



TASE300 Temperature Testing

January 20, 2012

Author:

Charles Audette

2621 Wasco Street / PO Box 1500 / Hood River, OR 97031

(541) 387-2120 phone / (541) 387-2030 fax

www.cloudcaptech.com / sales@cloudcaptech.com / support@cloudcaptech.com



Cloud Cap Technology, a Goodrich Company

Table of Contents

1	Purpose.....	3
2	Temperature Test	3
2.1	Ground Survival Low Temperature Test / Short Time Operating Low Temperature Test	3
2.2	Operating Low Temperature Test	3
2.3	Ground Survival High Temperature Test / Short-Time Operating High Temperature Test	3
2.4	Operating High Temperature Test.....	4
3	Temperature Test Results	4
3.1	Ground Survival Low Temperature Test / Short Time Operating Low Temperature Test	4
3.2	Operating Low Temperature Test	4
3.3	Ground Survival High Temperature Test and Short-time Operating High Temperature Test	7
3.4	Operating High Temperature Test.....	10

1 Purpose

This test was designed to determine performance characteristics of the TASE300 in extreme high and low temperatures following the testing standards and procedures based on DO-160 test criteria, with modifications centered on actual product usage.

2 Temperature Test

Category B2- Equipment intended for installation in non-pressurized and non-controlled temperature locations on an aircraft that is operated at altitudes of up to 25,000 ft. (7,620 m) MSL is identified as Category B2

2.1 Ground Survival Low Temperature Test / Short Time Operating Low Temperature Test

1. With the equipment off at ambient pressure, stabilize the equipment at -55°C and maintain for at least three hours.
2. Then increase the temperature to the short time operating low temperature of -45°C at a minimum rate of $2^{\circ}\text{C}/\text{minute}$.
3. Once the short time operating low temperature is reached, let the equipment soak for 30 ± 0 minutes or until internal stabilization is established.
4. Place the equipment into the operating state and maintain the test chamber air temperature at -45°C . Operate the equipment for at least 30 minutes.
5. Determine compliance with the applicable equipment performance standards.

2.2 Operating Low Temperature Test

1. With the equipment operating, adjust the test chamber air temperature to the appropriate operating low temperature of -45°C .
2. After the equipment temperature has stabilized, operate the equipment for a minimum of two hours while maintaining the temperature at -45°C .
3. Determine compliance with the applicable equipment performance standards.

2.3 Ground Survival High Temperature Test / Short-Time Operating High Temperature Test

1. With the equipment off at ambient pressure, stabilize the equipment at 85°C and maintain for at least three hours.
2. Decrease the temperature to the short time operating high temperature of 70°C at a minimum rate of $2^{\circ}\text{C}/\text{min}$.
3. Allow the chamber to stabilize for 30 minutes ± 0 and the equipment to soak.
4. Place the equipment into the operating state and maintain the test chamber air temperature at 70°C . Operate the equipment for at least 30 minutes.
5. Determine compliance with the applicable equipment performance standards.

2.4 Operating High Temperature Test

1. With the equipment operating, adjust the test chamber air temperature to the appropriate operating high temperature of 70°C.
2. After the equipment temperature has stabilized, operate the equipment for a minimum of two hours while maintaining the temperature at 70°C.
3. Determine compliance with the applicable equipment performance standards.

3 Temperature Test Results

3.1 Ground Survival Low Temperature Test / Short Time Operating Low Temperature Test

Testing completed by Charles Audette using CCT temperature chambers.

After maintaining the equipment in a non-operating state at -55°C for the stabilization time and three hour soak, the equipment was brought up to the short-time operating temperature. After stabilizing at -45°C for 30 minutes, the gimbal was turned on and operated normally for the required 30 minutes. The test was completed successfully and the equipment operation complied with our performance standards.

3.2 Operating Low Temperature Test

This test was done at the testing facility Cascade TEK by technician Tony Arbogast and operated by Charles Audette.

The test was completed successfully and the equipment operation complied with CCT's performance standards. The test data forms are listed below.

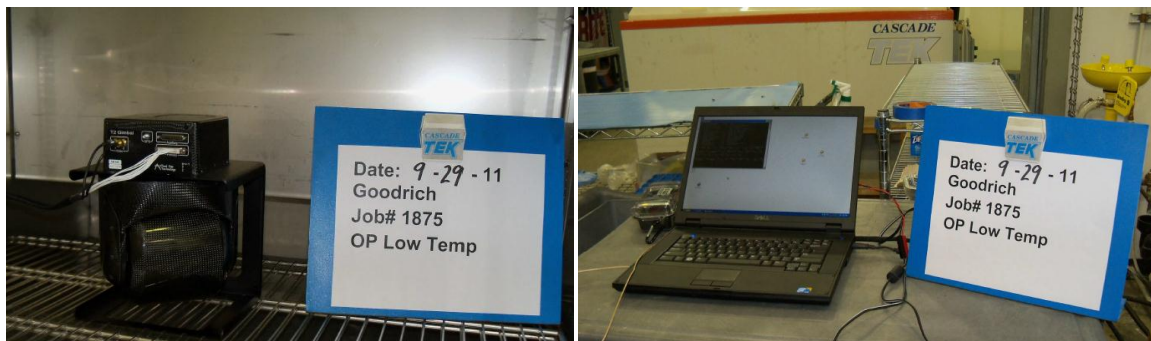


Figure 1 - Operating Low Temperature Test

3.3 Ground Survival High Temperature Test and Short-time Operating High Temperature Test

Testing completed at the Cascade TEK testing facility by technician Tony Arbogast and operated by Charles Audette.

The test was completed successfully and the equipment operation complied with CCT's performance standards. The test data forms are listed below.

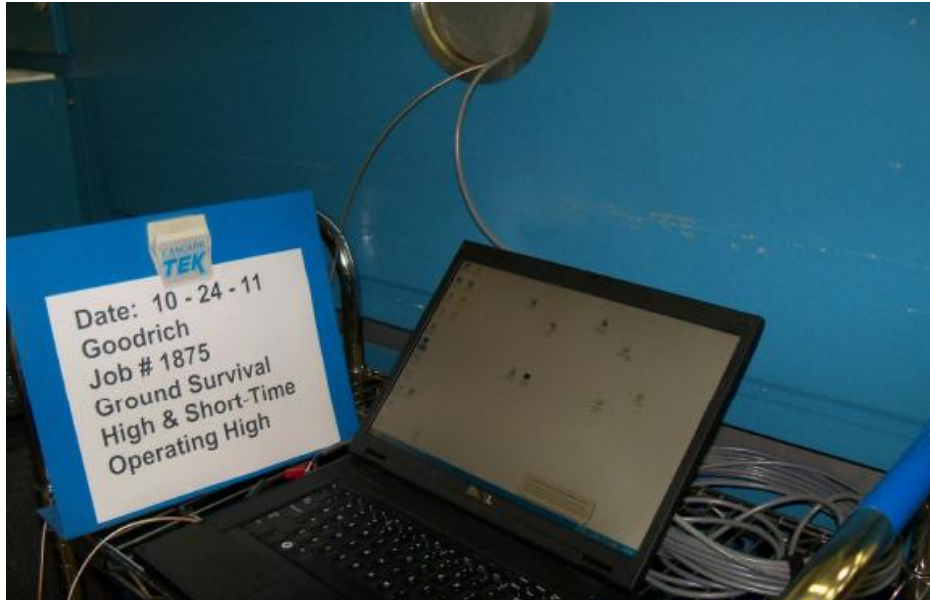
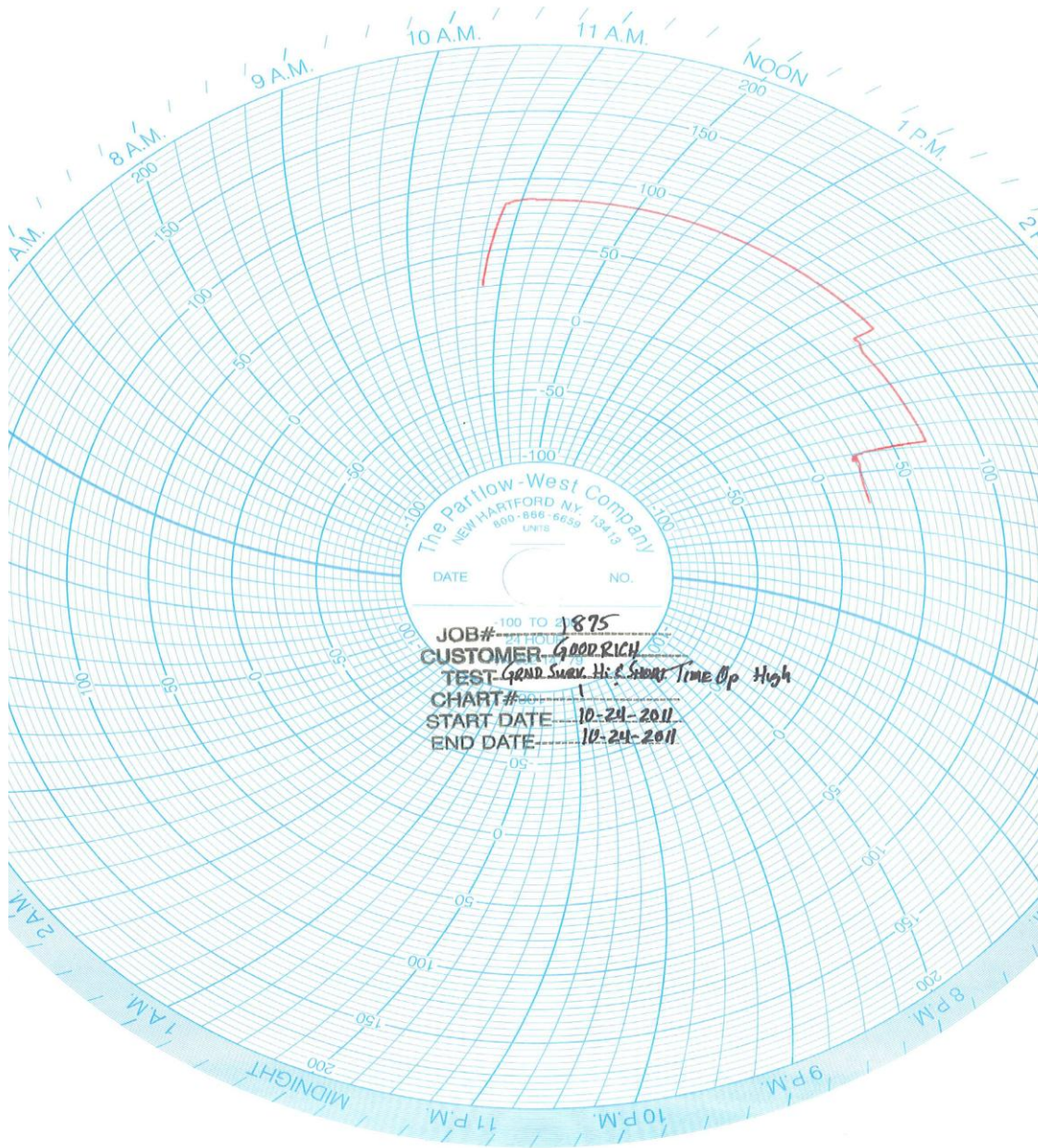


Figure 2 - Ground Survival High and Short-Time Operating High Temperature Test





Cascade Technical Sciences, Inc.

TEST DATA FORM DS10

DATE STARTED 10-24-2011	CUSTOMER Goodrich	TECHNICIAN SIGNATURE 
DATE COMPLETED 10-24-2011	SPECIMEN DESCRIPTION Tase 300 Gimbal	ENGINEER (SIGNATURE) 
TEMPERATURE (LABORATORY) +72°F	TYPE OF TEST Ground Survival High & Short-Time Operating High Temperature	ENGINEER 
HUMIDITY (LABORATORY) 34%	TEST SPECIFICATION RTCA DO-160F, Cat B2, 4.5.3	PARAGRAPH NUMBER 4.5.3
SPECIMEN NUMBERS (P/N - S/N) M/N- Tase 300 S/N- 044		JOB NUMBER 1875

PHOTO - Yes

DATE/TIME	REMARKS	TECH
10-24-11	TEST SUMMARY: Expose non-operating sample to +85°C and allow to stabilize. Then maintain for a period of 3 hours. Transition chamber to +70°C and stabilize. Once sample is stabilized power up sample and operate for 30 minutes. Customer to perform operational test of sample per specifications. Transition rates of 10c/minute.	TA
1036	Customer on-site and begin set up for exposure and check sample operation.	TA
1050	Customer reports sample operating o.k. Begin transition to +85°C (10c/minute) with sample non-operating. O.T. protection is set at 0°C & +95°C (T/C at +24.3°C)	TA
1057	Begin stabilization period at +85°C with sample non-operating (T/C at +68.8°C)	TA
1124	Stabilization period complete with T/C at +85.2°C. Begin 3 hr. minimum soak at +85°C.	TA
1425	3 hour soak at +85°C is complete. Transition chamber to +70°C (T/C at +85.8°C).	TA
1427	Begin stabilization period at +70°C with T/C at +83.0°C.	TA
1508	Power up sample and begin 30 minutes with T/C at +70.0°C and stable. Customer reports sample is operating o.k.	TA
1543	Begin ramp of chamber to ambient temperature with customer reporting sample operating o.k. (T/C at +74.8°C).	TA
1549	Chamber at ambient temperature and stabilize with sample operating o.k. T/C at +48.9°C	TA
1624	Sample stable at ambient temperature and customer to perform post exposure operational test & visual inspection.	TA
1635	Customer reports samples operating o.k. and returned to on-site customer.	TA
	- Test Complete -	

Test Data Form DS10-10/04



Cascade Technical Sciences, Inc.

TEST EQUIPMENT LIST

TEST: *Ground Survival High & Short Time Op High* JOB NUMBER: *1875* DATE: *10-24-2011*

EQUIPMENT DESCRIPTION	MANUFACTURER	MODEL	S/N	CAL NO.	CALIBRATED DATE (MM/DD/YY)	CALIBRATION DUE DATE (MM/DD/YY)
T-TRON AGREE	THERMOTRON	F-62-CHV-15-15	417-10718RF	1177	<i>5-11-2011</i>	<i>5-31-2012</i>
CONTROLLER	WATLOW	S4	22499	***	Calibrated with Chamber	***
CHART RECORDER	PARTLOW	MRC5000	1430973-0004	161	Calibrated with Chamber	***
<i>MULTILOGGER THERMOMETER</i>	<i>OMEGA</i>	<i>HH506AA</i>	<i>08000369</i>	<i>168</i>	<i>3-10-2011</i>	<i>3-31-2012</i>

DS2-8/04 Test Equipment List

3.4 Operating High Temperature Test

Testing completed by Charles Audette using CCT temperature chambers.

After maintaining the equipment in an operating state at 70°C for the stabilization time and the two hour soak, the gimbal operated normally for the duration of the test. Near the end of the test, the gimbal lost the motor homing function and the pan and tilt controls. After a power cycle, the gimbal returned to a full operational state and maintained full functionality. The test was completed successfully. The equipment operation complied with CCT’s performance standards.