Test Report Certification

QuieTek Corporation

No.75-1, Wang-Yeh Valley, Yung-Hsing, Chiung-Lin,
Hsin-Chu County, Taiwan, R.O.C.
Tel : 886-3-592-8858, Fax: 886-3-592-8859
E-Mail : quietek@ms24.hinet.net

Accredited by NIST(NVLAP), VCCI, BSMI, DNV, TUV

Applicant	: Mustek Systems Inc.
Address	: No.25, R&D Road II, Science-Based Industrial Park, Hsin-Chu , Taiwan, R.O.C.
Equipment Type	: Scanner
Model	: 1200 USB
FCC ID.	: HWFA4USB
Measurement Standard	: CISPR 22/1994
Measurement Procedure	: ANSI C63.4 /1992
Operation Voltage	: 120Vac/60Hz
Classification	: Class B
Test Result	: Complied
Test Date	: March 26, 1999
Report No.	: 993025F

The Test Results relate only to the samples tested.
The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.
This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Documented by: Kim Hung	Test Engineer: Jeff Chen	Approved: Gene Chang

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QTK 99-F007

1. General Information

1.1 EUT Description

Applicant	: Mustek Systems Inc.
Address	No.25, R&D Road II, Science-Based Industrial Park, Hsin-Chu , Taiwan, R.O.C.
Equipment Type	: Scanner
Model	: 1200 USB
FCC ID	: HWFA4USB
Operation Voltage	: 120Vac/60Hz
USB Data Cable	: Shielded, 1m Bonded a ferrite cores (2ea)
Power Adapter	: (1) HITRON, HES10B-1210-0-S Non-shielded, 1.8m, bonded a ferrite core (2)YHI, YS-1012-U12 Non-shielded, 1.8m, bonded a ferrite core

Remark: 1. This EUT is a upgrade version of original model 1200 USB (FCC ID: HWFA4USB). The difference is to re-layout the Main Board.
2. The data shown in this report reflects the worst-case data for each operation mode.

3. ALTERNATE ASIC BY MUSTEK, TYPE MA1017 WITH SAME 12 MHZ CLOCK FREQUENCY.
4. ALT AC ADAPTORS

1.2 Tested System Details

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

☒ Scanner (EUT)

Model Number	: 1200 USB
Serial Number	: N/A
Manufacturer	: Mustek System Inc.
Power Adapter	: (1) HITRON, HES10-1210-0-3 N on-shielded, 1.8m, bonded a ferrite core (2)YHI, HES10B-1210-0-S Non-shielded, 1.8m, bonded a ferrite core

☒ Host Personal Computer

Model Number	: PIIL97
Manufacturer	: ASUS
Serial Number	: AS10233
FCC ID	: DoC
Power Cord	: Non-Shielded, 1.8m

☒ Monitor

Model Number	: CM752ET-311
Serial Number	: T8F005799
FCC ID	: DoC
Manufacturer	: HITACHI
Data Cable	: Shielded, 1.5m
Power Cord	: Shielded, 1.8m

☒ Keyboard

Model Number	: 6311-TW2C
Serial Number	: N/A
FCC ID	: DoC
Manufacturer	: ACER
Data Cable	: Shielded,, 1.8m

☒ Mouse

Model Number	: M-S34
Serial Number	: LZB71178588
FCC ID	: DZL211029
Manufacturer	: HP
Data Cable	: Shielded, 1.8m

☒ Modem

Model Number	: 1414
Serial Number	: 980033034
FCC ID	: IFAXDM1414
Manufacturer	: ACEEX
Data Cable	: Shielded,, 1.5m
Power Adapter	: ACCEX, M/N: SCP41-91000A Cable Output : Shielded,, 1.5m

☒ Modem

Model Number	: 1414
Serial Number	: 980033039
FCC ID	: IFAXDM1414
Manufacturer	: ACEEX
Data Cable	: Shielded,, 1.5m
Power Adapter	: ACCEX, M/N: SCP41-91000A Cable Output : Shielded,, 1.5m

☒ Printer

Model Number	: C2642A
Serial Number	: MY75N1D2BC
FCC ID	: B94C2642X
Manufacturer	: HP
Data Cable	: Shielded,, 1.2m
Power Adapter	: NMB, M/N: C2175A Cable for AC IN: Non-shielded,, 0.7m Cable for AC Out: Non-shielded,, 1.5m

☒ CCD

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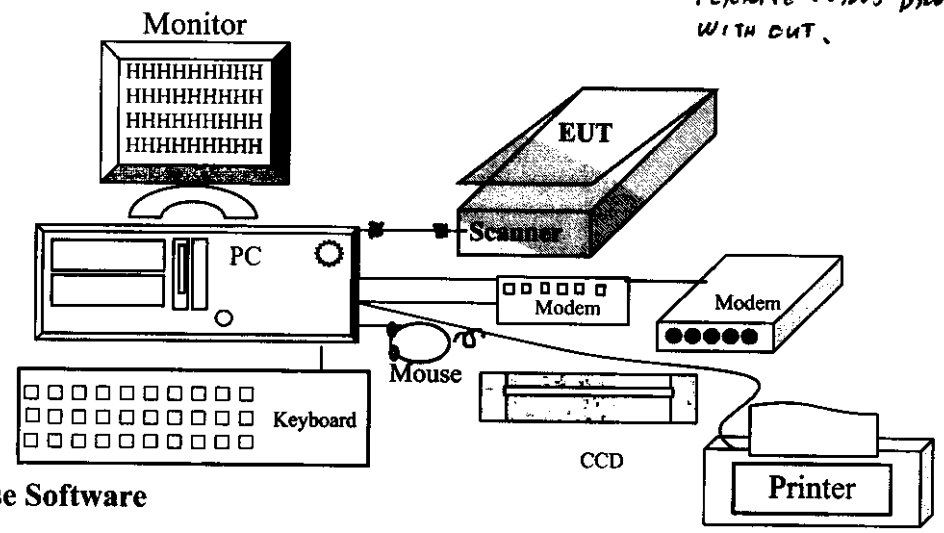
Model Number	: WCAM-3X
Serial Number	: N/A
Manufacturer	: MUSTEK
FCC ID	: DoC
Data Cable	: Shielded, 1.5m

1.3 EUT Configuration

■ FERRITE CORE / INTERFACE CABLE WITH FERRITE CORES PROVIDED WITH EUT.



1.4 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:

1.4.1 Setup the EUT and simulators as shown on 1.3

1.4.2 Turn on the power of all equipment.

1.4.3 Boot the PC from Hard Disk .

1.4.4 PC reads test software from disk and then sent to EUT

1.4.5 The scanner (EUT) will start to operate and capture the video figure into PC.

1.4.6 PC will display "video figure" on monitor.

1.4.7 Printer and modem will keep at standby mode during Scanner operation.

1.4.8 Repeat the above procedure 1.4.4 to 1.4.7

1.5 Test performed

Conducted emissions were invested over the frequency range from **0.15MHz to 30MHz** using a receiver bandwidth of 9KHz.

Radiated emissions were invested over the frequency range from **30MHz to 1000MHz** using a receiver bandwidth of 120KHz. Radiated testing was performed at an antenna to EUT distance of 10 meters .

1.6 Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
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

February 23, 1999 Accreditation on DNV
Statement No. : 413-99-LAB11

December 8, 1998 Registration on VCCI
Registration No. for No.2 Shielded Room C-858
Registration No. for No.1 Open Area Test Site R-823
Registration No. for No.2 Open Area Test Site R-835

January 04, 1999 Accreditation on TUV Rheinland
Certificate No.: I9865712-9901

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.

2. Conducted Emission

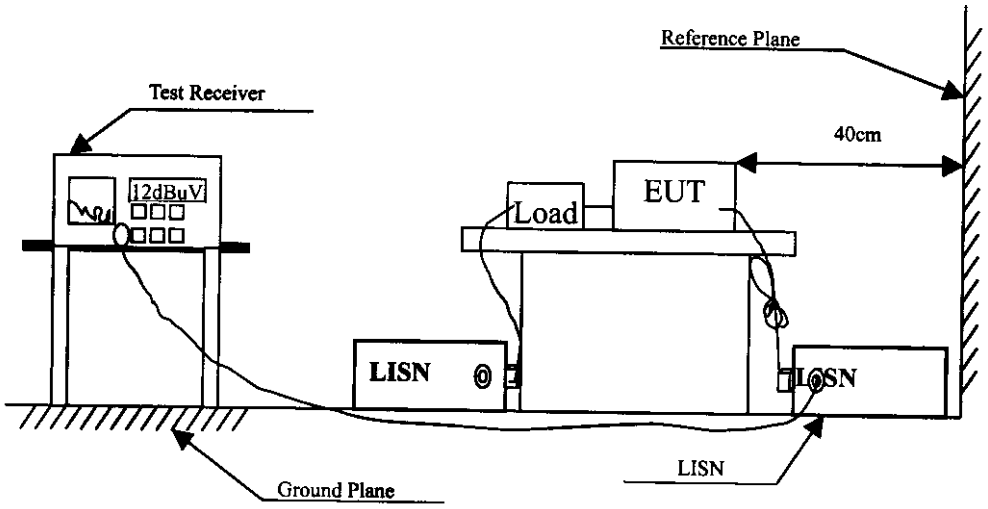
2.1 Test Equipment List

The following test equipment are used during the conducted emission test:

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-Z2/345J2356	May, 1998	
5	N0.2 Shielded Room			N/A	

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

2.2 Test Setup



2.3 Limits

CISPR 22 Limits (dBuV)					FCC Part 15 Subpart B (dBuV)				
Frequency MHz	Class A		Class B		Frequency MHz	Class A		Class B	
	QP	AV	MHz	AV		uV	dBuV	uV	dBuV
0.15 - 0.50	79	66	66-56	56-46	0.45-1.705	1000	60.0	250	48.0
0.50-5.0	73	60	56	46	1.705-30	3000	69.5	250	48.0
5.0 - 30	73	60	60	50					

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

2.4 Test Procedure

The EUT and simulators are 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 refers 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 equipment 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 9KHz.

2.5 Test Results

The emission from the EUT was below the specified limits. The worst case emissions are shown in Chapter 4. The acceptance criterion was met and the EUT passed the test.

3. Radiated Emission

3.1 Test Equipment

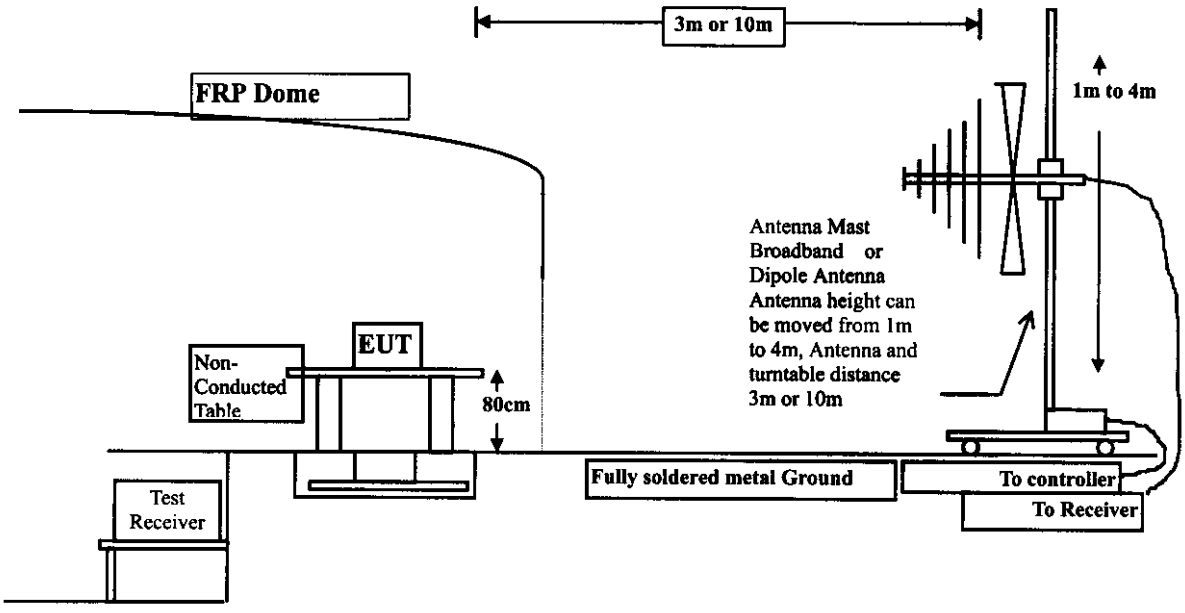
The following test equipment are used during the radiated emission test:

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

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.

3.2 Test Setup



3.3 Limits

CISPR 22 Limits (dBuV)					FCC Part 15 Subpart B (dBuV)				
Frequency MHz	Class A		Class B		Frequency	Class A		Class B	
	Distance (m)	dBuV/m	Distance (m)	dBuV/m		uV	dBuV	uV	dBuV
30 – 230	10	40	10	30	30 – 88	90	39	100	40.0
230 – 1000	10	47	10	37	88 – 216	150	43.5	150	43.5
					216 –960	210	46.5	200	46.0
					960 - 2000	300	49.5	500	54.0

Remark: 1. The tighter limit shall apply at the edge between two frequency bands.

2. 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. RF Line Voltage (dBuV) = 20 log RF Line Voltage (uV)

3.4 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. The EUT was positioned such that the distance from antenna to the EUT was 10 meters . The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

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.

3.5 Test Results

The emission from the EUT was below the specified limits. The worst case emissions are shown in Chapter 4. The acceptance criterion was met and the EUT passed the test.

4. Summary of Test Results

The test results in the emission was 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 test data of the emission and immunity are listed as the attached data.

All the tests were carried out with the EUT in normal operation, which was defined as:

(1) Mode 1 : HITRON: HES10B-1210-0-S

(2) Mode 2 : YHI:YS-1012-U12

The EUT passed all the tests.

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

➢ **Emission Test**

- Uncertainty in the Conducted Emission Test: < ± 2.0 dB
- Uncertainty in the field strength measured: < ± 4.0 dB

CONDUCTED EMISSION DATA

Date of Test	:	March 26, 1999	EUT	:	Scanner
Test Mode	:	Mode 1	Detect Mode	:	Quasi-Peak & Average

Frequency	Cable Loss	LISN Factor	Reading Level Line1	Measurement Level Line1	Limits
MHz	dB	dB	dBuV	dBuV	dBuV
0.176	0.01	0.10	45.64	45.75	64.65
0.201	0.02	0.10	35.46	35.58	63.55
*0.226	0.02	0.10	40.74	40.86	62.58
0.256	0.03	0.10	34.14	34.27	61.55
0.284	0.03	0.10	38.55	38.68	60.70
0.456	0.06	0.10	34.49	34.65	56.76

Average:

0.176	0.01	0.10	34.80	34.91	54.65
0.201	0.02	0.10	28.10	28.22	53.55
0.226	0.02	0.10	31.10	31.22	52.58
0.256	0.03	0.10	28.00	28.13	51.55
0.284	0.03	0.10	32.00	32.13	50.70
0.456	0.06	0.10	27.20	27.36	46.76

Remarks :

1. " * " means that this data is the worse emission level.

CONDUCTED EMISSION DATA

Date of Test	:	March 26, 1999	EUT	:	Scanner
Test Mode	:	Mode 1	Detect Mode	:	Quasi-Peak & Average

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level Line2 dBuV	Measurement Level Line2 dBuV	Limits dBuV
0.175	0.01	0.10	41.67	41.78	64.72
0.230	0.02	0.10	38.13	38.25	62.45
0.278	0.03	0.10	37.00	37.13	60.89
0.340	0.04	0.10	34.13	34.27	59.20
0.395	0.05	0.10	35.37	35.52	57.96
*0.623	0.08	0.10	38.90	39.08	56.00

Average:

0.175	0.01	0.10	33.60	33.71	54.72
0.230	0.02	0.10	33.00	33.12	52.45
0.278	0.03	0.10	29.80	29.93	50.89
0.340	0.04	0.10	29.30	29.44	49.20
0.395	0.05	0.10	30.10	30.25	47.96
0.623	0.08	0.10	30.40	30.58	46.00

Remarks :

1. " * " means that this data is the worse emission level.

CONDUCTED EMISSION DATA

Date of Test	:	March 26, 1999	EUT	:	Scanner
Test Mode	:	Mode 2	Detect Mode	:	Quasi-Peak & Average

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level Linel dBuV	Measurement Level Linel dBuV	Limits dBuV
*0.150	0.00	0.10	55.64	55.74	66.00
0.228	0.02	0.10	42.82	42.94	62.54
0.292	0.04	0.10	35.49	35.63	60.45
0.368	0.05	0.10	30.98	31.13	58.56
0.655	0.08	0.10	31.02	31.20	56.00
10.502	0.28	0.22	31.50	32.00	60.00

Average:

0.150	0.00	0.10	46.30	46.40	56.00
0.228	0.02	0.10	30.60	30.72	52.54
0.292	0.04	0.10	22.40	22.54	50.45
0.368	0.05	0.10	19.40	19.55	48.56
0.655	0.08	0.10	18.72	18.90	46.00
10.500	0.28	0.22	30.30	30.80	50.00

Remarks :

1. " * " means that this data is the worse emission level.

CONDUCTED EMISSION DATA

Date of Test	:	March 26, 1999	EUT	:	Scanner
Test Mode	:	Mode 2	Detect Mode	:	Quasi-Peak & Average

Frequency MHz	Cable Loss dB	LISN Factor dB	Reading Level Line2 dBuV	Measurement Level Line2 dBuV	Limits dBuV
*0.152	0.00	0.10	53.36	53.46	65.89
0.187	0.01	0.10	42.08	42.19	64.17
0.215	0.02	0.10	40.86	40.98	63.03
0.295	0.04	0.10	36.17	36.31	60.40
0.362	0.05	0.10	29.40	29.55	58.68
0.520	0.07	0.10	28.82	28.99	56.00

Average:

0.152	0.00	0.10	45.00	45.10	55.89
0.187	0.01	0.10	19.20	19.31	54.17
0.215	0.02	0.10	24.10	24.22	53.03
0.295	0.04	0.10	24.60	24.74	50.40
0.326	0.04	0.10	23.50	23.64	49.55
0.520	0.07	0.10	19.80	19.97	46.00

Remarks :

1. " * " means that this data is the worse emission level.

Radiated Emission Data

Date of Test : March 26, 1999 EUT : Scanner

Test Mode : Mode 1

Frequency MHz	Cable Loss dB	Ant Factor dB/m	Reading Level Horizontal dBuV/m	Emission Level Horizontal dBuV/m	Limits uV/m	Ant Pos cm	Table Pos deg
148.536	2.29	10.84	10.37	23.50	30	401	177
*204.050	2.83	9.38	11.34	23.55	30	401	177
214.900	2.93	9.01	3.31	15.25	30	401	177
235.700	3.13	10.95	1.75	15.83	37	401	177
259.562	3.35	13.82	11.87	29.05	37	401	177
275.900	3.52	12.91	1.17	17.61	37	401	177

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

Radiated Emission Data

Date of Test : March 26, 1999 EUT : Scanner

Test Mode : Mode 1

Frequency MHz	Cable Loss dB	Ant Factor dB/m	Reading Level Vertical dBuV/m	Emission Level Vertical dBuV/m	Limits uV/m	Ant Pos cm	Table Pos deg
49.640	1.34	7.80	2.15	11.29	30	100	177
52.620	1.36	6.99	4.80	13.16	30	100	177
76.400	1.60	7.23	4.95	13.78	30	100	177
79.380	1.63	6.62	13.05	21.30	30	100	177
*82.520	1.65	7.53	17.69	26.88	30	100	177
85.521	1.68	8.36	12.67	22.71	30	100	177

Remarks:

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

Radiated Emission Data

Date of Test : March 26, 1999 EUT : Scanner

Test Mode : Mode 2

Frequency MHz	Cable Loss dB	Ant Factor dB/m	Reading Level Horizontal dBuV/m	Emission Level Horizontal dBuV/m	Limits uV/m	Ant Table Pos cm	Table Pos deg
151.535	2.32	10.90	11.49	24.71	30	401	177
*157.535	2.38	10.34	12.14	24.86	30	401	177
160.535	2.40	10.32	11.29	24.01	30	401	177
169.535	2.50	9.56	9.20	21.26	30	401	177
214.535	2.92	8.97	12.44	24.34	30	401	177
220.535	2.99	9.53	9.35	21.87	30	401	177

Remarks:

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

Radiated Emission Data

Date of Test : March 26, 1999 EUT : Scanner

Test Mode : Mode 2

Frequency MHz	Cable Loss dB	Ant Factor dB/m	Reading Level Vertical dBuV/m	Emission Level Vertical dBuV/m	Limits uV/m	Ant Pos cm	Table Pos deg
57.300	1.41	6.65	3.31	11.37	30	100	177
*66.342	1.50	5.83	12.57	19.90	30	100	177
72.342	1.56	6.30	8.50	16.36	30	100	177
78.342	1.62	6.53	6.56	14.71	30	100	177
159.501	2.39	10.38	1.65	14.42	30	100	177
174.561	2.54	9.32	2.14	14.00	30	100	177

Remarks:

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

5. EMI Reduction Method During Compliance Testing

1. Added a ferrite core on the cable of motor.