Electronics Phase

Objectives: In this stage of the workshop, the goal is to transfer the completed schematic of the main board into a practical circuit on a donut board.

Main Task:

1. Safety Precautions:

- Work in a **well-ventilated space** with good lighting.
- **Do not inhale solder smoke**; keep your head away from the fumes.
- Handle the soldering gun carefully to prevent **accidental burns or slipping**.
- Be careful when holding components — **pins and legs heat up fast** during soldering.
- Take breaks during soldering to **avoid fatigue and mistakes**.
- Keep the soldering iron in a **holder** when not in use to avoid accidents.

2. Before Soldering

- Double-check your **STM32 pins and their functionality** before starting.
- Measure **exact hole positions** for each component to match your graph paper layout — otherwise, the design will not fit.
- Remember: the **schematic drawing is mirrored** compared to the donut board. Always verify the orientation before fixing anything.
- Plan the placement of the **power supply slide switch** on the side of the board.

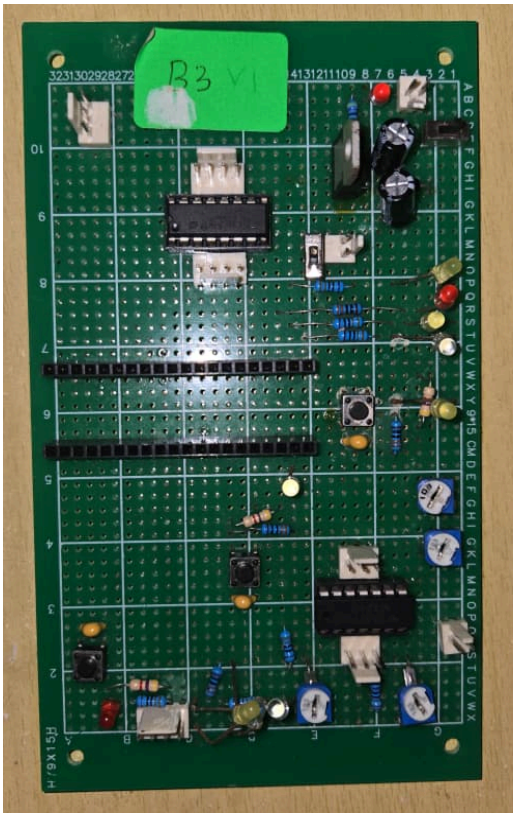
3. Soldering Guidelines

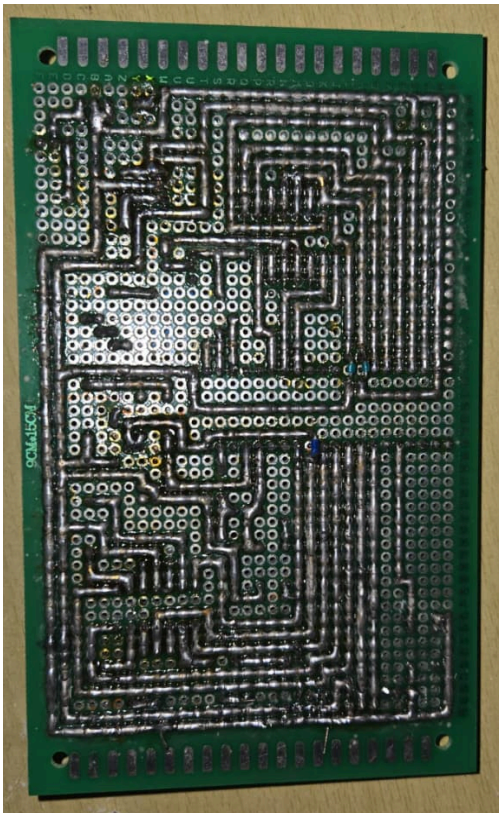
- Ensure that **nearby tracks are not shorted** (check continuity with a multimeter).
- Apply **flux/paste** to make heating faster and to help when desoldering.
- Use a **sponge** to clean the soldering tip regularly for better contact.
- Do not apply heat to **headers or components for too long**, as plastic may melt and pins may shift.

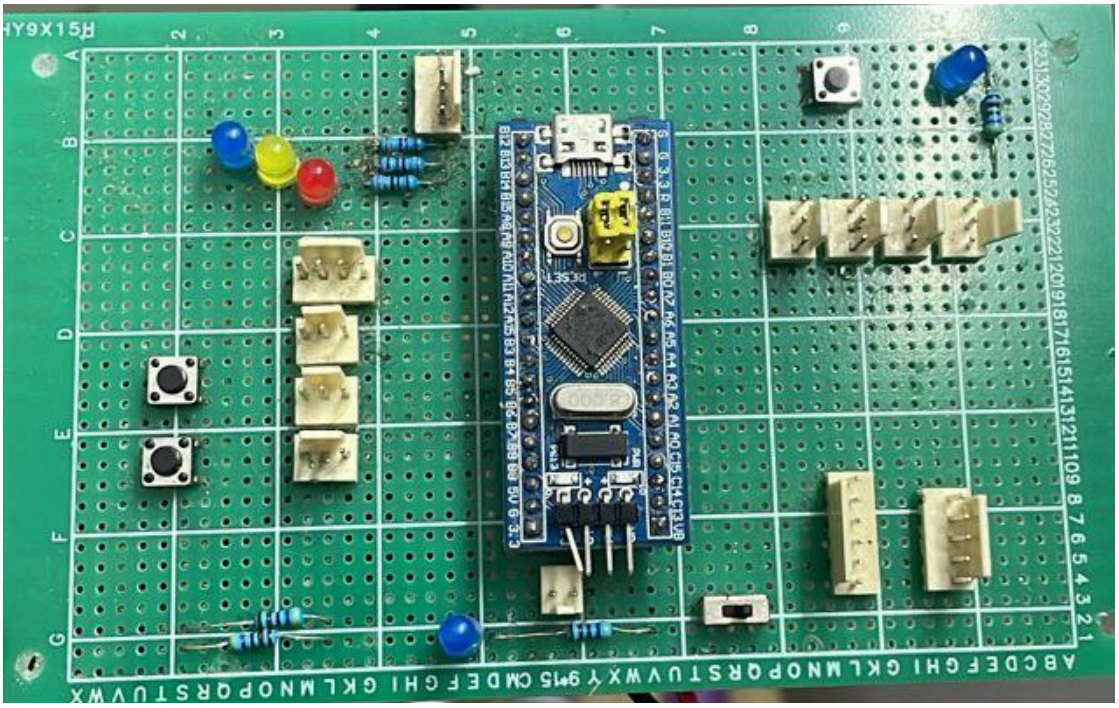
4. Verification & Completion

- **Never connect the board to the power supply before verification.**
- Inspect your donut board against the schematic and confirm that no shorts or missing connections remain.

Example:







Hints:

- How to Solder Properly on Zero PCB | How to Design Circuit on Zero PCB | D...
- Using Perfboard | Soldering Basics | Soldering for Beginners
- When soldering headers, LEDs, or resistors, **start by soldering only one pin** to fix the component in place. Then complete the remaining pins easily without holding it.
- For the **AC adapter cable**, solder the tips of the wires before inserting them into the screw switch to ensure a better fit.
- Components can be used as **bridges** to allow tracks to pass underneath and avoid intersections.
- **Flexible components** such as resistors and LEDs may be stretched slightly to allow more tracks to pass under them.
- Power supply or ground tracks can be routed through unused STM32 pins. However, if passing a 5V track, make sure the pin is 5V tolerant.

Optional Task:

You will receive full tokens if you complete only the main task and the circuit works perfectly.

Submission:

- Add a clear **picture of your completed donut board** to the PDF file.
- Add a **picture or show a video of your board powered with the provided AC adapter**, showing that all buttons and LEDs function correctly **without any code** (hardware test).
- Name the PDF file with task10_groupx_your_name, (replace x with your group number).
- This task should be submitted before 11th Sept 10:00pm (Malaysia time), 05:00pm (Makkah time).