



**CMA Testing  
and Certification  
Laboratories**  
廠商會檢定中心

## **TEST REPORT**

Report No. : AJ015049-001 Date : 2007 August 22

Application No. : LJ211992(2)

Client : Learning Curve Brands, Inc  
1111 W. 22nd Street Suite 320,  
Oak Brook, IL 60523,  
United States

Sample Description : One(1) submitted sample(s) stated to be John Deere 24" Radio Control Dozer  
of Model No. 15957  
Radio Frequency : 49.860MHz Transmitter  
Rating : 4 x 1.5V AA size batteries  
No. of submitted sample : Two (2) piece(s) \*\*\*

Date Received : 2007 May 21

Test Period : 2007 May 26 – 2007 June 04

Test Requested : FCC Part 15 Certification.

Test Method : 47 CFR Part 15 (10-1-05 Edition)  
ANSI C63.4 – 2003

Test Result : See attached sheet(s) from page 2 to 11.

Conclusion : The submitted sample was found to comply with requirement of FCC Part 15  
Subpart C.

*For and on behalf of*  
CMA Industrial Development Foundation Limited

Authorized Signature :

Danny Chui  
Deputy Manager - EL. Division

FCC ID: BMW-15915TX49

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**CMA Industrial Development Foundation Limited**

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### **1 General Information**

#### **1.1 General Description**

The equipment under test (EUT) is a transmitter for John Deere 24" Radio Control Dozer. It operates at 49.860MHz and the oscillation of radio control is generated by a crystal. The EUT is powered by 4 x 1.5V AA size batteries. There are two control sticks and five buttons on the EUT. When the control stick or button is pressed, it will transmit different radio control signal to the receiver.

The brief circuit description is listed as follows:

- Q4 and associated circuit act as a RF amplifier.
- X1, Q3 and associated circuit act as an oscillator.
- U1, Q5, Q6 and associated circuit act as an encoder.
- Q1, Q2 and associated circuit act as a voltage regulator.



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### **1.2 Location of the test site**

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003. A Semi-Anechoic Chamber Testing Site is set up for investigation and located at:

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
Fo Tan, Shatin,  
New Territories,  
Hong Kong.

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2003. A shielded room is located at :

Ground Floor, Yan Hing Centre,  
9 – 13 Wong Chuk Yeung Street,  
Fo Tan, Shatin,  
New Territories,  
Hong Kong.



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### **1.3 List of measuring equipment**

| Equipment         | Manufacturer | Model No. | Serial No. | Calibration Due Date |
|-------------------|--------------|-----------|------------|----------------------|
| EMI Test Receiver | R&S          | ESCI      | 100152     | 2007 September 20    |
| Broadband Antenna | Schaffner    | CBL6112B  | 2718       | 2008 May 23          |



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### **2 Description of the radiated emission test**

#### **2.1 Test Procedure**

Radiated emissions measurements are investigated and taken pursuant to the procedures of ANSI C63.4 – 2003.

The equipment under test (EUT) was placed on a non-conductive turntable with dimensions of 1.5m x 1m and 0.8m high above the ground. 3m from the EUT, a broadband antenna mounting on the mast received the signal strength. The turntable was rotated to maximize the emission level. The antenna was then moving along the mast from 1m up to 4m until no more higher value was found. Both horizontal and vertical polarization of the antenna were placed and investigated.

For below 30MHz, a loop antenna with its vertical plane is placed 3m from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. And the centre of the loop shall be 1 m above the ground.

The device was rotated through three orthogonal axes to determine which attitude and configuration produce the highest emission during measurement.

#### **2.2 Test Result**

Peak Detector data was measured unless otherwise stated.

“#” means emissions appearing within the restricted bands shall follow the requirement of section 15.205.

It was found that the EUT meet the FCC requirement.



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### **2.3 Radiated Emission Measurement Data**

#### **Radiated emission**

**pursuant to**

**the requirement of FCC Part 15 subpart C**

| Frequency<br>(MHz) | Polarity<br>(H/V) | Reading at<br>3m<br>(dB $\mu$ V/m) | Antenna and<br>Cable factor<br>(dB) | Average<br>Factor<br>(dB) | Field<br>Strength<br>(dB $\mu$ V/m) | Limit at 3m<br>(dB $\mu$ V/m) | Margin<br>(dB) |
|--------------------|-------------------|------------------------------------|-------------------------------------|---------------------------|-------------------------------------|-------------------------------|----------------|
| 49.860             | V                 | 59.7                               | 10.6                                | -6.7                      | 63.6                                | 80.0                          | -16.4          |
| 99.720             | H                 | 20.4                               | 9.5                                 | -                         | 29.9                                | 43.5                          | -13.6          |
| 149.578            | H                 | 10.9                               | 12.0                                | -                         | 22.9                                | 43.5                          | -20.6          |
| 199.440            | H                 | 12.6                               | 9.5                                 | -                         | 22.1                                | 43.5                          | -21.4          |
| #249.304           | H                 | 16.9                               | 9.8                                 | -                         | 26.7                                | 46.0                          | -19.3          |
| 299.160            | H                 | 9.6                                | 13.9                                | -                         | 23.5                                | 46.0                          | -22.5          |
| 349.024            | H                 | 10.3                               | 14.9                                | -                         | 25.2                                | 46.0                          | -20.8          |
| 398.882            | H                 | 11.5                               | 14.9                                | -                         | 26.4                                | 46.0                          | -19.6          |
| 448.740            | H                 | 9.8                                | 17.9                                | -                         | 27.7                                | 46.0                          | -18.3          |
| 498.598            | H                 | 10.0                               | 17.9                                | -                         | 27.9                                | 46.0                          | -18.1          |



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### **3 Description of the Line-conducted Test**

#### **3.1 Test Procedure**

Conducted emissions measurements are investigated and also taken pursuant to the procedures of ANSI C63.4 – 2003. The EUT was setup as described in the procedures, and both lines were measured.

#### **3.2 Test Result**

No measurement is required as the EUT is a battery-operated product.

#### **3.3 Graph and Table of Conducted Emission Measurement Data**

Not Applicable



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### **4 Photograph**

#### **4.1 Photographs of the Test Setup for Radiated Emission and Conduction Emission**

For electronic filing, the photos are saved with filename TSup1.jpg to TSup2.jpg.

#### **4.2 Photographs of the External and Internal Configurations of the EUT**

For electronic filing, the photos are saved with filename ExPho1.jpg to ExPho2.jpg and InPho1.jpg to InPho2.jpg.



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### **5 Supplementary document**

The following document were submitted by applicant, and for electronic filing, the document are saved with the following filenames:

| <b>Document</b>         | <b>Filename</b> |
|-------------------------|-----------------|
| ID Label/Location       | LabelSmp.jpg    |
| Block Diagram           | BlkDia.pdf      |
| Schematic Diagram       | Schem.pdf       |
| Users Manual            | UserMan.pdf     |
| Operational Description | OpDes.pdf       |

#### **5.1 Bandwidth**

The plot on saved in TestRpt2.pdf shows the fundamental emission is confined in the specified band. The field strength of any emission appearing between the band edges and up to 10 kHz above and below the band edges (49.81 and 49.91 MHz) is at least 26dB below the carrier level. It meets the requirement of Section 15.235(b).

#### **5.2 Duty cycle**

The duty cycle is simply the on-time divided by the period:

The duration of one cycle = 54.16ms

Effective period of the cycle = 0.94ms x 14 + 0.46ms x 26  
= 25.12ms

Duty Cycle = 25.12ms / 54.16ms  
= 0.46

Therefore, the average factor is found by  $20 \log_{10} 0.46 = -6.7\text{dB}$

#### **5.3 Transmission time**

Not Applicable

#### **5.4 Power Spectral Density**

Not Applicable



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### **6 Appendices**

|      |                                            |   |       |
|------|--------------------------------------------|---|-------|
| A1.  | Photos of the set-up of Radiated Emissions | 1 | page  |
| A2.  | Photos of External Configurations          | 1 | page  |
| A3.  | Photos of Internal Configurations          | 1 | page  |
| A4.  | ID Label/Location                          | 1 | page  |
| A5.  | Bandwidth Plot                             | 1 | page  |
| A6.  | Average Factor                             | 2 | pages |
| A7.  | Block Diagram                              | 1 | page  |
| A8.  | Schematics Diagram                         | 1 | page  |
| A9.  | User Manual                                | 1 | page  |
| A10. | Operation Description                      | 1 | page  |

\*\*\*\*\* End of Report \*\*\*\*\*