

National Technical Systems Test Report for Environmental Testing of the Clear Access Components

Prepared For

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Quality Review

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Revision History

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1.0 Introduction

This document presents the test procedures used and the results obtained during the performance of an Environmental test program. The test program was conducted to assess the ability of the specified Equipment Under Test (EUT) to successfully satisfy the requirements listed in Section 2.0.

2.0 References

The following references listed below form a part of this document to the extent specified herein.

- Pro V&V, Inc. Purchase Order(s) 2020-009, dated 10/26/2020
- National Technical Systems (NTS) Quote(s) OP0565149, dated 10/15/2020
- NTS Corporate Quality Policy Manual, Revision 9, dated 9/20/2018
- ISO/IEC 17025:2017(E) *General Requirements for the Competence of Testing and Calibration Laboratories*, dated 11/1/2017
- Test Specification: MIL-STD-810D
- Test Specification: Pro V&V SOW

3.0 Product Selection and Description

Pro V&V, Inc. selected and provided the test sample(s) to be used as the Equipment Under Test. Details below:

Table 3.0-1: Product Identification - Equipment Under Test (EUT)

Item	Qty.	Name/Description	Part Number	Serial Number
1	1	ELO	None	I193022853, I193922848, I193922854
2	1	OKI	None	BW01017752C0, BW01017757C0, BW02001275C0
3	1	UPS	None	PY3H22003015, PWLKP2000685, PWLKP2000675
4	2	ATI	None	20011265, 20011271

3.1 Security Classification

Non-classified

4.0 General Test Requirements

4.1 Test Equipment

NTS-provided equipment is calibrated according to ISO/IEC 17025:2017(E) and calibration is traceable to the National Institute of Standards and Technology (NIST). Calibration records are maintained on file at NTS.

4.2 Notice of Deviation

In accordance with NTS' quality procedures, when the EUT is observed to exceed or display susceptibility, a Notice of Deviation (NOD) document is generated by the technician performing the test. This NOD documents the requirement, how the EUT deviated from the requirement, and allows room for resolution of the deviation.

This document is reviewed and approved by the NTS Program Manager or Engineer and the NTS Quality Assurance Representative, and then forwarded to the customer contact. Once mitigated (or passed over), the steps taken to correct the deviation (or simply instruction from the customer to continue testing) are recorded in the NOD and a copy of the NOD is integrated into the body of the report, in the appropriate location.

5.0 Test Descriptions and Results

Table 5.0-1: Summary of Test Information & Results

Section	Test	Specification	Test Facility	Test Date	Name/Description	Part #	Serial #	Test Result*
5.1	Humidity	MIL-STD-810D, Method 507.2	Longmont	12/01/2020 – 12/11/2020	ELO	None	I193022853	Showed no visual damage
					OKI	None	BW01017752C0	
					UPS	None	PY3H22003015	
5.2	High Temperature	MIL-STD-810D, Method 502.2	Longmont	12/11/2020 – 12/14/2020	ELO	None	I193022853	Showed no visual damage
					OKI	None	BW01017752C0	
					UPS	None	PY3H22003015	
5.3	Temperature/ Power Variation	MIL-STD-810D, Methods 502.2 and 501.2	Longmont	12/14/2020 – 12/16/2020	ELO	None	I193922848, I193922854	Showed no visual damage
					UPS	None	PWLKP2000685 PWLKP2000675	
					ATI	None	20011265 20011271	
					OKI	None	BW01017757C0 BW02001275C0	
5.4	Low Temperature	MIL-STD-810D, Method 501.2	Longmont	12/14/2020	ELO	None	I193022853	Showed no visual damage
					OKI		BW01017752C0	
					UPS		PY3H22003015	
5.5	Bench Handling	MIL-STD-810D, Method 516.3, Procedure VI	Longmont	11/30/2020 - 12/18/2020	ELO	None	I193022853	Showed no visual damage
					OKI		BW01017752C0	
					UPS		PY3H22003015	
5.6	Transportation Vibration	MIL-STD-810D, Method 514.3, Category 1 and Pro V&V SOW	Longmont	12/17/2020	ELO	None	I193022853	Showed no visual damage
					OKI	None	BW01017752C0	
					UPS	None	PY3H22003015	

*The decision rule used to state compliance is in accordance with the test specification used for testing. Unless otherwise noted, testing was performed in accordance with the latest published version of test specification at time of test.

5.1 Humidity
5.1.1 Test Result

No evidence of damage.

5.1.2 Test Procedure

MIL-STD-810D, Method 507.2

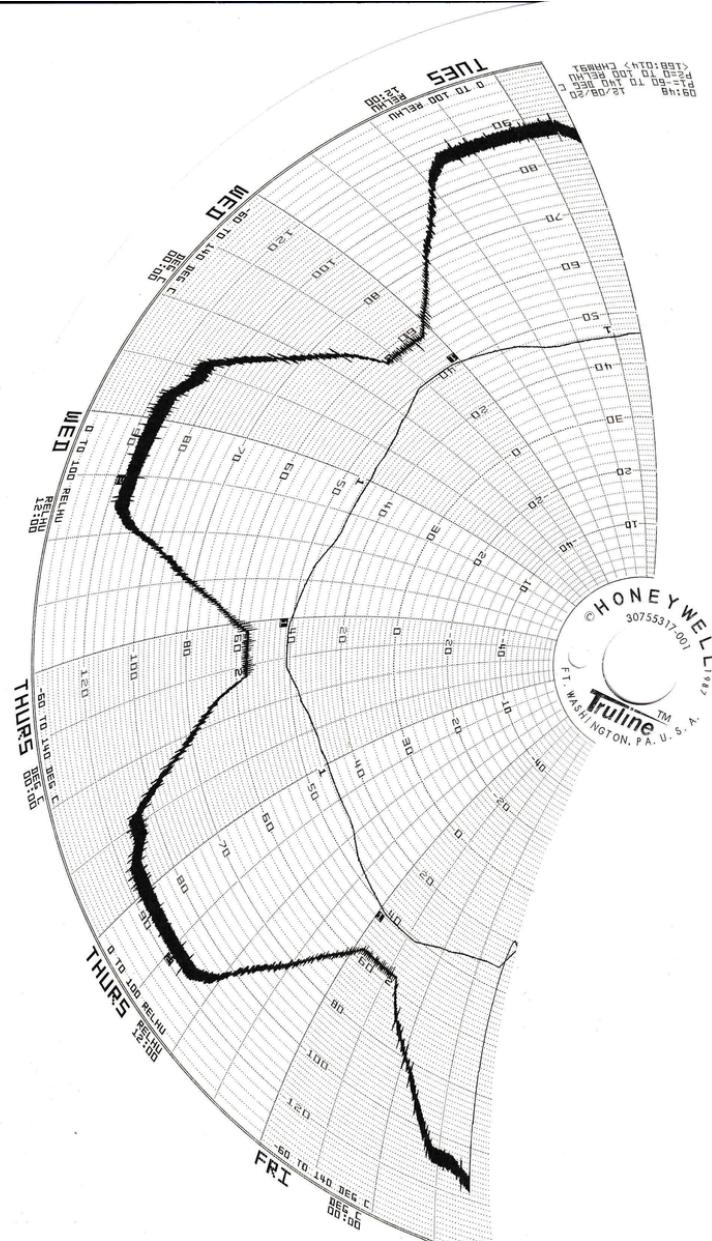
5.1.3 Test Datasheets

Start Date: 12/01/20 End Date: 12/11/20			MJO No: PR128128
Customer: Pro V&V/ClearVote 2.2 Test Performed: 10 Day Temperature/Humidity Test Test By: KM			
Part Name: ClearAccess		Serial No: See UUT Details	Customer Witness: N/A
Page 1 of 1		Test Specification: MIL-STD_810D	Temp: +31c to +41c Humidity: 59% RH to 88% RH
Date	Time	Remarks	Initials
12/01/20	08:00	Customer performed pre-test functional test on UUT	KM
12/01/20	09:00	Install UUT in chamber	KM
12/01/20	09:35	Start test profile mil-810 hot hum 10 day test	KM
12/11/20	10:30	Test has completed mil-810 hot hum 10 day test	KM
12/11/20	10:35	Chamber at +23c ambient	KM
12/11/20	10:40	Open chambers doors	KM
12/11/20	10:45	Customer inspected UUT and performed post-test functional test on UUT	KM
12/11/20	11:00	Test complete	KM
		Note: All test pass or fail determinations decided by Pro V&V Inc.	

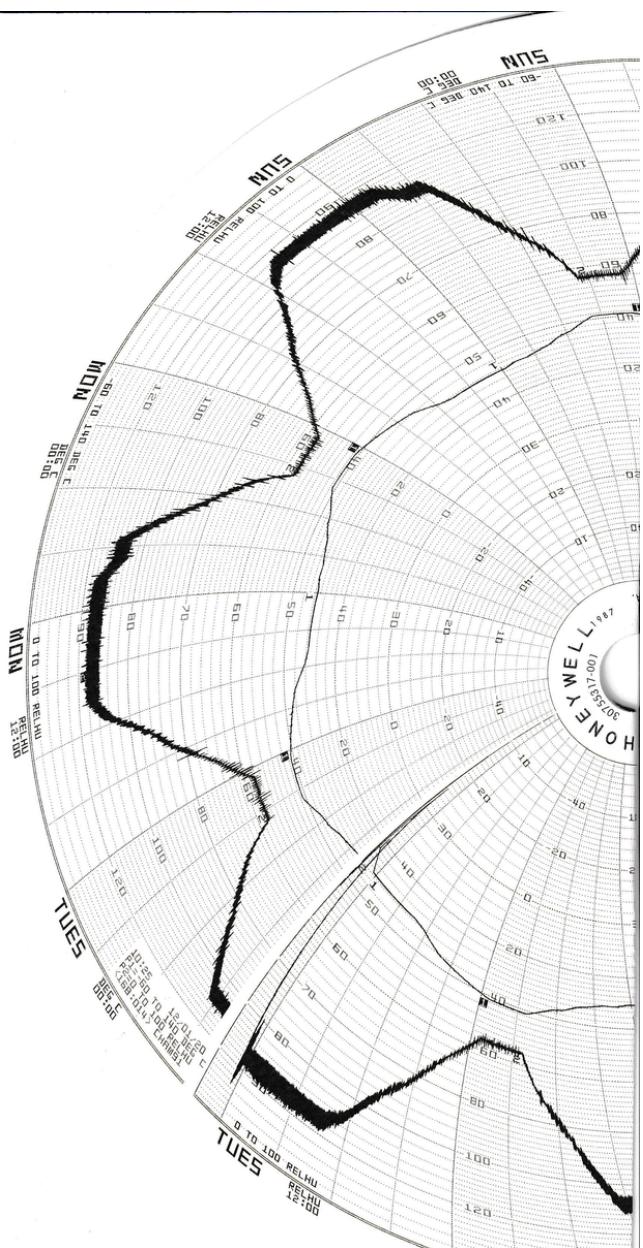
5.1.4 Test Photograph



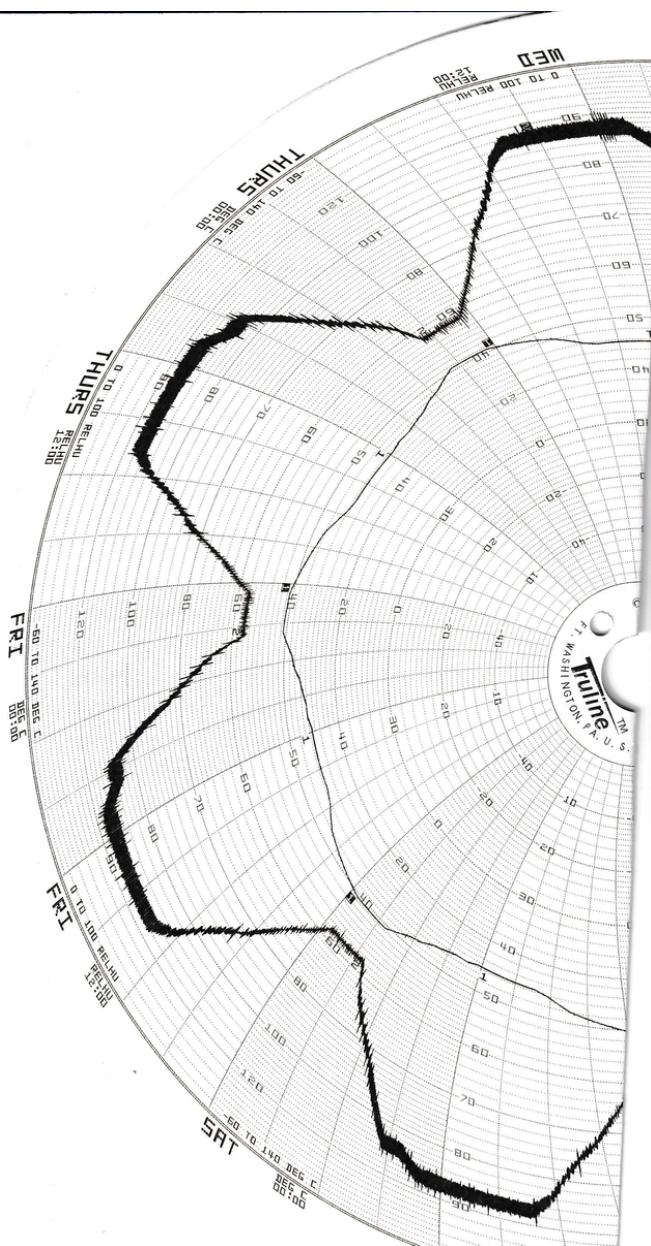
5.1.5 Test Data



Ch 91_3 Days_Humidity Test_Graph_Data



Ch 91_7 Days_Humidity Test_Graph_Data_Page_1



Ch 91_7 Days_Humidity Test_Graph_Data_Page_2

5.1.6 Test Equipment List

Table 5.1-1: Humidity Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
WC061722	N/A	N/A	N/A	Chamber 91	NCR	NCR
WC061723	Envirotronics	System +	N/A	Controller	02/11/20	02/11/21
WC061724	Honeywell	N/A	N/A	Chart Recorder	02/11/20	02/11/21

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.2 High Temperature
5.2.1 Test Result

No evidence of damage.

5.2.2 Test Procedure

MIL-STD-810D, Method 502.2

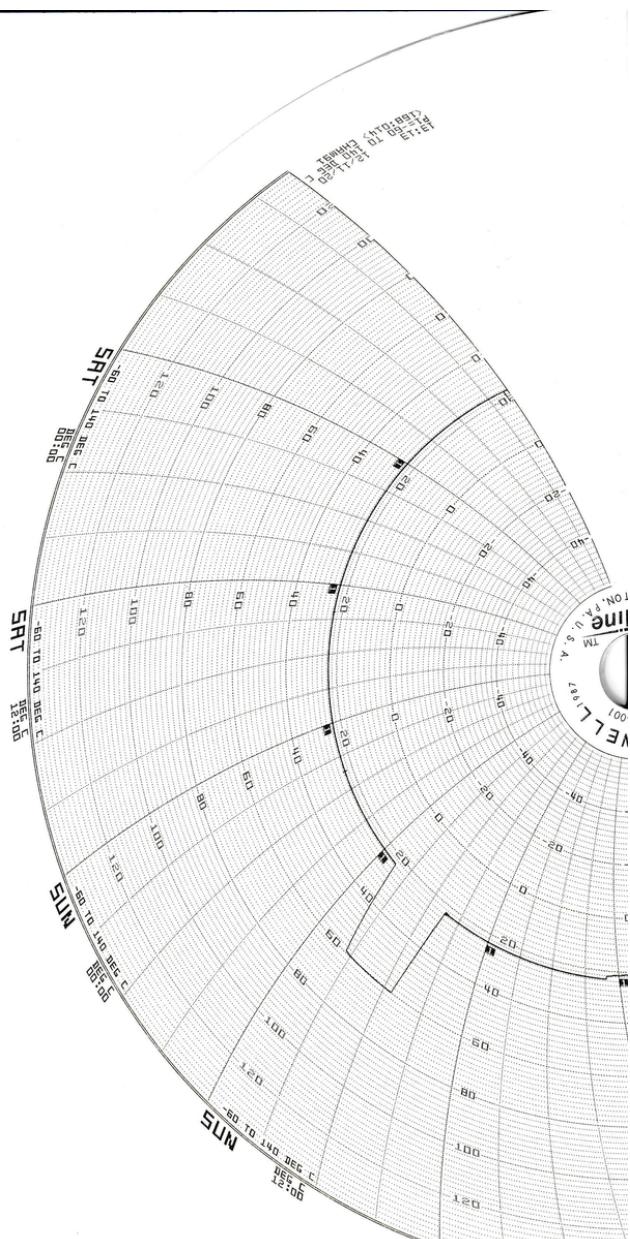
5.2.3 Test Datasheets

Start Date: 12/11/20		End Date: 12/14/20	MJO No: PR128128	
Customer: Pro V&V/ClearVote 2.2		Test Performed: High Temperature Test	Test By: KM	
Part Name: ClearAccess		Serial No: See UUT Details	Customer N/A	Witness: N/A
Page 1 of 1		Test Specification: MIL-STD_810D	Temp: +60c	Humidity: N/A
Date	Time	Remarks	Initials	
12/11/20	12:30	Start the following test profile	KM	
		Ramp to +23c		
		Ramp to +60c		
		Dwell at +60 for 4hrs		
		Ramp to +23c		
		Customer inspected UUT and performed post-test functional test on UUT		
12/14/20	17:30	Test complete	KM	
		Note: All test pass or fail determinations decided by Pro V&V Inc.		

5.2.4 Test Photograph



5.2.5 Test Data



+60c_Graph_Data

5.2.6 Test Equipment List

Table 5.2-1: High Temperature Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
WC061722	N/A	N/A	N/A	Chamber 91	NCR	NCR
WC061723	Envirotronics	System +	N/A	Controller	02/11/20	02/11/21
WC061724	Honeywell	N/A	N/A	Chart Recorder	02/11/20	02/11/21

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.3 Temperature/Power Variation
5.3.1 Test Result

No evidence of damage.

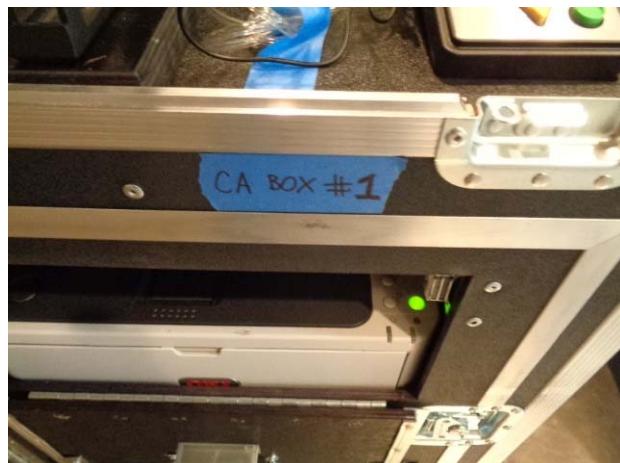
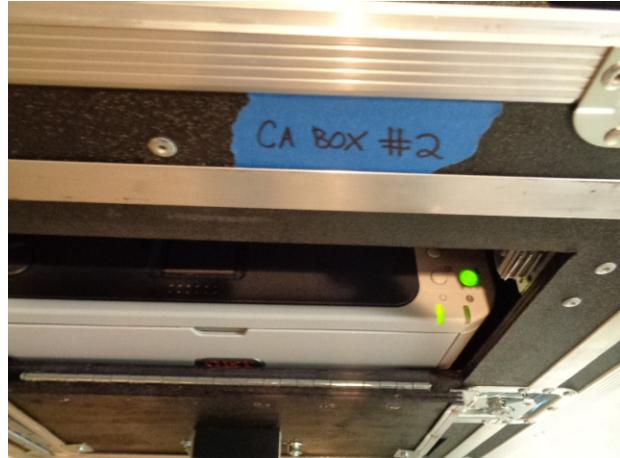
5.3.2 Test Procedure

MIL-STD-810D, Methods 502.2 and 501.2

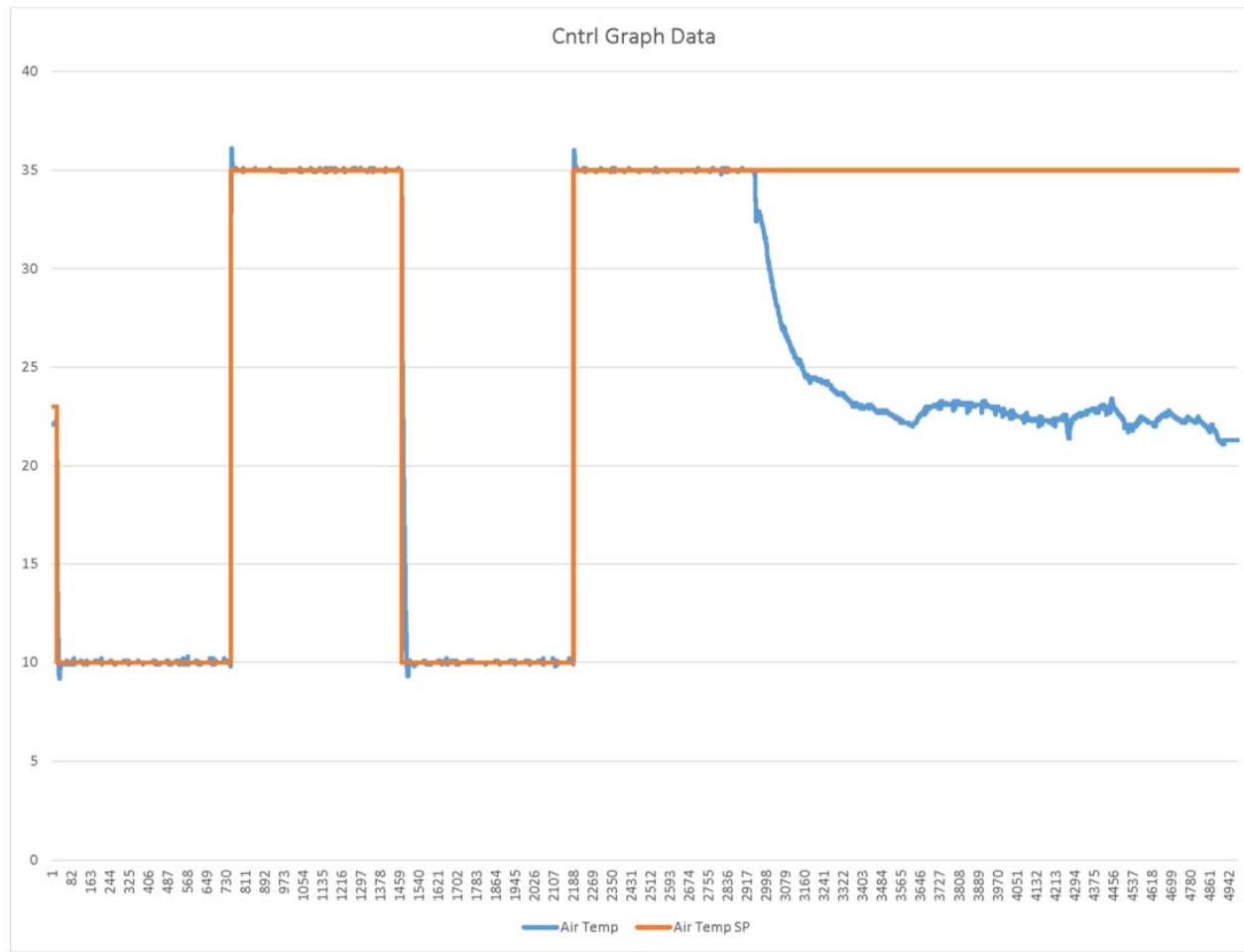
5.3.3 Test Datasheets

Start Date: 12/14/20	End Date: 12/16/20	MJO No: PR128128	
Customer: Pro V&V/ClearVote 2.2	Test Performed: Temperature Power Variation Test	Test By: KM	
Part Name: ClearAccess	Serial No: See UUT Details Sheet	Customer Witness: Yes	
Page 1 of 1	Test Specification: MIL-STD_810D	Temp: +10c to +35c Voltage: 105vllts to 129vllts	
Date	Time	Remarks	Initials
12/14/20	09:25	Set VAC to 117vllts & ramp to +10c	RSP
12/14/20	09:30	Start dwell at 117vllts & +10c for 4hrs	RSP
12/14/20	13:30	Lower VAC to 105vllts & dwell for 4hrs	GM
12/14/20	17:30	Raise VAC to 129vllts & dwell for 4hrs	KM
12/14/20	21:30	Lower VAC to 117vllts & Raise temperature to +35c & dwell for 4hrs	KM
12/15/20	01:30	Lower VAC to 105vllts & dwell for 4hrs	KM
12/15/20	05:30	Raise VAC to 129vllts & dwell for 4hrs	GM
12/15/20	09:30	Lower VAC to 117vllts & Lower temperature to +10c & dwell for 4hrs	GM
12/15/20	13:30	Lower VAC to 105vllts & dwell for 4hrs	GM
12/15/20	17:30	Raise VAC to 129vllts & dwell for 4hrs	KM
12/15/20	21:30	Lower VAC to 117vllts & Raise temperature to +35c & dwell for 4hrs	KM
12/16/20	01:30	Lower VAC to 105vllts & dwell for 4hrs	KM
12/16/20	05:30	Raise VAC to 129vllts & dwell for 4hrs	GM
12/16/20	09:30	Lower VAC to 117vllts & ramp to +23c ambient	GM
12/16/20	09:30	Temperature and power variation portion of test has completed	KM
12/16/20	09:30	Test will continue to run at +23c ambient for another 37hrs	KM
12/16/20	22:30	All Testing complete for a total of 85hrs	KM
		Note: All test pass or fail determinations decided by Pro V&V Inc.	

5.3.4 Test Photographs



5.3.5 Test Data



Cntrl_Graph_Data

5.3.6 Test Equipment List

Table 5.3-1: Temperature/Power Variation Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1734	Envirotronics	N/A	N/A	Chamber 42	NCR	NCR
1642	Thermotron	8800	N/A	Controller	11/05/20	11/05/21

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.4 Low Temperature

5.4.1 Test Result

No evidence of damage.

5.4.2 Test Procedure

MIL-STD-810D, Method 501.2

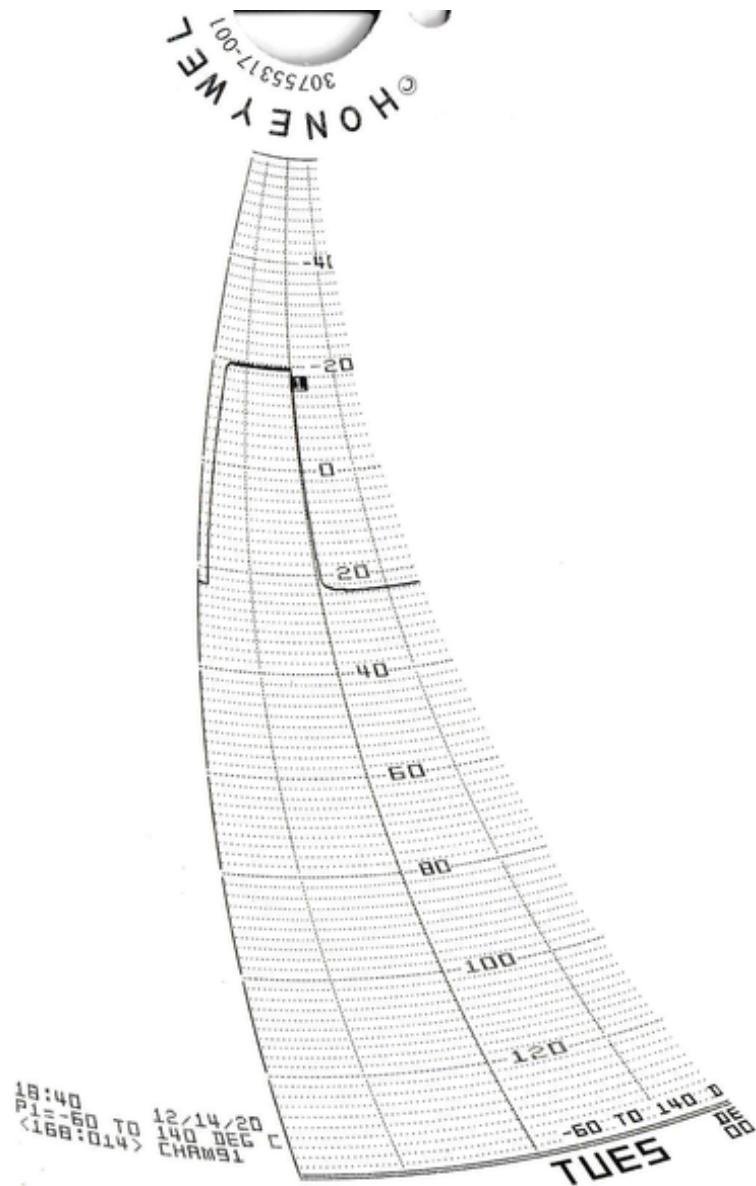
5.4.3 Test Datasheets

Start Date: 12/14/20		End Date: 12/14/20	MJO No: PR128128
Customer: Pro V&V/ClearVote 2.2		Test Performed: Cold Temperature Test	Test By: KM
Part Name: ClearAccess		Serial No: See UUT Details	Customer Witness: N/A
Page 1 of 1		Test Specification: MIL-STD_810D	Temp: -20c Humidity: N/A
Date	Time	Remarks	Initials
12/14/20	17:40	Start the following test profile	KM
		Ramp to +23c	
		Ramp to -20c	
		Dwell at -20 for 4hrs	
		Ramp to +23c	
		Customer inspected UUT and performed post-test functional test on UUT	
12/14/20	11:00	Test complete	KM
		Note: All test pass or fail determinations decided by Pro V&V Inc.	

5.4.4 Test Photographs



5.4.5 Test Data



-20c_Graph_Data

5.4.6 Test Equipment List

Table 5.4-1: Low Temperature Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
WC061722	N/A	N/A	N/A	Chamber 91	NCR	NCR
WC061723	Envirotronics	System +	N/A	Controller	02/11/20	02/11/21
WC061724	Honeywell	N/A	N/A	Chart Recorder	02/11/20	02/11/21

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.5 Bench Handling**5.5.1 Test Result**

No evidence of damage.

5.5.2 Test Procedure

MIL-STD-810D, Method 516.3, Procedure VI

5.5.2 Test Datasheets

Start Date: 12/15/20	End Date: 12/15/20	MJO No: PR128128	
Customer: Pro V&V/ClearVote 2.2	Test Performed: Bench Test	Test By: KM	
Part Name: ClearAccess	Serial No: See UUT Details	Customer Witness: Yes	
Page 1 of 1	Test Specification: MIL-STD_810D	Temp: N/A Humidity: N/A	
Date	Time	Remarks	Initials
12/15/20	18:00	Start 6 drops per corner of UUT from 4 inches	KM
		Total of 24 drops from 4 inches for UUT complete	
12/15/20	18:30	Test Complete and customer performed posttest	KM
		Note: All test pass or fail determinations decided by Pro V&V Inc.	

5.5.3 Test Photographs



5.5.4 Test Equipment List

Table 5.5-1: Bench Handling Test Equipment List

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
N/A	N/A	N/A	N/A	4 inch wooden block	NCR	NCR

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

5.6 Transportation Vibration

5.6.1 Test Result

No evidence of damage.

5.6.2 Test Procedure

MIL-STD-810D, Method 514.3, Category 1 and Pro V&V SOW

5.6.3 Test Datasheets

Start Date: 12/17/20	End Date: 12/17/20	MJO No: PR128128				
Customer: Pro V&V	Test Performed: Random Vibration	Test Engineer: Michael Nash				
Part Name: Clear Access	Serial numbers: See UUT details	Customer Witness: n/a				
Page 1 of 1	Test Specification: Customer SOW & MIL-STD-810D	Temp: 68° Humidity: 18%				
Date	Time	Axis	Plot No.	Serial No.	Remarks	Initials
12/17/20		Vert			Setup UUT on shaker HYD06 in the Vertical-Axis	MN
	0834		Run 1		Run 1.04 gRMS common carrier random profile on the UUT in the Vertical-Axis	MN
		Long			Setup UUT on shaker ED02 in the Longitudinal-Axis	MN
	1146		Run 2		Run 0.74 gRMS common carrier random profile on the UUT in the Longitudinal-Axis	MN
		Trans			Setup UUT on shaker ED02 in the Transverse-Axis	MN
	1253		Run 3		Run 0.2 gRMS common carrier random profile on the UUT in the Transverse-Axis	MN
					Testing complete	MN

5.6.4 Test Photographs



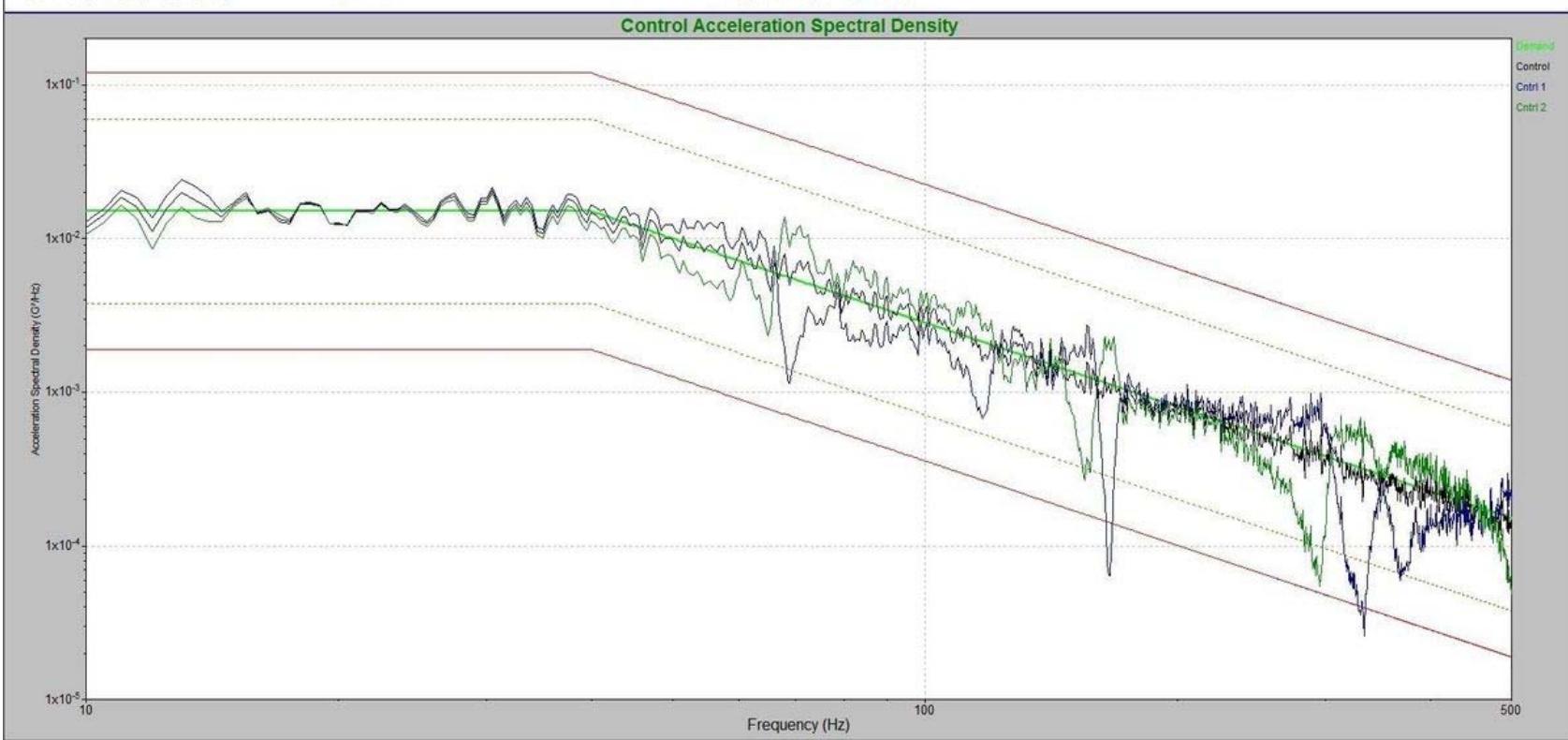
5.6.5 Test Data

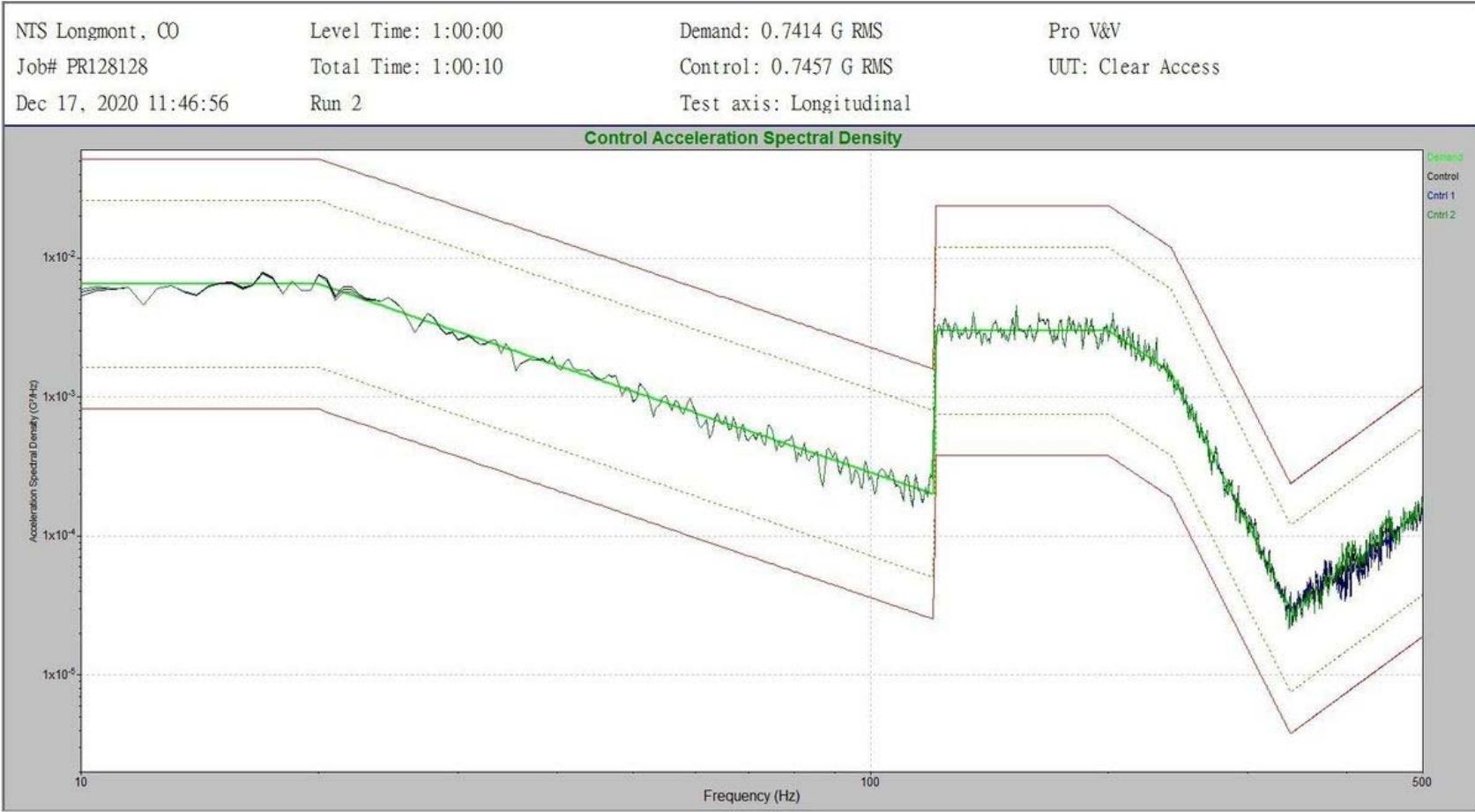
NTS Longmont, CO
 Job# PR128128
 Dec 17, 2020 08:34:54

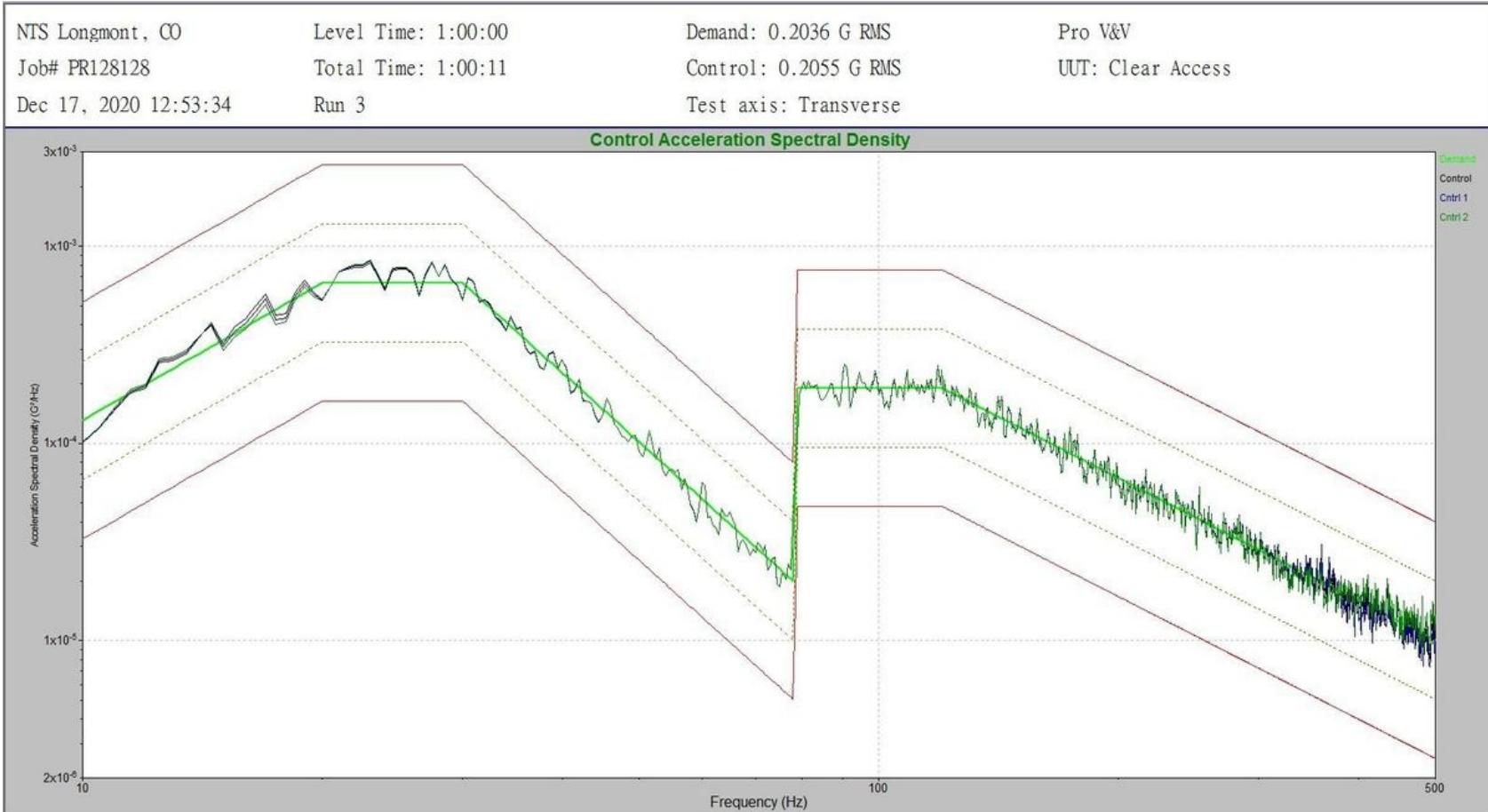
Level Time: 1:00:00
 Total Time: 1:00:16
 Run 1

Demand: 1.045 G RMS
 Control: 1.053 G RMS
 Test axis: Vertical

Pro V&V
 UUT: Clear Access







5.6.6 Test Equipment List

Table 5.6-1: Transportation Vibration Test Equipment List

ID Number	WC Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1750	WC061429	Team	80/10.5	544	Shaker System HYD06		NCR
1755	WC043856	Ling Electronics	DMA48/36 B335	83/338	Shaker System ED2		NCR
1704	WC061701	VR	VR9500	9521DE37	Vibration Controller	5/15/2020	5/15/2021
1670	WC061499	PCB	333A12	30536	Accelerometer	10/7/2020	10/7/2021
1672	WC061498	PCB	333A12	30538	Accelerometer	10/7/2020	10/7/2021
1623	WC070229	PCB	J320C02	10085	Accelerometer	4/14/2020	4/30/2021
1701	WC059861	PCB	353B02	205370	Accelerometer	4/14/2020	4/30/2021
1766	WC070466	Fluke	971	3623064	Temp/Humidity Meter	4/15/2020	4/15/2021

Calibration Abbreviations

CAL: Calibration

NCR: No Calibration Required

End of Report