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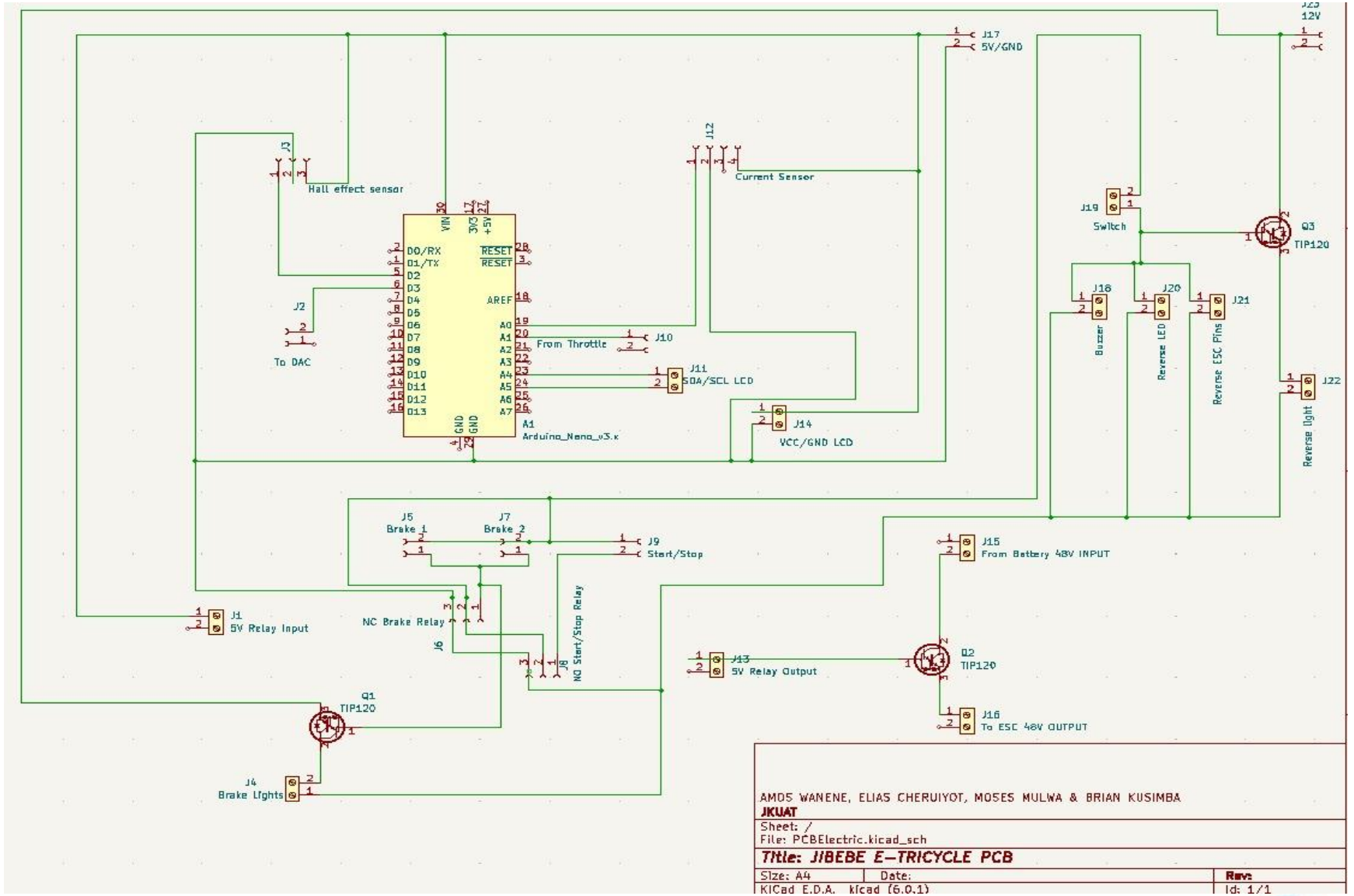
JIBEBE INTERNSHIP 2022

ELECTRIC TEAM: PAUL MOSES MULWA

TASKS COMPLETED LAST WEEK

- [#84] PCB Design – The PCB Design has now been fully finalized awaiting any changes that might arise before it's fabrication. Size – 16.5cm x 15cm
- [#101]LCD for Battery Percentage Display and Speed Display – This was tested successfully and now awaiting integration to 3D printed hub.
- [#98] Integration of DAC to motor speed control

PCB DESIGN


J17
5V/GND
12V
Hall effect sensor
Current Sensor
J19
Switch
Q3
TIP120
J16
Buzzer
J20
Reverse LED
J21
Reverse ESC Pins
J22
Reverse light
J2
To DAC
From Throttle
J10
J11
SDA/SCL LCD
J14
VCC/GND LCD
A1
Arduino_Nano_v3.x
J5
Brake 1
J7
Brake 2
J9
Start/Stop
J15
From Battery 48V INPUT
J1
5V Relay Input
NC Brake Relay
J6
J8
NO Start/Stop Relay
J13
5V Relay Output
Q2
TIP120
Q1
TIP120
J16
To ESC 48V OUTPUT
J4
Brake Lights
AMOS WANENE, ELIAS CHERUIYOT, MOSES MULWA & BRIAN KUSIMBA
JKUAT
Sheet: /
File: PCBElectric.kicad_sch
Title: JIBEBE E-TRICYCLE PCB
Size: A4
Date:
Rev:
KiCad E.D.A. kicad (6.0.1)
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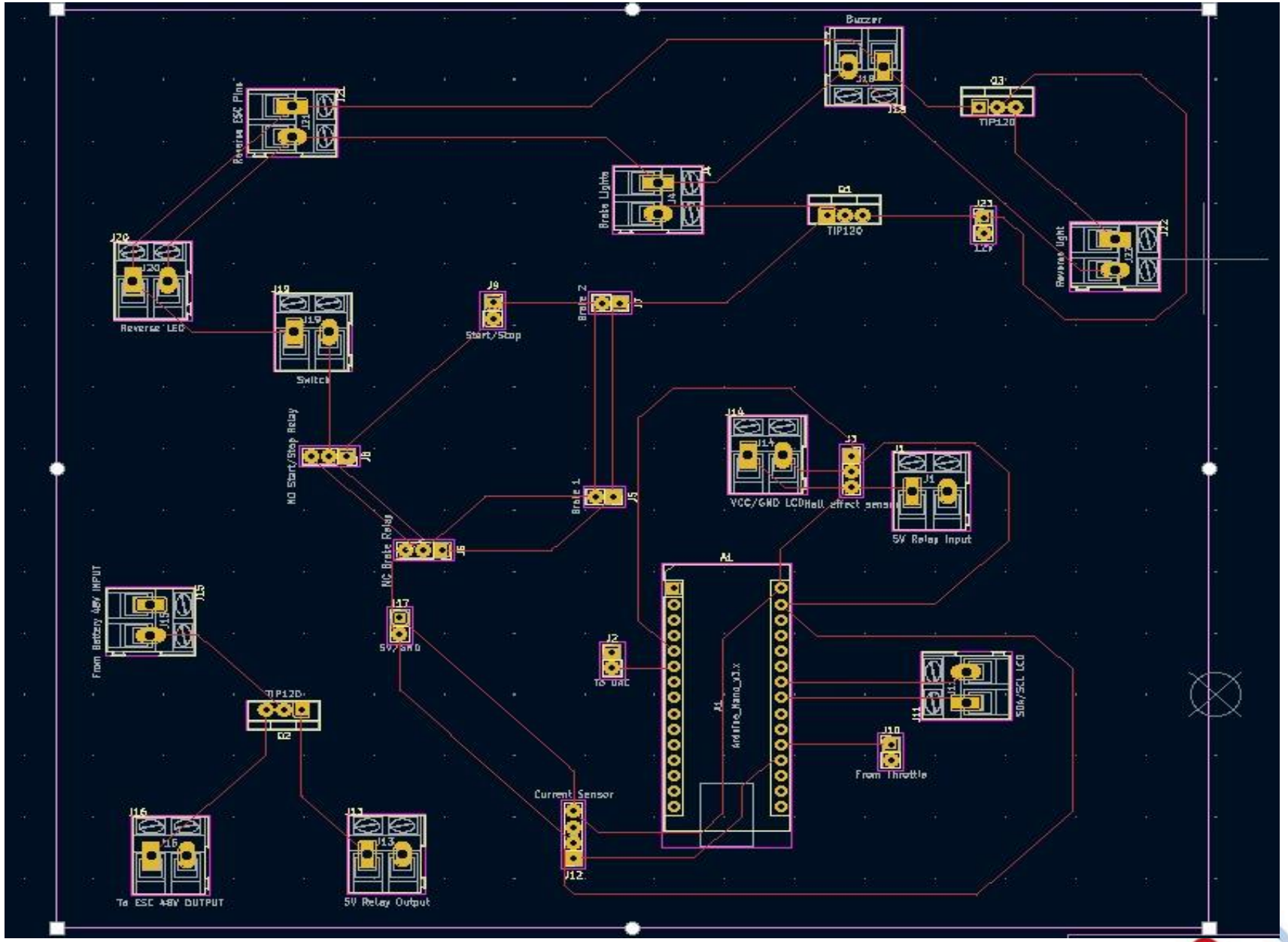
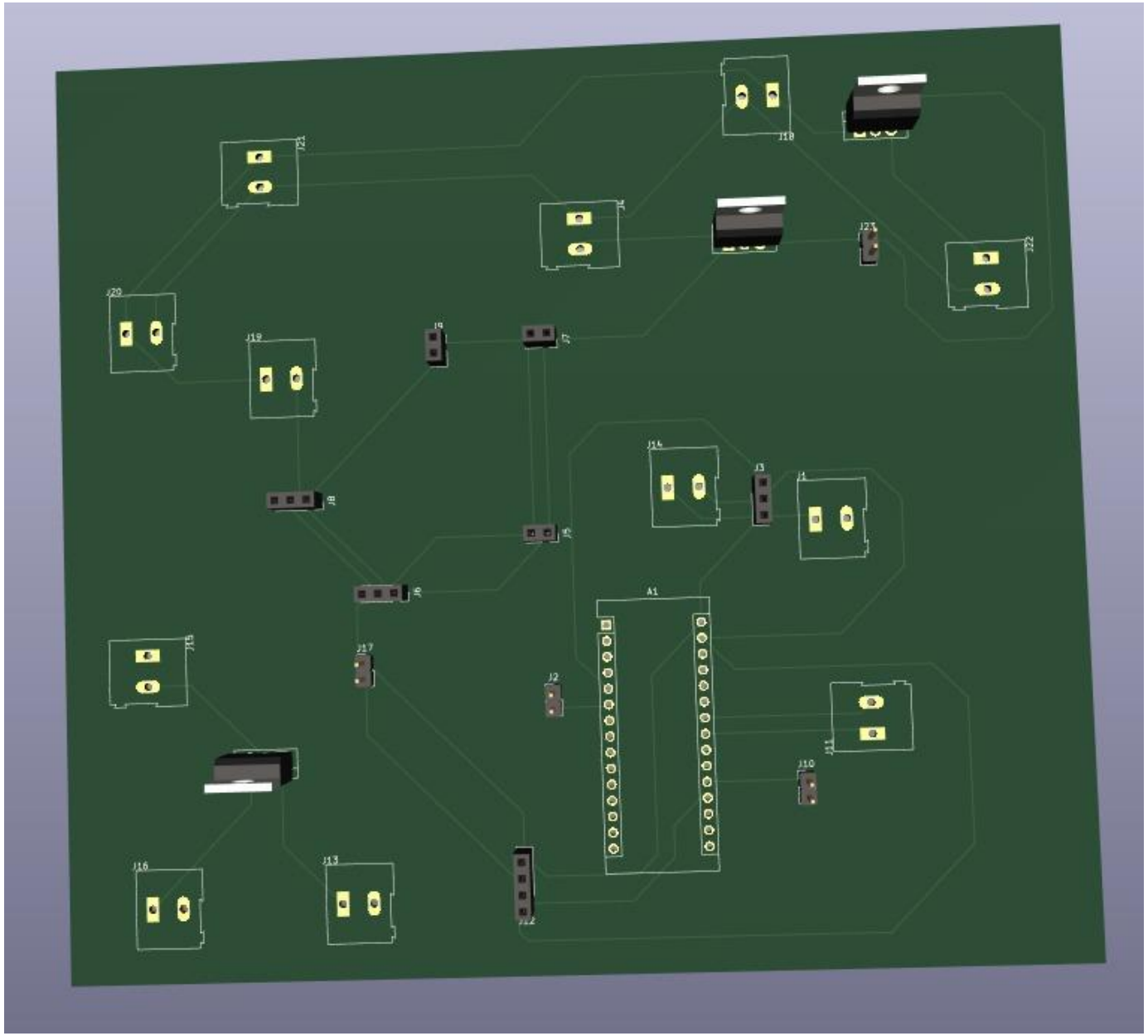
PCB DESIGN


Buzzer
Reverse ESC Pins
Brake Lights
TIP120
Reverse Light
Reverse LED
Switch
Start/Stop
Brake 2
Brake 1
NO Start/Stop Relay
NC Brake Relay
VCC/GND LCD
Hall effect sensor
5V Relay Input
From Battery 48V INPUT
5V/GND
To UART
SDA/SCL LCD
From Throttle
Current Sensor
To ESC 48V OUTPUT
5V Relay Output

PCB DESIGN


J18
J23
J22
J20
J19
J14
J3
J1
J8
J5
J6
A1
J15
J17
J2
J11
J10
J16
J13
J12

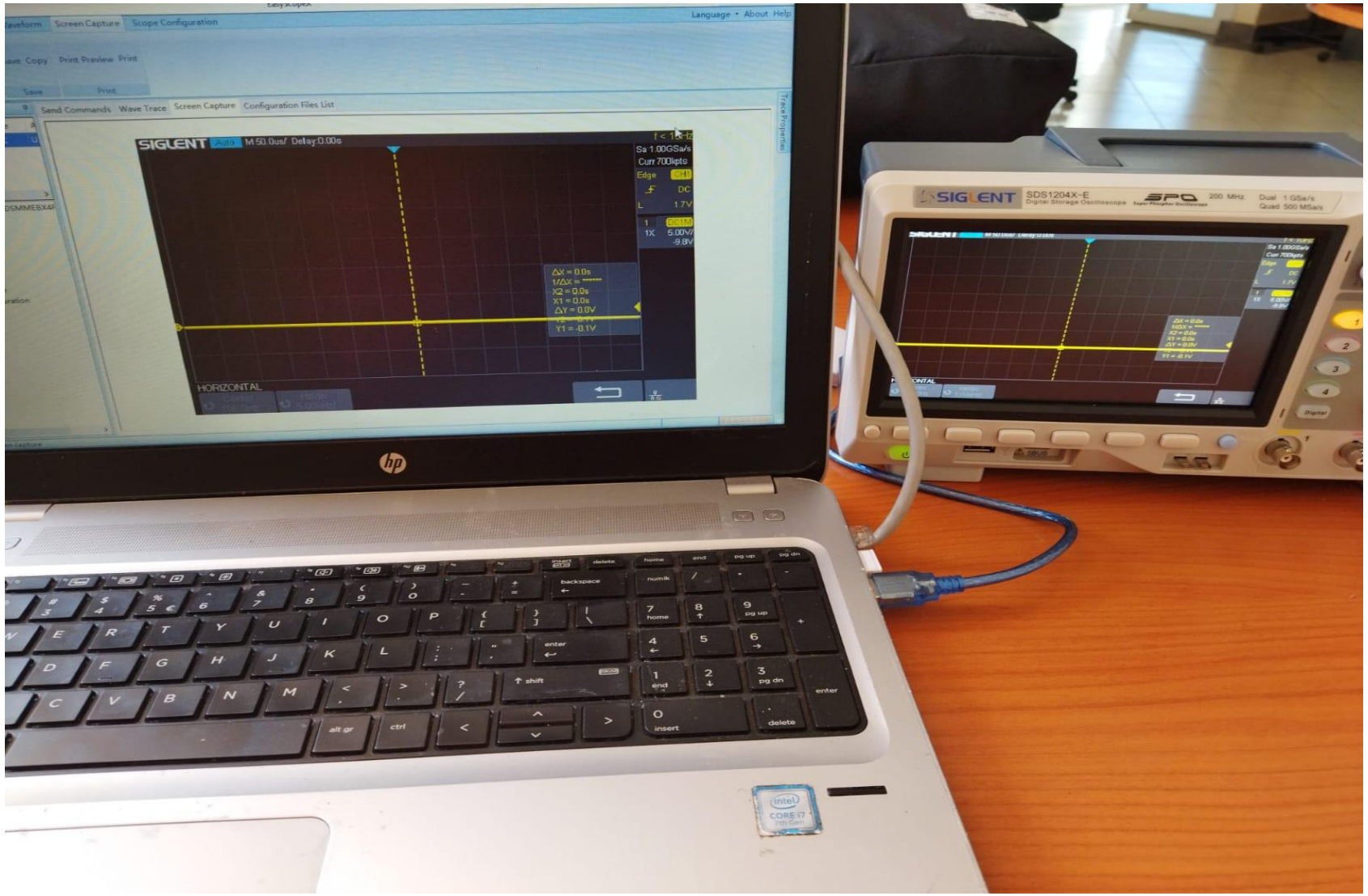
LCD TESTING

TASKS COMPLETED LAST WEEK

- [#98] Integration of DAC to motor speed control – This was done using the Arduino Due which has an inbuilt DAC. Range(0 -2.74V)

- Two outcomes were expected : Control maximum speed of the motor and try to mitigate the jerking effect.
- Several avenues were explored including using a low pass filter either using it's transfer function or a physical RC circuit.
- Ultimately the team decided to go with using an innovative analog Read and analog Write solution which allowed the team to both limit the maximum speed and also mitigate the jerking.

SPEED TESTING



PROGRESS UPDATES

- [#70] Acquisition of Tractor Motor – Our Supplier has acquired the 15Kw motor. They have also acquired 3 quotations from local suppliers. The motor also has a controller

TRACTOR MOTOR

TASKS IN THIS WEEK

- [#70] PCB Fabrication
- [#102] Design of 3D printed Hub for Reverse and Display functions – Software like Fusion 360 or Solidworks will be used for this purpose.

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Thank You