

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 digitizing tablet was connected to support equipment-personal computer. Peripherals of PC, such as monitor, Printer, mouse, and modem were contained in this system in order to comply with the ANSI C63.4/ CISPR22 Rules requirement. The transducers, both Pen and Mouse, were stand on the digitizing tablet during the measurement. The PC keyboard also connected with the EUT by the Keyboard/Power Adapter Cable. The PC operated in the default 640X480/31.5KHz VGA Graphic mode. This operated 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 (EUT).
5. Repeated from 2 to 4 continuously.

As the keyboard, mouse, and the digitizer composite system 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

The special I/O Cables as mentioned in product description, subclause 1-1 used for compliance testing. Those cables are normally supplied by the applicant and will be marketed with the EUT to the end user.

3-4. Equipment Modifications

Not available for this EUT intended for grant.

Applicant Signature : Allan ChaoDate : Nov. 13, 1998Type/Printed Name : Allan ChaoPosition : Vice President

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	Digitizing Tablet	AIPTEK	HyperPen 4000	Com Port	NRQSTO403A	EUT
E-2	Mouse	AIPTEK	Mouse	N/A	NRQMOUSEA	※
E-3	Stylus-Pen	AIPTEK	Pen	N/A	NRQAHPPEN	※
E-4	Monitor	Optquest	4500DC-E	VGA Port	GWGMULTI82	
E-5	PC	IBM	93V		ANO6282	
E-6	Thermal Printer	SII	DPU-414	Printer Port	N/A	
E-7	Keyboard	Forward	FDA-102A	K/B 2 Port	F4Z4K3FDA-102A	
E-8	Mouse	Logitech	SERIES.2-7S	Mouse Port	DZL6QBS2	
E-9	Modem	Datatronics	AT-1200CK	Com Port	E2O5OV1200CK	

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.

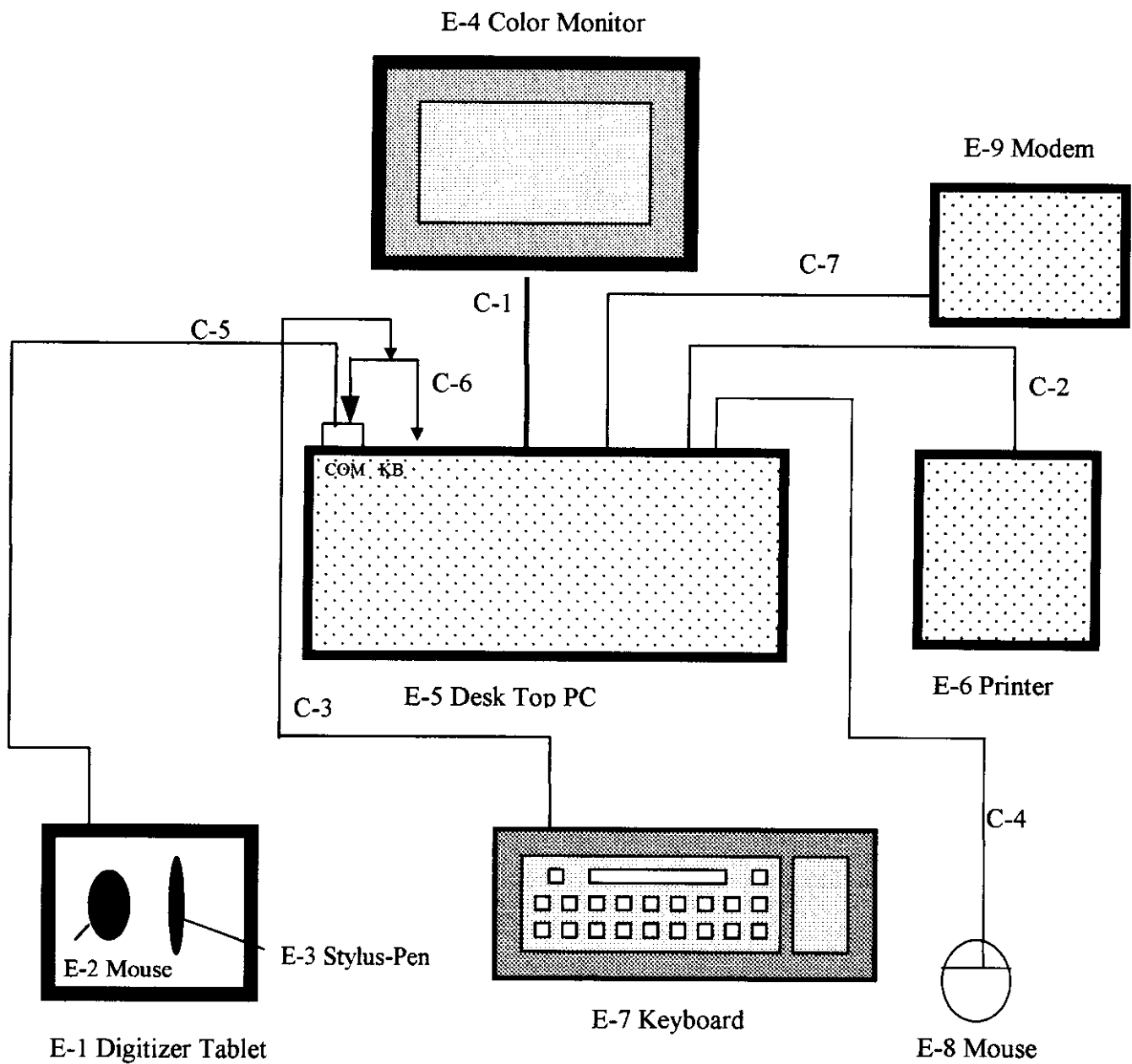
Table B. - Informations Cable Information

Item	I/O Cable	Device Connected	Shilded	Ferrite Core	Detachable/Permanently	Length	Note
C-1	Video Cable	PC-Monitor	Yes	No	Permanently attached on Monitor	150cm	
C-2	Centronics Cable	PC-Printer	Yes	No	Detachable type	200cm	
C-3	Keyboard Cable	EUT-Keyboard	Yes	No	Permanently attached on KB	200cm	
C-4	Mouse Cable	PC-Mouse	Yes	No	Permanently attached on Mouse	180cm	
C-5	Data/Power Cable	PC-EUT	Yes	No	Permanently attached on EUT	180cm	
C-6	Keyboard/Power Adaptor Cable	PC-EUT	Yes	No	Detachable type	180cm	※
C-7	RS-232 Cable	PC-Modem	Yes	No	Part of Modem, Detachable	180cm	

Note:

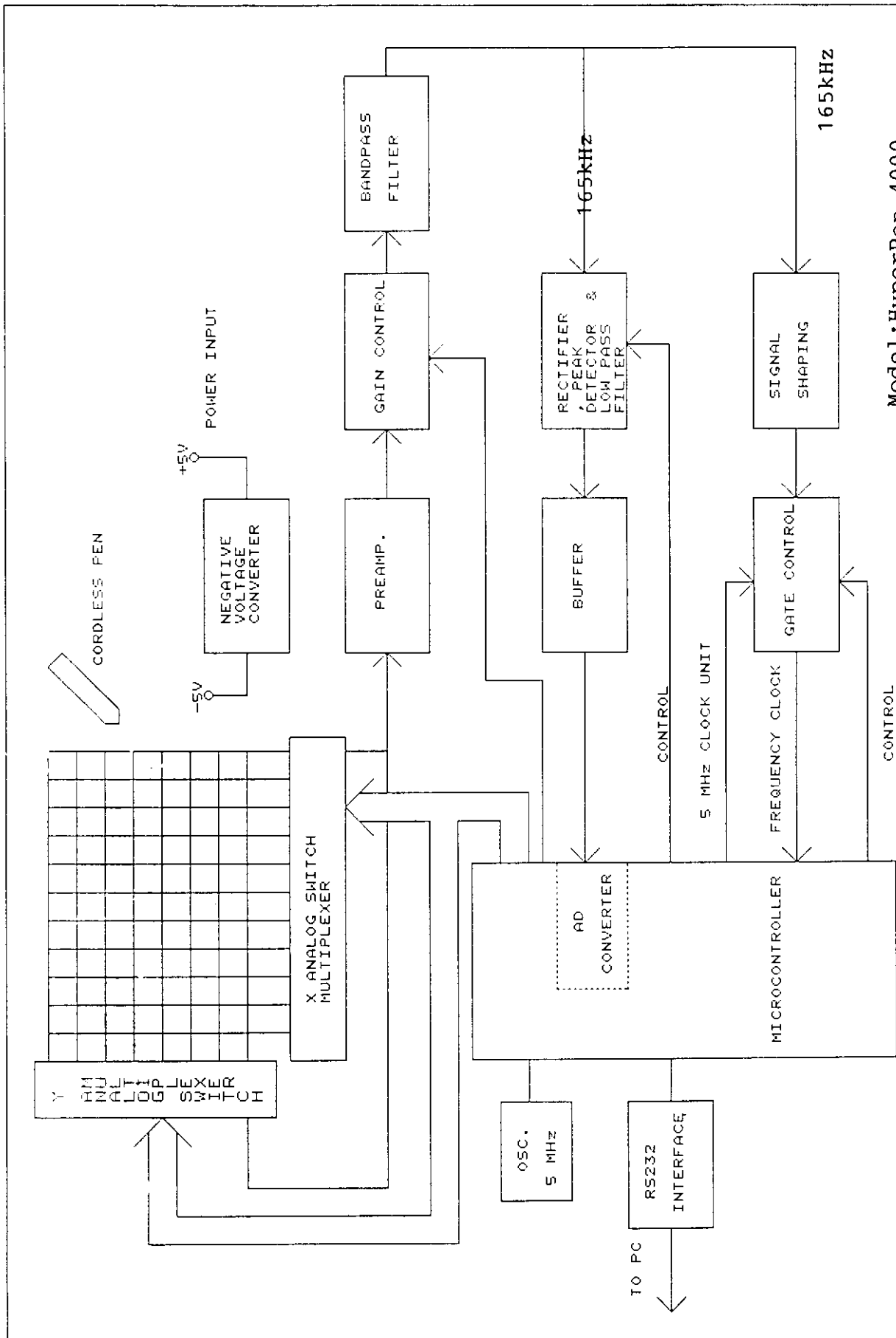
- (1) Unless otherwise marked as ※ in 「Remark」 column, Neutron consigns the supporting equipment(s) to the tested system.

Figure 3.1 Configuration of Tested System



4. Block Diagram(s)

Figure 4.1 Block diagram of system, Page 13.A



Model: HyperPen 4000

API TEK INTERNATIONAL INC.

Size	Document Number	REV
A	CLTBELK.SCH	
Date:	February 5, 1988	Sheet 1 of 1

CORDLESS PEN TABLET BLOCK DIAGRAM

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.

Test Mode: Digitizer and Pen

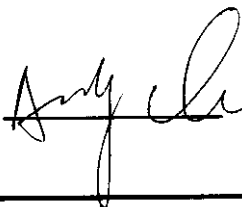
Judgement: Passed by -8.07 dB in mode of Neutral terminal 0.64 MHz

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe Margins (dBuV)	
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		Note
0.28	Line	46.29	*	60.85	50.85	-14.56	(QP)
0.36	Line	44.22	*	58.78	48.78	-14.56	(QP)
0.64	Line	44.20	36.87	56.00	46.00	-9.13	(AV)
0.77	Line	43.33	*	56.00	46.00	-12.67	(QP)
15.80	Line	47.23	*	60.00	50.00	-12.77	(QP)
0.28	Neutral	46.97	*	60.85	50.85	-13.88	(QP)
0.52	Neutral	43.26	*	56.00	46.00	-12.74	(QP)
0.64	Neutral	44.20	37.93	56.00	46.00	-8.07	(AV)
0.76	Neutral	43.47	*	56.00	46.00	-12.53	(QP)
15.80	Neutral	46.39	*	60.00	50.00	-13.61	(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 column 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 column of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Review :



Test Personnel :

Riker Hsu

Date:

Nov. 3, 1998

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.

Test Mode: Digitizer and Mouse

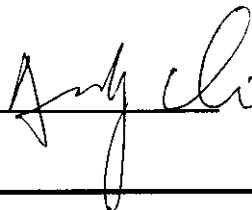
Judgement: Passed by -5.99 dB in mode of Line terminal 15.80 MHz

Freq. (MHz)	Terminal L/N	Measured(dBuV)		Limits(dBuV)		Safe Margins (dBuV)	
		QP-Mode	AV-Mode	QP-Mode	AV-Mode		Note
0.15	Line	43.25	*	65.84	55.84	-22.59	(QP)
0.20	Line	44.92	*	63.61	53.61	-18.69	(QP)
0.23	Line	45.34	*	62.45	52.45	-17.11	(QP)
0.30	Line	38.79	*	60.27	50.27	-21.48	(QP)
15.80	Line	54.01	37.18	60.00	50.00	-5.99	(QP)
0.15	Neutral	42.45	*	66.00	56.00	-23.55	(QP)
0.20	Neutral	44.83	*	63.82	53.82	-18.99	(QP)
0.23	Neutral	41.27	*	62.45	52.45	-21.18	(QP)
0.26	Neutral	38.86	*	61.37	51.37	-22.51	(QP)
15.80	Neutral	53.81	35.27	60.00	50.00	-6.19	(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 column 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 column of Interference Voltage Measured .
- (3) Measuring frequency range from 150KHz to 30MHz .

Review :



Test Personnel :

Riker Hsu

Date:

Nov. 3, 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.

Test Mode: Digitizer and Pen

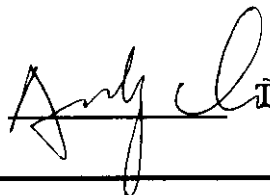
Judgement: Passed by -2.91 dB in polarity of Horizontal 488.00 MHz

(MHz)	H/V	(dBuV)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(QP)
32.38	V	31.14	- 5.30	25.84	30.00	- 4.16	
38.67	H	31.16	- 5.02	26.13	30.00	- 3.87	
57.54	V	32.62	- 5.63	26.99	30.00	- 3.01	
60.26	V	32.01	- 6.14	25.86	30.00	- 4.14	
69.44	H	35.10	- 8.08	27.02	30.00	- 2.98	
147.30	H	28.76	- 2.91	25.84	30.00	- 4.16	
219.20	V	29.59	- 3.76	25.83	30.00	- 4.17	
257.60	V	30.61	- 1.67	28.94	37.00	- 8.06	
333.60	H	27.59	1.57	29.16	37.00	- 7.84	
427.20	H	27.92	3.68	31.60	37.00	- 5.40	
466.40	V	27.97	5.40	33.37	37.00	- 3.63	
488.00	H	27.61	6.48	34.09	37.00	- 2.91	

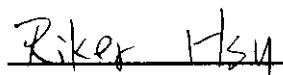
Remark :

- (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. :



Date:

Nov. 3, 1998

7. Radiated Emission Datas

- 7.1 The following data lists the significant emission frequencise, 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.

Test Mode: Digitizer and Mouse

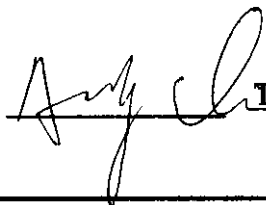
Judgement: Passed by -3.50 dB in polarity of Horizontal 81.85 MHz

(MHz)	H/V	(dBuV)	(dB)	(dBuV)	(dBuV/m)	(dBuV/m)	(QP)
42.24	V	29.98	- 4.63	25.35	30.00	- 4.65	
56.86	V	29.62	- 5.55	24.07	30.00	- 5.93	
81.85	H	35.74	- 9.24	26.50	30.00	- 3.50	
109.90	H	27.77	- 2.42	25.34	30.00	- 4.66	
119.93	V	28.50	- 2.21	26.29	30.00	- 3.71	
143.56	H	27.56	- 3.01	24.55	30.00	- 5.45	
219.20	V	28.57	- 3.76	24.81	30.00	- 5.19	
299.20	H	28.30	1.43	29.73	37.00	- 7.27	
333.60	V	28.50	1.57	30.07	37.00	- 6.93	
421.60	H	25.96	3.50	29.46	37.00	- 7.54	
488.00	V	26.42	6.48	32.90	37.00	- 4.10	
488.80	H	23.63	6.53	30.16	37.00	- 6.84	

Remark :

- (1) Reading inwhich 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 colum of 'Note' . Peak denotes that the Peak reading compliance with the QP Limits and then QP Mode measure-ment 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:

Nov. 06, 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:

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

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 + 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 dB and a Cable Factor of 1.1 dBuV. Then:

1. The Correction Factor will be calculated by

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

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	0.20
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