CKC LABORATORIES, INC. Testing the Future

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EMC/SAFETY

HID CORPORATION ADDENDUM TEST REPORT TO FC02-024D

FOR THE

6181A BIOCLASS RWKL575

FCC PART 15 SUBPART C SECTIONS 15.107, 15.209, 15.225 & RSS-210

COMPLIANCE

DATE OF ISSUE: JUNE 23, 2004

PREPARED FOR:

HID Corporation
9292 Jeronimo Road
Irvine, CA 92618-1905

P.O. No.: 10002477
W.O. No.: 81566

PREPARED BY:

Joyce Walker
CKC Laboratories, Inc.
5473A Clouds Rest
Mariposa, CA 95338

Date of test: June 10 - 14, 2004

Report No.: FC02-024E

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ADMINISTRATIVE INFORMATION

DATE OF TEST:	June 10 - 14, 2004
DATE OF RECEIPT:	June 10, 2004
PURPOSE OF TEST:	To demonstrate the compliance of the iCLASS R10, 6100A (6091-300); iCLASS RW300, 6111A (6092-300) and iCLASS RW400, 6121A (6093-300) with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209 & 15.225 devices. **Addendum A** is to add a statement regarding the correction factor to the voltage variation tables. **Addendum B** is to demonstrate the compliance of the Proximity Card Reader, 6094A (6094-300) with the requirements for FCC Part 15 Subpart C Sections 15.207, 15.209 and 15.225 devices. **Addendum C** is to change the model name to iCLASS Keypad Reader, 613xA (6094-300). **Addendum D** is to demonstrate with new testing the compliance of the 6181A bioCLASS RWKL575 with the requirements for FCC Part 15 Subpart C Sections 15.209, 15.225, Conducted CISPR 22 Class B and RSS 210 devices. **Addendum E** is to demonstrate with new testing the compliance of the 6181A bioCLASS RWKL575 to FCC Part 15 Subpart C Sections 15.207, 15.209, 15.225 and RSS-210 after modifications were made to the device.
TEST METHOD:	ANSI C63.4 (2001) & RSS-212
MANUFACTURER:	HID Corporation 9292 Jeronimo Road Irvine, CA 92618-1905
REPRESENTATIVE:	Frank de Vall
TEST LOCATION:	CKC Laboratories, Inc. 5473A Clouds Rest Mariposa, CA 95338

SUMMARY OF RESULTS

As received, the HID Corporation 6181A bioCLASS RWKL575, was found to be fully compliant with the following standards and specifications:

United States
- FCC Part 15 Subpart C Sections 15.207, 15.209 & 15.225
- ANSI C63.4 (1992) method

FCC Site No. 784962

Canada

RSS-210 using:
- FCC Part 15 Subpart C Sections 15.207, 15.209 & 15.225
- ANSI C63.4 (1992) method

Industry of Canada File No. IC 3082-D

CONDITIONS FOR COMPLIANCE

EUT drain wire is disconnected. Ground strap attached to EUT power supply.

APPROVALS

Steve Behm, Director of Engineering Services

QUALITY ASSURANCE:

Joyce Walker, Quality Assurance Administrative Manager

TEST PERSONNEL:

Randy Clark, EMC Engineer

Mike Wilkinson, Lab Manager

FCC 15.31(m) Number of Channels
This device operates on a single channel of 13.56 MHz.

FCC 15.33(a) Frequency Ranges Tested
15.207 Conducted Emissions: 150 kHz – 30 MHz
15.209 Radiated Emissions: 9 kHz – 1000 MHz

FCC SECTION 15.35: ANALYZER BANDWIDTH SETTINGS PER FREQUENCY RANGE			
TEST	BEGINNING FREQUENCY	ENDING FREQUENCY	BANDWIDTH SETTING
CONDUCTED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	9 kHz	150 kHz	200 Hz
RADIATED EMISSIONS	150 kHz	30 MHz	9 kHz
RADIATED EMISSIONS	30 MHz	1000 MHz	120 kHz

FCC 15.205 Restricted Bands
The fundamental operating frequency lies outside the restricted bands and therefore complies with the requirements of Section 15.205 of the FCC rules. Any spurious emission coming from the EUT was investigated to determine if any portion lies inside the restricted band. If any portion of a spurious emissions signal was found to be within a restricted band, investigation was performed to ensure compliance with Section 15.209.

EUT Operating Frequency
The EUT was operating at 13.56 MHz.

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

EQUIPMENT UNDER TEST (EUT) DESCRIPTION
The 6181A bioCLASS RWKL575 reader tested by CKC Laboratories was a production unit. The EUT is a proximity reader/writer with biometric finger print verification.

The EUT was named **Biometric Reader, 6181 (RWKLB575)** during testing. Since the time of testing, HID Corporation has changed the name of the device to **6181A bioCLASS RWKL575.** Any differences between the names does not affect their EMC characteristics and therefore complies to the level of testing equivalent to the tested model name shown on the data sheets.

The 6181A is the maximum configuration that includes reader with keypad, LCD display, and fingerprint reader. This is the one that was tested because it is worst case. to the following additional models:

6171A bioCLASS RWKL550 (the same as the 6181A with no fingerprint reader)
6190A bioCLASS BIO500 (the fingerprint reader, only)

EQUIPMENT UNDER TEST

bioCLASS
Manuf: HID Corporation
Model: 6181A (RWKLB575)
Serial: 002
FCC ID: JQ6609XA

PERIPHERAL DEVICES

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

DC Power Supply
Manuf: Topward Electric Instruments Co., Ltd
Model: TPS-2000
Serial: 920035
FCC ID: NA

REPORT OF MEASUREMENTS

The following tables report the worst case emissions levels recorded during the tests performed on the EUT. All readings taken were peak readings unless otherwise stated. The data sheets from which the emissions tables were compiled are contained in Appendix C.

Table 1: FCC 15.207 - Six Highest Conducted Emission Levels

FREQUENCY MHz	METER READING dBµV	CORRECTION FACTORS Lisn dB	dB	Cable dB	HPF dB	CORRECTED READING dBµV	SPEC LIMIT dBµV	MARGIN dB	NOTES
13.543410	36.6	0.4		0.4	0.1	37.5	50.0	-12.5	B
13.552410	37.9	0.5		0.4	0.1	38.9	50.0	-11.1	W
13.633500	32.4	0.4		0.4	0.1	33.3	50.0	-16.7	B
13.642500	34.4	.05		0.4	0.1	35.4	50.0	-14.6	W
13.687550	31.6	.05		0.4	0.1	32.6	50.0	-17.4	W
27.114890	30.8	.04		0.5	0.2	31.9	50.0	-18.1	W

Test Method: ANSI C63.4 (2001)
Spec Limit: FCC Part 15 Subpart C Section 15.207

NOTES: B = Black Lead
W = White Lead

COMMENTS: EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. Ground strap attached to EUT power supply. Frequency Range Investigated: 150kHz to 30MHz.

Table 2: FCC 15.225(a) - Fundamental Emission Levels									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
13.560	50.2	8.4		0.8	-19.0	40.4	84.0	-43.6	H
13.560	46.5	8.4		0.8	-19.0	36.7	84.0	-47.3	V

Test Method: ANSI C63.4 (2001)
Spec Limit: FCC Part 15 Subpart C Sections 15.225(a)
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. Ground strap attached to EUT power supply. Frequency Range Investigated: Carrier. Temperature: 23°C, humidity: 45%.

Table 3: FCC 15.209 - Highest Radiated Emission Levels 9kHz - 30MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Corr dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
27.122	19.2	4.9	-20.0	1.1		5.2	29.5	-24.3	V
27.126	26.7	4.9	-20.0	1.1		12.7	29.5	-16.8	H

Test Method: ANSI C63.4 (2001)
Spec Limit: FCC Part 15 Subpart C Sections 15.209
Test Distance: 10 Meters

NOTES: H = Horizontal Polarization
V = Vertical Polarization

COMMENTS: EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. Ground strap attached to EUT power supply. Frequency Range Investigated: 9kHz to 30MHz. Temperature: 23°C, humidity: 45%.

Table 4: FCC 15.209 - Six Highest Radiated Emission Levels 30 - 1000MHz									
	METER	CORRECTION FACTORS				CORRECTED	SPEC		
FREQUENCY MHz	READING dBµV	Ant dB	Amp dB	Cable dB	Dist dB	READING dBµV/m	LIMIT dBµV/m	MARGIN dB	NOTES
67.901	55.2	5.8	-27.2	1.9		35.7	40.0	-4.3	VQ
339.058	50.1	13.9	-26.7	4.4		41.7	46.0	-4.3	V
352.666	50.3	14.3	-26.8	4.5		42.3	46.0	-3.7	VQ
379.786	48.8	14.9	-27.0	4.9		41.6	46.0	-4.4	VQ
867.959	39.9	22.4	-27.6	7.8		42.5	46.0	-3.5	VQ
881.486	39.1	22.6	-27.4	8.0		42.3	46.0	-3.7	VQ

Test Method: ANSI C63.4 (2001)
Spec Limit: FCC Part 15 Subpart C Section 15.209
Test Distance: 3 Meters

NOTES: Q = Quasi Peak Reading
V = Vertical Polarization

COMMENTS: EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. Ground strap attached to EUT power supply. Frequency Range Investigated: 30 - 1000 MHz. Temperature: 23°C, humidity: 45%.

FCC 15.225 Temperature Testing

Customer:	HID
WO#:	
Date:	Jun 11 2004
Test Engineer:	Randy Clark
Device Model #:	6181A, BioClass
Operating Voltage:	12 **VDC/VAC**
Frequency Limit:	0.01 **PPM/%**

Temperature Variations

Channel Frequency:		**Channel 1 (MHz)** **13.56**	**Dev. (MHz)**
Temp (C)	Voltage		
-30	12		
-20	12	13.56049	0.00049
-10	12	13.56050	0.00050
0	12	13.56050	0.00050
10	12	13.56045	0.00045
20	12	13.56035	0.00035
30	12	13.56039	0.00039
40	12	13.56035	0.00035
50	12	13.56042	0.00042

Voltage Variations (±15%)

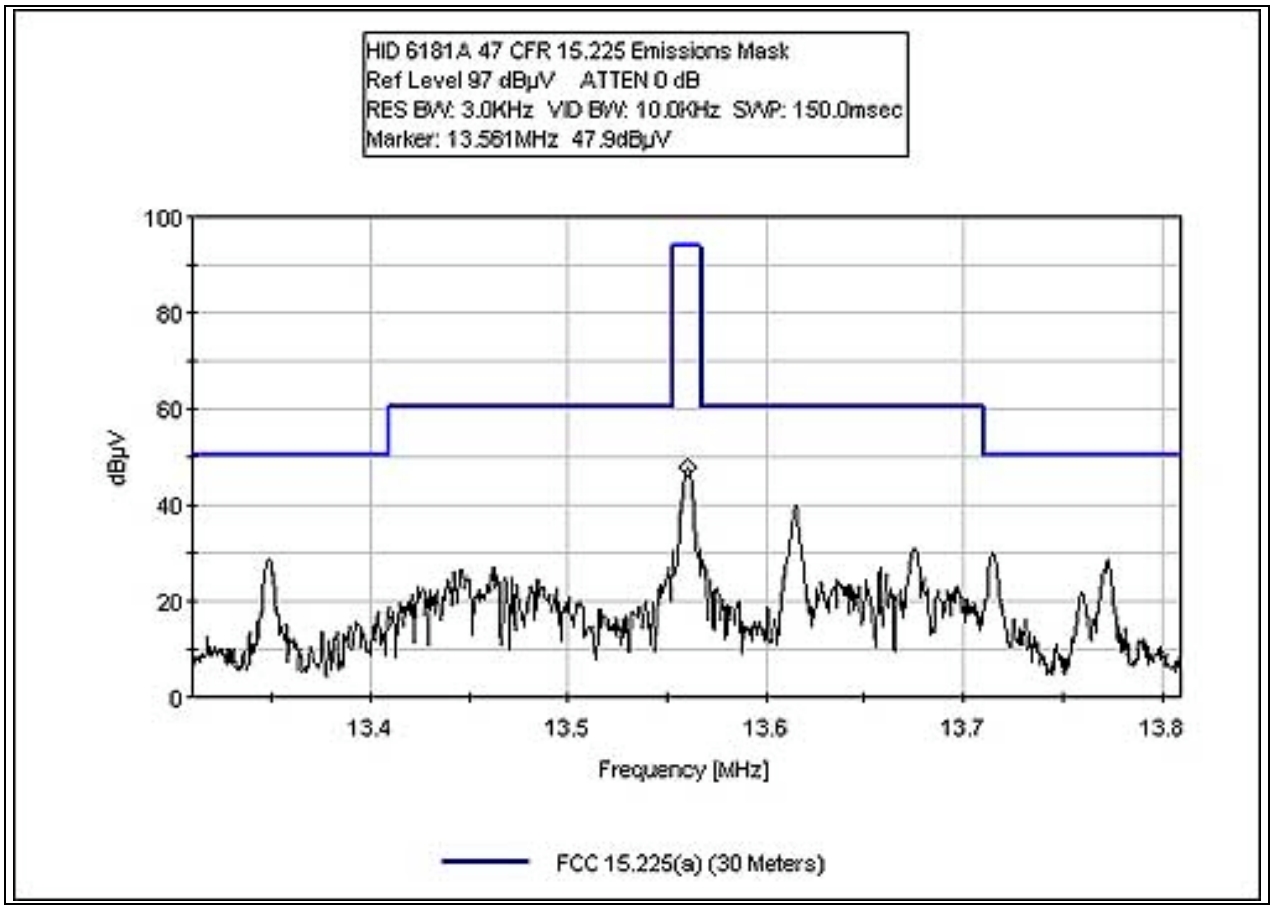
20	10.8	13.56036	0.00036
20	12	13.56035	0.00035
20	13.8	13.56031	0.00031

Max Deviation (MHz)	**0.00050**
Max Deviation (%)	**0.00369**
	PASS

Test Conditions:

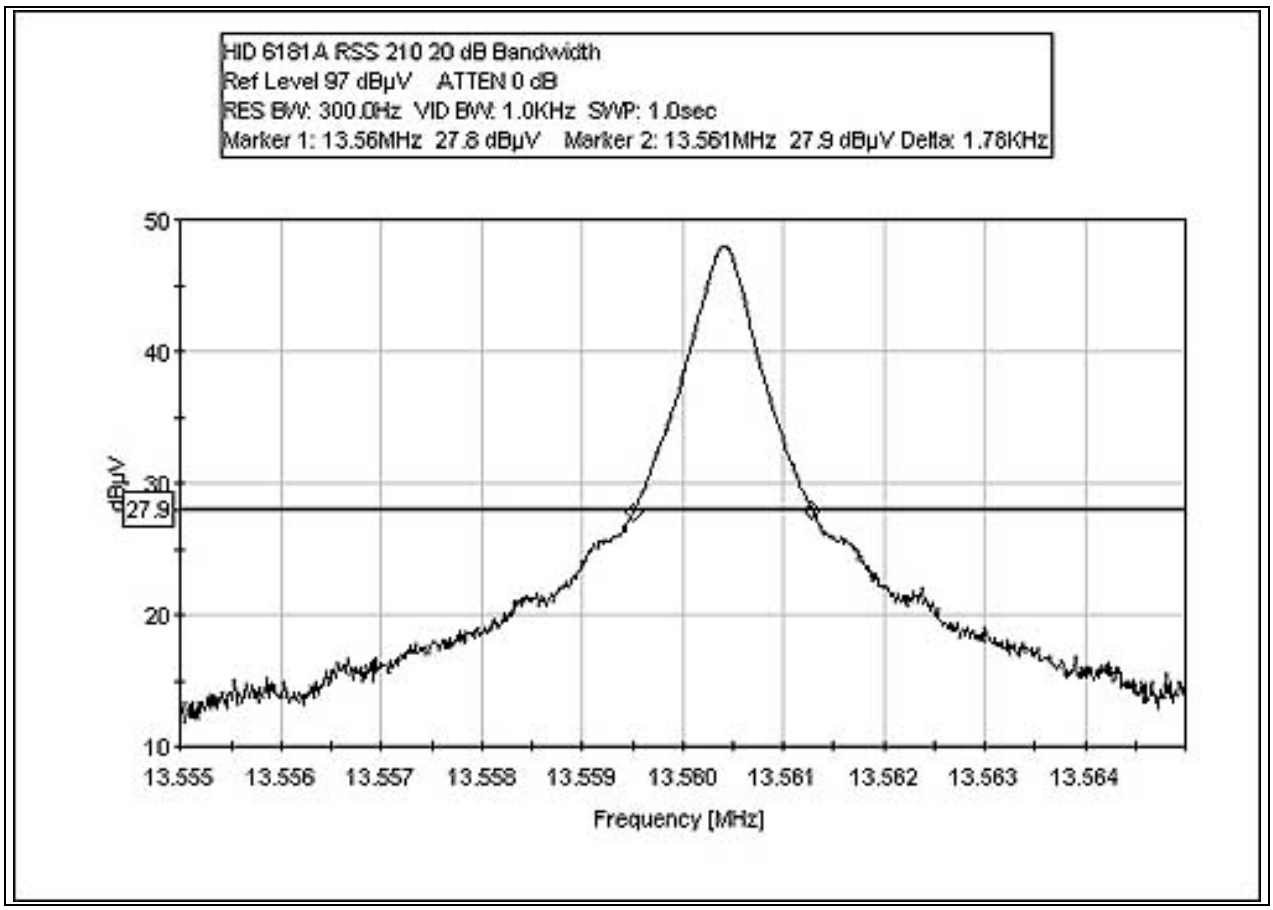
EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. EUT is placed inside of a temperature chamber. Carrier amplitude readings inside temperature chamber are calibrated to OATS readings.

EMISSIONS MASK



Emissions Mask

FCC 20dB & RSS-210 99% BANDWIDTH



Bandwidth

EUT SETUP

The equipment under test (EUT) was set up in a manner that represented its normal use, as shown in the photographs in Appendix A. Any special conditions required for the EUT to operate normally are identified in the comments that accompany the emissions tables. The corrected data was then compared to the applicable emission limits to determine compliance.

The cables were routed consistent with the typical application by varying the configuration of the test sample. Interface cables were connected to the available I/O ports of the test unit. The effect of varying the position of the cables was investigated to find the configuration that produced maximum emissions. I/O cables were of the type and length specified in the individual requirements. The length of cable that produced maximum emissions was selected.

The radiated and conducted emissions data of the EUT 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 Table A.

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

CORRECTION FACTORS

The basic spectrum analyzer reading was converted using correction factors as shown in the highest emissions readings in the tables. For radiated emissions in dBµV/m, the spectrum analyzer reading in dBµV was corrected by using the following formula in Table A. This reading was then compared to the applicable specification limit to determine compliance.

TABLE A: SAMPLE CALCULATIONS

	Meter reading	(dBµV)
+	Antenna Factor	(dB)
+	Cable Loss	(dB)
-	Distance Correction	(dB)
-	Preamplifier Gain	(dB)
=	Corrected Reading	(dBµV/m)

TEST INSTRUMENTATION AND ANALYZER SETTINGS

The test instrumentation and equipment listed in Appendix B were used to collect both the radiated and conducted emissions data. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. For frequencies from 30 to 1000 MHz, the biconilog antenna was used. Conducted emissions tests required the use of the FCC type LISNs.

The HP spectrum analyzer was used for all measurements. Table B shows the analyzer bandwidth settings that were used in designated frequency bands. For conducted emissions, an appropriate reference level and a vertical scale size of 10 dB per division were used. A 10 dB external attenuator was also used during conducted tests, with internal offset correction in the analyzer. 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.

SPECTRUM ANALYZER DETECTOR FUNCTIONS

The notes that accompany the measurements contained in the Tables 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.

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

For certain frequencies, 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.

EUT TESTING

Mains Conducted Emissions

During conducted emissions testing, the EUT was located on a wooden table measuring approximately 80 cm high, 1 meter deep, and 1.5 meters in length. One wall of the room where the EUT was located has a minimum 2 meter by 2 meter conductive plane. The EUT was mounted on the wooden table 40 cm away from the conductive plane, and 80 cm from any other conductive surface.

The vertical metal plane used for conducted emissions was grounded to the earth. Power to the EUT was provided through a LISN. The LISN was grounded to the ground plane. All other objects were kept a minimum of 80 cm away from the EUT during the conducted test.

The LISNs used were 50 µH-/+50 ohms. Above 150 kHz, a 0.15 µF series capacitor was added in-line prior to connecting the analyzer to restore the proper impedance for the range. A 30 to 50 second sweep time was used for automated measurements in the frequency bands of 150 kHz to 500 kHz, and 500 kHz to 30 MHz. All readings within 20 dB of the limit were recorded, and those within 6 dB of the limit were examined with additional measurements using a slower sweep time.

Radiated Emissions

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.

During the preliminary radiated scan, the EUT was powered up and operating in its defined FCC test mode. For radiated measurements from 9 kHz to 30 MHz, the magnetic loop antenna was used. The frequency range of 30 MHz to 1000 MHz was scanned with the biconilog antenna located about 1.5 meter above the ground plane in the vertical polarity. During this scan, the turntable was rotated and all peaks at or near the limit were recorded. A scan of the FM band from 88 to 110 MHz was then made using a reduced resolution bandwidth and frequency span. The biconilog antenna was changed to the horizontal polarity and the above steps were repeated. 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.

A thorough scan of all frequencies was made manually using a small frequency span, rotating the turntable and raising and lowering the antenna from one to four meters as needed. The test engineer maximized the readings with respect to the table rotation, antenna height, and configuration of EUT. Maximizing of the EUT was achieved by monitoring the spectrum analyzer on a closed circuit television monitor.

APPENDIX A

TEST SETUP PHOTOGRAPHS

PHOTOGRAPH SHOWING MAINS CONDUCTED EMISSIONS

Mains Conducted Emissions - Front View

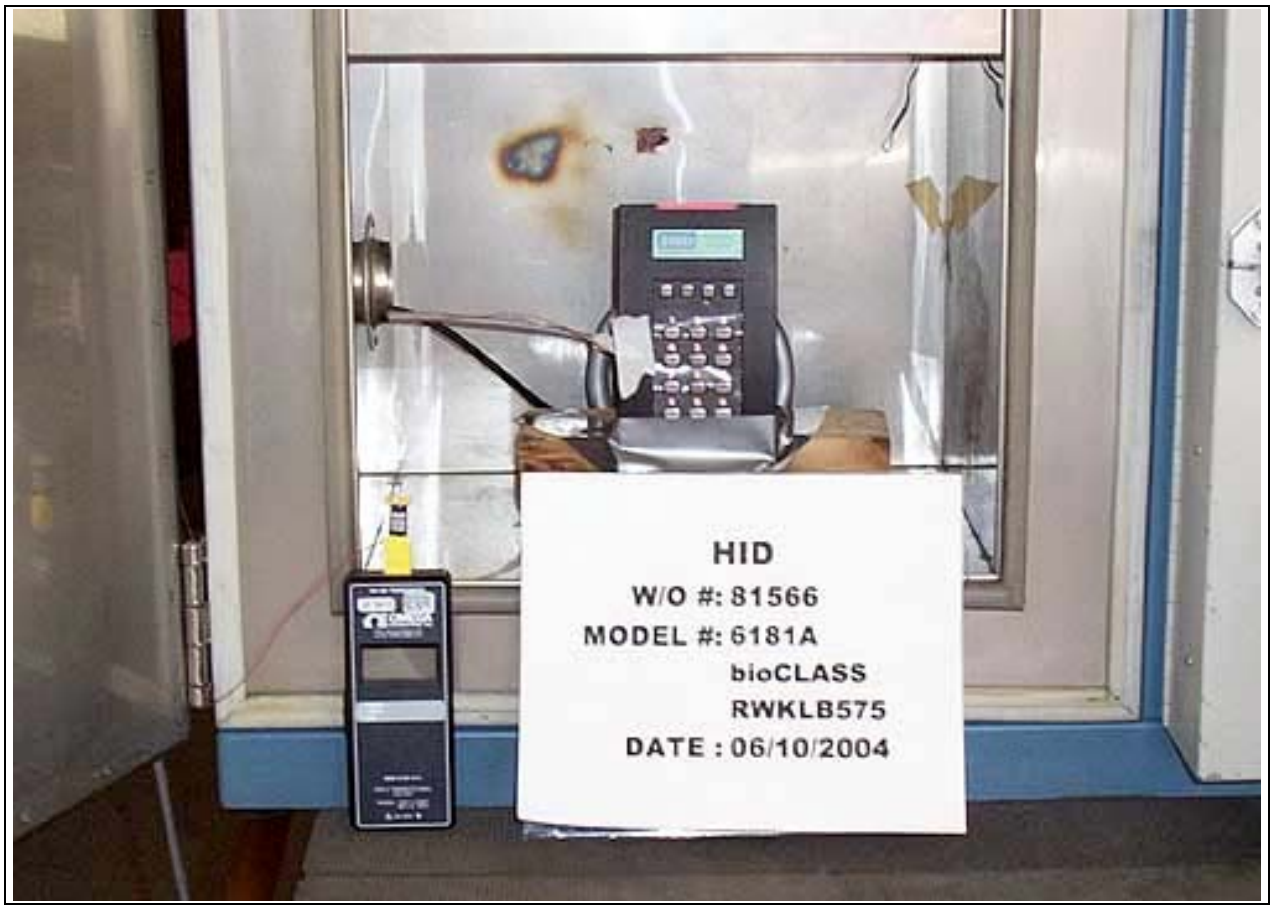
PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Front View

PHOTOGRAPH SHOWING RADIATED EMISSIONS

Radiated Emissions - Back View

PHOTOGRAPH SHOWING TEMPERATURE TESTING



Temperature Testing

APPENDIX B

TEST EQUIPMENT LIST

***FCC 15.207 Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2005	00490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2005	00489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2005	00478
8028-50-TS-24-BNC	8379276, 280	06/05/2003	06/05/2005	1248 & 1249

***FCC 15.225(a) Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2005	00490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2005	00489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2005	00478
EMCO Loop Antenna	1074	05/21/2003	05/21/2005	00226

***FCC 15.209 9kHz – 30MHz Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2005	00490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2005	00489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2005	00478
EMCO Loop Antenna	1074	05/21/2003	05/21/2005	00226

***FCC 15.209 30 – 1000MHz Test Equipment*:**

Function	S/N	Calibration Date	Cal Due Date	Asset #
HP 8566B SA	2209A01404	02/26/2003	02/26/2005	00490
HP 8566B SA Display	2403A08241	02/26/2003	02/26/2005	00489
HP 85650A QPA	2811A01267	02/26/2003	02/26/2005	00478
Chase CBL6111C Bilog	2456	12/13/2002	12/13/2004	01991
HP 8447D Preamp	1937A02604	03/07/2003	03/07/2005	00099

APPENDIX C:

MEASUREMENT DATA SHEETS

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.207 - AVE**
Work Order #: **81566** Date: 6/10/04
Test Type: **Conducted Emissions** Time: 2:46:00 PM
Equipment: **Biometric Reader** Sequence#: 44
Manufacturer: HID Tested By: Randal Clark
Model: 6181A (RWKLB575) 120V 60Hz
S/N: 002

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

Function	Manufacturer	Model #	S/N
Biometric Reader*	HID	6181A (RWKLB575)	002

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. Ground strap attached to EUT power supply. Frequency Range Investigated: 150kHz to 30MHz.

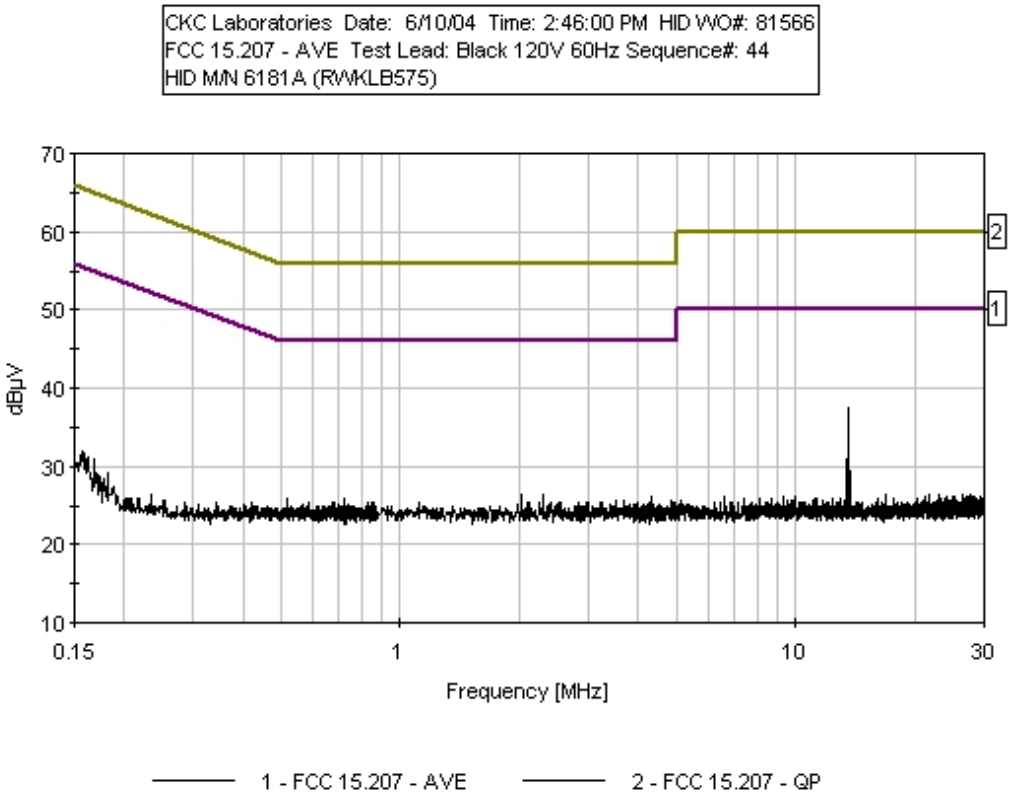
Transducer Legend:

T1=Cable - Internal + cab	T2=LISN Insertion Loss s/n280
T3=HP Filter AN02608	

Measurement Data: Reading listed by margin. Test Lead: Black

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.543M	36.6	+0.4	+0.4	+0.1		+0.0	37.5	50.0	-12.5	Black
2	13.634M	32.4	+0.4	+0.4	+0.1		+0.0	33.3	50.0	-16.7	Black
3	13.498M	30.0	+0.4	+0.4	+0.1		+0.0	30.9	50.0	-19.1	Black
4	13.588M	30.0	+0.4	+0.4	+0.1		+0.0	30.9	50.0	-19.1	Black
5	2.021M	25.9	+0.2	+0.3	+0.1		+0.0	26.5	46.0	-19.5	Black
6	516.509k	25.3	+0.1	+0.3	+0.3		+0.0	26.0	46.0	-20.0	Black
7	13.778M	28.4	+0.4	+0.4	+0.1		+0.0	29.3	50.0	-20.7	Black
8	13.679M	26.8	+0.4	+0.4	+0.1		+0.0	27.7	50.0	-22.3	Black

9	23.138M	25.5	+0.5	+0.4	+0.2	+0.0	26.6	50.0	-23.4	Black
10	26.553M	25.3	+0.5	+0.5	+0.2	+0.0	26.5	50.0	-23.5	Black
11	157.272k	29.6	+0.1	+0.3	+2.0	+0.0	32.0	55.6	-23.6	Black
12	181.997k	28.4	+0.1	+0.3	+0.4	+0.0	29.2	54.4	-25.2	Black



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.207 - AVE**
Work Order #: **81566** Date: 6/10/04
Test Type: **Conducted Emissions** Time: 2:49:26 PM
Equipment: **Biometric Reader** Sequence#: 45
Manufacturer: HID Tested By: Randal Clark
Model: 6181A (RWKLB575) 120V 60Hz
S/N: 002

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

Function	Manufacturer	Model #	S/N
Biometric Reader*	HID	6181A (RWKLB575)	002

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. Ground strap attached to EUT power supply. Frequency Range Investigated: 150kHz to 30MHz.

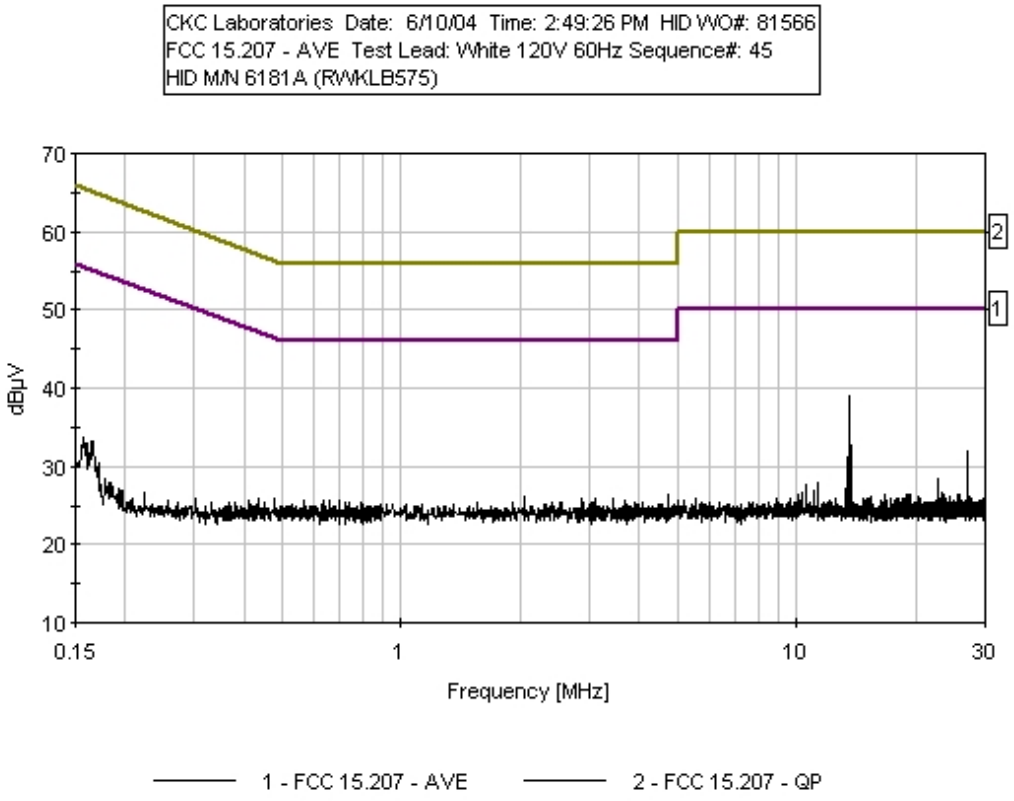
Transducer Legend:

T1=Cable - Internal + cab T2=LISN Insertion Loss s/n276
T3=HP Filter AN02608

Measurement Data: Reading listed by margin. Test Lead: White

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV	Spec dBµV	Margin dB	Polar Ant
1	13.552M	37.9	+0.4	+0.5	+0.1		+0.0	38.9	50.0	-11.1	White
2	13.643M	34.4	+0.4	+0.5	+0.1		+0.0	35.4	50.0	-14.6	White
3	13.688M	31.6	+0.4	+0.5	+0.1		+0.0	32.6	50.0	-17.4	White
4	27.115M	30.8	+0.5	+0.4	+0.2		+0.0	31.9	50.0	-18.1	White
5	13.588M	30.6	+0.4	+0.5	+0.1		+0.0	31.6	50.0	-18.4	White
6	13.498M	30.1	+0.4	+0.5	+0.1		+0.0	31.1	50.0	-18.9	White
7	4.747M	25.5	+0.3	+0.4	+0.1		+0.0	26.3	46.0	-19.7	White
8	13.408M	28.2	+0.4	+0.5	+0.1		+0.0	29.2	50.0	-20.8	White
9	22.751M	27.2	+0.5	+0.4	+0.2		+0.0	28.3	50.0	-21.7	White
10	156.545k	31.0	+0.1	+0.4	+2.1		+0.0	33.6	55.6	-22.0	White

11	11.345M	27.1	+0.3	+0.5	+0.1	+0.0	28.0	50.0	-22.0	White
12	165.271k	31.3	+0.1	+0.4	+1.3	+0.0	33.1	55.2	-22.1	White
13	10.552M	26.7	+0.3	+0.5	+0.1	+0.0	27.6	50.0	-22.4	White
14	11.075M	25.9	+0.3	+0.5	+0.1	+0.0	26.8	50.0	-23.2	White
15	23.373M	25.5	+0.5	+0.4	+0.2	+0.0	26.6	50.0	-23.4	White
16	178.361k	27.5	+0.1	+0.4	+0.4	+0.0	28.4	54.6	-26.2	White



Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.225(a) (30 Meters)**
Work Order #: **81566** Date: 6/11/04
Test Type: **Maximized Emissions** Time: 14:13:14
Equipment: **Biometric Reader** Sequence#: 48
Manufacturer: HID Tested By: Randal Clark
Model: 6181A (RWKLB575)
S/N: 002

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

Function	Manufacturer	Model #	S/N
Biometric Reader*	HID	6181A (RWKLB575)	002

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. Ground strap attached to EUT power supply. Frequency Range Investigated: Carrier. Temperature: 23ºC. Humidity: 45%.

Transducer Legend:

T1=Mag Loop - Site B - AN 00226 - 9kHz-30M	T2=Cable - 10 Meter

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	13.560M	50.2	+8.4	+0.8			-19.0 103	40.4	84.0	-43.6	Horiz 100
2	13.560M	46.5	+8.4	+0.8			-19.0	36.7	84.0	-47.3	Vert 100

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.209**
Work Order #: **81566** Date: 6/14/04
Test Type: **Maximized Emissions** Time: 10:11:46
Equipment: **Biometric Reader** Sequence#: 52
Manufacturer: HID Tested By: Randal Clark
Model: 6181A (RWKLB575)
S/N: 002

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

Function	Manufacturer	Model #	S/N
Biometric Reader*	HID	6181A (RWKLB575)	002

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. Ground strap attached to EUT power supply. Frequency Range Investigated: 9kHz to 30MHz. Temperature: 23ºC. Humidity: 45%.

Transducer Legend:

T1=Mag Loop - Site B - AN 00226 - 9kHz-30M	T2=Cable - 10 Meter
T3=15.31 10m 40dB/Dec Correction	

Measurement Data: Reading listed by margin. Test Distance: 10 Meters

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	27.126M	26.7	+4.9	+1.1	-20.0		+0.0 365	12.7	29.5	-16.8	Horiz 100
2	27.122M	19.2	+4.9	+1.1	-20.0		+0.0 365	5.2	29.5	-24.3	Vert 100

Test Location: CKC Laboratories •5473A Clouds Rest • Mariposa, CA 95338 • 1-800-500-4EMC (4362)

Customer: **HID**
Specification: **FCC 15.209**
Work Order #: **81566** Date: 6/11/04
Test Type: **Maximized Emissions** Time: 16:43:31
Equipment: **Biometric Reader** Sequence#: 54
Manufacturer: HID Tested By: Randal Clark
Model: 6181A (RWKLB575)
S/N: 002

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

Function	Manufacturer	Model #	S/N
Biometric Reader*	HID	6181A (RWKLB575)	002

Support Devices:

Function	Manufacturer	Model #	S/N
DC Power Supply	Topward Electric Instruments Co., Ltd	TPS-2000	920035

Test Conditions / Notes:

EUT is a biometric reader with an operating frequency 13.56MHz. 12VDC power is provided via support DC power supply. EUT drain wire is disconnected. Ground strap attached to EUT power supply. Frequency Range Investigated: 30 - 1000 MHz. Temperature: 23ºC. Humidity: 45%.

Transducer Legend:

T1=Amp - S/N 604	T2=Bilog Site B
T3=Cable - 10 Meter	

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

#	Freq MHz	Rdng dBµV	T1 dB	T2 dB	T3 dB	dB	Dist Table	Corr dBµV/m	Spec dBµV/m	Margin dB	Polar Ant
1	867.959M QP	39.9	-27.6	+22.4	+7.8		+0.0 192	42.5	46.0	-3.5	Vert 165
^	867.964M	42.6	-27.6	+22.4	+7.8		+0.0 184	45.2	46.0	-0.8	Vert 164
3	352.666M QP	50.3	-26.8	+14.3	+4.5		+0.0 155	42.3	46.0	-3.7	Vert 147
^	352.656M	53.1	-26.8	+14.3	+4.5		+0.0 155	45.1	46.0	-0.9	Vert 147
5	881.486M QP	39.1	-27.4	+22.6	+8.0		+0.0 192	42.3	46.0	-3.7	Vert 165
^	881.496M	44.9	-27.4	+22.6	+8.0		+0.0 192	48.1	46.0	+2.1	Vert 165
7	67.901M QP	55.2	-27.2	+5.8	+1.9		+0.0 9	35.7	40.0	-4.3	Vert 141
^	67.892M	57.1	-27.2	+5.8	+1.9		+0.0 9	37.6	40.0	-2.4	Vert 141
9	339.058M	50.1	-26.7	+13.9	+4.4		+0.0 164	41.7	46.0	-4.3	Vert 147
10	379.786M QP	48.8	-27.0	+14.9	+4.9		+0.0 209	41.6	46.0	-4.4	Vert 104

^	379.759M	50.8	-27.0	+14.9	+4.9	+0.0 209	43.6	46.0	-2.4	Vert 104
12	908.635M	37.9	-27.3	+22.9	+8.1	+0.0 171	41.6	46.0	-4.4	Vert 164
13	311.986M QP	50.8	-26.6	+13.2	+4.2	+0.0 145	41.6	46.0	-4.4	Vert 153
^	311.981M	52.1	-26.6	+13.2	+4.2	+0.0 152	42.9	46.0	-3.1	Vert 145
15	54.300M	53.6	-27.3	+7.3	+1.6	+0.0 66	35.2	40.0	-4.8	Vert 100
16	922.190M	37.0	-27.3	+23.1	+8.2	+0.0 174	41.0	46.0	-5.0	Vert 164
17	406.903M	47.5	-27.2	+15.6	+5.1	+0.0 194	41.0	46.0	-5.0	Vert 114
18	325.548M	49.9	-26.7	+13.5	+4.3	+0.0 134	41.0	46.0	-5.0	Vert 153
19	406.898M	47.4	-27.2	+15.6	+5.1	+0.0 206	40.9	46.0	-5.1	Vert 101
20	352.662M	48.7	-26.8	+14.3	+4.5	+0.0 123	40.7	46.0	-5.3	Horiz 100
21	40.785M	48.5	-27.3	+12.0	+1.4	+0.0 183	34.6	40.0	-5.4	Vert 100
22	935.766M	36.2	-27.2	+23.3	+8.1	+0.0 217	40.4	46.0	-5.6	Horiz 123
23	420.462M	46.8	-27.3	+15.8	+5.1	+0.0 213	40.4	46.0	-5.6	Vert 127
24	935.762M	36.1	-27.2	+23.3	+8.1	+0.0 189	40.3	46.0	-5.7	Vert 153
25	922.197M	36.1	-27.3	+23.1	+8.2	+0.0 219	40.1	46.0	-5.9	Horiz 128
26	895.081M QP	36.5	-27.3	+22.7	+8.1	+0.0 219	40.0	46.0	-6.0	Horiz 128
^	895.069M	39.5	-27.3	+22.7	+8.1	+0.0 219	43.0	46.0	-3.0	Horiz 128
28	420.460M	46.4	-27.3	+15.8	+5.1	+0.0 171	40.0	46.0	-6.0	Vert 101
29	895.079M QP	36.3	-27.3	+22.7	+8.1	+0.0 194	39.8	46.0	-6.2	Vert 174
^	895.082M	39.8	-27.3	+22.7	+8.1	+0.0 177	43.3	46.0	-2.7	Vert 164
31	596.754M QP	42.7	-27.8	+19.0	+5.9	+0.0 225	39.8	46.0	-6.2	Vert 172
^	596.756M	45.2	-27.8	+19.0	+5.9	+0.0 225	42.3	46.0	-3.7	Vert 172
33	949.279M	35.6	-27.2	+23.5	+7.8	+0.0 160	39.7	46.0	-6.3	Vert 153
34	393.296M QP	46.6	-27.1	+15.2	+5.0	+0.0 131	39.7	46.0	-6.3	Vert 116
^	393.319M	52.1	-27.1	+15.2	+5.0	+0.0 131	45.2	46.0	-0.8	Vert 116
36	257.723M	50.2	-26.5	+12.1	+3.7	+0.0 199	39.5	46.0	-6.5	Vert 161

37	447.548M	45.6	-27.5	+16.4	+5.0	+0.0 164	39.5	46.0	-6.5	Vert 101
38	311.979M	48.6	-26.6	+13.2	+4.2	+0.0 246	39.4	46.0	-6.6	Horiz 100
39	81.430M	51.6	-27.2	+6.9	+2.0	+0.0 -1	33.3	40.0	-6.7	Vert 120
40	284.861M	49.1	-26.5	+12.6	+3.9	+0.0 76	39.1	46.0	-6.9	Vert 211
41	867.960M QP	36.5	-27.6	+22.4	+7.8	+0.0 220	39.1	46.0	-7.0	Horiz 128
^	867.933M	39.5	-27.6	+22.4	+7.8	+0.0 220	42.1	46.0	-3.9	Horiz 128
^	867.962M	36.9	-27.6	+22.4	+7.8	+0.0 135	39.5	46.0	-6.5	Horiz 116
44	908.645M QP	35.4	-27.3	+22.9	+8.1	+0.0 219	39.1	46.0	-7.0	Horiz 128
^	908.628M	38.5	-27.3	+22.9	+8.1	+0.0 212	42.2	46.0	-3.8	Horiz 128
46	772.995M	38.7	-27.7	+21.1	+6.9	+0.0 190	39.0	46.0	-7.0	Vert 121
47	949.332M	34.8	-27.2	+23.5	+7.8	+0.0 217	38.9	46.0	-7.1	Horiz 123
48	854.400M QP	36.7	-27.7	+22.2	+7.7	+0.0 178	38.9	46.0	-7.1	Vert 169
^	854.399M	40.0	-27.7	+22.2	+7.7	+0.0 178	42.2	46.0	-3.8	Vert 169
50	447.593M	44.8	-27.5	+16.4	+5.0	+0.0 219	38.7	46.0	-7.3	Vert 100
51	474.672M	44.1	-27.7	+16.9	+5.3	+0.0 123	38.6	46.0	-7.4	Vert 100
52	623.883M	40.9	-27.9	+19.4	+6.1	+0.0 228	38.5	46.0	-7.5	Horiz 113
53	759.479M QP	38.2	-27.7	+21.0	+6.9	+0.0 191	38.4	46.0	-7.6	Vert 120
^	759.481M	40.5	-27.7	+21.0	+6.9	+0.0 191	40.7	46.0	-5.3	Vert 120
55	691.676M QP	39.2	-27.8	+20.2	+6.7	+0.0 151	38.3	46.0	-7.7	Horiz 102
^	691.665M	42.0	-27.8	+20.2	+6.7	+0.0 151	41.1	46.0	-4.9	Horiz 102
57	718.796M QP	38.8	-27.8	+20.5	+6.8	+0.0 218	38.3	46.0	-7.8	Horiz 100
^	718.777M	41.6	-27.8	+20.5	+6.8	+0.0 217	41.1	46.0	-4.9	Horiz 100
59	854.357M	36.0	-27.7	+22.2	+7.7	+0.0 208	38.2	46.0	-7.8	Horiz 108
60	623.853M	40.6	-27.9	+19.4	+6.1	+0.0 216	38.2	46.0	-7.8	Horiz 100
61	623.872M	40.6	-27.9	+19.4	+6.1	+0.0 231	38.2	46.0	-7.8	Horiz 100
62	366.225M	45.4	-26.9	+14.6	+4.7	+0.0 203	37.8	46.0	-8.2	Vert 116

63 QP	705.240M	38.2	-27.8	+20.4	+6.8	+0.0 187	37.6	46.0	-8.4	Vert 115
^	705.209M	40.3	-27.8	+20.4	+6.8	+0.0 187	39.7	46.0	-6.3	Vert 115
65 QP	813.719M	36.5	-27.7	+21.6	+7.2	+0.0 220	37.6	46.0	-8.4	Horiz 100
^	813.718M	39.5	-27.7	+21.6	+7.2	+0.0 220	40.6	46.0	-5.4	Horiz 100
67	678.103M	38.7	-27.9	+20.1	+6.6	+0.0 154	37.5	46.0	-8.5	Horiz 99
68 QP	840.843M	35.6	-27.7	+22.0	+7.6	+0.0 199	37.5	46.0	-8.5	Vert 181
^	840.806M	38.9	-27.7	+22.0	+7.6	+0.0 199	40.8	46.0	-5.2	Vert 181
70 QP	718.796M	37.8	-27.8	+20.5	+6.8	+0.0 180	37.3	46.0	-8.7	Vert 108
^	718.790M	41.3	-27.8	+20.5	+6.8	+0.0 180	40.8	46.0	-5.2	Vert 108
^	718.801M	40.2	-27.8	+20.5	+6.8	+0.0 186	39.7	46.0	-6.3	Vert 106
73 QP	705.211M	37.9	-27.8	+20.4	+6.8	+0.0 217	37.3	46.0	-8.7	Horiz 100
^	705.219M	42.1	-27.8	+20.4	+6.8	+0.0 217	41.5	46.0	-4.5	Horiz 100
75 QP	786.557M	36.5	-27.7	+21.3	+7.0	+0.0 171	37.1	46.0	-8.9	Vert 121
^	786.561M	43.0	-27.7	+21.3	+7.0	+0.0 171	43.6	46.0	-2.4	Vert 121
77	827.256M	35.6	-27.7	+21.8	+7.4	+0.0 206	37.1	46.0	-8.9	Vert 195
78	786.569M	36.4	-27.7	+21.3	+7.0	+0.0 184	37.0	46.0	-9.0	Horiz 100
79	827.242M	35.5	-27.7	+21.8	+7.4	+0.0 216	37.0	46.0	-9.0	Horiz 117
80 QP	773.035M	36.6	-27.7	+21.1	+6.9	+0.0 214	36.9	46.0	-9.2	Horiz 100
^	773.019M	40.0	-27.7	+21.1	+6.9	+0.0 214	40.3	46.0	-5.7	Horiz 100
82 QP	203.499M	49.1	-26.7	+8.6	+3.3	+0.0 120	34.3	43.5	-9.2	Vert 139
^	203.458M	51.5	-26.7	+8.6	+3.3	+0.0 120	36.7	43.5	-6.8	Vert 139
^	203.478M	47.6	-26.7	+8.6	+3.3	+0.0 174	32.8	43.5	-10.7	Vert 214
85	515.397M	41.1	-27.8	+17.7	+5.7	+0.0 153	36.7	46.0	-9.3	Vert 106
86 QP	691.676M	37.5	-27.8	+20.2	+6.7	+0.0 191	36.6	46.0	-9.4	Vert 137
^	691.681M	40.2	-27.8	+20.2	+6.7	+0.0 191	39.3	46.0	-6.7	Vert 139
88	827.292M	35.0	-27.7	+21.8	+7.4	+0.0 159	36.5	46.0	-9.5	Vert 165

89	800.129M	35.8	-27.7	+21.4	+7.0	+0.0 184	36.5	46.0	-9.5	Horiz 100
90	434.002M	42.7	-27.4	+16.1	+5.0	+0.0 209	36.4	46.0	-9.6	Vert 104
91	732.356M QP	36.5	-27.7	+20.7	+6.9	+0.0 213	36.4	46.0	-9.6	Horiz 100
^	732.349M	39.5	-27.7	+20.7	+6.9	+0.0 213	39.4	46.0	-6.6	Horiz 100
93	637.411M	38.4	-28.0	+19.6	+6.3	+0.0 110	36.3	46.0	-9.7	Vert 155
94	732.355M QP	36.3	-27.7	+20.7	+6.9	+0.0 185	36.2	46.0	-9.8	Vert 100
^	732.319M	39.8	-27.7	+20.7	+6.9	+0.0 185	39.7	46.0	-6.3	Vert 100
96	610.306M	38.8	-27.8	+19.2	+6.0	+0.0 224	36.2	46.0	-9.8	Horiz 108
97	54.288M	48.6	-27.3	+7.3	+1.6	+0.0 99	30.2	40.0	-9.8	Horiz 337
98	596.701M	39.1	-27.8	+19.0	+5.9	+0.0 224	36.2	46.0	-9.8	Horiz 107
99	840.838M QP	34.3	-27.7	+22.0	+7.6	+0.0 216	36.2	46.0	-9.8	Horiz 100
^	840.839M	37.6	-27.7	+22.0	+7.6	+0.0 216	39.5	46.0	-6.5	Horiz 100
101	813.718M QP	35.0	-27.7	+21.6	+7.2	+0.0 191	36.1	46.0	-9.9	Vert 184
^	813.718M	38.5	-27.7	+21.6	+7.2	+0.0 191	39.6	46.0	-6.4	Vert 184
103	800.133M	35.3	-27.7	+21.4	+7.0	+0.0 183	36.0	46.0	-10.0	Vert 187
104	583.140M	39.1	-27.8	+18.8	+5.9	+0.0 212	36.0	46.0	-10.0	Vert 172
105	759.477M QP	35.8	-27.7	+21.0	+6.9	+0.0 208	36.0	46.0	-10.1	Horiz 100
^	759.471M	39.1	-27.7	+21.0	+6.9	+0.0 208	39.3	46.0	-6.7	Horiz 100
107	325.541M	44.7	-26.7	+13.5	+4.3	+0.0 233	35.8	46.0	-10.2	Horiz 100
108	678.065M	36.7	-27.9	+20.1	+6.6	+0.0 73	35.5	46.0	-10.5	Vert 139
109	664.505M	37.0	-27.9	+19.9	+6.5	+0.0 236	35.5	46.0	-10.5	Vert 139
110	257.747M	46.1	-26.5	+12.1	+3.7	+0.0 216	35.4	46.0	-10.6	Horiz 100
111	664.564M	36.8	-27.9	+19.9	+6.5	+0.0 147	35.3	46.0	-10.7	Horiz 99
112	81.446M	47.5	-27.2	+6.9	+2.0	+0.0 252	29.2	40.0	-10.8	Horiz 186
113	393.327M	42.0	-27.1	+15.2	+5.0	+0.0 202	35.1	46.0	-10.9	Horiz 141
114	501.830M	40.0	-27.8	+17.4	+5.5	+0.0 141	35.1	46.0	-10.9	Horiz 100

115	542.493M	38.7	-27.8	+18.2	+5.9	+0.0 232	35.0	46.0	-11.0	Horiz 121
116	596.758M	37.9	-27.8	+19.0	+5.9	+0.0 227	35.0	46.0	-11.0	Horiz 100
117	108.565M	47.1	-27.2	+10.1	+2.4	+0.0 117	32.4	43.5	-11.1	Horiz 186
118	379.779M	42.1	-27.0	+14.9	+4.9	+0.0 193	34.9	46.0	-11.1	Horiz 141
119	501.822M	39.7	-27.8	+17.4	+5.5	+0.0 221	34.8	46.0	-11.2	Vert 101
120	610.313M QP	37.3	-27.8	+19.2	+6.0	+0.0 274	34.7	46.0	-11.3	Vert 178
^	610.290M	42.5	-27.8	+19.2	+6.0	+0.0 274	39.9	46.0	-6.1	Vert 178
122	745.868M QP	34.7	-27.7	+20.8	+6.9	+0.0 184	34.7	46.0	-11.3	Vert 100
^	745.859M	39.6	-27.7	+20.8	+6.9	+0.0 184	39.6	46.0	-6.4	Vert 100
124	162.765M	46.3	-26.9	+9.8	+2.9	+0.0 52	32.1	43.5	-11.4	Vert 100
125	352.671M	42.6	-26.8	+14.3	+4.5	+0.0 244	34.6	46.0	-11.4	Horiz 104
126	474.694M	39.9	-27.7	+16.9	+5.3	+0.0 210	34.4	46.0	-11.6	Vert 100
127	176.368M	47.3	-26.8	+8.4	+3.0	+0.0 231	31.9	43.5	-11.6	Horiz 101
128	569.635M QP	37.5	-27.8	+18.6	+6.0	+0.0 171	34.3	46.0	-11.7	Vert 178
^	569.621M	43.0	-27.8	+18.6	+6.0	+0.0 171	39.8	46.0	-6.2	Vert 178
130	528.953M	38.4	-27.8	+17.9	+5.8	+0.0 223	34.3	46.0	-11.7	Vert 99
131	271.271M	44.6	-26.5	+12.4	+3.8	+0.0 195	34.3	46.0	-11.7	Vert 178
132	989.959M	37.0	-27.0	+24.1	+8.0	+0.0 174	42.1	54.0	-11.9	Vert 144
133	67.897M	47.6	-27.2	+5.8	+1.9	+0.0 259	28.1	40.0	-11.9	Horiz 297
134	189.930M	46.5	-26.7	+8.3	+3.2	+0.0 234	31.3	43.5	-12.2	Horiz 139
135	623.873M QP	36.1	-27.9	+19.4	+6.1	+0.0 251	33.7	46.0	-12.3	Vert 155
^	623.856M	42.2	-27.9	+19.4	+6.1	+0.0 251	39.8	46.0	-6.2	Vert 155
137	637.412M	35.8	-28.0	+19.6	+6.3	+0.0 217	33.7	46.0	-12.3	Horiz 99
138	189.903M	46.2	-26.7	+8.3	+3.2	+0.0 190	31.0	43.5	-12.5	Vert 100
139	989.996M	36.3	-27.0	+24.1	+8.0	+0.0 202	41.4	54.0	-12.6	Horiz 116
140	650.987M	35.2	-28.0	+19.7	+6.4	+0.0 281	33.3	46.0	-12.7	Vert 139

141	284.811M	43.3	-26.5	+12.6	+3.9	+0.0 273	33.3	46.0	-12.7	Horiz 100
142	569.570M	36.5	-27.8	+18.6	+6.0	+0.0 229	33.3	46.0	-12.7	Horiz 141
143	461.112M	38.8	-27.6	+16.7	+5.1	+0.0 210	33.0	46.0	-13.0	Vert 100
144	176.378M	45.9	-26.8	+8.4	+3.0	+0.0 178	30.5	43.5	-13.0	Vert 100
145	257.712M	43.6	-26.5	+12.1	+3.7	+0.0 214	32.9	46.0	-13.1	Vert 101
146	230.596M	45.2	-26.5	+10.7	+3.4	+0.0 213	32.8	46.0	-13.2	Vert 167
147	962.850M	36.1	-27.1	+23.7	+7.9	+0.0 217	40.6	54.0	-13.4	Horiz 116
148	650.982M	34.4	-28.0	+19.7	+6.4	+0.0 211	32.5	46.0	-13.5	Horiz 99
149	230.608M	44.9	-26.5	+10.7	+3.4	+0.0 214	32.5	46.0	-13.5	Vert 101
150	217.061M	45.6	-26.6	+9.7	+3.4	+0.0 139	32.1	46.0	-13.9	Horiz 113
151	962.836M	35.5	-27.1	+23.7	+7.9	+0.0 194	40.0	54.0	-14.0	Vert 162
152	257.741M	42.7	-26.5	+12.1	+3.7	+0.0 197	32.0	46.0	-14.0	Vert 100
153	406.882M	38.3	-27.2	+15.6	+5.1	+0.0 207	31.8	46.0	-14.2	Horiz 145
154	420.426M	38.2	-27.3	+15.8	+5.1	+0.0 155	31.8	46.0	-14.2	Horiz 168
155	447.587M	37.5	-27.5	+16.4	+5.0	+0.0 139	31.4	46.0	-14.6	Horiz 194
156	976.417M	34.5	-27.1	+23.9	+7.9	+0.0 216	39.2	54.0	-14.8	Horiz 116
157	230.621M	43.5	-26.5	+10.7	+3.4	+0.0 239	31.1	46.0	-14.9	Horiz 100
158	244.179M	42.2	-26.5	+11.6	+3.6	+0.0 245	30.9	46.0	-15.1	Horiz 100
159	108.550M	43.0	-27.2	+10.1	+2.4	+0.0 76	28.3	43.5	-15.2	Vert 100
160	583.188M	33.8	-27.8	+18.8	+5.9	+0.0 225	30.7	46.0	-15.3	Horiz 108
161	488.270M	35.8	-27.7	+17.2	+5.4	+0.0 221	30.7	46.0	-15.3	Vert 101
162	339.111M	39.0	-26.7	+13.9	+4.4	+0.0 232	30.6	46.0	-15.4	Horiz 107
163	474.707M	36.0	-27.7	+16.9	+5.3	+0.0 171	30.5	46.0	-15.5	Horiz 159
164	122.116M	41.6	-27.2	+11.0	+2.5	+0.0 11	27.9	43.5	-15.6	Vert 100
165	122.122M	41.1	-27.2	+11.0	+2.5	+0.0 271	27.4	43.5	-16.1	Horiz 186
166	528.934M	34.0	-27.8	+17.9	+5.8	+0.0 221	29.9	46.0	-16.1	Horiz 121

167	217.038M	43.2	-26.6	+9.7	+3.4	+0.0 179	29.7	46.0	-16.3	Vert 183
168	556.035M	33.0	-27.8	+18.4	+6.0	+0.0 218	29.6	46.0	-16.4	Horiz 138
169	135.681M	40.3	-27.1	+11.0	+2.6	+0.0 106	26.8	43.5	-16.7	Vert 100
170	244.167M	40.5	-26.5	+11.6	+3.6	+0.0 197	29.2	46.0	-16.8	Vert 100
171	135.677M	39.8	-27.1	+11.0	+2.6	+0.0 133	26.3	43.5	-17.2	Horiz 186
172	515.334M	33.2	-27.8	+17.7	+5.7	+0.0 205	28.8	46.0	-17.2	Horiz 115
173	488.245M	33.6	-27.7	+17.2	+5.4	+0.0 201	28.5	46.0	-17.5	Horiz 167
174	976.396M	31.5	-27.1	+23.9	+7.9	+0.0 167	36.2	54.0	-17.8	Vert 150
175	433.986M	33.8	-27.4	+16.1	+5.0	+0.0 162	27.5	46.0	-18.5	Horiz 194
176	298.389M	36.9	-26.5	+12.8	+4.1	+0.0 266	27.3	46.0	-18.7	Vert 211
177	271.265M	37.4	-26.5	+12.4	+3.8	+0.0 255	27.1	46.0	-18.9	Horiz 100
178	298.426M	36.2	-26.5	+12.8	+4.1	+0.0 246	26.6	46.0	-19.4	Horiz 100
179	366.219M	33.9	-26.9	+14.6	+4.7	+0.0 261	26.3	46.0	-19.7	Horiz 114
180	990.009M	36.9	-27.0	+24.1	+0.0	+0.0 174	34.0	54.0	-20.0	Vert 144