CERTIFICATION TEST REPORT

FOR THE

TRANSMITTER, STARTXMTR

FCC PART 15 SUBPART C

COMPLIANCE

DATE OF ISSUE: JANUARY 6, 1999

PREPARED FOR:

Industrial Service Technology
DBA International Sports Timing
3286 Kentland Court, S.E.
Grand Rapids, MI 49548

P.O. No: 9181
W.O. No: 70302

Report No: **FC99-001**

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Dates of test: December 31, 1998 &
January 4, 1999

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	December 31, 1998 & January 4, 1999
PURPOSE OF TEST:	To demonstrate the compliance of the Transmitter, STARTXMTR, with the requirements for FCC Part 15, Subpart C devices.
MANUFACTURER:	Industrial Service Technology DBA International Sports Timing 3286 Kentland Court, S.E. Grand Rapids, MI 49548
REPRESENTATIVE:	Richard Farnsworth
TEST LOCATION:	CKC Laboratories, Inc. 22105 Wilson River Hwy Tillamook, OR 97141
TEST PERSONNEL:	Adam Ross
TEST METHOD:	ANSI C63.4 1992
FREQUENCY RANGE TESTED:	30 MHz - 10GHz
EQUIPMENT UNDER TEST:	**Transmitter** Manuf: LINX Model: STARTXMTR Serial: Prototype FCC ID: OCP-PC0285 (pending)

SUMMARY OF RESULTS

The Industrial Service Technology DBA International Sports Timing Transmitter, STARTXMTR, 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 15.249. The results in this report apply only to the items tested, as identified herein.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

Transmitting unit of a wireless starting system that modulates start and audio intelligence for use in swimming and track and field events.

MEASUREMENT UNCERTAINTY

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

EUT OPERATING FREQUENCY

The EUT was operating at 902-928MHz.

TEMPERATURE AND HUMIDITY DURING TESTING

The temperature during testing was within +15°C and + 35°C.
The relative humidity was between 20% and 75%.

PERIPHERAL DEVICES

The EUT was not tested with any peripheral devices.

REPORT OF MEASUREMENTS

The following Table reports the highest emissions levels recorded during the tests performed on the Transmitter, STARTXMTR. The data sheets from which this table was compiled are contained in Appendix B.

Table 1: Six Highest Radiated Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Ant dB	Amp dB	Cable dB	Dist dB	CORRECTED READING dBµV/m	SPEC LIMIT dBµV/m	MARGIN dB	NOTES
903.354	102.0	24.7	-40.1	4.3		90.9	94.0	-3.1	HQ
2710.040	48.7	31.5	-34.8	8.2		53.6	54.0	-0.4	HA
3637.400	39.7	33.0	-33.0	10.8		50.5	54.0	-3.5	VA
4546.750	39.2	33.9	-32.4	11.9		52.6	54.0	-1.4	VA
4606.753	38.4	34.1	-32.5	11.6		51.6	54.0	-2.4	VA
7274.820	33.7	36.9	-34.1	16.5		53.0	54.0	-1.0	VA

Test Method: ANSI C63.4 1992
Spec Limit : FCC Part 15.249
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: The transmitter is placed on the test table. Measurements are made on channels 0, 4 & 7 in each of three orthogonalities. The frequency range of measurements is 30 MHz to 10 GHz.

TABLE A

LIST OF TEST EQUIPMENT

Tillamook A

1. EMI Receiver System, Hewlett Packard, Model No. 8574A, S/N 3010A01076. Calibration date: November 25, 1998. Calibration due date: November 25, 1999.

2. Spectrum Analyzer, Hewlett Packard, Model No. 8593EM, S/N 362A00159. Calibration date: October 12, 1998. Calibration due date: October 12, 1999.

3. Preamp, Hewlett Packard, Model No. 83017A, S/N 3123A00283. Calibration date: March 23, 1998. Calibration due date: March 23, 1999.

4. Preamp, Hewlett Packard, Model No. 8447D, S/N 2727A05392. Calibration date: April 28, 1998. Calibration due date: April 28, 1999.

5. Preamp, Hewlett Packard, Model No. 83017A, S/N 3123A00283. Calibration date: March 23, 1998. Calibration due date: March 23, 1999.

6. Biconilog, Chase, Model No. CBL6111C, S/N 2455. Calibration date: October 22, 1998. Calibration due date: October 22, 1999.

7. Horn Antenna, EMCO, Model No. 3115, S/N 9006-3413. Calibration date: August 10, 1998. Calibration due date: August 10, 1999.

8. Tillamook A site calibration date: May 22, 1998. Tillamook A site calibration due date: May 22, 1999.

9. Test software, EMI Test 2.91.

EUT SETUP

The equipment under test (EUT) was setup in a manner that represented its normal use. Any special conditions required for the EUT to operate normally are identified in the comments that accompany Table 1 for radiated emissions

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 Transmitter, STARTXMTR. For radiated measurements from 30 to 1000 MHz, the biconilog antenna was used. For frequencies above 1000 MHz, the horn antenna was used. All antennas were located at a distance of 3 meters from the edge of the EUT. Conducted emissions tests required the use of the FCC type LISN's

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	30 MHz	1000 MHz	120 kHz
RADIATED EMISSIONS	1000 MHz	10 GHz	1 MHz

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in Table 1 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 Table 1. The following paragraphs describe in more detail the detector functions and when they were used to obtain the emissions data for the Transmitter, STARTXMTR.

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 exceed 1 GHz, 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 Transmitter, STARTXMTR, 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, with the I/O cables and line cords facing the antenna. The frequency range of 30 MHz - 1000 MHz was then scanned with the biconilog 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. Lastly, a scan of the FM band from 88 - 110 MHz was made, using a reduced resolution bandwidth and a reduced frequency span. The horn antenna was used to scan for frequencies above 1000 MHz. 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, the equipment was again facing the antenna. 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 and antenna height. Photographs showing the final worst case configuration of the EUT are contained in Appendix A.

FCC Part 15.215(c) - 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.

SAMPLE CALCULATIONS

The basic spectrum analyzer reading was converted using correction factors as shown in the emissions readings in Table 1. 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	Cbl-1, Cbl-2, or Cable	Amp	Bilog	Horn	Dist	Corr dBuV/m	Spec	Margin	Polar

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.
Bilog is the biconilog antenna factor in dB.
Horn is the horn antenna factor in dB.
Cbl-1, Cbl-2, or 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.

APPENDIX A

INFORMATION ABOUT THE EQUIPMENT UNDER TEST

INFORMATION ABOUT THE EQUIPMENT UNDER TEST	
Test Software/Firmware:	
CRT was displaying:	
Power Supply Manufacturer:	Battery
Power Supply Part Number:	
AC Line Filter Manufacturer:	
AC Line Filter Part Number:	
The EUT has no power cord.	

I/O PORTS	
Type	#

CRYSTAL OSCILLATORS	
Type	Freq. In MHz
Crystal	12.00

PRINTED CIRCUIT BOARDS				
Function	Model & Rev	Clocks, MHz	Layers	Location
Transmitter	PC0285 Rev C	none	2	
Linx module	Refer to Linx Specs			

REQUIRED EUT CHANGES TO COMPLY:
None.

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Flat View, Antenna Facing Away, Mic Down

NOTES:

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Flat View, Antenna Facing Away, Mic Up

NOTES:

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Front View, Upright

NOTES:

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Flat View, Antenna Facing Near, Mic Down

NOTES:

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Flat View, Antenna Facing Near, Mic Up

NOTES:

PHOTOGRAPH SHOWING RADIATED EMISSIONS

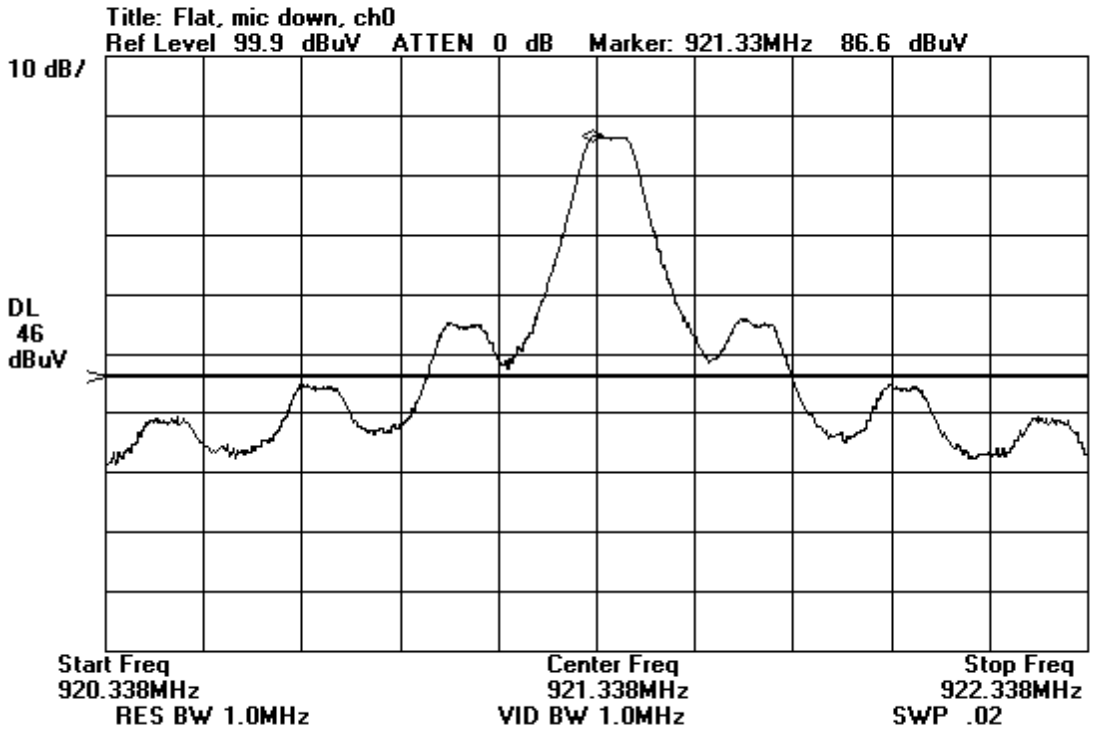
Radiated Emissions - Back View, Upright

NOTES:

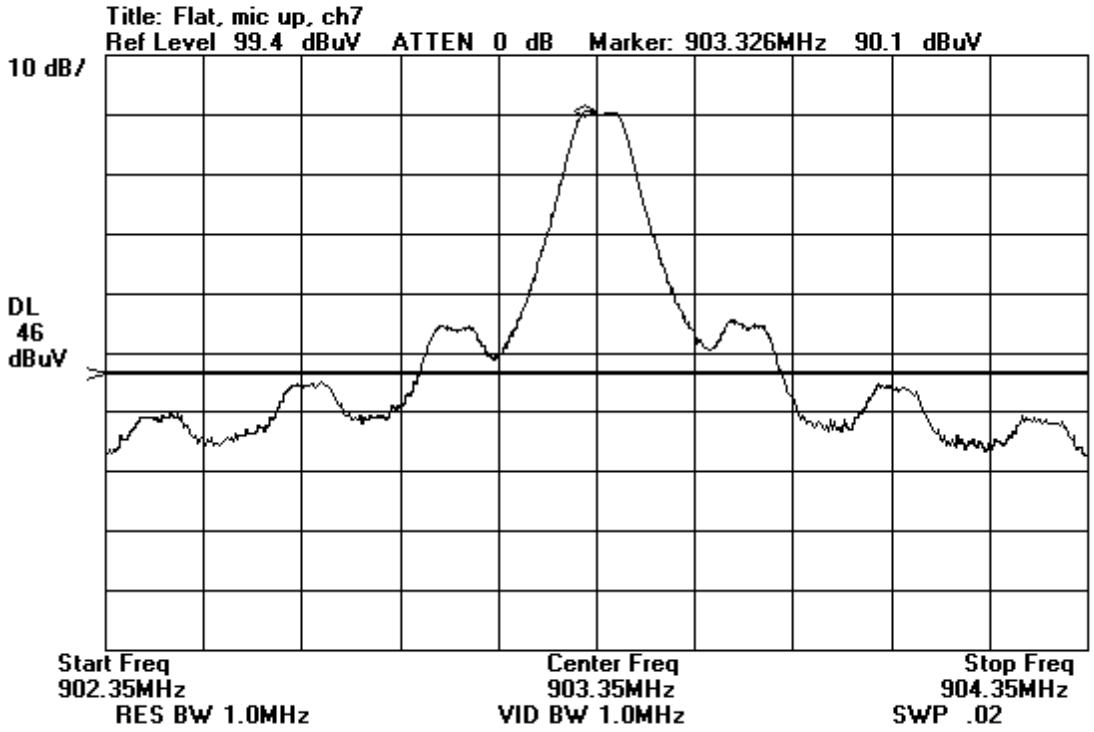
APPENDIX B

MEASUREMENT DATA SHEETS

Occupied Bandwidth Plot



Occupied Bandwidth Plot



Test Location: CKC LABORATORIES INC. • 22105 Wilson River Hwy, Site A • Tillamook, Oregon 97141 • (800) 500-4EMC

Customer:	**International Sports Timing**	Date:	Dec-31-98
Specification:	**FCC15.249**	Time:	16:54
Test Type:	**Maximized Emissions**	Sequence#:	6
Equipment:	**Transmitter**		
Manufacturer:	LINX	Tested By:	Adam Ross
Model:	STARTXMTR		
S/N:	Prototype		

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

Function	Manufacturer	Model #	S/N
Transmitter*	LINX	STARTXMTR	Prototype

Support Devices:

Function	Manufacturer	Model #	S/N
None			

Test Conditions / Notes:

The transmitter is placed on the test table. Measurements are made on channels 0, 4 & 7 in each of three orthogonalities. The frequency range of measurements is 30 MHz to 10 GHz.

Measurement Data: Sorted by Margin Test Distance: 3 Meters

#	Freq MHz	Rdng dBµV	Cbl-1 dB	Bilog Cbl-2 dB	Cable Horn dB	Amp dB	Dist dB	Corr DBµV/m	Spec dBµV/m	Margin dB	Polar
1	2710.040	48.7	+0.0	+0.0	+0.0	-34.8	+0.0	53.6	54.0	-0.4	Horiz
	Average		+1.1	+7.1	+31.5						
	flat, mic up, ch7										
^	2710.041	51.0	+0.0	+0.0	+0.0	-34.8	+0.0	55.9	54.0	+1.9	Horiz
			+1.1	+7.1	+31.5						
	flat, mic up, ch7										
^	2710.022	48.7	+0.0	+0.0	+0.0	-34.8	+0.0	53.6	54.0	-0.4	Horiz
			+1.1	+7.1	+31.5						
	flat, mic down, ch7										
4	7274.820	33.7	+0.0	+0.0	+0.0	-34.1	+0.0	53.0	54.0	-1.0	Vert
	Average		+3.2	+13.3	+36.9						
	upright, ch4										
^	7274.820	41.5	+0.0	+0.0	+0.0	-34.1	+0.0	60.8	54.0	+6.8	Vert
			+3.2	+13.3	+36.9						
	upright, ch4										
6	4546.750	39.2	+0.0	+0.0	+0.0	-32.4	+0.0	52.6	54.0	-1.4	Vert
	Average		+1.3	+10.6	+33.9						
	upright, ch4										
^	4546.750	44.0	+0.0	+0.0	+0.0	-32.4	+0.0	57.4	54.0	+3.4	Vert
			+1.3	+10.6	+33.9						
	upright, ch4										
8	4606.753	38.4	+0.0	+0.0	+0.0	-32.5	+0.0	51.6	54.0	-2.4	Vert
	Average		+1.3	+10.3	+34.1						
	upright, ch0										

^	4606.753	43.3	+0.0	+0.0	+0.0	-32.5	+0.0	56.5	54.0	+2.5	Vert
			+1.3	+10.3	+34.1						
	upright, ch0										
10	2710.020	46.1	+0.0	+0.0	+0.0	-34.8	+0.0	51.0	54.0	-3.0	Horiz
	Average		+1.1	+7.1	+31.5						
	flat, mic down, ch7										
11	903.354	102.0	+0.0	+0.0	+0.0	-40.1	+0.0	90.9	94.0	-3.1	Horiz
	Quasi Peak		+0.4	+3.9	+24.7						
	flat, mic up, ch7										
^	903.354	102.2	+0.0	+0.0	+0.0	-40.1	+0.0	91.1	94.0	-2.9	Horiz
			+0.4	+3.9	+24.7						
	flat, mic up, ch7										
^	903.340	100.9	+0.0	+0.0	+0.0	-40.1	+0.0	89.8	94.0	-4.2	Horiz
			+0.4	+3.9	+24.7						
	flat, mic down, ch7										
14	3637.400	39.7	+0.0	+0.0	+0.0	-33.0	+0.0	50.5	54.0	-3.5	Vert
	Average		+1.3	+9.5	+33.0						
	upright, ch4										
^	3637.400	44.6	+0.0	+0.0	+0.0	-33.0	+0.0	55.4	54.0	+1.4	Vert
			+1.3	+9.5	+33.0						
	upright, ch4										
16	5456.120	35.3	+0.0	+0.0	+0.0	-33.0	+0.0	50.0	54.0	-4.0	Vert
	Average		+1.4	+11.1	+35.2						
	upright, ch4										
^	5456.120	41.7	+0.0	+0.0	+0.0	-33.0	+0.0	56.4	54.0	+2.4	Vert
			+1.4	+11.1	+35.2						
	upright, ch4										
18	7370.833	31.1	+0.0	+0.0	+0.0	-34.1	+0.0	50.0	54.0	-4.0	Vert
	Average		+2.7	+13.2	+37.1						
	upright, ch0										
^	7370.820	35.1	+0.0	+0.0	+0.0	-34.1	+0.0	54.0	54.0	+0.0	Vert
			+2.7	+13.2	+37.1						
	upright, ch0										
20	903.335	100.9	+0.0	+0.0	+0.0	-40.1	+0.0	89.8	94.0	-4.2	Horiz
	Quasi Peak		+0.4	+3.9	+24.7						
	flat, mic down, ch7										
21	6365.470	33.6	+0.0	+0.0	+0.0	-34.3	+0.0	49.6	54.0	-4.4	Vert
	Average		+2.0	+12.1	+36.2						
	upright, ch4										
^	6365.470	40.7	+0.0	+0.0	+0.0	-34.3	+0.0	56.7	54.0	+2.7	Vert
			+2.0	+12.1	+36.2						
	upright, ch4										
23	3685.393	38.3	+0.0	+0.0	+0.0	-33.5	+0.0	48.9	54.0	-5.1	Vert
	Average		+1.3	+9.7	+33.1						
	upright, ch0										
^	3685.393	44.0	+0.0	+0.0	+0.0	-33.5	+0.0	54.6	54.0	+0.6	Vert
			+1.3	+9.7	+33.1						
	upright, ch0										
25	903.345	99.8	+0.0	+0.0	+0.0	-40.1	+0.0	88.7	94.0	-5.3	Vert
	Quasi Peak		+0.4	+3.9	+24.7						
	upright, ch7										

^	903.350	99.8	+0.0	+0.0	+0.0	-40.1	+0.0	88.7	94.0	-5.3	Vert
			+0.4	+3.9	+24.7						
	upright, ch7										
27	2728.050	42.9	+0.0	+0.0	+0.0	-34.8	+0.0	47.9	54.0	-6.1	Vert
			+1.1	+7.2	+31.5						
	upright, ch4										
28	2728.051	42.9	+0.0	+0.0	+0.0	-34.8	+0.0	47.9	54.0	-6.1	Horiz
			+1.1	+7.2	+31.5						
	flat, mic up, ch4										
29	921.358	98.6	+0.0	+0.0	+0.0	-40.1	+0.0	87.7	94.0	-6.3	Horiz
			+0.5	+4.0	+24.7						
	flat, mic down, ch0										
30	2710.050	42.5	+0.0	+0.0	+0.0	-34.8	+0.0	47.4	54.0	-6.6	Vert
	Average		+1.1	+7.1	+31.5						
	upright, ch7										
^	2710.050	46.5	+0.0	+0.0	+0.0	-34.8	+0.0	51.3	54.0	-2.7	Vert
			+1.1	+7.1	+31.5						
	upright, ch7										
32	5528.113	32.0	+0.0	+0.0	+0.0	-32.9	+0.0	46.8	54.0	-7.2	Vert
	Average		+1.2	+11.2	+35.3						
	upright, ch0										
^	5528.113	39.7	+0.0	+0.0	+0.0	-32.9	+0.0	54.5	54.0	+0.5	Vert
			+1.2	+11.2	+35.3						
	upright, ch0										
34	2764.033	41.5	+0.0	+0.0	+0.0	-34.6	+0.0	46.8	54.0	-7.2	Vert
			+1.1	+7.3	+31.5						
	upright, ch0										
35	909.351	97.8	+0.0	+0.0	+0.0	-40.1	+0.0	86.7	94.0	-7.3	Horiz
			+0.4	+3.9	+24.7						
	flat, mic up, ch4										
36	1842.700	50.2	+0.0	+0.0	+0.0	-37.1	+0.0	46.5	54.0	-7.5	Horiz
			+0.8	+5.8	+26.8						
	flat, mic down, ch0										
37	1806.682	50.0	+0.0	+0.0	+0.0	-36.8	+0.0	46.4	54.0	-7.6	Horiz
			+0.8	+5.8	+26.6						
	flat, mic down, ch7										
38	4606.780	32.9	+0.0	+0.0	+0.0	-32.5	+0.0	46.1	54.0	-7.9	Horiz
			+1.3	+10.3	+34.1						
	flat, mic down, ch0										
39	2764.033	40.7	+0.0	+0.0	+0.0	-34.6	+0.0	46.0	54.0	-8.0	Horiz
	Average		+1.1	+7.3	+31.5						
	flat, mic up, ch0										
^	2764.033	45.3	+0.0	+0.0	+0.0	-34.6	+0.0	50.6	54.0	-3.4	Horiz
			+1.1	+7.3	+31.5						
	flat, mic up, ch0										
^	2764.060	43.7	+0.0	+0.0	+0.0	-34.6	+0.0	49.0	54.0	-5.0	Horiz
			+1.1	+7.3	+31.5						
	flat, mic down, ch0										
42	921.365	96.7	+0.0	+0.0	+0.0	-40.1	+0.0	85.8	94.0	-8.2	Horiz
			+0.5	+4.0	+24.7						
	flat, mic up, ch0										

43	909.350	96.8	+0.0	+0.0	+0.0	-40.1	+0.0	85.7	94.0	-8.3	Vert
			+0.4	+3.9	+24.7						
	upright, ch4										
44	1818.703	49.3	+0.0	+0.0	+0.0	-36.9	+0.0	45.7	54.0	-8.3	Horiz
			+0.8	+5.8	+26.7						
	flat, mic down, ch4										
45	909.352	96.4	+0.0	+0.0	+0.0	-40.1	+0.0	85.3	94.0	-8.7	Horiz
			+0.4	+3.9	+24.7						
	flat, mic down, ch4										
46	6323.418	29.4	+0.0	+0.0	+0.0	-34.4	+0.0	45.2	54.0	-8.8	Vert
	Average		+2.0	+12.0	+36.2						
	upright, ch7										
^	6323.450	37.8	+0.0	+0.0	+0.0	-34.4	+0.0	53.6	54.0	-0.4	Vert
			+2.0	+12.0	+36.2						
	upright, ch7										
48	4516.750	31.7	+0.0	+0.0	+0.0	-32.4	+0.0	45.1	54.0	-8.9	Vert
	Average		+1.3	+10.7	+33.8						
	upright, ch7										
^	4516.750	38.7	+0.0	+0.0	+0.0	-32.4	+0.0	52.1	54.0	-1.9	Vert
			+1.3	+10.7	+33.8						
	upright, ch7										
50	2728.052	40.0	+0.0	+0.0	+0.0	-34.8	+0.0	45.0	54.0	-9.0	Horiz
			+1.1	+7.2	+31.5						
	flat, mic down, ch4										
51	5420.100	30.2	+0.0	+0.0	+0.0	-33.1	+0.0	44.7	54.0	-9.3	Vert
	Average		+1.4	+11.0	+35.2						
	upright, ch7										
^	5420.100	39.5	+0.0	+0.0	+0.0	-33.1	+0.0	54.0	54.0	+0.0	Vert
			+1.4	+11.0	+35.2						
	upright, ch7										
53	7226.730	25.1	+0.0	+0.0	+0.0	-34.0	+0.0	44.5	54.0	-9.5	Horiz
			+3.4	+13.3	+36.7						
	flat, mic down, ch7										
54	5420.050	29.8	+0.0	+0.0	+0.0	-33.1	+0.0	44.3	54.0	-9.7	Horiz
			+1.4	+11.0	+35.2						
	flat, mic down, ch7										
55	3613.360	33.1	+0.0	+0.0	+0.0	-32.7	+0.0	44.0	54.0	-10.0	Horiz
	Average		+1.2	+9.4	+33.0						
	flat, mic down, ch7										
^	3613.360	39.6	+0.0	+0.0	+0.0	-32.7	+0.0	50.5	54.0	-3.5	Horiz
			+1.2	+9.4	+33.0						
	flat, mic down, ch7										
^	3613.380	36.7	+0.0	+0.0	+0.0	-32.7	+0.0	47.6	54.0	-6.4	Horiz
			+1.2	+9.4	+33.0						
	flat, mic up, ch7										
58	1818.700	47.4	+0.0	+0.0	+0.0	-36.9	+0.0	43.8	54.0	-10.2	Vert
			+0.8	+5.8	+26.7						
	upright, ch4										
59	3637.400	32.8	+0.0	+0.0	+0.0	-33.0	+0.0	43.6	54.0	-10.4	Horiz
	Average		+1.3	+9.5	+33.0						
	flat, mic up, ch4										

^	3637.401	38.5	+0.0	+0.0	+0.0	-33.0	+0.0	49.3	54.0	-4.7	Horiz
			+1.3	+9.5	+33.0						
	flat, mic up, ch4										
^	3637.403	38.4	+0.0	+0.0	+0.0	-33.0	+0.0	49.2	54.0	-4.8	Horiz
			+1.3	+9.5	+33.0						
	flat, mic down, ch4										
62	1806.700	47.1	+0.0	+0.0	+0.0	-36.8	+0.0	43.5	54.0	-10.5	Vert
			+0.8	+5.8	+26.6						
	upright, ch7										
63	1806.701	47.1	+0.0	+0.0	+0.0	-36.8	+0.0	43.5	54.0	-10.5	Horiz
			+0.8	+5.8	+26.6						
	flat, mic up, ch7										
64	1842.672	46.6	+0.0	+0.0	+0.0	-37.1	+0.0	42.9	54.0	-11.1	Vert
			+0.8	+5.8	+26.8						
	upright, ch0										
65	3613.400	31.9	+0.0	+0.0	+0.0	-32.7	+0.0	42.8	54.0	-11.2	Vert
	Average		+1.2	+9.4	+33.0						
	upright, ch7										
^	3613.400	39.3	+0.0	+0.0	+0.0	-32.7	+0.0	50.2	54.0	-3.8	Vert
			+1.2	+9.4	+33.0						
	upright, ch7										
67	3637.405	31.8	+0.0	+0.0	+0.0	-33.0	+0.0	42.6	54.0	-11.4	Horiz
	Average		+1.3	+9.5	+33.0						
	flat, mic down, ch4										
68	1842.725	46.0	+0.0	+0.0	+0.0	-37.1	+0.0	42.3	54.0	-11.7	Horiz
			+0.8	+5.8	+26.8						
	flat, mic up, ch0										
69	4516.700	28.4	+0.0	+0.0	+0.0	-32.4	+0.0	41.8	54.0	-12.2	Horiz
	Average		+1.3	+10.7	+33.8						
	flat, mic down, ch7										
^	4516.703	36.0	+0.0	+0.0	+0.0	-32.4	+0.0	49.4	54.0	-4.6	Horiz
			+1.3	+10.7	+33.8						
	flat, mic down, ch7										
^	4516.720	32.2	+0.0	+0.0	+0.0	-32.4	+0.0	45.5	54.0	-8.5	Horiz
			+1.3	+10.7	+33.8						
	flat, mic up, ch7										
72	921.313	92.6	+0.0	+0.0	+0.0	-40.1	+0.0	81.7	94.0	-12.3	Vert
			+0.5	+4.0	+24.7						
	upright, ch0										
73	1818.701	44.4	+0.0	+0.0	+0.0	-36.9	+0.0	40.8	54.0	-13.2	Horiz
			+0.8	+5.8	+26.7						
	flat, mic up, ch4										
74	3685.393	30.0	+0.0	+0.0	+0.0	-33.5	+0.0	40.6	54.0	-13.4	Horiz
	Average		+1.3	+9.7	+33.1						
	flat, mic up, ch0										
^	3685.393	40.4	+0.0	+0.0	+0.0	-33.5	+0.0	51.0	54.0	-3.0	Horiz
			+1.3	+9.7	+33.1						
	flat, mic up, ch0										

^	3685.420	34.8	+0.0	+0.0	+0.0	-33.5	+0.0	45.3	54.0	-8.7	Horiz
			+1.3	+9.7	+33.1						
	flat, mic down, ch0										
77	2764.360	32.2	+0.0	+0.0	+0.0	-34.6	+0.0	37.5	54.0	-16.5	Horiz
	Average		+1.1	+7.3	+31.5						
	flat, mic down, ch0										
78	250.380	35.1	-26.4	+12.7	+3.8	+0.0	+0.0	25.2	46.0	-20.8	Horiz
			+0.0	+0.0	+0.0						
	flat, mic up, ch7										
79	250.400	34.6	-26.4	+12.7	+3.8	+0.0	+0.0	24.7	46.0	-21.3	Horiz
			+0.0	+0.0	+0.0						
	flat, mic up, ch7										