FCC TEST REPORT

for

Part 15, Subpart B Class B

Equipment	:	USB 4 port HUB
Model No.	:	UH400 rev. A1
FCC ID	:	MQ4UH400A
Filing Type	:	Original Grant
Applicant	:	AboCom Systems, Inc. 1F, No. 21, R&D Road II, Science-Based Industrial Park, Hsin-Chu, 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.

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Certificate No. : F8N2508

CERTIFICATE OF COMPLIANCE

for

FCC Part 15, Subpart B Class B

Equipment : USB 4 port HUB

Model No. : UH400 rev. A1

FCC ID : MQ4UH400A

Applicant : AboCom Systems, Inc.
1F, No. 21, R&D Road II,
Science-Based Industrial Park,
Hsin-Chu, 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. 25, 1998 at **SPORTON International Inc.** LAB. in Lin Kou.

W. L. Huang Jan 11, 99'

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

AboCom Systems, Inc.
1F, No. 21, R&D Road II,
Science-Based Industrial Park,
Hsin-Chu, Taiwan, R.O.C

1.2. Manufacturer

Same as 1.1.

1.3. Basic Description of Equipment under Test

Equipment	: USB 4 port HUB
Model No.	: UH400 rev. A1
FCC ID	: MQ4UH400A
Trade Name	: AboCom
USB cable	: Braided-Shielded, 1.5 m
Power Supply Type	: Linear
Power Cord	: N/A

1.4. Feature of Equipment under Test

- USB 1.0 specification compatibility.
- Plug-n-play with USB device.
- Support Bus-power mode and Self-power mode, indicate by LED.
- Support 1 upstream and 4 downstream USB ports.
- 6 LED indicators for HUB status.

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 that tended to maximize its emission characteristics in a typical application.
b. The HP Monitor, DELL PS/2 Keyboard, WINIC USB Mouse, HP Printer, ACEEX Modem and EUT were connected to the DELL PC for EMI test.
c. Frequency range investigated: conduction 450 KHz to 30 MHz, radiation 30 MHz to 1,000 MHz.

2.2. Description of Test System

Support Unit 1. -- Personal Computer (DELL)

FCC ID	: N/A
Model No.	: DCS
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0038
Remark	: This support device was tested to compy with FCC standards and authorized under a declaration of conformity.

Support Unit 2. -- Monitor (HP)

FCC ID	: ACJ93312116
Model No.	: D2807A
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0053
Data Cable	: Double-Shielded, 360 degree via metal backshells

Support Unit 3. -- PS/2 Keyboard (DELL)

FCC ID	: GYUM92SK
Model No.	: AT101
Power Supply Type	: N/A
Serial No.	: SP0064
Data Cable	: Shielded, 360 degree via metal backshells

Support Unit 4. -- USB Mouse (WINIC)

FCC ID	: F4ZFDM-A50
Model No.	: FDM-A50
Serial No.	: SP0092
Data Cable	: Shielded, 360 degree via metal backshells, 1.5m

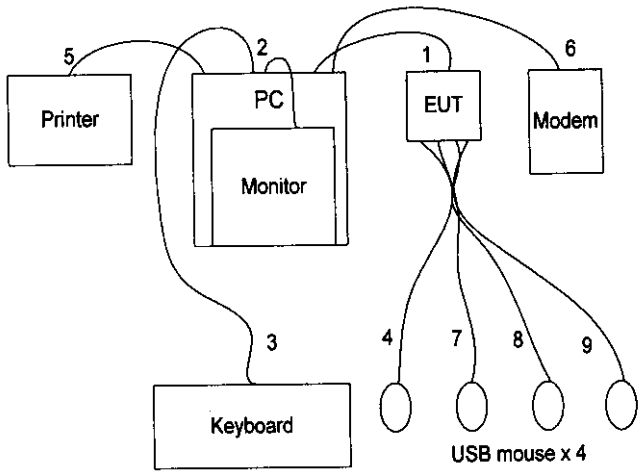
Support Unit 5. -- Printer (HP)

FCC ID	: DSI6XU2225
Model No.	: 2225C
Power Supply Type	: Linear
Power Cord	: N/A
Serial No.	: SP0024
Data Cable	: Shielded, 360 degree via metal backshells

Support Unit 6. -- Modem (ACEEX)

FCC ID	: IFAXDM1414
Model No.	: DM1414
Power Supply Type	: Linear
Power Cord	: N/A
Serial No.	: SP0016
Data Cable	: Shielded, 360 degree via metal backshells

2.3. Connection Diagram of Test System



1. The I/O cable was connected from PC to the EUT.
2. The I/O cable was connected from PC to the support device 2 (Monitor).
3. The I/O cable was connected from PC to the support device 3 (Keyboard).
4. The I/O cable was connected from EUT to the support device 4 (Mouse).
5. The I/O cable was connected from PC to the support device 5 (Printer).
6. The I/O cable was connected from PC to the support device 6 (Modem).
7. The I/O cable was connected from EUT to the support device 4 (Mouse).
8. The I/O cable was connected from EUT to the support device 4 (Mouse).
9. The I/O cable was connected from EUT to the support device 4 (Mouse).

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.

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, 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 1,000 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	HP8591EM
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.

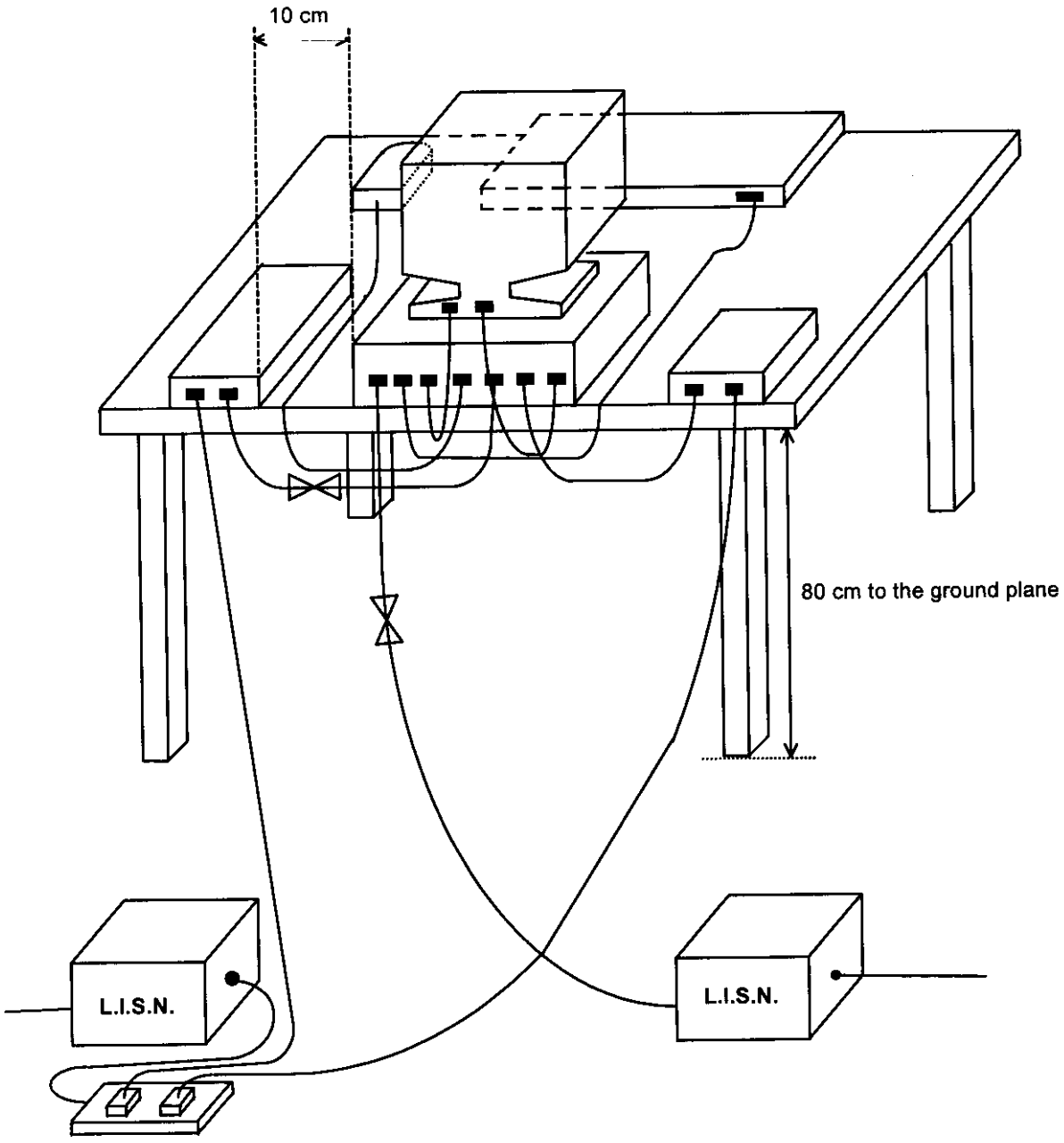
f. Both sides of AC line were checked for maximum conducted interference.

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

- Frequency Range of Test : from 0.45 MHz to 30 MHz
- Temperature : 25°C
- Relative Humidity : 64 %
- Test Mode : USB 4 Port HUB (UH400)
- Test Date : Nov. 25, 1998

The Conducted Emission test was passed at minimum margin

LINE 12.012 MHz / 42.00 dBuV.

Freq. (MHz)	Line/ Neutral	Meter Reading (dBuV)	(uV)	Limits (dBuV)	(uV)	Margin (dB)
24.758	L	33.00	44.67	48.00	251.19	-15.00
12.012	L	42.00	125.89	48.00	251.19	-6.00
0.538	L	33.40	46.77	48.00	251.19	-14.60
12.012	N	40.00	100.00	48.00	251.19	-8.00
0.368	N	28.00	25.12	48.00	251.19	-20.00
0.538	N	39.10	90.16	48.00	251.19	-8.90

Test Engineer : Peter Wang
Peter Wang

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.

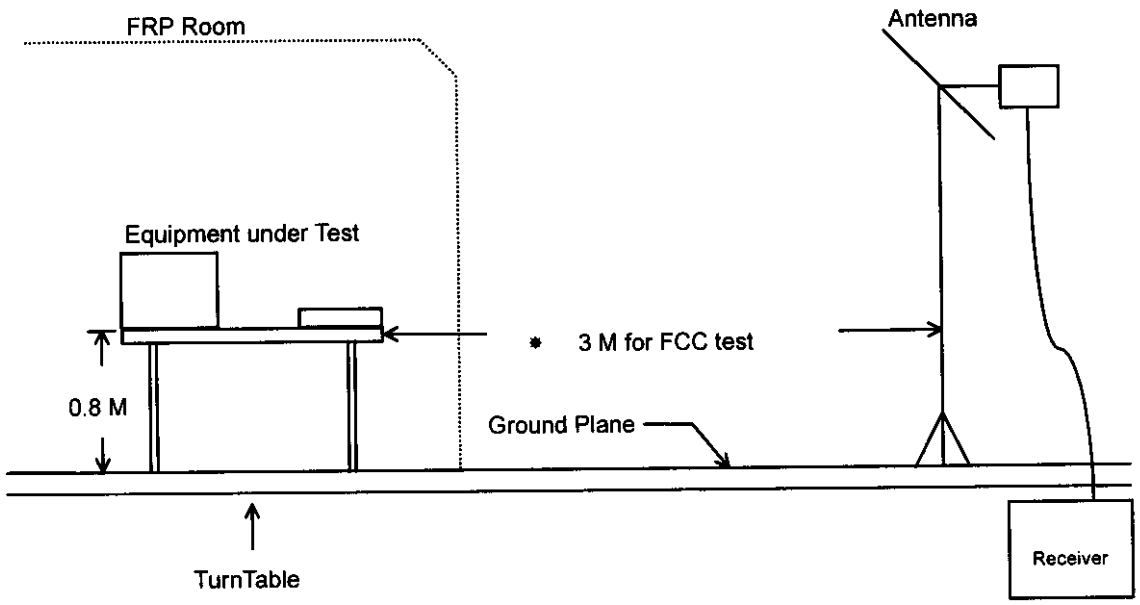
6.1. Major Measuring Instruments

Amplifier	(HP 87405A)
Attenuation	0 dB
RF Gain	25 dB
Signal Input	10 MHz to 3 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 ESCS30)
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 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

- Frequency Range of Test : from 30 MHz to 1,000 MHz
- Test Distance : 3 M
- Temperature : 20°C
- Relative Humidity : 70 %
- Test Mode : USB 4 Port HUB (UH400)
- Test Date : Nov. 24, 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

72.160 MHz / 36.74 dBuV (VERTICAL) Antenna Height 4 Meter, Turntable Degree 89 °.

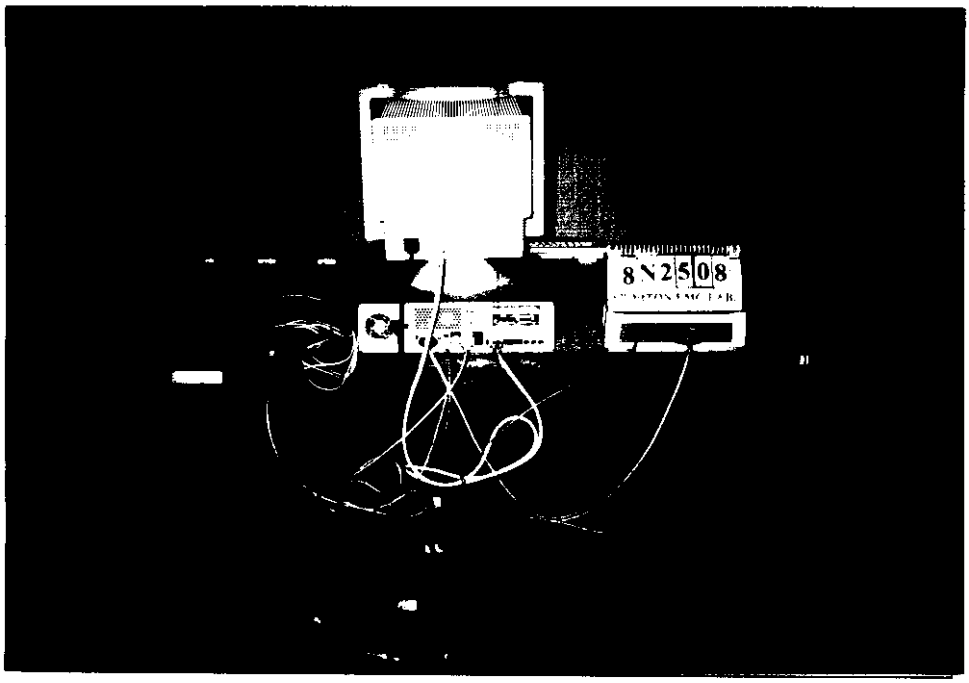
Frequency	Polarity	Antenna Factor	Cable Loss	Reading	Limits		Emission	Level	Margin
(MHz)		(dB)	(dB)	(dBuV)	(dBuV)	(uV)	(dBuV)	(uV)	(dB)
50.230	H	7.42	1.50	26.64	40.00	100.00	35.56	59.98	-4.44
52.950	H	6.50	1.50	28.61	40.00	100.00	36.61	67.69	-3.39
72.160	H	5.36	1.80	29.58	40.00	100.00	36.74	68.71	-3.26
84.060	H	7.59	1.72	24.09	40.00	100.00	33.40	46.77	-6.60
168.210	H	8.64	2.60	25.71	43.50	149.62	36.95	70.39	-6.55
71.990	V	5.34	1.80	28.52	40.00	100.00	35.66	60.67	-4.34

Test Engineer : Peter Wang
PETER WANG

6.5. Photographs of Radiated Emission Test Configuration

FRONT VIEW

REAR VIEW



7. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	18.1	1.2
35	15.2	1.3
40	12.6	1.3
45	9.9	1.5
50	7.5	1.5
55	5.8	1.5
60	5.0	1.6
65	4.8	1.6
70	5.1	1.8
75	5.7	1.8
80	6.7	1.8
85	7.8	1.7
90	8.8	1.9
95	9.3	1.9
100	10.0	2.1
110	11.2	2.0
120	11.3	2.2
130	11.3	2.5
140	10.7	2.5
150	9.9	2.5
160	9.3	2.6
170	8.5	2.6
180	8.4	2.8
190	8.2	2.8
200	8.3	2.7
220	8.4	2.9
240	10.9	3.0
260	13.0	3.3
280	12.4	3.6
300	12.8	3.6
320	13.3	3.9
340	13.8	4.0
360	14.4	4.2
380	15.0	4.4
400	15.5	4.4
450	16.2	4.9
500	17.4	4.8
550	19.1	5.3
600	18.4	5.4
650	18.9	6.0
700	18.9	6.1
750	19.7	6.6
800	19.7	6.5
850	20.4	6.5
900	20.5	6.8
950	20.9	7.5
1000	21.2	7.3

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
Amplifier (Site 1)	HP	87405A	3207A01437	10MHz –3.0GHz	June 26, 1998	Radiation
Spectrum Analyzer (site 1)	HP	8560E	3728A03185	30Hz – 2.9GHz	Sep. 24, 1998	Radiation
Receiver (Site 1)	R&S	ESCS30	70-213-4258	9KHz - 2.75GHz	Dec. 19, 1998	Radiation
Bilog Antenna (Site 1)	CHASE	CBL6112A	2442	30MHz -2GHz	Jun. 22, 1998	Radiation
Half-wave dipole antenna (site 1)	EMCO	3121C	9705-1285	28 M - 1GHz	May 19, 1998	Radiation
Turn Table (site 1)	EMCO	1060-1.211	9507-1805	0 ~ 360 degree	N/A	Radiation
Antenna Mast (site 1)	EMCO	1051-1.2	9502-1868	1 m - 4 m	N/A	Radiation