



FCC TEST REPORT

for

CISPR PUB. 22 Class A

Equipment : Analog Display Panel
Model No. : AMB-223AT, AMB-223A
FCC ID : N/A
Filing Type : Original Grant
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.

SPORTON International Inc.

TEL : 886-2-2696-2468
FAX : 886-2-2696-2255

FCC ID : N/A
Page No. : 1 of 27
Issued Date : May. 22, 2000

CERTIFICATE OF COMPLIANCE

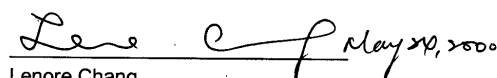
for

CISPR PUB. 22 Class A

Equipment : Analog Display Panel
Model No. : AMB-223AT, AMB-223A
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 May. 5, 2000 at **SPORTON International Inc.** LAB. in Lin Kou.


Lenore Chang
President

SPORTON International Inc.

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

SPORTON International Inc.

TEL : 886-2-2696-2468
FAX : 886-2-2696-2255

FCC ID : N/A
Page No. : 3 of 27
Issued Date : May. 22, 2000

6F, No.106, Sec.1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C. TEL:886-2-26962468 FAX:886-2-26962255

Scope of NVLAP Accreditation : IEC/CISPR 22, FCC Method - 47 CFR Part 15 - Digital Devices, AS-3548

Table of Contents

CERTIFICATE OF COMPLIANCE 3

1. General Description of Equipment under Test 4

 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

2. Test Configuration of Equipment under Test..... 5

 2.1. Test Manner..... 5

 2.2. Description of Test System 5

 2.3. Connection Diagram of Test System 7

3. Test Software 8

4. General Information of Test 9

 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

5. Test of Conducted Powerline..... 10

 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 Emission13

 5.5. Photographs of Conducted Powerline Test Configuration.....15

6. Test of Radiated Emission 19

 6.1. Major Measuring Instruments.....19

 6.2. Test Procedures.....20

 6.3. Typical Test Setup Layout of Radiated Emission.....21

 6.4. Test Result of Radiated Emission22

 6.5. Photographs of Radiated Emission Test Configuration.....24

7. Antenna Factor & Cable Loss 26

8. List of Measuring Equipment Used 27

Appendix A. Photographs of EUT A1 ~ A4

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	: Analog Display Panel
Model No.	: AMB-223AT, AMB-223A
FCC ID	: N/A
Trade Name	: Astech
VGA Cable	: Shielded, 1.1m
AV Cable	: Non-shielded, 1.2m
RS232 Cable	: Shielded, 1.7m
Power Supply Type	: Switching
AC Power Cord	: Non-Shielded, 1.8m, 3 pin
DC Power cable	: Shielded, 0.7m

1.4. Feature of Equipment under Test

- 12.1" SVGA color TFT LCD display
- Front panel is NEMA 4/12 compliant
- I/O port: RGB, RCA
- Power Supply: DC/12V external power adapter
- Max. resolution: 800 x 600
- Touchscreen: controller - RS-232 interface

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 PS/2 Keyboard, PRIMAX PS/2 Mouse, HP Printer, ACEEX Modem, and EUT were connected to the FIC PC for EMI test. The PANASONIC Video Player was connected to the EUT.
- c. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 1000MHz.

2.2. Description of Test System

Support Unit 1. -- Personal Computer (FIC)

FCC ID : N/A
Model No. : P2L97
Power Supply Type : Switching
Power Cord : Non-Shielded
Serial No. : SP0037
Data Cable : Shielded, 360 degree via metal backshells
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

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

FCC ID : GYUM92SK
Model No. : AT101(DE8M)
Serial No. : SP0054
Data Cable : Shielded, 360 degree via metal backshells, 1.9m

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

FCC ID : EMJMUSJQ
Model No. : MUS9J
Serial No. : SP0045
Data Cable : Shielded, 360 degree via metal backshells, 1.7m

Support Unit 4. -- Printer (HP)

FCC ID : B94C2642X
Model No. : DeskJet 400
Power Supply Type : Linear
Power Cord : Non-Shielded
Serial No. : SP0048
Data Cable : Shielded, 360 degree via metal backshells, 1.35m

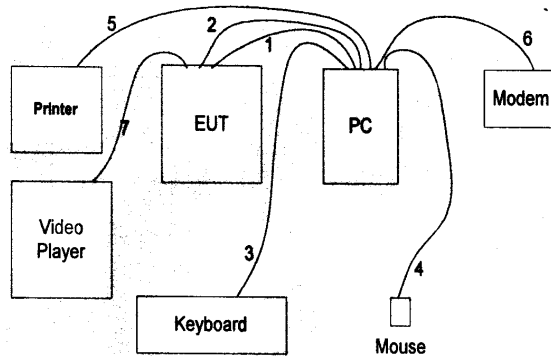
Support Unit 5. -- Modem (ACEEX)

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. -- Video Player (PANASONIC)

Model No. : PV-S7670
Serial No. : SP0149
Data Cable : Non-Shielded, 1.2m

2.3. Connection Diagram of Test System



1. The VGA cable is connected from PC to the EUT.
2. The RS232 cable is connected from PC to the EUT.
3. The I/O cable is connected from PC to the support unit 2.
4. The I/O cable is connected from PC to the support unit 3.
5. The I/O cable is connected from PC to the support unit 4.
6. The I/O cable is connected from PC to the support unit 5.
7. The I/O cable is connected from EUT to the support unit 6.

3. Test Software

An executive program, EMCTEST.EXE under WIN 98, 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

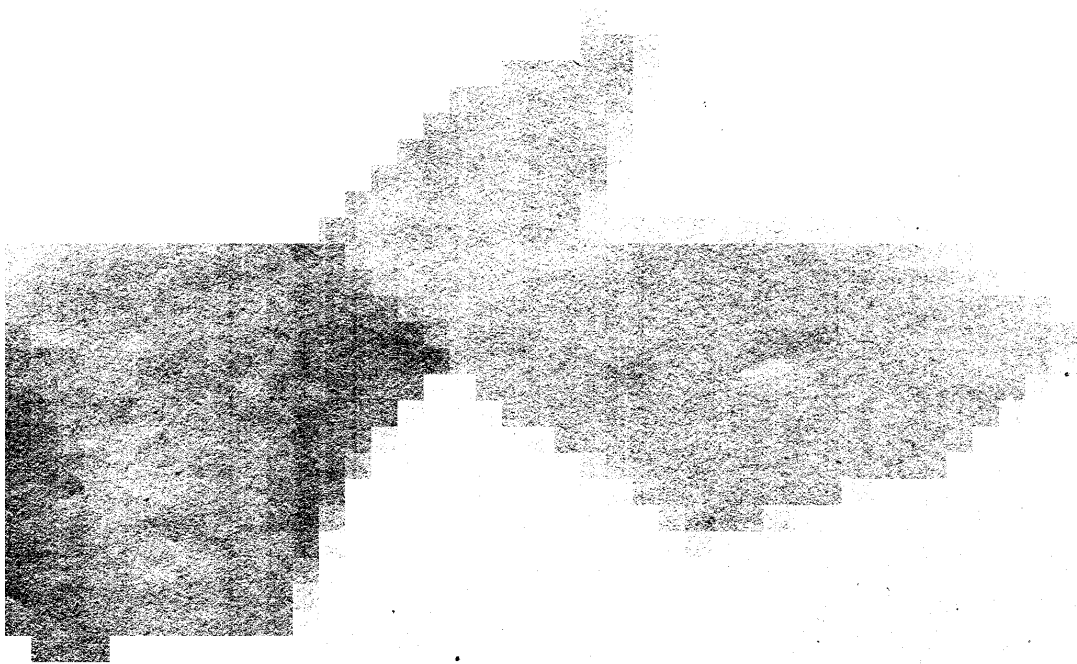
The test distance of radiated emission from antenna to EUT is 10 M.

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

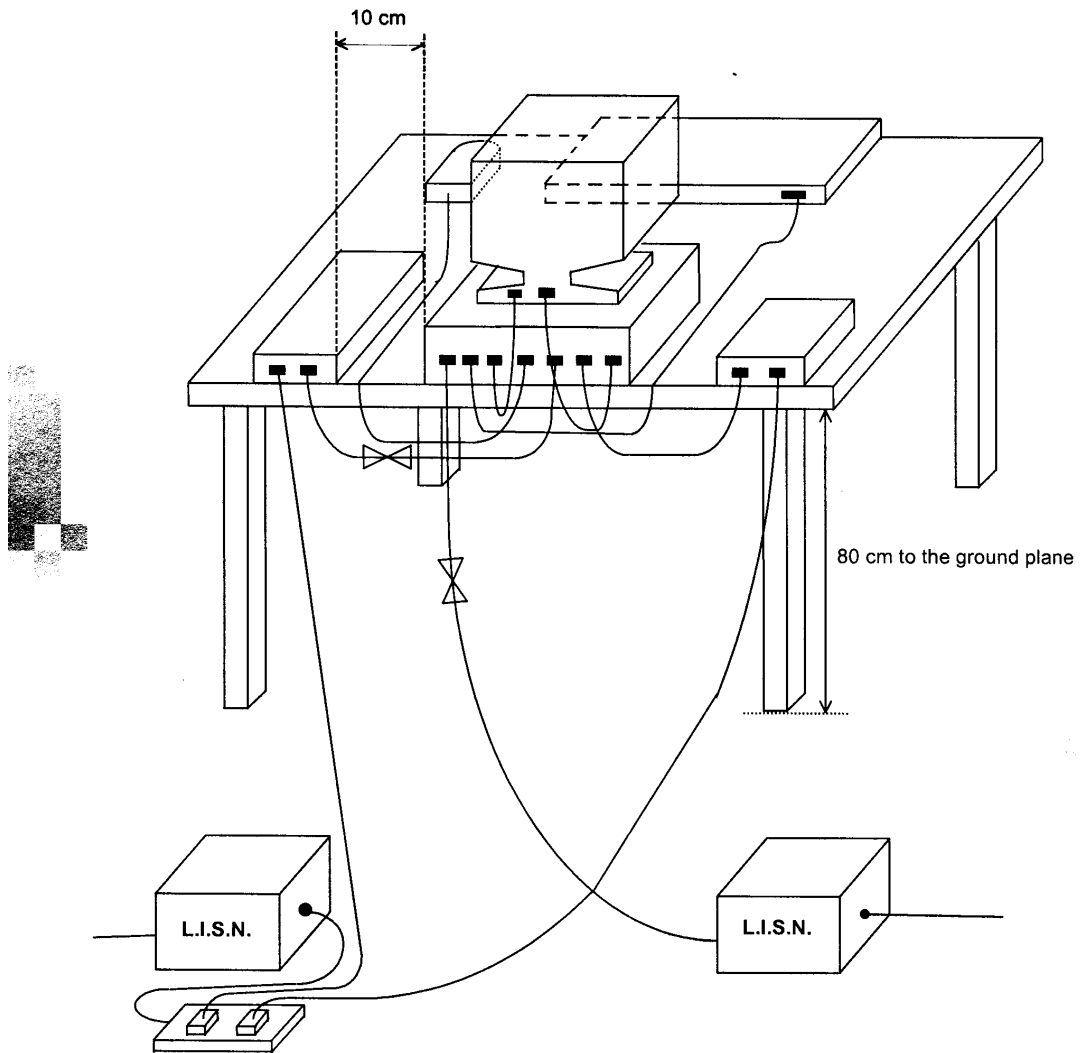
Test Receiver	HP 8591EM
Attenuation	0 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
Step MHz	0.007 MHz
IF Bandwidth	9 kHz



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

5.4.1. Test mode : VGA Mode 800x600

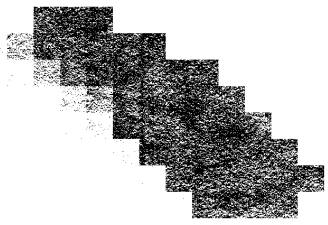
- Temperature : 27°C
- Relative Humidity : 58 %
- Test Date : May. 5, 2000

The Conducted Emission test was passed at minimum margin

NEUTRAL 1.081 MHz / 55.50 dBuV.

Freq. (MHz)	Line or Neutral	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.191	L	60.40	47.80	1047.13	245.47	79.00	66.00	8912.51	1995.26	-18.6	-18.2
0.892	L	54.70	54.70	543.25	543.25	73.00	60.00	4466.84	1000.00	-18.3	-5.3
1.082	L	55.30	55.30	582.10	582.10	73.00	60.00	4466.84	1000.00	-17.7	-4.7
0.764	N	54.80	54.80	549.54	549.54	73.00	60.00	4466.84	1000.00	-18.2	-5.2
0.891	N	54.90	54.90	555.90	555.90	73.00	60.00	4466.84	1000.00	-18.1	-5.1
1.081	N	55.60	55.50	602.56	595.66	73.00	60.00	4466.84	1000.00	-17.4	-4.5

Test Engineer : Aldrich
Aldrich Hong



5.4.2. Test mode : AV Mode

- Temperature : 27°C
- Relative Humidity : 58 %
- Test Date : May. 5, 2000

The Conducted Emission test was passed at minimum margin

LINE 1.092 MHz / 54.30 dBuV.

Freq. (MHz)	Line or Neutral	Meter Reading				Limits				Margin	
		Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dBuV)	A.V. (dBuV)	Q.P. (uV)	A.V. (uV)	Q.P. (dB)	A.V. (dB)
0.771	L	53.30	53.30	462.38	462.38	73.00	60.00	4466.84	1000.00	-19.7	-6.7
0.899	L	53.60	53.50	478.63	473.15	73.00	60.00	4466.84	1000.00	-19.4	-6.5
1.092	L	54.30	54.30	518.80	518.80	73.00	60.00	4466.84	1000.00	-18.7	-5.7
1.157	L	54.10	54.10	506.99	506.99	73.00	60.00	4466.84	1000.00	-18.9	-5.9
0.900	N	53.40	53.30	467.74	462.38	73.00	60.00	4466.84	1000.00	-19.6	-6.7
1.222	N	53.80	53.70	489.78	484.17	73.00	60.00	4466.84	1000.00	-19.2	-6.3

Test Engineer : Aldrich
Aldrich Hong

5.5. Photographs of Conducted Powerline Test Configuration

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

VGA Mode

FRONT VIEW



REAR VIEW



SIDE VIEW



AV Mode

FRONT VIEW



REAR VIEW



SPORTON International Inc.

TEL : 886-2-2696-2468

FAX : 886-2-2696-2255

FCC ID : N/A

Page No. : 17 of 27

Issued Date : May. 22, 2000

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.

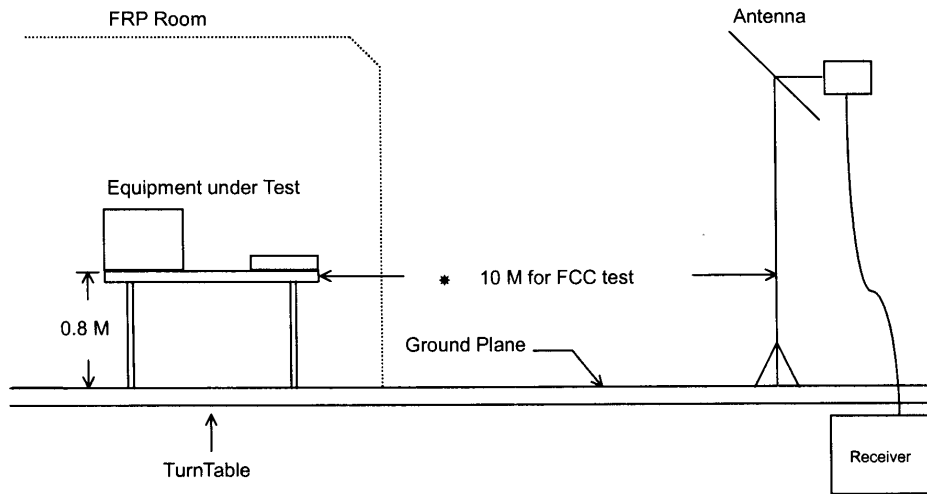
6.1. Major Measuring Instruments

Amplifier	(HP 8447D)
Attenuation	0 dB
RF Gain	25 dB
Signal Input	0.1 MHz to 1.3 GHz
Spectrum Analyzer	(HP 8568B)
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	1,000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	100 Hz to 1.5 GHz
Quasi-Peak Adapter	(HP 85650A)
Resolution Bandwidth	120 KHz
Frequency Band	30 MHz to 1 GHz
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 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

6.4.1. Test mode : VGA Mode 800x600

- Test Distance : 10 M
- Temperature : 28°C
- Relative Humidity : 41 %
- Test Date : May. 3, 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

188.984 MHz / 37.78 dBuV (VERTICAL) Antenna Height 1 Meter, Turntable Degree 107 °.

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV/m)	Level (uV/m)	Margin (dB)
					(dBuV/m)	(uV/m)			
190.056	H	9.50	1.50	25.37	40.00	100.00	36.37	65.84	-3.63
419.200	H	16.82	2.19	24.15	47.00	223.87	43.16	143.88	-3.84
439.471	H	16.94	2.45	23.83	47.00	223.87	43.22	144.88	-3.78
598.400	H	19.65	2.70	21.05	47.00	223.87	43.40	147.91	-3.60
188.984	V	9.52	1.50	26.76	40.00	100.00	37.78	77.45	-2.22
479.200	V	17.17	2.40	24.19	47.00	223.87	43.76	154.17	-3.24

Test Engineer : *William*
 WILLIAM LEE

6.4.2. Test mode : AV Mode

- Test Distance : 10 M
- Temperature : 28°C
- Relative Humidity : 41 %
- Test Date : May. 4, 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

400.000 MHz / 44.18 dBuV (VERTICAL) Antenna Height 1 Meter, Turntable Degree 260 °.

Frequency (MHz)	Polarity	Antenna Factor (dB/m)	Cable Loss (dB)	Reading (dBuV)	Limits		Emission (dBuV/m)	Level (uV/m)	Margin (dB)
					(dBuV/m)	(uV/m)			
201.000	H	9.37	1.50	21.62	40.00	100.00	32.49	42.12	-7.51
400.000	H	16.70	2.30	21.68	47.00	223.87	40.68	108.14	-6.32
479.200	H	17.17	2.40	19.39	47.00	223.87	38.96	88.72	-8.04
238.400	V	11.92	1.61	28.11	47.00	223.87	41.64	120.78	-5.36
400.000	V	16.70	2.30	25.18	47.00	223.87	44.18	161.81	-2.82
440.000	V	16.94	2.46	23.04	47.00	223.87	42.44	132.43	-4.56

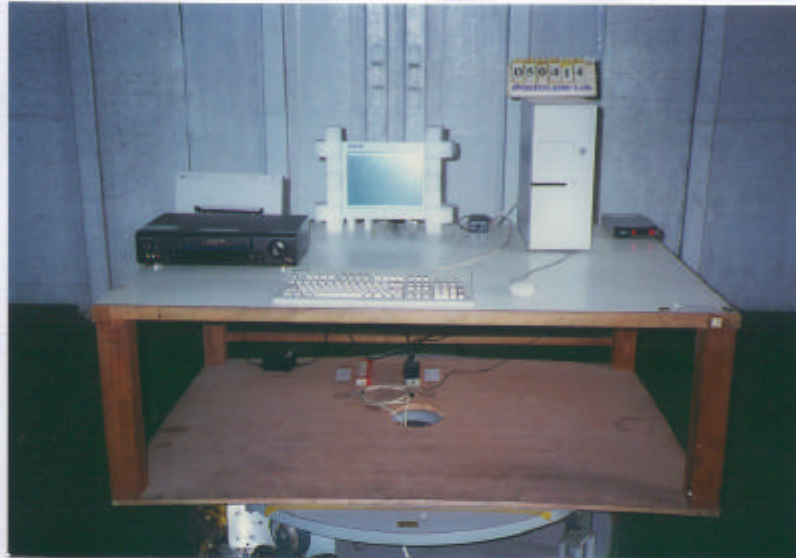
Test Engineer : *William*
 WILLIAM LEE

6.5. Photographs of Radiated Emission Test Configuration

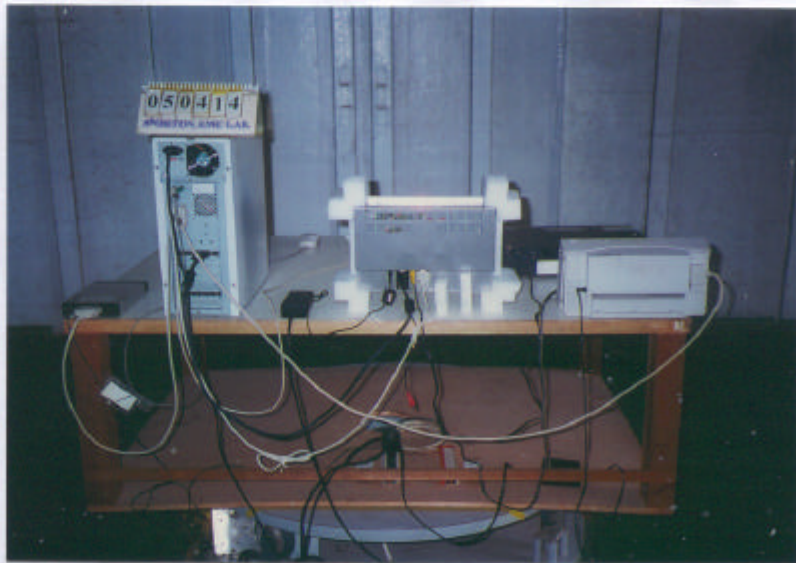
- The photographs show the configuration that generates the maximum emission.

VGA Mode

FRONT VIEW

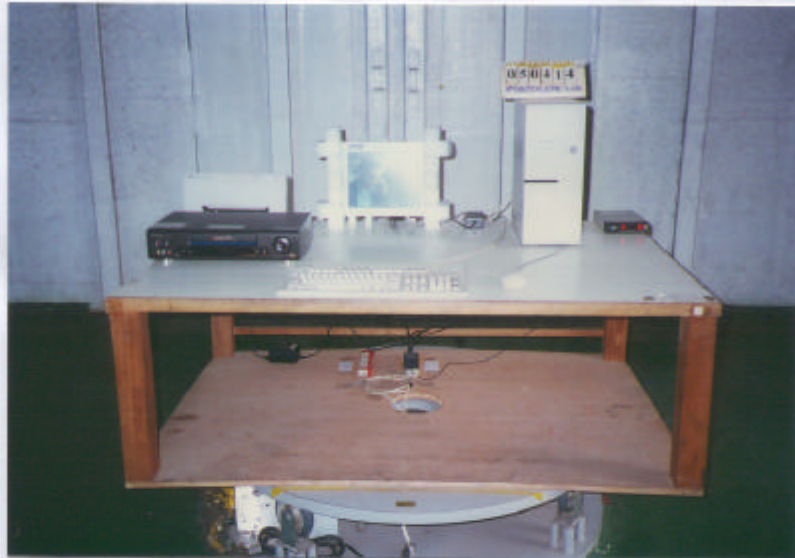


REAR VIEW

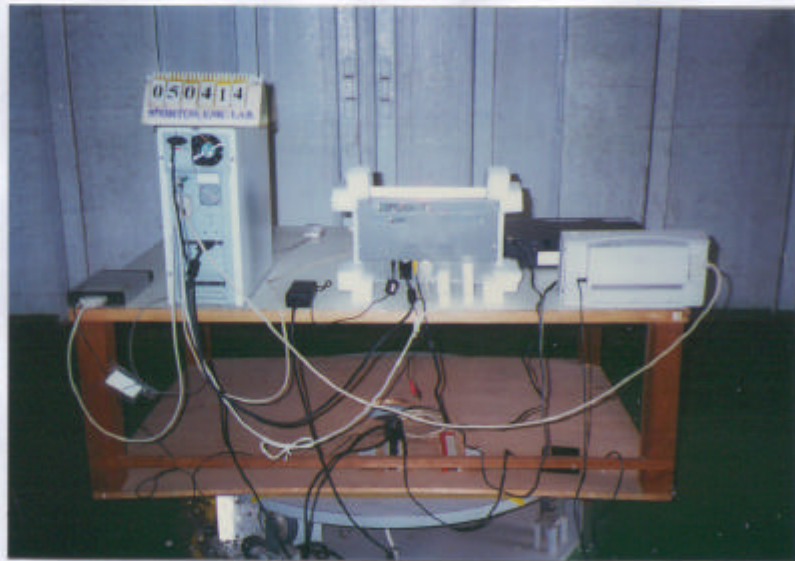


AV Mode

FRONT VIEW



REAR VIEW



SPORTON International Inc.

TEL : 886-2-2696-2468

FAX : 886-2-2696-2255

FCC ID : N/A

Page No. : 25 of 27

Issued Date : May. 22, 2000

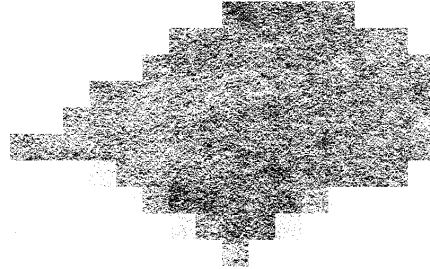
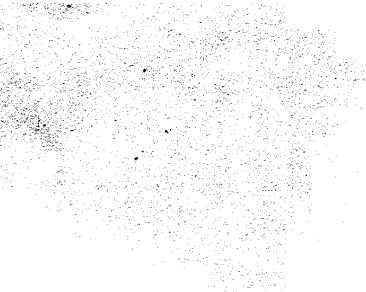
7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	17.0	0.6
35	16.3	0.6
40	12.6	0.7
45	12.4	0.8
50	10.4	0.8
55	8.4	0.8
60	6.4	0.9
65	6.4	0.9
70	6.4	1.0
75	6.7	1.0
80	7.1	1.0
85	7.5	1.1
90	7.8	1.1
95	9.3	1.0
100	10.7	1.1
110	11.9	1.1
120	12.9	1.2
130	12.6	1.3
140	12.2	1.3
150	11.4	1.4
160	9.5	1.4
170	9.8	1.4
180	9.7	1.5
190	9.5	1.5
200	9.3	1.5
220	10.7	1.6
240	12.0	1.6
260	13.0	1.8
280	13.7	1.8
300	14.4	2.0
320	14.9	2.1
340	15.3	2.1
360	15.8	2.2
380	16.3	2.2
400	16.7	2.3
450	17.0	2.5
500	17.3	2.5
550	18.5	2.6
600	19.7	2.7
650	19.2	2.9
700	18.7	3.2
750	19.3	3.3
800	19.9	3.4
850	21.2	3.6
900	22.4	3.8
950	21.7	3.9
1000	20.9	4.0

LKOP3

8. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver (site 2)	HP	8591EM	3710A01187	9 KHz - 18 GHz	Sep. 06. 1999	Conduction
LISN (Support Unit) (site 2)	Telemeter	NNB-2/16Z	98009	50 ohm / 50 uH	Dec. 06. 1999	Conduction
LISN (EUT) (site 2)	Telemeter	NNB-2/16Z	98087	50 ohm / 50 uH	Dec. 06. 1999	Conduction
Quasi-peak Adapter (site 3)	HP	85650A	2811A01116	9KHz -1GHz	Jun. 20. 1999	Radiation
Amplifier (Site 3)	HP	8447D	2944A09068	0.1MHz -1.3GHz	Sep. 02. 1999	Radiation
Spectrum Analyzer (site 3)	HP	8568B	2732A04100	100Hz - 1.5GHz	Jun. 20. 1999	Radiation
Bilog Antenna (Site 3)	CHASE	CBL6112A	2320	30MHz -2GHz	Sep. 08. 1999	Radiation
Half-wave dipole antenna (Site 3)	EMCO	3121C	9705-1285	28M - 1GHz	May 18. 1999	Radiation
Turn Table (site 3)	EMCO	2080	9711-2022	0 - 360 degree	N/A	Radiation
Antenna Mast (site 3)	EMCO	2075	9710-2101	1 m- 4 m	N/A	Radiation



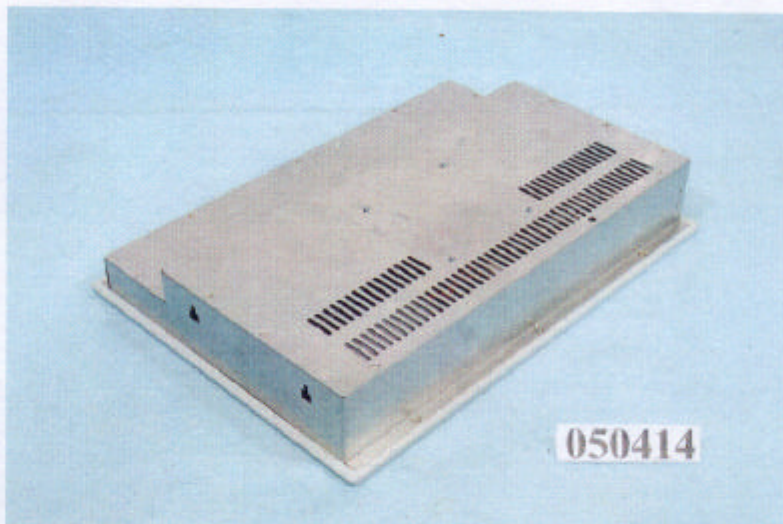
APPENDIX A. Photographs of EUT



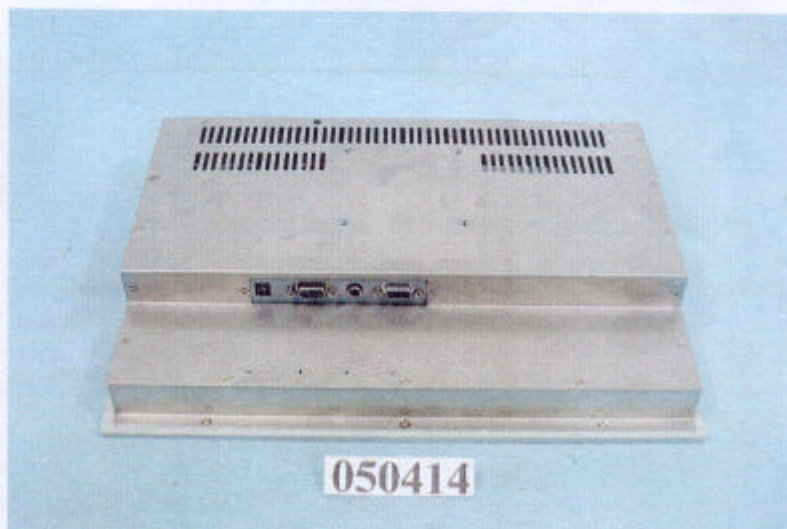
050414-01.jpg



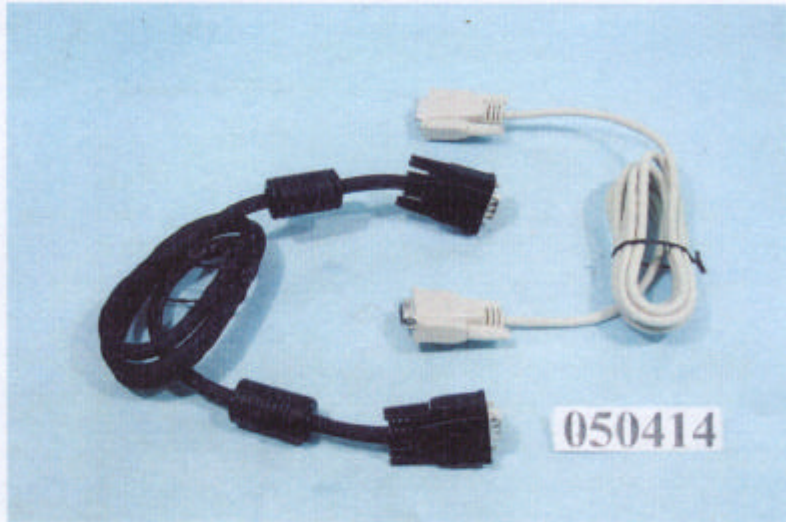
050414-02.jpg



050414-03.jpg



050414-04.jpg



050414-05.jpg



050414-06.jpg



050414-07.jpg