FCC CERTIFICATION TEST REPORT

for

Peet Brothers Company, Inc.
1308 Doris Avenue
Ocean, NJ 07712

FCC ID: KG7WSS04320

April 16, 1999

WLL PROJECT #: 4976X

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STATEMENT OF QUALIFICATIONS

for

Herbert W. Meadows

Washington Laboratories, Ltd.

I hold a Bachelor of Science in Electronics Engineering Technology. I have over two years of EMI testing experience and eight years of RF and microwave testing experience. I am qualified to perform EMC testing to the methods described in this test report. The measurements taken within this report are accurate within my ability to perform the tests and within the tolerance of the measuring instrumentation.

By: Herbert W. Meadows
Herbert W. Meadows
Compliance Engineer

Date: April 16, 1999

PEET BROS.
COMPANY, INC.

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29 January, 1999

Chief, Authorizations Branch
Federal Communications Commission
7435 Oakland Mills Road
Columbia, MD 21046

RE: LETTER OF AGENCY

This letter is to serve notice that Washinton Laboratories, Ltd. Is hereby authorized to act on behalf of Peet Bros. Company, Inc. in connection with the Application for Equipment Authorization attached herewith.

We certify that Peet Bros. Company is not subject to denial of federal benefits, that include FCC benefits, pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, U.S.C. 862. Further, no party, as defined in 47 CFR 1.2002(b), to the application is subject to denial of federal benefits, that includes FCC benefits.

Signed,
Peet Bros. Company, Inc.

William J. Peet II
President

FCC CERTIFICATION TEST REPORT

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FCC ID: KG7WSS04320

1.0 Introduction

This report has been prepared on behalf of Peet Brothers Company, Inc. to support the attached Application for Equipment Authorization. The test and application are submitted for an Intentional Radiator under Section 15.249 of the FCC Rules and Regulations. The Equipment Under Test was the Ultimeter Wireless Transmitter.

All measurements herein were performed according to the 1992 version of ANSI C63.4. The measurement equipment conforms to ANSI C63.2 Specifications for Electromagnetic Noise and field Strength Instrumentation. Calibration checks are made periodically to verify proper performance of the measuring instrumentation.

All measurements are performed at Washington Laboratories, Ltd. test center in Gaithersburg, MD. Site description and site attenuation data have been placed on file with the FCC's Sampling and Measurements Branch at the FCC laboratory in Columbia, MD. Washington Laboratories, Ltd. has been accepted by the FCC and approved by NIST NVLAP (NVLAP Lab Code: 200066-0) as an independent FCC test laboratory.

All results reported herein relate only to the equipment tested. The measurement uncertainty of the data contained herein is ±2.3 dB. Refer to Appendix A for Statement of Measurement Uncertainty. This report shall not be used to claim product endorsement by NVLAP or any agency of the US Government.

1.1 Summary

The Peet Brothers Company, Inc. Low Power Transmitter complies with the limits for an Intentional Radiator under Section 15.249.

2.0 Description of Equipment Under Test (EUT)

The Peet Brothers Company, Inc. Ultimeter Wireless Weather Display (WWD) Transmitter (EUT) is a low power transmitter that operates at 916.6MHz and is used for transmitting weather data to the Ultimeter 2000 receivers (display units). The unit is powered via a wall mount AC/DC power adapter that connects to a junction box. The junction box is used to collect data from various sensors and provide the weather data and power to a Ultimeter 2000 Keyboard. The Ultimeter 2000 Keyboard interfaces to the WWD Transmitter providing power and data.

2.1 On-board Oscillators

The Peet Brothers Company, Inc. Ultimeter Wireless Transmitter contains no oscillators but uses an HX2000 Hybrid Transmitter that generates the carrier frequency via quartz, and Surface Acoustic Wave (SAW) stabilized. The Hybrid Transmitter also contains a SAW filter for harmonic suppression.

3.0 Test Configuration

To complete the minimum test configuration required by the FCC, the EUT was configured with the external devices as described in Section 2.0. The EUT was tested in all three orthogonal planes. All testing was performed at 120VAC (AC/DC power adapter).

3.1 Testing Algorithm

To exercise the EUT during emissions testing the unit was powered-on and continuously transmitting.

Worst case emissions are recorded in the data tables.

3.2 Conducted Emissions Testing

The EUT was placed on an 80 cm high 1 x 1.5 m non-conductive table above a ground plane. Power to the AC/DC power adapter was provided through a Solar Corporation 50 Ω/50 μH Line Impedance Stabilization Network bonded to a 3 x 2 meter ground plane. The LISN has its AC input supplied from a filtered AC power source. Power was supplied to the peripherals through a second LISN. The peripherals were placed on the table in accordance with ANSI C63.4-1992. Power and data cables were moved about to obtain maximum emissions.

The 50 Ω output of the LISN was connected to the input of the spectrum analyzer and the emissions in the frequency range of 450 kHz to 30 MHz was measured. The detector function was set to quasi-peak or peak, as appropriate, and the resolution bandwidth during testing was at least 9 kHz, with all post-detector filtering no less than 10 times the resolution bandwidth.

3.3 Radiated Emissions Testing

The EUT was placed on an 80 cm high 1 x 1.5 meters non-conductive motorized turntable for radiated testing on a 3 meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Biconical, log periodic and horn broadband antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The peripherals were placed on the table in accordance with ANSI C63.4-1992. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

The output from the antenna was connected, via a preamplifier, to the input of the spectrum analyzer. The detector function was set to quasi-peak for frequencies below 1000 MHz and peak for frequencies above 1000 MHz. For frequencies below 1000 MHz, the measurement bandwidth on the spectrum analyzer system was set to at least 120 kHz, with all post-detector filtering no less than 10 times the measurement bandwidth. For frequencies above 1000 MHz, the resolution bandwidth on the spectrum analyzer system was set to 1 MHz and the video bandwidth on the spectrum analyzer system was set to 1 MHz for peak measurements.

3.3.1 Radiated Data Reduction and Reporting

To convert the raw spectrum analyzer radiated data into a form that can be compared with the FCC limits, it is necessary to account for various calibration factors that are supplied with the antennas and other measurement accessories. These factors are grouped into a composite antenna factor (AFc) and are supplied in the AFc column of Table 2. The AFc in dB/m is algebraically added to the Spectrum Analyzer Voltage in dbμV to obtain the Radiated Electric Field in dBμV/m. This level is then compared with the FCC limit.

Example:

Spectrum Analyzer Voltage:	VdBμV
Composite Antenna Factor:	AFcdB/m
Electric Field:	EdBμV/m = VdBμV + AFcdB/m
To convert to linear units:	EμV/m = antilog (EdBμV/m/20)

Data is recorded in Table 2.

Table 1

FCC Class B Conducted Emissions Data – Site 2

CLIENT: Peet Brothers Company, Inc.
FCC ID: KG7WSS04320
DATE: 3/25/99
VOLTAGE: 120VAC
BY: Herb Meadows
JOB #: 4976X

LINE 1 – NEUTRAL

FREQUENCY MHz	VOLTAGE (PEAK) dBuV	VOLTAGE uV	FCC LIMIT uV	MARGIN dB
0.46	40.9	110.9	250	-7.1
0.50	39.4	93.3	250	-8.6
1.60	31.6	38.0	250	-16.4
1.86	30.9	35.1	250	-17.1
13.65	28.3	26.0	250	-19.7
26.00	31.3	36.7	250	-16.7

LINE 2 – PHASE

FREQUENCY MHz	VOLTAGE (PEAK) dBuV	VOLTAGE uV	FCC LIMIT uV	MARGIN dB
0.45	41.6	120.2	250	-6.4
0.49	41.4	117.5	250	-6.6
1.59	32.0	39.8	250	-16.0
3.64	30.5	33.5	250	-17.5
10.13	31.0	35.5	250	-17.0
24.10	31.3	36.7	250	-16.7

Table 2

FCC 3M Radiated Emissions Data Per 15.249– Site 2

CLIENT: Peet Brothers Company, Inc.
FCC ID: KG7WSS04320
DATE: 3/25/99
BY: Herb Meadows
JOB #: 4976X

Frequency MHz	Polarity H/V	Azimuth Degree	Antenna Height m	SA Level (QP) dBuV	AFc dB/m	E-Field dBuV/m	E-Field uV/m	Limit uV/m	Margin dB
88.00	V	335.00	1.0	15.4	10.6	26.0	19.9	100.0	-14.0
916.60	H	157.50	1.5	56.2	28.3	84.5	16872.0	50000.0	-9.4
916.60	V	292.50	1.5	55.9	28.3	84.2	16299.3	50000.0	-9.7
				Average					
1833.20	H	247.50	1.0	46.9	-5.0	41.9	124.6	500.0	-12.1
2749.60	H	157.50	1.0	40.8	-2.1	38.7	85.8	500.0	-15.3
3666.40	V	157.50	1.0	45.6	-1.6	44.0	158.5	500.0	-10.0
4582.90	V	157.50	1.0	47.7	-0.3	47.4	234.4	500.0	-6.6
4582.90	H	257.50	1.0	45.0	-0.3	44.7	171.8	500.0	-9.3
5499.50	V	157.50	1.0	40.6	1.4	42.0	126.5	500.0	-11.9
6415.90	V	270.00	1.0	39.4	4.2	43.6	150.7	500.0	-10.4
8249.40	V	247.50	1.0	38.7	7.0	45.7	191.8	500.0	-8.3

Peak Emissions Above 1GHz

Frequency MHz	Polarity H/V	Azimuth Degree	Antenna Height m	SA Level (Peak) dBuV	AFc dB/m	E-Field dBuV/m	E-Field uV/m	Limit uV/m	Margin dB
1833.20	V	180.00	1.0	55.6	-5.0	50.6	339.3	5000.0	-23.4
1833.20	H	247.50	1.0	59.5	-5.0	54.5	531.6	5000.0	-19.5
2749.60	V	180.00	1.0	49.5	-2.1	47.4	233.5	5000.0	-26.6
2749.60	H	157.50	1.0	52.0	-2.1	49.9	311.4	5000.0	-24.1
3666.40	V	157.50	1.0	57.9	-1.6	56.3	653.1	5000.0	-17.7
3666.40	H	180.00	1.0	54.4	-1.6	52.8	436.5	5000.0	-21.2
4582.90	V	157.50	1.0	62.9	-0.3	62.6	1348.9	5000.0	-11.4
4582.90	H	257.50	1.0	61.3	-0.3	61.0	1122.0	5000.0	-13.0
5499.50	V	157.50	1.0	54.2	1.4	55.6	605.5	5000.0	-18.3
5499.50	H	180.00	1.0	53.2	1.4	54.6	539.6	5000.0	-19.3
6415.90	V	270.00	1.0	56.1	4.2	60.3	1030.7	5000.0	-13.7
6415.90	H	257.50	1.0	53.9	4.2	58.1	800.1	5000.0	-15.9
8249.40	V	247.50	1.0	57.8	7.0	64.8	1729.1	5000.0	-9.2

Table 3

System Under Test

FCC ID: KG7WSS04320

EUT:	Peet Brothers Company, Inc. RF Transmitter; M/N: Ultimeter WWD Transmitter; S/N; N/A FCC ID: KG7WSS04320
Keyboard:	Peet Brothers Company, Inc. Ultimeter 2000 Keyboard; M/N: WS2103; S/N: 9921307AA
AC Adaptor:	Class 2 Transformer, 9VDC Output; M/N: MWD-9350(G); S/N: N/A

Table 4

Interface Cables Used

Non-shielded I/O cables were used throughout the system under test.

The EUT was powered via a non-shielded AC power cord.

Table 5

Measurement Equipment Used

The following equipment is used to perform measurements:

Hewlett-Packard Spectrum Analyzer: HP 8568B

Hewlett-Packard Quasi-Peak Adapter: HP 85650A

Hewlett-Packard Preselector: HP 85685A

Hewlett-Packard Spectrum Analyzer: HP 8593A

Hewlett-Packard Preamplifier: HP 8449B

Antenna Research Associates, Inc. Biconical Log Periodic Antenna: LPB-2520A (Site 2)

Antenna Research Associates, Inc. Standard Gain Horn Antenna: DRG-118/A

Solar 50 Ω/50 µH Line Impedance Stabilization Network: 8012-50-R-24-BNC

Solar 50 Ω/50 µH Line Impedance Stabilization Network: 8028-50-TS-24-BNC

AH Systems, Inc. Portable Antenna Mast: AMS-4 (Site 2)

AH Systems, Inc. Motorized Turntable (Site 2)

RG-214 semi-rigid coaxial cable

RG-223 double-shielded coaxial cable

Appendix A

Statement of Measurement Uncertainty

For the purposes of the measurements performed by Washington Laboratories, the measurement uncertainty is ±2.3 dB. This has been calculated for a *worst-case situation* (radiated emissions measurements performed on an open area test site).

The following measurement uncertainty calculation is provided:

$$\text{Total Uncertainty} = (A^2 + B^2 + C^2)^{1/2}/(n-1)$$

where:
A = Antenna calibration uncertainty, in dB = 2 dB
B = Spectrum Analyzer uncertainty, in dB = 1 dB
C = Site uncertainty, in dB = 4 dB
n = number of factors in uncertainty calculation = 3

Thus, Total Uncertainty = $0.5\ (2^2 + 1^2 + 4^2)^{1/2} = \pm 2.3$ dB