



鴻友科技股份有限公司

Mustek Systems Inc.

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No. 25, R&D Rd., II Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.

Tel: 886-3-577-9373 Fax: 886-3-578-4139

FCC ID.: HWFFST

EXHIBIT 3

Test Report With Eut Photograph

Exhibit 3

QTK98-F001

**FCC Test Report
Application for Certification
On Behalf Of
Mustek Systems Inc.
Scanner
Model # : 1200 FS**

FCC ID : HWFFST

Project Name: C6S12F

**Prepared For:
Mustek Systems Inc.
No. 25, R&D Road II, Science-Based
Industrial Park, Hsin-Chu, Taiwan, R.O.C.**

**Report By : QuieTek Corporation
No.75-1, Wang-Yeh Valley, Yung-Hsing
Tsuen, Chiung-Lin, Hsin-Chu County,
Taiwan, R.O.C.
Tel : (03) 592-8858
Fax : (03) 592-8859**

The test results are traceable to the national or international standards
Test results given in this report only relate to the specimen(s) tested or measured.
This report shall not be reproduced excepted in full, without the written consent of QuieTek.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

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1. Test Report Certification

QTK99-F001

FCC ID.: HWFFST

Applicant : Mustek Systems Inc.
 Manufacturer : Mustek Systems Inc.
 EUT Description

Model Name : Scanner

Model No. : 1200 FS

Serial Number : N/A

FCC ID.: HWFFST

Power : 120V/60Hz AC

MEASUREMENT STANDARD USED :

CFR 47, Part 15 Radio Frequency Device Subpart B Unintentional Radiators Class B :1996

MEASUREMENT PROCEDURE USED :

ANSI C63.4 Methods of Measurements of Radio-Noise Emissions from Low-Voltage

Electrical and Electronic Equipment in the range of 9KHz to 40GHz. :1992

The device described above was tested by QuietTek Corporation to determine the maximum emission levels emanating from the device. The maximum emission levels were compared to the FCC Part 15 Subpart B limits for both radiated and conducted emissions.

The measurement results are contained in this test report and QuietTek Corporation is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT to be technically compliant with the FCC Part 15 Subpart B limits. And there are no deviation from the above measurement process.

Sample Received Date : December 15, 1998

Test Date : December 28, 1998

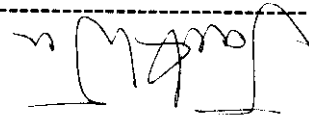
Documented by : Kathy Lee

Test Engineer:

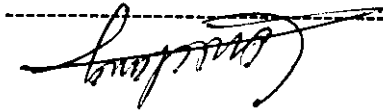
Approve & Authorized Signer:

NVLAP®

Jack Wu



Gene Chang



QuietTek Corporation

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Rev. 1

Accredited Lab. Of BCIO, NVLAP, VCCI, TUV

NVLAP Lab. Code : 200347-0

No.75-1, Wang-Yeh Valley, Yung-Hsing Tsuen,
 Chung-Lin, Hsin-Chu County, Taiwan, R.O.C.
 Tel : 03-592-8858, Fax : 03-592-8859

2. General Information
2.1 Production Description

Description	: Scanner
Model Number	: 1200 FS
Serial Number	: N/A
FCC ID.	: HWFFST
Applicant	: Mustek Systems Inc.
Address	: No. 25, R&D Road II, Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.
Manufacturer	: Mustek Systems Inc.
Address	: No. 25, R&D Road II, Science-Based Industrial Park, Hsin-Chu, Taiwan, R.O.C.
Data Cable	: Shielded, Detectable, 1m
	Bonded two ferrite cores
Power Cord	: Non-shielded, Detectable, 1.5m

Note: The data show in this test report reflects the worst-case data for each operation mode.

2.2 Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards, which have grants) are:

☒ Host Personal Computer with SCSI Card	
Model Number	VE 5/200 SERIES 4
Manufacturer	HP
Serial Number	SG80700310
FCC ID	Doc
Power Cord	Non-Shielded, Detachable, 1.8m
SCSI Card	
Model Number	3181LE
Manufacturer	DOMEX
Serial Number	3191D-004A8600100
FCC ID	KQ53191D-1
☒ Monitor	
Model Number	CM752ET-311
Serial Number	T8F006364
FCC ID	D0C
Manufacturer	HITACHI
Data Cable	Shielded, Undetachable, 1.5m
Power Cord	Shielded, Detachable, 1.8m
☒ Keyboard	
Model Number	6311-TW2C
Serial Number	N/A
FCC ID	Doc
Manufacturer	ACER
Data Cable	Shielded, Undetachable, 1.8m
☒ Mouse	
Model Number	M-S34
Serial Number	LZB75078428
FCC ID	DZL211029
Manufacturer	HP
Data Cable	Shielded, Undetachable, 1.8m
☒ Modem	
Model Number	1414
Serial Number	980033039
FCC ID	IFAXDM1414
Manufacturer	ACCEX
Data Cable	Shielded, Detachable, 1m
Power Adapter	ACCEX, M/N: SCP41-91000A
Cable Output	Shielded, Undetachable, 1m

☒ Printer

Model Number	C2642A
Serial Number	MY75J1D1D0
FCC ID	B94C2642X
Manufacturer	HP
Data Cable	Shielded, Detachable, 1.5m
Power Adapter	NMB, M/N: C2175A

Cable for AC IN: Non-shielded, Undetachable, 0.7m

Cable for AC Out: Non-shielded, Undetachable, 1.5m

☒ USB Mouse

Model Number	M-UB48
Serial Number	LTC74800118
FCC ID	DZL211137
Manufacturer	Logitech
Data Cable	Shielded, Undetachable, 1.8m

☒ USB Joystick

Model Number	JPD110
Serial Number	9814A15646
FCC ID	Doc
Manufacturer	Maxxtro
Data Cable	Shielded, Undetachable, 1.7m

☒ MO

Model Number	CS-640
Serial Number	N/A
FCC ID	Doc
Manufacturer	Fujitsu

2.3 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 3 meters.

2.4 Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	24-27
Humidity (%RH)	25-75	50-65
Barometric pressure (mbar)	860-1060	950-1000

Site Description: November 3, 1998 File on

Federal Communications Commission

FCC Engineering Laboratory

7435 Oakland Mills Road

Columbia, MD 21046

Reference 31040/SIT1300F2

September 30, 1998 Accreditation on NVLAP

NVLAP Lab Code: 200347-0

December 8, 1998 Registration on VCCI

Registration No. for Conducted Emission C-858

Registration No. for Radiated Emission R-823

Name of firm : Quietek Corporation

Site location : No.75-1, Wang-Yeh Valley, Yung-Hsing Tsuen,
Chiung-Lin, Hsin-Chu County, Taiwan, R.O.C.

Quietek Corporation

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Rev. 1

Accredited Lab. OF BCIQ, NVLAP, VCCI, TUV

NVLAP Lab. Code : 200347-0

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Chiung-Lin, Hsin-Chu County, Taiwan, R.O.C.
Tel : 03-592-8858, Fax : 03-592-8859

3. Conducted Power Line Test

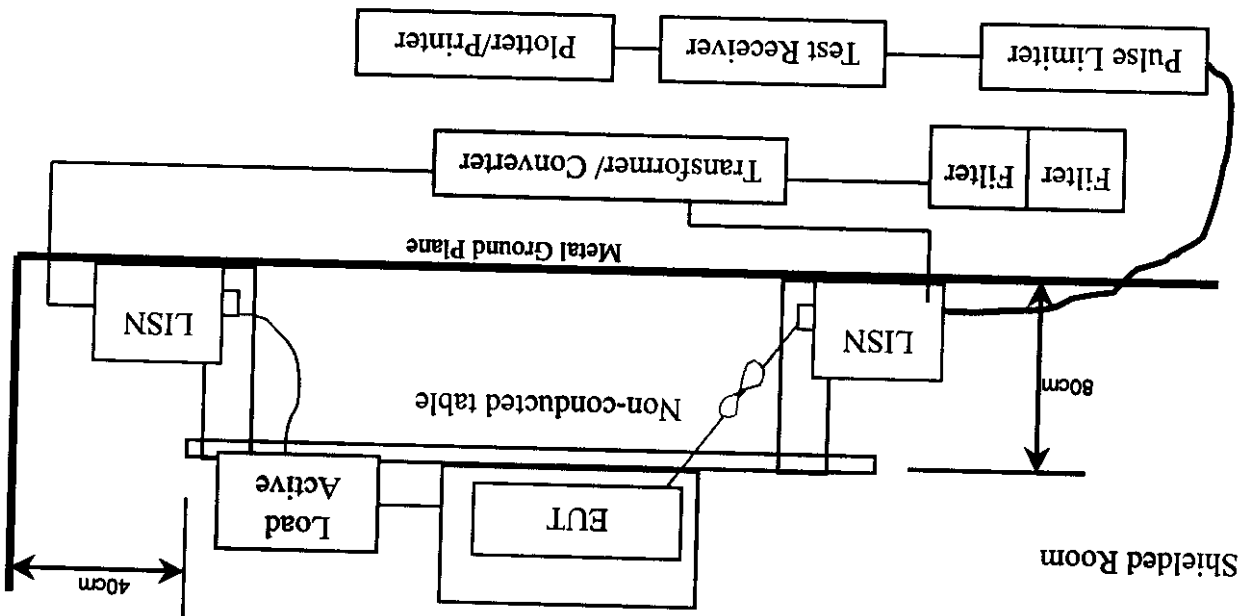
3.1 Test Equipments

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

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/17	May, 1998	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 1998	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 1998	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	N/A	
5	NO.2 Shielded Room			N/A	

Note: All equipment upon which need to calibrated are with calibration period of 1 year.

3.2 Block Diagram of Test Setup



3.3 Conducted Powerline Emission Limit

> FCC Part 15 Subpart B Limits

Frequency	Class A		Class B	
	Maximum RF Line Voltage			
MHz	UV	DBuV	uV	dBuV
0.45 - 1.705	1000	60.0	250	48.0
1.705 - 30	3000	69.5	250	48.0

Remarks : 1. RF Line Voltage (dBuV) = $20 \log \text{ RF Line Voltage (uV)}$

2. In the Above Table, the tighter limit applies at the band edges.

3.4 EUT Configuration on Measurement

The equipments which is listed 3.2 are installed on Conducted Power Line Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

3.5 EUT Exercise Software

The EUT exercise program used during conducted testing was designed to exercise the EUT in a manner similar to a typical use. The exercise sequence is listed as below:

- 3.5.1 Setup the EUT and simulators as shown on 3.2
- 3.5.2 Turn on the power of all equipment.
- 3.5.3 Boot the PC from Hard Disk .
- 3.5.4 PC reads test software from disk and then sent to scanner..
- 3.5.5 The Scanner (EUT) will start to operate and scan the video figure into PC.
- 3.5.6 PC will display "video figure" on monitor.
- 3.5.7 Printer and modem will keep at standby mode during Scanner operation.
- 3.5.8 Repeat the above procedure 3.5.4 to 3.5.7

3.6 Test Procedure

The EUT is connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm/50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

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

The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 10Khz. The frequency range from 0.45 MHz to 30 MHz is checked.

3.7 Conducted Emission Data

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages.

The uncertainty is calculated in accordance with NAMAS NIS 81. The total uncertainty for this test is as follows:

- Uncertainty in the field strength measured: $< \pm 2.0 \text{ dB}$

CONDUCTED EMISSION DATA

Date of Test	:	December 28, 1998	Temperature	:	23 °C
EUT	:	Scanner	Humidity	:	61 %
Test Mode	:	Normal	Detector Mode	:	Quasi-Peak

Frequency	Cable	LISN	Reading Level	Measurement Level	Limits
MHz	Loss Factor	dB	dBuV	dBuV	dBuV

0.536	0.07	0.10	29.13	29.30	48.00
3.388	0.18	0.15	33.20	33.53	48.00
11.235	0.29	0.24	34.99	35.52	48.00
16.001	0.33	0.37	33.53	34.23	48.00
20.005	0.38	0.42	30.61	31.50	48.00
24.005	0.38	0.52	30.61	31.50	48.00

Remarks :

1. " * " means that this data is the worse emission level.
2. All readings are Quasi-peak and average values.

Attached individual pages of peak scan curve data sheets.

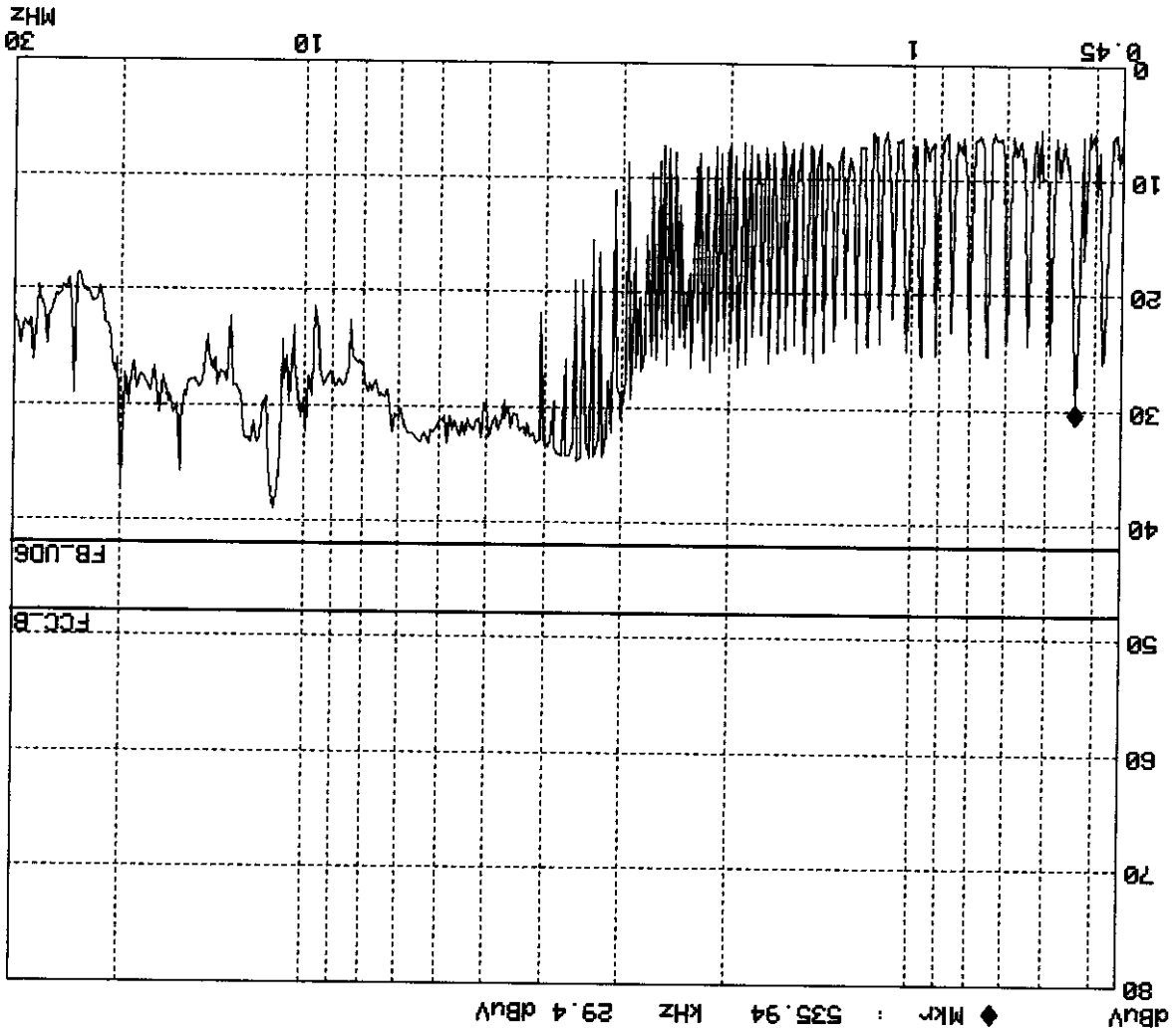
Manuf: MUSTEK CORPORATION
Operator: Jeff
Test Spec: AC 120V/60Hz
M/N: 1200FS
LINE 1
File name: FCC15B.SPC
Date: 24. Dec 98 13:39

Overview Scan Settings (1 Range)

Start 450k
Stop 30M
Step 3.9k
IF BW 9k
Detector PK
M-Time 0.10ms
Atten Pream OFF

Final Measurement: X QP

Meas Time: 1 s
Subranges: 8
Acc Margin: 6dB



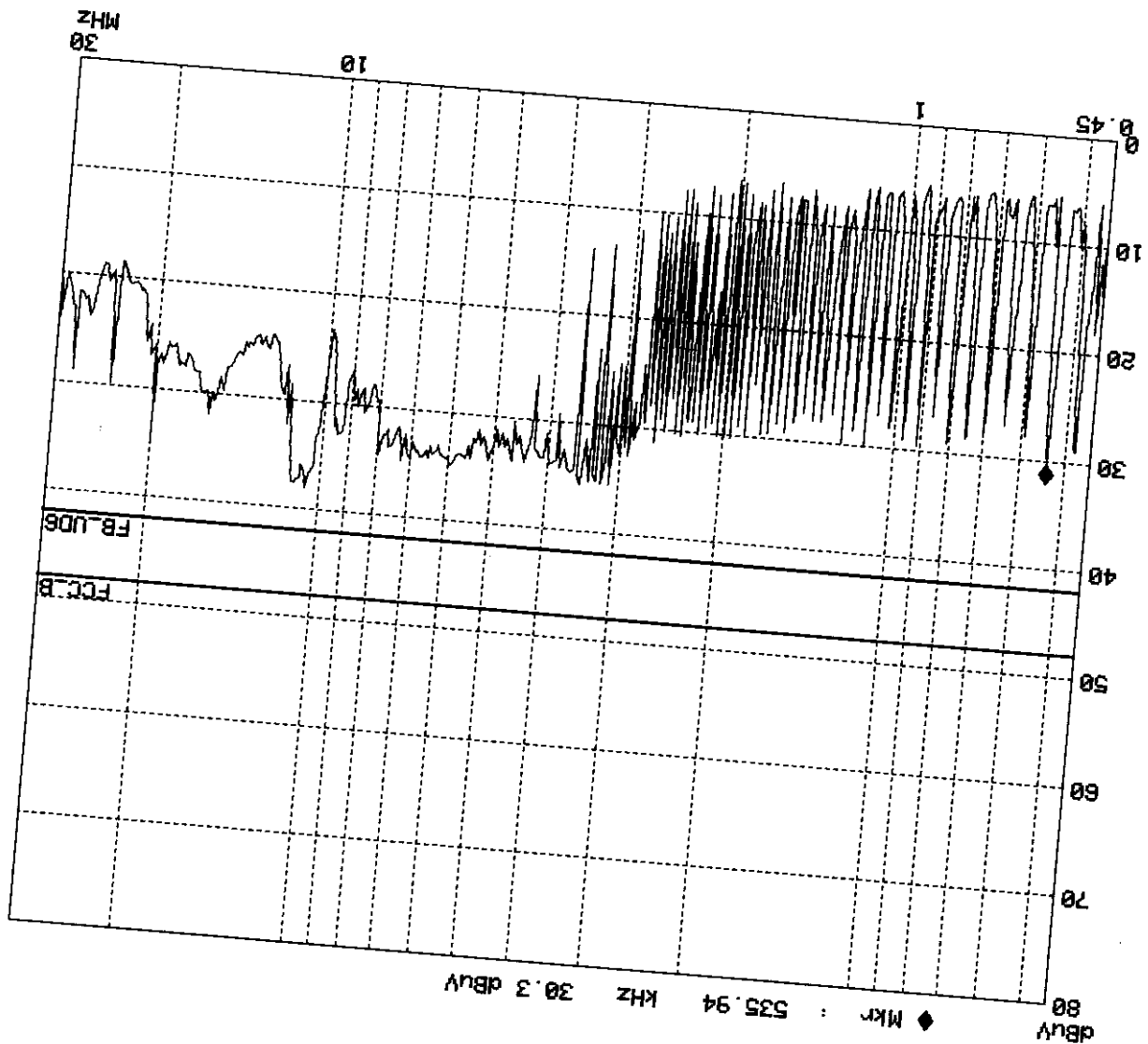
- Remarks :
1. " * " means that this data is the worse emission level.
 2. All readings are Quasi-peak and average values.
- Attached individual pages of peak scan curve data sheets.

0.536	0.07	0.11	0.15	0.11	0.10	29.85	30.02	27.77	35.38	34.43	30.37	37.88	8.00
1.130	0.11	0.17	0.22	0.37	0.45	29.67	29.07	33.93	35.05	33.93	30.37	37.88	8.00
3.282	0.17	0.28	0.37	0.45	0.35	29.67	29.07	33.93	35.05	33.93	30.37	37.88	8.00
10.602	0.28	0.37	0.45	0.35	0.35	29.67	29.07	33.93	35.05	33.93	30.37	37.88	8.00
16.003	0.33	0.37	0.45	0.35	0.35	29.67	29.07	33.93	35.05	33.93	30.37	37.88	8.00
20.005	0.35	0.37	0.45	0.35	0.35	29.67	29.07	33.93	35.05	33.93	30.37	37.88	8.00

Frequency	Cable	Loss	Factor	LISN	Reading Level	Measurement Level	Limits
MHz	dB	dB	dB	dB	Line2	Line2	dBuV

Date of Test	EUT	Test Mode	Normal	Detector Mode	Quasi-Peak
			Scanner	Humidity	61 %
			December 28, 1998	Temperature	23 °C

CONDUCTED EMISSION DATA



Operator: Jeff
 Test Spec: AC 120V/60Hz
 Comment: M/N:1200FS
 File name: FCC15B.SPC
 Date: 24. Dec 98 13:30

Overview Scan Settings (1 Range)
 Start 450k
 Stop 30M
 Step 3.9k
 IF BW 9k
 Detector PK
 Receiver Settings M-Time 0.10ms
 Atten Preamplifier OFF

Final Measurement: X QP
 Meas Time: 1 s
 Subranges: 8
 Acc Margin: 6dB

4. Radiation Emission Test

4.1 Test Equipment

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

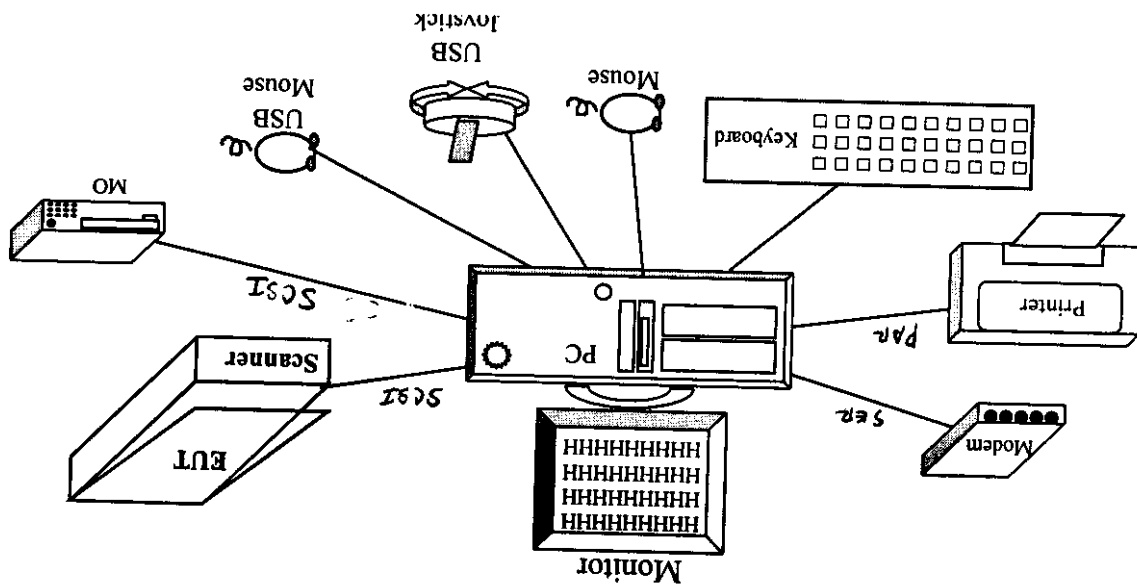
Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
SITE # 1	X	Test Receiver	R & S	ESCS 30 / 825442/14
		Spectrum Analyzer	Advantest	R3261C / 71720140
		Pre-Amplifier	HP	8447D/3307A01812
	X	Bilog Antenna	Chase	CBL6112B / 12452
SITE # 2	X	Horn Antenna	EM	EM6917 / 103325
	X	Test Receiver	R & S	ESCS 30 / 825442/17
		Spectrum Analyzer	Advantest	R3261C / 71720609
		Pre-Amplifier	HP	8447D/3307A01814
	X	Bilog Antenna	Chase	CBL6112B / 2455
	X	Horn Antenna	EM	EM6917 / 103325

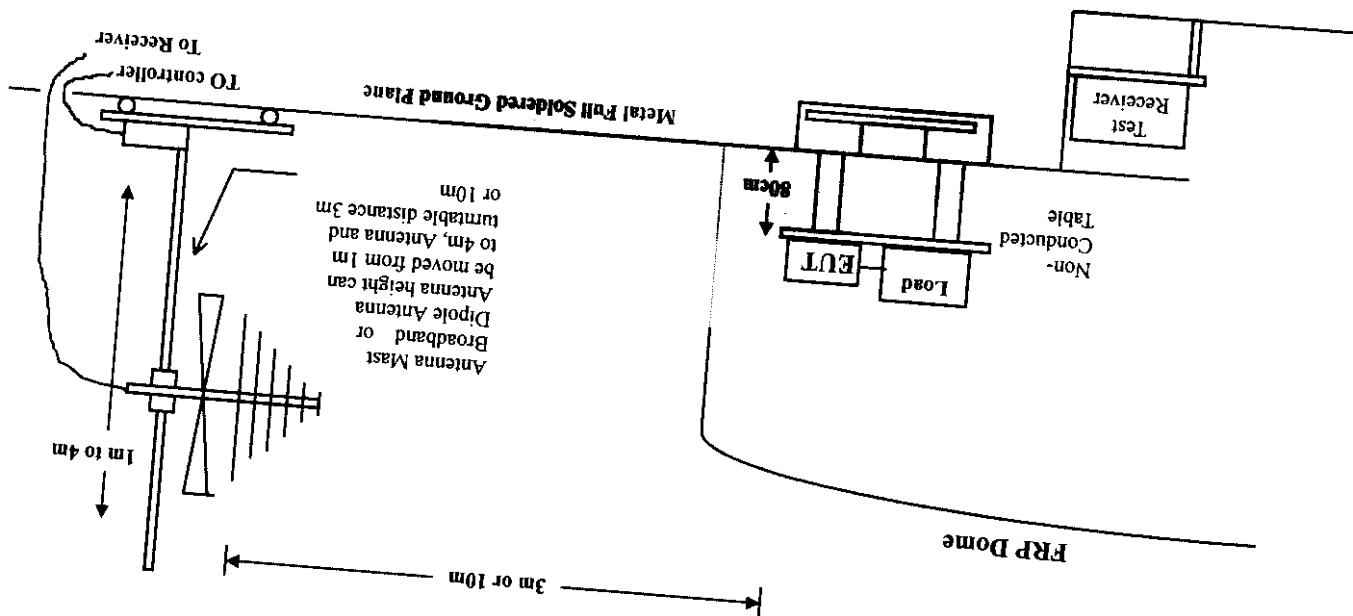
Note: 1. All equipment upon which need to calibrated are with calibration period of 1 year.
 2. Mark "X" test instruments are used to measure the final test results.

2. Test Site : ☒ Site #1 , ☐ Site #2

4.2 Test Setup

4.2.1 Block Diagram of Connections between EUT and simulators





4.3 Radiated Emission Limit

> FCC part 15 Subpart B Limits:

Remarks : 1. RF Line Voltage (dBuV) = 20 log RF Line Voltage (uV)

Frequency	MHz	Meter	Distance	Field Strength
30 - 88	3	100	uV/M	dBuV/M
88 - 216	3	150		40.0
216 - 960	3	200		43.5
960 - 2000	3	500		46.0
				54.0

2. In the Above Table, the tighter limit applies at the band edges.
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.

4.4 EUT Configuration

The equipments which is listed 4.2.1 are installed on Radiated Emission Test to meet the Commission requirement and operating in a manner which tends to maximize its emission characteristics in a normal application.

Same as Conducted Power Line Test which is listed in 3.5.

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3 meters away from the receiving antenna which is 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 bi-log and horn antenna) are used as a receiving antenna. Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4-1992 on radiated measurement.

The bandwidth below 1Ghz setting on the field strength meter (R&S Test Receiver ESCS 30) is 120 KHz, above 1Ghz are 1 MHz.

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

The initial step in collecting radiated data is a spectrum analyzer peak scan of the measurement range for all the test modes. Then the worst modes were reported the following data pages.

• The uncertainty is calculated in accordance with Namias NIS 81. The total uncertainty for this test is as follows:
 $< \pm 4.0 \text{ dB}$

RADIATED EMISSION DATA

Date of Test	:	December 28, 1998
EUT	:	Scanner
Test Mode	:	Normal
Temperature	:	23 °C
Humidity	:	61 %

Frequency	Cable	Ant	Reading Level	Emission Level	Limits Ant Table
MHz	dB	dB/m	Horizontal	Horizontal	Pos Pos
			dBuV/m	dBuV/m	cm deg

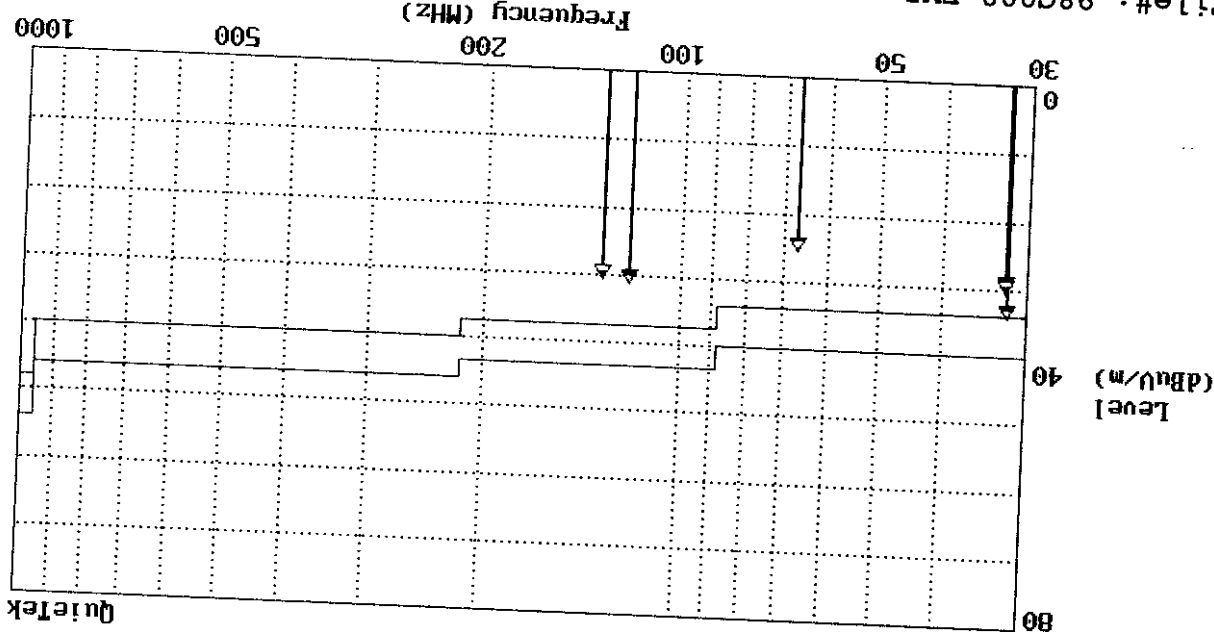
31.966	1.17	18.46	14.63	34.26	40.00	400	0
32.005	1.17	18.46	10.56	30.19	40.00	400	0
32.048	1.17	18.46	11.02	30.65	40.00	400	0
66.820	1.50	6.31	17.65	25.47	40.00	400	0
120.000	2.02	12.81	16.32	31.14	43.50	400	23
132.300	2.13	12.64	15.96	30.73	43.50	400	29

Remarks:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
2. " * ", means this data is the worse emission level.
3. Emission Level = Reading Level + Antenna Factor + Cable loss

File#: 98C008.RMI - 9
 Site: Quietek
 Limit: FCC CLASS-B 3m
 EUT: SCANNER 1200FS
 Power: AC 120V/60Hz
 Note:

Discrete Date: 12-28, 1998 Mon Time: 05:12:31 pm
 Probe: QTKANT-01A Horizontal
 Margin: 6 dB
 Std:
 Trace:



File#: 98C008.RMI - 9
 Site: Quietek
 Limit: FCC CLASS-B 3m
 EUT: SCANNER 1200FS
 Power: AC 120V/60Hz
 Note:

Discrete Date: 12-28, 1998 Mon Time: 05:12:31 pm
 Probe: QTKANT-01A Horizontal
 Margin: 6 dB

Frequency	Measure Level	Reading Level	Over Limit	Limit	Probe Factor	Cable Loss	Amp Factor	Ant Pos	Tabl
31.966	34.26	14.63	-5.74	40.00	18.46	1.17	0.00	400	0
32.005	30.19	10.56	-9.81	40.00	18.46	1.17	0.00	400	0
32.048	30.65	11.02	-9.35	40.00	18.46	1.17	0.00	400	0
66.820	25.47	17.65	-14.53	40.00	6.31	1.50	0.00	400	0
120.000	31.14	16.32	-12.36	43.50	12.81	2.02	0.00	400	23
132.300	30.73	15.96	-12.77	43.50	12.64	2.13	0.00	400	29

Quietek

RADIATED EMISSION DATA

Date of Test	:	December 28, 1998
EUT	:	Scanner
Test Mode	:	Normal
Temperature	:	23 °C
Humidity	:	61 %

Frequency	Cable	Ant	Reading Level	Emission Level	Limits Ant Table
MHz	dB	dB/m	Vertical	dBuV/m	Pos Pos
				dBuV/m	cm deg

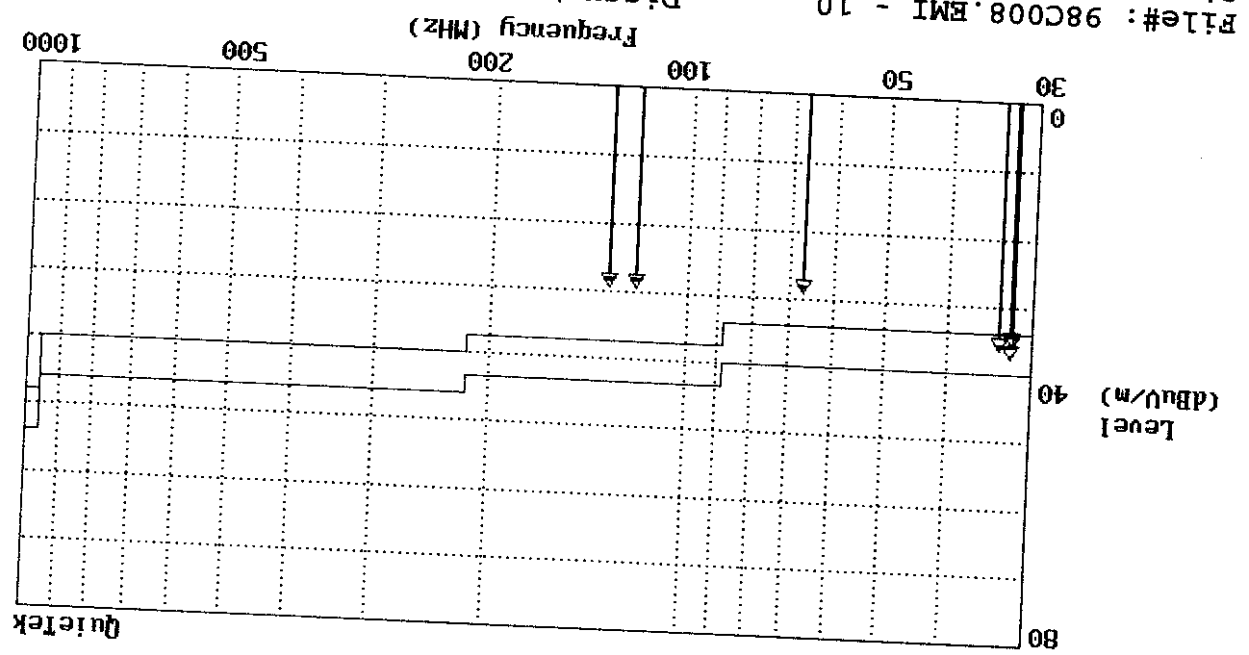
31.966	1.17	18.34	16.56	36.07	40.00	100	0
32.006	1.17	18.34	18.32	37.83	40.00	100	0
32.047	1.17	18.34	16.32	35.83	40.00	100	0
33.410	1.19	18.09	17.32	36.59	40.00	100	15
66.820	1.50	8.15	19.65	29.30	40.00	100	36
119.998	2.02	11.85	15.64	29.50	43.50	100	74
132.304	2.13	11.50	15.97	29.60	43.50	100	98

Remarks:

1. All Readings below 1GHz are Quasi-Peak, above are average value.
4. " * ", means this data is the worse emission level.
5. Emission Level = Reading Level + Antenna Factor + Cable loss

Site : Quietek
 Limit: FCC CLASS-B 3m
 EUT : SCANNER 1200FS
 Power: AC 120V/60Hz

Discrete Date : 12-28,1998 Mon Time: 05:14:41 pm
 Probe : QTKANT-01A Vertical
 Margin: 6 dB
 Std :
 Trace :



File#: 98C008.EMI - 10
 Site : Quietek
 Limit: FCC CLASS-B 3m
 EUT : SCANNER 1200FS
 Power: AC 120V/60Hz
 Note :
 Discrete Date : 12-28,1998 Mon Time: 05:14:41 pm
 Probe : QTKANT-01A Vertical
 Margin: 6 dB

Frequency	Measure Level	Reading Level	Over Limit	Limit	Probe Factor	Cable Loss	Amp Factor	Ant Pos	Tabl
31.966	36.07	16.56	-3.93	40.00	18.34	1.17	0.00	100	0
32.006	37.83	18.32	-2.17	40.00	18.34	1.17	0.00	100	0
32.047	35.83	16.32	-4.17	40.00	18.34	1.17	0.00	100	0
33.410	36.59	17.32	-3.41	40.00	18.09	1.19	0.00	100	15
66.820	29.30	19.65	-10.70	40.00	8.15	1.50	0.00	100	36
119.998	29.50	15.64	-14.00	43.50	11.85	2.02	0.00	100	74
132.304	29.60	15.97	-13.90	43.50	11.50	2.13	0.00	100	98

Quietek

5.

Summarization of Test Results

The test results in the conducted and radiated emission were performed according to the requirements of measurement standard and process. Quietek Corporation is assumed full responsibility for the accuracy and completeness of these measurements. The summarization of the worst value of conducted and radiated emission test is described as below:

➤ The worse value of Conducted Emission Test

Frequency (MHz)	Line	Measurement Level (dB(uV))	Limit Level (dB(uV))	Comment
20.005	L1	37.88	48.00	Pass
20.005	L2	37.88	48.00	Pass

➤ The worse value of Radiated Emission Test

Frequency (MHz)	Polarization	Measurement Level (dB(uV))	Limit Level (dB(uV))	Comment
31.966	H	34.26	40.00	Pass
32.006	V	37.83	40.00	Pass

6. EMI Reduction Method During Compliance Testing

No modification was made during testing.