



Functional Testing

Ngai Nam Chan Thomas (Presenter)

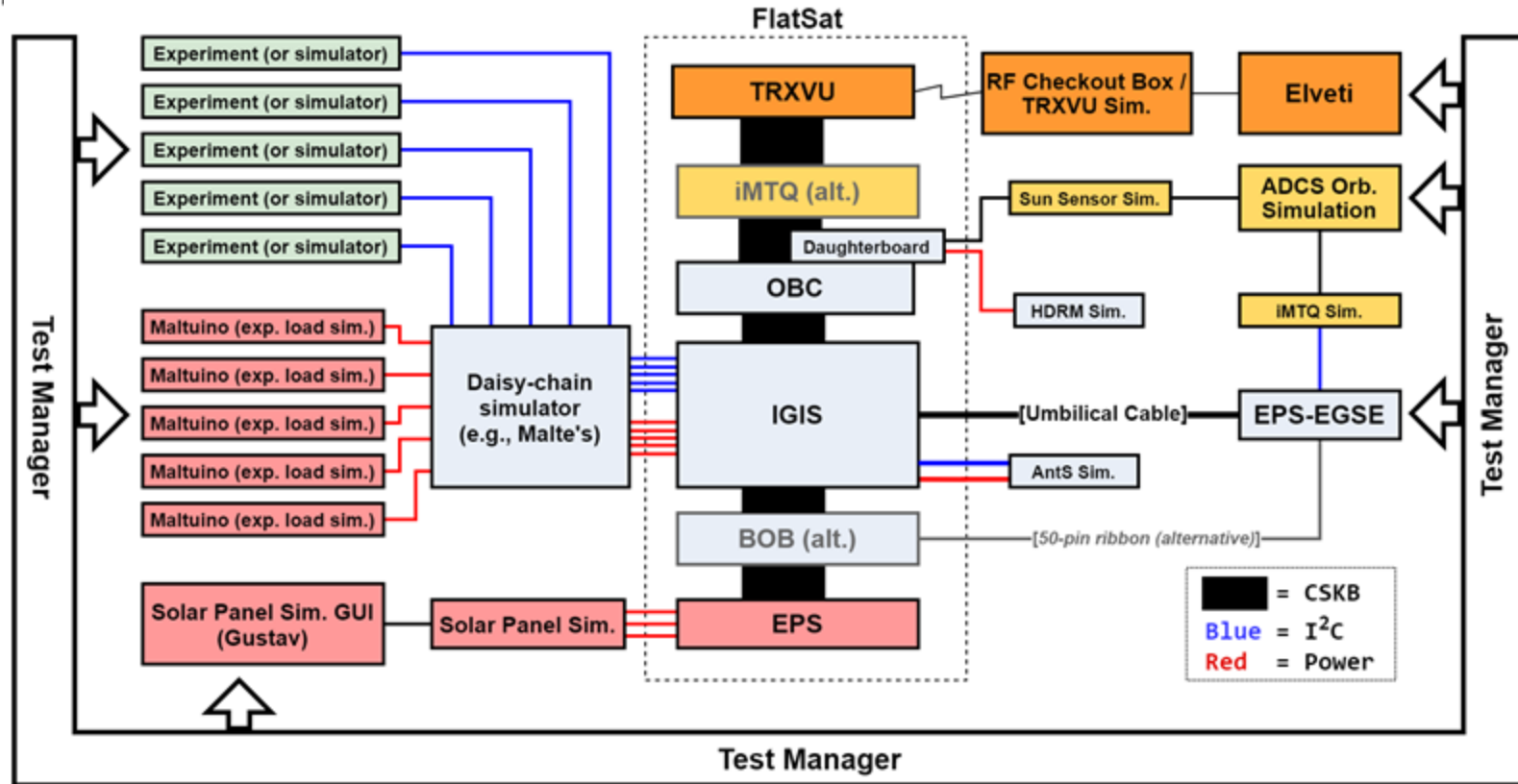
Joan Stude

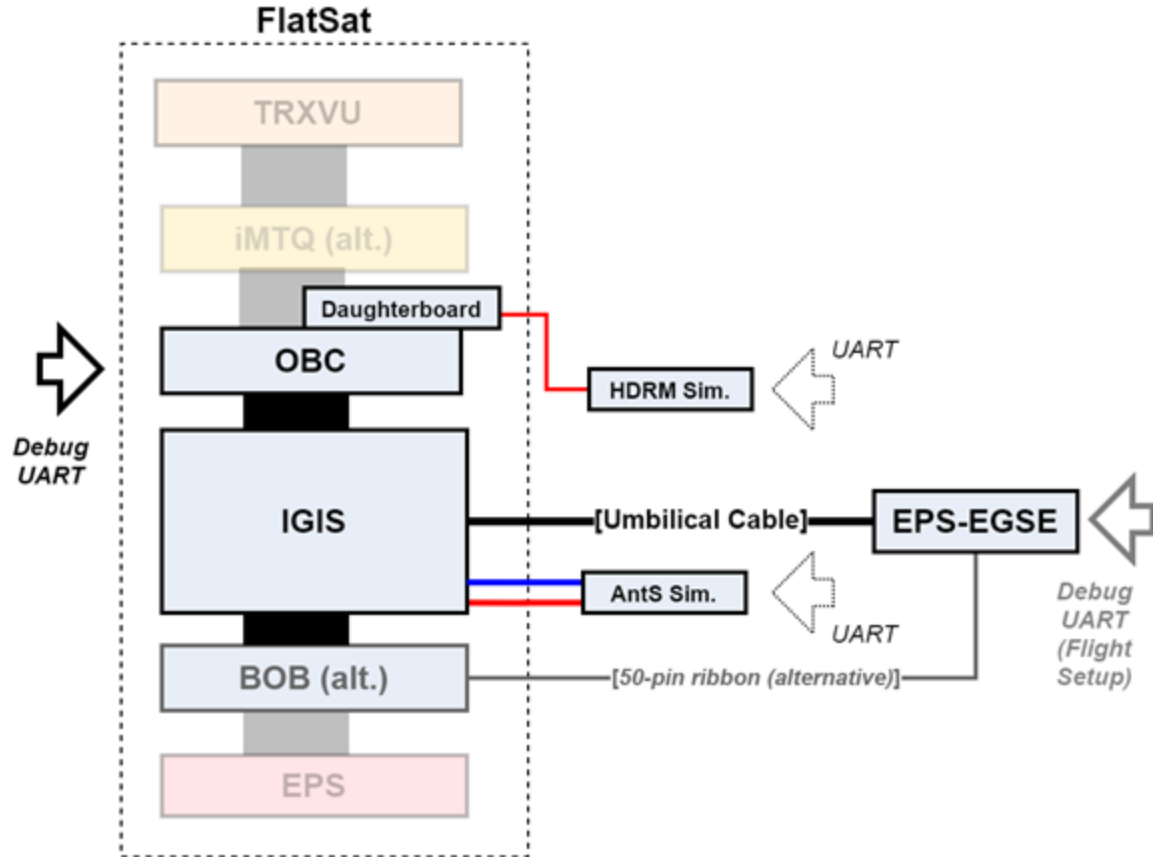
Dan Söderström

Hareekeshav Sethumadhavan Srinivasan



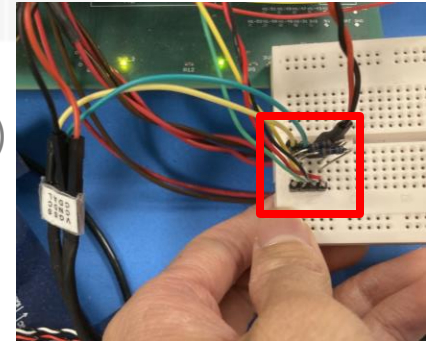
Functional Testing System



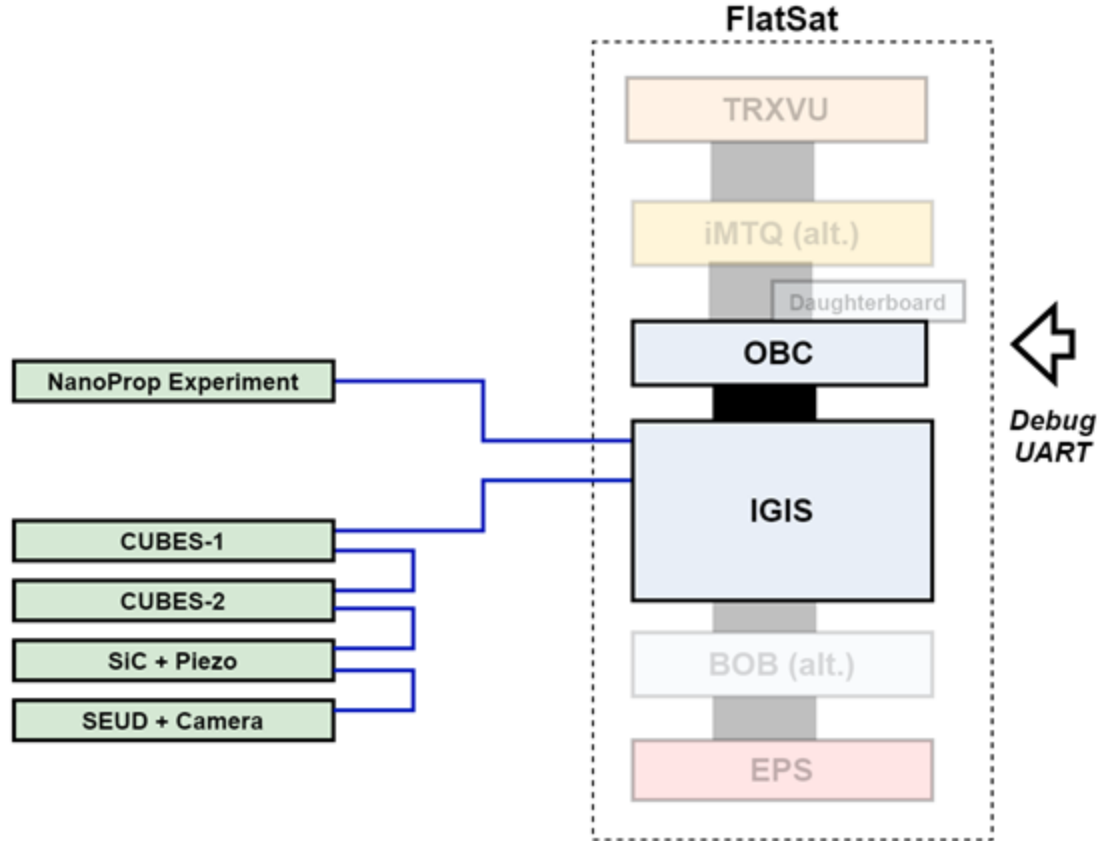




- **Work done since the beginning of semester:**
 - Design HDRM Sim. with power draw (reopened)
 - Arduino code modified to support changes in **initialization phase**
 - I²C Speed cannot operate in Fast Mode (400 kHz)
 - Attempts to lower I²C pull-up resistance to enable speed at 400 kHz
 - Troubleshooting with added pairs of pull-up resistors to lower resistance
 - **Results:** solution **NOT fully reliable** → use speed 100 kHz
- **Work on-going by the end of semester:**
 - During test in initialization phase (mission simulation)
 - Complete tests on AntS sim. "deployment"



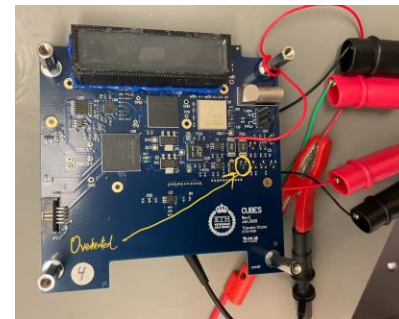
Troubleshooting I²C speed issues by adding different pairs of pull-up resistors.





- **Work done since the beginning of semester:**

- Test NanoProp operation (basic test)
 - Completed remaining VBAT range check
 - Documentation to be reviewed



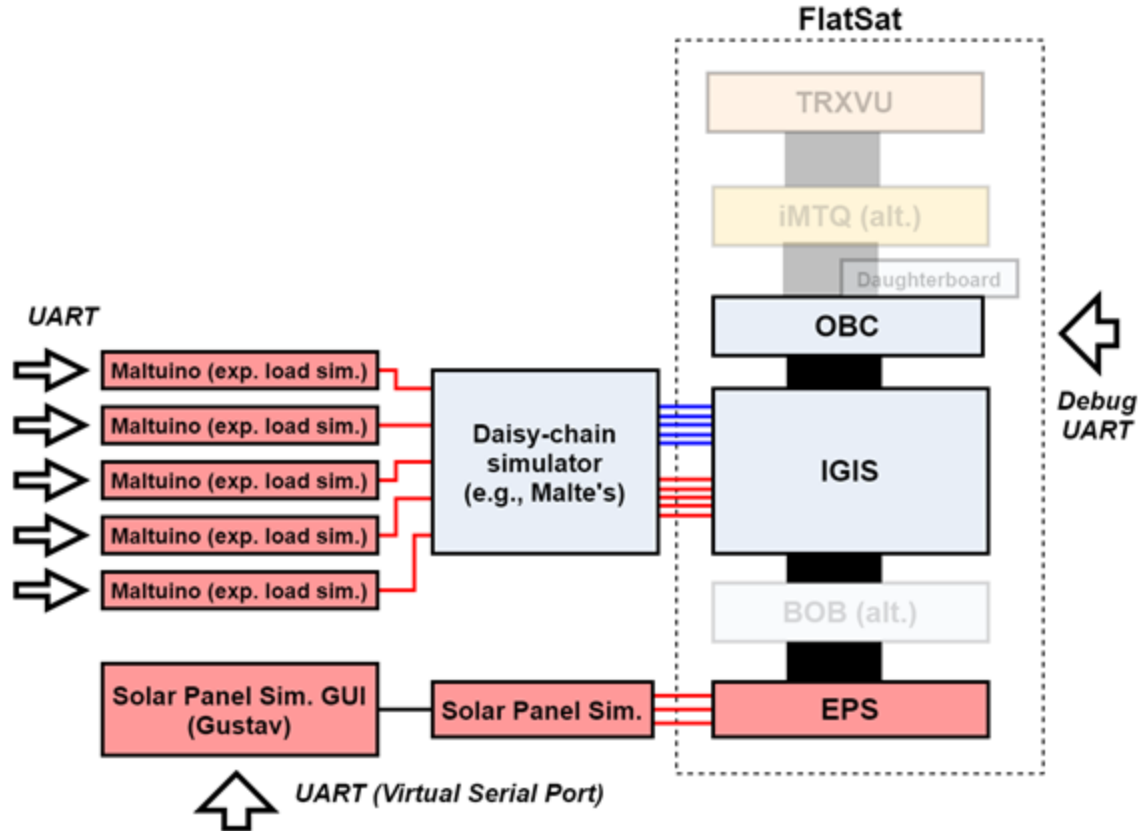
CUBES-1 DC Limit test with behaviors to be verified.

- **Work on-going and planned by the end of semester:**

- Test CUBES short-circuit & surge protection circuit (CUBES-1)
 - DC Limit test carried out with problems (overheating & protection behaviors)
 - Verifications required for safety → **FlatSat temporarily powered OFF**
- NanoProp Experiment Check (safety verified by GomSpace)
 - Interrupting NanoProp operation by power-cycling the FlatSat
 - Verify cause of clicking sound on thrusters by valve checks

- **When available:**

- Test SEUD & Camera (basic test & VBAT protection)





- **Work done since the beginning of semester:**

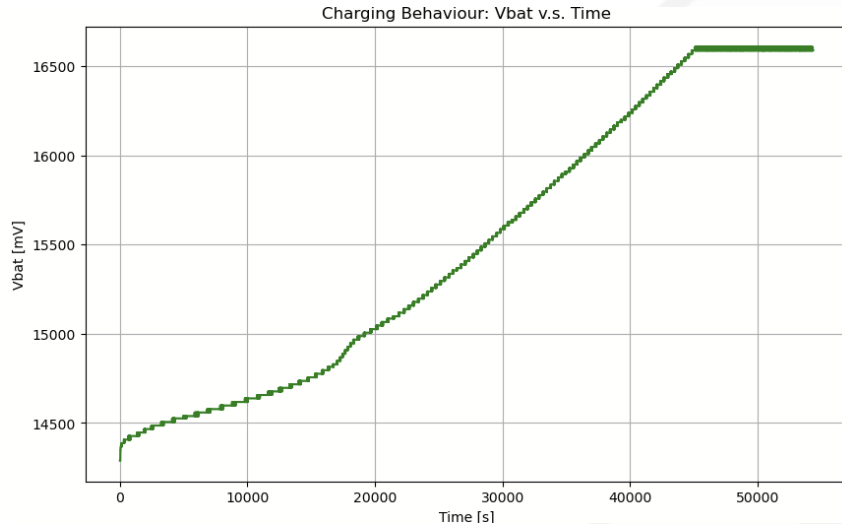
- Verify updated EPS I²C address via resets
 - Replaced reserved address with usable address
 - New address tested & **verified**
- Flight Battery testing
 - Test carried out using the non-flight P31us
 - Charging & Discharging behaviors monitored/logged via GOSH
 - Problems with EPS WDT → to **verify** when connected to **flight P31us**
- Test EPS I²C WDT
 - Test carried out by inducing a “hang” on OBCSW
 - WDT behaved as expected → reset FlatSat when triggered



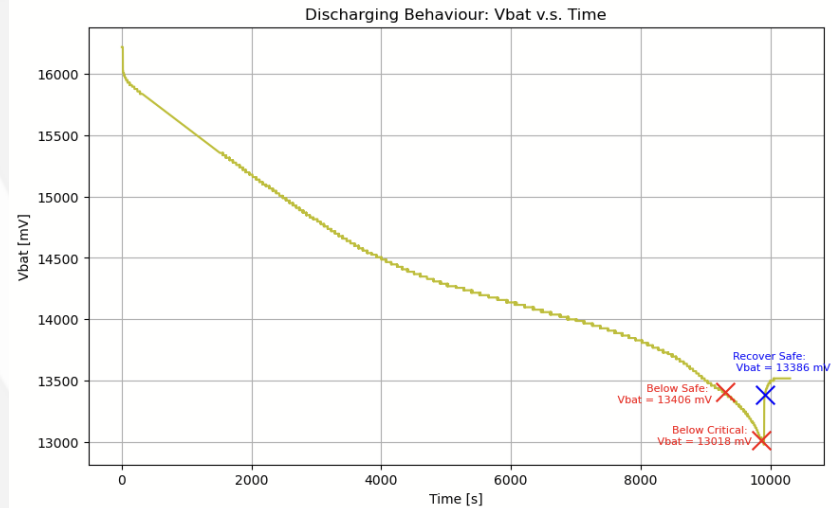
Flight Battery test – charging the battery with non-flight P31us.



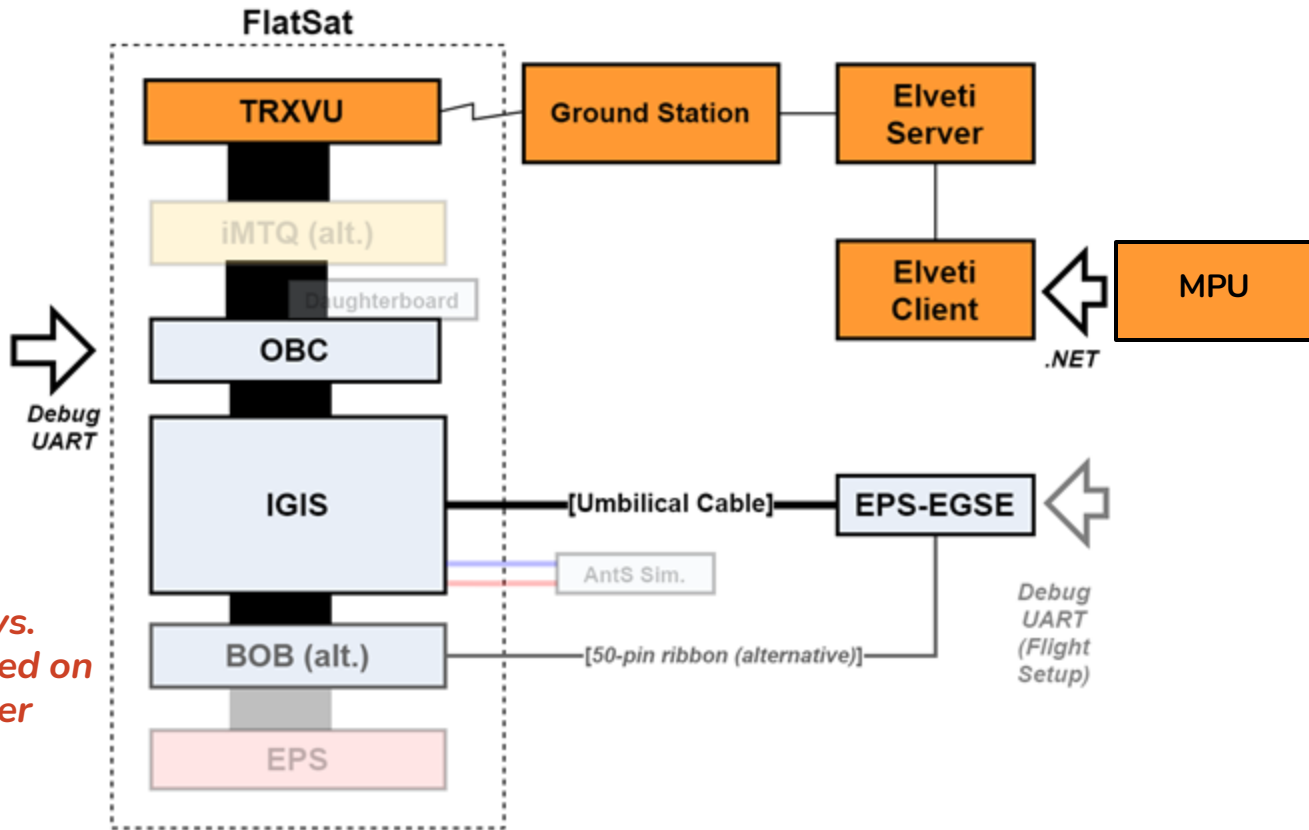
- Flight Battery testing: **Charging & Discharging** behaviors



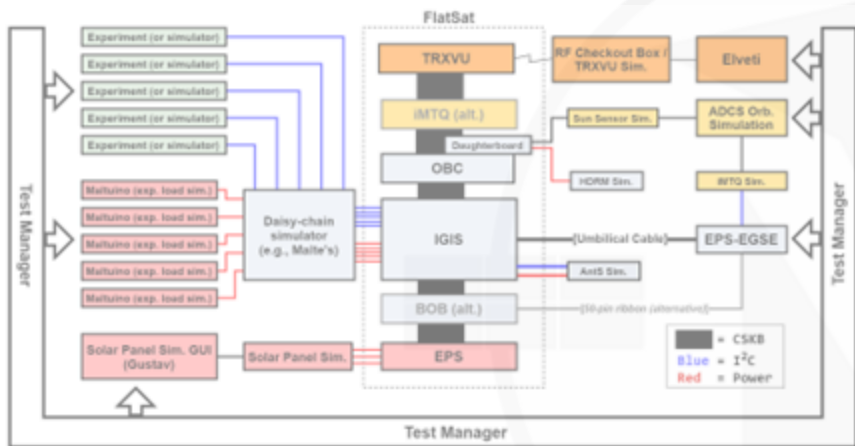
Charging behaviour matches with datasheet.



Discharging behaviour matches with datasheet.



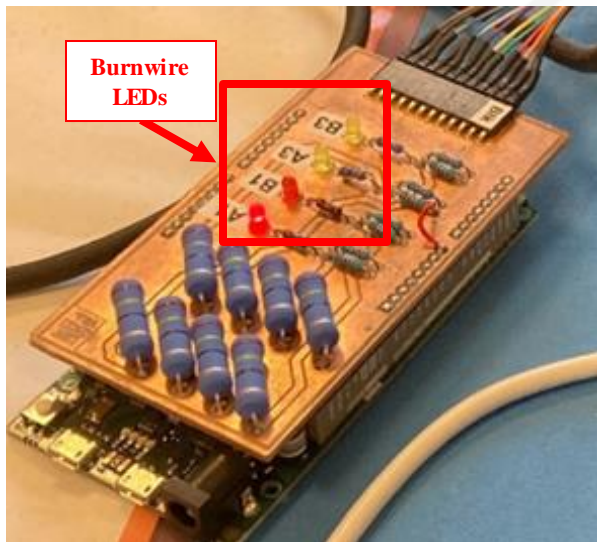
*Sat. Comms. Subsys.
has not been worked on
during this semester*



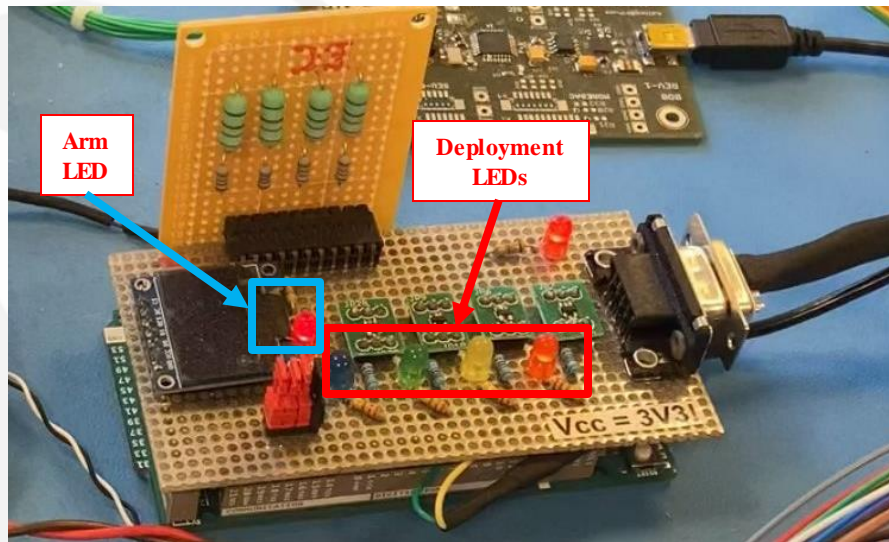


- Work on-going since the beginning of semester:
 - Test Initialization Phase
- Current Progress:
 - Test with HDRM sim. → Done
 - Identified problems for HDRM GPIO Pin configuration
 - HDRM Arduino code updated to support deployment rejection
 - Test with AntS sim. → In Progress
 - Identified deployment design issues (some antennae not being deployed)
 - Awaiting AntS deployment fix to complete test
 - Test with 30-mins loop → In Progress
 - Timer being setup in TestStand to check against OBCSW
 - Reusing previous test sequences to split fcmd messages from OBCSW
 - To resume when FlatSat can be used (currently powered off)

- **HDRM sim. & AntS sim.** responding to initialization deployment:



HDRM Sim. responds to OBCSW for initialization deployment.



AntS Sim. responds to OBCSW for initialization deployment.

