

# NAKUJA INTERNSHIP AVIONICS PROGRESS REPORT WEEK 11

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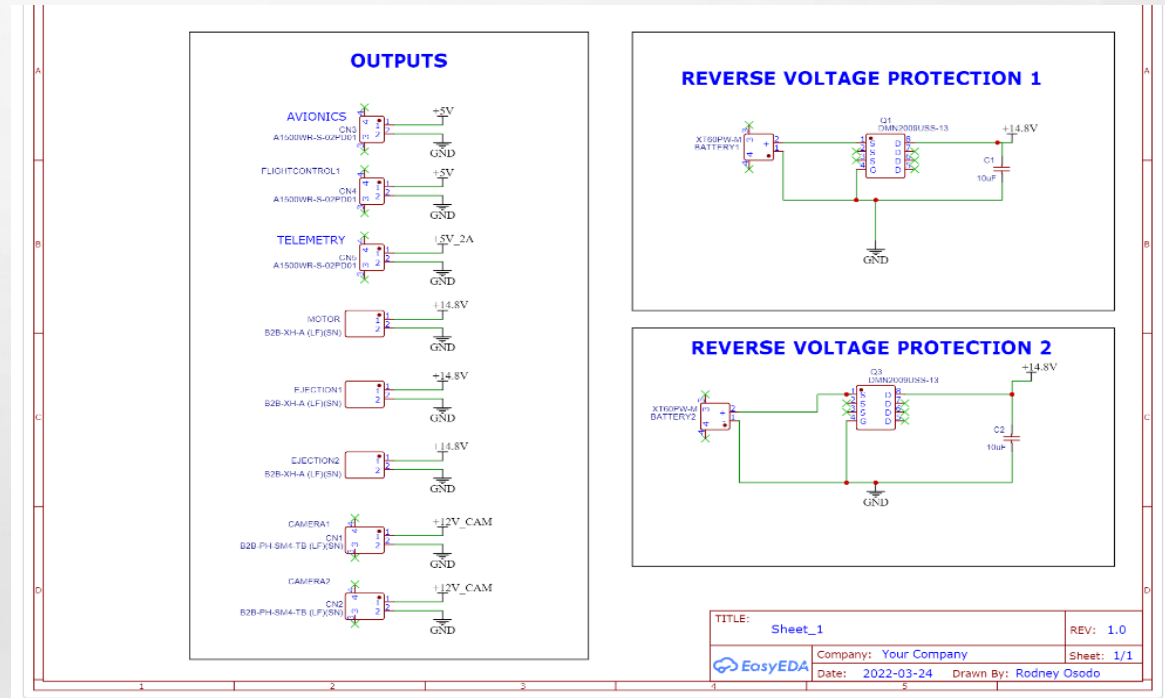
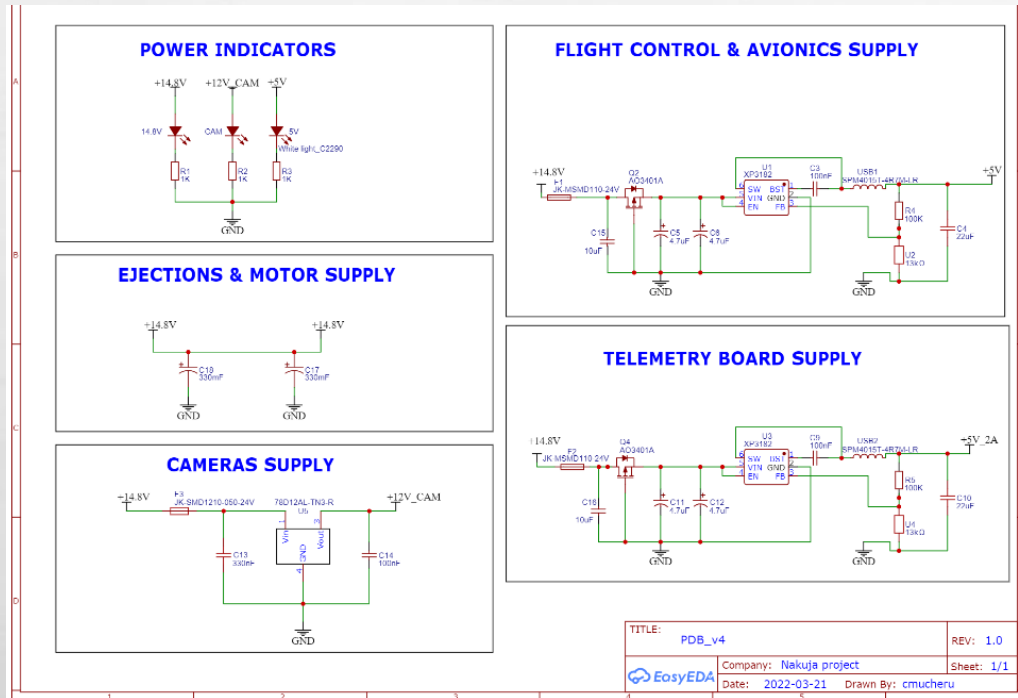
# TASKS COMPLETED THIS WEEK

- PCB redesign.
- Testing of the nichrome wire to be used for parachute ejection charge.
- Making crimson powder to be used for parachute ejection charge.
- Power distribution board design for more efficient power supply.

# PDB DESIGN

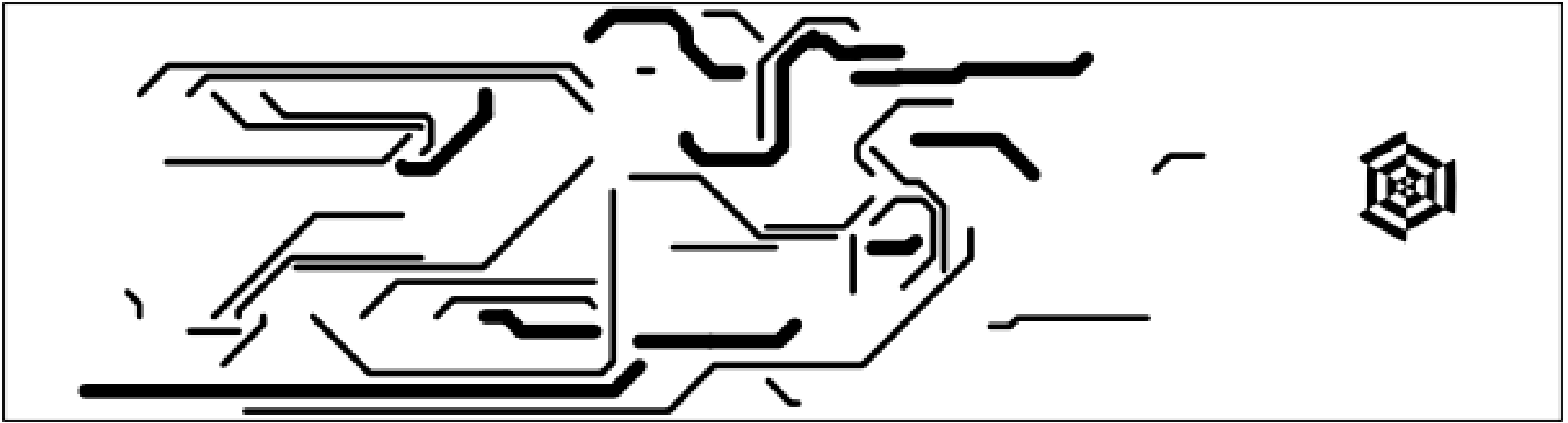
- No major changes made, just the adjustment of the JST pins for the 5v and 12 v to have differing pitch sizes
- The final design captured as shown;

# NEW PDB DESIGN



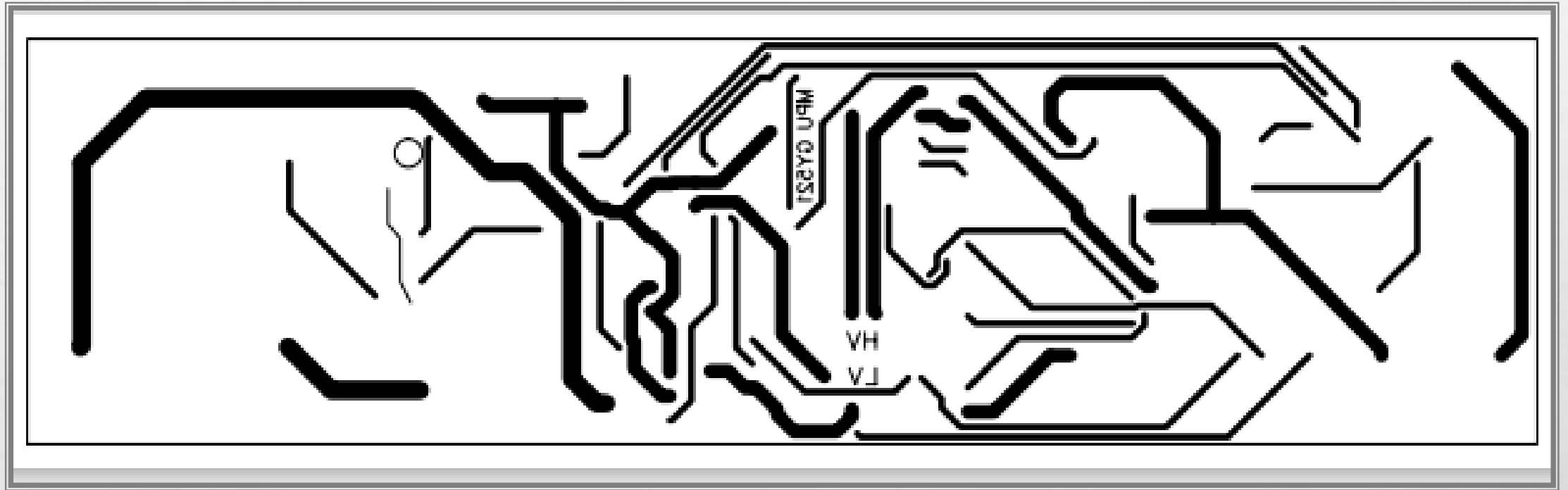
# PCB REDESIGN

- We have made a new design of the PCB that will address most of the issues we were encountering.
- The new design is captured as follows;



PCB top view





PCB bottom view

# TESTING OF THE NICHROME WIRE TO BE USED FOR PARACHUTE EJECTION CHARGE.

- Tests were done using different lengths of nichrome wire and the ideal length was established to be 12 cm.
- This is the ideal scenario where there is no delay and the nichrome wire does not melt due to too much current.
- Exact resistance of the wire yet to be established hence the exact current we'll be using still not known but with the wires we have, we won't be requiring too much current.



# CHALLENGES TO ADDRESS

- ESP 32 cam needs a hole on the airframe to pass the power cables through.
- Regarding the FPV TVL 1200 cam ;
  - the transmitter is malfunctioning.
  - The monitor is unresponsive and the device is excessively heating.
  - It could be drawing too much current since two cables were burnt in the previous test.
  - Suggestion to purchase new transmitter device. The receiver is okay.

# TASKS IN PROGRESS

- PCB FABRICATION.
- ANTENNA DESIGN.
- DETERMINE NEED FOR CHANGE OF THE ONBOARD MOSFET.
- AVIONICS BAY DESIGN.

# AVIONICS BAY DESIGN

- We decided that we are going to use PVC as the frame for the avionics bay.
- The bay will be partitioned into various sections separated by blocks.
- A picture of the bay will be provided soon.

# PCB FABRICATION

- New design of the PCB is ready and some members will visit gearbox to oversee the fabrication process.
- This will be completed this week.

# ANTENNA DESIGN

- Some members visited Pausti and were introduced to the devices we will be using to analyze the antenna designs.
- The antenna design though is scheduled to take place after the flight test
- Once the exact transmission parameters and limitations have been established, we will finalize on the transmission devices.

# MOSFET CHANGE

- After conducting tests on the firing of the parachutes, a decision will be made on whether to change the onboard MOSFET.
- The current MOSFETs can only do a maximum of 6.5A.
- We will do some tests to find the actual current values.



# TASKS THIS WEEK

- PCB FABRICATION.
- EVALUATION OF ONBOARD MOSFET TO SEE IF THERE'S NEED FOR CHANGE.
- DESIGN OF THE AVIONICS BAY.
- ANALYSIS OF THE ANTENNA DESIGN ( THE DESIGN WILL BE DONE AFTER THE FLIGHT TEST ).

**THANK YOU.**

