

QTK 98-F006

**FCC Test Report
Application for Certification
Class II Permissive Change
On Behalf Of
Mustek Systems Inc.
Scanner
Model : A3 II T**

Project Name: A3 II T

FCC ID : HWFA3II

**Prepared For:
Mustek Systems Inc.
No. 25, R&D Rd., 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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QTK98-F006**1. Test Report Certification****Applicant** : Mustek Systems Inc.**Manufacturer** : Mustek Systems Inc.**EUT Description**

(A) Model Name : Scanner

(B) Model No. : A3 II T

(C) Serial Number : N/A

(D) FCC ID. : HWFA3II

(E) 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 QuieTek 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 QuieTek 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.

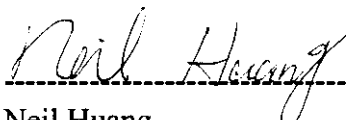
Test Date : November 04, 1998

Documented by : Kathy Lee

NVLAP®

Test Engineer:

Approve & Authorized Signer:


Neil Huang
Gene Chang

2. General Information

QTE 98-F006

2.1 Production Description

Description : Scanner *WITH OPTIONAL TRANSPARENCY ADAPTER*
Model Number : A3 II T
Serial Number : N/A
FCC ID. : HWFA3II
Applicant : Mustek Systems Inc.
Address : No. 25, R&D Rd., II, Science-Based Industrial Park,
Hisn-Chu , Taiwan, R.O.C.
Manufacturer : Mustek Systems Inc.
Address : No. 25, R&D Rd., II, Science-Based Industrial Park,
Hisn-Chu , Taiwan, R.O.C.
Power Adaptor #2 : YHI, M/N: YC-1015-15
Cable: Non-shielded, Undetachable, 1.2m
Bonded a ferrite core, but close to the EUT

*SCANNER INTERFACE CABLE : PROVIDED WITH SCANNER. INTERFACE CABLE
HAS 2 BONDED FERRITE CORES.*

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

* The EUT is a update model from FCC ID: HWFA3II

The difference is (1) added a top cover on the scanner. (2) change Model Number into A3IIT.

** ORIGINAL APPLICATION (TOK 98-F012) WAS GRANTED ON 3/31/98
CLOSE II CHANGE APPL (TOK 98-F039) WAS GRANTED ON 7/16/98*

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:

The types for all peripheral devices

☒ Host Personal Computer

Model Number	:	Serial 3564
Manufacturer	:	Compaq
FCC ID	:	DOC
CPU	:	Pentium II 233MHz, Clock: 66MHz
FDD	:	Mitsubish, MF355F-3490UC S/N: MF355F-3490UC
HDD	:	Seagate, ST34321A S/N: CT0000594
CD-ROM	:	Hitachi, CDR-8235 S/N: J7K132120
VGA Card	:	On board

☒ Scanner

Model Number	:	A3 EP
Serial Number	:	N/A
FCC ID	:	HWFA3II
Manufacturer	:	Mustek Systems Inc.

☒ Monitor

Model Number	:	CM752ET-311
FCC ID	:	DOC
Serial Number	:	T8F005799
Manufacturer	:	HITACHI

☒ Keyboard

Model Number	:	6311-TW2C
FCC ID	:	DOC
Serial Number	:	N/A
Manufacturer	:	ACER

☒ Printer

Model Number : C2642A
Serial Number : MY75N1D1D0
FCC ID : B94C2642X
Manufacturer : HP

☒ Modem

Model Number : 1414
Serial Number : 980033039
FCC ID : IFAXDM1414
Manufacturer : ACEEX

☒ Mouse

Model Number : M-S34
Serial Number : LZB75078478
FCC ID : DZL211029
Manufacturer : HP

☒ USB Camera

Model Number : PCC-300
Serial Number : Prototype
FCC ID : DOC
Manufacturer : KODAK

☒ GAMEPAD

Model Number : JPD110
Manufacturer : MAXXTRO
FCC ID : DOC

Description of the used cable in tested system

Item	Name	Shielded	Detachable	Length	Port Name	
					From	TO
1.	PC Power Cord	No	Yes	1.8m	PC	AC Socket
2.	Monitor Cable	Yes	No	1.5m	Monitor	PC
3.	Monitor Power Cord	Yes	Yes	1.8m	Monitor	AC Socket
4.	Keyboard Cable	Yes	No	1.2m	Keyboard	PC
5.	Modem Adaptor	No	Yes	1.9m	Modem	AC Socket
6.	Modem Data Cable	Yes	Yes	1.2m	Modem	PC Com1
7.	Printer Adaptor	No	Yes	1.9m	Printer	AC Socket
8.	Printer Data Cable	Yes	Yes	1.5m	Printer	PC Parallel
9.	Mouse Data Cable	Yes	No	1.5m	Mouse	PC PS2
10.	GAMEPAD Cable	No	Yes	1.8m	GAMEPAD	PC
11.	Camera	No	Yes	1.5m	Camera	PC

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

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.

3. Conducted Power Line Test

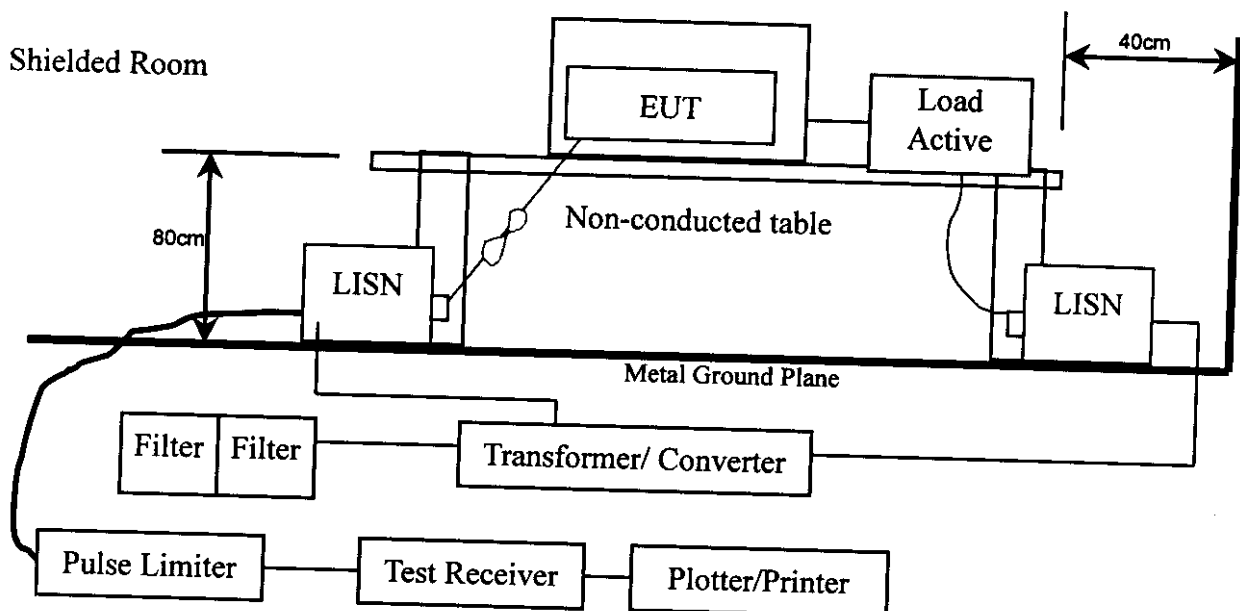
3.1 Test Equipments

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	N0.2 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	Maximum RF Line Voltage			
	Class A		Class B	
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) = $20 \log$ 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: $< \pm 2.0$ dB

CONDUCTED EMISSION DATA

Date of Test : Nov. 04, 1998
 EUT : Scanner
 Test Mode : Normal
 Detector Mode : Quasi-Peak & Average
 Temperature : 24.5 °C
 Humidity : 63 %
 Display Pattern : Video Figure

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level Line1 dBuV	Measurement Level Line1 dBuV	Limits dBuV
* 0.540	0.07	0.10	42.76	42.93	48.00
0.618	0.07	0.10	42.66	42.83	48.00
0.692	0.08	0.10	40.67	40.85	48.00
0.770	0.09	0.10	38.45	38.64	48.00
1.198	0.11	0.11	38.58	38.80	48.00
1.351	0.12	0.11	39.84	40.07	48.00

Remarks :

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

CONDUCTED EMISSION DATA

Date of Test	: Nov. 04, 1998	Temperature	: 24.5 °C
EUT	: Scanner	Humidity	: 63 %
Test Mode	: Normal	Display Pattern	: Video Figure
Detector Mode	: Quasi-Peak & Average		

Frequency	Cable	LISN	Reading Level	Measurement Level	Limits
MHz	Loss	Factor	Line2	Line2	
	dB	dB	dBuV	dBuV	dBuV
* 0.540	0.07	0.10	42.88	43.05	48.00
0.618	0.07	0.10	42.21	42.38	48.00
0.692	0.08	0.10	40.97	41.15	48.00
0.770	0.09	0.10	39.20	39.39	48.00
1.197	0.11	0.11	38.34	38.56	48.00
1.347	0.12	0.11	38.09	38.32	48.00

Remarks :

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

4. Radiation Emission Test

QTK98-F006

4.1 Test Equipment

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

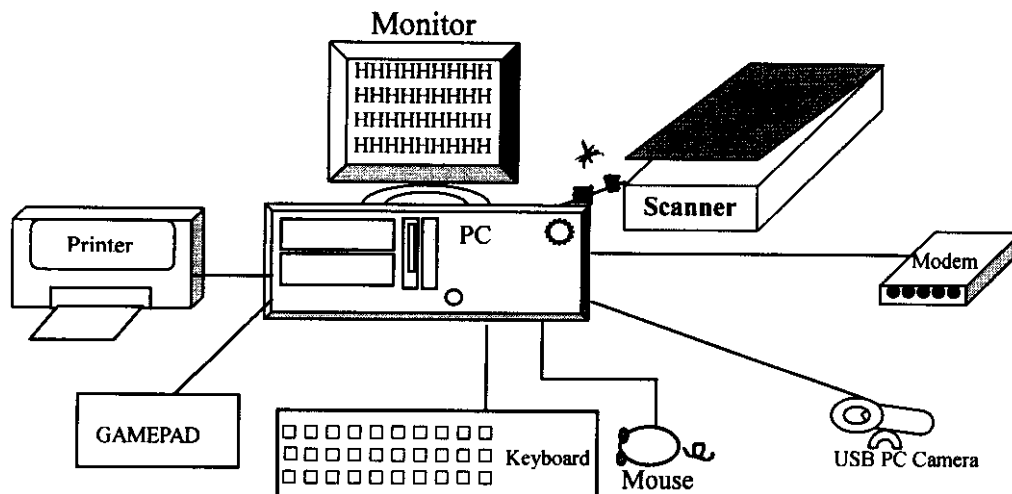
Test Site	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	Remark
SITE # 1	Test Receiver	R & S	ESCS 30 / 825442/14	May, 1998	
	Spectrum Analyzer	Advantest	R3261C / 71720140	May, 1998	
	Pre-Amplifier	HP	8447D/3307A01812	May, 1998	
	Bilog Antenna	Chase	CBL6112B / 12452	Sep., 1998	
	Horn Antenna	EM	EM6917 / 103325	May, 1998	
	Dipole Antenna	Schwarzbeck	VHAP/866,UHAP/543	May, 1998	
SITE # 2	Test Receiver	R & S	ESCS 30 / 825442/17	May, 1998	
	Spectrum Analyzer	Advantest	R3261C / 71720609	May, 1998	
	Pre-Amplifier	HP	8447D/3307A01814	May, 1998	
	Bilog Antenna	Chase	CBL6112B / 2455	Sep., 1998	
	Horn Antenna	EM	EM6917 / 103325	May, 1998	
	Dipole Antenna	Schwarzbeck	VHAP/866,UHAP/543	May, 1998	

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

2. Test Site : ☒ Site #1 , ☐ Site #2

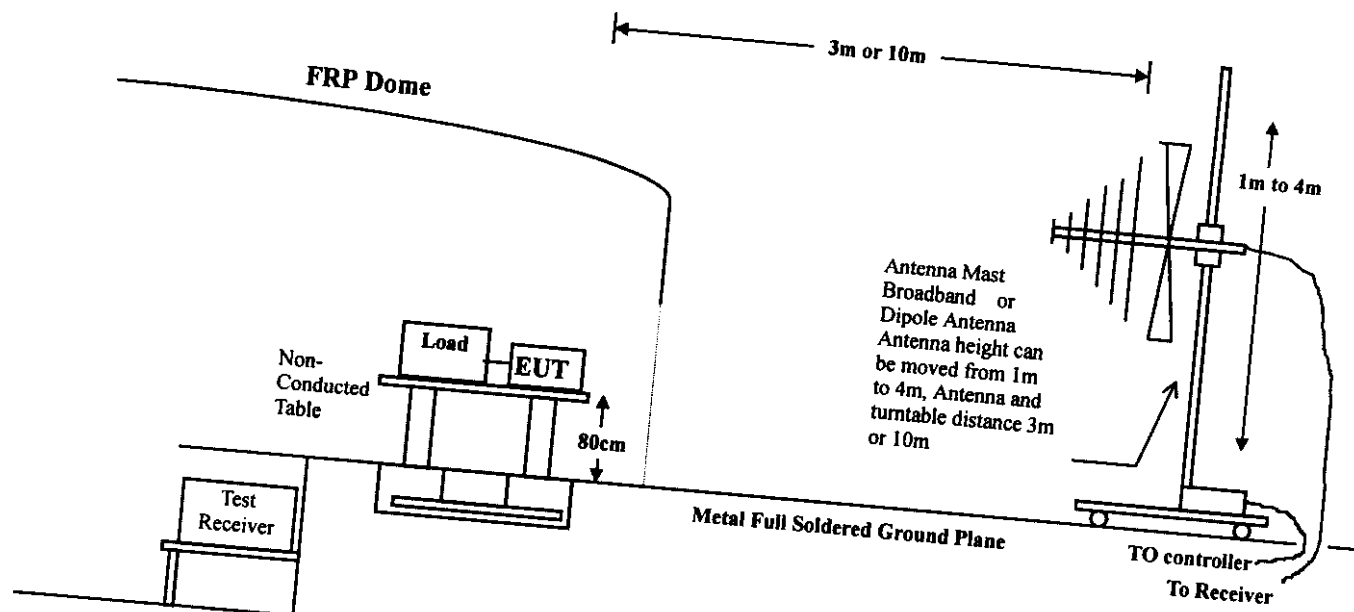
4.2 Test Setup

4.2.1 Block Diagram of Connections between EUT and simulators



* SCANNER (EUT) IS PROVIDED WITH INTERFACE CABLE WITH 2 FERRITE CORES.

4.2.2 Open Test Site Setup Diagram



4.3 Radiated Emission Limit

[] FCC part 15 Subpart B Limits:

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

- 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. 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.

4.5 Operating Condition of EUT

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

4.6 Test Procedure

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.

4.7 Radiated Emission Data

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 Nemas NIS 81. The total uncertainty for this test is as follows:

- Uncertainty in the field strength measured: $< \pm 4.0 \text{ dB}$

Radiated Emission Data

Date of Test	:	Nov. 04, 1998	Temperature	:	24.5 °C
EUT	:	Scanner	Humidity	:	63 %
Test Mode	:	Normal	Display Pattern	:	Video Figure

Frequency	Cable	Loss	Factor	Ant	Reading Level	Emission Level	Limits	Ant	Table
MHz	dB	dB/m	Vertical	dBuV/m	Vertical	dBuV/m	cm	deg	
40.003	1.24	13.65	19.23	34.12	40.00	99	168		
47.001	1.32	9.88	13.55	24.75	40.00	99	168		
64.531	1.48	7.64	10.65	19.77	40.00	99	168		
* 75.882	1.59	9.13	24.11	34.83	40.00	99	176		
154.227	2.35	10.38	6.82	19.54	43.50	99	168		
209.688	2.89	9.69	4.02	16.60	43.50	99	168		

- 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