

FCC TEST REPORT

for

Part 15, Subpart B Class B

Equipment : Monitor

Model No. : 15CX

FCC ID : NPU15CX

Filing Type : Original Grant

Applicant : ARIESTEC, INC.
3FL., NO. 100, MIN-CHUAN ROAD,
HSIN TIEN 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.

SPORTON International Inc.

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

SPORTON International Inc.

PCC ID : NPU15CX
Page No. : 1 of 24
Issued Date : Nov. 28, 1998
TEL : 886-2-2696-2468
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CERTIFICATE OF COMPLIANCE

for

FCC Part 15, Subpart B Class B

Equipment : Monitor

Model No. : 15CX

FCC ID : NPU15CX

Applicant : ARIESTEC, INC.
 3FL, NO. 100, MIN-CHUAN ROAD,
 HSIN TIEN 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** both radiated and conducted emission class B limits. Testing was carried out on Nov. 24, 1998 at SPORTON International Inc. LAB. in Lin Kou.

W. L. Huang
 General Manager

[Signature]
 Dec 07, 98

SPORTON International Inc.

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1. General Description of Equipment under Test

1.1. Applicant

ARIESTEC, INC.
3FL., NO. 100, MIN-CHUAN ROAD,
HSIN TIEN CITY, TAIPEI, TAIWAN, R.O.C.

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: Monitor
Model No.	: 15CX
FCC ID	: NPU15CX
Trade Name	: ARIESTEC
Data Cable	: Shielded
Power Supply Type	: Switching
Power Cord	: Non-Shielded

1.4. Feature of Equipment under Test

- 15" CRT
- Horizontal: 31-69KHz
- Vertical: 60~85Hz
- Max Resolution: 1280x1024
- Bend Width: 75 MHz
- Power: 100-250vac 50/60Hz
- Consumption: 95W

2. Test Configuration of Equipment under Test

2.1. Test Manner

- 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.
- The DELL PS/2 Keyboard, PRIMAX PS/2 Mouse, HP Printer, ACCEX Modem and EUT were connected to the FIC PC for EMI test.
- The Following display resolution were investigated during the compliance test:
 - Horizontal frequency (640x480 to 1,280x1,024, 31 KHz to 69 KHz)
 - Vertical frequency (60 Hz to 85 Hz)
- According to the above tests, we listed the following display modes as the worst cases:
 - 1,024x768 (non-interlaced 69 KHz), refresh rate 85 Hz.
 - 1,280x1,024 (non-interlaced 64 KHz), refresh rate 60 Hz.
- Frequency range investigated: conduction 450 KHz to 30 MHz, radiation 30 MHz to 2,000 MHz.

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)
	Power Supply Type	: N/A
	Serial No.	: SP0054
	Data Cable	: Shielded, 360 degree via metal backshells

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

FCC ID : EMJMU9JQ
 Model No. : MUS9J
 Power Supply Type : N/A
 Serial No. : SP0045
 Data Cable : Braided-Shielded, 360 degree via metal backshells

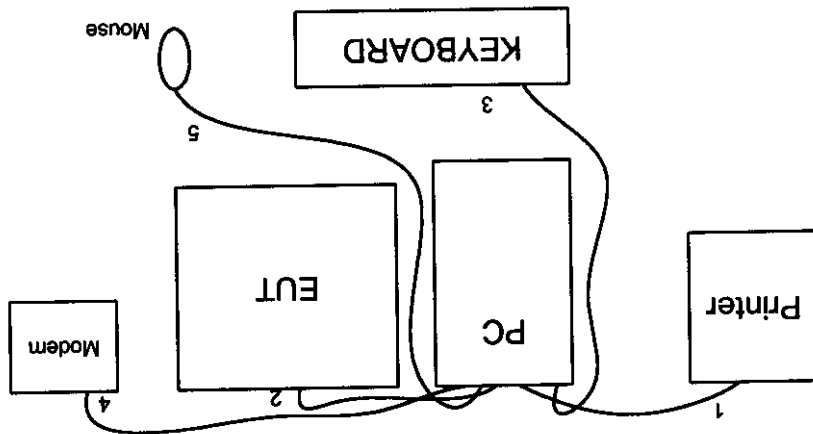
Support Unit 4. -- Printer (HP)

FCC ID : B94C2642X
 Model No. : Desk Jet 400
 Power Supply Type : Linear
 Power Cord : N/A
 Serial No. : SP0050
 Data Cable : Braided-Shielded, 360 degree via metal backshells

Support Unit 5. -- Modem (ACEEX)

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

2.3. Connection Diagram of Test System



1. The I/O cable is connected from PC to the support unit 4.
2. The I/O 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 5.
5. The I/O cable is connected from PC to the support unit 3.

3. Test Software

Two executive program, EMITEST.EXE & WINFCC.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. in an openarea test site.
Openarea Test Site Location : No. 30-2, Lin 6, Diling-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 2,000 MHz

4.5. Test Distance

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

5. Test of Conducted Powerline

Conducted Emissions were measured from 450 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.

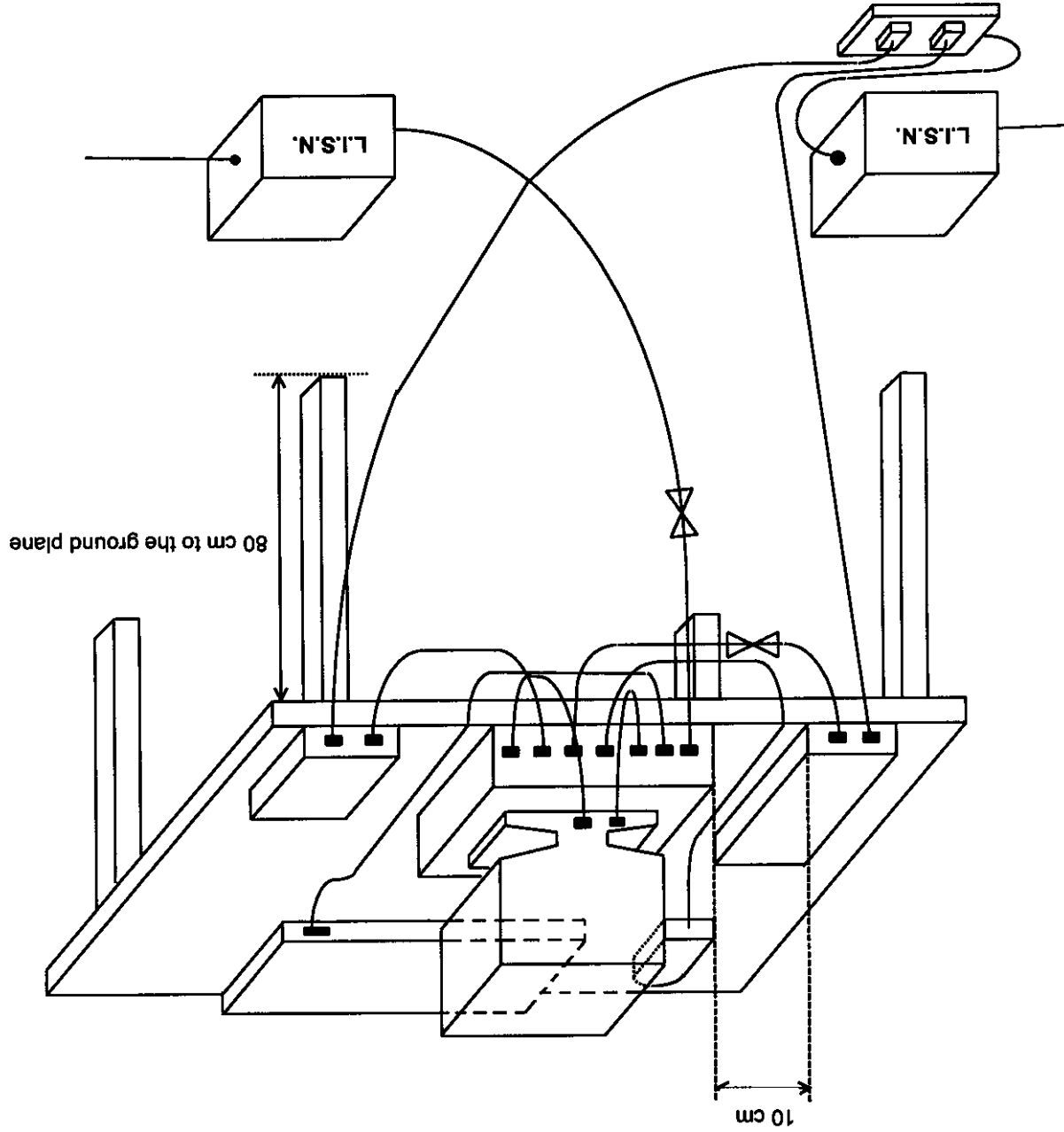
5.1. Major Measuring Instruments

Test Receiver	HP 8591EM
Attenuation	0 dB
Start Frequency	0.45 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 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 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 : 1024x768 85Hz/ 69K

- Temperature : 22°C
- Relative Humidity : 71 %
- Test Date : Nov. 24, 1998

The Conducted Emission test was passed at minimum margin

NEUTRAL 6.894 MHz /44.50 dBuV.

Freq. (MHz)	Line/ Neutral	Meter Reading (dBuV)	Limits (dBuV)	Margin (dB)
0.620	L	38.50	48.00	-9.50
7.583	L	40.00	48.00	-8.00
23.713	L	41.70	48.00	-6.30
6.894	N	44.50	48.00	-3.50
8.755	N	40.10	48.00	-7.90
23.713	N	43.20	48.00	-4.80

Test Engineer :

KENNY CHUANG
Kenny Chuang

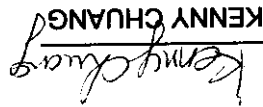
5.4.2. Test mode : 1280x1024 60Hz/64K

- Temperature : 22°C
- Relative Humidity : 71 %
- Test Date : Nov. 24, 1998

The Conducted Emission test was passed at minimum margin

NEUTRAL 7.066 MHz / 44.50 dBuV.

Freq. (MHz)	Line/ Neutral	Meter Reading (dBuV)	Limits (dBuV)	Margin (dB)
0.770	L	38.20	48.00	-9.80
7.194	L	40.70	48.00	-7.30
27.100	L	41.80	48.00	-6.20
7.066	N	44.50	48.00	-4.80
8.669	N	38.80	48.00	-9.20
27.100	N	42.80	48.00	-5.20

Test Engineer :  KENNY CHUANG

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 2,000 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.

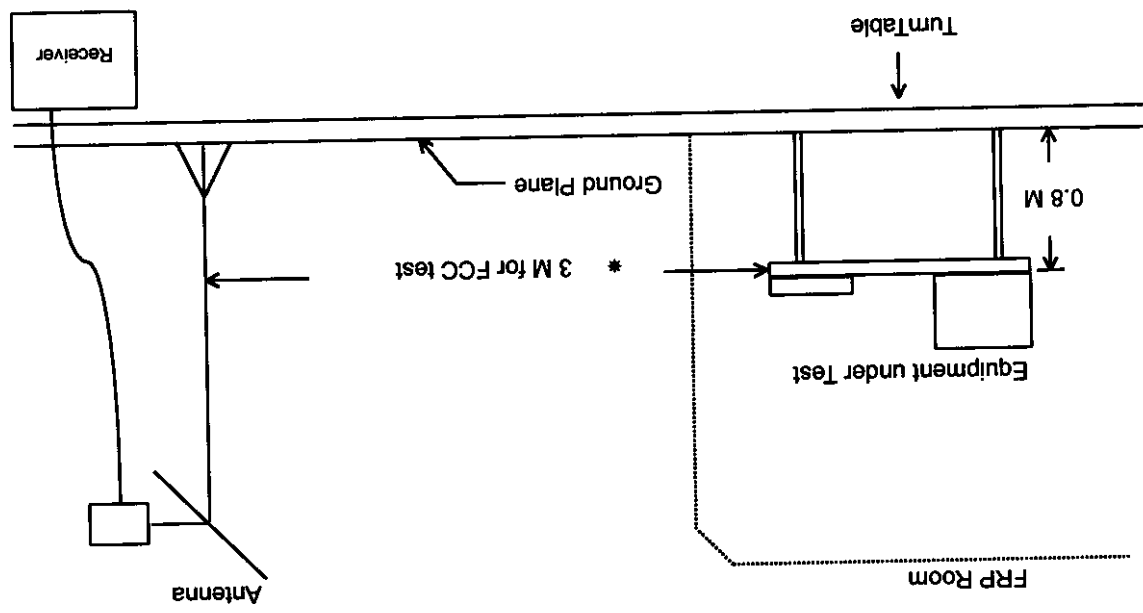
6.1. Major Measuring Instruments

Amplifier	(HP 87405A)	0 dB	25 dB	10 MHz to 3 GHz	(HP 8560E)	0 dB	30 MHz	2,000 MHz	1 MHz	30 Hz to 2.9 GHz	(R&S ESVP)	120 KHz	30 MHz to 1 GHz	ON for Quasi-Peak Mode	OFF for Peak Mode
Attenuation															
RF Gain															
Signal Input															
Spectrum Analyzer															
Attenuation															
Start Frequency															
Stop Frequency															
Video Bandwidth															
Signal Input															
Test Receiver															
Resolution Bandwidth															
Frequency Band															
Quasi-Peak Detector															

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

6.4.1. Test mode : 1024x768 85Hz/ 69K

- Test Distance : 3 M
- Temperature : 29°C
- Relative Humidity : 55 %
- Test Date : Nov. 17, 1998
- 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

36.632 MHz / 36.18 dBuV (VERTICAL) Antenna Height 1.5 Meter, Turntable Degree 160 °.

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV)	Emission (dBuV)	Level (uV)	Margin (dB)
493.905	H	17.76	3.76	18.68	46.00	199.53	40.21	102.45
36.632	V	14.89	0.87	20.43	40.00	100.00	36.18	64.42
44.417	V	11.21	1.09	20.59	40.00	100.00	32.89	44.11
55.950	V	6.47	1.30	26.38	40.00	100.00	34.15	50.99
213.361	V	9.87	2.43	23.44	43.50	149.62	35.74	61.24
534.552	V	19.18	3.94	18.78	46.00	199.53	41.90	124.45

Test Engineer : *Jack Deng*
JACK DENG

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6.4.2. Test mode : 1280x1024 60Hz/64K

- Test Distance : 3 M
- Temperature : 29°C
- Relative Humidity : 55 %
- Test Date : Nov, 17, 1998
- 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

55.510 MHz / 35.79 dBuV (VERTICAL) Antenna Height 1.5 Meter, Turntable Degree 60 °

Frequency (MHz)	Polarity	Antenna Factor (dB)	Cable Loss (dB)	Reading (dBuV)	Limits (dBuV)	Emission (dBuV)	Level (uV)	Margin (dB)
71.520	H	6.32	1.50	24.90	40.00	32.72	43.25	-7.28
136.395	H	12.06	2.00	22.28	43.50	149.62	36.34	-7.16
34.577	V	15.80	0.80	15.66	40.00	100.00	32.26	-7.74
55.510	V	6.58	1.30	27.91	40.00	100.00	35.79	-4.21
69.066	V	6.13	1.46	27.83	40.00	100.00	35.42	-4.58
136.049	V	12.10	2.00	21.33	43.50	149.62	35.43	-8.07

Test Engineer : Jack Deng
JACK DENG

SPORTON International Inc.

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7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	14.7	.8
35	15.9	.8
40	12.8	1.0
45	11.0	1.1
50	7.8	1.3
55	6.7	1.3
60	5.5	1.3
65	5.8	1.3
70	6.2	1.5
75	6.6	1.5
80	7.0	1.5
85	8.3	1.7
90	9.6	1.7
95	10.1	1.7
100	10.7	1.8
110	11.7	1.9
120	12.7	2.0
130	12.7	2.0
140	11.7	2.0
150	11.0	2.2
160	10.3	2.2
170	10.3	2.2
180	9.4	2.3
190	9.1	2.3
200	8.8	2.5
220	10.4	2.4
240	11.9	2.4
260	13.0	2.5
280	13.7	2.5
300	14.4	2.7
320	14.5	2.8
340	14.7	2.9
360	15.2	3.0
380	15.9	3.1
400	16.6	3.3
450	17.5	3.5
500	17.8	3.8
550	19.8	4.0
600	20.0	4.3
650	20.2	4.5
700	20.1	4.8
750	20.7	5.0
800	20.7	5.2
850	20.5	5.2
900	21.7	5.3
950	20.4	5.7
1000	22.1	5.8
2000	26.4	9.7

SPORTON International Inc.

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8. List of Measuring Equipments Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMC Receiver (site 2)	HP	8591EM	3710A01187	9 KHz - 18 GHz	Sep. 15, 1998	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	Jul. 06, 1998	Conduction
Spectrum Analyzer (Site 4)	HP	8560E	3728A03186	30Hz - 2.9GHz	Sep. 16, 1998	Radiation
Amplifier (Site 4)	HP	87405A	3207A01437	10MHz - 3.0GHz	Jun. 26, 1998	Radiation
Test Receiver (Site 4)	R&S	ESVP	893610/003	20MHz - 1.3GHz	Apr. 13, 1998	Radiation
BiLog Antenna (Site 4)	CHASE	CBL6112A	2288	30MHz - 2GHz	Jul. 14, 1998	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