



SPORTON JUL 23 1998

## FCC TEST REPORT

for

### PART 15, SUBPART B CLASS B

Equipment : SCSI CARD

MODEL NO. : AEC-6710D

F C C I D : NFZAEC-6710D30

Filing Type : Original Grant

APPLICANT : **ACARD TECHNOLOGY CORP.**  
1F, No. 36, Wu Hsing Street,  
Taipei, Taiwan, R.O.C.

- The test result refers exclusively to the test presented test model / sample.
- Without the written authorization of the test lab., the Test Report may not be copied.

### **SPORTON INTERNATIONAL INC.**

6F, No. 106, Hsin Tai Wu Rd., Sec. 1, Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

**TABLE OF CONTENT**

<b>SECTION TITLE</b>	<b>PAGE</b>
<b>CERTIFICATE OF COMPLIANCE</b> .....	<b>3</b>
<b>1. GENERAL DESCRIPTION OF EQUIPMENT UNDER TEST</b> .....	<b>4</b>
1.1. APPLICANT.....	4
1.2. MANUFACTURER.....	4
1.3. BASIC DESCRIPTION OF EQUIPMENT UNDER TEST.....	4
1.4. FEATURE OF EQUIPMENT UNDER TEST.....	4
<b>2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST</b> .....	<b>5</b>
2.1. TEST MANNER.....	5
2.2. DESCRIPTION OF TEST SYSTEM.....	5
2.3. CONNECTION DIAGRAM OF TEST SYSTEM.....	7
<b>3. TEST SOFTWARE</b> .....	<b>8</b>
<b>4. GENERAL INFORMATION OF TEST</b> .....	<b>9</b>
4.1. TEST FACILITY.....	9
4.2. STANDARD FOR METHODS OF MEASUREMENT.....	9
4.3. TEST IN COMPLIANCE WITH.....	9
4.4. FREQUENCY RANGE INVESTIGATED.....	9
4.5. TEST DISTANCE.....	9
<b>5. TEST OF CONDUCTED POWERLINE</b> .....	<b>10</b>
5.1. MAJOR MEASURING INSTRUMENTS.....	10
5.2. TEST PROCEDURES.....	11
5.3. TYPICAL TEST SETUP LAYOUT OF CONDUCTED POWERLINE.....	12
5.4. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION.....	13
5.5. PHOTOGRAPHS OF CONDUCTED POWERLINE TEST CONFIGURATION.....	14
<b>6. TEST OF RADIATED EMISSION</b> .....	<b>16</b>
6.1. MAJOR MEASURING INSTRUMENTS.....	16
6.2. TEST PROCEDURES.....	17
6.3. TYPICAL TEST SETUP LAYOUT OF RADIATED EMISSION.....	18
6.4. TEST RESULT OF RADIATED EMISSION.....	19
6.5. PHOTOGRAPHS OF RADIATED EMISSION TEST CONFIGURATION.....	20
<b>7. ANTENNA FACTOR AND CABLE LOSS</b> .....	<b>21</b>
<b>8. LIST OF MEASURING INSTRUMENTS USED</b> .....	<b>22</b>



## CERTIFICATE OF COMPLIANCE

for

### FCC PART 15, SUBPART B CLASS B

Equipment : SCSI CARD

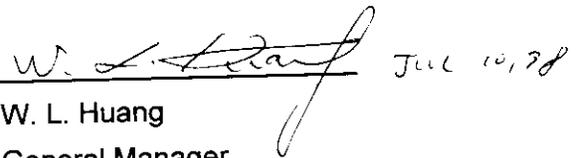
MODEL NO. : AEC-6710D

F C C I D : NFZAEC-6710D30

APPLICANT : **ACARD TECHNOLOGY CORP.**  
1F, No. 36, Wu Hsing Street,  
Taipei, Taiwan, R.O.C.

### I HEREBY CERTIFY THAT :

The measurement shown in this report were made in accordance with the procedures given in **ANSI C63.4 -1992** and the energy emitted by this equipment was **passed** both radiated and conducted emissions CLASS B limits. Testing was carried out on Jun. 29, 1998 at **SPORTON International Inc.** in LIN KUO.

  
W. L. Huang  
General Manager

**SPORTON INTERNATIONAL INC.**

6F, No. 106, Hsin Tai Wu Rd., Sec. 1, Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

## **2. TEST CONFIGURATION OF EQUIPMENT UNDER TEST**

### **2.1. TEST MANNER**

- a. The EUT has been associated with personal computer and peripherals pursuant to ANSI C63.4-1992 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The DELL keyboard, SONY monitor, PRIMAX mouse, HP printer, SCSI CD-ROM and ACEEX modem were connected to the F.I.C PC.
- c. Frequency range investigated: Conduction 450 KHz to 30 MHz, Radiation 30 MHz to 1000 MHz.

### **2.2. DESCRIPTION OF TEST SYSTEM**

Support Device 1. --- PERSONAL COMPUTER (F.I.C)

FCC ID :N/A  
 Model No. :P2LP7  
 Serial No. :SP1040  
 Data Cable :Shielded, 360 degree via metal backshells.  
 Power Supply Type :Switching  
 Power Cord :Shielded

Remark:This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Device 2. --- MODEM ( ACEEX)

FCC ID :IFAXDM1414  
 Model No. :DM1414  
 Serial No. :SP0015  
 Data Cable :Shielded, 360 degree via metal backshells  
 Power Supply Type :Linear

## Support Device 3. --- PRINTER (HP)

FCC ID :B94C2642X  
Model No. :Desk Jet 400  
Serial No. :SP0004  
Data Cable :Shielded, 360 degree via metal backshells  
Power Supply Type :Linear

## Support Device 4. --- MONITOR (SONY)

FCC ID :AK8GDM17SE2T  
Model No. :GDM-17SE2T  
Serial No. :SP1041  
Data Cable :Shielded  
Power Supply Type :Switching  
Power Cord :Non-shielded

## Support Device 5. --- KEYBOARD (DELL)

FCC ID :GYUM92SK  
Model No. :AT101(DE8M)  
Serial No. :SP1007  
Data Cable :Shielded, 360 degree via metal backshells

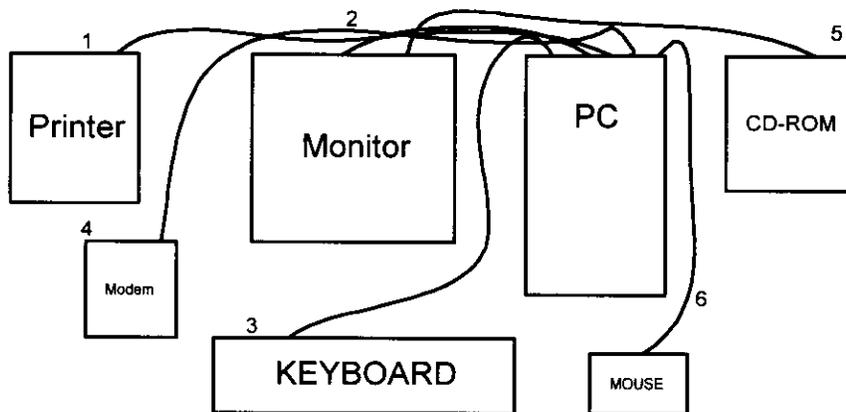
## Support Device 6. --- MOUSE (PRIMAX)

FCC ID :EMJMUSJQ  
Model No. :MUS9J  
Serial No. :SP1006  
Data Cable :Shielded, 360 degree via metal backshells

## Support Device 7. --- SCSI CD-ROM (ADVANCE)

FCC ID :KDK93U1000HFS  
Model No. :93U1000HFS  
Serial No. :SP1021  
Data Cable : Shielded, 360 degree via metal backshells  
Power Cord :Shielded  
Power Supply Type :Switching

2.3. CONNECTION DIAGRAM OF TEST SYSTEM



1. The I/O cable is connected to the support device 3.
2. The I/O cable is connected to the support device 4.
3. The I/O cable is connected to the support device 5.
4. The I/O cable is connected to the support device 2.
5. The I/O cable is connected from the EUT to the support device 7.
6. The I/O cable is connected to the support device 6.

### **3. TEST SOFTWARE**

An executive program, EMITEST.EXE under WIN98, which generates a complete line of continuously repeating " H " pattern is used as the test software.

The program was executed as follows :

- a. Turn on the power of all equipment.
- b. Set up the CD-ROM and play music.
- c. The PC reads the test program from the floppy disk drive and runs it.
- d. The PC sends " H " messages to the momitor, and the monitor displays " H " patterns on the screen.
- e. The PC sends " H " messages to the printer, then the printer prints them on the paper.
- f. The PC sends " H " messages to the modem.
- g. The PC sends " H " messages to the internal Hard Disk, then the hard disk reads and writes the message.
- h. Repeat the steps from b to g.

## **4. GENERAL INFORMATION OF TEST**

### **4.1. TEST FACILITY**

This test was carried out by SPORTON INTERNATIONAL INC. in an openarea test site.

Openarea Test Site Location : No. 30-1, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang,  
Taipei Hsien, Taiwan, R.O.C.

TEL : 886-2-2601-1640

FAX : 886-2-2601-1695

### **4.2. STANDARD FOR METHODS OF MEASUREMENT**

ANSI C63.4-1992

### **4.3 .TEST IN COMPLIANCE WITH**

FCC PART 15, SUBPART B CLASS B

### **4.4. FREQUENCY RANGE INVESTIGATED**

a. Conduction : from 450 KHz to 30 MHz

b. Radiation : from 30 MHz to 1000 MHz

### **4.5. TEST DISTANCE**

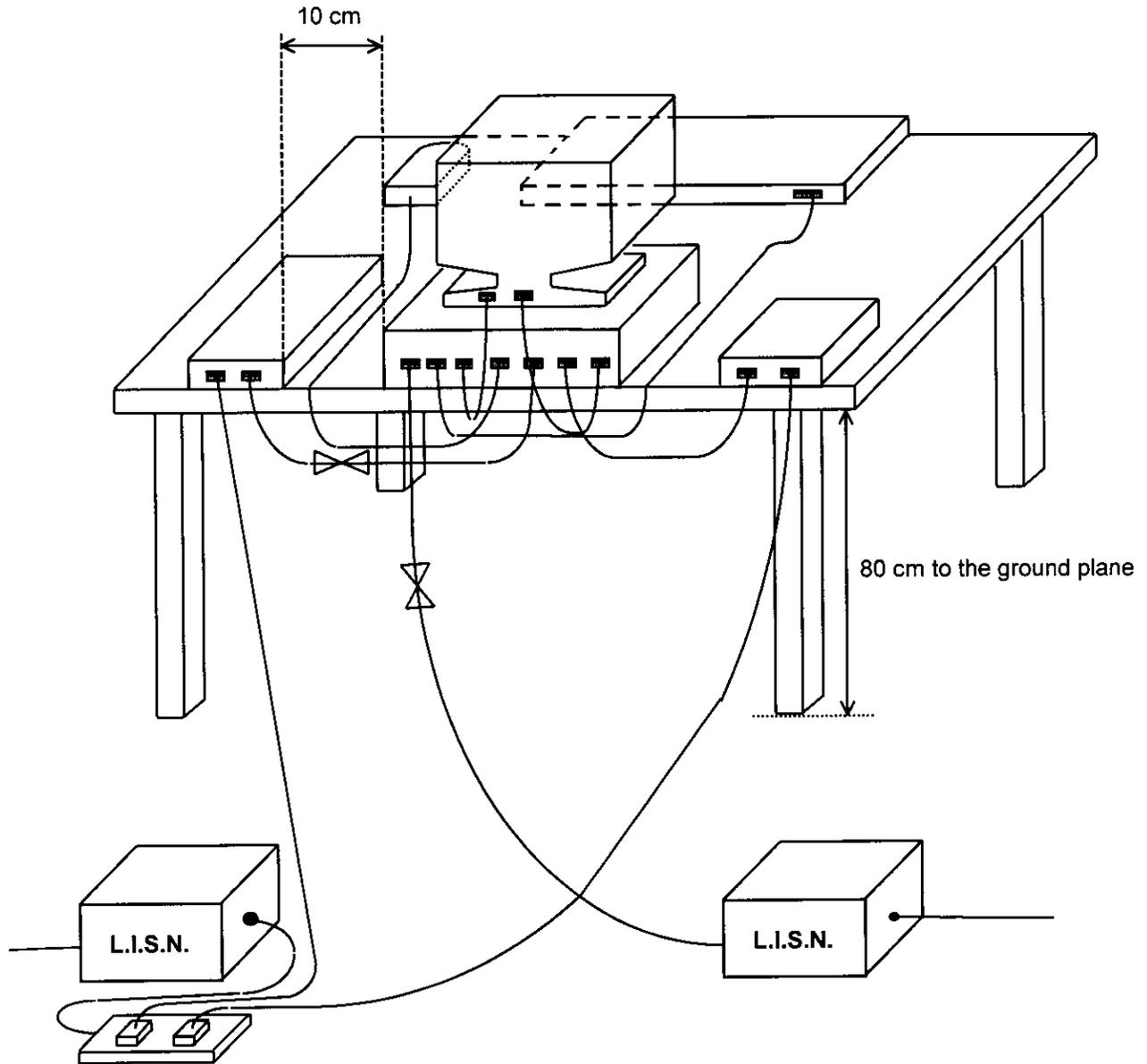
The test distance of radiated emission from antenna to EUT is 3M.



**5.2. TEST PROCEDURES**

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room and was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network ( LISN ).
- c. All the support units are connect to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm , 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 450 KHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- i. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported otherwise the emissions which do not have 6 dB margin will be retested on by one using the quasi-peak method and reported.

5.3. TYPICAL TEST SETUP LAYOUT OF CONDUCTED POWERLINE



**5.4. TEST RESULT OF AC POWERLINE CONDUCTED EMISSION**

- Frequency Range of Test : from 0.45 MHz to 30 MHz
- Temperature : 26°C
- Relative Humidity : 37% RH
- All emissions not reported here are more than 10 dB below the prescribed limit.
- Test Date : Jun. 29, 1998

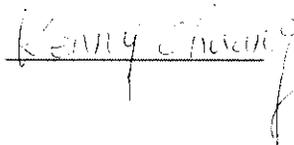
**The Conducted Emission test was passed at minimum margin**

**NEUTRAL 0.50MHz / 44.80dBuV.**

Frequency ( MHz )	Line / Neutral	Meter Reading		Limits		Margin ( dB )
		( dBuV )	( uV )	( dBuV )	( uV )	
0.50	N	44.80	173.78	48.00	251.19	-3.20
0.72	N	32.70	43.15	48.00	251.19	-15.30
8.00	N	34.40	52.48	48.00	251.19	-13.60
9.52	N	34.90	55.59	48.00	251.19	-13.10
0.50	L	44.80	173.78	48.00	251.19	-3.20
9.81	L	31.60	38.02	48.00	251.19	-16.40

Test Engineer :

KENNY CHUANG



## 6. TEST OF RADIATED EMISSION

Radiated emissions from 30 MHz to 1000MHz were measured with a bandwidth of 120 KHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in Figure 6-3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

### 6.1. MAJOR MEASURING INSTRUMENTS

- RF Preselector

Attenuation	0 dB
RF Gain	20 dB
Signal Input	Input 2 ( for 20 MHz to 2 GHz )

- Spectrum Analyzer

	8560E
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	1000MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	Input 1 ( for 30MHz - 2.9GHz )

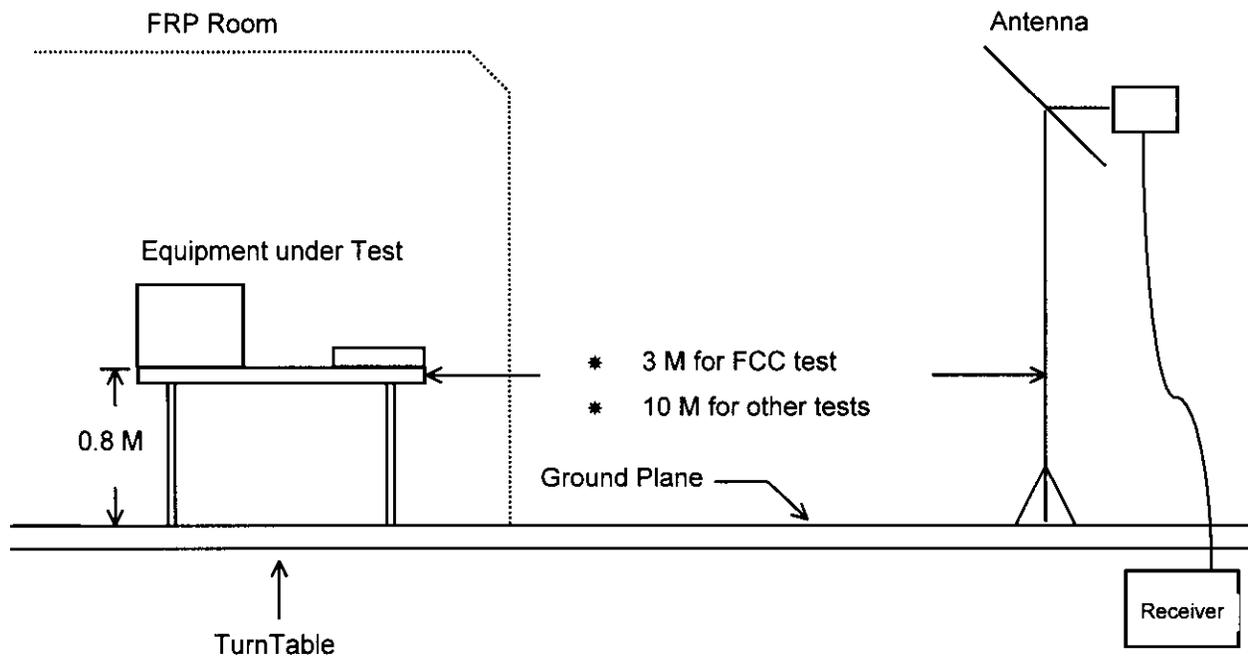
- Quasi-Peak Adapter

Resolution Bandwidth	120 KHz
Frequency Band	30MHz - 2.9GHz
Quasi-Peak Detector	ON for Quasi-Peak Mode
OFF for Peak Mode	

**6.2. TEST PROCEDURES**

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower ( from 1 M to 4 M ) and turn table ( from 0 degree to 360 degrees ) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported otherwise the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3. TYPICAL TEST SETUP LAYOUT OF RADIATED EMISSION



**6.4. TEST RESULT OF RADIATED EMISSION**

- Equipment meets the technical specifications of 15.109
- Frequency Range of Test : from 30 MHz to 1000 MHz
- Test Distance : 3 M
- Temperature : 30°C
- Relative Humidity :55% RH
- Test Date :Jun. 29, 1998
- Emission level ( dBuV/m ) = 20 log Emission level ( uV/m )
- Sample Calculation at 46.09MHz  
Corrected Reading = 1.54+ 1.00+ 32.01= 34.55(dBuV/m )

**The Radiated Emission test was passed at minimum margin**

**Horizontal 46.09 MHz / 34.55dBuV**

**Antenna Height 3.5 Meter , Turntable Degree 180°.**

Frequency ( MHz )	Antenna Polarity	Antenna Factor ( dB )	Cable Loss ( dB )	Reading ( dBuV )	Limits ( dBuV )	Level ( uV )	Emission ( dBuV )	Level ( uV )	Margin ( dB )
46.09	H	1.54	1.00	32.01	40.00	100	34.55	53.39	-5.45
132.24	H	10.89	1.82	20.92	43.50	150	33.64	48.08	-9.86
201.27	H	14.07	2.40	20.22	43.50	150	36.69	68.31	-6.81
39.00	V	0.27	0.92	32.10	40.00	100	33.28	46.13	-6.72
167.37	V	12.23	2.16	22.59	43.50	150	36.98	70.63	-6.52
201.27	V	14.07	2.40	20.06	43.50	150	36.53	67.07	-6.97

Test Engineer :

JACK DENG

Jack Deng

7. ANTENNA FACTOR AND CABLE LOSS

Frequency ( Mhz )	Antenna Factor ( dB )	Cable Loss ( dB )
30	-1.91	0.90
35	-0.50	0.92
40	0.61	1.04
45	1.40	1.28
50	2.39	1.10
55	3.54	1.11
60	4.40	1.30
65	4.84	1.40
70	5.59	1.37
75	6.21	1.24
80	7.60	1.51
85	7.73	1.60
90	8.22	1.60
95	8.90	1.70
100	9.36	1.70
110	10.01	1.70
120	10.41	1.90
130	10.84	1.90
140	11.42	1.91
150	11.91	2.01
160	12.25	2.11
170	12.72	2.21
180	13.02	2.30
190	13.50	2.30
200	14.05	2.40
220	15.11	2.50
240	16.81	2.60
260	17.51	2.71
280	17.70	2.90
300	17.89	2.91
320	18.00	3.10
340	18.33	3.20
360	19.44	3.30
380	20.31	3.40
400	21.19	3.50
450	21.10	3.70
500	22.21	4.10
550	23.42	4.30
600	24.01	4.50
650	25.11	4.70
700	26.00	4.90
750	26.41	5.11
800	27.10	5.50
850	27.51	5.60
900	27.90	5.80
950	28.01	5.90
1000	29.00	6.20

※Remark: For frequency above 1000 MHz, we used low cable loss BNC cable to test.

## 8. LIST OF MEASURING INSTRUMENTS USED

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver (site 2)	HP	8591EM	3710A01187	9 KHz - 18 GHz	Sep. 29, 1997	Conduction
LISN (EUT) (site 2)	Telemeter	NNB-2/16Z	98009	50 ohm / 50 uH	Jan. 29, 1998	Conduction
LISN (Support Unit) (site 2)	EMCO	3810/2NM	9703-1839	50 ohm / 50 uH	March 06, 1997	Conduction
Spectrum Analyzer (Site 4)	HP	8560E	3728A03186	30MHz - 2.9GHz	Sep. 24, 1997	Radiation
Amplifier (Site 4)	HP	8447D	2944A09072	0.1MHz -1.3GHz	Sep. 17, 1997	Radiation
Test Receiver (Site 4)	R&S	ESVP	893610/003	20MHz - 1.3GHz	April 13, 1998	Radiation
Bilog Antenna (Site 4)	CHASE	CBL6112A	2288	30MHz -2GHz	Jul. 24, 1997	Radiation
Half-wave dipole antenna (Site 4)	EMCO	3121C	9705-1285	28 M - 1GHz	May 19, 1998	Radiation
Turn Table (site 4)	EMCO	2080	9711-1090	0 ~ 360 degree	N/A	Radiation
Antenna Mast (site 4)	EMCO	2075	9711-2114	1 m- 4 m	N/A	Radiation

※ The column of Remark indicates that the instruments used for conduction ("C") or radiation ("R") test.

Remark : Except the calibration interval of LISN (EMCO/3810/2NM) is one and half years, the

Calibration interval of all instruments are one year.