Introduction to PCB

by

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So what is PCB?
A printed circuit board, or PCB, is used to mechanically support and electrically connect electronic components using conductive pathways, tracks or signal traces etched from copper sheets laminated onto a non-conductive substrate.
To fabricate a circuit we already have....
Then why use PCB?
Comparison between bread board and PCB
Comparison between dot board and PCB

Messy dot board

Neat PCB

SINGLE LAYER PCB (BOTTOM)
Between Strip board and PCB

Strip board

PCB

DOUBLE LAYER PCB (BOTTOM)
Can we make at home?
Of course! But do not expect it to be like
It will be like
You will need the following ...

- Copper clad board
- Hacksaw
- Circuit Printout
- Sandpaper
- Iron-box
- Marker and scale
- Water
- Soldering rod and tin
Key Steps in Fabrication

- Circuit Design
- PCB Cutting & Ironing
- Etching
- Drilling & Tinning
- Soldering & Debugging
Circuit Design

Why you need a PCB design software?
• They provide the exact dimensions of the components.
• Auto-routing is available.

We shall be using Easily Applicable Graphical Layout Editor (EAGLE) Software.
TONER TRANSFER METHOD

SINGLE LAYER PCB(BOTTOM)
SINGLE LAYER PCB(BOTTOM)
Before ironing

• Clean the surface
• Two methods
  - manual
  - chemical
Ironing

• Duration 3-5 minutes

• Settings
Do Ironing till.....
Let the PCB cool down!

- Air cooling – 10 minutes
- Peeling off of the paper slowly (use water for better results)
Use Permanent marker
Etching

The chemistry behind the process is

\[ \text{Cu} + \text{H}_2\text{O}_2 + 2\text{HCl} \rightarrow \text{CuCl}_2 + 2\text{H}_2\text{O} \]
Drilling

Drilling tools
• Motorized Drill
• Hand Drill

Drill bits
• 0.8 mm
• 1 mm
Tinning

Prevents oxidation and Improves the conductivity
Soldering & Debugging

Solder the components.

Caution: Avoid overheating. It damages the component and the tracks.
Summary

- Circuit Design
- Cutting & Ironing
- Etching
- Tinning
- Soldering & Debugging