

# Introduction to PCB Design

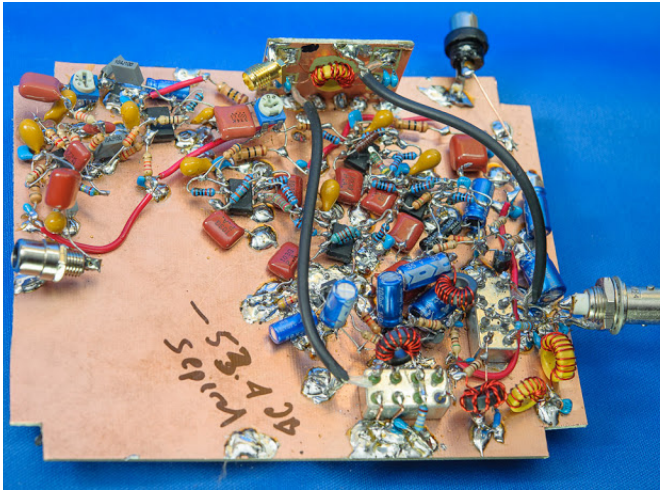
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# Course Logistics

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# Why use a PCB?

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Example of point-to-point construction



## Point-to-Point Construction

Good points

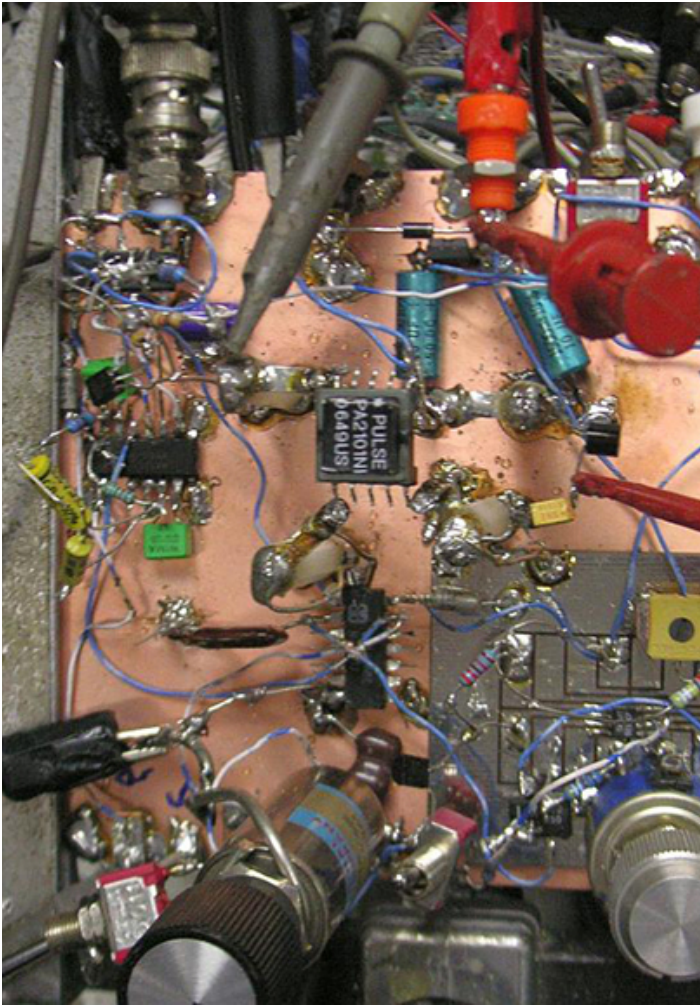
- Excellent flexibility
- Minimize parasitics / closer to ideal

Not so good points

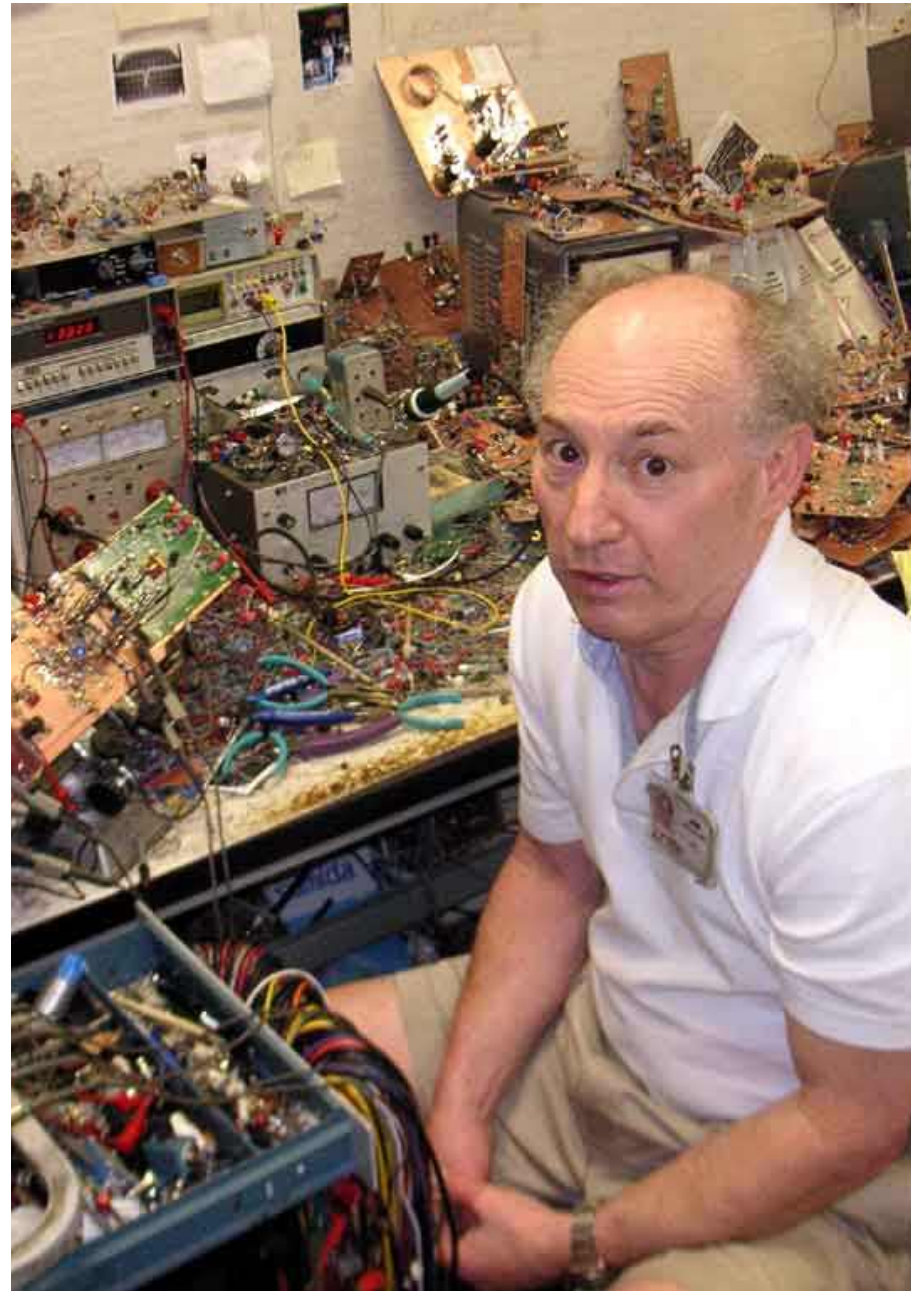
- Easily damaged
- Hard to reproduce
- Hard to avoid shorts (Teflon™ tubing!)

# Why use a PCB?

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Jim's Battery Stack Monitor Prototype

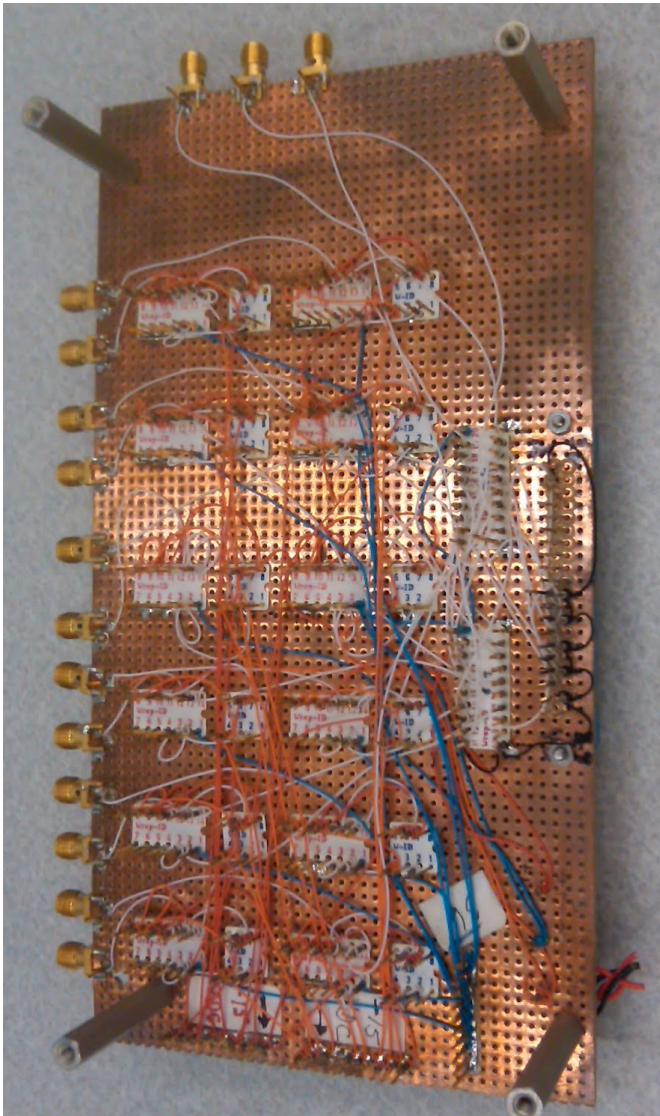


Jim Williams at bench in 2007



# Why use a PCB?

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## Wire wrap construction

### Good points

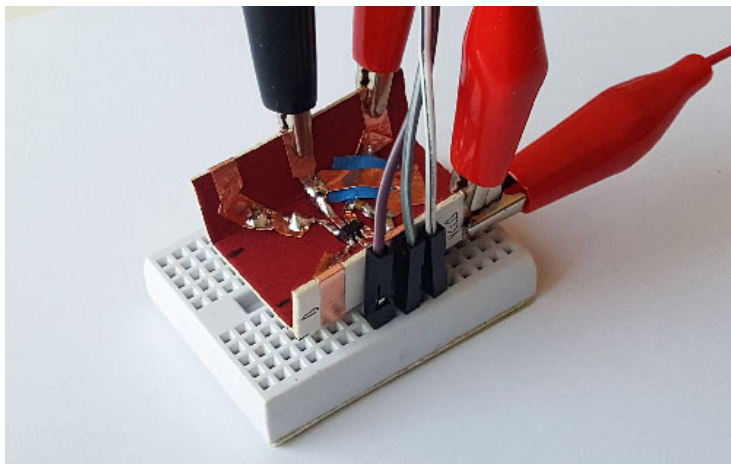
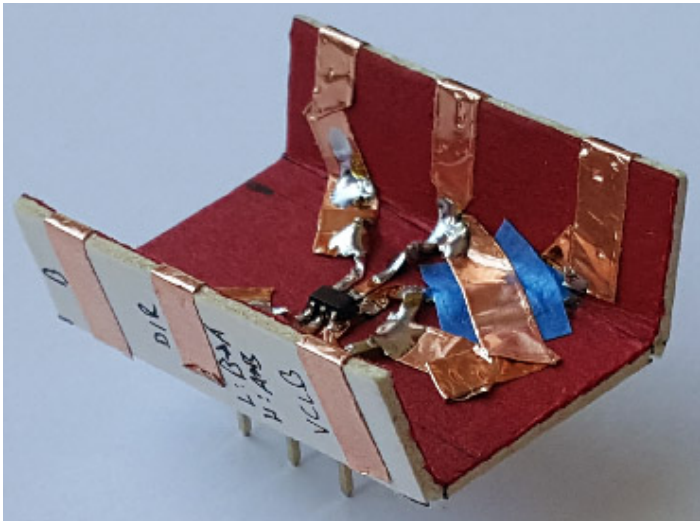
- Easy / rapid build
- Relatively rigid / more robust
- Colored wire distinguishes nets

### Not so good points

- Poor high frequency performance
- Hard to replicate / labor intensive
- Pins can only accommodate 3 wires

# Why use a PCB?

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<https://www.bunniestudios.com/blog/?p=5259>

## Copper tape construction

### Good points

- Easy / rapid build
- SMT compatible
- Relatively rigid / more robust
- Copper tape yields excellent performance
- “Flat” construction easy to store
- Easy to annotate

### Not so good points

- People point and stare
- Hard to replicate / labor intensive

# Why a PCB?

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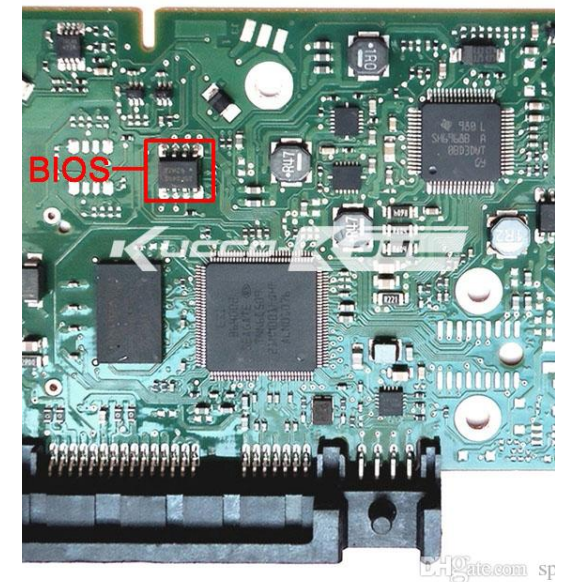
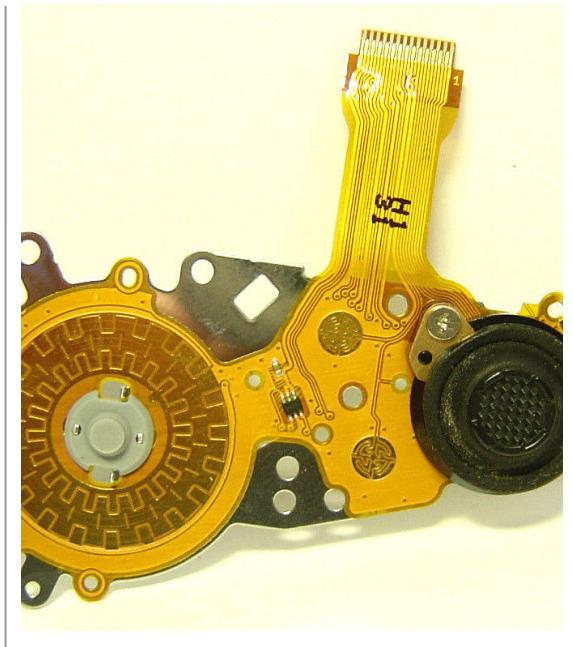
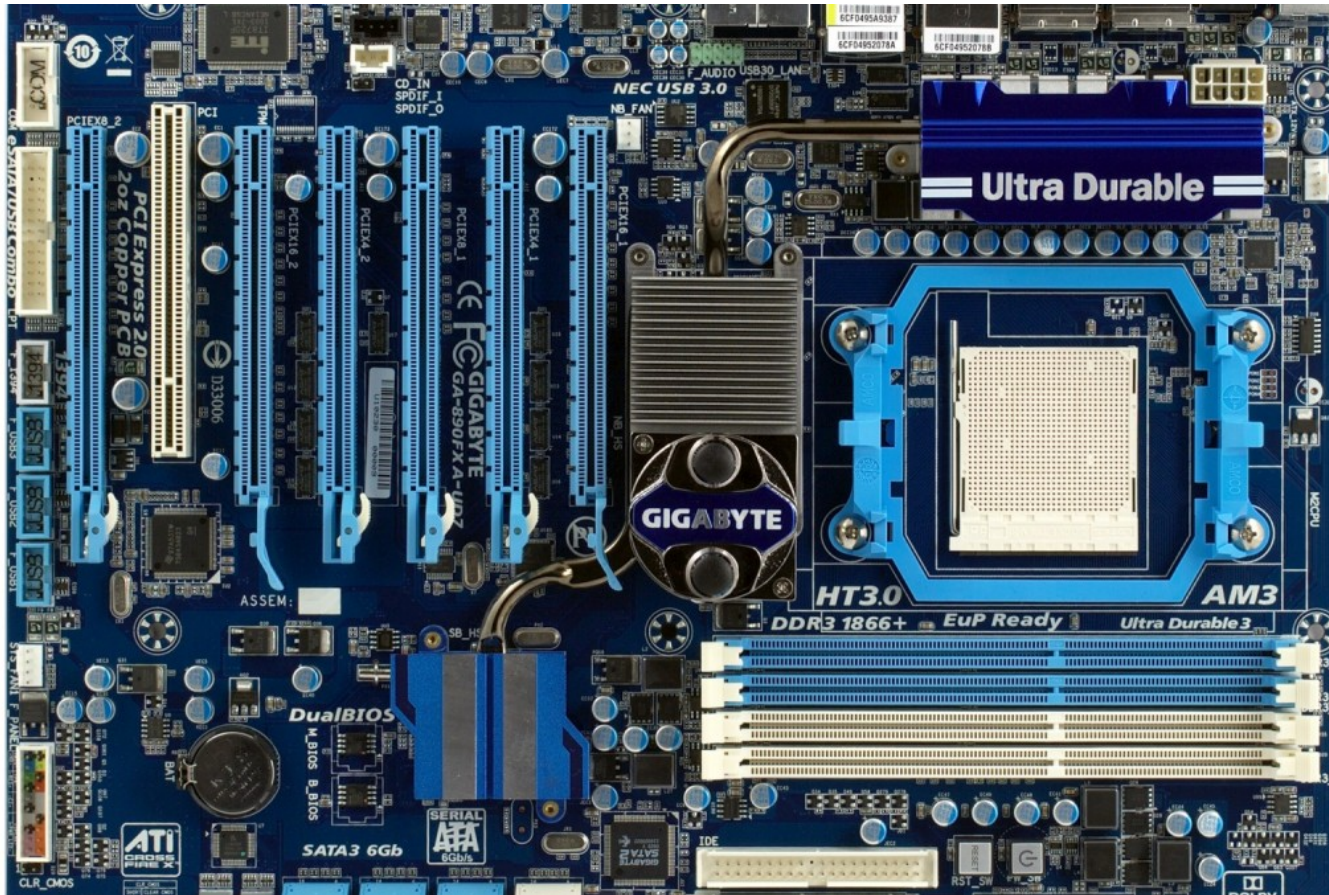
We need something that is -

- easily replicated
- inexpensive
- mechanically stable
- easily assembled
- has enough I/O density

and has predictable performance



# The Solution - PRINTED CIRCUIT BOARDS (PCBs) !





# The CAD Tool Saga

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- CAD tools evolve
- *YOU* drive the tool availability
- We will focus on stable aspects-
  - motivation (*why* are we doing what we are doing)
  - design considerations (functional requirements)
  - design process (workflow)

# How did we select the tool?

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	Altium / CircuitMaker	Eagle	OrCAD	KiCAD	Upverter