

FCC PART 15 B

EMI MEASUREMENT AND TEST REPORT

For

AVIAS LIMITED

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FCC ID: SBHAV2238MEC2

July 6, 2004

This Report Concerns: ☒ Original Report	Equipment Type: MEC STATION DELUXE
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Report Number: RSZ04051703	
Test Date: June 27-30, 2004	
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Note: The test report is specially limited to the use of the above client company and the product model. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The AVIAS LIMITED 's product, model MEC SD-001 or the "EUT" as referred to in this report was a MEC STATION DELUXE which measures approximately 19.5cm L x 11.0cm W x 4.0cm H, rated input voltage: DC 9V.

Note:

A: Mobile Entertainment Center (MEC Station DELUXE), a multimedia entertainment device on a colorful LCD display panel (16:9 format), makes you enjoy the delight of the digitalize entertainment every moment.

B: MEC Station DELUXE comprises many latest technologies include Fire Wire IEEE 1394 (high speed transferring technology), digital audio and Video decoding, portable disk storage, embedded LINUX real time operating system, and powerful multimedia processing engine.

C: MEC Station DELUXE supports nearly all-digital photo/music/video/flash formats, which could be downloaded from the web.

D: MEC Station DELUXE could be used as a portable hard disk drive to be an external storage device of PC.

Switching Adapter mode: RHE-090220-2, Input: AC 100-240V 50/60Hz, Output: DC 9V.

** The test data gathered are from production sample, serial number: 0405200004, provided by the manufacturer.*

Objective

The following test report is prepared on behalf of AVIAS LIMITED. in accordance with Part 2, Subpart J, and Part 15, Subparts A and B of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine compliance with FCC Part 15 B limits for Information Technology Equipment.

Related Submittal(s)/Grant(s)

No related submittal(s).

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2001, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 KHz to 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory Corporation. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2001.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1400F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Host System Configuration List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
LEGEND	System PC	Qitian1200	N/A	DoC
Seagate	Hard Drive	ST 320410A	5FG2TFAX	DoC
Sony	3.5" Floppy Drive	FDD-MPF920-E	72930348	DoC
LEGEND	Motherboard	MS-6395	N/A	DoC
TELTA	SPS	DPS-145PB-111F	Lup0219016447C	DoC

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
LEGEND	Keyboard	SK-1688	C205007790	DoC
HP	Laser Jet 5L Printer	C3941A	JPTV0132337	DoC
SAST	Modem	AEM-2100	0293	DoC
SAMSUNG	Monitor	550E	N/A	DoC
LEGEND	Mouse	M-s61	LZA21702500	DoC

External I/O Cable

Cable Description	Length (M)	From/Port	To
Shielded Detachable KB Cable	1.6	KB Port/Host	Keyboard
Shielded Detachable Mouse Cable	1.5	Mouse Port/Host	EUT
Shielded Detachable Printer Cable	1.6	Parallel Port/Host	Printer
Shielded Detachable Serial Cable	1.6	Serial Port/Host	Modem
Shielded Detachable VGA Cable	1.5	VGA Port/Host	Monitor
Shielded 1394 Cable	1.0	EUT 1394 Port	Test PC
Unshielded Adapter Cable	1.2	Switching Adapter	EUT
Unshielded Video Cable	1.2	EUT Video /Audio	TV

SYSTEM TEST CONFIGURATION

Justification

The system was configured for testing in a typical fashion (as normally used by a typical user).

EUT Exercise Software

The EUT exercising program used during radiated and conducted testing was designed to exercise the various system components in a manner similar to a typical use. The software offered by manufacture, can let the EUT being normal operation.

Special Accessories

Interface cable used for compliance testing is shielded as normally supplied by *AVIAS LIMITED*, and its respective support equipment manufacturers.

Schematics

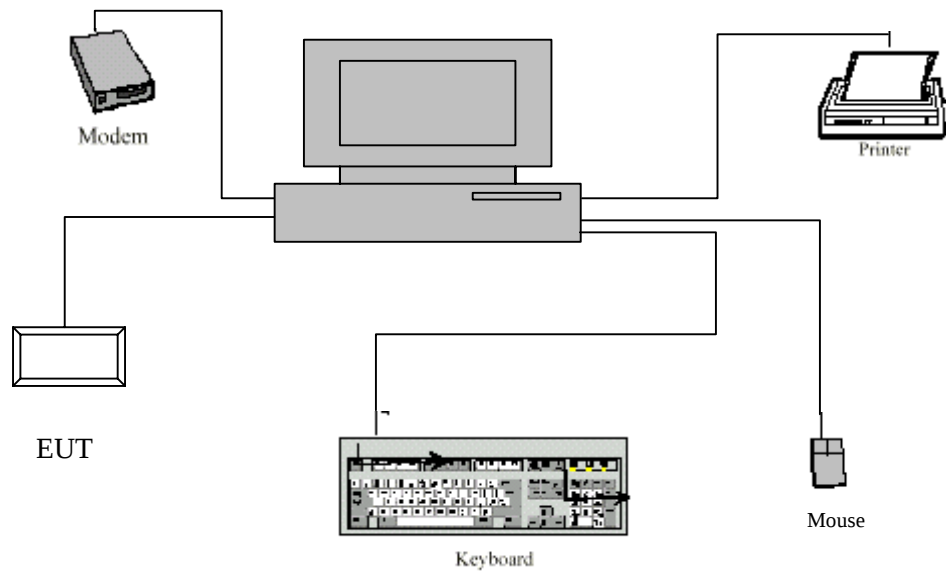
Please refer to the Exhibit C.

Equipment Modifications

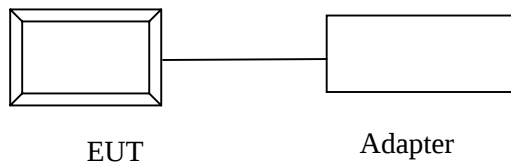
The EUT tested was not modified by BACL.

Configuration of EUT

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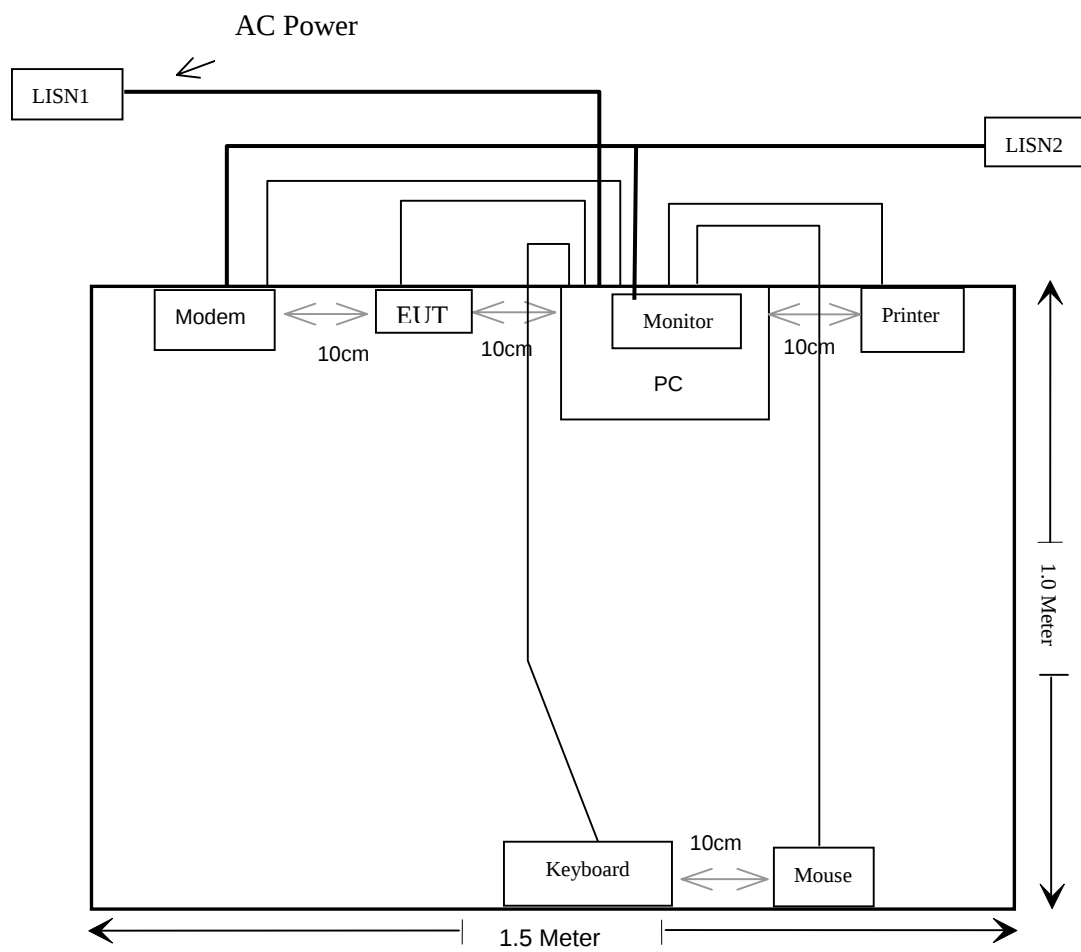


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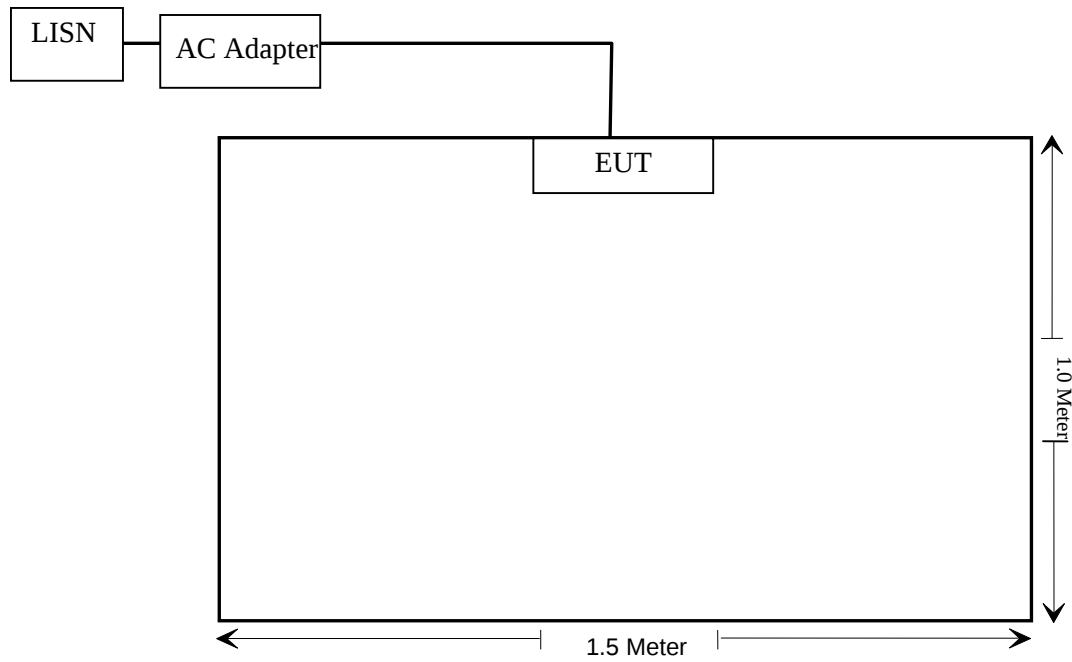


Test Setup Block Diagram

Downloading mode:



Playing mode:



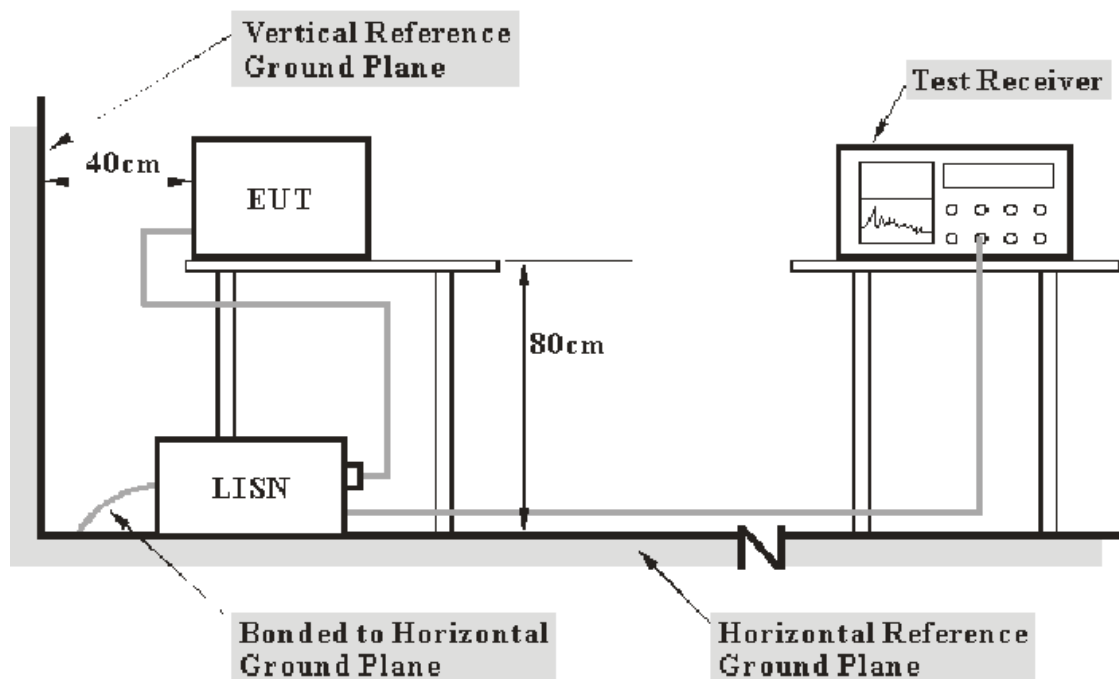
§15.107 - CONDUCTED EMISSIONS

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, and LISN.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement at BACL is ± 2.4 dB.

EUT Setup



- Note:**
1. Support units were connected to second LISN.
 2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.4-2001 measurement procedure. The specification used was with the FCC Part 15 B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The Host PC was connected to a 120 VAC/ 60Hz power source.

Spectrum Analyzer Setup

The spectrum analyzer was set to investigate the spectrum from 150 KHz to 30MHz.

During the conducted emission test, the spectrum analyzer was set with the following configurations:

<i>Frequency Range</i>	<i>RBW</i>	<i>Video B/W</i>
150KHz - 30MHz	10KHz	10KHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
COM Power	LISN	LI-200	12208	2003-10-30	2004-10-29
COM Power	LISN	LI-200	12005	2003-10-30	2004-10-29
HP	Spectrum Analyzer	8568B	2517A01610	2003-10-30	2004-10-29
HP	Spectrum Analyzer Display Unit	8568B	2517A10039	2003-10-30	2004-10-29
HP	Quasi-Peak Adapter	8565A	3107A01572	2003-10-30	2004-10-29
R/S	Spectrum Analyzer	FSEM	849720/019	2003-10-30	2004-10-29
FLUKE	True RMS Multimeter	187	78540402	2004-3-23	2005-3-22

*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

During the conducted emission test, the host PC system power cord was connected to the outlet of the first LISN, the monitor and all other support equipment power cords connected to the outlet of the second LISN.

Maximizing procedure were performed on the six (6) highest emissions of the EUT.

All data was recorded in the Quasi-peak detection mode.

Test Data

Date of Test : June 27-30, 2004 Temperature : 25°C
 EUT : MEC STATION DELUXE Humidity : 45%
 M/N : MEC SD-001 Operating Mode : Downloading
 S/N : 0405200004 Test Engineer: William Chang

LINE CONDUCTED EMISSIONS				FCC PART 15 B	
Frequency MHz	Amplitude dBμV	Detector QP/AV/Peak	Phase Line/Neutral	Limit dBμV	Margin dB
0.153	53.2	AV	Line	55.84	-2.63
0.159	52.3	AV	Line	55.52	-3.19
0.179	51.1	AV	Neutral	54.53	-3.45
0.158	51.5	AV	Neutral	55.57	-4.10
0.153	60.0	QP	Line	65.84	-5.84
0.159	59.7	QP	Line	65.52	-5.87
0.179	58.3	QP	Neutral	64.53	-6.28
0.158	58.9	QP	Neutral	65.57	-6.71
4.935	30.2	AV	Line	46.00	-15.82
4.935	37.7	QP	Line	56.00	-18.28
9.734	30.0	AV	Neutral	50.00	-20.05
9.734	36.3	QP	Neutral	60.00	-23.73

Date of Test : June 27-30, 2004 Temperature : 25°C
 EUT : MEC STATION DELUXE Humidity : 45%
 M/N : MEC SD-001 Operating Mode : Playing
 S/N : 0405200004 Test Engineer: William Chang

LINE CONDUCTED EMISSIONS				FCC PART 15 B	
Frequency MHz	Amplitude dBμV	Detector QP/AV/Peak	Phase Line/Neutral	Limit dBμV	Margin dB
0.151	54.9	AV	Line	55.94	-1.06
0.354	46.2	AV	Neutral	48.87	-2.70
0.179	51.6	AV	Line	54.53	-2.90
0.159	52.3	AV	Neutral	55.52	-3.21
0.151	62.0	QP	Line	65.94	-3.99
0.222	48.7	AV	Line	52.74	-4.02
0.179	59.4	QP	Line	64.53	-5.17
0.215	47.7	AV	Neutral	53.01	-5.28
0.159	59.7	QP	Neutral	65.52	-5.85
0.354	52.4	QP	Neutral	58.87	-6.45
0.222	55.7	QP	Line	62.74	-7.04
0.215	54.9	QP	Neutral	63.01	-8.12

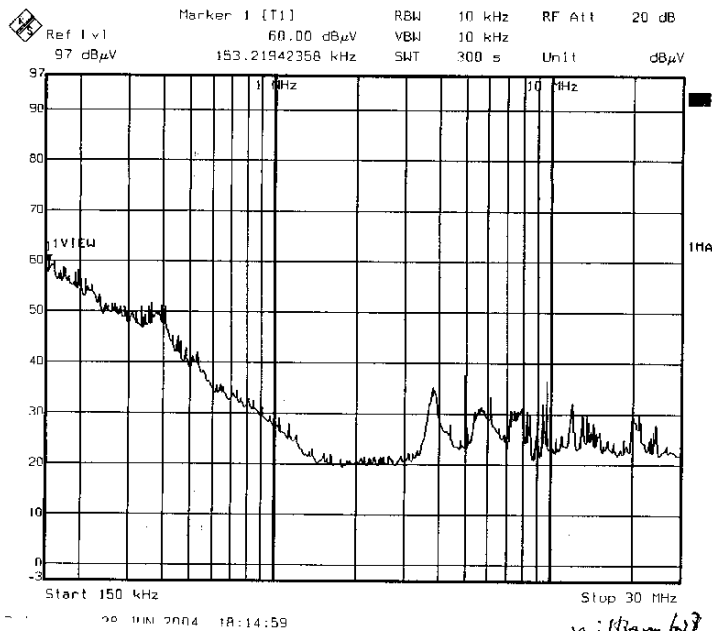
Test Result: Pass

Plot(s) of Test Data

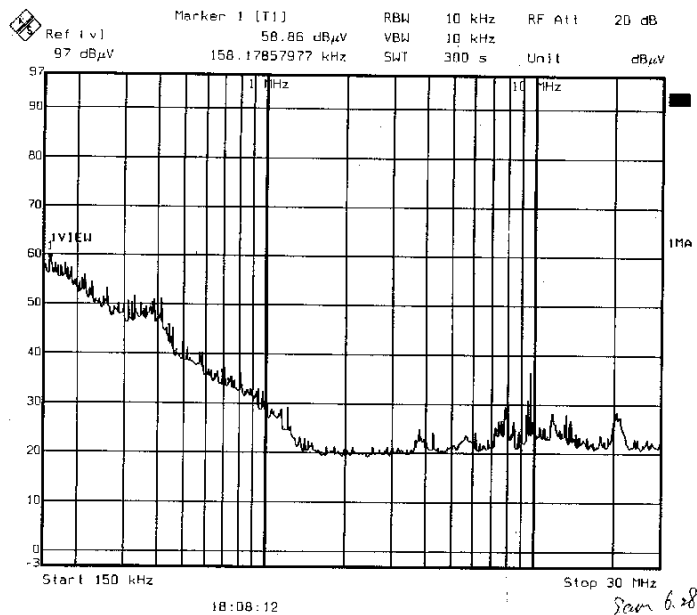
Plot(s) of Test Data is presented hereinafter as reference.

Downloading mode:

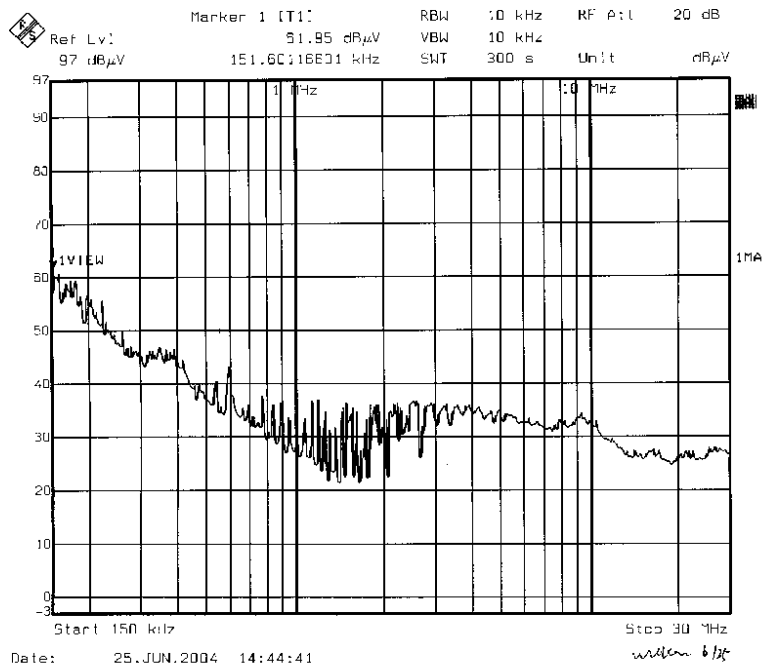
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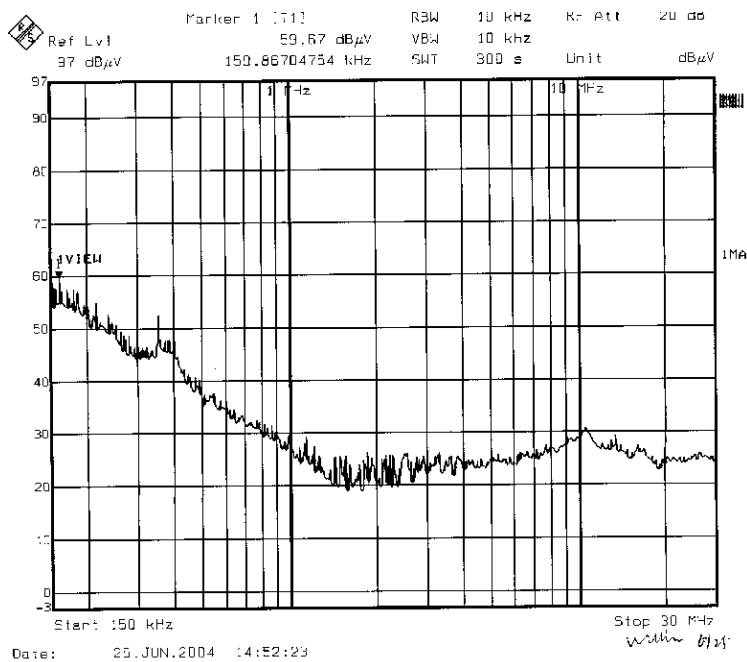
Neutral:



Playing mode:
Line:



Neutral:



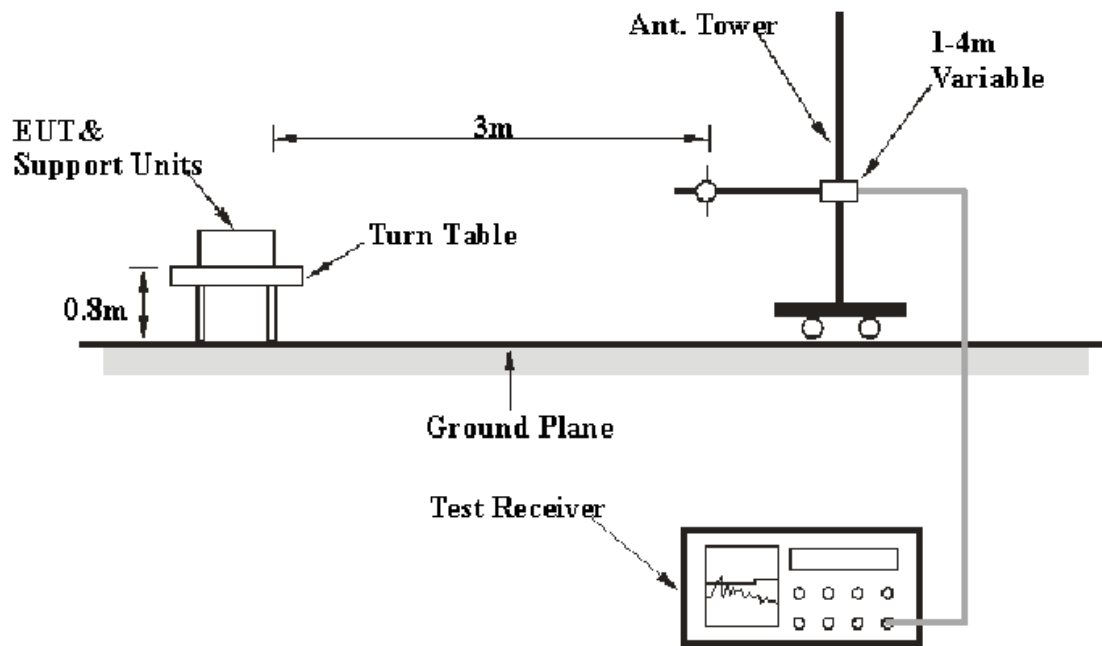
§15.109 - RADIATED EMISSION

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

EUT Setup



The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the ANSI C63.4-2001. The specification used was the FCC Part 15 B limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

The Host PC was connected to a 120 VAC/ 60Hz power source.

Spectrum Analyzer Setup

The system was investigated from 30MHz to 1000MHz.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

<u>Frequency Range</u>	<u>RBW</u>	<u>Video B/W</u>
30 – 1000MHz	100KHz	100KHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R/S	Spectrum Analyzer	FSEM	849720/019	2003-10-30	2004-10-29
HP	Amplifier	8447D	2944A09795	2003-8-5	2004-8-4
ETS	Log Periodic Antenna	3146	9603-4421	2003-8-5	2004-8-4
ETS	Biconical Antenna	3110B	3360	2003-8-5	2004-8-4
FLUKE	True RMS Multimeter	187	78540402	2004-3-23	2005-3-22
HP	Amplifier (1-26.5GHz)	8449B	3147A00400	2003-11-5	2004-11-4
A.H.System	Horn Antenna (700MHz-18GHz)	SAS-200/571	261	2003-11-5	2004-11-4
YOKOROWA	Coaxial Cable 1#	N/A	NO: 001	2003-8-5	2004-8-4
YOKOROWA	Coaxial Cable 1#	N/A	NO: 002	2003-8-5	2004-8-4

* **Statement of Traceability: BACL Corp.** attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the EUT, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Class B Limit}$$

Test Data

Date of Test:	June 27-30, 2004	Temperature:	25°C
EUT:	MEC STATION DELUXE	Humidity:	45%
M/N:	MEC SD-001	Operating Mode:	Downloading
S/N:	0405200004	Test Engineer:	William Chang

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 15 B	
Frequency MHz	Ampl. dBμV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
280.120	54.82	45	1.0	v	12.6	1.3	24.62	44.1	46.0	-1.9
48.020	51.76	45	1.0	v	11.3	0.7	26.2	37.6	40.0	-2.4
71.950	52.06	45	1.0	v	9.6	0.9	26.08	36.5	40.0	-3.5
280.120	52.62	0	1.0	h	12.6	1.3	24.62	41.9	46.0	-4.1
71.950	51.28	270	1.0	h	9.6	0.9	26.08	35.7	40.0	-4.3
144.020	50.23	45	1.2	v	13.2	1.0	25.58	38.9	43.5	-4.7
48.020	49.38	60	1.2	h	11.3	0.7	26.2	35.2	40.0	-4.8
119.980	50.66	60	1.0	v	11.9	1.1	25.69	38.0	43.5	-5.5
144.020	49.01	90	1.2	h	13.2	1.0	25.58	37.6	43.5	-5.9
119.980	48.95	45	1.2	h	11.9	1.1	25.69	36.3	43.5	-7.2
216.050	52.29	180	1.2	v	10.1	1.2	25.06	38.5	46.0	-7.5
216.050	50.33	180	1.2	h	10.1	1.2	25.06	36.6	46.0	-9.4

Date of Test : June 27-30, 2004 Temperature : 25°C
 EUT : MEC STATION DELUXE Humidity : 45%
 M/N : MEC SD-001 Operating Mode : Playing
 S/N : 0405200004 Test Engineer: William Chang

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 15 B	
Frequency MHz	Ampl. dBμV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dB	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
280.120	53.82	45	1.0	v	12.6	1.3	24.62	43.1	46.0	-2.9
280.120	53.62	0	1.0	h	12.6	1.3	24.62	42.9	46.0	-3.1
48.020	50.16	45	1.0	v	11.3	0.7	26.2	36.0	40.0	-4.0
119.980	52.19	60	1.0	v	11.9	1.1	25.69	39.5	43.5	-4.0
71.950	51.28	270	1.0	h	9.6	0.9	26.08	35.7	40.0	-4.3
71.950	51.06	45	1.0	v	9.6	0.9	26.08	35.5	40.0	-4.5
48.020	49.38	60	1.2	h	11.3	0.7	26.2	35.2	40.0	-4.8
144.020	50.01	90	1.2	h	13.2	1.0	25.58	38.6	43.5	-4.9
144.020	49.23	45	1.2	v	13.2	1.0	25.58	37.9	43.5	-5.7
119.980	49.95	45	1.2	h	11.9	1.1	25.69	37.3	43.5	-6.2
216.050	52.33	180	1.2	h	10.1	1.2	25.06	38.6	46.0	-7.4
216.050	51.29	180	1.2	v	10.1	1.2	25.06	37.5	46.0	-8.5

Test Result: Pass