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FEDERAL COMMUNICATIONS COMMISSION  
Registration number: 282399

Report No.: 04.05.0994EF  
Page: 1 of 14  
FCC ID: RF7WR-3

## ***FCC TEST REPORT***

**Application No.** : 04.05.0994EF  
**Applicant** : STL INTERNATIONAL LTD  
**FCC ID** : RF7WR-3

**Fundamental Frequency** : 915 MHz

**Equipment under Test (EUT):**

**Name** : WIRELESS RECEIVER  
**Model** : WR-3

**Standards** : FCC PART 15, SUBPART C : 2002

**Date of Receipt** : 10 May 2004

**Date of Test** : 26 to 27 May 2004

**Date of Issue** : 03 June 2004

<b>Test Result :</b>	<b>PASS *</b>
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\* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Kent Hsu  
Laboratory Manager

This report refers to the General Conditions for Inspection and Testing Services, printed overleaf

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product and does not permit the use of the SGS PRODUCT CERTIFICATION MARK.. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government.

All test results in this report can be traceable to National or International Standards.



## 2 Contents

	Page
1 COVER PAGE.....	1
2 CONTENTS .....	2
3 GENERAL INFORMATION.....	3
3.1 CLIENT INFORMATION .....	3
3.2 DETAILS OF E.U.T. ....	3
3.3 DESCRIPTION OF SUPPORT UNITS.....	3
3.4 TEST LOCATION .....	3
3.5 OTHER INFORMATION REQUESTED BY THE CUSTOMER.....	3
3.6 TEST FACILITY .....	4
4 TEST RESULTS.....	5
4.1 TEST INSTRUMENTS .....	5
4.2 E.U.T. OPERATION .....	5
4.3 TEST PROCEDURE & MEASUREMENT DATA.....	6
4.3.1 Radiated Emissions .....	6
4.3.2 Conducted Emissions Mains Terminals, 150kHz to 30MHz .....	9
4.3.3 Measurement Data .....	9
4.3.4 Band Edges.....	10
5 PHOTOGRAPHS - RADIATED EMISSION TEST SETUP.....	11
6 PHOTOGRAPHS – CONDUCTED EMISSION TEST SETUP .....	11
7 PHOTOGRAPHS - EUT CONSTRUCTIONAL DETAILS.....	12-14

### **3 General Information**

#### **3.1 Client Information**

Applicant: STL INTERNATIONAL LTD

Address of Applicant: TUNG KONG INDUSTRIAL ZONE.LIU MEI  
VILLAGE,YUEN ZHOU,BOLOU,PRC

#### **3.2 Details of E.U.T.**

Product Name: WIRELESS RECEIVER

Model: WR-3

Power Supply: 120Vac / 60Hz (for AC/DC Adapter supplied)  
AC/AC Adapter: Input: 120Vac/60Hz;  
Output: 9Vdc, 200mA.

Power Cord: 1.8 m , 2 wires unshielding AC cable

#### **3.3 Description of Support Units**

The EUT was tested as an independent unit: a 915MHz radio transmitter.It also as a receiver been tested for another product ( model: WT-2).

#### **3.4 Test Location**

All tests were performed at:-  
SGS-CSTC Standards Technical Services Ltd., Guangzhou Safety & EMC Laboratory, 1/F,  
Building No. 1, Agriculture Machinery Materials Company Warehouse Ltd., Wushan Road  
Shipai, Tianhe District, Guangzhou, China. P.C. 510630.  
Tel: +86 20 3848 1001  
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#### **3.5 Other Information Requested by the Customer**

None.

### **3.6 Test Facility**

The test facility is recognized, certified, or accredited by the following organizations:

- **NVLAP – Lab Code: 200611-0**  
SGS-CSTC Standards Technical Services Co., Ltd., Guangzhou EMC Laboratory is recognized under the National Voluntary Laboratory Accreditation Program (NVLAP/NIST). NVLAP Code: 2000611-0. Effective through February 2, 2003.
- **ACA**  
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our NVLAP accreditation.
- **VCCI**  
The 3m Semi-anechoic chamber and Shielded Room (11.5m x 4m x 4m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1599 and C-1706 respectively.  
Date of Registration: February 28, 2003. Valid until May 30, 2005
- **SGS UK(Certificate No.: 32), SGS-TUV SAARLAND and SGS-FINKO**  
Have approved SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory as a supplier of EMC TESTING SERVICES and SAFETY TESTING SERVICES.
- **CNAL – LAB Code: L0141**  
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of Testing Laboratories.
- **FCC – Registration No.: 282399**  
SGS-CSTC Standards Technical Services Co., Ltd., EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 282399, May 31, 2002. With the above and NVLAP, SGS-CSTC is an authorized test laboratory for the DoC process.

## 4 Test Results

### 4.1 Test Instruments

Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Date (dd-mm-yy)	Cal.Due date (dd-mm-yy)
3mSemi-Anechoic Chamber	Frankonia	N/A	N/A	16-02-2004	15-02-2005
EMI Test Receiver	Rohde & Schwarz	ESCS30	100085	05-11-2003	04-11-2004
EMI Test Software	Rohde & Schwarz	ES-K1	N/A	N/A	N/A
Coaxial cable	SGS	N/A	N/A	05-12-2003	04-12-2004
Bilog Type Antenna	Schaffner -Chase	CBL6143	5070	18-01-2004	17-01-2005
Horn Antenna	Rohde & Schwarz	HF906	100095	02-04-2004	01-04-2005
Spectrum Analyzer	Rohde & Schwarz	FSP30	100324	23-12-2003	22-12-2004
0.1-1300 MHz Pre-Amplifier	HP	8447D OPT 010	2944A06252	31-05-2004	30-05-2005
Shielding Room	Frankonia	12 x 4 x 4 m <sup>3</sup>	EMC0103	N/A	N/A
LISN	Schaffner Chase	MNZ050D11	1421	05-11-2003	04-11-2004
EMI Test Receiver	Rohde & Schwarz	ESCS30	100086	10-12-2003	09-12-2004
Coaxial Cable	SGS	2m	EMC0107	02-06-2004	01-06-2005

### 4.2 E.U.T. Operation

Input voltage: 120Vac / 60Hz (for AC/DC Adapter supplied)

Operating Environment:

Temperature: 24.0 °C

Humidity: 52 % RH

Atmospheric Pressure: 1008 mbar

EUT Operation:

Test the EUT in transmitting mode.

### 4.3 Test Procedure & Measurement Data

#### 4.3.1 Radiated Emissions

##### 4.3.1.1 Test in transmitting mode

Test Requirement: FCC Part15 C  
Test Method: Based on FCC Part15 C Section 15.249  
Test Date: 26 May 2004  
Measurement Distance: 3m (Semi-Anechoic Chamber)  
Frequency range 30 MHz - 10,000 MHz for transmitting mode.  
Test instrumentation resolution bandwidth 120 kHz (30 MHz - 1,000 MHz)  
1 MHz (1000 MHz - 10,000 MHz)  
Receive antenna scan height 1 m - 4 m, polarization Vertical/Horizontal

Requirements:

Fundamental Frequency MHz	Field Strength of Fundamental (dBuV/m @ 3m)	Field Strength of Harmonics and Spurious Emissions (dBuV/m @ 3m)
902 to 928	94.0	54.0
2400 to 2483.5	94.0	54.0
5725 to 5875	94.0	54.0
24000 to 24250	108.0	68.0

The fundamental frequency of the EUT is 915MHz

The limit for average field strength dBuV/m for the fundamental frequency= 94.0 dBuV/m.

No fundamental is allowed in the restricted bands.

The limit for average field strength dBuV/m for the harmonics and spurious frequencies = 54.0 dBuV/m. Spurious in the restricted bands must be less than 54.0 dBuV/m or 15.209.

**Test Procedure:** The procedure used was ANSI Standard C63.4-2000. The receive was scanned from 30MHz to 10GHz. When an emission was found, the table was rotated to produce the maximum signal strength. An initial pre-scan was performed for in peak detection mode using the receiver. The EUT was measured for both the Horizontal and Vertical polarities and performed a pre-test three orthogonal planes. For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. The worst case emissions were reported.

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier .  
The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Peramlifer Factor

The following test results were performed on the EUT:

#### 1. Fundamental emission

Test Frequency (MHz)	Peak (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
915.000	91.2	80.3	114.0	22.8	33.7

Test Frequency (MHz)	Average (dBuV/m)		Limits (dBuV/m)	Margin (dB)	
	Vertical	Horizontal		Vertical	Horizontal
915.000	82.3	70.0	94.0	11.7	24.0

#### 2. Spurious Emissions

Test Frequency (MHz)	Vertical (dBuV/m)		Horizontal (dBuV/m)		Limits (dBuV/m)		Margin (dB)			
							Vertical		Horizontal	
	Peak	AV	Peak	AV	Peak	AV	Peak	AV	Peak	AV
1830.000	53.4	45.3	48.7	32.7	74.0	54.0	20.6	8.7	25.3	21.3
2745.000	46.7	37.4	36.6	30.3	74.0	54.0	27.3	16.6	37.4	23.7
3660.000	32.4	33.8	34.5	34.0	74.0	54.0	41.6	20.2	39.5	20.0
4575. 000	34.8	34.5	35.4	35.2	74.0	54.0	39.2	19.5	38.6	18.8
5490. 000	35.7	35.7	36.5	36.2	74.0	54.0	38.3	18.3	37.5	17.8
6405. 000	35.9	37.3	35.3	36.8	74.0	54.0	38.1	16.7	38.7	17.2
7320. 000	38.0	37.0	37.2	36.5	74.0	54.0	36.0	17.0	36.8	17.5
8235. 000	37.4	38.2	36.6	38.0	74.0	54.0	36.6	15.8	37.4	16.0
9150.000	38.2	37.6	37.8	37.5	74.0	54.0	35.8	16.4	36.2	16.5

According to 15.35 (b) When average radiated emission measurements are specified in the regulations, including emission measurements below 1000 MHz, there is also a limit on the radio frequency emissions, as measured using instrumentation with a peak detector function, corresponding to 20 dB above the maximum permitted average limit for the frequency being investigated unless a different peak emission limit is otherwise specified in the rules, e.g., see Section 15.255.

TEST RESULTS: The unit does meet the FCC requirements

#### 4.3.1.2 Test in receiving mode

Test Requirement: FCC Part15 B  
 Test Method: Based on FCC Part15 B  
 Test Date: 26 May 2004  
 Frequency Range: 30MHz to 1GHz  
 Measurement Distance: 3m  
 Class: Class B  
 Limit:  
     40.0 dB $\mu$ V/m between 30MHz & 88MHz  
     43.5 dB $\mu$ V/m between 88MHz & 216MHz  
     46.0 dB $\mu$ V/m between 216MHz & 960MHz  
     54.0 dB $\mu$ V/m above 960MHz  
 Detector: Peak for pre-scan (120kHz resolution bandwidth)  
             Quasi-Peak if maximised peak within 6dB of limit

The following quasi-peak measurements were performed on the EUT:

Frequency (MHz)	Antenna Polarization	Emission Level (dB $\mu$ V/m)	Limit dB $\mu$ V/m)	Margin (dB)
45.875	Vertical	26.8	40.0	13.2
147.438	Vertical	28.0	43.5	15.5
162.188	Vertical	26.5	43.5	17.0
176.930	Vertical	30.1	43.5	13.4
206.430	Vertical	23.9	43.5	19.6
519.020	Vertical	28.4	46.0	17.6
147.520	Horizontal	28.6	43.5	14.9
162.198	Horizontal	29.3	43.5	14.2
265.240	Horizontal	30.4	46.0	15.6
280.160	Horizontal	31.7	46.0	14.3
339.140	Horizontal	29.6	46.0	16.4
914.882	Horizontal	38.9	46.0	7.1

The field strength is calculated by adding the Antenna Factor, Cable Factor & Peramplifier .  
 The basic equation with a sample calculation is as follows:  
 Final Test Level = Receiver Reading + Antenna Factor + Cable Factor – Peramplifier Factor

TEST RESULTS: The unit does meet the FCC requirements.



#### 4.3.2 Conducted Emissions Mains Terminals, 150kHz to 30MHz

Test Requirement: FCC Part15 B  
 Test Method: ANSI C63.4  
 Test Date: 27 May 2004  
 Frequency Range: 150KHz to 30MHz  
 Class / Severity: Class B  
 Detector: Peak for pre-scan (9kHz Resolution Bandwidth)  
 Operating Environment:  
     Temperature: 24.0 °C      Humidity: 52% RH      Atmospheric Pressure: 1012 Mbar  
 EUT Operation: Test in receiveing mode.For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage.

#### 4.3.3 Measurement Data

An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.

The following Quasi-Peak and Average measurements were performed on the EUT.:

Freq. MHz	Line	QP Level dBuV	Limit dBuV	Margin dB	AV Level dBuV	Limit dBuV	Margin dB
0.156	Live	23.5	65.7	42.2	2.7	55.7	53.0
0.298	Live	22.1	60.3	38.2	-1.5	50.3	51.8
0.372	Live	18.1	58.5	40.4	-2.6	48.5	51.1
0.463	Live	12.5	56.6	44.1	-3.6	46.6	50.2
0.566	Live	13.2	56.0	42.8	-7.1	46.0	53.1
0.759	Live	9.8	56.0	46.2	-8.2	46.0	54.2
0.156	Neutral	22.4	65.7	43.3	2.5	55.7	53.2
0.298	Neutral	21.8	60.3	38.5	-1.6	50.3	51.9
0.372	Neutral	17.6	58.5	40.9	-2.8	48.5	51.3
0.463	Neutral	11.8	56.6	44.8	-3.7	46.6	50.3
0.566	Neutral	12.4	56.0	43.6	-7.2	46.0	53.2
0.759	Neutral	9.3	56.0	46.7	-8.3	46.0	54.3

TEST RESULTS: The unit does meet the FCC requirements.

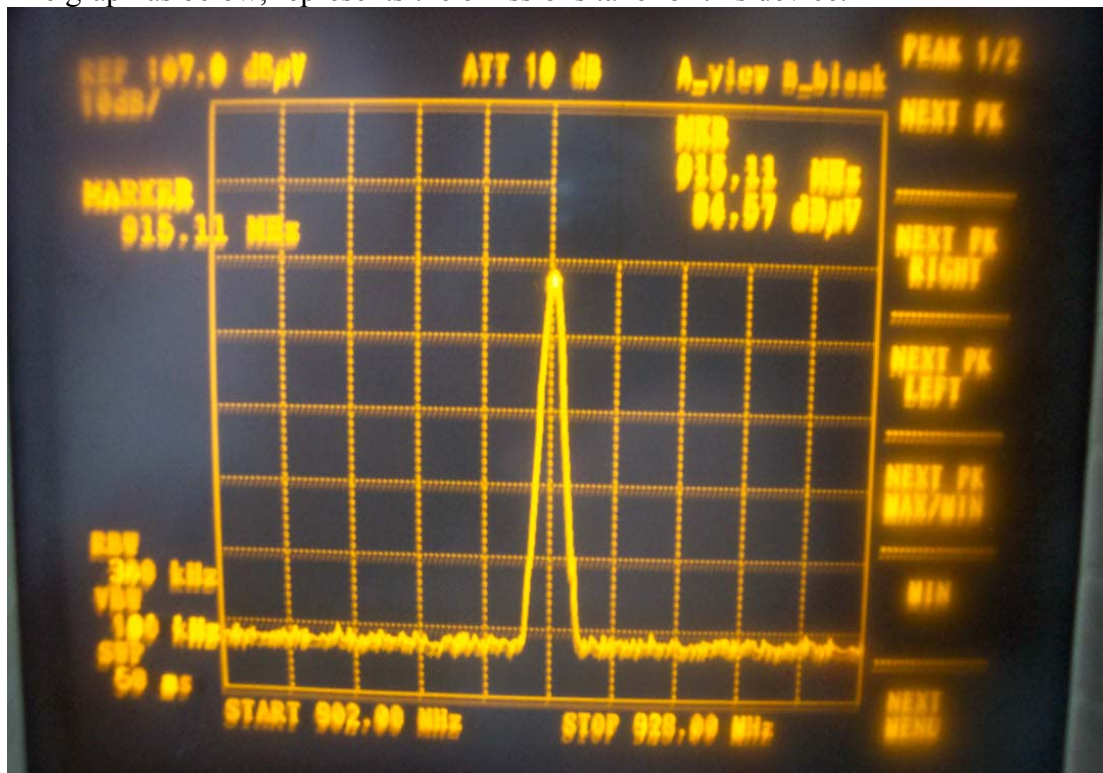
## 4.3.4 Band Edges

Test Requirement: FCC Part15 C  
Test Method: Based on FCC Part15 C Section 15.249  
Test Date: 27 May 2004

Requirements: 15.249 (c) Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.

Method of measurement: A small sample of the transmitter output was fed into the Spectrum Analyzer and the attached plot was taken. The vertical is set to 10dB per division. The horizontal scale is set to 100KHz per division.

The graph as below, represents the emissions take for this device.

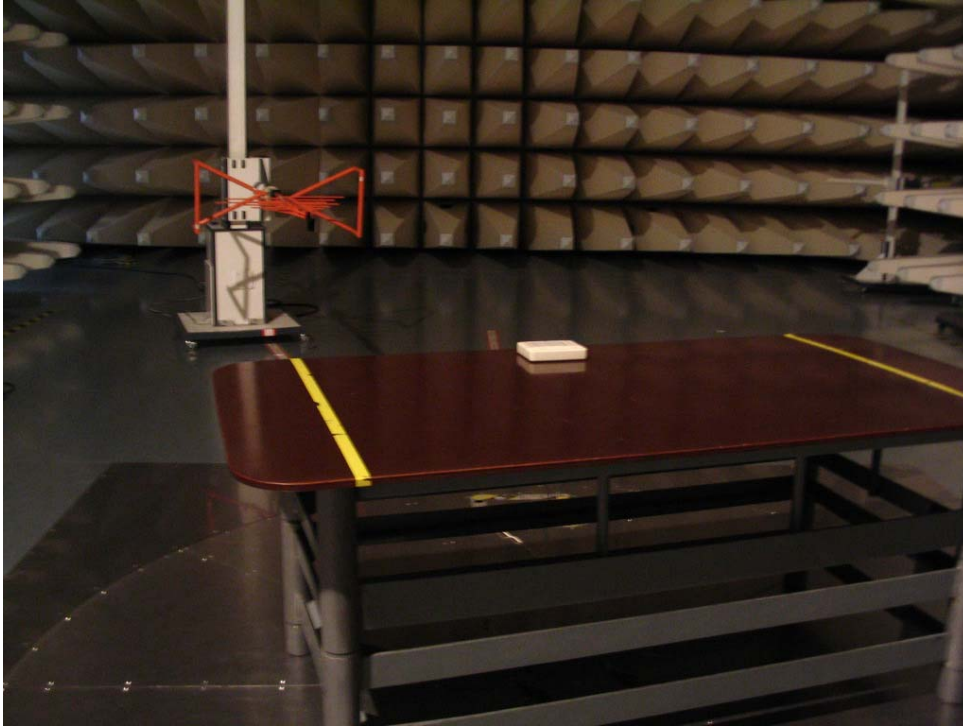


The fundamental frequency is 915MHz.

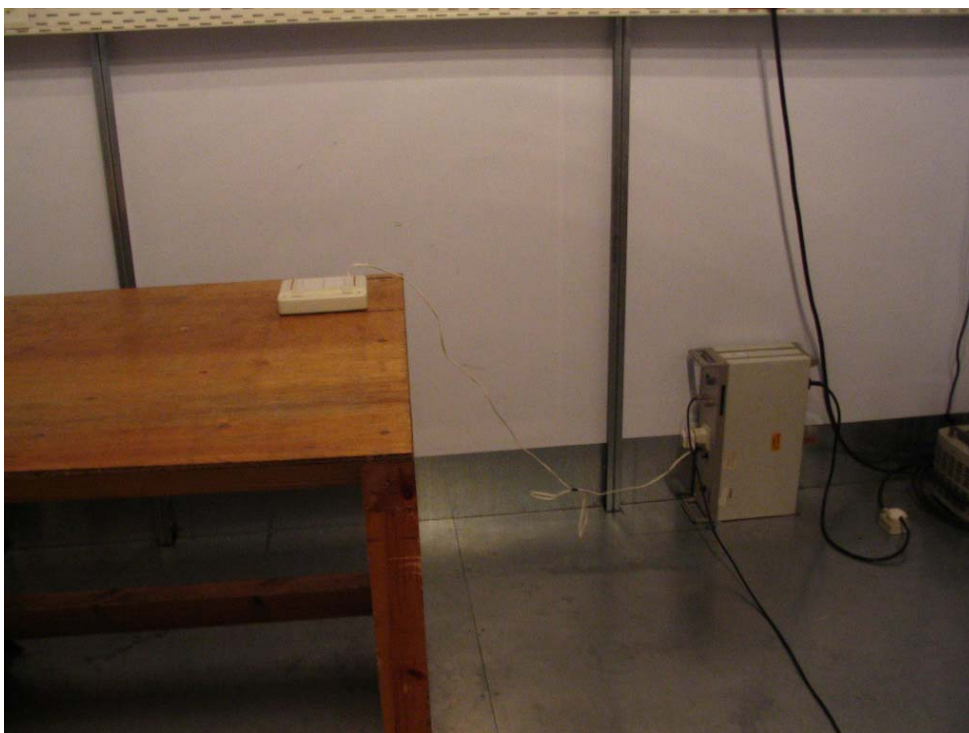
The level of band edges frequency: 902MHz and 928MHz are very below the level of the fundamental or the limits of section 15.209.

The results: The unit does meet the FCC requirements.

## **5 Photographs - Radiated Emission Test Setup**



## **6 Photographs – Conucted Emission Test Setup**



## 7 Photographs - EUT Constructional Details





