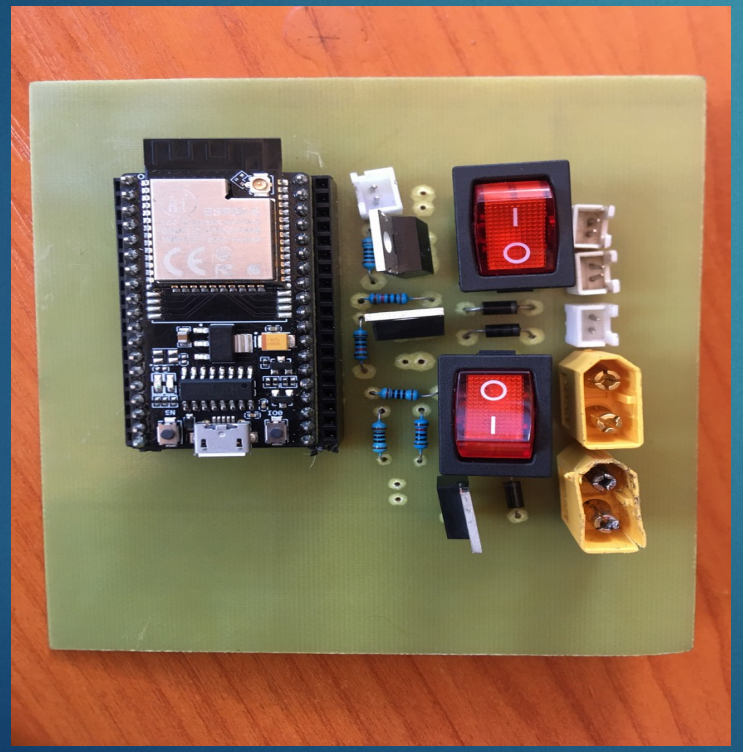
LIQUID PROPULSION TEAM WEEK 8

THIS WEEKS’ OBJECTIVES

- Programing and fabricating the control circuit
- Testing and Integrating the Control Circuit with the Power Distribution Board
- Review of SA CUP rules

#121;Programing and fabricating the control circuit

- We managed to fabricate the control circuit
- We also programmed the board.



Objectives of the board

- Houses the microcontroller board that controls the ignition Circuit i.e: firing
- Has override switches for manually overriding the microcontroller in case it malfunctions during the engine operation.
- Is modular enabling extension of other circuitry.

#127;INTEGRATION WITH POWER DISTRIBUTION BOARD

Integrated the power distribution board with the power board.

Results

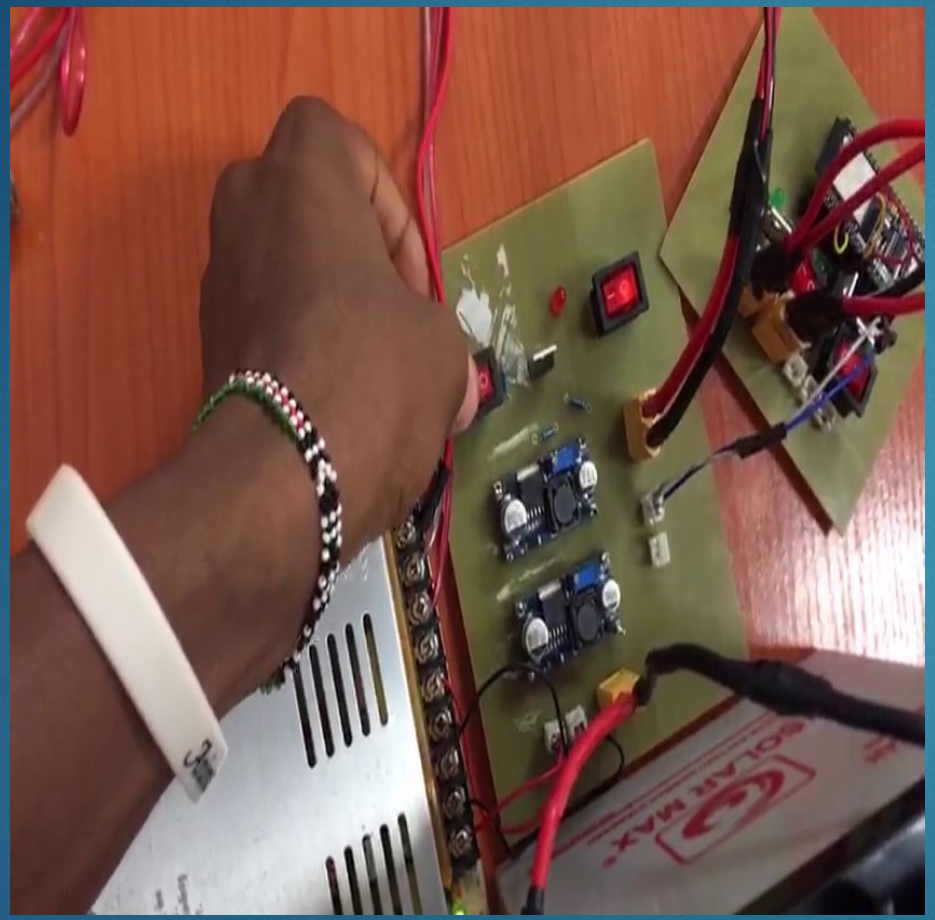
- Managed to control switching of the solenoid valves via the control board using written code.
- The board did not fire the ignition coil.

Solution.

We are doing a bench test to try trouble-shooting The circuit.

BENCH TEST

FINAL RESULT



with the changes made, the was a spark ignited

TEMPERATURE SENSOR CALIBRATION

temperature_sensor_ds18b20 | Arduino IDE 2.3.2

File Edit Sketch Tools Help

ESP32 Dev Module

temperature_sensor_ds18b20.ino

```
37  // After we got the temperatures, we can print them here.
38  // We use the function ByIndex, and as an example get the temperature from the first sensor only.
39  float tempC = sensors.getTempCByIndex(0);
```

Output Serial Monitor

Message (Enter to send message to 'ESP32 Dev Module' on 'COM4')

```
Requesting temperatures...DONE
Error: Could not read temperature data
Requesting temperatures...DONE
Temperature for the device 1 (index 0) is: 27.00°C
Requesting temperatures...DONE
Temperature for the device 1 (index 0) is: 26.94°C
Requesting temperatures...DONE
Temperature for the device 1 (index 0) is: 26.94°C
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Requesting temperatures...DONE
Temperature for the device 1 (index 0) is: 26.94°C
Requesting temperatures...DONE
Temperature for the device 1 (index 0) is: 27.50°C
Requesting temperatures...DONE
Temperature for the device 1 (index 0) is: 28.06°C
```
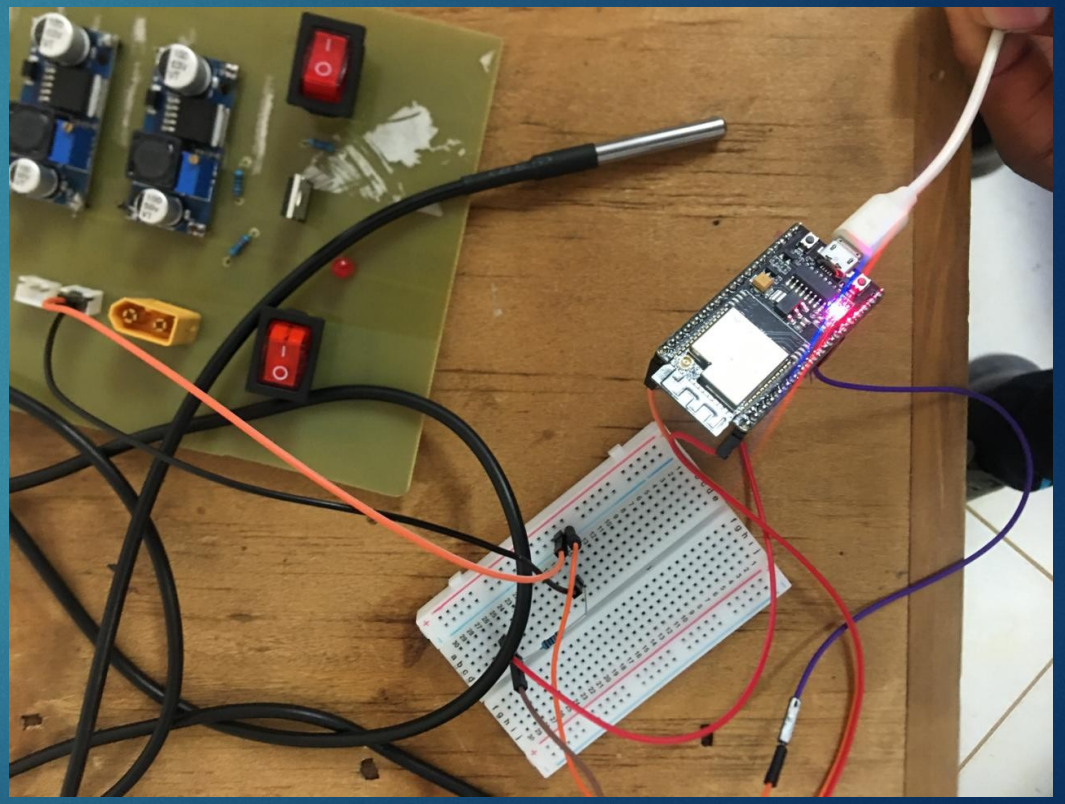
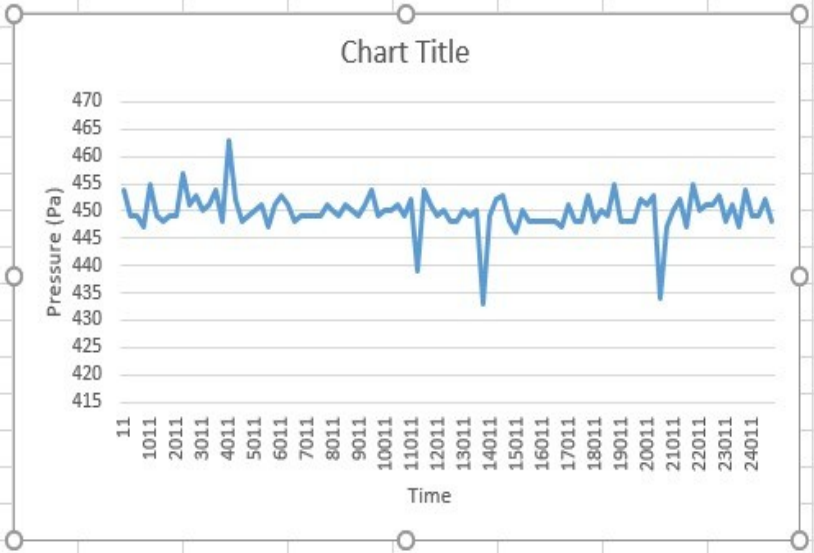
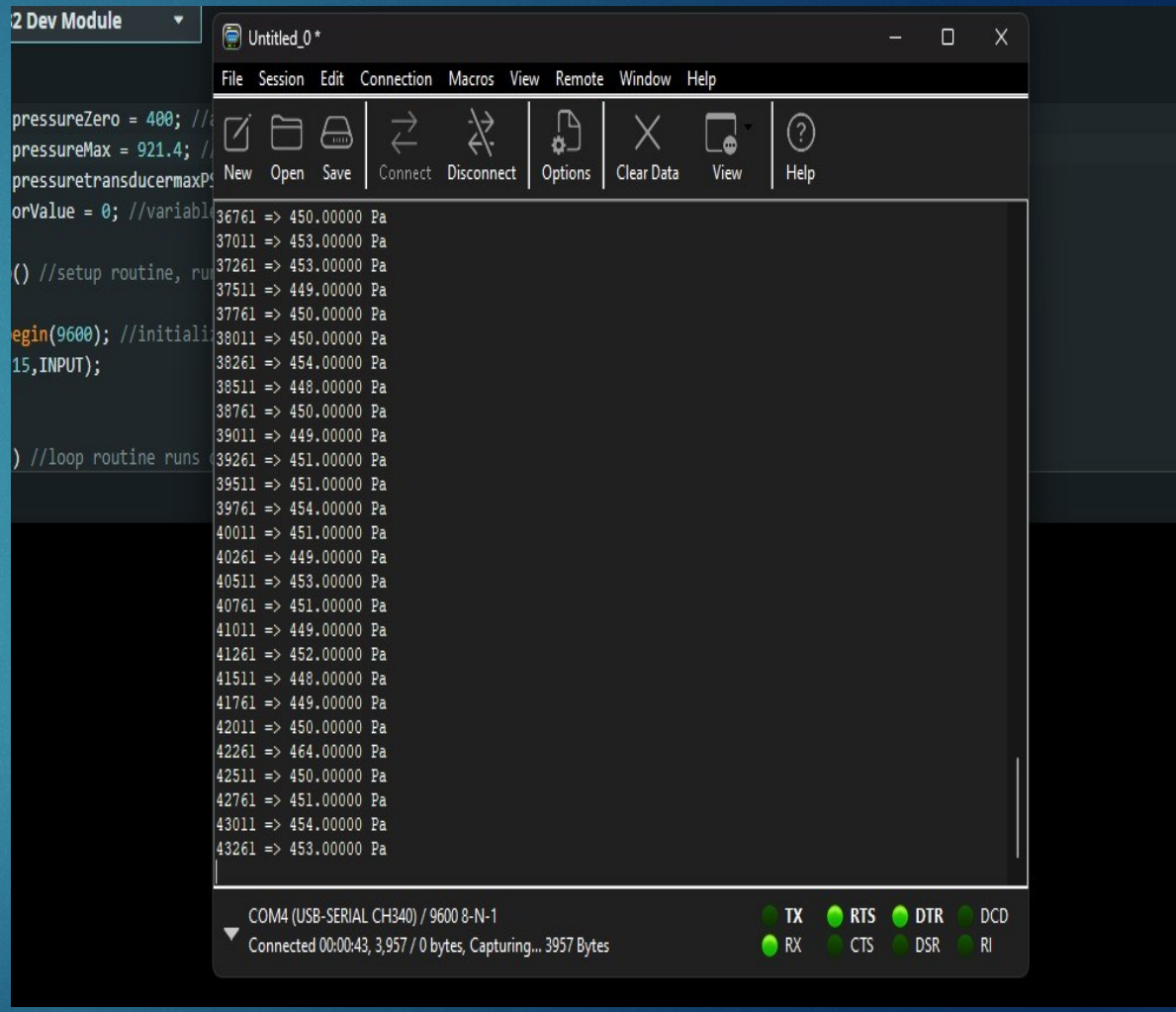



STORING OF PRESSURE SENSOR DATA

	A	B	C
1	11		454
2	261		449
3	511		449
4	761		447
5	1011		455
6	1261		449
7	1511		448
8	1761		449
9	2011		449
10	2261		457
11	2511		451
12	2761		453
13	3011		450
14	3261		451
15	3511		454
16	3761		448
17	4011		463
18	4261		452
19	4511		448
20	4761		449
21	5011		450
22	5261		451





SA CUP RULES

- All liquid engines must be static fired, well characterized, and tested as per section 5.17.
- Launch vehicles entered in the SA Cup must use non-toxic propellants.
- Liquid engines are designed with stored fuel and stored oxidizer in the liquid state.
- All liquid propellants used in the engines must be non-toxic.
- Liquid and gaseous propellants in hybrid and liquid propulsion systems must have a means for remotely controlled venting or offloading.
- Static hot-fire testing is required for SRAD propulsion systems prior to the SA Cup.
- The minimum thrust-to-weight ratio for all competition launches should be 5:1, except as noted in section 5.12.
- The filling time for liquid engines should be less than or equal to 30 minutes, and rockets should vent/detank in less than or equal to 30 minutes, including in fault and failsafe conditions.

Next Week’s Objectives

- Remote operation
- Addition of rails into test stand
- Addition of safety features eg buzzer
- Finding appropriate flow sensor

THANK YOU