

FCC TEST REPORT

for

47 CFR, Part 2, Part 15 Subpart B and CISPR PUB. 22

Equipment : Disk Array

Model No. : DeskForce II

FCC ID : NKF-DESKFORCEII

Filing Type : Certification

Applicant : **MaxTronic International Co., Ltd.**
4F, No. 529, Chung Cheng Rd., Hsin Tien City, Taipei Hsien,
Taiwan, R.O.C.

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SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

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History of this test report

Original Report Issue Date: Jun. 03, 2003

☒ No additional attachment.

☐ Additional attachment were issued as following record:

Attachment No.	Issue Date	Description

CERTIFICATE OF COMPLIANCE

for

47 CFR, Part 2, Part 15 Subpart B and CISPR PUB. 22

Equipment : Disk Array

Model No. : DeskForce II

FCC ID : NKF-DESKFORCEII

Applicant : **MaxTronic International Co., Ltd.**
4F, No. 529, Chung Cheng Rd., Hsin Tien City, Taipei Hsien,
Taiwan, R.O.C.

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 - 1992** and the energy emitted by this equipment was **passed** both radiated and conducted emission limits. Testing was carried out on May 27, 2003 at **SPORTON International Inc.** LAB.

 
K. J. Lin
Manager

SPORTON International Inc.

6F, No.106, Sec. 1, Hsin Tai Wu Rd., Hsi Chih, Taipei Hsien, Taiwan, R.O.C.

1. General Description of Equipment under Test

1.1 Applicant

MaxTronic International Co., Ltd.
4F, No. 529, Chung Cheng Rd., Hsin Tien City, Taipei Hsien, Taiwan, R.O.C.

1.2 Manufacturer

Same as 1.1

1.3 Basic Description of Equipment under Test

Equipment	: Disk Array
Model No.	: DeskForce II
FCC ID	: NKF-DESKFORCEII
Trade Name	: Arena
TP Cable	: Non-Shielded, 2m
SCSI Cable x 4	: Shielded, 1m
RS-232 Cable	: Shielded, 1.8m
Power Supply Type	: Switching
AC Power Cord	: Non-Shielded, 1.8m, 3 pin

1.4 Feature of Equipment under Test

- Interface:
 - Host Bus: Ultra 160 LVD SCSI x 2
 - Disk Bus: Ultra ATA-100 x 8
- Drives: Hot swap, user replaceable up to eight 3.5" drives (1" height)
- Maximum fault tolerant capacity: >2 TB
- Drive MTBF: >1,000,000 hrs
- Host requirement: Host independent
- Operating systems: O/S independent and transparent
- Data Rebuild: Automatic data regeneration
- LCD display panel: 2 x 16 characters
- Cooling fans:
 - 12cm ball bearing fan
 - 2 fans
- Power supply capacity: Dual 300W independent power supplies (SH-300SRD-P/300W)
- AC input voltage: 115 / 230V (+/-10%), 60/50Hz
- HDD: IBM / DPTA-353750 / 37.5GB
 - Maxtor / 51020H2 / 20GB
 - Seagate / ST313032A / 13GB
 - Seagate / ST313620A / 13.6GB
 - Seagate / ST36422A

2. Test Configuration of Equipment under Test

2.1 Test Manner

- a. The EUT has been associated with personal computer and peripherals pursuant to ANSI C63.4-1992 and configuration operated in a manner which tended to maximize its emission characteristics in a typical application.
- b. The complete test system included SAMSUNG Monitor, Genuine PS/2 Keyboard, LOGITECH PS/2 Mouse, HP Printer, ACEEX Modem, COMPAQ PC, Arena Disk Array and EUT for EMI test.
- c. The following test modes were performed:
 - Mode 1. Power x 1, LAN: 10Mbps
 - Mode 2. Power x 2, LAN: 10Mbps
- d. Frequency range investigated: conduction 150 KHz to 30 MHz, radiation 30 MHz to 1000MHz.

2.2 Description of Test System

Support Unit 1. -- Monitor (SAMSUNG)

FCC ID	: N/A
Model No.	: Syncmaster 550S
Power Supply Type	: Switching
Power Cord	: Non-Shielded
Serial No.	: SP0181
Data Cable	: Shielded, 1.7m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 2. -- PS/2 Keyboard (Genuine)

FCC ID	: N/A
Model No.	: K288
Serial No.	: SP0054
Data Cable	: Shielded, 360 degree via metal backshells, 1.3m
Remark	: This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 3. -- PS/2 Mouse (LOGITECH)

FCC ID	: DZL211029
Model No.	: M-S34
Serial No.	: SP0041
Data Cable	: Shielded, 1.7m

Support Unit 4. -- Printer (HP)

FCC ID : B94C2642X
Model No. : DJ 400
Power Supply Type : Linear
Power Cord : Non-Shielded
Serial No. : SP0048
Data Cable : Shielded, 1.35m

Support Unit 5. -- Modem (ACEEX)

FCC ID : IFAXDM1414
Model No. : DM1414
Power Supply Type : Linear
Power Cord : Non-Shielded
Serial No. : SP0015
Data Cable : Shielded, 1.15m

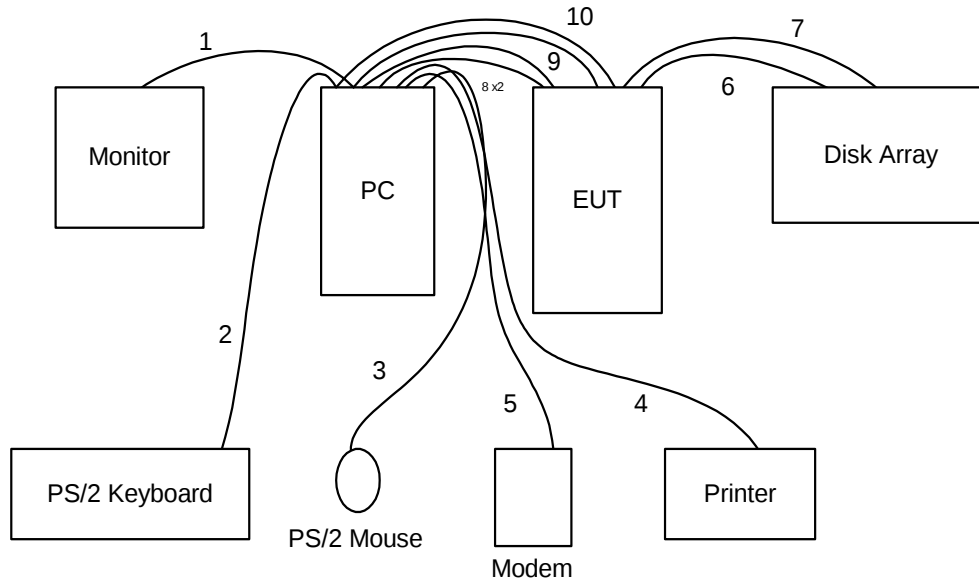
Support Unit 6. -- Personal Computer (COMPAQ)

FCC ID : N/A
Model No. : Evo D380mx
Power Supply Type : Switching
Power Cord : Non-Shielded
Serial No. : SP0001
Remark : This support device was tested to comply with FCC standards and authorized under a declaration of conformity.

Support Unit 7. -- Disk Array (Arena)

FCC ID : NKF-RackForce II
Model No. : RackForce II
Serial No. : SP0314

2.3 Connection Diagram of Test System



1. The I/O cable is connected from PC to the support unit 1.
2. The I/O cable is connected from PC to the support unit 2.
3. The I/O cable is connected from PC to the support unit 3.
4. The I/O cable is connected from PC to the support unit 4.
5. The I/O cable is connected from PC to the support unit 5.
6. The SCSI cable is connected from EUT to the support unit 7.
7. The SCSI cable is connected from EUT to the support unit 7.
8. These SCSI cables are connected from PC to the EUT.
9. The RS-232 cable is connected from PC to the EUT.
10. The TP cable is connected from PC to the EUT.

3. Test Software

An executive program, EMITEST.EXE under WIN XP, which generate a complete line of continuously repeating “ H “ pattern was used as the test software.

The programs was executed as follows:

- a. Turn on the power of all equipment.
- b. The PC reads the test program from the hard disk drive and runs it.
- c. The PC sends “ H “ messages to the monitor, and the monitor displays “ H “ patterns on the screen.
- d. The PC sends “ H “ messages to the printer, then the printer prints them on the paper.
- e. The PC sends “ H “ messages to the modem.
- f. The PC sends “ H ” messages to the internal Hard Disk, and the Hard Disk reads and writes the message.
- g. Repeat the steps from c to f.

At the same time, “HDD Copy” was executed to read and write data from EUT to PC.

4. General Information of Test

4.1 Test Facility

Test Site Location : No. 30-2, Lin 6, Diing-Fwu Tsuen, Lin-Kou-Hsiang,
Taipei Hsien, Taiwan, R.O.C.
TEL : 886-2-2601-1640
FAX : 886-2-2601-1695
Test Site No. : CO01-LK, OS04-LK

4.2 Test Voltage

115V/60Hz

4.3 Standard for Methods of Measurement

ANSI C63.4-1992

4.4 Test in Compliance with

CISPR PUB. 22 and FCC Part 15, Subpart B Class B

4.5 Frequency Range Investigated

- a. Conduction: from 150 kHz to 30 MHz
- b. Radiation: from 30 MHz to 1000 MHz

4.6 Test Distance

The test distance of radiated emission from antenna to EUT is 10 M.

5. Test of Conducted Powerline

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz and return leads of the EUT according to the methods defined in ANSI C63.4-1992 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 5.3. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

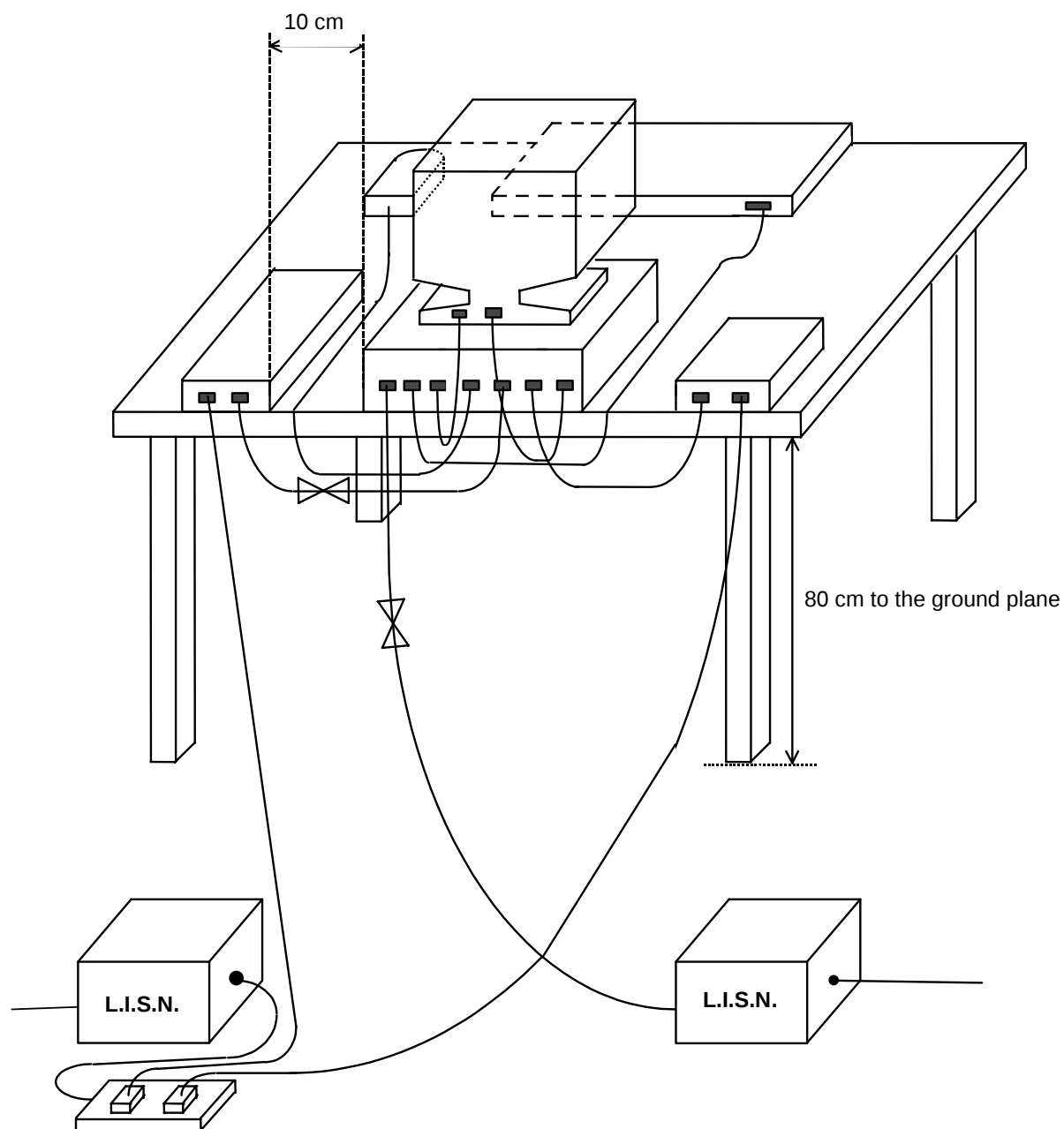
5.1 Major Measuring Instruments

- Test Receiver (R&S ESCS 30)
 - Attenuation 10 dB
 - Start Frequency 0.15 MHz
 - Stop Frequency 30 MHz
 - IF Bandwidth 9 KHz

5.2 Test Procedures

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connect to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

5.3 Typical Test Setup Layout of Conducted Powerline

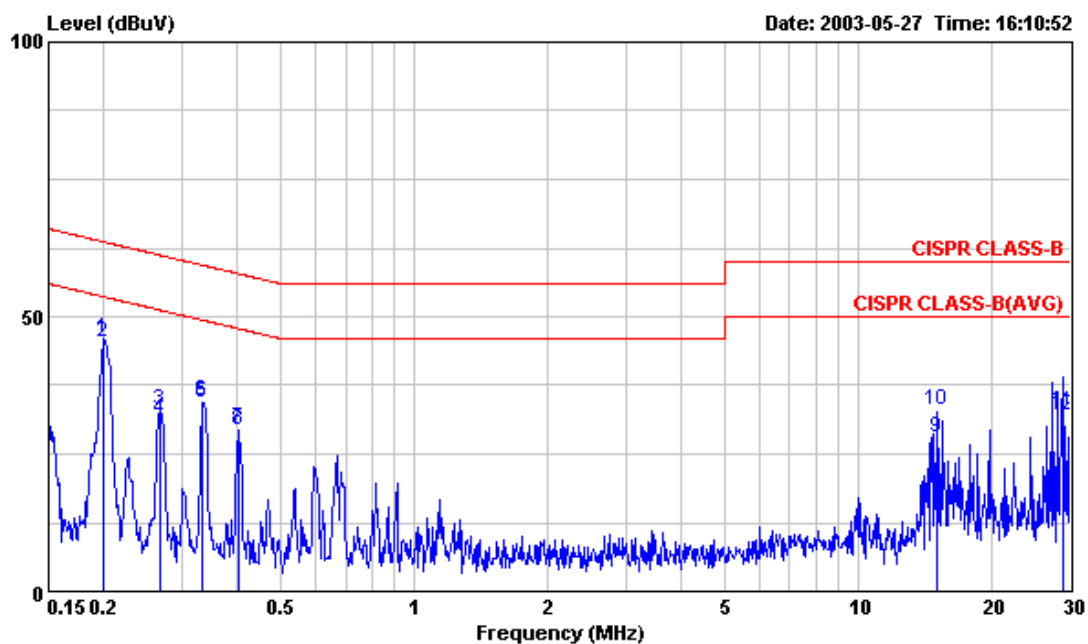


5.4 Test Result of AC Powerline Conducted Emission

5.4.1 Test Mode: Mode 1

- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 24 °C
- Relative Humidity: 61 %
- All emissions not reported here are more than 10 dB below the prescribed limit.

■ The test was passed at the minimum margin that marked by a frame in the following table



Site : CO01-LK
 Condition : CISPR CLASS-B CO01 LISN-91-12-17 LINE
 EUT : DISK ARRAY
 MODEL : DESKFORCE II
 POWER : 110V/60HZ
 MEMO : POWER*1

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.200	46.00	-17.61	63.61	45.90	0.10	0.00	QP
2	0.200	45.27	-8.34	53.61	45.17	0.10	0.00	Average
3	0.267	32.89	-28.34	61.23	32.75	0.10	0.04	QP
4	0.267	31.40	-19.83	51.23	31.26	0.10	0.04	Average
5	0.334	34.21	-15.14	49.35	34.04	0.10	0.07	Average
6	0.334	34.74	-24.61	59.35	34.57	0.10	0.07	QP
7	0.402	29.52	-28.29	57.81	29.32	0.10	0.10	QP
8	0.402	29.30	-18.51	47.81	29.10	0.10	0.10	Average
9	15.063	28.11	-21.89	50.00	27.10	0.71	0.30	Average
10	15.063	33.05	-26.95	60.00	32.04	0.71	0.30	QP
11	28.748	32.73	-27.27	60.00	30.70	1.53	0.50	QP
12	28.748	31.95	-18.05	50.00	29.92	1.53	0.50	Average

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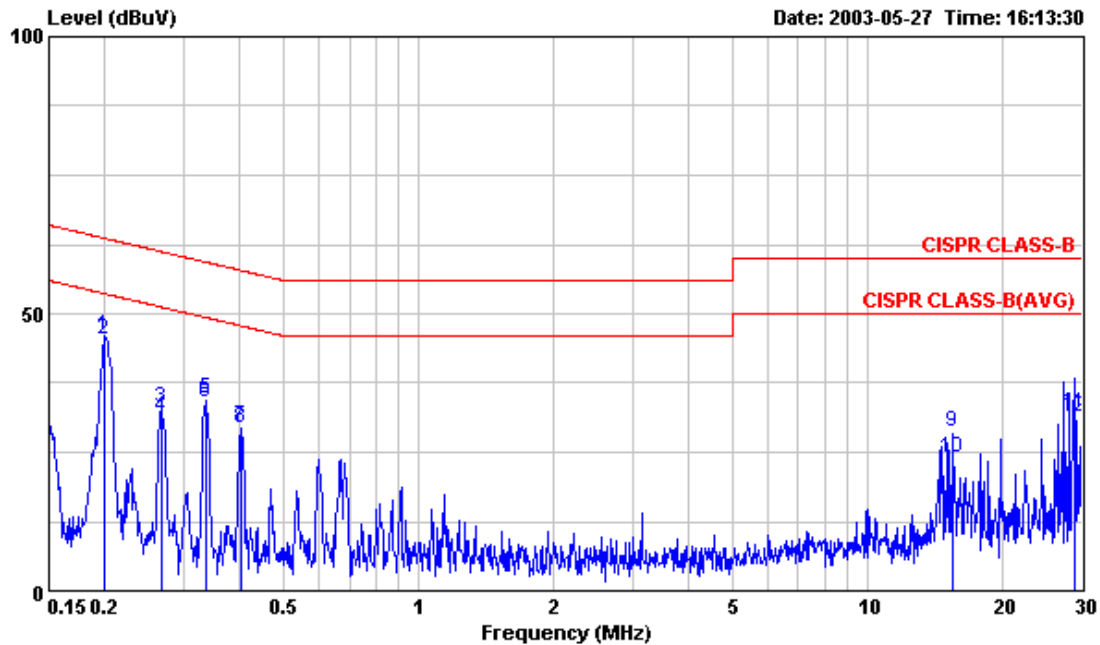
TEL : 886-2-2696-2468

FAX : 886-2-2696-2255

FCC ID : NKF-DESKFORCEII

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Issued Date : Jun. 03, 2003



Site : CO01-LK
 Condition : CISPR CLASS-B CO01 LISN-91-12-17 NEUTRAL
 EUT : DISK ARRAY
 MODEL : DESKFORCE II
 POWER : 110V/60HZ
 MEMO : POWER*1

	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.200	46.06	-17.55	63.61	45.96	0.10	0.00	QP
2	0.200	45.32	-8.29	53.61	45.22	0.10	0.00	Average
3	0.267	32.95	-28.26	61.21	32.81	0.10	0.04	QP
4	0.267	31.40	-19.81	51.21	31.26	0.10	0.04	Average
5	0.335	34.62	-24.72	59.34	34.45	0.10	0.07	QP
6	0.335	34.12	-15.22	49.34	33.95	0.10	0.07	Average
7	0.402	29.52	-28.29	57.81	29.32	0.10	0.10	QP
8	0.402	29.30	-18.51	47.81	29.10	0.10	0.10	Average
9	15.406	28.63	-31.37	60.00	27.69	0.63	0.31	QP
10	15.406	24.09	-25.91	50.00	23.15	0.63	0.31	Average
11	28.750	32.04	-27.96	60.00	30.11	1.43	0.50	QP
12	28.750	31.19	-18.81	50.00	29.26	1.43	0.50	Average

Test Engineer: Neil

Neil Huang

SPORTON International Inc.

TEL : 886-2-2696-2468

FAX : 886-2-2696-2255

FCC ID : NKF-DESKFORCEII

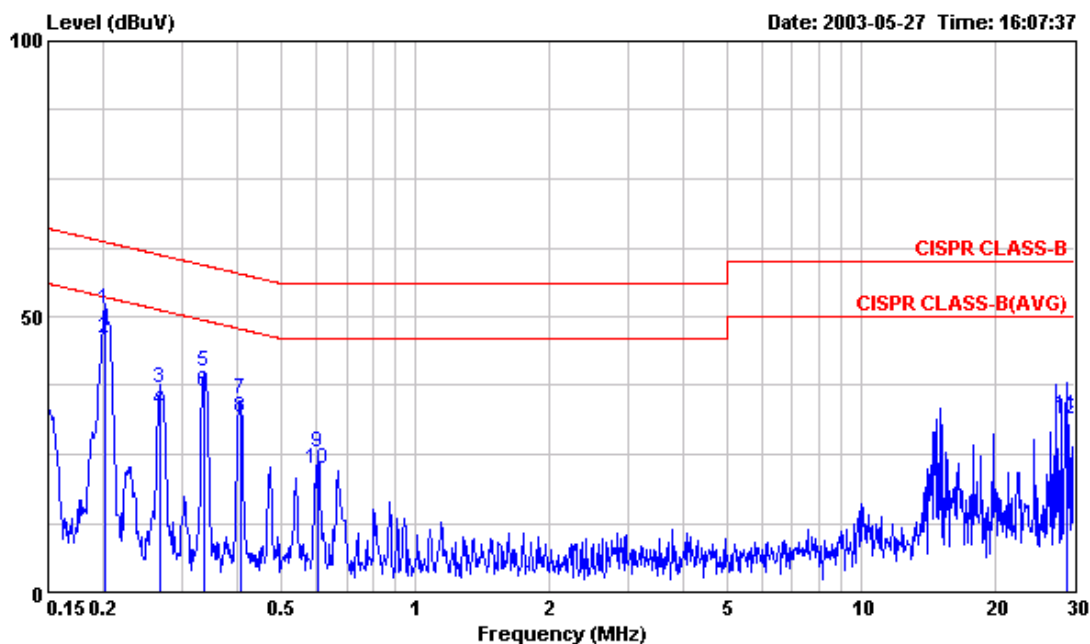
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Issued Date : Jun. 03, 2003

5.4.2 Test Mode: Mode 2

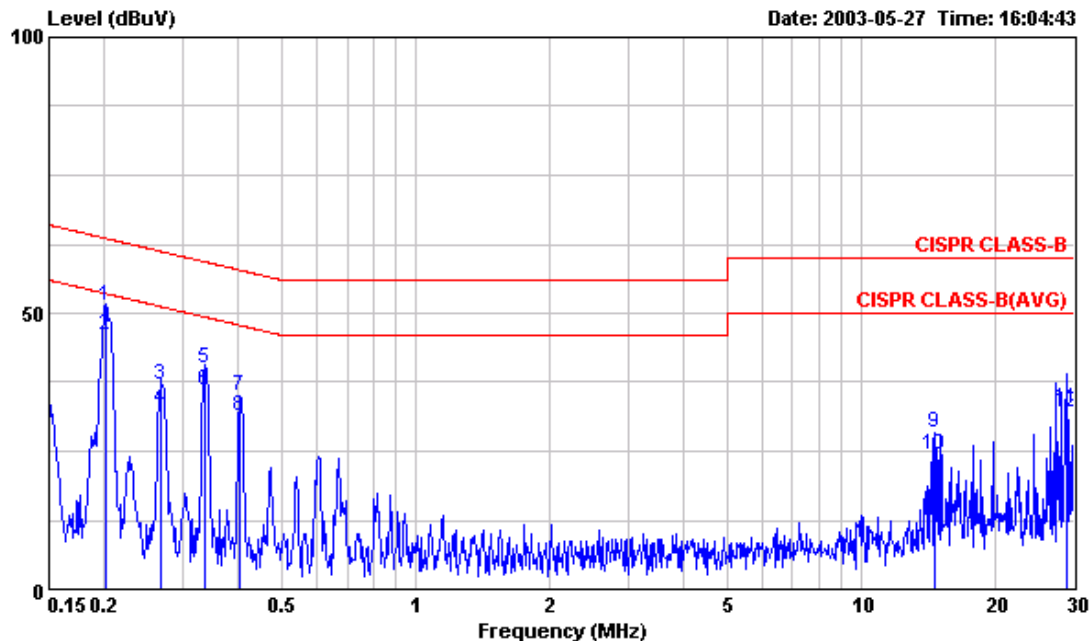
- Frequency Range of Test: from 0.15 MHz to 30 MHz
- Temperature: 24 °C
- Relative Humidity: 61 %
- All emissions not reported here are more than 10 dB below the prescribed limit.

■ The test was passed at the minimum margin that marked by a frame in the following table



Site : CO01-LK
 Condition : CISPR CLASS-B CO01 LISN-91-12-17 LINE
 EUT : DISK ARRAY
 MODEL : DESKFORCE II
 POWER : 110V/60HZ
 MEMO : POWER*2

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.202	51.17	-12.36	63.53	51.07	0.10	0.00	QP
2	0.202	46.04	-7.49	53.53	45.94	0.10	0.00	Average
3	0.268	37.15	-24.02	61.17	37.01	0.10	0.04	QP
4	0.268	32.90	-18.27	51.17	32.76	0.10	0.04	Average
5	0.336	40.14	-19.16	59.30	39.97	0.10	0.07	QP
6	0.336	36.26	-13.04	49.30	36.09	0.10	0.07	Average
7	0.404	34.96	-22.81	57.77	34.76	0.10	0.10	QP
8	0.404	31.60	-16.17	47.77	31.40	0.10	0.10	Average
9	0.604	25.39	-30.61	56.00	25.19	0.10	0.10	QP
10	0.604	22.22	-23.78	46.00	22.02	0.10	0.10	Average
11	28.750	32.08	-27.92	60.00	30.05	1.53	0.50	QP
12	28.750	31.21	-18.79	50.00	29.18	1.53	0.50	Average



Site : CO01-LK
 Condition : CISPR CLASS-B CO01 LISN-91-12-17 NEUTRAL
 EUT : DISK ARRAY
 MODEL : DESKFORCE II
 POWER : 110V/60HZ
 MEMO : POWER*2

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB	
1	0.201	51.29	-12.28	63.57	51.19	0.10	0.00	QP
2	0.201	46.12	-7.45	53.57	46.02	0.10	0.00	Average
3	0.268	36.90	-24.27	61.17	36.76	0.10	0.04	QP
4	0.268	32.80	-18.37	51.17	32.66	0.10	0.04	Average
5	0.336	40.01	-19.29	59.30	39.84	0.10	0.07	QP
6	0.336	36.11	-13.19	49.30	35.94	0.10	0.07	Average
7	0.402	34.90	-22.91	57.81	34.70	0.10	0.10	QP
8	0.402	31.31	-16.50	47.81	31.11	0.10	0.10	Average
9	14.610	28.37	-31.63	60.00	27.48	0.59	0.30	QP
10	14.610	24.50	-25.50	50.00	23.61	0.59	0.30	Average
11	28.748	32.79	-27.21	60.00	30.86	1.43	0.50	QP
12	28.748	32.04	-17.96	50.00	30.11	1.43	0.50	Average

Test Engineer: Neil

Neil Huang

6. Test of Radiated Emission

Radiated emissions from 30 MHz to 1,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-1992. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 6.3. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

6.1 Major Measuring Instruments

- Spectrum Analyzer (HP 8560E)
 - Attenuation 10 dB
 - Start Frequency 30 MHz
 - Stop Frequency 1000 MHz
 - Resolution Bandwidth 120 KHz
 - Signal Input 30 MHz – 2.9 GHz

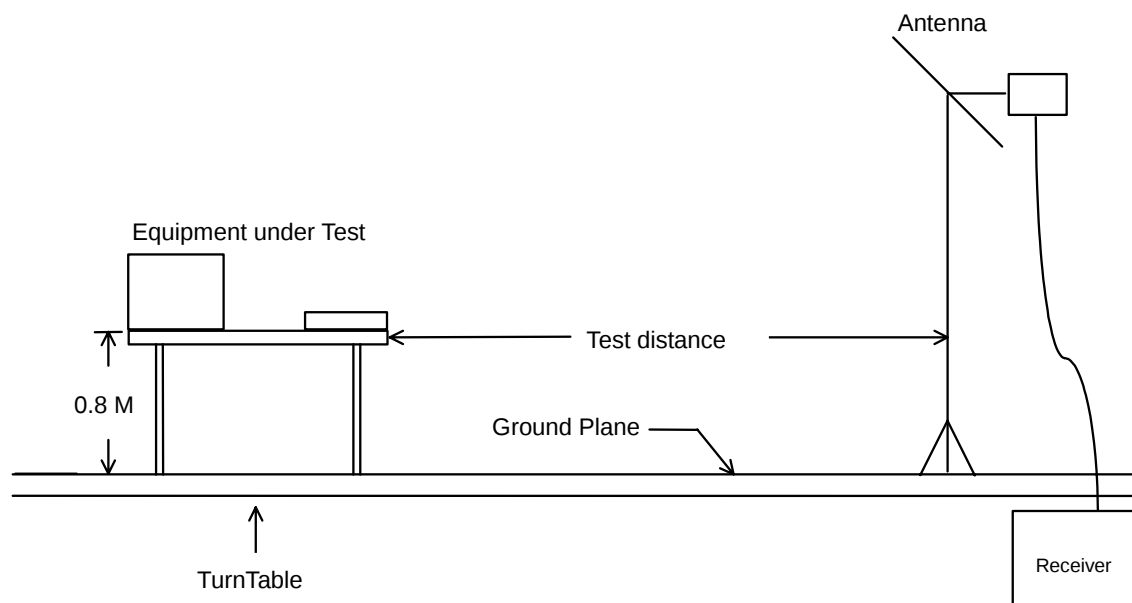
- Test Receiver (HP 8546A)
 - Resolution Bandwidth 120 KHz
 - Frequency Band 9 K – 6.5 GHz
 - Quasi-Peak Detector ON for Quasi-Peak Mode
OFF for Peak Mode

- Amplifier (HP 87405A)
 - RF Gain 25 dB
 - Signal Input 10 MHz – 3 GHz

6.2 Test Procedures

- a. The EUT was placed on a rotatable table top 0.8 meter above ground.
- b. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method and reported.

6.3 Typical Test Setup Layout of Radiated Emission

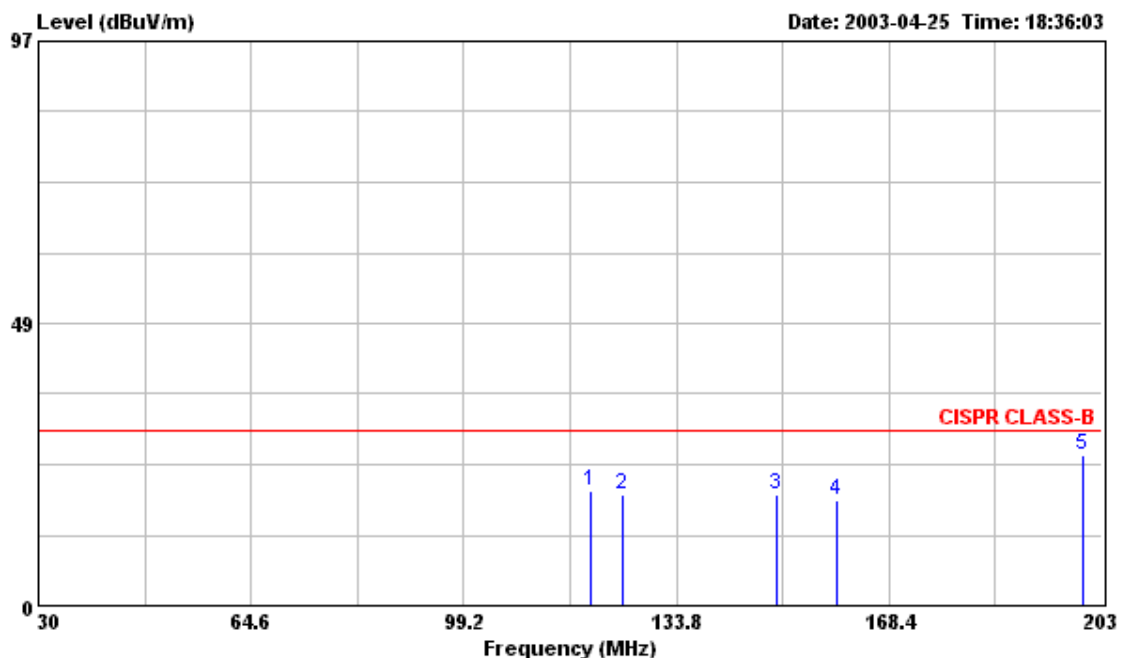


6.4 Test Result of Radiated Emission

6.4.1 Test Mode: Mode 1

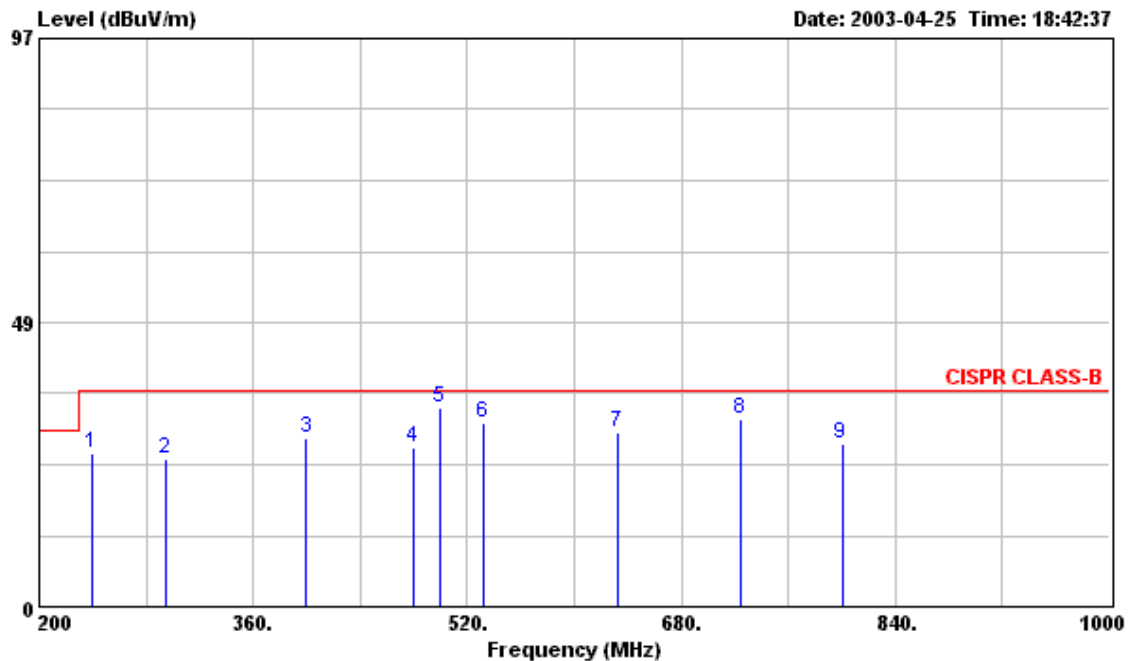
- Frequency Range of Test: from 30 MHz to 1,000 MHz
- Test Distance: 10 M
- Temperature: 23 °C
- Relative Humidity: 58 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following test record



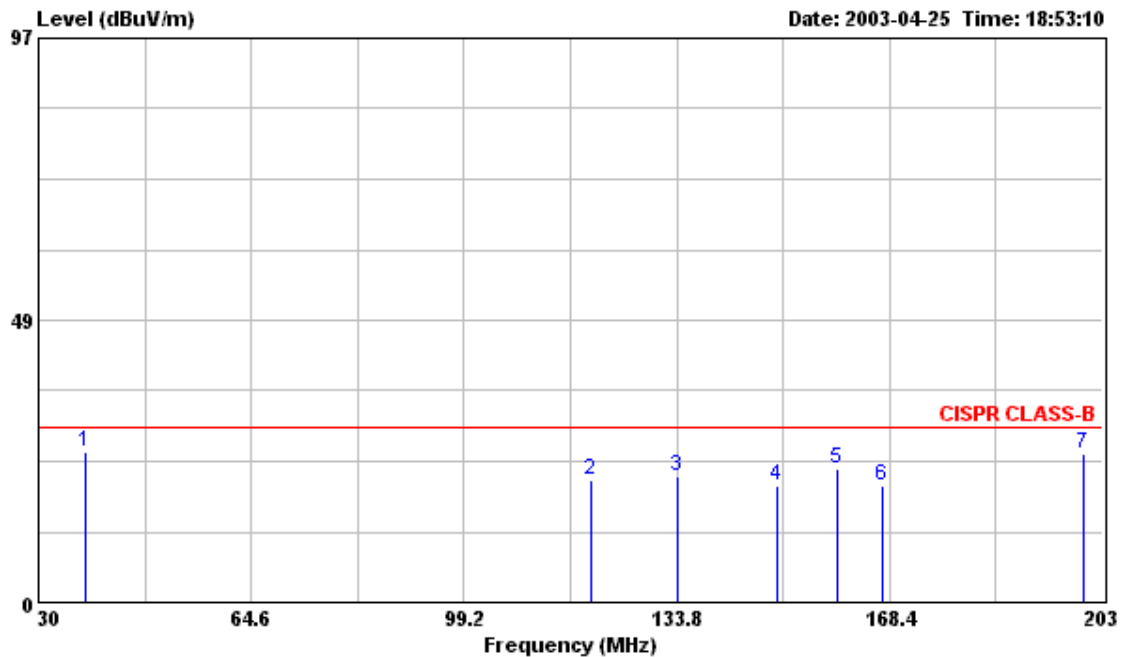
Site : OS04-LK
 Condition : CISPR CLASS-B 10m CHASE2288 HORIZONTAL
 EUT : DISK ARRAY
 POWER : 110VAC (POWER*1)
 MODE :
 MEMO : DESK FORCE II
 : LAN:10M (UTP)

	Freq	Level	Over	Limit	Read	Antenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Factor	Loss	Factor	Remark	Pos	Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	120.000	19.61	-10.39	30.00	31.17	11.60	1.84	25.00	Peak	---	---
2	125.000	19.00	-11.00	30.00	30.56	11.60	1.84	25.00	Peak	---	---
3	150.000	19.22	-10.78	30.00	32.08	9.80	2.34	25.00	Peak	---	---
4	159.920	18.05	-11.95	30.00	30.99	9.40	2.64	24.98	Peak	---	---
5	200.000	25.76	-4.24	30.00	38.86	8.80	3.00	24.90	Peak	---	---



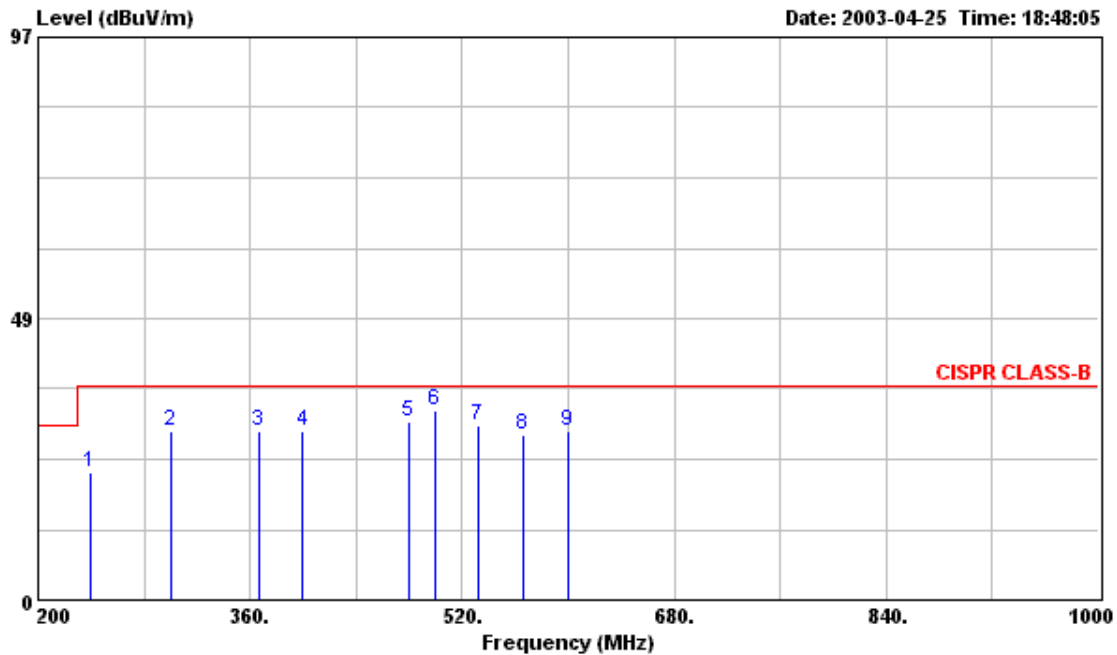
Site : OS04-LK
 Condition : CISPR CLASS-B 10m CHASE2288 HORIZONTAL
 EUT : DISK ARRAY
 POWER : 110VAC (POWER*1)
 MODE :
 MEMO : DESK FORCE II
 : LAN:10M (UTP)

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	240.000	26.04	-10.96	37.00	36.70	11.32	3.00	24.98	Peak	---	---
2	294.400	25.28	-11.72	37.00	34.34	12.81	3.04	24.91	Peak	---	---
3	400.000	28.71	-8.29	37.00	34.68	15.70	3.33	25.00	Peak	---	---
4	480.000	27.03	-9.97	37.00	30.66	17.14	4.23	25.00	Peak	---	---
5 @	500.000	34.00	-3.00	37.00	37.00	17.50	4.50	25.00	Peak	200	109
6	532.800	31.45	-5.55	37.00	34.49	17.89	4.07	25.00	Peak	---	---
7	632.800	29.82	-7.18	37.00	32.00	18.79	4.06	25.03	Peak	---	---
8	724.000	32.06	-4.94	37.00	33.35	19.38	4.41	25.08	Peak	---	---
9	800.000	27.80	-9.20	37.00	27.00	20.30	5.50	25.00	Peak	---	---



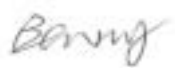
Site : OS04-LK
 Condition : CISPR CLASS-B 10m CHASE2288 VERTICAL
 EUT : DISK ARRAY
 POWER : 110VAC (POWER*1)
 MODE :
 MEMO : DESK FORCE II
 : LAN:10M (UTP)

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBUV/m	dB	dBUV/m	dBuV	dB/m	dB	dB		cm	deg
1	37.500	25.88	-4.12	30.00	36.00	13.66	1.10	24.88	QP	---	---
2	120.000	20.94	-9.06	30.00	32.50	11.60	1.84	25.00	Peak	---	---
3	133.800	21.73	-8.27	30.00	33.82	10.94	1.97	25.00	Peak	---	---
4	150.000	19.89	-10.11	30.00	32.75	9.80	2.34	25.00	Peak	---	---
5	160.000	22.88	-7.12	30.00	35.82	9.40	2.64	24.98	Peak	---	---
6	167.190	20.04	-9.96	30.00	33.44	9.12	2.45	24.97	Peak	---	---
7	200.000	25.42	-4.58	30.00	38.52	8.80	3.00	24.90	Peak	---	---



Site : OS04-LK
 Condition : CISPR CLASS-B 10m CHASE2288 VERTICAL
 EUT : DISK ARRAY
 POWER : 110VAC (POWER*1)
 MODE :
 MEMO : DESK FORCE II
 : LAN:10M (UTP)

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	240.000	21.87	-15.13	37.00	32.53	11.32	3.00	24.98	Peak	---	---
2	300.000	29.02	-7.98	37.00	38.02	12.90	3.00	24.90	Peak	---	---
3	366.400	28.97	-8.03	37.00	35.83	14.77	3.34	24.97	Peak	---	---
4	400.000	29.21	-7.79	37.00	35.18	15.70	3.33	25.00	Peak	---	---
5	480.000	30.87	-6.13	37.00	34.50	17.14	4.23	25.00	Peak	---	---
6	500.000	32.50	-4.50	37.00	35.50	17.50	4.50	25.00	Peak	---	---
7	532.800	30.12	-6.88	37.00	33.16	17.89	4.07	25.00	Peak	---	---
8	566.400	28.54	-8.46	37.00	31.34	18.26	3.94	25.00	Peak	---	---
9	600.000	28.94	-8.06	37.00	31.17	18.60	4.17	25.00	Peak	---	---

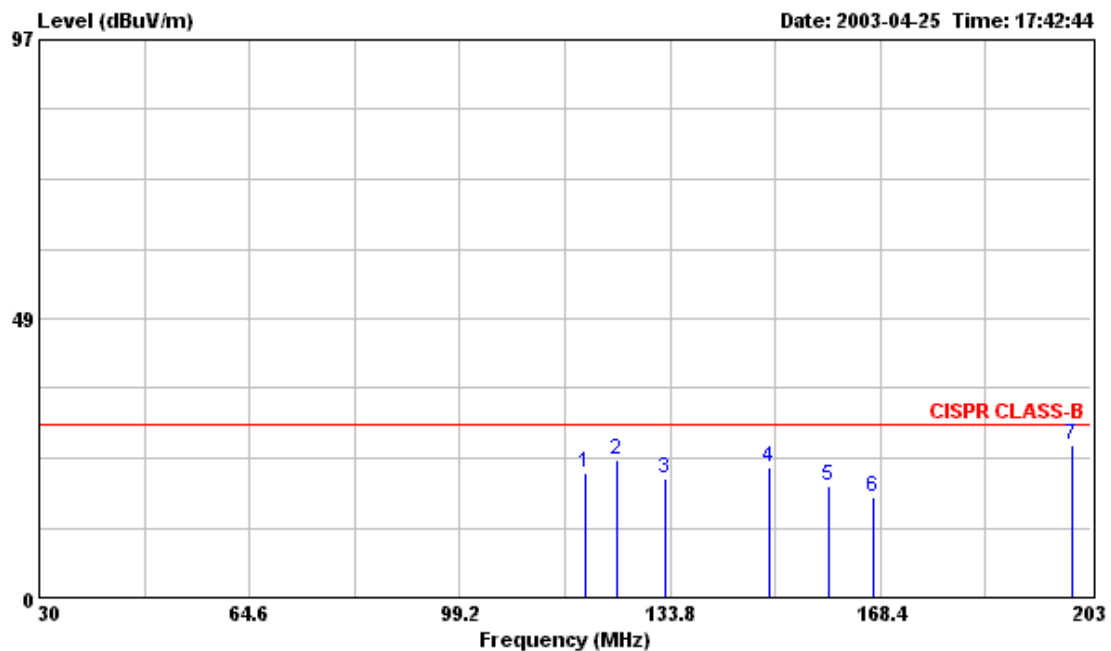
Test Engineer: 

Benny Lee

6.4.2 Test Mode: Mode 2

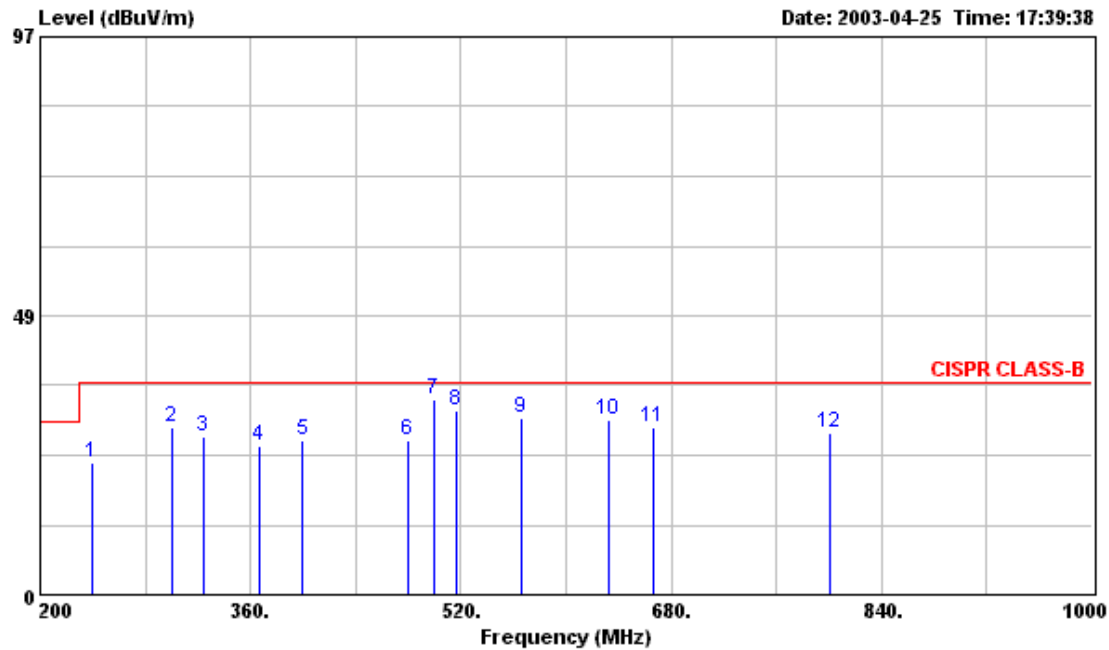
- Frequency Range of Test: from 30 MHz to 1,000 MHz
- Test Distance: 10 M
- Temperature: 23 °C
- Relative Humidity: 58 %
- Emission level (dBuV/m) = 20 log Emission level (uV/m)
- Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level

■ The test was passed at the minimum margin that marked by the frame in the following test record



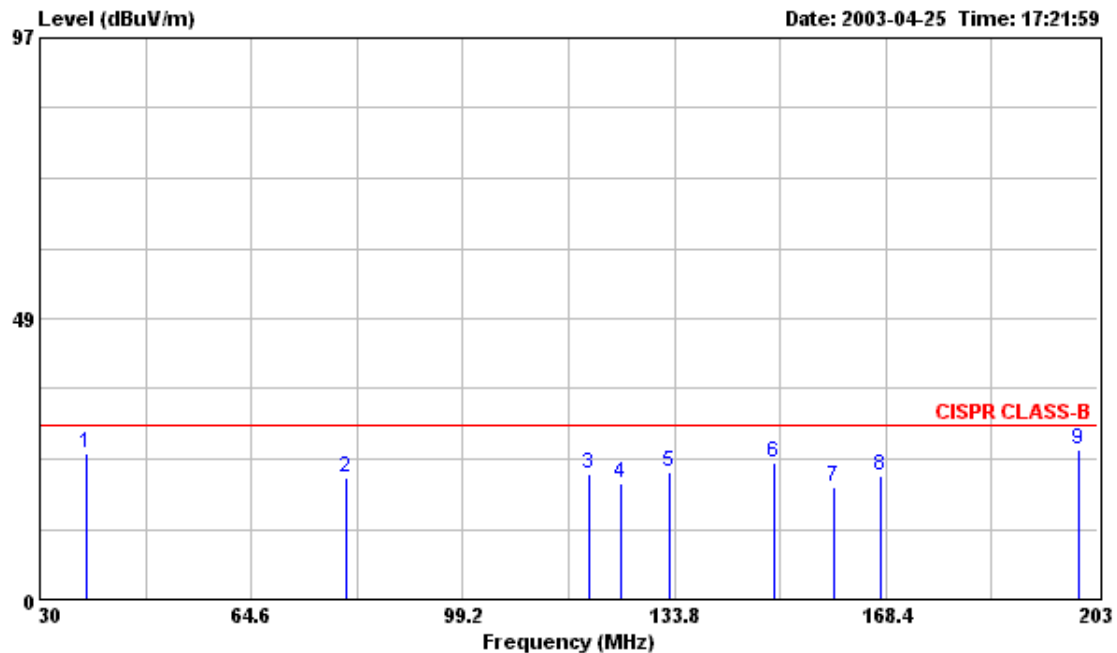
Site : OS04-LK
 Condition : CISPR CLASS-B 10m CHASE2288 HORIZONTAL
 EUT : DISK ARRAY
 POWER : 110VAC (POWER*2)
 MODE :
 MEMO : DESK FORCE II
 : LAN:10M (UTP)

	Freq	Level	Over	Limit	ReadAntenna	Cable	Preamp		Ant	Table
	MHz	dBuV/m	Limit	Line	Level	Loss	Factor	Remark	Pos	Pos
			dB	dBuV/m	dBuV	dB/m	dB	dB	cm	deg
1	120.000	21.61	-8.39	30.00	33.17	11.60	1.84	25.00 Peak	---	---
2	125.000	23.83	-6.17	30.00	35.39	11.60	1.84	25.00 Peak	---	---
3	133.110	20.59	-9.41	30.00	32.64	11.01	1.94	25.00 Peak	---	---
4	150.000	22.74	-7.26	30.00	35.60	9.80	2.34	25.00 Peak	---	---
5	160.000	19.55	-10.45	30.00	32.49	9.40	2.64	24.98 Peak	---	---
6	167.360	17.53	-12.47	30.00	31.00	9.08	2.41	24.96 Peak	---	---
7 @	200.000	26.42	-3.58	30.00	39.52	8.80	3.00	24.90 Peak	---	---



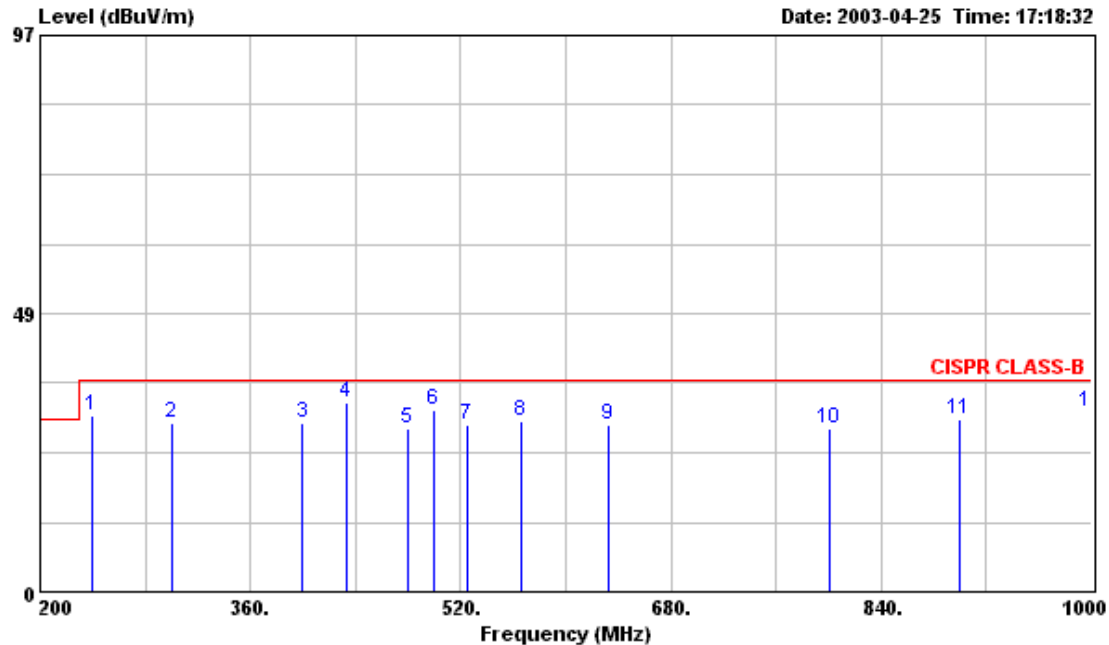
Site : OS04-LK
 Condition : CISPR CLASS-B 10m CHASE2288 HORIZONTAL
 EUT : DISK ARRAY
 POWER : 110VAC (POWER*2)
 MODE :
 MEMO : DESK FORCE II
 : LAN:10M (UTP)

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	240.000	22.87	-14.13	37.00	33.53	11.32	3.00	24.98	Peak	---	---
2	300.000	29.18	-7.82	37.00	38.18	12.90	3.00	24.90	Peak	---	---
3	324.800	27.51	-9.49	37.00	35.67	13.60	3.17	24.93	Peak	---	---
4	366.400	25.97	-11.03	37.00	32.83	14.77	3.34	24.97	Peak	---	---
5	400.000	26.88	-10.12	37.00	32.85	15.70	3.33	25.00	Peak	---	---
6	480.000	26.70	-10.30	37.00	30.33	17.14	4.23	25.00	Peak	---	---
7 @	500.000	33.83	-3.17	37.00	36.83	17.50	4.50	25.00	Peak	200	136
8	516.000	31.98	-5.02	37.00	35.00	17.69	4.29	25.00	Peak	---	---
9	566.400	30.70	-6.30	37.00	33.50	18.26	3.94	25.00	Peak	---	---
10	632.800	30.49	-6.51	37.00	32.67	18.79	4.06	25.03	Peak	---	---
11	666.400	29.17	-7.83	37.00	31.16	18.97	4.11	25.07	Peak	---	---
12	800.000	28.13	-8.87	37.00	27.33	20.30	5.50	25.00	Peak	---	---



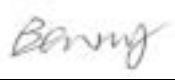
Site : OS04-LK
 Condition : CISPR CLASS-B 10m CHASE2288 VERTICAL
 EUT : DISK ARRAY
 POWER : 110VAC (POWER*2)
 MODE :
 MEMO : DESK FORCE II
 : LAN:10M (UTP)

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamp Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	37.500	25.28	-4.72	30.00	35.40	13.66	1.10	24.88	QP	---	---
2	80.000	21.13	-8.87	30.00	38.17	6.80	1.16	25.00	Peak	---	---
3	120.000	21.77	-8.23	30.00	33.33	11.60	1.84	25.00	Peak	---	---
4	125.000	20.00	-10.00	30.00	31.56	11.60	1.84	25.00	Peak	---	---
5	132.940	22.10	-7.90	30.00	34.15	11.01	1.94	25.00	Peak	---	---
6	150.000	23.47	-6.53	30.00	36.33	9.80	2.34	25.00	Peak	---	---
7	160.000	19.55	-10.45	30.00	32.49	9.40	2.64	24.98	Peak	---	---
8	167.540	21.18	-8.82	30.00	34.65	9.08	2.41	24.96	Peak	---	---
9	200.000	25.92	-4.08	30.00	39.02	8.80	3.00	24.90	Peak	---	---



Site : OS04-LK
 Condition : CISPR CLASS-B 10m CHASE2288 VERTICAL
 EUT : DISK ARRAY
 POWER : 110VAC (POWER*2)
 MODE :
 MEMO : DESK FORCE II
 : LAN:10M (UTP)

	Freq	Level	Over Limit	Limit Line	ReadAntenna Level	Antenna Factor	Cable Loss	Preamplifier Factor	Remark	Ant Pos	Table Pos
	MHz	dBuV/m	dB	dBuV/m	dBuV	dB/m	dB	dB		cm	deg
1	240.000	30.87	-6.13	37.00	41.53	11.32	3.00	24.98	Peak	---	---
2	300.000	29.35	-7.65	37.00	38.35	12.90	3.00	24.90	Peak	---	---
3	400.000	29.54	-7.46	37.00	35.51	15.70	3.33	25.00	Peak	---	---
4	432.800	32.95	-4.05	37.00	38.00	16.29	3.66	25.00	Peak	---	---
5	480.000	28.53	-8.47	37.00	32.16	17.14	4.23	25.00	Peak	---	---
6	500.000	31.83	-5.17	37.00	34.83	17.50	4.50	25.00	Peak	---	---
7	524.800	29.13	-7.87	37.00	32.17	17.79	4.17	25.00	Peak	---	---
8	566.400	29.70	-7.30	37.00	32.50	18.26	3.94	25.00	Peak	---	---
9	632.800	28.99	-8.01	37.00	31.17	18.79	4.06	25.03	Peak	---	---
10	800.000	28.30	-8.70	37.00	27.50	20.30	5.50	25.00	Peak	---	---
11	900.000	30.00	-7.00	37.00	29.83	20.50	4.67	25.00	Peak	---	---
12	1000.000	31.43	-5.57	37.00	29.83	21.60	5.00	25.00	Peak	---	---

Test Engineer: 

Benny Lee

7. EMI Suppression Component List

1. For HDD, used aluminum foil to contact iron panel with the slot of iron case.
(As the Internal photo No.10)
2. Added core (LF-65) to RS232 and LAN with one turn.
(As the Internal photo No.2 & No.4)
3. Stuck RS232 and LAN on the inside of iron panel, the power cable of front panel was stuck on the inside of case.
(As the Internal photo No.4)
4. Used Gasket to strengthen the contact of the mechanism.
(As the Internal photo No.2 & No.3 & No.6)
5. Added 2 cores (LF-65) on LED and the cable of control panel.
(As the Internal photo No.2)
6. Added core (LF-100) to SCSI cable.
(As the Internal photo No.34 & No.35)

8. Antenna Factor & Cable Loss

Frequency (MHz)	Antenna Factor (dB)	Cable Loss (dB)
30	17.8	1.17
35	15.1	1.00
40	12.7	1.17
45	10.2	1.17
50	6.6	1.33
55	6.0	1.50
60	5.4	1.33
65	5.1	1.33
70	4.8	1.00
75	5.8	1.16
80	6.8	1.16
85	7.7	1.50
90	8.6	1.50
95	9.6	1.33
100	10.4	1.50
110	11.0	1.66
120	11.6	1.84
130	11.2	1.84
140	10.5	2.17
150	9.8	2.34
160	9.4	2.64
170	9.0	2.34
180	8.7	2.00
190	8.8	2.33
200	8.8	3.00
220	10.2	2.50
240	11.4	3.00
260	12.2	2.83
280	12.6	3.16
300	12.9	3.00
320	13.5	3.14
340	14.0	3.27
360	14.6	3.34
380	15.1	3.33
400	15.7	3.33
450	16.6	3.83
500	17.5	4.50
550	18.1	3.83
600	18.6	4.17
650	18.9	4.00
700	19.1	4.33
750	19.7	4.50
800	20.3	5.50
850	20.4	4.50
900	20.5	4.67
950	21.0	4.66
1000	21.6	5.00

9. List of Measuring Equipment Used

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Receiver	R&S	ESCS 30	100174	9 KHz - 2.75 GHz	Dec. 12, 2002	Conduction (CO01-LK)
LISN	Telemeter	NNB-2/16Z	98009	9KHz ~ 30MHz	Dec. 17, 2002	Conduction (CO01-LK)
LISN	Telemeter	NNB-2/16Z	98087	9KHz ~ 30MHz	Dec. 17, 2002	Conduction (CO01-LK)
RF Cable-CON	Suhner Switzerland	RG223/U	CB017	9KHz~30MHz	Jan. 08, 2003	Conduction (CO01-LK)
50 ohm BNC type Terminal	NOBLE	50ohm	TM002	50 ohm	May 19, 2003	Conduction (CO01-LK)
Open Area Test Site	SPORTON	OATS-10	OS04-LK	30MHz~1GHz 10m,3m	Aug. 03, 2002	Radiation (OS04-LK)
Spectrum Analyzer	HP	8560E	3728A03190	30MHz – 2.9GHz	Nov. 04, 2002	Radiation (OS04-LK)
Amplifier	HP	87405A	3207A01437	10MHz – 3GHz	Aug. 12, 2002	Radiation (OS04-LK)
Receiver	HP	8546A	3325A00108	9 K – 6.5 GHz	Dec. 28, 2002	Radiation (OS04-LK)
Bilog Antenna	CHASE	CBL6112B	2288	30MHz -2GHz	Jun. 22, 2002	Radiation (OS04-LK)
Turn Table	EMCO	2080	9711-2021	0 ~ 360 degree	N/A	Radiation (OS04-LK)
Antenna Mast	EMCO	2075	9711-2115	1 m- 4 m	N/A	Radiation (OS04-LK)
RF Cable-R10m	BELDEN	RG8/U	CB011	30MHz~1GHz	Jan. 06, 2003	Radiation (OS04-LK)
RF Cable-R03m	BELDEN	RG8/U	CB012	30MHz~1GHz	Jan. 06, 2003	Radiation (OS04-LK)

* Calibration Interval of instruments listed above is one year.

10. Uncertainty of Test Site

Uncertainty of Conducted Emission Measurement

Contribution	Probability Distribution	150KHz – 30MHz
Cable and I/P attenuator calibration	normal(k=2)	±0.3
RCV/SPA specification	rectangular	±2.5
LISN coupling specification	rectangular	±1.5
Transducer factor frequency interpolation	rectangular	±0.2
Mismatch Receiver VSWR $\Gamma_1=0.09$ LISN VSWR $\Gamma_2=0.33$ Uncertainty= $20\log(1-\Gamma_1*\Gamma_2)$	U-shaped	0.2
combined standard uncertainty Ue(y)	normal	±1.7
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±3.4

$$U = \sqrt{\{(0.3/2)^2 + (2.5^2 + 1.5^2 + 0.2^2)/3 + (0.2)^2/2\}} = 1.7$$

Uncertainty of Radiated Emission Measurement

Contribution	Probability Distribution	3m	10m
Antenna factor calibration	normal(k=2)	±1.6	±1.6
cable loss calibration	normal(k=2)	±0.3	±0.3
RCV/SPA specification	rectangular	±2.5	±2.5
Antenna Directivity	rectangular	±3	±0.5
Antenna Factor V.S. Height	rectangular	±2	±2
Antenna Factor Interpolation for Frequency	rectangular	±0.25	±0.25
site imperfection	rectangular	±2	±2
Mismatch Receiver VSWR $\Gamma_1=0.09$ Antenna VSWR $\Gamma_2=0.67$ Uncertainty= $20\log(1-\Gamma_1*\Gamma_2)$	U-shaped	±0.54	±0.54
combined standard uncertainty Ue(y)	normal	±2.9	±2.4
Measuring uncertainty for a level of confidence of 95% U=2Ue(y)	normal (k=2)	±5.8	±4.8

$$U = \sqrt{\{(1.6/2)^2 + (0.3/2)^2 + (3^2 + 0.5^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\}} = 2.4 \text{ for 10m test distance}$$

$$U = \sqrt{\{(1.6/2)^2 + (0.3/2)^2 + (3^2 + 3^2 + 2^2 + 0.25^2 + 2^2)/3 + (0.54)^2/2\}} = 2.9 \text{ for 3m test distance}$$