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## FCC PART 15 SUB PART B

### RECEIVER TEST REPORT

Applicant	DELTA SYSTEMS INC.	
Address	10036 AURORA - HUDSON ROAD 1734 FROST ROAD	
	STREETSBORO OH 44241 USA	
Model Number	2039-500-9	
FCC ID	R932039500	
Product Description	915MHz Receiver	
Date Sample Received	4/16/2007	
Date Tested	4/24/2007	
Tested By	Nam Nguyen	
Approved By	Mario de Aranzeta	
Report Number	909AUT7TestReport.pdf	
Test Results	<input checked="" type="checkbox"/> PASS	<input type="checkbox"/> FAIL

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**



Certificate # 0955-01

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## ATTESTATION STATEMENT

This equipment has been tested in accordance with the standards identified in the referenced test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.



Certificate #0955-01

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.

I attest that the necessary measurements were made by me or under my supervision, at TIMCO ENGINEERING, INC. located at 849 N.W. State Road 45, Newberry, Florida 32669 USA.

**Authorized by:** Mario de Aranzeta

**Function:** Chief Testing Engineer

**Date:** April 26, 2007

## REPORT SUMMARY

Disclaimer	The test result only related to the item tested.
Purpose of Test Report	To demonstrate the compliance with FCC Par15.109 requirements for a receiver.
Applicable Rule(s)	FCC Pt 15.109, ANSI C63.4 2003, RSS-210
Related Report	909BUT7TestReport.pdf (RSS-210)

## TEST ENVIRONMENT AND SYSTEM

Test Facility	The test sites used by Timco Engineering Inc. are located at 849 NW State Road 45 Newberry, FL 32669 USA.
Test Condition:	The temperature was 26°C with a relative humidity of 50%.
Test Exercise (e.g. software description, test signal, etc.):	The DUT was placed in normal operation mode.
Supporting Peripheral Equipment	Not applicable. The device is a stand-alone device.
Deviation to the standard(s)	No deviation from the standard(s)
Modification to the DUT:	No modification was made to the DUT.

## DUT SPECIFICATION

Manufacturer	Delta Systems		
Description	Receiver		
FCC ID	R932039500		
Model Name	2039-500-9		
Family Model(s)	N/A		
Operating Frequency	915MHz		
DUT Power Source	<input type="checkbox"/> 110–120Vac/50– 60Hz <input type="checkbox"/> DC Power <input checked="" type="checkbox"/> Battery Operated Exclusively		
Test Item	<input type="checkbox"/> Prototype	<input checked="" type="checkbox"/> Pre-Production	<input type="checkbox"/> Production
Type of Equipment	<input type="checkbox"/> Fixed	<input type="checkbox"/> Mobile	<input checked="" type="checkbox"/> Portable

**TEST EQUIPMENT LIST**

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/20/07	3/19/10
3-Meter OATS	TEI	N/A	N/A	Listed 1/11/06	1/10/09
Antenna: Biconnical	Eaton	94455-1	1057	CAL 12/12/05	12/12/07
Antenna: Biconnical	Eaton	94455-1	1096	CAL 10/11/06	10/11/08
Antenna: Biconnical	Electro-Metrics	BIA-25	1171	CAL 4/29/05	4/29/07
Analyzer Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/13/05	4/13/07
Analyzer Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 9/5/05	9/5/07
Analyzer Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/13/05	4/13/07
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/5/06	10/5/08
LISN	Electro-Metrics	EM-7820	2682	CAL 4/28/05	4/28/07
Antenna: Log-Periodic	Eaton	96005	1243	CAL 12/14/05	12/14/07

## TEST PROCEDURE

**Radiation Interference:** The test procedure used was ANSI C63.4-2003 using a spectrum analyzer with a pre-selector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The video bandwidth was always greater than or equal to the RBW.

**Formula Of Conversion Factors:** The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

**Example:**

$$\begin{array}{l} \text{Freq (MHz)} \quad \text{Meter Reading} \quad + \text{ACF} \quad + \text{CL} \quad = \text{FS} \\ 33 \quad \quad \quad 20 \text{ dBuV} \quad \quad + 10.36 \text{ dB/m} \quad + 0.40 \text{ dB} = 30.36 \text{ dBuV/m @ 3m} \end{array}$$

**ANSI C63.4-2003 Measurement Procedures:** The DUT was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

If powerline conducted testing was required for this device, the DUT was setup as described in ANSI C63.4-2003 with the DUT 40 cm from the vertical ground wall.

## RADIATED SPURIOUS EMISSIONS

**Rules Part No.:** 15.109

**Requirements:**

Frequency	Limits
30 – 88 MHz	40.0 dB $\mu$ V/m measured @ 3 meters
80 – 216 MHz	43.5 dB $\mu$ V/m measured @ 3 meters
216 – 960 MHz	46.0 dB $\mu$ V/m measured @ 3 meters
Above 960 MHz	54.0 dB $\mu$ V/m measured @ 3 meters

Test Data:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity V/H	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
915.0	925.70	6.6	H	1.99	23.41	32.00	14.00
915.0	925.70	8.4	V	1.99	22.66	33.05	12.95
915.0	1,851.40	7.6	H	2.78	30.31	40.69	13.31
915.0	1,851.40	8.2	V	2.78	30.31	41.29	12.71
915.0	2,777.10	6.8	H	3.44	32.93	43.17	10.83
915.0	2,777.10	7.5	V	3.44	32.93	43.87	10.13
915.0	3,702.80	6.6	H	4.23	33.46	44.29	9.71
915.0	3,702.80	7.3	V	4.23	33.46	44.99	9.01
915.0	4,628.50	6.4	H	4.81	34.20	45.41	8.59
915.0	4,628.50	7.6	V	4.81	34.20	46.61	7.39

Emissions attenuated more than 20 dB below the permissible value are not reported.

## POWER LINE CONDUCTED INTERFERENCE

**Rules Part No.:** Part 15.107

**Requirements:**

Frequency (MHz)	Quasi Peak Limits (dBuV)	Average Limits (dBuV)
0.15 – 0.5	66 – 56 *	56 – 46 *
0.5 – 5.0	56	46
5.0 – 30	60	50

\* Decreases with the logarithm of the frequency

**Test Result:** Not applicable because the DUT is battery operated exclusively