

RFI / EMI TEST REPORT

APPLICANT : MAXTRONIC INTERNATIONAL CO., LTD.

E. U. T. : Disk Array (RAIO)

TRADE NAME : N/A

FCC ID : NKF-SILVERWORK II

REGULATION : CFR 47 , Part 15 Subpart B , **Class B**

TEST SITE : PEP Testing Laboratory

TEST ENGINEER : 

TEST DATE : 07 / 11 / 2000

ISSUED DATE : JULY / 27 / 2000

REPORT No. : E890376

VERIFICATION**WE HEREBY VERIFY THAT:**

The E. U. T. listed below has completed RFI testing by PEP Testing Laboratory and the interference emissions can pass **FCC Class B** limitations .

The tested configurations and the facility complies with the radiated and AC line conducted test site criteria in ANSI C63 .4 - 1992 .

Any data in this RFI report is “ **reference** ” only .

APPLICANT : MAXTRONIC INTERNATIONAL CO., LTD.*

PRODUCT : Disk Array (RAIO)*

FCC ID : NKF-SILVERWORK II*

MODEL : Silver Work II*



M. Y. TSUI / Manager

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1. GENERAL

1.1 GENERAL INFORMATION:

APPLICANT : MAXTRONIC INTERNATIONAL CO., LTD.

4F, NO. 529, CHUNG CHENG RD., HSIN
TIEN CITY, TAIPEI HSIEN, TAIWAN,
R. O. C.

MANUFACTURER : MAXTRONIC INTERNATIONAL CO., LTD.

4F, NO. 529, CHUNG CHENG RD., HSIN
TIEN CITY, TAIPEI HSIEN, TAIWAN,
R. O. C.

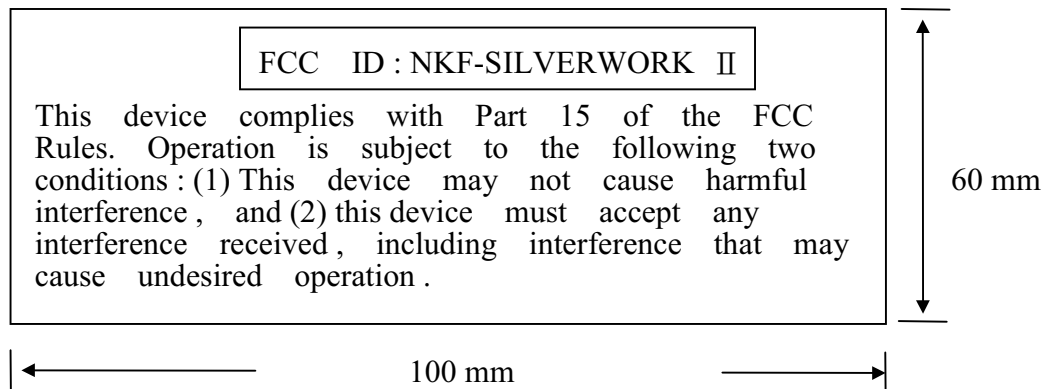
MEASUREMENT PROCEDURE : ANSI C63 , 4 - 1992

TESTED FOR COMPLIANCE WITH : Title 47 of CFR
Part 15 , Subpart B , Class B

1.2 PLACE OF MEASUREMENT PEP Testing Laboratory

1.3 LABELING REQUIREMENT

A FCC ID label shall be permanently attached and conspicuously located on the equipment :



1.4 INFORMATION TO THE USER

The following FCC statement should be declared in a conspicuous location in the user's manual.

Federal Communications Commission (FCC) Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio / TV technician for help.

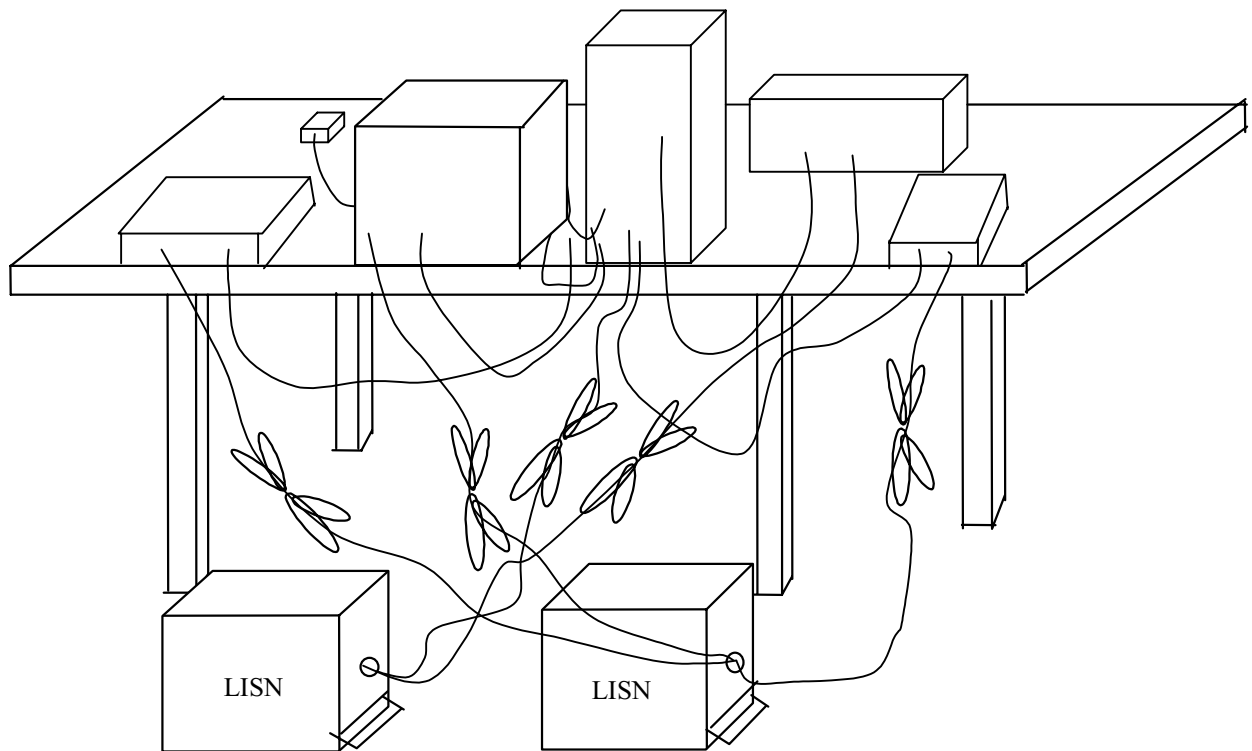
Warning : A shielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord be used.

Use only shielded cables to connect I/O devices to this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

2. CONDUCTION EMISSIONS TEST

2.1 GENERAL SETUP OF THE TEST FACILITIES



2.2 TEST PROCEDURES

The system was setup as described above , with the EMI diagnostic software .

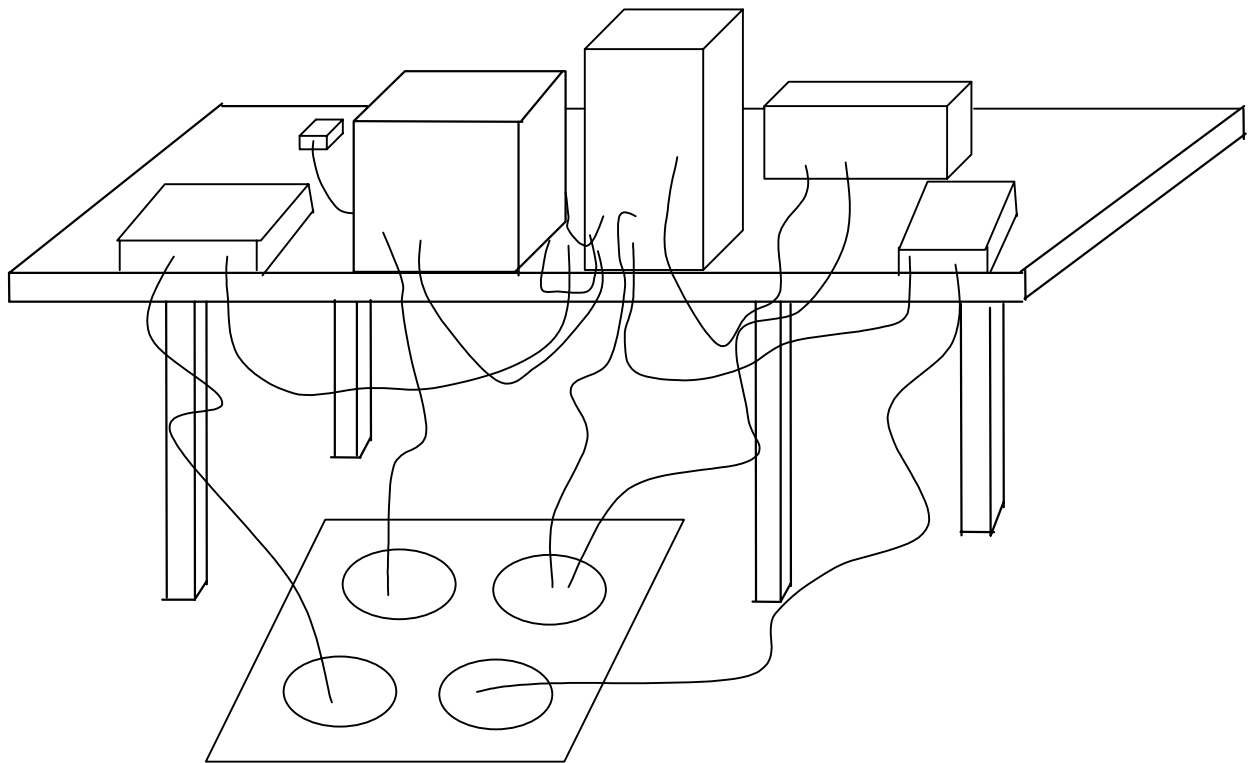
Both the line of power cord , hot and neutral , were run with the EMI tests software .

To get the maximum power line conducted emission , we changed the configuration by varying the monitor power cord fed from floor outlet and from the outlet on the power supply of this computer .

The highest emissions were recorded in the RFI test report .

3. RADIATED EMISSIONS TEST

3.1 GENERAL SETUP OF THE FACILITIES



3.2 TEST PROCEDURES

Radiated emissions test was carried out by **PEP Testing Laboratory** at the open field test site authorized by FCC .

The EUT and supporting equipments were setup with the EMI diagnostic software .

- a. setting up the EUT under normally position , and scanning it from 30 MHz to 1000 MHz , then recording those narrow band noises which cannot be 6 dBuV below lower bound . Both horizontal and vertical antenna are measured from 1 meter height to 4.0 meter height , and turntable rotate 360 degrees .
- b. fixing the EUT rear face to antenna and antenna 1.0 meter height . We adjusted I/O cables to find the highest coupling noise and moved the height of antenna from 1 to 4 meters , then rotated the turntable simultaneously .
- c. checking following step b. all points which were recorded in step a.
- d. changing the peripherals position , and routine steps a. b. c.

The highest emissions were recorded in the RFI test report .

4. DESCRIPTION FOR EUT TESTING CONFIGURATION

**** TEST PROCEDURE ----**

- (A) The EUT is Disk Array system , FCC ID : NKF-SILVERWORK II , for more detail information about the EUT , please refer user's manual .
- (B) Test method : We put the EUT and high HDD inside a case , one SCSI port connected to PC , another terminated by terminator , the RS232 port connected to PC's RS232 port . The EUT was enabled by files read / write between EUT and HDD inside the PC , the HDDs inside the EUT will be enabled by sequence from one to eight during the test .
We provided the worst case data in this report .
- (C) After the EUT was set up , we did the conducted emission test in the shielded room and the worst case placement finding as the ANSI C63.4 requirement ; similarly , the radiated emission test was done at the open field site .
- (D) If the peak value of the noise can't under Non-consumer equipment limit 3 dBuV more , we'll change Biconical antenna or Log-periodic antenna for Dipole antenna and record its Quasi-Peak value , making sure it can under 6 dBuV at least .
- (E) In the RFI test report , we provided the worst conducted emission testing data and radiated emission test data.

5. SUPPORTING DEVICES TO TEST

SUPPORT UNIT 1. ----- PERSONAL COMPUTER

Manufacturer : ASUS Inc.
 Model Number : P2-99
 Power Supply Type : Switching
 Power Cord : Shielded, Detachable, 1.2m
 Data Cable : Shielded, Detachable, 1.2m
 FCC ID : Declaration of conformity(DoC)

SUPPORT UNIT 2. ----- MONITOR

Manufacturer : SAMSUNG
 Model Number : 550S
 Power Supply Type : Switching
 Power Cord : Shielded, Detachable, 1.2m
 Data Cable : Shielded, Undetachable, 1m
 FCC ID : Declaration of Conformity(DoC)

SUPPORT UNIT 3. ----- PRINTER

Manufacturer : Hewlett-Packard Singapore Pte Ltd.
 Model Number : HP400
 Power Supply Type : Linear
 Power Cord : Non-Shielded, Detachable, 1.2m
 Data Cable : Shielded, Detachable, 1m. 2464
 FCC ID : B94C2642X

SUPPORT UNIT 4. ----- MOUSE

Manufacturer : LOGITECH
 Model Number : M-S34
 Power Supply Type : N/A
 Power Cord : N/A
 Data Cable : Shielded, Undetachable, 1m
 FCC ID : DZL211106

SUPPORT UNIT 5. ----MODEM

Manufacturer : ACEEX
 Model Number : 1414
 Power Supply Type : Linear
 Power Cord : Non-Shielded, Detachable, 1.2m
 Data Cable : Shielded, Detachable, 1m
 FCC ID : IFAXDM1414

SUPPORT UNIT 6. ---- KEYBOARD

Manufacturer : BTC
 Model Number : 5121W
 Power Supply Type : N/A
 Power Cord : N/A
 Data Cable : Shielded, Undetachable, 1.2m
 FCC ID : E5XKB5121WTH0110

SUPPORT UNIT 7. ---- SCSI Card

Manufacturer : Adapter
 Model Number : AHA-2940W / 2940UW
 Power Supply Type : N/A
 Power Cord : N/A
 Data Cable : N/A
 FCC ID : TGT2940UW

EQUIPMENT UNDER TEST ----

Manufacturer : MAXTRONIC INTERNATIONAL CO., LTD.

Model Number : Silver Work II

Data Cable : N/A

FCC ID : NKF-SILVERWORK II

6. TEST CONFIGURATION**Radiated emission detector function :****(1) 30MHZ~1GHZ : Quasi-Peak Value****Resolution BW : 120KHZ Video BW : 300KHZ****(2) above 1GHZ : Quasi-Peak value and Average Value****Resolution BW : 1MHZ Video BW : 1MHZ***** either Q. P. or average value will be recorded
in the report****Conducted emission detector function :****(1) 450KHZ~30MHZ : Quasi-Peak Value****Resolution BW : 9KHZ Video BW : 30KHZ****The else descriptions : N/A****Conducted Emission Test Photo. : Page 16****Test Data : Hot 17****Neutral 18****Radiated Emission Test Photo. : Page 19****Test Data : Horizontal 20****Vertical 21**

CONDUCTED TEST CONFIGURATION PHOTO.

< FRONT VIEW >



CONDUCTED EMISSIONS TEST DATA**Note : HOT LINE TEST**

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
0.568	27.61	-20.39	48.00	25.80	0.10	1.71	-10.00
0.923	25.03	-22.97	48.00	23.20	0.10	1.73	-10.00
2.105	25.59	-22.41	48.00	23.79	0.11	1.69	-10.00
3.582	26.98	-21.02	48.00	25.10	0.18	1.70	-10.00
4.173	24.91	-23.09	48.00	23.01	0.21	1.69	-10.00
7.542	31.24	-16.76	48.00	29.20	0.41	1.63	-10.00
12.004	26.29	-21.71	48.00	24.20	0.59	1.50	-10.00
15.107	29.01	-18.99	48.00	26.81	0.70	1.50	-10.00
17.087	31.53	-16.47	48.00	29.21	0.79	1.53	-10.00
18.860	29.40	-18.60	48.00	27.00	0.86	1.54	-10.00
22.701	40.26	- 7.74	48.00	37.60	1.01	1.65	-10.00

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

CONDUCTED EMISSIONS TEST DATA**Note : NEUTRAL LINE TEST**

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
0.539	27.40	-20.60	48.00	25.60	0.10	1.70	-10.00
0.923	25.23	-22.77	48.00	23.40	0.10	1.73	-10.00
2.105	25.79	-22.21	48.00	23.99	0.11	1.69	-10.00
2.371	26.63	-21.37	48.00	24.81	0.12	1.70	-10.00
3.553	26.88	-21.12	48.00	25.00	0.18	1.70	-10.00
7.542	27.21	-20.69	48.00	25.20	0.48	1.63	-10.00
11.975	27.83	-20.17	48.00	25.60	0.73	1.50	-10.00
15.136	28.21	-19.79	48.00	25.80	0.91	1.50	-10.00
17.028	31.32	-16.68	48.00	28.80	0.99	1.53	-10.00
22.701	40.86	- 7.14	48.00	38.00	1.21	1.65	-10.00

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

RADIATED TEST CONFIGURATION PHOTO.

< FRONT VIEW >



< REAR VIEW >



RADIATED EMISSIONS TEST DATA**Antenna polarization : HORIZONTAL ; Test distance : 3 m ;**

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
39.997	31.70	- 8.30	40.00	37.90	12.60	0.90	19.70
79.997	33.39	- 6.61	40.00	45.09	6.70	1.50	19.90
119.997	31.86	-11.64	43.50	37.86	11.50	2.20	19.70
139.997	35.21	- 8.29	43.50	42.19	10.61	2.20	19.79
239.997	28.92	-17.08	46.00	34.31	10.90	3.22	19.51
259.997	26.75	-19.25	46.00	29.83	13.16	3.36	19.60
319.997	20.75	-26.25	47.00	22.96	13.59	3.82	19.62
439.997	24.31	-22.69	47.00	23.09	16.30	4.90	19.98
599.922	28.25	-18.75	47.00	23.66	18.69	5.80	19.90
699.922	32.08	-14.92	47.00	26.28	19.20	6.30	19.70

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

RADIATED EMISSIONS TEST DATA**Antenna polarization : VERTICAL ; Test distance : 3 m ;**

Freq. (MHz)	Level (dB)	Over Limit (dB)	Limit Line (dB)	Read Level (dB)	Probe Factor (dB)	Cable Loss (dB)	Preamp Factor (dB)
39.997	31.73	- 8.27	40.00	37.93	12.60	0.90	19.70
79.997	35.61	- 4.39	40.00	47.31	6.70	1.50	19.90
119.993	29.05	-14.45	43.50	35.05	11.50	2.20	19.70
139.993	23.67	-19.83	43.50	30.65	10.61	2.20	19.79
159.993	26.83	-16.67	43.50	34.81	9.21	2.50	19.69
239.993	30.22	-15.78	46.00	35.61	10.90	3.22	19.51
259.993	30.43	-15.57	46.00	33.51	13.16	3.36	19.60
319.993	23.96	-23.04	47.00	26.17	13.59	3.82	19.62
399.993	33.08	-13.92	47.00	32.50	15.98	4.70	20.10
440.093	31.45	-15.55	47.00	30.23	16.30	4.90	19.98
700.093	29.52	-17.48	47.00	23.72	19.20	6.30	19.70

Note :

1. Level = Read Level + Probe Factor + Cable Loss – Preamp Factor
2. Over Limit = Level – Limit Line

APPENDIX A.
PHOTOS OF EUT APPEARANCE
<EUT FRONT VIEW >



<EUT REAR VIEW >



APPENDIX B.
List of Test Equipment

Emission	Instrument	Model No.	Serial No.	Cal. Data	Cal. Interval
Conduction (No.1)	R & S Receiver	ESHS10	830223/008	Oct. 21, 2000	1 Year
	Rolf Heine LISN (EUT)	NNB-4/63TL	98008	Jun. 10, 2001	1 Year
	EMCO LISN(2'd)	3825/2	9311-2150	Non-EUT LISN	N/A
	Spectrum Analyzer	3261A	91720076	Apr. 24, 2001	1 Year
	RF Cable	Rg400	N/A	Apr. 15, 2001	1 Year
Radiation (O.P 1)	R & S Receiver	ESVS30	863342/039	Apr. 17, 2001	1 Year
	Anritsu Pre-Amp.	MH648A	M15080	Apr. 14, 2001	1 Year
	R & S Pre-Amp.	ESMI-Z7	612278/011	Jun. 01, 2001	1 Year
	Schaffner Antenna	CC2680	2655	Jun. 01, 2001	1 Year
	COM-Power Horn Ant.	AH-118	10056	Aug. 24, 2000	1 Year
	EMCO RF Clable	175series	NO. 1	Apr. 15, 2001	1 Year