Certification of Compliance

CFR 47 Part 15 Subpart B / PC peripherals

Test Report File No. 03-IST-278 **Date of Issue** Nov. 7, 2003

Model **JP-200**

Kind of Product MP3 Player

Applicant Arthur Technology Co., Ltd.

Address Rm402, KCS Bldg., 228-13, Yongdap_dong, Seongdong-Ku, Seoul, Korea

Manufacturer Arthur Technology

Address Rm402, KCS Bldg., 228-13, Yongdap_dong, Seongdong-Ku, Seoul, Korea

Test Result **(*)Positive** **( ) Negative**

Reviewed By

J.H. Lee / General Manager of EMC

Approved By

G. Chung / Chief

- Investigations requested : Measurement to the relevant clauses of F.C.C rules and regulations Part 15 Subpart B – PC Peripherals
- The test report with appendix consists of 17 pages.
- The test result only responds to the tested sample.
- It is not allowed to copy this report even partly without the allowance of IST EMC Laboratory.
- This equipment as for has been shown to be capable of continued compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4 1992.

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INFORMATIONS OF TEST LABORATORY

EMC LABORATORY of IST Co., Ltd. (Yongin Lab., ***Filed to FCC***)
San 21-8, Goan-Ri, Baekam-Myun, Yongin-City
Kyonggi-Do, 449-860, Korea
TEL : +82 31 333 4093 FAX : +82 31 333 4094

EMC LABORATORY of IST Co., Ltd. (Yangji Lab., ***Filed to FCC***)
80, Jeil-RI, Yangji-Myun, Yongin-City
Kyonggi-Do, 449-825, Korea
TEL : +82 31 323 3012 FAX : +82 31 323 3014

ENVIRONMENTAL CONDITIONS

Temperature	21 ℃
Humidity	48 %
Atmospheric pressure	1003 mbar

POWER SUPPLY SYSTEM USED

Power supply system	120Vac 60Hz

Product Information

Memory Capacity	Internal 64MB/128MB(Tested)/256MB/512MB
Voltage	1.5V DC
Battery	AAA(General)
LCD	LCD Numerals(4 Line 128x64 Full Dot Matrix) EL Back Lighting
Dimension/Weight	30 x 73 x 15 mm / 35g (excluding battery)
Case	ABS
File Transfer Rate	4.8Mbps
Voice Recording	MPEG I,III Layer-3, VAD,TVF,SYNC,SILENCE,BR
Noise	90dB
Earphone Output	10nW

Find product information in User's manual.

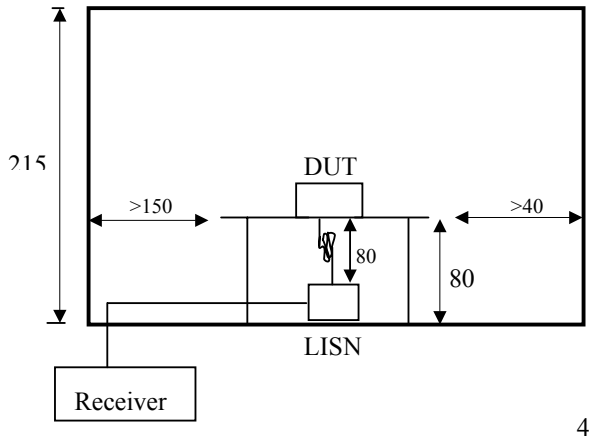
DESCRIPTIONS OF TEST

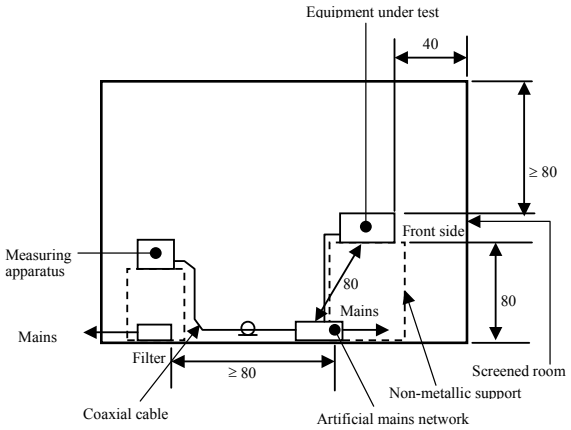
Conducted Emissions:

The measurement were performed over the frequency range of 0.15MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an bandwidth of 10KHz or for "quasi-peak" within a bandwidth of 9KHz.

- Procedure of Test

The line-conducted facility is located in a shielded room. The wooden table 80cm height is placed 40cm away from the vertical wall and 1.5m away from the other wall of the shielded room. The LISNs are bonded to bottom of the shielded room. The EUT is located on the wooden table with distance more than 80cm from the LISN and powered from the powered LISN .The peripheral equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cutting power line filters. All electrical cables are shielded by braided tinned steel tubing with inner ϕ 1.2cm. If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply lines will be connected to the appropriate LISN. All interconnecting cables more than 1m were shortened by non-inductive bundling to a 1m length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating conditions. The RF output of the LISN was connected to the R/S receiver to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was re-measured using Quasi-Peak detector and average detector by manual measurement or final measurement program of R&S, after scanned by automatic Peak mode for frequency range from 0.15 to 30MHz. The bandwidth of the receiver was set to 10kHz. The EUT, peripheral equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.





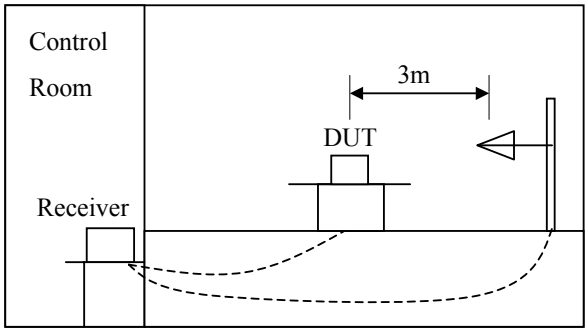
DESCRIPTION OF TEST

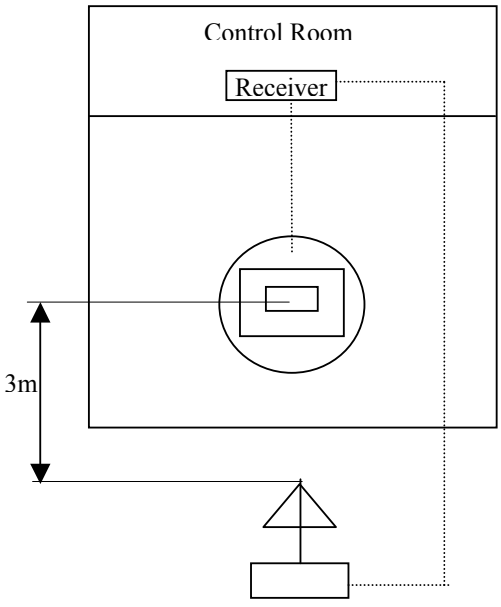
Radiated Emissions:

The measurement was performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurement was made with the detector set for "quasi-peak" within a bandwidth of 120KHz.

- Procedure of Test

Preliminary measurements were made at 3 meter using bi-conical and log-periodic antennas, and spectrum analyzer to determine the frequency producing the max. emission in anechoic chamber. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turn-table azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 30MHz to 230MHz using bi-conical antenna and 230 to 1000MHz using log-periodic antenna. Above 1GHz, linearly polarized double ridge horn antennas were used. Final measurements were made at open site with 3 or 10 meters test distance using Bi-log antenna, Bi-conical antenna, Log-periodic antenna or horn antenna. The OATS have been verified in regular for its normalized site attenuations. The test equipment was placed on a wooden table. Sufficient time for the EUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1MHz depending on the frequency of type of signal. The EUT, peripheral equipment and interconnecting cables were configured as same in chamber, were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission.





SUMMARY

☒ Conducted Emission

The requirements are	● MET ○ Not MET
Minimum limit margin	5.8dB at 1.163MHz
Maximum limit exceeding	

Remarks : With average detector/Live Phase

☒ Radiated Emission

The requirements are	● MET ○ Not MET
Minimum limit margin	4.9dB at 479.9MHz
Maximum limit exceeding	

Remarks :

Reported By

H.C. Kim / EMC Engineer

Note :

☒ means the test is applicable, ☐ is not applicable.

TEST CONDITIONS AND DATA

Conducted Emissions

[Applicable]

◆ Test Equipment Used

Model Name	Manufacturer	Description	Next Cal. Date
ESH3	Rohde Schwarz	Receiver	Jul. 22, 2004
3725/2	EMCO	LISN	Jul. 23, 2004
ESH3-Z2	Rohde Schwarz	Pulse Limiter	Jul. 22, 2004
EZM	Rohde Schwarz	Spectrum Monitor	-

◆ Auxiliary Equipment Used

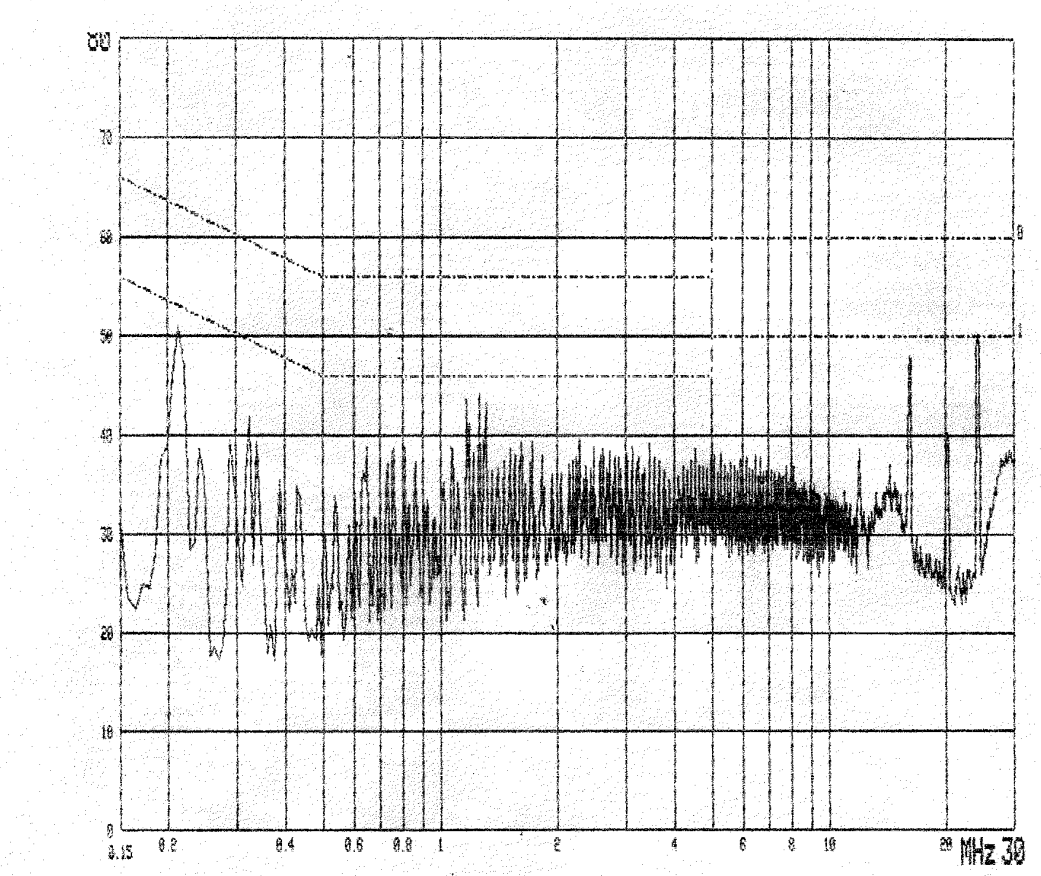
Model Name	Manufacturer	Descriptions	FCC Compliance Information
Brio BA600/550	HP	Desktop PC	DoC
529B	Daewoo	Monitor	Q5F7NFCMC529B
M-SAS51	HP	Mouse(PS/2)	LZA90401209
M-U48a	LOGITECH	Mouse(Serial)	DZL210365
SK-2502C	HP	Keyboard	DoC
A0302380	Northern Telecom	Printer	DSI6XU22225C-L
X03-5740	8892384-00000	Microsoft	DoC

◆ Test Program Up/Down (Read/Write) repeat

◆ Test Area Shielded Room

Note :

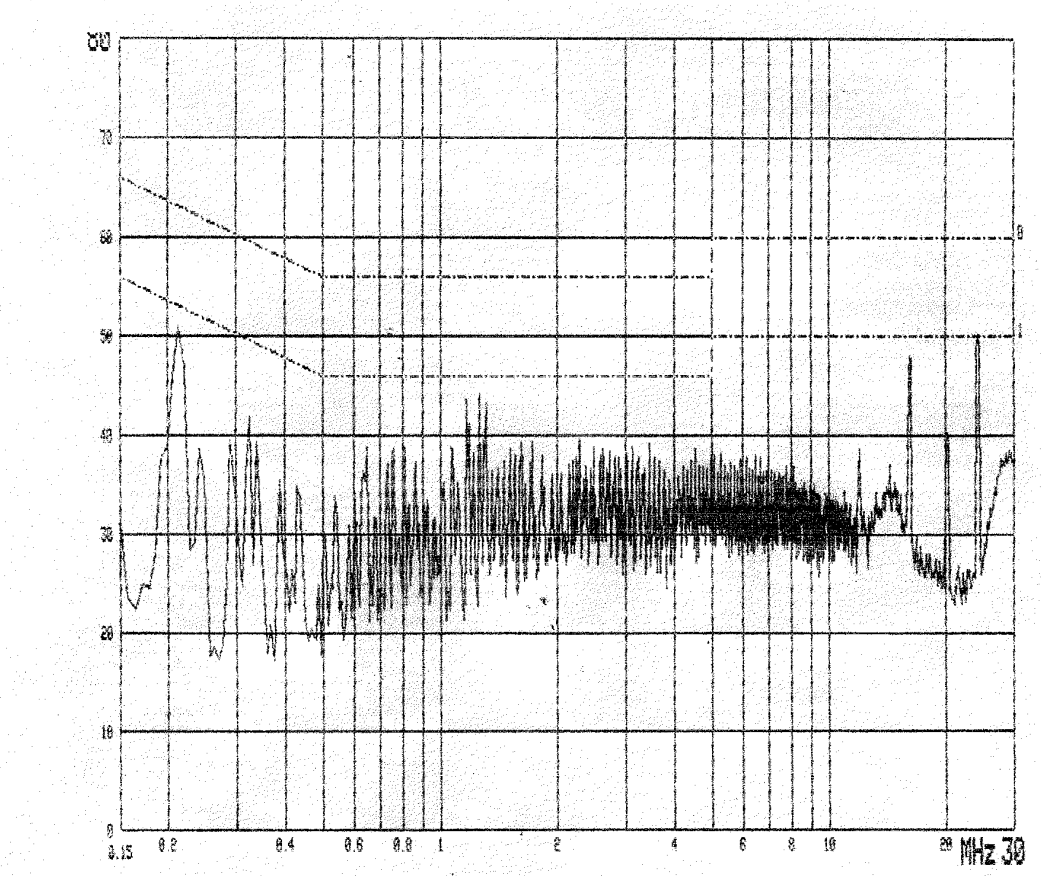
Conducted Emissions



MODEL NAME : JP-200
120Vac 60Hz PHASE : N

Peak Plotted

Conducted Emissions



MODEL NAME : JP-200
120Vac 60Hz PHASE : N

Peak plotted

Measured Data

Frequency	Corrections		Phase	Quasi-Peak			Average		
				Limit	Reading	Result	Limit	Reading	Result
[MHz]	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]	[dBuV]
0.212	1.0	0.5	L1	63.1	49.5	51.0	53.1	40.4	41.9
0.288	0.8	0.5	L1	60.6	36.0	37.3	50.6	36.9	38.2
0.322	0.7	0.4	L1	59.7	41.3	42.4	49.7	33.1	34.2
0.338	0.7	0.4	L1	59.3	36.9	38.0	49.3	37.6	38.7
0.387	0.6	0.4	N	58.1	34.0	35.0	48.1	34.5	35.0
0.428	0.6	0.4	L1	57.3	30.3	31.3	47.3	26.1	27.1
0.645	0.4	0.4	N	56.0	36.1	36.9	46.0	35.6	36.4
0.800	0.3	0.4	N	56.0	23.3	24.0	46.0	18.3	19.0
1.163	0.3	0.5	L1	56.0	38.8	39.6	46.0	39.4	40.2
1.256	0.3	0.5	N	56.0	19.7	20.5	46.0	13.3	14.1
1.309	0.3	0.5	N	56.0	40.2	41.0	46.0	37.8	38.6
2.276	0.3	0.6	N	56.0	40.1	41.0	46.0	37.8	38.7
5.252	0.3	0.5	N	60.0	25.6	26.4	50.0	19.7	20.5
11.974	0.4	0.6	N	60.0	31.5	32.5	50.0	25.6	26.6
16.263	0.5	0.7	N	60.0	42.1	43.3	50.0	20.7	21.9
20.222	0.4	0.7	N	60.0	29.9	31.0	50.0	14.5	15.6
24.128	0.3	0.7	L1	60.0	42.5	43.5	50.0	17.7	18.7
28.619	0.4	0.8	L1	60.0	22.4	23.6	50.0	16.4	17.6

TEST CONDITIONS AND DATA

Radiated Emission

[Applicable]

◆ Test Equipment Used

Model Name	Manufacturer	Description	Next Cal. Date
ESVS10	Rohde & Schwarz	Receiver	Dec. 9, 2004
VHA9103	Schwarzbeck	Antenna	Jun. 20, 2004
HUF Z3	Rohde & Schwarz	Antenna	Jun. 18, 2004

◆ Auxiliary Equipment Used

Model Name	Manufacturer	Descriptions	FCC Compliance Information
Brio BA600/550	HP	Desktop PC	DoC
529B	Daewoo	Monitor	Q5F7NFCMC529B
M-SAS51	HP	Mouse(PS/2)	LZA90401209
M-U48a	LOGITECH	Mouse(Serial)	DZL210365
SK-2502C	HP	Keyboard	DoC
A0302380	Northern Telecom	Printer	DSI6XU22225C-L
X03-5740	8892384-00000	Microsoft	DoC

◆ Test Program Up/Down (Read/Write) repeat

◆ Test Area Open Area Test Site

Note :

Radiated Emissions

(Disturbance Radiation)

- The measured values are as following

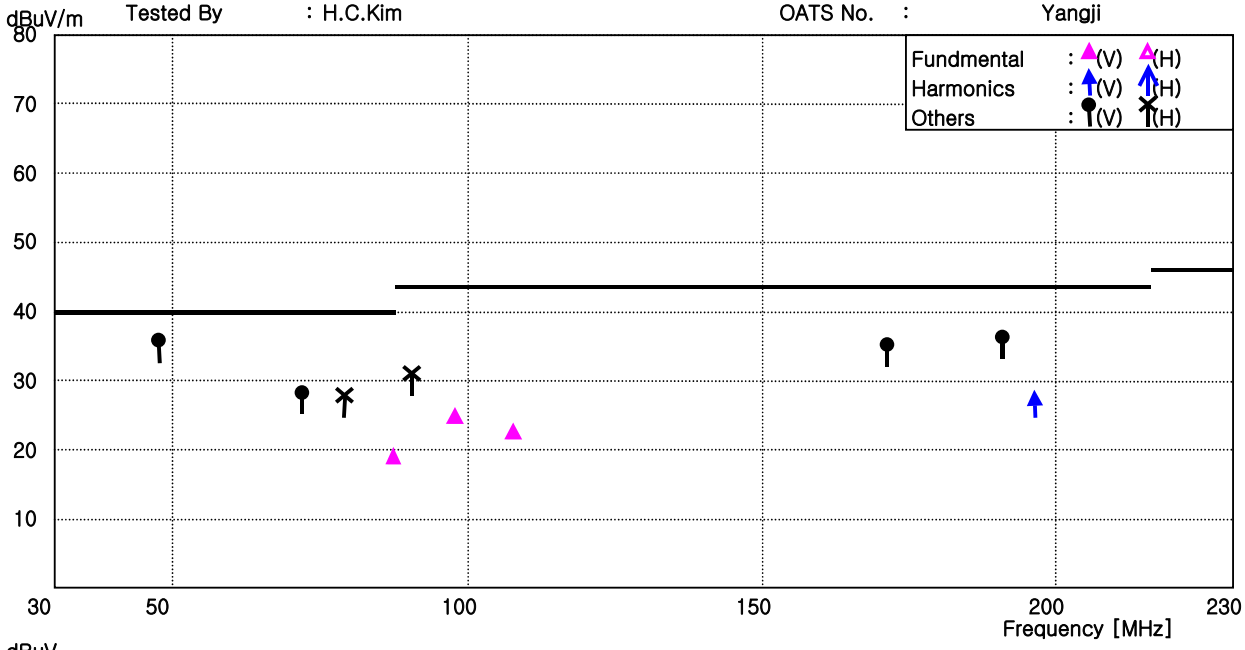
	Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Polar. [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
Up/	47.8	22.8	12.0	1.0	133	V	35.8	40.0	4.2
Down	72.0	20.9	5.9	1.5	0	V	28.3	40.0	11.7
	79.3	19.9	6.4	1.6	138	H	27.9	40.0	12.1
	90.7	20.6	8.6	1.9	60	H	31.1	43.5	12.4
	171.2	16.8	15.4	3.1	215	V	35.3	43.5	8.2
	190.8	17.3	15.7	3.4	140	V	36.4	43.5	7.1
	238.4	20.4	11.4	3.9	240	H	35.7	46.0	10.3
	249.0	19.0	11.5	3.9	173	H	34.4	46.0	11.6
	469.5	18.8	16.3	5.9	92	H	41.0	46.0	5.0
	479.9	19.3	16.6	6.0	147	H	41.9	46.0	4.1
	492.2	18.2	17.4	6.1	121	H	41.7	46.0	4.3
FM	87.5	10.1	7.9	1.8	171	V	19.8	40.0	20.2
	98.0	13.8	9.9	1.9	0	V	25.6	43.5	17.9
	196.3	9.3	15.9	3.4	0	V	28.6	43.5	14.9
	107.9	10.0	11.3	2.1	0	V	23.4	43.5	20.1

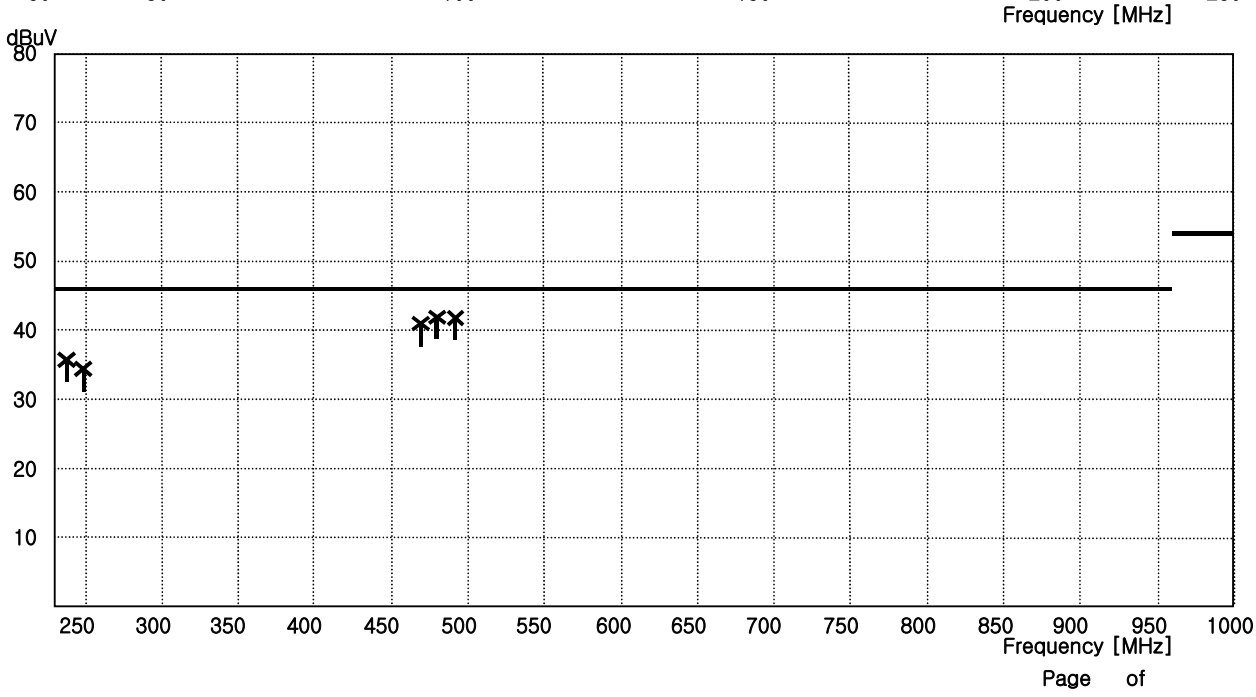
End of data

Note : ***Included the data for FM receiving mode***

Radiated Emissions

Report No.	: 03-IST-278	Date :	10/03/2003
Applicant	: Arthur Tech		
Model	: JP-200	Serial No. :	N/A
Regulations	: CFR47 Pt15	Rule :	FCC
Class	: B		
Range	: 30-1000MHz	Test Result	Pass
Test Modes	: USB	Dist.(m) :	3m
Tested By	: H.C.Kim	OATS No. :	Yangji





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Appendix A. The DUT Photos

Front View

Rear View

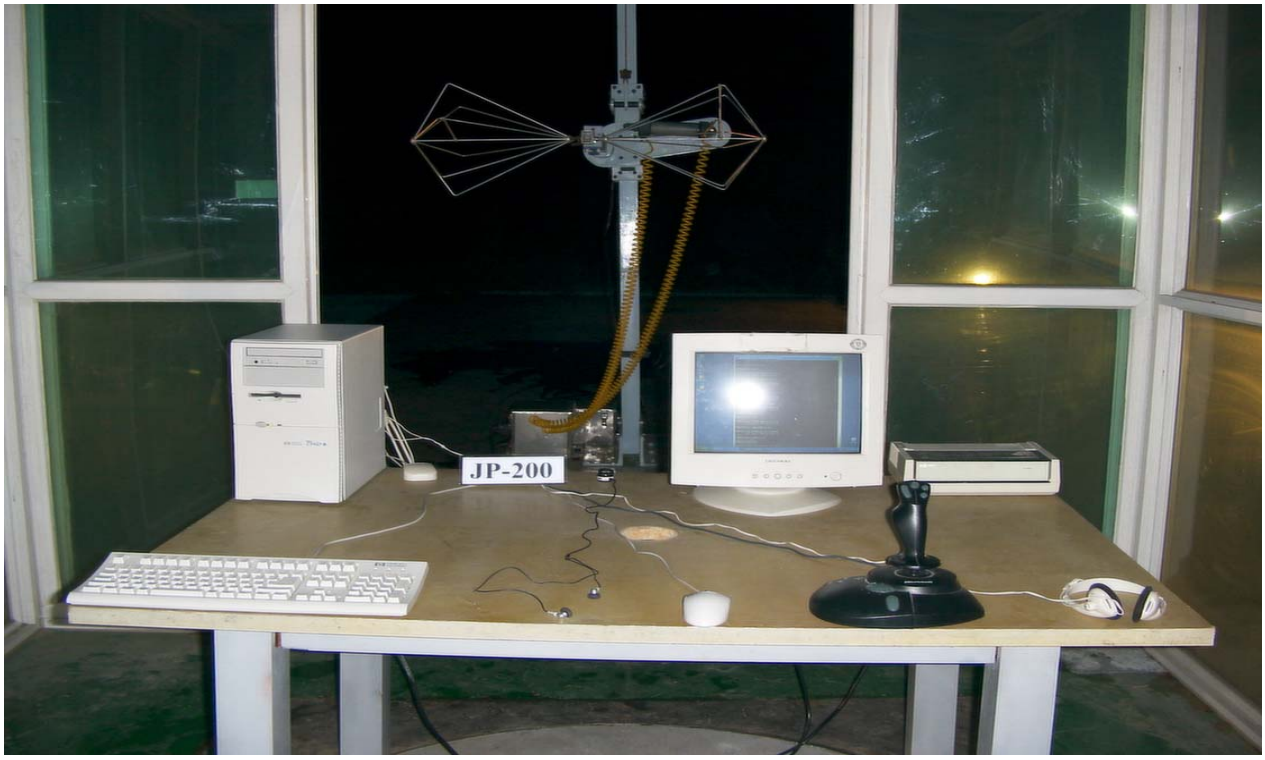
USB Cable

Earphone

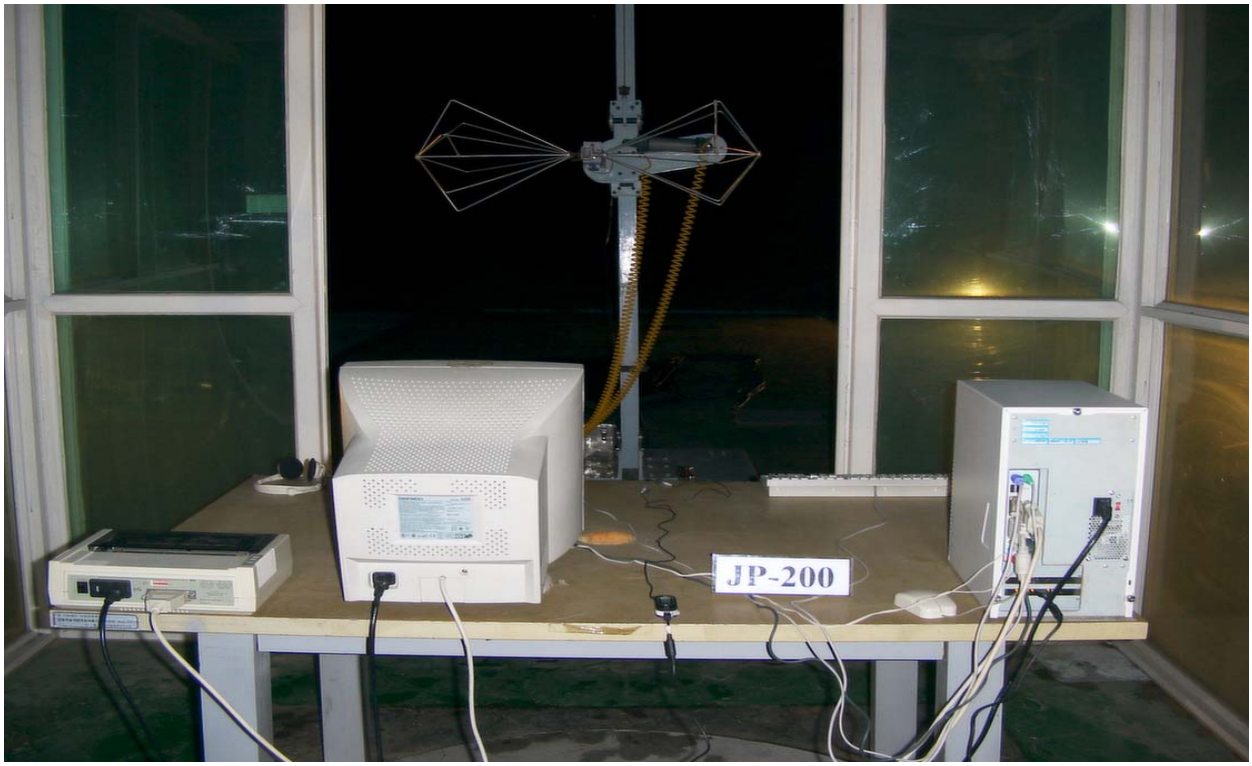
Appendix B. The Test Setup Photos

Conducted Emissions-Front View

Conducted Emissions-Rear View



Radiated Emissions-Front View



Radiated Emissions-Rear View