FCC 15 ID TEST REPORT

For

EZKEY CORP.

15F1, - 7, No. 258, Liancheng Rd., Junghe City, Taipei, Taiwan, R. O. C.

Model: MWIERGO

September 22, 2003

This Report Concerns:	**Equipment Type:**
☒ Original Report	EZKEY MOUSE - ITE

Test Engineer:	Jandy Su
Report Number:	RSZ03090101
Test Date:	September 17, 2003
Reviewed By:	
Prepared By:	Bay Area Compliance Lab Corp. ShenZhen Suite C, 41-D Electronics Science & Technology Building, No. 2070 Shennanzhong Rd ShenZhen, Guandong 518031, P.R. China Tel: (755) 83296449 Fax: (755) 83273756

TABLE OF CONTENTS

1 - GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

The *EZKEY CORP.* 's product, model *ERGO* or the "EUT" as referred to in this report is an EZKEY MOUSE which measures approximately 13.0cm L x 8.0cm W x 4.0cm H, rated input voltage: DC 5V, PC input: 120 V/60Hz.

* *The test data was only good for the test sample. It may have deviation for other test sample.*

1.2 Objective

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

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

1.3 Related Submittal(s)/Grant(s)

No related submittal(s).

1.4 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.

1.5 Test Facility

The open Area Test site used by Bay Area Compliance Laboratory Corporation to collect radiated electromagnetic disturbance and disturbance voltage measurement data is located in the No. 3 building JingHua Courtyard, Shennanzhong Rd ShenZhen, Guandong 518031, P.R. C, Xinmiao District, Wuhou Avenue, Chengdu City, Sichuan Province, P. R. C, and 230 Commercial Street, Sunnyvale, CA 94085 USA.

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.

Additionally, Bay Area Compliance Laboratory Corporation is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (NVLAP). The scope of the accreditation covers the FCC Method - 47 CFR Part 15 - Digital Devices, IEC/CISPR 22: 1998, and AS/NZS 3548: Electromagnetic Interference - Limits and Methods of measurement of Information Technology Equipment test methods under NVLAP Lab Code 200167-0.

1.6 Test Equipment List

Manufacturer	Description	Model	Serial Number	Cal. Due Date
R/S	Spectrum Analyzer	FSEM	849720/019	08/05/2004
HP	Amplifier	8447D	2944A09795	08/05/2004
ETS	Log Periodic Antenna	3146	9603-4421	09/05/2004
ETS	Biconical Antenna	3110B	3360	08/05/2004
Solar Electronics	LISN	TYPE 8012-50-R-24-BNC	21162	09/05/2004
Solar Electronics	LISN	TYPE 8012-50-R-25-BNC	21163	10/05/2004
COM Power	LISN	LI-200	12208	10/30/2003
COM Power	LISN	LI-200	12005	10/30/2003
HP	Spectrum Analyzer	8568B	2517A01610	10/30/2003
HP	Spectrum Analyzer Display Unit	8568B	2517A10039	10/30/2003
HP	Quasi-Peak Adapter	8565A	3107A01572	10/31/2004
FCC	Absorbing Clamp	F-201-23mm	90	12/21/2004

*** Statement of Traceability**: Bay Area Compliance Laboratory Corp. certifies that all calibration has Been performed using suitable standards traceable to the NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY (NIST)

1.7 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

1.8 Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
SAST	Modem	AEM-2100	0293	DOC
LEGEND	Keyboard	SK-1688	C2057790	DOC
SAMSUNG	Monitor	550E	N/A	DOC
HP	Laser Jet 5L Printer	C3941A	JPTV013237	DOC

1.9 External I/O Cabling

Cable Description	Length (M)	From/Port	To
Shielded Detachable KB Cable	1.6	KB Port/Host	Keyboard
Unshielded Undetachable Mouse Cable	1.45	USB Port	EUT
Shielded Detachable Serial Cable	1.6	Serial Port/Host	Modem
Shielded Detachable Printer Cable	1.6	Parallel Port/Host	Printer
Shielded Detachable VGA Cable	1.5	VGA Port/Host	Monitor

2 - SYSTEM TEST CONFIGURATION

2.1 Justification

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

2.2 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, H pattern, contained on the hard drive, is started in a DOS window under the Windows 98 operating system. Once loaded, the program sequentially exercises each system component.

The sequence used is as follows:

1. Lines of Hs scroll across the VGA monitor.
2. The modem(s) receives Hs.
3. The printer output Hs.

The complete cycle takes approximately 5 - 10 seconds and the process is continuously repeated.

2.3 Special Accessories

As shown in section 2.6, interface cable used for compliance testing is shielded as normally supplied by *EZKEY CORP.,* and its respective support equipment manufacturers.

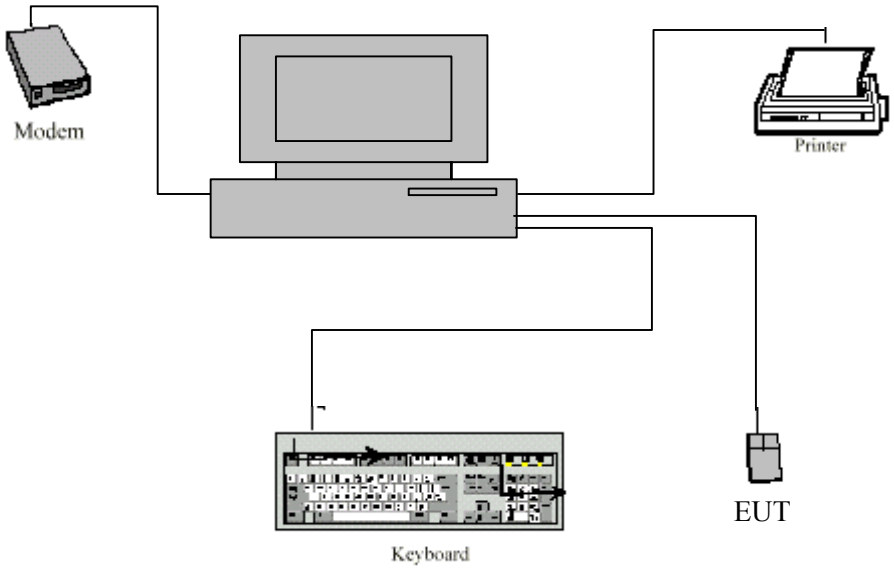
2.4 Block Diagram

Please refer to the Appendix D.

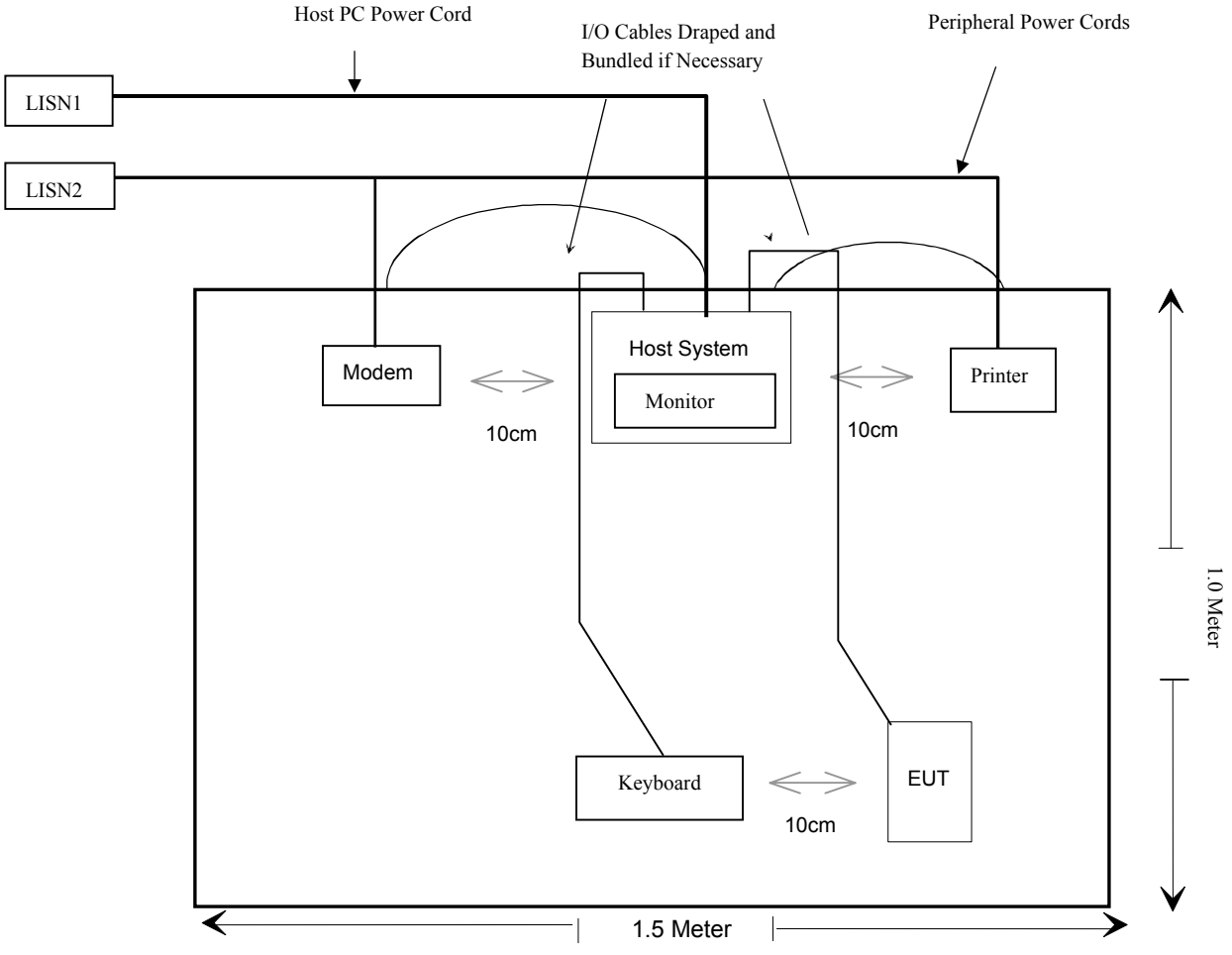
2.5 Equipment Modifications

No modifications were made by BACL to ensure EUT to comply with the applicable limits and requirements.

2.6 Configuration of Test System



2.7 Test Setup Block Diagram



3 - CONDUCTED EMISSIONS TEST DATA

3.1 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.

3.2 EUT Setup

The measurement was performed at the **O**pen **A**rea **T**est **S**ite, using the same setup per ANSI C63.4 - 2001 measurement procedure. The specification used was the FCC Part 15 Class B limits.

The host PC was placed on the center of the back edge on the test table. The monitor was placed on the PC .The printer was placed on the right side of the host PC. The modem was placed on the left side of the host PC.

The Keyboard was placed directly in front of the monitor, flushed with the front of the host PC. The EUT was placed on the right side of the Keyboard.

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.

3.3 Spectrum Analyzer Setup

The spectrum analyzer was set with the following configurations:

Start Frequency	150kHz
Stop Frequency	30MHz
Sweep Speed	Auto
IF Bandwidth	100 kHz
Video Bandwidth	10kHz
Resolution Bandwidth	10kHz
Quasi-Peak Adapter Bandwidth	9 kHz
Quasi-Peak Adapter Mode	Normal

3.4 Test Procedure

During the conducted emission test, the host PC system power cord was connected to the auxiliary outlet of the first LISN with the monitor and all other support equipment power cords connected to the auxiliary outlet of the second LISN. Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance using all installation combination.

All data was recorded in the peak detection mode. Quasi-peak readings were only performed when an emission was found to be marginal (within -4 dBμV of specification limits). Quasi-peak readings are distinguished with a "**Qp**" or **"AV"**.

3.5 Summary of Test Results

According to the data in section 3.6, the EUT complied with the FCC Part 15 Conducted margin for a Class B device, with the *worst* margin reading of:

- 3.1 dBμV (QP) at **0.15 MHz** in the **Line** mode, **0.15-30MHz**.

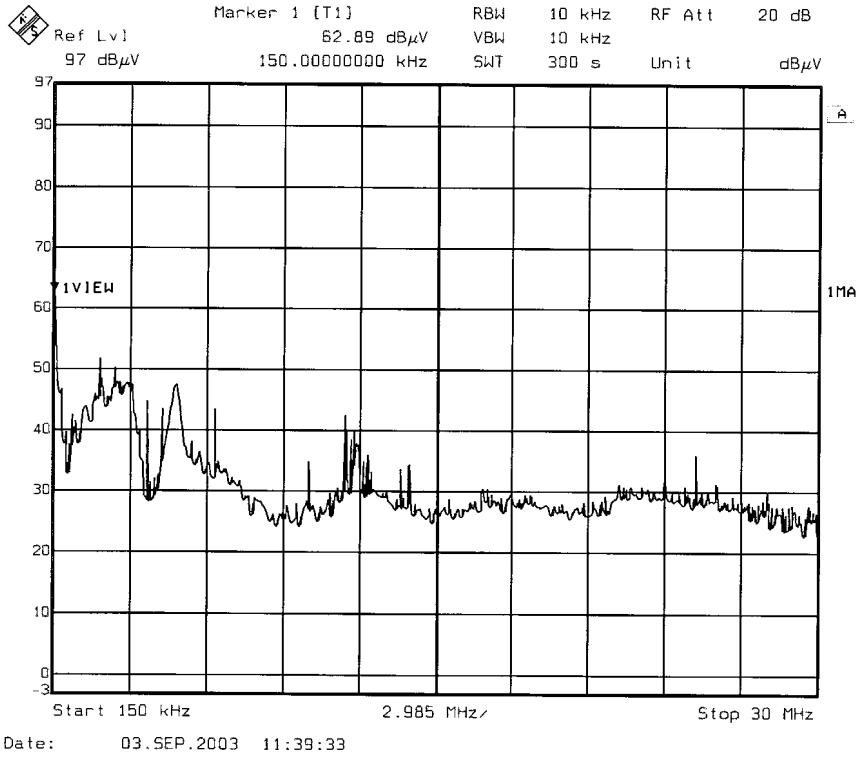
3.6 Conducted Emissions Test Data

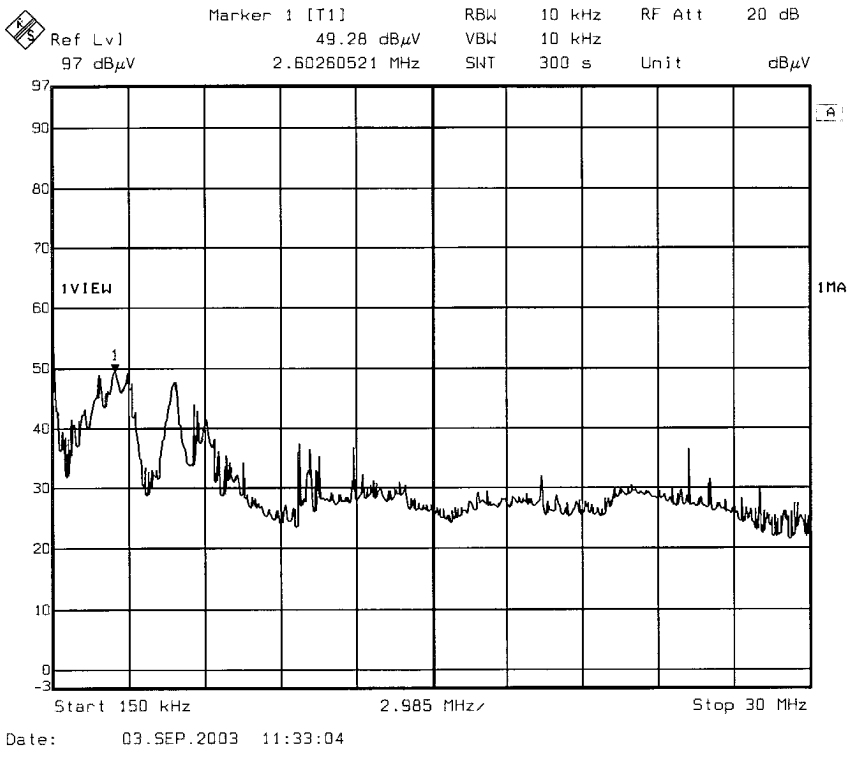
Date of Test	:	September 17, 2003	Temperature	:	25□
EUT	:	EZKEY MOUSE	Humidity	:	70□
M/N	:	ERGO	Operating Mode	:	Running
S/N	:	N/A	Test Engineer:		Jandy Su

LINE CONDUCTED EMISSIONS				FCC PART 15 CLASS B	
Frequency	Amplitude	Detector	Phase	Limit	Margin
MHz	dBμV	QP/Av/Peak	Line/Neutral	dBμV	dB
0.15	62.89	QP	Line	66	-3.1
2.58	51.22	QP	Line	56	-4.8
2.60	49.28	QP	Neutral	56	-6.7
0.15	54.39	QP	Neutral	66	-11.6
5.39	48.03	QP	Line	60	-12.0
5.32	47.27	QP	Neutral	60	-12.7
2.58	42.38	AV	Line	56	-13.6
0.15	51.39	AV	Line	66	-14.6
2.60	41.03	AV	Neutral	56	-15.0
5.39	41.21	AV	Line	60	-18.8
5.32	40.17	AV	Neutral	60	-19.8
0.15	44.28	AV	Neutral	66	-21.7

3.7 Plot of Conducted Emissions Test Data

Plot of Conducted Emissions Test Data is presented hereinafter as reference.





4 - RADIATED EMISSION DATA

4.1 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.

4.2 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 Class B limits.

The host PC was placed on the center of the back edge on the test table. The monitor was placed on the PC .The printer was placed on the right side of the host PC. The modem was placed on the left side of the host PC.

The Keyboard was placed directly in front of the monitor, flushed with the front of the host PC. The EUT was placed on the right side of the Keyboard.

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.

4.3 Spectrum Analyzer Setup

According to FCC Rules, 47 CFR, Section 15.33, the system was tested from 30 to 1000 MHz.

The spectrum analyzer was set with the following configurations during the radiated emission test:

Start Frequency	30 MHz
Stop Frequency	1000 MHz
Sweep Speed	Auto
IF Bandwidth	100 KHz
Video Bandwidth	1 MHz
Quasi-Peak Adapter Bandwidth	120 KHz
Quasi-Peak Adapter Mode	Normal
Resolution Bandwidth	100 KHz

4.4 Test Procedure

For the radiated emissions test, the host PC system, 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 peak detection mode. Quasi-peak readings performed only when an emission was found to be marginal (within -4 dBμV of specification limits), and are distinguished with a "**Qp**" in the data table.

4.5 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:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - 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:

Margin = Corr. Ampl. - FCC Class B Limit

4.6 Summary of Test Results

According to the data in section 4.7, the EUT complied with the FCC Part 15 Class B standards, and had the worst margin of:

- 3.1 dBμV at **54.21 MHz** in the **Horizontal** polarization, **30 – 1000MHz, 3 meters**.

4.7 Radiated Emissions Test Result

Date of Test	:	September 17, 2003	Temperature	:	25□
EUT	:	EZKEY MOUSE	Humidity	:	70□
M/N	:	ERGO	Operating Mode	:	Running
S/N	:	N/A	Test Engineer:		Jandy Su

INDICATED		TABLE	ANTENNA		CORRECTION FACTOR			CORRECTEI AMPLITUDI	FCC PART 15 CLASS B	
Frequency MHz	Ampl. dBμV/m	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable dB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
54.21	51.24	45	1	h	10.5	0.2	25	36.9	40.0	-3.1
54.13	51.13	90	1	v	10.5	0.2	25	36.8	40.0	-3.2
114.38	50.11	180	1.2	h	11.7	1.2	25	38.0	43.5	-5.5
114.28	49.97	180	1.2	v	11.7	1.2	25	37.9	43.5	-5.6
126.42	49.03	45	1	h	12.3	1.1	25	37.4	43.5	-6.1
132.46	48.71	45	1.2	h	12.6	1.0	25	37.3	43.5	-6.2
126.37	48.79	60	1.0	v	12.3	1.1	25	37.2	43.5	-6.3
132.24	48.53	120	1.0	v	12.6	1.0	26	36.1	43.5	-7.4