



# PEP Testing Laboratory

## RFI / EMI TEST REPORT

**APPLICANT** : ULTIMA ELECTRONICS CORP.  
**E. U. T.** : MOUSE  
**TRADE NAME** : N/A  
**FCC ID** : ITEUECUM500P  
**REGULATION** : CFR 47 , Part 15 Subpart B , Class B  
**TEST SITE** : PEP Testing Laboratory  
**TEST ENGINEER** : *James Wong*  
**TEST DATE** : *10 / 7 / 1998*  
**ISSUED DATE** : OCT. / 14 / 1998  
**REPORT No.** : 980518

# FEDERAL COMMUNICATIONS COMMISSION

7435 Oakland Mills Road  
Columbia, MD 21046  
Telephone: 301-725-1585 (ext-218)  
Facsimile: 301-344-2050

November 25, 1996

IN REPLY REFER TO  
31040/SIT  
1300F2

PEP Testing Laboratory  
12-3 Fl., No. 27-1, Lane 169  
Kang-Ning St., Hsi-chi Town  
Taipei Hsien, Taiwan, R.O.C.

Attention: M. Y. Tsui

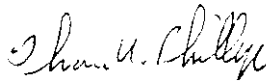
Re: Measurement facility located at above address  
(3 meter site)

Gentlemen:

Your submission of the description of the subject measurement facility has been reviewed and found to be in compliance with the requirements of Section 2.948 of the FCC Rules. The description has, therefore, been placed on file and the name of your organization added to the Commission's list of facilities whose measurement data will be accepted in conjunction with applications for certification or notification under Parts 15 or 18 of the Commission's Rules. Our list will also indicate that the facility complies with the radiated and AC line conducted test site criteria in ANSI C63.4-1992. Please note that this filing must be updated for any changes made to the facility, and at least every three years the data on file must be certified as current.

Per your request, the above mentioned facility has been also added to our list of those who perform these measurement services for the public on a fee basis. This list is published periodically and is also available on the Laboratory's Public Access Link as described in the enclosed Public Notice.

Sincerely,



Thomas W. Phillips  
Electronics Engineer  
Customer Service Branch

Enclosure:  
PAL PN



# PEP Testing Laboratory

## VERIFICATION

### WE HEREBY VERIFY THAT:

The E. U. T. listed below has completed RFI testing by PEP Testing Laboratory and the interference emissions can pass **FCC Class B** limitations.

The tested configurations and the facility complies with the radiated and AC line conducted test site criteria in ANSI C63.4 - 1992.

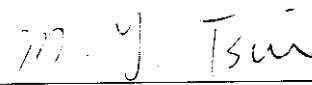
Any data in this RFI report is " **reference** " only.

**APPLICANT** : ULTIMA ELECTRONICS CORP.\*

**PRODUCT** : MOUSE\*

**FCC ID** : ITEUECUM500P\*

**MODEL** : UM500P\*

  
\_\_\_\_\_  
M. Y. TSUI  
Manager

### PEP Testing Laboratory

12-3FL., NO. 27-1, Lane 169, Kang-Ning St.,  
Hsi-Chi, Taipei Hsien, Taiwan, R. O. C.  
TEL: 886-2-26922097 FAX: 886-2-26956236



# PEP Testing Laboratory

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# PEP Testing Laboratory

## 1. GENERAL

### 1.1 GENERAL INFORMATION:

APPLICANT : ULTIMA ELECTRONICS CORP.

7F, NO. 100, LI DE CHUNG HO  
CITY, TAIPEI HSIEN, TAIWAN  
R. O. C.

MANUFACTURER : ULTIMA ELECTRONICS CORP.

7F, NO. 100, LI DE CHUNG HO  
CITY, TAIPEI HSIEN, TAIWAN  
R. O. C.

MEASUREMENT PROCEDURE : ANSI C63 , 4 - 1992

TESTED FOR COMPLIANCE WITH : Title 47 of CFR  
Part 15 , Subpart B , Class B

### 1.2 PLACE OF MEASUREMENT PEP Testing Laboratory



# PEP Testing Laboratory

## 1.4 INFORMATION TO THE USER

The following FCC statement should be declared in a conspicuous location in the user's manual.

### Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

Warning : A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

Use only shielded cables to connect I/O devices to this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

**FCC ID : ITEUECUM500P**

The photographs title listing below is **FCC ID : ITEUECUM500P** 8" x 10"  
photographs (each for one piece):

- |        |    |                         |
|--------|----|-------------------------|
| PHOTO. | 1. | EUT FRONT VIEW          |
| PHOTO. | 2. | EUT REAR VIEW           |
| PHOTO. | 3. | EUT INSIDE VIEW         |
| PHOTO. | 4. | EUT COMPONENT SIDE VIEW |
| PHOTO. | 5. | EUT SOLDERING SIDE VIEW |

**FCC ID : ITEUECUM500P**

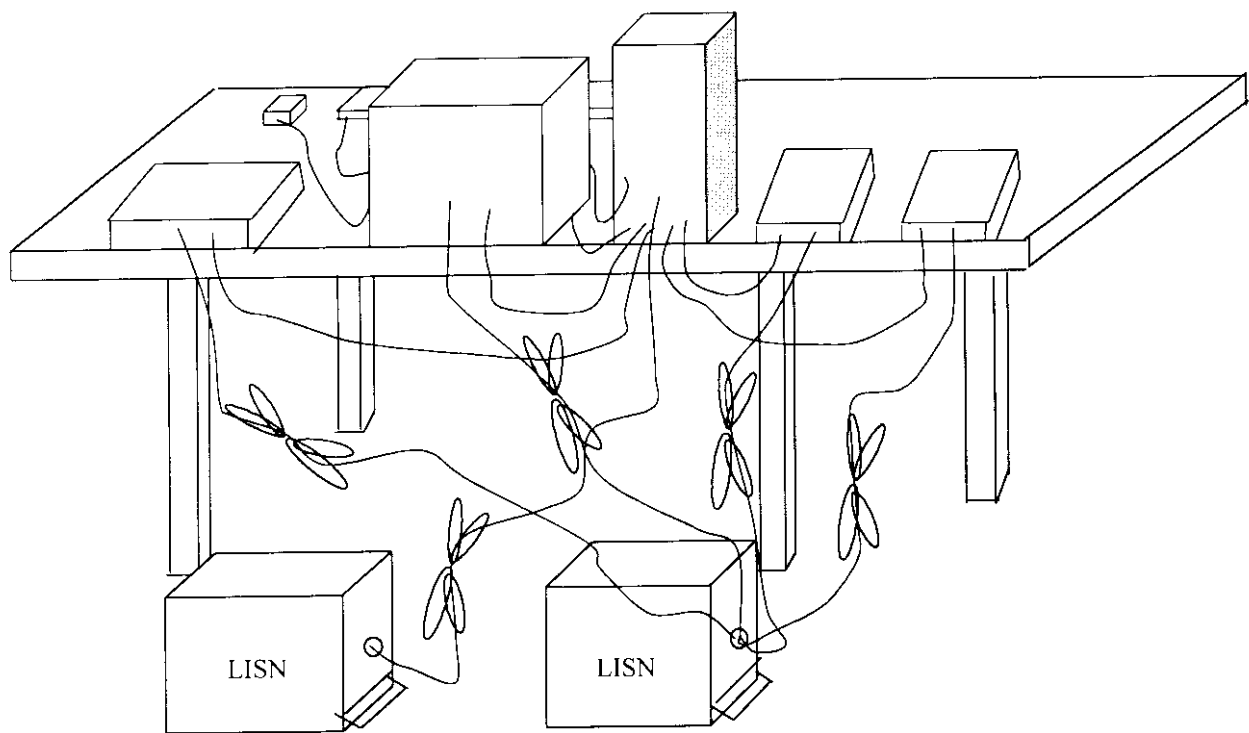
This file include :

- (A) **FORM 159 & US \$940 CHECK**
- (B) **FORM 731**
- (C) **ANTI-DRUG LETTER**
- (D) **AUTHORIZATION LETTER**
- (E) **FCC ID. LABEL**
- (F) **BLOCK DIAGRAM**
- (G) **PHOTOGRAPHS ( 8" x 10" )**
- (H) **USER'S GUIDE MANUAL**
- (I) **OPEN SITE TEST REPORT**



## 2. CONDUCTION EMISSIONS TEST

### 2.1 GENERAL SETUP OF THE TEST FACILITIES





## 2.2 TEST PROCEDURES

The system was setup as described above, with the EMI diagnostic software.

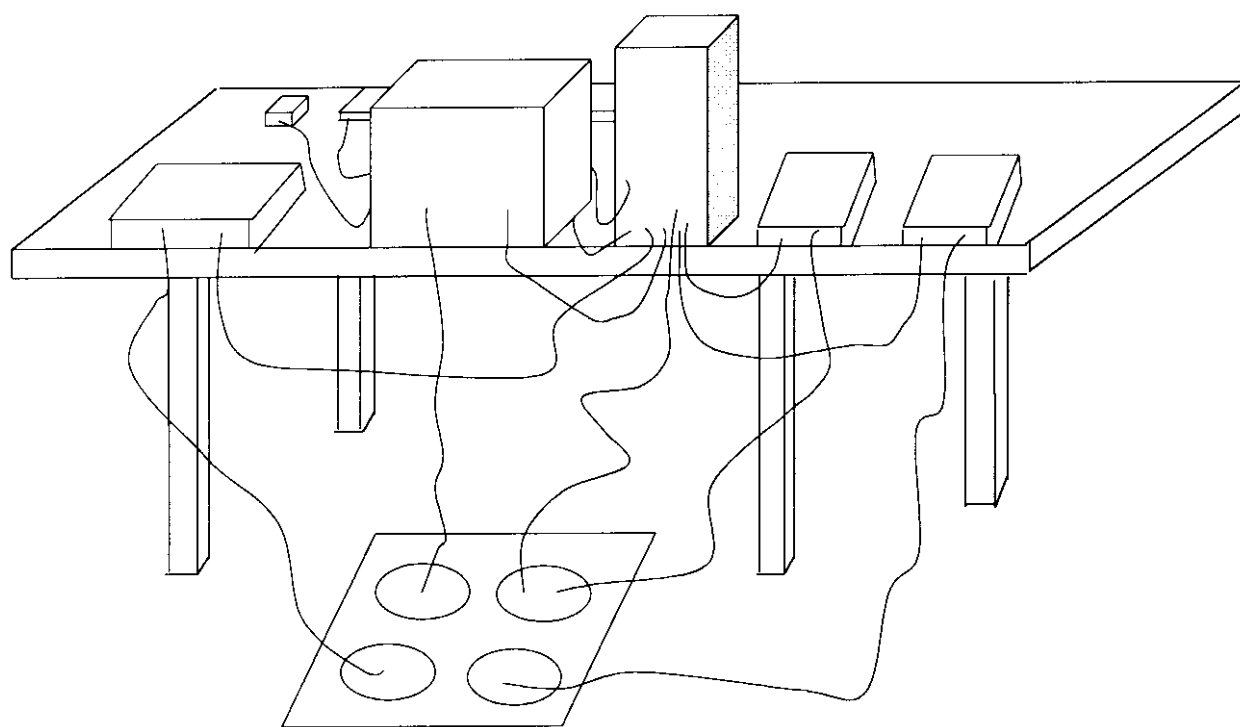
Both the line of power cord, hot and neutral, were run with the EMI tests software.

To get the maximum power line conducted emission, we changed the configuration by varying the monitor power cord fed from floor outlet and from the outlet on the power supply of this computer.

The highest emissions were recorded in the RFI test report.

### 3. RADIATED EMISSIONS TEST

#### 3.1 GENERAL SETUP OF THE FACILITIES





# PEP Testing Laboratory

## 3.2 TEST PROCEDURES

Radiated emissions test was carried out by **PEP Testing Laboratory** at the open field test site authorized by FCC .

The EUT and supporting equipments were setup with the EMI diagnostic software .

a. setting up the EUT under normally position , and scanning it from 30 MHz to 1000 MHz , then recording those narrow band noises which cannot be 6 dBuV below lower bound . Both horizontal and vertical antenna are measured from 1 meter height to 4.0 meter height , and turntable rotate 360 degrees .

b. fixing the EUT rear face to antenna and antenna 1.0 meter height .  
We adjusted I/O cables to find the highest coupling noise and moved the height of antenna from 1 to 4 meters , then rotated the turntable simultaneously .

c. checking following step b. all points which were recorded in step a.

d. changing the peripherals position , and routine steps a. b. c.

The highest emissions were recorded in the RFI test report .



# PEP Testing Laboratory

## 4. DESCRIPTION FOR EUT TESTING CONFIGURATION

### **\*\* TEST PROCEDURE ----**

- (A) The EUT was PS/2 PC mouse , FCC ID : ITEUECUM500P , for more detail information about the EUT , please refer user's manual .
- (B) The EUT was inserted into the mouse port on a tower PC under test and enabled by FCC EMITEST program , we provided worse case data in this report .
- (C) After the EUT was set up , we did the conducted emission test in the shielded room and the worst case placement finding as the ANSI C63.4 requirement ; similarly , the radiated emission test was done at the open field site .
- (D) If the peak value of the noise can't under Non-consumer equipment limit 3 dBuV more , we'll change Biconical antenna or Log-periodic antenna for Dipole antenna and record its Quasi-Peak value , making sure it can under 6 dBuV at least .
- (E) In the RFI test report , we provided the worst conducted emission testing data in page C-1.\*  
For the radiated emission test , the worst data recorded in the page R-1.\*

### **\*\* I / O DATA CABLES INFORMATIONS ---**

Please refer the page 9 .



## 5. SUPPORTING DEVICES TO TEST

### **SUPPORT UNIT 1. - - - - PERSONAL COMPUTER**

Manufacturer : ASUS Inc.  
Model Number : P2L97  
Power Supply Type : Switching  
Power Cord : Shielded, Detachable, 1.2m  
Data Cable : Shielded, Detachable, 1.2m  
FCC ID : N/A

### **SUPPORT UNIT 2. - - - - MONITOR**

Manufacturer : Acer Peripherals Inc.  
Model Number : 7134T  
Power Supply Type : Switching  
Power Cord : Shielded, Detachable, 1.2m  
Data Cable : Shielded, Undetachable, 1m  
FCC ID : JVP7134T

### **SUPPORT UNIT 3. - - - - PRINTER**

Manufacturer : Hewlett-Packard Singapore Pte Ltd.  
Model Number : HP 2225C<sup>+</sup>  
Power Supply Type : Linear  
Power Cord : Non-Shielded, Detachable, 1.2m  
Data Cable : Shielded, Detachable, 1m. 2464  
FCC ID : DSI6XU2225



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## **SUPPORT UNIT 4. - - - - MODEM × 2**

Manufacturer : ACEEX  
Model Number : 1414  
Power Supply Type : Linear  
Power Cord : Non-Shielded, Detachable, 1.2m  
Data Cable : Shielded, Detachable, 1m  
FCC ID : IFAXDM1414

## **SUPPORT UNIT 5. - - - - KEYBOARD**

Manufacturer : Acer Peripherals Inc.  
Model Number : 6311-KW  
Power Supply Type : N/A  
Power Cord : N/A  
Data Cable : Shielded, Undetachable, 1.2m  
FCC ID : JVPKBS-WIN



# PEP Testing Laboratory

## **EQUIPMENT UNDER TEST ---- MOUSE**

**Manufacturer : ULTIMA ELECTRONICS CORP.**

**Model Number : UM500P**

**Data Cable : Shielded, Undetachable, 1.2m**

**FCC ID : ITEUECUM500P**



## 6. TEST CONFIGURATION

**Radiated emission detector function :**

**(1) 30MHZ~1GHZ : Quasi-Peak Value**

**Resolution BW : 120KHZ Video BW : 300KHZ**

**(2) above 1GHZ : Quasi-Peak value and Average Value**

**Resolution BW : 1MHZ Video BW : 1MHZ**

**\* either Q. P. or average value will be recorded  
in the report**

**Conducted emission detector function :**

**(1) 450KHZ~30MHZ : Quasi-Peak Value**

**Resolution BW : 9KHZ Video BW : 30KHZ**

**The else descriptions : N/A**

**Conducted Emission Test Photo. : Page C-1**

**Test Data : Hot C-1.1**

**Neutral C-1.2**

**Radiated Emission Test Photo. : Page R-1**

**Test Data : Horizontal R-1.1**

**Vertical R-1.2**



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## CONDUCTED EMISSIONS TEST DATA

**Note : HOT LINE TEST**

| Freq.<br>(MHz) | Level<br>(dB) | Over<br>Limit<br>(dB) | Limit<br>Line<br>(dB) | Read<br>Level<br>(dB) | Probe<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Preamp<br>Factor<br>(dB) |
|----------------|---------------|-----------------------|-----------------------|-----------------------|-------------------------|-----------------------|--------------------------|
| 0.450          | 28.95         | -19.05                | 48.00                 | 26.92                 | 0.30                    | 1.73                  | 0.00                     |
| 7.306          | 31.97         | -16.03                | 48.00                 | 28.99                 | 1.13                    | 1.85                  | 0.00                     |
| 8.192          | 29.82         | -18.18                | 48.00                 | 26.84                 | 1.13                    | 1.86                  | 0.00                     |
| 21.844         | 24.39         | -23.61                | 48.00                 | 21.01                 | 1.32                    | 2.06                  | 0.00                     |
| 22.672         | 30.84         | -17.16                | 48.00                 | 27.48                 | 1.29                    | 2.07                  | 0.00                     |
| 23.263         | 28.87         | -19.13                | 48.00                 | 25.52                 | 1.27                    | 2.09                  | 0.00                     |
| 24.060         | 31.19         | -16.81                | 48.00                 | 27.84                 | 1.24                    | 2.12                  | 0.00                     |
| 25.952         | 27.10         | -20.90                | 48.00                 | 23.67                 | 1.25                    | 2.18                  | 0.00                     |
| 28.286         | 28.12         | -19.88                | 48.00                 | 24.53                 | 1.37                    | 2.22                  | 0.00                     |
| 29.173         | 25.96         | -22.04                | 48.00                 | 22.31                 | 1.41                    | 2.24                  | 0.00                     |

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line



# PEP Testing Laboratory

## CONDUCTED EMISSIONS TEST DATA

### Note : NEUTRAL LINE TEST

| Freq.<br>(MHz) | Level<br>(dB) | Over<br>Limit<br>(dB) | Limit<br>Line<br>(dB) | Read<br>Level<br>(dB) | Probe<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Preamp<br>Factor<br>(dB) |
|----------------|---------------|-----------------------|-----------------------|-----------------------|-------------------------|-----------------------|--------------------------|
| 0.450          | 30.68         | -17.32                | 48.00                 | 28.65                 | 0.30                    | 1.73                  | 0.00                     |
| 7.217          | 30.33         | -17.67                | 48.00                 | 27.36                 | 1.12                    | 1.85                  | 0.00                     |
| 8.340          | 29.09         | -18.91                | 48.00                 | 26.16                 | 1.07                    | 1.86                  | 0.00                     |
| 22.583         | 32.13         | -15.87                | 48.00                 | 28.77                 | 1.29                    | 2.07                  | 0.00                     |
| 23.322         | 29.48         | -18.52                | 48.00                 | 26.12                 | 1.27                    | 2.09                  | 0.00                     |
| 24.149         | 30.16         | -17.84                | 48.00                 | 26.81                 | 1.23                    | 2.12                  | 0.00                     |
| 24.740         | 28.84         | -19.16                | 48.00                 | 25.49                 | 1.21                    | 2.14                  | 0.00                     |
| 25.479         | 27.45         | -20.55                | 48.00                 | 24.06                 | 1.22                    | 2.16                  | 0.00                     |
| 28.286         | 26.99         | -21.01                | 48.00                 | 23.40                 | 1.37                    | 2.22                  | 0.00                     |
| 29.823         | 25.93         | -22.07                | 48.00                 | 22.24                 | 1.44                    | 2.25                  | 0.00                     |

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line



# PEP Testing Laboratory

## RADIATED EMISSIONS TEST DATA

Antenna polarization : HORIZONTAL ; Test distance : 10 m ;

| Freq.<br>(MHz) | Level<br>(dB) | Over<br>Limit<br>(dB) | Limit<br>Line<br>(dB) | Read<br>Level<br>(dB) | Probe<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Preamp<br>Factor<br>(dB) |
|----------------|---------------|-----------------------|-----------------------|-----------------------|-------------------------|-----------------------|--------------------------|
| 102.080        | 17.02         | -26.48                | 43.50                 | 34.91                 | 0.38                    | 1.73                  | 20.00                    |
| 108.030        | 21.02         | -22.48                | 43.50                 | 37.34                 | 1.88                    | 1.80                  | 20.00                    |
| 180.280        | 25.55         | -17.95                | 43.50                 | 38.84                 | 4.30                    | 2.41                  | 20.00                    |
| 186.740        | 22.20         | -21.30                | 43.50                 | 35.25                 | 4.44                    | 2.50                  | 20.00                    |
| 237.600        | 19.84         | -26.16                | 46.00                 | 35.10                 | 1.74                    | 3.01                  | 20.00                    |
| 269.600        | 19.35         | -26.65                | 46.00                 | 33.30                 | 2.74                    | 3.31                  | 20.00                    |
| 303.200        | 19.65         | -26.35                | 46.00                 | 33.09                 | 2.95                    | 3.61                  | 20.00                    |
| 337.600        | 24.89         | -21.11                | 46.00                 | 37.94                 | 3.23                    | 3.72                  | 20.00                    |
| 467.200        | 24.07         | -21.93                | 46.00                 | 33.78                 | 5.98                    | 4.32                  | 20.00                    |
| 567.200        | 23.94         | -22.06                | 46.00                 | 30.05                 | 9.05                    | 4.85                  | 20.00                    |

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line



# PEP Testing Laboratory

## RADIATED EMISSIONS TEST DATA

Antenna polarization : VERTICAL ; Test distance : 10 m ;

| Freq.<br>(MHz) | Level<br>(dB) | Over<br>Limit<br>(dB) | Limit<br>Line<br>(dB) | Read<br>Level<br>(dB) | Probe<br>Factor<br>(dB) | Cable<br>Loss<br>(dB) | Preamp<br>Factor<br>(dB) |
|----------------|---------------|-----------------------|-----------------------|-----------------------|-------------------------|-----------------------|--------------------------|
| 48.190         | 16.14         | -23.86                | 40.00                 | 35.23                 | -0.15                   | 1.06                  | 20.00                    |
| 92.390         | 12.57         | -30.93                | 43.50                 | 31.91                 | -0.88                   | 1.54                  | 20.00                    |
| 102.080        | 16.22         | -27.28                | 43.50                 | 34.11                 | 0.38                    | 1.73                  | 20.00                    |
| 108.030        | 22.43         | -21.07                | 43.50                 | 38.75                 | 1.88                    | 1.80                  | 20.00                    |
| 176.030        | 18.71         | -24.79                | 43.50                 | 32.61                 | 3.70                    | 2.40                  | 20.00                    |
| 241.600        | 18.67         | -27.33                | 46.00                 | 30.75                 | 4.89                    | 3.04                  | 20.00                    |
| 303.200        | 19.95         | -26.05                | 46.00                 | 30.46                 | 5.88                    | 3.61                  | 20.00                    |
| 337.200        | 23.07         | -20.66                | 46.00                 | 33.12                 | 6.23                    | 3.72                  | 20.00                    |
| 467.200        | 24.19         | -21.81                | 46.00                 | 30.90                 | 8.98                    | 4.32                  | 20.00                    |
| 571.200        | 25.36         | -20.64                | 46.00                 | 30.90                 | 9.60                    | 4.86                  | 20.00                    |

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line



# PEP Testing Laboratory

## List of Test Equipment

| Instrument                | Model No.           | Cal. Due Date | S/N        |
|---------------------------|---------------------|---------------|------------|
| R&S Receiver              | ESVS30(30M~1GHZ)    | Apr. 21, 1999 | 863342/012 |
| R&S Receiver              | ESBI (20~5GHZ)      | Feb. 12, 1999 | 845658/003 |
| Spectrum Analyzer         | HP8591A(9K~1.8GHZ)  | Apr. 15, 1999 | 3225A03039 |
| Spectrum Analyzer         | R3261A (9K~2.6GHZ)  | Dec. 03 1999  | 91720076   |
| EMCO L.I.S.N.             | 3825/2 (10K~30MHZ)  | Apr. 15, 1999 | 9311-2150  |
| L.I.S.N.                  | KNW-242(10K~30MHZ)  | Jan. 31, 1999 | 8-837-7    |
| R & S L.I.S.N.            | ESH3-Z5(9K~30MHZ)   | Jul. 09, 1999 | 844982/039 |
| Anritsu Pre-Amp.          | MH648A(100K~1.4GHZ) | Sep. 20, 1999 | M40076     |
| R & S Pre-Amp.            | ESMI-Z7(20M~7GHZ)   | Feb. 12, 1999 | 6/2278/011 |
| COM-Power Horn Antenna    | AH-118 (1G~18GHZ)   |               | 10056      |
| EMCO Dipole Antenna       | 3121C (20M~1GHZ)    | May. 22, 1999 | 9611-1230  |
| EMCO Biconical Antenna    | 3110B (30M~300M)    | Mar. 10, 1999 | 2932       |
| EMCO Log-Periodic Antenna | 3146A (300M~1GHZ)   | Apr. 14, 1999 | 1384       |