

FCC/MELLOW

DEC 28 1998

EXHIBIT 4

Test Report

Test Report

TTEMC-F98180

APPLICATION FOR CERTIFICATION
On Behalf of
Datatronics Technology, Inc.
Gateway

Model : HUGO7026

FCC ID : E2O7026

Prepared for : Datatronics Technology, Inc.
15/2, Lane 768, Pa-Teh Rd., Sec. 4,
Taipei, Taiwan, R.O.C.

Prepared By : Taiwan Tokin EMC Eng. Corp.
No. 53-11, Tin-Fu Tsun, Lin-Kou,
Taipei Hsien, Taiwan, R.O.C.

Tel: (02) 2609-9301, 2609-2133

File Number : ATM-G98305
Report Number : TTEMC-F98180
Date of Test : Nov. 09 ~ 23, 1998
Date of Report : Dec. 02, 1998

TABLE OF CONTENTS

Description	Page
Test Report Certification.....	3
1. GENERAL INFORMATION	4
1.1. Description of Device (EUT).....	4
1.2. Tested Supporting System Details	5
1.3. Description of Test Facility	6
2. POWERLINE CONDUCTED TEST	7
2.1. Test Equipment	7
2.2. Block Diagram of Test Setup.....	7
2.3. Powerline Conducted Emission Limit (CLASS B).....	7
2.4. EUT's Configuration during Compliance Measurement.....	8
2.5. Operating Condition of EUT.....	8
2.6. Test Procedure.....	9
2.7. Test Results	9
2.8. Line Conducted RF Voltage Measurement Results.....	10
3. RADIATED EMISSION TEST	13
3.1. Test Equipment	13
3.2. Block Diagram of Test Setup.....	13
3.3. Radiation Limit (CLASS B)	14
3.4. EUT's Configuration during Compliance Measurement.....	14
3.5. Operating Condition of EUT.....	14
3.6. Test Procedure.....	15
3.7. Test Results	15
3.8. Radiated Emission Measurement Results.....	16
4. MODIFICATIONS TO EUT	18
5. DEVIATIONS TO TEST SPECIFICATIONS	19
6. PHOTOGRAPHS.....	20
6.1. Photos of Powerline Conducted Measurement.....	20
6.2. Photos of Radiated Measurement at Open Field Test Site	21

Tok98-F064

TEST REPORT CERTIFICATION

Applicant : Datatronics Technology, Inc.
Manufacturer : Datatronics Technology, Inc.
FCC ID : E207026
EUT Description : Gateway
(A) MODEL NO. : HUGO7026
(B) SERIAL NO. : N/A
(C) POWER SUPPLY : AC 120V/60Hz

Measurement Procedure Used :

FCC RULES AND REGULATIONS PART 15 SUBPART B CLASS B OCTOBER 1997
AND FCC / ANSI C63.4-1992

The device described above was tested by TAIWAN TOKIN EMC ENG. CORP. to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15B Class B limits both radiated and conducted emissions.

The measurement results were contained in this test report and TAIWAN TOKIN EMC ENG. CORP. was assumed full responsibility for the accuracy and completeness of these measurements. Also, this report showed that the EUT to be technically compliance with the FCC official limits.

This report applied to above tested sample only. This report shall not be reproduced in part without written approval of Taiwan Tokin EMC Eng. corp.

Date of Test : Nov. 09 ~ 23, 1998

Prepared by : Monica Chang Dec. 17, '98
(MONICA CHANG)

Test Engineer : ben cheng Dec. 17, '98
(BEN CHENG)

Approve & Authorized Signer :

Jackie Deng 12/18/98
(JACKIE DENG)

T0698-F064

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

Description	:	Gateway
Model Number	:	HUGO7026
FCC ID	:	E2O7026
Serial Number	:	N/A
Applicant	:	Datatronics Technology, Inc. 15/2, Lane 768, Pa-Teh Rd., Sec. 4, Taipei, Taiwan, R.O.C.
Manufacturer	:	Datatronics Technology, Inc. 15/2, Lane 768, Pa-Teh Rd., Sec. 4, Taipei, Taiwan, R.O.C.
Ethernet Network Cable	:	Shielded, Detachable, 2m
RS-232 Data Cable	:	Shielded, Detachable, 1.5m
Power Adapter	:	Amigo, M/N AM-91500A Input : 120V/60Hz Output : 9VAC/1500mA Cable : Non-Shielded, Undetachable, 1.9m
Date of Receipt of Sample	:	May 12, 1998
Date of Test	:	Nov. 09 ~ 23, 1998

1.2. Tested Supporting System Details

1.2.1. PERSONAL COMPUTER

Mother Board	:	Asus, M/N P2L97 FCC ID By DoC
CPU	:	Intel Pentium II 233MMX
S.P.S.	:	Powertech, M/N PT-6145DE3
Floppy Driver 3.5"	:	Mitsumi, M/N D359T6
Case	:	Enlight, M/N EN-7230
Hard Disk Driver	:	Seagate, M/N ST32122A
VGA Card	:	C.P., M/N C740SD FCC ID By Doc
LAN Card	:	UMC, M/N 510-10002-001 S/N 44490108097
Disk Ctrl Card	:	Within Mother Board
Serial/Parallel Card	:	Within Mother Board
RS-232 Data Cable	:	Shielded, Detachable, 1.5m
Exchange Adapter	:	Cable: Detachable, 0.1m.
Power Cord	:	Non-Shielded, Detachable, 1.8m

1.2.2. MONITOR

Model Number	:	PM36B
Serial Number	:	W821111454
FCC ID	:	IIBTC1
Manufacturer	:	Funai Electric Company of Taiwan
Data Cable	:	Shielded, Undetachable, 1.2m
Power Cord	:	Non-Shielded, Detachable, 1.5m

1.2.3. KEYBOARD

Model Number	:	5121
Serial Number	:	J83300819
FCC ID	:	E5XKBM104M10UC
Manufacturer	:	Behavior Tech Computer Corp.
Data Cable	:	Shielded, Undetachable, 1.0m

1.2.4. PRINTER

Model Number	:	2225C
Serial Number	:	2526S40437
FCC ID	:	BS46XU2225C
Manufacturer	:	Hewlett Packard
Power Cord	:	Non-Shielded, Undetachable, 1.8m
Data Cable	:	Shielded, Detachable, 1.2m

1.2.5. MOUSE #1

Model Number	:	M-S35
Serial Number	:	LZA82103128
FCC ID	:	DZL211029
Manufacturer	:	Logitech
Data Cable	:	Non-Shielded, Undetachable, 1.8m

1.2.6. MOUSE #2

Model Number	:	M-S35
Serial Number	:	LZA82103138
FCC ID	:	DZL211029
Manufacturer	:	Logitech
Data Cable	:	Non-Shielded, Undetachable, 1.8m

1.2.7. USB GAMEPAD

Model Number	:	INT-003
Serial Number	:	N/A
FCC ID	:	CWTEAK032
Manufacturer	:	Alps
Data Cable	:	Shielded, Undetachable, 2.3m Bonded a ferrite core

1.2.8. DUMMY LOAD

Model Number	:	N/A
Serial Number	:	N/A
Manufacturer	:	N/A
Ethernet Network Cable*5	:	Shielded, Detachable, 2m

1.3. Description of Test Facility

Site Description (No. 2 Open Site)	:	Jul. 15, 1996 Re-file on Federal Communication Commission FCC Engineering Laboratory 7435 Oakland Mills Road Columbia, MD 21046, U.S.A.
Name of Firm	:	Taiwan Tokin EMC Eng. Corp.
Site Location	:	No. 53-11, Tin-Fu Tsun, Lin-Kou, Taipei Hsien, Taiwan, R.O.C.
NVLAP lab. Code	:	200077-0

Tuk98-F064

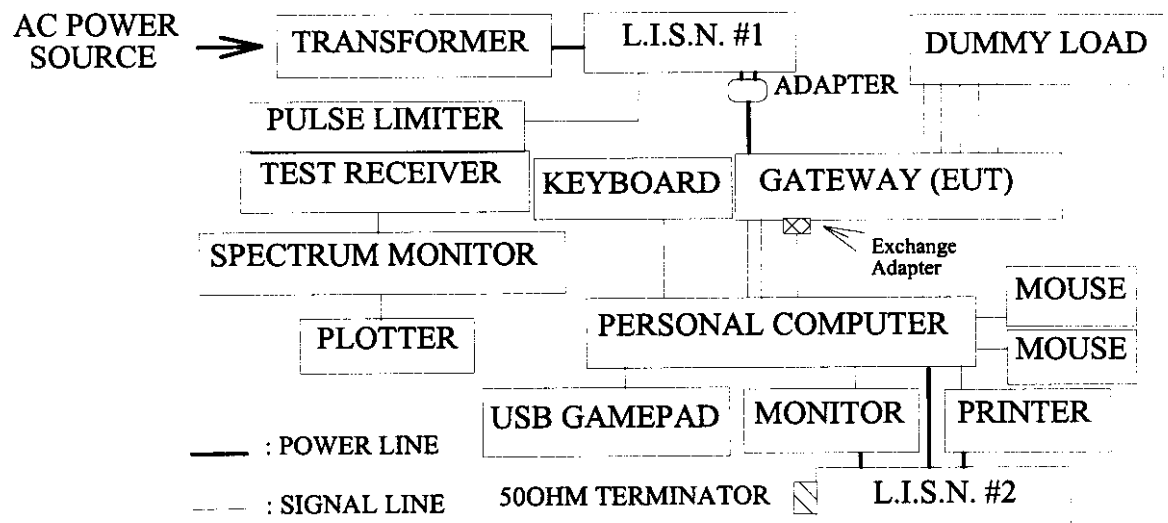
2. POWERLINE CONDUCTED TEST

2.1. Test Equipment

The following test equipments were used during the power line conducted tests :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde & Schwarz	ESH3	880647/035	Jun.24, 98'	1 Year
2.	L.I.S.N. # 1	Kyoritsu	KNW-407	8-855-9	Apr.14, 98'	1 Year
3.	L.I.S.N. # 2	Kyoritsu	KNW-407	8-881-13	Apr.14, 98'	1 Year

2.2. Block Diagram of Test Setup



2.3. Powerline Conducted Emission Limit (CLASS B)

Frequency	Maximum RF Line Voltage	
	uV	dBuV
0.45MHz ~ 30Mhz	250	48

REMARKS : RF LINE VOLTAGE (dBuV) = 20 log RF LINE VOLTAGE (uV)

2.4. EUT's Configuration during Compliance Measurement

The following equipments were installed on RF LINE VOLTAGE measurement to meet the Commission requirement and operating in a manner which tend to maximize its emission characteristics in a normal application.

2.4.1. Gateway (EUT)

Model Number	:	HUGO7026
Serial Number	:	N/A
FCC ID	:	E2O7026
Manufacturer	:	Datatronics Technology, Inc.
Ethernet Network Cable	:	Shielded, Detachable, 2m
RS-232 Data Cable	:	Shielded, Detachable, 1.5m
Power Adapter	:	Amigo, M/N AM-91500A
		Input : 120V/60Hz
		Output : 9VAC/1500Ma
		Non-Shielded, Undetachable, 1.9m

2.4.2. Supporting System : As in Section 1.2

2.5. Operating Condition of EUT

2.5.1. Setup the EUT and simulator as shown on 2.2.

2.5.2. Turn on the power of all equipments.

2.5.3. The Personal Computer performs the Internet Software in MS-DOS of Windows 95.

2.5.4. The Personal Computer transmitted data to the dummy load via the Gateway (EUT).

2.5.5. The other peripheral devices were drove and operated in turn during all testing.

2.6. Test Procedure

The EUT was connected to the power mains through a line impedance stabilization network (L.I.S.N.# 1). The other peripheral devices power cord connected to the power mains through a line impedance stabilization network (L.I.S.N. # 2). This provided a 50 ohm coupling impedance for the measuring equipment. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line were checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipments and all of the interface cables were changed according to FCC ANSI C63.4-1992 on conducted measurement.

The bandwidth of the R&S Test Receiver ESH3 was set at 10KHz.

The frequency range from 450KHz to 30MHz was checked.

All the test results are listed in section 2.8.

2.7. Test Results

PASSED. Please refer to the following pages.

2.8. Line Conducted RF Voltage Measurement Results

The frequency range from 450KHz to 30 MHz was investigated.

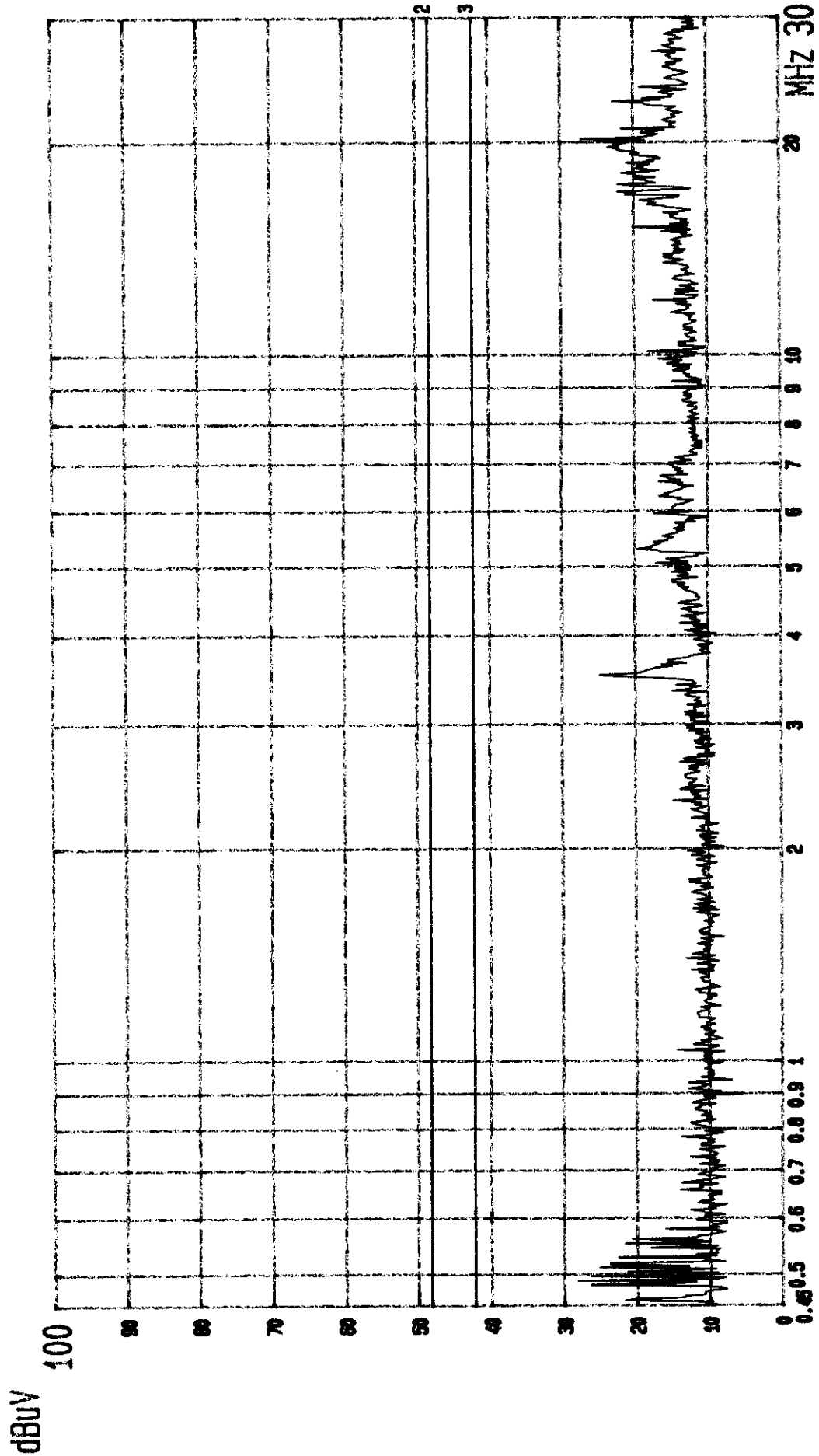
All emissions not report below are too low against the prescribed limits.

Date of Test : Nov. 19, 1998 Temperature : 24 °C

EUT : Gateway Humidity : 45 %

Frequency (MHz)	Factor dB	Measurement (dBuV)		Reading (dBuV)		Limits (dBuV)	Margin (dBuV)	
		VA	VB	VA	VB		VA	VB
0.4740	0.5	*	21.0	*	21.5	48.0	*	26.5
0.4803	0.5	21.2	*	21.7	*	48.0	26.3	*
0.5104	0.5	*	12.4	*	12.9	48.0	*	35.1
0.5551	0.5	18.6	*	19.1	*	48.0	28.9	*
3.5231	0.5	23.4	*	23.9	*	48.0	24.1	*
3.5895	0.5	*	24.7	*	25.2	48.0	*	22.8
5.4122	0.8	16.5	*	17.3	*	48.0	30.7	*
6.4021	0.8	*	28.3	*	29.1	48.0	*	18.9
11.3651	1.0	*	21.2	*	22.2	48.0	*	25.8
16.8200	1.0	13.7	*	14.7	*	48.0	33.3	*
19.6203	1.0	21.5	*	22.5	*	48.0	25.5	*
20.2717	1.1	*	18.3	*	19.4	48.0	*	28.6

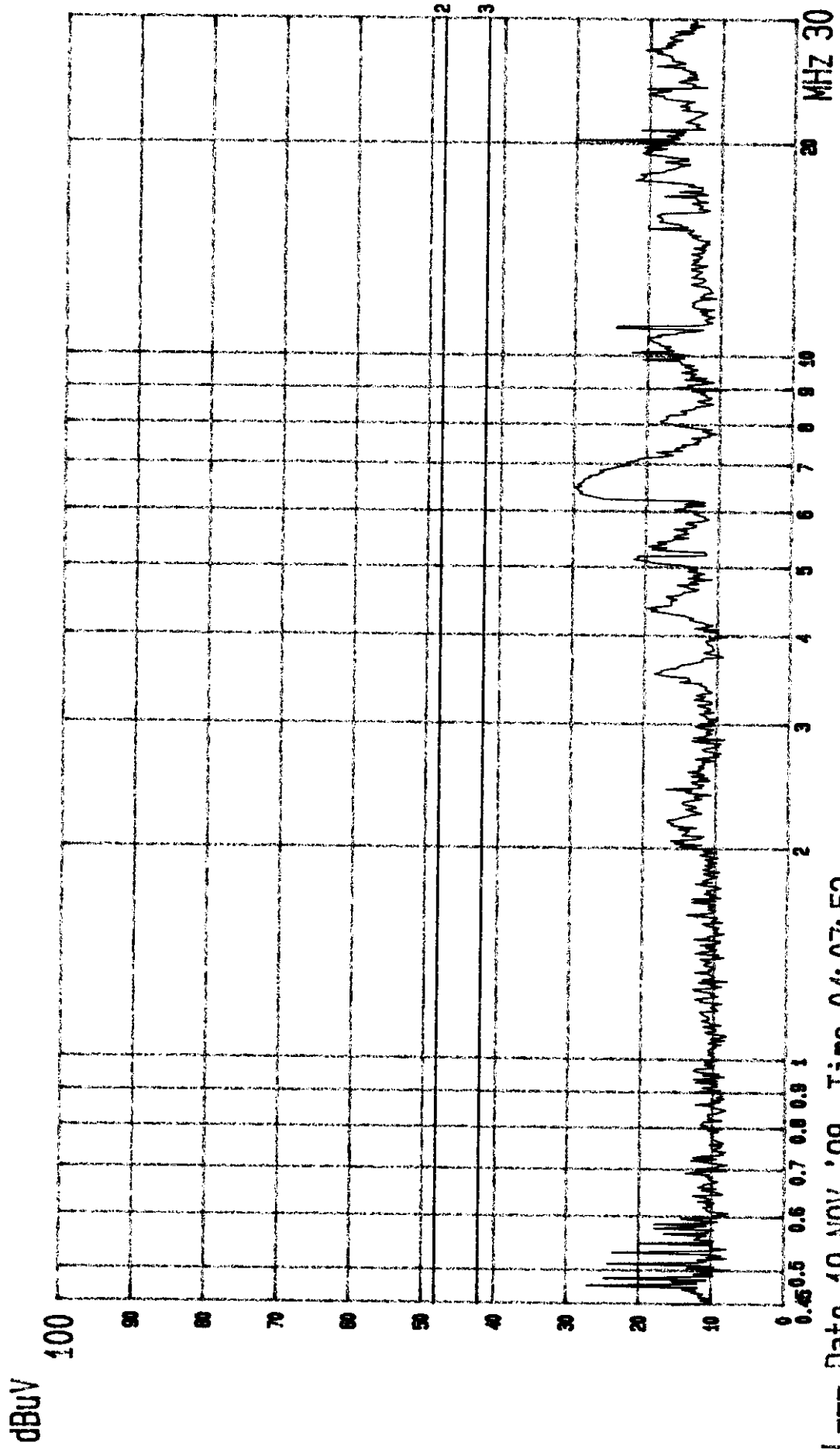
- Remark :
1. All readings are Quasi-Peak values.
 2. Factor = Insertion Loss + Cable Loss
 3. The worst emission was detected at 6.4021MHz with corrected signal level of 29.1dBuV (limit is 48dBuV) when the VB side of the EUT was connected to L.I.S.N.



--- Date 19.NOV. '98 Time 04:09:54
 DATATRONIC
 LINE: VA.

M/N: HUGO 7026

PAGE: 001.
 (PEAK VALUE) TTEMIC.



--- Date 19.NOV.'98 Time 04:07:52
 DATA TRONIC
 LINE: VB.
 EUT: GATE-WAY

(PEAK VALUE) ITEM C.

M/N: HUGO 7026

PAGE: 002.

T0698-F064

3. RADIATED EMISSION TEST

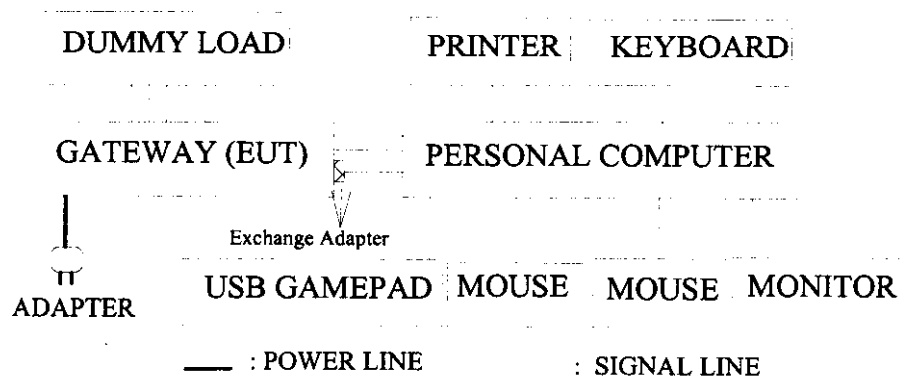
3.1. Test Equipment

The following test equipments are used during the radiated emission tests :

Item	Type	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Test Receiver	Rohde&Schwarz	ESVP	893202/001	Jul.24, 98'	1 Year
2.	Broadband Antenna	Chase	VBA6106A	1240	Jul. 15, 98'	1 Year
3.	Broadband Antenna	Chase	UPA6109	1048	Jul. 15, 98'	1 Year

3.2. Block Diagram of Test Setup

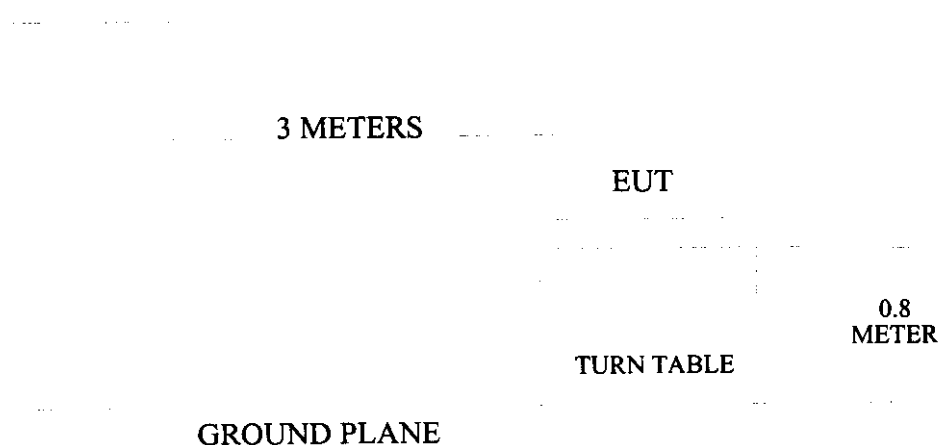
3.2.1. Block Diagram of connection between EUT and simulators



3.2.2. Open Field Test Site Setup Diagram

ANTENNA TOWER

ANTENNA ELEVATION VARIES FROM 1METER TO 4 METERS



3.3. Radiation Limit (CLASS B)

FREQUENCY	DISTANCE	FIELD STRENGTHS LIMITS	
		uV/M	dBuV/M
30 ~ 88	3	100	40.0
88 ~ 216	3	150	43.5
216 ~ 960	3	200	46.0
960 ~ 1000	3	500	54.0

- Remark :
- (1) Emission level (dBuV/M) = 20 log Emission level (uV/M)
 - (2) The tighter limit applies at the edge between two frequency bands.
 - (3) Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.

3.4. EUT's Configuration during Compliance Measurement

The configuration of EUT and its simulators were same as those used in conducted measurement. Please refer to 2.4.

3.5. Operating Condition of EUT

Same as conducted measurement which is listed in 2.5.

3.6. Test Procedure

The EUT and its simulators were placed on a turn table which was 0.8 meter above ground. The turn table rotate 360 degrees to determine the position of the maximum emission level. EUT was set 3 meters away from the receiving antenna which were mounted on a antenna tower. The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated biconical and log periodical antenna) and dipole antenna were used as receiving antenna. Both horizontal and vertical polarization of the antenna were set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4-1992 on radiated measurement.

The bandwidth of the R&S Test Receiver ESVP was set at 120KHz.

The frequency range from 30MHz to 1000MHz was checked.

All the test results are listed in section 3.8.

3.7. Test Results

PASSED. Please refer to the following pages.

3.8. Radiated Emission Measurement Results

The frequency spectrum from 30 MHz to 1000MHz was investigated. All the emissions not reported below were too low against the FCC CLASS B limit.

Date of Test : Nov. 23, 1998 Temperature : 24 °C
 EUT : Gateway Humidity : 87 %

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dBuV/m
			Horizontal dBuV		Horizontal dBuV/m	Limits dBuV/m	
40.001	19.98	2.08	-2.10		19.96	40.00	20.04
* 66.670	11.28	2.77	22.50		36.55	40.00	3.45
120.007	19.19	3.83	7.10		30.12	43.50	13.38
133.340	20.15	4.03	8.00		32.18	43.50	11.32
159.998	21.00	4.48	1.80		27.28	43.50	16.22
160.000	21.00	4.48	2.10		27.58	43.50	15.92
180.014	21.24	4.74	-0.70		25.28	43.50	18.22
200.010	21.71	5.04	6.00		32.75	43.50	10.75
233.345	22.40	5.46	11.30		39.16	46.00	6.84
240.045	22.59	5.58	9.20		37.37	46.00	8.63
266.680	23.31	5.91	13.30		42.52	46.00	3.48
319.994	14.15	6.57	6.30		27.02	46.00	18.98
333.349	14.74	6.79	17.30		38.83	46.00	7.17
359.995	14.97	7.04	10.00		32.01	46.00	13.99
366.685	14.88	7.14	16.90		38.92	46.00	7.08
379.998	16.31	7.31	2.50		26.12	46.00	19.88
400.019	16.72	7.52	11.70		35.94	46.00	10.06
433.354	16.70	7.89	9.10		33.69	46.00	12.31
466.689	16.99	8.26	8.30		33.55	46.00	12.45
479.993	17.02	8.37	-1.60		23.79	46.00	22.21
500.024	17.60	8.60	6.80		33.00	46.00	13.00

- Remark :
1. All reading were Quasi-Peak values.
 2. The worst emission was detected at 66.670MHz with corrected signal level of 36.55dBuV/m (limit was 40.0dBuV/m) when the antenna was at horizontal polarization and was at 1m high and the turn table was at 145 ° .
 3. 0 ° is the table front facing the antenna. Degree was calculated from 0 ° clockwise facing the antenna.

Date of Test : Nov. 23, 1998 Temperature : 24 °C
 EUT : Gateway Humidity : 87 %

Frequency MHz	Antenna Factor dB/m	Cable Loss dB	Meter Reading		Emission Level		Margin dBuV/m
			Vertical dBuV		Vertical dBuV/m	Limits dBuV/m	
40.000	18.76	2.08	7.30		28.14	40.00	11.86
* 66.670	12.76	2.77	20.90		36.43	40.00	3.57
120.007	18.31	3.83	6.10		28.24	43.50	15.26
133.339	18.70	4.03	7.80		30.53	43.50	12.97
160.001	21.32	4.48	1.10		26.90	43.50	16.60
179.996	19.04	4.74	1.60		25.38	43.50	18.12
200.010	22.29	5.04	6.00		33.33	43.50	10.17
233.345	22.48	5.46	11.00		38.94	46.00	7.06
240.043	22.83	5.58	1.50		29.91	46.00	16.09
266.680	21.85	5.91	5.20		32.96	46.00	13.04
319.995	14.91	6.57	3.30		24.78	46.00	21.22
333.349	16.11	6.79	15.40		38.30	46.00	7.70
359.994	13.78	7.04	1.90		22.72	46.00	23.28
366.685	14.04	7.14	9.20		30.38	46.00	15.62
379.992	14.76	7.31	-0.10		21.97	46.00	24.03
400.020	16.00	7.52	11.50		35.02	46.00	10.98
433.354	16.97	7.89	11.20		36.06	46.00	9.94
466.690	17.80	8.26	9.40		35.46	46.00	10.54
480.006	18.36	8.37	-2.10		24.63	46.00	21.37
500.024	18.51	8.60	6.90		34.01	46.00	11.99

- Remark :
1. All reading were Quasi-Peak values.
 2. The worst emission was detected at 66.670MHz with corrected signal level of 36.43dBuV/m (limit was 40.0dBuV/m) when the antenna was at vertical polarization and was at 1m high and the turn table was at 250 ° .
 3. 0 ° is the table front facing the antenna. Degree was calculated from 0 ° clockwise facing the antenna.

4. MODIFICATIONS TO EUT

1. Changed 33ohm resistor R119 into ferrite bead.
2. Added a resistor 10ohm and a bypass capacitor 10pF on Pin 115 of U1.
3. Deleted the ferrite beads of L29, L30.
4. Added a resistor 10ohm and a bypass capacitor 10pF of Pin 9 of U17.
5. Added a resistor 10ohm and a bypass capacitor 10pF of Pin 2 of U17.
6. Added a resistor 10ohm and a bypass capacitor 10pF of Pin 2 of U16.
7. Added a resistor 10ohm and a bypass capacitor 10pF of Pin 2 of U28.
8. Added a resistor 10ohm and a bypass capacitor 10pF of Pin 3 of U28.
9. Added a resistor 10ohm and a bypass capacitor 10pF of Pin 3 of U27.
10. Changed 33ohm resistor R132 into ferrite bead and added a bypass capacitor 10pF.
11. Added a copper on solder side of PCB.

5. DEVIATIONS TO TEST SPECIFICATIONS

[NONE]