Compliance Testing, LLC
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Test Report

Prepared for: Southwest Microwave, Inc

Model: Intrepid 330

Description: Digital Microwave Field Disturbance Sensor

To

FCC Part 15B
Class B

And

IC ICES-003

Date of Issue: March 15, 2012

On the behalf of the applicant:	**Southwest Microwave, Inc.** **9055 S. McKemy Street** **Tempe, AZ 85284**
Attention of:	**Edward J. Foley, Vice President, Engineering** **Ph: (480) 783-0201** **E-Mail: edf@southwestmicrowave.com**

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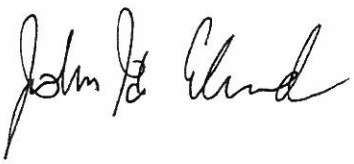


John Erhard
Project Test Engineer

Test Report Revision History

Revision	Date	Revised By	Reason for Revision
1.0	3/15/12	John Erhard	Original Document

Table of Contents

The applicant has been cautioned as to the following

FCC

15.21 – Information to user

The user's manual or instruction manual for an intentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

15.27(a) – Special Accessories

Equipment marketed to a consumer must be capable of complying with the necessary regulations in the configuration in which the equipment is marketed. Where special accessories such as shielded cables and/or special connectors are required to enable an unintentional or intentional radiator to comply with the emission limits in the part, the equipment must be marketed with, i.e. shipped and sold with, those special accessories. However, in lieu of shipping or packaging the special accessories with the unintentional or intentional radiator, the responsible party may employ other methods of ensuring that the special accessories are provided to the consumer without an additional charge.

Information detailing any alternative method used to supply the special accessories for a grant of equipment authorization or retained in the verification records, as appropriate. The party responsible for the equipment, as detailed in §2.909 of this chapter, shall ensure that these special accessories are provided with the equipment. The instruction manual for such devices shall include appropriate instructions on the first page of text concerned with the installation of the device that these special accessories must be used with the device. It is the responsibility of the user to use the needed special accessories supplied with the equipment.

Industry Canada

Products subject to Industry Canada ICES-003 must be labeled in English and/or French (based on the intended market and any other applicable provincial or federal regulations) as follows:

This Class B digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classes B est conforme à la norme NMB-o003 du Canada.

ILAC / A2LA

Compliance Testing, LLC, has been accredited in accordance with the recognized International Standard ISO/IEC 17025:2005. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (refer joint ISO-ILAC-IAF Communiqué dated January 2009)

The tests results contained within this test report all fall within our scope of accreditation, unless noted below.

Please refer to http://www.compliancetesting.com/labscope.html for current scope of accreditation.

Testing Certificate Number: **2152.01**

ACCREDITED
TESTING CERT
#2152.01

FCC OATS Reg, #933597

IC Reg. #2044A-1

Non-accredited tests contained in this report:

N/A

Test and Measurement Data
Sub-part 2.1033(b)

All tests and measurement data shown were performed in accordance with FCC Rule Parts: 15.107, 15.109; Unintentional Radiators.

All tests and measurement data shown are deemed satisfactory evidence of compliance with Industry Canada Interference-Causing Equipment Standard ICES-003.

Name of Test	FCC Section	ICES-003
A/C Powerline Conducted Emissions	15.107	Section 5
Radiated Emissions	15.109	Section 5

Standard Test Conditions and Engineering Practices

Except as noted herein, the following conditions and procedures were observed during the testing

In accordance with ANSI C63.4-2009, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40 ° C (50 ° to 104 ° F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Environmental Conditions	
Temperature Range (° C)	Humidity Range (%)
24.02	12.72

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures.
All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst case measurement.

EUT Description

Model: Intrepid 330
Description: Digital Microwave Field Disturbance Sensor
Firmware: N/A
Software: N/A
Additional Information:
24.125 GHz Transmitter

EUT Operation during Tests

The EUT hardware is in a normal operating configuration set to transmit and receive upon the application of power.

Accessories: None

Cables: None

Modifications: None

15.203: Antenna Requirement:

X	The antenna is permanently attached to the EUT
	The antenna uses a unique coupling
	The EUT must be professionally installed
	The antenna requirement does not apply

Test Summary

Specification	Test Name	Pass, Fail, N/A	Comments
15.107	A/C Powerline Conducted Emissions	Pass	
15.109	Radiated Emissions	Pass	

15.107 D/C Powerline Conducted Emissions

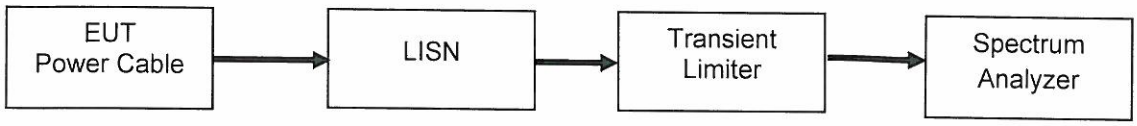
Name of Test: D/C Powerline Conducted Emissions **Engineer:** John Erhard

Test Equipment Utilized: i00379, i00123, i00270 **Test Date:** 3/14/2012

Test Procedure

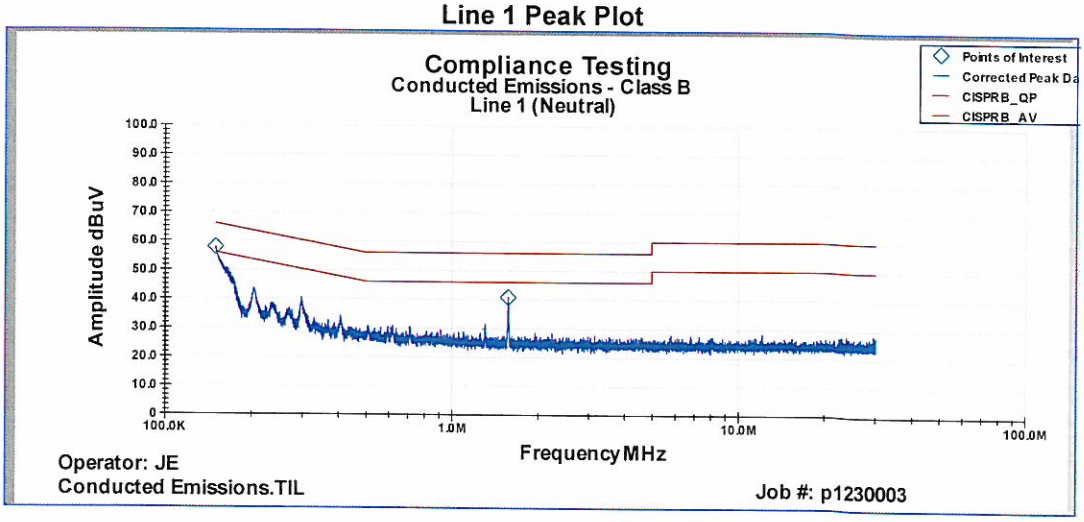
The EUT power cable was connected to a LISN and the monitored output of the LISN was connected to a transient limiter, which then connected directly to a spectrum analyzer. The conducted emissions from 150 kHz to 30 MHz were measured and compared to the specification limits. The device was powered by a 12 VDC battery. The normal operating voltage is 10 – 60 VDC.

Test Setup

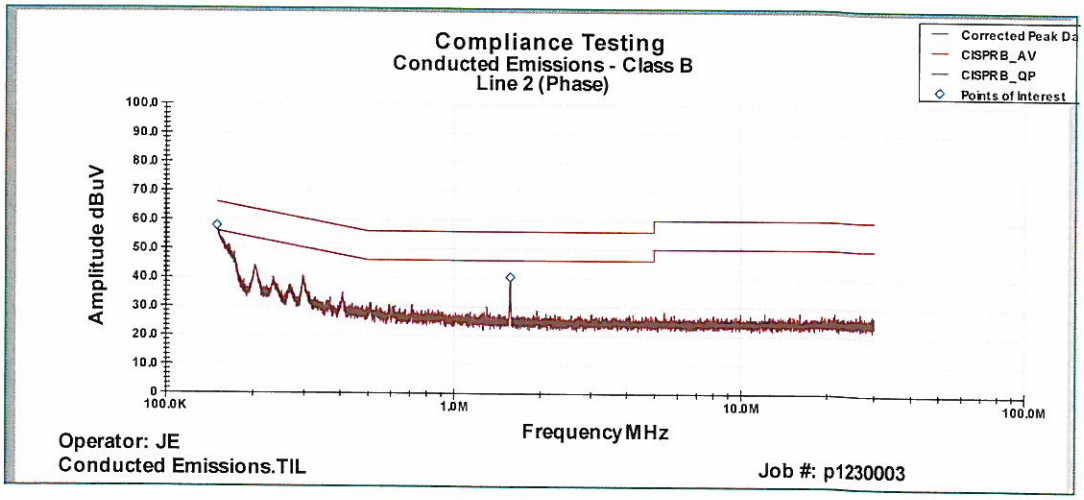


Conducted Emissions Test Results

Line 1 Peak Plot



Line 2 Peak Plot



Line 1 Neutral Avg Detector

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L1 Final Data (dBuV)	Limit (dBuV)	Avg Margin (dB)
1.5813 MHz	27.09	0.00	0.059	10.100	37.253	46.000	-8.747
150.03 KHz	41.48	0.30	0.020	10.200	51.998	55.999	-4.001

Line 2 Phase Avg Detector

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L2 Final Data (dBuV)	Limit (dBuV)	Avg Margin (dB)
1.5787 MHz	26.91	0.00	0.059	10.100	37.066	46.000	-8.934
150.01 KHz	41.69	0.30	0.020	10.200	52.210	56.000	-3.790

Line 1 Neutral QP Detector

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L1 Final Data (dBuV)	Limit (dBuV)	QP Margin (dB)
1.5813 MHz	29.621	0.000	0.059	10.100	39.780	56.000	-16.220
150.03 KHz	45.557	0.300	0.020	10.200	56.076	65.999	-9.923

Line 2 Phase QP Detector

Frequency	Measured Value (dBuV)	LISN Corr. Factor (dB)	Cable Loss (dB)	Transient Limiter (dB)	L2 Final Data (dBuV)	Limit (dBuV)	QP Margin (dB)
1.5787 MHz	29.71	0.00	0.059	10.100	39.866	56.000	-16.134
150.01 KHz	45.82	0.30	0.020	10.200	56.343	66.000	-9.657

No other signals were within 20 dB of the limit.

15.109 Radiated Emissions

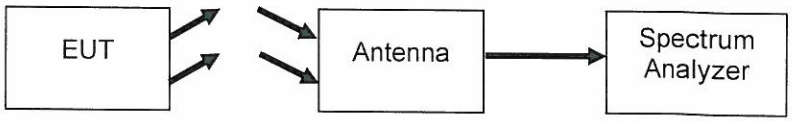
Name of Test: Radiated Emissions **Engineer:** John Erhard

Test Equipment Utilized: i00033, i00267 **Test Date:** 3/15/2015

Test Procedure

The EUT was tested in an Open Area Test Site (OATS) set 3m from the receiving antenna. A spectrum analyzer was used to verify that the EUT met the requirements for Radiated Emissions. The EUT was tested by rotating it 360 degrees with the antenna in both the vertical and horizontal orientation while raised from 1 to 4 meters to ensure the signal levels were maximized. All emissions from 30 MHz to 1 GHz were examined.

Test Setup



Settings

RBW = 120 KHz

VBW = 300 KHz

Detector – Quasi Peak

Sample Calculations

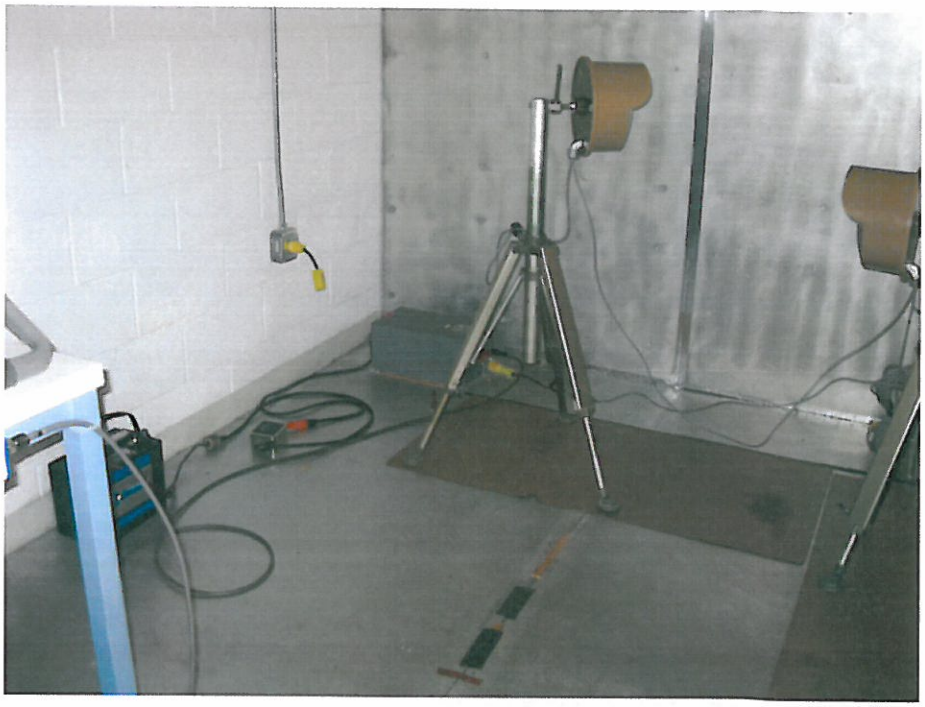
Corrected Value = Measured Value + Correction factor

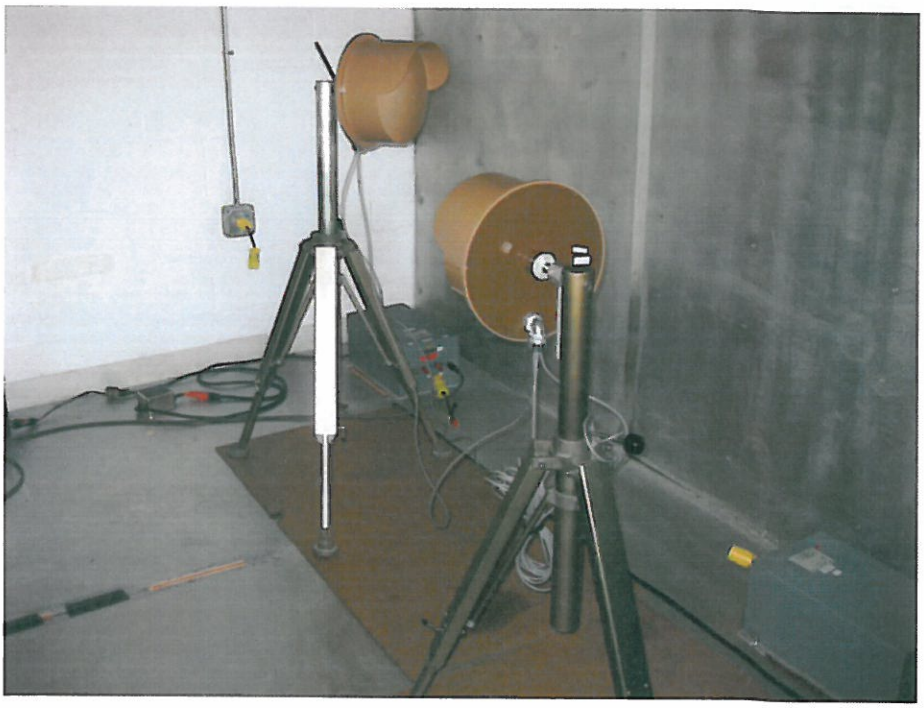
Correction factor = ACF +Cable loss

Radiated Emissions

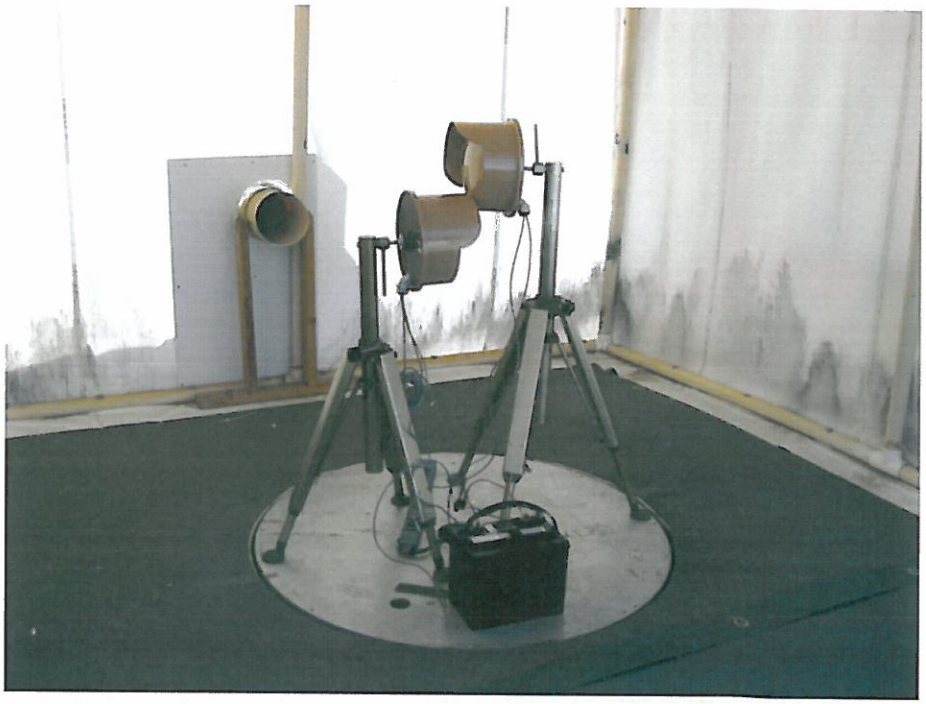
Emission Freq (MHz)	Measured Value (dBuV/m)	Corr. Factor (dB)	Corr. Value (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Antenna Polarity (V/H)	Antenna Height (cm)	Turntable Position (deg)
47.935	13.330	10.547	23.877	40.000	-16.123	V	118	324
262.544	9.720	15.127	24.847	46.000	-21.153	V	109	356
364.990	7.730	17.040	24.770	46.000	-21.230	V	183	218
527.150	8.050	20.566	28.616	46.000	-17.384	V	151	248
811.150	7.610	24.733	32.343	46.000	-13.657	V	99	241
947.000	6.760	27.235	33.995	46.000	-12.005	V	99	110

Conducted Emissions Test Setup Photos





Radiated Emissions Test Setup Photos



Test Equipment Utilized

Description	Manufacturer	Model Number	CT Asset #	Last Cal Date	Cal Due Date
EMI Receiver	HP	8546A	i00033	12/20/11	12/20/12
Transient Limiter	Com-Power	LIT-930	i00123	Verified on: 3/14/2012	
Bilog Antenna	Schaffner	CBL6111C	i00267	12/19/11	12/19/13
LISN	FCC	FCC-LISN-50-32-2-01	i00270	9/30/10	9/30/12
Humidity / Temp Meter	Newport	IBTHX-W-5	i00282	11/5/11	11/5/12
Humidity / Temp Meter	Control Company	4189CC	i00355	1/11/12	1/11/13
Spectrum Analyzer	Agilent	E7405A	i00379	12/14/11	12/14/12

In addition to the above listed equipment standard RF connectors and cables were utilized in the testing of the described equipment. Prior to testing these components were tested to verify proper operation.

END OF TEST REPORT