

# **FCC TEST REPORT**

for

**CISPR PUB. 22 Class B**

Equipment : Home Lan Modem

Model No. : HNH010-D75

FCC ID : H8NHNH010D75

Filing Type : Original Grant

Applicant : **ASKEY COMPUTER CORP.**  
2F, No. 2, Lane 497, Chung-Cheng Rd.,  
Hsin-Tien, Taipei, 23136, 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.

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# **CERTIFICATE OF COMPLIANCE**

**for**

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Applicant : **ASKEY COMPUTER CORP.**  
2F, No. 2, Lane 497, Chung-Cheng Rd.,  
Hsin-Tien, Taipei, 23136, 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 B limits. Testing was carried out on Sep. 7, 1999 at **SPORTON International Inc.** LAB. in Lin Kou.

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W. L. Huang  
General Manager

***SPORTON International Inc.***

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

## **1. General Description of Equipment under Test**

### **1.1. Applicant**

ASKEY COMPUTER CORP.  
2F, No. 2, Lane 497, Chung-Cheng Rd.,  
Hsin-Tien, Taipei, 23136, Taiwan, R.O.C.

### **1.2. Manufacturer**

Same as 1.1.

### **1.3. Basic Description of Equipment under Test**

Equipment : Home Lan Modem  
Model No. : HNH010-D75  
FCC ID : H8NHNH010D75  
Trade Name : ASKEY  
Telephone DATA CABLE : Non-Shielded, 10m  
Power Supply Type : From PC  
Power Cord : N/A

### **1.4. Feature of Equipment under Test**

- Home LAN Communication :
  - Protocols : HomePNA 1.0 Specification
  - Data Speed : 1Mbps data rate
  - AFE type : Integrated AFE
  - Protocols : V.90, V.34, V.32bis, V.32, V.23, V.22bis, V.22, V.21, Bell212A and Bell103
  - Error Correction : V.42, MNP2-4
  - Data Compression : V.42bis, MNP5
  - Command set : Enhanced TIA/EIA-602 command set
  - DTE Speed : 300 to 115200 bps
  - Data Format : 10 bits, including start bit, stop bit and parity.

## **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 remote F.I.C. P.C., SONY Monitor, DELL PS/2 Keyboard, PRIMAX PS/2 Mouse, HP Printer, ACEEX Modem, GERICO Telephone and EUT were connected to the IBM P.C. for EMI test.
- c. The phone jack of the EUT was connected to the TRANBON telephone by telephone line and line jack was connected the remote PC.
- d. 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	: 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	: EMJMUJSJQ
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	: Braided-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. -- Telephone (GERICO)

FCC ID	: N/A
Model No.	: GT-266
Serial No.	: SP0134
Data Cable	: Non-Shielded, 2.1m

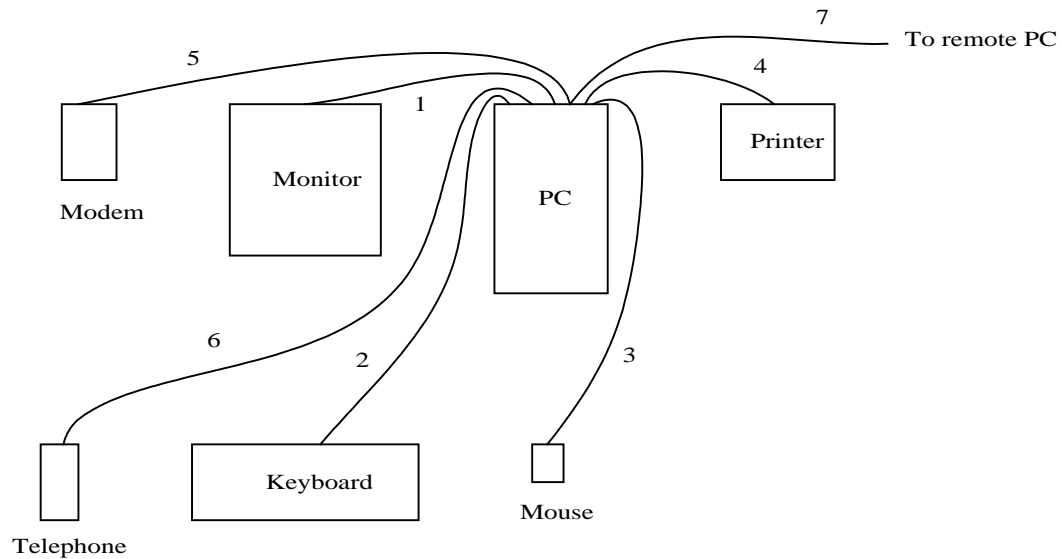
## Support Unit 7. -- Personal Computer (IBM)

FCC ID	: N/A
Model No.	: Aptiva V75M
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0148
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 8. -- 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.

### 2.3. Connection Diagram of Test System



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



### **3. Test Software**

An executive program, EMITEST.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.

At the same time, HYPER TERMINAL and COPYING were executed to transmit data with remoter PC during testing.

## **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 B

### **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.

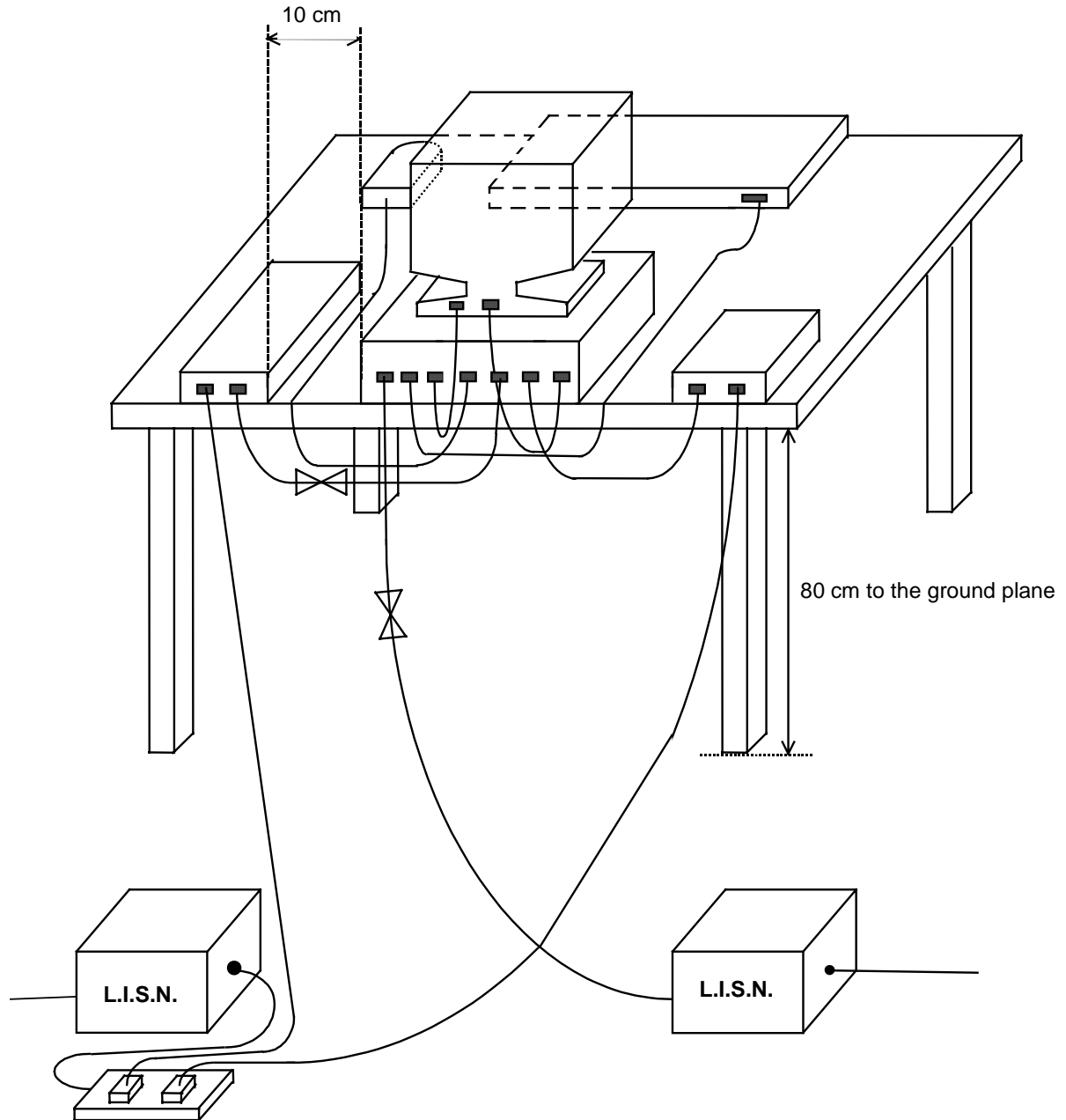
### **5.1. Major Measuring Instruments**

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 : 26°C
- Relative Humidity : 56 %
- Test Date : Sep. 7, 1999

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

**LINE 0.363 MHz / 41.80 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)
0.283	L	45.40	43.20	186.21	144.54	60.73	50.73	1087.35	343.85	-15.3	-7.5
0.363	L	43.90	41.80	156.68	123.03	58.66	48.66	857.00	271.01	-14.8	-6.9
0.908	L	37.80	34.10	77.62	50.70	56.00	46.00	630.96	199.53	-18.2	-11.9
4.941	L	42.00	38.50	125.89	84.14	56.00	46.00	630.96	199.53	-14.0	-7.5
0.365	N	40.80	39.00	109.65	89.13	58.61	48.61	852.50	269.59	-17.8	-9.6
4.941	N	40.30	38.20	103.51	81.28	56.00	46.00	630.96	199.53	-15.7	-7.8

Test Engineer : \_\_\_\_\_

ALEX WU

**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**

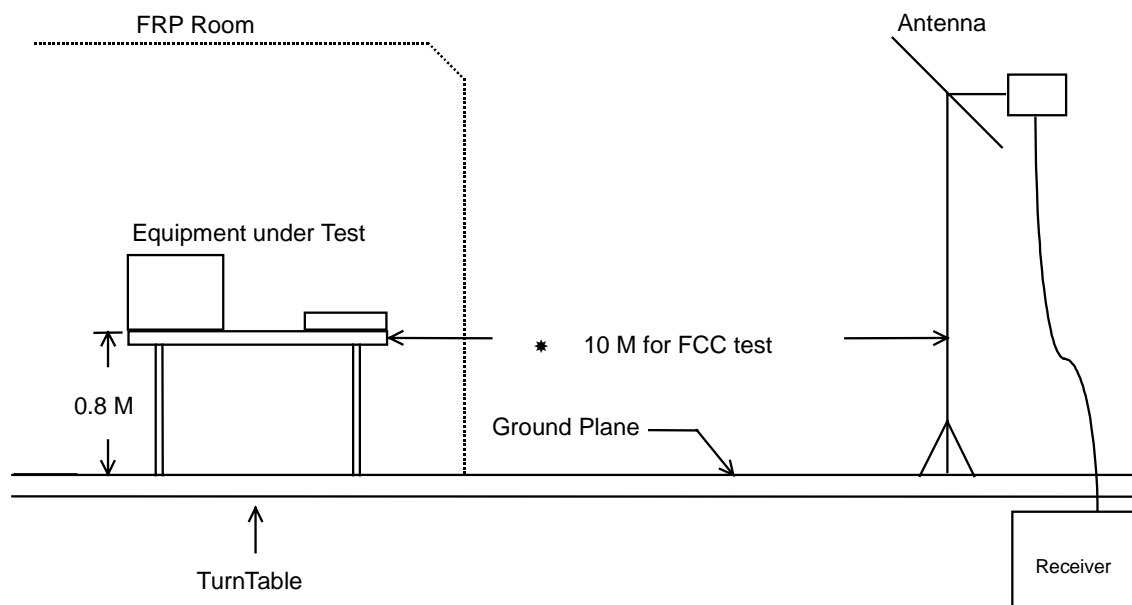
Radiated emissions from 30 MHz to 1,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

### **6.1. Major Measuring Instruments**

Amplifier	(HP 87405A)
Attenuation	0 dB
RF Gain	25 dB
Signal Input	10 MHz to 3.0 GHz
Spectrum Analyzer	(HP 8560E)
Attenuation	0 dB
Start Frequency	30 MHz
Stop Frequency	1,000 MHz
Resolution Bandwidth	1 MHz
Video Bandwidth	1 MHz
Signal Input	30 Hz to 2.9 GHz
Test Receiver	(R & S ESVP)
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**

- Frequency Range of Test : from 30 MHz to 1,000 MHz
- Test Distance : 10 M
- Temperature : 33°C
- Relative Humidity : 60 %
- Test Date : Sep. 7, 1999
- 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**

**190.680 MHz / 26.89 dBuV (VERTICAL) Antenna Height 1 Meter, Turntable Degree 289 °.**

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)			
190.680	V	8.50	1.83	16.56	30.00	31.62	26.89	22.11	-3.11
476.700	V	17.33	3.09	13.24	37.00	70.79	33.66	48.19	-3.34
571.214	V	18.68	3.50	11.44	37.00	70.79	33.62	47.97	-3.38
190.890	H	8.50	1.83	15.33	30.00	31.62	25.66	19.19	-4.34
299.437	H	13.00	2.33	17.14	37.00	70.79	32.47	42.02	-4.53
310.595	H	13.30	2.33	16.90	37.00	70.79	32.53	42.32	-4.47

Test Engineer : \_\_\_\_\_  
JACK DENG

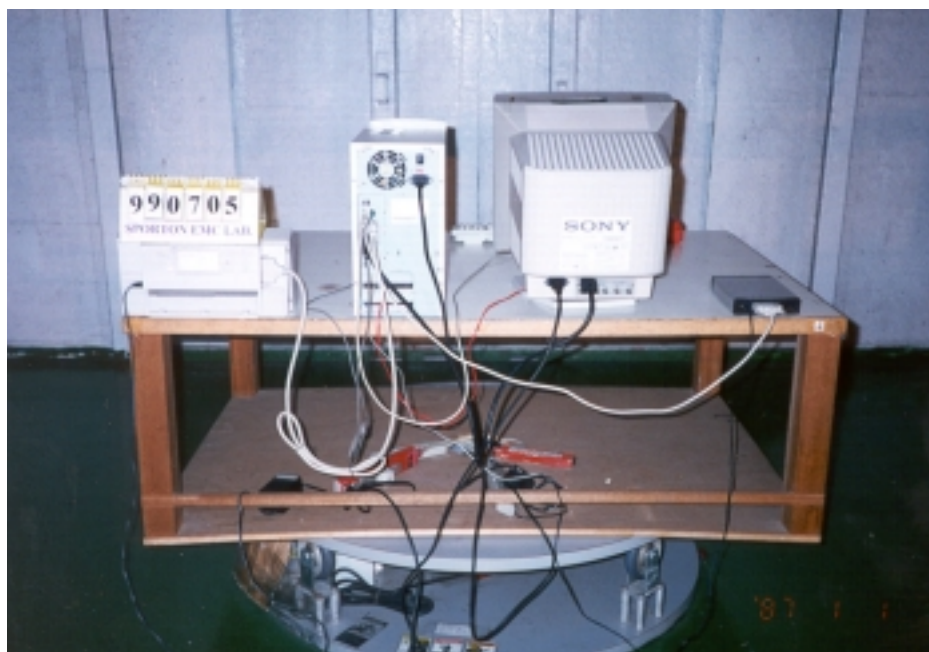
**6.5. Photographs of Radiated Emission Test Configuration**

- 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	17.8	0.7
35	14.8	0.8
40	12.6	0.7
45	9.4	0.8
50	7.7	0.8
55	5.8	1.0
60	5.1	0.8
65	4.9	1.0
70	5.1	1.0
75	6.0	1.0
80	6.7	1.0
85	7.9	1.2
90	8.9	1.2
95	9.6	1.2
100	10.2	1.2
110	11.3	1.2
120	11.6	1.3
130	11.4	1.3
140	10.8	1.5
150	10.2	1.5
160	9.2	1.5
170	9.1	1.7
180	8.2	1.8
190	8.4	1.8
200	8.9	1.8
220	8.7	2.0
240	10.9	2.0
260	13.3	2.0
280	12.5	2.2
300	13.0	2.3
320	13.6	2.3
340	13.9	2.5
360	14.5	2.7
380	14.9	2.7
400	16.0	2.8
450	16.5	3.0
500	17.5	3.2
550	18.7	3.5
600	18.6	3.5
650	18.9	3.7
700	19.1	4.0
750	19.8	4.0
800	19.9	4.5
850	20.5	4.3
900	20.4	4.7
950	21.0	4.7
1000	21.2	4.8

LKOP4

## 8. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver (site 1)	HP	8591EM	3536A00672	9 KHz – 1.8 GHz	Aug. 26, 1999	Conduction
LISN (site 1)	EMCO	3850/2	9510-1035	50 ohm / 50 uH	Oct. 23, 1998	Conduction
LISN (site 1)	KYORITSU	KNW-47	8-693-10	50 ohm / 50 uH	Oct. 23, 1998	Conduction
EMI Filter (site 1)	CORCOM	MRI-2030	N/A	480 VAC / 30 A	N/A	Conduction
Spectrum Analyzer (Site 4)	HP	8560E	3728A03185	30Hz - 2.9GHz	Sep. 08, 1999	Radiation
Amplifier (Site 4)	HP	8447D	2944A09072	0.1MHz -1.3GHz	Sep. 03, 1999	Radiation
Test Receiver (Site 4)	R&S	ESVP	893610/003	20MHz - 1.3GHz	Apr. 12, 1999	Radiation
Bilog Antenna (Site 4)	CHASE	CBL6112B	2445	30MHz -2GHz	Apr. 01, 1999	Radiation
Half-wave dipole antenna (Site 4)	EMCO	3121C	9705-1285	28 M - 1GHz	May 18, 1999	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.