

Exhibit B: Test Report
World Telemetry, Inc.
DataLink WTDL0901

Project Number: 04073-10

Prepared for:
World Telemetry, Inc.
6655 South Lewis Ave., Ste. 150
Tulsa , Oklahoma 74136

By

Professional Testing (EMI), Inc.
1601 FM 1460, Suite B
Round Rock, Texas 78664

May 2004

CERTIFICATION
Electromagnetic Interference Test Report
World Telemetry, Inc.
DataLink WTDL0901
(Intentional Radiator Portion)

Table of Contents

Title Page	1
Table of Contents	2
Certificate of Compliance	3
1.0 EUT Description	5
1.01 EUT Operation	5
2.0 Electromagnetic Emissions Testing	5
2.1 Radiated Emissions Measurements	5
2.1.1 Test Procedure	6
2.1.2 Test Criteria	6
2.1.3 Test Results	6
3.0 Antenna Requirement	6
3.1 Evaluation Procedure	7
3.3 Evaluation Results	7
4.0 Modifications to Equipment	7
5.0 List of Test Equipment	7

Figures

FIGURE 1: Radiated Emissions Test Setup	8
---	---

Appendices

Appendix A Emissions Data Sheet	9
Appendix B Occupied Bandwidth Data Sheets	12

THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF PROFESSIONAL TESTING (EMI), INC.



Certificate Of Compliance

Applicant: World Telemetry, Inc.
Applicant's Address: 6655 South Lewis Ave., Ste. 150
Tulsa, Oklahoma 74136
FCC ID: SBOWTDL0901
Project Number: 04073-10
Test Dates: October 16 to 27, 2003

I, Jeffrey A. Lenk, for Professional Testing (EMI), Inc., being familiar with the FCC rules and test procedures have reviewed the test setup, measured data and this report. I believe them to be true and accurate.

The **World Telemetry, Inc., DataLink WTDL0901** was tested to and found to be in compliance with FCC Part 15 Subpart C for an Intentional Radiator.

The highest emissions generated by the above equipment are listed below:

	<u>Frequency (MHz)</u>	<u>Level (dBμV/m)</u>	<u>Limit (dBμV/m)</u>	<u>Margin (dB)</u>
Fundamental	903.02	92.2	94	-1.8
Spurious	221.2	39.7	46	-6.3



Lab Code 200062-0

Jeffrey A. Lenk
President

This report has been reviewed and accepted by World Telemetry, Inc.. The undersigned is responsible for ensuring that **World Telemetry, Inc., DataLink WTDL0901** will continue to comply with the FCC rules.

1.0 EUT Description

The **DataLink WTDL0901** (EUT) is a transceiver used to collect data and relay utility meter information. It is powered by a battery about the size of a “C” cell. L 3v lithium 123 cell..

47 CFR 15.249	Fundamental Transmit Power
47 CFR 15.205 & 15.249	Spurious Radiated Power
47 CFR 15.203	Antenna Requirement

The system tested consisted of the following:

<u>Manufacturer & Model</u>	<u>Serial #</u>	<u>FCC ID #</u>	<u>Description</u>
World Telemetry, Inc., DataLink WTDL0901	N/A	SBOWTDL0901	Wireless Transceiver/Dialer

1.01 EUT Operation

The **DataLink WTDL0901** was continuously transmitting for the purpose of this test.

2.0 Electromagnetic Emissions Testing

Professional Testing (EMI), Inc. (PTI), follows the guidelines of NIST for all uncertainty calculations, estimates and expressions thereof for EMC testing.

2.1 Radiated Emissions Measurements

Radiated emission measurements were made of the Fundamental and Spurious Emission levels for the **DataLink WTDL0901**. Measurements of the occupied bandwidth were also made.

Measurements of the maximum emission levels for the fundamental and the spurious/harmonic emissions of the **DataLink WTDL0901** were made at the Professional Testing "Open Field" Site 3, located in Round Rock, Texas to determine the radio noise radiated from the EUT. A “Description of Measurement Facilities” has been submitted to the FCC and approved pursuant to Section 2.948 of CFR 47 of the FCC rules.

Tests of the fundamental for the device were performed to determine the worst case polarization of the devices. The fundamental emissions of the device were measured with the antennas of the device in the three orthogonal axes.

2.1.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable which allows 360 degree rotation. For measurements of the fundamental signal, a measurement antenna was positioned at a distance of 3 meters as measured from the closest point of the EUT. For spurious/harmonic measurements above 1 GHz, the measurement antenna was placed 1 meter from the EUT. The radiated emissions were maximized by rotating the EUT.

A Spectrum Analyzer with peak detection was used to find the maximums of the radiated emissions during the variability testing. A drawing showing the test setup is given as Figure 1.

2.1.2 Test Criteria

The table below shows FCC Part 15.249 radiated limits for an intentional radiator operating at 903 MHz band. FCC Part 15.249 allows the use of its spurious limit which is higher than the 15.209 limit normally associated with the restricted bands outlined in 15.205. The spurious measurements of the harmonic were performed to the 10th harmonic of the fundamental. The reference distance for each limit is also shown in this table.

<u>Signal Type</u>	<u>Test Distance (Meters)</u>	<u>Field Strength</u>	
		<u>(μV/m)</u>	<u>(dBμV/m)</u>
Fundamental 903.022 MHz	3	50,000	94
Harmonics (2nd through 10th)	3	500	54

Note: Radiated emissions above 1000 MHz were measured at 1 meter and the limit was increased by 9.5 dB.

2.1.3 Test Results

The radiated test data for the fundamental is included in Appendix A. Peak detection was used during the test and the corrected signal level was then averaged to account for the duty cycle of the pulsed transmission of the 903 MHz transmitter. The radiated emission test data for the harmonics is included in Appendix A. The emissions were maximized at each frequency and the highest emissions identified were measured using peak detection. The radiated emissions generated by the **DataLink WTDL0901** are below the FCC Part 15.249 maximum emission criteria.

3.0 Antenna Requirement

An analysis of the **DataLink WTDL0901** was performed to determine compliance with Section 15.203 of the Rules. This section requires specific handling and control of antennas used for devices subject to regulations under the Intentional Radiator portions of Part 15.

3.1 Evaluation Procedure

The structure and application of the **DataLink WTDL0901** were analyzed with respect to the rules. The antenna for the DataLink is a wire that is soldered to the PCB and is inside of the EUT housing and is not accessible to the user. An auxiliary antenna port is not present.

3.2 Evaluation Criteria

Section 15.203 of the rules states that the subject device must meet at least one of the following criteria:

- (a) Antenna be permanently attached to the unit.
- (b) Antenna must use a unique type of connector to attach to the EUT.
- (c) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

3.3 Evaluation Results

The **DataLink WTDL0901** meets the criteria of this rule by virtue of having an internal antenna not accessible to the user. The EUT is therefore compliant with §15.203.

4.0 Modifications to Equipment

C-31 filled with 0.1 µf. C-27 filled with 6pF.

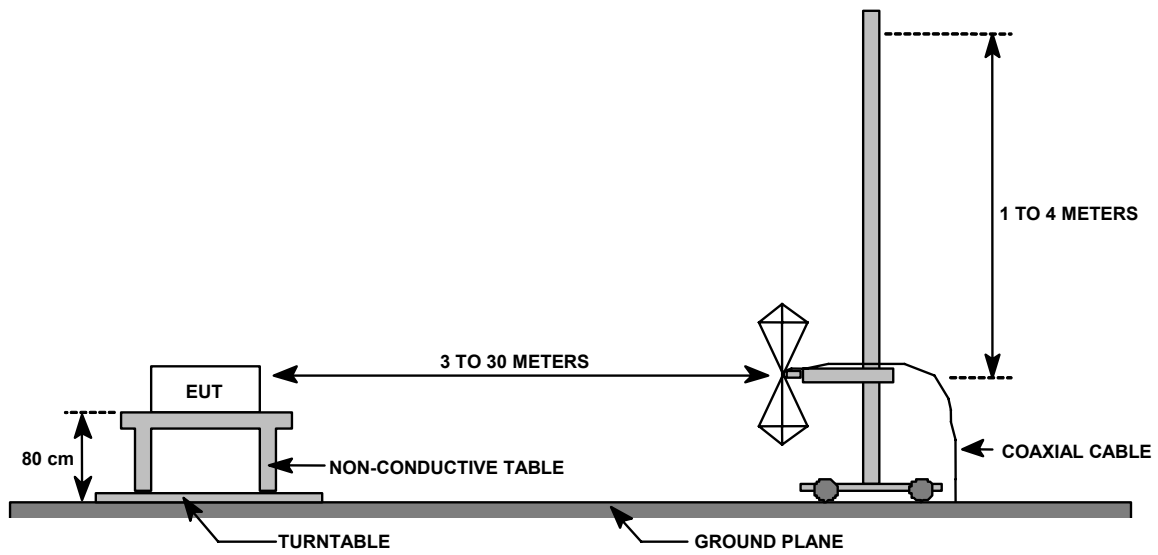
5.0 List of Test Equipment

A list of the test equipment utilized to perform the testing is given below. The date of calibration is given for each.

Electromagnetic Emissions Test Equipment

<u>Device</u>	<u>Description</u>	<u>Calibration Due</u>
EMCO 3146	Log Periodic Antenna	December 2004
HP 85650A	Quasi Peak Adapter	November 2004
HP 8566B	Spectrum Analyzer	November 2004
HP 8447D	Preamplifier	November 2004
Compliance Design B-100	Biconical Antenna	December 2004
Tektronix 2706	RF Preselector	January 2005
MITEQ	20GHz Preamplifier	May 2005
MITEQ	18GHz 20dB Preamplifier	June 2004
EMCO 3115	Ridge Guide Antenna	June 2004

FIGURE 1: Radiated Emissions Test Setup



**Radiated Data Sheet
Fundamental and Spurious
World Telemetry, Inc.
DataLink WTDL0901
Peak Detection**

Test Date: October 22, 2003
Measurement Distance (Meters): 3
-6 level, two capacitors added

Vertical

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elevatio n (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	-10 dBm								
903.02	30	2	74.6	26.0	25.2	11.5	85.3	94	-8.7
907.38	30	2	34.2	26.1	25.2	11.7	45.0	46	-1.0
905.19	30	2	33.1	26.0	25.2	11.6	43.8	46	-2.2
250.683	200	2	32.7	26.6	14.4	6.5	27.0	46	-19.0
235.953	200	2	32.2	26.6	13.8	6.3	25.7	46	-20.3
221.208	120	1	37	26.6	13.3	6.1	29.7	46	-16.3

Horizontal

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elevatio n (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Corrected Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
	-10 dBm								
903.02	90	1	81.5	26.0	25.2	11.5	92.2	94	-1.8
907.38	90	1	38.7	26.1	25.2	11.7	49.5	46	3.5
905.19	90	1	37.4	26.0	25.2	11.6	48.1	46	2.1
398.15	90	1	31	26.9	18.1	7.4	29.6	46	-16.4
368.66	90	1	33	27.0	17.7	7.4	31.1	46	-14.9
250.683	120	1.5	45.1	26.6	14.4	6.5	39.4	46	-6.6
235.953	120	1.5	42.3	26.6	13.8	6.3	35.8	46	-10.2
221.208	120	1.3	47	26.6	13.3	6.1	39.7	46	-6.3
206.452	120	1.3	38.8	26.7	13.1	5.7	30.9	44	-13.1
117.976	270	2.5	36.8	26.5	12.6	4.1	27.1	44	-16.9

TEST ENGINEER: Mike Royer

Microwave Radiated Data Sheet
Fundamental and Harmonics
World Telemetry, Inc.
DataLink WTDL0901
Peak Detection

Test Date: October 24, 2003
Measurement Distance (Meters): 1
-10 level, two capacitors added

Vertical

Corrected Level = Recorded Level - Amplifier Gain + Antenna Factor + Cable Loss

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/M)	Cable Loss (dB)	Corrected Level (dBuV/M)	Limit (dBuV/M)	Margin (dB)
1806	maximum	1	39.7	22.9	26.7	2.4	45.9	63.5	-17.6
2709	maximum	1	30.6	22.6	29.3	3.0	40.3	63.5	-23.2
3612	maximum	1	26.1	22.9	31.9	3.6	38.7	63.5	-24.8
4515	noise	floor	14	23.2	33.3	4.1	28.2	63.5	-35.3
5418	noise	floor	14	23.0	34.9	4.4	30.3	63.5	-33.2
6321	noise	floor	17.2	22.2	35.2	5.1	35.2	63.5	-28.3
7224	noise	floor	17.2	21.4	36.8	5.4	38.0	63.5	-25.5
8127	noise	floor	17.2	21.2	37.5	5.3	38.9	63.5	-24.6
9030	noise	floor	17.2	21.1	37.3	5.6	39.0	63.5	-24.5
9933	noise	floor	17.2	20.4	38.0	6.1	41.0	63.5	-22.5

Horizontal

Corrected Level = Recorded Level - Amplifier Gain + Antenna Factor + Cable Loss

Freq. (MHz)	EUT Dir (Deg.)	Antenna Elevation (Meters)	Recorded Level (dBuV)	Amplifier Gain (dB)	Antenna Factor (dB/M)	Cable Loss (dB)	Corrected Level (dBuV/M)	Limit (dBuV/M)	Margin (dB)
1806	maximum	1	40.8	22.9	26.7	2.4	47.0	63.5	-16.5
2709	maximum	1	23.5	22.6	29.3	3.0	33.2	63.5	-30.3
3612	maximum	1	16.4	22.9	31.9	3.6	29.0	63.5	-34.5
4515	noise	floor	14	23.2	33.3	4.1	28.2	63.5	-35.3
5418	noise	floor	14	23.0	34.9	4.4	30.3	63.5	-33.2
6321	noise	floor	17.2	22.2	35.2	5.1	35.2	63.5	-28.3
7224	noise	floor	17.2	21.4	36.8	5.4	38.0	63.5	-25.5
8127	noise	floor	17.2	21.2	37.5	5.3	38.9	63.5	-24.6
9030	noise	floor	17.2	21.1	37.3	5.6	39.0	63.5	-24.5
9933	noise	floor	17.2	20.4	38.0	6.1	41.0	63.5	-22.5

TEST ENGINEER: Mike Royer

Appendix B **Occupied Bandwidth Data Sheets**

Occupied Bandwidth Datasheet
World Telemetry, Inc.
DataLink WTDL0901

903 MHz Transmitter

