1. REVIEW

Flight: BEXUS 26

Experiment: TUBULAR

Review location: LTU Kiruna / Sweden

Date: 10th October 2018

Review Board Members

Stefan Krämer (SSC, Science Services, Payloads)

Experiment Team Members

Natalie Lawton	Núria Agües Paszkowsky
Kyriaki	Blazaki
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2. GENERAL COMMENTS

2.1. Review Summary

The Team presented a fully integrated Experiment and the functions were proven within a End to End test. The quality of manufacturing is very good and all functions were verified. The testing phase is finished and was performed successfully.

The Aircoil will be integrated at the campaign. The Experiment has been testes togher with the aircoil and fit checked.

2.2. Mechanics

Net Mass (measured)	n/a	kg
Gross Mass (measured)	24.17kg CAC: 11.95kg AAC: 12.22kg	kg

- The Mechanical integration is finished. The experiment looks is well mounted, safe and sturdy
- The separation level to the detachable CAC Box is clearly marked for recovery purpose
- Only a few sharp edges need rework

2.3. Electronics

Low Battery Voltage	24	1.17A

Average Battery Voltage	28.87V	0.750A / 1.25A
High Battery Voltage	31.64	1.5A

- The Electronics is finalised and fully tested
- The manufacturing quality is good
- The cables are harnessed

2.4. Software

Uplink	n/a
Downlink	162bytes/s

- Ground Station
  - Ground Station SW is finished and is looks good. All functions are visible.
  - Experiment status is clearly verifiable
  - The SW has a high level of complexity and information
- Experiment
  - SW design frozen since 13 Sept.
  - All functions are tested on durability
  - Communication verified

2.5. Verification and testing

- Pre campaign Testing phase is finished. All necessary tests were successfully accomplished.

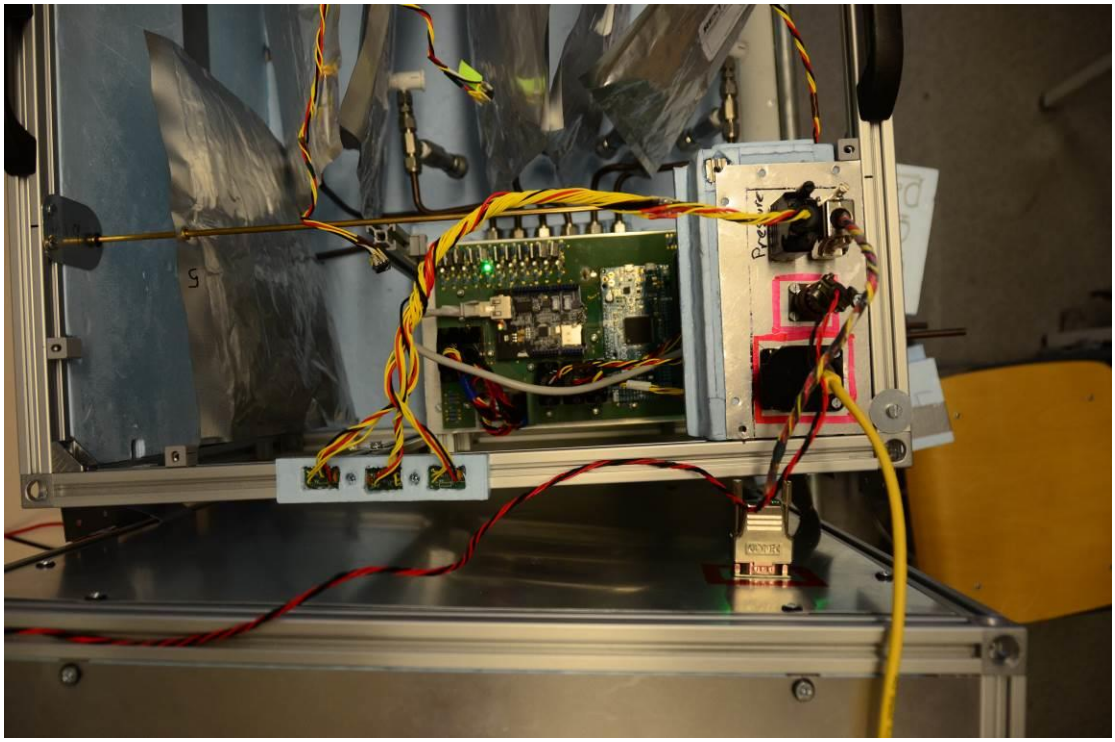
2.6. End-to-end Test

- The End to End test in a accelerated test mode was successful.
- All functions are verified.
- Valves open and close in sequence and depending on sensor input
- Bags are filled in sequence with air samples by the use of the pump

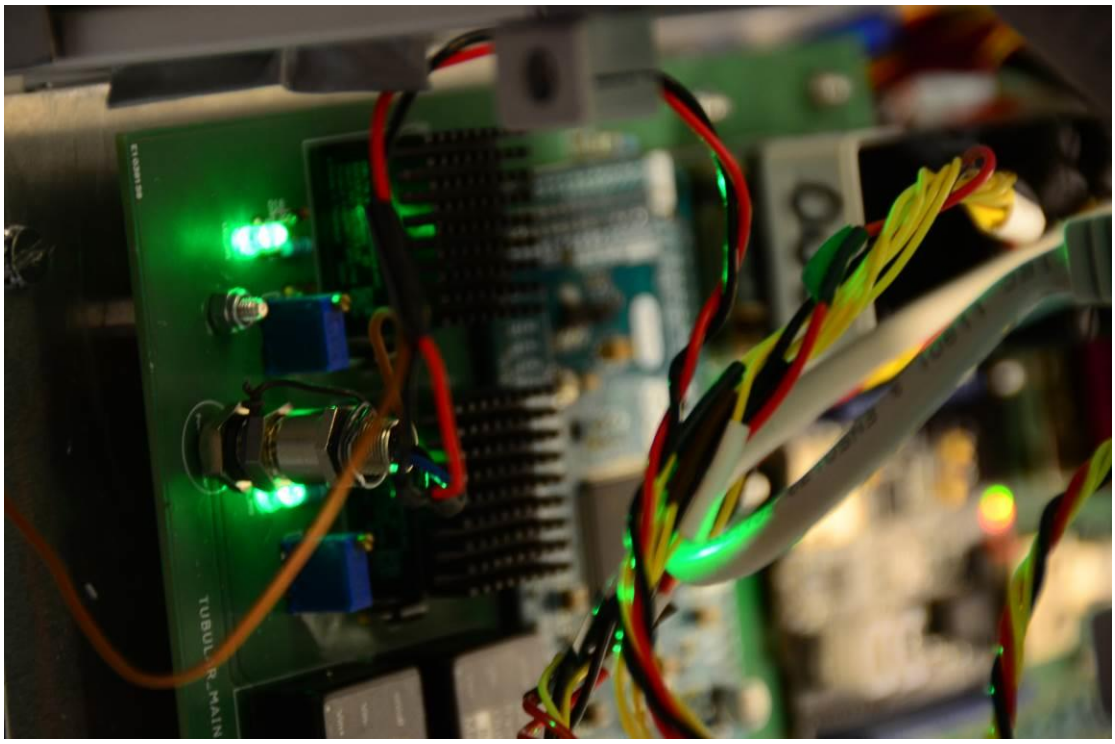
2.7. Launch Site requirements

- The team requires access to the gondola after FCT for flushing the system until Pick up of the gondola
- The procedure has been discussed and seems feasible. It will be discussed during the campaign with OPS and REC.

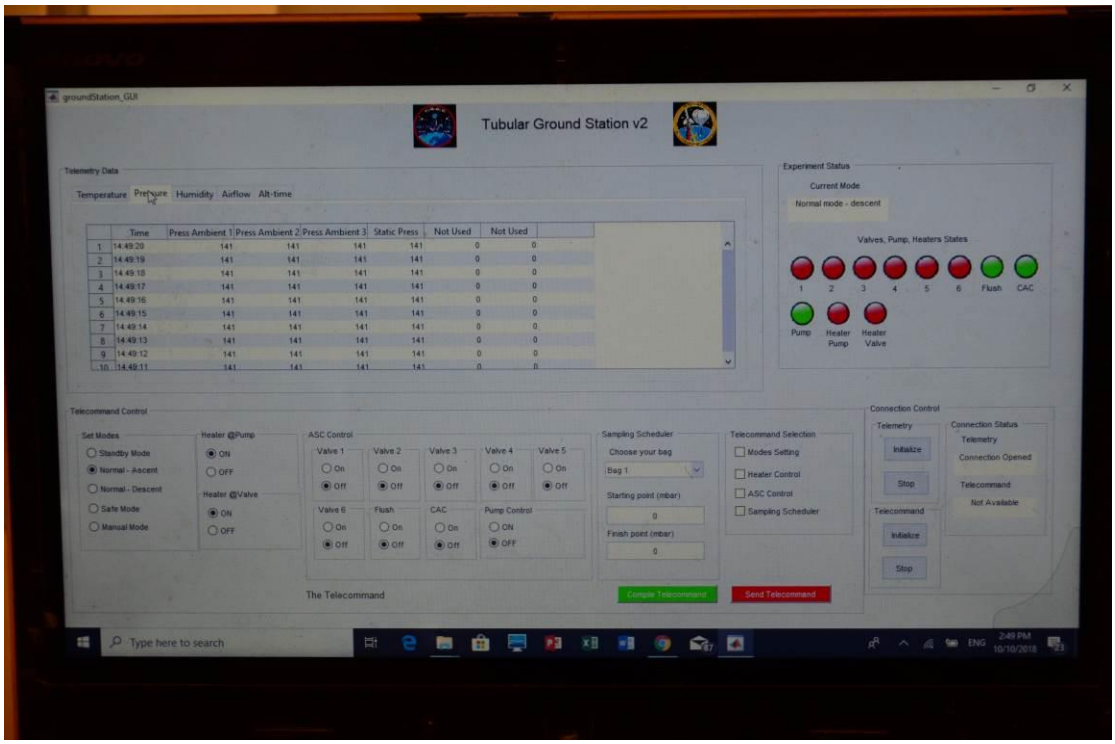
3. PHOTOGRAPHS



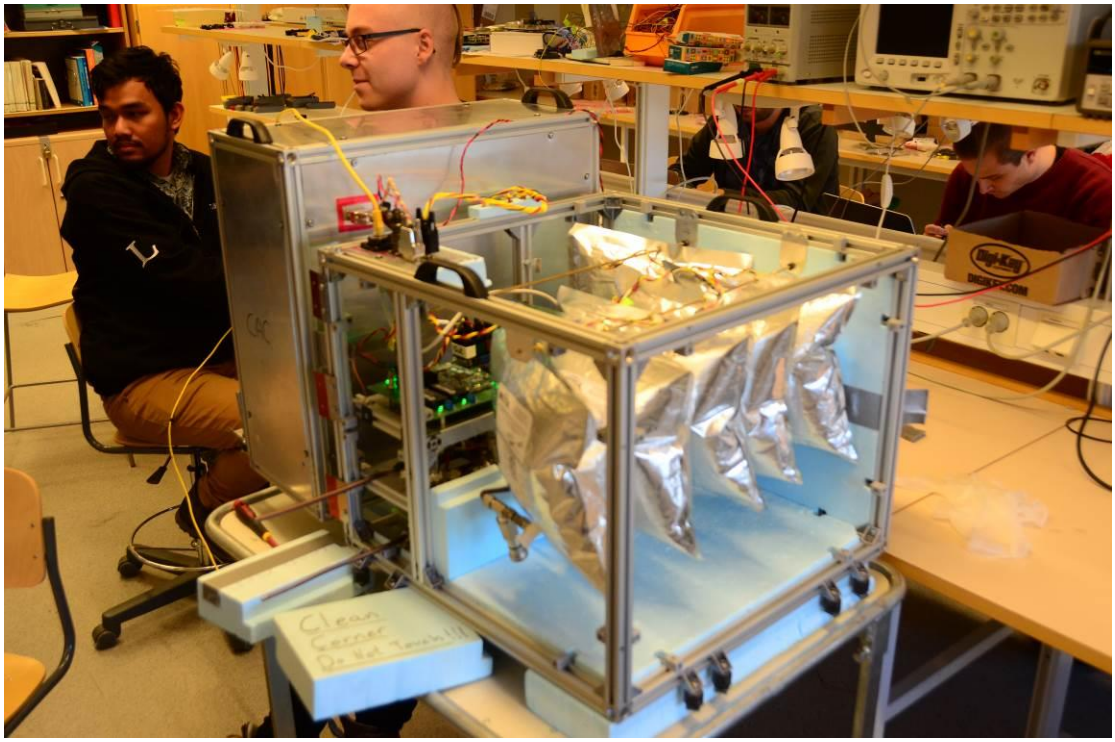
Picture 1: Top View Brain Box



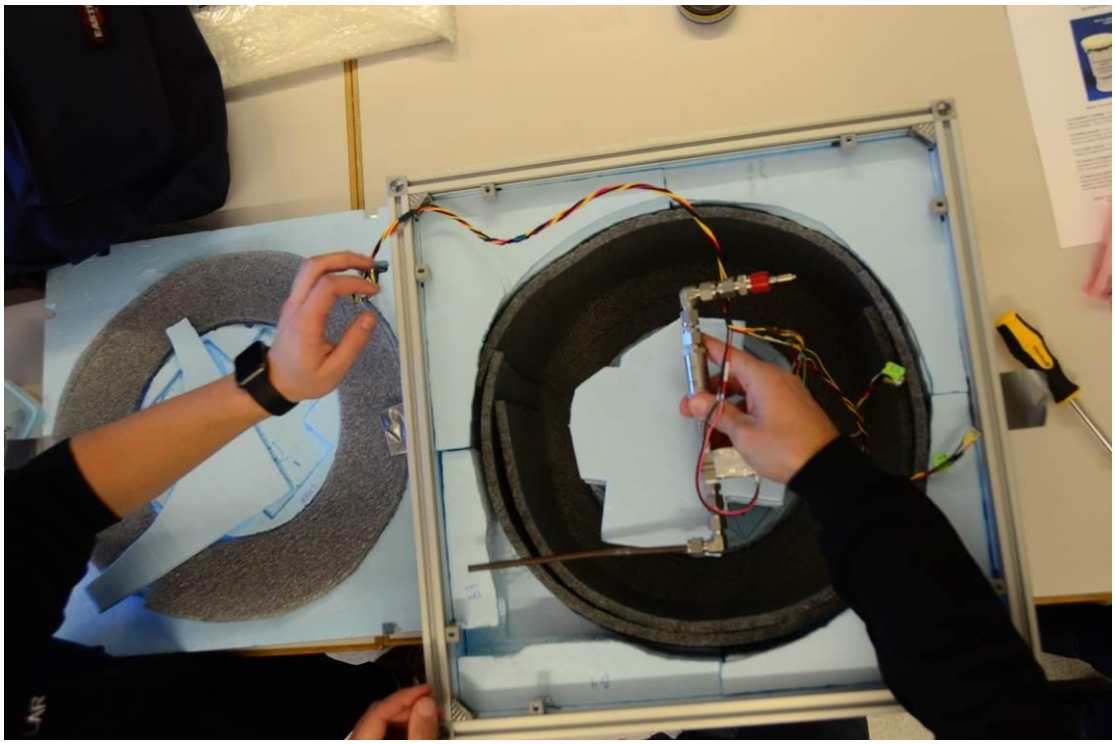
Picture 2: Detail of power connector Brain Box



Picture 3: Screenshot Ground Station GUI



Picture 4:Experiment Setup during End-to End Test with inflated bags



Picture 5: CAC box with valve for Aircoil

4. REVIEW BOARD COMMENTS AND RECOMMENDATIONS

4.1. Science

- No comments

4.2. Requirements and constraints (SED chapter 2)

- No comments

4.3. Mechanics (SED chapter 4.2.1 & 4.4)

- **Round the edges of sheet metal components**
- **Consider using some cable pads for attaching cables or tubes**
- **Replace the corner mounting brackets**

4.4. Electronics and data management (SED chapter 4.2.2, 4.2.3, 4.5 & 4.7)

- Tie cables up to structural parts where necessary
- Twisted pair only on power lines.

4.5. Thermal (SED chapter 4.2.4 & 4.6)

- No comments

4.6. Software (SED chapter 4.8)

- Ground Station

- No comments

- Experiment
  - No comments

4.7. Verification and testing (SED chapter 5)

- No comments

4.8. Safety and risk analysis (SED chapter 3.4)

- **No comments**

4.9. Organisation, project planning & outreach (SED chapters 3.1, 3.2 & 3.3)

- No comments

4.10. End-to-end Test

- No comments

5. FINAL REMARKS

5.1. Summary of main actions for the experiment team

- Bring the Experiment to Esrange and fly it.

5.2. Summary of main actions for the organisers

- **No actions**

5.3. EAR Result: pass / conditional pass / fail

- **Pass**

5.4. Next SED version due

6. EXPERIMENT ACCEPTANCE REVIEW – EAR

Experiment documentation must be submitted at least five working days (the exact date will be announced) before the review (SED version 4) This will take place upon delivery of the completed experiment to EuroLaunch. The review may take place at either the location of the students' university, or a DLR, SSC or ESA institute.

Content of EAR:

- Team presentation of project status
- Follow-up of IPR action items
- Review of schedule status with respect to REXUS program timeline and upcoming activities
- Demonstration of the fully integrated experiment
- Experiment mass properties determination/discussion
- Mechanical and electrical interface checkout
- Electrical Interface Test (REXUS service system simulator test or BEXUS E-link functionality test)
- Flight Simulation Test (FST) – including a full end to end system demonstration
- Experiment acceptance decision: Passed/conditional pass/failed. If a conditional pass is elected, the immediate action items should be discussed, along with an appropriate deadline(s)