3. System Test Configuration

3-1. Justification

The EUT, cordless mouse, is tested individually without any accessories on the test table. Also, the measurement for the intentional radiator covering the frequency range from 165 Khz to the 10th harmonic 1650 Khz. Further, the radiated emission measurements was made at by a loop antenna at 1 meter distance to EUT.

The tested results was extrapolated to the specified distance by using the square of an inverse linear distance extrapolation factor(40dB/decade)

3-2. EUT Exercise Software

As the EUT, cordless mouse, is strictly a input device, no data is transmitted. However, the EUT continuously radiated emissions during testing.

3-3. Special Accessories

N/A

3-4. Equipment Modifications

Not available for this EUT intended for grant.

Applicant Signature :	Allan Chao	**Date :**	Oct. 29, 1998
Type/Printed Name :	Allan Chao	**Position :**	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 an 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	AIPTEK	Mouse		NRQMOUSEA	EUT

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

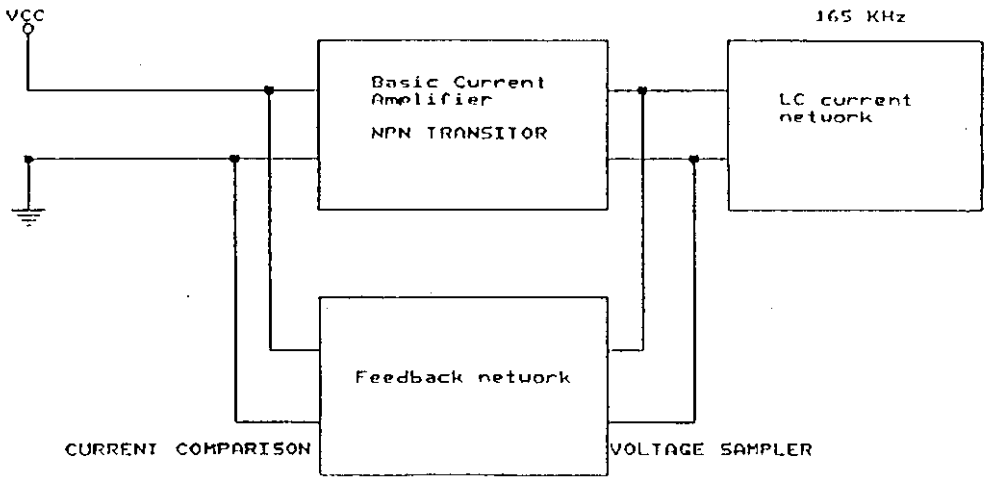
Item	I/O Cable	Device Connected	Shielded	Ferrite	Detachalbe/Permanently	Note
	N/A					

Note:

(1) The EUT is tested individually without any accessories on the test table.

4. Block Diagram(s)

Figure 4.1 Block diagram of system, Page 13.A



AIPTEK INC.		
Title: WIRELESS MOUSE oscillation block diagram		
Size: A	Document Number: C:\MYWORK4\TABLET\BLOCK3.SCH	REV: a
Date: February 16, 1998	Sheet of	

5. Conducted and Radiated Measurement Photos

5-1. Conducted Measurement Photos

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7. Radiated Emission Datas

7.1 The following data lists the significant emission frequencies, measured levels, plus the limit. Explanation of field strength limit calculation is given in paragrapg 7.2.

Condition : Test Distance : 1 meter
Type of Antenna: Loop Antenna

Freq. (KHz)	Frequency Within Band (MHz)	Receiver* Reading in dBuV/m	Factor (dB)	Corrected (dBuV/m)	Limitation Calculated (dBuV)	Limitation Converted 1 m dist. (dBuV/m)
165	0.009	40.6	20.20	65.40	23.2 (300m)	122.3
330	0.490	36.4	20.08	43.38	17.7 (300m)	116.8
495	0.490	36.3	20.00	48.60	33.7 (300m)	92.8
660		35.6	20.00	* *	31.2 (30m)	90.3
825		35.1	20.00	* *	29.3 (30m)	88.4
990		34.9	20.00	* *	27.7 (30m)	86.8
1155		34.1	20.00	* *	26.3 (30m)	85.4
1320		34.1	20.00	* *	25.2 (30m)	84.3
1480		33.7	20.00	* *	24.2 (30m)	83.28
1650	1.705	35.1	20.00	* *	23.2 (30m)	82.3

* All receiver readings (the measured field strength levels) are measured from loop antenna directly.
* The emission limits shown in the above table are base on measurements employing a quasi-peak dectorexcept for the frequency bands 9-90 KHz, 110-490 KHz and above 1000MHz. Radiated emission limits in these three bands are based on measurements employing an average dector.
* The tighter limit applies at the band edges.
* **Remark:** "**" means that the noise emission is too low to detect by Field Strength Meter.

Review : Andy Chiu Test Personnel. : Riker Hsu Date: OCT. 29, 1998

7-2.1. 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 caculated by

Correction Factor = AF + CF - AG = 7.2 + 1.1 - 0 = 8.3 (dB)

as shown in the data tables' Correction Factor column.

2. The Field Strength will be calculated by

FS = RA + Correction Factor = 23.7 + 8.3 = 32 (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:

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

7-2.1. Field Strength Limits Calculation

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 - 0.490	2400/F (KHz)	300
0.490 - 1.705	24000/F (KHz)	30
1.705 - 30.0	30	30
30 - 88	100	3
88 - 216	150	3
216 - 960	200	3
above 960	500	3

As the Test Methodology mentioned in Section 1-4, the measurement distance between the EUT and Loop Antenna was selected by 1 meter, the Field strength Limits of each frequency band are calculated by the following equation to convert its corresponding distance to 1 meter:

Ed2 / Ed1 = (d2/d1) square.....equation (1)
where d1 will be 1 meter, then

E1 = Ed2 * (d2) /1m square .....equation (2)
where E1 denotes the field strength limit at measurement distance 1 meter.

The measured field strength levels are read from receiver directly in dBuv/m unit. For easy to compare with field strength limits, taking command logarithm both side of equation (2), then it will be calculated as equation (3) in dBuV/m unit.

20 log (E1) = 20 log [(Ed2) * (d2) square], then

20 log (E1) = 20 log (Ed2) + 40 log (d2).....equation (3)

Example for calculation

1. Frequency located in band of 0.009-0.490 MHz, the field strength limit of each frequency be caculated as

20 log 2400 / F (KHz) + 40 log 300

Assume a frequency of 120 KHz be calculated, then the Field strength Limit in dBuV will be obtained

20 log (2400/120) + 40 log 300 = 125.1 (dBuV/m)

2. Frequency located in band of 0.490 - 1.705 MHz, the field strength limit of each frequency be caculated as

20 log 24000/F(KHz) + log 30

Assume a frequency of 600KHz becalculated, then the Field Strength Limit in dBuV will be obtained

20 log (24000/600) + 40 log 30 = 91.1 (dBuV/m)

3. Frequency located in band of 30-88 MHz, the field strength limit of each frequency be caculated as

20 log 100 + 40 log 3

Assume a frequency of 60 MHz be calculated, then the Field Strength Limit in dBuV will be obtained

20 log 100 + 40 log 3 = 59.1 (dBuV/m)

7-3. Correction Factor VS Frequency

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30.00	11.60	0.10
35.00	10.80	0.20
40.00	11.20	0.20
45.00	11.30	0.20
50.00	11.10	0.40
55.00	10.50	0.50
60.00	9.90	0.60
65.00	8.70	0.60
70.00	7.70	0.60
75.00	6.60	0.60
80.00	6.30	0.60
85.00	7.20	0.70
90.00	8.60	0.70
95.00	10.10	0.70
100.00	11.40	0.70
110.00	12.90	0.90
120.00	13.40	1.00
130.00	13.20	1.00
140.00	12.50	1.00
150.00	12.20	1.10
160.00	13.00	1.10
170.00	14.50	1.10
180.00	15.90	1.10
190.00	17.00	1.10
200.00	17.50	1.20
225.00	12.20	1.20
250.00	13.30	1.30
275.00	14.20	1.40
300.00	15.90	1.30
325.00	14.80	1.40
350.00	15.90	1.50
375.00	20.80	1.60
400.00	17.10	1.60
450.00	18.10	1.70
500.00	19.40	1.60
550.00	19.70	2.00
600.00	20.10	2.10
650.00	21.00	2.00
700.00	22.30	2.30
750.00	22.20	2.40
800.00	22.20	2.50
850.00	23.50	2.50
900.00	24.30	2.70
950.00	24.60	2.60
1000.00	25.70	2.80

8. Photos of Tested EUT:

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