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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

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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	Ulab
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)

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

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

Tested by: _____ 19 April 2004
signature date
Chris Maidens, EMC Specialist

Reviewed by: _____ 19 April 2004
signature date
Kevin Carr, Wireless Specialist

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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.

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.

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 (µV/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 (µV/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 318.05MHz.

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	5th harmonic of the highest frequency or 40GHz, whichever is lower.

Engineering Considerations

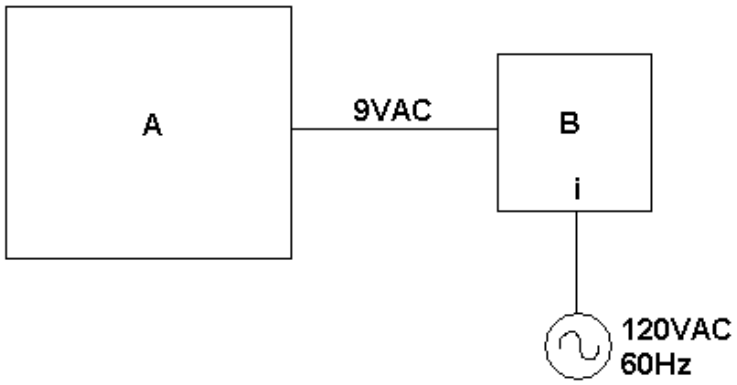
Product Modification	
To achieve compliance the following change(s) were made during compliance testing: None	
Justification	
The EUT was pre-scanned for radiated emissions in normal mode and in "test" mode. No significant differences were noted, therefore final OATS measurements were performed in normal 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

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	

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)					



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 (dBμV)	Ant. Factor (dB)	Amp. Gain (dB)	Cable Loss (dB)	Field Strength (dBμV/m)	Limit (dBμV/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

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

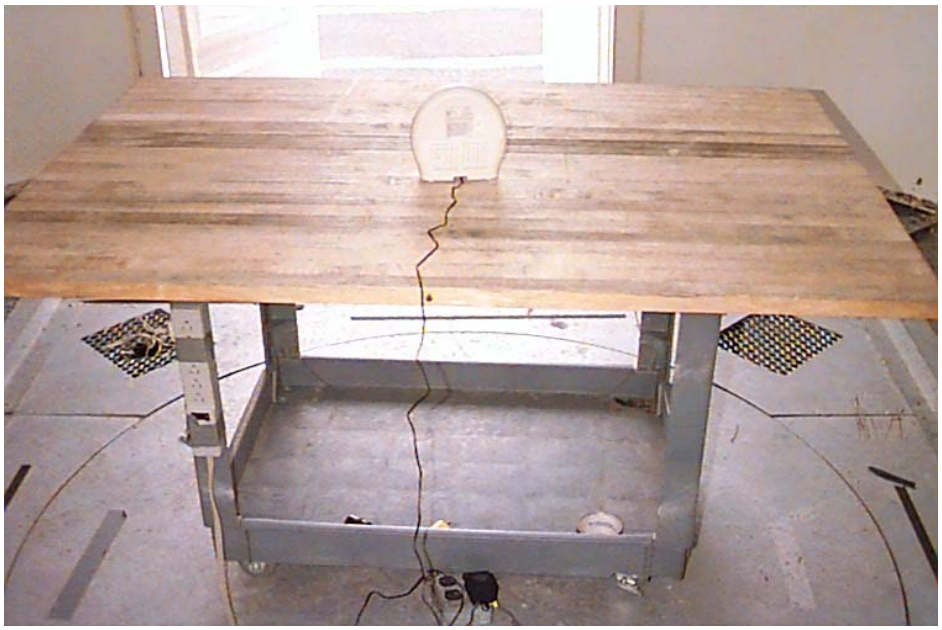
Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair

Radiated Disturbance, continued

Radiated Disturbance Setup Photos

Front View

Rear View



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	

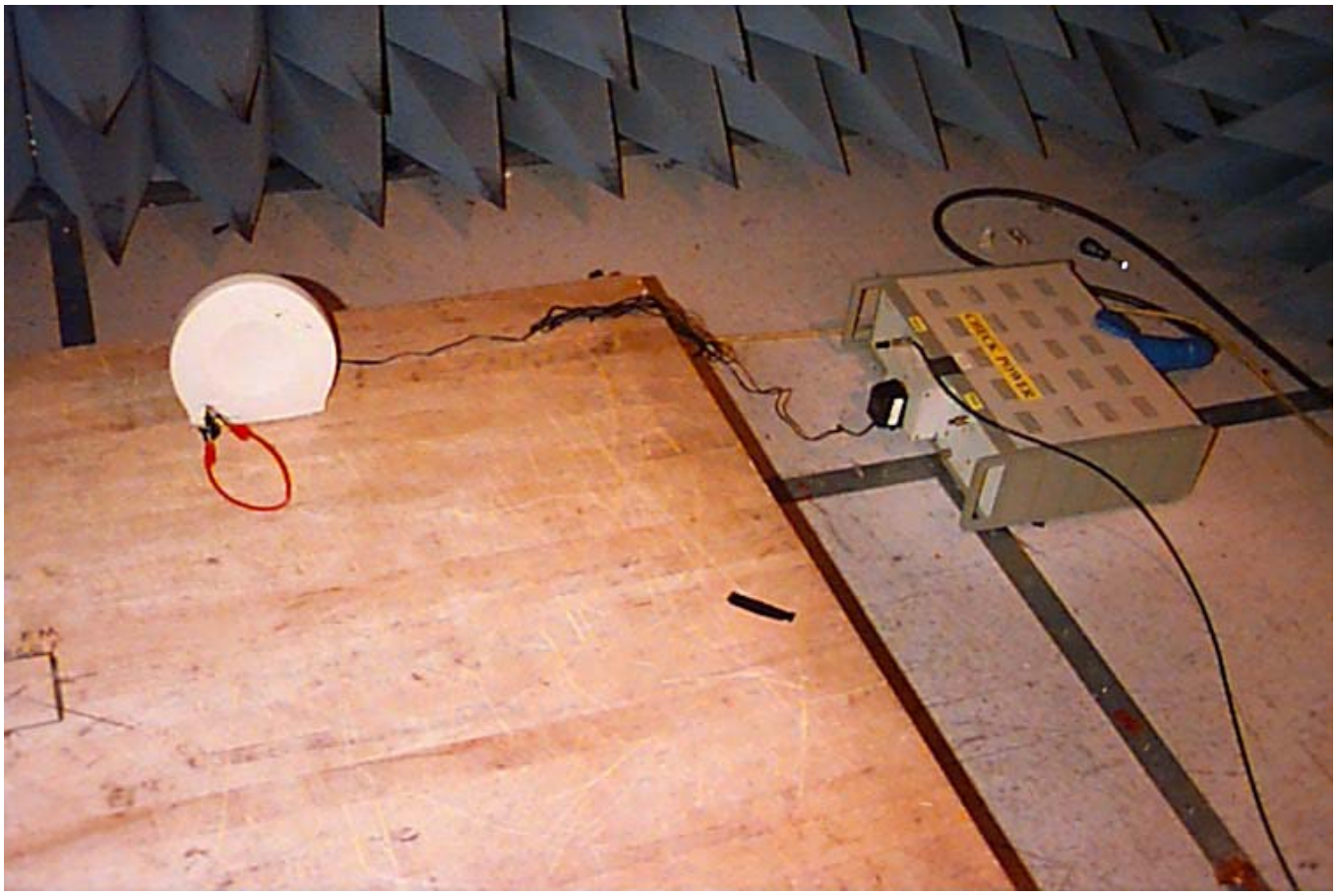
Conducted Disturbance at Mains, continued

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

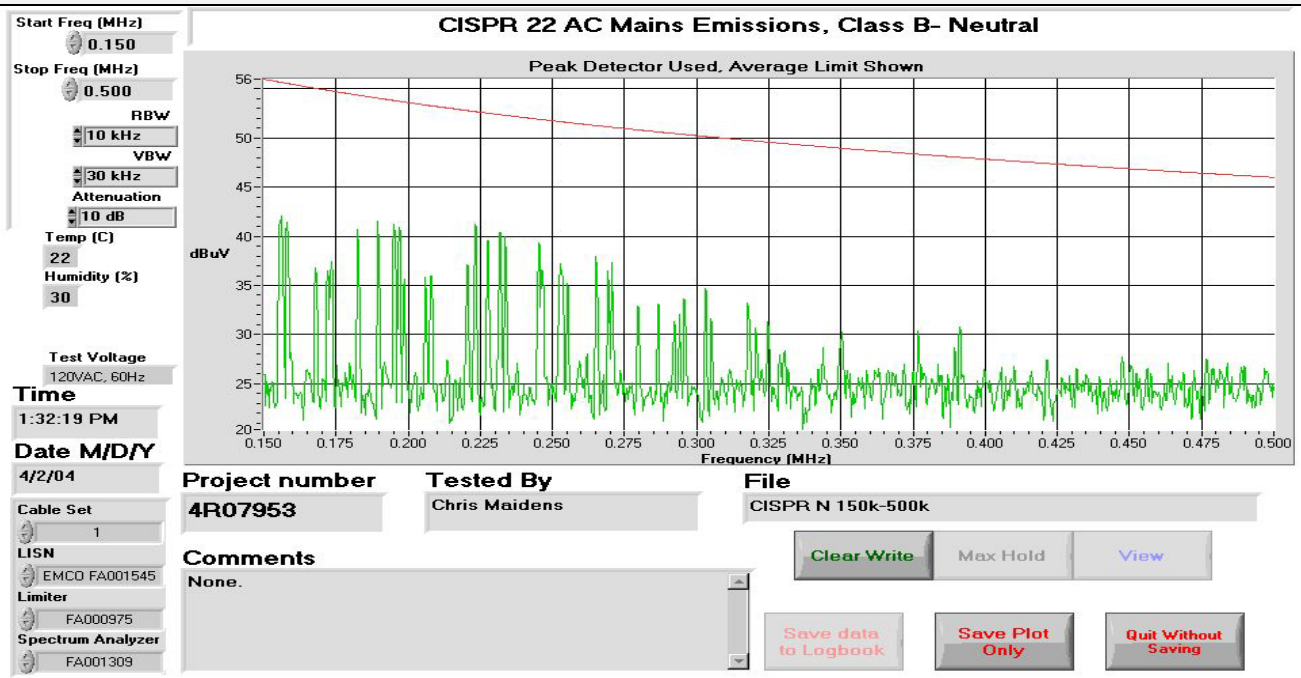
Note: N/A = Not Applicable, NCR = No Cal Required, COU = CAL On Use, OUT = Out For CAL/Repair

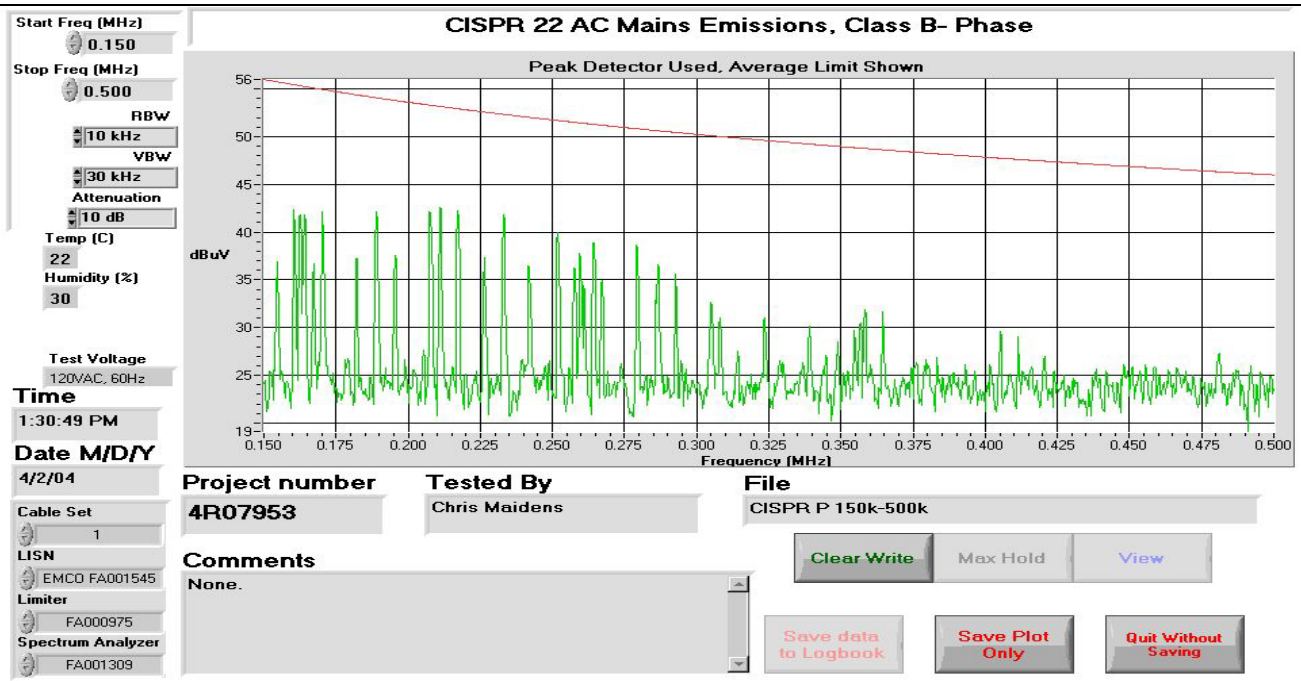
Conducted Disturbance at Mains Setup Photos



Conducted Disturbance at Mains, continued

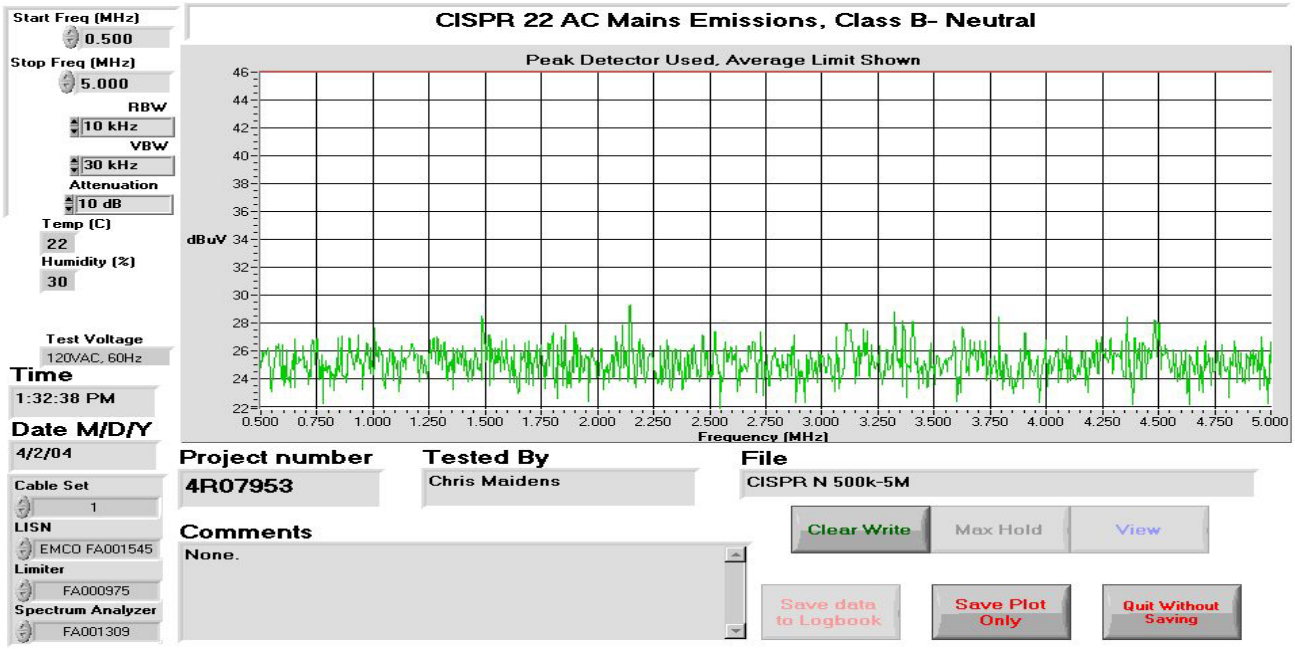
Conducted Disturbance at Mains Plots

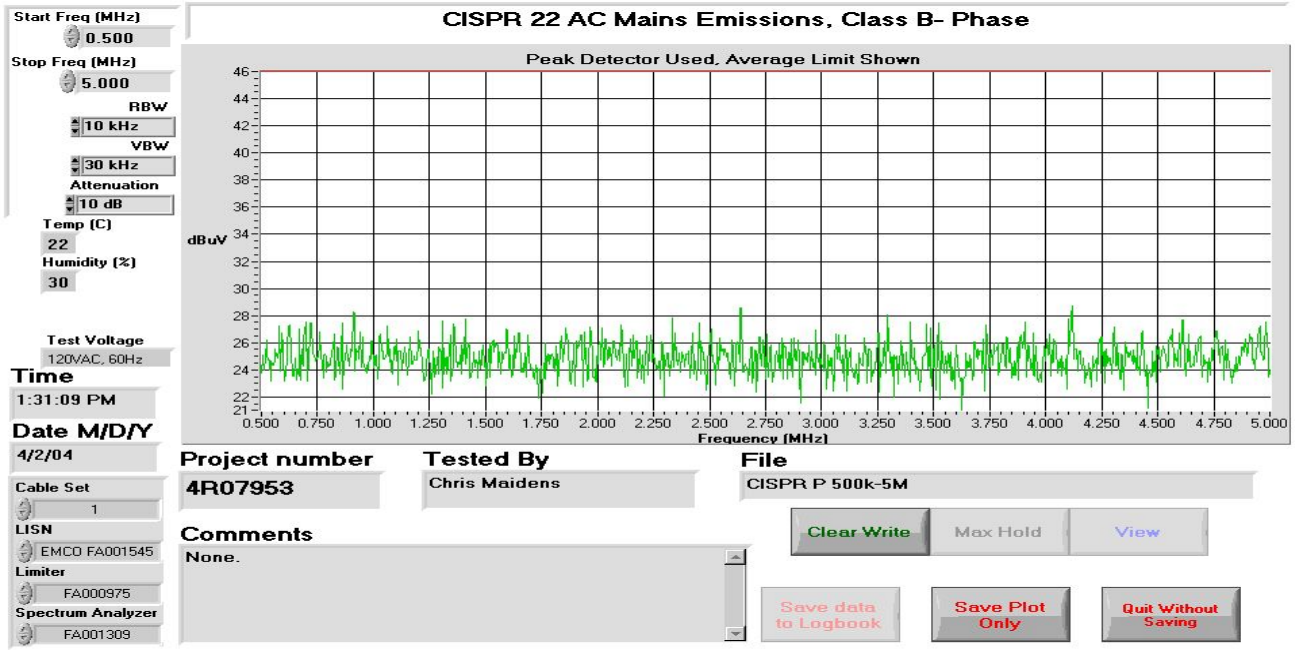




Conducted Disturbance at Mains, continued

Conducted Disturbance at Mains Plots, continued





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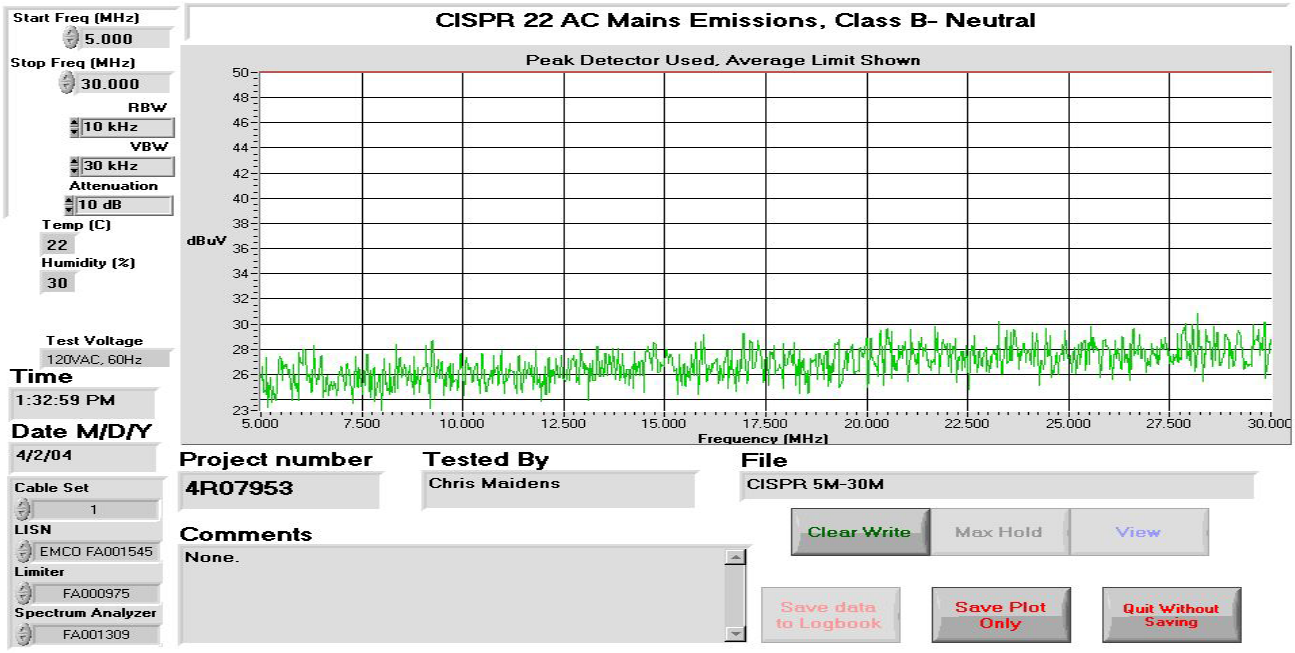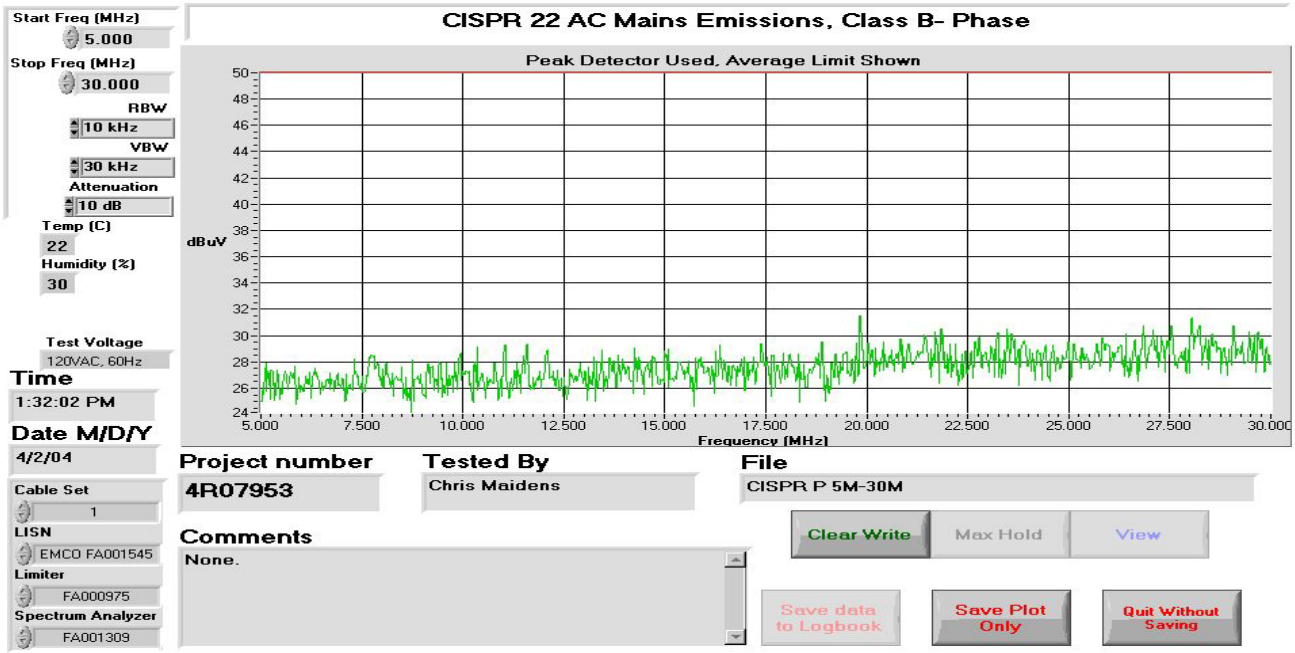
Conducted Disturbance at Mains Plots, continued