CERTIFICATION TEST REPORT

FOR THE

RF MOUSE, COMPUTER PERIPHERALS, M-RK53

FCC PART 15 SUBPART C

COMPLIANCE

DATE OF ISSUE: NOVEMBER 12, 1999

PREPARED FOR:

Logitech Inc.
6505 Kaiser Drive
Fremont, CA 94555

P.O. No: 619483
W.O. No: 72892

Report No: FC99-035

PREPARED BY:

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Date of test: October 28 & 29, 1999

DOCUMENTATION CONTROL:

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APPROVED BY:

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	October 28 & 29, 1999
PURPOSE OF TEST:	To demonstrate the compliance of the RF Mouse, Computer Peripherals, M-RK53, with the requirements for FCC Part 15 Subpart C devices.
MANUFACTURER:	Logitech Inc. 6505 Kaiser Drive Fremont, CA 94555
REPRESENTATIVE:	Bharat Shah
TEST LOCATION:	CKC Laboratories, Inc. 1653 Los Viboras Road Hollister, CA 95023
TEST PERSONNEL:	Art Rice
TEST METHOD:	ANSI C63.4 1992
FREQUENCY RANGE TESTED:	9 kHz - 1000 MHz
EQUIPMENT UNDER TEST:	**RF Mouse, Computer Peripherals** Manuf: Logitech Model: M-RK53 Serial: none FCC ID: DZL221369 (pending)

SUMMARY OF RESULTS

The Logitech Inc. RF Mouse, Computer Peripherals, M-RK53, was tested in accordance with ANSI C63.4 1992 for compliance with FCC Part 15 Subpart C.

As received, the above equipment was found to be fully compliant with the limits of FCC Part 15 Subpart C. The results in this report apply only to the items tested, as identified herein.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

Computer peripheral cordless mouse.

MEASUREMENT UNCERTAINTY

Associated with data in this report is a ±4dB measurement uncertainty.

EUT OPERATING FREQUENCY

The EUT was operating at 27.045 MHz.

PERIPHERAL DEVICES

The EUT was tested with the following peripheral device(s):

RF Receiver
Manuf: Logitech
Model: C-RD3-DUAL
Serial: DVT208
FCC ID: DoC

Modem
Manuf: Best Data
Model: 56SIPX
Serial: 56SPX72729
FCC ID: DoC

Monitor
Manuf: NEC
Model: JC-1745UMA-1
Serial: 7221430LA
FCC ID: DoC

Host PC
Manuf: Dell
Model: Dimension XPS T450
Serial: 1H43F
FCC ID: DoC

Printer
Manuf: HP
Model: C2655-60015
Serial: SG69K111KR
FCC ID: DoC

Cordless Keyboard
Manuf: Logitech
Model: Y-RB7
Serial: none
FCC ID: DZL211255

REPORT OF MEASUREMENTS

The following tables report the highest worst case levels recorded during the tests performed on the RF Mouse, Computer Peripherals, M-RK53. All readings taken are peak readings unless otherwise noted by a “Q” or “A”. The data sheets from which these tables were compiled are contained in Appendix B.

Table 1: Fundamental Emission

FREQUENCY	METER READING	CORRECTION FACTORS				CORRECTED READING	SPEC LIMIT	MARGIN	NOTES
		Dipole	Pream	Cable	Dist				
MHz	dBµV	dB	dB	dB	dB	dBµV/m	dBµV/m	dB	
27.048	79.3	-2.8	-27.9	1.1		49.7	80.0	-30.3	HDA
27.048	62.7	-2.8	-27.9	1.1		33.1	80.0	-46.9	VDA

Test Method: ANSI C63.4 1992

Spec Limit : FCC Part 15.227
Test Distance: 3 Meters

NOTES:
H = Horizontal Polarization
V = Vertical Polarization
N = No Polarization
D = Dipole Reading
Q = Quasi Peak Reading
A = Average Reading

COMMENTS: EUT is setup to produce worst case emissions in accordance to ANSI C 63.4. The dual receiver is sensing the cordless keyboard and cordless mouse, which are continuously transmitting. The dual receiver is connected to the host PC. The modem, monitor and printer are connected to the host PC. Measuring the fundamental of the 27.045 MHz transmitter. In a separate test I found that 95 pulses of 0.95 mS occurred in 100 mS. This calculated to a 0.9025 % duty cycle. That resulted in -0.89 dB correction for "Pulse width modulation averaged reading".

Table 2: Six Highest Spurious Emission Levels - 9kHz-30MHz

FREQUENCY	METER READING	CORRECTION FACTORS				CORRECTED READING	SPEC LIMIT	MARGIN	NOTES
		Mag Loop Ant	Pream	Cable	Dist				
MHz	dBµV	dB	dB	dB	dB	dBµV/m	dBµV/m	dB	
0.084	33.7	10.9				44.6	109.1	-64.5	N
0.162	49.4	9.6				59.0	103.4	-44.4	N
0.318	45.8	9.8				55.6	97.5	-41.9	N
2.041	32.0	10.1				42.1	70.0	-27.9	N
4.000	24.9	9.8				34.7	70.0	-35.3	N
27.057	43.9	6.6				50.5	70.0	-19.5	N

Test Method: ANSI C63.4 1992

Spec Limit : FCC Part 15.209

Test Distance: 3 Meters

NOTES:
H = Horizontal Polarization
V = Vertical Polarization
N = No Polarization
D = Dipole Reading
Q = Quasi Peak Reading
A = Average Reading

COMMENTS: EUT is setup to produce worst case emissions in accordance to ANSI C 63.4. The dual receiver is sensing the cordless keyboard and cordless mouse, which are continuously transmitting. The dual receiver is connected to the host PC. The modem, monitor and printer are connected to the host PC. Measuring any spurious signals .009-30 MHz. Video display was shut off during this test. Maximized any signal found that was within 10 dB of the limit.

Table 3: Six Highest Spurious Emission Levels - 30-1000MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY	READING	Ant	Pream	Cable	Dist	READING	LIMIT	MARGIN	NOTES
MHz	dBµV	dB	dB	dB	dB	dBµV/m	dBµV/m	dB	
135.863	49.5	12.1	-27.5	2.7		36.8	43.5	-6.7	V
798.477	34.1	24.6	-27.7	7.6		38.6	46.0	-7.4	H
816.247	33.6	24.3	-27.6	7.6		37.9	46.0	-8.1	H
865.336	34.2	23.1	-27.3	7.8		37.8	46.0	-8.2	HQ
898.751	33.8	22.3	-27.2	8.2		37.1	46.0	-8.9	VQ
898.762	33.5	22.3	-27.2	8.2		36.8	46.0	-9.2	HQ

Test Method: ANSI C63.4 1992

Spec Limit : FCC Part 15C
Test Distance: 3 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization
N = No Polarization
D = Dipole Reading
Q = Quasi Peak Reading
A = Average Reading

COMMENTS: EUT is setup to produce worst case emissions in accordance to ANSI C 63.4. The dual receiver is sensing the cordless keyboard and cordless mouse, which are continuously transmitting. The dual receiver is connected to the host PC. The modem, monitor and printer are connected to the host PC. Measuring the harmonics of the 27.045 MHz transmitter and any spurious signals 30-1000 MHz. Maximized any signal found that was within 10 dB of the limit.

TABLE A

LIST OF TEST EQUIPMENT

Hollister C
Industry Canada File No. IC 3170-C

Equipment used for 15.227

Function	S/N	Calibration Date	Cal Due Date
HP 85680B SA	2601A2378	09/17/1999	09/17/2000
HP 85662A Display	2542A10641	09/17/1999	09/17/2000
HP 85650A QPA	3033A01467	09/17/1999	09/17/2000
HP 8447D Preamp	2727A06124	01/08/1999	01/08/2000
CKC Dipole set	006-X1	09/20/1999	09/20/2000

Equipment used for 15.209 9kHz-30MHz

Function	S/N	Calibration Date	Cal Due Date
HP 85680B SA	2601A2378	09/17/1999	09/17/2000
HP 85662A Display	2542A10641	09/17/1999	09/17/2000
HP 85650A QPA	2811A01065	08/1/1999	08/1/2000
Loop Antenna, EMCO 6502	2078	06/17/1999	06/17/2000

Equipment used for 15.209 30MHz-1000MHz

HP 8447D Preamp	2727A06124		01/08/2000
HP 85680B SA	2601A2378	09/17/1999	09/17/2000
HP 85662A Display	2542A10641	09/17/1999	09/17/2000
HP 85650A QPA	3033A01467	09/17/1999	09/17/2000
Site C radiated cables	Cable99c	01/04/1999	01/04/2000
SAS-200/540 Biconical	293	04/22/1999	04/22/2000
SAS-200/512 Log Periodic	CKC-HC	06/28/1999	06/28/2000

1. Hollister Site C. Calibration date: April 19, 1999. Calibration due date: April 19, 2000.

2. Test software, EMI Test 2.91.

EUT SETUP

The equipment under test (EUT) and the peripheral(s) listed were set up in a manner that represented their normal use. Any special conditions required for the EUT to operate normally are identified in the comments that accompany Tables 1-3. Additionally, a complete description of all the ports and I/O cables is included on the information sheets contained in Appendix A.

During radiated emissions testing, the EUT was mounted on a nonconductive, rotating table 80 cm above the conductive grid. The nonconductive table dimensions were 1 meter by 1.5 meters. This configuration is typical for radiated emissions testing of table top devices.

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Table A were used to collect the radiated emissions data for the RF Mouse, Computer Peripherals, M-RK53. For radiated measurements from 9 kHz to 30 MHz, the magnet loop antenna was used, below 300 MHz, the biconical antenna was used and for frequencies from 300 to 1000 MHz, the log periodic antenna was used. The dipole antenna(s) were used for specific frequencies as indicated in the data sheets in Appendix B. All antennas were located at a distance of 3 meters from the edge of the EUT.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. During radiated testing, the measurements were made with 0 dB of attenuation, a reference level of 97 dBµV, and a vertical scale of 10 dB per division.

TABLE B : ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE

TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in Tables 1-3 indicate the type of detector function used to obtain the given readings. Unless otherwise noted, all readings were made in the "Peak" mode. Whenever a "Quasi-Peak" or "Average" reading is listed as one of the six highest readings, this is indicated as a "Q" or an "A" in the appropriate table. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data for the RF Mouse, Computer Peripherals, M-RK53.

Peak

In this mode, the Spectrum Analyzer or test engineer recorded all emissions at their peak value as the frequency band selected was scanned. By combining this function with another feature of the analyzer called "peak hold," the analyzer had the ability to measure transients or low duty cycle transient emission peak levels. In this mode the analyzer made a slow scan across the frequency band selected and measured the peak emission value found at each frequency across the band.

Quasi-Peak

When the true peak values exceeded or were within 2 dB of the specification limit, quasi-peak measurements were taken using the HP Quasi-Peak Adapter for the HP Spectrum Analyzer. The detailed procedure for making quasi peak measurements contained in the HP Quasi-Peak Adapter manual were followed.

Average

When the frequencies are less than 30 MHz, average measurements may be made using the spectrum analyzer. To make these measurements, the test engineer reduces the video bandwidth on the analyzer until the modulation of the signal is filtered out. At this point the analyzer is set into the linear mode and the scan time is reduced.

TEST METHODS

The radiated emissions data of the RF Mouse, Computer Peripherals, M-RK53, was taken with the HP Spectrum Analyzer. Incorporating the applicable correction factors for distance, antenna, cable loss and amplifier gain, the data was reduced as shown in the "Sample Calculations". The corrected data was then compared to the FCC Part 15, Subpart C emissions limits to determine compliance.

Preliminary and final measurements were taken in order to better ensure that all emissions from the EUT were found and maximized.

Radiated Emissions Testing

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. The frequency range of 9 kHz – 30 MHz was scanned using the magnetic loop antenna. 30 MHz - 88 MHz was then scanned with the biconical antenna located about 1.5 meter above the ground plane in the vertical configuration. During this scan, the turntable was rotated and all peaks which were at or near the limit were recorded. The frequency range of 100 - 300 MHz was scanned with the biconical antenna in the same manner, and the peaks recorded. Lastly, a scan of the FM band from 88 - 110 MHz was made, using a reduced resolution bandwidth and a reduced frequency span. The biconical antenna was changed to the horizontal polarity and the above steps were repeated. After changing to the log periodic antenna in the horizontal configuration, the frequency range of 300 - 1000 MHz was scanned. The log periodic antenna was changed to the vertical polarity and the frequency range of 300 - 1000 MHz was again scanned. Care was taken to ensure that no frequencies were missed within the FM and TV bands. An analysis was performed to determine if the signals that were at or near the limit were caused by an ambient transmission. If unable to determine by analysis, the equipment was powered down to make the final determination if the EUT was the source of the emission.

For the final radiated scan, a thorough scan of all frequencies was manually made using a small frequency span, rotating the turntable as needed. Comparison with the previously recorded measurements was then made.

Using the peak readings from both scans as a guide, the test engineer then maximized the readings with respect to the table rotation, antenna height and configuration of the peripherals and cables. Maximizing of the cables was achieved by monitoring the spectrum analyzer on a closed circuit television monitor while the EUT cables were being moved and rearranged on the EUT table for maximum emissions. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

FCC Part 15.215- Occupied Bandwidth Measurements

In accordance with Part 15.215(c), the fundamental frequency was kept within the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Frequency Range of Transmitter: 27 MHz

In accordance with Part 15.247(a), the field strength of the emissions within the 26.96-27.28 MHz band did not exceed 10,000 microvolts/meter at 3 meters. The emission limit in was based on the measurement instrumentation employing an average detector. The provisions in 15.35 for limiting peak emissions apply.

SAMPLE CALCULATIONS

The basic spectrum analyzer reading was converted using correction factors as shown in the six highest emissions readings in Tables 1-3. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula:

Meter reading (dBµV)
+ Antenna Factor (dB)
+ Cable Loss (dB)
- Distance Correction (dB)
- Pre-amplifier Gain (dB)

= Corrected Reading (dBµV/m)

This reading was then compared to the applicable specification limit to determine compliance.

A typical data sheet will display the following in column format:

#	Freq MHz	Rdng dBuV	Cable	Amp.	Bicon Ant.	Log Ant.	Dist	Corr dBuV/m	Spec	Margin	Polar
	Dipole	Mag Loop									

means reading number
Freq MHz is the frequency in MHz of the obtained reading.
Rdng dBuV is the reading obtained on the spectrum analyzer in dBµV.
Amp. is short for the preamplifier factor or gain in dB.
Bicon Ant. is the biconical antenna factor in dB.
Log Ant. is the log periodic antenna factor in dB.
Cable is the cable loss in dB of the coaxial cable on the OATS.
Dist is the distance factor (in dB). It is used when testing at a different test distance than the one stated in the spec.
Corr dBµV/m is the corrected reading which is now in dBµV/m (field strength).
Spec is the specification limit (dB) stated in the agency's regulations.
Margin is the closeness to the specified limit in dB; + is over and - is under the limit.
Polar is the Polarity of the antenna with respect to earth.
Dipole is the dipole factor in dB.
Mag Loop Ant is the magnetic loop antenna in dB.

APPENDIX A

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

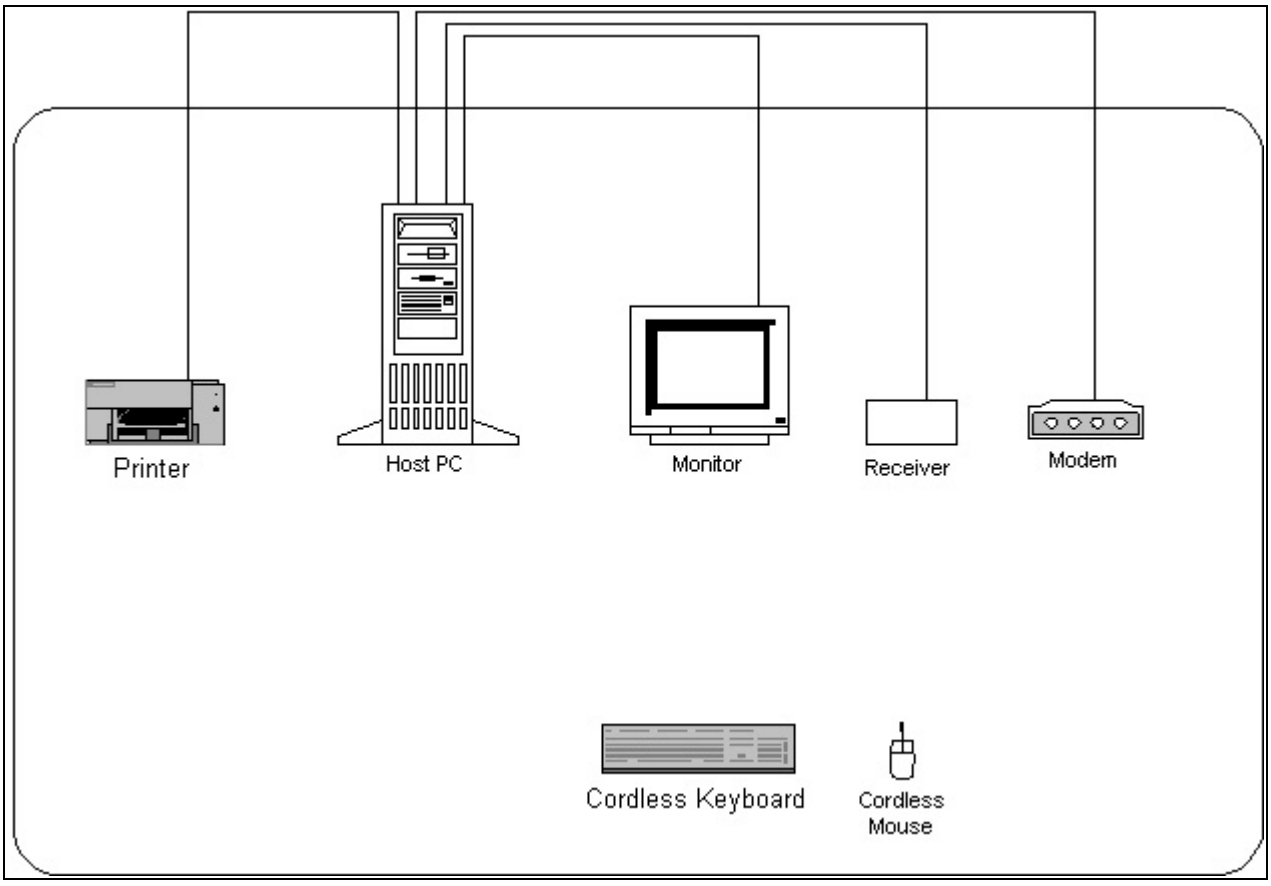
INFORMATION ABOUT THE EQUIPMENT UNDER TEST	
Test Software/Firmware:	Logitech Software
CRT was displaying:	Control panel and Cursor was moving
Power Supply Manufacturer:	N/A
Power Supply Part Number:	N/A
AC Line Filter Manufacturer:	N/A
AC Line Filter Part Number:	N/A
Line voltage used during testing:	**N/A**

I/O PORTS	
Type	#

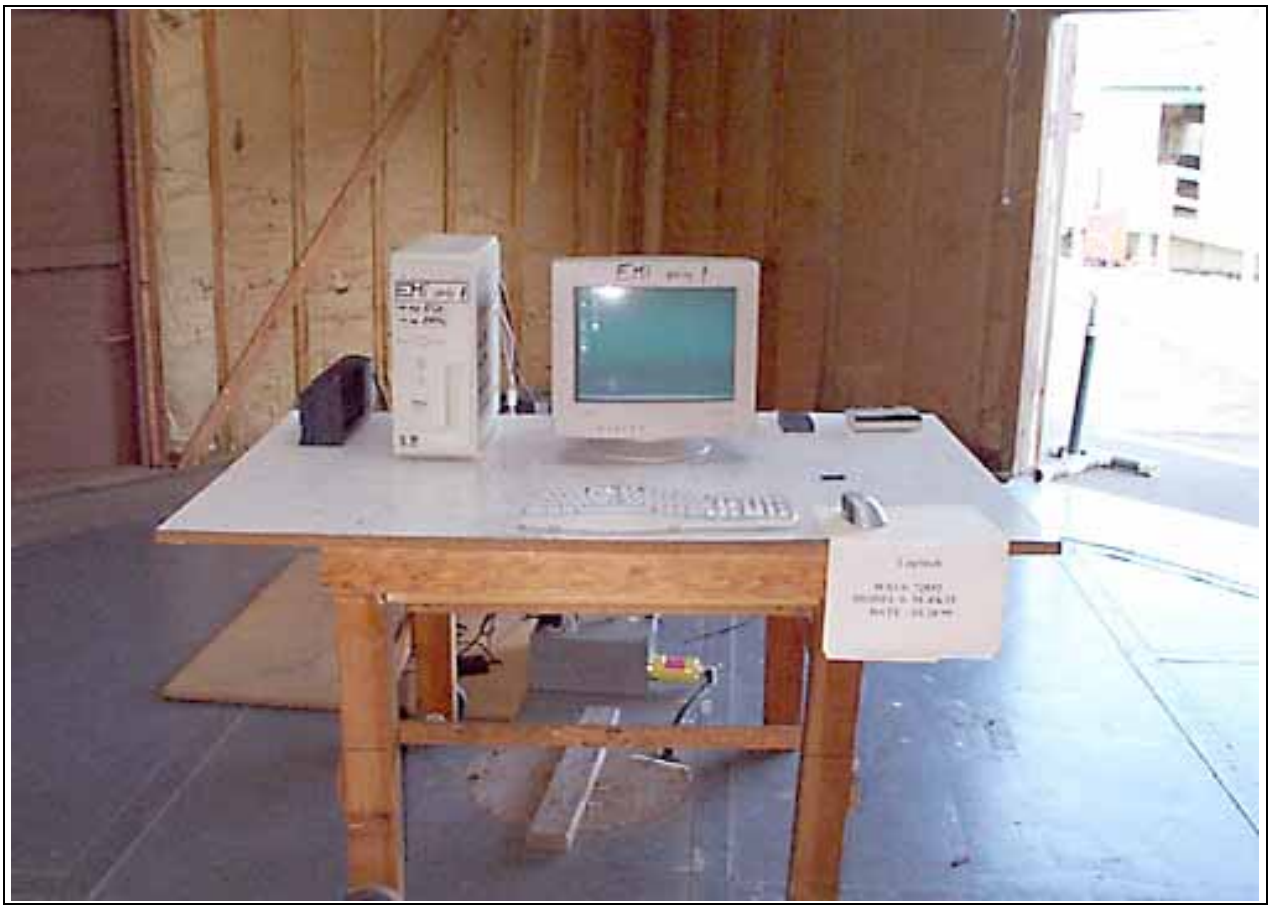
CRYSTAL OSCILLATORS	
Type	Freq In MHz
Ceramic	13.5225 MHz

PRINTED CIRCUIT BOARDS				
Function	Model & Rev	Clocks, MHz	Layers	Location
211369-0000	Rev A	13.5225 MHz	2 layer	

EQUIPMENT CONFIGURATION BLOCK DIAGRAM

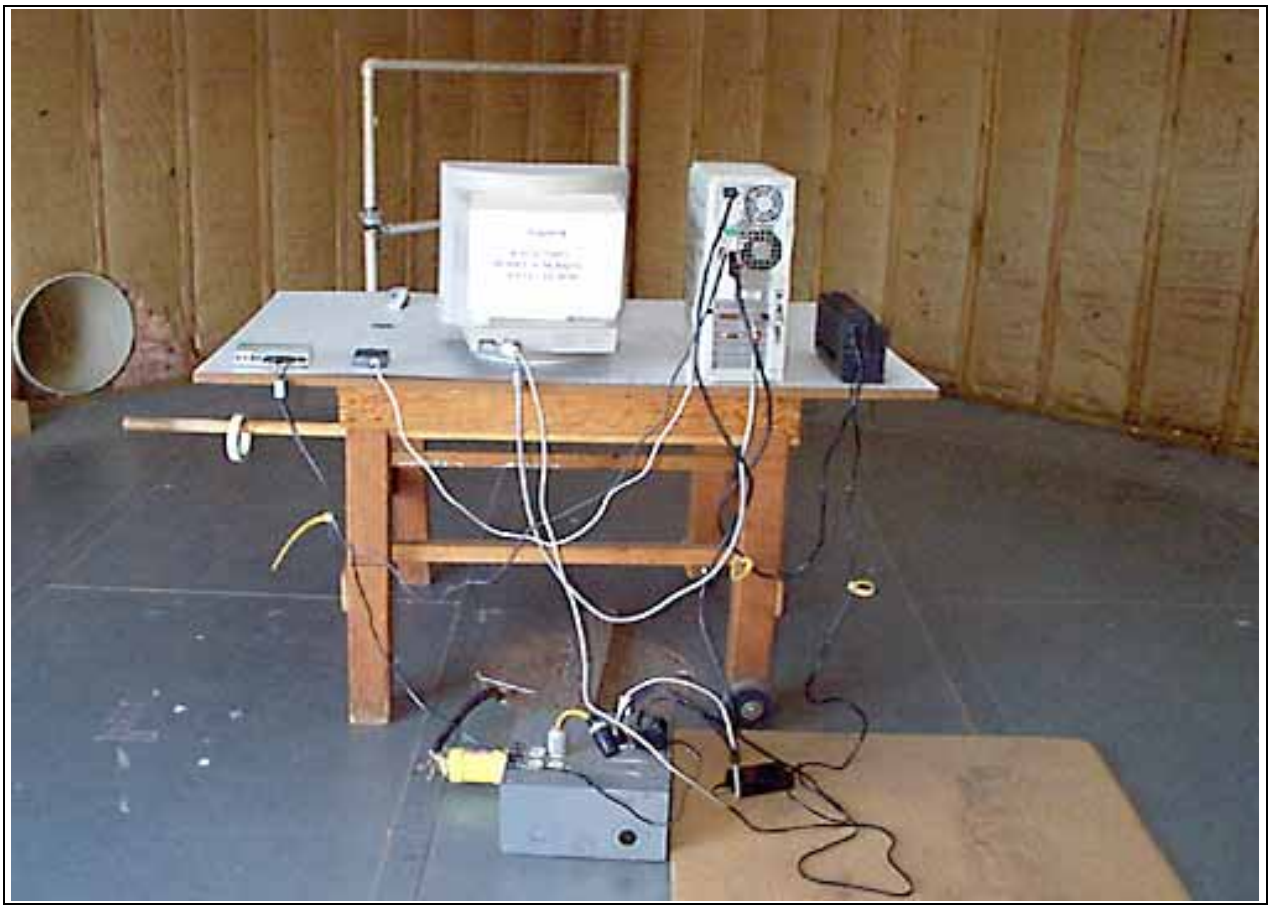


PHOTOGRAPH SHOWING RADIATED EMISSIONS



Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

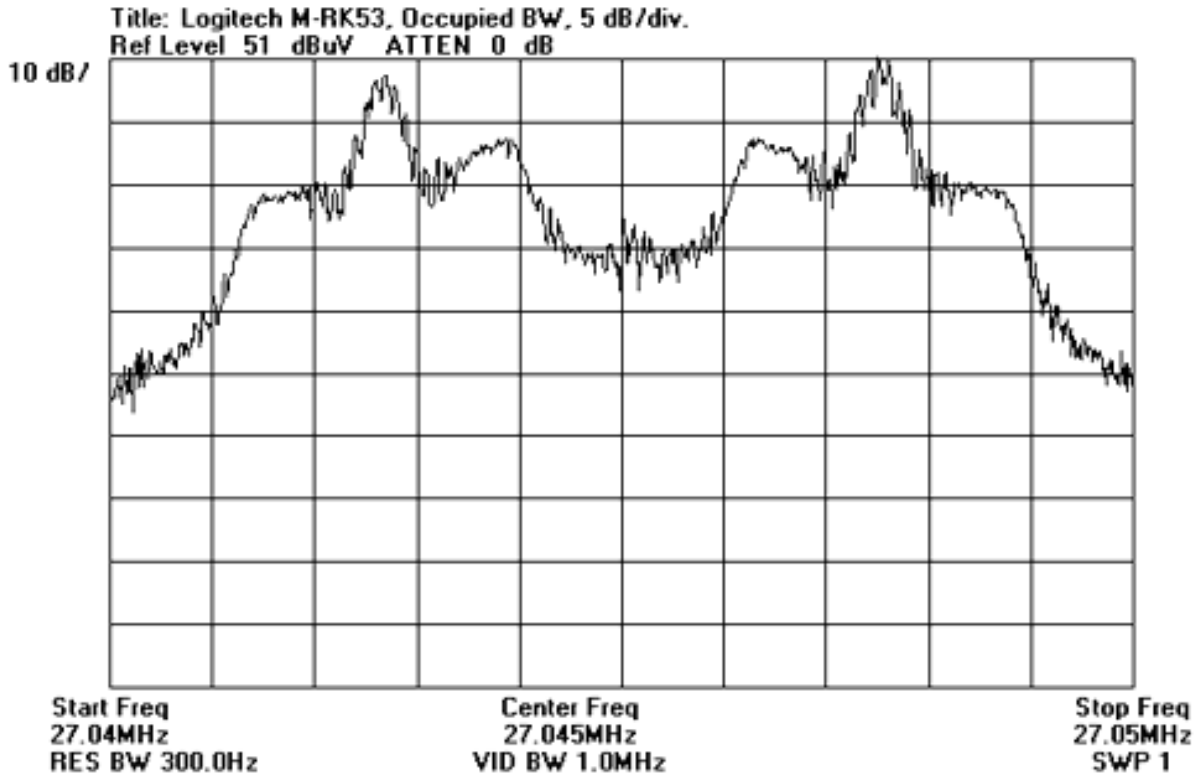


Radiated Emissions - Back View

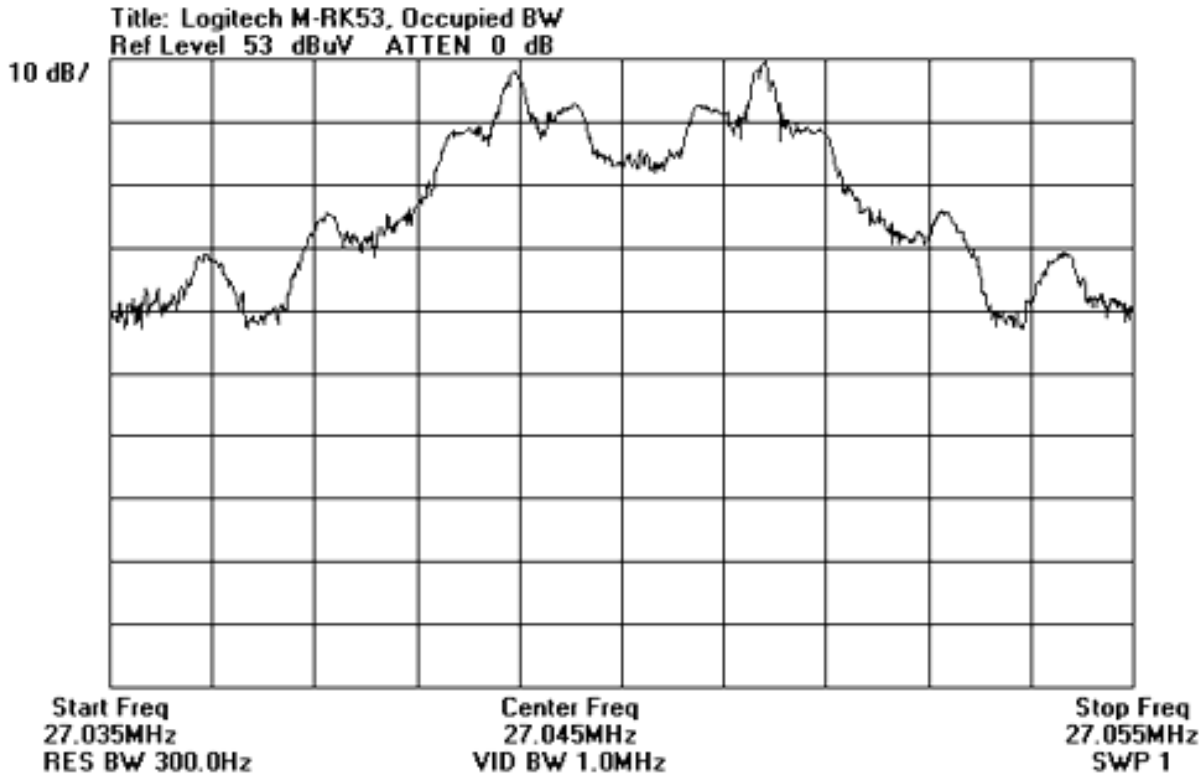
APPENDIX B

MEASUREMENT DATA SHEETS

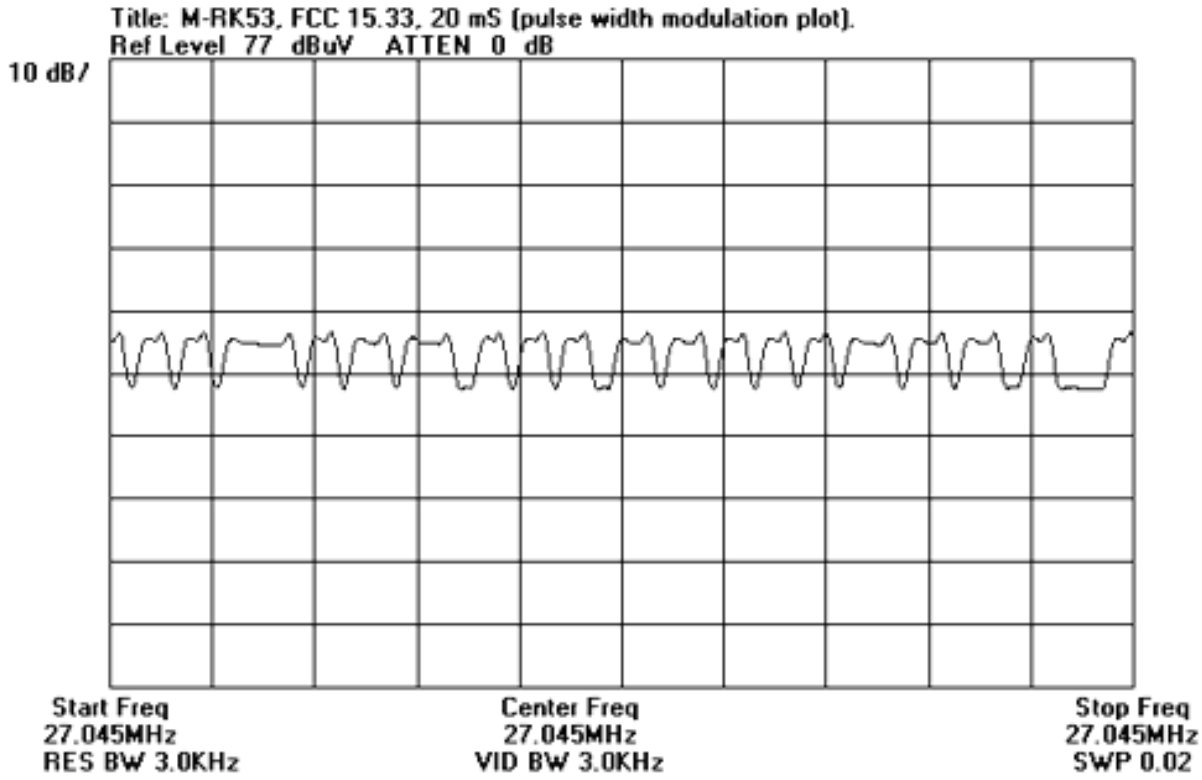
Occupied Bandwidth Plot Part 15.215



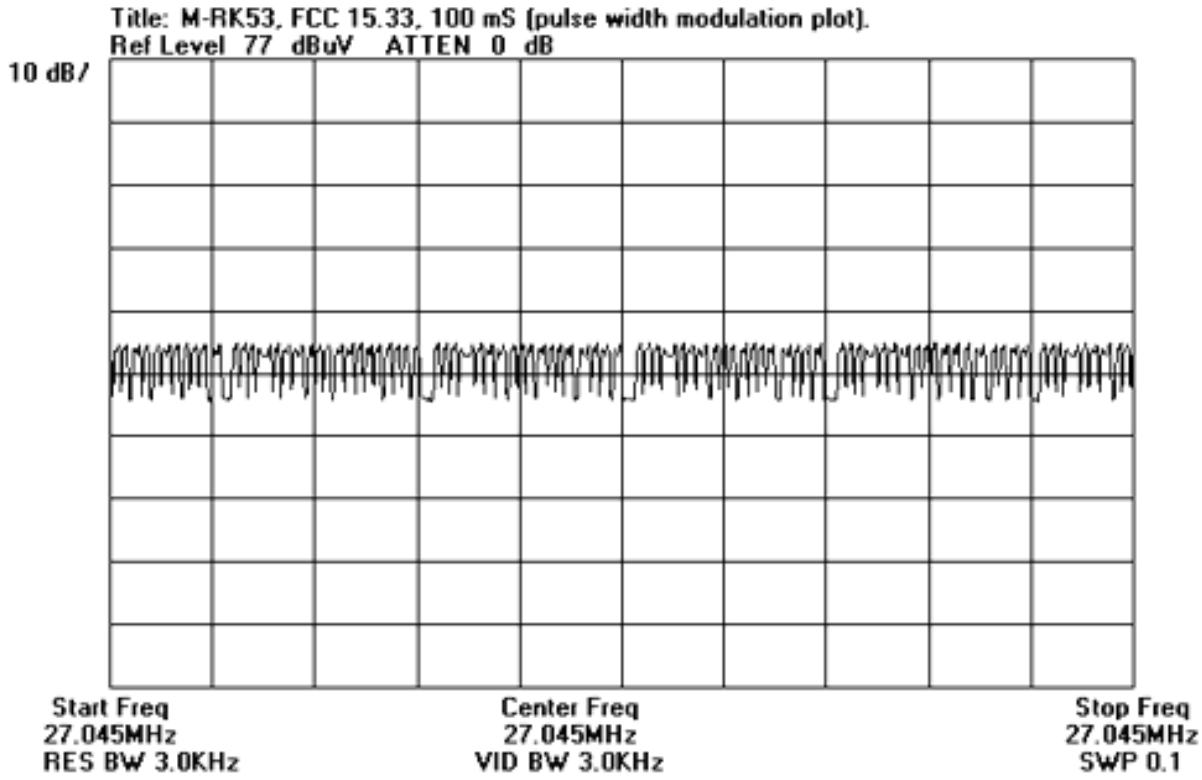
Occupied Bandwidth Plot Part 15.215



Frequency Range of Radiated Measurements Part 15.33



Frequency Range of Radiated Measurements Part 15.33



Test Location: CKC Laboratories, Inc. • 1653 Los Viboras Road ,Site C • Hollister, CA 95023 • (831) 637-1051

Customer: **Logitech, Inc.**
Specification: **FCC 15.227**
Work Order #: **72892** Date: Thu Oct-28-1999
Test Type: **Maximized Emissions** Time: 14:02:25
Equipment: **Cordless Mouse** Sequence#: 2
Manufacturer: Logitech Tested By: Art Rice
Model: M-RK53
S/N: None

***Test Equipment Used*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 85680B SA	2601A2378	09/17/1999	09/17/2000	1377
HP 85662A Display	2542A10641	09/17/1999	09/17/2000	0
HP 85650A QPA	3033A01467	09/17/1999	09/17/2000	641
HP 8447D Preamp	2727A06124	01/08/1999	01/08/2000	480
CKC Dipole set	006-X1	09/20/1999	09/20/2000	0

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Cordless Mouse*	Logitech	M-RK53	none

Support Devices:

Function	Manufacturer	Model #	S/N
RF Receiver	Logitech	C-RD3-DUAL	DVT208
Modem	Best Data	56SIPX	56SPX72729
Monitor	NEC	JC-1745UMA-1	7221430LA
Host PC	Dell	Dimension XPS T450	1H43F
Printer	HP	C2655-60015	SG69K111KR
Cordless Keyboard	Logitech	Y-RB7	none

Test Conditions / Notes:

EUT is setup to produce worst case emissions in accordance to ANSI C 63.4. The dual receiver is sensing the cordless keyboard and cordless mouse, which are continuously transmitting. The dual receiver is connected to the host PC. The modem, monitor and printer are connected to the host PC. Measuring the fundamental of the 27.045 MHz transmitter. In a separate test I found that 95 pulses of 0.95 mS occurred in 100 mS. This calculated to a 0.9025 % duty cycle. That resulted in -0.89 dB correction for "Pulse width modulation averaged reading".

Measurement Data: Reading listed by order taken. Test Distance: 3 Meters

#	Freq MHz	Rdng DBµV	Dipole dB	Preamp dB	Cable dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	27.048M Dipole Ave	79.3	-2.8	-27.9	+1.1		+0.0	49.7	80.0	-30.3	Horiz
2	27.048M Dipole Ave	62.7	-2.8	-27.9	+1.1		+0.0	33.1	80.0	-46.9	Vert

Test Location: CKC Laboratories, Inc. • 1653 Los Viboras Road ,Site C • Hollister, CA 95023 • (831) 637-1051
Customer: **Logitech, Inc.**
Specification: **FCC15.209**
Work Order #: **72892** Date: Fri Oct-29-1999
Test Type: **Maximized Emissions** Time: 11:55:24
Equipment: **Cordless Mouse** Sequence#: 5
Manufacturer: Logitech Tested By: Art Rice
Model: M-RK53
S/N: None

***Test Equipment Used*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 85680B SA	2601A2378	09/17/1999	09/17/2000	1377
HP 85662A Display	2542A10641	09/17/1999	09/17/2000	0
HP 85650A QPA	2811A01065	08/1/1999	08/1/2000	0
Loop Antenna, EMCO 6502	2078	06/17/1999	06/17/2000	0

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Cordless Mouse*	Logitech	M-RK53	none

Support Devices:

Function	Manufacturer	Model #	S/N
RF Receiver	Logitech	C-RD3-DUAL	DVT208
Modem	Best Data	56SIPX	56SPX72729
Monitor	NEC	JC-1745UMA-1	7221430LA
Host PC	Dell	Dimension XPS T450	1H43F
Printer	HP	C2655-60015	SG69K111KR
Cordless Keyboard	Logitech	Y-RB7	none

Test Conditions / Notes:

EUT is setup to produce worst case emissions in accordance to ANSI C 63.4. The dual receiver is sensing the cordless keyboard and cordless mouse, which are continuously transmitting. The dual receiver is connected to the host PC. The modem, monitor and printer are connected to the host PC. Measuring any spurious signals .009-30 MHz. Video display was shut off during this test. Maximized any signal found that was within 10 dB of the limit.

Measurement Data: Reading listed by order taken. Test Distance: 3 Meters

#	Freq	Rdng	Mag Loop Ant			Dist	Corr	Spec	Margin	Polar
	MHz	DBµV	dB	dB	dB	Table	dBµV/m	dBµV/m	dB	Ant
1	11.280k	42.0	+14.7			+0.0	56.7	126.5 Ambient level.	-69.8	None
2	84.070k	33.7	+10.9			+0.0	44.6	109.1 Ambient level.	-64.5	None
3	162.060k	49.4	+9.6			+0.0	59.0	103.4 Ambient level.	-44.4	None

4					55.6	97.5	-	None
	318.300k	45.8		+0.0			41.9	
			+9.8			Ambient level.		
5					42.1	70.0	-	None
	2.041M	32.0		+0.0			27.9	
			+10.1			Ambient level.		
6					34.7	70.0	-	None
	4.000M	24.9		+0.0			35.3	
			+9.8			Ambient level.		
7					50.5	70.0	-	None
	27.057M	43.9		+0.0			19.5	
			+6.6					

Test Location: CKC Laboratories, Inc. • 1653 Los Viboras Road ,Site C, Hollister, CA 95023 • (831) 637-1051
Customer: **Logitech, Inc.**
Specification: **FCC15.209**
Work Order #: **72892** Date: Thu Oct-28-1999
Test Type: **Maximized Emissions** Time: 12:25:17
Equipment: **Cordless Mouse** Sequence#: 1
Manufacturer: Logitech Tested By: Art Rice
Model: M-RK53
S/N: None

***Test Equipment Used*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8447D Preamp	2727A06124		01/08/2000	0
HP 85680B SA	2601A2378	09/17/1999	09/17/2000	0
HP 85662A Display	2542A10641	09/17/1999	09/17/2000	0
HP 85650A QPA	3033A01467	09/17/1999	09/17/2000	0
Site C radiated cables	Cable99c	01/04/1999	01/04/2000	0
SAS-200/540 Biconical	293	04/22/1999	04/22/2000	0
SAS-200/512 Log Periodic	CKC-HC	06/28/1999	06/28/2000	510

***Equipment Under Test* (* = EUT):**

Function	Manufacturer	Model #	S/N
Cordless Mouse*	Logitech	M-RK53	none

Support Devices:

Function	Manufacturer	Model #	S/N
RF Receiver	Logitech	C-RD3-DUAL	DVT208
Modem	Best Data	56SIPX	56SPX72729
Monitor	NEC	JC-1745UMA-1	7221430LA
Host PC	Dell	Dimension XPS T450	1H43F
Printer	HP	C2655-60015	SG69K111KR
Cordless Keyboard	Logitech	Y-RB7	none

Test Conditions / Notes:

EUT is setup to produce worst case emissions in accordance to ANSI C 63.4. The dual receiver is sensing the cordless keyboard and cordless mouse, which are continuously transmitting. The dual receiver is connected to the host PC. The modem, monitor and printer are connected to the host PC. Measuring the harmonics of the 27.045 MHz transmitter and any spurious signals 30-1000 MHz. Maximized any signal found that was within 10 dB of the limit.

Measurement Data: Reading listed by margin. Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Pream DB	Bicon Ant dB	Cable dB	Log Ant dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	898.760M	41.8	-27.2	+0.0	+8.2	+22.3	+0.0	45.1	46.0	-0.9	Horiz
2	898.759M	41.2	-27.2	+0.0	+8.2	+22.3	+0.0	44.5	46.0	-1.5	Vert
3	865.324M	37.7	-27.3	+0.0	+7.8	+23.1	+0.0	41.3	46.0	-4.7	Horiz

4	135.863M	49.5	- 27.5	+12.1	+2.7	+0.0	+0.0	36.8	43.5	- 6.7	Vert		
5	798.477M	34.1	- 27.7	+0.0	+7.6	+24.6	+0.0	38.6	46.0	- 7.4	Horiz		
6	816.247M	33.6	- 27.6	+0.0	+7.6	+24.3	+0.0	37.9	46.0	- 8.1	Horiz		
7	865.336M QP	34.2	- 27.3	+0.0	+7.8	+23.1	+0.0	37.8	46.0	- 8.2	Horiz		
8	63.355M	47.8	- 27.9	+10.2	+1.7	+0.0	+0.0	31.8	40.0	- 8.2	Vert	BB noise.	
9	87.580M	46.8	- 27.8	+10.4	+2.1	+0.0	+0.0	31.5	40.0	- 8.5	Vert	BB noise.	
10	898.751M QP	33.8	- 27.2	+0.0	+8.2	+22.3	+0.0	37.1	46.0	- 8.9	Vert		
11	898.762M QP	33.5	- 27.2	+0.0	+8.2	+22.3	+0.0	36.8	46.0	- 9.2	Horiz		
12	133.169M	46.7	- 27.5	+11.9	+2.7	+0.0	+0.0	33.8	43.5	- 9.7	Vert	BB noise	
13	135.220M	46.3	- 27.5	+12.1	+2.7	+0.0	+0.0	33.6	43.5	- 9.9	Vert	5th harmonic	
14	32.028M	45.6	- 27.9	+10.5	+1.1	+0.0	+0.0	29.3	40.0	- 10.7	Vert		
15	230.806M	42.6	- 27.0	+16.0	+3.6	+0.0	+0.0	35.2	46.0	- 10.8	Horiz		
16	732.346M	33.6	- 27.9	+0.0	+7.0	+22.3	+0.0	35.0	46.0	- 11.0	Vert		
17	832.115M	30.8	- 27.5	+0.0	+7.6	+23.9	+0.0	34.8	46.0	- 11.2	Horiz		
18	434.000M	39.4	- 27.8	+0.0	+5.2	+17.9	+0.0	34.7	46.0	- 11.3	Horiz		
19	764.184M	31.8	- 27.8	+0.0	+7.2	+23.4	+0.0	34.6	46.0	- 11.4	Horiz		
20	54.317M	43.5	- 27.8	+10.6	+1.5	+0.0	+0.0	27.8	40.0	- 12.2	Horiz	2nd harmonic	
21	162.271M	42.3	- 27.3	+13.1	+3.1	+0.0	+0.0	31.2	43.5	- 12.3	Vert	6th harmonic	
22	397.300M	38.0	- 27.5	+0.0	+5.0	+18.1	+0.0	33.6	46.0	- 12.4	Horiz		

23			-					27.6	40.0	-	Vert
	75.990M	42.5	27.8	+10.9	+2.0	+0.0	+0.0			12.4	
24			-					33.5	46.0	-	Horiz
	730.197M	32.2	27.9	+0.0	+7.0	+22.2	+0.0			12.5	
25			-					26.2	40.0	-	Vert
	81.135M	40.8	27.8	+11.2	+2.0	+0.0	+0.0			13.8	
									3rd harmonic		
26			-					32.0	46.0	-	Horiz
	264.061M	37.9	26.9	+17.0	+4.0	+0.0	+0.0			14.0	
27			-					25.6	40.0	-	Vert
	54.088M	41.3	27.8	+10.6	+1.5	+0.0	+0.0			14.4	
									2nd harmonic		
28			-					31.4	46.0	-	Horiz
	301.500M	39.9	26.8	+0.0	+4.4	+13.9	+0.0			14.6	
29			-					30.8	46.0	-	Horiz
	243.437M	37.7	26.9	+16.3	+3.7	+0.0	+0.0			15.2	

30			-					30.6	46.0	-	Horiz	
	713.254M	30.0	27.9	+0.0	+7.0	+21.5	+0.0			15.4		
31			-					30.5	46.0	-	Horiz	
	628.322M	32.2	28.3	+0.0	+6.5	+20.1	+0.0			15.5		
32			-					27.9	43.5	-	Vert	
	192.050M	36.9	27.2	+14.9	+3.3	+0.0	+0.0			15.6		
33			-					29.9	46.0	-	Vert	
	243.484M	36.8	26.9	+16.3	+3.7	+0.0	+0.0			16.1		
										9th harmonic		
34			-					27.4	43.5	-	Vert	
	108.177M	42.2	27.6	+10.5	+2.3	+0.0	+0.0			16.1		
										4th harmonic		
35			-					29.8	46.0	-	Vert	
	300.711M	38.4	26.8	+0.0	+4.4	+13.8	+0.0			16.2		
36			-					27.3	43.5	-	Horiz	
	139.413M	39.6	27.4	+12.3	+2.8	+0.0	+0.0			16.2		
37			-					29.5	46.0	-	Vert	
	526.478M	33.8	28.2	+0.0	+5.8	+18.1	+0.0			16.5		
38			-					29.5	46.0	-	Horiz	
	587.084M	32.1	28.2	+0.0	+6.2	+19.4	+0.0			16.5		
39			-					28.9	46.0	-	Vert	
	512.036M	33.6	28.1	+0.0	+5.7	+17.7	+0.0			17.1		
40			-					27.5	46.0	-	Vert	
	216.371M	35.4	27.1	+15.7	+3.5	+0.0	+0.0			18.5		
										8th harmonic		
41			-					27.4	46.0	-	Horiz	
	320.200M	35.1	27.0	+0.0	+4.5	+14.8	+0.0			18.6		
42			-					27.1	46.0	-	Horiz	
	332.800M	34.3	27.1	+0.0	+4.5	+15.4	+0.0			18.9		
43			-					27.1	46.0	-	Horiz	
	256.939M	33.3	26.9	+16.8	+3.9	+0.0	+0.0			18.9		
44			-					26.4	46.0	-	Vert	
	230.767M	33.8	27.0	+16.0	+3.6	+0.0	+0.0			19.6		
45			-					25.9	46.0	-	Vert	
	264.052M	31.8	26.9	+17.0	+4.0	+0.0	+0.0			20.1		
46			-					25.7	46.0	-	Vert	
	270.424M	31.4	26.9	+17.2	+4.0	+0.0	+0.0			20.3		
										10th harmonic		
47			-					22.7	43.5	-	Vert	
	189.318M	31.9	27.2	+14.7	+3.3	+0.0	+0.0			20.8		
										7th harmonic		