# NAKUJA PROJECT INTERNSHIP

PROGRESS REPORT
WEEK 6

# WEEK 6(16TH FEBRUARY - 22ND FEBRUARY)

**Tasks achieved:**

- Research on potassium perchlorate. #85
- Nozzle fabrication. (Modification to fit the casing) #52

- Fabricate snap rings groove. #86

- Static fire safety orientation. #22

- Iterative static firing test. (First)#19
- Modify snap rings  fit bulkhead.#87

# The Nozzle fitted into the casing

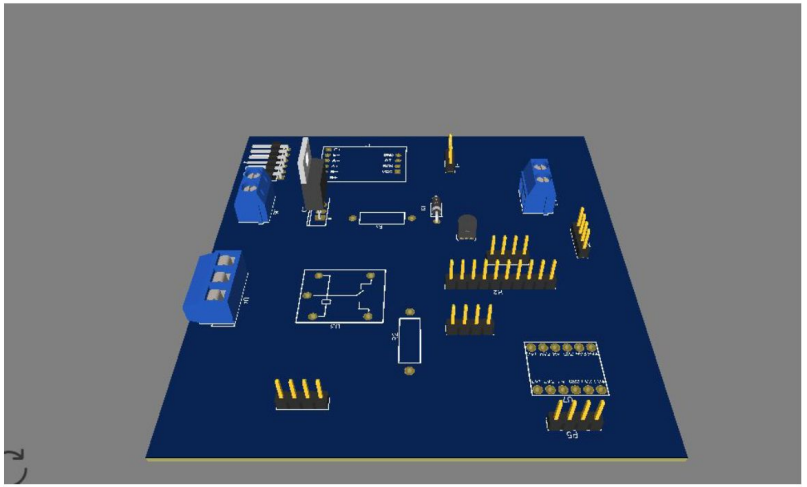
# TEST STAND PCB(Failed)

## TEST STAND PCB DESIGN

Designs were made;

Design 1, 2 & 3 all failed.

Design 4 is complete, etching in progress

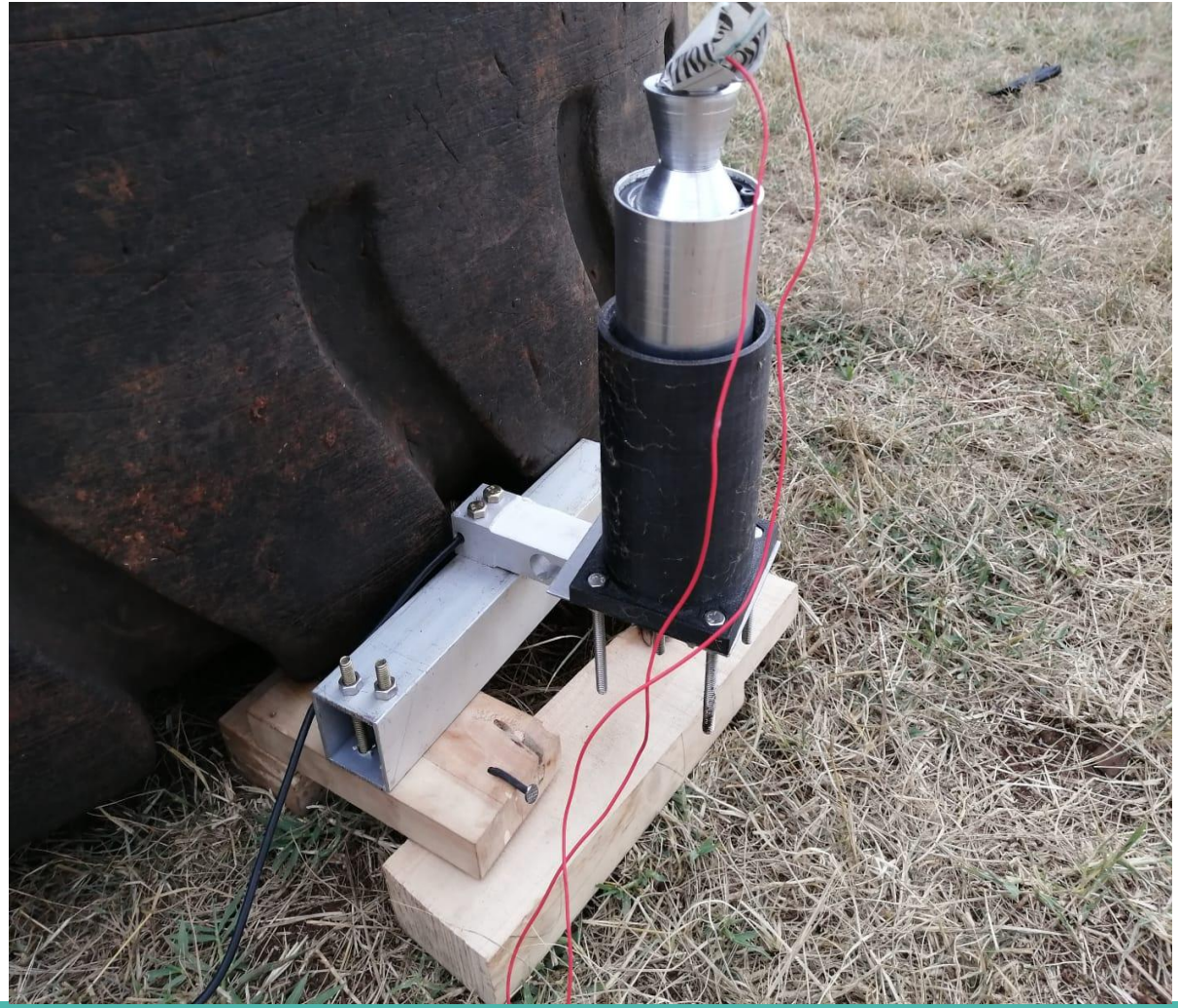


# SNAP RING GROOVES

The snap rings are supposed to help keep the nozzle secure from the propellant pressure during ignition.

# STATIC FIRING TEST

The Test-stand setup



# STATIC FIRING TEST

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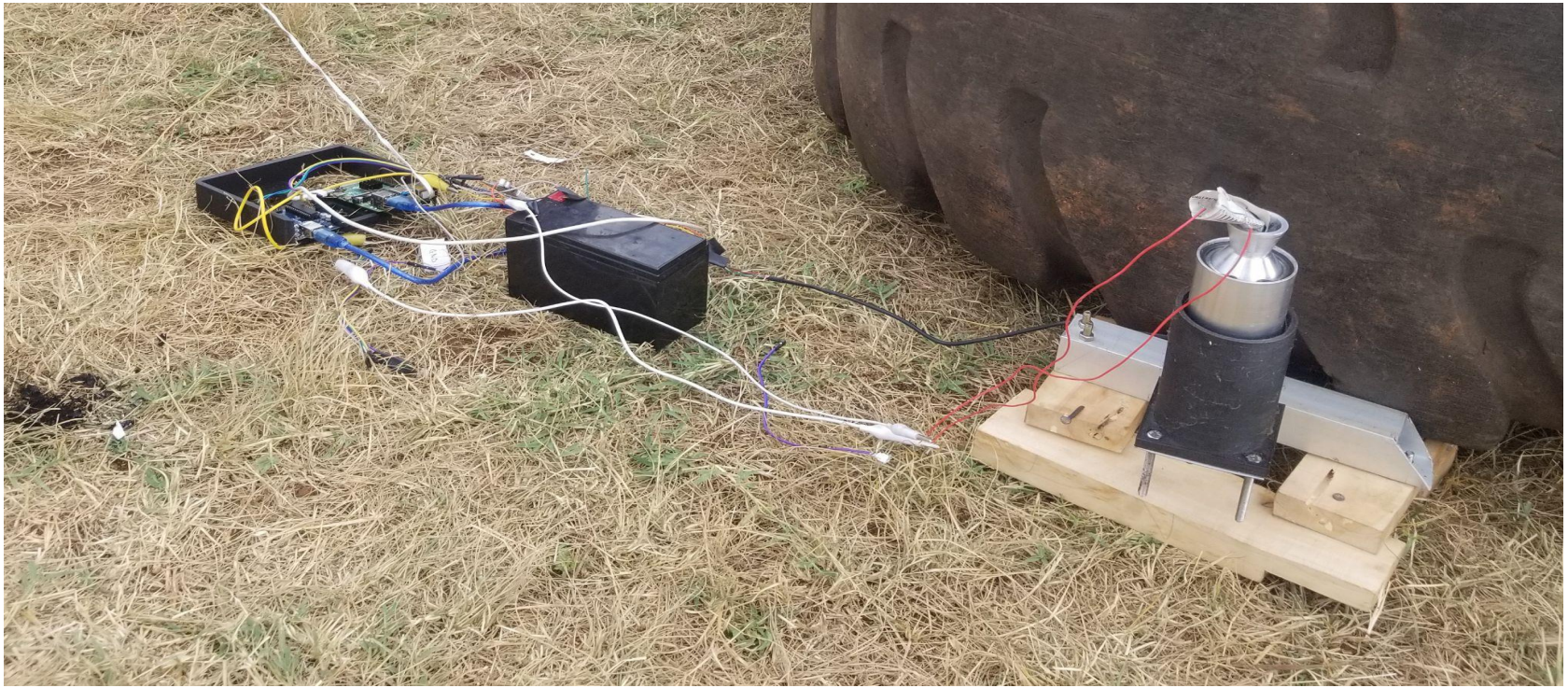
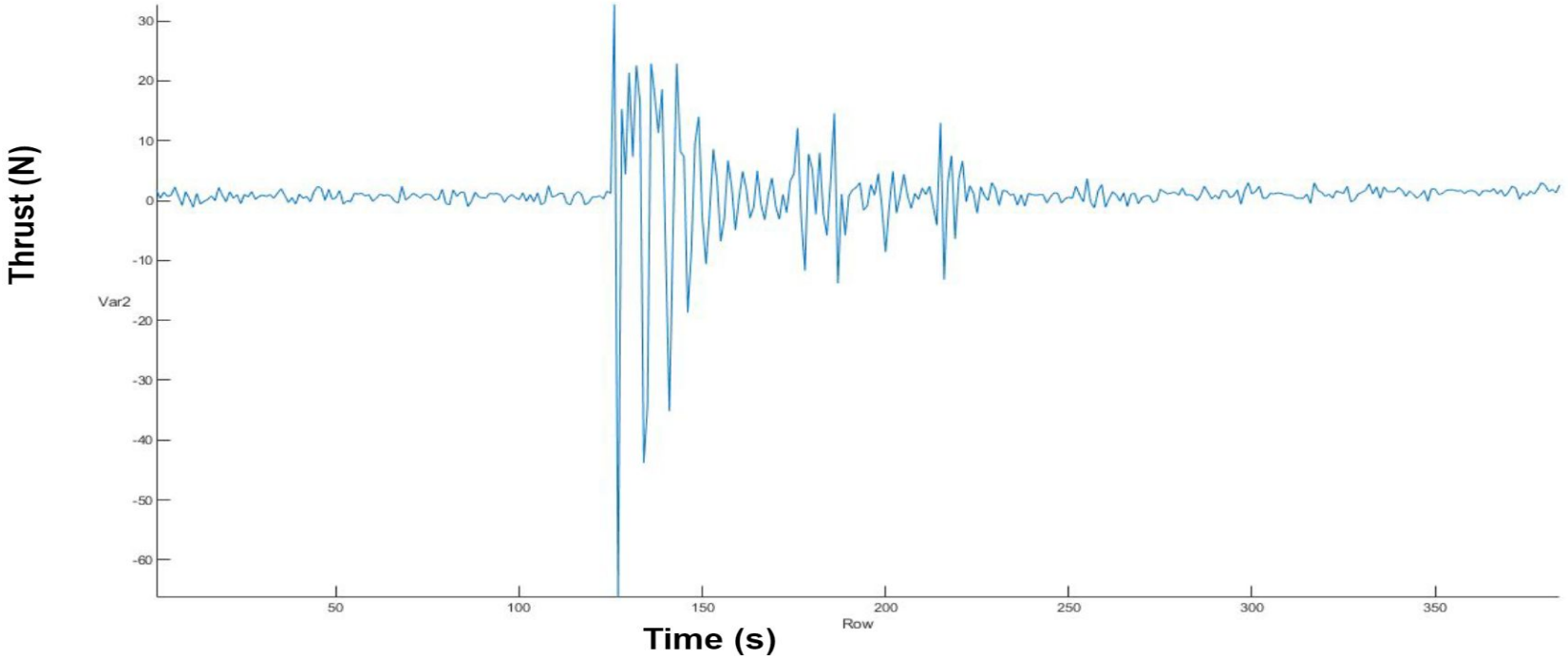


# STATIC FIRING TEST

The static firing video.

## THRUST-TIME CURVE



# OBSERVATIONS.

- The igniter took a few seconds before igniting opposed to the immediate response we expected. That was after several tries.

- The fuel took close to one minute before it fully burnt out. According to the simulations, the fuel should take 2 seconds to burn out.

- No data was collected from the Raspberry Pi.

# MODIFICATIONS

- Cast fuel and ensure it dries fully before setting it up for ignition. This will increase the burn time rate.
- Research and develop igniters that will efficiently ignite after a few seconds.
- Incorporate the new suggestions given on the improvement of the dashboard. This will enable the visualization of the data recorded.
- Look into how we can have the nozzle temperature measured.
- Incorporate wireless connection.

# Tasks to be done

- Preparation of Potassium Perchlorate. #85
- Fuel casting. #56
- Test stand PCB design #32
- PCB Etching.#33
- Preparation and Ignition Testing.#68
- Casing fabrication (Finalising). #71
- Data fetcher -Test stand. #97
- Temperature and pressure measurement during static testing. #98
- Camera mount for Test stand. #99

# TIMELINE

| MONTH | WEEK | ACTIVITY |
|---|---|---|
| JAN | 1 | Designs [Casing, Nozzle, Bulkhead, Casting tools, test stand] |
| | 2 | Fabrication [Casing, Nozzle, Casting tools] |
| FEB | 3 | Casting of fuel and Test Stand revamp |
| | 4 | Iterative static firing tests |
| | 5 | Iterative static fires and fuel improvement |
| | 6 | Launch Pad design and Fabrication |
| MAR | 7 | Iterative Static Fires |
| | 8 | Launch |