

HomeTek Technology Inc.

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## FCC TEST REPORT FOR

APPLICANT : EZKEY Corp.  
ADDRESS : 11F, NO. 167, FU HO RD.,  
YUNG HO CITY, TAIPEI HSIEN,  
TAIWAN, R. O. C.  
EUT : Computer Keyboard  
MODEL NO. : EZ-2000  
FCC ID : MWIEZ-2000

Under Part 15, SUBPART B.

CLASS B

Certification

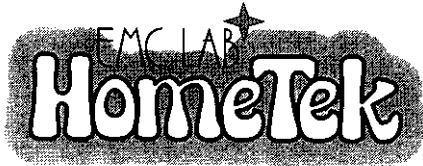
PREPARED BY :

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Report # : FB7C023



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## TEST REPORT CERTIFICATION

EUT : Computer Keyboard  
MODEL NO. : EZ-2000  
FCC ID : MWIEZ-2000  
Final Test Date : 4/15/98  
APPLICANT : EZKEY Corp.  
ADDRESS : 11F, NO. 167, FU HO RD.,  
YUNG HO CITY, TAIPEI HSIEN,  
TAIWAN, R. O. C.

MEASUREMENT PROCEDURE USED :

PART 15 SUBPART B OF FCC RULES AND REGULATIONS  
( 47 CFR PART 15 ) FCC / ANSI C63.4-1992

WE HEREBY SHOW THAT :

THE MEASUREMENT SHOWN IN THE ATTACHMENT WERE MADE IN ACCORDANCE  
WITH THE PROCEDURES INDICATED, AND THE MAXIMUM ENERGY EMITTED BY THE  
EQUIPMENT WAS FOUND TO BE WITHIN THE FCC LIMITS APPLICABLE.

TEST ENGINEER : Tomy HU DATE : 98/4/20

CHECK BY : JOSEPH CHOU DATE : 4/22/98

APPROVED BY : R.S. HUANG/Manager DATE : 04/22/98



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## GENERAL INFORMATION

1 APPLICANT : EZKEY Corp.  
2 ADDRESS : 11F, NO. 167, FU HO RD.,  
YUNG HO CITY, TAIPEI HSIEN,  
TAIWAN, R. O. C.

3 MANUFACTURER : EZKEY Corp.  
4 ADDRESS : 11F, NO. 167, FU HO RD.,  
YUNG HO CITY, TAIPEI HSIEN,  
TAIWAN, R. O. C.

5 DESCRIPTION OF EUT :

EUT : Computer Keyboard  
FCC ID : MWIEZ-2000  
Model Number : EZ-2000  
Serial # : N/A  
Data Cable : SHIELDED  
Power Cord : N/A  
Power Supply Type : SWITCHING

6 FEATURES OF EUT :

- 6.1 This keyboard is designed to be AT, PS/2 mode Mode Selection selection is done by auto-switchable
- 6.2 There are three LEDs on the keyboard to indicate Indicators 'Caps Lock', 'Num Lock', 'Scroll Lock' and "Ezkey Lock"
- 6.3 The keyboard has 16 keys type ahead capability

- 6.4 With the exception of the Pause key, all keys are Delay and typematic  
When a key is pressed and held down, the Repeat keyboard delays 0.5  
second and begins sending a make Rate Code for that key at a rate of  
10.9 characters per second
- 6.5 In AT mode, the typematic delay and repeat rate are programmable, this is  
done by command from host



## **MODIFICATION LIST**

THE FOLLOWING ACCESSORIES WERE ADDED TO THE EUT DURING TESTING :

NO MODIFICATION BY HOMETEK TECHNOLOGY INC.

## CONDUCTED POWER LINE TEST

### 1 TEST INSTRUMENTS & FACILITIES

The following test Instruments was used during the conducted test :

| Item | Instruments/<br>Facilities | Specification                          | Manufacturer       | Model # /<br>S/N#     | Date Of<br>Cal. |
|------|----------------------------|----------------------------------------|--------------------|-----------------------|-----------------|
| 1    | EMI Receiver               | 9KHz ~ 30MHz                           | ROHDE &<br>SCHWARZ | ESHS 30<br>844827/007 | FEB/98          |
| 2    | LISN                       | 50 $\Omega$ /50uH/100A<br>9KHz ~ 30MHz | SCHWARZ<br>BECK    | NNLK 8121<br>8121370  | FEB/98          |
| 3    | LISN                       | 9KHz ~ 30MHz                           | ROHDE &<br>SCHWARZ | ESH3-Z5<br>846128/007 | FEB/98          |
| 4    | Signal Generator           | 9KHz ~ 2080MHz                         | ROHDE &<br>SCHWARZ | SMY02<br>845096/018   | FEB/98          |
| 5    | Pulse Limiter              | 9KHz ~ 30MHz                           | ROHDE &<br>SCHWARZ | ESH3Z2<br>357.8810.52 | N/A             |

Note : All equipment upon which need to calibrated are with period of 1 year.

### 2 TEST PROCEDURE

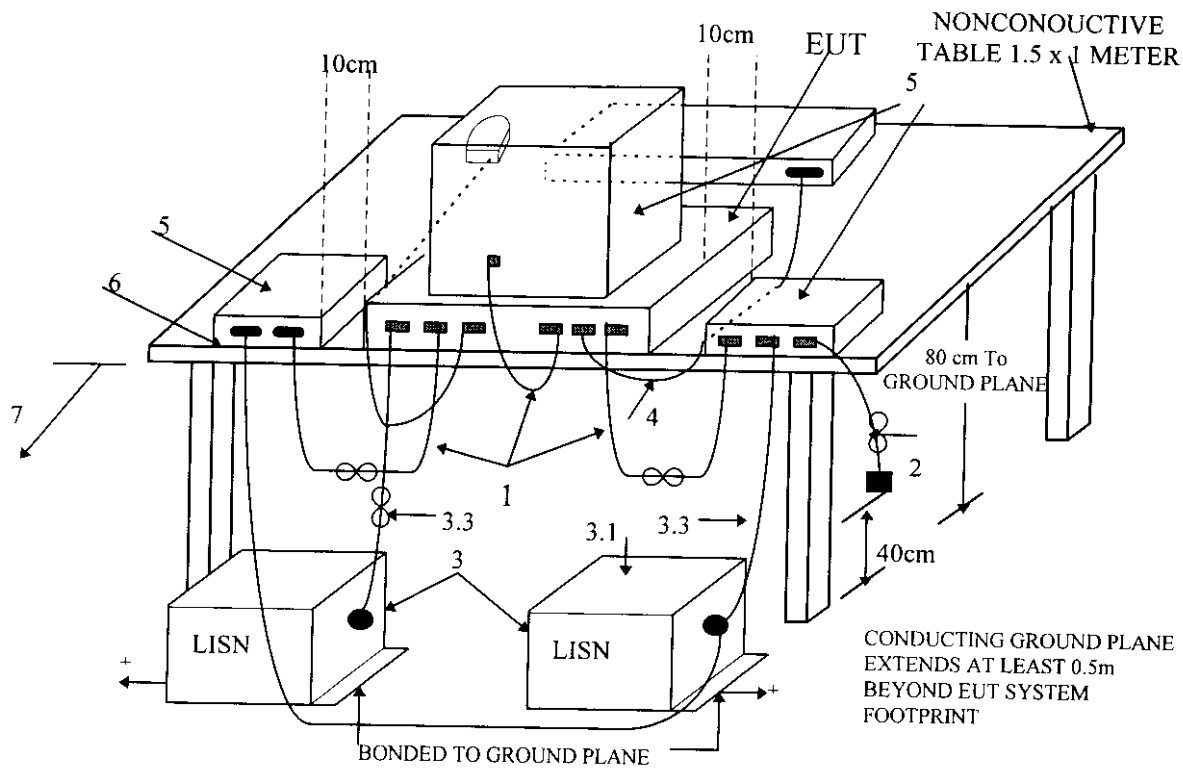
- 2.1 The EUT was tested according to **ANSI C63.4 - 1992**.
- 2.2 The EUT was placed 0.4 meter from the conducting wall of shielding room and kept at least 0.8 meter from any other grounded conducting surface.
- 2.3 The frequency range form 0.45 MHz to 30 MHz was investigated.
- 2.4 The LISN used was 50 Ohm / 50 uHenry as specified by Section 5.1 of **ANSI C63.4 - 1992**.
- 2.5 All the support peripherals are connect to the other LISN.
- 2.6 Cables and peripherals were moved to find the maximum emission levels for each frequency.

### 3 TEST SETUP

#### 3.1 Typical : Setup Of Conducted Test

ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE OF 9kHz TO 40 GHz

ANSI  
C63.4-1992



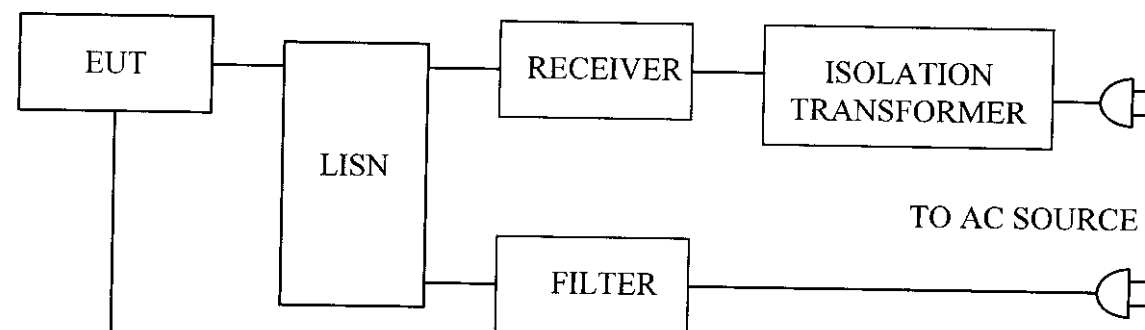
+LISNs may have to be moved to the side to meet 3.3 below.

#### LEGEND:

1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.
2. I/O cables that are connected to a peripheral shall be bundled in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1m.
3. EUT connected to one LISN. Unused LISN connectors shall be terminated in 50  $\Omega$ . LISN can be placed on top of, or immediately beneath, ground plane.
  - 3.1 All other equipment powered from second LISN.
  - 3.2 Multiple outlet strip can be used for multiple power cords of non-EUT equipment.
  - 3.3 LISN at least 80 cm from nearest part of EUT chassis.
4. Cables of hand-operated devices, such as keyboards, mouses, etc., have to be placed as close as possible to the host.
5. Non-EUT components being tested.
6. Rear of EUT, including peripherals, shall be all aligned and flush with rear of tabletop.
7. Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the floor ground plane (see 5.2).

#### Test Configuration Tabletop Equipment Conducted Emission

### 3.2 Block Diagram Of Conducted Test



- ☒ Monitor
- ☒ Printer
- ☒ Modem
- ☒ Key Board
- ☒ Mouse
- ☐ Joystick
- ☐ Network Cable
- ☐ Speaker
- ☐ Line in Device

## 4 CONFIGURATION OF THE EUT

The EUT was configured according to **ANSI C63.4 - 1992**. All I/O ports were connected to the appropriate peripherals. All peripherals and cables are listed below (including internal device) :

### 4.1 EUT

|               |   |                   |
|---------------|---|-------------------|
| Device        | : | Computer Keyboard |
| Manufacturer  | : | EZKEY             |
| Model Number  | : | EZ-2000           |
| Serial Number | : | N/A               |
| FCC ID        | : | MWIEZ-2000        |
| Data Cable    | : | Shielded          |
| Power Cord    | : | N/A               |

### 4.2 PERIPHERALS

#### ☒ Host Personal Computer

|               |   |                 |
|---------------|---|-----------------|
| Manufacturer  | : | HP              |
| Model Number  | : | Vectra VE 5/133 |
| Serial Number | : | SG72200516      |
| FCC ID        | : | B94VECTRAVE53   |
| Data Cable    | : | Shielded, 1.5m  |
| Power Cord    | : | Shielded, 1.8m  |



☒ Monitor

Manufacturer : ATEC  
Model Number : G450DU  
Serial Number : 714PD000Q0002  
FCC ID : GKR450  
Data Cable : Shielded, 1.5m  
Power Cord : UN-Shielded, 1.8m

☒ Printer

Manufacturer : HP  
Model Number : DJ400  
Serial Number : MY77M1C3Q8  
FCC ID : B94C2642X  
Data Cable : Shielded, 1.5m  
Power Cord & Adaptor : UN-Shielded, 1.8m

☒ Modem I

Manufacturer : DATATRONIC  
Model Number : 1200CK  
Serial Number : N/A  
FCC ID : E2050V1200CK  
Data Cable : Shielded, 1.5m  
Power Cord & Adaptor : UN-Shielded, 1.8m



☐ Modem II

Manufacturer : DATATRONIC  
Model Number : 1200CK  
Serial Number : N/A  
FCC ID : E2050V1200CK  
Data Cable : Shielded, 1.5m  
Power Cord & Adaptor : UN-Shielded, 1.8m

☒ Mouse (PS II)

Manufacturer : HP  
Model Number : M-S34  
Serial Number : LZA61236877  
FCC ID : DZL210582  
Data Cable : Shielded, 1.8m

4.3 REMARK :

## 5 EUT OPERATING CONDITION

- 5.1 Operating condition is according to **ANSI C63.4 - 1992**.
- 5.2 The oscillator Frequency of EUT were 4 MHz.
- 5.3 EUT power ON.
- 5.4 Test program sent "H" pattern to peripherals as following :
  - 5.4.1 Printer
  - 5.4.2 Monitor
  - 5.4.3 Modem
  - 5.4.4 Key Board
  - 5.4.5 Mouse

## 6 LIMIT OF CONDUCTED POWER LINE EMISSION CLASS B:

| Frequency Range  | Class A | Class B |
|------------------|---------|---------|
| 0.45 ~ 1.705 MHz | 1000 uV | 250 uV  |
| 1.705 ~ 30 MHz   | 3000 uV | 250 uV  |
|                  |         |         |

- 6.1 In the above table, the tighter limit applies at the band edges.

## 7 RESULT OF CONDUCTED POWER LINE TEST (1)

7.1 The frequency range from 0.45 MHz to 30 MHz was investigated. All readings are quasi-peak values.

7.2 IF bandwidth : 9 kHz, Meas Time : 1 sec.

7.3 Temperature : 21 °C, Humidity : 72 % RH.

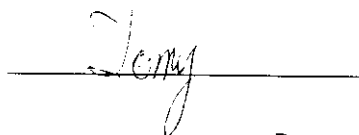
7.4 Quasi-Peak :

| Frequency (MHz) | Line 1 |       | Line 2 |       | Limit |     |
|-----------------|--------|-------|--------|-------|-------|-----|
|                 | dBuV   | uV    | dBuV   | uV    | dBuV  | uV  |
| 0.475           | 37.03  | 71.04 | 33.86  | 49.32 | 48    | 250 |
| 0.945           | 36.66  | 68.08 | 33.57  | 47.70 | 48    | 250 |
| 1.180           | 31.49  | 37.54 | 34.14  | 50.93 | 48    | 250 |
| 1.535           | 34.63  | 53.89 | 35.03  | 56.43 | 48    | 250 |
| 1.770           | 33.67  | 48.25 | 35.81  | 61.73 | 48    | 250 |
| 2.360           | 32.10  | 40.27 | 35.49  | 59.50 | 48    | 250 |
| 3.890           | 28.35  | 26.15 | 34.71  | 54.39 | 48    | 250 |
| 6.300           | 28.73  | 27.32 | 33.56  | 47.64 | 48    | 250 |

### REMARK :

1. Model : EZ-2000
2. Measuring mode :
3. Uncertainty in conduction emission measured :  $< \pm 2.0\text{dB}$ .

Test Engineer :



## RADIATED EMISSION TEST

### 1 TEST INSTRUMENTS & FACILITIES

The following test Instruments was used during the radiated emission test :

| Item | Instruments /facilities | Specification    | Manufacturer       | Model # / S/N#        | Location        | Date of Cal. |
|------|-------------------------|------------------|--------------------|-----------------------|-----------------|--------------|
| 1    | SPECTRUM ANALYZER       | 9KHz ~ 1.8GHz    | HP                 | HP8591<br>3710A06158  | Open Site<br>I  | APR/98       |
| 2    | EMI TEST RECEIVER       | 20MHz ~ 1GHz     | ROHDE &<br>SCHWARZ | ESVS10<br>845165/017  | Open Site<br>I  | FEB/98       |
| 3    | PRE-AMPLIFIER           | 0.1MHz ~ 1.3 GHz | HP                 | 8447D<br>1937A02095   | Open Site<br>I  | MAY/97       |
| 4    | EMI TEST RECEIVER       | 20Hz ~ 26.5GHz   | ROHDE &<br>SCHWARZ | ESMI<br>845442/006    | Open Site<br>II | FEB/98       |
| 5    | PRE-AMPLIFIER           | 20MHz ~ 7GHz     | ROHDE &<br>SCHWARZ | ESMI-Z7<br>846363/001 | Open Site<br>II | FEB/98       |
| 6    | SIGNAL GENERATOR        | 9KHz ~ 2080MHz   | ROHDE &<br>SCHWARZ | SMY02<br>845096/018   |                 | FEB/98       |
| 7    | ANTENNA (BI-LOG)        | 25MHz ~ 2GHz     | ARA                | LPB2520<br>S/N:1096   | Open Site<br>I  | MAR/98       |
| 8    | ANTENNA (BI-LOG)        | 25MHz ~ 2GHz     | ARA                | LPB2520<br>S/N:1095   | Open Site<br>II | MAR/98       |
| 9    | ANTENNA (DIPOLE)        | 30 ~ 300MHz      | ROHDE &<br>SCHWARZ | HZ-12<br>842899/08    |                 | JAN/98       |
| 10   | ANTENNA (DIPOLE)        | 300 ~ 1000MHz    | ROHDE &<br>SCHWARZ | HZ-13<br>842007/0004  |                 | JAN/98       |

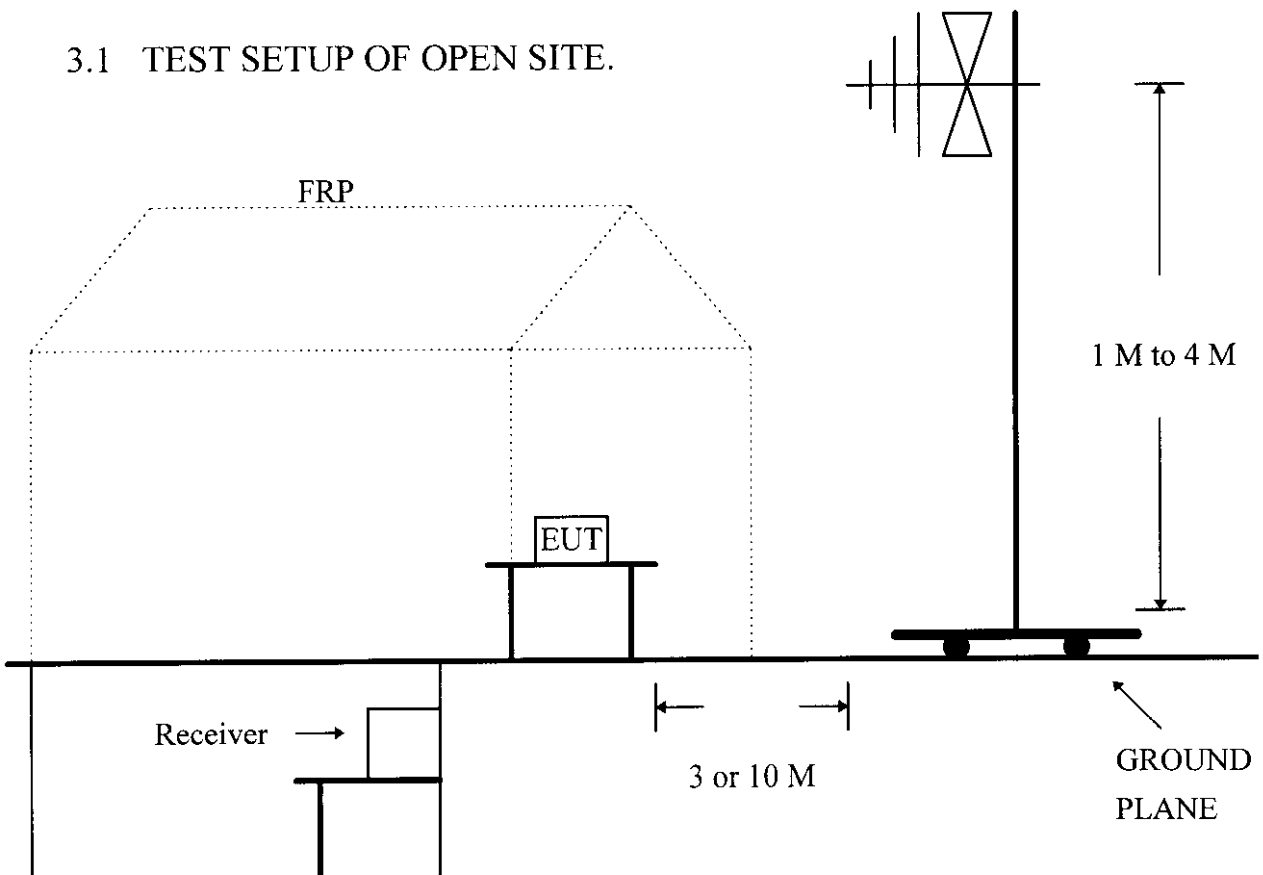
Note : All equipment upon which need to calibrated are with period of 1 year.

## 2 TEST PROCEDURE

- 2.1 The EUT was test according to **ANSI C63.4 - 1992**.
- 2.2 The radiated test was performed at HomeTek Lab's Open Site II.
- 2.3 This site is on file with the FCC laboratory division, reference 31040/site 1300F2,  
Date : August 22, 1997.
- 2.4 The frequency range from 30 MHz to 1 GHz, the measurement were made  
at 3 meters, with a BI-log antenna.

## 3 TEST SETUP

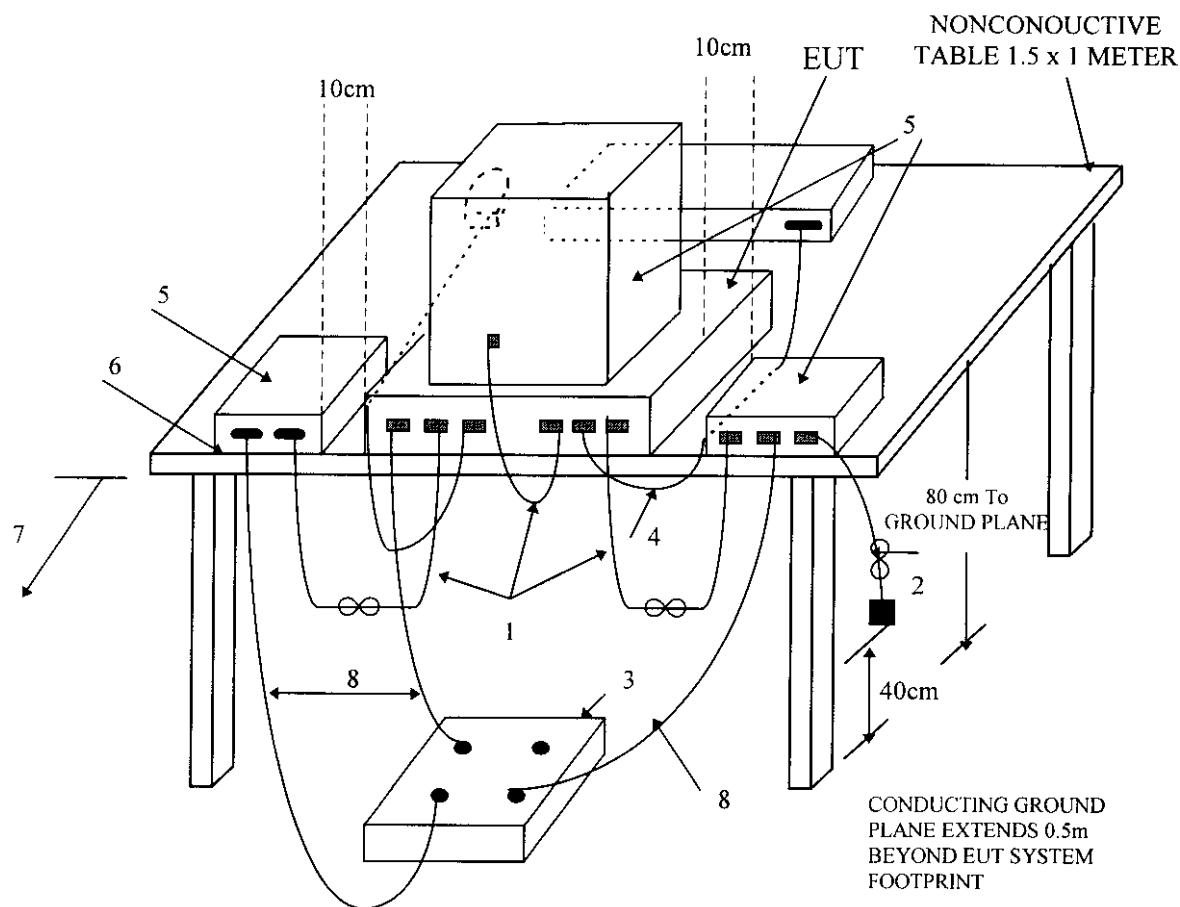
### 3.1 TEST SETUP OF OPEN SITE.



### 3.2 TEST SET OF EUT

ELECTRICAL AND ELECTRONIC EQUIPMENT IN THE RANGE OF 9kHz TO 40 GHz

ANSI  
C63.4-1992



#### LEGEND:

1. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth forming a bundle 30 to 40 cm long, hanging approximately in the middle between ground plane and table.
2. I/O cables that are connected to a peripheral shall be bundled in center. The end of the cable may be terminated if required using correct terminating impedance. The total length shall not exceed 1m.
3. If LISNs are kept in the test setup for radiated emissions, it is preferred that they be installed under the ground plane with the receptacle flush with the ground plane.
4. Cables of hand-operated devices, such as keyboards, mice, etc., have to be placed as close as possible to the controller.
5. Non-EUT components of EUT system being tested.
6. The rear of all components of the system under test shall be located flush with the rear of the table.
7. No vertical conducting wall used.
8. Power cords drape to the floor and are routed over to receptacle.

**Test Configuration**  
**Tabletop Equipment Radiated Emission**

#### 4 CONFIGURATION OF THE EUT

Same as “Conducted Power Line test”, section 4

#### 5 EUT OPERATING CONDITION

5.1 Same as “Conducted Power Line test”, section 5

5.2 The radiated emission in the frequency range from 30 MHz - 1000 MHz was test in a horizontal and vertical polarization at HomeTek Lab’s open site II.

#### 6 LIMIT OF RADIATED EMISSION CLASS B:

| Frequency<br>(MHz) | Measurement<br>Distance | Limit (uV/m) |         |
|--------------------|-------------------------|--------------|---------|
|                    |                         | Class A      | Class B |
| 30 - 88            | 3 (M)                   | 300          | 100     |
| 88 - 216           | 3 (M)                   | 500          | 150     |
| 216 - 960          | 3 (M)                   | 700          | 200     |
| Above 1000         | 3 (M)                   | 1000         | 500     |

6.1 The tighter limit shall apply at the edge between two frequency bands.

6.2 Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

## 7 RESULT OF RADIATED EMISSION TEST (1)

- 7.1 The frequency range from 30 MHz to 1 GHz was investigated. All readings are quasi-peak values with resolution bandwidth of 120 kHz.
- 7.2 The measurements above 1 GHz with a resolution bandwidth of 1 MHz are peak reading at 3 meters.
- 7.3 The measurements were made at 3 meters of HomeTek Lab's open site II.
- 7.4 Temperature : 21 °C, Humidity : 72 % RH.
- 7.5 Radiated Emission data : **Horizontal**

| Frequency (MHz) | Reading Level (dBuV) | ANT factor (dBuV) | Cable Loss (dBuV) | Emission Level (dBuV) | Emission Level (uV/m) | Limit (dBuV) | Limit (uV/m) |
|-----------------|----------------------|-------------------|-------------------|-----------------------|-----------------------|--------------|--------------|
| 32.11           | 6.44                 | 15.49             | 0.41              | 22.34                 | 13.09                 | 40.0         | 100          |
| 42.29           | 10.10                | 15.48             | 0.46              | 26.04                 | 20.04                 | 40.0         | 100          |
| 74.69           | 12.84                | 8.30              | 0.53              | 21.67                 | 12.12                 | 40.0         | 100          |
| 87.66           | 17.69                | 9.37              | 0.56              | 27.62                 | 24.04                 | 40.0         | 100          |
| 109.77          | 20.23                | 11.30             | 0.63              | 32.16                 | 40.55                 | 43.5         | 150          |
| 114.54          | 14.69                | 11.60             | 0.63              | 26.92                 | 22.18                 | 43.5         | 150          |
| 165.79          | 15.79                | 10.62             | 0.74              | 27.15                 | 22.78                 | 43.5         | 150          |
| 170.49          | 18.50                | 11.14             | 0.75              | 30.39                 | 33.08                 | 43.5         | 150          |

- Emission Level = Reading Level + ANT Factor + Cable Loss.
- Sample Calculation for 170.49 MHz .
- Corrected Reading : ( 18.50 ) + ( 11.14 ) + ( 0.75 ) = 30.39 . (Emission Level)

7.6 Radiated Emission data : **Vertical**

| Frequency<br>(MHz) | Reading<br>Level<br>(dBuV) | ANT<br>factor<br>(dBuV) | Cable<br>Loss<br>(dBuV) | Emission<br>Level<br>(dBuV) | Emission<br>Level<br>(uV/m) | Limit<br>(dBuV) | Limit<br>(uV/m) |
|--------------------|----------------------------|-------------------------|-------------------------|-----------------------------|-----------------------------|-----------------|-----------------|
| 32.10              | 8.70                       | 16.48                   | 0.41                    | 25.59                       | 19.03                       | 40.0            | 100             |
| 42.24              | 6.97                       | 18.68                   | 0.46                    | 26.11                       | 20.21                       | 40.0            | 100             |
| 109.76             | 22.20                      | 14.03                   | 0.63                    | 36.86                       | 69.66                       | 43.5            | 150             |
| 159.97             | 23.97                      | 8.83                    | 0.79                    | 33.59                       | 47.81                       | 43.5            | 150             |
| 186.13             | 19.39                      | 9.20                    | 0.74                    | 29.33                       | 29.28                       | 43.5            | 150             |
| 220.40             | 11.88                      | 12.02                   | 0.88                    | 24.78                       | 17.34                       | 46.0            | 200             |
| 232.09             | 18.58                      | 13.03                   | 0.89                    | 32.50                       | 41.17                       | 46.0            | 200             |
| 255.04             | 17.77                      | 14.64                   | 0.91                    | 33.32                       | 46.34                       | 46.0            | 200             |

- Emission Level = Reading Level + ANT Factor + Cable Loss.
- Sample Calculation for 255.04 MHz .
- Corrected Reading : ( 17.77 ) + ( 14.64 ) + ( 0.91 ) = 33.32 . (Emission Level)

REMARK :

1. Model : EZ-2000
2. Measuring mode :
3. Uncertainty in radiated emission measured :  $< \pm 4.0\text{dB}$ .

Test Engineer :

*Jenny*