

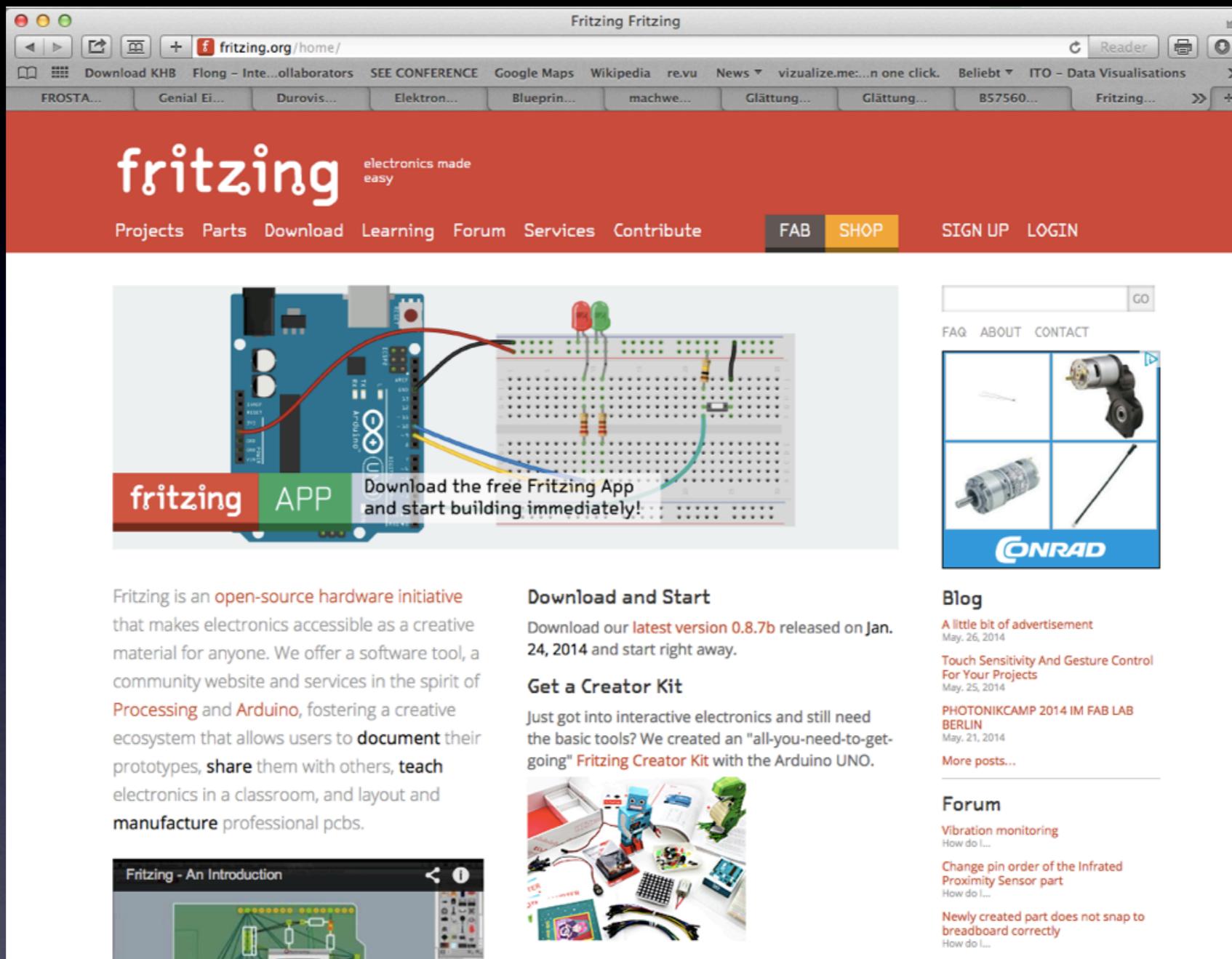
# PCB-milling

using Fritzing & VisualMill

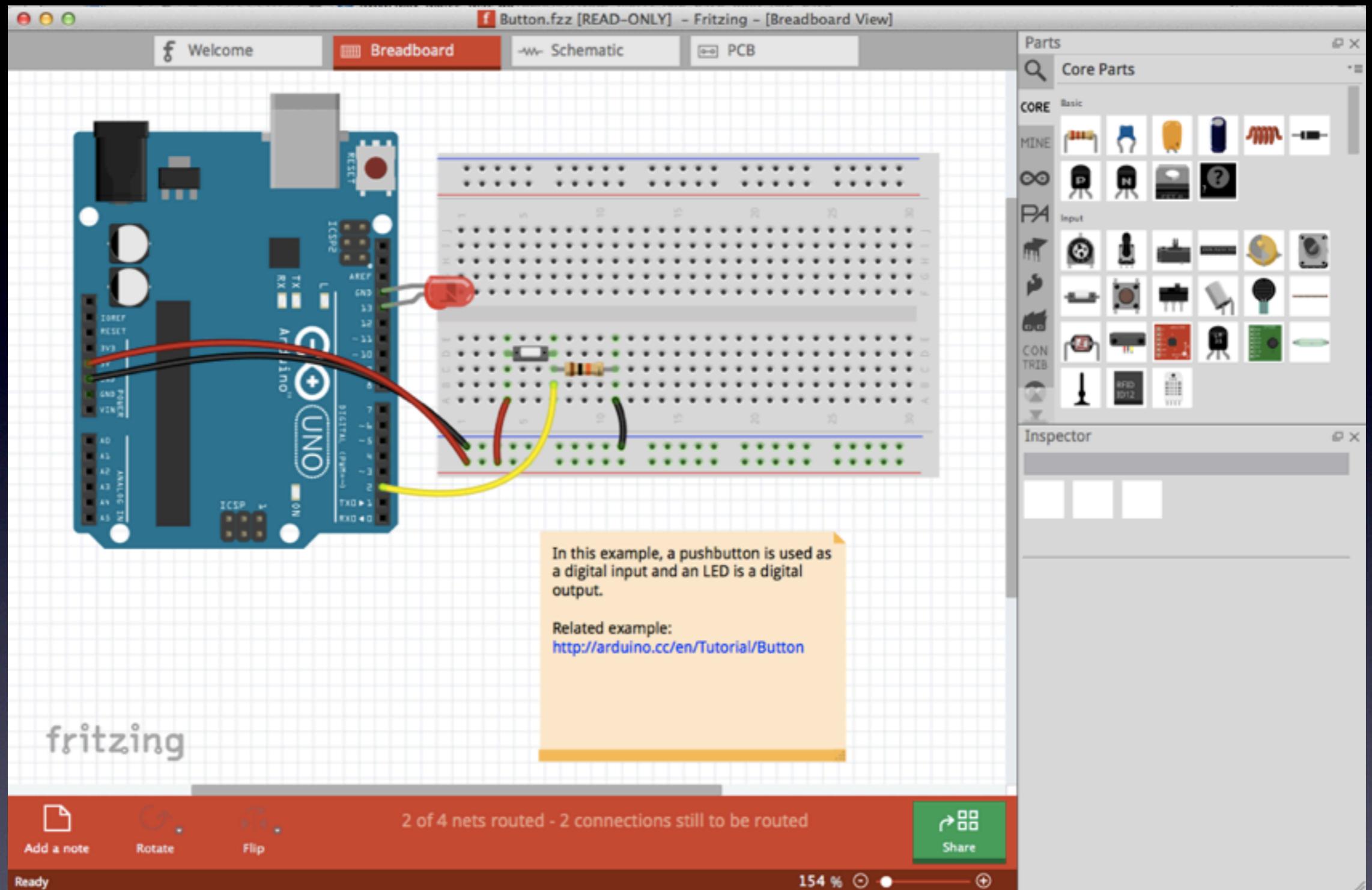
Making a pcb, why:

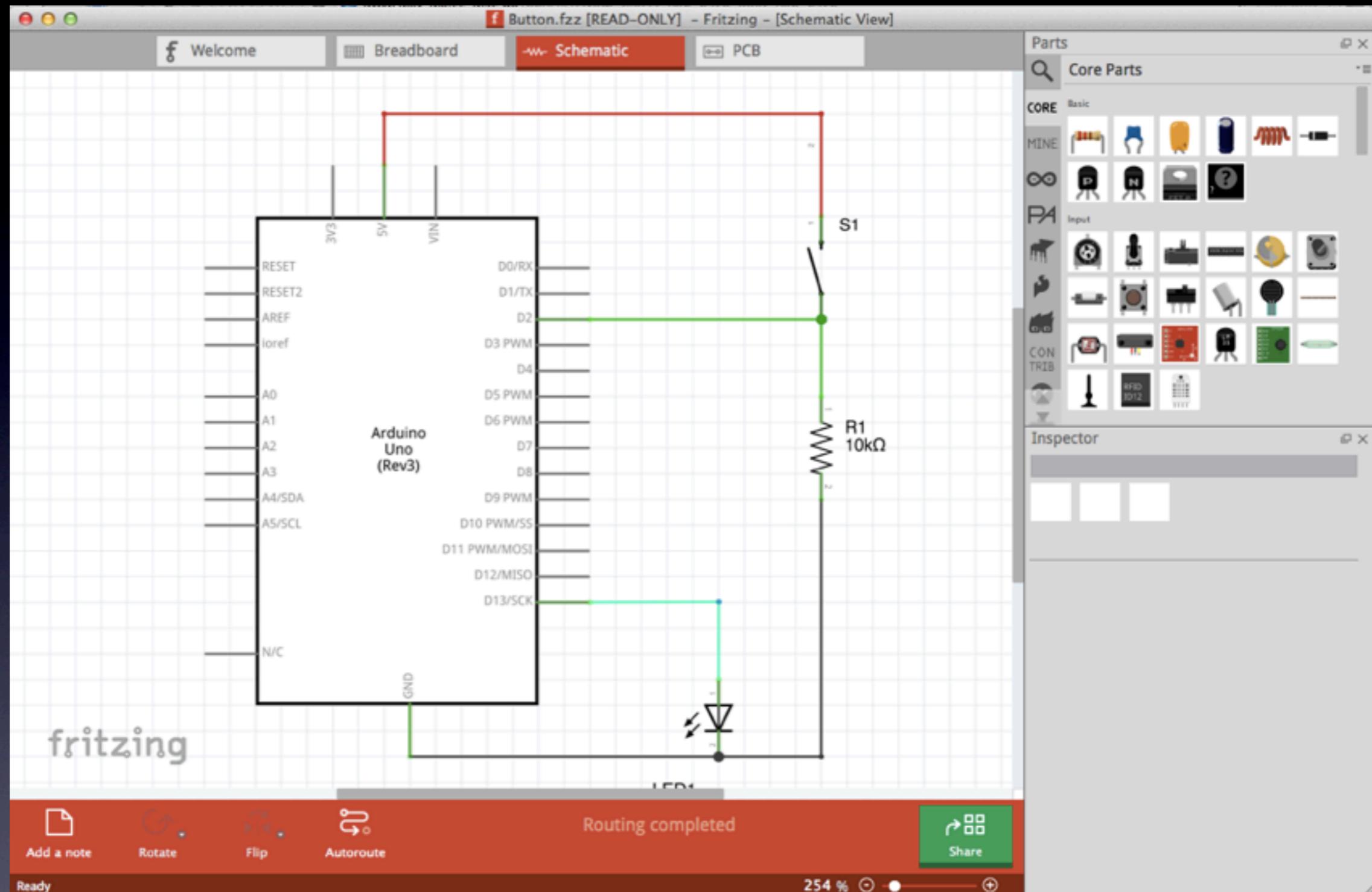
- fixed circuit (all soldered - no loosening)
- more than 1 to make (series-production)
- minimize space (put stuff denser than on breadboard)
- ease of use (plug & play - shields)

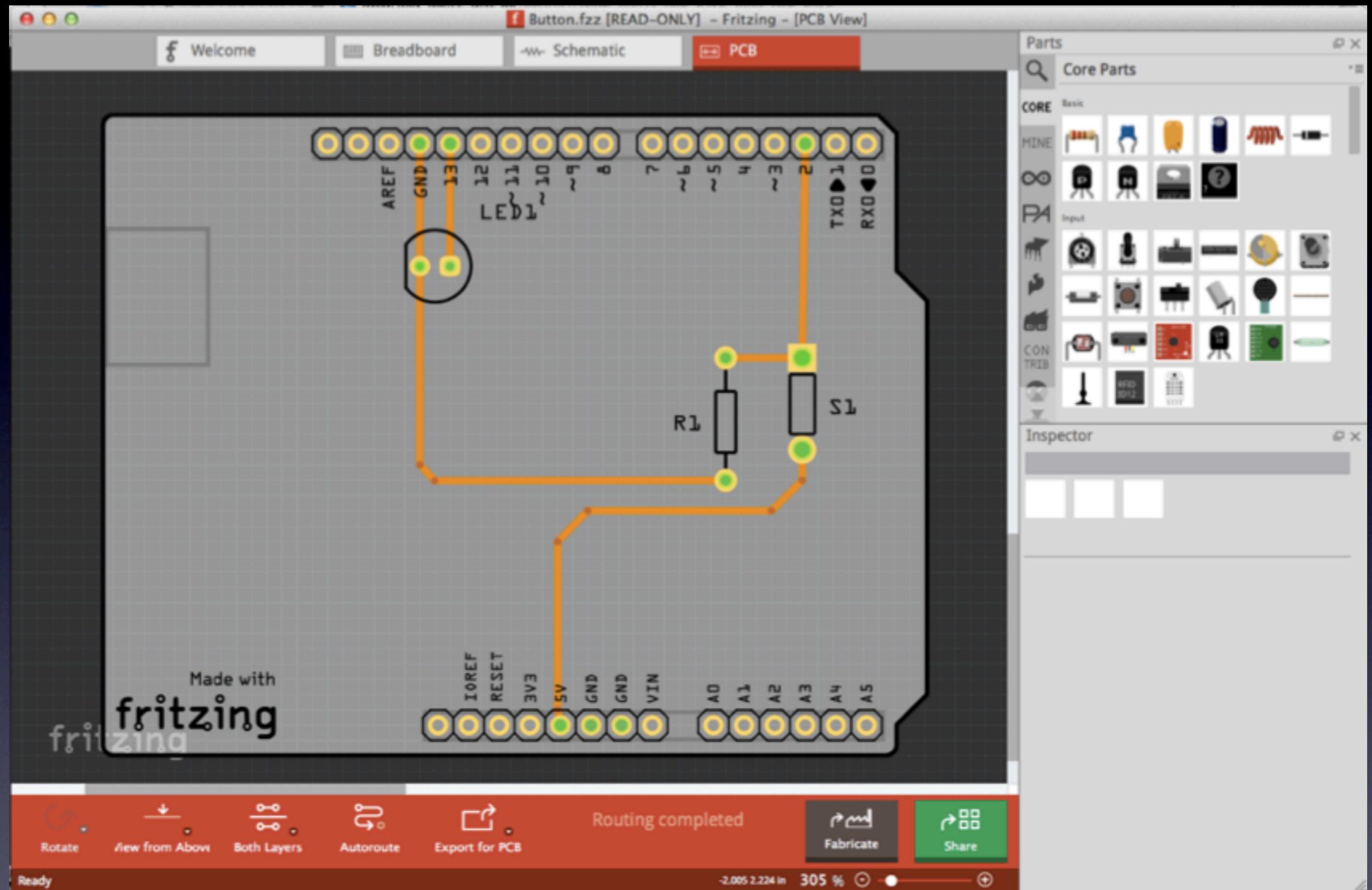
Fritzing (developed at the FHP) is an easy beginner-tool for layout of circuits:



[www.fritzing.org](http://www.fritzing.org)







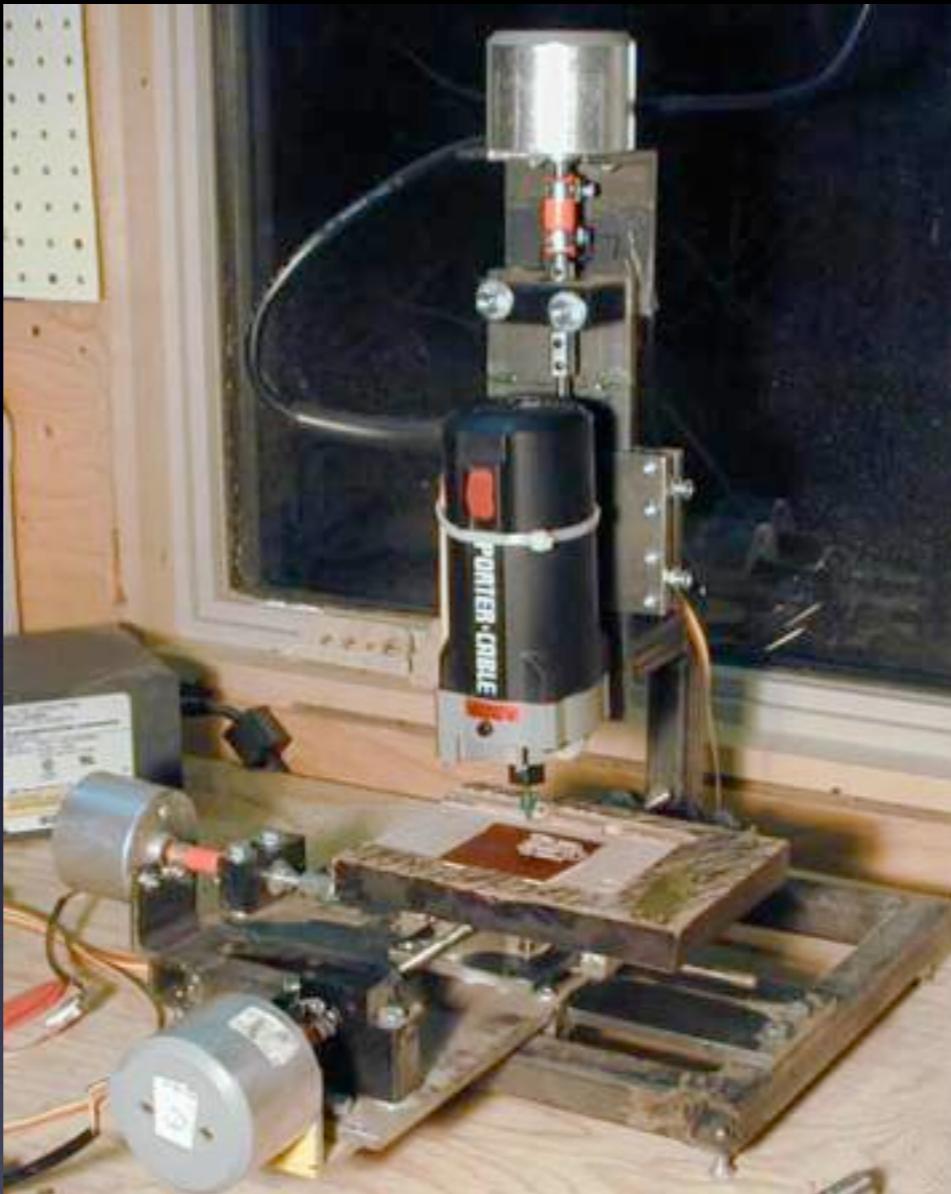
Milling a pcb, why:

- no chemistry
- no superlong waiting - fast
- drilling of holes is done at the same time - has to be done manually after etching
- precision
- cheap base material

Milling a pcb, why not:

- Millingmachine is expensive or takes long to make
- ease of misalignment, error in g-code
- health-issues (just others) GFK-dust
- expensive tooling-heads
- learning-ramp of „knowledge“ of milling-process with g-code, post and all of that

Small machine sufficient:



Actually a diy 3-axe machine is sufficient

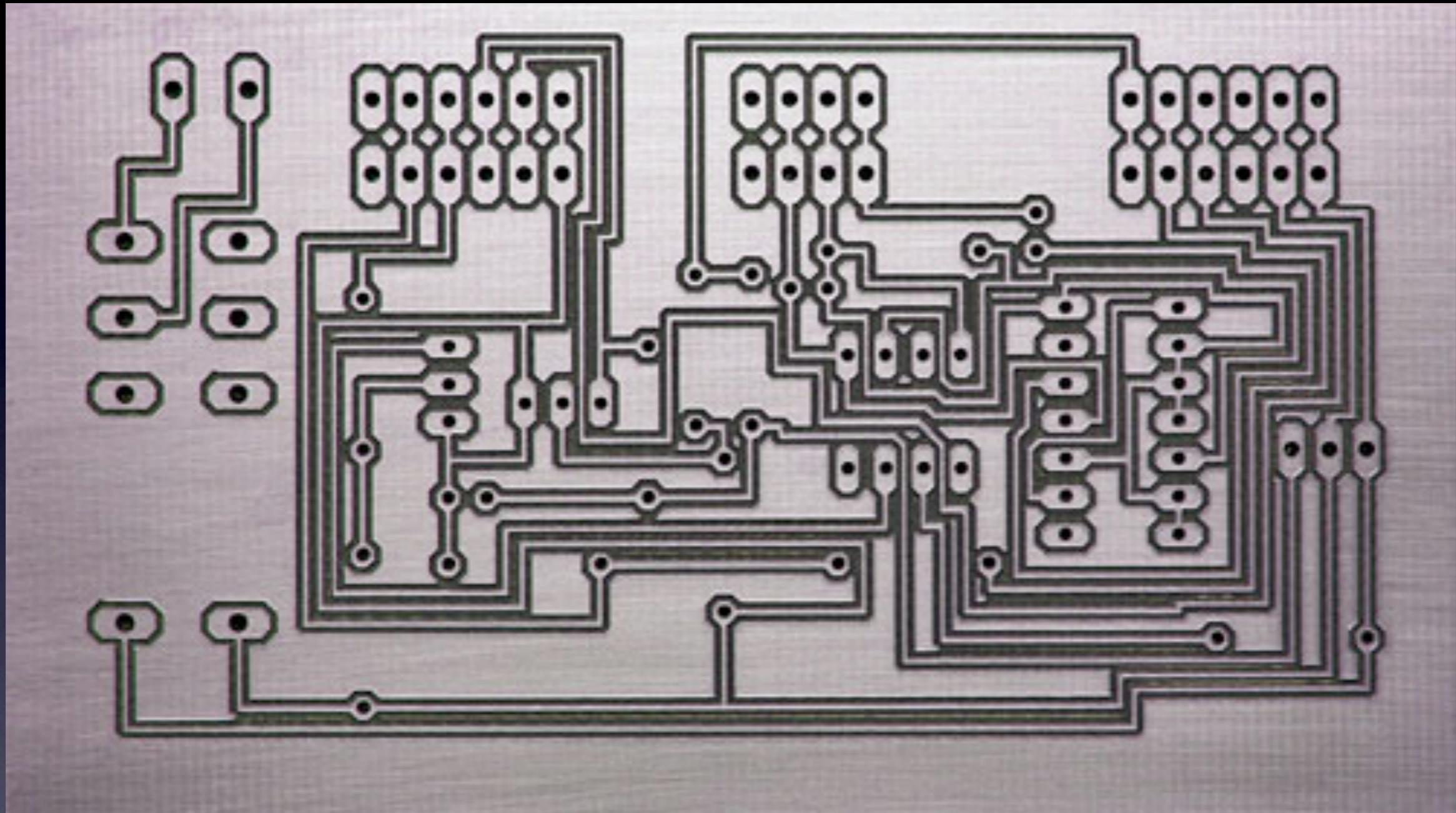
## Ton's of diffrent CAM-programs



<http://www.mecsoft-europe.de/freemill.html>

Here we use VisualMill, so we go with the minimal version FreeMill

Sehr gute Seite (leider nur in Deutsch) für weitere Informationen:



[http://www.einfach-cnc.de/platinen\\_frasen.html](http://www.einfach-cnc.de/platinen_frasen.html)

Find more general information:



[http://reprap.org/wiki/PCB\\_Milling](http://reprap.org/wiki/PCB_Milling)