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National Technical Systems
Environmental & Dynamics Lab
1601 Dry Creek Dr. #2000
Longmont, CO 80503

Main: 303-776-7249
Fax: 303-776-7314

Date: 12 OCTOBER 2018

Customer:
Pro V&V, Inc.
700 Boulevard South
Suite 102
Huntsville, AL 35802

Purchase Order Number: 2018-010

A. TEST: Thermal, Humidity, Bench Handling, Vibration, and Temperature/Power Variation

B. TEST ITEMS: ClearCast Voting Machine
See page 2 for Test Item Identification

C. SPECIFICATIONS: 1. Quotation Number OP0257934-01
2. ISO 17025:2005

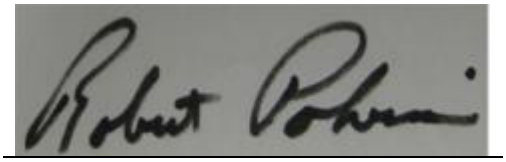
D. RESULTS:

This is to certify that the ClearCast Voting Machine was subjected to environmental/dynamic testing according to the above specifications.

See Page 2 for Summary of Test Results. The ClearCast Voting Machine was returned to Pro V&V for post-tests and final evaluation.

Test data, an equipment list, and photographs are attached.

Greg Gagne,
Technical Writer



Bob Polverari,
Technical Reviewer

REVISIONS

Revision	Reason for Revision	Date
NR	Initial Release	12 October 2018
1	Added vibration testing performed.	16 November 2018

TEST ITEM IDENTIFICATION

Quantity	Sample Description	Serial Numbers
2	ClearCast Voting Machines	CASTD002009
		CASTD002010

SUMMARY OF TEST RESULTS

Upon completion of testing, the test samples were removed from the test fixture and subjected to a visual inspection. No anomalies were noted. The Test Samples were returned to Pro V&V.

Humidity Testing

Test was started on 05 September 2018 and completed on 17 September 2018 by subjecting one (1) UUT to 10-day Humidity Testing in accordance with Quotation Number OP0257934-01 and MIL-STD-810D.

Note: All test pass/fail determination decided by Pro V&V.

Thermal Testing

Testing was started on 17 September 2018 and completed on 19 September 2018 by exposing the test sample to high and low temperature testing in accordance with Quotation Number OP0257934-01 and MIL-STD-810D.

High Temperature: The test sample was placed in the chamber and exposed to +60°C (with a ramp rate from ambient at 5°C per minute) for a 4-hour dwell.

Low Temperature: The test sample was placed in the chamber and exposed to -20°C (with a ramp rate from ambient at 5°C per minute) for a 4-hour dwell.

Note: All test pass/fail determination decided by Pro V&V.

Bench Handling Test

Testing was started and completed on 20 September 2018 by exposing one (1) UUT to Bench Handling testing in accordance with Quotation Number OP0257934-01 and MIL-STD-810D.

The test sample was subjected to six (6) drops per corner of UUT from four (4) inches for a total of twenty-four (24) drops.

Note: All test pass/fail determination decided by Pro V&V.

Temperature/Power Variation Testing

Testing was started on 24 September 2018 and completed on 27 September 2018 by exposing two (2) UUT's to Power Variation testing in accordance with Quotation Number OP0257934-01 and MIL-STD-810D.

The test samples were placed in the chamber and exposed to voltage and temperature variances with a 4-hour dwell per sequence, noting that the power varies every 4 hours for two (2) 24 hour cycles, with the temperature varying every 12 hours for two (2) 24 hour cycles. See Test Log on page 9 for detailed sequences.

Note: All test pass/fail determination decided by Pro V&V.

Vibration Testing

Testing was started and completed on 20 September 2018 by exposing one (1) UUT to Transportation Vibration Testing in accordance with Quotation Number OP0257934-01 and MIL-STD-810D.

The test sample was secured to the shaker and the following profiles were run on the corresponding axes:

- Transverse axis: 0.20 gRMS random vibration profile
- Longitudinal axis: 0.74 gRMS random vibration profile
- Vertical axis: 1.04 gRMS random vibration profile

Note: All test pass/fail determination decided by Pro V&V.

TEST LOGS

TEST 10 Day Humidity Test MJO PR085361

CUSTOMER Pro V&V Inc P/N N/A S/N CASTD002009

TEST ITEM ClearVote 1.5

SPECIFICATION MIL-STD-810D PARA

DATE	TIME	LOG ENTRIES	INITIALS
09/05/18	09:00	Start 10 day humidity test	KM
	14:30	Noticed frig pack is not on - reset frig pack and will restart test	KM
	15:00	Start 10 day humidity test	KM
09/17/17	06:30	Test complete & open chambers doors and allow UUT to drift back to ambient	KM
	08:00	Customer inspected UUT	KM
		Note:All test pass or fail determinations decided by Pro V&V Inc.	

TEST BY Kerry Martin DATE 09/17/18

PAGE 1 OF 1 ENGINEER GOV'T QAR N/A

TEST High Temp +60c Test MJO PR085361

CUSTOMER Pro V&V Inc P/N N/A S/N CASTD002009

TEST ITEM ClearVote 1.5

SPECIFICATION MIL-STD-810D PARA

DATE	TIME	LOG ENTRIES	INITIALS
09/17/18	15:40	Start High Temperature profile as follows	KM
		Ramp to +60c at 5c per minute	
		Start dwell at +60c for 4hrs	
		Bring chamber to ambient +23c	
09/18/18	09:00	Customer performed post test on UUT	KM
	09:05	Test complete	KM
		Note:All test pass or fail determinations decided by Pro V&V Inc.	

PAGE 1 OF 1

TEST BY Kerry Martin DATE 09/18/18

ENGINEER GOV'T QAR N/A

TEST Low Temp -20c Test MJO PR085361

CUSTOMER Pro V&V Inc P/N N/A S/N CASTD002009

TEST ITEM ClearVote 1.5

SPECIFICATION MIL-STD-810D PARA

DATE	TIME	LOG ENTRIES	INITIALS
09/18/18	09:20	Start the following test profile	KM
		Ramp to -20c at 5c per minute	
		Start dwell at -20c for 4hrs	
		Bring chamber to ambient +23c	
		Customer performed post test on UUT	
		Test complete	
		Note:All test pass or fail determinations decided by Pro V&V Inc.	
09/18/18	11:15	Chamber 59 is not cooling properly will move UUT to chamber to run low temp test	KM
	11:30	Start the following test profile	KM
		Ramp to -20c at 5c per minute	
		Start dwell at -20c for 4hrs	
		Bring chamber to ambient +23c	
		Customer performed post test on UUT	
09/19/18	o6:30	Test complete	KM
		Note:All test pass or fail determinations decided by Pro V&V Inc.	

PAGE 1 OF 1

TEST BY Kerry Martin DATE 09/19/18

ENGINEER GOV'T QAR N/A

TEST Bench Test MJO PR085361

CUSTOMER Pro V&V Inc P/N N/A S/N CASTD002009

TEST ITEM ClearVote 1.5

SPECIFICATION MIL-STD-810D PARA

DATE	TIME	LOG ENTRIES	INITIALS
09/20/18	07:30	Start 6 drops per corner of UUT from 4 inches	KM
09/20/18	08:00	Total of 24 drops from 4 inches for UUT complete	KM
		Note:All test pass or fail determinations decided by Pro V&V Inc.	

PAGE 1 OF 1

TEST BY Kerry Martin DATE 09/20/18

ENGINEER GOV'T QAR N/A

TEST Temperature Power Variation Test MJO PR085361

CUSTOMER Pro V&V Inc P/N S/N See Below

TEST ITEM ClearVote 1.5

SPECIFICATION MIL-STD-810D PARA

DATE	TIME	LOG ENTRIES	INITIALS
		Serial Numbers - CASTD002009, CASTD002010	
09/24/18	09:00	Set VAC to 117vlts	KM
	09:00	Set temperature to +10c & dwell 4hrs	KM
	13:00	Lower VAC to 105vlts & dwell 4hrs	KM
	17:00	Raise VAC to 129vlts & dwell 4hrs	KM
	21:00	Lower VAC to 117vlts & set temperature to 23c	KM
	21:00	Raise temperature to +35c & dwell 4hrs	KM
09/25/18	01:00	Lower VAC to 105vlts & dwell 4hrs	KM
	05:00	Raise VAC to 129vlts& dwell 4hrs	KM
	09:00	Lower VAC to 117vlts	KM
	09:00	Lower temperature to +10c & dwell 4hrs	KM
	13:00	Lower VAC to 105vlts & dwell 4hrs	KM
	17:00	Raise VAC to 129vlts & dwell 4hrs	KM
	21:00	Lower VAC to 117vlts	KM
	21:00	Raise temperature to +35c & dwell 4hrs	KM
09/26/18	01:00	Lower VAC to 105vlts & dwell 4hrs	KM
	05:00	Raise VAC to 129vlts & dwell 4hrs	KM
	09:00	Lower VAC to 117vlts & ramp to +23c	KM
	09:00	Temp and power variation portion of test has completed	KM
	09:00	Test will contine to run at ambient +23c for 37hrs	KM
09/27/18	22:00	Test Complete	KM

PAGE 1 OF 1

TEST BY Kerry Martin DATE 09/27/18

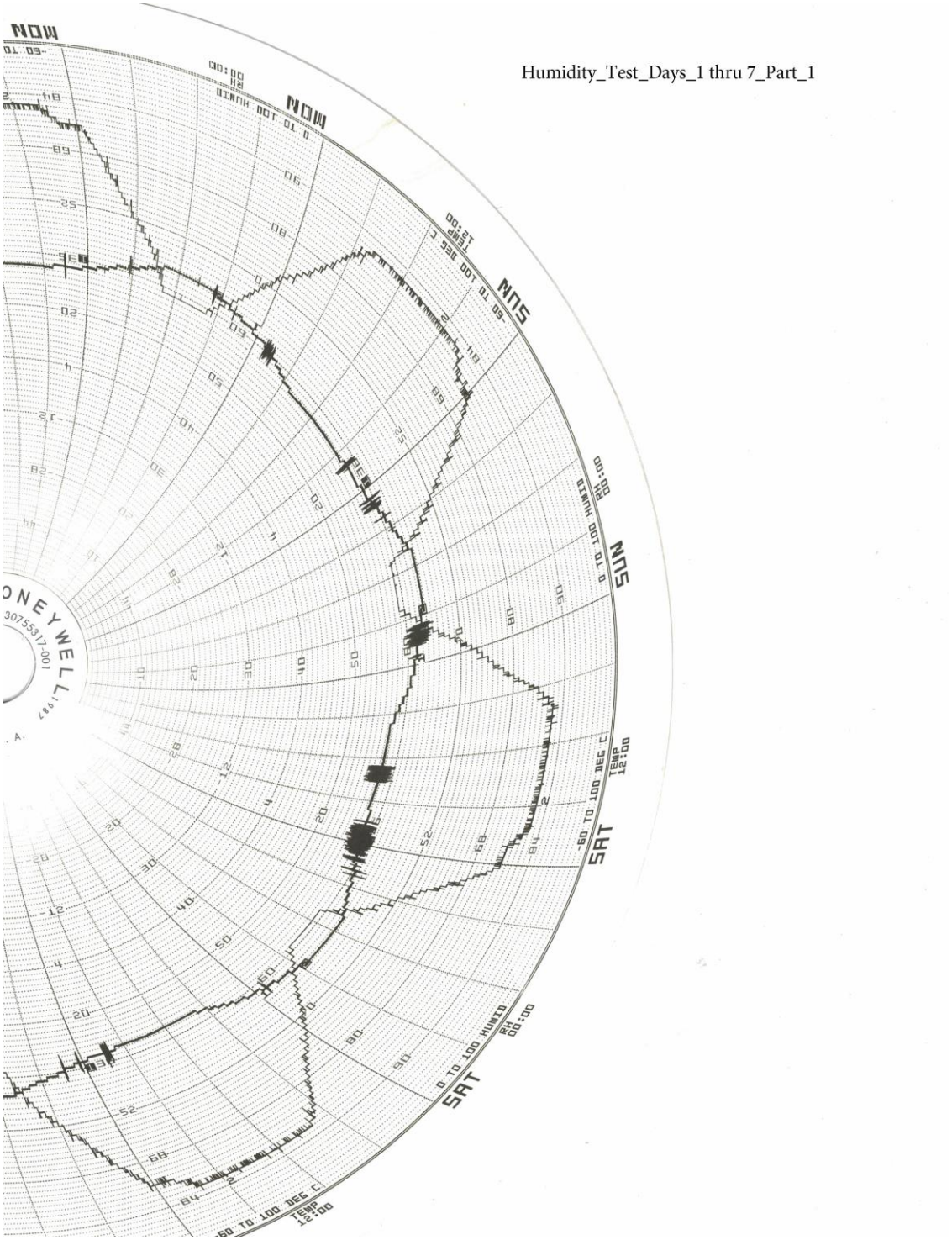
ENGINEER GOV'T QAR N/A

Start Date: 9/20/18 End Date: 9/20/18			**MJO No: PR085361**
Customer: Pro V&V	Test Performed: Transportation Vibration	Test Engineer:	Michael Nash
Part Name: Clearcast Voting Machine	Serial numbers: CASTD002009	Customer Witness:	N/A
Page of	Test Specification: Mil-STD-810D	Temp: 70° Humidity: 45%	

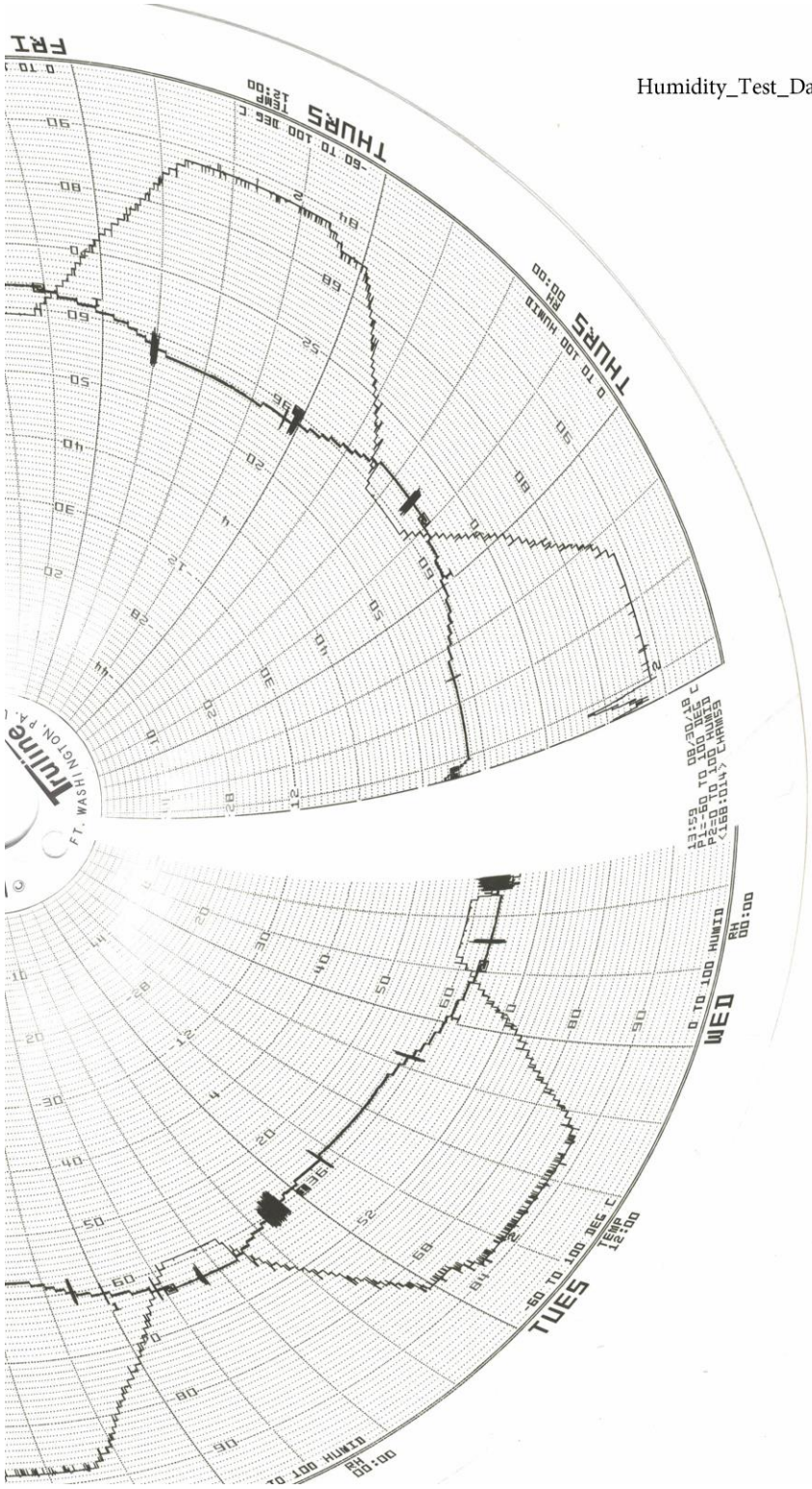
Date	Time	Axis	Plot No.	Serial No.	Remarks	Initials
9/20/18	0930	Trans			Setup UUT on shaker HYD05 in the Transverse-Axis	MN
	0953		Run 1		Run .20 gRMS random vibration on packaged UUT in the Transverse-Axis	MN
	1055	Long			Rotate UUT to the Longitudinal-Axis	MN
	1103		Run 2		Run .74 gRMS random vibration on packaged UUT in the Longitudinal-Axis	MN
	1205	Vert			Changeover to shaker HYD06 in the Vertical-Axis	MN
	1222		Run 3		Run 1.04 gRMS random vibration on packaged UUT in the Vertical-Axis	MN
	1330				Units were functionally tested and worked to design. Testing complete.	MN

TEST DATA

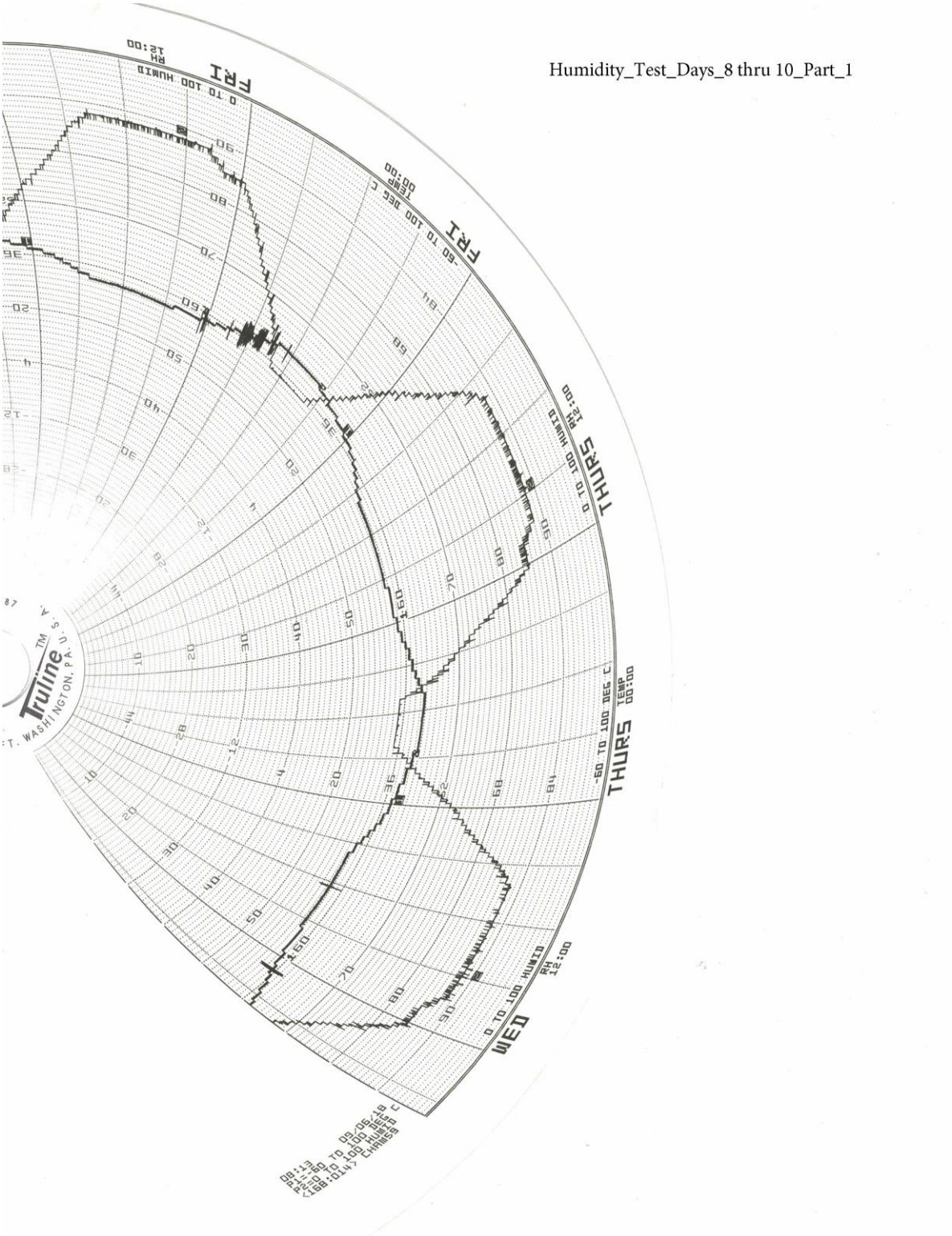
Humidity:



Humidity_Test_Days_1 thru 7_Part_2



Humidity_Test_Days_8 thru 10_Part_1



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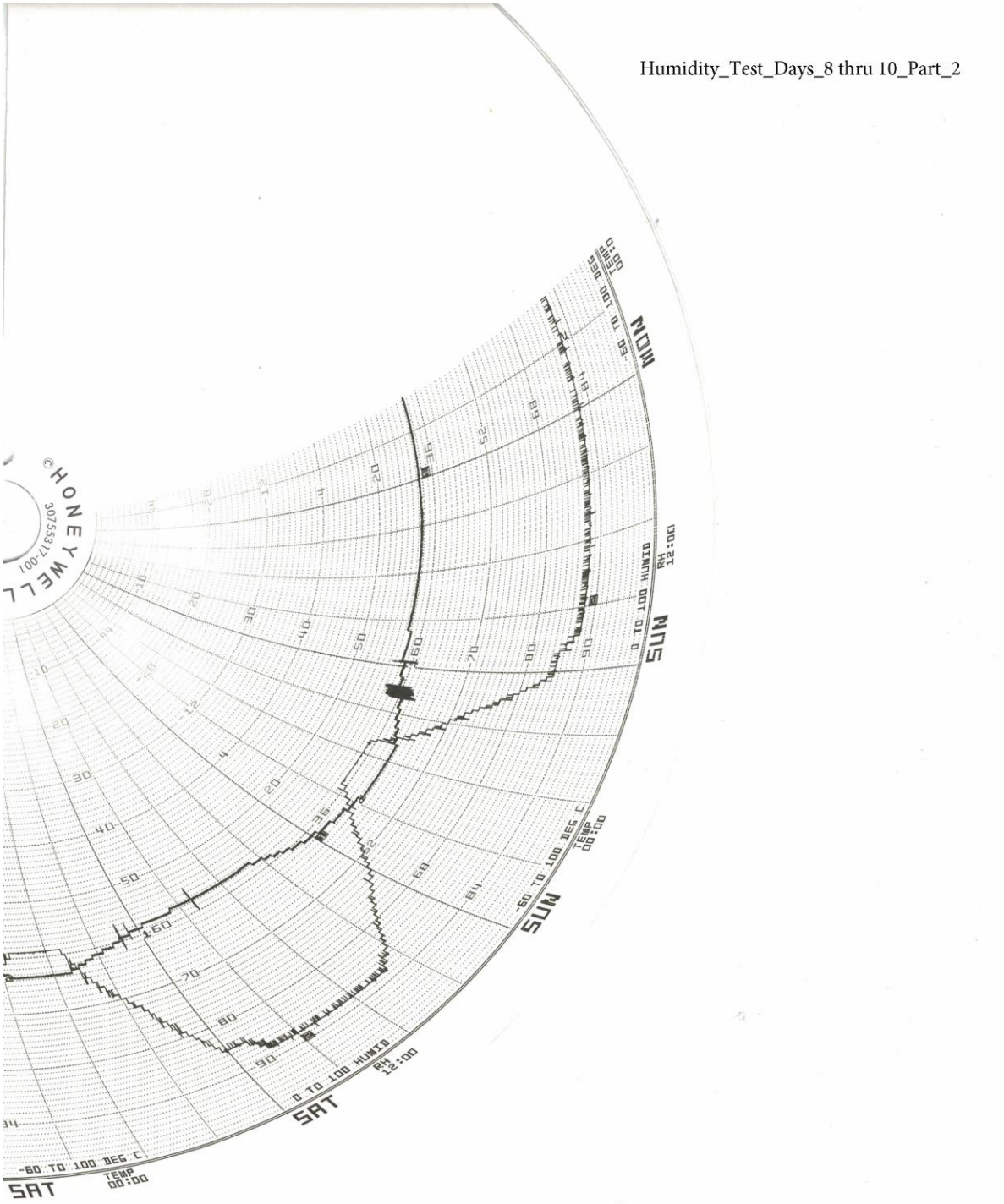
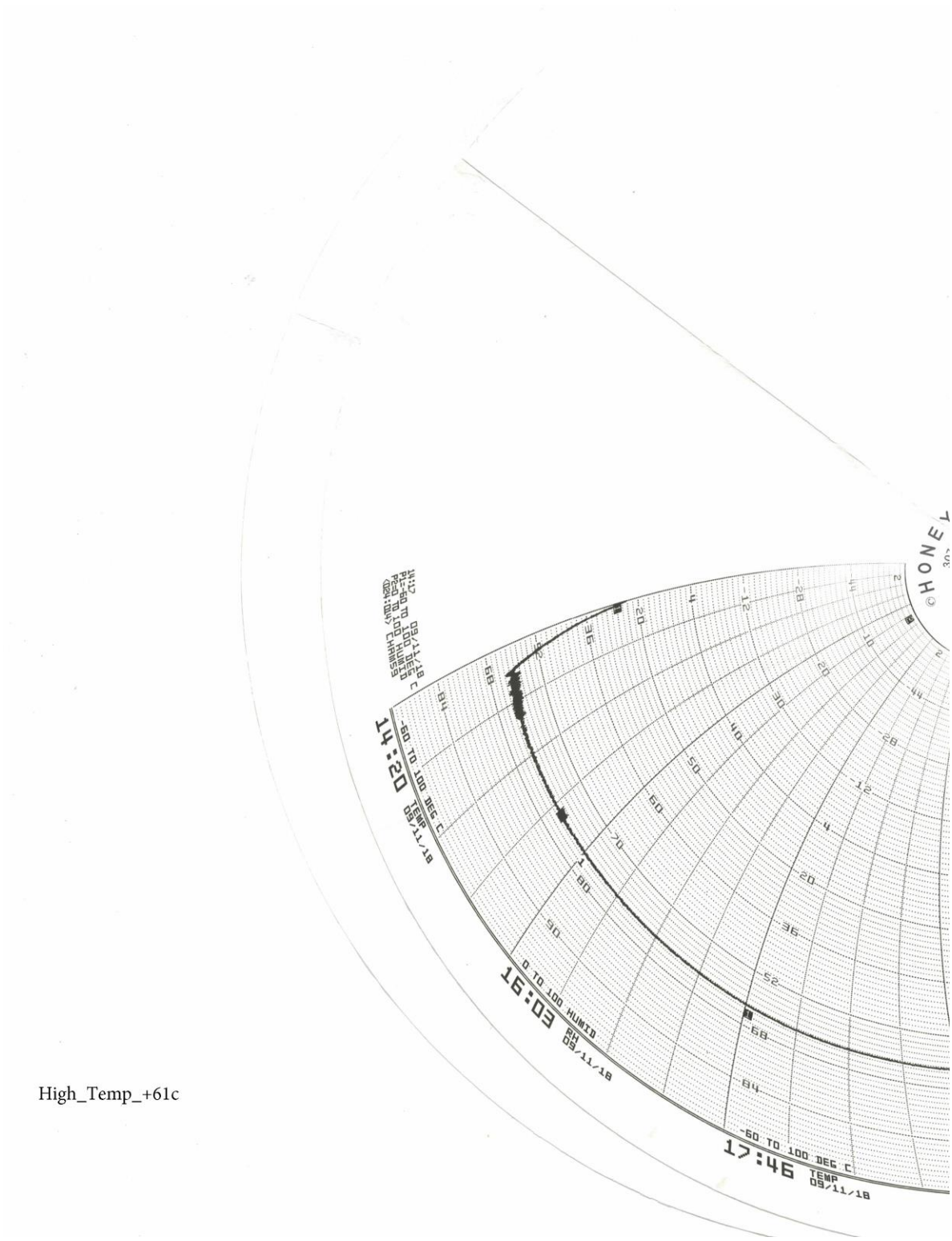
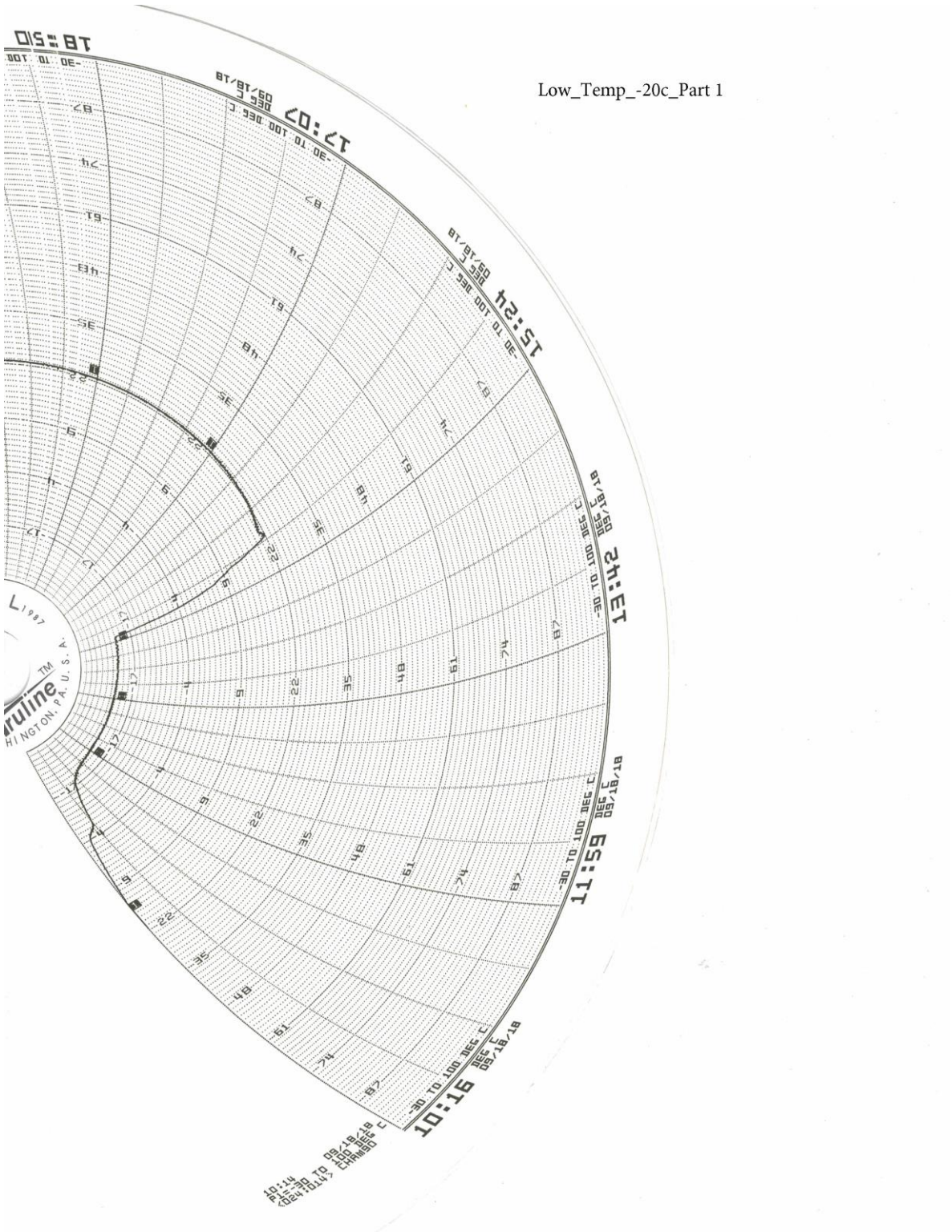


High Temperature:

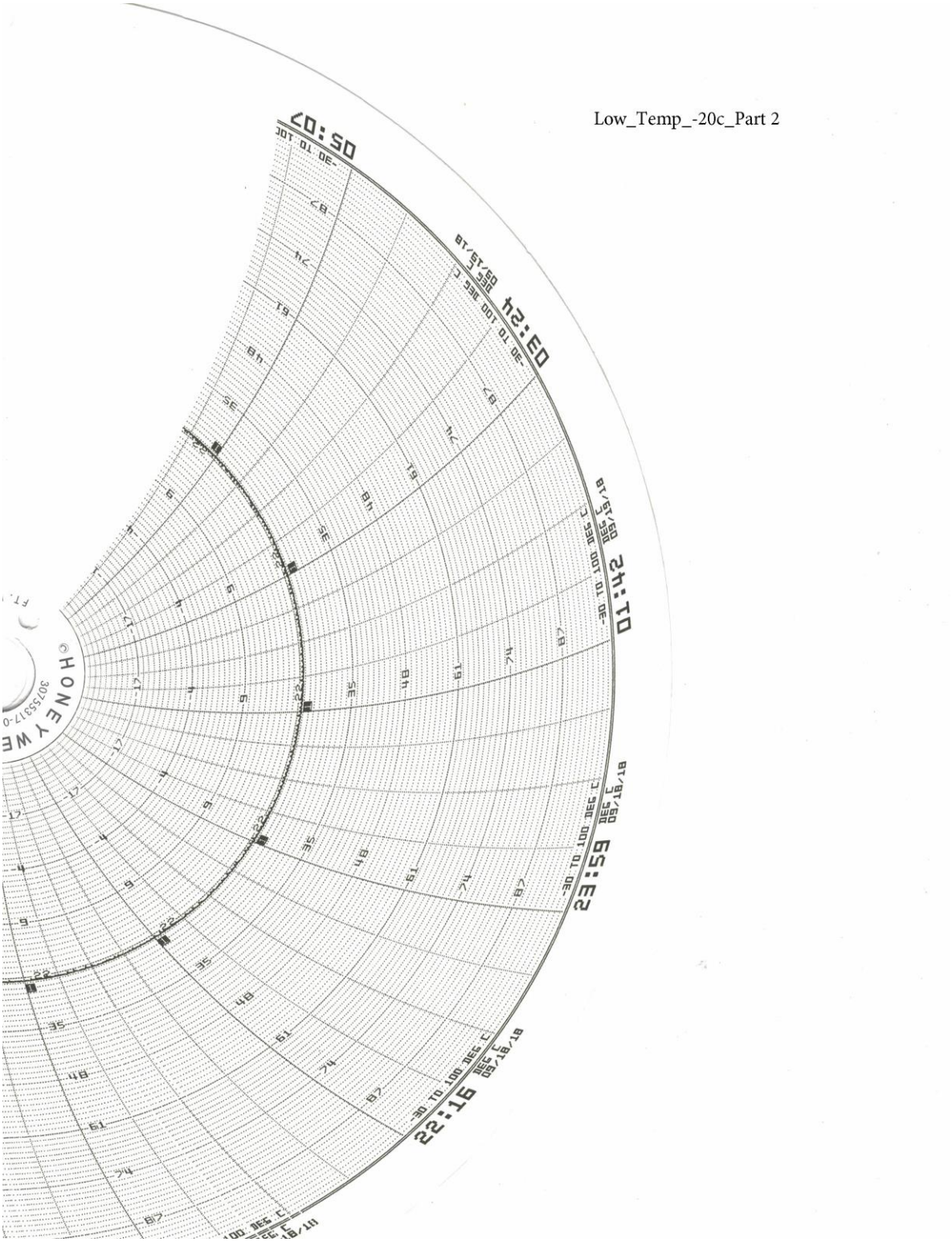


High_Temp_+61c

Low Temperature:

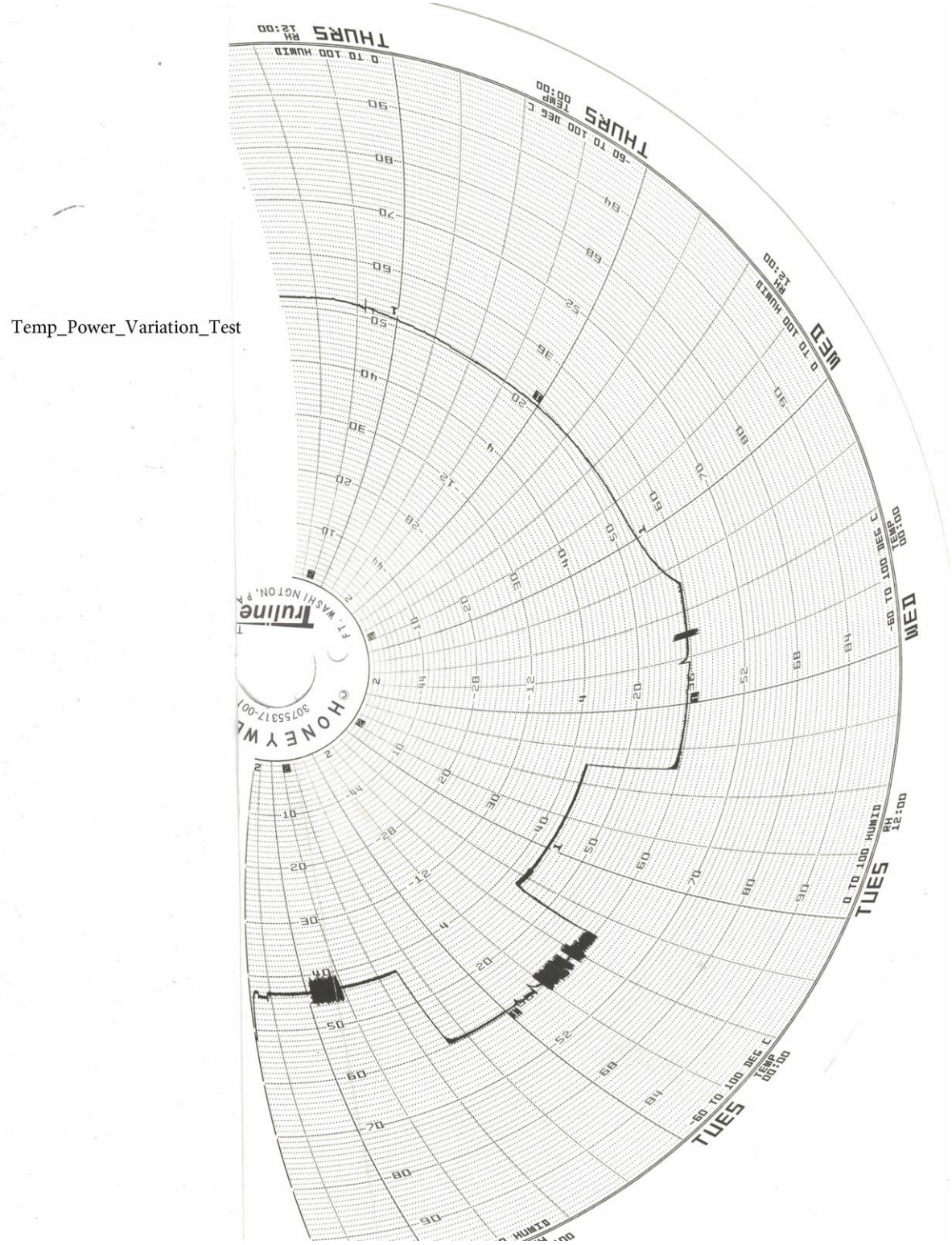


Low_Temp_-20c_Part 2

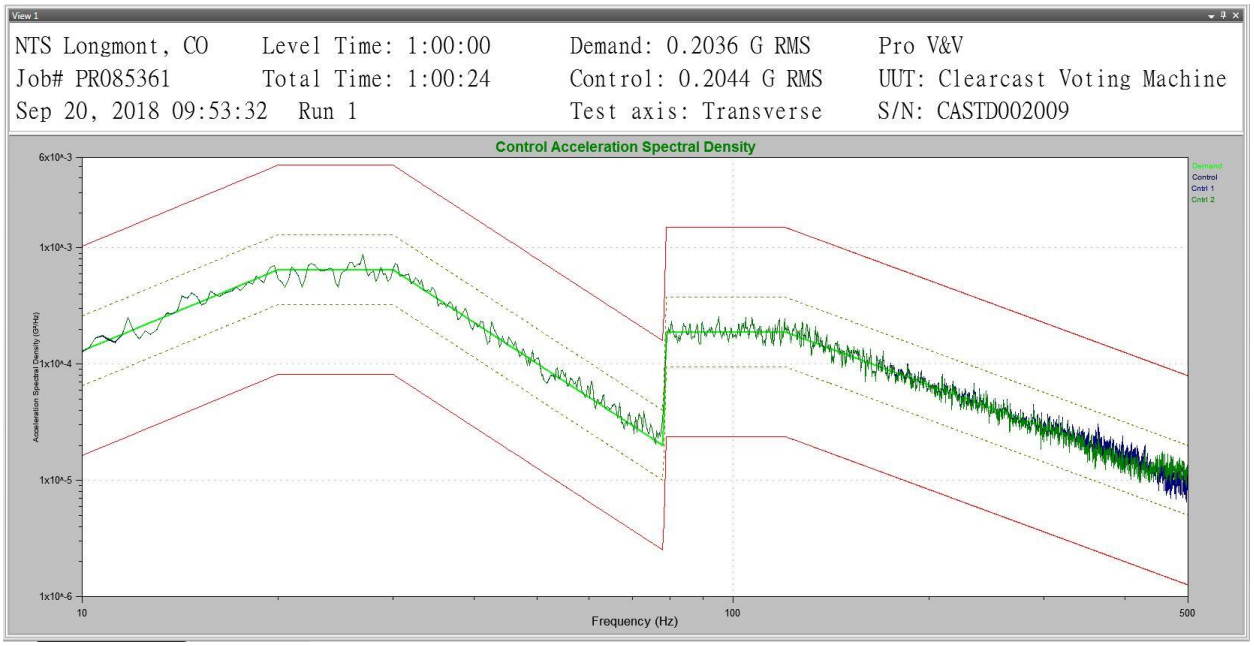


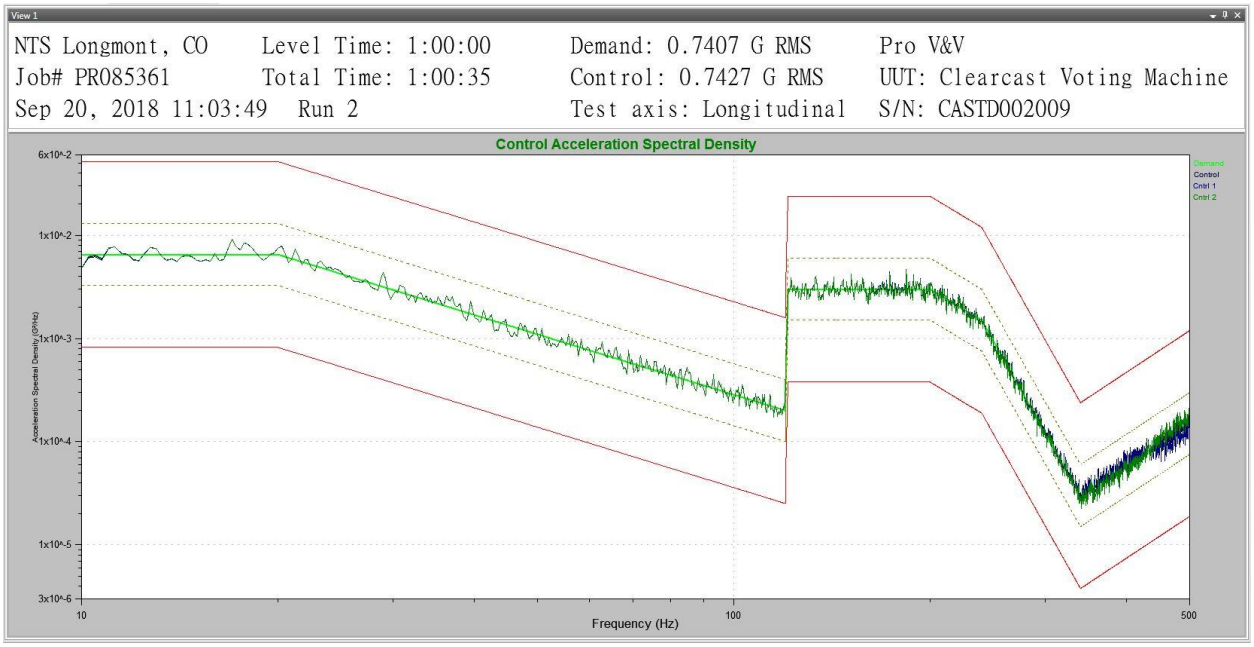
Power Variation:

Temp_Power_Variation_Test



Vibration:


View 1
NTS Longmont, CO
Job# PR085361
Sep 20, 2018 09:53:32 Run 1
Level Time: 1:00:00
Total Time: 1:00:24
Demand: 0.2036 G RMS
Control: 0.2044 G RMS
Test axis: Transverse
Pro V&V
UUT: Clearcast Voting Machine
S/N: CASTD002009
Control Acceleration Spectral Density
Demand
Control
Cntrl 1
Cntrl 2
6x10^-3
1x10^-3
1x10^-4
1x10^-5
1x10^-6
Acceleration Spectral Density (G²/Hz)
10
100
500
Frequency (Hz)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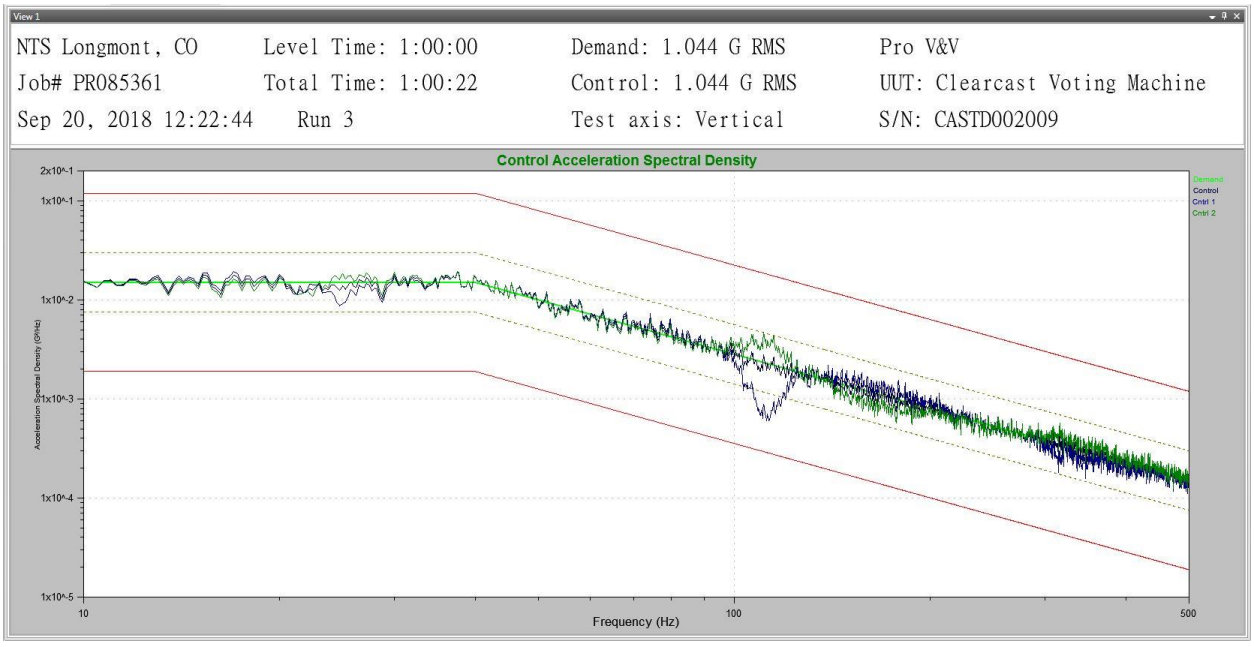
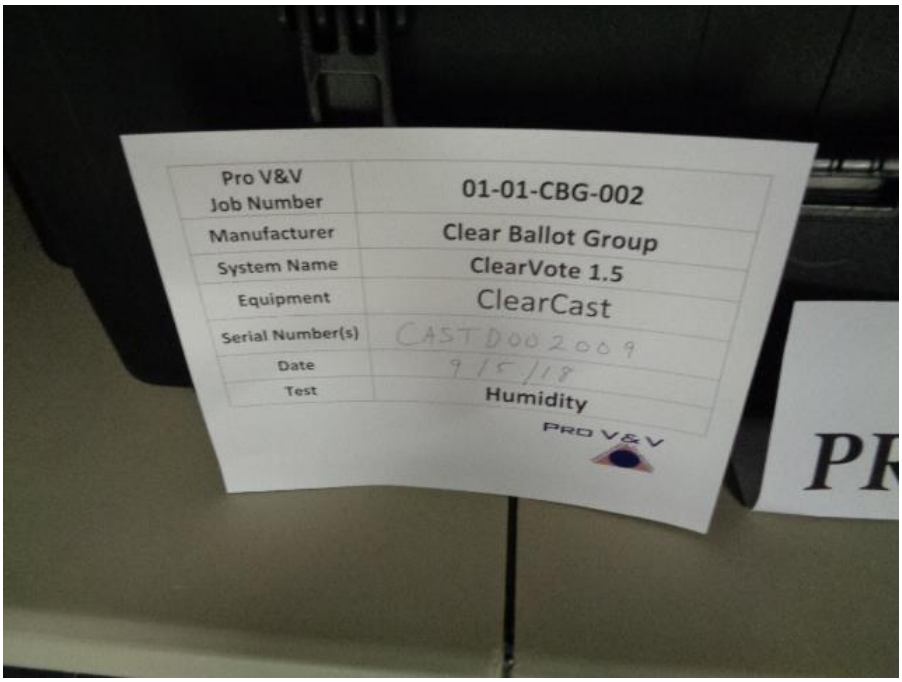
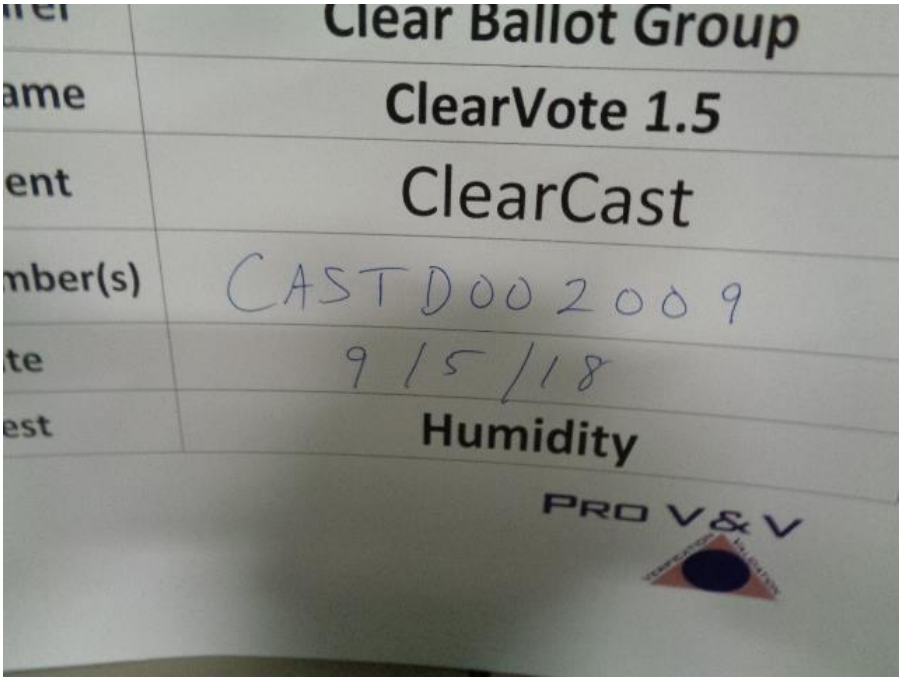
NTS Longmont, CO
Job# PR085361
Sep 20, 2018 11:03:49 Run 2
Level Time: 1:00:00
Total Time: 1:00:35
Demand: 0.7407 G RMS
Control: 0.7427 G RMS
Test axis: Longitudinal
Pro V&V
UUT: Clearcast Voting Machine
S/N: CASTD002009
Control Acceleration Spectral Density
Demand
Control
Cntrl 1
Cntrl 2
6x10^-2
1x10^-2
1x10^-3
1x10^-4
1x10^-5
3x10^-6
Acceleration Spectral Density (G²/Hz)
10
100
500
Frequency (Hz)


View 1
NTS Longmont, CO
Job# PR085361
Sep 20, 2018 12:22:44
Level Time: 1:00:00
Total Time: 1:00:22
Run 3
Demand: 1.044 G RMS
Control: 1.044 G RMS
Test axis: Vertical
Pro V&V
UUT: Clearcast Voting Machine
S/N: CASTD002009
Control Acceleration Spectral Density
2x10^-1
1x10^-1
1x10^-2
1x10^-3
1x10^-4
1x10^-5
Acceleration Spectral Density (G²/Hz)
10
100
500
Frequency (Hz)
Demand
Control
Cntrl 1
Cntrl 2

TEST SETUP

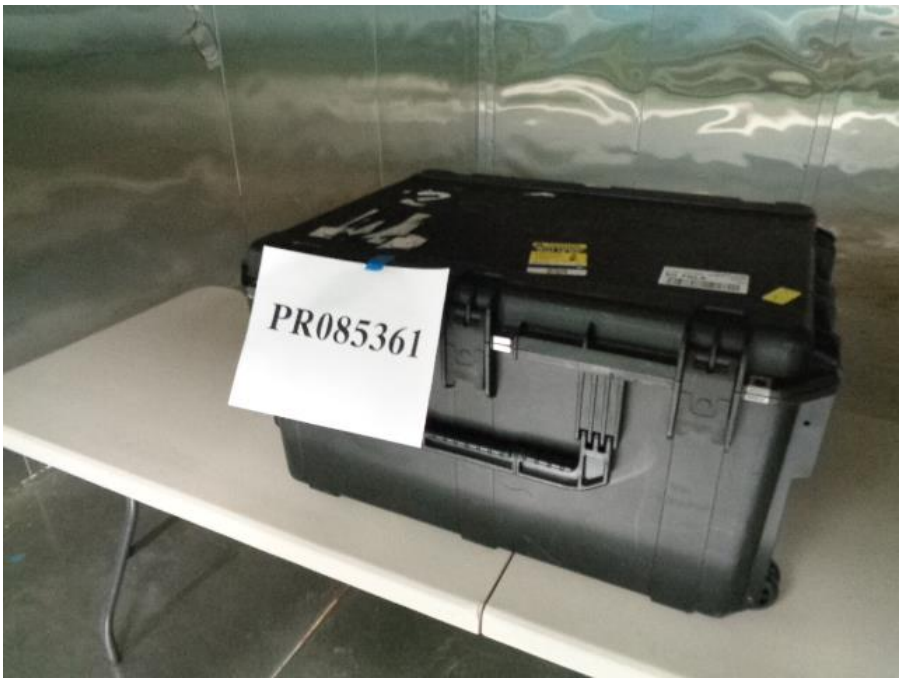
Humidity:

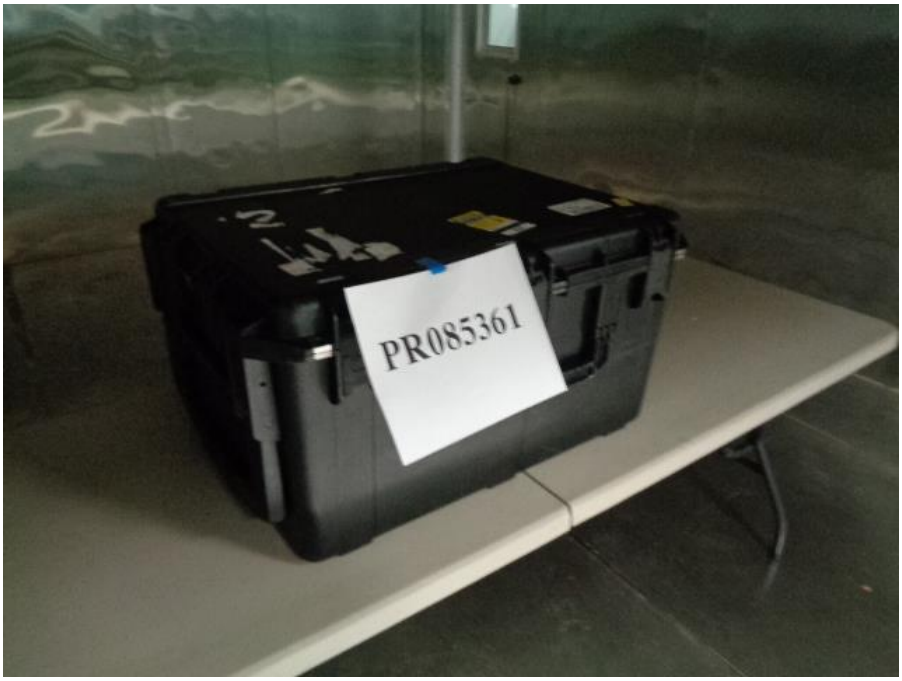



Clear Ballot Group
ClearVote 1.5
ClearCast
CASTD002009
9/5/18
Humidity
PRO V&V

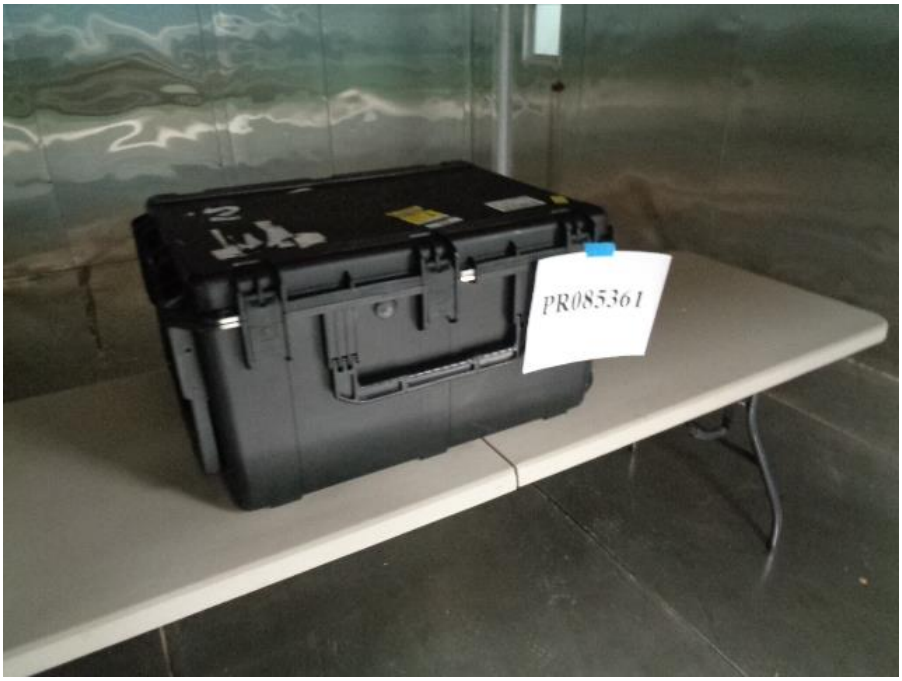

01-01-CBG-002
Clear Ballot Group
ClearVote 1.5
ClearCast
Humidity
PR085361

High Temperature:




PR085361

Low Temperature:

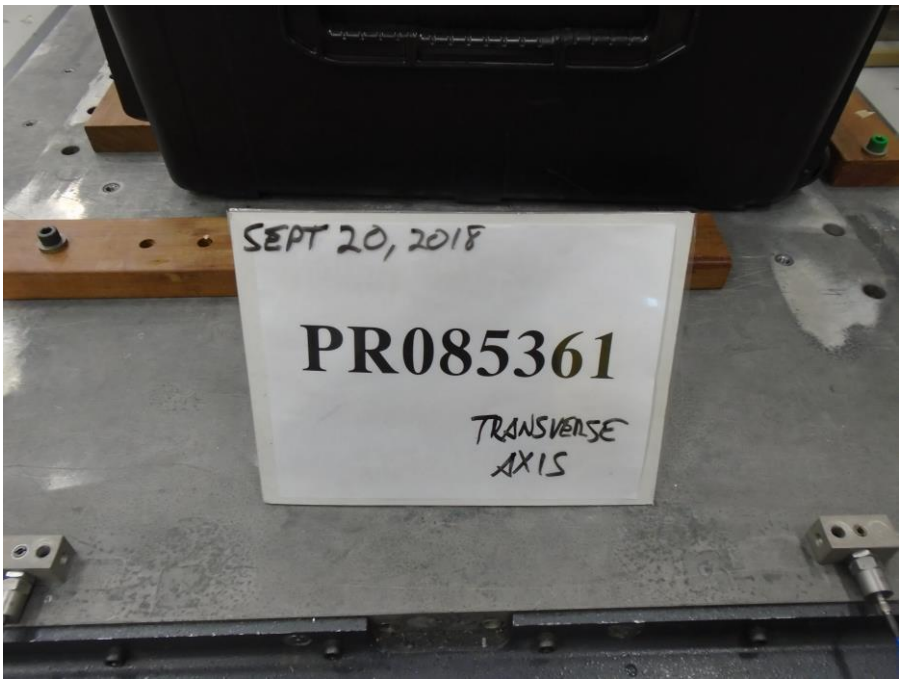

PR085361

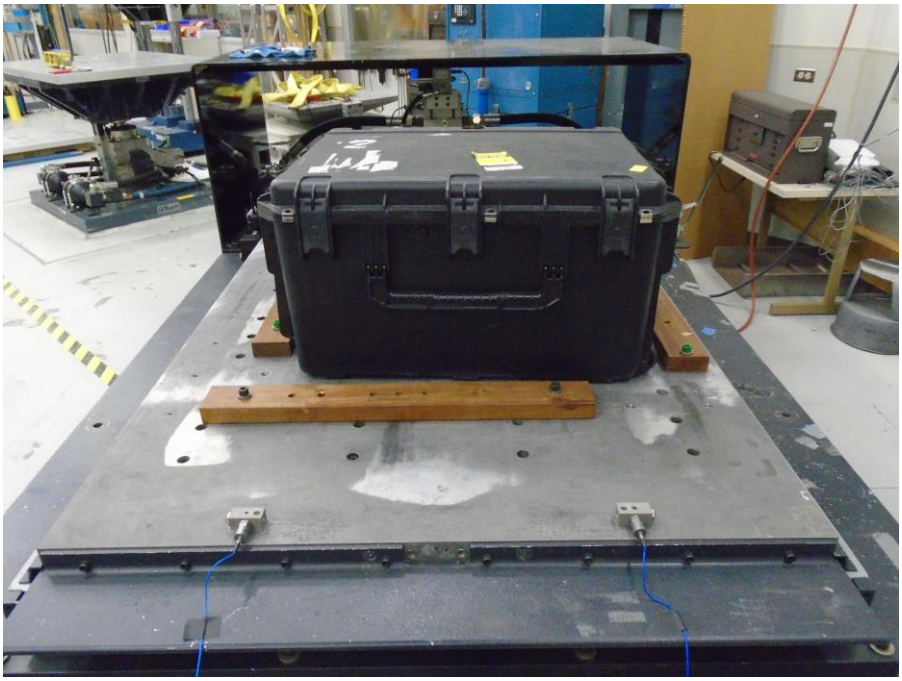

PR085361

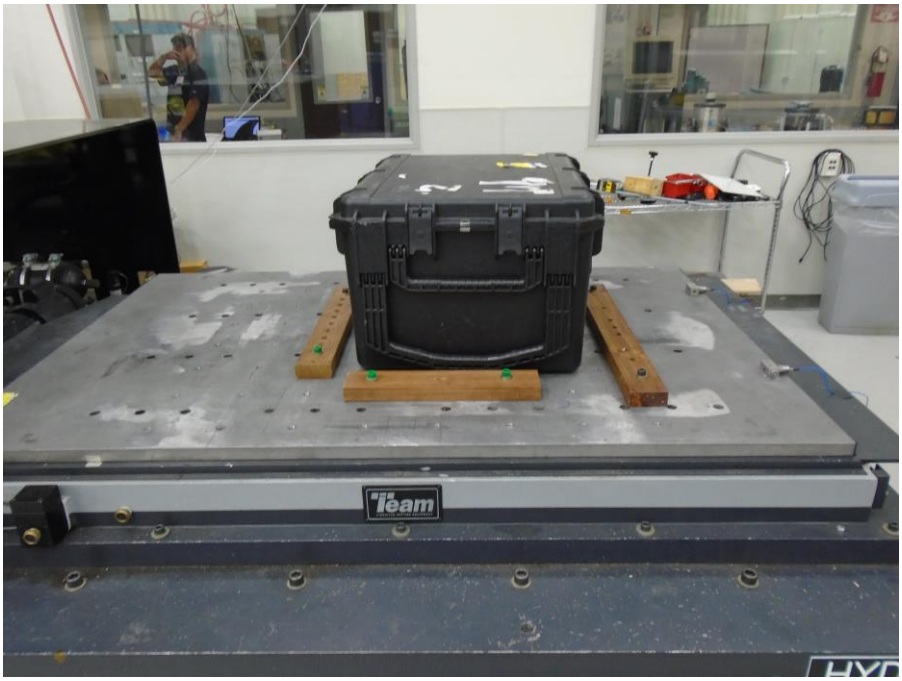
Bench Handling:


PR085361

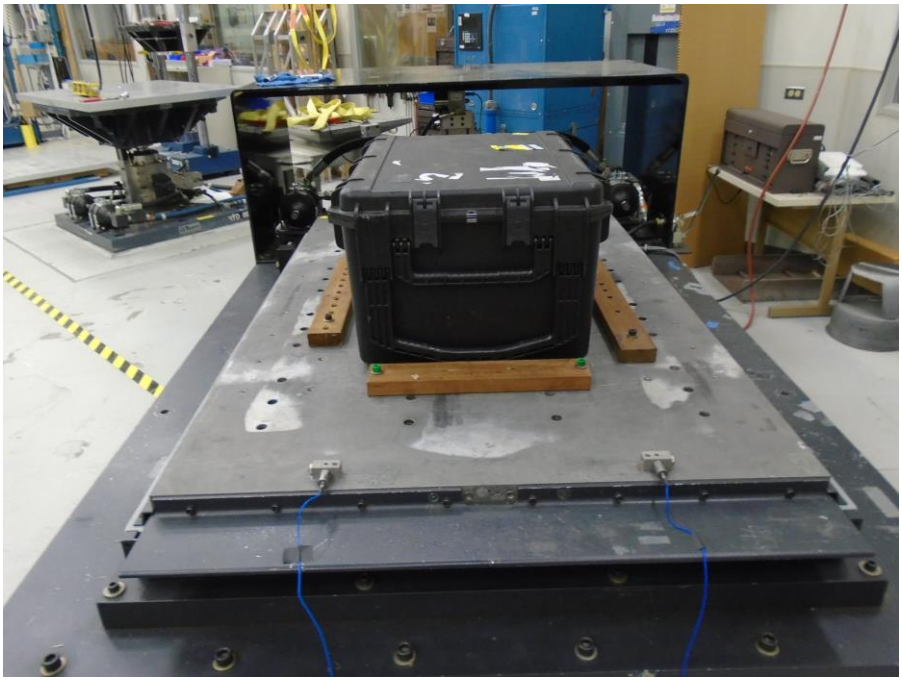
Vibration:

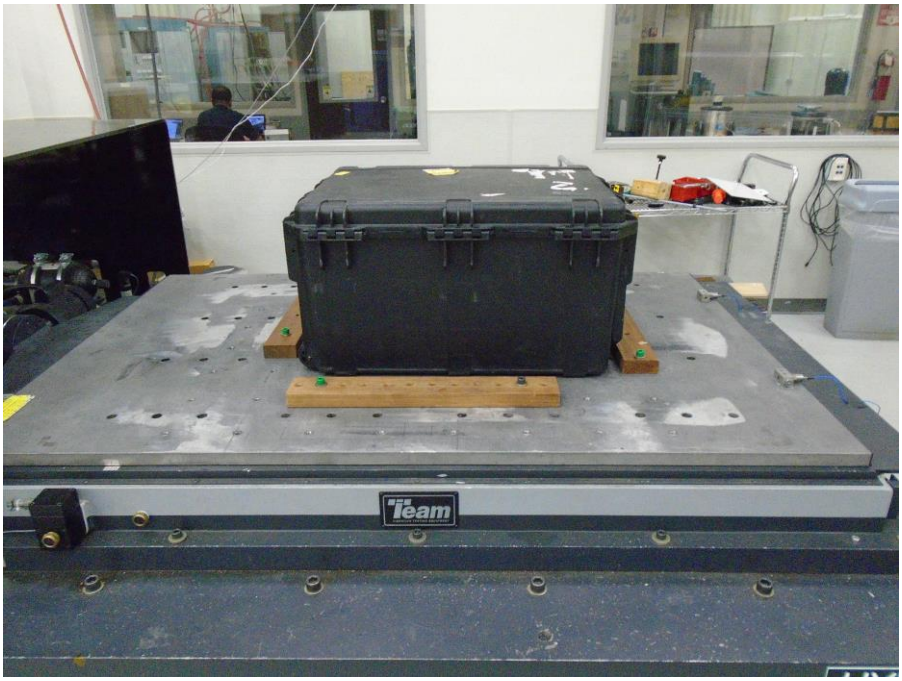




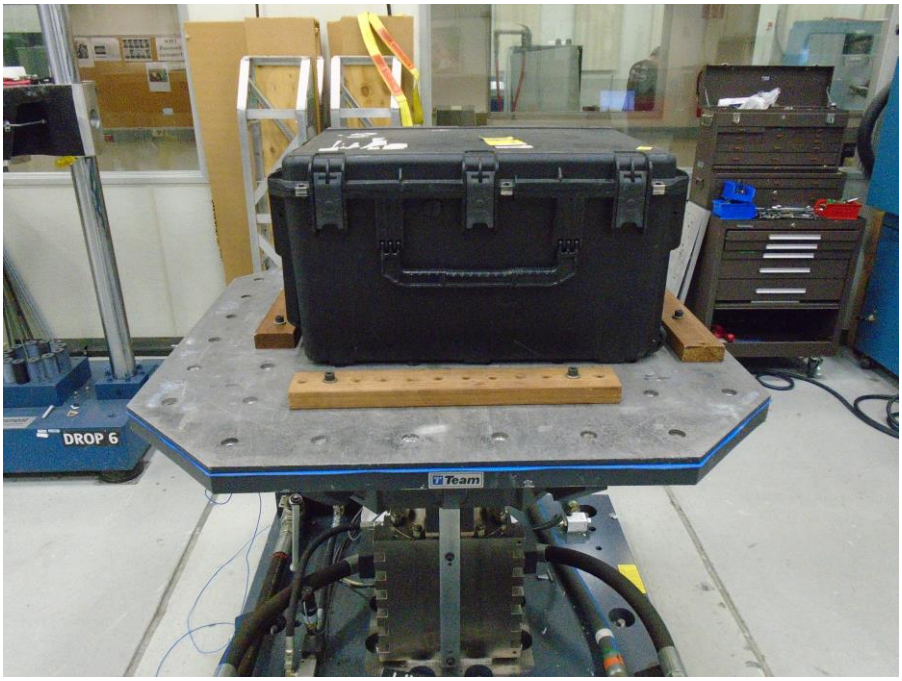

Team

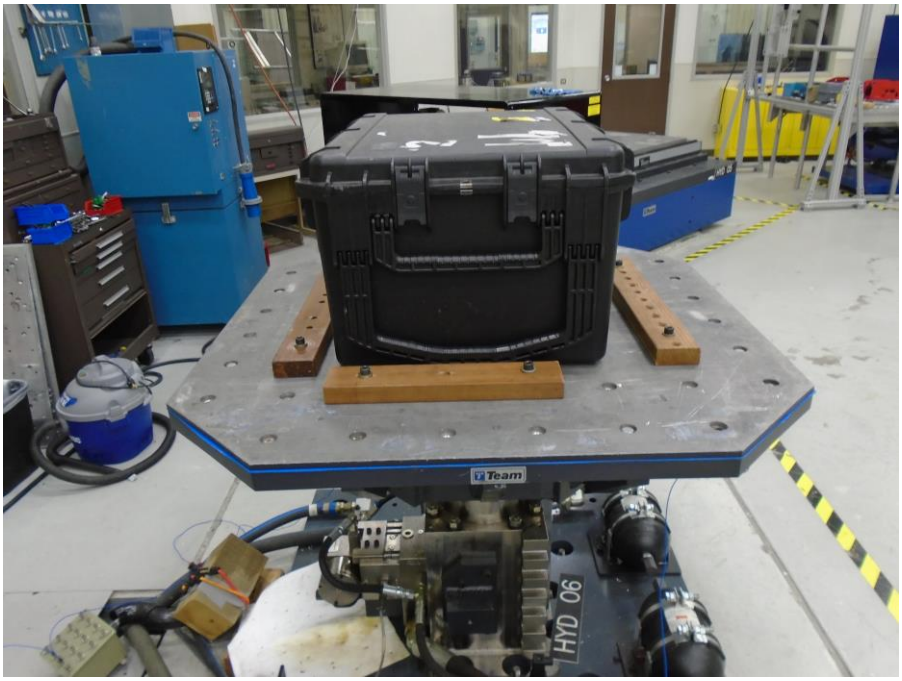

SEPT 20, 2018
PR085361
LONGITUDINAL
AXIS




Team


SEPT 20, 2018
PR085361
VERTICAL
AXIS
Team


DROP 6
Team


Team
HYD 06

TEST EQUIPMENT LOGS

Test Title:	10 Day Humidity Test		
Customer:	Pro V&V Inc	**Date:**	09/05/18
Part Name:	ClearVote 1.5	**MJO No.:**	PR085361
Part No.:	N/A	**P.O. No.:**	
Serial No.:	CASTD002009	**NTS Eng.:**	
Test Spec:	MIL-STD-810D	**Revision:**	

Equipment	Manufacture / Model	NTS I.D. #	Cal. Date	In-Service	Due Date
Chamber 59	N/A	1733	N/A	Yes	N/A
Controller	Watlow F4	1653	09/28/17	Yes	09/28/18
Chart Recorder	Honeywell	1654	09/28/17	Yes	09/28/18

Test By: Kerry Martin **Date:** 09/17/18

Page 1 of 1 **Engr.:** **Govt. QAR:**

Test Title:	High Temperature +60c Test		
Customer:	Pro V&V Inc	**Date:**	
Part Name:	ClearVote 1.5	**MJO No.:**	PR085361
Part No.:	N/A	**P.O. No.:**	
Serial No.:	CASTD002009	**NTS Eng.:**	
Test Spec:	MIL-STD-810D	**Revision:**	

Equipment	Manufacture / Model	NTS I.D. #	Cal. Date	In-Service	Due Date
Chamber 59	N/A	1733	N/A	Yes	N/A
Controller	Watlow F4	1653	09/28/17	Yes	09/28/18
Chart Recorder	Honeywell	1654	09/28/17	Yes	09/28/18

Test By: Kerry Martin **Date:** 09/18/18

Page 1 **of** 1 **Engr.:** **Govt. QAR:**

Test Title:	Low Temperature -20c Test		
Customer:	Pro V&V Inc	**Date:**	09/18/18
Part Name:	ClearVote 1.5	**MJO No.:**	PR085361
Part No.:	N/A	**P.O. No.:**	
Serial No.:	CASTD002009	**NTS Eng.:**	
Test Spec:	MIL-STD-810D	**Revision:**	

Equipment	Manufacture / Model	NTS I.D. #	Cal. Date	In-Service	Due Date
Chamber 59	N/A	1733	N/A	Yes	N/A
Controller	Watlow F4	1653	09/28/17	Yes	09/28/18
Chart Recorder	Honeywell	1654	09/28/17	Yes	09/28/18
Chamber 90	American Cooler	1732	N/A	Yes	N/A
Controller	Watlow F4	1645	10/06/17	Yes	10/06/18
Chart Recorder	Honeywell	1646	10/06/17	Yes	10/06/18

Test By:	Kerry Martin	**Date:**	09/19/18
Page 1 **of** 1	**Engr.:**	**Govt. QAR:**	

Test Title:	Bench Test		
Customer:	Pro V&V Inc	**Date:**	09/20/18
Part Name:	ClearVote 1.5	**MJO No.:**	PR085361
Part No.:	N/A	**P.O. No.:**	
Serial No.:	CASTD002009	**NTS Eng.:**	
Test Spec:	MIL-STD-810D	**Revision:**	

Equipment	Manufacture / Model	NTS I.D. #	Cal. Date	In-Service	Due Date
Wooden Block	4 Inch Wooden Block	N/A	N/A	N/A	N/A

Test By: Kerry Martin **Date:** 09/20/18

Page 1 of 1 **Engr.:** **Govt. QAR:**

Test Title:	Temperature Power Variation Test		
Customer:	Pro V&V Inc	**Date:**	09/24/18
Part Name:	ClearVote 1.5	**MJO No.:**	PR085361
Part No.:	N/A	**P.O. No.:**	
Serial No.:	CASTD002009, CASTD002010	**NTS Eng.:**	
Test Spec:	MIL-STD-810D	**Revision:**	

Equipment	Manufacture / Model	NTS I.D. #	Cal. Date	In-Service	Due Date
Chamber 59	N/A	1733	N/A	Yes	N/A
Controller	Watlow F4	1653	09/21/18	Yes	09/21/19
Chart Recorder	Honeywell	1654	09/21/18	Yes	09/21/19
Data Acquisiton/Switch Unit	Agilent/34970A	MY41034421	12/29/17	Yes	12/29/18
Multiplexer 20 Channel	Agilent/34901A	1801	12/29/17	Yes	12/29/18

Test By:	Kerry Martin	**Date:**	09/27/18
Page 1 **of** 1	**Engr.:**	**Govt. QAR:**	

Vibration:

ID Number	Manufacturer	Model #	Serial #	Description	Cal Date	Cal Due
1750	Team	80/10.5	544	Shaker System HYD06	For reference only	
1751	Team	483 48-16	494	Shaker System HYD05	For reference only	
1704	Vibration Research	VR9500	9521DE37	Vibration Controller	6/11/2018	6/11/2019
1697	PCB	353B34	LW204221	Accelerometer	10/04/17	10/04/18
1698	PCB	353B34	LW204222	Accelerometer	11-13-17	11-13-18
1766	Fluke	971	3623064	Temperature/Humidity meter	4/23/2018	4/23/2019

END OF REPORT