



# Nemko

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Conseil canadien des normes  
Laboratoire accrédité  
Portée d'accréditation 75

TM

**Test Report:** 4W07953

**Applicant:** Terrapin Communications Inc.  
4017 Carling Avenue, Suite 201  
Ottawa, Ontario  
K2K 2A3

**Equipment Under Test:** SafetyTurtle Base Station with Maxim Receiver

**Model Number:** B102

**In Accordance With:** FCC 47 CFR Part 15, Subpart B  
Verification

**Tested By:** Nemko Canada Inc.  
303 River Road, R.R. 5  
Ottawa, Ontario K1V 1H2

**Authorized By:** Kevin Carr, Wireless Specialist

**Date:** 19 April 2004

**Total Number of Pages:** 17



Nemko Canada Inc., Ottawa, Ontario  
Canada

Reference Standard: FCC 47 CFR Part 15, Subpart B

Test Report No: 4W07953

Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

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Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

## Measurement Uncertainty

### Accuracy of Measurement

Measurement uncertainty was calculated using the methods described in CISPR 16-4 *Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements* and Nemko Canada Inc. procedure EMC/MUC/001 *Uncertainty in EMC Measurements*.

### Test Specific Measurement Uncertainty

Measurement	Test Specification	U <sub>lab</sub>
Conducted disturbance	9kHz – 150kHz	4.0dB
	150kHz – 30MHz	3.6dB
Radiated disturbance	30MHz – 200MHz Horizontal polarization	4.7dB
	200MHz – 1000MHz Horizontal polarization	4.7dB
	30MHz – 200MHz Vertical polarization	4.9dB
	200MHz – 1000MHz Vertical polarization	4.9dB

## Lab Environmental Conditions

### Lab Conditions

Ambient Temperature: 15°C to 35°C, Relative Humidity: 30% to 60%, Atmospheric Pressure: 86kPa (860mbar) to 106kPa (1 060mbar)



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Reference Standard: FCC 47 CFR Part 15, Subpart B

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Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

## Declaration

Product Name: SafetyTurtle

Model No: B102



Serial No: 0013694

Name of Applicant: Terrapin Communications Inc.

Name of Manufacturer: BreconRidge Manufacturing Solutions Corporation



Nemko Canada Inc., Ottawa, Ontario Canada

### TEST RESULT

PASS	FAIL
X	

**In the configuration tested, the EUT complied with the requirements of:  
FCC 47 CFR Part 15, Subpart B for Class B. Digital Devices.**

*Note: See Summary of Test Results and Engineering Considerations for full details.*

Tested by: \_\_\_\_\_  
signature  
Chris Maidens, EMC Specialist

19 April 2004  
date



Reviewed by: \_\_\_\_\_  
signature  
Kevin Carr, Wireless Specialist

19 April 2004  
date

Nemko Canada Inc., a testing laboratory, is accredited by the Standards Council of Canada.  
The tests included in this report are within the scope of this accreditation.



Nemko Canada Inc., Ottawa, Ontario  
Canada

**Reference Standard: FCC 47 CFR Part 15, Subpart B**

**Test Report No: 4W07953**

**Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver**

## Summary of Test Results

### General

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15, Subpart B for Digital Devices.

These tests were conducted using measurement procedures of ANSI C63.4-2001.

The equipment was tested for conducted emissions from 0.15MHz to 30MHz using a 50 microhenry line impedance stabilization network (L.I.S.N.) as described in ANSI C63.4-2001. Peripheral equipment was also operated through a 50 microhenry L.I.S.N.

### Limits For Conducted Disturbance At The Mains Ports: Paragraph No. 15.107 for Class A

Frequency Range MHz	Limits dB(µV)		Result
	Quasi-Peak	Average	
0.15 to 0.50	79	66	N/A
0.50 to 30	73	60	

### Limits For Conducted Disturbance At The Mains Ports: Paragraph No. 15.107 for Class B

Frequency Range MHz	Limits dB(µV)		Result
	Quasi-Peak	Average	
0.15 to 0.50	66 to 56	56 to 46	Complied
0.5 to 5	56	46	
5 to 30	60	50	

### Notes

1. The lower limit shall apply at the transition frequency.
2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 to 0.50MHz.

**Nemko****Nemko Canada Inc., Ottawa, Ontario  
Canada****Reference Standard: FCC 47 CFR Part 15, Subpart B****Test Report No: 4W07953****Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver****Summary of Test Results, continued****Limits For Radiated Disturbance: Paragraph No. 15.109**

Frequency Range MHz	Limits For Radiated Disturbance At A Measuring Distance Of 10 Meters Class A	
	Quasi-Peak Limits dB ( $\mu$ V/m)	Result
30 - 88	39.1	N/A
88 - 216	43.5	
216 - 960	46.4	
Above 960	49.5	
Frequency Range MHz	Limits For Radiated Disturbance At A Measuring Distance Of 3 Meters Class B	
	Quasi-Peak Limits dB ( $\mu$ V/m)	Result
30 - 88	40.0	Complied
88 - 216	43.5	
216 - 960	46.0	
Above 960	54.0	

**Notes**

1. The lower limit shall apply at the transition frequency.
2. Additional provisions may be required for cases where interference occurs.

The spectrum was investigated from 30MHz up to the frequency shown in the following table based on the highest operating frequency used in the EUT

The highest operational frequency used in the EUT was [318.05](#)MHz.

Highest Frequency Generated or Used in the Device Which the Device Operates or Tunes (MHz)	Upper Frequency of Measurement Range (MHz)
Below 1.075	30
1.705 – 108	1000
108 – 500	2000
500 – 1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40GHz, whichever is lower.



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Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

## Engineering Considerations

### Product Modification

To achieve compliance the following change(s) were made during compliance testing: [None](#)

### Justification

The EUT was pre-scanned for radiated emissions in normal mode and in “test” mode.

No significant differences were noted, therefore final OATS measurements were performed in normal mode.

### Deviations

The following deviations from, additions to, or exclusions from the test specification have been made: [None](#)

### Test Report Revision History

Issue #	Details of changes made to test report
-	Original Report Issued



Nemko Canada Inc., Ottawa, Ontario  
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Reference Standard: FCC 47 CFR Part 15, Subpart B

Test Report No: 4W07953

Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

## General Information Regarding the Equipment Under Test (EUT)

Date Received In Laboratory:	March 29, 2004
Nemko Identification Number:	Refer to Nemko Canada receiving report.
EUT Mains Input Voltage and Frequency	
Voltage: 120VAC	
Frequency: 60Hz	
Description & Theory of Operation	
The MAX1473 is a fully integrated low-power CMOS super-heterodyne ASK receiver. The chip consists of a low-noise amplifier (LNA), a differential image-rejection mixer, an on chip phase-locked-loop (PLL) with integrated voltage-controlled oscillator (VCO), a 10.7 MHz IF limiting amplifier with received-signal-strength indicator (RSSI) and an analog base band data recovery circuit.	
The EUT is a table top device.	
Exercise/Monitoring method	
The EUT was tested for emissions while receiving normally.	
Software Version	
Version 9.02 Release Date December 13, 2003	



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Reference Standard: FCC 47 CFR Part 15, Subpart B

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Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

## Equipment Configuration

### Equipment Configuration List

Item	Description	Identification: (M/N #, S/N #, P/N #, Rev.)
(A)	SafetyTurtle with Maxim Receiver	M/N: B101 ; S/N: 0013694
(B)	Wall plug 120 to 9 volt AC transformer cube	M/N: CH-93001-NA

### EUT Ports

Item	Description	Indoor/Outdoor	Type (See Legend)	Qty
i.	AC Power Input	Outdoor	1	1

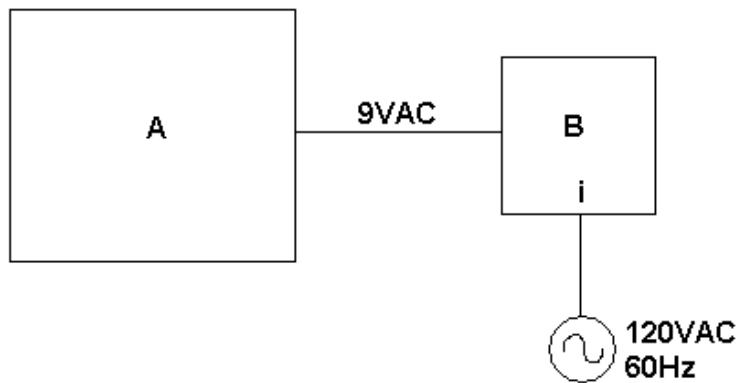
### Legend:

1 = AC Power Input/Output, 2 = DC Power Input/Output, 3 = Telecom, 4 = Non-telecom I/O, 5 = Maintenance, 6 = Fiber Optic

### Notes

None

### Configuration of the Equipment Under Test (EUT)





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Reference Standard: FCC 47 CFR Part 15, Subpart B

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Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

## Radiated Disturbance

Test Date: April 2, 2004

Engineer's Name: Chris Maidens

Tested as per: Table Top

Mains Input Voltage: 120VAC

Mains Input Frequency: 60Hz

### Enclosure Investigation Data

Test Distance (meters): 3

Dome: 1

Freq. (MHz)	Ant.	Pol. V/H	RCVD Signal (dB $\mu$ V)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Field Strength (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Detector	Amp.
60.2550	BC2	V	19.6	8.9	N/A	0.9	29.4	40.0	10.6	Q-Peak	N/A
111.8000	BC2	V	20.4	11.1	N/A	1.3	32.8	43.5	10.7	Q-Peak	N/A
110.4710	BC2	V	14.7	11.0	N/A	1.3	27.0	43.5	16.5	Q-Peak	N/A
39.0060	BC2	V	11.4	11.2	N/A	0.8	23.3	40.0	16.7	Q-Peak	N/A
110.3000	BC2	H	14.4	10.4	N/A	1.3	26.1	43.5	17.4	Q-Peak	N/A
35.6520	BC2	V	9.3	11.7	N/A	0.8	21.8	40.0	18.2	Q-Peak	N/A
51.3390	BC2	V	10.8	9.8	N/A	0.8	21.5	40.0	18.5	Q-Peak	N/A
50.6690	BC2	V	9.8	9.9	N/A	0.8	20.5	40.0	19.5	Q-Peak	N/A
120.5060	BC2	V	9.8	12.2	N/A	1.4	23.4	43.5	20.1	Q-Peak	N/A
115.4870	BC2	V	10.2	11.6	N/A	1.4	23.1	43.5	20.4	Q-Peak	N/A
81.5050	BC2	V	9.9	7.4	N/A	1.0	18.3	40.0	21.7	Q-Peak	N/A

### Legend:

Antenna Legend: BC = Biconical, BL = Bilog, LP = Log-Periodic, Horn = Horn, ED = EMCO Dipole

Detector Legend: Q-Peak = 120kHz RBW, Average = 1.0MHz RBW

### Notes

The spectrum was scanned for emissions up to 2000MHz.

### Deviations

Refer to Engineering Considerations.

### Test Result

**Final Test Result: Complied**



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Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

Radiated Disturbance, continued

Equipment List – Prescan for Radiated Emissions (Shielded Chamber)

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	June. 05/03	June. 05/04
1 Year	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	June. 05/03	June. 05/04
NCR	Bilog	Schaffner	CBL6112B	FA001504	NCR	NCR
NCR	0.1 – 1300 MHz Amplifier	Hewlett Packard	8447D	FA001748	NCR	NCR
1 Year	1.0 – 2.0 GHz Amplifier	JCA	12-400	FA001498	June. 18/03	June. 18/04

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair

Equipment List - Radiated Emissions

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	Receiver	Rohde & Schwarz	ESVP	FA000871	Jan. 16/04	Jan. 16/05
1 Year	Biconical (2) Antenna	EMCO	3109	FA000904	July. 24/03	July. 24/04

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair



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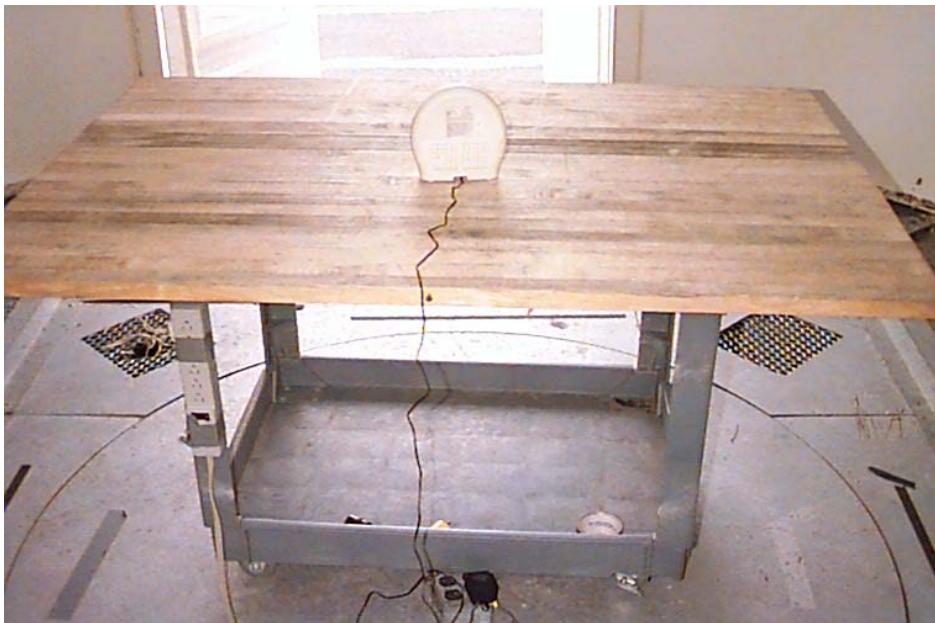
Radiated Disturbance, continued

Radiated Disturbance Setup Photos

Front View



Rear View





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Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

## Conducted Disturbance at Mains Port

Conducted Disturbance at Mains Port Test Data:

Test Date: April 2, 2004

Engineer's Name: Chris Maidens

Tested as per: Table Top/Floor Standing

Mains Input Voltage: 120VAC

Mains Input Frequency: 60Hz

Spectrum plots for each frequency band can be found at the back of this section. \*All plots were generated with a peak detector.

Port Investigation Data

Port under test:

Results: [Refer to Plots of this section.](#)

Notes

None

Deviations

Refer to Engineering Considerations.

Test Result

**Final Test Result: Complied**



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Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

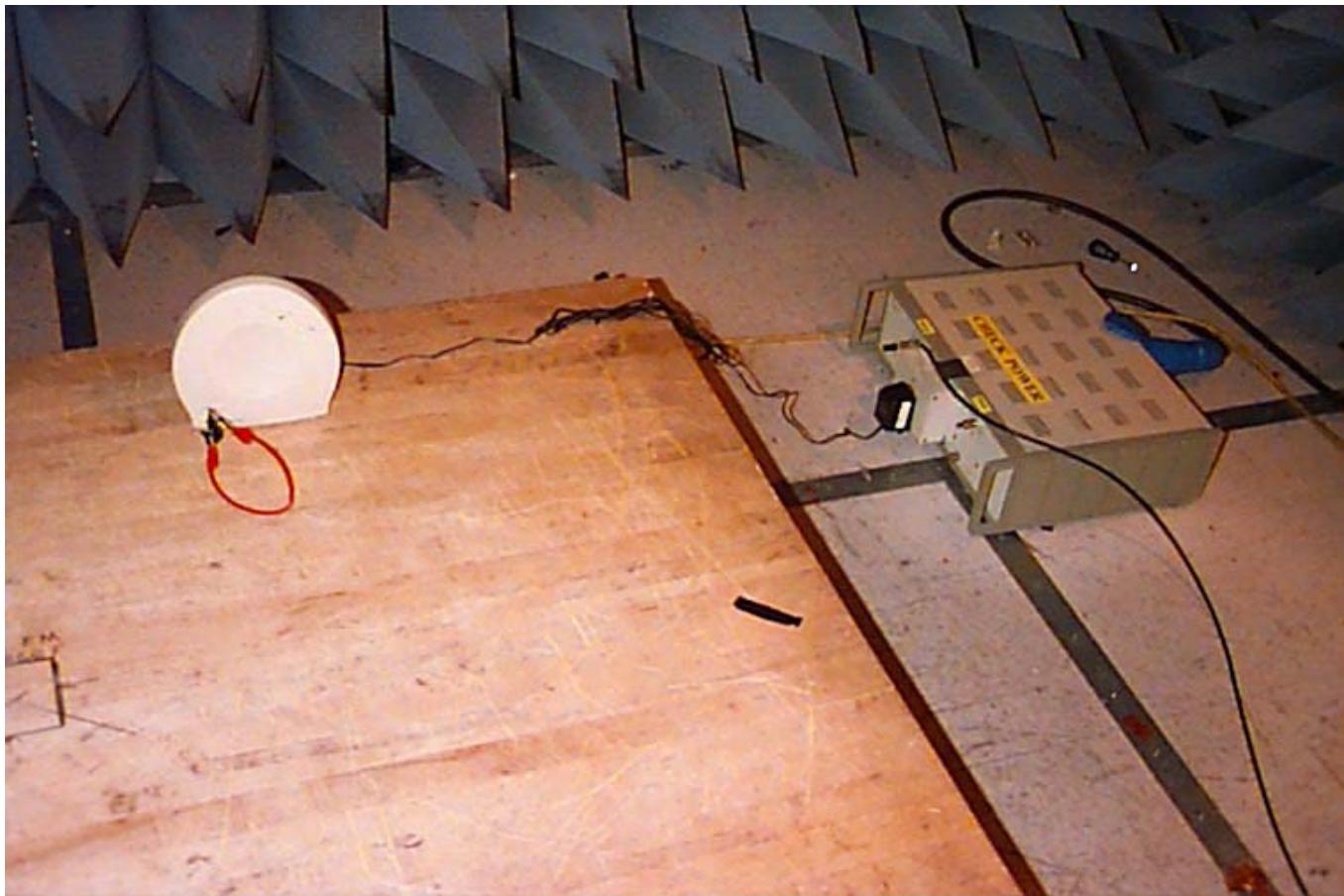
#### Conducted Disturbance at Mains, continued

#### Equipment List – Conducted Emissions

CAL Cycle	Equipment	Manufacturer	Model No.	Asset/Serial No.	Last Cal.	Next Cal.
1 Year	LISN	EMCO	4825/2	FA001545	Oct. 30/03	Oct. 30/04
1 Year	Spectrum Analyzer	Hewlett-Packard	8566B	FA001309	June. 05/03	June. 05/04
1 Year	Spectrum Analyzer Display	Hewlett-Packard	85662A	FA001309	June. 05/03	June. 05/04
1 Year	Transient Limiter	Hewlett-Packard	1194 7A	FA000975	June. 16/03	June. 16/04

Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair

#### Conducted Disturbance at Mains Setup Photos





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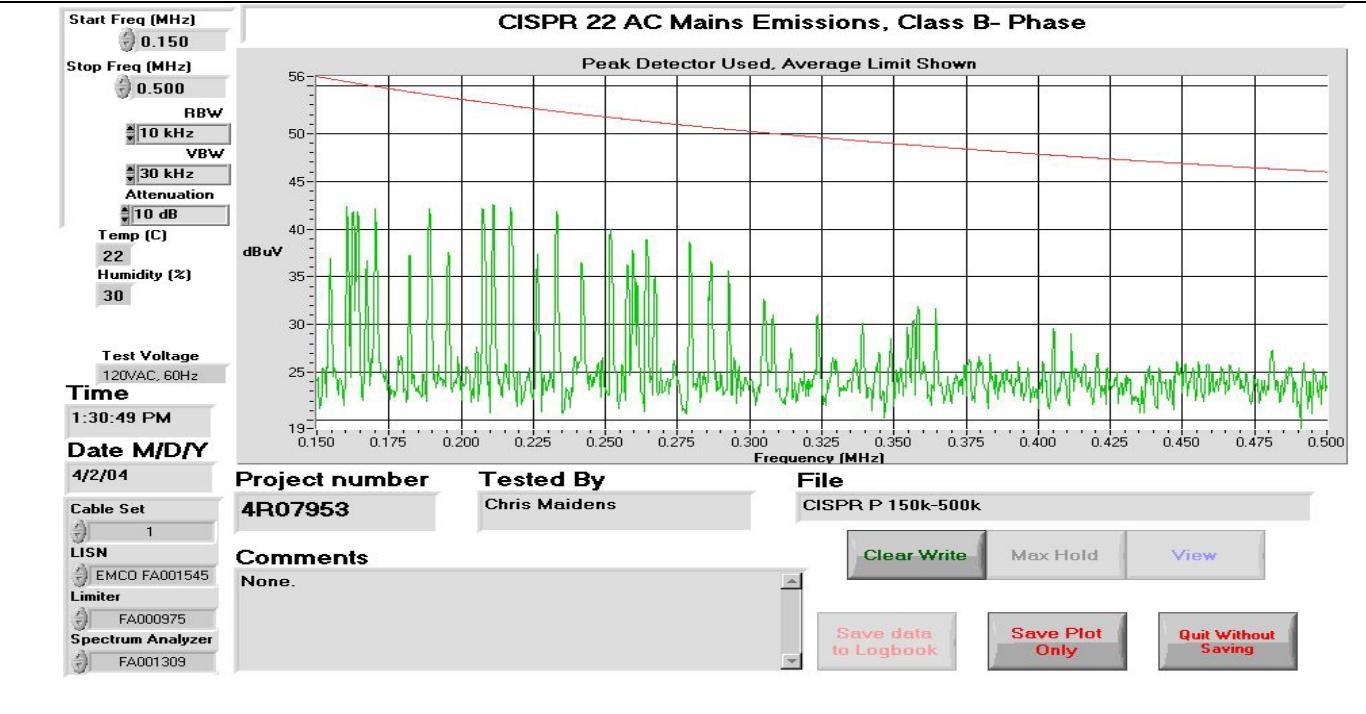
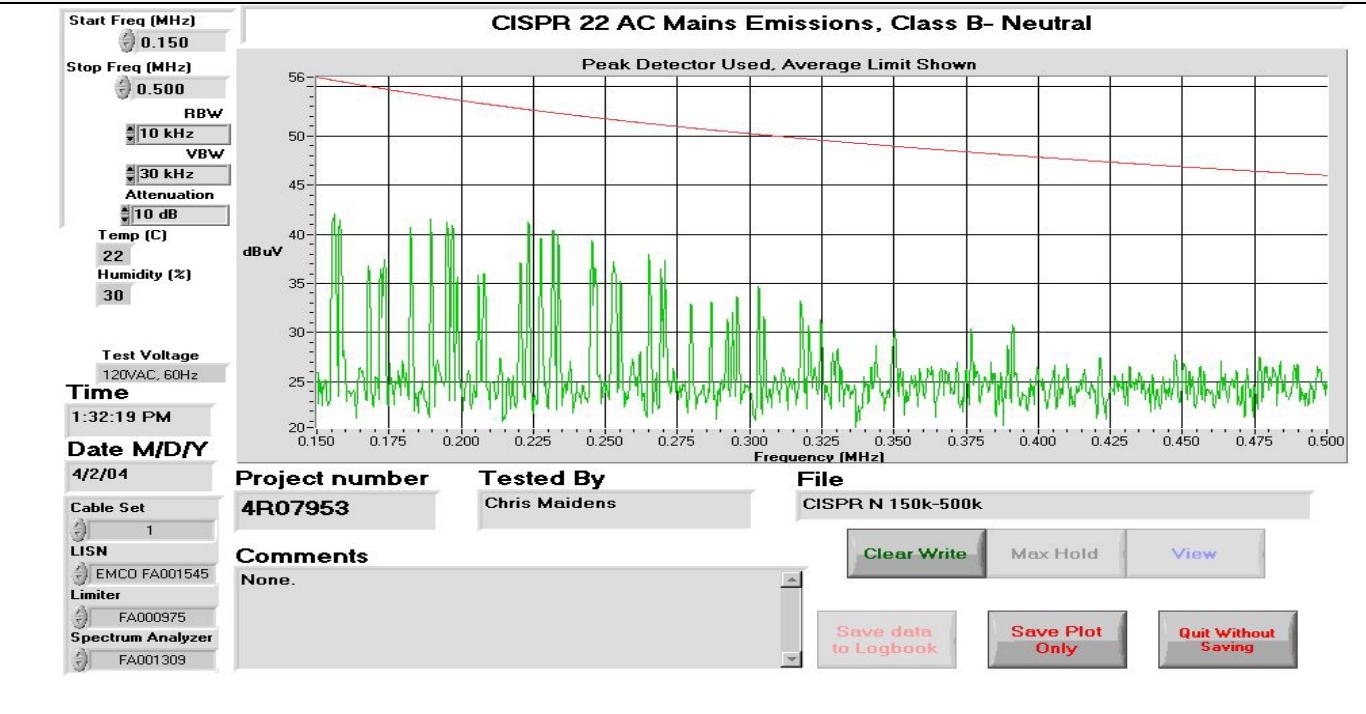
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Conducted Disturbance at Mains, continued

Conducted Disturbance at Mains Plots





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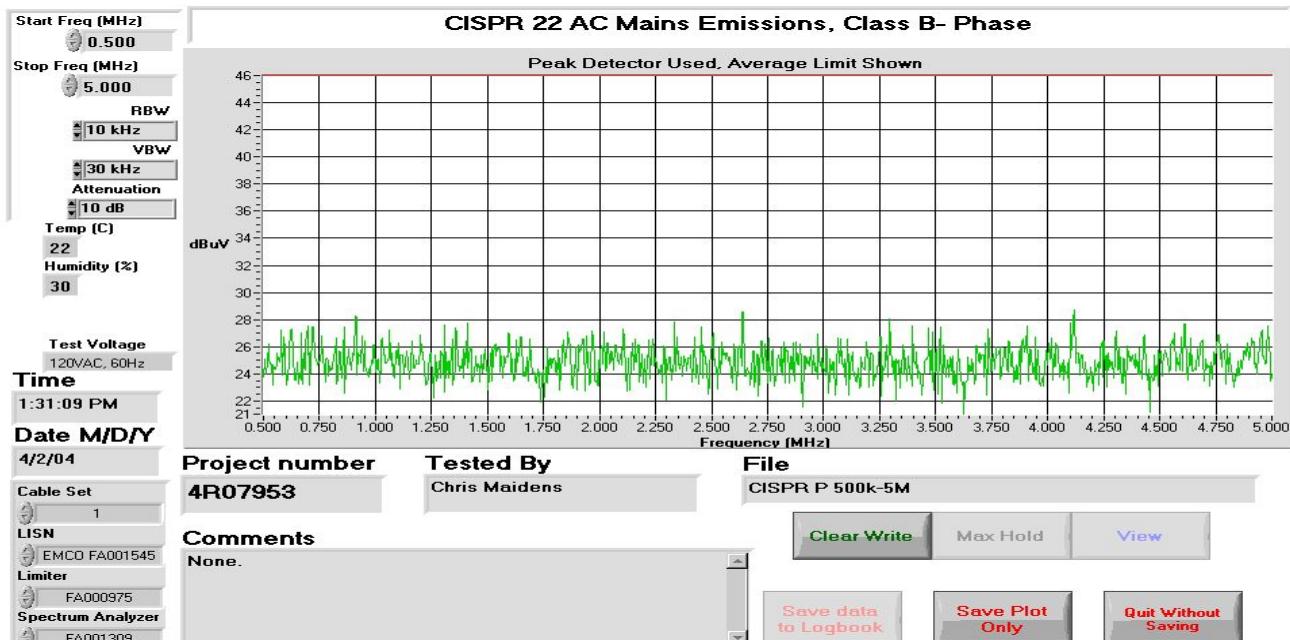
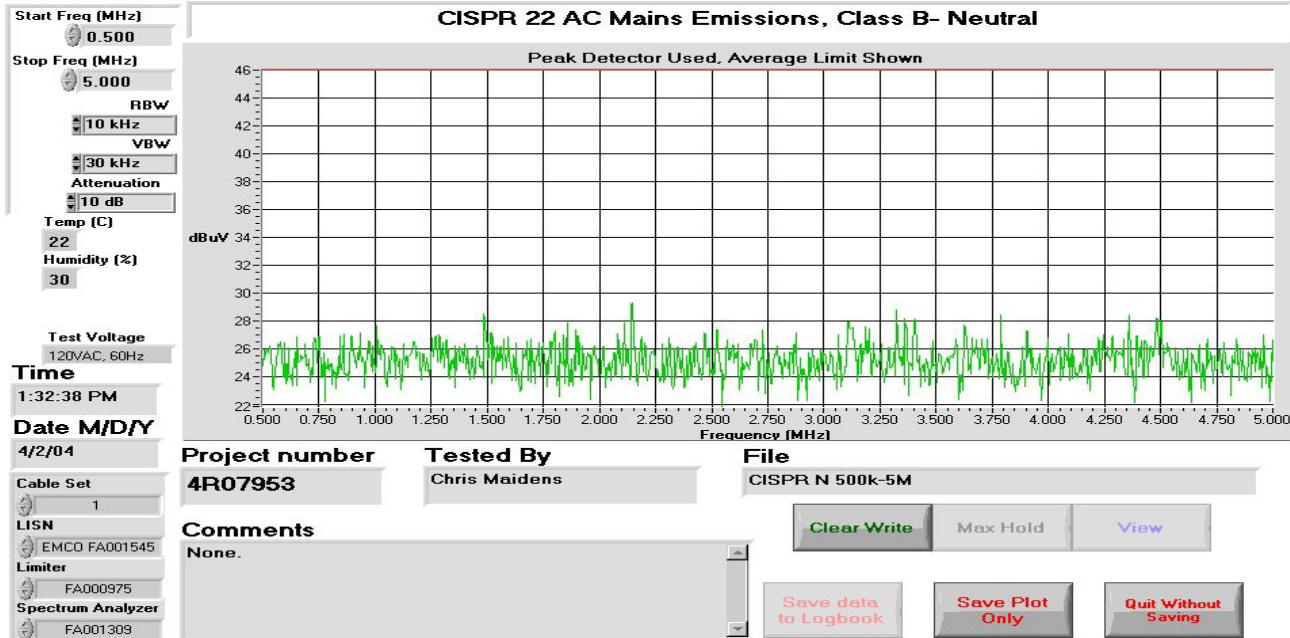
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Equipment (EUT): SafetyTurtle Base Station with Maxim Receiver

Conducted Disturbance at Mains, continued

Conducted Disturbance at Mains Plots, continued





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Conducted Disturbance at Mains, continued

Conducted Disturbance at Mains Plots, continued

