

HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.

INT'L STANDARD CERTIFICATION TEAM
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA
TEL : +82 31 639 8518 FAX : +82 31 639 8525 www.hctec.co.kr

CERTIFICATION

Manufacture;

IMAGEQUEST CO., LTD.
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI,
KYOUNKI-DO, 467-701, KOREA

Date of Issue: OCTOBER 10, 2001

Test Report No.: HCT-F01-1001

**Test Site: HYUNDAI CALIBRATION & CERTIFICATION
TECHNOLOGIES CO., LTD.**

FCC ID :

PJIW15L00001

MODEL / TYPE :

W150

FCC Rule Part(s): Part 15 & 2; ET Docket 95-19
Classification: Part 15, Class B Computing Device/Personal Computer(JBC)
Standard(s): FCC Class B: 1998 (CISPR 22)
Equipment(EUT) Type: 15" LCD Client Monitor
Max Resolution: 1024X768 (@48KHz/ 60Hz)
CPU: Intel Strong ARM 32bit RISC Processor 206 MHz (235 MIPS)
Port/ Connector(s): RJ-45, PS/2, SERIAL, USB, AUDIO IN/OUT

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-1992.(See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

HYUNDAI C-Tech. certifies that no party to application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse of 1988,21 U.S.C.853(a).



Report prepared by : Ki-Soo Kim
Manager of EMC Tech. Part



TABLE OF CONTENTS

PAGE

1.	GENERAL INFORMATION.....	3
	1.1 Product Description.....	3
	1.2 Related submittal(s)/Grant(s).....	3
	1.3 Tested System Details.....	4
	1.4 Test Methodology.....	4
	1.5 Test Facility.....	4
2.	SYSTEM TEST CONFIGURATION.....	5
	2.1 Justification.....	5
	2.2 EUT Exercise Software.....	5
	2.3 Cable Description.....	6
	2.4 Noise Suppression Parts on Cable.....	6
	2.5 Equipment Modifications.....	7
	2.6 Configuration of Tested System.....	8
3.	PRELIMINARY TESTS.....	9
	3.1 Power line Conducted Emissions Tests.....	9
	3.2 Radiated Emissions Tests.....	9
4.	FINAL CONDUCTED AND RADIATED EMISSION TESTS SUMMARY.....	9
	4.1 Conducted Emission Tests.....	10
	4.2 Radiated Emission Tests.....	11
5.	FIELD STRENGTH CALCULATION.....	12
6.	LIST OF TEST EQUIPMENT	13

ATTACHMENT A	ID Label / Location Info.
ATTACHMENT B.....	External Photos.
ATTACHMENT C	Block Diagram..
ATTACHMENT D	Test Setup Photos.
ATTACHMENT E	User's Manual.
ATTACHMENT F	Internal Photos.

1. GENERAL INFORMATION

1.1 Product Description

The ImageQuest CO., LTD. Model W150 (referred to as the EUT in this report) is a 15" LCD Client Monitor HOR. Freq. 48KHz w/max. Resolution of 1024X768 . Product specification information described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	PLASTIC
LIST OF EACH OSC. OR XTAL. FREQ.(FREQ. 1MHz)	32.768KHz, 3.6864MHz, 6MHz, 11.2896MHz, 12.288MHz, 20MHz
POWER REQUIREMENT	DC 12V 3.1A
NUMBER OF LAYERS	MAIN BOARD 4 LAYER OSD BOARD 1 LAYER POWER BOARD 1 LAYER INVERTER BOARD 2 LAYER
CPU	Intel Strong ARM 32 bit RISC Processor 206 MHz (235 MIPS)
Flash memory	8MB FLASH Expandable to 16MB
RAM memory	16MB SDRAM Expandable to 32MB
Audio	16-bit stereo
MAX. RESOLUTION	1024X768 16bit True color Up to 1280 X 1024 256 colors
LCD TYPE	15" (LCD Type : HSD150SX73)

1.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

1.3 Tested System Details

The Model names for all equipment, plus descriptions used in the tested system (including inserted cards) are:

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
MONITOR (EUT)	IMAGEQUEST CO., LTD.	W150	PJIW15L00001	HOST
PC(SERVER)	Hyundai MultiCAV CO.,LTD	POWER 8500	-	EUT
KEY BOARD	H/P	SK-2501-2D-K	GYUR385K	EUT
MOUSE	H/P	Intellimouse 1.1	C3KKMP5	EUT
USB KEY BOARD	GATEWAY	SK-9900U	DoC	EUT
USB MOUSE	GATEWAY	INTELLIMOUSE 1.1A	DoC	EUT
MODEM	3COM CORPORATION	56K FAX MODEM	DoC	EUT
EAR PHONE	Hyundai MultiCAV CO.,LTD	BOOM MIC HEADSET	-	EUT

1.4 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 10 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1,MAEKOK-RI,HOBUP-MYUN,ICHON-SI,KYOUNGKI-DO, 467-701,KOREA. The site is constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated July 24,2000(Confirmation Number: EA90661)

2.SYSTEM TEST CONFIGURATION

2.1 Justification

The device was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components and I/O cards inside the E.U.T were used.

DEVICE TYPE	MANUFACTURE	MODEL/PART NUMBER
MAIN BOARD	Minet INC.	MTC 2000 LE
POWER BOARD	SAMSUNG electronics.	PSCV450114D
OSD BOARD	KSD Co.,LTD.	W150
INVERTOR BOARD	SungWooE.COM	SW-W150A
LCD BOARD	SAMSUNG electronics Co.,LTD	LTM150XH-T01

2.2 EUT exercise Software

The EUT exercise program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software, contained on a 3-1/2 inch disc, was inserted into drive A and is auto starting on power-up. Once loaded, the program sequentially exercises each system component in turn. The sequence used is :(1) Display test, (2) RS 232 test (3) Key board test,(4) Printer test,(5) FDD test,(6) HDD test. The complete cycle takes about 20 seconds and is repeated continuously. As the keyboard and mouse are strictly input devices, no data is transmitted to them during test. They are however, continuously scanned for data input activity. The video resolution modes setup and change program was used during the radiated and conducted emission testing.

2.3 Cable Description

	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
MONITOR(EUT)	N	Y	1.8(P), 1.5(D)
PC(HOST)	N	N/A	1.8(P)
KEY BOARD	N/A	Y	2.0(D)
MOUSE	N/A	Y	1.8(D)
USB KEY BOARD	N/A	Y	2.6(D)
USB MOUSE	N/A	Y	1.9(D)
MODEM	N	Y	2.0(P),0.8(D)
EAR PHONE	N/A	Y	1.8(D)

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.

2.4 Noise Suppression Parts on Cable. (I/O CABLE)

	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
MONITOR(EUT)	Y	BOTH END	Y	BOTH END
KEY BOARD	Y	PC END	Y	PC END
MOUSE	N	N/A	Y	PC END
USB KEY BOARD	Y	PC END	Y	PC END
USB MOUSE	N	N/A	Y	PC END
MODEM	Y	PC END	Y	BOTH END
EAR PHONE	N	N/A	Y	PC END
LAN CABLE	N	N/A	Y	BOTH END

2.5 Equipment Modifications

N/A

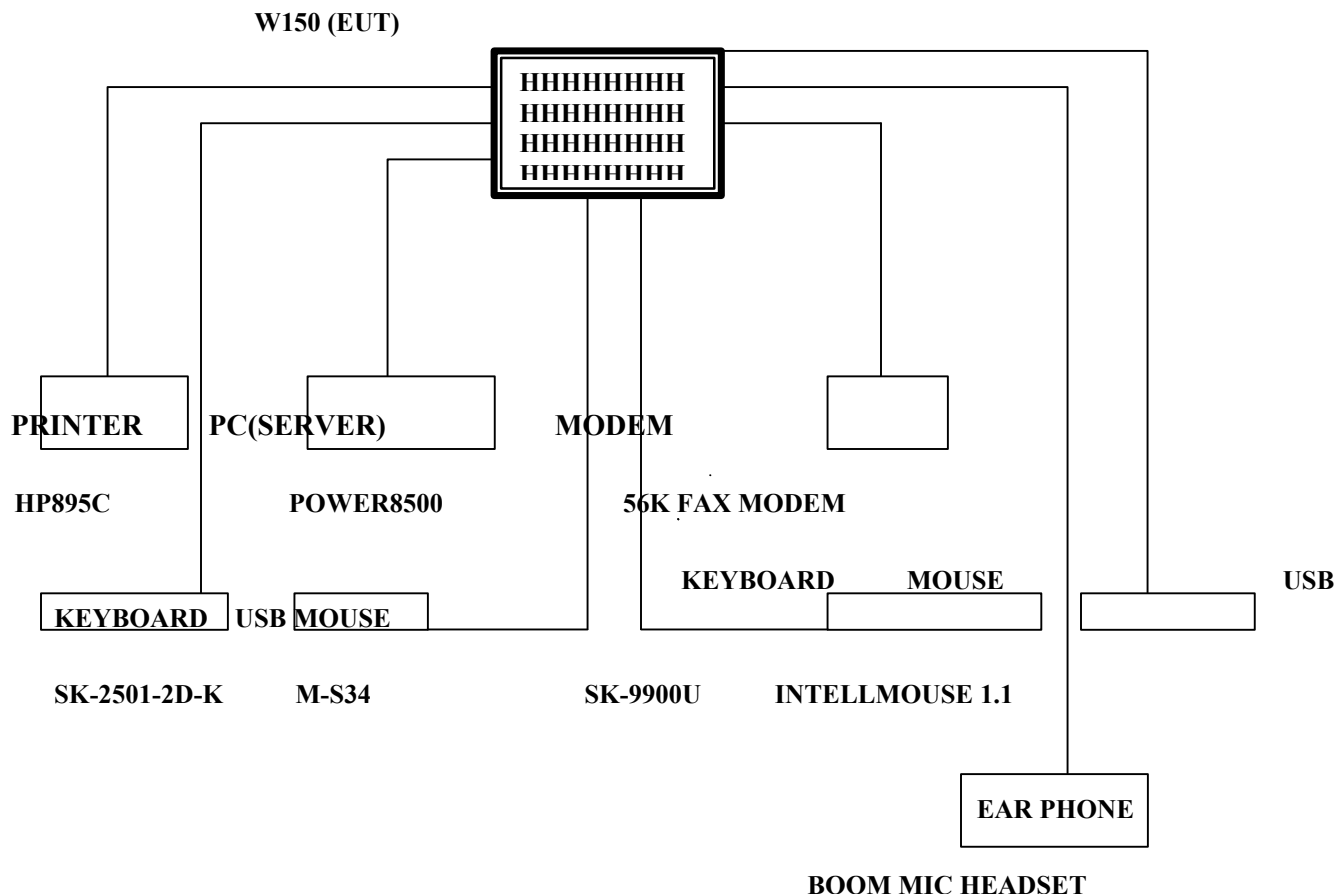
2.6 Configuration of Test system

Line Conducted Test : EUT was connected to LISN, all other supporting equipment were connected to another LISN.

Preliminary Power line Conducted Emission tests were performed by using the procedure in ANSI C63.4/1992 7.2.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary Radiated Emissions tests were conducted using the procedure in ANSI C63.4/1992 8.3.1.1 to determine the worse operating condition. Final Radiated Emission tests were conducted at 10 meter open area test site.

[Configuration of Tested System]



3. PRELIMINARY TESTS

3.1 AC Power line Conducted Emission Tests

During Preliminary Tests, the following operating mode were investigated

Processor Speed (MHz)	Video Resolution	The operating condition
206 MHz	1024X768 (48KHz/60Hz)	X

* Loading the mpeg file from server to WBT

4.2 Radiated Emission Tests

During Preliminary Tests, the following operating mode were investigated

Processor Speed (MHz)	Video Resolution	The operating condition
206 MHz	1024X768 (48KHz/60Hz)	X

* Loading the mpeg file from server to WBT

Tested by **Kyoung-Houn SEO / Engineer**

Date : **SEPTEMBER 17, 2001**

4. FINAL CONDUCTED AND RADIATED EMISSION TESTS SUMMARY

4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Humidity Level : 34 % Temperature : 27
 Limit apply to : CISPR 22
 Type of Tests : CLASS B
 Date : SEPTEMBER 20 , 2001
 Result : PASSED BY 15.1 dB
 EUT : 15" LCD CLIENT MONITOR

Operating Condition : 1024X768 (Hf : 48KHz, Vf : 60Hz)

Detector : CISPR Quasi-Peak (6 dB Bandwidth : 9 KHz)
 CISPR Average(6 dB Bandwidth : 9 KHz)

Line Conducted Emission Tabulated Data

Power Line Conducted Emissions			CISPR 22		
Frequency (MHz)	Amplitude (dBuV)	Conductor	Limit (dBuV)	Margin (dB)	Detector Mode
0.155	40.6	HOT	56.0	15.1	Average
0.155	40.4	NEUTRAL	56.0	15.3	Average
0.585	25.6	HOT	46.0	20.4	Average
0.650	26.40	NEUTRAL	46.0	19.6	Average

Measured by : Kyoung-Houn SEO / Engineer

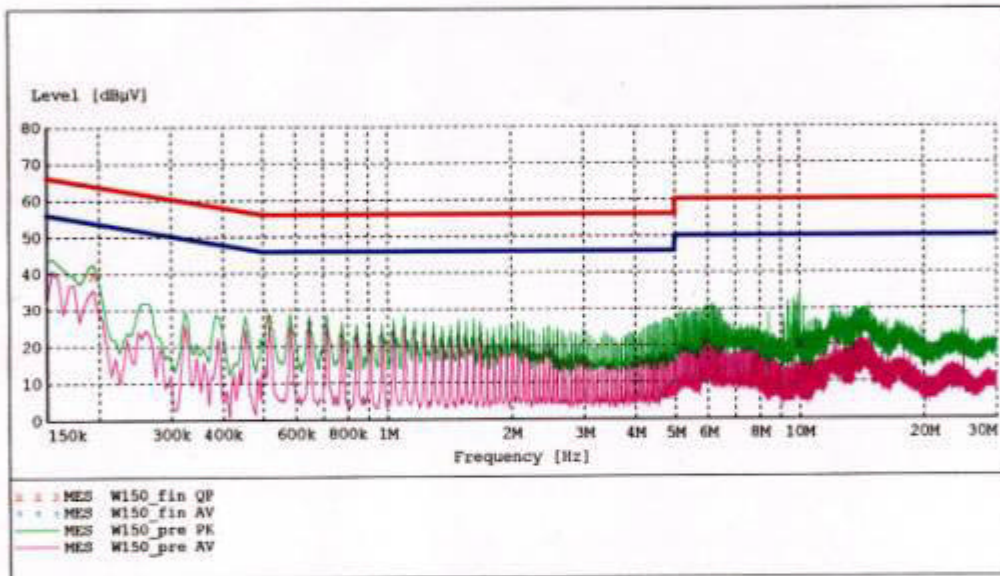
Date : SEPTEMBER 20 , 2001

**HYUNDAI C-TECH. CO., LTD.
EMC TEST LAB.**

EUT: W150
 Manufacturer: ImageQuest Co., Ltd.
 Operating Condition:
 Test Site: Shield Room
 Operator:
 Test Specification:
 Comment: N
 Start of Test: 9/20/01 / 12:22:29PM

SCAN TABLE:

Short Description:			Detector	Meas. Time	IF Bandw.	Transducer
Start Frequency	Stop Frequency	Step Width				
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak	100.0 ms	9 kHz	CABLE LOSS (NEW)
500.0 kHz	5.0 MHz	5.0 kHz	Average	10.0 ms	9 kHz	CABLE LOSS (NEW)
			MaxPeak			
			Average			



MEASUREMENT RESULT: "W150_fin QF"

9/20/01 12:25PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.195000	39.50	0.5	64	24.3	1	---
0.520000	27.90	0.5	56	28.1	1	---
10.040000	20.50	1.3	60	39.5	1	---

MEASUREMENT RESULT: "W150_fin AV"

9/20/01 12:25PM

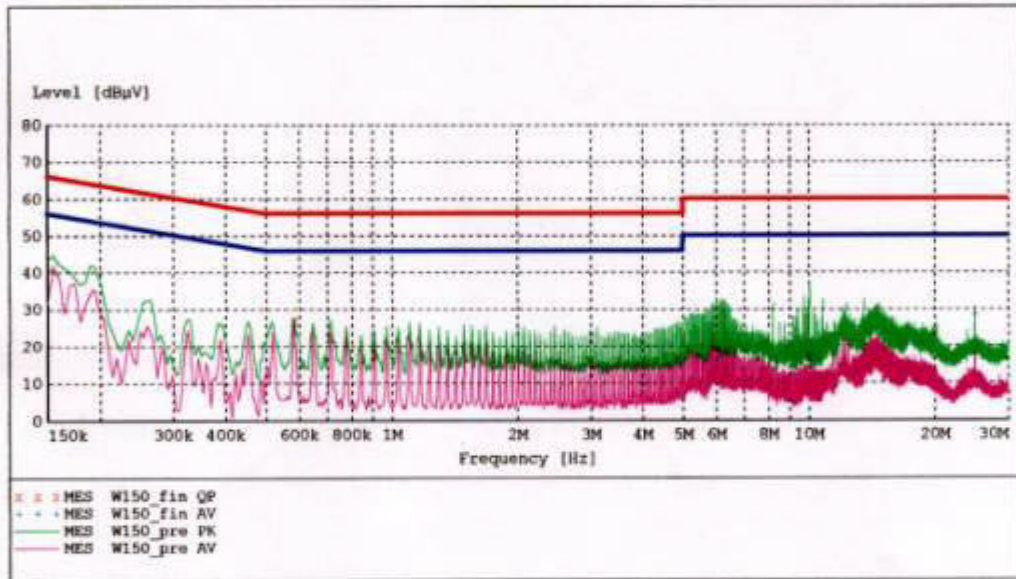
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.155000	40.40	0.5	56	15.3	1	---
0.650000	26.40	0.5	46	19.6	1	---
25.060000	28.70	2.1	50	21.3	1	---

HYUNDAI C-TECH. CO., LTD.
EMC TEST LAB.

EUT: W150
 Manufacturer: ImageQuest Co., Ltd.
 Operating Condition:
 Test Site: Shield Room
 Operator:
 Test Specification:
 Comment: H
 Start of Test: 9/20/01 / 12:18:44PM

SCAN TABLE:

Short Description:			Detector	Meas. Time	IF Bandw.	Transducer
Start Frequency	Stop Frequency	Step Width				
150.0 kHz	500.0 kHz	5.0 kHz	MaxPeak	100.0 ms	9 kHz	CABLE LOSS (NEW)
500.0 kHz	5.0 MHz	5.0 kHz	Average			
			MaxPeak	10.0 ms	9 kHz	CABLE LOSS (NEW)
			Average			



MEASUREMENT RESULT: "W150_fin QP"

9/20/01 12:21PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.155000	41.20	0.5	66	24.5	1	---
0.585000	26.90	0.5	56	29.1	1	---
10.040000	17.10	1.3	60	42.9	1	---

MEASUREMENT RESULT: "W150_fin AV"

9/20/01 12:21PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.155000	40.60	0.5	56	15.1	1	---
0.585000	25.60	0.5	46	20.4	1	---
25.060000	28.50	2.1	50	21.5	1	---

4.2 Radiated Emissions Tests

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Humidity Level : 36 % Temperature : 23
 Limit apply to : CISPR 22
 Type of Tests : CLASS B
 Date : SEPTEMBER 12, 2001
 Result : PASSED BY 3.0dB

EUT : 15" LCD CLIENT MONITOR
 Operating Condition : 1024X768 (Hf :48 kHz, Vf : 60 Hz)
 Detector : CISPR Quasi-Peak (6 dB Bandwidth : 120 KHz)

Frequency MHz	Reading dBuV	Ant. Factor dB	Cable Loss dB	ANT POL (H/V)	Total dBuV/m	Limit dB	Margin dB
76.6	16.99	6.01	1.80	V	24.8	30.0	-5.2
82.7	16.77	6.83	1.90	H	25.5	30.0	-4.5
88.7	13.14	7.66	1.90	V	22.7	30.0	-7.3
97.5	14.43	9.67	2.00	H	26.1	30.0	-3.9
162.5	9.48	14.82	2.70	H	27.0	30.0	-3.0
171.8	8.71	14.99	2.70	H	26.4	30.0	-3.6
392.8	12.67	16.53	4.20	H	33.4	37.0	-3.6
457.5	10.00	17.80	4.70	H	32.5	37.0	-4.5
489.0	8.93	18.17	4.80	H	31.9	37.0	-5.1
497.8	10.67	18.23	4.90	V	33.8	37.0	-3.2
504.8	9.26	18.64	4.90	H	32.8	37.0	-4.2
769.0	4.37	22.73	6.50	V	33.6	37.0	-3.4

Measured by Kyoung-Houn SEO / Engineer

Date : SEPTEMBER 12 , 2001

5. Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dBuV is obtained. The Antenna Factor of 7.4 and a Cable Factor of 1.1 is added. The 30 dBuV/m value was mathematically converted to its corresponding level in uV/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dBuV/m}$$

Level in uV/m = Common Antilogarithm $[(30 \text{ dBuV/m})/20] = 31.6 \text{ uV/m}$

6. LIST OF TEST EQUIPMENT

TYPE	MANUFACTURE		MODEL
CAL. DATE			
EMI Test Receiver	Rohde & Schwarz	ESH3	2001.6.29
EMI Test Receiver	Rohde & Schwarz	ESVP	2001.2.14
EMI Test Receiver	Rohde & Schwarz	ESI40	2001.1.18
EMI Test Receiver	Rohde & Schwarz	ESVS30	2001.6.26
Spectrum Monitor	Rohde & Schwarz	EZM	N.A
Graphic Plotter	Rohde & Schwarz	DOP2	N.A
Printer	Rohde & Schwarz	PDN	N.A
Spectrum Analyzer	H.P	8591EM	2001.7.11
LISN	EMCO	3825/2	2001.7.13
LISN	Rohde & Schwarz	ESH2-Z5	2001.7.14
Amplifier	Hewlett-Packard	8447E	2001.3.2
Dipole Antennas	Rohde & Schwarz	VHAP	2001.6.28
Dipole Antennas	Rohde & Schwarz	UHAP	2001.6.28
Biconical Antenna	Rohde & Schwarz	BBA-9106	2001.6.28
Log-Periodic Antenna	Rohde & Schwarz	UHALP-9107	2001.6.26
Antenna Position Tower	EMCO	1051-12	N.A
Turn Table	EMCO	1060-06	N.A
Line Filter	KEENE	ULW 2X30-60	N.A
Power Analyzer	Voltech	PM 3300	2001.2.20
Reference Network Impedance	Voltech	IEC 555	N.A
AC Power Source	PACIFIC	Magnetic Module	N.A
AC Power Source	PACIFIC	360AMX	N.A