MEASUREMENT/TECHNICAL REPORT

APPLICANT: Wintime Electronics Corp.

MODEL NO.: UW403BPEN

FCC ID: G54UW403BPEN

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

Equipment type: Cordless Stylus Pen

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 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 CFR (10-1-90 Edition) provision.

Report Prepared

by Testing House : **Neutron Engineering Inc.**

for Company Name : Wintime Electronics Corp.

Address : 9Fl., No. 738, Chung Cheng Rd., Chung Ho City, Taipei Hsine, Taiwan, R.O.C.

Applicant Signature : Hanker Hsu

Hanker Hsu/Manager

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) and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Part 15, Subpart C.

Prepared by :	Sherry Kuo	Sherry Kuo
Reviewed by :	Vincent Su	Vincent Su
Approved by :	George Yao	George Yao
Issued Date :	Feb. 1, 2001	
Report No. :	NEI-FCCB-00175	
Company Stamp :		NEUTRON ENGINEERING INC. 鼎新電腦股份有限公司

NEUTRON ENGINEERING INC.

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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 Facility 6
1-5 Test Facility 6

2. System Test Configuration
2-1 Justification 7
2-2 EUT Exercise 7
2-3 Special Accessories 8
2-4 Equipment modifications 8
2-5 Configuration of Tested System 9

3. Block Diagram(s) 10

4. Radiated Emission Datas 11
4-1 Reaiated Emission Data 11
4-2.1 Field Strength Calculation 12

5. Attachment
Photos of Tested EUT 16
User Manual 17

1. GENERAL INFORMATION

1-1. Product Description

The Wintime Electronics Corp. Cordless Stylus-Pen, Model: UW403BPEN (referred to as the EUT in this report) is a part of digitizing tablet composite system. It is designed as an "Input Device" for IBM compatible PC.

The EUT designed with a LC-circuit that intentionally generates a 414KHz frequency and emits radio frequency by induction. The EUT therefore be considered as a part of composite system that covering computer peripheral and intentional radiator.

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

1-2-1. Models Covered

This is a separate application for filing the intentional radiator portion of computing device peripheral testing. The cordless stylus-pen (transmitter) intended to operate with a certified digitizer tablet that authorized by DoC.

Relative submittal(s) for Subpart B, unintentional radiator, compliance testing of the EUT has been filed at the same time with this application under Declaration of Conformity.

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
UW403BPEN(1)	G54UW403BPEN	Cordless Stylus-Pen	N/A

Notes:

(1) EUT submitted for grant.

1-4. Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (1992). Radiated testing was performed at an antenna to EUT distance 1 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.132-1, Lane 329, Sec. 2, Palain Road Shijr 221, Taipei, Taiwan, R.O.C. of NEUTRON ENGINEERING INC. This site has been fully described in report dated Jan. 25, 1999, submitted to your office, and accepted in a letter dated Sep. 02, 1999(Reg. No. 95335).

2. System Test Configuration

2-1. Justification

The EUT, cordless stylus pen, is tested individually without any accessories on the test table. Also, the measurement for the intenional radiator covering the frequency range from 414 Khz to the 10th harmonic 4140Khz. Further, the radiated emission measurements was made at by a loop antenna at 1 meter distance to EUT.

2-2. EUT Exercise

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

2-3. Special Accessories

Not available for this EUT intended for grant.

2-4. Equipment Modifications

Not available for this EUT intended for grant.

Applicant Signature:	Hanker Hsu	**Date:**	Feb. 9, 2001
Type/Printed Name:	Hanker Hsu	**Position:**	Manager

2.5 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	Corded Stylus Pen	Wintime	UW403BPEN3	N/A	G54UW403BPEN	EUT

Table B. - Information Cable Information

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

3. Block Diagram(s)

Figure 3.1 Block diagram of system, Page 11.A

4. Radiated Emission Datas

4.1 The following data lists the significant emission frequencies, measured levels, plus the limit. Explanation of field strength limit calculation is given in paragrapg 6.1.

Condition : Test Distance : 1 meter

Type of Antenna: Loop Antenna

Freq. (KHz)	Frequency Within Band (MHz)	Receiver* Reading in dBuV/m	Factor (dB) Cable Loss	Field Strength (uV/m)	Required Measurement Distance(m)	Limitation Converted 1 m dist. (dBuV/m)	Over Limit
414	0.009-0.49	84.8	0.1	5.8	300	114.35	-29.55
828	0.49	59.5	0.1	28.99	30	88.33	-28.83
1242	↕	55.5	0.1	19.32	30	84.81	-29.31
1656	1.705	57.1	0.1	14.49	30	82.31	-25.21
2070	↕	58.9	0.2	30.00	30	88.63	-29.73
2484	↕	37.7	0.2	30.00	30	88.63	-50.93
2898	30	55.8	0.2	30.00	30	88.63	-32.83
3312	↕	37.7	0.3	100.00	3	59.08	-21.38
3726	↕	41.3	0.3	100.00	3	59.08	-17.78
4140	88	38.9	0.3	100.00	3	59.08	-20.18

* 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 : Vincent Lin Test Personnel. : David Date: Jan. 15, 2001

4-2.1 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:

$$\mathbf{Log^{-1}【(32.0dBuV/m)/20】 = 39.8 (uV/m)}$$

4-2.2. 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)

4-2-2 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) + 40 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 30 + 40 log 30

Assume a frequency of 6 MHz be calculated, then the Field Strength Limit in dBuV will be obtained

20 log 30 + 40 log 30 = 88.6 dBuV/m

4. 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

4-3. 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

Attachment

Photos of Tested EUT

1. **Photo # 1. Front View**

2. **Photo # 2. Unit partially Disassembled**

Attachment

User's Manual