



FOUNTAIN TECHNOLOGIES, INC.

COMPLIANCE LABORATORY

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LIST OF EXHIBITS

EXHIBIT A:

Electromagnetic Emission Compliance Report

of

WIRELESS OUTDOOR LIGHT CONTROL RECEIVER
MODEL: HW2190R

FCC ID: NA2HW2190R

EXHIBIT B:

User's Manual

1. GENERAL INFORMATION

1.1 Verification of Compliance

EUT: WIRELESS OUTDOOR LIGHT CONTROL RECEIVER

Model: HW2190R

Applicant: LAMSON&SESSIONS CO.

Test Type: CERTIFICATION

Result: PASS

Tested by: FOUNTAIN COMPLIANCE LABORATORY

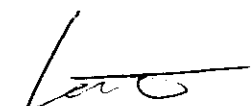
Test Date: 07/17/98

Report Number: 0048-980629-04(R)

The above equipment was tested by Fountain Technologies, Inc. Compliance Laboratory for compliance with the requirement set forth in the FCC rules and regulations Part 15, subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Fountain Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	± 2.36	± 2.99	± 1.83


 Wei Li
 Lab Manager
 Fountain Compliance Lab
 Fountain Technologies, Inc.


 Date

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC ID	CABLE
Product	WIRELESS OUTDOOR LIGHT CONTROL RECEIVER ⁽¹⁾	NA2HW2190R	
Housing	PLASTICS		
Power Supply	Built-in		Non-shielded
Clock/OSC Freq.	311.2MHz		
Device Type	SUPERREGENERATIVE RECEIVER		
Light set	60 Watts		(2)

(1) EUT submitted for grant.

(2) Cables are permanent connected.

1.4 Test Methodology

Both conducted and radiated tests were performed according to the procedures in ANSI C63.4-1992. Radiated test was performed at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at 50 Randolph Road, Somerset, New Jersey. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated May 19, 1997 (Refer to: 31040/PRV 1300F2). The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

1.6 Test Equipment

Manufacture	Model	Serial No.	Description	Last Cal dd/mm/yy	Cal Due dd/mm/yy
Hewlett-Packard	HP8546A	3625A00341	EMI Receiver	12/11/97	12/11/98
Fischer Custom	LISN-2	900-4-009	Line Impedance Stabilization Networks	01/04/98	01/04/99
EMCO	3115	4945	Double Ridge Guide Horn Antenna	03/10/97	03/10/98
ARA	BCD-235/B	172	30-200MHz Biconical Antenna	19/05/98	19/05/99
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	30/04/98	30/04/99

All Test Equipment Used are Calibrated Traceable to NIST Standards.

1.7 Statement for the Document Use

This report shall not be reproduced except in full, without the written approval of the laboratory. And this report must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government.

5. CONDUCTED EMISSION DATA

5.1 Test Methods and Conditions

EMI Receiver was scanned from 450KHz to 30MHz with maximum hold mode for maximum emission. The IF Bandwidth is 9KHz. Recorded data was sent to the plotter to generate output in linear format. At the input of the EMI Receiver, a HP transient limiter is inserted for protective purpose. This limiter has a 10 dB attenuation in the range of 450KHz to 30MHz. That factor was automatically compensated by the receiver, so the readings are the corrected readings. The reference of the plot is the FCC Class B limit 250 μ V in Figure 5.1 through Figure 5.2.

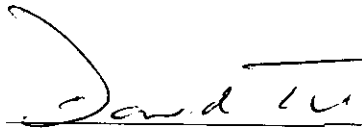
Emissions that have peak values close to the specification limit (if any) are also measured in the quasi-peak mode to determine compliance.

5.2 Test Data

Figure 5.1 through Figure 5.2 show the neutral and line conducted emissions.

Test Personnel:

Tester Signature



Date

7-17-1998

Typed/Printed Name: David Tu

Figure 5.1 Neutral Conducted
Emission
page 14

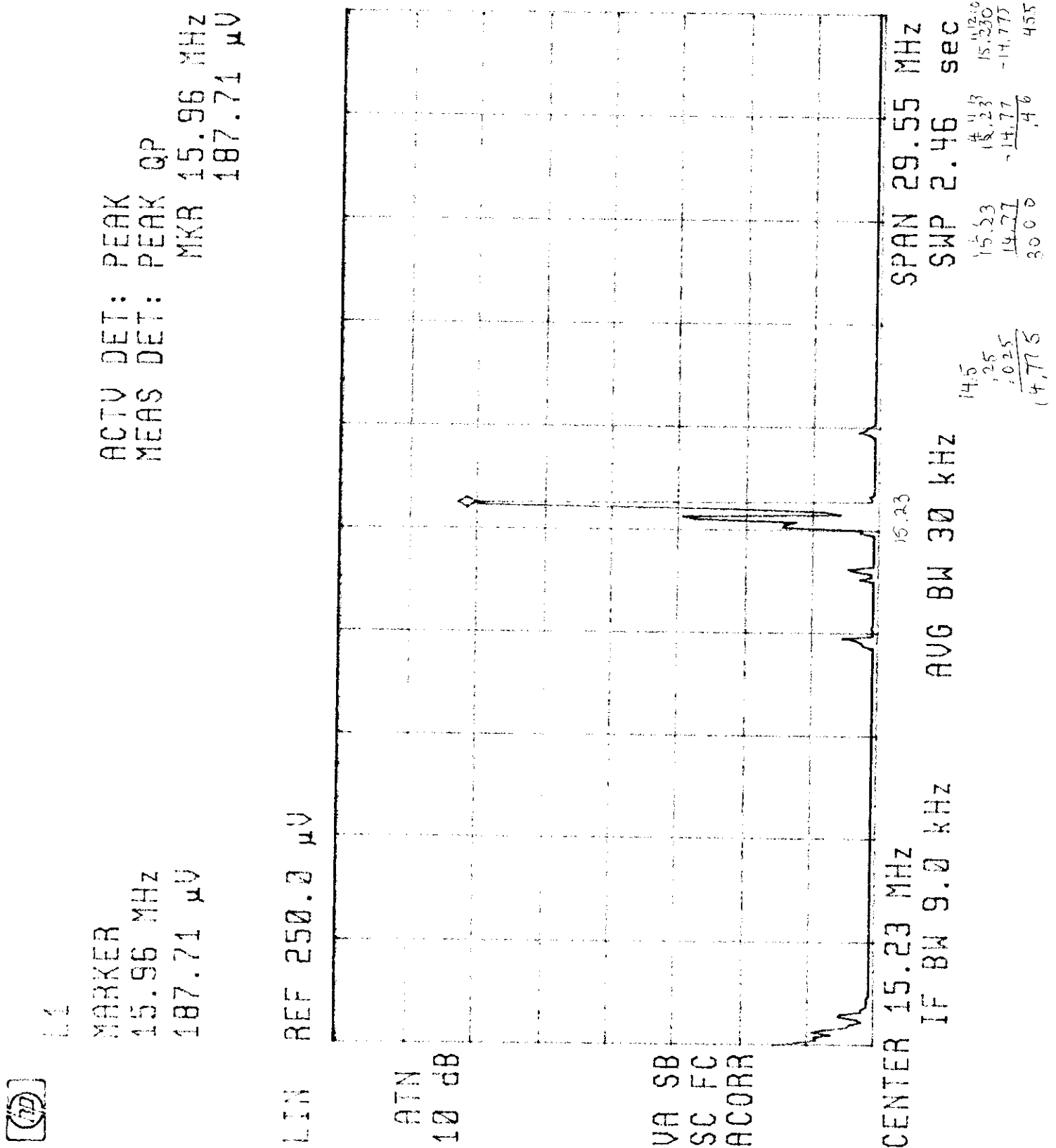


Figure 5.2 Line Conducted
Emission
page 15



L2

MARKER

15.89 MHz

192.52 μ V

ACTV DET: PEAK

MEAS DET: PEAK QP

MKR 15.89 MHz

192.52 μ V

LIN REF 250.0 μ V

ATN
10 dB

VA SB
SC FC
ACORR

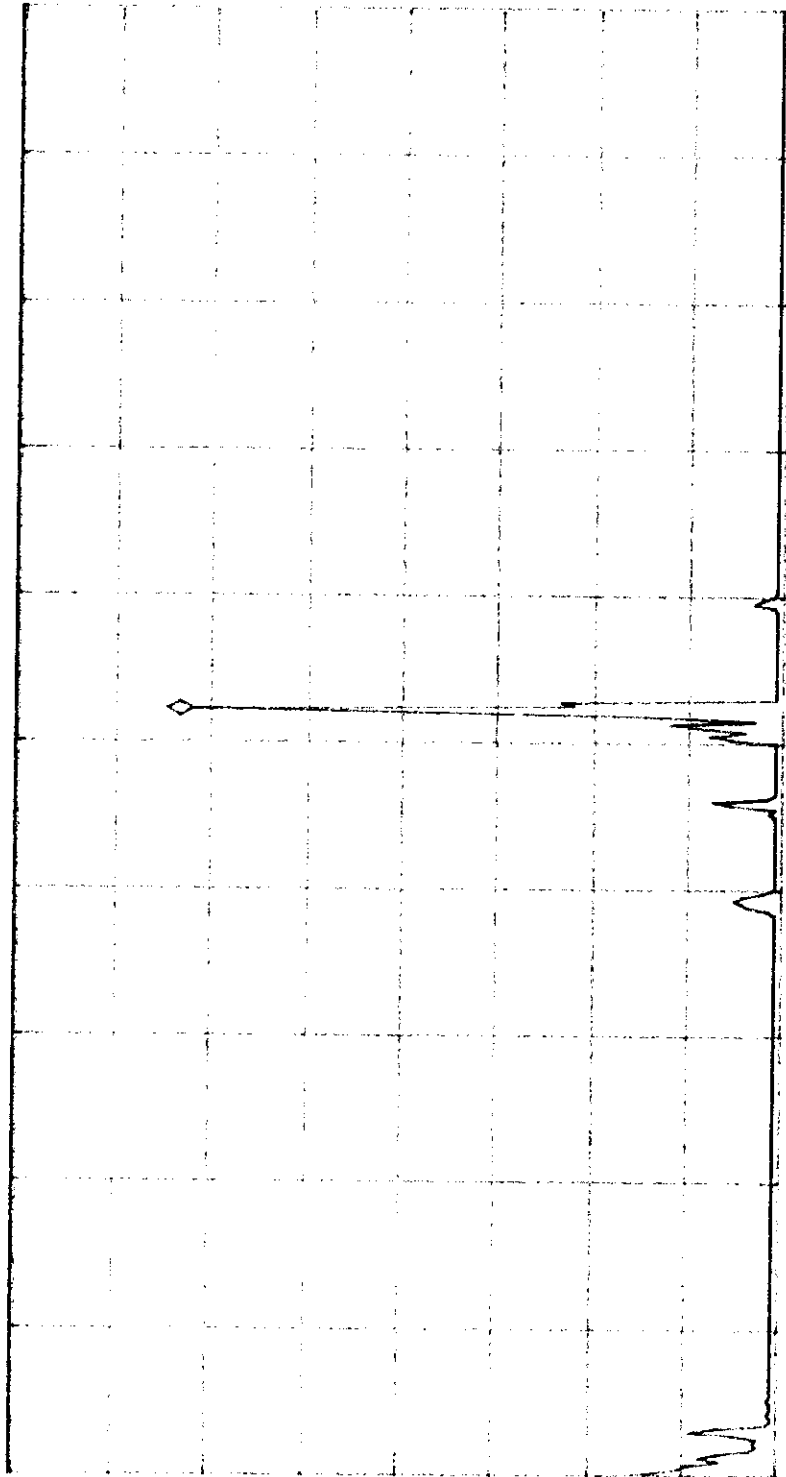
CENTER 15.23 MHz

IF BW 9.0 kHz

AUG BW 30 kHz

SPAN 29.55 MHz

SWP 2.46 sec



6. RADIATED EMISSION DATA

6.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA - AF - CF - AG$$

where FS: Corrected Field Strength in dB μ V/m

RA: Amplitude of EMI Receiver before correction in dB μ V

AF: Antenna Factor in dB/m

CF: Cable Attenuation Factor in dB

AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

So the receiver readings are recorded without further correction.

6.2 Test Methods and Conditions

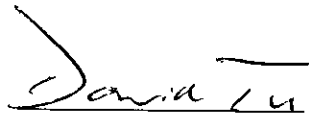
The initial step in collecting radiated data is a EMI Receiver scan of the measurement range 30MHz - 5GHz. Significant peaks are then marked down and these signals are then measured with quasi-peak detector conform with CISPR 16. IF bandwidth is 120kHz and video bandwidth is 300kHz for measuring 30MHz-1GHz. Both bandwidth are 1MHz for above 1GHz measurement.

6.3 Test Data

The following data lists the significant emission frequencies, polarity, corrected amplitude reading of the EMI Receiver, the Class B limit, and the difference between the corrected reading and the Class B limit. Explanation of the correction is given in section 6.1.

Test Personnel:

Tester Signature



Date

7-17-1998

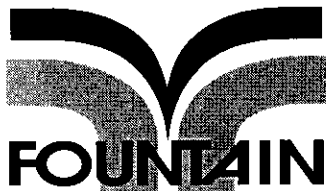
Typed/Printed Name: David Tu

Radiated Emission Data

Frequency (MHz)	Polarity [H, V]	Height (m)	Azimuth (Degree)	Amplitude Reading (dB μ V/m)	Class B 3m Limit (dB μ V/m)	Difference from limit (dB)
272.5	H	1.0	060	31.4	46.0	-14.6
276.1	H	1.0	060	34.6	46.0	-11.4
280.5	H	1.0	060	34.1	46.0	-11.9
284.6	H	1.0	060	37.2	46.0	-8.8
290.5	H	1.0	060	36.3	46.0	-9.7
311.3	H	1.0	060	42.4	46.0	-3.6
317.5	H	1.0	060	33.9	46.0	-12.1
319.1	H	1.0	060	34.4	46.0	-11.6
280.5	V	1.0	087	32.3	46.0	-13.7
290.5	V	1.0	087	35.0	46.0	-11.0
311.3	V	10.	079	36.6	46.0	-9.4

7. PHOTOS OF TESTED EUT

The following photos show the inside details of the EUT.



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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

WIRELESS OUTDOOR LIGHT CONTROL RECEIVER

MODEL: HW2190R

FCC ID: NA2HW2190R

AUGUST 18, 1998

This report concerns (check one): Original grant ☒ Class II change ☐
Equipment type: Superregenerative Receiver

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes ☐ no ☒

If yes, defer until: _____ (date)

Company agrees to notify the Commission by _____ (date)
of the intended date of announcement of the product so that the grant can be
issued on that date.

Transition Rules Request per 15.37? yes ☐ no ☒

If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR
[10-1-90 Edition] provision.

Report prepared for:

LAMSON&SESSIONS CO.

Report prepared by:

Fountain Compliance Lab

Report number:

0048-980629-04(R)



The test result in this report IS supported and covered by the NVLAP accreditation

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