

# FCC TEST REPORT

**REPORT NO.:** RF911010R01

**MODEL NO.:** G-RB7 (for Gamepad)  
C-X3A18 (for Receiver Unit)

**RECEIVED:** October 10, 2002

**TESTED:** Oct. 15 ~ Nov. 12, 2002

**APPLICANT:** Logitech Inc.

**ADDRESS:** 6505 Kaiser Drive Fremont, CA 94555-3615

**ISSUED BY:** Advance Data Technology Corporation

**LAB LOCATION:** 47 14th Lin, Chiapau Tsun, Linko, Taipei,  
Taiwan, R.O.C.

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0528  
ILAC MRA



Lab Code: 200102-0

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## 1 CERTIFICATION

**PRODUCT :** Logitech Cordless Controller for X-Box  
**BRAND NAME :** Logitech  
**MODEL NO. :** G-RB7 (for Gamepad)  
C-X3A18 (for Receiver Unit)  
**APPLICANT :** Logitech Inc.  
**STANDARDS :** 47 CFR Part 15, Subpart C (Section 15.249)  
ANSI C63.4-1992

We, **Advance Data Technology Corporation**, hereby certify that one sample of the designation has been tested in our facility from Oct. 15, 2002 to Nov. 12, 2002, The test record, data evaluation and Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's EMC characteristics under the conditions herein specified.

CHECKED BY : Emily Lu , DATE : Nov. 13, 2002  
Emily Lu

APPROVED BY : Dr. Alan Lane , DATE : Nov. 13, 2002  
Dr. Alan Lane, Manager

## 2 SUMMARY OF TEST RESULTS

The EUT has been tested according to the following specifications:

| APPLIED STANDARD: 47 CFR Part 15, Subpart C |                                                    |        |                                                                                   |
|---------------------------------------------|----------------------------------------------------|--------|-----------------------------------------------------------------------------------|
| Standard Section                            | Test Type and Limit                                | Result | REMARK                                                                            |
| 15.207                                      | AC Power Conducted Emission                        | PASS   | Meet the requirement of limit<br>Minimum passing margin is -17.25dBuV at 0.170MHz |
| 15.249                                      | Transmitter Radiated Emissions Spec.: Table 15.209 | PASS   | Meet the requirement of limit<br>Minimum passing margin is -9.50dBuV at 144.00MHz |
| 15.249                                      | Band Edge Measurement                              | PASS   | Meet the requirement of limit                                                     |

### 3 GENERAL INFORMATION

#### 3.1 GENERAL DESCRIPTION OF EUT

|                           |                                                                                                |
|---------------------------|------------------------------------------------------------------------------------------------|
| <b>PRODUCT</b>            | Logitech Cordless Controller for X-Box                                                         |
| <b>MODEL NO.</b>          | G-RB7 (for Gamepad)<br>C-X3A18 (for USB Receiver Unit)                                         |
| <b>POWER SUPPLY</b>       | 6VDC 200mA from Batteries for Gamepad<br>5VDC 500mA from host equipment for XBOX Receiver Unit |
| <b>MODULATION TYPE</b>    | FHSS (FSK)                                                                                     |
| <b>FREQUENCY RANGE</b>    | 2402MHz ~ 2480MHz                                                                              |
| <b>NUMBER OF CHANNEL</b>  | 79                                                                                             |
| <b>ANTENNA TYPE</b>       | Sheet metal inverted-F antenna                                                                 |
| <b>DATA CABLE</b>         | 0.8m (Nonshielded) with ferrite core                                                           |
| <b>I/O PORTS</b>          | XBOX                                                                                           |
| <b>ASSOCIATED DEVICES</b> | NA                                                                                             |

**NOTE:**

1. FCC ID: DZLGRB7 is applied for model number G-RB7 (Gamepad) and FCC ID: DZLCX3A18 is applied for model number C-X3A18 (XBOX Receiver Unit: a transceiver).
2. For more detailed features description, please refer to the manufacturer's specifications or User's Manual.

### **3.2 DESCRIPTION OF TEST MODES**

The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

Test result A is for model G-RB7 and test result B is for model C-X3A18.

### **3.3 GENERAL DESCRIPTION OF APPLIED STANDARDS**

The EUT is a Logitech Cordless Controller for X-Box. According to the specifications of the manufacturer, it must comply with the requirements of the following standards:

**FCC CFR 47 Part 15, Subpart C. (15.249)**  
**ANSI C63.4 : 1992**

All tests have been performed and recorded as per the above standards.

### 3.4 DESCRIPTION OF SUPPORT UNITS

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| NO. | PRODUCT  | BRAND | MODEL NO. | SERIAL NO.               | FCC ID           |
|-----|----------|-------|-----------|--------------------------|------------------|
| 1   | NOTEBOOK | DELL  | PP01L     | TW-09C748-12800-19O-B220 | FCC DoC APPROVED |
| 2   | PRINTER  | EPSON | LQ-300+   | DCGY017096               | FCC DoC APPROVED |
| 3   | MODEM    | ACEEX | 1414      | 980020504                | IFAXDM1414       |

| NO. | SIGNAL CABLE DESCRIPTION OF THE ABOVE SUPPORT UNITS                                                  |
|-----|------------------------------------------------------------------------------------------------------|
| 1   | NA                                                                                                   |
| 2   | 1.2m braid shielded wire, terminated with DB25 and Centronics connector via metallic frame, w/o core |
| 3   | 1.2 m braid shielded wire, terminated with DB25 and DB9 connector via metallic frame, w/o core.      |

**NOTE:** All power cords of the above support units are non shielded (1.8m).

## 4 TEST PROCEDURES AND RESULTS

### 4.1 CONDUCTED EMISSION MEASUREMENT

#### 4.1.1 LIMITS OF CONDUCTED EMISSION MEASUREMENT

| FREQUENCY OF EMISSION (MHz) | CONDUCTED LIMIT (dBμV) |          |
|-----------------------------|------------------------|----------|
|                             | Quasi-peak             | Average  |
| 0.15-0.5                    | 66 to 56               | 56 to 46 |
| 0.5-5                       | 56                     | 46       |
| 5-30                        | 60                     | 50       |

- NOTE:**
1. The lower limit shall apply at the transition frequencies.
  2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.
  3. All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

#### 4.1.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER                         | MODEL NO. | SERIAL NO.   | CALIBRATED UNTIL |
|----------------------------------------------------|-----------|--------------|------------------|
| ROHDE & SCHWARZ Test Receiver                      | ESCS30    | 834115/016   | Mar. 3, 2003     |
| ROHDE & SCHWARZ Artificial Mains Network (For EUT) | ESH3-Z5   | 847265/023   | Jan. 10, 2003    |
| * ROHDE & SCHWARZ 4-wire ISN                       | ENY41     | 838119/028   | Dec. 10, 2002    |
| * ROHDE & SCHWARZ 2-wire ISN                       | ENY22     | 837497/018   | Dec. 10, 2002    |
| EMCO L.I.S.N. (For peripherals)                    | 3825/2    | 9504-2359    | July 10, 2003    |
| Software                                           | Cond-V2L  | NA           | NA               |
| RF cable (JYEBAO)                                  | 5D-FB     | Cable-C03.01 | July 11, 2003    |
| Terminator (For EMCO LISN)                         | NA        | E1-01-300    | Feb. 20, 2003    |
| Terminator (For EMCO LISN)                         | NA        | E1-01-301    | Feb. 20, 2003    |
| Shielded Room                                      | Site 3    | ADT-C03      | NA               |
| VCCI Site Registration No.                         | Site 3    | C-274        | NA               |

- NOTE:**
1. The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
  2. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
  3. “\*”: These equipment are used for conducted telecom port test only (if tested).
  4. The test was performed in ADT Open Site No. 3.





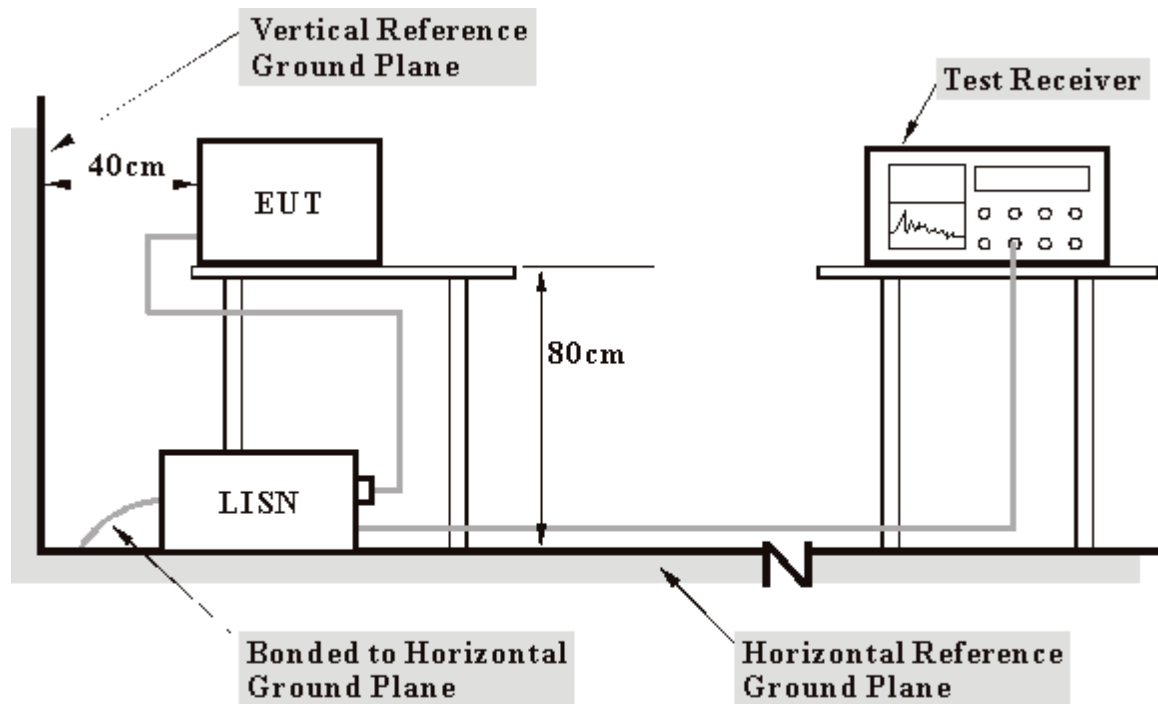
#### 4.1.3 TEST PROCEDURES

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- c. The frequency range from 150 kHz to 30 MHz was searched. Emission levels over 10dB under the prescribed limits could not be reported

#### 4.1.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.1.5 TEST SETUP



- Note:** 1. Support units were connected to second LISN.  
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.1.6 TEST RESULTS (A)

This EUT is excused from investigation of conducted emission, for it is powered by battery only. According to paragraph 15.207(a), measurements to demonstrate compliance with the conducted limited are not required for devices which only employ battery power for operation and which do not operate from the AC power lines or contain provisions for operation while connected to the AC power lines.

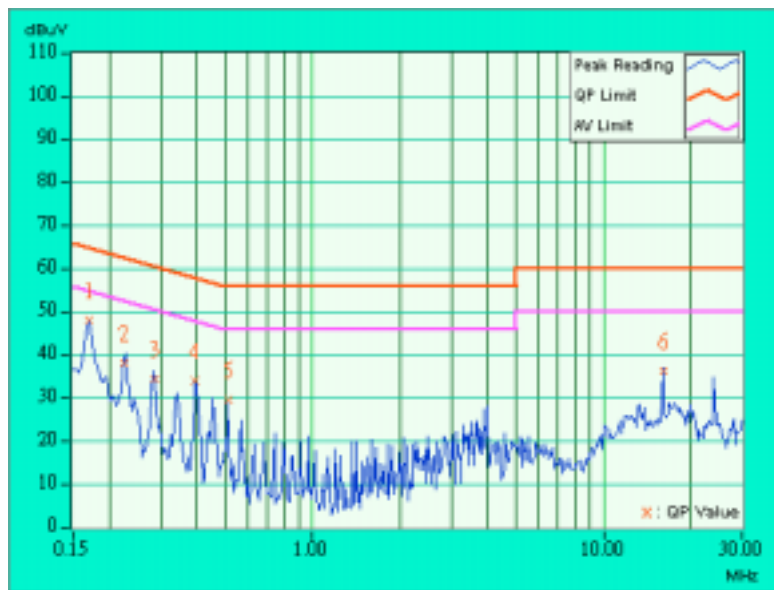
#### 4.1.7 TEST RESULTS (B)

|                                 |                                        |                              |          |
|---------------------------------|----------------------------------------|------------------------------|----------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | C-X3A18  |
| <b>MODE</b>                     | Channel 0                              | <b>6dB BANDWIDTH</b>         | 9 kHz    |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>PHASE</b>                 | Line (L) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 24deg. C, 48%RH, 1005 hPa              | <b>TESTED BY:</b> Cody Chang |          |

| No | Freq.  | Corr. Factor | Reading Value [dB (uV)] |     | Emission Level [dB (uV)] |     | Limit [dB (uV)] |       | Margin (dB) |     |
|----|--------|--------------|-------------------------|-----|--------------------------|-----|-----------------|-------|-------------|-----|
|    | [MHz]  |              | Q.P.                    | AV. | Q.P.                     | AV. | Q.P.            | AV.   | Q.P.        | AV. |
| 1  | 0.170  | 0.10         | 47.53                   | -   | 47.63                    | -   | 64.98           | 54.98 | -17.35      | -   |
| 2  | 0.224  | 0.10         | 37.60                   | -   | 37.70                    | -   | 62.66           | 52.66 | -24.96      | -   |
| 3  | 0.287  | 0.10         | 33.54                   | -   | 33.64                    | -   | 60.62           | 50.62 | -26.98      | -   |
| 4  | 0.396  | 0.10         | 33.49                   | -   | 33.59                    | -   | 57.94           | 47.94 | -24.35      | -   |
| 5  | 0.512  | 0.12         | 28.81                   | -   | 28.93                    | -   | 56.00           | 46.00 | -27.07      | -   |
| 6  | 16.000 | 0.72         | 35.42                   | -   | 36.14                    | -   | 60.00           | 50.00 | -23.86      | -   |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

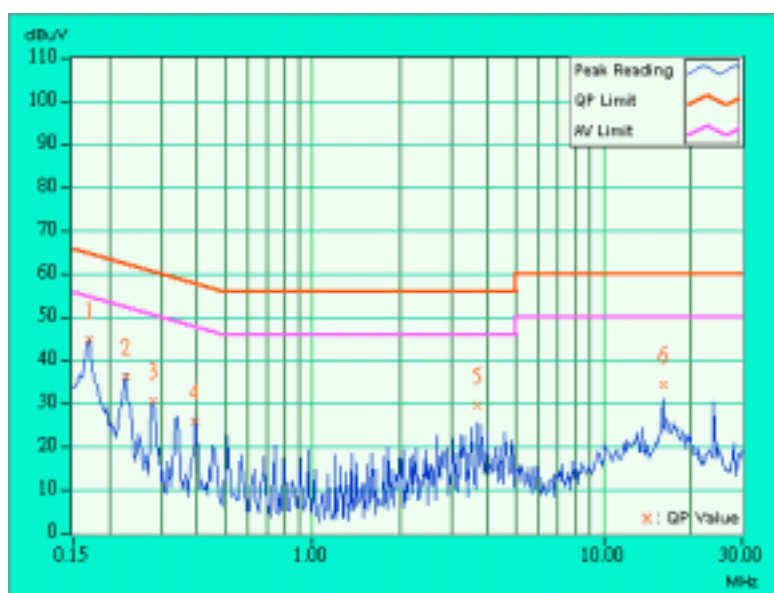


|                                 |                                        |                              |             |
|---------------------------------|----------------------------------------|------------------------------|-------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | C-X3A18     |
| <b>MODE</b>                     | Channel 0                              | <b>6dB BANDWIDTH</b>         | 9 kHz       |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>PHASE</b>                 | Neutral (N) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 24deg. C, 48%RH, 1005 hPa              | <b>TESTED BY:</b> Cody Chang |             |

| No | Freq.  | Corr. Factor | Reading Value [dB (uV)] |     | Emission Level [dB (uV)] |     | Limit [dB (uV)] |       | Margin (dB) |     |
|----|--------|--------------|-------------------------|-----|--------------------------|-----|-----------------|-------|-------------|-----|
|    | [MHz]  | (dB)         | Q.P.                    | AV. | Q.P.                     | AV. | Q.P.            | AV.   | Q.P.        | AV. |
| 1  | 0.170  | 0.10         | 44.19                   | -   | 44.29                    | -   | 64.98           | 54.98 | -20.69      | -   |
| 2  | 0.228  | 0.10         | 35.62                   | -   | 35.72                    | -   | 62.52           | 52.52 | -26.80      | -   |
| 3  | 0.283  | 0.10         | 30.19                   | -   | 30.29                    | -   | 60.73           | 50.73 | -30.44      | -   |
| 4  | 0.396  | 0.10         | 25.57                   | -   | 25.67                    | -   | 57.93           | 47.93 | -32.26      | -   |
| 5  | 3.691  | 0.38         | 28.93                   | -   | 29.31                    | -   | 56.00           | 46.00 | -26.69      | -   |
| 6  | 16.000 | 0.52         | 34.05                   | -   | 34.57                    | -   | 60.00           | 50.00 | -25.43      | -   |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

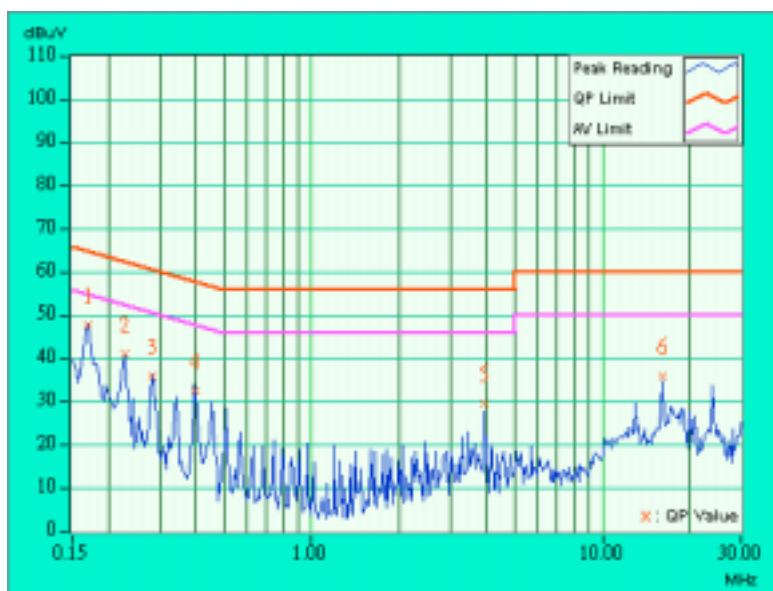


|                                 |                                        |                              |          |
|---------------------------------|----------------------------------------|------------------------------|----------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | C-X3A18  |
| <b>MODE</b>                     | Channel 39                             | <b>6dB BANDWIDTH</b>         | 9 kHz    |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>PHASE</b>                 | Line (L) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 24deg. C, 48%RH, 1005 hPa              | <b>TESTED BY:</b> Cody Chang |          |

| No | Freq.  | Corr. Factor | Reading Value [dB (uV)] |     | Emission Level [dB (uV)] |     | Limit [dB (uV)] |       | Margin (dB) |     |
|----|--------|--------------|-------------------------|-----|--------------------------|-----|-----------------|-------|-------------|-----|
|    | [MHz]  | (dB)         | Q.P.                    | AV. | Q.P.                     | AV. | Q.P.            | AV.   | Q.P.        | AV. |
| 1  | 0.170  | 0.10         | 47.03                   | -   | 47.13                    | -   | 64.98           | 54.98 | -17.85      | -   |
| 2  | 0.228  | 0.10         | 40.34                   | -   | 40.44                    | -   | 62.52           | 52.52 | -22.08      | -   |
| 3  | 0.283  | 0.10         | 35.20                   | -   | 35.30                    | -   | 60.73           | 50.73 | -25.43      | -   |
| 4  | 0.400  | 0.10         | 31.73                   | -   | 31.83                    | -   | 57.85           | 47.85 | -26.02      | -   |
| 5  | 3.918  | 0.49         | 28.95                   | -   | 29.44                    | -   | 56.00           | 46.00 | -26.56      | -   |
| 6  | 16.000 | 0.72         | 35.25                   | -   | 35.97                    | -   | 60.00           | 50.00 | -24.03      | -   |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

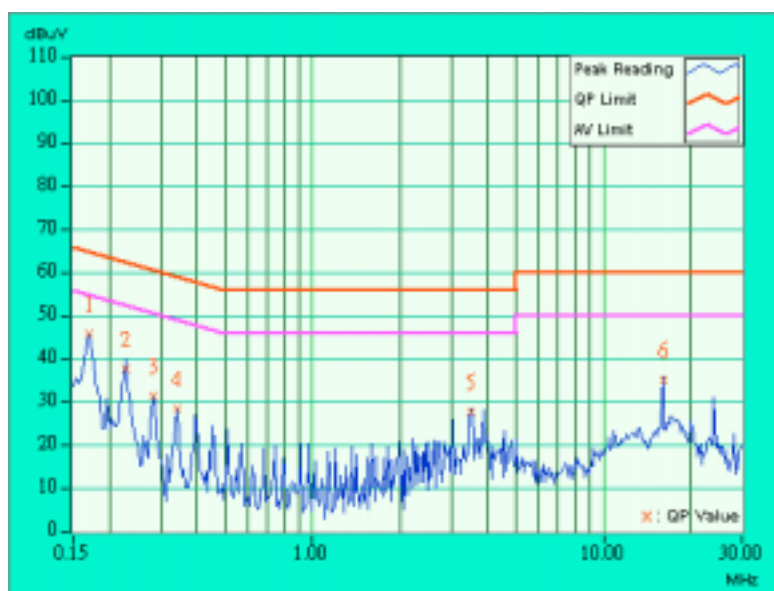


|                                 |                                        |                              |             |
|---------------------------------|----------------------------------------|------------------------------|-------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | C-X3A18     |
| <b>MODE</b>                     | Channel 39                             | <b>6dB BANDWIDTH</b>         | 9 kHz       |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>PHASE</b>                 | Neutral (N) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 24deg. C, 48%RH, 1005 hPa              | <b>TESTED BY:</b> Cody Chang |             |

| No | Freq.  | Corr. Factor | Reading Value [dB (Uv)] |     | Emission Level [dB (uV)] |     | Limit [dB (uV)] |       | Margin (dB) |     |
|----|--------|--------------|-------------------------|-----|--------------------------|-----|-----------------|-------|-------------|-----|
|    | [MHz]  | (dB)         | Q.P.                    | AV. | Q.P.                     | AV. | Q.P.            | AV.   | Q.P.        | AV. |
| 1  | 0.170  | 0.10         | 45.28                   | -   | 45.38                    | -   | 64.98           | 54.98 | -19.60      | -   |
| 2  | 0.228  | 0.10         | 37.12                   | -   | 37.22                    | -   | 62.52           | 52.52 | -25.30      | -   |
| 3  | 0.283  | 0.10         | 30.91                   | -   | 31.01                    | -   | 60.73           | 50.73 | -29.72      | -   |
| 4  | 0.341  | 0.10         | 27.86                   | -   | 27.96                    | -   | 59.17           | 49.17 | -31.21      | -   |
| 5  | 3.523  | 0.38         | 27.13                   | -   | 27.51                    | -   | 56.00           | 46.00 | -28.49      | -   |
| 6  | 16.000 | 0.52         | 34.49                   | -   | 35.01                    | -   | 60.00           | 50.00 | -24.99      | -   |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.

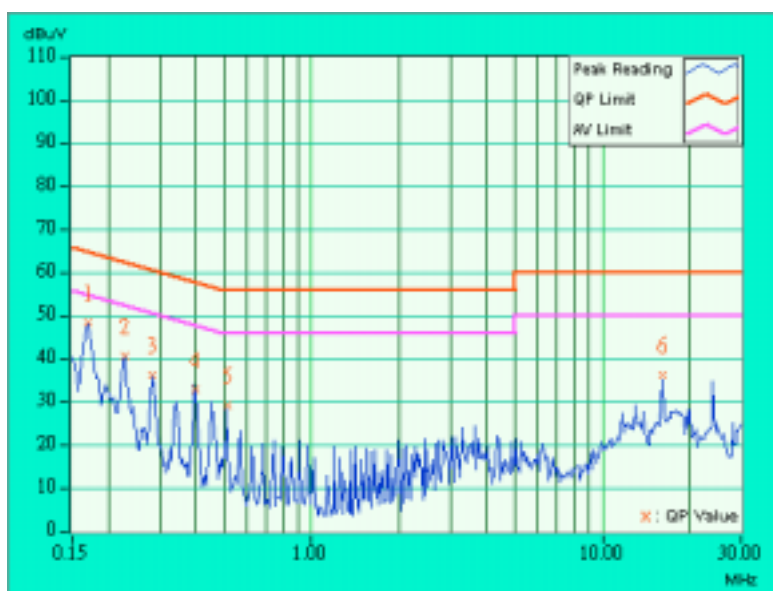


|                                 |                                        |                              |          |
|---------------------------------|----------------------------------------|------------------------------|----------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | C-X3A18  |
| <b>MODE</b>                     | Channel 78                             | <b>6dB BANDWIDTH</b>         | 9 kHz    |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>PHASE</b>                 | Line (L) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 24deg. C, 48%RH, 1005 hPa              | <b>TESTED BY:</b> Cody Chang |          |

| No | Freq.  | Corr. Factor | Reading Value [dB (uV)] |     | Emission Level [dB (uV)] |     | Limit [dB (uV)] |       | Margin (dB) |     |
|----|--------|--------------|-------------------------|-----|--------------------------|-----|-----------------|-------|-------------|-----|
|    | [MHz]  | (dB)         | Q.P.                    | AV. | Q.P.                     | AV. | Q.P.            | AV.   | Q.P.        | AV. |
| 1  | 0.170  | 0.10         | 47.63                   | -   | 47.73                    | -   | 64.98           | 54.98 | -17.25      | -   |
| 2  | 0.228  | 0.10         | 39.96                   | -   | 40.06                    | -   | 62.52           | 52.52 | -22.46      | -   |
| 3  | 0.283  | 0.10         | 35.62                   | -   | 35.72                    | -   | 60.73           | 50.73 | -25.01      | -   |
| 4  | 0.400  | 0.10         | 32.07                   | -   | 32.17                    | -   | 57.85           | 47.85 | -25.68      | -   |
| 5  | 0.512  | 0.12         | 28.51                   | -   | 28.63                    | -   | 56.00           | 46.00 | -27.37      | -   |
| 6  | 16.000 | 0.72         | 35.57                   | -   | 36.29                    | -   | 60.00           | 50.00 | -23.71      | -   |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.



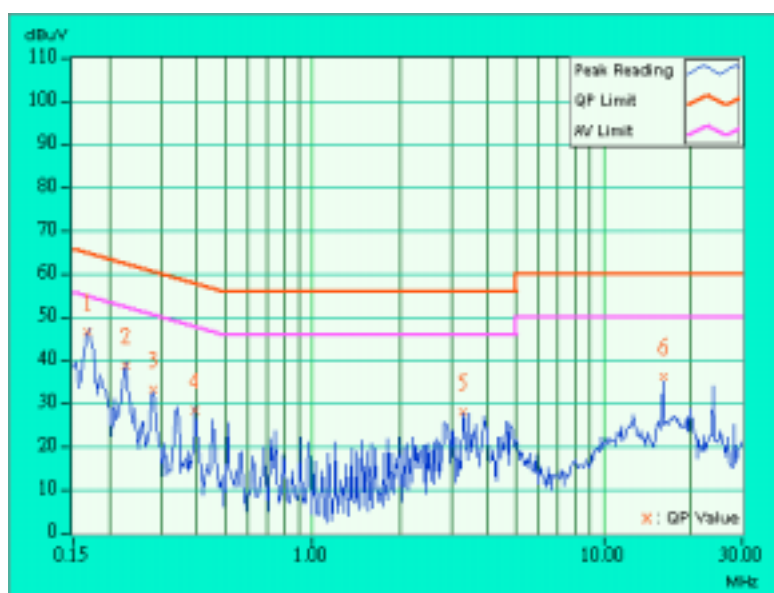


|                                 |                                        |                              |             |
|---------------------------------|----------------------------------------|------------------------------|-------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | C-X3A18     |
| <b>MODE</b>                     | Channel 78                             | <b>6dB BANDWIDTH</b>         | 9 kHz       |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>PHASE</b>                 | Neutral (N) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 24deg. C, 48%RH, 1005 hPa              | <b>TESTED BY:</b> Cody Chang |             |

| No | Freq.  | Corr. Factor | Reading Value [dB (uV)] |     | Emission Level [dB (uV)] |     | Limit [dB (uV)] |       | Margin (dB) |     |
|----|--------|--------------|-------------------------|-----|--------------------------|-----|-----------------|-------|-------------|-----|
|    | [MHz]  | (dB)         | Q.P.                    | AV. | Q.P.                     | AV. | Q.P.            | AV.   | Q.P.        | AV. |
| 1  | 0.168  | 0.10         | 46.10                   | -   | 46.20                    | -   | 65.05           | 55.05 | -18.85      | -   |
| 2  | 0.228  | 0.10         | 38.36                   | -   | 38.46                    | -   | 62.52           | 52.52 | -24.06      | -   |
| 3  | 0.284  | 0.10         | 32.98                   | -   | 33.08                    | -   | 60.70           | 50.70 | -27.62      | -   |
| 4  | 0.396  | 0.10         | 27.88                   | -   | 27.98                    | -   | 57.94           | 47.94 | -29.96      | -   |
| 5  | 3.293  | 0.36         | 27.50                   | -   | 27.86                    | -   | 56.00           | 46.00 | -28.14      | -   |
| 6  | 16.000 | 0.52         | 35.79                   | -   | 36.31                    | -   | 60.00           | 50.00 | -23.69      | -   |

**NOTE:**

1. QP. and AV. are abbreviations of quasi-peak and average individually.
2. "-": NA
3. The emission levels of other frequencies were very low against the limit.
4. Margin value = Emission level - Limit value
5. Emission Level = Reading Value + Correction Factor.



## 4.2 RADIATED EMISSION MEASUREMENT

### 4.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

According to 15.249 the field strength of emissions from intentional radiators operated under these frequencies bands shall not exceed the following:

| Fundamental Frequency<br>(MHz) | Field Strength of Fundamental (dBuV/m) |         |
|--------------------------------|----------------------------------------|---------|
|                                | Peak                                   | Average |
| 2400 ~ 2483.5                  | 114                                    | 94      |

Emissions radiated outside of the specified bands, shall be according to the general radiated limits in 15.209 as following:

| Frequencies<br>(MHz) | Field strength<br>(microvolts/meter) | Measurement distance<br>(meters) |
|----------------------|--------------------------------------|----------------------------------|
| 0.009-0.490          | 2400/F(kHz)                          | 300                              |
| 0.490-1.705          | 24000/F(kHz)                         | 30                               |
| 1.705-30.0           | 30                                   | 30                               |
| 30-88                | 100                                  | 3                                |
| 88-216               | 150                                  | 3                                |
| 216-960              | 200                                  | 3                                |
| Above 960            | 500                                  | 3                                |

**NOTE:**

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. As shown in 15.35(b), for frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

#### 4.2.2 TEST INSTRUMENTS

| DESCRIPTION & MANUFACTURER         | MODEL NO.            | SERIAL NO.               | CALIBRATED UNTIL |
|------------------------------------|----------------------|--------------------------|------------------|
| * HP Spectrum Analyzer             | 8590L                | 3544A01176               | May 13, 2003     |
| * HP Preamplifier                  | 8447D                | 2944A08485               | Apr. 29, 2003    |
| * HP Preamplifier                  | 8449B                | 3008A01201               | Dec. 06, 2002    |
| * HP Preamplifier                  | 8449B                | 3008A01292               | Aug. 07, 2003    |
| * ROHDE & SCHWARZ TEST RECEIVER    | ESMI                 | 839013/007<br>839379/002 | Jan. 27, 2003    |
| SCHWARZBECK Tunable Dipole Antenna | VHA 9103<br>UHA 9105 | E101051<br>E101055       | Nov. 23, 2002    |
| ANTENNA (Large Biconical)          | VHBA9123             | 449                      | Dec. 10, 2002    |
| * CHASE BILOG Antenna              | CBL6112A             | 2221                     | Aug. 02, 2003    |
| * SCHWARZBECK Horn Antenna         | BBHA9120-D1          | D130                     | Jul. 03, 2003    |
| * EMCO Horn Antenna                | 3115                 | 9312-4192                | Apr. 09, 2003    |
| * EMCO Turn Table                  | 1060                 | 1115                     | NA               |
| * SHOSHIN Tower                    | AP-4701              | A6Y005                   | NA               |
| * Software                         | AS61D4               | NA                       | NA               |
| * ANRITSU RF Switches              | MP59B                | M35046                   | Jan. 25, 2003    |
| * TIMES RF cable                   | LMR-600              | CABLE-ST5-01             | Jul. 12, 2003    |
| Open Field Test Site               | Site 5               | ADT-R05                  | Jul. 19, 2003    |
| VCCI Site Registration No.         | Site 5               | R-1039                   | NA               |

- NOTE:** 1. The measurement uncertainty is less than +/- 3.0dB, which is calculated as per the NAMAS document NIS81.
2. The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.
3. "\*" = These equipment are used for the final measurement.
4. The horn antenna and HP preamplifier (model: 8449B) are used only for the measurement of emission frequency above 1GHz if tested.
5. The test was performed in ADT Open Site No. 5.

#### 4.2.3 TEST PROCEDURES

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna is a broadband antenna, and its height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10 dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10 dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

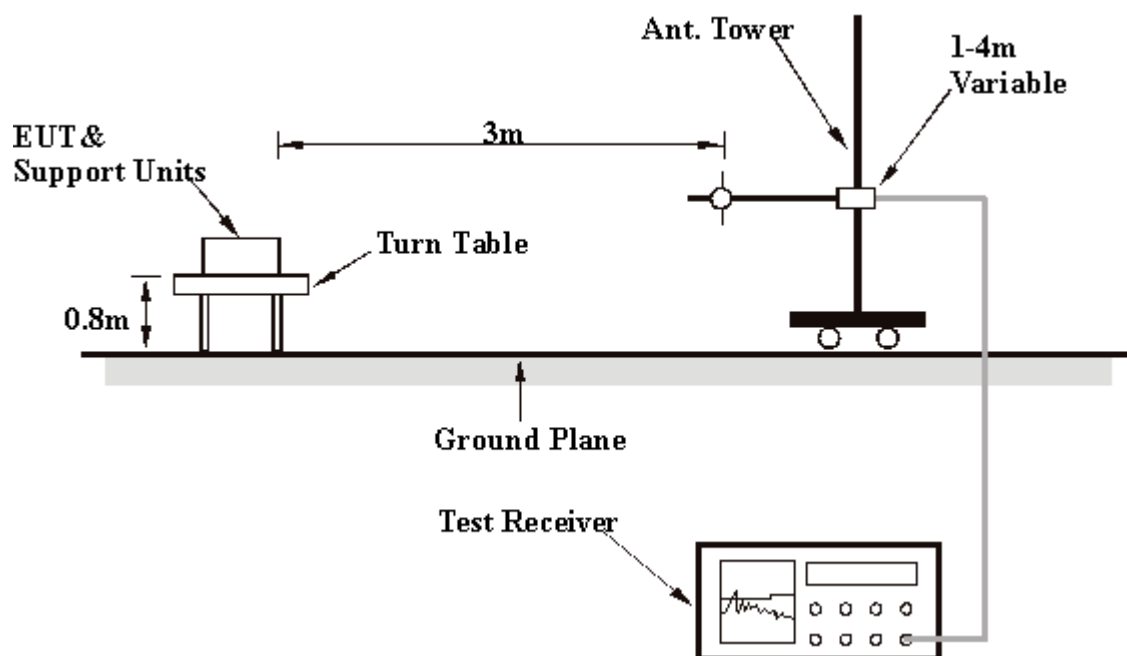
**NOTE:**

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Peak detection (PK) and Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 1 MHz for Peak detection at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 30 Hz for Average detection (AV) at frequency above 1GHz.

#### 4.2.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.2.5 TEST SETUP



For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

#### 4.2.6 TEST RESULTS (A)

##### Digital Portion:

|                                 |                                        |                              |             |
|---------------------------------|----------------------------------------|------------------------------|-------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | G-RB7       |
| <b>MODE</b>                     | Channel 78                             | <b>FREQUENCY RANGE</b>       | 30-1000 MHz |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>DETECTOR FUNCTION</b>     | Quasi-Peak  |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH, 1050 hPa              | <b>TESTED BY:</b> Gary Chang |             |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                 | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                   | 121.00      | 25.2 QP                 | 43.50          | -18.30      | 1.47H              | 321                  | 10.35            | 11.58               | 3.27              | 0.00                 | -14.85                 |
| 2                                                   | 152.00      | 27.0 QP                 | 43.50          | -16.50      | 1.43H              | 286                  | 13.30            | 10.16               | 3.54              | 0.00                 | -13.70                 |
| 3                                                   | 215.40      | 26.2 QP                 | 43.50          | -17.30      | 1.49H              | 237                  | 12.12            | 9.83                | 4.25              | 0.00                 | -14.08                 |
| 4                                                   | 220.00      | 25.7 QP                 | 46.00          | -20.30      | 1.11H              | 331                  | 11.28            | 10.12               | 4.30              | 0.00                 | -14.42                 |
| 5                                                   | 250.00      | 27.0 QP                 | 46.00          | -19.00      | 1.00H              | 79                   | 10.31            | 12.02               | 4.67              | 0.00                 | -16.69                 |
| 6                                                   | 260.00      | 26.2 QP                 | 46.00          | -19.80      | 1.06H              | 205                  | 8.27             | 13.03               | 4.90              | 0.00                 | -17.93                 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|---------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                               | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                 | 120.00      | 26.0 QP                 | 43.50          | -17.50      | 1.27V              | 230                  | 11.10            | 11.65               | 3.25              | 0.00                 | -14.90                 |
| 2                                                 | 166.00      | 28.0 QP                 | 43.50          | -15.50      | 1.32V              | 129                  | 14.87            | 9.44                | 3.68              | 0.00                 | -13.12                 |
| 3                                                 | 218.00      | 27.5 QP                 | 46.00          | -18.50      | 1.35V              | 120                  | 13.08            | 10.12               | 4.30              | 0.00                 | -14.42                 |
| 4                                                 | 240.00      | 25.7 QP                 | 46.00          | -20.30      | 1.48V              | 287                  | 9.74             | 11.41               | 4.55              | 0.00                 | -15.96                 |
| 5                                                 | 249.00      | 26.5 QP                 | 46.00          | -19.50      | 1.39V              | 226                  | 10.02            | 11.85               | 4.63              | 0.00                 | -16.48                 |
| 6                                                 | 352.00      | 26.0 QP                 | 46.00          | -20.00      | 1.24V              | 236                  | 5.96             | 14.31               | 5.73              | 0.00                 | -20.05                 |

##### NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss  
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

## RF Portion :

|                                 |                                        |                              |                          |
|---------------------------------|----------------------------------------|------------------------------|--------------------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | G-RB7                    |
| <b>MODE</b>                     | Channel 0                              | <b>FREQUENCY RANGE</b>       | Above 1000 MHz           |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>DETECTOR FUNCTION</b>     | Peak(PK)<br>Average (AV) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH,<br>1050 hPa           | <b>TESTED BY:</b> Gary Chang |                          |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                 | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                   | *2402.00    | 58.6 AV                 | 94.00          | -35.40      | 1.54H              | 336                  | 98.30            | 27.67               | 2.53              | 36.72                | 6.52                   |
| 2                                                   | *2402.00    | 92.6 PK                 | 114.00         | -21.40      | 1.54H              | 336                  | 99.10            | 27.67               | 2.53              | 36.72                | 6.52                   |
| 3                                                   | 4804.00     | 44.8 PK                 | 74.00          | -29.20      | 1.60H              | 287                  | 46.00            | 31.52               | 4.01              | 36.70                | 1.18                   |
| 4                                                   | 7206.00     | 47.7 PK                 | 74.00          | -26.30      | 1.29H              | 7                    | 43.00            | 36.13               | 5.51              | 36.98                | -4.67                  |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|---------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                               | Freq. (MHz) | Emission Level (dBuV/m) | Limit (DbuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                 | *2402.00    | 58.2 AV                 | 94.00          | -35.80      | 1.34V              | 330                  | 98.07            | 27.67               | 2.53              | 36.72                | 6.52                   |
| 2                                                 | *2402.00    | 92.2 PK                 | 114.00         | -21.80      | 1.34V              | 330                  | 98.70            | 27.67               | 2.53              | 36.72                | 6.52                   |
| 3                                                 | 4804.00     | 42.8 PK                 | 74.00          | -31.20      | 1.37V              | 321                  | 44.00            | 31.52               | 4.01              | 36.70                | 1.18                   |
| 4                                                 | 7206.00     | 45.7 PK                 | 74.00          | -28.30      | 1.14V              | 6                    | 41.00            | 36.13               | 5.51              | 36.98                | -4.66                  |

### NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss  
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " \* " : Fundamental frequency
5. The other emission levels were very low against the limit.
6. The manufacturer declared that Tx will not transmit greater than 2ms in a 100 msec period of time per channel. Therefore, the duty cycle should be equal to  $20 \log (0.02) = -34.0 \text{ dB}$ .
7. Average value = peak reading -  $20 \log (\text{duty cycle})$ .

|                                 |                                        |                              |                          |
|---------------------------------|----------------------------------------|------------------------------|--------------------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | G-RB7                    |
| <b>MODE</b>                     | Channel 39                             | <b>FREQUENCY RANGE</b>       | Above 1000 MHz           |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>DETECTOR FUNCTION</b>     | Peak(PK)<br>Average (AV) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH,<br>1050 hPa           | <b>TESTED BY:</b> Gary Chang |                          |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                 | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                   | *2441.00    | 60.0 AV                 | 94.00          | -34.00      | 1.43H              | 186                  | 99.80            | 27.81               | 2.66              | 36.71                | 6.24                   |
| 2                                                   | *2441.00    | 94.0 PK                 | 114.00         | -20.00      | 1.43H              | 186                  | 100.28           | 27.81               | 2.66              | 36.71                | 6.24                   |
| 3                                                   | 4882.00     | 47.9 PK                 | 74.00          | -26.10      | 1.30H              | 2                    | 49.00            | 31.59               | 4.03              | 36.70                | 1.08                   |
| 4                                                   | 7322.00     | 51.0 PK                 | 74.00          | -23.00      | 1.07H              | 357                  | 46.00            | 36.33               | 5.72              | 37.03                | -5.02                  |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|---------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                               | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                 | *2441.00    | 92.8 PK                 | 114.00         | -21.20      | 1.40V              | 309                  | 99.00            | 27.81               | 2.66              | 36.71                | 6.24                   |
| 2                                                 | *2441.00    | 58.8 AV                 | 94.00          | -35.20      | 1.40V              | 309                  | 96.50            | 27.81               | 2.66              | 36.71                | 6.24                   |
| 3                                                 | 4882.00     | 47.1 PK                 | 74.00          | -26.90      | 1.21V              | 6                    | 48.20            | 31.59               | 4.03              | 36.70                | 1.08                   |
| 4                                                 | 7322.00     | 50.4 PK                 | 74.00          | -23.60      | 1.18V              | 58                   | 45.40            | 36.33               | 5.72              | 37.03                | -5.02                  |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss  
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " \* " : Fundamental frequency
5. The other emission levels were very low against the limit.
6. The manufacturer declared that Tx will not transmit greater than 2ms in a 100 msec period of time per channel. Therefore, the duty cycle should be equal to  $20 \log (0.02) = -34.0 \text{ dB}$ .
7. Average value = peak reading -  $20 \log (\text{duty cycle})$ .



|                                 |                                        |                              |                          |
|---------------------------------|----------------------------------------|------------------------------|--------------------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | G-RB7                    |
| <b>MODE</b>                     | Channel 78                             | <b>FREQUENCY RANGE</b>       | Above 1000 MHz           |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>DETECTOR FUNCTION</b>     | Peak(PK)<br>Average (AV) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH,<br>1050 hPa           | <b>TESTED BY:</b> Gary Chang |                          |

| <b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b> |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|----------------------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                            | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                              | *2480.00    | 61.0 AV                 | 94.00          | -33.00      | 1.02H              | 329                  | 99.70            | 27.96               | 2.78              | 36.70                | 5.96                   |
| 2                                                              | *2480.00    | 95.0 PK                 | 114.00         | -19.00      | 1.02H              | 329                  | 101.00           | 27.96               | 2.78              | 36.70                | 5.96                   |
| 3                                                              | 4960.00     | 46.5 PK                 | 74.00          | -27.50      | 1.51H              | 123                  | 47.40            | 31.72               | 4.08              | 36.70                | 0.89                   |
| 4                                                              | 7440.00     | 49.2 PK                 | 74.00          | -24.80      | 1.15H              | 312                  | 43.80            | 36.54               | 5.93              | 37.08                | -5.39                  |

| <b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b> |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|--------------------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                          | Freq. (MHz) | Emission Level (dBuV/m) | Limit (DbuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                            | *2480.00    | 56.8 AV                 | 94.00          | -37.20      | 1.00V              | 134                  | 96.20            | 27.96               | 2.78              | 36.70                | 5.96                   |
| 2                                                            | *2480.00    | 90.8 PK                 | 114.00         | -23.20      | 1.00V              | 134                  | 96.80            | 27.96               | 2.78              | 36.70                | 5.96                   |
| 3                                                            | 4960.00     | 50.1 PK                 | 74.00          | -23.90      | 1.42V              | 196                  | 51.00            | 31.72               | 4.08              | 36.70                | 0.89                   |
| 4                                                            | 7440.00     | 49.4 PK                 | 74.00          | -24.60      | 1.32V              | 11                   | 44.00            | 36.54               | 5.93              | 37.08                | -5.39                  |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss  
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. “ \* ” : Fundamental frequency
5. The other emission levels were very low against the limit.
6. The manufacturer declared that Tx will not transmit greater than 2ms in a 100 msec period of time per channel. Therefore, the duty cycle should be equal to  $20 \log (0.02) = -34.0 \text{ dB}$ .
7. Average value = peak reading – 20 log (duty cycle).

## 4.2.7 TEST RESULTS (B)

### Digital Portion:

|                                 |                                        |                              |             |
|---------------------------------|----------------------------------------|------------------------------|-------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | C-X3A18     |
| <b>MODE</b>                     | Channel 78                             | <b>FREQUENCY RANGE</b>       | 30-1000 MHz |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>DETECTOR FUNCTION</b>     | Quasi-Peak  |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH, 1050 hPa              | <b>TESTED BY:</b> Gary Chang |             |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                 | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                   | 240.00      | 33.0 QP                 | 46.00          | -13.00      | 1.53H              | 106                  | 17.04            | 11.41               | 4.55              | 0.00                 | -15.96                 |
| 2                                                   | 252.00      | 26.0 QP                 | 46.00          | -20.00      | 1.04H              | 265                  | 8.98             | 12.29               | 4.73              | 0.00                 | -17.03                 |
| 3                                                   | 272.00      | 31.0 QP                 | 46.00          | -15.00      | 1.04H              | 31                   | 13.54            | 12.53               | 4.93              | 0.00                 | -17.47                 |
| 4                                                   | 288.00      | 29.0 QP                 | 46.00          | -17.00      | 1.39H              | 20                   | 11.10            | 12.88               | 5.01              | 0.00                 | -17.91                 |
| 5                                                   | 336.00      | 31.0 QP                 | 46.00          | -15.00      | 1.04H              | 3                    | 11.55            | 13.92               | 5.53              | 0.00                 | -19.45                 |
| 6                                                   | 368.00      | 31.0 QP                 | 46.00          | -15.00      | 1.43H              | 3                    | 10.28            | 14.86               | 5.87              | 0.00                 | -20.72                 |
| 7                                                   | 384.00      | 30.0 QP                 | 46.00          | -16.00      | 1.84H              | 26                   | 8.48             | 15.50               | 6.02              | 0.00                 | -21.53                 |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|---------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                               | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                 | 84.00       | 25.0 QP                 | 40.00          | -15.00      | 1.02V              | 3                    | 14.71            | 7.63                | 2.66              | 0.00                 | -10.29                 |
| 2                                                 | 120.00      | 27.0 QP                 | 43.50          | -16.50      | 1.05V              | 300                  | 12.10            | 11.65               | 3.25              | 0.00                 | -14.90                 |
| 3                                                 | 132.00      | 33.0 QP                 | 43.50          | -10.50      | 1.42V              | 11                   | 18.47            | 11.16               | 3.37              | 0.00                 | -14.53                 |
| 4                                                 | 144.00      | 34.0 QP                 | 43.50          | -9.50       | 1.02V              | 3                    | 19.94            | 10.58               | 3.48              | 0.00                 | -14.06                 |
| 5                                                 | 156.00      | 33.0 QP                 | 43.50          | -10.50      | 1.16V              | 12                   | 19.54            | 9.88                | 3.58              | 0.00                 | -13.47                 |
| 6                                                 | 216.00      | 26.0 QP                 | 43.50          | -17.50      | 1.13V              | 15                   | 11.75            | 9.97                | 4.28              | 0.00                 | -14.26                 |
| 7                                                 | 220.00      | 0.0 QP                  | 46.00          | -46.00      | 1.02V              | 3                    | -14.42           | 10.12               | 4.30              | 0.00                 | -14.42                 |
| 8                                                 | 240.00      | 32.0 QP                 | 46.00          | -14.00      | 1.18V              | 3                    | 16.04            | 11.41               | 4.55              | 0.00                 | -15.96                 |
| 9                                                 | 352.00      | 31.0 QP                 | 46.00          | -15.00      | 1.08V              | 343                  | 10.96            | 14.31               | 5.73              | 0.00                 | -20.04                 |

#### NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss  
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. The other emission levels were very low against the limit.

## RF Portion :

|                                 |                                        |                          |                          |
|---------------------------------|----------------------------------------|--------------------------|--------------------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>             | C-X3A18                  |
| <b>MODE</b>                     | Channel 0                              | <b>FREQUENCY RANGE</b>   | Above 1000 MHz           |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>DETECTOR FUNCTION</b> | Peak(PK)<br>Average (AV) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH, 1050 hPa              | <b>TESTED BY:</b>        | Gary Chang               |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                 | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                   | *2402.00    | 93.0 PK                 | 114.00         | -21.00      | 1.26H              | 61                   | 99.50            | 27.67               | 2.53              | 36.72                | 6.52                   |
| 2                                                   | *2402.00    | 59.0 AV                 | 94.00          | -35.00      | 1.26H              | 61                   | 97.50            | 27.67               | 2.53              | 36.72                | 6.52                   |
| 3                                                   | 4804.00     | 43.8 PK                 | 74.00          | -30.20      | 1.16H              | 75                   | 45.00            | 31.52               | 4.01              | 36.70                | 1.18                   |
| 4                                                   | 7206.00     | 48.4 PK                 | 74.00          | -25.60      | 1.13H              | 61                   | 43.70            | 36.13               | 5.51              | 36.98                | -4.66                  |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|---------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                               | Freq. (MHz) | Emission Level (dBuV/m) | Limit (DBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                 | *2402.00    | 62.3 AV                 | 94.00          | -31.70      | 1.06V              | 143                  | 101.00           | 27.67               | 2.53              | 36.72                | 6.52                   |
| 2                                                 | *2402.00    | 96.3 PK                 | 114.00         | -17.70      | 1.06V              | 143                  | 102.80           | 27.67               | 2.53              | 36.72                | 6.52                   |
| 3                                                 | 4804.00     | 47.8 PK                 | 74.00          | -26.20      | 1.00V              | 7                    | 49.00            | 31.52               | 4.01              | 36.70                | 1.18                   |
| 4                                                 | 7206.00     | 47.8 PK                 | 74.00          | -26.20      | 1.47V              | 152                  | 43.10            | 36.13               | 5.51              | 36.98                | -4.66                  |

### NOTE:

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss  
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. “ \* ” : Fundamental frequency
5. The other emission levels were very low against the limit.
6. The manufacturer declared that Tx will not transmit greater than 2ms in a 100 msec period of time per channel. Therefore, the duty cycle should be equal to  $20 \log (0.02) = 34.0 \text{ dB}$ .
7. Average value = peak reading – 20 log (duty cycle).

8.

|                                 |                                        |                          |                          |
|---------------------------------|----------------------------------------|--------------------------|--------------------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>             | C-X3A18                  |
| <b>MODE</b>                     | Channel 39                             | <b>FREQUENCY RANGE</b>   | Above 1000 MHz           |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>DETECTOR FUNCTION</b> | Peak(PK)<br>Average (AV) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH, 1050 hPa              | <b>TESTED BY:</b>        | Gary Chang               |

| ANTENNA POLARITY & TEST DISTANCE: HORIZONTAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|-----------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                 | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                   | *2441.00    | 91.8 PK                 | 114.00         | -22.20      | 1.24H              | 38                   | 98.00            | 27.81               | 2.66              | 36.71                | 6.24                   |
| 2                                                   | *2441.00    | 57.8 AV                 | 94.00          | -36.20      | 1.24H              | 38                   | 97.30            | 27.81               | 2.66              | 36.71                | 6.24                   |
| 3                                                   | 4882.00     | 44.6 PK                 | 74.00          | -29.40      | 1.01H              | 253                  | 45.70            | 31.59               | 4.03              | 36.70                | 1.08                   |
| 4                                                   | 7322.00     | 48.0 PK                 | 74.00          | -26.00      | 1.41H              | 5                    | 43.00            | 36.33               | 5.72              | 37.03                | -5.03                  |

| ANTENNA POLARITY & TEST DISTANCE: VERTICAL AT 3 M |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|---------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                               | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                 | *2441.00    | 60.6 AV                 | 94.00          | -33.40      | 1.37V              | 19                   | 99.56            | 27.81               | 2.66              | 36.71                | 6.24                   |
| 2                                                 | *2441.00    | 94.6 PK                 | 114.00         | -19.40      | 1.37V              | 19                   | 100.80           | 27.81               | 2.66              | 36.71                | 6.24                   |
| 3                                                 | 4882.00     | 49.1 PK                 | 74.00          | -24.90      | 1.01V              | 224                  | 50.20            | 31.59               | 4.03              | 36.70                | 1.08                   |
| 4                                                 | 7322.00     | 47.8 PK                 | 74.00          | -26.20      | 1.86V              | 201                  | 42.80            | 36.33               | 5.72              | 37.03                | -5.02                  |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss  
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " \* " : Fundamental frequency
5. The other emission levels were very low against the limit.
6. The manufacturer declared that Tx will not transmit greater than 2ms in a 100 msec period of time per channel. Therefore, the duty cycle should be equal to  $20 \log (0.02) = -34.0 \text{ dB}$ .
7. Average value = peak reading -  $20 \log (\text{duty cycle})$ .

|                                 |                                        |                              |                          |
|---------------------------------|----------------------------------------|------------------------------|--------------------------|
| <b>EUT</b>                      | Logitech Cordless Controller for X-Box | <b>MODEL</b>                 | C-X3A18                  |
| <b>MODE</b>                     | Channel 78                             | <b>FREQUENCY RANGE</b>       | Above 1000 MHz           |
| <b>INPUT POWER (SYSTEM)</b>     | 120Vac, 60 Hz                          | <b>DETECTOR FUNCTION</b>     | Peak(PK)<br>Average (AV) |
| <b>ENVIRONMENTAL CONDITIONS</b> | 25deg. C, 60%RH,<br>1050 hPa           | <b>TESTED BY:</b> Gary Chang |                          |

| <b>ANTENNA POLARITY &amp; TEST DISTANCE: HORIZONTAL AT 3 M</b> |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|----------------------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                            | Freq. (MHz) | Emission Level (dBuV/m) | Limit (dBuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                              | *2480.00    | 57.7 AV                 | 94.00          | -36.30      | 1.00H              | 96                   | 96.00            | 27.96               | 2.78              | 36.70                | 5.96                   |
| 2                                                              | *2480.00    | 91.7 PK                 | 114.00         | -22.30      | 1.00H              | 96                   | 97.70            | 27.96               | 2.78              | 36.70                | 5.96                   |
| 3                                                              | 4960.00     | 46.1 PK                 | 74.00          | -27.90      | 1.50H              | 259                  | 47.00            | 31.72               | 4.08              | 36.70                | 0.89                   |

| <b>ANTENNA POLARITY &amp; TEST DISTANCE: VERTICAL AT 3 M</b> |             |                         |                |             |                    |                      |                  |                     |                   |                      |                        |
|--------------------------------------------------------------|-------------|-------------------------|----------------|-------------|--------------------|----------------------|------------------|---------------------|-------------------|----------------------|------------------------|
| No.                                                          | Freq. (MHz) | Emission Level (dBuV/m) | Limit (DbuV/m) | Margin (dB) | Antenna Height (m) | Table Angle (Degree) | Raw Value (dBuV) | Antenna Factor (dB) | Cable Factor (dB) | Pre-Amp. Factor (dB) | Correction Factor (dB) |
| 1                                                            | *2480.00    | 93.9 PK                 | 114.00         | -20.10      | 1.01V              | 59                   | 99.90            | 27.96               | 2.78              | 36.70                | 5.96                   |
| 2                                                            | *2480.00    | 59.9 AV                 | 94.00          | -34.10      | 1.01V              | 59                   | 97.90            | 27.96               | 2.78              | 36.70                | 5.96                   |
| 3                                                            | 4960.00     | 50.1 PK                 | 74.00          | -23.90      | 1.07V              | 357                  | 51.00            | 31.72               | 4.08              | 36.70                | 0.89                   |

**NOTE:**

1. Emission level = Raw value - Correction Factor
2. Correction Factor = Pre-Amp. Factor - Ant. Factor - Cable loss  
(Pre-Amp. Factor = 0, when a Pre-Amplifier is not used for the test.)
3. Margin value = Emission level - Limit value
4. " \* " : Fundamental frequency
5. The other emission levels were very low against the limit.
6. The manufacturer declared that Tx will not transmit greater than 2ms in a 100 msec period of time per channel. Therefore, the duty cycle should be equal to  $20 \log (0.02) = 34.0\text{dB}$ .
7. Average value = peak reading – 20 log (duty cycle).

### 4.3 BAND EDGES MEASUREMENT

#### 4.3.1 LIMITS OF BAND EDGES MEASUREMENT

Below -20dB of the highest emission level of operating band (in 100KHz RB).

#### 4.3.2 TEST INSTRUMENTS

| Description & Manufacturer | Model No. | Serial No. | Calibrated Until |
|----------------------------|-----------|------------|------------------|
| R&S SPECTRUM ANALYZER      | FSEK30    | 100049     | July 24, 2003    |

#### Notes:

- 1.The measurement uncertainty is less than +/- 2.6dB, which is calculated as per the NAMAS document NIS81.
- 2.The calibration interval of the above test instruments is 12 months. And the calibrations are traceable to NML/ROC and NIST/USA.

#### 4.3.3 TEST PROCEDURE

The transmitter output was connected to the spectrum analyzer via a low lose cable. Set both RBW and VBW of spectrum analyzer to 100 kHz with suitable frequency span including 100 kHz bandwidth from band edge. The band edges was measured and recorded.

#### 4.3.4 DEVIATION FROM TEST STANDARD

No deviation

#### 4.3.5 EUT OPERATING CONDITION

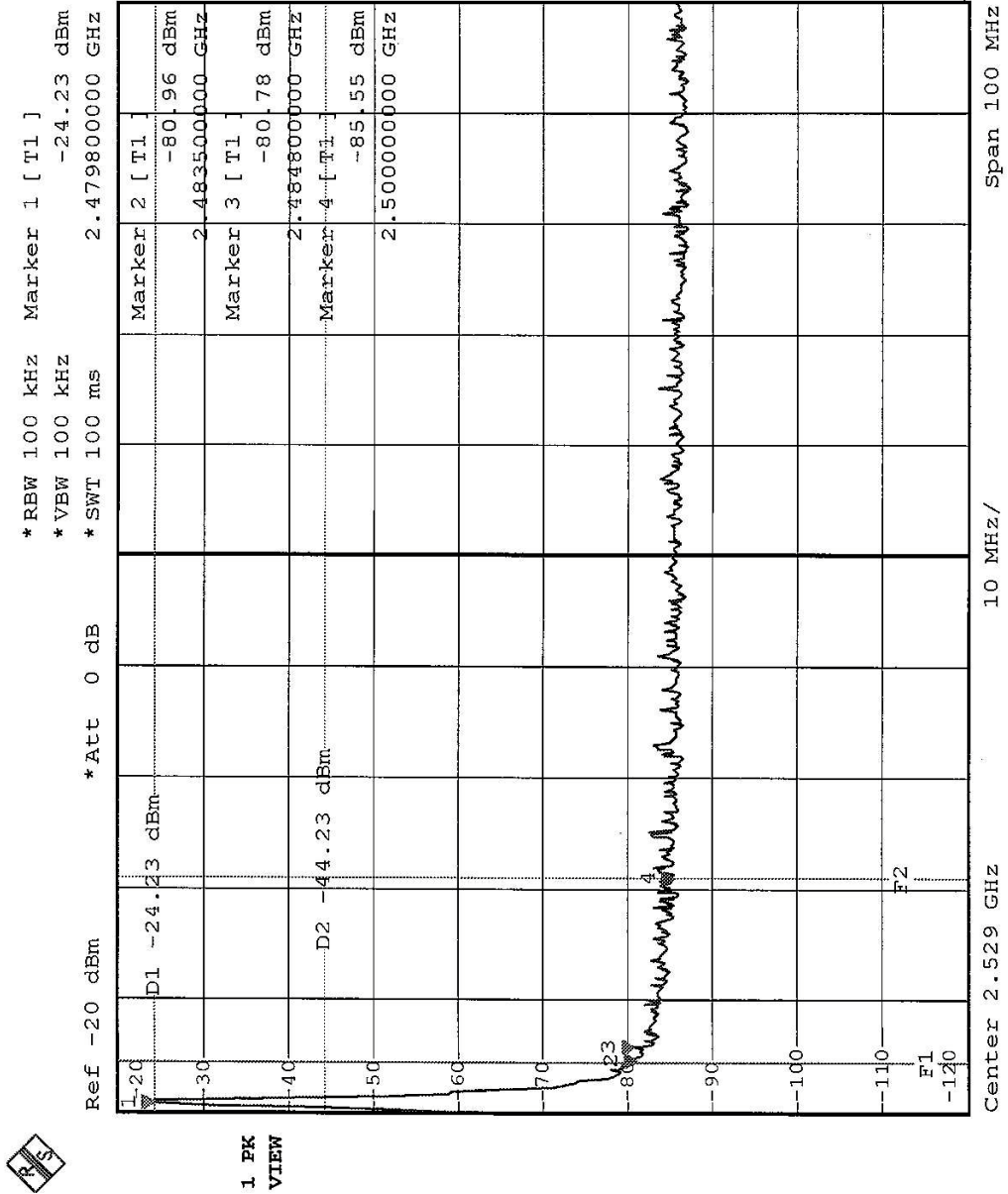
The software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel frequencies individually.

#### 4.3.6 TEST RESULTS

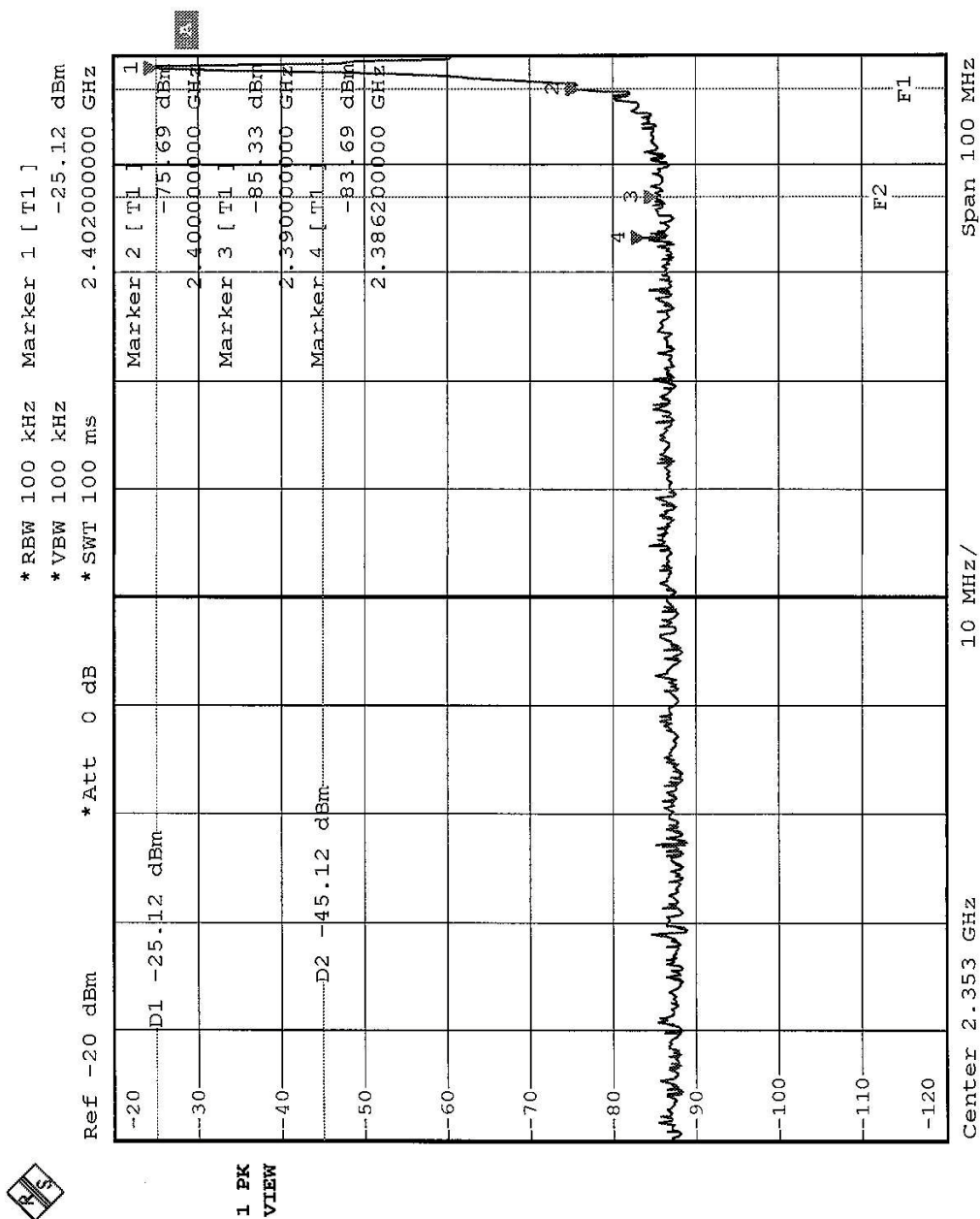
The spectrum plots are attached below. D2 line indicates the highest level, D1 line indicates the 20dB offset below D2. It shows compliance with the requirement in part 15.249.

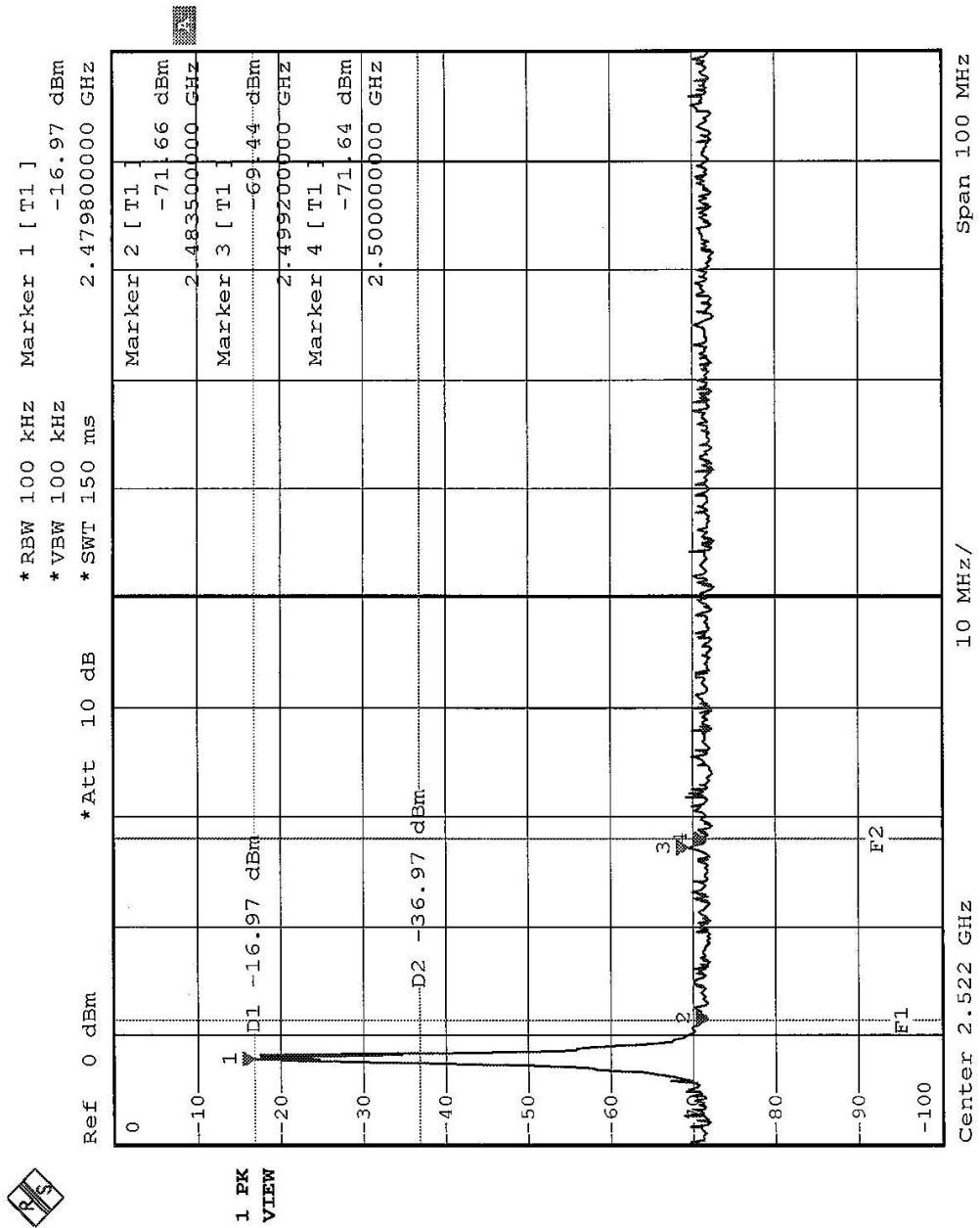
**Note for test result (A) on page 32-33:** The band edge emission plot on the following 2 pages shows 56.55dB / 58.57dB delta between carrier maximum power and local maximum emission in restrict band (2.4848GHz / 2.3862GHz). The emission of carrier strength list in the test result of channel 78 at the item 4.2.6 (Page 25) is 61.0dBuV/m, so the maximum field strength in restrict band is  $61.0 - 56.55 = 4.45$ dBuV/m which is under 54dBuV/m limit.

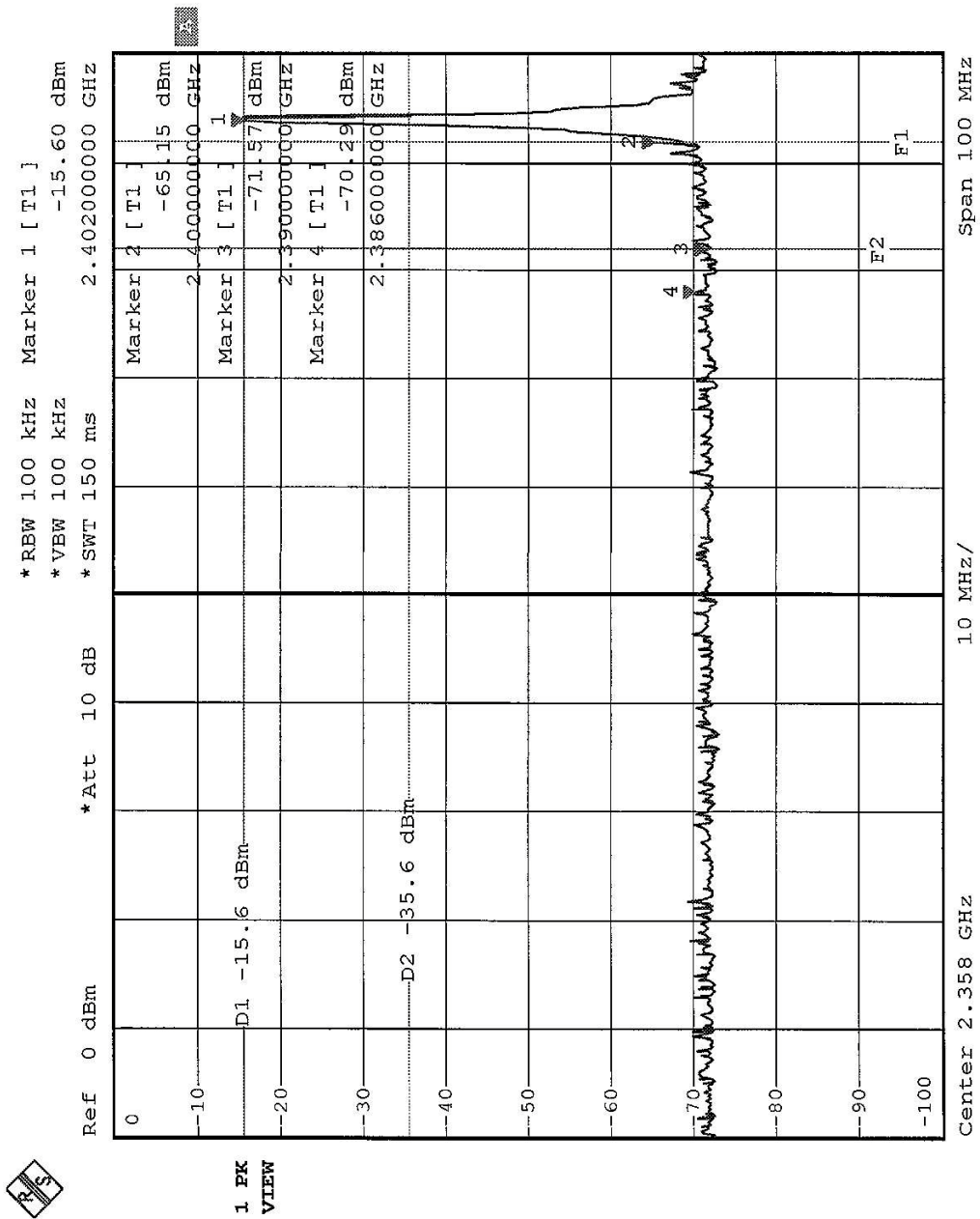
**Note for test result (B) on page 34-35:** The band edge emission plot on the following 2 pages shows 52.47dB / 54.69dB delta between carrier maximum power and local maximum emission in restrict band (2.4992GHz / 2.3860GHz). The emission of carrier strength list in the test result of channel 0 at the item 4.2.7 (Page 27) is 62.3dBuV/m, so the maximum field strength in restrict band is  $62.3 - 54.69 = 7.61$ dBuV/m which is under 54dBuV/m limit.













## **4.4 ANTENNA REQUIREMENT**

### **4.4.1 STANDARD APPLICABLE**

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

### **4.4.2 ANTENNA CONNECTED CONSTRUCTION**

The antenna used in this product is Sheet metal Inverted-F antenna. There is no antenna connector. The maximum Gain of this antenna is only -1dBi.

## 5 PHOTOGRAPHS OF THE TEST CONFIGURATION

### CONDUCTED EMISSION TEST



## RADIATED EMISSION TEST





## 6 INFORMATION ON THE TESTING LABORATORIES

We, ADT Corp., were founded in 1988 to provide our best service in EMC and Safety consultation. Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025, Guide 25 or EN 45001:

|                    |                 |
|--------------------|-----------------|
| <b>USA</b>         | FCC, NVLAP      |
| <b>Germany</b>     | TUV Rheinland   |
| <b>Japan</b>       | VCCI            |
| <b>New Zealand</b> | MoC             |
| <b>Norway</b>      | NEMKO           |
| <b>R.O.C.</b>      | BSMI, DGT, CNLA |

Copies of accreditation certificates of our laboratories obtained from approval agencies can be downloaded from our web site: [www.adt.com.tw/index.5/phtml](http://www.adt.com.tw/index.5/phtml).

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The address and road map of all our labs can be found in our web site also.