

FCC PART 15 TEST REPORT

Applicant : MaxTronic International Co., Ltd.
Equipment : RAID
Model : ArenaIndy

Contain

Exhibit A Label

Exhibit B Test Report

Exhibit C User Manual

Exhibit D Block Diagram

Exhibit E Circuit Diagram

Exhibit F Photograph of EUT

Exhibit B
Test Report

Test Report Certification

Best Laboratory Co., Ltd.

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Applicant : MaxTronic International Co., Ltd.
Address : 4F, No. 529, Chung Cheng Rd.,
Hsin Tien City, Taipei Hsien, Taiwan, R.O.C.
Equipment : RAID
FCC ID : NKF- ArenaIndy
Model : ArenaIndy
Device's Class : Class B Device
Measurement Standard : FCC Part 15.109(g)
Measurement Procedure : CISPR 22; 1997
Operating Voltage : 120VAC, 60Hz
Test Result : **Compliance** (Detail showed in the test report)
Sample Received : Aug. 22, 2001
Test Date : Oct. 25, 2001
Report Number : RE-A09-FC-667
Test Firm : No. 336, Ba Lian Rd., Sec. 1,
Hsi Chih City, Taipei Hsien, Taiwan, R.O.C.

Remark:

- (1) The test report is only relating to the sample tested
- (2) The test report shall not be reproduced except in full, without the written approval of Best Laboratory Co., Ltd.
- (3) The test report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.
- (4) The test result of this report are traceable to the national or international standards.

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Date Issued : Apr. 2, 2002

Contain

1	General Information	
1.1	EUT Description.....	3
1.2	Test System Detail.....	4
1.3	Tested Configuration.....	6
1.4	EUT Exercise Software.....	7
1.5	Test Performed.....	7
2	Conducted Emission Measurement	
2.1	Test Equipment List.....	8
2.2	Test Set-Up.....	8
2.3	Limit	8
2.4	Test Procedure.....	9
2.5	Test Specification.....	9
2.6	Test Result.....	9
3	Radiated Emission Measurement	
3.1	Test Equipment List.....	10
3.2	Test Set-Up.....	10
3.3	Limit.....	11
3.4	Test Procedure.....	11
3.5	Test Specification.....	11
3.6	Test Result.....	11
4	Modification List	
5	Appendix	
	Appendix A: Summary of Test Result.....	14
	Appendix B: The Photograph of measurement.....	18

1. General Information

1.1 EUT Description

Applicant : MaxTronic International Co., Ltd.

Address : 4F, No. 529, Chung Cheng Rd.,
Hsin Tien City, Taipei Hsien, Taiwan, R.O.C.

Equipment : RAID

FCC ID : NKF- ArenaIndy

Model : ArenaIndy

Device's Class : Class B Device

Operation Voltage : 120VAC, 60Hz

Output Ports :

Power Port : Connected with the AC power source via one power cable
which length is 1.8 meters long, non-shielded, no ferrite bead.

Host #1 Port : Connected with the SCSI card installed in the PC located in
near-end, via one SCSI cable which length is 1.55 meters long,
shielded, no ferrite bead.

Host #2 Port : Directly connected with one terminator.

Terminal Port: Connected with one RS-232 cable, 1.7 meters long, shielded,
with ferrite bead, to the serial port of PC.

HDD #1 Socket: Putted in one hard disk driver.

1.2 Test System Detail

PC : TECO

Model No. : M18-D8K7-1
Serial No. : 991120-0118; 991120-0144
FCC ID : DoC Approval
BSMI : 3872A092
Power Type : 100-240VAC, 50/60Hz, 1.5A, Switching
Power Cord : 180cm long, non-shielded, no ferrite bead.
Data Cable : 120cm long, shielded, with ferrite bead

Monitor : Viewsonic

Model No. : VCDT321496-1D
Serial No. : HR94500066
FCC ID : DoC Approval
BSMI : 3882A702
Power Type : 100-240VAC, 50/60Hz, 1.5A, Switching
Power Cord : 180cm long, non-shielded, no ferrite bead.
Data Cable : 120cm long, shielded, with ferrite bead
Backshell : Metal
Connected Port : VGA Port

Keyboard : Logitech

Model No. : SK-720
Serial No. : N/A
FCC ID : GYUR49SK
BSMI : 3872A806
Power Type : By PC
Data Cable : 180cm long, shielded, no ferrite bead
Backshell : Metal
Connected Port : PS/2 Keyboard Port

Mouse : Logitech

Model No. : M-S48a
Serial No. : N/A
FCC ID : JNZ201213
BSMI : 4882A001
Power Type : By PC
Data Cable : 120cm long, non-shielded, no ferrite bead
Backshell : Metal
Connected Port : PS/2 Mouse Port

Printer : Epson

Model No. : P950
Serial No. : BW9Y113923
FCC ID : DoC Approval
BSMI : 3872P001
Power Type : 120VAC, 60Hz, 0.4A
Power Core : 165cm long, non-shielded, no ferrite bead
Data Cable : 120cm long, shielded, no ferrite bead
Backshell : Metal
Connected Port : Parallel Port

Modem : ACEEX

Model No. : XDM-9624
 Serial No. : 0017884
 FCC ID : IFAXDM-9624
 Power Type : 120VAC, 60Hz / 9VAC, 1A
 Power Core : 1.9meters long, non-shielded, no ferrite bead
 Data Cable : RS-232, shielded, 1.2meters long, no ferrite bead
 RJ11C x 2, 7' long, non-shielded, no ferrite bead
 Backshell : Metal
 Connected Port : Serial Port

USB Mouse : Logitech

Model No. : M-BB48
 Serial No. : LZE92250126; LZE9225591
 FCC ID : DoC Approval
 BSMI : 4872A221
 Power Type : By PC
 Data Cable : 120cm long, shielded, no ferrite bead
 Backshell : Metal
 Connected Port : USB Port

Earphone set : KOKA

Model No. : MS-321
 Serial No. : N/A
 FCC ID : DoC Approval
 Data Cable : 145cm long, non-shielded, no ferrite bead
 Backshell : Metal
 Connected Port : Spk. & Mic. Port

Walkman : KOKA

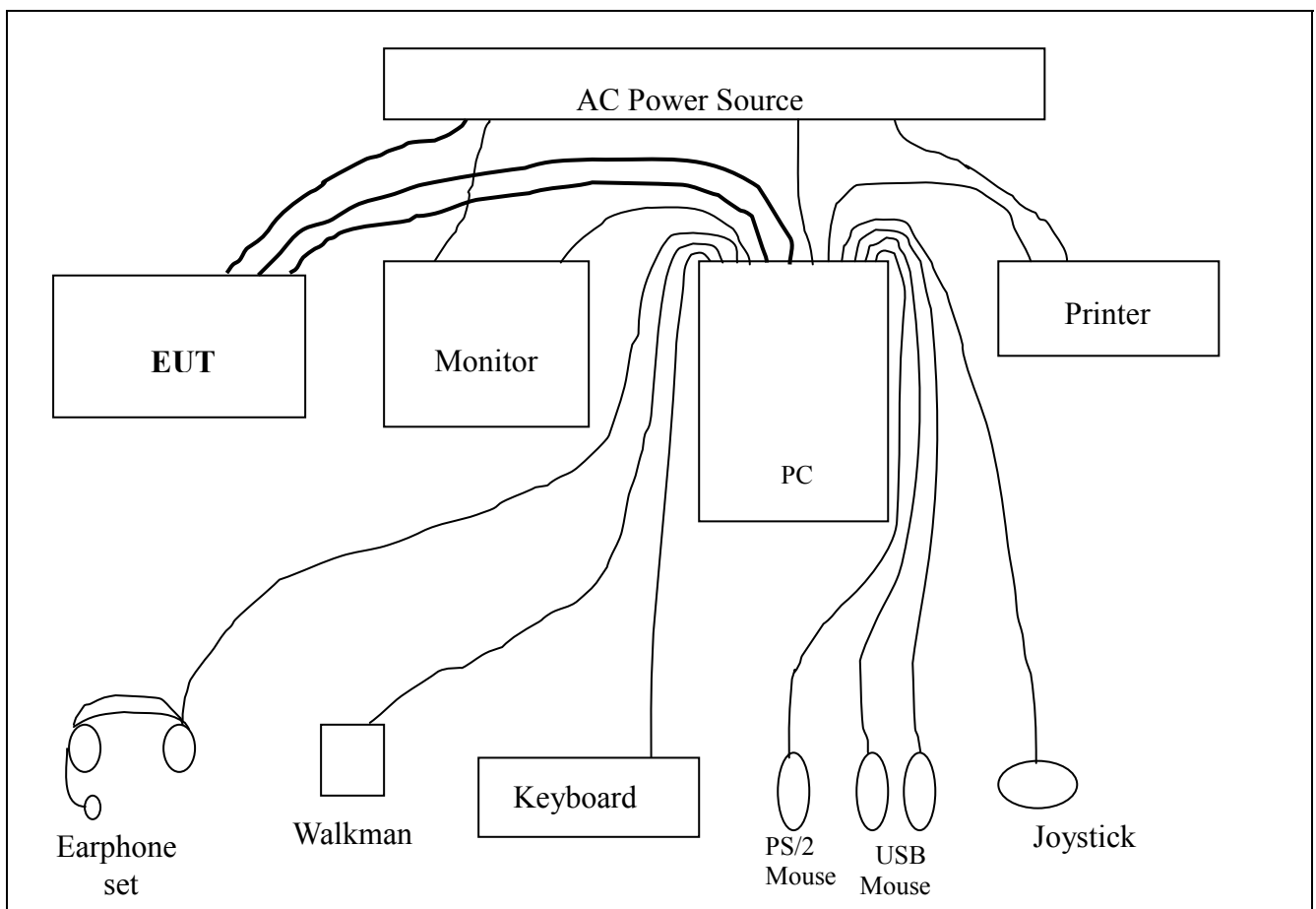
Model No. : KW-250
 Serial No. : N/A
 FCC ID : DoC Approval
 Power Type : 9VDC
 Data Cable : 120cm long, shielded, no ferrite bead

1.3 EUT Configuration

- (1) The power port of EUT is connected with the AC power source.
- (2) The terminal port of EUT is connected with the serial #1 port of PC.
- (3) The Host #1 port of EUT is connected with the SCSI card installed in the PC located in near-end.
- (4) The Host #2 port of EUT is directly connected with terminator.
- (5) There is one hard disk driver putted in the HDD #1 socket of EUT.

(**PS: Please refers to the Photograph**)

Drawing of Configuration



1.4 EUT Exercise Software

The testing software is provided by the applicant.

The testing software is designed to exercise the EUT in a manner similar to a typical use. The testing program will continuously working sequence in the “ Write-Read-Delete “ mode. The software will enable all functions of EUT.

1.5 Test Performed

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver which bandwidth is set at 9KHz.

Radiated emissions were invested over the frequency range from 30MHz to 1000MHz using a receiver which bandwidth is set at 120KHz. Radiated measurement was performed at distance that from an antenna to EUT is 10 meters.

The testing result of pretest was shown out that the “Transmitting/Receiving” mode is worse than the “ Standby “ mode. So, the final measurement was made on the “Transmitting/Receiving” mode.

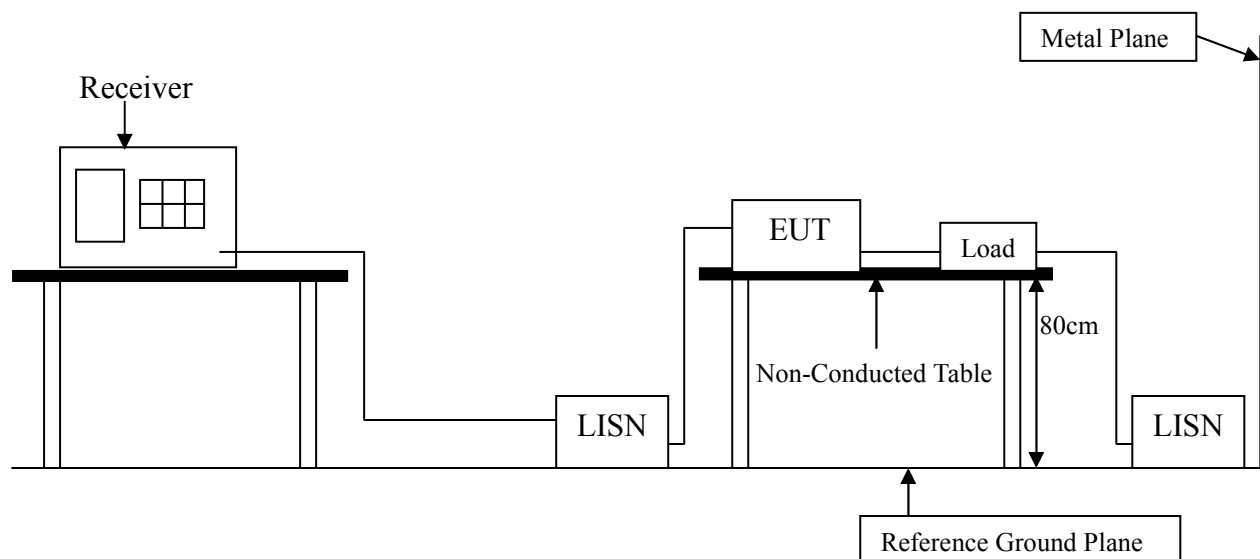
2 Conducted Emission Measurement

2.1 Test Equipment

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	LISN (EUT)	Rolf Heine	NNB-2/16Z	99084	May 14, 2001
2.	LISN (AXE)	Rolf Heine	NNB-2/16Z	99086	May 14, 2001
3.	EMI Receiver	Rohde & Schwarz	ESI 7	830154/001	June 27, 2001
4.	50Ω Terminator	Amphenol	46650-51	N/A	Dec. 10, 2000
5.	RF Cable	Belden	M17/158	MIL-C-17	Jan. 20, 2001

Remark: All equipment upon which need to calibrated are with calibration period of one year.

2.2 Test Set-Up



2.3 Limit

CISPR 22

Frequency	Limit (dBμV)			
	Class A		Class B	
MHz	QP	Avg.	QP	Avg.
0.15 ~ 0.50	79	66	66 ~ 56	56 ~ 46
0.50 ~ 5.0	73	60	56	46
5.0 ~ 30.0	73	60	60	50

FCC Part 15

Frequency	Limit (dBμV)	
	Class A	Class B
MHz	QP	QP
0.50 ~ 1.705	60	48.0
1.705 ~ 30	69.5	48.0

Remark: 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 (LISN). It provides a 50 ohm / 50 μ H coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm / 50 μ H coupling impedance with 50 ohm termination. (Please refers to the block diagram of the test setup and photograph.)

Both sides of AC line are checked for the maximum conducted emission interference. In order to find the maximum emissions, the relating positions of equipment and all of the interference cables must be changed according to CISPR 22; 1997 regulation: The measurement procedure on conducted emission interference.

The resolution bandwidth of the field strength meter (Rohde & Schwarz) is set at 9KHz.

2.5 Test Specification

According to the CISPR 22; 1997

2.6 Test Result

The emissions that come from the EUT were below the specified limits. The worst case of conducted emissions measurement are shown in the appendix A. The acceptance criterion was met and the EUT has pass the measurement.

2.7 Deviation from the Test Method

No Deviation

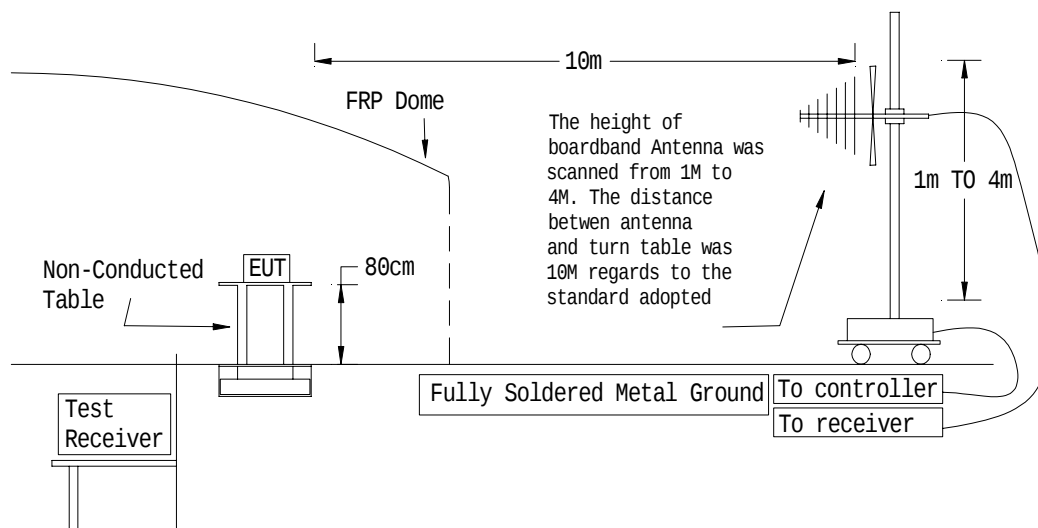
3. Radiated Emission Measurement

3.1 Test Equipment List

No.	Instrument	Manufacture	Model	Serial No.	Last Calibrate
1.	Antenna	Mess-Elektronik	VULB 9160	9160-3078	Jan. 19, 2001
2.	EMI Receiver	Rohde & Schwarz	ESI 7	830154/001	June 27, 2001
3.	RF Cable	Adventest	AD-N-CA-01	2000-0220	Jan. 20, 2001
4.	OATS	Bestlab	N/A	OATS#1	May 28, 2001

Remark: All equipment upon which need to calibrated are with calibration period of one year.

3.2 Test Setup



3.3 Limit

CISPR 22

Frequency MHz	Class A		Class B	
	Distance (Meter)	Limit (dB μ V/m)	Distance (Meter)	Limit (dB μ V/m)
30 ~ 230	10	40	10	30
230 ~ 1000	10	47	10	37

FCC Part 15

Frequency MHz	Class A		Class B	
	Distance (Meter)	Limit (dB μ V/m)	Distance (Meter)	Limit (dB μ V/m)
30 ~ 88	10	39	3	40
88 ~ 216	10	43.5	3	43.5
216 ~ 960	10	46.5	3	46
960 Above	10	49.5	3	54

Remark: In the above table, the tighter limit applies at the band edges

3.4 Test Procedure

The EUT and its simulators are placed on turn table, non-ducted and wooden, which is 0.8 meter above ground. The turn table rotates 360 degree to determine the position of the maximum emission level. The EUT was positioned such that distance from antenna to the EUT is 10 meters. The antenna is moved up and down between 1 meter to 4 meter to receive 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 interference cables must be manipulated according to CISPR 22; 1997 regulation: the test procedure of the radiated emission measurement.

The bandwidth set on the field strength is 120KHz when the frequency range is below 1GHz

3.5 Test Specification

According to CISPR 22; 1997

3.6 Test Result

The emissions that come from the EUT was below the specified limits. The worst case of conducted emissions measurement are shown in the appendix A. The acceptance criterion was met and the EUT has pass the measurement.

3.7 Deviation from the Test Method

No Deviation

4. Modification List for EMC Complying Test

The modification is solely made by the applicant

5. Appendix

Appendix A: Summary of Test Result

Appendix B: The test photograph of EUT

Appendix A: Summary of Test Result

The test result in the emission and immunity were performed according to the requirement of measurement standard and procedures. Best Laboratory is assumed full responsibility for the accuracy and completeness of these measurements. The Test data of the emissions and immunity are listed as the appendix data.

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

******* EMC Test Result: The EUT has been pass the all measurements. *******

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: | <±2.0dB |
| * Uncertainty in the Field Strength measurement: | <±4.0dB |

Conducted Emission Test

Date Measurement Performed: Aug. 28, 2001

EUT : RAID

Testing Mode : Transmitting/Receiving

Temperature : 26°C

Humidity : 75%RH

Line 1:

Frequency (KHz)	Corrected Amplitude (dBμV)			Limit (dBμV)		Margin dB
	Peak	QP	Avg.	QP	Avg.	
150.8500	50.42	***	***	65.98	55.98	-5.56
197.6000	54.48	***	***	64.64	54.64	-2.16
327.6500	36.38	***	***	60.92	50.92	-14.54
9600.0000	33.01	***	***	60.00	50.00	-16.99
14448.0000	32.20	***	***	60.00	50.00	-17.80
24056.0000	43.66	***	***	60.00	50.00	-6.34

Line 2:

Frequency (KHz)	Corrected Amplitude (dBμV)			Limit (dBμV)		Margin dB
	Peak	QP	Avg.	QP	Avg.	
196.750	54.70	54.01	53.80	64.66	54.66	-0.86
199.300	54.81	54.00	53.47	64.59	54.59	-1.12
327.650	39.89	39.05	38.74	60.92	50.92	-11.03
9568.000	36.53	34.98	33.51	60.00	50.00	-13.47
14360.000	34.78	33.19	30.92	60.00	50.00	-15.22
24056.000	46.59	45.40	45.13	60.00	50.00	-3.41

*** Remark: The above corrected amplitude are all under the average limit. ***

Field Strength Measurement

Date Measurement Performed: Sep. 04, 2001

EUT : RAID
 Testing Mode : Transmitting/Receiving
 Polarity : Vertical
 Temperature : 25°C
 Humidity : 56%RH

Frequency (MHz)	Reading Amplitude (dBμV/m)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
73.709	18.86	68	1.00	9.06	27.92	30.00	-2.08
167.553	9.61	317	2.99	12.92	22.52	30.00	-7.48
197.975	12.18	116	2.99	10.26	22.44	30.00	-7.56
336.053	10.36	324	4.00	14.79	25.16	37.00	-11.84

Remark:

1. The “ Correction Factor “ contains antenna factor, cable loss.
2. The formula of “ Corrected Amplitude “ is as follow:
 Reading Amplitude + Correction Factor = Corrected Amplitude.

Field Strength Measurement

Date Measurement Performed: Sep. 04, 2001

EUT : RAID
 Testing Mode : Transmitting/Receiving
 Polarity : Horizontal
 Temperature : 23°C
 Humidity : 69%RH

Frequency (MHz)	Reading Amplitude (dBμV/m)	Table Degree (°)	Antenna Height (Meter)	Correction Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
336.053	18.66	129	2.00	14.79	33.45	37.00	-3.55
624.205	4.89	209	3.00	21.22	26.11	37.00	-10.89
659.857	1.25	233	1.00	21.78	23.03	37.00	-13.97

Remark:

1. The “ Correction Factor “ contains antenna factor, cable loss.
2. The formula of “ Corrected Amplitude “ is as follow:
 Reading Amplitude + Correction Factor = Corrected Amplitude.

Appendix B: The Test Photograph of EUT

The Photograph of Conducted Emission Test



The Photograph of Radiated Emission Test

