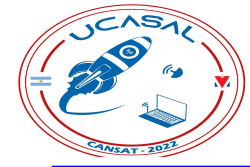




Environmental Test Document

1064
UCASAL



Overview



Performed tests:

- Drop test
- Thermal test
- Vibration test
- Vacuum test



Drop Test Configuration



Drop test Requirements:

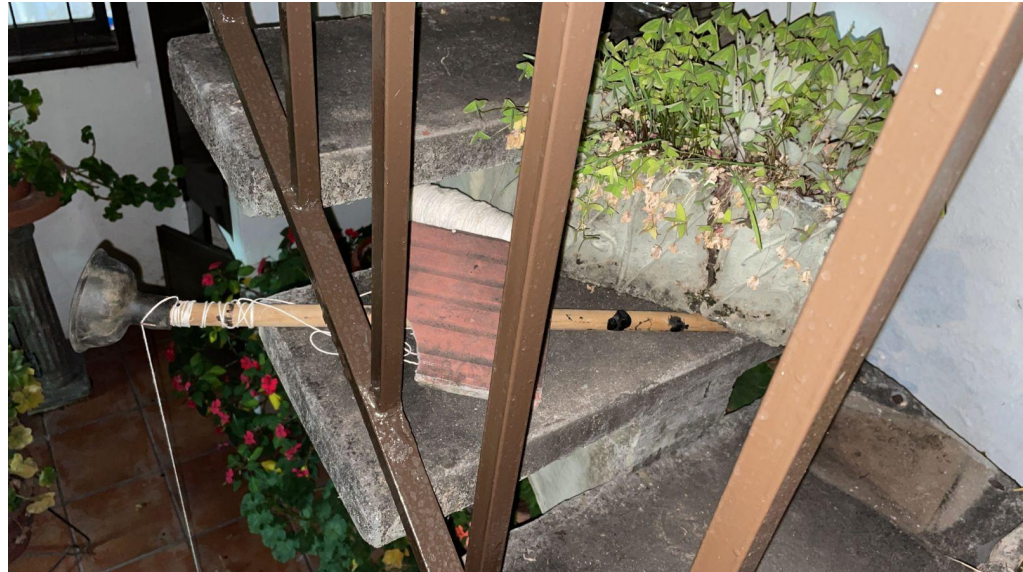
- This test requires a 61 cm non-stretching cord.
- CANSAT, and free space so the cansat does not hit the ground.
- The structure must not flex during the drop test.

Drop Test Configuration

We put a thick wooden stick in a ladder secured by a weight to avoid movement, then we attached with the rope the cansat tied to the parachute cord with a length of 61 cm

Materials used:

- Wooden stick and rigid rope





Drop Test Procedures



Drop Test Procedure

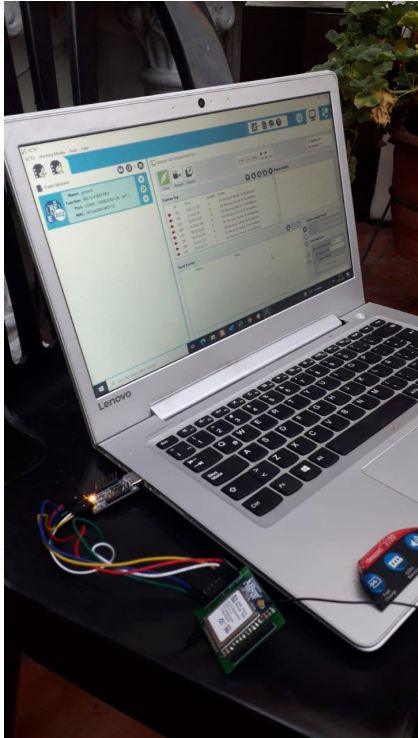
1. Power on CanSat.
2. Verify telemetry is being received.
3. Raise CanSat by the attached cord, so that the attachment points of the cord, on the eye bolt and the parachute, are at the same height.
4. Release the CanSat.
5. Verify the CanSat did not lose power.
6. Inspect for any damage, or detached parts.
7. Verify telemetry is still being received.



Drop Test Results



Pictures before the test



How CanSat was secured during the test







Drop Test Results



Drop test video link:

- <https://www.youtube.com/watch?v=Tml1x93eNg8&list=PLB4T2blgpn1zDjfDYQ6E9uwNnkYHthWgt&index=1>

The screenshot shows a YouTube video player interface. The video title is "CANSAT 2022 DropTest Team UCASAL # 1064" by Enzo Juarez. The video is at 0:02 / 0:25. The video content shows the UCASAL logo, which features a rocket, a laptop, and the text "UCASAL" and "CANSAT 2022". The video player has a search bar, a Premium button, and a list of related videos on the right. The related videos are:

- 1. CANSAT 2022 DropTest Team UCASAL # 1064 (0:26)
- 2. CANSAT 2022 Thermal Test Team UCASAL #... (0:22)
- 3. CANSAT 2022 Vibration Test Team... (1:23)
- 4. CANSAT 2022 Vacuum Test Team UCASAL #... (0:38)

Below the video player, the text "CANSAT 2022 DropTest Team UCASAL # 1064" is displayed, followed by "4 visualizaciones 27 may 2022 This is the video of Drop Test from UCASAL Team to CANSAT Competition 2022".



Thermal Test Configuration



Thermal test requirements:

- This test requires a method to heat the CanSat to 60C for a period of 2 hours.
- With the heated gun we could achieve a constant temperature because it has temperature regulation



Thermal Test Configuration



Thermal test setup: A insulated foam box was builded with ducttape and foam sheet cut to size, then a heat gun with temperature regulation.

Materials used:

- Insulated foam box
- Heat gun
- Digital thermometer





Thermal Test Procedures



Thermal Test Procedure

1. Place CanSat into a thermal chamber.
2. Turn on the CanSat.
3. Close and seal the thermal chamber.
4. Turn on the heat source.
5. Monitor the temperature and turn off the heat source when the internal temperature reaches 60C and turn on the heat source when the temperature drops to 55C.

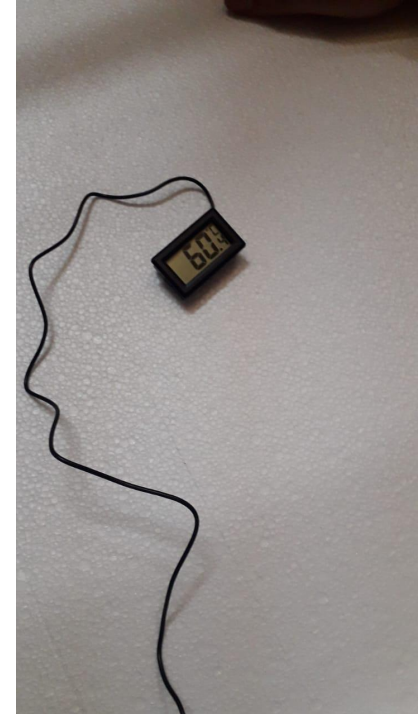
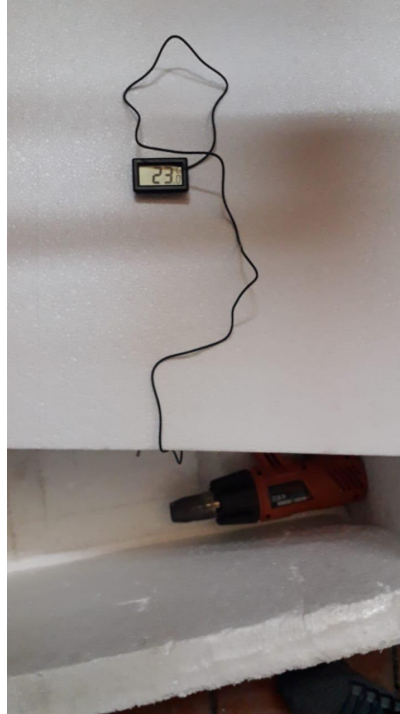


Thermal Test Procedures



6. Maintain the test conditions for two hours.
7. Turn off the heat source and perform visual inspection and any functional tests to verify the CanSat survived the thermal exposure and can operate as expected.
8. With the CanSat still hot, test any mechanisms and structures to make sure the integrity has not been compromised. Take precautions to avoid injury.
9. Verify epoxy joints and composite materials still maintain their strengths.

Pictures after and during the test





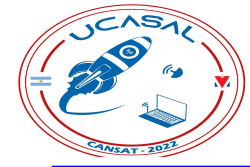
Thermal Test Results



Thermal test video link:

- <https://www.youtube.com/watch?v=z6ZLSaMW8qI&list=PLB4T2blgpn1zDjfDYQ6E9uwNnkYHthWgt&index=2>

The image shows a YouTube video player interface. The video title is "CANSAT 2022 Thermal Test Team UCASAL #1064". The video is from the channel "CANSAT 2022 Test" and is part of a playlist. The video player shows a thumbnail with the UCASAL logo and the text "CANSAT 2022 Thermal Test". The video is currently at 0:01 / 0:21. The video description reads: "1 visualización 27 may 2022 This is the video of Thermal Test from UCASAL Team to CANSAT Competition 2022". The video player also shows a list of other videos in the playlist, including "CANSAT 2022 DropTest Team UCASAL # 1064", "CANSAT 2022 Thermal Test Team UCASAL #...", "CANSAT 2022 VibrationTest Team...", and "CANSAT 2022 Vacuum Test Team UCASAL #...".



Vibration Test Configuration



We use a sander secured to a vise, then the cansat was secured with duct tape and the vibration test was made power on and off in short cycles and checking that telemetry was correct.

Materials used:

- Power sander





Vibration Test Procedures



Vibration Test Procedures

1. Power on the CanSat.
2. Verify accelerometer data is being collected.
3. Power up the sander.
4. Once the sander is up to full speed, wait 5 seconds.
5. Power down the sander to a full stop.
6. Repeat steps iii to v four more times.
7. Inspect the CanSat for damage and functionality.
8. Verify accelerometer data is still being collected.
9. Power down CanSat.



Vibration Test Results



Close Record Detach

CTS CD DSR DTR RTS

Frames log

ID	Time	Length	Frame
135	19:18:24.672	11	RX (Receive) Packet 16-bit Address
136	19:18:25.651	11	RX (Receive) Packet 16-bit Address
137	19:18:26.705	11	RX (Receive) Packet 16-bit Address
138	19:18:27.698	11	RX (Receive) Packet 16-bit Address
139	19:18:28.677	11	RX (Receive) Packet 16-bit Address
140	19:18:29.741	11	RX (Receive) Packet 16-bit Address
141	19:18:30.734	11	RX (Receive) Packet 16-bit Address
142	19:18:31.791	11	RX (Receive) Packet 16-bit Address

Send frames



Vibration Test Results



Vibration test video link:

- <https://www.youtube.com/watch?v=JcvvOYnsc4&list=PLB4T2blgpn1zDjfDYQ6E9uwNnkYHthWgt&index=3>

The screenshot shows a YouTube video player interface. The video title is "CANSAT 2022 Team UCASAL #1064 Vibration Test". The video player shows a progress bar at 0:03 / 1:23. The video content displays the UCASAL logo, which features a rocket and a laptop, and the text "CANSAT 2022".

Below the video player, the video title "CANSAT 2022 VibrationTest Team UCASAL # 1064" is displayed, along with the view count "4 visualizaciones" and the date "27 may 2022". A description follows: "This is the video of Vibration Test from UCASAL Team to CANSAT Competition 2022".

On the right side of the player, a playlist titled "CANSAT 2022 Test" by Enzo Juarez is shown, containing 4 items:

- 1. CANSAT 2022 DropTest Team UCASAL # 1064 (0:26)
- 2. CANSAT 2022 Thermal Test Team UCASAL #... (0:22)
- 3. CANSAT 2022 VibrationTest Team... (1:23)
- 4. CANSAT 2022 Vacuum Test Team UCASAL #... (0:38)

At the bottom right, there are tabs for "Todos", "Subidas recientes", and "Visto".



Vacuum Test Configuration



- List materials used

A bucket 18 litres

A vacuum cleaner (was broken before the test)

- This test could not be performed because the vacuum cleaner broke before it.



Vacuum Test Procedures



- This test could not be performed because the vacuum cleaner broke before it.

Vacuum Test Results

- Show picture of just before vacuum test





Vacuum Test Results



- The 1064 agrees to get a new vacuum cleaner, to be able to carry out this test correctly, and send the result.



Vacuum Test Results



Vacuum test video link:

- <https://www.youtube.com/watch?v=B4DHOETePwA&list=PLB4T2blgpn1zDjfDYQ6E9uwNnkYHthWgt&index=4>

The screenshot shows a YouTube video player interface. The video title is "CANSAT 2022 Vacuum Test Team UCASAL #1064". The video is from the "CANSAT 2022 Test" playlist by Enzo Juarez. The video player shows a thumbnail with the UCASAL logo and the text "CANSAT 2022 Team UCASAL #1064 Vacuum Test". The video is currently at 0:01 / 0:37. The right sidebar shows a list of videos in the playlist, including "CANSAT 2022 DropTest Team UCASAL # 1064", "CANSAT 2022 Thermal Test Team UCASAL #...", "CANSAT 2022 VibrationTest Team...", and "CANSAT 2022 Vacuum Test Team UCASAL #...".

CANSAT 2022 Vacuum Test Team UCASAL # 1064

1 visualización 27 may 2022 This is the video of Vacuum Test from UCASAL Team to CANSAT Competition 2022



Summary



- Drop test worked correctly.
- Thermal test worked correctly.
- Vibration test worked correctly.
- Vacuum test didn't work correctly, because the vacuum cleaner was broken before the test.