

MEASUREMENT/TECHNICAL REPORT

APPLICANT: WORLD WIDE LICENSES LTD.

MODEL NO.: MUO 5M

FCC ID: NW7M5M

This report concerns (check one) : Original Grant _____ ✓
 Class II Change _____

Equipment type: MOUSE

Deferred grant requested per 47CLR 0.457(d)(1)(ii)?
Yes _____ No _____ ✓ If yes, defer until: _____ (date)

We, the undersigned, agree to notify the Commission by (date) _____ / _____ / _____ of the intended date of announce ment of the product so that the grant can be issued on that date.

Transiyion Rules Request per 15.37? Yes _____ No _____ ✓
If no, assumed Part 15, Subpart B for unintentional radiator the new 47 CLR (10-1-90 Edition)
provision.

Report Prepared

by Testing House : Neutron Engineering Inc.

for Company Name: WORLD WIDE LICENSES LTD.

Address: 14F Hong Kong Pacific Centre, 28 Hankow Road, Tsimshatsui,
Kowloom, Hong Kong.

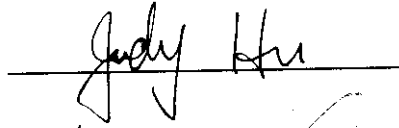
Applicant Signature : Peter Lee
Peter Lee / Senior Engineer

CERTIFICATION

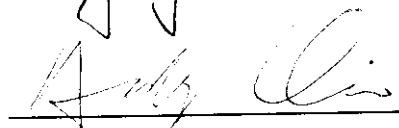
We hereby certify that:

The test data , data evaluation , test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4 (1992)/CISPR22(1996) and the energy emitted by the sample EUT tested as described in this report is in compliance with CLASS B conducted and radiated emission limits of FCC Rules Part 15 , Subpart B/CISPR22(1996).

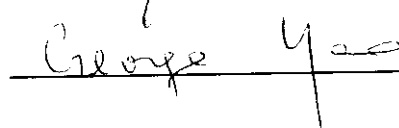
Prepared by : Judy Hu



Reviewed by : Andy Chiu



Approved by : George Yao



Issued Date : MAY 28, 1998

Report No. : NEI-FCCB-98074

Company Stamp :



NEUTRON ENGINEERING INC.
20, Alley 50, Lane 119, Dong Hwu Rd.,
P.O. Box 6-158, Nei Hwu,
Taipei, Taiwan
TEL : (02) 2633-6872 FAX : (02) 2633-4578

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1. GENERAL INFORMATION

1-1. Product Description

The World Wide Licenses Ltd. Model: MUO 5M (referred to as the EUT in the report) is a two keys MS serial mouse. It is designed as an "Input Device" for IBM PC AT/XT or compatible PC.

The Summarized feature of EUT are described as following:

- 1). Oscillator Frequency: 32768 Hz
- 2). Interface Port: RS232
It provides a permanently, shielded, D-Sub 9 pin, cable connector without ferrite core attached to interconnect with PC.
- 3). Power Consumption: 120mW, 10mA at 12 Vdc Supply, in average.

1-2. Related Submittal(s) / Grant (s)

1-2-1. Models Covered

Only the EUT model MUO 5M is submitted for FCC ID filing.

1-2-2. Models Difference

N/A

1-3. Tested System Details

The FCC IDs for all equipments, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

Model No.	FCC ID	Equipment	Cable
NE64	KFBNE64	Monitor	Shielded Data Cable ⁽²⁾ Non-Shielded Power Cord
PRESARIO7222	EJH3326	PC	Non-Shielded Power Cord
HP2225C+	DSI6XU2225	Printer	Shielded Parallel Data Cable Non-Shielded Power Cord
FDA-102A	F4Z4K3FDA-102A	Keyboard	Shielded Data Cable
MUO 5M ⁽¹⁾	NW7M5M	Mouse	Shielded Data Cable

Notes:

(1) EUT submitted for grant.

(2) Monitor's attached video cable without ferrite core.

1-4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992)/CISPR22(1996). Radiated testing was performed at an antenna to EUT distance 10 meters.

1-5. Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on the address of No. 5, All 2, Lane 220, Kang Lo St., Nei Hwu, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Feb.4, 1998 Submitted to your office, and accepted in a letter dated March 28, 1998 (31040/SIT-1300F2).

3. System Test Configuration

3-1. Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). The mouse was connected to support equipment-personal computer. Peripherals of PC, such as monitor, keyboard and printer were contained in this system in order to comply with the ANSI C63.4/CISPR22(1996) Rules requirement. The PC operated in the default 640x480/31.5KHz VGA Graphic mode. This operating condition was tested and used to collect the included data.

3-2. EUT Exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disk, was inserted into driver A and is auto-starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is:

1. Read(write) from(to) mass storage device(Disk).
2. Send "H" pattern to video port device(Monitor).
3. Send " H " pattern to parallel port device(Printer).
4. Send " H " pattern to COM1 port device (Mouse).
5. Repeated from 1 to 4 continuously.

As the Keyboard and mouse are strictly input devices, no data is transmitted from them during test. They are, however, continuously scanned for data input activity.

3-3. Special Accessories

Not available for this EUT intended for grant.

3-4. Equipment Modifications

Not available for this EUT intended for grant.

3.5 Configuration of Tested System

The configuration of tested system is described as the block diagram shown in next page Figure 3.1 and details information of I/O cable and power cord connection are tabulated as Table A and B. The monitor is powered from a floor mounted receptacle (referred to as the wall outlet in the previous described) was tested.

TABLE A - Test Equipment

Item	Equipment	Mfr.	Model/Type No.	I/O Port	FCC ID	Remark
E-1	Mouse	World Wide	MUO 5M	Com1 Port	NW7M5M	EUT
E-2	Monitor	Chern-Yih	NE64	VGA Port	KFBNE64	
E-3	PC	COMPAQ	Vectra VL 5/75 S3		K4UVECTRAVL5	
E-4	Printer	HP	HP2225C+	Centronic Port	DSI6XU2225	
E-5	Keyboard	Forward	FDA-102A	KB DIN Port	F4Z4K3FDA-102A	

Remark:

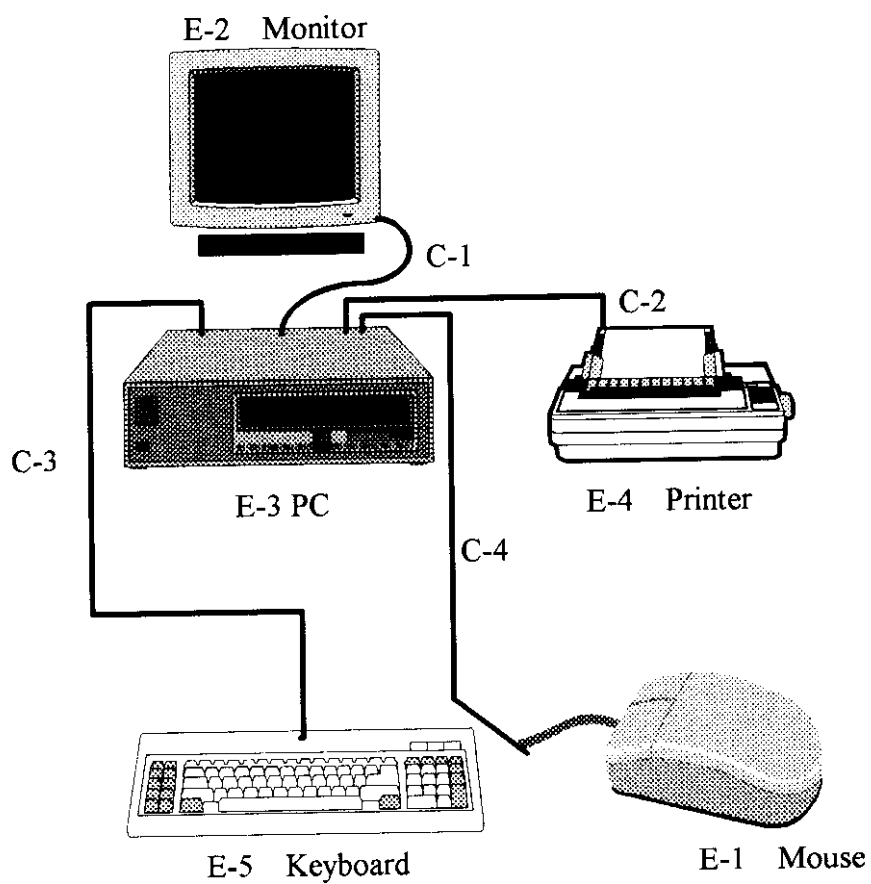
- (1) Unless otherwise denoted as EUT in 「Remark」 column, device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as ※ in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.

Table B. - Informations Cable Information

Item	I/O Cable	Device Connected	Shilded	Ferrite	Detachable/Permanently	Note
C-1	Video Cable	PC-Monitor	Yes	No	Permanently attached on Monitor	
C-2	Centronics Cable	PC-Printer	Yes	No	Part of Printer, Detachable	
C-3	Keyboard Cable	PC-Keyboard	Yes	No	Permanently attached on Keyboard	
C-4	Mouse Cable	PC-Mouse	Yes	No	Permanently attached on Mouse	※

Note:

- (1) Unless otherwise marked as ※ in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.

Figure 3.1 Configuration of Tested System

6. Conducted Emission Datas

6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Judgement: Passed by -11.20 dB in mode of **Neutral** terminal 0.51 MHz

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe Margins	
		QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.27	Line	46.04	*	61.12	51.12	-15.08	(QP)
0.51	Line	44.80	*	56.00	46.00	-11.20	(QP)
0.89	Line	39.87	*	56.00	46.00	-16.13	(QP)
12.19	Line	33.00	*	60.00	50.00	-27.00	(QP)
15.80	Line	37.07	*	60.00	50.00	-22.93	(QP)
0.27	Neutral	46.04	*	61.12	51.12	-15.08	(QP)
0.51	Neutral	44.80	*	56.00	46.00	-11.20	(QP)
0.89	Neutral	39.87	*	56.00	46.00	-16.13	(QP)
12.19	Neutral	33.00	*	60.00	50.00	-27.00	(QP)
15.80	Neutral	37.07	*	60.00	50.00	-22.93	(QP)

Remark :

- (1) Reading in which marked as QP means measurements by using are Quasi-Peak Mode with Detector BW=9KHz ; SPA setting in RBW=100KHz, VBW =100KHz, Swp. Time = 0.3 sec./MHz . Reading in which marked as AV means measurements by using are Average Mode with instrument setting in RBW=1MHz, VBW=10Hz, Swp. Time =0.3 sec./MHz .
- (2) All readings are QP Mode value unless otherwise stated AVG in colum of 『Note』 . If the QP Mode Measured value compliance with the QP Limits and lower than AVG Limits, the EUT shall be deemed to meet both QP & AVG Limits and then only QP Mode was measured, but AVG Mode didn't perform . In this case, a " *" marked in AVG Mode colum of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Review : Andy Chen Test Personnel : R. Ker Hsu Date: MAY 18, 1998

7. Radiated Emission Datas

- 7.1 The following data lists the significant emission frequency, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by -2.21 dB in polarity of **Horizon** 219.2 MHz

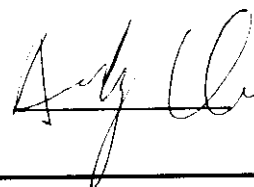
Table 5-2 Radiated Emission Data

Freq. (MHz)	Polar. H/V	Reading(RA) (dBuV/m)	Corr.Factor. (dBuV/m)	Corrected FS (dBuV/m)	Limits (QP) (dBuV/m)	Margins (dBuV/m)	Note (QP)
81.75	V	19.10	6.76	25.86	30.00	- 4.14	
179.40	V	6.10	18.11	24.21	30.00	- 5.79	
181.00	H	5.50	18.28	23.78	30.00	- 6.22	
187.10	H	6.90	18.73	25.63	30.00	- 4.37	
191.50	V	6.40	18.86	25.26	30.00	- 4.74	
193.50	H	5.40	18.80	24.20	30.00	- 5.80	
219.20	H	16.00	11.79	27.79	30.00	- 2.21	
220.80	V	11.00	11.73	22.73	30.00	- 7.27	
228.00	H	15.10	11.85	26.95	30.00	- 3.05	
266.40	H	13.80	14.68	28.48	37.00	- 8.52	
298.40	V	14.50	16.79	31.29	37.00	- 5.71	
307.20	V	14.60	16.61	31.21	37.00	- 5.79	

Remark :

- (1) Reading in which marked as QP or Peak means measurements by using are Quasi-Peak Mode or Peak Mode with Detector BW=120KHz ; SPA setting in RBW=1MHz, VBW =1MHz, Swp. Time = 0.3 sec./MHz.
- (2) All readings are Peak unless otherwise stated QP in column of 'Note'. Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measurement didn't perform.
- (3) Measuring frequency range from 30MHz to 1000MHz.
- (4) If the peak scan value lower limit more than 20dB, then this signal data does not show in table.

Review :



Test Personnel :

Riker Hsu

Date:

MAY 11, 1998

7-3. Correction Factor VS Frequency

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30.00	11.10	0.20
35.00	10.80	0.00
40.00	11.20	0.40
45.00	11.50	0.40
50.00	11.30	0.90
55.00	10.50	0.00
60.00	9.90	0.00
65.00	8.70	0.20
70.00	7.60	0.00
75.00	6.40	0.50
80.00	6.10	0.10
85.00	7.00	0.80
90.00	8.00	0.30
95.00	10.00	0.40
100.00	11.20	0.60
110.00	12.60	0.60
120.00	13.00	0.60
130.00	12.50	0.50
140.00	12.00	0.20
150.00	12.00	1.00
160.00	13.20	1.20
170.00	14.80	1.60
180.00	16.30	1.90
190.00	17.00	1.90
200.00	17.30	1.40
225.00	10.50	1.10
250.00	11.70	2.00
275.00	12.80	2.40
300.00	14.50	2.40
325.00	14.00	1.90
350.00	14.20	2.40
375.00	14.60	2.90
400.00	15.10	2.70
450.00	16.20	3.20
500.00	17.60	3.70
550.00	17.80	3.90
600.00	18.40	4.30
650.00	19.50	4.00
700.00	20.80	4.10
750.00	20.50	5.30
800.00	21.10	5.90
850.00	22.40	5.80
900.00	23.50	5.50
950.00	24.00	6.30
1000.00	24.80	5.20

8. Photos of Tested EUT:

1. Photo # 1. Front View
2. Photo # 2. Rear View
3. Photo # 3. Unit Partially Disassembled
4. Photo # 4. Unit Partially Disassembled
5. Photo # 5. Unit Partially Disassembled
6. Photo # 6. Unit Partially Disassembled

7-2. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor (1)

CL = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

Remark :

(1) The Correction Factor = AF + CL - AG, as shown in the data tables' Correction Factor column.

(2) AG is not available for Neutron's Open Site Facility

Example of Calculation:

Assume a Receiver Reading of 23.7 dBuV is obtained with an Antenna Factor of 7.2 dB and a Cable Factor of 1.1 dB. Then:

1. The Correction Factor will be calculated by

$$\text{Correction Factor} = AF + CL - AG = 7.2 + 1.1 - 0 = 8.3 \text{ (dB)}$$

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

$$FS = RA + \text{Correction Factor} = 23.7 + 8.3 = 32 \text{ (dBuV/m)}.$$

FS is the value shown in the data tables' Corrected Reading column and RA is the value shown in the data tables' Receiver Reading column. The 32 dBuV/m value was mathematically converted to its corresponding level in uV/m as:

$$\text{Log}^{-1} \left[(32.0 \text{ dBuV/m}) / 20 \right] = 39.8 \text{ (uV/m)}$$