



HYUNDAI CALIBRATION & CERTIFICATION TECH. CO., LTD.

PRODUCT COMPLIANCE TEAM
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA
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CERTIFICATION (Permissive change class)

Manufacture;
IMAGEQUEST CO., LTD.
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI,
KYOUNKI-DO, 467-701, KOREA
IMAGEQUEST FRN : 0005-8664-39

Date of Issue: FEBRUARY 18, 2002
Test Report No.: HCT-F02-0203
Test Site: HYUNDAI CALIBRATION & CERTIFICATION
TECHNOLOGIES CO., LTD.
HCT FRN : 0005-8664-21

FCC ID : **PJIL15B0C060**
MODEL / TYPE : **L1510B**

FCC Rule Part(s): Part 15 & 2; ET Docket 95-19
Classification: FCC Class B Peripheral Device (JBP)
Standard(s): FCC Class B: 1998 (CISPR 22)
Equipment(EUT) Type: 15" LCD Monitor
Max Resolution: 1024X768 (@60KHz/ 75Hz)
Port/ Connector(s): 15-pin D-sub VGA connector, USB 1 upstream port and 2 downstream ports
Audio port, Ear Phone port.
LCD PANEL: HYUNDAI DISPLAY TECHNOLOGY INC. (HT15X13-100)

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



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1. GENERAL INFORMATION

1.1 Product Description

The ImageQuest CO., LTD. Model L1510B (referred to as the EUT in this report) is a 15" LCD Monitor HOR. Freq. 60KHz 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)	12MHz, 20MHz
POWER REQUIREMENT	DC 12V/5V --- 2.0A/2.0A
NUMBER OF LAYERS	MAIN BOARD 4 LAYER OSD BOARD 2 LAYER POWER BOARD 1 LAYER INVERTER BOARD 2 LAYER AUDIO & USB BOARD 2 LAYER
MAX. RESOLUTION	1024X768 (@60KHz/ 75 Hz)
H-SYNC FREQUENCY RANGE	31KHz 60KHz
V-SYNC FREQUENCY RANGE	56Hz 75Hz
LCD TYPE	15" (LCD Type : HT15X13-100)

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:

TYPE DEVICE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
MONITOR (EUT)	IMAGEQUEST CO., LTD.	L1510B	PJIL15B0C060	HOST
PC(HOST)	H/P	DTPC-17	DoC	N/A
KEY BOARD	H/P	SK-2501-2D-K	GYUR385K	HOST
PRINTER	H/P	HP895C	DoC	HOST
MODEM	3COM CORPORATION	56K FAX MODEM	DoC	HOST
VIDEO CARD	DIAMOND	3D3000	DoC	HOST
MOUSE	H/P	INTELLIMOUSE	DZL211029	HOST
EAR PHONE	HYUNDAI MULTICAV	BOOM MIC HEADSET	N/A	HOST
USB MOUSE	LOGITECH	LZA04152669	DoC	EUT
USB FLASH DRIVE	SOFT BANK	E-D900-00-2988	DoC	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	ImageQuest CO., Ltd.	3041001042
POWER BOARD	C&C TECH CO.,LTD.	3610200093
OSD BOARD	ImageQuest CO., Ltd.	3010700794
INVERTOR BOARD	ImageQuest CO., Ltd.	3610400244
AUDIO & USB BOARD	ImageQuest CO., Ltd.	3010700795
LCD BOARD	Hyundai Display Technology Inc.	HT15X13-100

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)
PRINTER	N	Y	2.0(P),1.8(D)
KEY BOARD	N/A	Y	2.0(D)
MODEM	N	Y	2.0(P),0.8(D)
MOUSE	N/A	Y	1.8(D)
AUDIO CABLE	N/A	Y	2.0(D)
USB MOUSE	N/A	Y	0.8(D)
USB FRESH DRIVER	N/A	N/A	N/A

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
PRINTER	Y	PC END	Y	BOTH END
KEY BOARD	Y	PC END	Y	PC END
MODEM	Y	PC END	Y	BOTH END
MOUSE	N	N/A	Y	PC END
AUDIO CABLE	Y	BOTH END	Y	BOTH END
USB MOUSE	Y	EUT END	Y	EUT END
USB FRESH DRIVER	N	N/A	Y	EUT END

2.5 Equipment Modifications

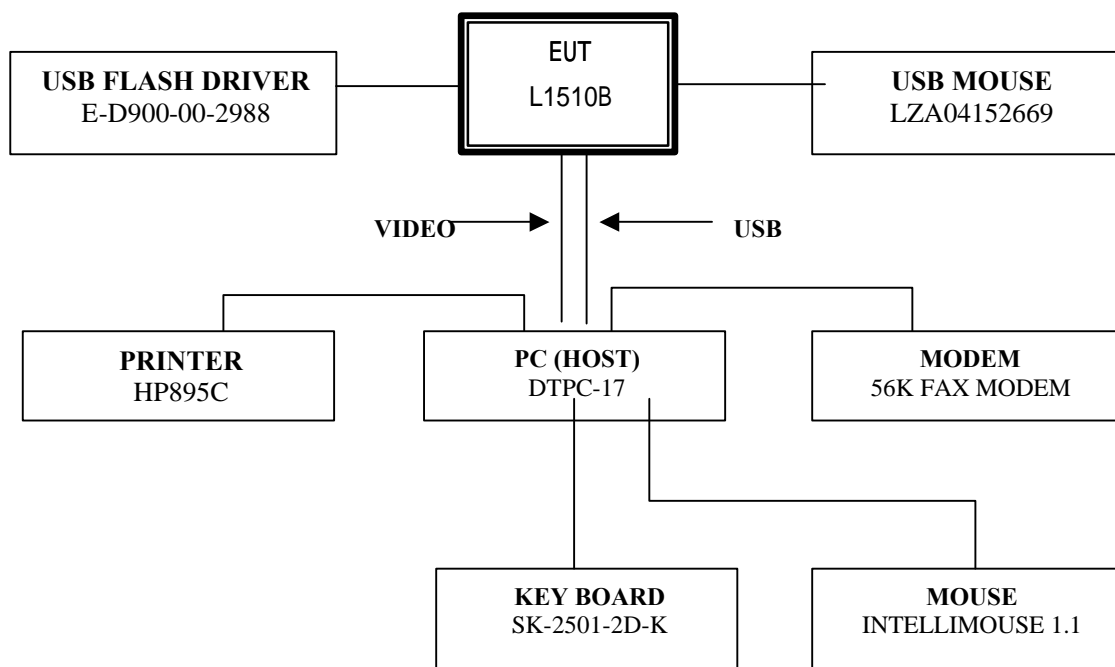
N/A

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 (w/max)	The worst operating condition
Pentium 350 MHz	1024X768 (60KHz/75Hz)	X
	1024X768 (48.4KHz/60Hz)	
	1024X768 (56.5KHz/70Hz)	
	720X400 (31.5KHz/70Hz)	
	800 x 600 (46.7 KHz/75Hz)	
	640 x 480 (31.5KHz/60Hz)	

4.2 Radiated Emission Tests

During Preliminary Tests, the following operating mode were investigated

Processor Speed (MHz)	Video Resolution (w/max)	The worst operating condition
Pentium 350 MHz	1024X768 (60KHz/75Hz)	X
	1024X768 (48.4KHz/60Hz)	
	1024X768 (56.5KHz/70Hz)	
	720X400 (31.5KHz/70Hz)	
	800 x 600 (46.7 KHz/75Hz)	
	640 x 480 (31.5KHz/60Hz)	

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

Date : **JANUARY 2, 2002**

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	: 21
Limit apply to	: CISPR 22		
Type of Tests	: CLASS B		
Date	: JANUARY 9 , 2002		
Result	: PASSED BY -8.4dB		
EUT	: 15" LCD MONITOR		

Operating Condition : 1024X768 (Hf : 60KHz, Vf : 75Hz)

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
0.19	45.6	NEUTRAL	54.0	8.4	Average
0.85	47.6	HOT	56.0	8.4	Quasi-Peak
0.960	47.1	HOT	56.0	8.9	Quasi-Peak
0.190	54.7	NEUTRAL	64.0	9.4	Quasi-Peak

NOET:

- All video modes and resolutions were investigated and the worst-case emissions are reported
Other video modes & resolution were tested and found to be in compliance.

Measured by : Kyoung-Houn SEO / Engineer

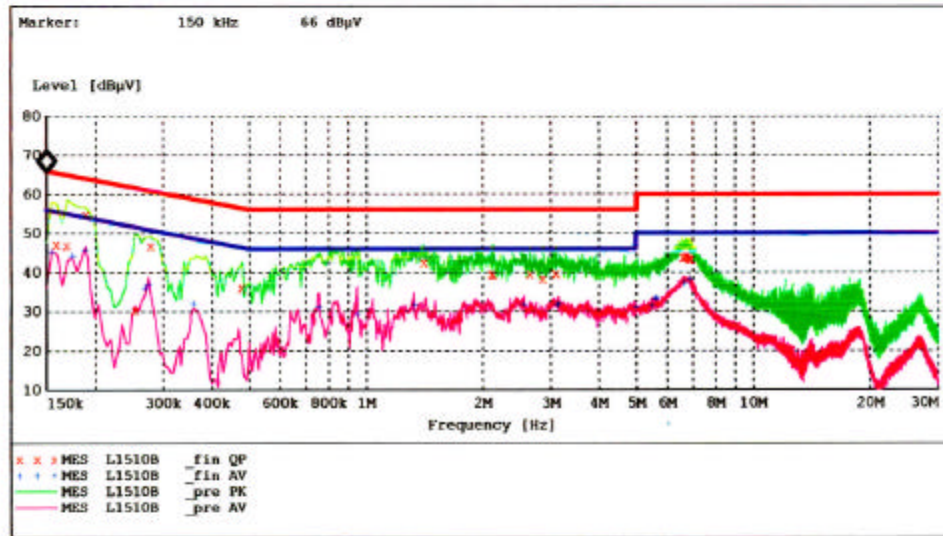
Date : JANUARY 9, 2002

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

EUT: L1510B
 Manufacturer: IMAGEQUEST
 Operating Condition: 1024 X 768 75Hz
 Test Site: Shield Room
 Operator: KH-Seo
 Test Specification: MIC CLASS B
 Comment: N
 Start of Test: 1/9/02 / 5:22:20PM

SCAN TABLE: "EN 55022 V (PKH) "

Short Description:			EN 55022 Voltage			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
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: "L1510B fin QP"

1/9/02 5:26PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.160000	47.10	0.5	66	18.4	1	---
0.170000	46.80	0.5	65	18.1	1	---
0.190000	54.70	0.5	64	9.4	1	---
0.255000	30.30	0.5	62	31.2	1	---
0.280000	46.60	0.5	61	14.2	1	---
0.480000	36.00	0.5	56	20.4	1	---
1.410000	42.50	0.5	56	13.5	1	---
2.115000	39.40	0.6	56	16.6	1	---
2.140000	39.30	0.6	56	16.7	1	---
2.660000	39.40	0.6	56	16.6	f	---
2.870000	38.20	0.6	56	17.8	1	---
3.105000	39.60	0.6	56	16.4	1	---
6.610000	43.70	1.1	60	16.3	1	---
6.690000	44.00	1.1	60	16.0	1	---

MEASUREMENT RESULT: "L1510B _fin QP"

(continued)

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
6.765000	44.00	1.1	60	16.0	1	---
6.795000	43.90	1.1	60	16.1	1	---
6.870000	43.50	1.1	60	16.5	1	---
6.925000	43.30	1.1	60	16.7	1	---

MEASUREMENT RESULT: "L1510B _fin AV"

1/9/02 5:26PM

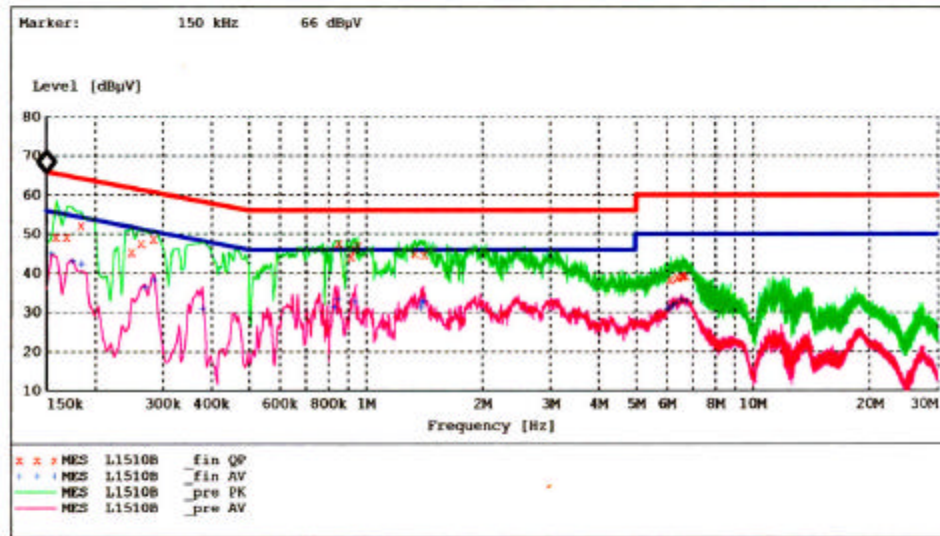
Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.155000	45.20	0.5	56	10.5	1	---
0.175000	44.20	0.5	55	10.5	1	---
0.190000	45.60	0.5	54	8.4	1	---
0.270000	35.90	0.5	51	15.2	1	---
0.275000	36.90	0.5	51	14.1	1	---
0.360000	32.00	0.5	49	16.8	1	---
0.760000	31.00	0.5	46	15.0	1	---
0.955000	29.20	0.5	46	16.8	1	---
1.340000	31.60	0.5	46	14.4	1	---
2.575000	31.70	0.6	46	14.3	1	---
3.145000	31.80	0.6	46	14.2	1	---
3.160000	31.90	0.6	46	14.1	1	---
5.000000	31.00	0.9	46	15.0	1	---
5.505000	31.40	1.0	50	18.6	1	---
5.620000	33.10	1.0	50	16.9	1	---
5.665000	33.30	1.0	50	16.7	1	---
6.650000	37.40	1.1	50	12.6	1	---
6.870000	38.30	1.1	50	11.7	1	---

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

EUT: L1510B
 Manufacturer: IMAGEQUEST
 Operating Condition: 1024 X 768 75Hz
 Test Site: Shield Room
 Operator: KH-Seo
 Test Specification: MIC CLASS B
 Comment: H
 Start of Test: 1/9/02 / 5:28:35PM

SCAN TABLE: "EN 55022 V (PKH)"

Short Description:			EN 55022 Voltage			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
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: "L1510B _fin QP"

1/9/02 5:32PM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.160000	49.20	0.5	66	16.2	1	---
0.170000	49.10	0.5	65	15.9	1	---
0.185000	52.20	0.5	64	12.1	1	---
0.250000	45.30	0.5	62	16.5	1	---
0.265000	47.60	0.5	61	13.6	1	---
0.285000	48.70	0.5	61	11.9	1	---
0.855000	47.60	0.5	56	8.4	1	---
0.920000	44.20	0.5	56	11.8	1	---
0.945000	46.00	0.5	56	10.0	1	---
0.960000	47.10	0.5	56	8.9	1	---
1.345000	44.90	0.5	56	11.1	1	---
1.420000	44.70	0.5	56	11.3	1	---
6.140000	38.20	1.0	60	21.8	1	---
6.385000	38.90	1.0	60	21.1	1	---

MEASUREMENT RESULT: "L1510B _fin QP"

(continued)

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
6.395000	38.80	1.0	60	21.2	1	---
6.590000	39.40	1.1	60	20.6	1	---
6.615000	39.20	1.1	60	20.8	1	---
6.710000	39.30	1.1	60	20.7	1	---

MEASUREMENT RESULT: "L1510B _fin AV"

1/9/02 5:32PM

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Line	PE
0.155000	44.90	0.5	56	10.8	1	---
0.175000	43.00	0.5	55	11.8	1	---
0.185000	42.30	0.5	54	12.0	1	---
0.270000	36.30	0.5	51	14.8	1	---
0.285000	38.20	0.5	51	12.5	1	---
0.380000	30.90	0.5	48	17.3	1	---
0.835000	31.30	0.5	46	14.7	1	---
0.850000	33.20	0.5	46	12.8	1	---
0.945000	32.60	0.5	46	13.4	1	---
1.395000	31.10	0.5	46	14.9	1	---
1.405000	32.50	0.5	46	13.5	1	---
1.415000	32.90	0.5	46	13.1	1	---
6.075000	30.80	1.0	50	19.2	1	---
6.140000	31.20	1.0	50	18.8	1	---
6.250000	31.80	1.0	50	18.2	1	---
6.370000	32.30	1.0	50	17.7	1	---
6.595000	33.20	1.1	50	16.8	1	---
6.790000	32.80	1.1	50	17.2	1	---

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

<u>DATE</u>	<u>TYPE</u>	<u>MANUFACTURE</u>	<u>MODEL</u>	<u>CAL .</u>
	EMI Test Receiver	Rohde & Schwarz	ESH3	2001.6.29
	EMI Test Receiver	Rohde & Schwarz	ESVP	2002.2.14
	EMI Test Receiver	Rohde & Schwarz	ESI40	2001.11.5
	EMI Test Receiver	Rohde & Schwarz	ESVS30	2001.3.6
	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	2002.2.7
	LISN	Rohde & Schwarz	ESH2-Z5	2001.8.12
	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