

# **F C C - TEST REPORT**

REPORT NO.: 25773/1/400F

# **FCC – Test Report**

Date: 2001-05-02

**No.** 25773/1/400F

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FCC listed testlab  
acc. to Section 2.948 of the FCC - Rules  
in compliance with the requirements of  
ANSI C63.4 - 1992

**Product** : School Bus  
**Model** : 90345T (27MHz)  
**Applicant** : ECHO TOYS LTD  
**Manufacturer** : ECHO TOYS LTD

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## LABORATORY - REPORT

**APPLICANT:** ECHO TOYS LTD  
**ADDRESS:** 8 A&B, Block 1, Tai Ping Industrial Centre  
57 Ting Kok Road  
Taipo, NT  
HONG KONG

**DATE OF SAMPLE RECEIVED:** 2001-03-19

**DATE OF TESTING:** 2001-05-02

### DESCRIPTION OF SAMPLE:

Product: School Bus  
Manufacturer: ECHO TOYS LTD  
Model number: 90345T (27MHz)  
Rating: DC 9V ('6F22' Size Battery x 1)  
Country of Origin: P.R. CHINA

**INVESTIGATIONS REQUESTED:** Measurements to the relevant clauses of F.C.C. Rules and Regulations  
Part 15 Subpart C - Intentional Radiators

**RESULTS:** See the attached test sheets

**CONCLUSIONS** From the measurement data obtained, the tested sample was considered to have COMPLIED with the requirements for the relevant clauses of Federal Communications Commission Rules as specified above.

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Authorized Signature

**Remark:** Purpose of those tests in this report is to provide the applicant with the necessary test data of their device for the submission to FCC with application for Equipment Authorization under the FCC Equipment Authorization Program. The tests themselves are not Approval Tests

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## Summary of Test Results

### Interference Radiation:

Test result: O.K.  
Test data: See attached data sheet

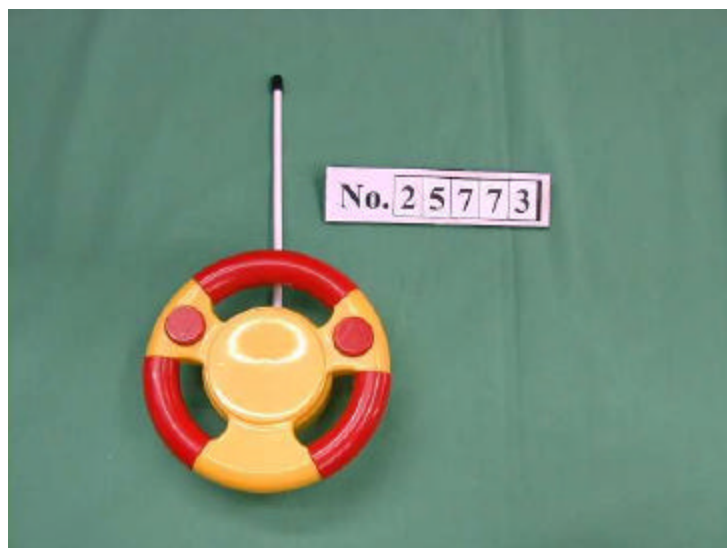
### Interference Voltage:

Test result: N.A.  
Test data: N.A.

### Measurement of Emissions within Band Edges

Test result: O.K.  
Test data: See attached data sheet

### PHOTOGRAPH OF THE SAMPLE



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## TEST EQUIPMENT LIST

| Equipment                       | Manufacturer    | Model                    | Serial No.          | Remark                            |
|---------------------------------|-----------------|--------------------------|---------------------|-----------------------------------|
| Test Receiver                   | Rohde & Schwarz | ESH 3                    | 863497/015          | 10KHz – 30MHz                     |
| Test Receiver                   | Rohde & Schwarz | ESVP                     | 860688/022          | 25MHz – 1,300 MHz                 |
| Artificial Mains Network (LISN) | Schwarzbeck     | NSLK 8127                | --                  | 2 x 10A, 50Ω, 50μH<br>10KHz-30MHz |
| Antenna System                  | Schwarzbeck     | BBA 9106 /<br>UHALP 9107 | --                  | 30MHz – 1000MHz                   |
| Antenna Mast System             | Schwarzbeck     | AM9104                   | --                  | Max. 4 meters height              |
| Spectrum Analyzer with Q. Peak  | Tektronix       | 2712                     | B023006             | 9KHz – 1.8GHz                     |
| Interface for Spectrum 2712     | Tektronix       | TD3F14A                  | --                  |                                   |
| Test Receiver                   | Rohde & Schwarz | ESH 3                    | 892580/006          | 10KHz – 30MHz                     |
| Test Receiver                   | Rohde & Schwarz | ESVP                     | 863512/012          | 25MHz – 1,300 MHz                 |
| Impulse Limiter                 | Rohde & Schwarz | ESH-3-Z2                 | --                  |                                   |
| Artificial Mains Network (LISN) | Schwarzbeck     | NSLK 8127                | --                  | 2 x 10A, 50Ω, 50μH<br>10KHz-30MHz |
| Antenna System                  | Schwarzbeck     | BBA 9106 /<br>UHALP 9107 | --                  | 30MHz – 1000MHz                   |
| Signal Generator                | Rohde & Schwarz | SWS 2                    | 879113/42           | 100KHz – 1040 MHz                 |
| Digital Multimeter              | Tektronix       | DM2510G                  | DM-<br>2510GTW10555 | 10KHz – 30MHz                     |
| Turntable with Controller       | Drehtisch       | DT312                    | --                  | φ120 cm                           |

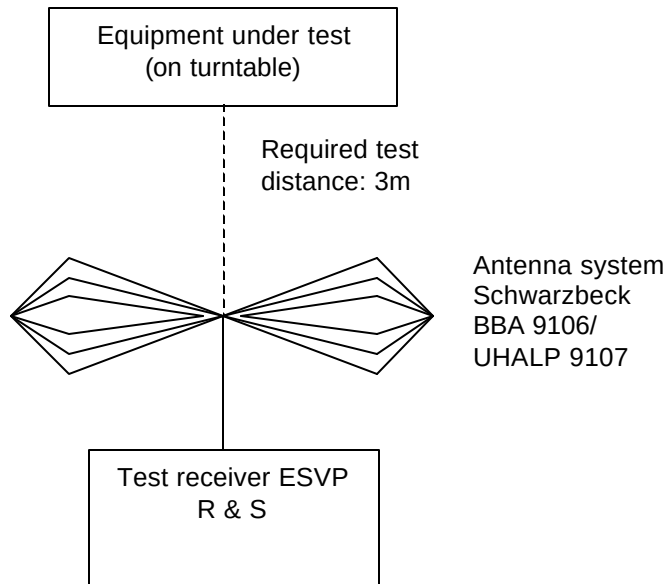
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## Radiated Emission Test Procedure



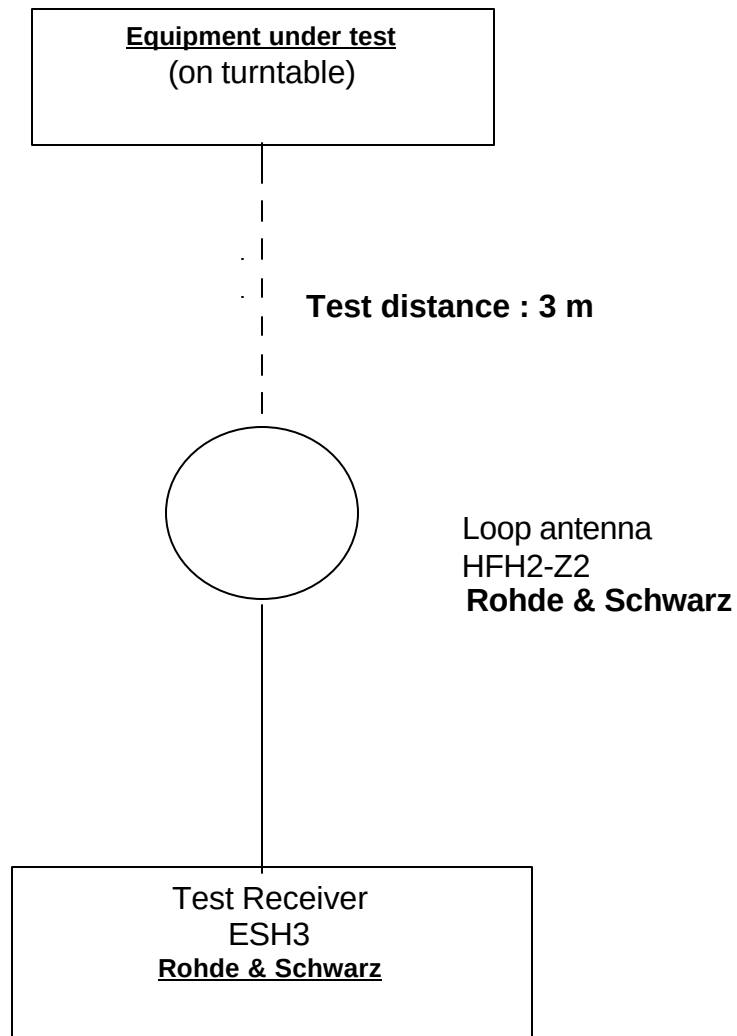
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## Radiated Emission Test Procedure ( < 30 MHz)





# Interference Radiation

Measurement of Radiated Emissions (27MHz-1000MHz)

Acc: FCC Part 15 Subpart C

IECC Ref: 25773/1/400F  
 Model: 90345T (27MHz)  
 Applicant: ECHO TOYS LTD  
 Ser.Nr.: 1  
 Set under test: School Bus  
 Connected sets: -  
 Operating mode: Power "On"

Test Equipment  
 Receiver: ESVP Rohde & Schwarz  
 Antenna: Schwarzbeck BBA 9106  
 and UHALP 9107

|          | Frequency (MHz) | Horz. Reading dB(μV) | Vert. Reading dB(μV) | Antenna Factor (dB) | Horiz. Test Result (μV/m) | Vert. Test Result (μV/m) | Limit (μV/m) |
|----------|-----------------|----------------------|----------------------|---------------------|---------------------------|--------------------------|--------------|
| Harm. 2  | 54.28           | < 16                 | < 16                 | 10.2                | < 20                      | < 20                     | 100          |
| Harm. 3  | 81.42           | < 16                 | < 16                 | 7.1                 | < 14                      | < 14                     | 100          |
| Harm. 4  | 108.56          | < 16                 | < 16                 | 11.6                | < 24                      | < 24                     | 150          |
| Harm. 5  | 135.7           | < 16                 | < 16                 | 14.3                | < 33                      | < 33                     | 150          |
| Harm. 6  | 162.84          | < 16                 | < 16                 | 15.6                | < 38                      | < 38                     | 150          |
| Harm. 7  | 189.98          | < 16                 | < 16                 | 16.3                | < 41                      | < 41                     | 150          |
| Harm. 8  | 217.12          | < 16                 | < 16                 | 16.9                | < 44                      | < 44                     | 200          |
| Harm. 9  | 244.26          | < 16                 | < 16                 | 17.6                | < 48                      | < 48                     | 200          |
| Harm. 10 | 271.4           | < 16                 | < 16                 | 18.5                | < 53                      | < 53                     | 200          |
| Harm. 11 | 298.54          | < 16                 | < 16                 | 19.9                | < 62                      | < 62                     | 200          |
| Harm. 12 | 325.68          | < 16                 | < 16                 | 16.8                | < 44                      | < 44                     | 200          |
| Harm. 13 | 352.82          | < 16                 | < 16                 | 17.5                | < 47                      | < 47                     | 200          |
| Harm. 14 | 379.96          | < 16                 | < 16                 | 18.0                | < 50                      | < 50                     | 200          |
| Harm. 15 | 407.1           | < 16                 | < 16                 | 18.4                | < 53                      | < 53                     | 200          |
| Harm. 16 | 434.24          | < 16                 | < 16                 | 18.8                | < 55                      | < 55                     | 200          |
| Harm. 17 | 461.38          | < 16                 | < 16                 | 19.2                | < 57                      | < 57                     | 200          |
| Harm. 18 | 488.52          | < 16                 | < 16                 | 19.5                | < 60                      | < 60                     | 200          |
| Harm. 19 | 515.66          | < 16                 | < 16                 | 19.9                | < 62                      | < 62                     | 200          |
| Harm. 20 | 542.8           | < 16                 | < 16                 | 20.1                | < 64                      | < 64                     | 200          |
| Harm. 21 | 569.94          | < 16                 | < 16                 | 20.5                | < 67                      | < 67                     | 200          |
| Harm. 22 | 597.08          | < 16                 | < 16                 | 20.9                | < 70                      | < 70                     | 200          |
| Harm. 23 | 624.22          | < 16                 | < 16                 | 21.2                | < 73                      | < 73                     | 200          |
| Harm. 24 | 651.36          | < 16                 | < 16                 | 21.6                | < 76                      | < 76                     | 200          |
| Harm. 25 | 678.5           | < 16                 | < 16                 | 22.1                | < 80                      | < 80                     | 200          |
| Harm. 26 | 705.64          | < 16                 | < 16                 | 22.5                | < 84                      | < 84                     | 200          |
| Harm. 27 | 732.78          | < 16                 | < 16                 | 22.8                | < 88                      | < 88                     | 200          |
| Harm. 28 | 759.92          | < 16                 | < 16                 | 23.2                | < 91                      | < 91                     | 200          |
| Harm. 29 | 787.06          | < 16                 | < 16                 | 23.5                | < 95                      | < 95                     | 200          |
| Harm. 30 | 814.2           | < 16                 | < 16                 | 23.9                | < 99                      | < 99                     | 200          |
| Harm. 31 | 841.34          | < 16                 | < 16                 | 24.3                | < 103                     | < 103                    | 200          |
| Harm. 32 | 868.48          | < 16                 | < 16                 | 24.6                | < 107                     | < 107                    | 200          |
| Harm. 33 | 895.62          | < 16                 | < 16                 | 24.9                | < 112                     | < 112                    | 200          |
| Harm. 34 | 922.76          | < 16                 | < 16                 | 25.4                | < 117                     | < 117                    | 200          |
| Harm. 35 | 949.9           | < 16                 | < 16                 | 25.8                | < 123                     | < 123                    | 200          |
| Harm. 36 | 977.04          | < 16                 | < 16                 | 26.2                | < 128                     | < 128                    | 500          |

Radiation Measurement below 30MHz (using loop antenna)

| Frequency (MHz) | Maximum Test Result (μV/m) |         | Limit (μV/m) |         |
|-----------------|----------------------------|---------|--------------|---------|
|                 | Peak                       | Average | Peak         | Average |
| 27.14           | 446.7                      | 223.9   | 100000       | 10000   |

Note: The measured radiation outside the operation band and below 30MHz were negligible.

Date: \_\_\_\_\_

☒ O.K.

Test result:

Operator: \_\_\_\_\_

## Notes for Radiation Measurement

**1. Measurement facility:**

Measurement facility located at Fanling (Hong Kong), placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules.

**2. Distance between the EUT and measuring antenna:**

3 meters.

**3. Measuring instrumentations:**

Rohde & Schwarz ESVP Test Receiver ( 20 - 1300 MHz ) with a CISPR weighting QP detector, 6 dB bandwidth set at 120 KHz.

In the frequency range above 1000 MHz Spectrum Analyzer FMSM26 and Analyzer Display Unit FSA-D are used, bandwidth set at 100 kHz.

**4. Measuring antenna:**

Broad-band antenna for the frequency range 30 - 300 MHz and frequency range 300 - 1000 MHz, connected with 10 meters coaxial cable. Cable loss of the coaxial cable included in the Antenna Factor for measurement data. The antennas are capable of measuring both horizontal and vertical polarizations.

In the frequency range above 1 GHz horn-antenna RGA 50/60 is used.

**5. Frequency range scanned:**

The frequency range 30 - 5000 MHz has been scanned. Readings of the highest emissions relating to the limit were reported as above.

**6. Arrangement of EUT:**

During the test, the sample was operated at rated supply voltage and arranged for maximum emissions. To find the maximum emission, the antenna was raised from 1 to 4 meters and was stopped at the maximum emission point.

**7. Measuring Procedure:**

In accordance with the relevant sections of the American National Standards Institute (ANSI) C63.4-1992 'Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9KHz to 40GHz'.

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## Measurement Data of Emissions within Band Edges

MKR: 27.1435 MHz

52.976 dB $\mu$ V

5dB/

Apr/27

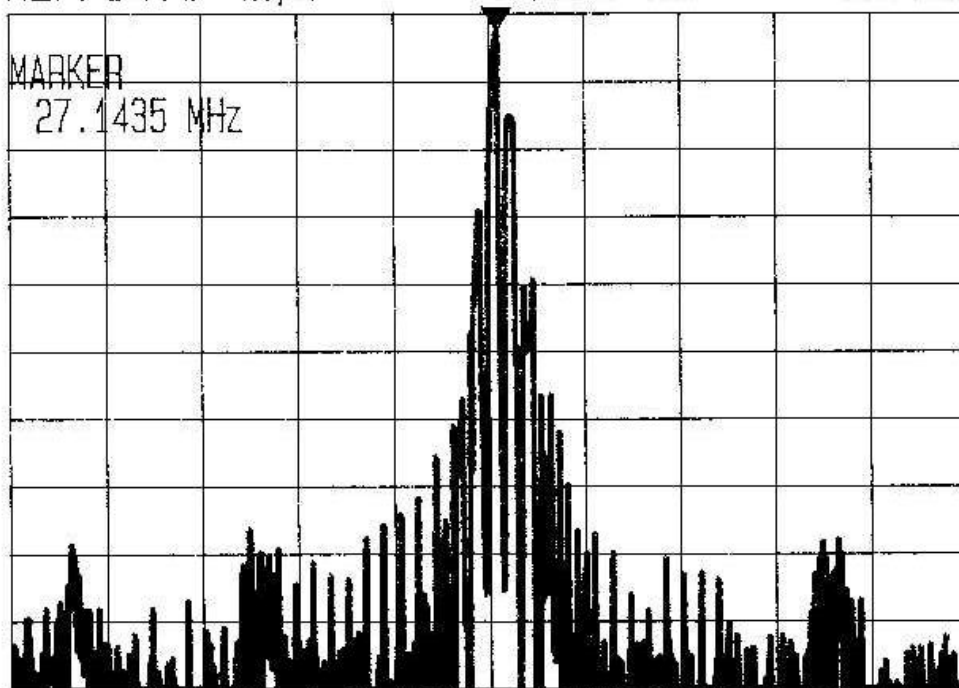
A\_view

REF: 54.3 dB $\mu$ V

ATT: 0 dB

13:30

B\_blank



ST: 26.9808 MHz

SP: 27.3008 MHz

RBW: 9 kHz

VBW: 100 kHz

SWP: 200 ms

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## Notes for Measurement of Emissions within Band Edges

1. **Measurement facility:**

Measurement facility located at Fanling (Hong Kong) placed on file with the FCC Pursuant to Section 2.948 of the FCC Rules.

2. **Measuring instrumentations:**

Spectrum Analyzer: Tektronix 2712

3. **Frequency range scanned:**

The frequency range acc. to FCC rules and regulations part 15 subpart C - Intentional Radiators.

4. **Arrangement of EUT:**

During the test, the sample was operated.

5. **Measuring Procedure:**

In accordance with the relevant sections of American National Standards Institute (ANSI) C63.4 - 1992 'Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz'.