

MEASUREMENT/TECHNICAL REPORT**APPLICANT:** Tremon Enterprises Co., Ltd**MODEL NO.:** MMP-10**FCC ID:** JKGMUO3P

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

Equipment type: MOUSE

Deferred grant requested per 47CFR 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 announcement of the product so that the grant can be issued on that date.

Transiyion Rules Request per 15.37?

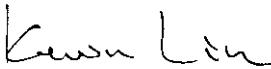
Yes No

If no, assumed Part 15, Subpart B for unintentional radiator the new 47 CFR (10-1-90 Edition) provision.

Report Prepared**by Testing House :** Neutron Engineering Inc.**for Company :**

Name Tremon Enterprises Co., Ltd.

Address 15F, No. 116 Sec. 1, Shin-Tai 5th. Rd. Hsichih Taipei County Taiwan.

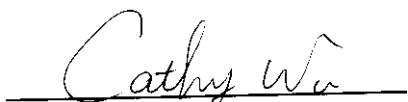
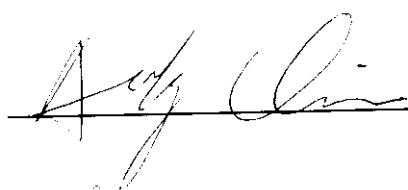
Applicant Signature :

Kevin Lin/R & D Manger

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)/CISPR 22(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/CISPR 22(1996).

Prepared by : Cathy Wu**Reviewed by :** Andy Chiu**Approved by :** George Yao**Issued Date :** May 13, 1998**Report No. :** NEI-FCCB-98056**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

Table of Contents

1. General Information	
1-1 Product Description	4
1-2 Related Submittal(s)/Grant(s)	4
1-3 Tested System Details	5
1-4 Test Methodology	6
1-5 Test Facility	6
2. Product Labelling	
Figure 2-1 FCC ID Label	7
Figure 2-2 Location of Label on EUT	7
3. System Test Configuration	
3-1 Justification	8
3-2 EUT Exercise Software	8
3-3 Special Accessories	9
3-4 Equipment Modifications	9
3-5 Configuration of Tested System	10
Figure 3-1 Configuration of Tested System	12
4. Block Diagram(s)	
5. Conducted and Radiated Measurement Photos	
Figure 5-1 Conducted Measurement Photos	14
Figure 5-2 Radiated Emission Data	15
6. Conducted Emission Data	
7. Radiated Emission Data	
7-1 Radiated Emission Data	17
7-2 Field Strength Calculation	18
7-3 Correction Factor Table VS Frequency	19
8. Attachment	
Photos of Tested EUT	20
User Manual	21

1. GENERAL INFORMATION

1-1. Product Description

The Tremon Enterprises Co., Ltd. Model: MMP-10(referred to as the EUT in the report) is a three keys PS/2 mouse. It is designed as an "Input Device" for IBM PC AT or compatible.

The summarized feature of EUT are described as following:

- 1). Oscillator Frequency: 35 KHz
- 2). Interface Port: It provides a permanently attached mini DIN type cable connector to interconnect with PC. Also, this interface cable is a shielded type, without ferrite attached.
- 3). Power Consumption: 110mW, 22mA at 5 Vdc Supply, in average.

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

1-2-1. Models Covered

Only the EUT model MMP-10 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
MMP-10	JKGMUO3P	Mouse	Shielded Data Cable
93V	ANO6282	PC	Shielded Power Cord
NE64	KFBNE64	Monitor	Shielded Data Cable ⁽²⁾ Un-Shielded Power Cord
HP2225C+	DSI6XU2225	Printer, Parallel I/F	Shielded Parallel Data Cable Un-Shielded Power Cord
AT-1200CK	E2O5OV1200CK	Modem, Serial I/F	Shielded Serial Data Cable Un-Shielded Power Cord
6311	FVI6311-K	Keyboard	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)/CISPR 22(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, modem and printer were contained in this system in order to comply with the ANSI C63.4/CISPR 22(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 COM port device (Modem).
5. Repeated from 1 to 4 continuously.

As the Keyboard and mouse are strictly input devices, no data is transmitted to (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.

Applicant Signature : Kevin Lin **Date :** May 13, 1998
Type/Printed Name : Kevin Lin **Position :** R & D Manager

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	Monitor	Chern Yin	NE64	VGA Port	KFBNE64	
E-2	PC	IBM	93V	N/A	ANO6282	
E-3	Mouse	Tremor	MMP-10	PS/2 Port	JKGMUO3P	EUT
E-4	Printer	HP	HP2225C+	Centronic Port	DSI6XU2225	
E-5	Modem	Datatronics	AT-1200CK	Com 2 Port	E2050V1200CK	
E-6	Keyboard	ACER	6311	KB DIN Port	FVI6311-K	

Remark:

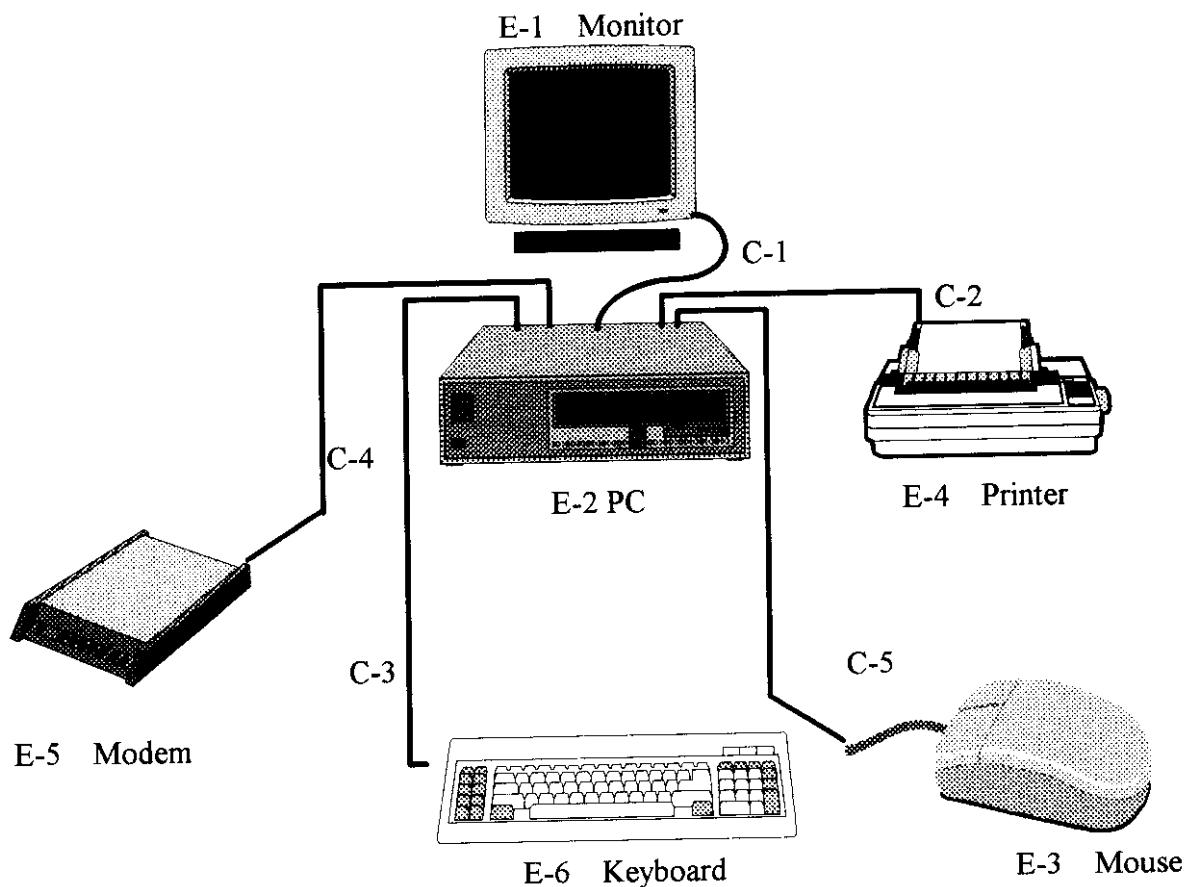
- (1) Unless otherwise denoted as EUT in 「Remark」 column, device(s) used in tested system is a support equipment.
- (2) Unless otherwise marked as * in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.

Table B. - Informations Cable Information

Item	I/O Cable	Device Connected	Shielded	Ferrite Core	Detachable/Permanently	Length	Note
C-1	Video Cable	PC-Monitor	Yes	No	Permanently attached	150cm	
C-2	Centronics Cable	PC-Printer	Yes	No	Detachable type	200cm	
C-3	Keyboard Cable	PC-Keyboard	Yes	No	Permanently attached	200cm	
C-4	RS-232 Cable	PC-Modem	Yes	No	Detachable type	120cm	
C-5	Mouse Cable	PC-Mouse	Yes	No	Permanently attached	280cm	※

Note:

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

Figure 3.1 Configuration of Tested System

4. Block Diagram(s)

Figure 4.1 Block diagram of system, Page 13.A

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.

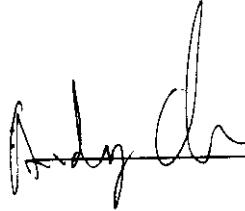
Judgement: Passed by **-16.80 dB** in mode of **Neutral terminal 14.14 MHz**

Freq. (MHz)	Terminal	Measured(dBuV)		Limits(dBuV)		Safe Margins		
		L/N	QP-Mode	AV-Mode	QP-Mode	AV-Mode	(dBuV)	Note
0.17	Line		44.36	*	65.16	55.16	-20.80	(QP)
0.38	Line		39.35	*	58.35	48.35	-19.00	(QP)
4.01	Line		25.56	*	56.00	46.00	-30.44	(QP)
12.00	Line		41.96	*	60.00	50.00	-18.04	(QP)
14.14	Line		43.20	*	60.00	50.00	-16.80	(QP)
0.38	Neutral		38.33	*	58.26	48.26	-19.93	(QP)
0.42	Neutral		34.82	*	57.47	47.47	-22.65	(QP)
4.01	Neutral		26.28	*	56.00	46.00	-29.72	(QP)
12.00	Neutral		41.14	*	60.00	50.00	-18.86	(QP)
14.99	Neutral		42.05	*	60.00	50.00	-17.95	(QP)

Remark :

- (1) Reading inwhich 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 inwhich 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 deemd 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

Test Personnel : Robert Tseng Date: April 10, 1998

7. Radiated Emission Data

7.1 The following data lists the significant emission frequencies, 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 **-5.85 dB** in polarity of **Vertical 121.10 MHz**

Table 5-2 Radiated Emission Data

Freq. (MHz)	Ant. H/V	Reading(RA) (dBuV)	Corr.Factor(CF) (dB)	Measured(FS) (dBuV/m)	Limits(QP) (dBuV/m)	Safe Margins (dBuV/m)	Note
32.00	H	12.10	11.10	23.20	30.00	- 6.80	
49.60	V	11.40	12.18	23.58	30.00	- 6.42	
121.10	V	10.60	13.55	24.15	30.00	- 5.85	
141.50	H	11.10	12.29	23.39	30.00	- 6.61	
142.20	V	10.90	12.33	23.23	30.00	- 6.77	
150.20	H	10.70	13.02	23.72	30.00	- 6.28	
203.20	V	9.90	12.30	22.20	30.00	- 7.80	
219.20	H	9.40	11.79	21.19	30.00	- 8.81	
219.20	V	11.70	11.79	23.49	30.00	- 6.51	
228.80	H	8.00	11.92	19.92	30.00	-10.08	
267.20	H	10.00	14.73	24.73	37.00	-12.27	
350.40	V	13.70	16.61	30.31	37.00	- 6.69	

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: Andy Chen Test Personnel: Robert Berg Date: April 15, 1998

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:

$$\mathbf{FS = RA + AF + CF - AG}$$

Where **FS = Field Strength**

RA = Receiver Amplitude

AF = Antenna Factor (1)

CF = Cable Attenuation Factor (1)

AG = Amplifier Gain (1) (2)

Remark :

(1) The Correction Factor = AF + CF - 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 dBuV and a Cable Factor of 1.1 dBuV. Then:

1. The Correction Factor will be caculated by

$$\mathbf{Correction Factor = AF + CF - AG = 7.2 + 1.1 - 0 = 8.3 \text{ (dBuV)}}$$

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

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

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:

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

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