

TEST RESULT SUMMARY

FCC Part 15 Subpart C Section 15.249

MANUFACTURER	Vaddio 9433 Science Center Drive New Hope MN 55428
DESCRIPTION OF EQUIPMENT	Wireless audio link and IR LED illuminator
NAME OF EQUIPMENT	AutoTrak Belt Pack Unit
MODEL NUMBER(S) TESTED	998-7210-000
TEST REPORT NUMBER	WC1003764
TEST DATE(S)	06 May 2010

TÜV SÜD America Inc, as an independent testing laboratory, declares that the equipment tested as specified above conforms to the electromagnetic compatibility requirements of FCC Part 15 Subpart C Sections 15.249 "Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5875 MHz and 24.0-24.25 GHz".

It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications necessary for compliance made during testing on the above mentioned date(s) must be implemented in all production units for compliance to be maintained.

Date: 07 June 2010

Tested by:

Approved by:



Joel T. Schneider
Senior EMC Engineer

Location: Taylors Falls MN
USA

Greg Jakubowski
Senior EMC Technician
Not Transferable

EMC TEST REPORT

Test Report No.	<u>WC1003764</u>	Date of issue: <u>07 June 2010</u>
Description of Equipment	<u>Wireless audio link and IR LED illuminator</u>	
Model No(s) Tested	<u>998-7210-000</u>	
Serial No(s) Tested	<u>n/a</u>	
Manufacturer	<u>Vaddio 9433 Science Center Drive New Hope MN 55428</u>	

Test Result **Positive** **Negative**

TÜV SÜD America Inc reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. TÜV SÜD America Inc shall have no liability for any deductions, inferences or generalizations drawn by the client or others from TÜV SÜD America Inc issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full without our written approval. This report shall not be used by the client to claim product endorsement by NVLAP, NIST, or any agency of the US government.

TÜV SÜD America Inc and its professional staff hold government and Professional organization certifications and are members of AAMI, ACIL, AEA, ANSI, IEEE, NARTE, and VCCI.

REVISION RECORD

REVISION	TOTAL NUMBER OF PAGES	DATE	DESCRIPTION
	26	07 June 2010	Initial Release



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STATEMENT OF MEASUREMENT UNCERTAINTY

The data and results referenced in this document are accurate. The reader is cautioned that there is some measurement variability due to the tolerances of the test equipment that can contribute to a nominal product measurement uncertainty. Furthermore, component differences and manufacturing process variability of production units similar to that tested may result in additional product uncertainty. If necessary, refer to the test lab for the actual measurement uncertainty for specific tests.

TEST EQUIPMENT

All measurement instrumentation is traceable to the National Institute of Standards and Technology and is calibrated according to internal procedure.

EMC TEST REGULATIONS:

The tests were performed according to the following regulations:

- FCC Part 15 Subpart C Section 15.249

ENVIRONMENTAL CONDITIONS IN THE LAB

	<u>Actual</u>
Temperature:	: 20 °C
Relative Humidity	: 28%
Atmospheric pressure	: 99 kPa

POWER SUPPLY UTILIZED

Power supply system : 6 VDC

SIGN EXPLANATIONS

- not applicable
- applicable



Field strength of fundamental

FCC 15.249(a)

Test summary

The requirements are: - MET - NOT MET

Test was performed in accordance with the test procedure of ANSI C63.4: 2003

Maximum field strength of fundamental is 93.92 dBuV/m or 49.7 mV/m at 3 meters at 903.36 MHz

Antenna Height: - 1 to 4 meters

Antenna Polarization: - Horizontal - Vertical

EUT Azimuth: - EUT rotated 360 degrees

Test location

- Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

- Wild River Lab Tech Area, conducted measurement

Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
WRLE03203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	04-Jun-10
WRLE02690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	28-Oct-10
WRLE02674	85662A	Hewlett-Packard	Analyzer Display	2050A02007	28-Oct-10
OWLE02682	85650A	Hewlett-Packard	Quasi-Peak Adapter	2811A01127	03-Feb-11

Test limit

Fundamental Frequency (MHz)	Field strength (mV/m qp)	Field strength (dB μ V/m qp)
902 - 928	50	94.0

Test data

List of measurements for run #: 3

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 15.249 902-928 fund. 3m	DELTA2
Measurements maximized						
2nd device						
Device on its back (battery side) – worst case of 3 orthogonal axes						
high channel						
921.36 MHz	67.08 Qp	3.11 / 22.78 / 0.0 / 0.0	92.96	H / 1.00 / 272	-1.04	n/a
mid channel						
912.36 MHz	67.44 Qp	3.1 / 22.72 / 0.0 / 0.0	93.25	H / 1.00 / 280	-0.75	n/a
low channel						
903.36 MHz	68.23 Qp	3.08 / 22.61 / 0.0 / 0.0	93.92	H / 1.00 / 278	-0.08	n/a

Field strength of harmonics

FCC 15.249(a)

Test summary

The requirements are: - MET - NOT MET

Test was performed in accordance with the test procedure of ANSI C63.4: 2003

Maximum peak field strength of harmonics is 52.97 dBuV/m or 445 uV/m at 3 meters at 2.764 GHz

Maximum average field strength of harmonics is 51.85 dBuV/m or 391.3 uV/m at 3 meters at 2.764 GHz

Above 1 GHz, rbw and vbw = 1 MHz for peak readings.

Above 1 GHz, rbw = 1 MHz, vbw = 10 Hz for average readings.

Antenna Height: - 1 to 4 meters

Antenna Polarization: - Horizontal - Vertical

EUT Azimuth: - EUT rotated 360 degrees

Test location

- Wild River Lab Large Test Site (Open Area Test Site)

- Wild River Lab Small Test Site (Open Area Test Site)

- Wild River Lab Tech Area, conducted measurement

Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
OWLE02074	3115	EMCO	Ridge Guide Antenna	2504	09-Feb-11
WRLE02690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	28-Oct-10
WRLE02674	85662A	Hewlett-Packard	Analyzer Display	2050A02007	28-Oct-10
WRLE10527	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	Code B 28-Sep-10
WRLE03935	F548B-1	Acronetics	1 – 2 GHz Bandpass Filter	010	Code B 25-Sep-10
WRLE03934	F549B-1	Acronetics	2 – 4 GHz Bandpass Filter	010	Code B 30-Sep-10

Cal Code B = Calibration verification performed internally.

Test limit

Fundamental Frequency (MHz)	Field strength (uV/meter)	Field strength (dBuV/meter)
902 - 928	500, AV 5000, PK	54.0 74.0

Test data

See following page for summary

Measurement summary for limit1: FCC 15.249 spurs/harmonics 3m (Av)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.249 spurs/harmonics 3m av
2.764 GHz	60.83 Av	5.43 / 29.19 / 43.61 / 0.0	51.85	V / 1.00 / 22	-2.15
2.737 GHz	60.86 Av	5.39 / 29.12 / 43.59 / 0.0	51.77	V / 1.00 / 22	-2.23
2.71 GHz	60.19 Av	5.36 / 29.04 / 43.58 / 0.29	51.29	V / 1.00 / 20	-2.71
1.843 GHz	60.63 Av	4.41 / 27.34 / 42.91 / 0.0	49.48	V / 1.08 / 312	-4.52
1.825 GHz	58.96 Av	4.39 / 27.26 / 42.86 / 0.0	47.75	V / 1.09 / 282	-6.25
3.685 GHz	52.09 Av	6.9 / 31.79 / 43.7 / 0.0	47.09	V / 1.15 / 114	-6.91
1.807 GHz	57.48 Av	4.37 / 27.17 / 42.82 / 0.62	46.82	V / 1.06 / 323	-7.18
3.613 GHz	50.39 Av	6.79 / 31.59 / 43.7 / 0.52	45.59	V / 1.16 / 132	-8.41
3.649 GHz	50.66 Av	6.84 / 31.69 / 43.7 / 0.0	45.5	V / 1.18 / 156	-8.5

Measurement summary for limit2: FCC 15.249 spurs/harmonics 3m pk (Pk)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC 15.249 spurs/harmonics 3m pk
2.764 GHz	61.95 Pk	5.43 / 29.19 / 43.61 / 0.0	52.97	V / 1.00 / 22	-21.03
2.737 GHz	61.7 Pk	5.39 / 29.12 / 43.59 / 0.0	52.61	V / 1.00 / 22	-21.39
2.71 GHz	61.45 Pk	5.36 / 29.04 / 43.58 / 0.29	52.55	V / 1.00 / 20	-21.45
1.843 GHz	61.55 Pk	4.41 / 27.34 / 42.91 / 0.0	50.4	V / 1.08 / 312	-23.6
3.685 GHz	54.6 Pk	6.9 / 31.79 / 43.7 / 0.0	49.6	V / 1.15 / 114	-24.4
3.649 GHz	54.75 Pk	6.84 / 31.69 / 43.7 / 0.0	49.59	V / 1.18 / 156	-24.41
3.613 GHz	54.1 Pk	6.79 / 31.59 / 43.7 / 0.52	49.3	V / 1.16 / 132	-24.7
1.807 GHz	59.7 Pk	4.37 / 27.17 / 42.82 / 0.62	49.04	V / 1.06 / 323	-24.96
1.825 GHz	59.95 Pk	4.39 / 27.26 / 42.86 / 0.0	48.74	V / 1.09 / 282	-25.26

end scan 1 - 9.3 GHz

Spurious emissions

FCC 15.249(d)

Test summary

The requirements are: ■ - MET □ - NOT MET

Test was performed in accordance with ANSI C63.4 2003

Maximum peak radiated spurious emission is 56.25 dB_uV/m or 649.4 uV/m at 3 meters at 1.939 GHz

Maximum average radiated spurious emission is 50.8 dB_uV/m or 346.7 uV/m at 3 meters at 1.939 GHz

Minimum margin of compliance = 3.2 dB

Above 1 GHz, rbw and vbw = 1 MHz for peak readings.

Above 1 GHz, rbw = 1 MHz, vbw = 10 Hz for average readings.

Antenna Height: ■ - 1 to 4 meters

Antenna Polarization: ■ - Horizontal ■ - Vertical

EUT Azimuth: ■ - EUT rotated 360 degrees

Test location

■ - Wild River Lab Large Test Site (Open Area Test Site)

□ - Wild River Lab Small Test Site (Open Area Test Site)

□ - Wild River Lab Tech Area, conducted measurement

Test equipment

TUV ID	Model	Manufacturer	Description	Serial	Cal Due
WRLE03203	EM-6917B	Electro-Metrics	Biconicalog Periodic	106	04-Jun-10
WRLE02690	8566B	Hewlett-Packard	Spectrum Analyzer	2430A00930	28-Oct-10
WRLE02674	85662A	Hewlett-Packard	Analyzer Display	2050A02007	28-Oct-10
OWLE02682	85650A	Hewlett-Packard	Quasi-Peak Adapter	2811A01127	03-Feb-11
OWLE02074	3115	EMCO	Ridge Guide Antenna	2504	09-Feb-11
WRLE10527	SL18B4020	Phase One Microwave	Preamplifier 1 – 18 GHz	0001	Code B 28-Sep-10
WRLE03935	F548B-1	Acronetics	1 – 2 GHz Bandpass Filter	010	Code B 25-Sep-10
WRLE03934	F549B-1	Acronetics	2 – 4 GHz Bandpass Filter	010	Code B 30-Sep-10
WRLE10616	ZHL-1042J	Mini-Circuits	Preamplifier 10 - 3000 MHz	QA0746005	Code B 23-Oct-10

Cal Code B = Calibration verification performed internally.

Test limit

-50 dBc, or the 15.209 limits below, whichever is the lesser attenuation

Frequency (MHz)	Field strength (uV/meter)	Field strength (dB _u V/meter)
30 - 88	100, QP	40.0
88 - 216	150, QP	43.5
216 - 960	200, QP	46.0
Above 960	500, QP	54.0
> 1000	500, AV 5000, PK	54.0 74.0

Test data

See following pages

Measurement summary for limit2: FCC 15.249 spurs/harmonics 3m pk (Pk)

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA2 FCC 15.249 spurs/harmonics 3m pk
1.939 GHz	66.35 Pk	4.52 / 27.81 / 43.15 / 0.73	56.25	V / 1.24 / 260	-17.75

Measurement summary for limit1: FCC 15.249 spurs/harmonics 3m (Av)

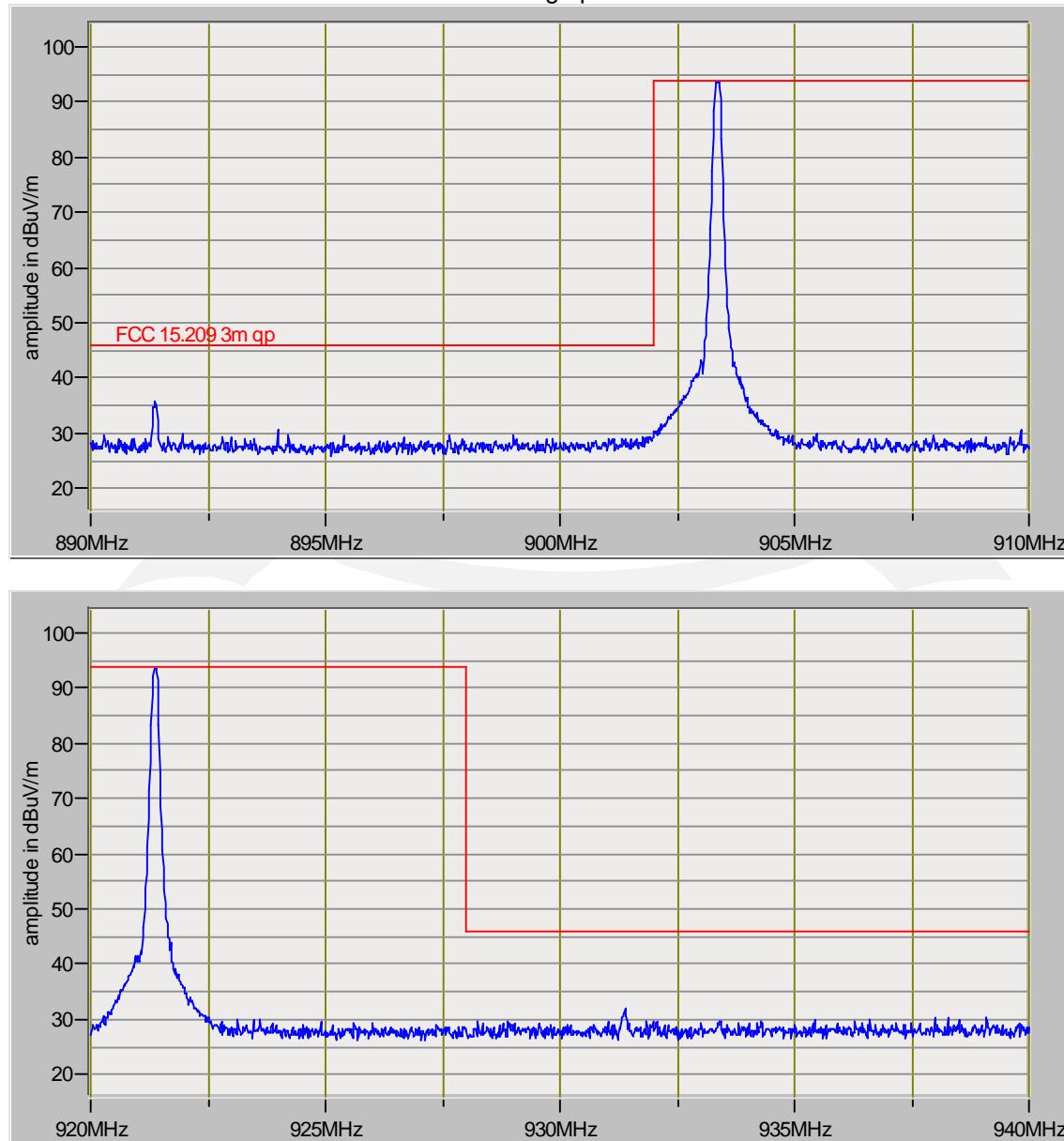
FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.249 spurs/harmonics 3m av
1.939 GHz	60.9 Av	4.52 / 27.81 / 43.15 / 0.73	50.8	V / 1.24 / 260	-3.2

end scan 1 - 9.3 GHz

List of measurements for run #: 4

FREQ	LEVEL (dBuV)	CABLE / ANT / PREAMP / ATTEN (dB)	FINAL (dBuV / m)	POL / HGT / AZ (m)(DEG)	DELTA1 FCC 15.209 3m qp	DELTA2 FCC 15.249 - 20dBc 3m qp
Begin spurious emissions scan 30 - 1000 MHz						
Device lying on its back, battery side. Worst case fundamental carrier position high channel						
Device rotated 360 degrees, measurement antenna 1-4 meters high, vertical & horizontal						
No significant spurious emissions detected						
Repeat previous scan with mid and low channels						
No significant spurious emissions detected						
End spurious scan 30 - 1000 MHz						

Band edge plots

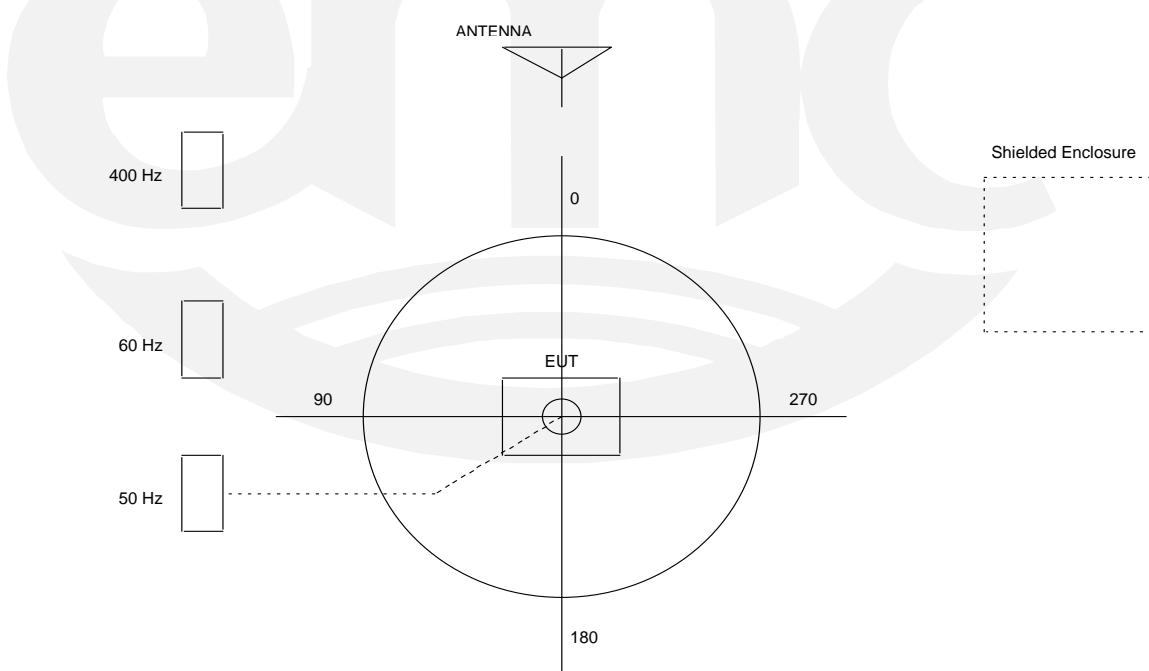


TEST SETUP FOR EMISSIONS TESTING

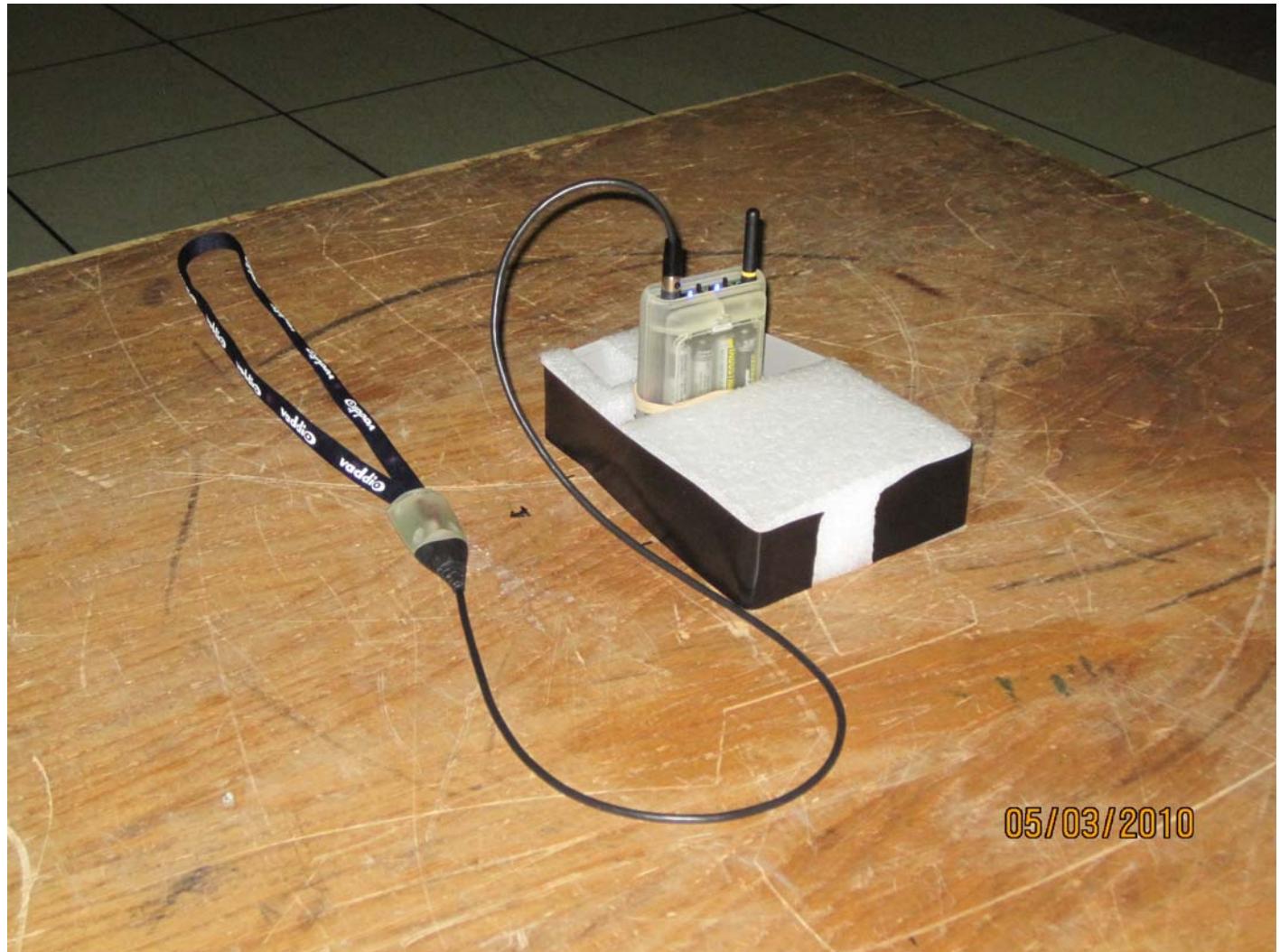
WILD RIVER LAB Large Test Site

Notes:

1. Items shown in dotted lines are located on the floor below the test area. It is 5 meters vertically from the ground floor to the test area.
2. 50 Hz, 60 Hz, and 400 Hz are power panels for alternating current.
3. The antenna may be positioned horizontally 3, 10 or 30 meters from the center of the turntable.
4. The circle is a 6.7 meter diameter turntable.
5. A ground plane is in the plane of this sheet.
6. The test sample is shown in the azimuthal position representing zero degrees.



Test-setup photo(s):
Radiated measurements



Test-setup photo(s):
Radiated measurements



Test-setup photo(s):
Radiated measurements



Equipment Under Test (EUT) Test Operation Mode:
The device under test was operated under the following conditions:

- Standby
- Test program (H - Pattern)
- Test program (color bar)
- Test program (customer specific)
- Practice operation
- Normal operating mode
- Fixed frequencies, channels (low, mid, high)

Configuration of the device under test:

- See Constructional Data Form in Appendix B
- See Product Information Form(s) in Appendix B

GENERAL REMARKS:

None

Modifications required to pass:

- None
- As indicated on the data sheet(s)

Test Specification Deviations: Additions to or Exclusions from:

- None
- As indicated in the Test Plan

SUMMARY:

The requirements according to the technical regulations are

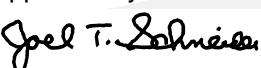
- - met and the equipment under test does fulfill the general approval requirements.
- - **not** met and the equipment under test does **not** fulfill the general approval requirements.

EUT Received Date: 06 May 2010Condition of EUT: NormalTesting Start Date: 06 May 2010Testing End Date: 06 May 2010**TÜV SÜD AMERICA INC**

Tested by:

Greg Jakubowski
Senior EMC Technician

Approved by:

Joel T Schneider
Senior EMC Engineer

Appendix A

Constructional Data Form



Form



EMC Test Plan and Constructional Data Form

PLEASE COMPLETE THIS DOCUMENT IN FULL, ENTERING N/A IF THE FIELD IS NOT APPLICABLE. IF TESTING RESULTS IN MODIFICATIONS TO THE EQUIPMENT, PLEASE SUBMIT A REVISED TP/CDF INDICATING THOSE MODIFICATIONS.

NOTE: *This information will be input into your test report as shown below. Press the F1 key at any time to get HELP for*

... will be input into your test report as shown below. Press the **Tab** key at any time to get **ALL** the current field selected.

Company: Vaddio
Address: 9433 Science Center Drive

Contact: William Fischer Position: Engineer
Phone: 763-971-4452 Fax: 763-971-4464
E-mail Address: bfischer@vaddio.com

General Equipment Description -- NOTE: This information will be input into your test report as shown below.

EUT Description	Wireless audio link and IR LED illuminator	
EUT Name	AutoTrak Belt Pack Unit	
Model No.:	998-7210-000	Serial No.:
Product Options:	none	
Configurations to be tested:	normal	

Equipment Modification (If applicable, indicate modifications since EUT was last tested. If modifications are made during this testing, submit revised TP/CDF after testing is complete.)

Modifications since last test: _____

Modifications made during test: _____

Test Objective(s): Please indicate the tests to be performed, entering the applicable standard(s) where noted.

<input type="checkbox"/> EMC Directive 2004/108/EC (EMC) Std: _____	<input checked="" type="checkbox"/> FCC: Class <input type="checkbox"/> A <input type="checkbox"/> B Part _____
<input type="checkbox"/> Machinery Directive 89/392/EEC (EMC) Std: _____	<input type="checkbox"/> VCCI: Class <input type="checkbox"/> A <input type="checkbox"/> B
<input type="checkbox"/> Medical Device Directive 93/42/EEC (EMC) Std: _____	<input type="checkbox"/> BSMI: Class <input type="checkbox"/> A <input type="checkbox"/> B (Separate Report)
<input type="checkbox"/> Vehicle Directive: <input type="checkbox"/> 2001/3/EC (EMC) <input type="checkbox"/> 2004/104/EC (EMC) <input type="checkbox"/> Other Vehicle Std: _____	<input type="checkbox"/> Canada: Class <input type="checkbox"/> A <input type="checkbox"/> B
<input type="checkbox"/> FDA Reviewers Guidance for Premarket Notification Submissions (EMC)	<input type="checkbox"/> Australia: Class <input type="checkbox"/> A <input type="checkbox"/> B
	<input type="checkbox"/> Other: _____

Third Party Certification, if applicable (*Signature on Page 6 Required)

Attestation of Conformity (AoC)* EMC Certification (used with Octagon Mark)*
 Certificate of Conformity (CoC)* Compliance Document*
 Protection Class (N/A for vehicles) Class I Class II Class III
(Press F1 when field is selected to show additional information on Protection Class.)
 FCC / TCB Certification Industry Canada / FCB Certification
 E-Mark Certification Taiwan Certification

Form



EMC Test Plan and Constructional Data Form

Attendance

Test will be: Attended by the customer Unattended by the customer

Failure - Complete this section if testing will not be attended by the customer.

If a failure occurs, TÜV SÜD America should:

- Call contact listed above, if not available then stop testing. (After hrs phone): _____
- Continue testing to complete test series.
- Continue testing to define corrective action.
- Stop testing.

EUT Specifications and Requirements

Length: 4" Width: 1" Height: 3" Weight: 1lbs

Power Requirements

Regulations require testing to be performed at typical power ratings in the countries of intended use. (i.e., European power is typically 230 VAC 50 Hz or 400 VAC 50 Hz, single and three phase, respectively)

Voltage: 6vdc (If battery powered, make sure battery life is sufficient to complete testing.)

of Phases: _____

Current (Amps/phase(max)): _____ Current (Amps/phase(nominal)): _____

Other _____

Other Special Requirements

Typical Installation and/or Operating Environment

(i.e. Hospital, Small Business, Industrial/Factory, etc.)

Office, presentation room

EUT Power Cable

<input type="checkbox"/> Permanent	OR	<input type="checkbox"/> Removable	Length (in meters): _____
<input type="checkbox"/> Shielded	OR	<input type="checkbox"/> Unshielded	
<input type="checkbox"/> Not Applicable			

EMC Test Plan and Constructional Data Form

Type	EUT Interface Ports and Cables				Qty	Shielding		Termination	Connector Type	Port Termination	Length tested (in meters)	Removable	Permanent							
	Analog	Digital	During Test			Yes	No													
			Active	Passive		Type	Type													
EXAMPLE: RS232	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	2	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Foil over braid	Coaxial	Metallized 9-pin D-Sub	Characteristic Impedance	6	<input checked="" type="checkbox"/>	<input type="checkbox"/>						
balanced audio	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	braid	coax	mini-XLR	Medallion Mic	.914	<input checked="" type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						
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	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>	<input type="checkbox"/>						<input type="checkbox"/>	<input type="checkbox"/>						

**EMC Test Plan and Constructional Data Form****EUT Software.**

Revision Level: 1.0

Description: normal operation firmware

Equipment Under Test (EUT) Operating Modes to be Tested -- list the operating modes to be used during test. It is recommended the equipment be tested while operating in a typical operation mode. FCC testing of personal computers and/or peripherals requires that a simple program generate a complete line of upper case H's. Provide a general description of all software, firmware, and PLD algorithms used in the equipment. List all code modules as described above, with the revision level used during testing. Consult with your TÜV Product Service Representative if additional assistance is required.

1. Transmitter testing. Belt pack unit is connected to Medallion unit with lanyard. Transmit frequency may be changed via DIP switch settings.
- 2.
- 3.

Equipment Under Test (EUT) System Components -- List and describe all components which are part of the EUT. For FCC & Taiwan testing a minimum configuration is required. (ie. Mouse, Printer, Monitor, External Disk Drive, Motherboard, etc)

Description	Model #	Serial #	FCC ID #
AutoTrak Belt Pack Unit	998-7210-000		
AutoTrak Medallion Unit	998-7220-000		

Form



EMC Test Plan and Constructional Data Form

Support Equipment -- List and describe all support equipment which is not part of the EUT. (i.e. peripherals, simulators, etc)
This information is required for FCC & Taiwan testing.

<i>Description</i>	<i>Model #</i>	<i>Serial #</i>	<i>FCC ID #</i>
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Oscillator Frequencies

<i>Manufacturer</i>	<i>Frequency</i>	<i>Derived Frequency</i>	<i>Component # / Location</i>	<i>Description of Use</i>
Microchip	12mhz	12mhz	U4 Belt Pack Unit	control microprocessor

Power Supply

Manufacturer	Model #	Serial #	Type
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____
			<input type="checkbox"/> Switched-mode: (Frequency) _____ <input type="checkbox"/> Linear <input type="checkbox"/> Other: _____

Power Line Filters

<i>Manufacturer</i>	<i>Model #</i>	<i>Location in EUT</i>

EMC Test Plan and Constructional Data Form

Critical EMI Components (Capacitors, ferrites, etc.)

Description	Manufacturer	Part # or Value	Qty	Component # / Location

EMC Critical Detail -- Describe other EMC Design details used to reduce high frequency noise.

PLEASE ENTER NAMES BELOW (INSERT ELECTRONIC SIGNATURE IF POSSIBLE)

Authorization (Signature Required if a Third Party Certification is checked on pg 1)

William Fischer

5-8-10

Customer authorization to perform tests
according to this test plan.

Date

William Fischer

5-8-10

Test Plan/CDF Prepared By (please print)

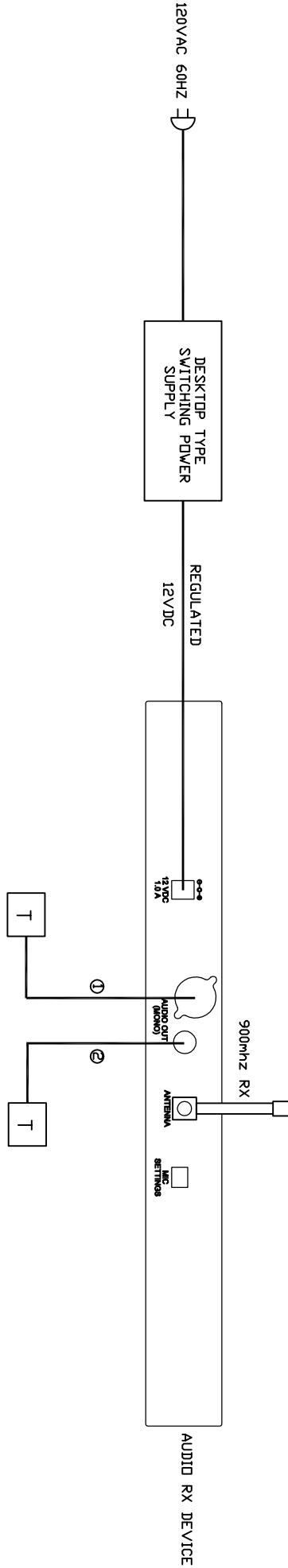
Date

VADDIO
AUTOTRAK AUDIO
INTERFACE

EMI TEST CONFIGURATION

998-7200-002

- ① Cable 12' XLR to XLR Shielded Passive Termination
- ② Cable 6' RCA to RCA Shielded Passive Termination
- ③ Cable 3' Mini-XLR to Permanent Attachment. Internal audio coax shielded.



Appendix B

Measurement Protocol



MEASUREMENT PROTOCOL

GENERAL INFORMATION

Test Methodology

Emission testing is performed according to the procedures in ANSI C63.4-2003.

Measurement Uncertainty

The test system for conducted emissions is defined as the LISN, tuned receiver or spectrum analyzer, and coaxial cable. The test system has a measurement uncertainty of ± 1.8 dB. The test system for radiated emissions is defined as the antenna, the pre-amplifier, the spectrum analyzer and the coaxial cable. The test system has a measurement uncertainty of ± 4.8 dB. The equipment comprising the test systems is calibrated on an annual basis.

Justification

The Equipment Under Test (EUT) is configured in a typical user arrangement in accordance with the manufacturer's instructions. A cable is connected to each available port and either terminated with a peripheral into its characteristic impedance or left unterminated. When appropriate, the cables are manually manipulated with respect to each other to obtain maximum emissions from the unit.

Conducted Emissions

The final level, in $\text{dB}\mu\text{V}$, equals the EMI receiver level plus the cable loss and LISN factor.

Radiated Emissions

The final level, in $\text{dB}\mu\text{V/m}$, equals the reading from the spectrum analyzer (Level $\text{dB}\mu\text{V}$), adding the antenna correction factor and cable loss factor (Factor dB) to it, and subtracting the preamp gain (and duty cycle correction factor, if applicable). This result then has the limit subtracted from it to provide the Delta, which gives the tabular data as shown in the data sheets in Attachment A. Intentional radiators are rotated through 3 orthogonal axes to determine the test position yielding the maximum emission levels.

Example:

FREQ (MHz)	LEVEL ($\text{dB}\mu\text{V}$)	CABLE/ANT/PREAMP (dB)	FINAL (dB)	POL/HGT/AZ (m)	DELTA1 (deg)
60.80	42.5Qp +	1.2 + 10.9 - 25.5 =	29.1	V 1.0 0.0	-10.9