FCC TEST REPORT

for

CISPR PUB. 22 Class A

Equipment	:	Industrial Panel PCs
Model No.	:	PMI-3000/PMI-3000T
FCC ID	:	N/A
Filing Type	:	Verification
Applicant	:	**Astech Technology Co., Ltd.** 6F-4, No. 351, Chung-Shan Rd., Sec. 2, Chung-Ho City, 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.
- **Certificate or Test Report must not be used by the applicant to claim the product in this test report endorsement by NVLAP or any agency of U.S. government.**

SPORTON International Inc.

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

CERTIFICATE OF COMPLIANCE

for

CISPR PUB. 22 Class A

Equipment	:	Industrial Panel PCs
Model No.	:	PMI-3000/PMI-3000T
FCC ID	:	N/A
Applicant	:	**Astech Technology Co., Ltd.** 6F-4, No. 351, Chung-Shan Rd., Sec. 2, Chung-Ho City, Taipei, Taiwan, R.O.C.

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 1992** and the energy emitted by this equipment was ***passed*** **CISPR PUB. 22** both radiated and conducted emission class A limits. Testing was carried out on Jul. 21, 2000 at **SPORTON International Inc.** LAB. in Lin Kou.

Aug. 03, 2000

Lenore Chang
President

SPORTON International Inc.

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

Table of Contents

1. General Description of Equipment under Test

1.1. Applicant

Astech Technology Co., Ltd.
6F-4, No. 351, Chung-Shan Rd., Sec. 2,
Chung-Ho City, Taipei, Taiwan, R.O.C.

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: Industrial Panel PCs
Model No.	: PMI-3000/PMI-3000T
FCC ID	: N/A
Trade Name	: Astech
Data Cable	: Please see section 2.2 of this test report for details
Power Supply Type	: Switching
Power Cord	: Non-Shielded, 1.75m, 3 pin

1.4. Feature of Equipment under Test

- Construction: Heavy-duty steel chassis & NEMA 4/12 plastic front panel.
- CPU: 3865SX-40
- Memory: 4M DRAM
- Display: 9.4" VGA(640*480)DSTN color LCD
- LCD/CRT controller: HMC86508, simultaneous LCD and CRT display 1MB DRAM on board
- I/O port: 4 serial ports: three RS-232, one RS-232/422/485
  1 parallel port (support ECP/EPP)
  1 keyboard port
  1 PS/2 mouse interface
- HDD: 2.5" HDD bay
- FDD: Expansion FDD connector for AS-40 (optional)
- Power Supply: Universal 55W switching power supply

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 SONY Monitor, DELL PS/2 Keyboard, PRIMAX PS/2 Mouse, HP Printer, ASTECH External FDD and ACEEX Modem were connected to the EUT for EMI test.
c. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 1000MHz.

2.2. Description of Test System

Support Unit 1. -- Monitor (SONY)

FCC ID	: AK8GDM17SE2T
Model No.	: GDM-17SE2T
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0013
Data Cable	: Shielded, 360 degree via metal backshells, 1.15m

Support Unit 2. -- PS/2 Keyboard (DELL)

FCC ID	: GYUM90SK
Model No.	: AT101W
Serial No.	: SP0019
Data Cable	: Shielded, 360 degree via metal backshells, 1.5m

Support Unit 3. -- PS/2 Mouse (PRIMAX)

FCC ID	: EMJMUSJQ
Model No.	: MUS9J
Serial No.	: SP0045
Data Cable	: Non-Shielded, 360 degree via metal backshells, 1.75m

Support Unit 4. -- Printer (HP)

FCC ID	: DSI6XU2225
Model No.	: 2225C
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0014
Data Cable	: Shielded, 360 degree via metal backshells, 1.2m

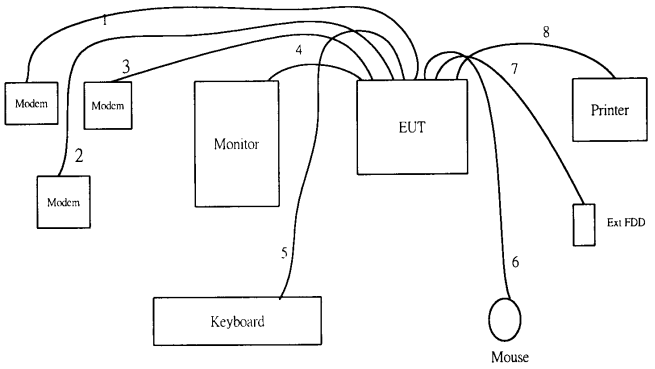
Support Unit 5. -- Modem (ACEEX)

FCC ID	: IFAXDM1414
Model No.	: DM1414
Power Supply Type	: Linear
Power Cord	: Non-Shielded
Serial No.	: SP0015
Data Cable	: Shielded, 360 degree via metal backshells, 1.15m

Support Unit 6 – FDD (ASTECH)

Spec.	: AS-40
Data Cable	: Shielded, 1.9m

2.3. Connection Diagram of Test System



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

3. Test Software

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

The program was executed as follows :

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

4. General Information of Test

4.1. Test Facility

This test was carried out by SPORTON International Inc.

Test Site Location : No. 30-2, 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

CISPR PUB. 22 Class A

4.4. Frequency Range Investigated

a. Conduction: from 150 kHz to 30 MHz
b. Radiation : from 30 MHz to 1,000 MHz

4.5. Test Distance

The test distance of radiated emission from antenna to EUT is 10 M.

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 115 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-1992 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

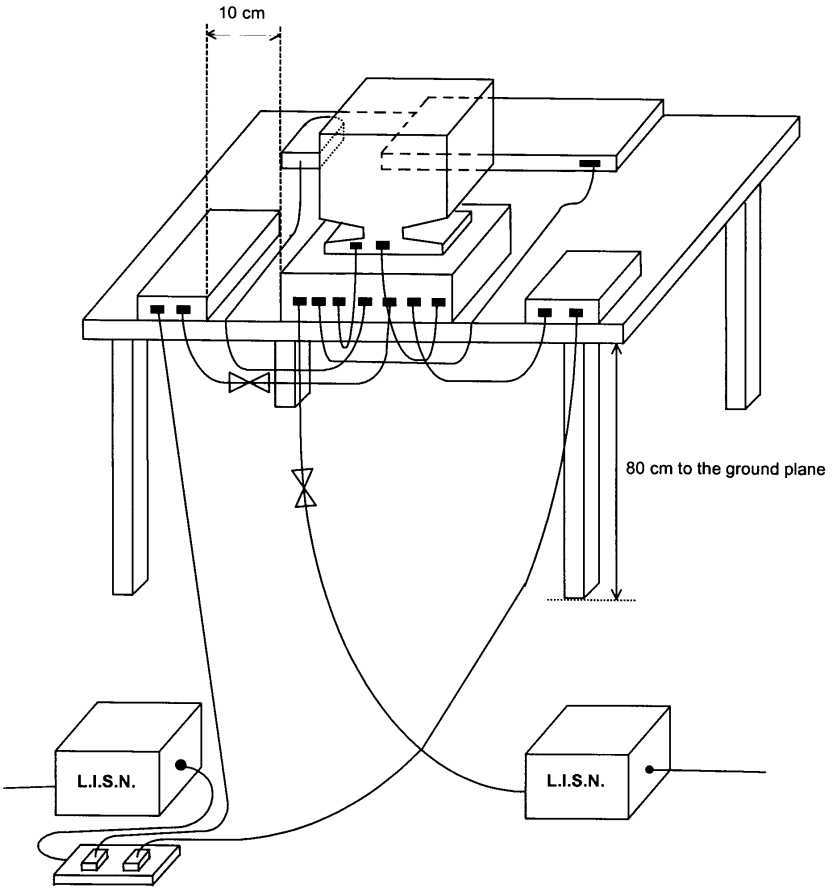
5.1. Major Measuring Instruments

Test Receiver	HP 8591EM
Attenuation	0 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
Step MHz	0.007 MHz
IF Bandwidth	9 kHz

5.2. Test Procedures

a. The EUT was placed 0.4 meter from the conducting wall of the shielding room 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 150 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 one 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 0.15 MHz to 30 MHz
- Temperature : 28°C
- Relative Humidity : 47 %
- Test Date : Jul. 21, 2000

The Conducted Emission test was passed at minimum margin

NEUTRAL 0.188 MHz / 46.20 dBuV.

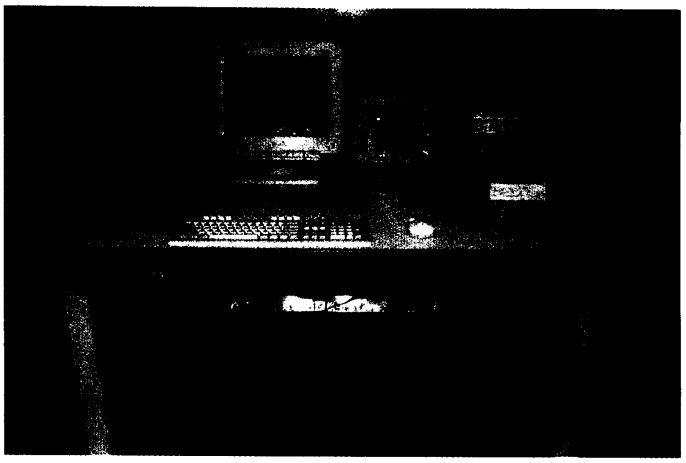
Freq.	Line	Meter Reading				Limits				Margin	
	or	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.	Q.P.	A.V.
(MHz)	Neutral	(dBuV)	(dBuV)	(uV)	(uV)	(dBuV)	(dBuV)	(uV)	(uV)	(dB)	(dB)
0.188	L	54.60	44.30	537.03	164.06	79.00	66.00	8912.51	1995.26	-24.4	-21.7
0.250	L	44.20	34.60	162.18	53.70	79.00	66.00	8912.51	1995.26	-34.8	-31.4
3.944	L	34.30	31.10	51.88	35.89	73.00	60.00	4466.84	1000.00	-38.7	-28.9
0.188	N	55.10	46.20	568.85	204.17	79.00	66.00	8912.51	1995.26	-23.9	-19.8
0.250	N	45.00	35.70	177.83	60.95	79.00	66.00	8912.51	1995.26	-34.0	-30.3
3.944	N	34.90	31.60	55.59	38.02	73.00	60.00	4466.84	1000.00	-38.1	-28.4

Test Engineer : Jackson Huang

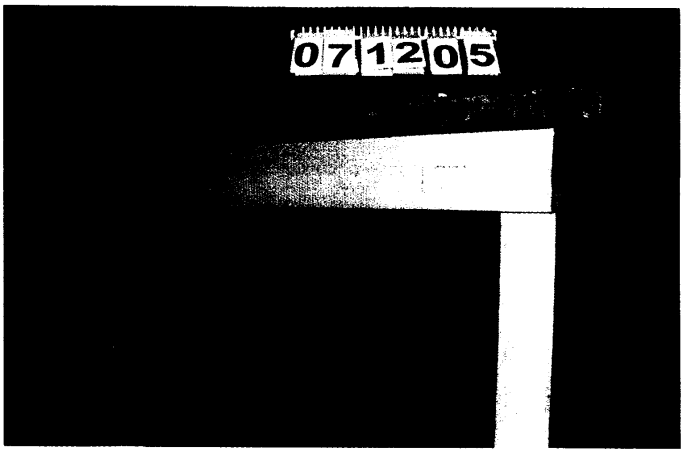
5.5. Photographs of Conducted Powerline Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW



SIDE VIEW

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 1,000 MHz 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 section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

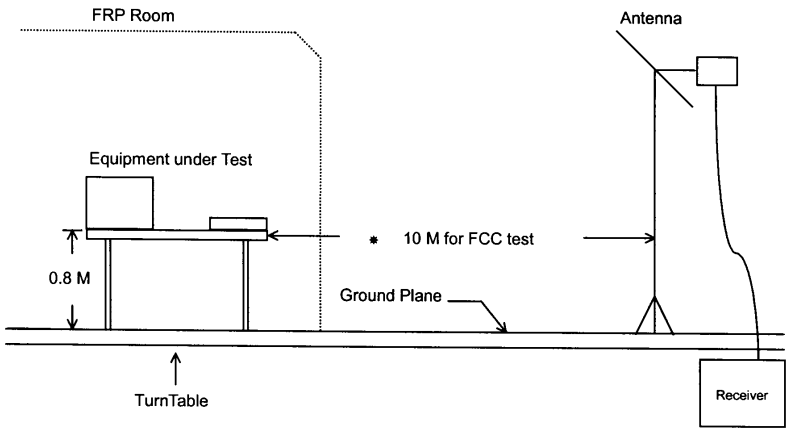
6.1. Major Measuring Instruments

• Amplifier	(HP 8447D)
Attenuation	0 dB
RF Gain	25 dB
Signal Input	0.1 MHz to 1.3 GHz
• Spectrum Analyzer	(ADVANTEST R3261C)
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	1000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	9 KHz to 2.6 GHz

6.2. Test Procedures

a. The EUT was placed on a rotatable table top 0.8 meter above ground.
b. The EUT was set 10 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

- Frequency Range of Test : from 30 MHz to 1,000 MHz
- Test Distance : 10 M
- Temperature : 30°C
- Relative Humidity : 49 %
- Test Date : Jul. 20, 2000
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading : Antenna Factor + Cable Loss + Reading = Emission

The Radiated Emission test was passed at minimum margin

192.620 MHz / 35.37 dBuV (HORIZONTAL) Antenna Height 4 Meter, Turntable Degree 0 °.

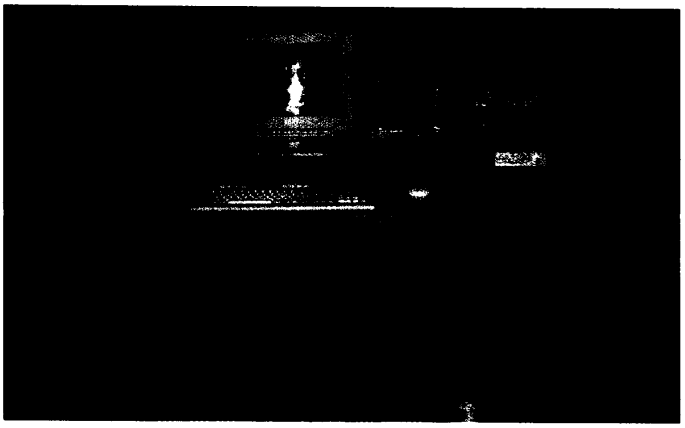
Frequency	Polarity	Antenna Factor	Cable Loss	Reading	Limits		Emission	Level	Margin
(MHz)		(dB/m)	(dB)	(dBuV)	(dBuV/m)	(uV/m)	(dBuV/m)	(uV/m)	(dB)
161.307	H	9.71	2.32	22.45	40.00	100.00	34.48	52.97	-5.52
175.147	H	9.35	2.43	21.51	40.00	100.00	33.29	46.18	-6.71
192.620	H	9.38	2.52	23.47	40.00	100.00	35.37	58.68	-4.63
60.275	V	5.97	1.25	27.42	40.00	100.00	34.64	53.95	-5.36
126.361	V	11.49	2.08	19.61	40.00	100.00	33.18	45.60	-6.82
135.703	V	10.99	2.19	21.44	40.00	100.00	34.62	53.83	-5.38

Test Engineer : _____
BENSON TSAI

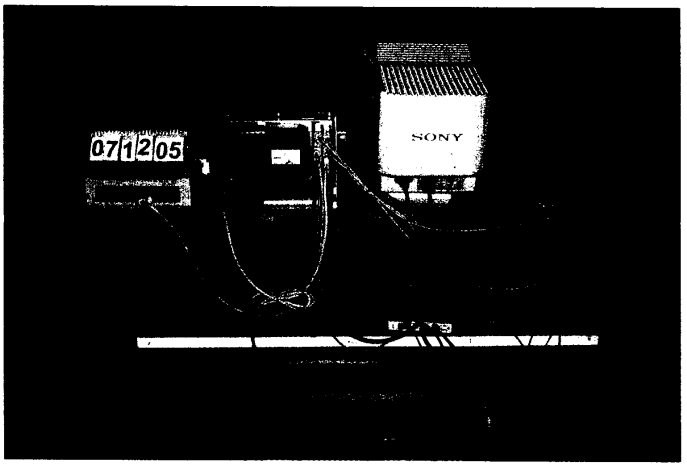
6.5. Photographs of Radiated Emission Test Configuration

- The photographs show the configuration that generates the maximum emission.

FRONT VIEW



REAR VIEW



7. Antenna Factor & Cable Loss

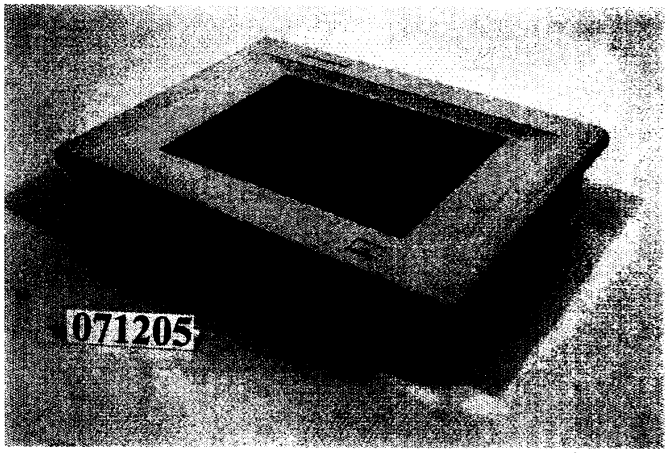
Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	19.2	0.8
35	13.4	0.9
40	13.4	0.9
45	11.5	1.1
50	9.9	1.1
55	7.9	1.2
60	6.0	1.3
65	6.4	1.4
70	6.8	1.5
75	7.1	1.5
80	7.3	1.5
85	8.2	1.6
90	9.2	1.6
95	10.1	1.6
100	11.0	1.7
110	11.4	1.9
120	11.8	2.0
130	11.3	2.2
140	10.8	2.2
150	10.7	2.2
160	9.7	2.3
170	9.4	2.4
180	9.5	2.5
190	9.4	2.5
200	9.3	2.6
220	10.4	2.8
240	11.4	3.0
260	12.2	2.9
280	12.5	3.2
300	12.9	3.2
320	13.3	3.3
340	13.7	3.6
360	14.5	3.9
380	15.5	3.9
400	16.5	3.9
450	16.5	4.2
500	18.3	4.4
550	18.9	4.8
600	20.1	4.8
650	18.1	5.1
700	17.2	5.4
750	17.9	5.8
800	18.0	6.1
850	17.7	6.6
900	21.0	6.6
950	21.0	6.9
1000	20.3	7.0

NHOP3

8. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver	HP	8591EM	3710A01187	9 KHz – 1.8 GHz	Jul. 07, 2000	Conduction
LISN (for EUT)	EMCO	3810/2	9703-1838	50uH / 50 OHM	Aug. 30, 1999	Conduction
LISN (for support device)	Kyoritsu	KNW-407	8-1010-15	50uH / 50 OHM	Nov. 16, 1999	Conduction
EMI Filter	CORCOM	MRI-2030	N/A	480VAC / 30A	N/A	Conduction
Spectrum Analyzer (site 3)	Advantest	R3261C	71720471	9KHz - 2.6GHz	Dec. 12, 1999	Radiation
Amplifier (Site 3)	HP	8447D	2944A06292	0.1MHz -1.3GHz	Feb. 19, 2000	Radiation
Bilog Antenna (Site 3)	CHASE	CBL6112A	2218	30MHz - 2GHz	Jan. 29, 2000	Radiation
Half-wave dipole antenna (Site 3)	EMCO	3121C	8912-1285	20MHz - 1GHz	May 17, 2000	Radiation
Turn Table	EMCO	1060-1.211	9508-1805	0 ~ 360 degree	N/A	Radiation
Antenna Mast	EMCO	1051-1.2	9502-1868	1 m - 4 m	N/A	Radiation

APPENDIX A. Photographs of EUT



071205-01.jpg

071205-02.jpg