Test Report of

Radiated and Conducted Emissions Testing Performed on the ClearAccess and ClearCast

Issue Date: 08 August 2019

Prepared for: **Pro V&V, Inc.**
700 Boulevard South
Huntsville, AL 35802

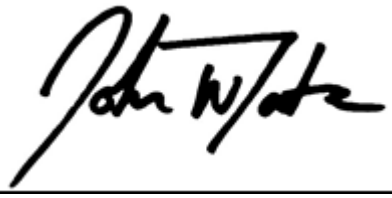
Prepared by: **National Technical Systems**
NTS Longmont
1736 Vista View Drive
Longmont, Colorado 80504

ACCREDITED
Certificate Number: 0214.43

SIGNATURES

Prepared by:  Date: 08 August 2019

Technical Writer, Greg Gagne

Reviewed by:  Date: 08 August 2019

Technical Reviewer, John Tate

REVISIONS

Revision	Reason for Revision	Date
NR	Initial Release	08 August 2019

Table of Contents

1.0 ADMINISTRATIVE DATA

1.1 PURPOSE OF TESTS

This report documents the test efforts performed on the ClearAccess/ClearCast to verify compliance to the Class B limits of CFR Title 47, FCC Part 15 and ICES-003. FCC Part 15 is the U.S. document which governs electromagnetic emissions from computing devices for conducted and radiated emissions, respectively. This was a formal qualification test and was conducted from 15-24 July 2019.

The emission limits applied to the product tested are defined in CFR Title 47. The UUT was set up as specified in CISPR 16.

The normative references of this standard define the test methods used for the emissions testing. These standards are contained in Table 1-1.

Table 1-1: Standards Table

CFR Title 47 FCC Part 15	ICES-003, Issue 6, 2016
ANSI C63.4: 2014	EAC 2005 VVSG Volumes I and II

1.2 DESCRIPTION OF TEST ITEM

The UUT is a ballot marking device (Configuration 1)/precinct tabulator (Configuration 2) designed for use in “voting during elections” environments.

1.3 MANUFACTURER

Clear Ballot Group
700 Boulevard South, Suite 102
Huntsville, AL 35802

1.4 REFERENCE DOCUMENTS

1. Quotation Number OP0521624 - 1
2. ISO 17025:2005

1.5 QUANTITY OF ITEMS TESTED

Quantity	Test Item Description	Part/Model Numbers	Serial Numbers
1	ClearAccess	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	A17C002919, AK76022990A0, PY3JN2000184
1	ClearCast	Model D	041902577

1.6 SECURITY CLASSIFICATION

Unclassified

1.7 TESTS CONDUCTED BY

National Technical Systems
NTS Longmont
1736 Vista View Drive
Longmont, Colorado 80504

1.8 DISPOSITION OF TEST ITEMS

Returned to:

Pro V&V, Inc.
700 Boulevard South
Huntsville, AL 35802

1.9 TEST ENVIRONMENT

1.9.1 Radiated Emissions Test Site

Radiated emissions testing was performed at a distance of 10-meters in a semi-anechoic 10-meter chamber. This chamber is calibrated annually and meets the volumetric site attenuation requirements of CISPR 16 at a distance of 10 meters. For measurements from 30 MHz to 1 GHz, a biconilog antenna is used in conjunction with a high-gain, low-noise preamplifier. This is connected to a spectrum analyzer with a Quasi-Peak (QP) Adapter, via an RF Preselector.

Radiated emissions testing is broken into two parts: pre-scan and QP/maximization. Pre-scanning a product from 30 MHz to 1 GHz consists of measuring peak emissions from eight radials (every 45 degrees), at four antenna heights (1 m, 2 m, 3 m and 4 m) for both antenna polarities. Data is recorded in a graph showing amplitude vs. frequency of the emissions, and frequencies for QP/maximization are chosen based on this graph. The procedure for maximizing emissions is as follows:

1. The analyzer is tuned to the frequency associated with the emissions having the least margin.
2. The turntable and antenna mast are moved to the location where the maximum emission was measured during the pre-scan.
3. Both are then oriented such that the maximum emission is obtained.
4. Cables on the UUT are manually manipulated to achieve the maximum emission.
5. The turntable and antenna mast are then re-adjusted to ensure a

maximum reading.

6. If the signal in question is less than 1 GHz, quasi-peak detection is performed on the signal for a minimum of 10 seconds. For signals greater than 1 GHz, video averaging is performed.
7. Turntable/antenna mast maximization and QP detection are performed on all other signals within 6 dB of the limit. In the event that there are not six signals within 6 dB of the limit, the highest six signals are maximized. This ensures that a minimum of six signals are maximized and appear in the final data table.

In the event that emission measurements are required above 1 GHz, the antenna is changed to a double-ridged horn equipped with a preamplifier and run directly into the spectrum analyzer. The QP adapter and RF preselector are not used above 1 GHz.

Pre-scanning a product from 1-18 GHz is performed similarly, except that 16 radials (every 22.5 degrees) and three antenna heights (1 m, 1.5 m and 2 m) are used. A similar maximization process is used as for the lower frequency range, except that average measurements are performed, rather than QP measurements.

1.9.2 Conducted Emissions Test Site

Conducted emissions testing was performed on a 10’ by 10’ ground plane, which is bonded to the wall of the 10-meter chamber, using its wall as the vertical coupling plane. Line impedance stabilization networks (LISNs) was inserted in series with both the UUT and the support equipment. The LISNs used were standard 50 Ω/50 µH LISNs which complied with the requirements of CISPR 16. These LISNs are calibrated annually for both complex impedance and insertion loss. Measurement equipment used was a spectrum analyzer with a QP adapter. In addition, a transient limiter and a high-pass filter are used to protect the front-end of the receiver from transients and low-frequency noise, respectively.

1.9.3 Measurement Uncertainty

The measurement uncertainty for NTS’s emissions test facility complies with the requirements defined in CISPR 16. The complete calculations of NTS’s measurement uncertainty are contained in an NTS memo, which is available upon request. However, a summary of NTS’s measurement uncertainty is given in Table 1-2.

Table 1-2: Measurement Uncertainty

Test	Requirement	Actual
Conducted Emissions	3.60 dB	3.04 dB
Radiated Emissions – Horizontal Polarity	5.20 dB	4.67 dB
Radiated Emissions – Vertical Polarity	5.20 dB	5.01 dB

1.10 TEST APPARATUS

The instrumentation used in the performance of these tests is periodically calibrated and standardized within manufacturer's rated accuracies and are traceable to the National Institute of Standards and Technology. The calibration procedures and practices are in accordance with ISO 17025:2005. Certification of calibration is on file subject to inspection by authorized personnel.

1.11 SOURCE INSPECTION

NTS QA

1.12 PURCHASE ORDER NUMBER

2019-011

2.0 TEST RESULTS SUMMARY

Table 2-1: Summary of Test Results

Test	Specification	Test Dates	Results
Radiated Emissions	CFR Title 47, FCC Part 15	15-24 July 2019	Complies
Conducted Emissions	CFR Title 47, FCC Part 15	16-24 July 2019	Complies

3.0 RADIATED EMISSIONS TEST

3.1 REFERENCES

CFR Title 47, FCC Part 15

3.2 SERIAL NUMBERS

Table 3-1: Serial Numbers

A17C002919, AK76022990A0, PY3JN2000184
041902577

3.3 TEST PROCEDURE

The UUT was set up for Radiated Emissions Testing in accordance with CFR Title 47, FCC Parts 15 and tested to Class B limits specified in CFR Title 47, FCC Parts 15.107 and 15.109. The UUT was set up as specified in ANSI C63.4: 2014.

Radiated electric field emissions were measured on the UUT over the frequency range from 30 MHz to 1 GHz. The UUT was powered by 120 VAC/60 Hz, configured in its “printing ballots” mode, and exercised continually during testing. Cables were oriented such that the maximum emission was achieved and quasi-peak detection was performed on all signals (minimum of six) used in the final data table.

3.4 SPECIAL CONFIGURATIONS

N/A

3.5 TEST RESULTS

Radiated Emissions Test Data is presented in Appendix A.

Configuration	Test Input Voltage	Test Result	Margin dB	Frequency MHz
1	120 VAC / 60 Hz	Complies	0.73	666.676
2	120 VAC / 60 Hz	Complies	3.88	231.729

4.0 CONDUCTED EMISSIONS TEST

4.1 REFERENCES

CFR Title 47, FCC Part 15

4.2 SERIAL NUMBERS

Table 4-1: Serial Numbers

A17C002919, AK76022990A0, PY3JN2000184
041902577

4.3 TEST PROCEDURE

The UUT was set up for Radiated Emissions Testing in accordance with CFR Title 47, FCC Parts 15 and tested to Class B limits specified in CFR Title 47, FCC Parts 15.107 and 15.109. The UUT was set up as specified in ANSI C63.4: 2014.

Conducted emissions were measured on the AC power input of the UUT over the frequency range from 150 kHz to 30 MHz. With the UUT configured in its "printing ballots" mode, testing was performed with UUT powered from 120 VAC/60 Hz. The input power to the UUT was run through a standard 50 Ω/50 µH line impedance stabilization network (LISN) which complied with the requirements of CISPR 16. Emissions were compared to both quasi-peak (QP) and average limits, with QP detection and averaging performed on the six highest signals.

4.4 SPECIAL CONFIGURATIONS

N/A

4.5 TEST RESULTS

Conducted Emissions Test Data is presented in Appendix B.

Configuration	Test Input Voltage	Test Result	Margin dB	Frequency MHz
1	120 VAC / 60 Hz	Complies	8.03	15.663
2	120 VAC / 60 Hz	Complies	8.59	0.584

APPENDIX A: Radiated Emissions Test Data

Configuration 1:

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 15, 2019
Temperature:	26˚C Humidity: 47%	Pressure:	839mb
Input Voltage:	120Vac/60Hz		
Configuration of Unit:	Printing ballots		
Test Engineer:	Kevin Johnson		

PR100763-11-RE.doc FR0100

Type	Frequency (MHz)	Level (dBuV)	Transducer (dB/m)	Gain / Loss (dB)	Final (dBuV/m)	Azm(deg)/Pol/Hgt(m)	Margin: FCC Class B QP (dB)
QP	30.361	25.6	25.1	-29.7	21.0	211/V-Pole/3.83	8.53
QP	60.054	39.9	11.7	-29.2	22.4	85/V-Pole/2.40	7.17
QP	72.039	40.9	12.3	-28.9	24.2	66/V-Pole/1.80	5.31
QP	84.222	34.2	11.7	-28.7	17.2	252/V-Pole/2.09	12.36
QP	96.001	34.2	13.3	-28.5	19.0	82/V-Pole/1.41	14.05
QP	528.000	36.0	22.2	-27.8	30.4	137/V-Pole/2.50	5.13
QP	624.997	34.8	23.5	-27.6	30.7	358/V-Pole/1.91	4.85
QP	666.676	38.2	24.1	-27.5	34.8	184/V-Pole/2.00	0.73

The highest emission measured was at **666.676 MHz,** which was **0.73 dB** below the limit.

- "Type" refers to the type of measurement performed. The type of measurement made is based on the requirements of the particular standard:
  - PK = Peak Measurement: RBW is 120kHz, VBW is 3 MHz
  - QP = Quasi-Peak Measurement: RBW is 120kHz, VBW is 3 MHz, and QP Detection is ENABLED
  - AV = Video Average Measurement: RBW is 1 MHz, VBW is 10 Hz
- The "field strength" (FS) emissions level is attained by adding the received amplitude measured (RA), Antenna factor (AF), and cable factor (CF) minus the amplifier gain (AG). FS = RA + AF + CF – AG .Final measurements are made with the Azimuth, Polarity, Height, and EUT Cables positioned for maximum radiation. If applicable, cables positions are noted in the test log. (Sample Calculation: 49.6 dBuV + 11.4 dB/m – 28.8 dB (CF/AG) = 32.2 dBuV/m. **Important Note**: This is a sample calculation only for the purpose of demonstration, and does not reflect data in this report.)
- The "Azm/Pol/Hgt" indicates the turn-table *azimuth*, the antenna *polarity*, and the antenna *height* where the maximum emissions level was measured.
- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The PRESCAN is a peak measurement and is performed with the RBW set to 120 kHz, VBW set to 3 MHz (30 MHz to 1 GHz), and the RBW set to 1 MHz, VBW set to 100 kHz (> 1 GHz)

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK760 22990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 15, 2019

PR100763-11-RE.doc FR0100

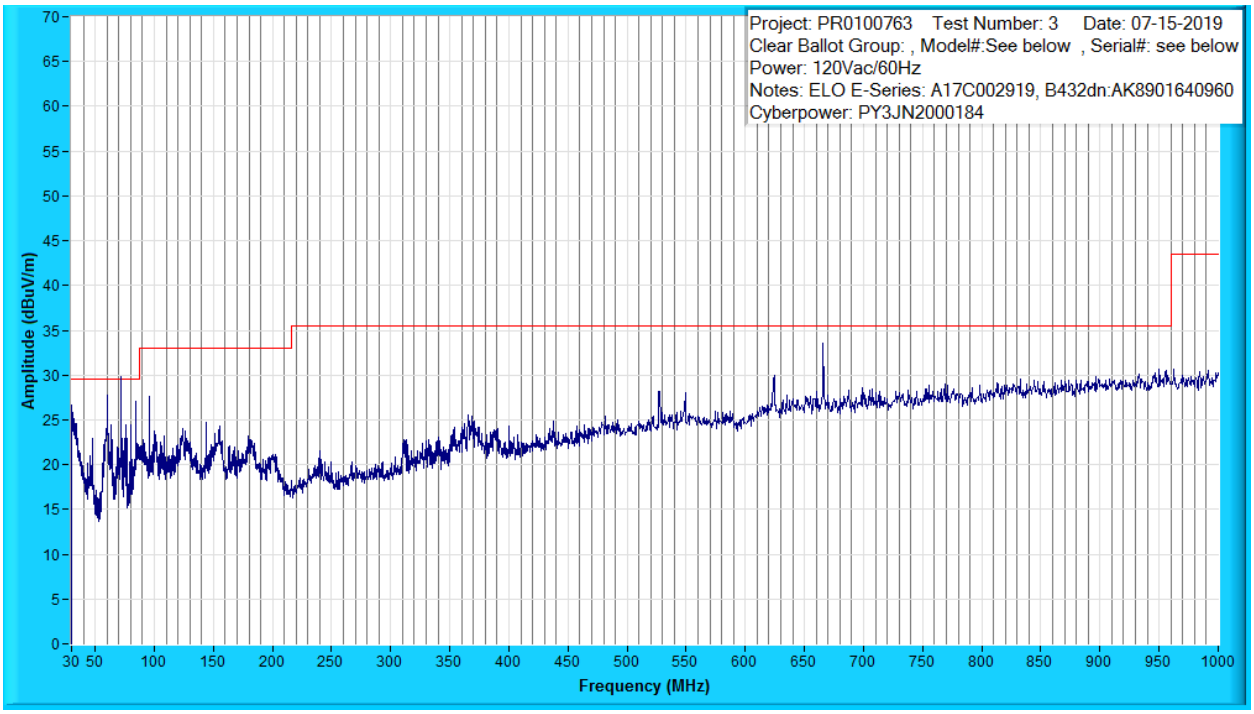


Figure A1: Radiated Emissions Prescan, 30MHz to 1000MHz, Peak Measurements at 10m Distance

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 15, 2019

PR100763-11-RE.doc FR0100

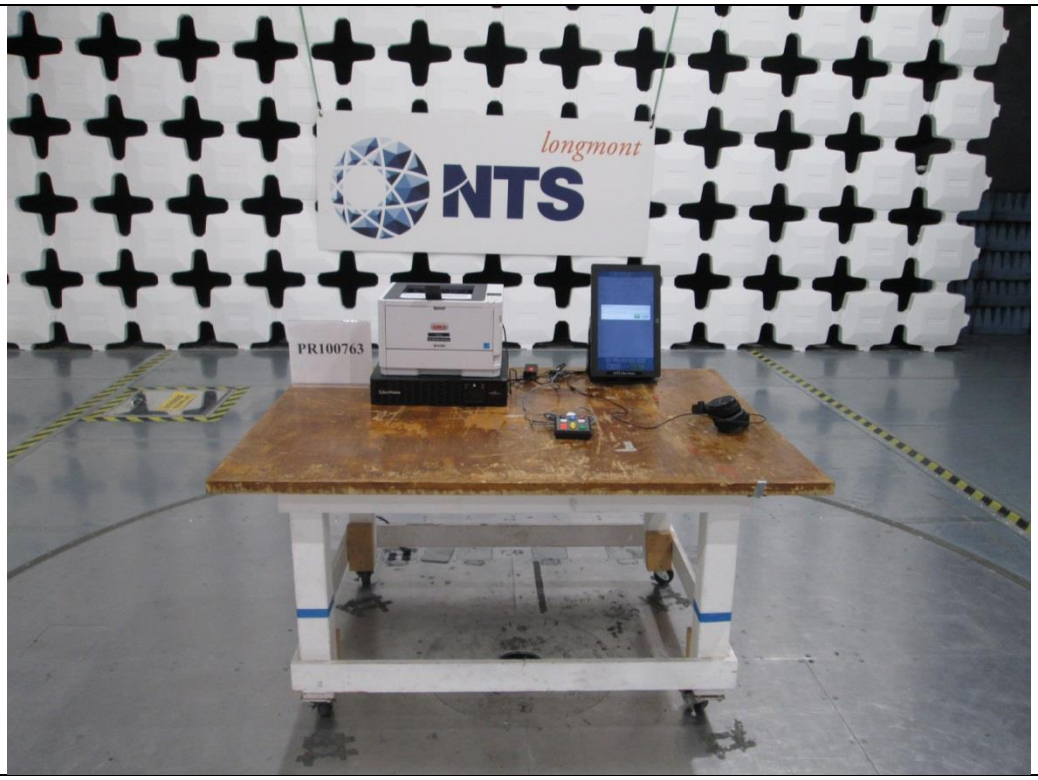


Figure A2: Radiated Emissions Test Setup – Front Side

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 15, 2019

PR100763-11-RE.doc FR0100

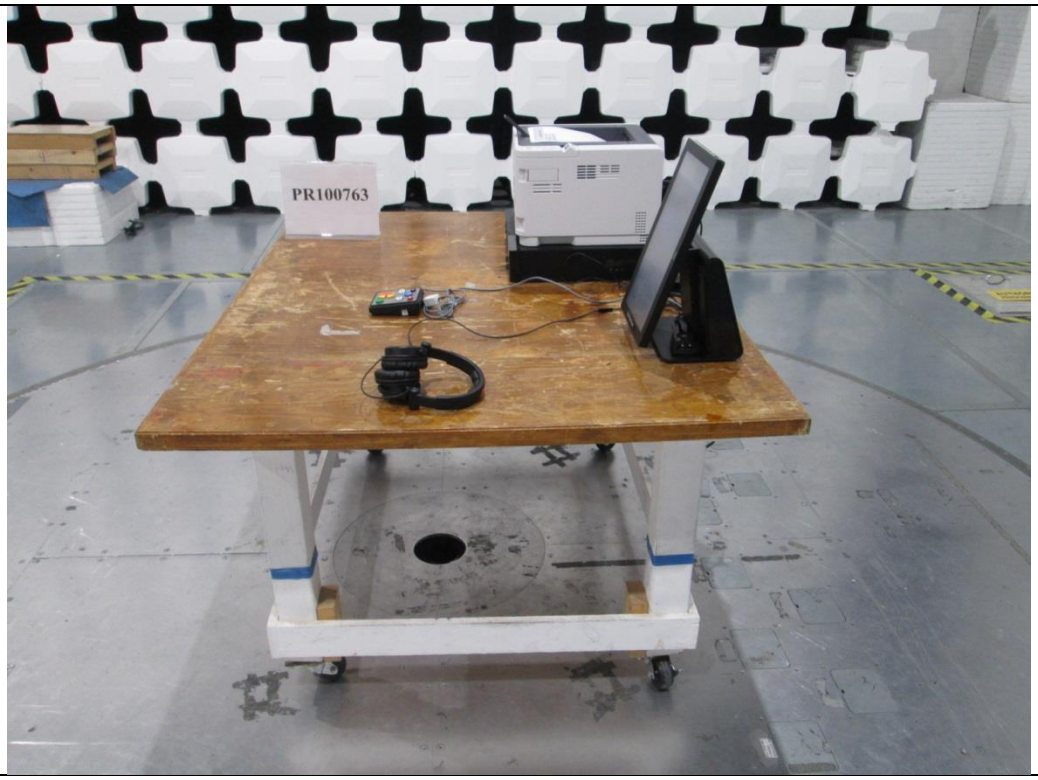


Figure A3: Radiated Emissions Test Setup – Right Side

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 15, 2019

PR100763-11-RE.doc FR0100

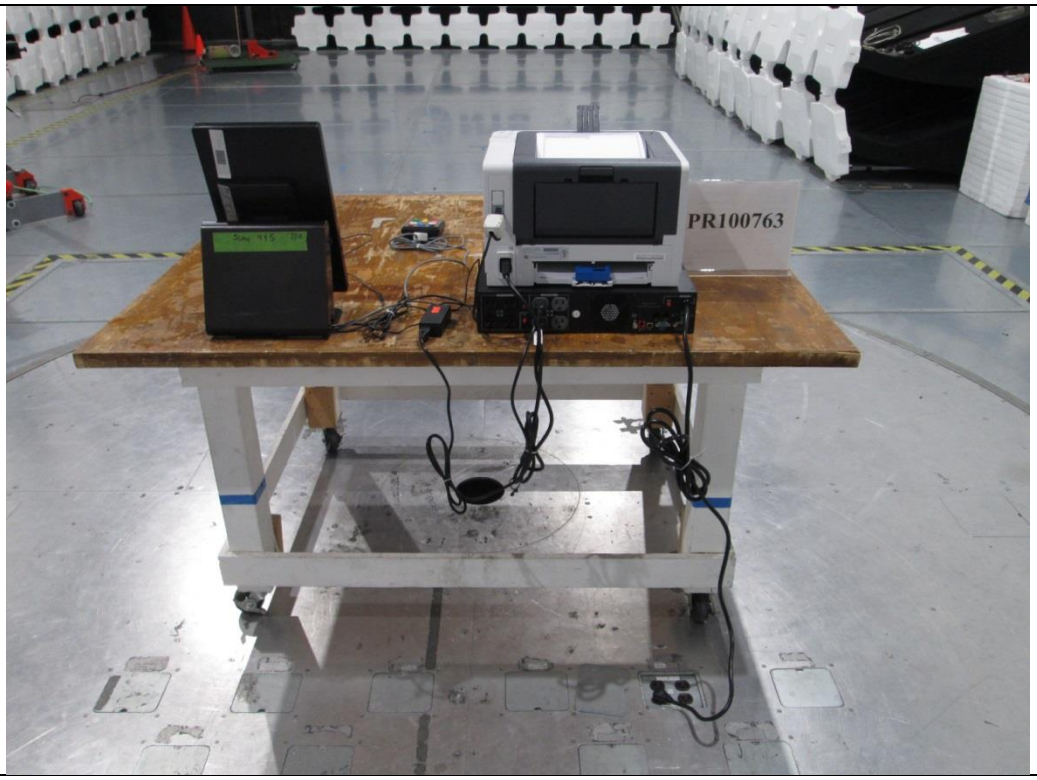


Figure A4: Radiated Emissions Test Setup – Back Side

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 15, 2019

PR100763-11-RE.doc FR0100

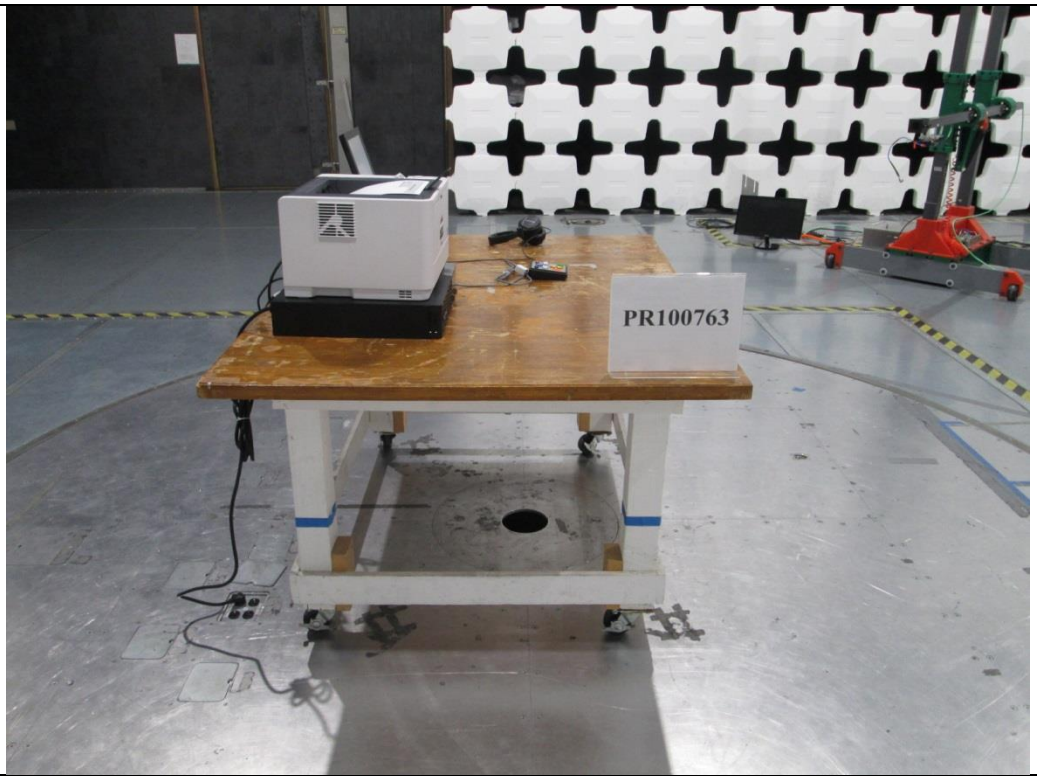


Figure A5: Radiated Emissions Test Setup –Left Side

Radiated Emissions, CISPR / EN 55011

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 15, 2019

PR100763-11-RE.doc FR0100

Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1220	Mini-Circuits	ZKL-2	NA	Preamp, 10 - 2000 MHz, 30 dB	11/18/2018	11/18/2019
1223	Hewlett Packard	85650A	3303A01859	Quasi-Peak Adaptor	09/14/2018	09/14/2019
1232	Sunol Sciences	JB1	A071605-2	Bilog Antenna, 30 MHz to 2.0 GHz	09/11/2018	09/11/2019
1335	Hewlett Packard	85662A	2542A10937	Spectrum Analyzer Display	09/14/2018	09/14/2019
1336	Hewlett Packard	8566B	2532A02062	Spectrum Analyzer RF Section	09/14/2018	09/14/2019
1338	Hewlett Packard	85685A	3506A01551	RF Preselector	09/14/2018	09/14/2019
1396	CIR Enterprises	10m Chamber #2	002	10m Chamber with 4m turntable	03/29/2018	03/29/2020
1410	Sunol Sciences	SC110V	021611-1	System Controller 10meter #2	NA	NA
1492	Fluke	87/5 Multimeter	23350032	True RMS Multimeter	05/09/2019	05/09/2020
1500	Pacific Power Source	3060-MS/M93235	0871_08097	62KVA-175 AMP, Frequency 47-500Hz, Power Supply	NA	NA
1592	EMCI	CEAS	V4.1.2	Commercial Emissions Automation Software - 10M # 2	NA	NA

Configuration 2:

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019
Temperature:	75˚C Humidity: 54%	Pressure:	842 mb
Input Voltage:	120Vac/60Hz		
Configuration of Unit:	Printing ballots		
Test Engineer:	Mike Tidquist		

PR100763-11-RE.doc FR0100

Type	Frequency (MHz)	Level (dBuV)	Transducer (dB/m)	Gain / Loss (dB)	Final (dBuV/m)	Azm(deg)/Pol/Hgt(m)	Margin: FCC Class B QP (dB)
QP	30.575	28.2	25.0	-29.7	23.4	138/V-Pole/3.62	6.12
QP	38.442	33.5	19.3	-29.7	23.2	300/H-Pole/3.98	6.38
QP	133.250	39.4	18.1	-28.7	28.7	340/V-Pole/4.00	4.30
QP	231.729	44.6	15.4	-28.3	31.7	296/V-Pole/1.00	3.88
QP	382.811	37.2	19.3	-28.2	28.3	168/V-Pole/3.07	7.20
QP	700.346	25.4	24.5	-27.3	22.6	200/V-Pole/1.00	12.93
QP	882.921	25.1	26.4	-27.2	24.2	44/H-Pole/1.01	11.29
QP	993.318	24.8	27.6	-27.3	25.1	225/V-Pole/1.01	18.35

The highest emission measured was at **231.729 MHz,** which was **3.88 dB** below the limit.

- "Type" refers to the type of measurement performed. The type of measurement made is based on the requirements of the particular standard:
  - PK = Peak Measurement: RBW is 120kHz, VBW is 3 MHz
  - QP = Quasi-Peak Measurement: RBW is 120kHz, VBW is 3 MHz, and QP Detection is ENABLED
  - AV = Video Average Measurement: RBW is 1 MHz, VBW is 10 Hz
- The "field strength" (FS) emissions level is attained by adding the received amplitude measured (RA), Antenna factor (AF), and cable factor (CF) minus the amplifier gain (AG). FS = RA + AF + CF – AG .Final measurements are made with the Azimuth, Polarity, Height, and EUT Cables positioned for maximum radiation. If applicable, cables positions are noted in the test log. (Sample Calculation: 49.6 dBuV + 11.4 dB/m – 28.8 dB (CF/AG) = 32.2 dBuV/m. **Important Note**: This is a sample calculation only for the purpose of demonstration, and does not reflect data in this report.)
- The "Azm/Pol/Hgt" indicates the turn-table *azimuth*, the antenna *polarity*, and the antenna *height* where the maximum emissions level was measured.
- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The PRESCAN is a peak measurement and is performed with the RBW set to 120 kHz, VBW set to 3 MHz (30 MHz to 1 GHz), and the RBW set to 1 MHz, VBW set to 100 kHz (> 1 GHz)

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-RE.doc FR0100

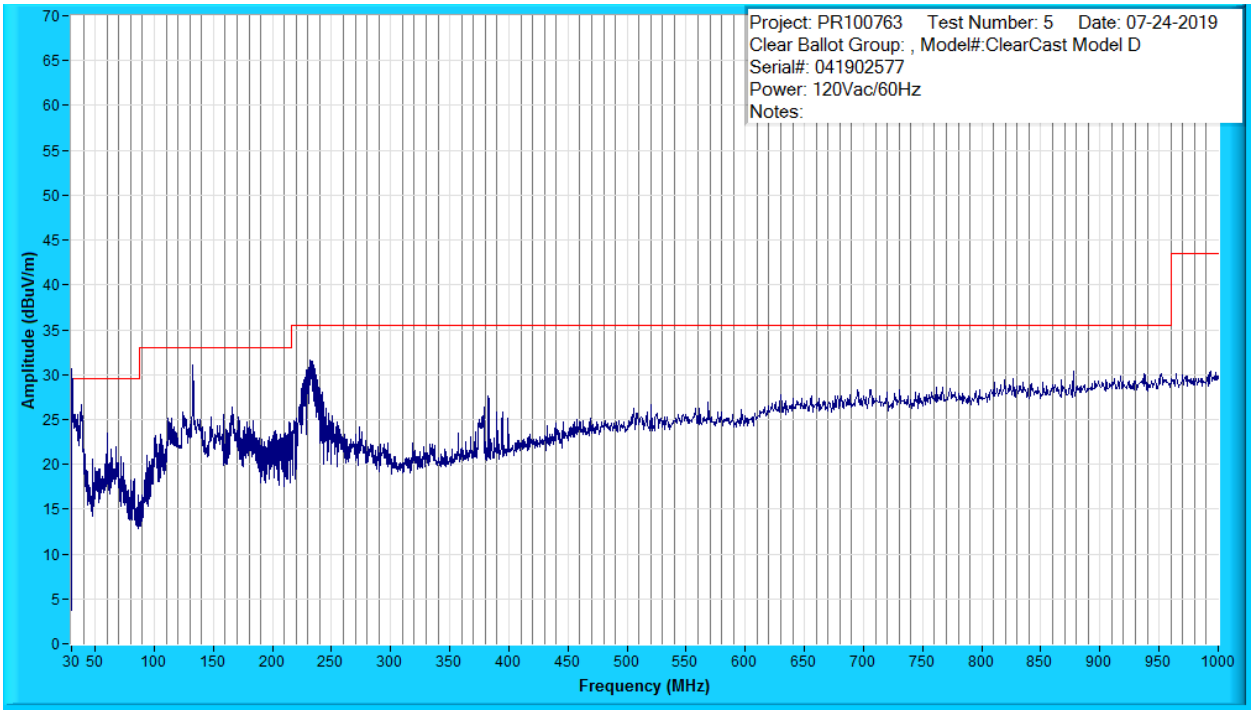


Figure A1: Radiated Emissions Prescan, 30MHz to 1000MHz, Peak Measurements at 10m Distance

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-RE.doc FR0100

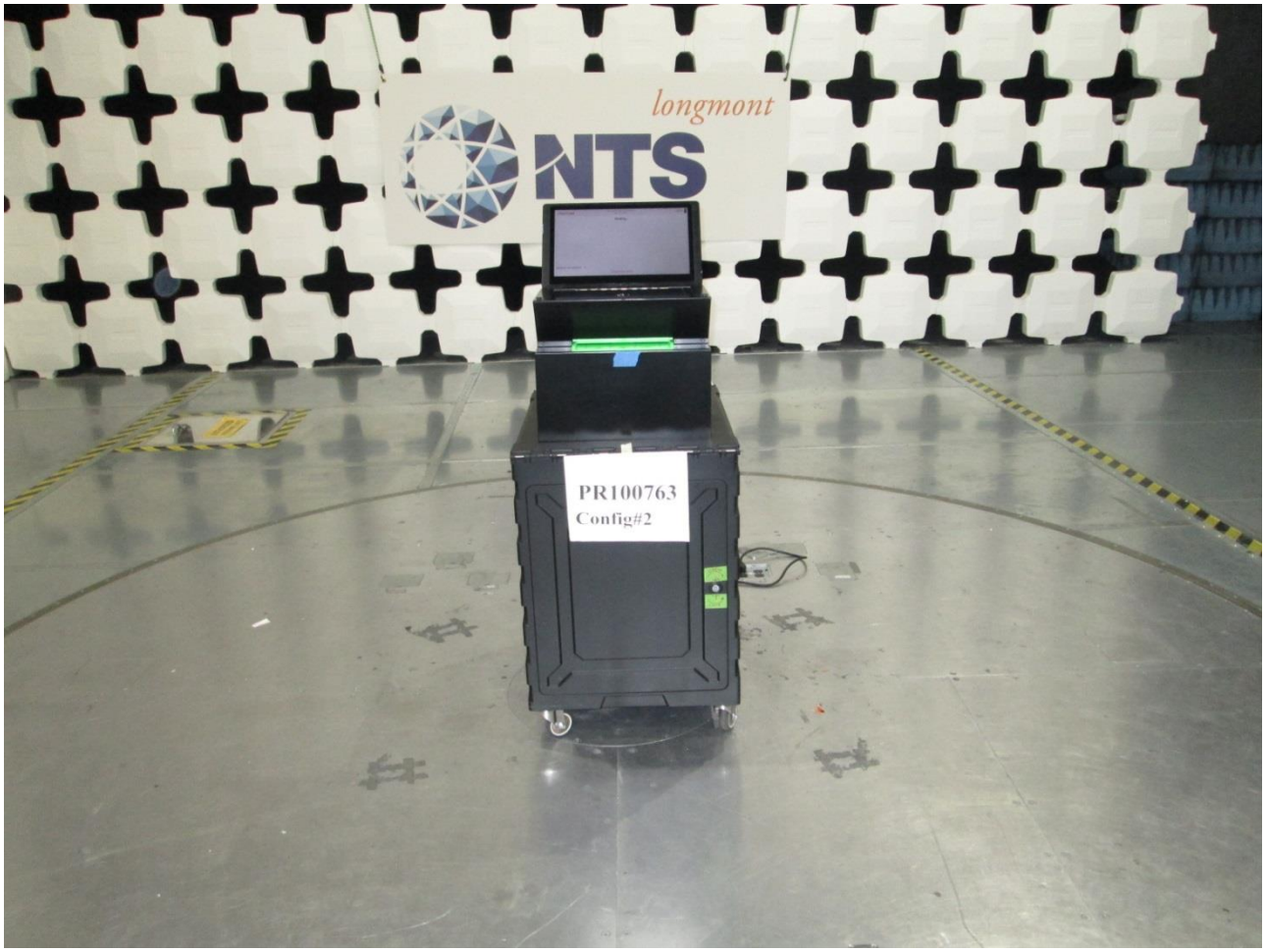


Figure A2: Radiated Emissions Test Setup – Front Side

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-RE.doc FR0100

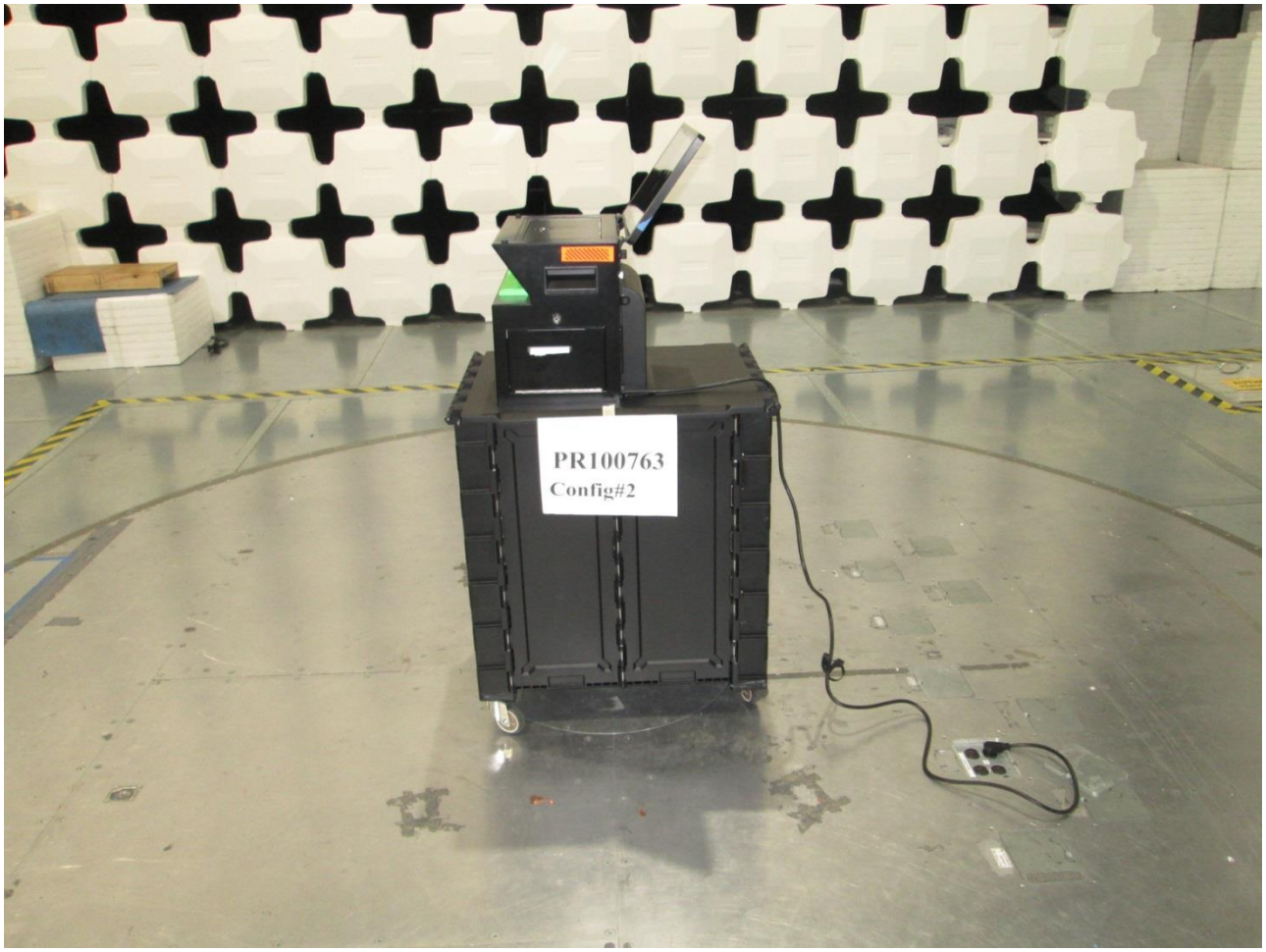


Figure A3: Radiated Emissions Test Setup – Right Side

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-RE.doc FR0100

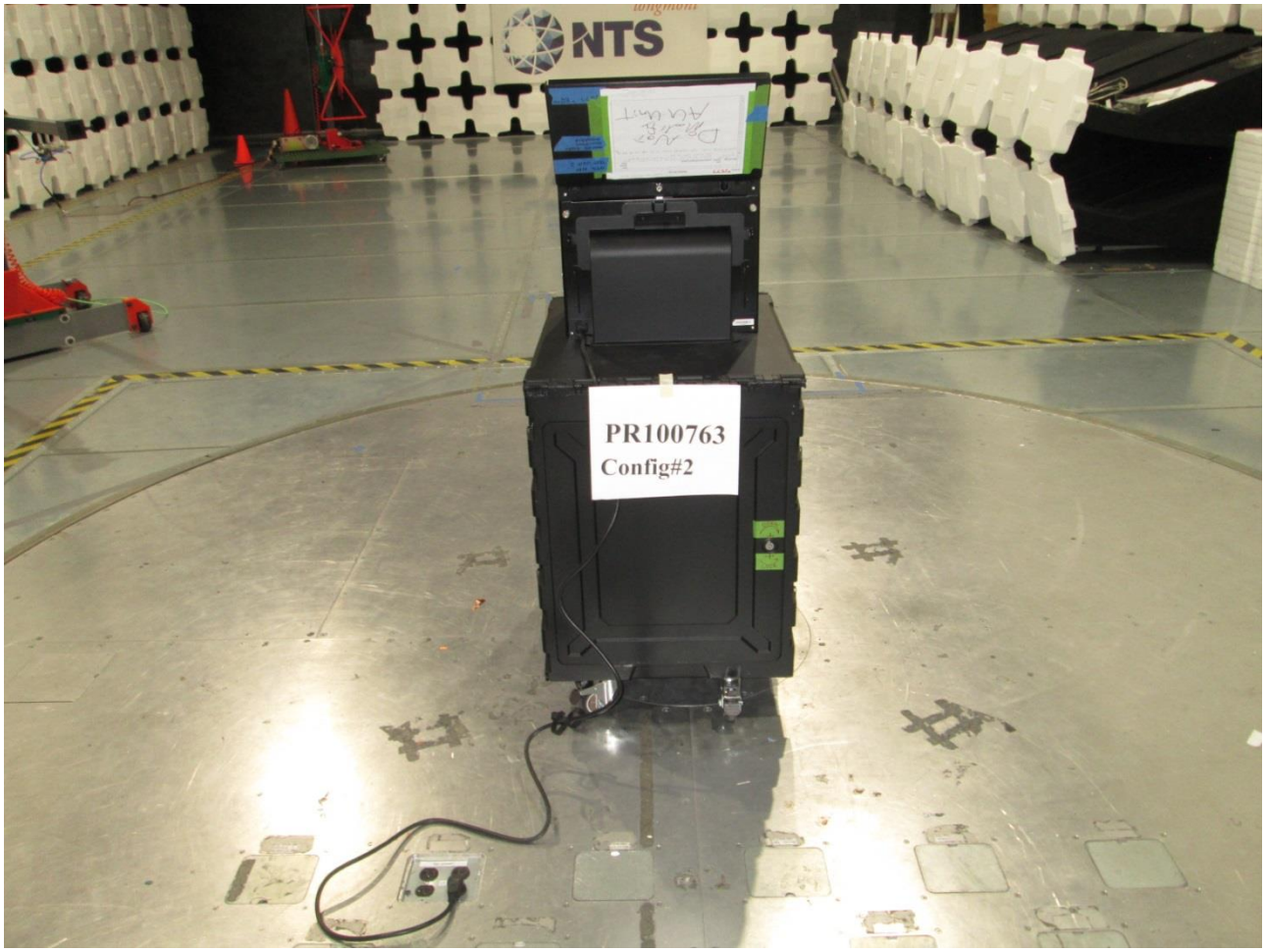


Figure A4: Radiated Emissions Test Setup – Back Side

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-RE.doc FR0100

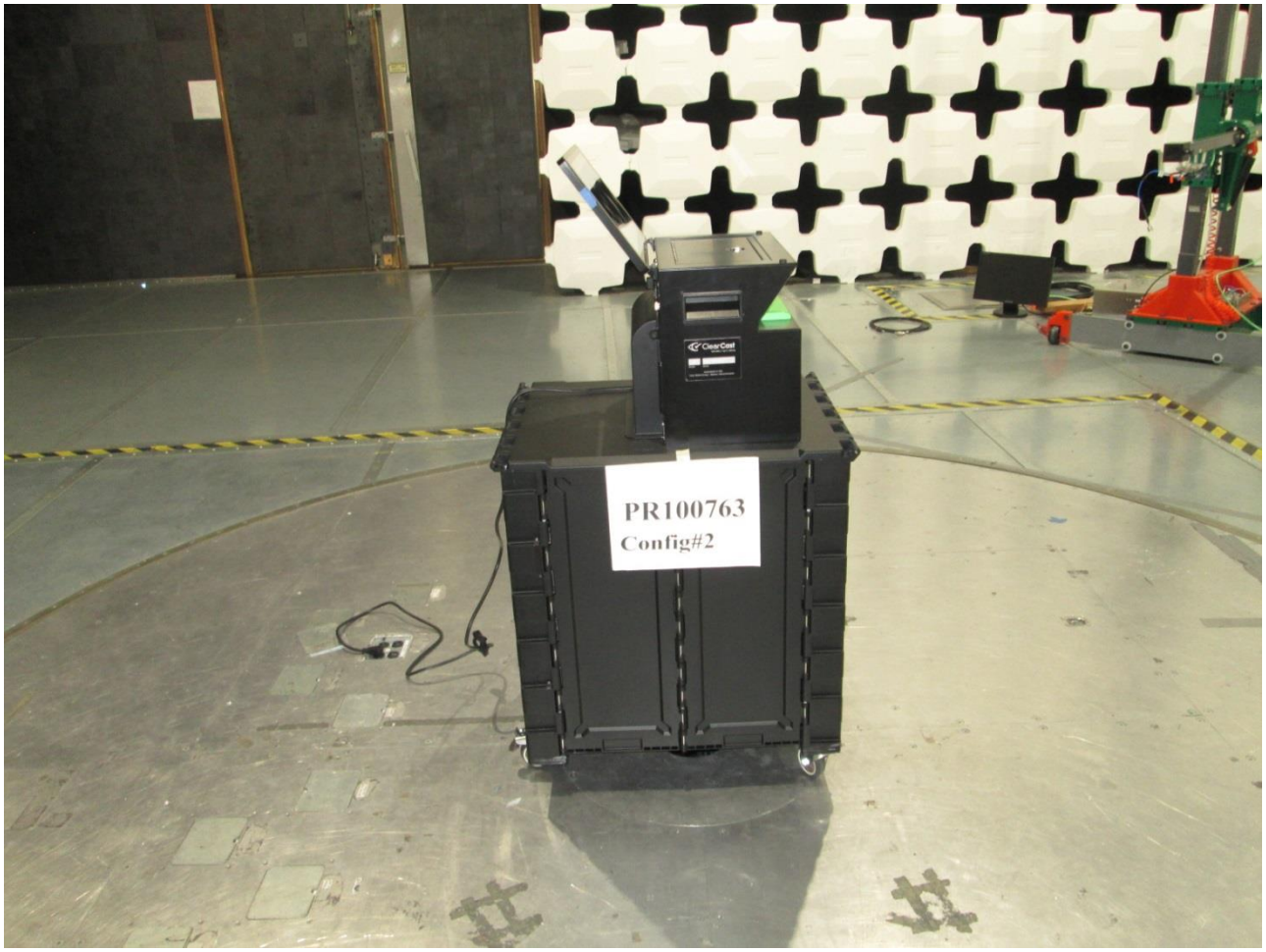


Figure A5: Radiated Emissions Test Setup – Left Side

Radiated Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-RE.doc FR0100

Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1220	Mini-Circuits	ZKL-2	NA	Preamp, 10 - 2000 MHz, 30 dB	11/18/2018	11/18/2019
1223	Hewlett Packard	85650A	3303A01859	Quasi-Peak Adaptor	09/14/2018	09/14/2019
1232	Sunol Sciences	JB1	A071605-2	Bilog Antenna, 30 MHz to 2.0 GHz	09/11/2018	09/11/2019
1335	Hewlett Packard	85662A	2542A10937	Spectrum Analyzer Display	09/14/2018	09/14/2019
1336	Hewlett Packard	8566B	2532A02062	Spectrum Analyzer RF Section	09/14/2018	09/14/2019
1338	Hewlett Packard	85685A	3506A01551	RF Preselector	09/14/2018	09/14/2019
1396	CIR Enterprises	10m Chamber #2	002	10m Chamber with 4m turntable	03/29/2018	03/29/2020
1410	Sunol Sciences	SC110V	021611-1	System Controller 10meter #2	NA	NA
1492	Fluke	87/5 Multimeter	23350032	True RMS Multimeter	05/09/2019	05/09/2020
1500	Pacific Power Source	3060-MS/M93235	0871_08097	62KVA-175 AMP, Frequency 47-500Hz, Power Supply	NA	NA
1592	EMCI	CEAS	V4.1.2	Commercial Emissions Automation Software - 10M # 2	NA	NA

APPENDIX B: Conducted Emissions Test Data

Configuration 1:

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 16, 2019
Temperature:	23˚C Humidity: 62%	Pressure:	838mb
Input Voltage:	120Vac/60Hz		
Configuration of Unit:	Printing ballots		
Test Engineer:	Kevin Johnson		

PR100763-11-CE.doc FR0100

Type	Frequency (MHz)	Level (dBuV)	Transducer (dB)	Gain / Loss (dB)	Final (dBuV)	Test Point	Margin: FCC Class B AV (dB)	Margin: FCC Class B QP (dB)
AV	0.153	28.4	0.0	16.1	44.5	Line 1	11.42	-
QP	0.153	28.8	0.0	16.1	44.9	Line 1	-	21.02
AV	0.442	12.6	0.0	16.1	28.7	Line 1	18.94	-
QP	0.442	18.5	0.0	16.1	34.6	Line 1	-	23.07
AV	0.598	12.2	0.0	16.2	28.5	Line 1	17.52	-
QP	0.598	18.0	0.0	16.2	34.3	Line 1	-	21.74
AV	2.395	4.3	0.1	16.2	20.6	Line 1	25.41	-
QP	2.395	9.4	0.1	16.2	25.7	Line 1	-	30.31
AV	15.663	25.9	0.3	15.7	42.0	Line 1	8.03	-
QP	15.663	35.3	0.3	15.7	51.4	Line 1	-	8.62
AV	18.435	11.9	0.4	15.8	28.2	Line 1	21.80	-
QP	18.435	20.7	0.4	15.8	37.0	Line 1	-	23.04
AV	0.160	27.3	0.0	16.1	43.4	Neutral	12.28	-
QP	0.160	33.8	0.0	16.1	49.9	Neutral	-	15.78
AV	1.304	4.0	0.0	16.2	20.2	Neutral	25.84	-
QP	1.304	9.2	0.0	16.2	25.5	Neutral	-	30.54
AV	1.640	4.8	0.0	16.2	21.0	Neutral	25.03	-
QP	1.640	-5.6	0.0	16.2	10.7	Neutral	-	45.34
AV	1.723	5.0	0.0	16.2	21.2	Neutral	24.78	-
QP	1.723	7.5	0.0	16.2	23.7	Neutral	-	32.31
AV	15.575	18.7	0.3	15.7	34.8	Neutral	15.22	-
QP	15.575	24.7	0.3	15.7	40.8	Neutral	-	19.24
AV	21.012	2.5	0.5	15.9	18.9	Neutral	31.08	-
QP	21.012	6.1	0.5	15.9	22.5	Neutral	-	37.53

The highest emission measured was at **15.663 MHz,** which was **8.03 dB** below the limit.

- "Type" refers to the type of measurement performed. The type of measurement made is based on the requirements of the particular standard:
  - PK = Peak Measurement: RBW is 9 kHz, VBW is 3 MHz
  - QP = Quasi-Peak Measurement: RBW is 9 kHz, VBW is 3 MHz, and QP Detection is ENABLED
  - AV = Video Average Measurement: RBW is 9 kHz, VBW is 10 Hz
- The "field strength" (FS) emissions level is attained by adding the received amplitude measured (RA), Antenna factor (AF), and cable factor (CF) minus the amplifier gain (AG). FS = RA + AF + CF – AG .Final measurements are made with the Azimuth, Polarity, Height, and EUT Cables positioned for maximum radiation. If applicable, cables positions are noted in the test log. (Sample Calculation: 49.6 dBuV + 11.4 dB/m – 28.8 dB (CF/AG) = 32.2 dBuV/m. **Important Note**: This is a sample calculation only for the purpose of demonstration, and does not reflect data in this report.)
- The "TestPoint" indicates which AC or DC input power line or which I/O cable the measurement was made on.
- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The PRESCAN is a peak measurement and is performed with the RBW set to 9 kHz, and the VBW set to 3 MHz

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK760 22990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 16, 2019

PR100763-11-CE.doc FR0100

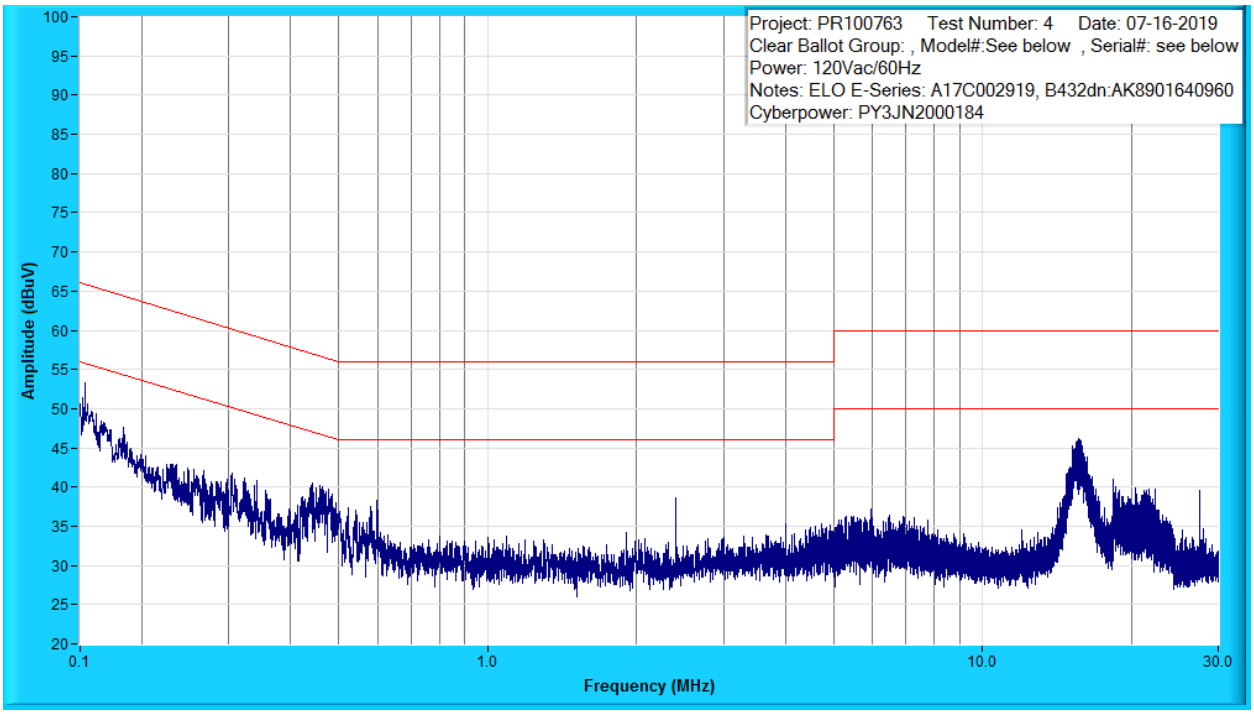


Figure B1: Conducted Emissions Prescan, Line 1, 0.150MHz to 30MHz, Peak Measurements

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 16, 2019

PR100763-11-CE.doc FR0100

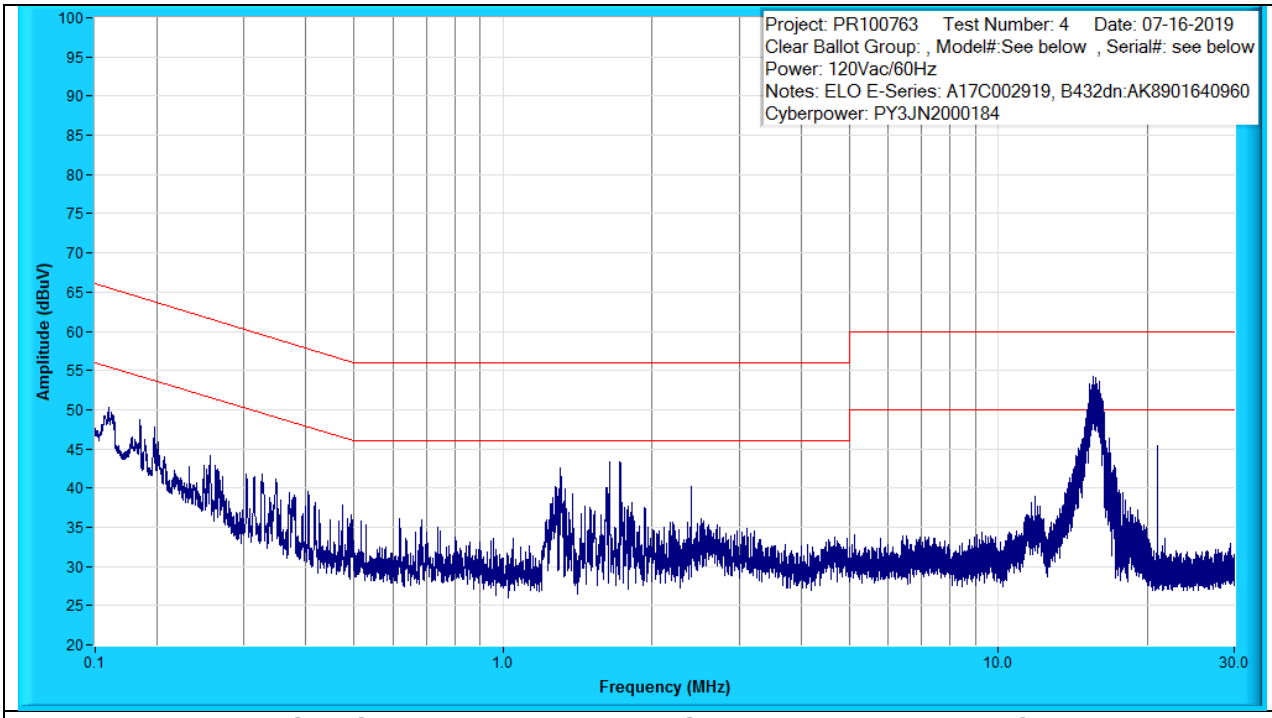


Figure B2: Conducted Emissions Prescan, Neutral, 0.150MHz to 30MHz, Peak Measurements

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 16, 2019

PR100763-11-CE.doc FR0100

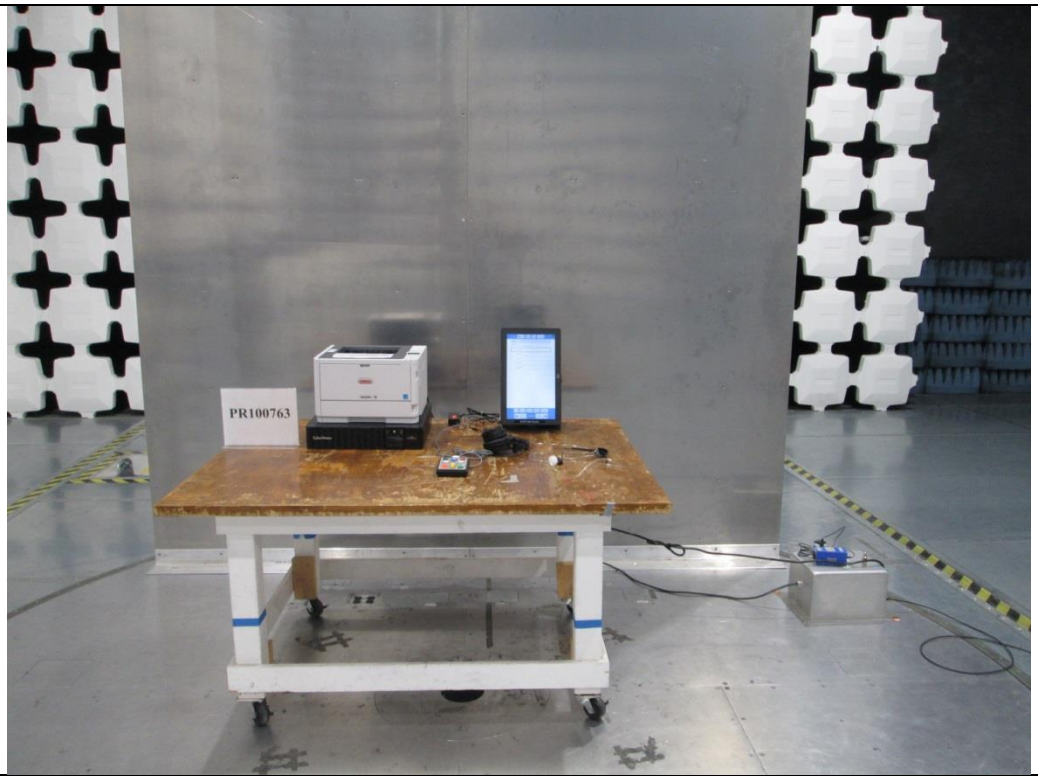


Figure B3: Conducted Emissions Test Setup – Front Side

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 16, 2019

PR100763-11-CE.doc FR0100

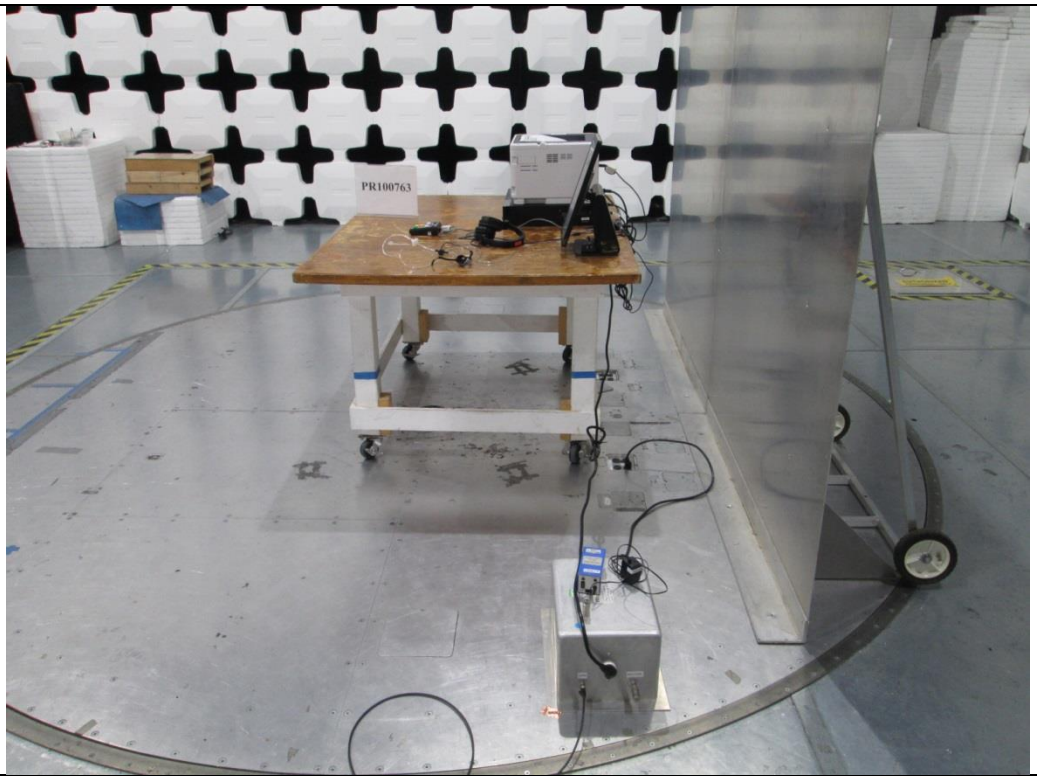


Figure B4: Conducted Emissions Test Setup – Right Side

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 16, 2019

PR100763-11-CE.doc FR0100

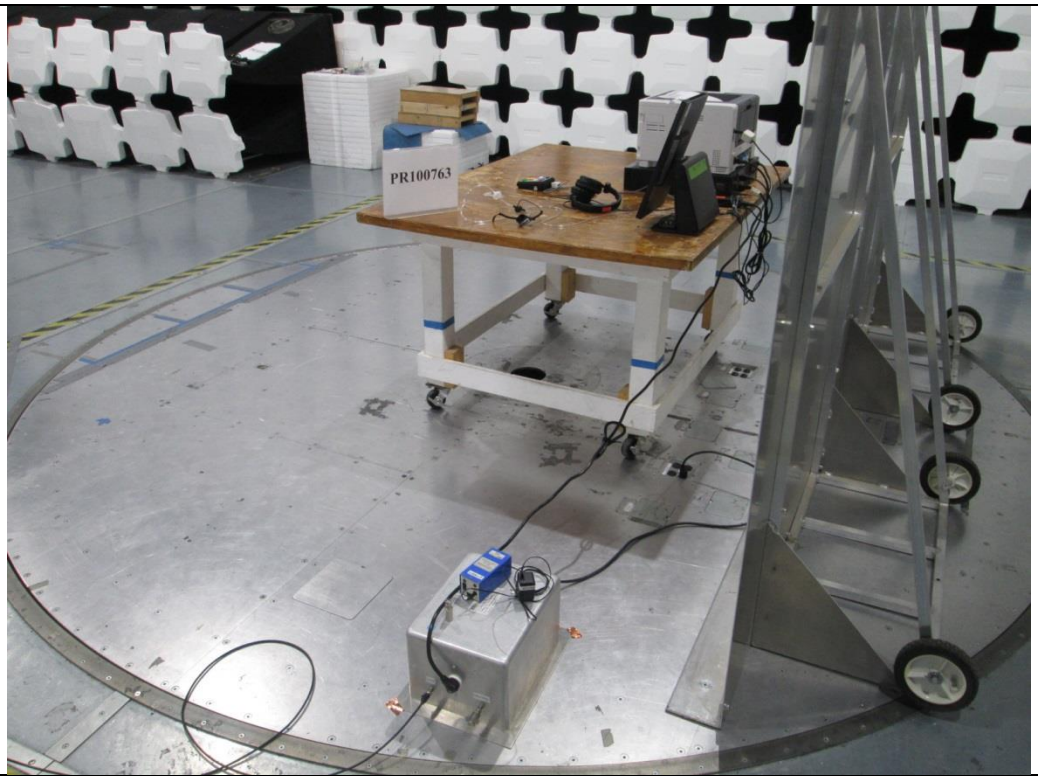


Figure B5: Conducted Emissions Test Setup – Back Side

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 16, 2019

PR100763-11-CE.doc FR0100

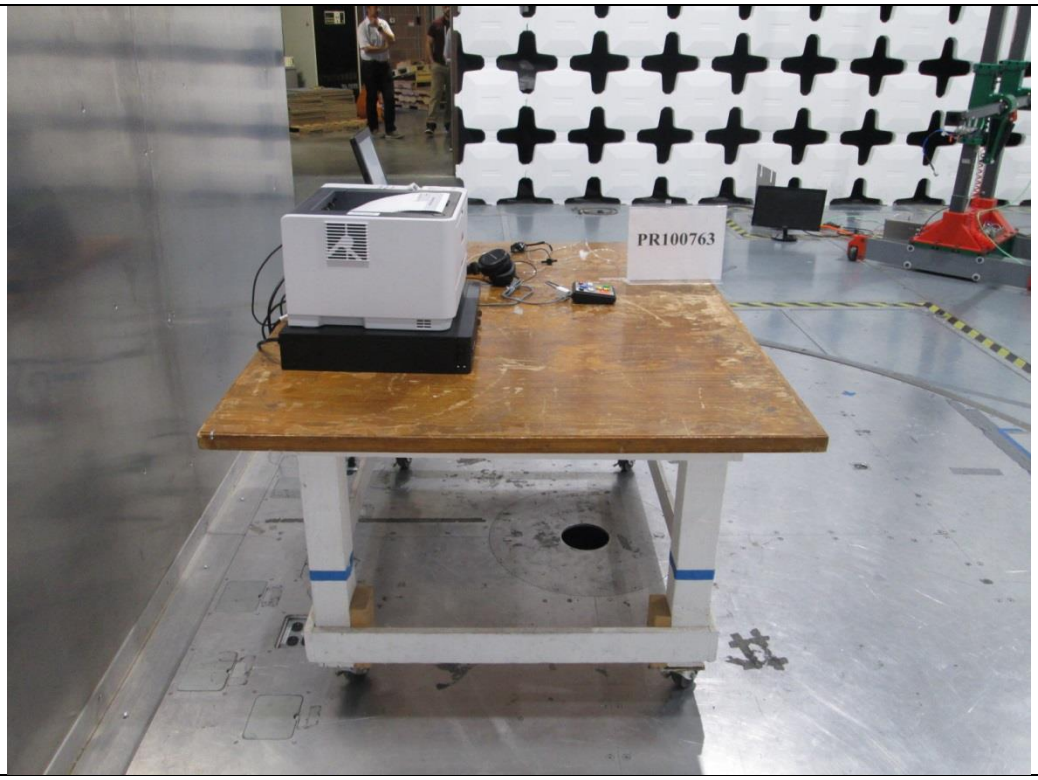


Figure B6: Conducted Emissions Test Setup – Left Side

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ELO E(AIO Desktop), B432(Oki printer), PY3JN2000184 (CyberPower UPS)	S/N:	A17C002919,AK76022990A0, PY3JN2000184
Standard Referenced:	FCC Part 15	Date:	July 16, 2019

PR100763-11-CE.doc FR0100

Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1201	Agilent Technology	11947A	3107A03805	Transient Limiter, 9 kHz to 200 MHz	03/29/2019	03/29/2020
1223	Hewlett Packard	85650A	3303A01859	Quasi-Peak Adaptor	09/14/2018	09/14/2019
1335	Hewlett Packard	85662A	2542A10937	Spectrum Analyzer Display	09/14/2018	09/14/2019
1336	Hewlett Packard	8566B	2532A02062	Spectrum Analyzer RF Section	09/14/2018	09/14/2019
1338	Hewlett Packard	85685A	3506A01551	RF Preselector	09/14/2018	09/14/2019
1396	CIR Enterprises	10m Chamber #2	002	10m Chamber with 4m turntable	03/29/2018	03/29/2020
1492	Fluke	87/5 Multimeter	23350032	True RMS Multimeter	05/09/2019	05/09/2020
1556	EMCI	EMCI, 2 Phase LISN	10	150 kHz to 30 MHz, 277 Vac/400 Vdc, 50/60 Hz, 16 A	03/05/2019	03/05/2020
1592	EMCI	CEAS	V4.1.2	Commercial Emissions Automation Software - 10M # 2	NA	NA

Configuration 2:

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019
Temperature:	78˚C Humidity: 48%	Pressure:	842 mb
Input Voltage:	120Vac/60Hz		
Configuration of Unit:	Printing ballots		
Test Engineer:	Mike Tidquist		

PR100763-11-CE.doc FR0100

Type	Frequency (MHz)	Level (dBuV)	Transducer (dB)	Gain / Loss (dB)	Final (dBuV)	Test Point	Margin: FCC Class B AV (dB)	Margin: FCC Class B QP (dB)
AV	0.178	26.3	0.0	16.1	42.4	Line 1	12.77	-
QP	0.178	32.8	0.0	16.1	48.9	Line 1	-	16.29
AV	0.408	22.6	0.0	16.1	38.7	Line 1	9.91	-
QP	0.408	30.8	0.0	16.1	47.0	Line 1	-	11.68
AV	0.494	20.4	0.0	16.1	36.5	Line 1	9.65	-
QP	0.494	28.2	0.0	16.1	44.4	Line 1	-	11.81
AV	0.584	21.2	0.0	16.2	37.4	Line 1	8.59	-
QP	0.584	28.3	0.0	16.2	44.5	Line 1	-	11.48
AV	0.903	9.4	0.0	16.2	25.7	Line 1	20.33	-
QP	0.903	17.9	0.0	16.2	34.1	Line 1	-	21.91
AV	2.403	4.5	0.1	16.2	20.8	Line 1	25.21	-
QP	2.403	11.2	0.1	16.2	27.4	Line 1	-	28.56
AV	13.765	8.8	0.3	15.8	25.0	Line 1	25.02	-
QP	13.765	20.3	0.3	15.8	36.4	Line 1	-	23.59
AV	0.165	26.6	0.0	16.1	42.8	Neutral	12.79	-
QP	0.165	29.8	0.0	16.1	45.9	Neutral	-	19.68
AV	0.403	23.6	0.0	16.1	39.8	Neutral	8.99	-
QP	0.403	31.8	0.0	16.1	48.0	Neutral	-	10.81
AV	0.494	20.6	0.0	16.1	36.8	Neutral	9.40	-
QP	0.494	28.2	0.0	16.1	44.4	Neutral	-	11.82
AV	0.539	16.9	0.0	16.1	33.1	Neutral	12.93	-
QP	0.539	25.4	0.0	16.1	41.6	Neutral	-	14.43
AV	0.587	20.9	0.0	16.2	37.1	Neutral	8.93	-
QP	0.587	28.5	0.0	16.2	44.8	Neutral	-	11.24
AV	11.114	9.9	0.4	15.9	26.2	Neutral	23.80	-
QP	11.114	17.8	0.4	15.9	34.0	Neutral	-	25.99
AV	13.567	9.5	0.3	15.8	25.6	Neutral	24.37	-
QP	13.567	20.4	0.3	15.8	36.5	Neutral	-	23.50

The highest emission measured was at **0.584 MHz,** which was **8.59 dB** below the limit.

- "Type" refers to the type of measurement performed. The type of measurement made is based on the requirements of the particular standard:
  - PK = Peak Measurement: RBW is 9 kHz, VBW is 3 MHz
  - QP = Quasi-Peak Measurement: RBW is 9 kHz, VBW is 3 MHz, and QP Detection is ENABLED
  - AV = Video Average Measurement: RBW is 9 kHz, VBW is 10 Hz
- The "field strength" (FS) emissions level is attained by adding the received amplitude measured (RA), Antenna factor (AF), and cable factor (CF) minus the amplifier gain (AG). FS = RA + AF + CF – AG .Final measurements are made with the Azimuth, Polarity, Height, and EUT Cables positioned for maximum radiation. If applicable, cables positions are noted in the test log. (Sample Calculation: 49.6 dBuV + 11.4 dB/m – 28.8 dB (CF/AG) = 32.2 dBuV/m. **Important Note**: This is a sample calculation only for the purpose of demonstration, and does not reflect data in this report.)
- The "TestPoint" indicates which AC or DC input power line or which I/O cable the measurement was made on.
- The "Margin" is with reference to the emissions limit. A positive number indicates that the emission measurement is below the limit. A negative number indicates that the emission measurement exceeds the limit.
- The PRESCAN is a peak measurement and is performed with the RBW set to 9 kHz, and the VBW set to 3 MHz

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-CE.doc FR0100

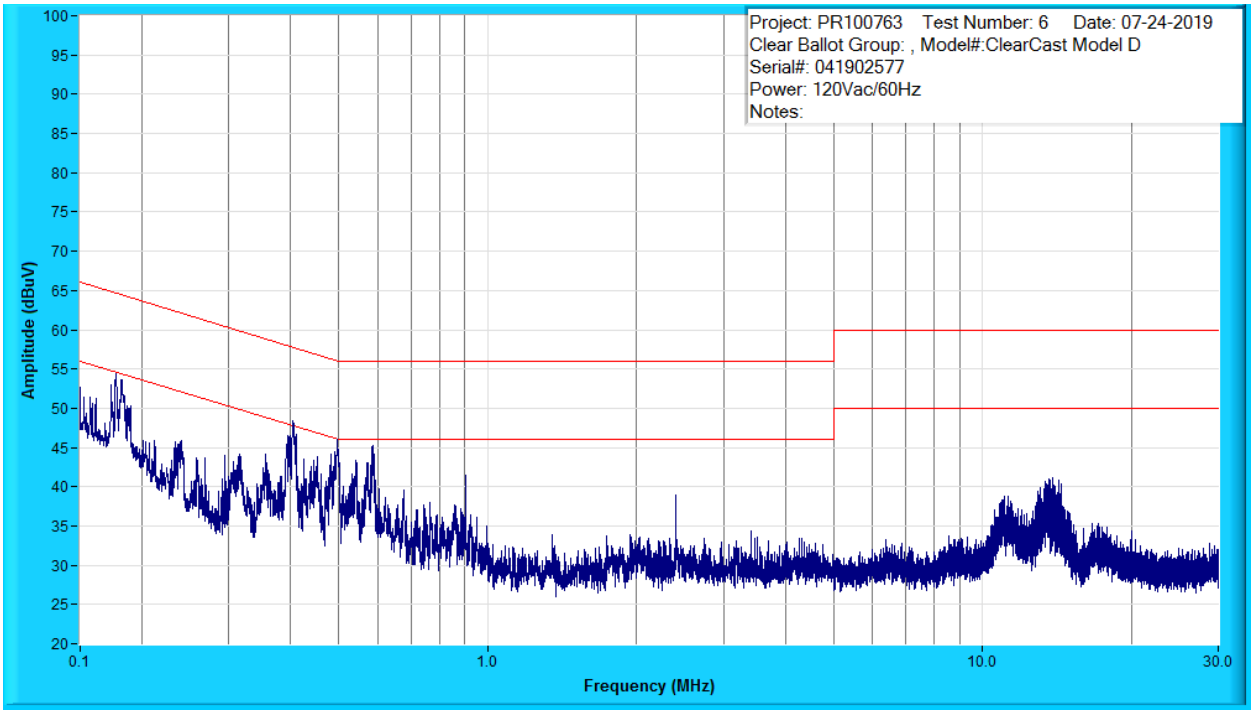


Figure B1: Conducted Emissions Prescan, Line 1, 0.150MHz to 30MHz, Peak Measurements

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-CE.doc FR0100

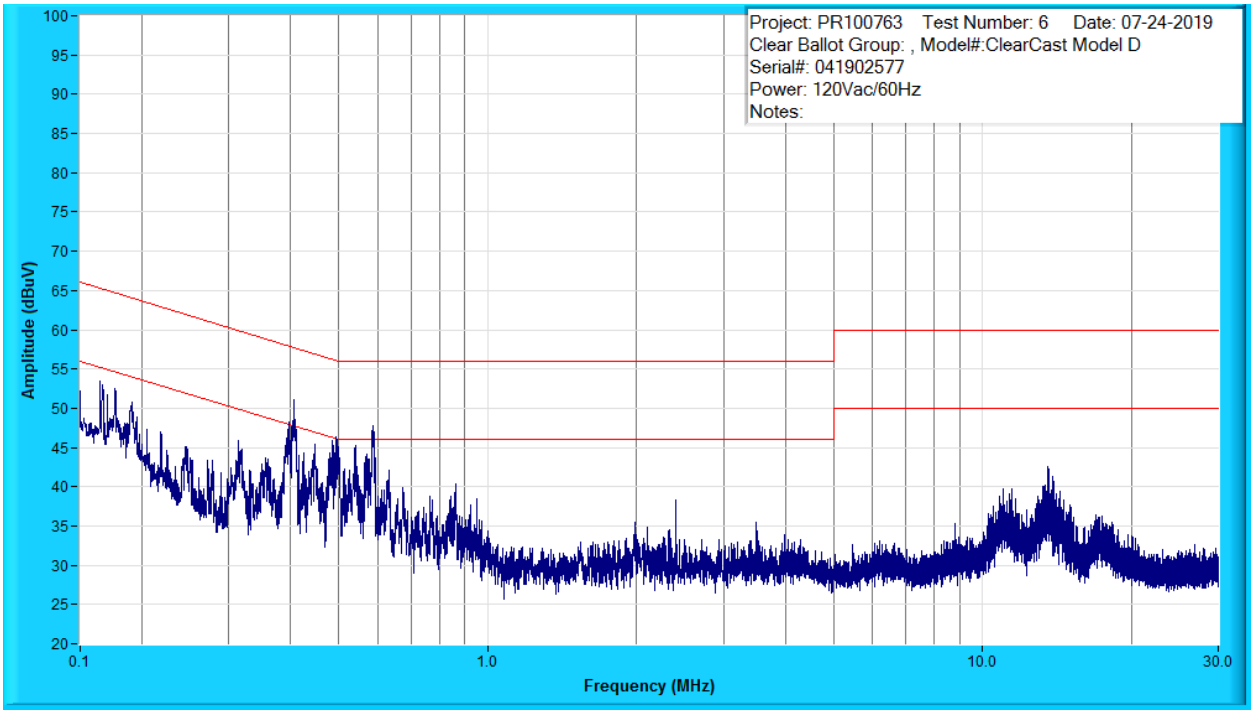


Figure B2: Conducted Emissions Prescan, Neutral, 0.150MHz to 30MHz, Peak Measurements

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-CE.doc FR0100

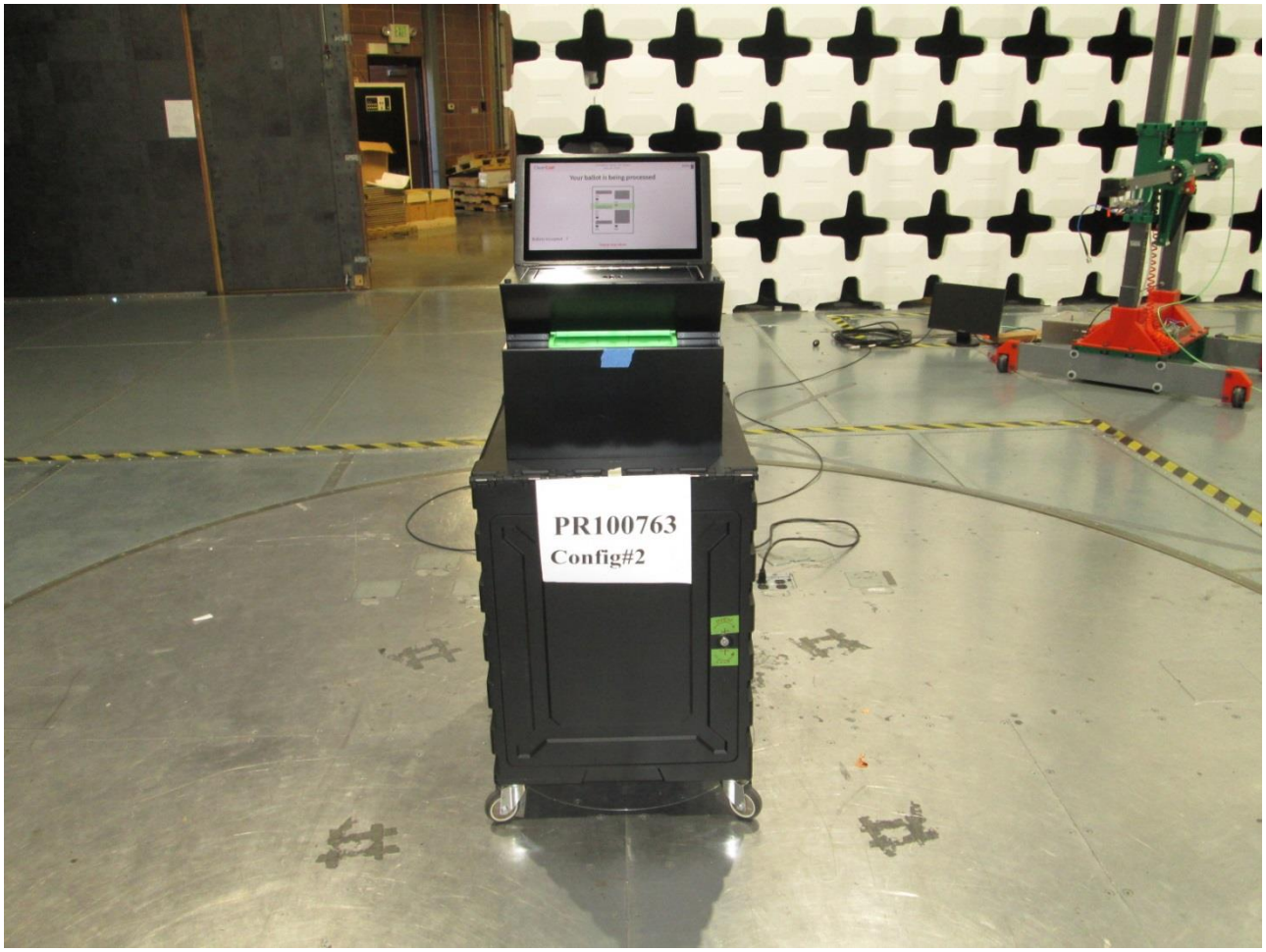


Figure B3: Conducted Emissions Test Setup – Front Side

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-CE.doc FR0100

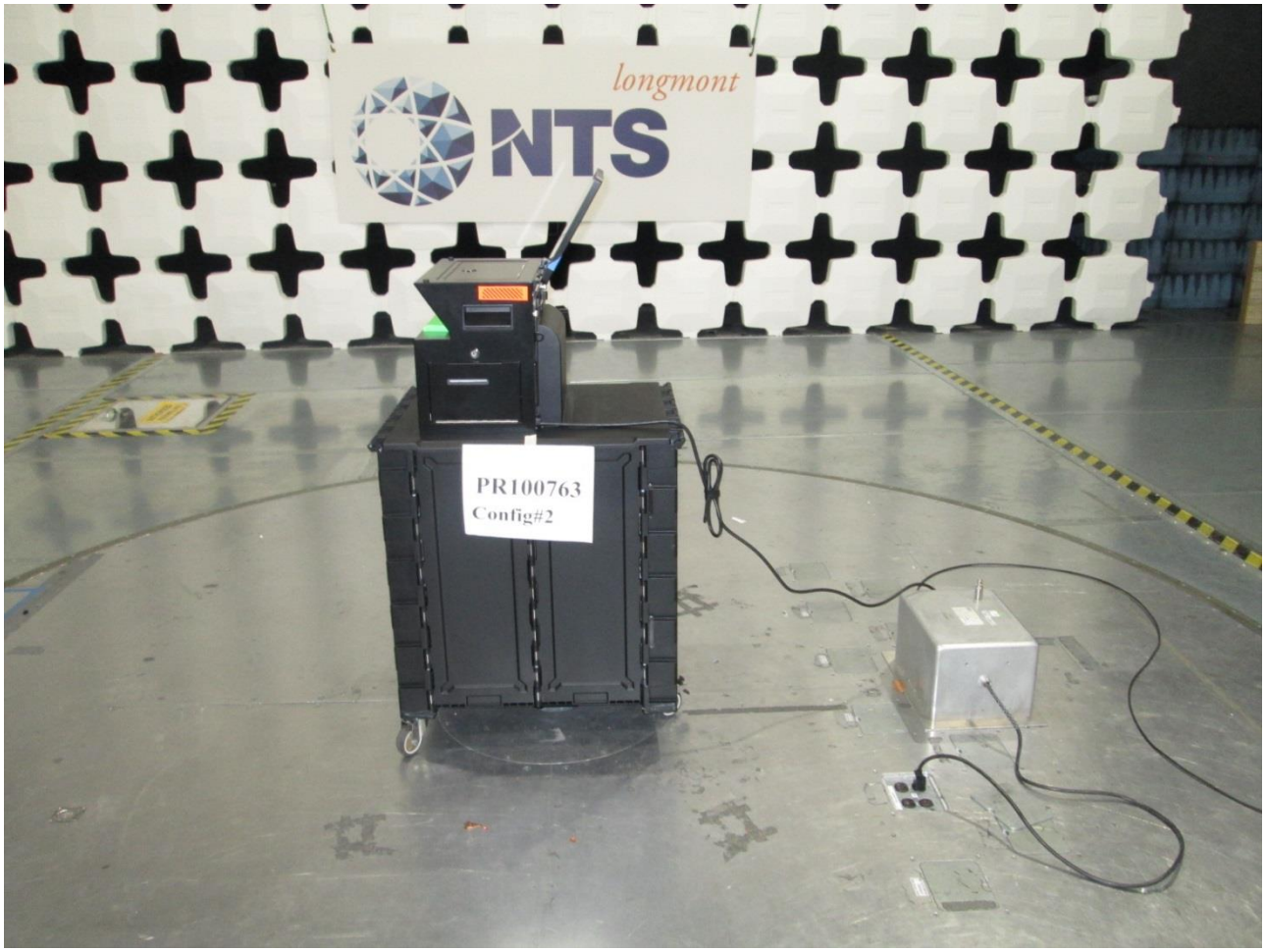


Figure B4: Conducted Emissions Test Setup – Right Side

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-CE.doc FR0100

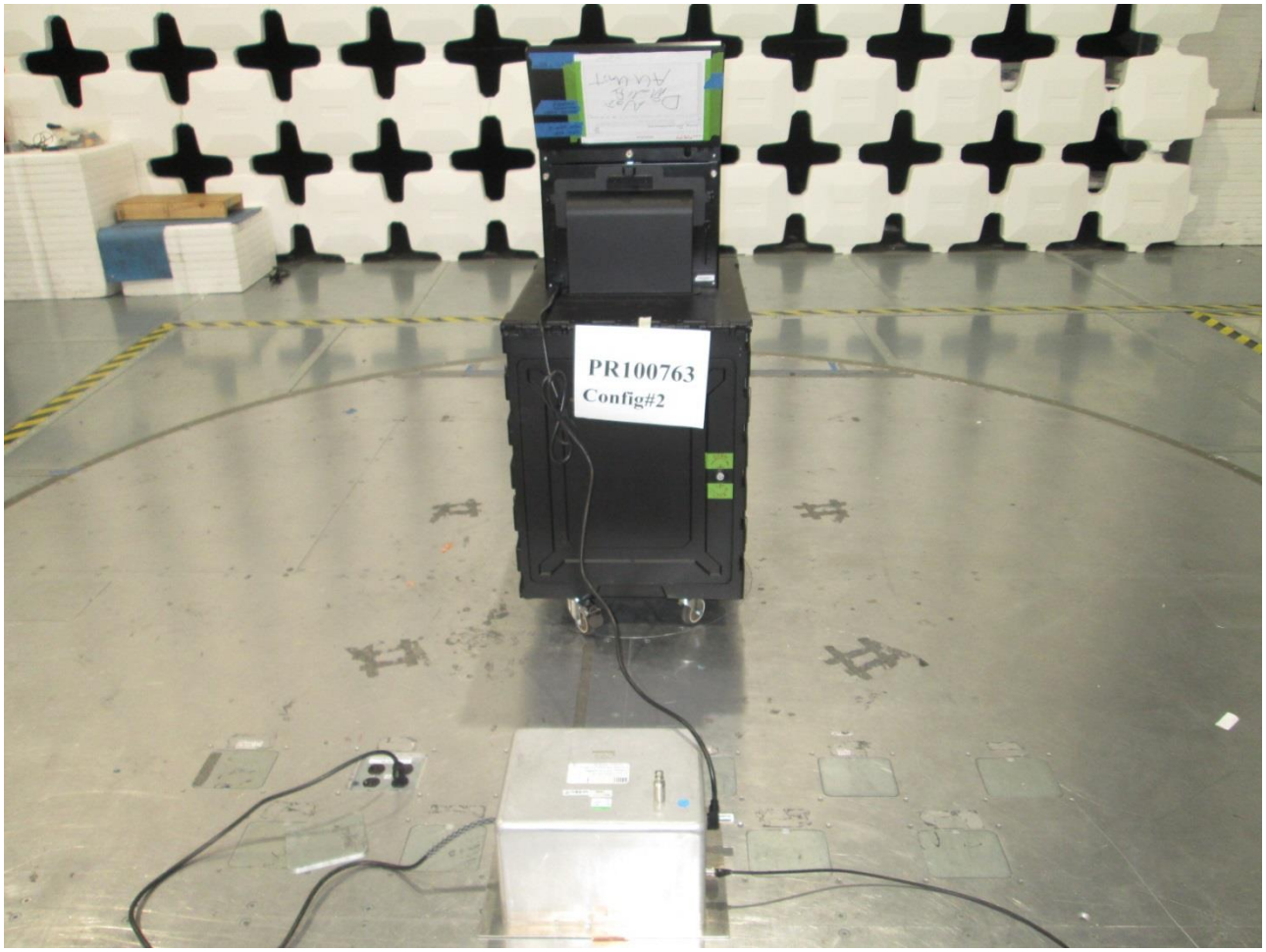


Figure B5: Conducted Emissions Test Setup – Back Side

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-CE.doc FR0100

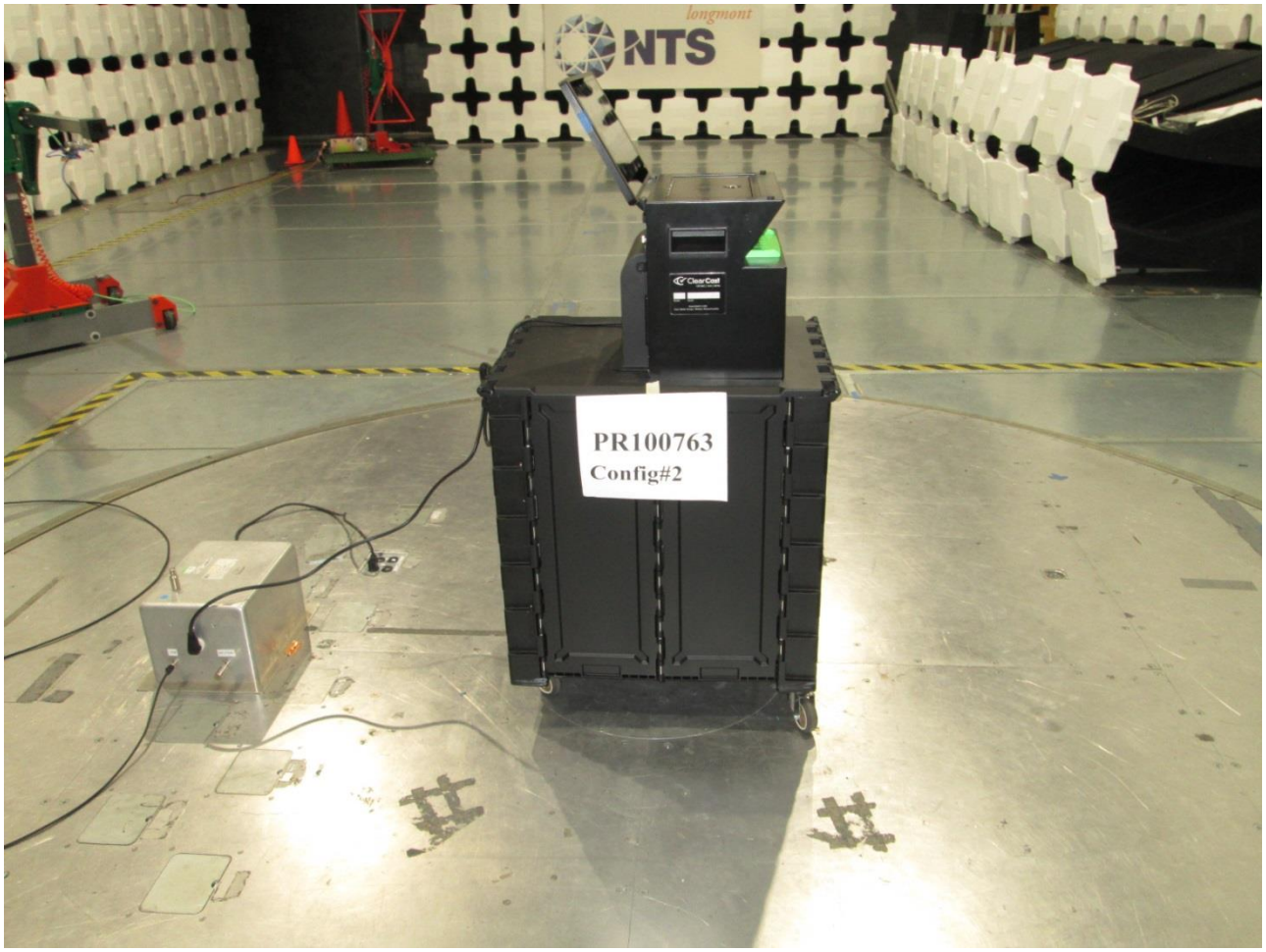


Figure B6: Conducted Emissions Test Setup – Left Side

Conducted Emissions, FCC Part 15

Manufacturer:	Clear Ballot Group (manufacturer) Pro V&V (client)	Project Number:	PR100763
Customer Representative:	Stephen Han	Test Area:	10m2
Model:	ClearCast Model D	S/N:	041902577
Standard Referenced:	FCC Part 15	Date:	July 24, 2019

PR100763-11-CE.doc FR0100

Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1201	Agilent Technology	11947A	3107A03805	Transient Limiter, 9 kHz to 200 MHz	03/29/2019	03/29/2020
1223	Hewlett Packard	85650A	3303A01859	Quasi-Peak Adaptor	09/14/2018	09/14/2019
1335	Hewlett Packard	85662A	2542A10937	Spectrum Analyzer Display	09/14/2018	09/14/2019
1336	Hewlett Packard	8566B	2532A02062	Spectrum Analyzer RF Section	09/14/2018	09/14/2019
1338	Hewlett Packard	85685A	3506A01551	RF Preselector	09/14/2018	09/14/2019
1396	CIR Enterprises	10m Chamber #2	002	10m Chamber with 4m turntable	03/29/2018	03/29/2020
1492	Fluke	87/5 Multimeter	23350032	True RMS Multimeter	05/09/2019	05/09/2020
1556	EMCI	EMCI, 2 Phase LISN	10	150 kHz to 30 MHz, 277 Vac/400 Vdc, 50/60 Hz, 16 A	03/05/2019	03/05/2020
1592	EMCI	CEAS	V4.1.2	Commercial Emissions Automation Software - 10M # 2	NA	NA

APPENDIX C: Product Data Sheet

Configuration 1:

1.0 Client Information

Client Information	
Manufacturer Name	Clear Ballot Group (manufacturer) Pro V&V (client)
Address	700 Boulevard South Suite 102
City	Huntsville
State	AL
Zip Code	35802
Client Representative	Stephen Han
Title	Project Engineer
Phone	256-713-1111
Fax	256-713-1112
Email	stephen.han@provandv.com

2.0 Product Information - General

Product Information	
Product Name (**as it should appear on test report**)	ClearAccess
Model Number (of UUT to be tested)	ClearAccess
Functional description of product (what is it, what does it do, etc.)	ballot marking device
List all modes of operation	Regular and audio
Can modes be operated simultaneously? If so, explain.	Yes
What mode(s) will be used for testing?	Both
Product type (IT, Medical, Scientific, Industrial, etc.)	IT
Is the product an intentional radiator	no
Product Dimensions	Multiple
Product Weight	Multiple
Will fork lift be required	No
Applicable Standards, if known	EAC 2005 VVSG Volumes I and II
Describe all environment(s) where product will be used (residential, commercial, industrial, etc.)	Used for voting during elections
Does product consist of multiple components? (If yes, please describe each system component)	Yes. printers, varies laptops, UPS
Cycle time > 3 seconds? (If yes, how long?)	Yes.
Highest internally generated frequency	
Product Set-up Time	15 minutes
Boot up time in the event of an unintentional power down	2 minutes but UUT will be on UPS

Identify **ALL** I/O connections on the unit(s) under test, as well as **MAXIMUM** associated cable lengths below

Model No.	Description	I/O Type		Length (m)	Patient Connect? (See Note)	QTY
		UUT-UUT	UUT - SE			
	USB					
	power					

Note: "Patient Connect" column applies only to medical devices.

3.0 Power

Power Requirements	
Does/can product connect to AC mains? (If so, can the UUT function when connected to AC?)	Yes.
Input Voltage Rating as it appears on unit, power supply, or power brick	n/a
Input Current (specify @ 230 Vac/50 Hz)	
Single or Multi-Phase (If multi-phase, specify delta or wye)	single
Is input power connector two-prong (Hot & Neutral) or 3-prong (H, N, Ground)	3 prong
Does UUT have more than 1 power cord? (If yes, explain.)	No

4.0 Unit Under Test (UUT) – Detailed Information

UUT Hardware	
Condition	New
Configuration During Test	Printing Ballots
Input Power	Normal AC power

UUT Components			
Name	**Model No.**	**Serial No.**	**Description**
ELO	E	A17C002919	AIO Desktop
Oki	B432	AK76022990A0	Printer
CyberPower	PR1500RT2U	PY3JN2000184	UPS

I/O Cabling
See Section 2.0 for details

UUT Software/Firmware		
Name	**Version/Revision**	**Functionality**
ClearAccess	2.0.0h	Voting systems software

UUT Operating Conditions	
List all frequencies generated/used by the product.	n/a
How will product be exercised during test?	Printing ballots
How will product be monitored during test?	Visually
What are the product's critical parameters?	Unit keeps printing
Specify tolerance of all critical parameters.	Unit keeps printing

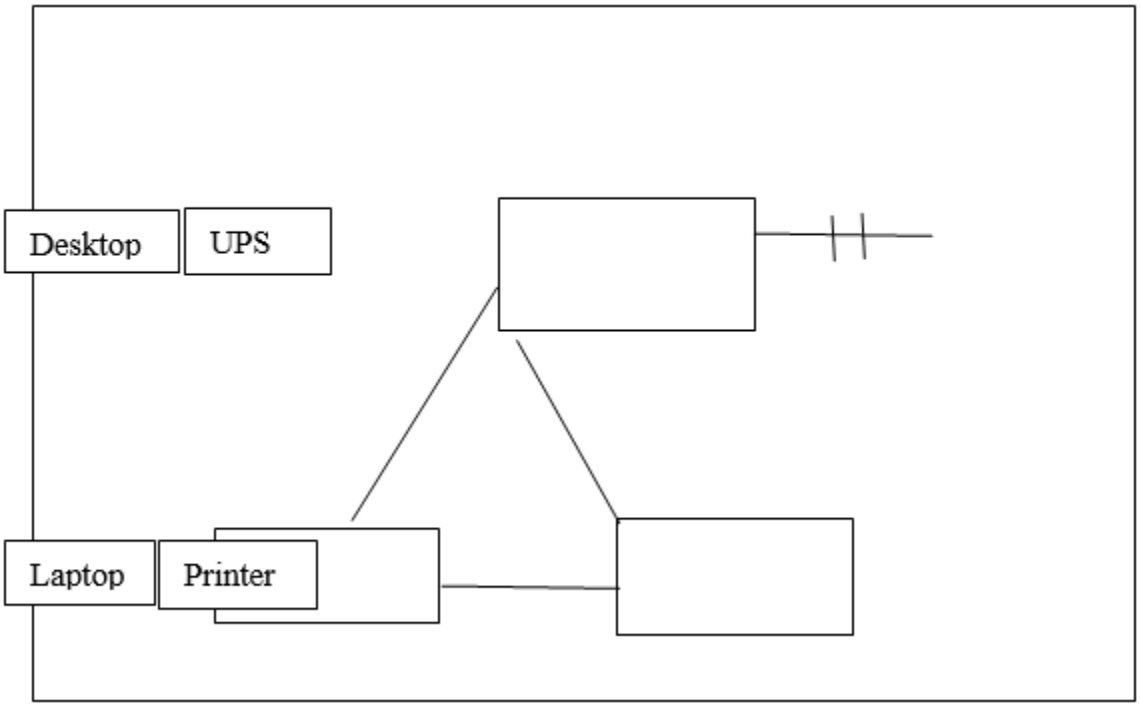
5.0 Support Equipment (SE) – Detailed Information

Support Equipment (SE)			
Name	**Model No.**	**Serial No.**	**Description**
MonoPrice		CBG-HP-02	Headphones
Storm	8button	17020511	ATI
Zebra	DS457	18285000501808	Bar code scanner

SE I/O Cabling				
Model No.	**Description**	**Shielded?**	**Length**	**Quantity**
Generic	USB	N	>3M	1
Generic	3.5mm Headphone jack	N	>3M	1

SE Software/Firmware		
Name	**Version/Revision**	**Functionality**
		n/a

6.0 Block Diagram



Important note: The product data sheet is a critical piece of documentation which is used as the basis for any test reports that NTS will generate; it must be completed *prior* to testing. It should be reviewed carefully by the client. If incorrect information is provided resulting in revisions to test repor

Configuration 2:

1.0 Client Information

Client Information	
Manufacturer Name	Clear Ballot Group (manufacturer) Pro V&V (client)
Address	700 Boulevard South Suite 102
City	Huntsville
State	AL
Zip Code	35802
Client Representative	Stephen Han
Title	Project Engineer
Phone	256-713-1111
Fax	256-713-1112
Email	stephen.han@provandv.com

2.0 Product Information - General

Product Information	
Product Name (**as it should appear on test report**)	ClearCast
Model Number (of UUT to be tested)	ClearCast
Functional description of product (what is it, what does it do, etc.)	Precinct Tabulator
List all modes of operation	Regular
Can modes be operated simultaneously? If so, explain.	Yes
What mode(s) will be used for testing?	Both
Product type (IT, Medical, Scientific, Industrial, etc.)	IT
Is the product an intentional radiator	no
Product Dimensions	
Product Weight	
Will fork lift be required	No
Applicable Standards, if known	EAC 2005 VVSG Volumes I and II
Describe all environment(s) where product will be used (residential, commercial, industrial, etc.)	Used for voting during elections
Does product consist of multiple components? (If yes, please describe each system component)	No
Cycle time > 3 seconds? (If yes, how long?)	Yes. 5 sec
Highest internally generated frequency	
Product Set-up Time	15 minutes
Boot up time in the event of an unintentional power down	0 minutes - internal backup battery

Identify **ALL** I/O connections on the unit(s) under test, as well as **MAXIMUM** associated cable lengths below

Model No.	Description	I/O Type		Length (m)	Patient Connect? (See Note)	QTY
		UUT-UUT	UUT - SE			
	power					

Note: "Patient Connect" column applies only to medical devices.

3.0 Power

Power Requirements	
Does/can product connect to AC mains? (If so, can the UUT function when connected to AC?)	Yes.
Input Voltage Rating as it appears on unit, power supply, or power brick	n/a
Input Current (specify @ 230 Vac/50 Hz)	Normal
Single or Multi-Phase (If multi-phase, specify delta or wye)	single
Is input power connector two-prong (Hot & Neutral) or 3-prong (H, N, Ground)	3 prong
Does UUT have more than 1 power cord? (If yes, explain.)	No

4.0 Unit Under Test (UUT) – Detailed Information

UUT Hardware	
Condition	New
Configuration During Test	Scanning ballots
Input Power	Normal AC power

UUT Components			
Name	**Model No.**	**Serial No.**	**Description**
ClearCast	D	041902593	Precinct Tabulator

I/O Cabling
See Section 2.0 for details

UUT Software/Firmware		
Name	**Version/Revision**	**Functionality**
ClearCast	2.0.0	Voting systems software

UUT Operating Conditions	
List all frequencies generated/used by the product.	n/a
How will product be exercised during test?	Scanning Ballots
How will product be monitored during test?	Visually
What are the product's critical parameters?	Unit keeps scanning
Specify tolerance of all critical parameters.	Unit keeps scanning

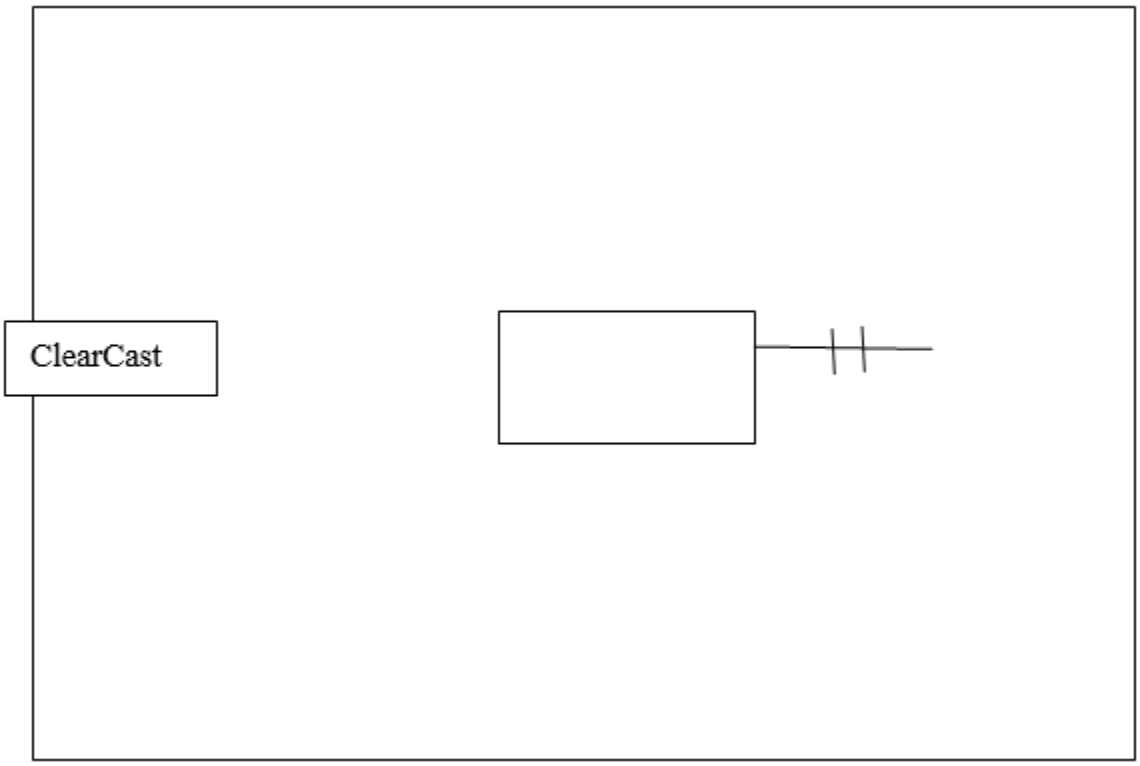
5.0 Support Equipment (SE) – Detailed Information

Support Equipment (SE)			
Name	**Model No.**	**Serial No.**	**Description**
n/a			

SE I/O Cabling				
Model No.	**Description**	**Shielded?**	**Length**	**Quantity**
n/a				

SE Software/Firmware		
Name	**Version/Revision**	**Functionality**
n/a		

6.0 Block Diagram



Important note: The product data sheet is a critical piece of documentation which is used as the basis for any test reports that NTS will generate; it must be completed *prior* to testing. It should be reviewed carefully by the client. If incorrect information is provided resulting in revisions to test reports

APPENDIX D: Test Log

EMI\ENV Test Log

Manufacturer:	Pro V&V	Project Number:	PR100763
Model:	**Config#1(Clear Vote 2.0)**	S/N:	A17C002919
	E (ELO)		AK76022990A0
	B432 (Oki)		PY3JN2000184
	PR1500RT2U (CyberPower)		Config#2:041902577
	Config#2(ClearCast Model D)		
Customer Representative:	Michael Walker		
Standard Referenced:	FCC		

FR0105

10m Emissions

Test	Test Code	Date	Event	OT	Time (hrs)	Result	Initials
RE	6001	July 15, 2019 1230-1330	Initial Product Set-up & Configuration Engineering / Trouble-Shoot Test#1: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, 10 meter distance **AMBIENT SCAN**		1.0	Complete	KJ
RE	1342	1330-1430	Test#2: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, 10 meter distance 120Vac/60Hz ELO E-Series: A17C002919 B432dn: AK76022990A0 Cyberpower: PY3JN2000184 Config#1 NOTE: Client says unpopulated ports on the UPS are diagnostic only. UUT failed at 666.676MHz by 3.31dB		2.0	Fail	KJ
RE		1430-1630	Test#3: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, 10 meter distance 120Vac/60Hz ELO E-Series: A17C002919 B432dn: AK8901640960 Cyberpower: PY3JN2000184 Config#1 NOTE: Client says unpopulated ports on the UPS are diagnostic only. **Client changed out the printer to the backup printer** **B432dn: AK8901640960**		2.0	Pass	KJ
CE	2341	July 16, 2019 0800-1000	Test#4: 150kHz – 30MHz Config#1 120Vac/60Hz		2.0	Pass	KJ

10m Emissions

Test	Test Code	Date	Event	OT	Time (hrs)	Result	Initials
4-3	4398	1000	Radiated RF Immunity (10m 2) (4.1.2.10) (Config. #1) 10V/m, 80 - 1000 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell 120 VAC / 60 Hz Printing and script stopped. Field was not on. Printing and script stopped at 167.7689MHz. Right side, H-pole. Printer power off, PC re-booted Printing and script stopped at 101MHz. Rights side, H-pole. Printer power off, PC re-booted PC has the following error message "Warning- logs are not valid" Printing and script stopped at 564MHz. Rights side, H-pole. Printer power off, PC re-booted Battery in the UPS is at 18%. Client believes that the battery is too low to hold the unit up. When the unit prints it does switch to battery power. Client will try to put a new battery in the UPS. Testing resumed after putting a new battery in the UPS. Unit had a paper jam at 710MHz. back side, V-pole Finished everything tested but right side.				KJ
RE	1342	July 24, 2019 0800-1000	Test #5: Radiated Emissions: 30MHz – 1GHz, 8 rads, 4 heights, 3 second dwell, ref level = 80dB, 10 meter distance 120Vac/60Hz		2.0	Pass	MT
CE	2341	1000-1100	Test #6: Conducted Emissions, 150 kHz - 30 MHz 120 VAC / 60 Hz		1.0	Pass	MT
---	---	1100-1200	Setup For RI		1.0	Complete	MT
---	---	1200-1230	Lunch		---	---	MT
Running Radiated Immunity in 10M #2 Chamber							
4-3	4398	1230-1630	Radiated RF Immunity (10m 2) (Config. #2) 10V/m, 80 - 1000 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell 120 VAC / 60 Hz Front and Right side both polarities complete. Back Side Vertical polarity complete. Still need Back Horizontal and left side both Polarities.		4.0	---	MT
4-3		July 25, 2019 0800-1200	Continue: Radiated RF Immunity (10m 2) (Config. #2) 10V/m, 80 - 1000 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell 120 VAC / 60 Hz		4.0	Pass	MT

Regular hours: 19.0

10m Emissions

Test	Test Code	Date	Event	OT	Time (hrs)	Result	Initials
				Overtime/Prem hours:			
				Total hours:	19.0		

Ground Planes / CALC

Test	Test Code	Date	Event	OT	Time (hrs)	Result	Initials
4-4	4411	July 17, 2019 0800 - 0930	Equipment setup		1.5	---	CL
---	---	0930 - 1030	Waiting on correct paper to be brought over.		1.0	---	CL
---	---	1030 - 1100	Electrical Fast Transient / Burst (4.1.2.6) (Config. #2) Mains: +/- 2kV, I/O: +/- 1kV 120 VAC / 60 Hz		.5	Pass	CL
4-2	4254	1100 - 1330	Electrostatic Discharge (4.1.2.8) (Config. #1) +/- 8kV Contact, +/-2, 4, 8, 15kV Air 120 VAC / 60 Hz		2.5	Pass	CL

Project #: PR100763
B90622

Work Order #: 2019052202A

PO#:
Amount:

Company: Pro V&V
700 Boulevard South
Suite 102
Huntsville, AL 35802
Phone: 256-713-11111
Fax:

Contact: Michael Walker
Email: michael.walker@provandv.com

Model#:
Serial #:

Test Notes: Voting Machine Testing
Formal test reports

Quoted Work

Date	Test Code	Description	Standard	Result	Cost	Billed
July 15, 2019	1342	Radiated Emissions, 30 MHz - 1 GHz (4.1.2.9) (Config. #1) 30 MHz - 1 GHz 120 VAC / 60 Hz	FCC Part 15, Class B	Pass		
July 24, 2019	1342	Radiated Emissions, 30 MHz - 1 GHz (4.1.2.9) (Config. #2) 30 MHz - 1 GHz 120 VAC / 60 Hz	FCC Part 15, Class B	Pass		
July 24, 2019	2341	Conducted Emissions, 150 kHz - 30 MHz (4.1.2.9) (Config. #2) -- 120 VAC / 60 Hz	FCC Part 15, Class B	Pass		
July 16, 2019	2341	Conducted Emissions, 150 kHz - 30 MHz (4.1.2.9) (Config. #1) -- 120 VAC / 60 Hz	FCC Part 15, Class B	Pass		
	4254	Electrostatic Discharge (4.1.2.8) (Config. #1) +/- 8kV Contact, +/-2, 4, 8, 15kV Air 120 VAC / 60 Hz	EN61000-4-2			
July 17, 2019	4254	Electrostatic Discharge (4.1.2.8) (Config. #2) +/- 8kV Contact, +/-2, 4, 8, 15kV Air 120 VAC / 60 Hz	EN61000-4-2	Pass		
July 24, 2019	4398	Radiated RF Immunity (10m 2) (4.1.2.10) (Config. #2) 10V/m, 80 - 1000 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell 120 VAC / 60 Hz	EN61000-4-3	Pass		
	4398	Radiated RF Immunity (10m 2) (4.1.2.10) (Config. #1) 10V/m, 80 - 1000 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell 120 VAC / 60 Hz	EN61000-4-3			

Quoted Work						
Date	**Test Code**	**Description**	**Standard**	**Result**	**Cost**	**Billed**
	4411	Electrical Fast Transient / Burst (4.1.2.6) (Config. #1) Mains: +/- 2kV, I/O: +/- 1kV 120 VAC / 60 Hz	EN61000-4-4			
July 17, 2019	4411	Electrical Fast Transient / Burst (4.1.2.6) (Config. #2) Mains: +/- 2kV, I/O: +/- 1kV 120 VAC / 60 Hz	EN61000-4-4	Pass		
	4596	Surge Immunity (4.1.2.7) (Config. #1) Mains: +/- 2kV CM, +/- 2kV DM, (0, 90, 180, 270) 120 VAC / 60 Hz	EN61000-4-5			
	4596	Surge Immunity (4.1.2.7) (Config. #2) Mains: +/- 2kV CM, +/- 2kV DM, (0, 90, 180, 270) 120 VAC / 60 Hz	EN61000-4-5			
	4622	Conducted RF Immunity (4.1.2.11) (Config. #1) 10Vrms, 0.15 - 80 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell 120 VAC / 60 Hz	EN61000-4-6			
	4622	Conducted RF Immunity (4.1.2.11) (Config. #2) 10Vrms, 0.15 - 80 MHz, 1% Step, 80% AM, 1kHz sine, 3s dwell 120 VAC / 60 Hz	EN61000-4-6			
	4831	Power Frequency H-Field Immunity (4.1.2.12) (Config. #2) 30A/m, 50 / 60 Hz, 3 axes 120 VAC / 60 Hz	EN61000-4-8			
	4831	Power Frequency H-Field Immunity (4.1.2.12) (Config. #1) 30A/m, 50 / 60 Hz, 3 axes 120 VAC / 60 Hz	EN61000-4-8			
	4194	Voltage Dips and Interruptions (Surge of +/- 15%) (4.1.2.5) (Config. #1) Surge of +/- 15% line variation of nominal line voltage 120 VAC / 60 Hz	EN61000-4-11			
	4194	Voltage Dips and Interruptions (Surge of +/- 15%) (4.1.2.5) (Config. #2) Surge of +/- 15% line variation of nominal line voltage 120 VAC / 60 Hz	EN61000-4-11			
	4193	Voltage Dips and Interruptions (4.1.2.5) (Config. #2) 70% nom, 0.6 cycles / 40% nom, 6 cycles & 1 sec. / 0% nom, 300 cycles 120 VAC / 60 Hz	EN61000-4-11			

Quoted Work						
Date	**Test Code**	**Description**	**Standard**	**Result**	**Cost**	**Billed**
	4193	Voltage Dips and Interruptions (4.1.2.5) (Config. #1) 70% nom, 0.6 cycles / 40% nom, 6 cycles & 1 sec. / 0% nom, 300 cycles 120 VAC / 60 Hz	EN61000-4-11			
	4196	Voltage Dips and Interruptions (Inc./Red. of Nom. Voltage)(4.1.2.5)(Conf # Electric power increases of 7.5% and reductions of 12.5% of nominal specified power. (See Protocol) 120 VAC / 60 Hz	EN61000-4-11			
	4196	Voltage Dips and Interruptions (Inc./Red. of Nom. Voltage)(4.1.2.5)(Conf # Electric power increases of 7.5% and reductions of 12.5% of nominal specified power. (See Protocol) 120 VAC / 60 Hz	EN61000-4-11			
July 15, 2019	6001	Initial Product Set-up & Configuration Engineering / Trouble-Shoot ---	--	Complete		
	9040	Emissions Test Report - Soft Copy One Report, Two Configurations --	--			
	9010	Immunity Test Report - Soft Copy One Report, Two Configurations --	--			

Unquoted Work				
Date	**Test Code**	**Description**	**Cost**	**Billed**

Modifications Required For Compliance		
Test	**Description of Modification**	**Client Initials**

APPENDIX E: Laboratory Accreditations

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2005

NATIONAL TECHNICAL SYSTEMS (NTS) - LONGMONT
1736 Vista View Drive
Longmont, CO 80504-5242
Mr. Eric Loucks Phone: 870 574 0031

ELECTRICAL

Valid To: February 29, 2020 Certificate Number: 0214.43

In recognition of the successful completion of the A2LA evaluation process, accreditation is granted to this laboratory to perform the following Electromagnetic Compatibility/Interference (EMC/EMI), Lightning, Transient, Surge, and Product Safety tests:

Test Technology:	Test Method(s)[1,2]:
Emissions	
Radiated and Conducted	CFR 47 FCC, Parts 15B (using ANSI C63.4:2014), and 18 (using MP-5:1986); ANSI C63.4:2009; CISPR 32, Ed. 1 (2012-01); EN 55032:2012/AC:2013; AS/NZS CISPR 22 (2002); AS/NZS 3548 (1997); AS/NZS CISPR 14-1 (2003); IEC/CISPR 14-1, Ed. 4 (2003); IEC 61000-3-12, Ed. 2.0 (2011); EN 61000-3-12 (2011); IEC 61000-6-1, Ed. 2 (2005-03); IEC 61000-6-2, Ed. 2.0 (2005-01); IEC 61000-6-3 (1996); EN 61000-6-3 (2001) + A1 (2004); EN 61000-6-4 (2007); KN 32:2015 (Annex 11); KN 22; KN 11
Harmonics	IEC 61000-3-2, Ed. 2.2 (2004-11); IEC 61000-3-2, Ed. 3.0 (2005) + A1 (2008) + A2 (2009); IEC 61000-3-2, Ed. 4.0 (2014-05)
Flicker	IEC 61000-3-3, Ed. 1.1 (2002-03); EN 61000-3-3 + A1 (2001); IEC 61000-3-3, Ed. 1.1 (2003) + A2 (2005); IEC 61000-3-3, Ed. 3.0 (2013-05)
Immunity	
Electrostatic Discharge (ESD)	IEC 61000-4-2 (2001); EN 61000-4-2 (2001) + A2 (2001); EN 61000-4-2 + A1 (1998) + A2 (2001); IEC 61000-4-2, Ed. 2.0 (2008-12); EN 61000-4-2 (2009-05); KN 61000-4-2; KN 61000-4-2 (2008-5); KN 61000-4-2 (Annex 1-1)
Radiated	IEC/EN 61000-4-3, Ed. 2.1 (2002) + A1 (2002); EN 61000-4-3; IEC 61000-4-3 (1995) + A1 (1998) + A2 (2000); EN 61000-4-3 (2002) + A1 (2002); IEC 61000-4-3, Ed. 3.0 (2006-02) + A1 (2007) + A2 (2010); EN 61000-4-3 (2006) + A1 (2008) + A2 (2010); KN 61000-4-3; KN 61000-4-3 (2008-5); KN 61000-4-3 (Annex 1-2)

5202 Presidents Court, Suite 220 | Frederick, MD 21703-8515 | Phone: 301 644 3248 | Fax: 240 454 9449 | www.A2LA.org

Test Technology:	Test Method(s)[1,2]:
Immunity (cont'd)	
Electrical Fast Transient/Burst	IEC 61000-4-4, Ed. 2.0 (2004-07); EN 61000-4-4 (2004); EN 61000-4-4:2012; IEC 61000-4-4 (2012-04); KN 61000-4-4; KN 61000-4-4 (2008-5); KN 61000-4-4 (Annex 1-3)
Surge	IEC 61000-4-5, Ed. 2.0 (2005-11); EN 61000-4-5; IEC 61000-4-5, Ed. 3.0 (May 2014); BS EN 61000-4-5 (2006); EN 61000-4-5: 2014; KN 61000-4-5; KN 61000-4-5 (2008-5); KN 61000-4-5 (Annex 1-4); IEEE C62.41.1 (2002); IEEE C62.41.2 (2002); IEEE C62.45 (2002)
Conducted	IEC 61000-4-6, Ed. 2.1 (2004); EN 61000-4-6; EN 61000-4-6 (1996) + A1 (2001); IEC 61000-4-6, Ed. 2.2 (2006-05); IEC 61000-4-6, Ed. 3.0 (2008); IEC 61000-4-6, Ed. 4.0 (2013); EN 61000-4-6 (2009); EN 61000-4-6 (2014); KN 61000-4-6; KN 61000-4-6 (2008-5); KN 61000-4-6 (Annex 1-5)
Power Frequency Magnetic Field	IEC 61000-4-8 (2001) + A1 (2000); EN 61000-4-8 (2001) + A1 (2000); EN 61000-4-8 (1993) + A1 (2001); IEC 61000-4-8 (2009); EN 61000-4-8:2010; KN 61000-4-8; KN 61000-4-8 (2008-5); KN 61000-4-8 (Annex 1-6)
Voltage Dips, Short Interruptions, and Voltage Variations	IEC 61000-4-11, Ed. 2 (2004-03); EN 61000-4-11; EN 61000-4-11 (1994) + A1 (2001); EN 61000-4-11 (2004); KN 61000-4-11; KN 61000-4-11 (2008-5); KN 61000-4-11 (Annex 1-7)
Product Safety	
Medical Electrical Equipment	IEC 60601-1-2, Ed. 3.0 (2007); KN 60601-1-2 (2008-5); IEC 60601-1-2, Ed. 4, (2014-02); EN 60601-1-2 (2007); EN 60601-1-2 (2015)
Generic/Product Family Standards and Industry Standards	
Generic Standards	EN 61326-1: 2013; KN 35: 2015
Information Technology Equipment	IEC/CISPR 22 (1997); EN 55022 (1998) + A1 (2000); IEC/CISPR 22 (1993); EN 55022 (1994); IEC/CISPR 22 (1993); EN 55022 (1994) + A1 (1995) + A2 (1997); CNS 13438 (1997); IEC/CISPR 22, Ed. 4 (2003-04); EN 55022 (1998); IEC/CISPR 22, Ed. 5 (2005); EN 55022 (1998); IEC/CISPR 22, Ed. 5 (2005) + A1 (2005); EN 55022 (1998) + A1 (2000) + A2 (2003);

Test Technology:	Test Method(s)[1,2]:
Generic/Product Family Standards and Industry Standards (cont'd)	
Information Technology Equipment (cont'd)	CNS 13438 (2006) (up to 6 GHz); IEC/CISPR 22, Edition 5.2 (2006-03); EN 55022 (2006); EN 55022 (2006) + A1 (2007); EN 55022:2010; IEC/CISPR 22 (2008-09); AS/NZS CISPR 22 (2009); TCVN 7189:2009 (CISPR 22:2006); VCCI V-3 (2009.04, 2011.04, 2013.04, 2014.04, 2015.04) (up to 6 GHz); CISPR 24 Ed 2.0 (2010-08); EN 55024 (2010); KN 24
Industrial, Scientific, and Medical (ISM) Equipment	AS/NZS CISPR 11 (2002); IEC/CISPR 11, Ed. 4.1 (2004-06); AS/NZS CISPR 11 (2004); IEC/CISPR 11, Ed. 4.1 (2004-06) + A1 (2004); EN 55011 (1998) + A1 (1999) + A2 (2002); IEC/CISPR 11 (2003); EN 55011 (1998) + A2(2002); EN 55011 (2009) + A1 (2010); IEC/CISPR 11 Ed. 5 (2009-05); CISPR 11 Ed. 5.1 (2010)
Measure	IEC 61326-1 Ed. 2.0 (2013)
Military/Defense	MIL-STD-461F, G Method CE101 (30 Hz to 10 kHz); MIL-STD-461F, G Method CE102 (10 kHz to 10 MHz); MIL-STD-461F, G Method CE106 (10 kHz to 40 GHz); MIL-STD-461F, G Method CS101 (30 Hz to 150 kHz); MIL-STD-461F, G Method CS106; MIL-STD-461F, G Method CS114 (10 kHz to 200 MHz); MIL-STD-461F, G Method CS115; MIL-STD-461F, G Method CS116 (10 kHz to 100 MHz); MIL-STD-461F, G Method RE101 (30 Hz to 100 kHz); MIL-STD-461F, G Method RE102 (10 kHz to 18 GHz); MIL-STD-461F, G Method RE103 (10 kHz to 40 GHz); MIL-STD-461F, G Method RS101 (30 Hz to 100 kHz); MIL-STD-461F, G Method RS103 (2 MHz to 40 GHz); MIL-STD-704 D, E, F; MIL-HDBK-704-8 Method LDC101; MIL-HDBK-704-8 Method LDC102; MIL-HDBK-704-8 Method LDC103; MIL-HDBK-704-8 Method LDC104; MIL-HDBK-704-8 Method LDC105; MIL-HDBK-704-8 Method LDC201; MIL-HDBK-704-8 Method LDC301; MIL-HDBK-704-8 Method LDC302; MIL-HDBK-704-8 Method LDC401; MIL-HDBK-704-8 Method LDC501; MIL-HDBK-704-8 Method LDC601

[1] When the date, revision or edition of a test method standard is not identified on the scope of accreditation, the laboratory is expected to be using the current version within one year of the date of publication, per part C., Section 1 of A2LA *R101 - General Requirements- Accreditation of ISO-IEC 17025 Laboratories*. If a specifier/regulator imposes a different transition period, this will supersede the A2LA one-year implementation period.

[2] The laboratory is only accredited for testing activities outlined within the test methods listed above. Reference to any other activity within these standards, such as risk management or risk assessment, does not fall within the laboratory's accredited capabilities.

On the following types of products:

Telecommunication Equipment, Network Equipment, Industrial and Commercial Equipment, Electronic (Digital) Equipment, Medical, Aerospace, Military. Information Technology Equipment, Multimedia Equipment, Scientific Equipment

Testing Activities Performed in Support of FCC Declaration of Conformity and Certification in Accordance with 47 Code of Federal Regulations and FCC KDB 974614, Appendix A, Table A.1[3]

Rule Subpart/Technology	Test Method	Maximum Frequency (MHz)
Unintentional Radiators Part 15B	ANSI C63.4:2014	18000
Industrial, Scientific, and Medical Equipment Part 18	FCC MP-5 (February 1986)	18000

[3]Accreditation does not imply acceptance to the FCC equipment authorization program. Please see the FCC website (https://apps.fcc.gov/oetcf/eas/) for a listing of FCC approved laboratories.

Accredited Laboratory

A2LA has accredited

NATIONAL TECHNICAL SYSTEMS (NTS) - LONGMONT

Longmont, CO

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 8th day of October 2018.

President and CEO
For the Accreditation Council
Certificate Number 0214.43
Valid to February 29, 2020

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

END OF REPORT