

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 Keyboard was connected to support equipment-personal computer. Peripherals of PC, such as monitor, mouse, modem and printer were contained in this system in order to comply with the CISPR22 (1996) Rules requirement. The PC operated in the default 640 x 480 / 31.5 KHz VGA Graphic mode. This operating condition was tested and used to collect the included data. The system was configured for testing in a typical fashion (as a customer would normally use it). The Keyboard was connected to support equipment-personal computer. Peripherals of PC, such as monitor, mouse, modem and printer were contained in this system in order to comply with the CISPR22 (1996) Rules requirement. The PC operated in the default 640 x 480 / 31.5 KHz 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 serial port device (Modem).
5. Repeated from 2 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

No any other special accessory used for compliance testing.

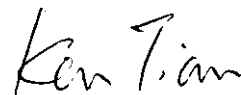
3-4. Equipment Modifications

In order to achieve in compliance with Class B levels, the following change(s) were made by NEUTRON test house during the compliance testing:

Please refer to the next page as the modifications described and cross reference of photos of tested EUT.

The above modifications will be implemented in all product models of this equipment.

Applicant Signature :



Date :

May 4, 1999

Type/Printed Name :

Ken Tian

Position :

Product Management and R&D Division

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	Logitech	SERIES2-7S	PS/2 Port	DZL6QBS2	
E-2	Monitor	Chern-Yih	NE64	VGA Port	KFBNE64	
E-3	PC	IBM	93V		ANO6282	
E-4	Printer	SII	DPU-414	Printer Port	N/A	
E-5	Modem	Datatronics	AT-1200CK	COM Port	E2O5OV1200CK	
E-6	Keyboard	QTRONIX	SCORPIUS 98A	PS/2 Port	FZQ4NE98A	EUT

Note:

- (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 support equipment(s) to the tested system.

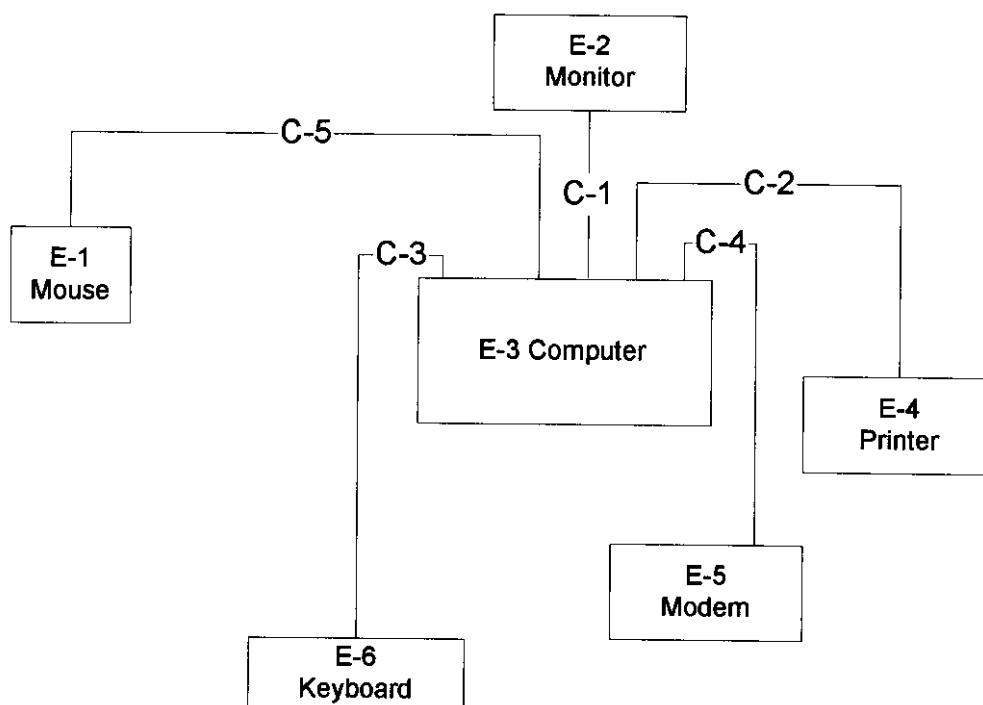
Table B. - Informations Cable Information

Item	I/O Cable	Device Connected	Shielded	Ferrite	Detachable / Permanently	Length	Note
C-1	Video Cable	PC-Monitor	Yes	No	Permanently attached on Monitor	150 cm	
C-2	Centronics Cable	PC-Printer	Yes	No	Part of Printer, Detachable	200 cm	
C-3	Keyboard Cable	PC-Keyboard	Yes	No	Permanently attached on KB	200 cm	※
C-4	RS-232 Cable	PC-Modem	Yes	No	Part of Modem, Detachable	175 cm	
C-5	Mouse Cable	PC-Mouse	Yes	No	Permanently attached on Mouse	280 cm	

Note:

- (1) Unless otherwise marked as ※ in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.
- (2) For detachable type I/O cable should be specified the length in cm in 「Length」 column.

Fig. 3-1 Configuration of Tested System



6. Conducted Emission Datas

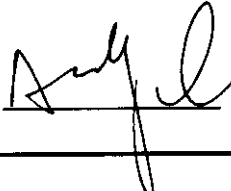
- 6.1 The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Judgement: Passed by **-13.94** dB in mode of **Line** terminal **0.15** MHz

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe (dBuV)	Margins Note
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		
0.15	L	52.00	*	65.94	55.94	-13.94	(QP)
0.20	L	42.40	*	63.57	53.57	-21.17	(QP)
0.23	L	42.20	*	62.31	52.31	-20.11	(QP)
0.27	L	38.20	*	61.21	51.21	-23.01	(QP)
18.92	L	41.66	*	60.00	50.00	-18.34	(QP)
0.15	N	49.80	*	66.00	56.00	-16.20	(QP)
0.20	N	43.40	*	63.82	53.82	-20.42	(QP)
0.23	N	41.40	*	62.38	52.38	-20.98	(QP)
0.27	N	39.20	*	61.24	51.24	-22.04	(QP)
18.92	N	41.66	*	60.00	50.00	-18.34	(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 :  Test Personnel : Riker 1/34 Date: Apr. 28, 1999

7. Radiated Emission Datas

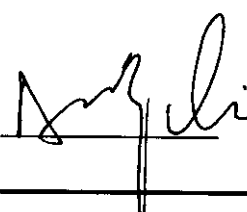
- 7.1 The following data lists the significant emission frequency, measured levels, correction factor (includes cable and antenna corrections), the corrected reading, as well as the limit. Explanation of the Correction Factor is given in paragraph 7.2.

Judgement: Passed by **-3.27** dB in polarity of **Horizontal 67.4** MHz

Freq. (MHz)	Polar. H/V	Reading(RA) (dBuV)	Corr.Factor. (dB)	Corrected F (dB)	Limits (QP) (dBuV/m)	Margins (dBuV/m)	Note (QP)
61.28	V	43.00	- 16.42	26.58	30.00	- 3.42	
67.40	H	44.00	- 17.27	26.73	30.00	- 3.27	
86.10	V	40.35	- 18.35	22.00	30.00	- 8.00	
111.77	H	40.60	- 15.50	25.10	30.00	- 4.90	
143.32	V	35.25	- 13.31	21.94	30.00	- 8.06	
173.14	H	36.60	- 13.91	22.69	30.00	- 7.31	
243.20	V	35.83	- 13.73	22.10	37.00	- 14.90	
244.80	H	38.60	- 13.64	24.96	37.00	- 12.04	
272.00	H	36.40	- 12.66	23.74	37.00	- 13.26	
372.80	V	35.86	- 8.83	27.03	37.00	- 9.97	
376.80	H	34.04	- 8.68	25.36	37.00	- 11.64	
428.80	V	34.74	- 7.18	27.56	37.00	- 9.44	

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 1/50 Date: Apr. 28, 1999

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:

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

7-3. Correction Factor VS Frequency

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30.00	11.10	0.90
35.00	10.80	0.50
40.00	11.20	1.00
45.00	11.50	0.80
50.00	11.30	1.00
55.00	10.50	1.30
60.00	9.90	1.00
65.00	8.70	1.50
70.00	7.60	1.20
75.00	6.40	1.40
80.00	6.10	1.30
85.00	7.00	1.40
90.00	8.00	1.70
95.00	10.00	1.50
100.00	11.20	1.90
110.00	12.60	2.00
120.00	13.00	1.80
130.00	12.50	1.80
140.00	12.00	2.00
150.00	12.00	2.20
160.00	13.20	2.40
170.00	14.80	2.50
180.00	16.30	2.50
190.00	17.00	2.50
200.00	17.30	2.40
225.00	10.50	2.70
250.00	11.70	3.10
275.00	12.80	3.70
300.00	14.50	4.00
325.00	14.00	4.50
350.00	14.20	4.50
375.00	14.60	4.60
400.00	15.10	4.80
450.00	16.20	5.40
500.00	17.60	6.50
550.00	17.80	7.00
600.00	18.40	7.10
650.00	19.50	7.10
700.00	20.80	7.20
750.00	20.50	7.50
800.00	21.10	8.00
850.00	22.40	8.60
900.00	23.50	8.90
950.00	24.00	9.70
1000.00	24.80	10.30

8. Photos of Tested EUT:

Photo #	1	Front View (Model No.: SCORPIUS 98A plus)
Photo #	2	Rear View (Model No.: SCORPIUS 98A plus)
Photo #	3	Front View (Model No.: SCORPIUS 98A)
Photo #	4	Rear View (Model No.: SCORPIUS 98A)
Photo #	5	Unit Partially disassembled
Photo #	6	Unit Partially disassembled
Photo #	7	Unit Partially disassembled
Photo #	8	Unit Partially disassembled
Photo #	9	Unit Partially disassembled
Photo #	10	Unit Partially disassembled (Model No.: SCORPIUS 98A plus)
Photo #	11	Unit Partially disassembled (Model No.: SCORPIUS 98A plus)