | Temperature (°C) | Pressure (kPa) | Pass/Fail (P/F) | Date Completed | Comment # |
|-----------|---------------|--------------|------------------|----------------|-----------------|----------------|-----------|
| A         | A             | 46.8         | 20.6             | 99.6           | P               | 2/19/99        |           |
|           |               |              |                  |                |                 |                |           |

The EUT was considered to **Pass** the Requirements.

**Comments:**

| Comment # | Description |
|-----------|-------------|
|           |             |
|           |             |
|           |             |
|           |             |

**Test 2 - Test Equipment Used:** Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field

| Equipment ID | Description                           | Manufacturer      | Model Number | Last Cal. | Next Cal. |
|--------------|---------------------------------------|-------------------|--------------|-----------|-----------|
| AT0004       | Log Periodic Antenna, 200 to 1000 MHz | Electro-Metrics   | EM-6950      | 4/21/98   | 4/30/99   |
| ATA034       | 52ft Cable, N - N                     | UL                | HELIAX       | 8/6/98    | 8/31/99   |
| ATA038       | 33ft Cable, N - N                     | EMC Technologist  | RG-214       | 7/2/98    | 7/31/99   |
| MG0556       | 15M Tape Measure                      | Lufkin            | 530-15CM     | 5/7/98    | 5/31/99   |
| PG0183       | Pressure Indicator                    | Meriam            | A0060IH      | 5/6/98    | 5/31/99   |
| RTP024       | Biconical Antenna                     | Electro-Metrics   | EM-6912A     | 1/16/99   | 1/31/00   |
| SAR001       | EMI Receiver                          | Hewlett Packard   | 8572A        | 10/13/98  | 10/31/99  |
| TE0195       | Temperature/Humidity Indicator        | Vaisala           | HM34         | 8/5/98    | 8/31/99   |
| ZPS004       | 60Hz Patch Panel                      | Gus Berthold Inc. | UL-EMC-RTP-1 | N/A       | N/A       |
|              |                                       |                   |              |           |           |

The above equipment has been calibrated and is within the manufacturer's published limit of error. Calibration is traceable to the National Institute of Standards & Technology(NIST) and conforms to ANSI/NCSL Z540-1-1994.

**Test 2 - Discrete Data:** Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field

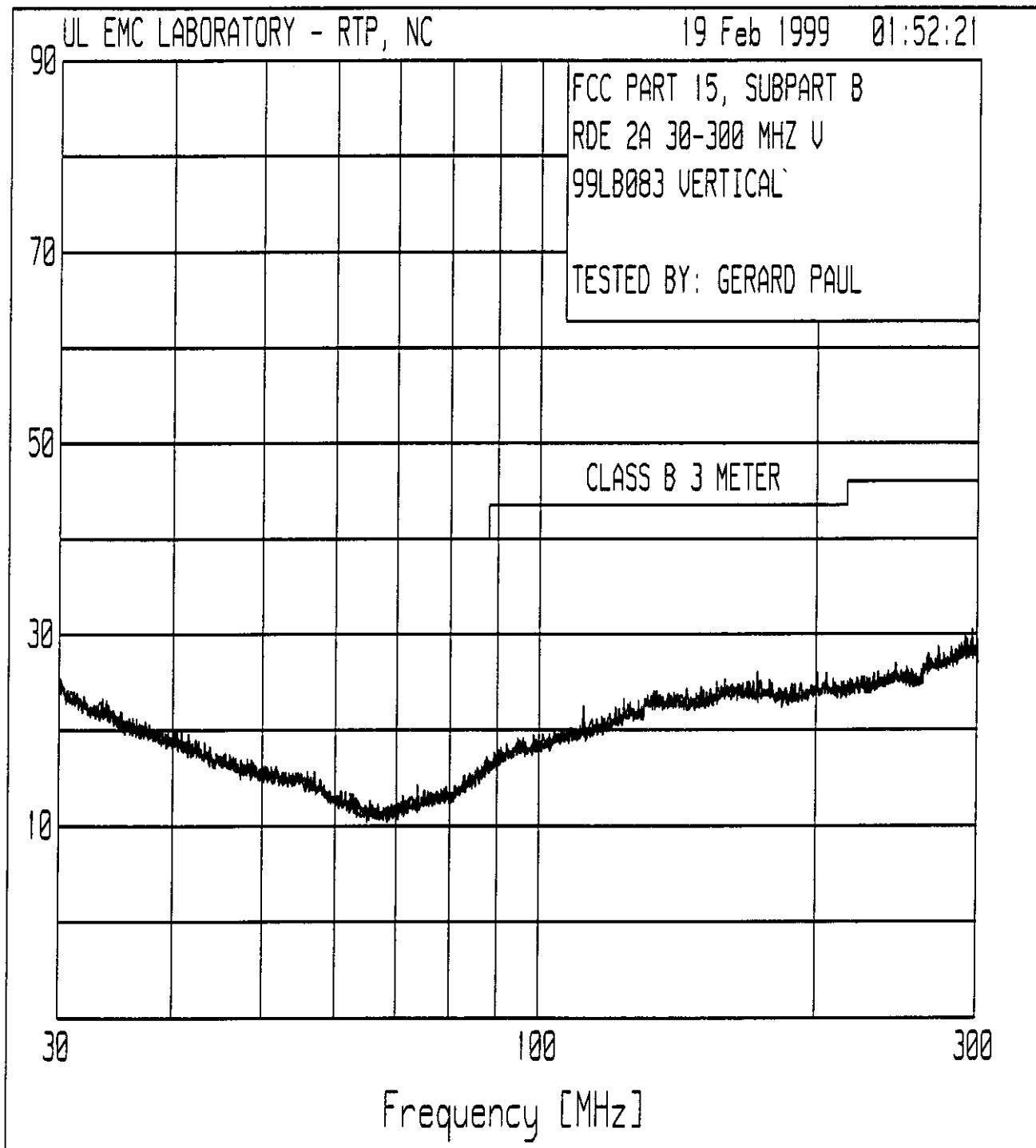
| Test Item | Type*<br>(P/Q/A) | Antenna Polarity<br>(H/V) | Antenna Distance<br>(m) | Measured Frequency<br>(MHz) | Measured Value<br>(dB $\mu$ V/m) | Equipment Correction<br>(dB) | Corrected Value<br>(dB $\mu$ V/m) | Specified Limit<br>(dB $\mu$ V/m) | Spec Margin<br>(dB) | See Comment # |
|-----------|------------------|---------------------------|-------------------------|-----------------------------|----------------------------------|------------------------------|-----------------------------------|-----------------------------------|---------------------|---------------|
| A         | P                | V                         | 3                       | 30.1369                     | 6.4                              | 18.2                         | 24.6                              | 40.0                              | -15.4               |               |
| A         | P                | V                         | 3                       | 111.6260                    | 7.7                              | 14.8                         | 22.5                              | 43.5                              | -21.0               |               |
| A         | P                | V                         | 3                       | 123.4551                    | 6.4                              | 16.8                         | 23.2                              | 43.5                              | -20.3               |               |
| A         | P                | V                         | 3                       | 158.5043                    | 6.2                              | 18.2                         | 24.4                              | 43.5                              | -19.1               |               |
| A         | P                | V                         | 3                       | 244.0680                    | 6.8                              | 20.1                         | 26.9                              | 46.0                              | -19.1               |               |
| A         | P                | V                         | 3                       | 292.0795                    | 7.6                              | 22.0                         | 29.6                              | 46.0                              | -16.4               |               |
| A         | P                | V                         | 3                       | 351.4195                    | 11.9                             | 18.7                         | 30.6                              | 46.0                              | -15.4               |               |
| A         | P                | V                         | 3                       | 421.9318                    | 8.3                              | 19.7                         | 28.0                              | 46.0                              | -18.0               |               |
| A         | P                | V                         | 3                       | 463.1016                    | 11.2                             | 20.4                         | 31.6                              | 46.0                              | -14.4               |               |
| A         | P                | V                         | 3                       | 589.9606                    | 8.1                              | 22.5                         | 30.6                              | 46.0                              | -15.4               |               |
| A         | P                | V                         | 3                       | 735.1983                    | 8.6                              | 24.5                         | 33.1                              | 46.0                              | -12.9               |               |
| A         | P                | V                         | 3                       | 902.3412                    | 8.9                              | 27.0                         | 35.9                              | 46.0                              | -10.1               |               |
| A         | P                | H                         | 3                       | 30.8900                     | 6.7                              | 19.3                         | 26.0                              | 40.0                              | -14.0               |               |
| A         | P                | H                         | 3                       | 45.4031                     | 7.9                              | 12.7                         | 20.6                              | 40.0                              | -19.4               |               |
| A         | P                | H                         | 3                       | 110.3116                    | 6.7                              | 13.8                         | 20.5                              | 43.5                              | -23.0               |               |
| A         | P                | H                         | 3                       | 131.5602                    | 7.2                              | 16.3                         | 23.5                              | 43.5                              | -20.0               |               |
| A         | P                | H                         | 3                       | 262.0265                    | 7.6                              | 20.1                         | 27.7                              | 46.0                              | -18.3               |               |
| A         | P                | H                         | 3                       | 299.7760                    | 7.4                              | 23.6                         | 31.0                              | 46.0                              | -15.0               |               |
| A         | P                | H                         | 3                       | 349.0553                    | 13.4                             | 18.5                         | 31.9                              | 46.0                              | -14.1               |               |
| A         | P                | H                         | 3                       | 463.1016                    | 15.1                             | 20.8                         | 35.9                              | 46.0                              | -10.1               |               |
| A         | P                | H                         | 3                       | 519.9194                    | 9.1                              | 23.0                         | 32.1                              | 46.0                              | -13.9               |               |
| A         | P                | H                         | 3                       | 581.7840                    | 8.6                              | 22.9                         | 31.5                              | 46.0                              | -14.5               |               |
| A         | P                | H                         | 3                       | 658.0991                    | 8.8                              | 24.0                         | 32.8                              | 46.0                              | -13.2               |               |
| A         | P                | H                         | 3                       | 929.6618                    | 9.6                              | 27.5                         | 37.1                              | 46.0                              | -8.9                |               |
|           |                  |                           |                         |                             |                                  |                              |                                   |                                   |                     |               |
|           |                  |                           |                         |                             |                                  |                              |                                   |                                   |                     |               |
|           |                  |                           |                         |                             |                                  |                              |                                   |                                   |                     |               |
|           |                  |                           |                         |                             |                                  |                              |                                   |                                   |                     |               |
|           |                  |                           |                         |                             |                                  |                              |                                   |                                   |                     |               |
|           |                  |                           |                         |                             |                                  |                              |                                   |                                   |                     |               |

\* P = Peak, Q = Quasi-Peak, A = Average.

Sample Calculation: Corrected Value = Measured Value + Equipment Correction (Antenna Factor + Cable Loss)

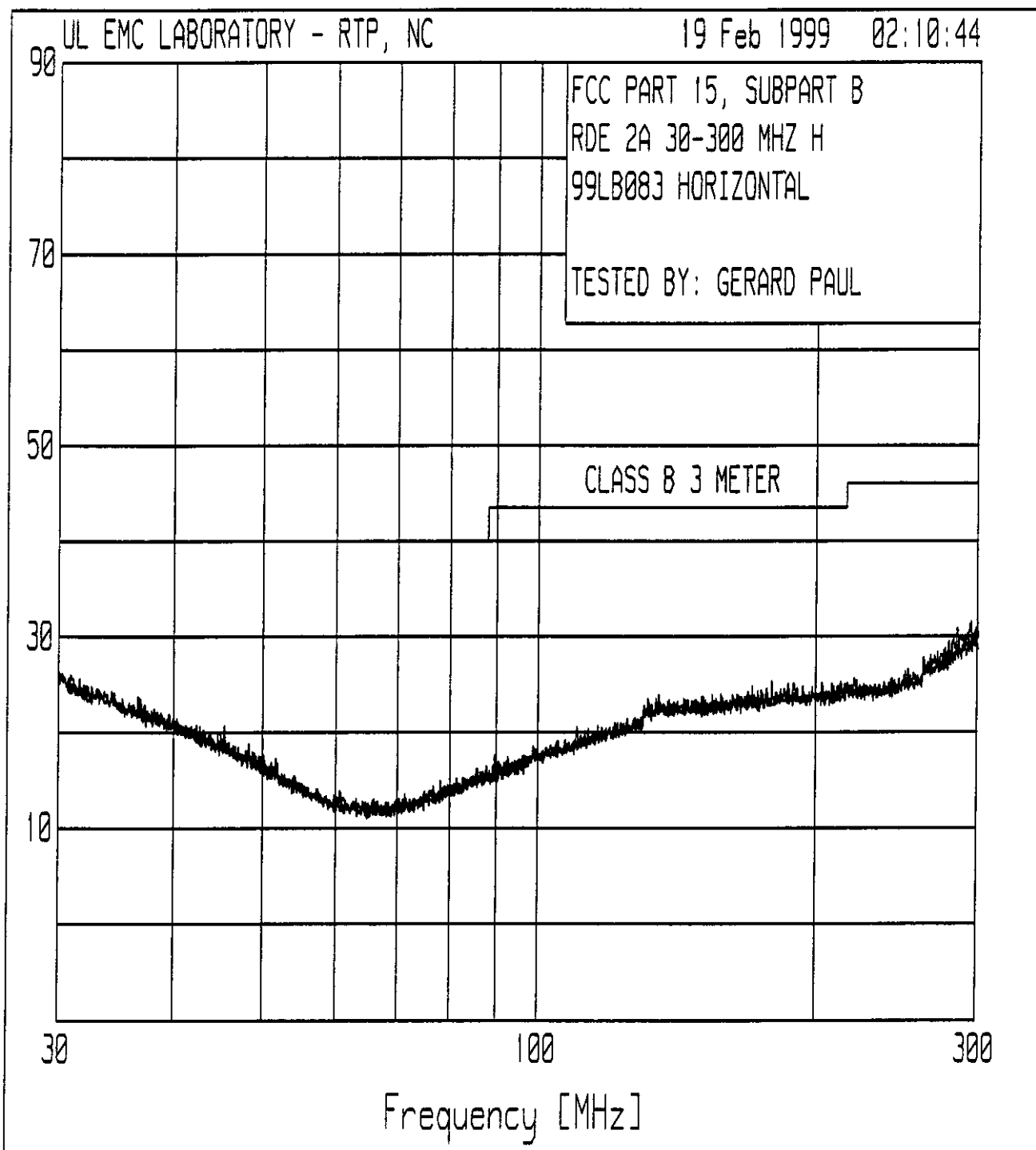
**Test 2 Item A - Peak Plot:**

Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field



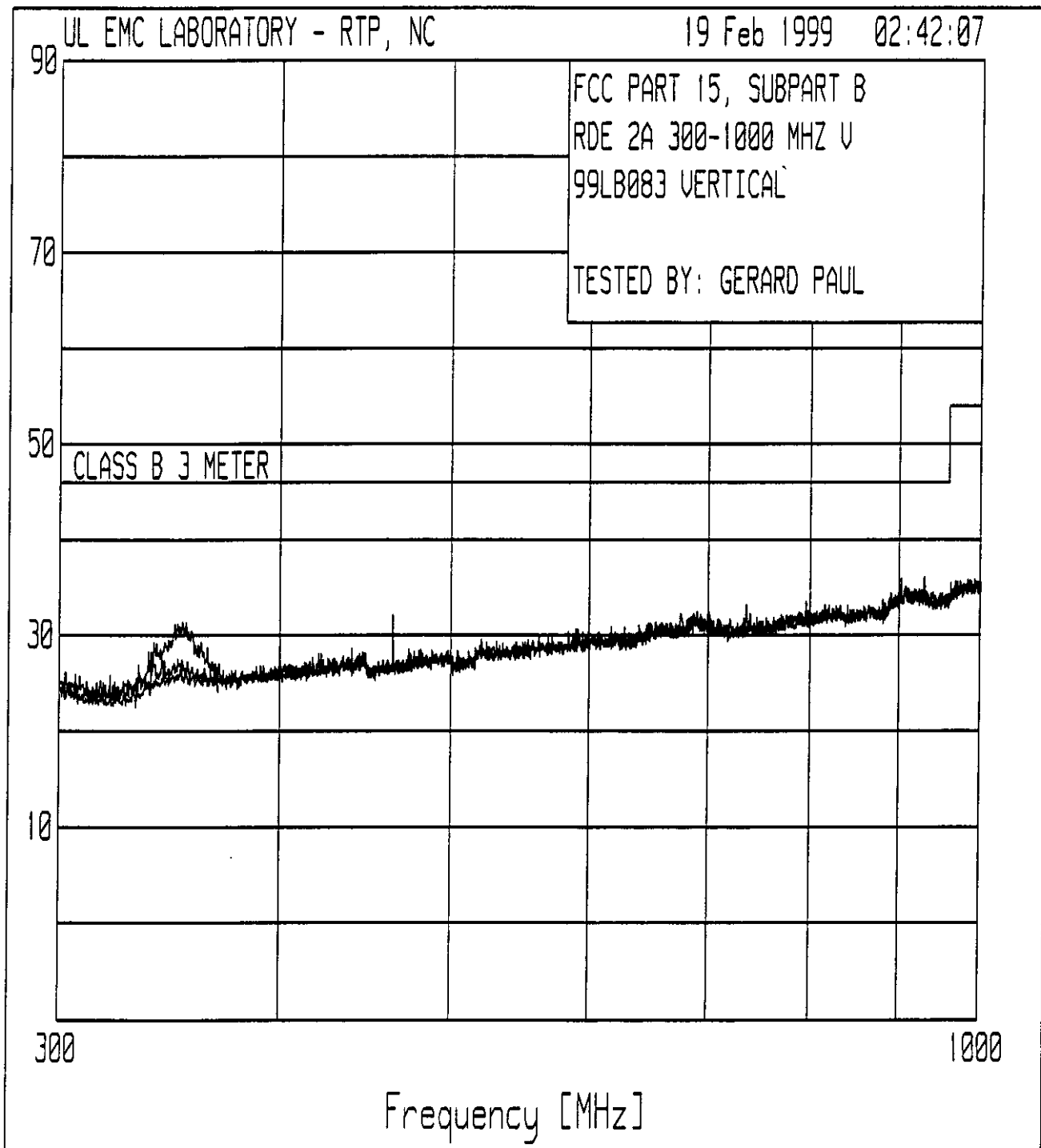
Test 2 Item A - Peak Plot:

Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field



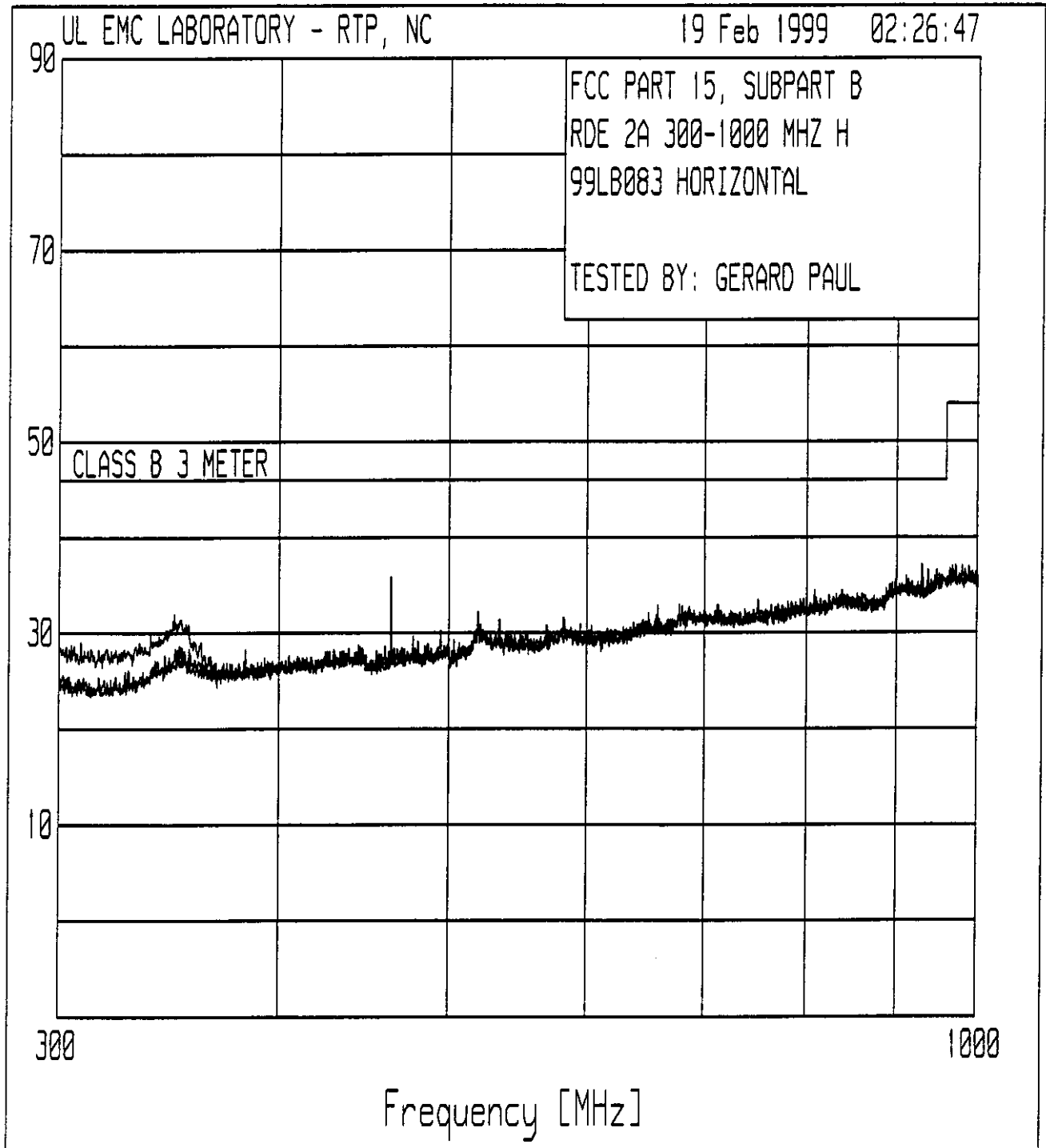
Test 2 Item A - Peak Plot:

Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field



**Test 2 Item A - Peak Plot:**

Radiated Disturbance Emissions - 30 to 1000 MHz Electric Field



**Appendix A: NVLAP Accreditation Certificate**

National Institute  
of Standards and Technology



National Voluntary  
Laboratory Accreditation Program

ISO/IEC GUIDE 25:1990  
ISO 9002:1987

## Scope of Accreditation



Page: 1 of 1

**ELECTROMAGNETIC COMPATIBILITY  
AND TELECOMMUNICATIONS**

**NVLAP LAB CODE 200246-0**

**UNDERWRITERS LABORATORIES, INC.**

12 Laboratory Drive  
Research Triangle Park, NC 27709  
Mr. James R. Beyreis  
Phone: 847-272-8800 Fax: 847-272-8129

***NVLAP Code Designation / Description***

**International Special Committee on Radio Interference (CISPR) Methods**

12/CIS22 IEC/CISPR 22:1993: Limits and methods of measurement of radio disturbance characteristics of information technology equipment

**Federal Communications Commission (FCC) Methods**

12/F01 FCC Method - 47 CFR Part 15 - Digital Devices  
12/F01a Conducted Emissions, Power Lines, 450 KHz to 30 MHz  
12/F01b Radiated Emissions

**Australian Standards referred to by clauses in AUSTEL Technical Standards**

12/T51 AS/NZS 3548: Electromagnetic Interference - Limits and Methods of Measurement of Information Technology Equipment

June 30, 1999

Effective through

For the National Institute of Standards and Technology