



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

*FCC PART 15, SUBPART B CLASS B
and
FCC PART 15, SUBPART C
TEST REPORT*

for


the

RF KEYBOARD

MODEL: RT7N00

Prepared for

LOGITECH, INC.
6505 KAISER DRIVE
FREMONT, CALIFORNIA 94555-3615

Prepared by: 
DOUG MOON

Approved by: 
KEVIN BOTHMANN

ELECTRO MAGNETIC TEST, INC.
1547 PLYMOUTH STREET
MOUNTAIN VIEW , CALIFORNIA 94043
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DATE: AUGUST 28, 2001

	REPORT BODY	APPENDICES			TOTAL
		A	B	C	
PAGES	16	15	4	4	39

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GENERAL REPORT SUMMARY

This electromagnetic emission test report is generated by Electro Magnetic Test Inc., which is an independent testing and consulting firm. The test report is based on testing performed by Electro Magnetic Test personnel according to the measurement procedure described in the test specification given below and in the "Test Procedures" section of this report.

The measurement data and conclusions appearing herein relate only to the sample tested and this report may not be reproduced in any form unless done so in full.

Associated with the data in this report is a ± 2 dB measurement uncertainty.

This report must not be used to claim product endorsement by NVLAP or any other agency of the U.S. Government.

Electro Magnetic Test, Inc. is approved to perform EMI/EMC testing by the following agencies:

COUNTRY	AGENCY	LAB APPROVAL #
USA	Federal Communications Commission (FCC)	*
USA	National Voluntary Lab Accreditation Program (NVLAP)	200147-0
Canada	Industry Canada	IC 2804
Japan	Voluntary Control Council For Interference (VCCI)	See Below
	Open Field Test Site Registration Number	R-589
	Conducted Emissions Test Site Registration Number	C-604
Taiwan	Bureau Of Standards, Metrology and Inspection (BSMI)	SL2-IN-E-1024
Australia / New Zealand	Australian Communications Authority (AUSTEL)	*
European Community	TUV Rheinland (EMC for the European Community)	*

*These agencies do not issue a lab approval number to test labs.



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GENERAL REPORT SUMMARY (CONTINUED)

Device Tested: RF Keyboard
 Model: RT7N00
 S/N: N/A

Product Description: The EUT is a wireless keyboard to be used with a personal computer. The EUT consists of a transmitter inside a keyboard which communicates with a receiver that connects to the USB port on a personal computer.

Modifications: The EUT was not modified during the testing.

Manufacturer: Logitech, Inc.
 6505 Kaiser Drive
 Fremont, California 94555-3615

Test Date(s): August 14 and 15, 2001

Test Specifications: EMI requirements
 FCC Title 47, Part 15 Subpart B, Class B
 FCC Title 47, Part 15 Subpart C
 Test Procedure: ANSI C63.4: 1992.

Test Deviations: The test procedure was not deviated from during the testing.

SUMMARY OF TEST RESULTS

TEST	DESCRIPTION	RESULTS
1	Conducted RF Emissions, 450 kHz - 30 MHz.	Complies with the Class B limits of FCC Title 47, Part 15 Subpart B.
2	Radiated RF Emissions, 26.96 MHz - 27.28 MHz.	Complies with the limits of FCC Title 47, Part 15 Subpart C. (Section 15.227)
3	Radiated RF Emissions, 30 MHz - 1000 MHz.	Complies with the Class B limits of FCC Title 47, Part 15 Subpart B.

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1. PURPOSE

This document is a qualification test report based on the Electromagnetic Interference (EMI) tests performed on the RF Keyboard Model: RT7N00. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4: 1992. The tests were performed in order to determine whether the electromagnetic emissions from the equipment under test, referred to as EUT hereafter, are within the **Class B** specification limits defined in FCC Title 47, Part 15, Subpart B. The EUT was also tested to determine if the electromagnetic emissions were within the limits defined in FCC Title 47, Subpart C, Section 15.227.



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2. ADMINISTRATIVE DATA

2.1 Location of Testing

The EMI tests described herein were performed at the test facility of Electro Magnetic Test, 1547 Plymouth Street, Mountain View, California 94043.

2.2 Traceability Statement

The calibration certificates of all test equipment used during the test are on file at the location of the test. The measurement results in this report and the calibration of the test equipment are traceable to the National Institute of Standards and Technology (NIST).

2.3 Cognizant Personnel

Logitech, Inc.

Bharat Shah Agency/Reliability Engineer

Electro Magnetic Test, Inc.

Michael Fennell Test Technician
 Doug Moon Test Technician
 Kevin Bothmann Lab Manager

2.4 Date Test Sample was Received

The test sample was received on August 13, 2001

2.5 Disposition of the Test Sample

The test sample has not been returned at this time.

2.6 Abbreviations and Acronyms

The following abbreviations and acronyms may be used in this document.

RF	Radio Frequency
EMI	Electromagnetic Interference
EUT	Equipment Under Test
P/N	Part Number
S/N	Serial Number
HP	Hewlett Packard
ITE	Information Technology Equipment
CML	Corrected Meter Limit
LISN	Line Impedance Stabilization Network
CISPR	International Special Committee On Radio Interference
FCC	Federal Communications Commission

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3. APPLICABLE DOCUMENTS

The following documents are referenced or used in the preparation of this EMI Test Report.

SPEC	TITLE
FCC Title 47, Part 15, Subpart B.	FCC Rules - Radio frequency devices (including digital devices).
FCC Title 47, Part 15, Subpart C.	FCC Rules – Radio frequency devices (intentional radiators) (Section 15.227)
ANSI C63.4 1992	Methods of measurement of radio-noise emissions from low-voltage electrical and electronic equipment in the range of 9 kHz to 40 GHz.

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4. DESCRIPTION OF TEST CONFIGURATION**4.1 Description of Test Configuration - EMI**

The host computer was connected to the receiver, mouse, monitor, external modem, and printer via its USB, mouse, video, serial, and parallel ports, respectively. The printer was connected to its AC power adapter via its power input port. During the testing process, the EUT was communicating with the receiver. The EUT was continuously sending "H" characters to the receiver, and the characters were displayed on the monitor.

The EUT is battery powered, but the conducted emissions test was performed on the host computer with the receiver connected to insure that communication with the EUT will not cause the computer to be out of compliance.

It was determined that the emissions were at their highest level when the EUT was operating in the above configuration. The cables were moved to maximize the emissions. The final conducted as well as radiated data was taken in this mode of operation. All initial investigations were performed with the EMI receiver in manual mode scanning the frequency range continuously. The cables were bundled and routed as shown in the photographs in Appendix A.

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4.1.1 Cable Construction and TerminationCable #1

This is a 4 foot braid and foil shielded cable connecting the computer to the receiver. It has a USB metallic connector at the computer end, and is hardwired into the receiver. The shield of the cable was grounded to the chassis via the connector.

Cable #2

This is a 6 foot foil shielded cable connecting the computer to the mouse. It has a 6 pin mini DIN metallic connector at the computer end, and is hardwired into the mouse. The shield of the cable was grounded to the chassis via the connector.

Cable #3

This is a 6 foot braid and foil shielded cable connecting the computer to the monitor. It has a high density DB-15 pin metallic connector with a factory installed ferrite bead at the computer end, and is hardwired into the monitor. The cable was bundled to a length of 4 feet. The shield of the cable was grounded to the chassis via the connector.

Cable #4

This is a 6 foot foil shielded cable connecting the computer to the external modem. It has a DB-9 pin metallic connector at the computer end, and has a DB-25 pin metallic connector at the external modem end. The cable was bundled to a length of 4 feet. The shield of the cable was grounded to the chassis via the connectors.

Cable #5

This is a 6 foot foil shielded cable connecting the computer to the printer. It has a DB-25 pin metallic connector at the computer end, and has a 36 pin Centronics metallic connector at the printer end. The shield of the cable was grounded to the chassis via the connectors.

Cable #6

This is a 6 foot unshielded cable connecting the printer to its AC power adapter. It has a 1/4 inch round metallic connector at the printer end, and is hardwired into the power adapter. The cable was bundled to a length of 4 feet.


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5. LISTS OF EUT, ACCESSORIES AND TEST EQUIPMENT
5.1 EUT and Accessory List

EQUIPMENT TYPE	MANU-FACTURER	MODEL	SERIAL NUMBER	FCC ID
RF KEYBOARD (EUT)	LOGITECH, INC.	RT7N00	N/A	DZL127640
RECEIVER	LOGITECH, INC.	C-UA3-DUAL	N/A	DoC
COMPUTER	HEWLETT PACKARD	8180	US73553464	DoC
MOUSE	COMPAQ	M-S34	N/A	DZL211029
MONITOR	DELL	P780	9289215	DoC
EXTERNAL MODEM	US ROBOTICS	28,800 FAX/MODEM	0008390160602136	CJE-0340
PRINTER	HEWLETT PACKARD	C4582A	CN798120CZ	B94C2164X
PRINTER POWER SUPPLY	HEWLETT PACKARD	C2175A	9100-5124	N/A


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5.2 EMI Test Equipment

EQUIPMENT TYPE	MANUFACTURER	MODEL NUMBER	SERIAL NUMBER	CAL. DATE	CAL. CYCLE
Spectrum Analyzer	Hewlett Packard	8566B	3013A07296	August 2, 2001	1 Year
RF Preselector	Hewlett Packard	85685A	3010A01157	August 2, 2001	1 Year
Quasi-Peak Adapter	Hewlett Packard	85650	2521A00584	August 2, 2001	1 Year
Preamplifier	Com Power	PA-102	1482	March 1, 2001	1 Year
RF Attenuator	Mini-Circuits	CAT-10	Asset #1000	December 6, 2000	1 Year
LISN	Com Power	LI-200	12012	April 24, 2001	1 Year
LISN	Com Power	LI-200	12214	April 24, 2001	1 Year
LISN	Com Power	LI-200	1767	April 24, 2001	1 Year
LISN	Com Power	LI-200	1768	April 24, 2001	1 Year
Loop Antenna	Com Power	AL-130	25308	March 21, 2001	1 Year
Biconical Antenna	Com Power	AB-100	01557	November 11, 2000	1 Year
Log Periodic Antenna	Com Power	AL-100	16037	November 11, 2000	1 Year
Antenna Mast	Com Power	AM-400	N/A	N/A	N/A
Turntable	Com Power	TT-100	N/A	N/A	N/A
Computer	Compaq	Series 3284	X637BBS20212	N/A	N/A
Printer	Epson	P930A	3HR1398903	N/A	N/A
Plotter	Hewlett Packard	7470A	2308A96499	N/A	N/A



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6. **TEST SITE DESCRIPTION**

6.1 **Test Facility Description**

Please refer to section 7.1.1 and 7.1.2 of this report for EMI test location.

6.2 **EUT Mounting, Bonding and Grounding**

The EUT was mounted on a 1.0 by 1.5 meter non-conductive table 0.8 meters above the ground plane.

The EUT was not grounded.

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7. TEST PROCEDURES

The following sections describe the test methods and the specifications for the tests.

7.1 RF Emissions**7.1.1 Conducted Emissions Test**

The HP 8566B spectrum analyzer was used as a measuring meter along with the HP 85650A quasi-peak adapter. The data was collected with the spectrum analyzer in the peak detect mode with the "Max Hold" feature activated. The quasi-peak detector was used only where indicated in the data sheets. A 10 dB attenuation pad was used for the protection of the spectrum analyzer input stage, and the spectrum analyzer offset was adjusted accordingly to read the actual data measured. The LISN output was read by the HP 8566B spectrum analyzer. The output of the second LISN was terminated by a 50 ohm termination. The effective measurement bandwidth used for the conducted emissions test was 9 kHz.

Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The EUT was powered through the LISN, which was bonded to the ground plane. The LISN power was filtered and the filter was bonded to the ground plane. The EUT was set up with the minimum distances from any conductive surfaces as specified in ANSI C63.4: 1992. The excess power cord was wrapped in a figure eight pattern to form a bundle not exceeding 0.4 meters in length.

The initial test data was taken in manual mode while scanning the frequency ranges of 0.45 MHz to 1.6 MHz, 1.6 MHz to 5 MHz and 5 MHz to 30 MHz. The conducted emissions from the EUT were maximized for operating mode as well as cable and peripheral placement. Once a predominant frequency (within 12 dB of the limit) was found, it was more closely examined with the spectrum analyzer span adjusted to 1 MHz.

The final data was collected under program control by the HP 85869PC software in several overlapping sweeps by running the spectrum analyzer at a minimum scan rate of 10 seconds per octave.

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7.1.2 Radiated Emissions Test

The HP 8566B spectrum analyzer was used as a measuring meter along with the HP 85650A quasi-peak adapter. The Com Power Preamplifier PA-102 was used to increase the sensitivity of the instrument. The spectrum analyzer was used in the peak detect mode with the "Max Hold" feature activated. In this mode, the spectrum analyzer records the highest measured reading over all the sweeps. The HP 85650A quasi-peak adapter was used only for those readings which are marked accordingly on the data sheets. The effective measurement bandwidth used for the radiated emissions test was 10 kHz from 26.96 MHz to 27.28 MHz and 120 kHz from 30 MHz to 1000 MHz.

Broadband loop, biconical and log periodic antennas were used as transducers during the measurement. The loop antenna was used from 26.96 MHz to 27.28 MHz, the biconical antenna was used from 30 MHz to 300 MHz, and the log periodic antenna was used from 300 MHz to 1 GHz. The frequency spans were wide (30 MHz to 88 MHz, 88 MHz to 216 MHz, 216 to 300 MHz and 300 MHz to 1 GHz) during preliminary investigations. The final data was taken with a frequency span of 1 MHz. Furthermore, the frequency span was reduced during the preliminary investigations as deemed necessary.

The open field test site of Electro Magnetic Test, Inc. was used for radiated emission testing. This test site is set up according to ANSI C63.4: 1992. Please see section 6.2 of this report for mounting, bonding and grounding of the EUT. The turntable supporting the EUT is remote controlled using a motor. The turntable permits EUT rotation of 360 degrees in order to maximize emissions. Also, the antenna mast allows height variation of the antenna from 1 meter to 4 meters. Data was collected in the worst case (highest emission) configuration of the EUT. At each reading, the EUT was rotated 360 degrees and the antenna height was varied from 1 to 4 meters (for E field radiated field strength).

The presence of ambient signals was verified by turning the EUT off. In case an ambient signal was detected, the measurement bandwidth was reduced temporarily and verification was made that an additional adjacent peak did not exist. This ensures that the ambient signal does not hide any emissions from the EUT. The EUT was tested at a 3 meter test distance to obtain final test data.

Calculation Of Radiated Emission Test Data:

Amplitude - Gain + Antenna Factor + Cable Loss = Corrected Amplitude

Corrected Amplitude - Limit = Margin



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8.

CONCLUSIONS

The RF Keyboard Model: RT7N00 meets all of the **Class B** requirements of the FCC Title 47, Part 15, Subpart B and FCC Title 47, Subpart C, Section 15.227.



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APPENDIX A

***RADIATED AND CONDUCTED EMISSIONS
DATA SHEETS***



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***RADIATED AND CONDUCTED EMISSIONS
DATA SHEETS***

Electro Magnetic Test, Inc.
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Radiated Emissions Test Data

Purpose of Test: QUALIFICATION ENGINEERING MANUFACTURING AUDIT
FCC Class B Test Date: 08-15-01
Company Name: LOGITECH, INC.
EUT Model Number: RT7N00
EUT Serial Number: N/A
EUT Description: RF KEYBOARD

Test Setup Configuration

EUT Clock Speeds:

EUT Power Cords: SHIELDED NOT SHIELDED
EUT tested at: LOW SPEED HIGH SPEED
EUT is: IN COMPLIANCE OUT OF COMPLIANCE with FCC Class B.

EUT Modifications during this test:
 MODIFIED NOT MODIFIED

Modifications: _____

NOTE: A formal report on passing data will be generated when required.
Design, debug and consultation services are available at all times.

Test Engineer: MICHAEL FENNELL

Electro Magnetic Test, Inc.

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FCC Class B Test Date: 08-15-01
 Company Name: LOGITECH, INC.
 EUT Model Number: RT7N00
 EUT Description: RF KEYBOARD

RADIATED EMISSION TEST RESULTS

Freq	Ampl	M	P	A	Ht	Dist	Ori	Gain	ACor	CCor	DCor	CorAmp	Limit	Margin	Flags
MHz	dBuV	-	-	-	m	m	deg	dB	dBuV/m	dB	dB	dBuV/m	dBuV/m	dB	FH---

THE FOLLOWING READINGS ARE FOR THE TRANSMITTER PORTION OF THE EUT (FCC PART 15.227)
 (FIELD STRENGTH OF FUNDAMENTAL EMISSIONS)

VERTICAL POLARIZATION

-FUNDAMENTAL-

27.144	49.0	P	V	M	1.0	3.0	45	0.0	5.5	0.9	0.0	55.4	80.0	-24.6	-----
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HORIZONTAL POLARIZATION

-FUNDAMENTAL-

27.144	45.7	P	H	M	1.0	3.0	135	0.0	5.5	0.9	0.0	52.1	80.0	-27.9	-----
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THE FOLLOWING READINGS ARE FOR THE TRANSMITTER PORTION OF THE EUT (FCC PART 15.209)
 (FIELD STRENGTH OF HARMONICS AND SPURIOUS EMISSIONS)

VERTICAL POLARIZATION

-2nd HARMONIC-

54.288	41.5	P	V	B	1.0	3.0	45	21.8	10.7	1.3	0.0	31.7	40.0	-8.3	-----
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-3rd HARMONIC-

81.434	40.3	P	V	B	1.0	3.0	225	21.8	9.3	1.7	0.0	29.5	40.0	-10.5	-----
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-4th HARMONIC-

108.578	34.6	P	V	B	1.0	3.0	225	21.7	10.1	1.9	0.0	24.9	43.5	-18.6	-----
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-5th HARMONIC-

135.723	28.4	P	V	B	1.0	3.0	90	21.7	11.7	2.0	0.0	20.4	43.5	-23.1	-----
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-6th HARMONIC-

162.862	30.1	P	V	B	1.5	3.0	135	21.8	13.6	2.2	0.0	24.1	43.5	-19.4	-----
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-7th HARMONIC-

190.010	34.0	P	V	B	1.0	3.0	315	21.7	15.4	2.4	0.0	30.1	43.5	-13.4	-----
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-8th HARMONIC-

217.153	32.6	P	V	B	1.0	3.0	180	21.7	16.7	2.6	0.0	30.2	46.0	-15.8	-----
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-9th HARMONIC-

244.298	27.4	P	V	B	1.5	3.0	315	21.6	18.1	2.7	0.0	26.6	46.0	-19.4	-----
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-10th HARMONIC-

271.442	29.0	P	V	B	2.0	3.0	45	21.5	20.3	2.8	0.0	30.6	46.0	-15.4	-----
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HORIZONTAL POLARIZATION

-2nd HARMONIC-

54.288	39.7	P	H	B	1.0	3.0	225	21.8	10.7	1.3	0.0	29.9	40.0	-10.1	-----
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-3rd HARMONIC-

81.434	35.0	P	H	B	1.5	3.0	45	21.8	9.3	1.7	0.0	24.2	40.0	-15.8	-----
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-4th HARMONIC-

108.576	33.9	P	H	B	2.0	3.0	135	21.7	10.1	1.9	0.0	24.2	43.5	-19.3	-----
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-5th HARMONIC-

135.720	29.0	P	H	B	2.0	3.0	315	21.7	11.7	2.0	0.0	21.0	43.5	-22.5	-----
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-6th HARMONIC-

162.864	28.5	P	H	B	1.5	3.0	45	21.8	13.6	2.2	0.0	22.5	43.5	-21.0	-----
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-7th HARMONIC-	190.009	36.1	P H B	2.0	3.0	270	21.7	15.4	2.4	0.0	32.2	43.5	-11.3	-----
-8th HARMONIC-	217.154	34.2	P H B	1.5	3.0	270	21.7	16.7	2.6	0.0	31.8	46.0	-14.2	-----
-9th HARMONIC-	244.296	27.1	P H B	1.5	3.0	0	21.6	18.1	2.7	0.0	26.3	46.0	-19.7	-----
-10th HARMONIC-	271.442	31.2	P H B	1.5	3.0	270	21.5	20.3	2.8	0.0	32.8	46.0	-13.2	-----

THE FOLLOWING ARE SPURIOUS EMISSIONS (30-1000MHz)

VERTICAL POLARIZATION

315.767	32.6	P V L	2.5	3.0	180	21.7	15.3	3.0	0.0	29.2	46.0	-16.8	-----
352.262	28.4	P V L	2.0	3.0	135	21.8	14.6	3.2	0.0	24.4	46.0	-21.6	-----
482.082	28.9	P V L	2.0	3.0	135	21.5	17.5	3.8	0.0	28.7	46.0	-17.3	-----

HORIZONTAL POLARIZATION

315.767	32.7	P H L	1.5	3.0	45	21.7	15.3	3.0	0.0	29.3	46.0	-16.7	-----
352.286	31.2	P H L	1.5	3.0	0	21.8	14.6	3.2	0.0	27.2	46.0	-18.8	-----
482.079	31.1	P H L	2.0	3.0	0	21.5	17.5	3.8	0.0	30.9	46.0	-15.1	-----

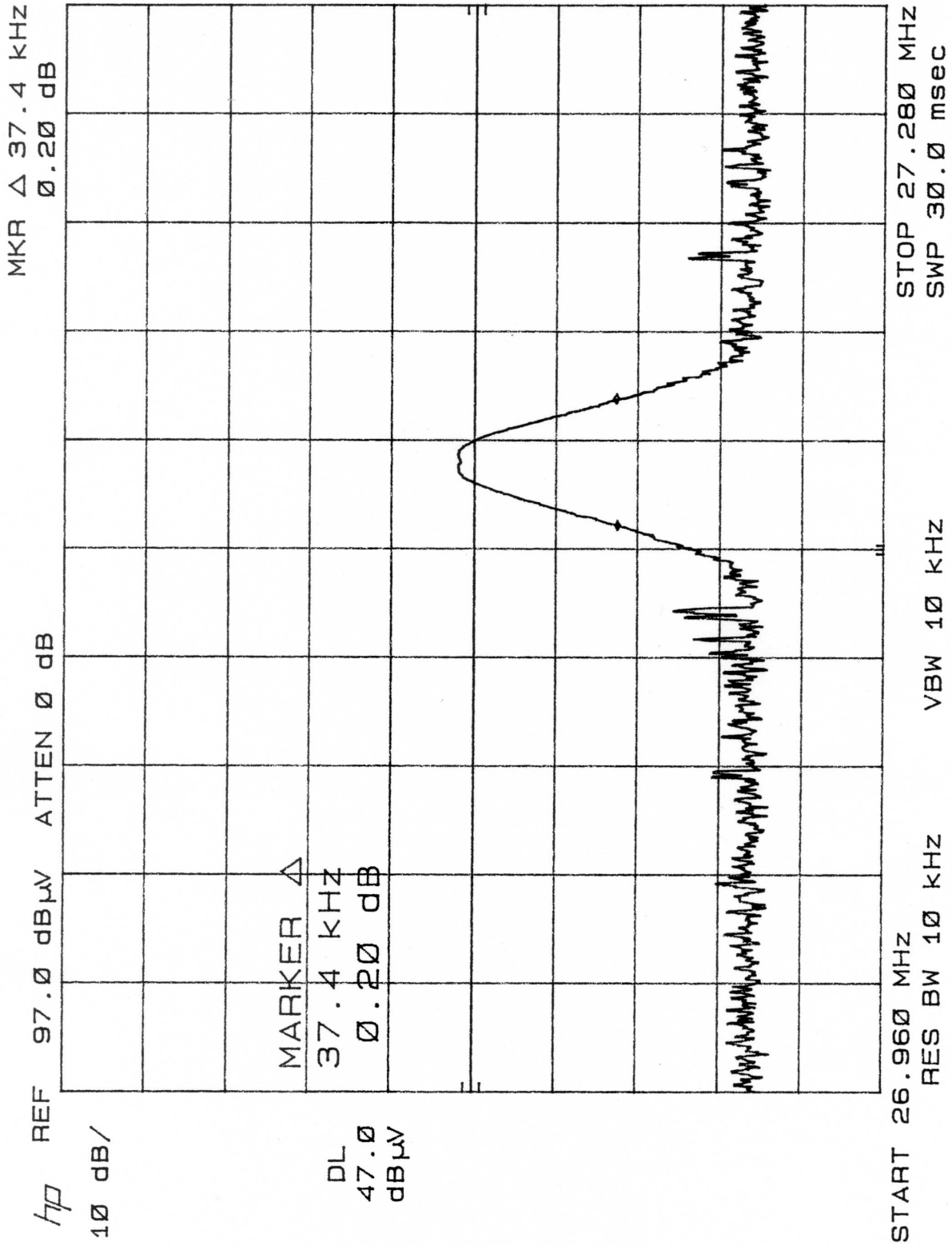
THE FOLLOWING READINGS ARE FOR THE DIGITAL DEVICE PORTION OF THE EUT
FCC PART 15.109 (30-1000MHz)

VERTICAL POLARIZATION

166.210	37.3	P V B	1.5	3.0	0	21.8	13.8	2.2	0.0	31.5	43.5	-12.0	-----
217.593	40.9	P V B	2.0	3.0	225	21.7	16.7	2.6	0.0	38.5	46.0	-7.5	-----
299.170	40.0	P V B	1.0	3.0	180	21.7	22.3	2.9	0.0	43.5	46.0	-2.5	-----
299.170	38.6	Q V B	1.0	3.0	180	21.7	22.3	2.9	0.0	42.1	46.0	-3.9	-----
332.407	42.4	P V L	2.0	3.0	315	21.8	14.9	3.1	0.0	38.6	46.0	-7.4	-----
332.378	43.4	P V L	2.0	3.0	315	21.8	14.9	3.1	0.0	39.6	46.0	-6.4	-----
398.844	43.7	P V L	1.5	3.0	225	21.4	15.7	3.5	0.0	41.5	46.0	-4.5	-----
432.104	38.7	P V L	1.5	3.0	315	21.4	17.0	3.6	0.0	37.9	46.0	-8.1	-----
465.360	42.8	P V L	2.5	3.0	315	21.4	17.6	3.7	0.0	42.7	46.0	-3.3	-----
598.281	36.1	P V L	2.0	3.0	135	21.1	20.4	4.3	0.0	39.7	46.0	-6.3	-----
687.271	38.8	P V L	2.0	3.0	135	20.9	20.2	4.7	0.0	42.8	46.0	-3.2	-----
691.739	33.9	P V L	1.0	3.0	90	20.9	20.2	4.8	0.0	38.0	46.0	-8.0	-----
797.745	32.1	P V L	1.5	3.0	315	20.3	20.8	5.1	0.0	37.7	46.0	-8.3	-----
997.205	31.1	P V L	1.5	3.0	180	19.6	24.3	6.0	0.0	41.8	54.0	-12.2	-----

HORIZONTAL POLARIZATION

166.190	36.9	P H B	1.5	3.0	270	21.8	13.8	2.2	0.0	31.1	43.5	-12.4	-----
217.578	29.9	P H B	2.0	3.0	180	21.7	16.7	2.6	0.0	27.5	46.0	-18.5	-----
299.155	43.4	P H B	2.0	3.0	180	21.7	22.3	2.9	0.0	46.9	46.0	0.9	-----
299.155	41.4	Q H B	2.0	3.0	180	21.7	22.3	2.9	0.0	44.9	46.0	-1.1	-----
332.407	42.0	P H L	2.0	3.0	135	21.8	14.9	3.1	0.0	38.2	46.0	-7.8	-----
398.844	40.6	P H L	2.0	3.0	135	21.4	15.7	3.5	0.0	38.4	46.0	-7.6	-----
432.104	40.0	P H L	2.0	3.0	180	21.4	17.0	3.6	0.0	39.2	46.0	-6.8	-----
465.360	42.8	P H L	2.0	3.0	225	21.4	17.6	3.7	0.0	42.7	46.0	-3.3	-----
598.281	35.9	P H L	2.0	3.0	45	21.1	20.4	4.3	0.0	39.5	46.0	-6.5	-----
687.271	37.9	P H L	2.0	3.0	315	20.9	20.2	4.7	0.0	41.9	46.0	-4.1	-----
691.739	37.1	P H L	2.0	3.0	90	20.9	20.2	4.8	0.0	41.2	46.0	-4.8	-----
797.745	30.8	P H L	2.0	3.0	225	20.3	20.8	5.1	0.0	36.4	46.0	-9.6	-----
997.205	27.8	P H L	2.0	3.0	45	19.6	24.3	6.0	0.0	38.5	54.0	-15.5	-----



PLOT SHOWING BANDWIDTH OF FUNDAMENTAL FREQUENCY



ELECTRO MAGNETIC TEST, INC.

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FRONT VIEW

LOGITECH, INC.

RF KEYBOARD

MODEL: RT7N00

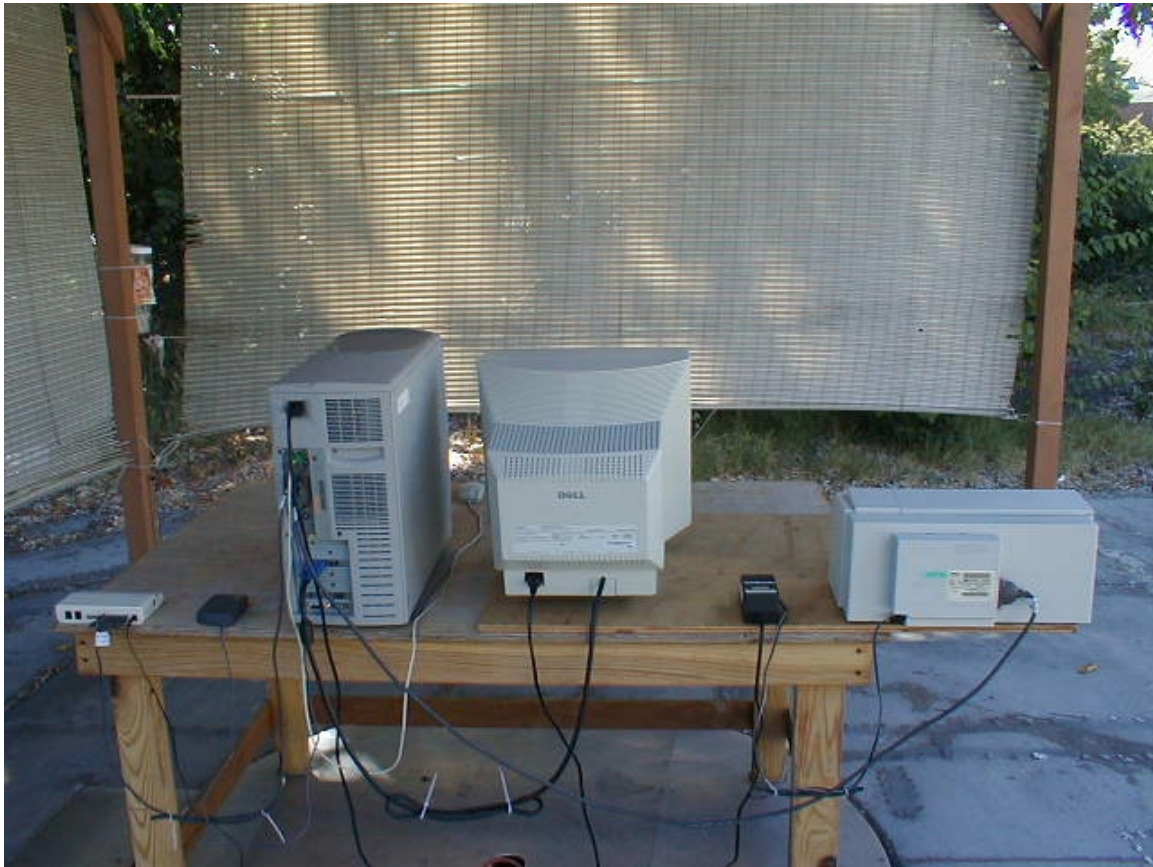
FCC CLASS B - RADIATED EMISSIONS - 8-14-01 & 8-15-01

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

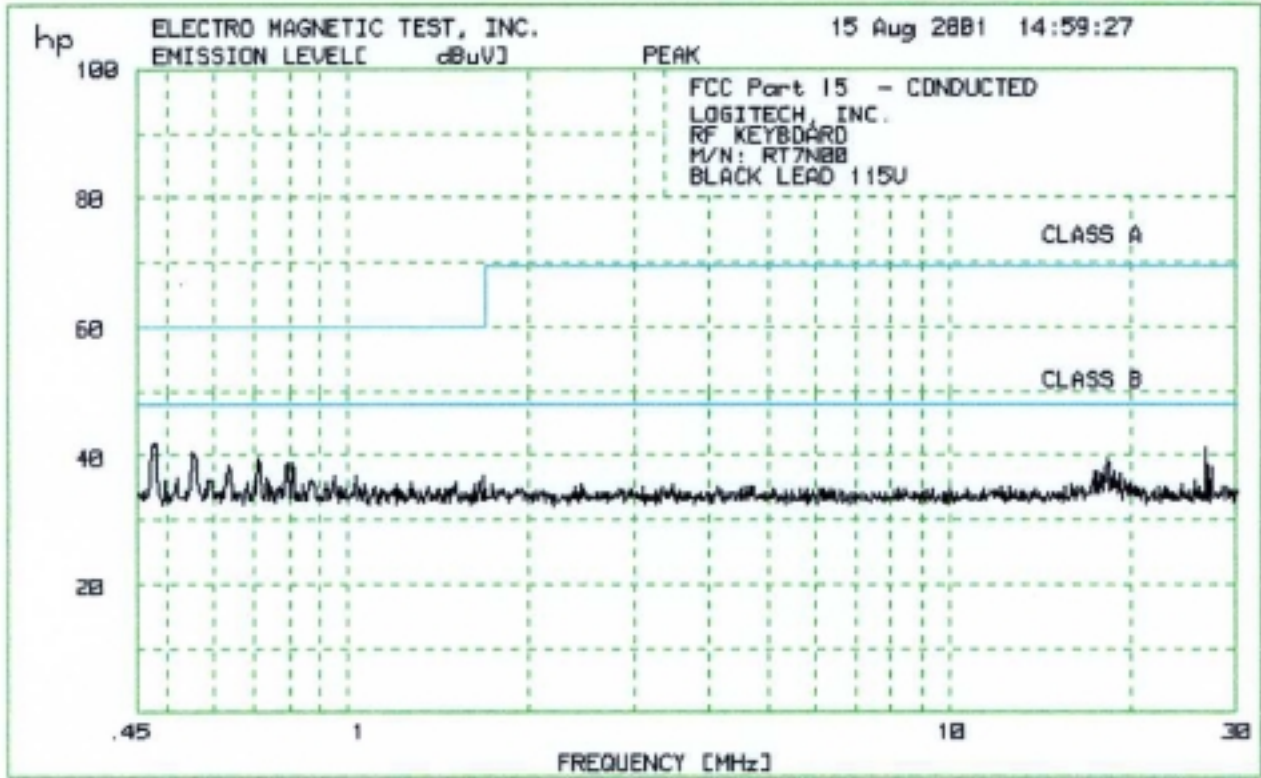


REAR VIEW

LOGITECH, INC.
RF KEYBOARD
MODEL: RT7N00

FCC CLASS B - RADIATED EMISSIONS - 8-14-01 & 8-15-01

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**

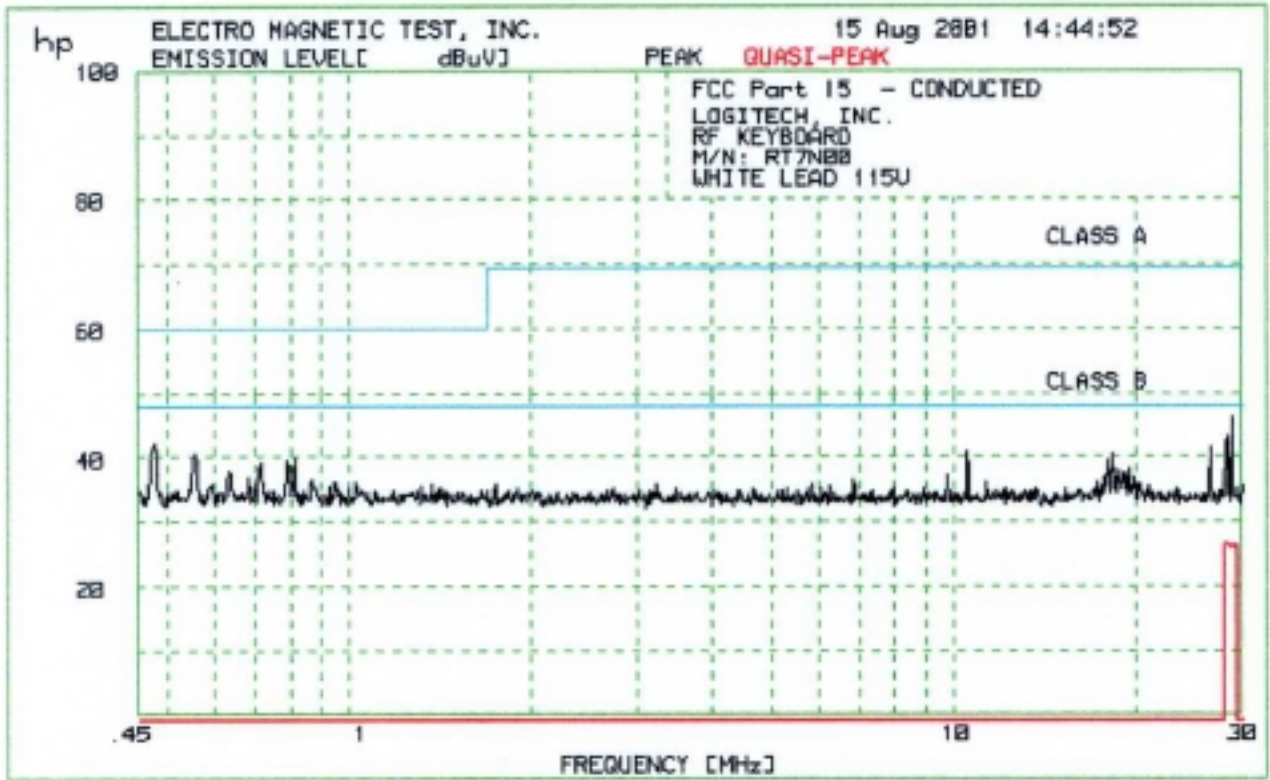


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ELECTRO MAGNETIC TEST, INC.      15 Aug 2001  14:59:27
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```
1. CONDUCTED WITH PRESELECTOR
   1.1 FCC Part 15 - CONDUCTED
=====
```

```
45 highest Peaks above -50 dB of Limit Line #2
peak criteria = .1 dB
```

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	.4792	41.7	-6.3
2	26.67	41	-7.0
3	.555	40.4	-7.6
4	18.36	39.4	-8.6
5	.7139	39.3	-8.7
6	.7995	38.8	-9.2
7	.8131	38.7	-9.3
8	.6374	38.5	-9.5
9	27.24	38.1	-9.9
10	17.61	37.5	-10.5
11	18.75	37.5	-10.5
12	17.39	37.3	-10.7
13	17.83	37.2	-10.8
14	19.15	37.1	-10.9
15	1.694	36.8	-11.2
16	18.06	36.7	-11.3
17	.9536	36.6	-11.4
18	1.033	36.6	-11.4
19	.5212	36.5	-11.5
20	.7383	36.3	-11.7
21	.5886	36.2	-11.8
22	19.47	36.1	-11.9
23	25.47	36.1	-11.9
24	18.91	36	-12.0
25	.4998	35.9	-12.1
26	.8768	35.9	-12.1
27	.6846	35.8	-12.2
28	.926	35.8	-12.2
29	1.285	35.7	-12.3
30	1.659	35.7	-12.3
31	17.24	35.7	-12.3
32	1.513	35.6	-12.4
33	1.632	35.5	-12.5
34	19.89	35.5	-12.5
35	24.43	35.4	-12.6
36	.8479	35.3	-12.7
37	1.072	35.3	-12.7
38	1.206	35.3	-12.7
39	1.745	35.3	-12.7
40	2.451	35.3	-12.7
41	3.487	35.3	-12.7
42	15.99	35.3	-12.7
43	20.05	35.3	-12.7
44	.702	35.2	-12.8
45	4.677	35.2	-12.8



=====

ELECTRO MAGNETIC TEST, INC. 15 Aug 2001 14:44:52

=====

1. CONDUCTED WITH PRESELECTOR
 1.1 FCC Part 15 - CONDUCTED

=====

45 highest Peaks above -50 dB of Limit Line #2
 peak criteria = .1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	28.77	46.3	-1.7
2	28.29	43.2	-4.8
3	.4772	42.1	-5.9
4	.4732	41.5	-6.5
5	26.56	41.4	-6.6
6	10.55	40.7	-7.3
7	18.36	40.4	-7.6
8	.5597	40.3	-7.7
9	.8165	39.7	-8.3
10	.7929	39.5	-8.5
11	18.06	39.4	-8.6
12	.7169	39.2	-8.8
13	18.52	38.1	-9.9
14	19.47	38.1	-9.9
15	18.75	37.9	-10.1
16	.6348	37.7	-10.3
17	18.99	37.4	-10.6
18	19.15	37.4	-10.6
19	9.786	37.2	-10.8
20	.6846	36.6	-11.4
21	17.76	36.6	-11.4
22	19.89	36.6	-11.4
23	6.851	36.4	-11.6
24	.8732	36.3	-11.7
25	11.33	36.2	-11.8
26	17.24	36.2	-11.8
27	1.028	36.1	-11.9
28	.9496	36	-12.0
29	.5936	35.8	-12.2
30	3.246	35.8	-12.2
31	20.31	35.7	-12.3
32	1.374	35.6	-12.4
33	1.752	35.6	-12.4
34	5.866	35.6	-12.4
35	.9338	35.5	-12.5
36	19.72	35.5	-12.5
37	.726	35.4	-12.6
38	6.247	35.4	-12.6
39	17.61	35.4	-12.6
40	1.317	35.3	-12.7
41	21	35.3	-12.7
42	.9616	35.2	-12.8
43	12.22	35.2	-12.8
44	17.1	35.2	-12.8
45	.5458	35.1	-12.9

=====

ELECTRO MAGNETIC TEST, INC. 15 Aug 2001 14:44:52

=====

- 1. CONDUCTED WITH PRESELECTOR
- 1.1 FCC Part 15 - CONDUCTED

=====

Quasi-Peaks above -50 dB of Limit Line #2
peak criteria = .1 dB

PEAK#	FREQ (MHz)	(dBuV)	DELTA
1	28.17	26.5	-21.5
2	28.89	26.4	-21.6
3	29.25	26.3	-21.7



ELECTRO MAGNETIC TEST, INC.

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FRONT VIEW

LOGITECH, INC.

RF KEYBOARD

MODEL: RT7N00

FCC CLASS B - CONDUCTED EMISSIONS - 8-15-01

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



ELECTRO MAGNETIC TEST, INC.

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REAR VIEW

LOGITECH, INC.

RF KEYBOARD

MODEL: RT7N00

FCC CLASS B - CONDUCTED EMISSIONS - 8-15-01

**PHOTOGRAPH SHOWING THE EUT CONFIGURATION
FOR MAXIMUM EMISSIONS**



ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

APPENDIX B

TEST SETUP DIAGRAMS



ELECTRO MAGNETIC TEST, INC.

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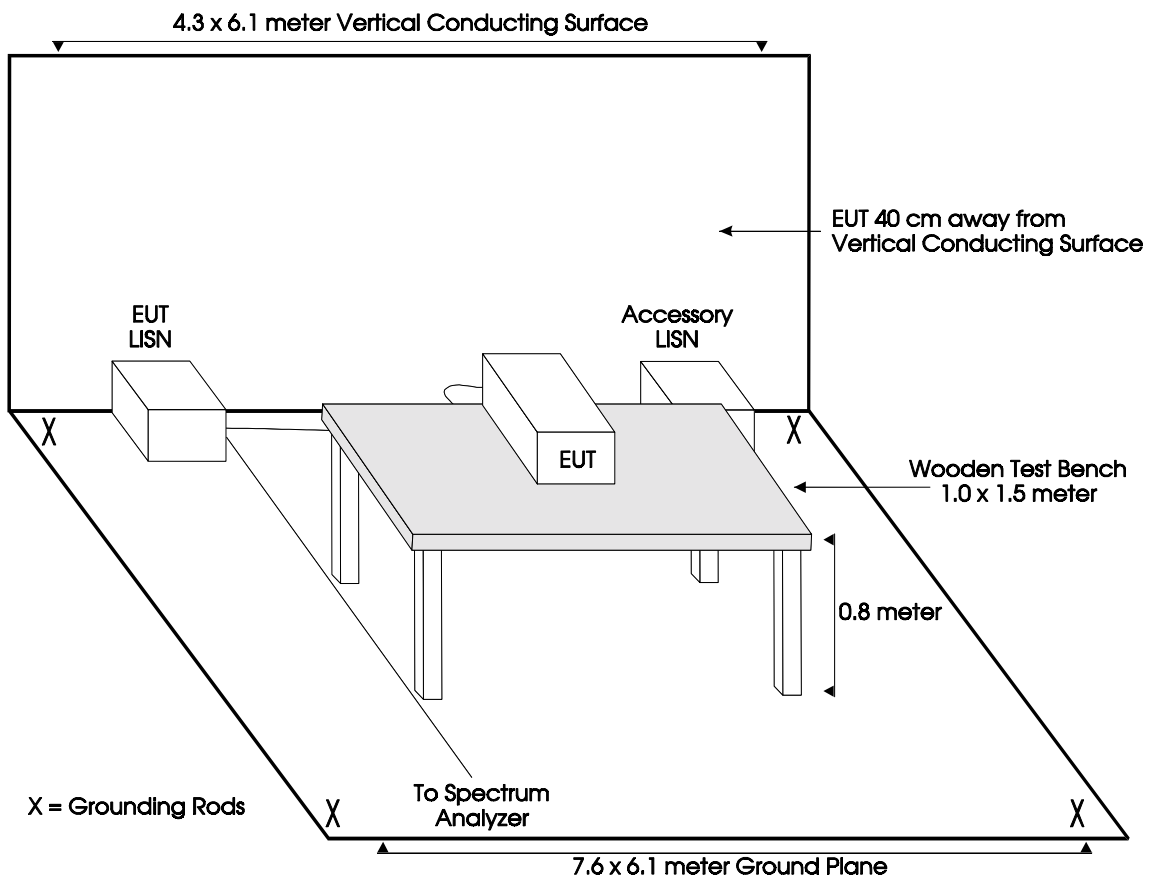


FIGURE 1 - CONDUCTED EMISSIONS TEST SETUP SITE A



ELECTRO MAGNETIC TEST, INC.

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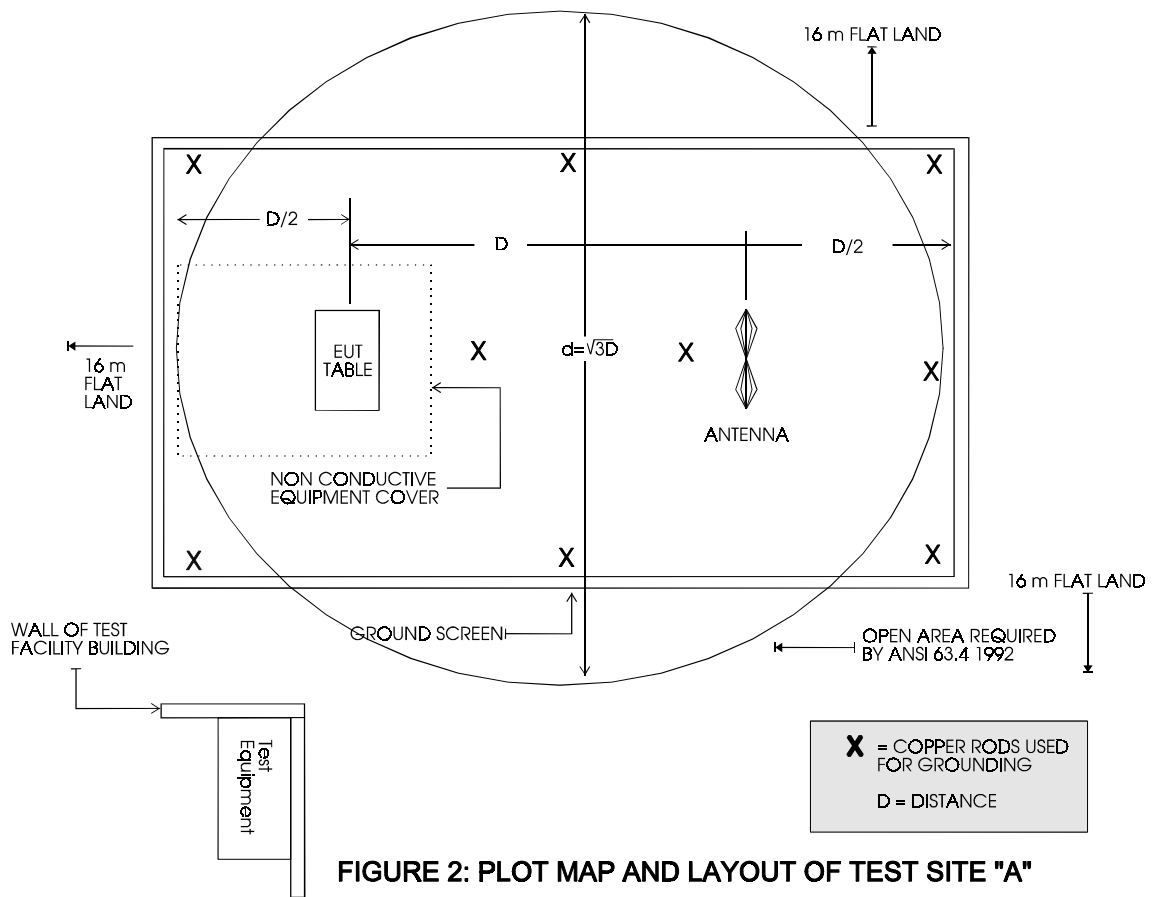
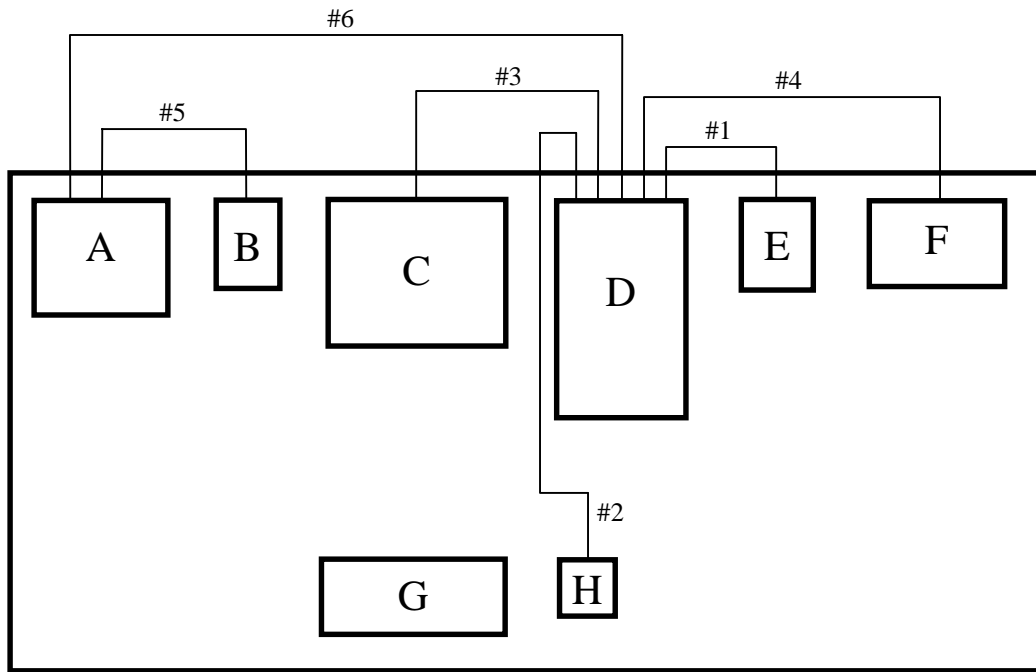


FIGURE 2: PLOT MAP AND LAYOUT OF TEST SITE "A"



ELECTRO MAGNETIC TEST, INC.
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Wooden Test Table ↗

A. Printer	E. Receiver
B. Printer AC Power Adapter	F. External Modem
C. Monitor	G. EUT
D. Computer	H. Mouse

FIGURE 3: EQUIPMENT CONFIGURATION BLOCK DIAGRAM



ELECTRO MAGNETIC TEST, INC.

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APPENDIX C

ANTENNA FACTORS AND EFFECTIVE GAIN FACTORS

**ELECTRO MAGNETIC TEST, INC.**

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

LAB "A" EFFECTIVE: 3/21/01**COM-POWER LOOP ANTENNA MODEL: AL-130, S/N: 25308**

FREQUENCY MHz	MAGNETIC dB/m	ELECTRIC dB/m
0.09	-21.0	30.5
0.01	-23.6	27.9
0.02	-33.1	18.4
0.05	-39.7	11.8
0.075	-41.0	10.5
0.1	-41.1	10.4
0.15	-41.2	10.3
0.25	-41.4	10.1
0.5	-41.4	10.1
0.75	-41.4	10.1
1	-41.0	10.5
2	-40.8	10.7
3	-41.0	10.5
4	-40.8	10.7
5	-40.9	10.6
10	-42.0	9.5
15	-43.9	7.6
20	-44.4	7.1
25	-45.8	5.7
30	-46.2	5.3



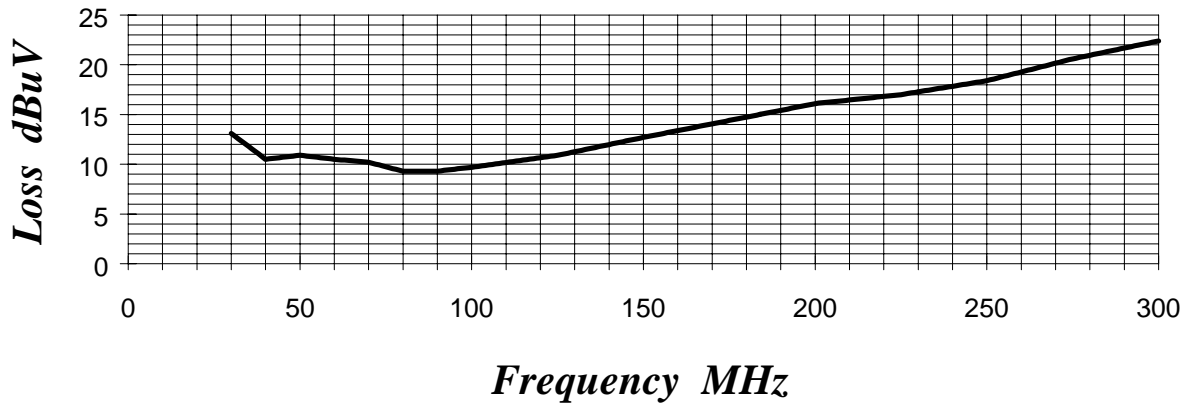
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

EFFECTIVE 11-11-00

LAB "A" BICONICAL ANTENNA

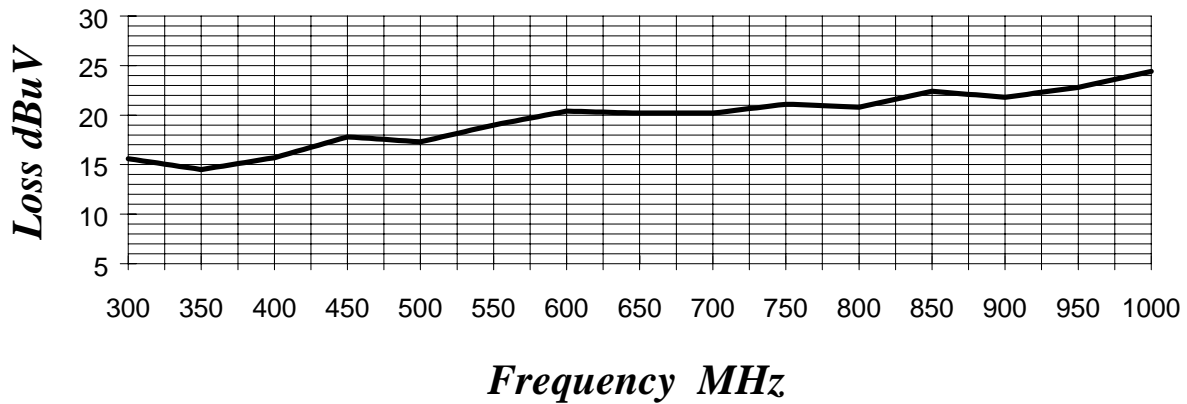
AB-100 S/N: 1557



EFFECTIVE 11-11-00

LAB "A" LOG PERIODIC ANTENNA

AL-100 S/N: 16037





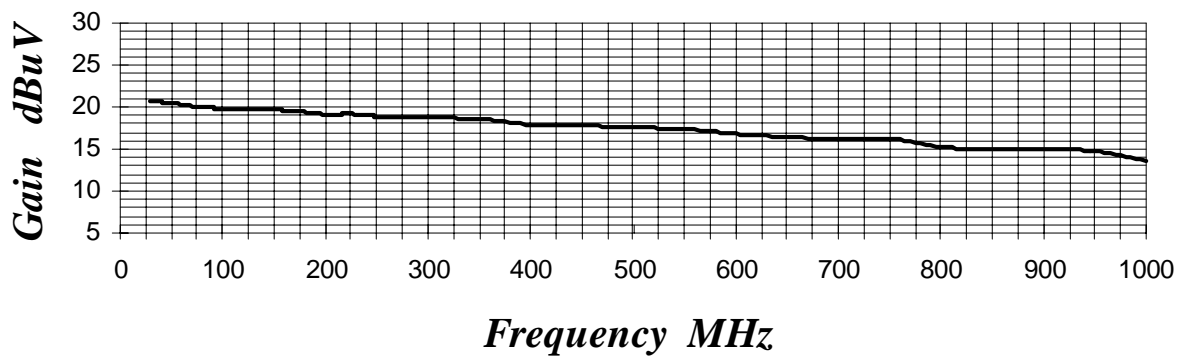
ELECTRO MAGNETIC TEST, INC.

1547 Plymouth Street, Mountain View, CA 94043 Tel: (650) 965-4000 Fax: (650) 965-3000

LAB "A" EFFECTIVE 3-1-01

PREAMPLIFIER M/N: PA-102 S/N: 1482

EFFECTIVE GAIN AT 3 METERS



PREAMPLIFIER M/N: PA-102 S/N: 1482

EFFECTIVE GAIN AT 10 METERS

