



**FCC CFR47 PART 22 SUBPART H  
AND PART 24 SUBPART E  
CERTIFICATION TEST REPORT**

**FOR**

**DUAL BAND PHONE CDMA 1XRTT /EVDO WITH BLUETOOTH**

**MODEL NUMBER: E2000**

**FCC ID: OVK60-E2-5G5**

**REPORT NUMBER: 07U11133-1**

**ISSUE DATE: JUNE 24, 2007**

*Prepared for*  
**KYOCERA WIRELESS**  
**10300 CAMPUS POINT DRIVE**  
**SAN DIEGO, CA 92121, U.S.A.**

*Prepared by*  
**COMPLIANCE CERTIFICATION SERVICES**  
**47173 BENICIA STREET**  
**FREMONT, CA 94538, U.S.A.**  
**TEL: (510) 771-1000**  
**FAX: (510) 661-0888**

**NVLAP**<sup>®</sup>

NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
--	06/24/07	Initial Issue	T. Chan

## TABLE OF CONTENTS

<b>1. ATTESTATION OF TEST RESULTS.....</b>	<b>4</b>
<b>2. TEST METHODOLOGY .....</b>	<b>5</b>
<b>3. FACILITIES AND ACCREDITATION .....</b>	<b>5</b>
<b>4. CALIBRATION AND UNCERTAINTY.....</b>	<b>5</b>
4.1. <i>MEASURING INSTRUMENT CALIBRATION.....</i>	<i>5</i>
4.2. <i>MEASUREMENT UNCERTAINTY.....</i>	<i>5</i>
<b>5. EQUIPMENT UNDER TEST.....</b>	<b>6</b>
5.1. <i>DESCRIPTION OF EUT .....</i>	<i>6</i>
5.2. <i>MAXIMUM OUTPUT POWER .....</i>	<i>6</i>
5.3. <i>DESCRIPTION OF AVAILABLE ANTENNAS.....</i>	<i>6</i>
5.4. <i>SOFTWARE AND FIRMWARE .....</i>	<i>6</i>
5.5. <i>WORST-CASE CONFIGURATION AND MODE.....</i>	<i>7</i>
5.6. <i>DESCRIPTION OF TEST SETUP .....</i>	<i>7</i>
<b>6. TEST AND MEASUREMENT EQUIPMENT .....</b>	<b>9</b>
<b>7. LIMITS AND RESULTS .....</b>	<b>10</b>
7.1. <i>RADIATED RF POWER OUTPUT.....</i>	<i>10</i>
7.2. <i>FIELD STRENGTH OF SPURIOUS RADIATION.....</i>	<i>13</i>
<b>8. SETUP PHOTOS .....</b>	<b>16</b>

## 1. ATTESTATION OF TEST RESULTS

**COMPANY NAME:** KYOCERA WIRELESS  
10300 CAMPUS POINT DRIVE  
SAN DIEGO, CA 92121, USA

**EUT DESCRIPTION:** DUAL BAND CDMA 1XRTT / 1XEVDO, BLUETOOTH

**MODEL:** E2000

**SERIAL NUMBER:** 01979

**DATE TESTED:** JUNE 18-19, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 22 SUBPART H	NO NON-COMPLIANCE NOTED (Radiated Portion)
FCC PART 24 SUBPART E	NO NON-COMPLIANCE NOTED (Radiated Portion)

Compliance Certification Services, Inc. tested the above equipment in accordance with the requirements set forth in the above standards. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

**Note:** The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by Compliance Certification Services and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by Compliance Certification Services will constitute fraud and shall nullify the document. No part of this report may be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any government agency.

Approved & Released For CCS By:



THU CHAN  
EMC SUPERVISOR  
COMPLIANCE CERTIFICATION SERVICES

Tested By:



THANH NGUYEN  
EMC ENGINEER  
COMPLIANCE CERTIFICATION SERVICES

## 2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with TIA/EIA 603C (2004), ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15 and FCC CFR 47 Part 22H and 24E.

## 3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA. The sites are constructed in conformance with the requirements of ANSI C63.4, ANSI C63.7 and CISPR Publication 22. All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

## 4. CALIBRATION AND UNCERTAINTY

### 4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

### 4.2. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Radiated Emission, 30 to 200 MHz	+/- 3.3 dB
Radiated Emission, 200 to 1000 MHz	+4.5 / -2.9 dB
Radiated Emission, 1000 to 2000 MHz	+4.5 / -2.9 dB
Power Line Conducted Emission	+/- 2.9 dB

Uncertainty figures are valid to a confidence level of 95%.

## 5. EQUIPMENT UNDER TEST

### 5.1. DESCRIPTION OF EUT

The EUT is a Dual Phone CDMA 1xRTT/ EVDO with Bluetooth transceiver.

The radio module is manufactured by Kyocera Wireless Corp.

### 5.2. MAXIMUM OUTPUT POWER

The transmitter has a maximum ERP and EIRP output powers as follows:

Frequency Range (MHz)	Modulation	Output ERP (dBm)	Output ERP (mW)
824.7 - 848.31	1xEVDO	27.90	616.60

Frequency Range (MHz)	Modulation	Output EIRP (dBm)	Output EIRP (mW)
1851.2- 1908.8	1xEVDO	30.30	1071.52

### 5.3. DESCRIPTION OF AVAILABLE ANTENNAS

The radio utilizes an internal antenna for Cell and PCS.

### 5.4. SOFTWARE AND FIRMWARE

The EUT driver software installed in the host support equipment during testing was

StargraphitePassThru.exe and BtCLI BlueSuite, rev. 1.19.

The test utility software used during testing was CDMA2000, rev.B.10.11.L

## 5.5. WORST-CASE CONFIGURATION AND MODE

The worst-case is determined as the highest output power. The highest measured output power was at mid channel for CELL band and low channel for PCS band.

The worst-case configuration has been evaluated @ X-position for Cell band and @ Y position for PCS bands by comparing the fundamental ERP / EIRP output power.

## 5.6. DESCRIPTION OF TEST SETUP

### SUPPORT EQUIPMENT

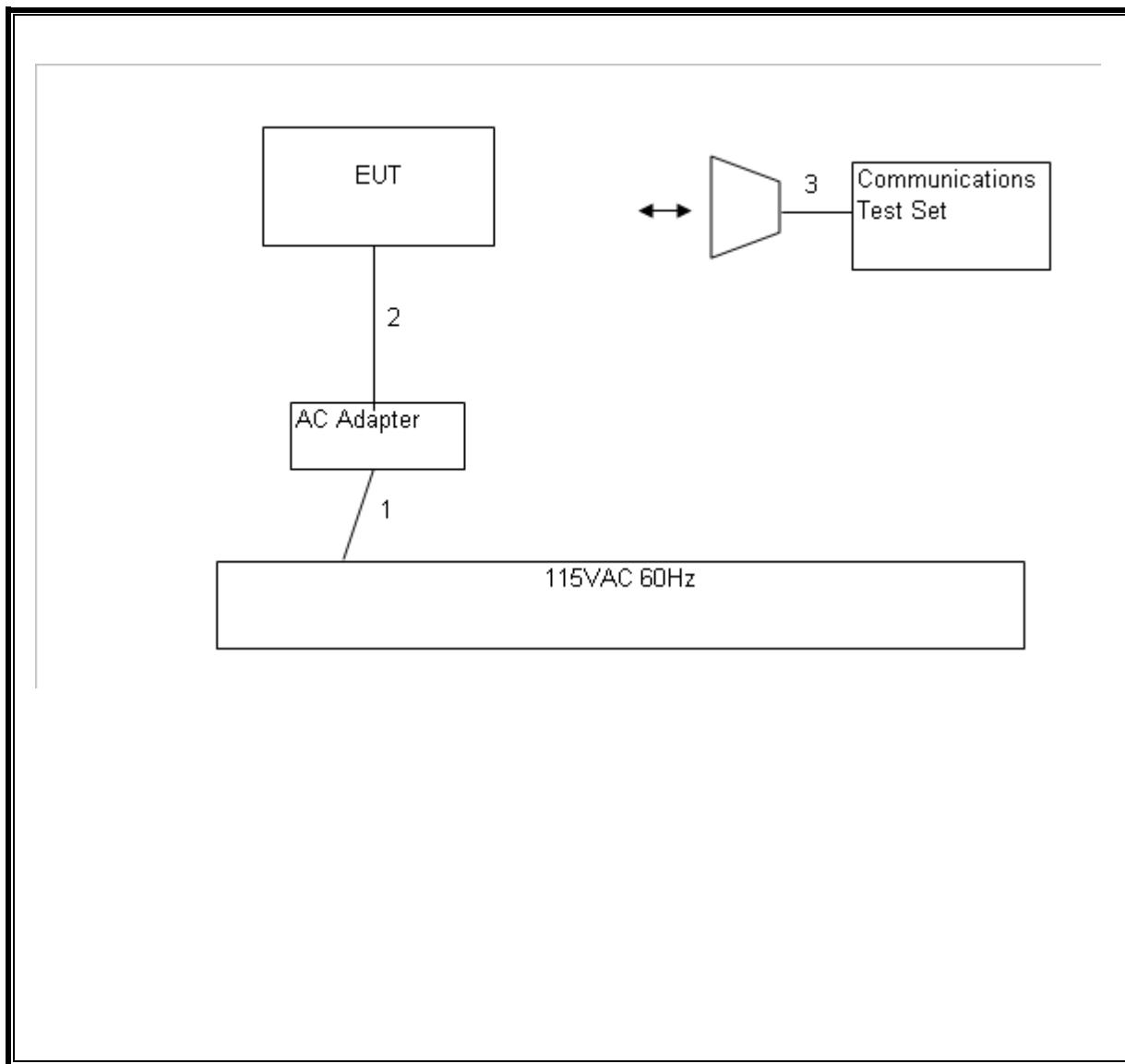
PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
Laptop Computer	DELL	LATITUDE D600	CN-0G5152-48643-457-7191	DoC
AC/DC Adapter	Dell	PA-1900-0202	CN-0U7809-71615-5C2-1700	DoC

### I/O CABLES

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	USB	1	USB	Unshielded	1.5m	N/A
2	DC	1	DC	Unshielded	1m	N/A
3	RF In/Out	1	Horn	Unshielded	1m	N/A

### TEST SETUP

The EUT is a stand alone unit during the tests. Test software exercised the unit by the support Laptop.

**SETUP DIAGRAM FOR TESTS**

## 6. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	Cal Due
Spectrum Analyzer, 1.8 GHz	Agilent / HP	8591A	3009A00791	10/12/07
Antenna, Bilog 30 MHz ~ 2 Ghz	Sunol Sciences	JB1	A121003	08/13/07
Preamplifier, 1300 MHz	Agilent / HP	8447D	1937A02062	01/23/08
Spectrum Analyzer 3 Hz ~ 44 GHz	Agilent / HP	E4446A	US42070220	11/26/07
Preamplifier, 1 ~ 26.5 GHz	Agilent / HP	8449B	3008A00369	08/01/07
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	04/22/08
2.7GHz HPF	MicroTronic	HPM13194	2	CNR
1.5GHz HPF	MicroTronic	HPM13195	1	CNR
Communication Test Set	Agilent	E5515C	91936	04/08/08
Signal Generator 2 -40 GHz	R & S	SMP04	DE 34210	06/02/08
Signal Generator 1024 MHz	R & S	SMY01	DE 12311	05/11/08
Dipole	EMCO	3121C-DB2	22435	05/07/08
Antenna, Horn 1 ~ 18 GHz	EMCO	3115	6717	04/22/08

## 7. LIMITS AND RESULTS

### 7.1. RADIATED RF POWER OUTPUT

#### LIMIT

22.913(a) The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.  
 24.232(b) Mobile/portable stations are limited to 2 watts e.i.r.p. peak power and the equipment must employ means to limit the power to the minimum necessary for successful communications.

#### TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.2.17

#### RESULTS

No non-compliance noted.

##### 850 MHz 1 x EVDO

Channel	Frequency (MHz)	ERP Peak Power (dBm)	ERP Peak Power (mW)
Low	824.7	27.80	602.56
Middle	836.5	27.90	616.60
High	848.3	27.00	501.19

##### 1900 MHz 1 x EVDO

Channel	Frequency (MHz)	EIRP Peak Power (dBm)	EIRP Peak Power (mW)
Low	1851.25	30.30	1071.52
Middle	1880.00	29.20	831.76
High	1908.75	30.00	1000.00

**CDMA Output Power (ERP)**

**High Frequency Substitution Measurement**  
**Compliance Certification Services, Fremont 5m Chamber Site**

**Company:** Kyocera Wireless  
**Project #:** 07U11133  
**Date:** 6/15/2007  
**Test Engineer:** Can Ming Chung  
**Configuration:** worst case x-position  
**Mode:** TX CELL BAND 850 EV-DO REV-0

**Test Equipment:**

Receiving: Sunol T122, and 5m Chamber N-type Cable (Setup this one for testing EUT)

Substitution: Dipole S/N: 00022117, and 4ft SMA Cable Warehouse S/N: 177081002

f MHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	ERP (dBm)	Limit (dBm)	Margin (dB)	Notes
824.70	96.4	V	22.8	0.5	0.0	22.3	38.5	-16.1	
824.70	103.6	H	28.3	0.5	0.0	27.8	38.5	-10.7	
836.50	96.0	V	23.0	0.6	0.0	22.4	38.5	-16.0	
836.50	103.6	H	28.5	0.6	0.0	27.9	38.5	-10.5	
848.30	93.8	V	20.6	0.7	0.0	19.9	38.5	-18.5	
848.30	103.2	H	27.7	0.7	0.0	27.0	38.5	-11.4	

Rev. 1.24.7

**CDMA Output Power (EIRP)**

High Frequency Fundamental Measurement Compliance Certification Services, Fremont 5m Chamber Site																		
Company:	Kyocera Wireless																	
Project #:	07U11133																	
Date:	6/15/2007																	
Test Engineer:	Can Ming Chung																	
Configuration:	EUT only Y position (worst case)																	
Mode:	TX PCS 1900 EV-DO REV-0																	
<u>Test Equipment:</u>																		
Receiving: Horn T73, and 12ft S/N: 197209005 (Setup this one for testing EUT)																		
Substitution: Horn T60 Substitution, 4ft SMA Cable Warehouse S/N: 177081002																		
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes									
1.851	96.3	V	22.9	0.9	8.3	30.3	33.0	-2.7										
1.851	93.6	H	19.7	0.9	8.3	27.1	33.0	-5.9										
1.880	96.0	V	21.7	0.9	8.3	29.2	33.0	-3.8										
1.880	92.0	H	17.2	0.9	8.3	24.7	33.0	-8.3										
1.909	95.8	V	22.5	0.9	8.4	30.0	33.0	-3.0										
1.909	91.0	H	18.1	0.9	8.4	25.6	33.0	-7.4										
Rev. 1.24.7																		

## 7.2. FIELD STRENGTH OF SPURIOUS RADIATION

### LIMIT

§22.917 (e) and §24.238 (a) Out of band emissions. The power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least  $43 + 10 \log (P)$  dB.

### TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 3.2.12, FCC 22.917 (h), & FCC 24.238 (b)

### RESULTS

No non-compliance noted.

Note: No emissions were found within 30-1000MHz & after the third harmonic of 20dB below the system noise.

**CDMA Spurious & Harmonic (ERP)**

Compliance Certification Services, Fremont 5m A-Chamber											
Company:	Kyocera Wireless										
Project #:	07U11133										
Date:	6/15/2007										
Test Engineer:	Can Ming Chung										
Configuration:	worst case x-position(lay)										
Mode:	TX CELL BAND 850 EV-DO REV-0										
<b>Test Equipment:</b>											
EMCO Horn 1-18 GHz			Horn > 18 GHz			Limit			High Pass Filter		
T73; S/N: 6717 @3m						FCC 24			<input checked="" type="checkbox"/>		
Hi Frequency Cables											
<input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)											
Pre-amplifier 1-26 GHz			Pre-amplifier 26-40 GHz								
T144 Miteq 3008A00											
<b>f</b> GHz	<b>SA reading</b> (dBuV/m)	<b>Ant. Pol.</b> (H/V)	<b>SG reading</b> (dBm)	<b>CL</b> (dB)	<b>Gain</b> (dBi)	<b>Gain</b> (dBd)	<b>EIRP</b> (dBm)	<b>Limit</b> (dBm)	<b>Margin</b> (dB)	<b>Notes</b>	
Low Ch											
1.650	63.3	V	-45.7	3.8	8.0	5.8	-41.5	-13.0	-28.5		
2.465	48.7	V	-56.2	4.9	9.5	7.4	-51.6	-13.0	-38.6		
3.288	46.5	V	-54.6	5.6	9.8	7.6	-50.4	-13.0	-37.4		
1.649	63.8	H	-44.4	3.8	8.0	5.8	-40.3	-13.0	-27.3		
2.474	50.5	H	-54.2	4.9	9.5	7.4	-49.5	-13.0	-36.5		
3.299	45.9	H	-55.1	5.6	9.8	7.6	-50.9	-13.0	-37.9		
Mid Ch											
1.673	61.2	V	-47.6	3.9	8.0	5.9	-43.5	-13.0	-30.5		
2.534	46.9	V	-57.7	4.9	9.6	7.4	-53.1	-13.0	-40.1		
3.347	46.0	V	-54.9	5.6	9.8	7.6	-50.7	-13.0	-37.7		
1.673	61.7	H	-46.4	3.9	8.0	5.9	-42.2	-13.0	-29.2		
2.508	49.8	H	-54.8	4.9	9.6	7.4	-50.1	-13.0	-37.1		
3.347	47.7	H	-53.1	5.6	9.8	7.6	-48.9	-13.0	-35.9		
High Ch											
1.693	57.8	V	-50.9	3.9	8.1	5.9	-46.8	-13.0	-33.8		
2.545	49.1	V	-55.4	4.9	9.6	7.4	-50.8	-13.0	-37.8		
3.365	46.9	V	-53.9	5.6	9.7	7.6	-49.8	-13.0	-36.8		
1.695	60.7	H	-47.3	3.9	8.1	5.9	-43.1	-13.0	-30.1		
2.539	51.4	H	-53.0	4.9	9.6	7.4	-48.3	-13.0	-35.3		
3.387	47.8	H	-52.8	5.7	9.7	7.6	-48.7	-13.0	-35.7		

Rev. 4.12.7

**CDMA Spurious & Harmonic (EIRP)**

High Frequency Substitution Measurement Compliance Certification Services, Fremont 5m A-Chamber											
Company: Kyocera Wireless Project #: 07U11133 Date: 6/15/2007 Test Engineer: Can Ming Chung Configuration: EUT only Y position is the worst case(stand) Mode: TX PCS 1900 EV-DO REV-0											
<u>Test Equipment:</u>											
 T73; S/N: 6717 @3m			 Horn > 18GHz			 Limit FCC 24			 <input checked="" type="checkbox"/> High Pass Filter		
Hi Frequency Cables <input type="checkbox"/> (2 ft) <input type="checkbox"/> (2 ~ 3 ft) <input type="checkbox"/> (4 ~ 6 ft) <input checked="" type="checkbox"/> (12 ft)			 Pre-amplifier 1-26GHz			 Pre-amplifier 26-40GHz			T144 Miteq 3008A00		
f GHz	SA reading (dBuV/m)	Ant. Pol. (H/V)	SG reading (dBm)	CL (dB)	Gain (dBi)	Gain (dBd)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Notes	
<b>Low Ch</b>											
3.702	54.0	V	-45.0	5.9	9.7	7.6	-41.3	-13.0	-28.3		
5.534	52.4	V	-41.5	7.4	11.2	9.1	-37.6	-13.0	-24.6		
7.403	47.5	V	-44.3	8.3	12.6	10.4	-40.0	-13.0	-27.0		
9.254	56.8	V	-33.4	9.3	13.0	10.8	-29.7	-13.0	-16.7		
3.702	52.1	H	-46.8	5.9	9.7	7.6	-43.0	-13.0	-30.0		
5.553	56.9	H	-35.9	7.4	11.3	9.1	-32.1	-13.0	-19.1		
7.043	48.7	H	-42.7	8.1	12.3	10.2	-38.5	-13.0	-25.5		
9.254	53.6	H	-36.6	9.3	13.0	10.8	-32.9	-13.0	-19.9		
<b>Mid Ch</b>											
3.759	55.7	V	-43.1	6.0	9.7	7.6	-39.3	-13.0	-26.3		
5.690	54.9	V	-39.3	7.5	11.6	9.4	-35.2	-13.0	-22.2		
7.518	46.4	V	-45.4	8.3	12.6	10.5	-41.1	-13.0	-28.1		
9.398	53.2	V	-36.9	9.4	13.0	10.9	-33.3	-13.0	-20.3		
3.769	51.2	H	-47.3	6.0	9.7	7.6	-43.6	-13.0	-30.6		
5.640	58.4	H	-34.7	7.4	11.5	9.3	-30.6	-13.0	-17.6		
7.518	51.1	H	-39.9	8.3	12.6	10.5	-35.6	-13.0	-22.6		
9.399	54.4	H	-35.6	9.4	13.0	10.9	-32.0	-13.0	-19.0		
<b>High Ch</b>											
3.819	52.2	V	-46.2	6.0	9.7	7.5	-42.6	-13.0	-29.6		
5.727	56.8	V	-37.4	7.5	11.7	9.5	-33.3	-13.0	-20.3		
7.549	47.9	V	-43.8	8.3	12.6	10.5	-39.5	-13.0	-26.5		
9.542	54.6	V	-35.3	9.6	13.1	11.0	-31.7	-13.0	-18.7		
3.818	53.7	H	-44.6	6.0	9.7	7.5	-40.9	-13.0	-27.9		
5.725	57.2	H	-36.1	7.5	11.6	9.5	-31.9	-13.0	-18.9		
7.633	53.1	H	-37.7	8.4	12.7	10.5	-33.4	-13.0	-20.4		
9.543	51.6	H	-38.2	9.6	13.1	11.0	-34.7	-13.0	-21.7		

Rev. 4.12.7

**NOTE: SETUP PHOTOS ARE CONTAINED IN A SEPARATE DOCUMENT**