



ADDENDUM TO ITRON, INC. TEST REPORT FC07-038

FOR THE

AUTOMATED METER READING SYSTEM, FC 200

FCC PART 101 PARTIAL TESTING

DATE OF ISSUE: MAY 22, 2007

PREPARED FOR:

Itron, Inc.
2111 N. Molter Rd.
Liberty Lake, WA 99019

P.O. No.: 1343
W.O. No.: 86392

PREPARED BY:

Mary Ellen Clayton
CKC Laboratories, Inc.
5046 Sierra Pines Drive
Mariposa, CA 95338

Date of test: April 5-30, 2007

Report No.: FC07-038A

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ADMINISTRATIVE INFORMATION

DATE OF TEST: April 5-30, 2007

DATE OF RECEIPT: April 5, 2007

FREQUENCY RANGE TESTED: 9 kHz-10 GHz

MANUFACTURER: Itron, Inc.
2111 N. Molter Rd.
Liberty Lake, WA 99019

REPRESENTATIVE: Jeff Gilbert

TEST LOCATION: CKC Laboratories, Inc.
110 Olinda Place
Brea, CA 92823

TEST METHOD: FCC Part 101

PURPOSE OF TEST: **Original Report:** To demonstrate the compliance of the Automated Meter Reading System, FC 200 with partial testing of the requirements for FCC Part 101 devices.
Addendum A: To revise the operating power and the format of the radiated spurious emissions data.

APPROVALS:

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:



Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:



Septimiu Apahidean, EMC Engineer



Eddie Wong, EMC Engineer



CONDITIONS FOR COMPLIANCE

No modifications to the EUT were necessary to comply for the testing that was performed.

EQUIPMENT UNDER TEST (EUT) DESCRIPTION

The customer declares the EUT tested by CKC Laboratories was representative of a production unit.

EQUIPMENT UNDER TEST

Automated Meter Reading System

Manuf: Itron, Inc.
Model: FC 200
Serial: DZGEG6362ZZ7838

Power Supply

Manuf: Lien Engineering
Model: DC72W1P-363A
Serial: 2240

PERIPHERAL DEVICES

The EUT was not tested with peripheral devices.

TEMPERATURE AND HUMIDITY DURING TESTING

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

FCC 2.1033 (c)(5) FREQUENCY RANGE

952-960 MHz

FCC 2.1033 (c)(6) OPERATING POWER

3.01 Watts EIRP antenna substitution

FCC 101.111(a)(5) EMISSIONS MASK

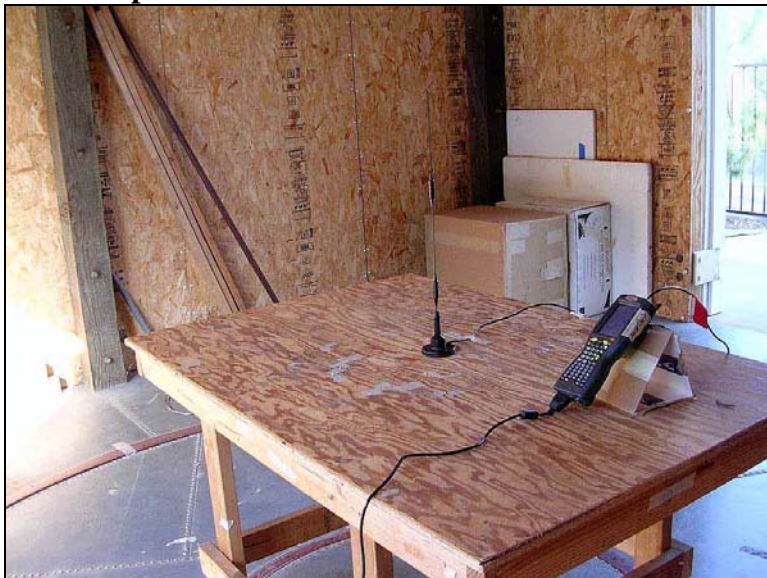
Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
Spectrum Analyzer RF Section	02462	HP	8568B	2928A04874	091406	091408
Spectrum Analyzer Display Section	02472	HP	85662A	3001A18430	091406	091408
QP Adapter	01437	HP	85650A	3303A01884	091406	091408
Bilog Antenna	00851	Schaffner- Chase EMC	CBL6111C	2629	020206	020208
Antenna cable (10 meter site D)	P04382	Andrew	LDF1-50	Cable#17	091906	091908
Antenna cable from bulkhead to antenna	P05569	Pasternack	RG-214/U	Cable #33	022207	022209
Preamp to SA Cable (3 feet)	P05555	Pasternack	E100316-I	Cable #22	080904	081008
Pre-amp	00010	HP	8447D	2727A05392	060606	060608

Test Conditions

The battery operated handheld device is placed on the wooden table in upright position with the antenna installed. Mode: Tx, 952MHz, 956 MHz, 960 MHz, Default Power level setting = 198. A battery charger is connected to the power input port during the test.

Test Setup Photos



101.111 Emission limitations.

(5) When using transmissions employing digital modulation techniques on the 900 MHz multiple address frequencies with a 12.5 kHz bandwidth, the power of any emission must be attenuated below the unmodulated carrier power of the transmitter (P) in accordance with the following schedule:

(i) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 2.5 kHz up to and including 6.25 kHz: At least $53 \log_{10}(f_d/2.5)$ decibels;

(ii) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 6.25 kHz up to and including 9.5 kHz: At least $103 \log_{10}(f_d/3.9)$ decibels;

(iii) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 9.5 kHz up to and including 15 kHz: At least $157 \log_{10}(f_d/5.3)$ decibels; and

(iv) On any frequency removed from the center of the authorized bandwidth by a displacement frequency greater than 15 kHz: At least 50 plus $10 \log_{10}(P)$ or 70 decibels, whichever is the lesser attenuation.

Radiated Field Emission mask measured is generated with the following sample calculation at 956MHz

IFrequency (MHz)	Freq offset	Required atten (dB)	Required atten (dB)	dBuV at source	dBm at source	P transmit at source (W)	P density at 3 meter (W)	RF Field strength at 3 meter (V)	RF Field Strength at 3 meter (dBuV)
4.00000	- > 15kHz	50+10Log(p)	44.77	87.0	-20.0	9.9763E-06	8.8210E-08	0.0058	75.2
955.98500	-15kHz	50+10Log(p)	44.77	87.0	-20.0	9.9763E-06	8.8210E-08	0.0058	75.2
955.98500	-15kHz	157 x 10 log(fd/5.3)	70.94	60.8	-46.2	2.4132E-08	2.1337E-10	0.0003	49.1
955.99050	-9.5kHz	157 x 10 log(fd/5.3)	39.79	92.0	-15.0	3.1402E-05	2.7766E-07	0.0102	80.2
955.99050	-9.5kHz	103 x 10 log (fd/3.9)	39.83	91.9	-15.1	3.1153E-05	2.7545E-07	0.0102	80.2
955.99375	-6.25kHz	103 x 10 log (fd/3.9)	21.10	110.7	3.7	2.3254E-03	2.0561E-05	0.0880	98.9
955.99375	-6.25kHz	53 x 10 log(fd/2.5)	19.90	111.9	4.9	3.0647E-03	2.7098E-05	0.1011	100.1
955.99750	-2.5kHz	53 x 10 log(fd/2.5)	0.00	131.8	24.8	2.9929E-01	2.6463E-03	0.9988	120.0
956.00250	+2.5kHz	53 x 10 log(fd/2.5)	0.00	131.8	24.8	2.9929E-01	2.6463E-03	0.9988	120.0
956.00625	+6.25kHz	53 x 10 log(fd/2.5)	19.90	111.9	4.9	3.0647E-03	2.7098E-05	0.1011	100.1
956.00625	+6.25kHz	103 x 10 log (fd/3.9)	21.10	110.7	3.7	2.3254E-03	2.0561E-05	0.0880	98.9
956.00950	+9.5kHz	103 x 10 log (fd/3.9)	39.83	91.9	-15.1	3.1153E-05	2.7545E-07	0.0102	80.2
956.00950	+9.5kHz	157 x 10 log(fd/5.3)	39.79	92.0	-15.0	3.1402E-05	2.7766E-07	0.0102	80.2
956.01500	+15kHz	157 x 10 log(fd/5.3)	70.94	60.8	-46.2	2.4132E-08	2.1337E-10	0.0003	49.1
956.01500	+15kHz	50+10Log(p)	44.77	87.0	-20.0	9.9763E-06	8.8210E-08	0.0058	75.2
9560.00000	+ > 15kHz	50+10Log(p)	44.77	87.0	-20.0	9.9763E-06	8.8210E-08	0.0058	75.2

Power Density (Isotropic)

$$P_D = \frac{P_t}{4\pi r^2}$$

P_D = Power Density in Watts /m²

P_t = Average Transmit Power

r = Test distance

Field Intensity E (V/m)

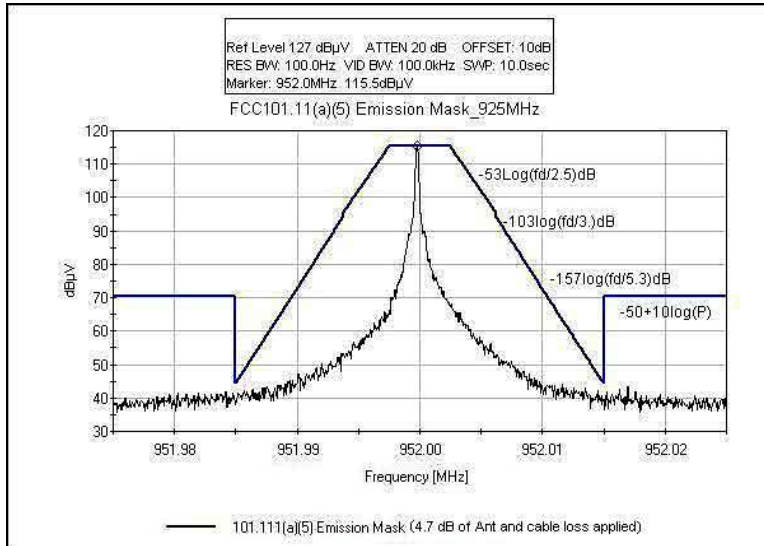
$$E = \sqrt{P_D \times 377}$$

$$E = \frac{\sqrt{P_t \times 377}}{4\pi r^2}$$

$$E = \sqrt{\frac{P_t \times 30}{r^2}}$$

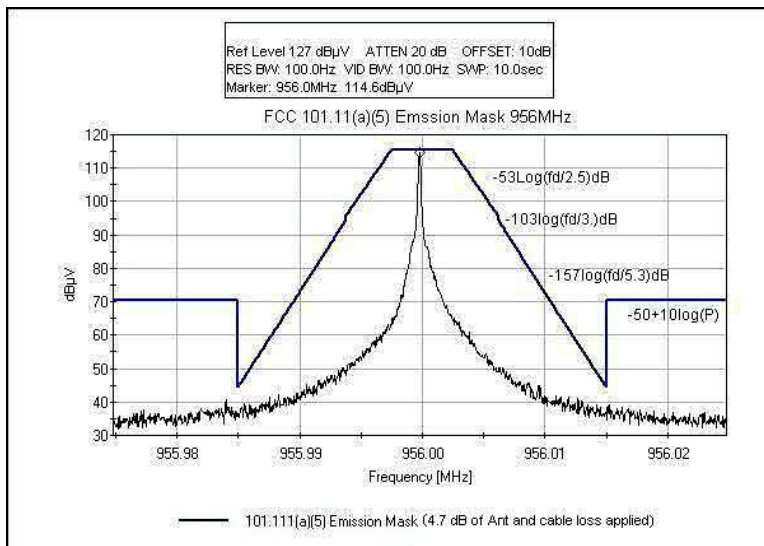
Test Plots

FCC 101.111(a)(5) EMISSIONS MASK - 952 MHz



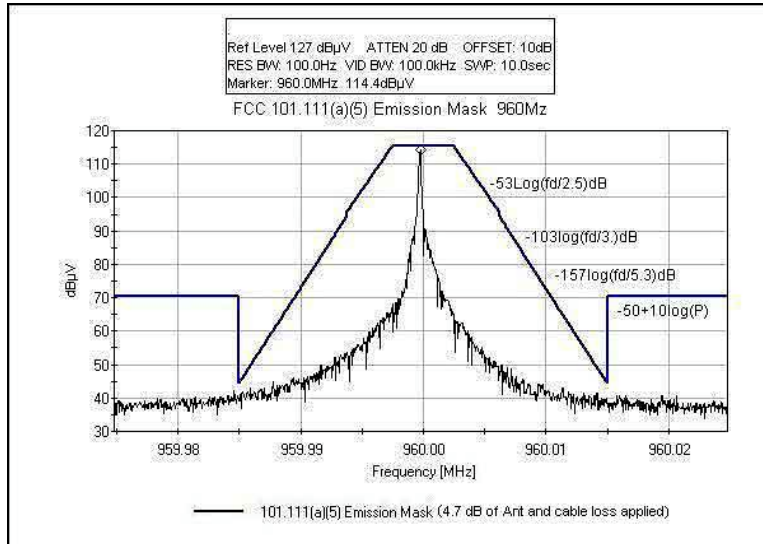
Tested by: Eddie Wong

FCC 101.111(a)(5) EMISSIONS MASK - 956 MHz



Tested by: Eddie Wong

FCC 101.111(a)(5) EMISSIONS MASK - 960 MHz



Tested by: Eddie Wong

OCCUPIED BANDWIDTH -20dBc

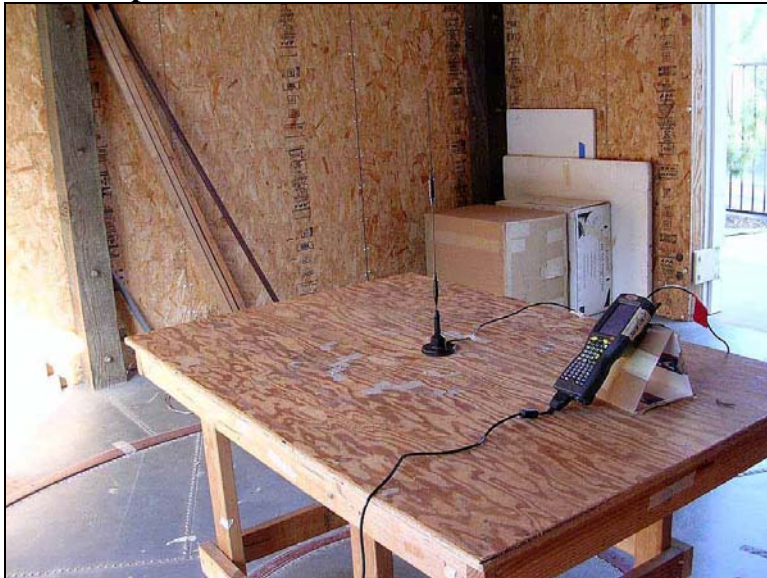
Test Equipment

Equipment	Asset #	Manufacturer	Model #	Serial #	Cal Date	Cal Due
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QP Adapter	01437	HP	85650A	3303A01884	091406	091408
Bilog Antenna	00851	Schaffner- Chase EMC	CBL6111C	2629	020206	020208
Antenna cable (10 meter site D)	P04382	Andrew	LDF1-50	Cable#17	091906	091908
Antenna cable from bulkhead to antenna	P05569	Pasternack	RG-214/U	Cable #33	022207	022209
Preamp to SA Cable (3 feet)	P05555	Pasternack	E100316-I	Cable #22	080904	081008
Pre-amp	00010	HP	8447D	2727A05392	060606	060608

Test Conditions

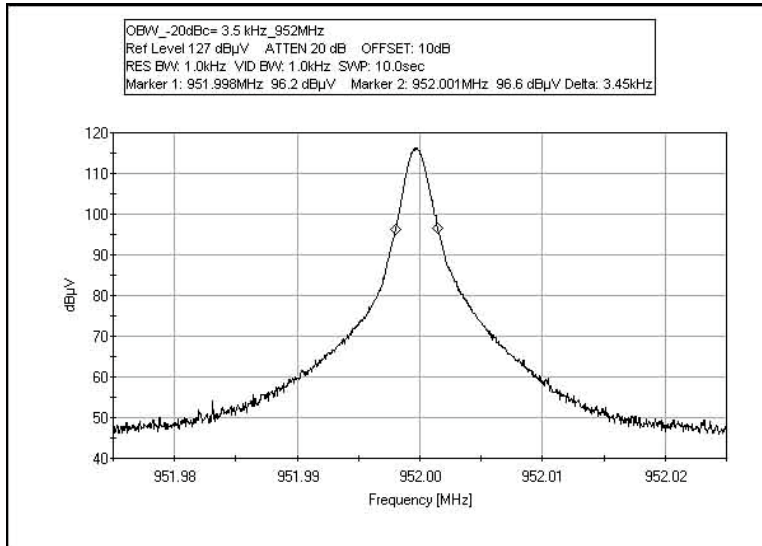
The battery operated handheld device is placed on the wooden table in upright position with the antenna installed. Mode: Tx, 952MHz, 956 MHz, 960 MHz, Default Power level setting = 198. A battery charger is connected to the power input port during the test.

Test Setup Photos



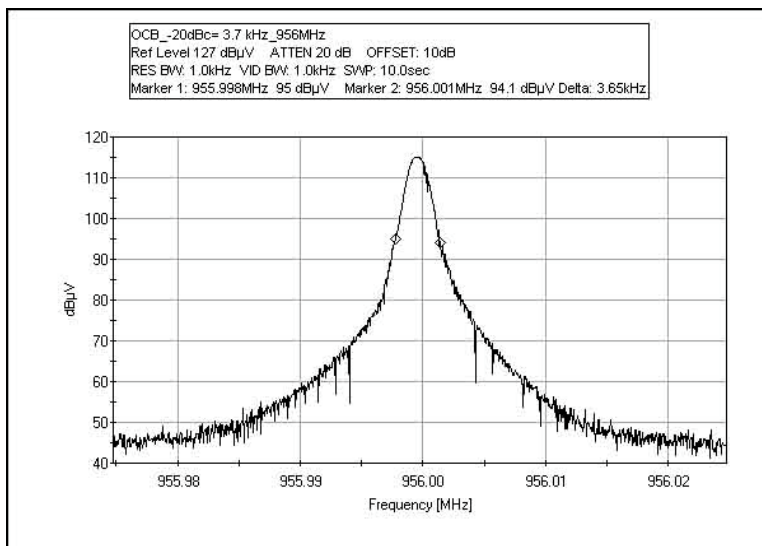
Test Plots

OCCUPIED BANDWIDTH -20dBc - 952 MHz



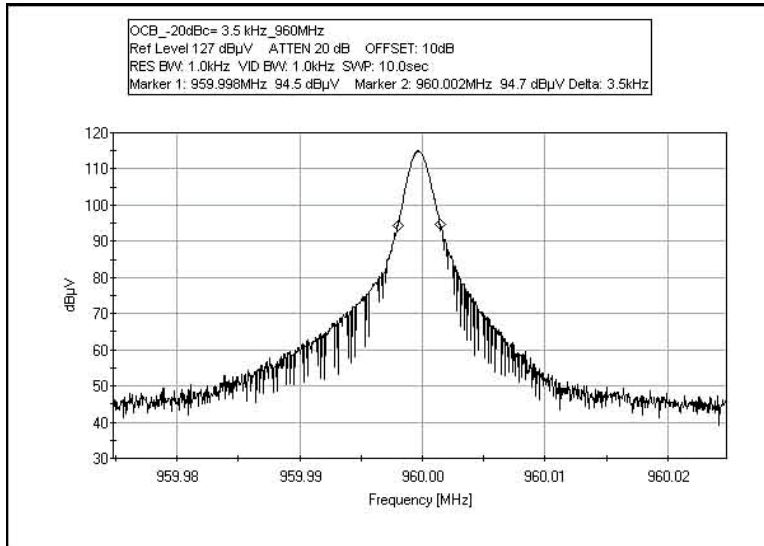
Tested by: Eddie Wong

OCCUPIED BANDWIDTH -20dBc - 956 MHz



Tested by: Eddie Wong

OCCUPIED BANDWIDTH -20dBc - 960 MHz



Tested by: Eddie Wong

FCC 2.1033(c)(14)/2.1053/101.111(a)(5) - FIELD STRENGTH OF SPURIOUS RADIATION

Test Setup Photos







Test Data Sheets

Test Location: CKC Laboratories, Inc. • 110 N Olinda Place • Brea, CA 92823 • 714-993-6112

Customer: **Itron, Inc**
 Specification: **FCC 101.111 A5 (v)**
 Work Order #: **86392** Date: 4/27/2007
 Test Type: **Maximized Emissions** Time: 14:24:29
 Equipment: **Automated Meter Reading System** Sequence#: 25
 Manufacturer: Itron, Inc. Tested By: Sep Apahidean
 Model: FC 200
 S/N: DZGEG6362ZZ7838

Test Equipment:

Function	S/N	Calibration Date	Cal Due Date	Asset #
1.5GHz High Pass Filter	3643A00027	06/27/2005	06/27/2007	02116
Spectrum Analyzer	US44300438	01/03/2007	01/03/2009	02672
Horn Antenna	6246	06/29/2006	06/29/2008	00849
24" SMA Cable	1-40GHz_white	02/16/2007	02/16/2009	P05204
Microwave Pre-amp	3123A00281	07/19/2006	07/19/2008	00786
Heliac Antenna Cable	P5565	09/18/2006	09/18/2008	P05565

Equipment Under Test (* = EUT):

Function	Manufacturer	Model #	S/N
Automated Meter Reading System*	Itron, Inc.	FC 200	DZGEG6362ZZ7838
Power Supply	Lien Engineering	DC72W1P-363A	2240

Support Devices:

Function	Manufacturer	Model #	S/N
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Test Conditions / Notes:

The battery operated handheld device is placed on the wooden table in upright position with the antenna installed. Mode: Tx, 952MHz, 956MHz and 960MHz. Modulation turned on. Limit of -26 dBm = 81 dBuV. A battery charger is connected to the power input port during the test. 22°C, 50% relative humidity. Frequency range of measurement = 9 kHz - 10 GHz. Frequency 9 - 150 kHz RBW=200 Hz, VBW=200 Hz; 150 kHz - 30 MHz RBW=9 kHz, VBW=9 kHz; 30 - 1000 MHz RBW=120 kHz, VBW=120 kHz; 1 - 10GHz RBW=1 MHz, VBW=1 MHz.



Operating Frequency: 952-960 MHz

Channels: Low, Mid and High

Highest Measured Output Power: 34.79 ERP(dBm)= 3.01 ERP(Watts)

Distance: 3 meters

Limit: $43+10\text{Log}(P)$ 47.79 dBc

Freq. (MHz)	Reference Level (dBm)	Antenna Polarity (H/V)	dBc
1,909.01	-30.3	Vert	65.09
2,863.37	-22.8	Vert	57.59
3,817.97	-26	Vert	60.79
4,772.38	-29	Vert	63.79
5,727.34	-38.5	Vert	73.29
6,681.37	-38.4	Vert	73.19
1,909.01	-26.5	Horiz	61.29
2,863.77	-30.7	Horiz	65.49
3,817.99	-23.2	Horiz	57.99
4,772.49	-28.2	Horiz	62.99
5,726.92	-38.5	Horiz	73.29
1,911.99	-27	Horiz	61.79
2,868.08	-30.7	Horiz	65.49
3,823.95	-21.2	Horiz	55.99
4,780.12	-28.6	Horiz	63.39
5,736.09	-39.7	Horiz	74.49
6,692.15	-38.9	Horiz	73.69
1,912.04	-28.7	Vert	63.49
2,867.94	-22.1	Vert	56.89
3,824.01	-28.1	Vert	62.89
4,779.99	-31.8	Vert	66.59
5,736.12	-39.7	Vert	74.49
6,691.90	-39	Vert	73.79
1,919.97	-27.7	Vert	62.49
2,879.95	-24.7	Vert	59.49
3,839.96	-25	Vert	59.79
4,800.06	-26.5	Vert	61.29
5,759.79	-41.3	Vert	76.09
6,719.90	-38.1	Vert	72.89
7,679.75	-37.3	Vert	72.09
1,919.97	-28.3	Horiz	63.09
2,879.86	-33.3	Horiz	68.09
3,840.02	-18.8	Horiz	53.59
4,799.91	-27.9	Horiz	62.69
5,759.90	-39.7	Horiz	74.49
6,719.73	-38.3	Horiz	73.09
7,679.79	-37	Horiz	71.79