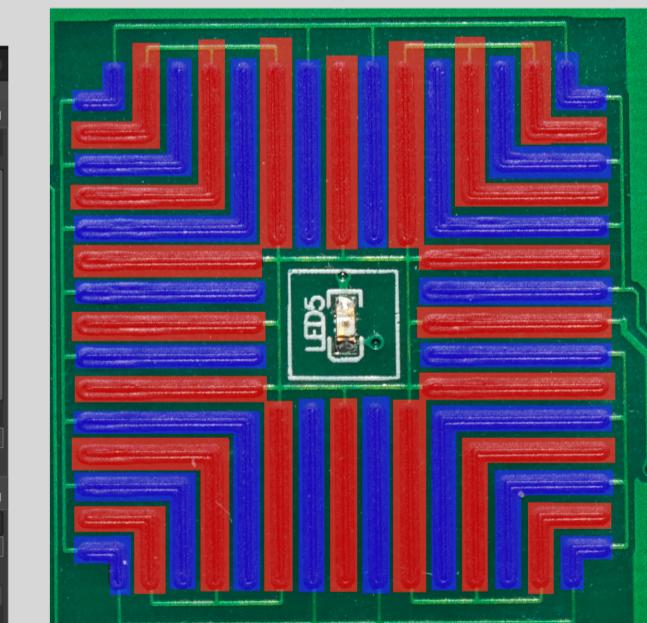
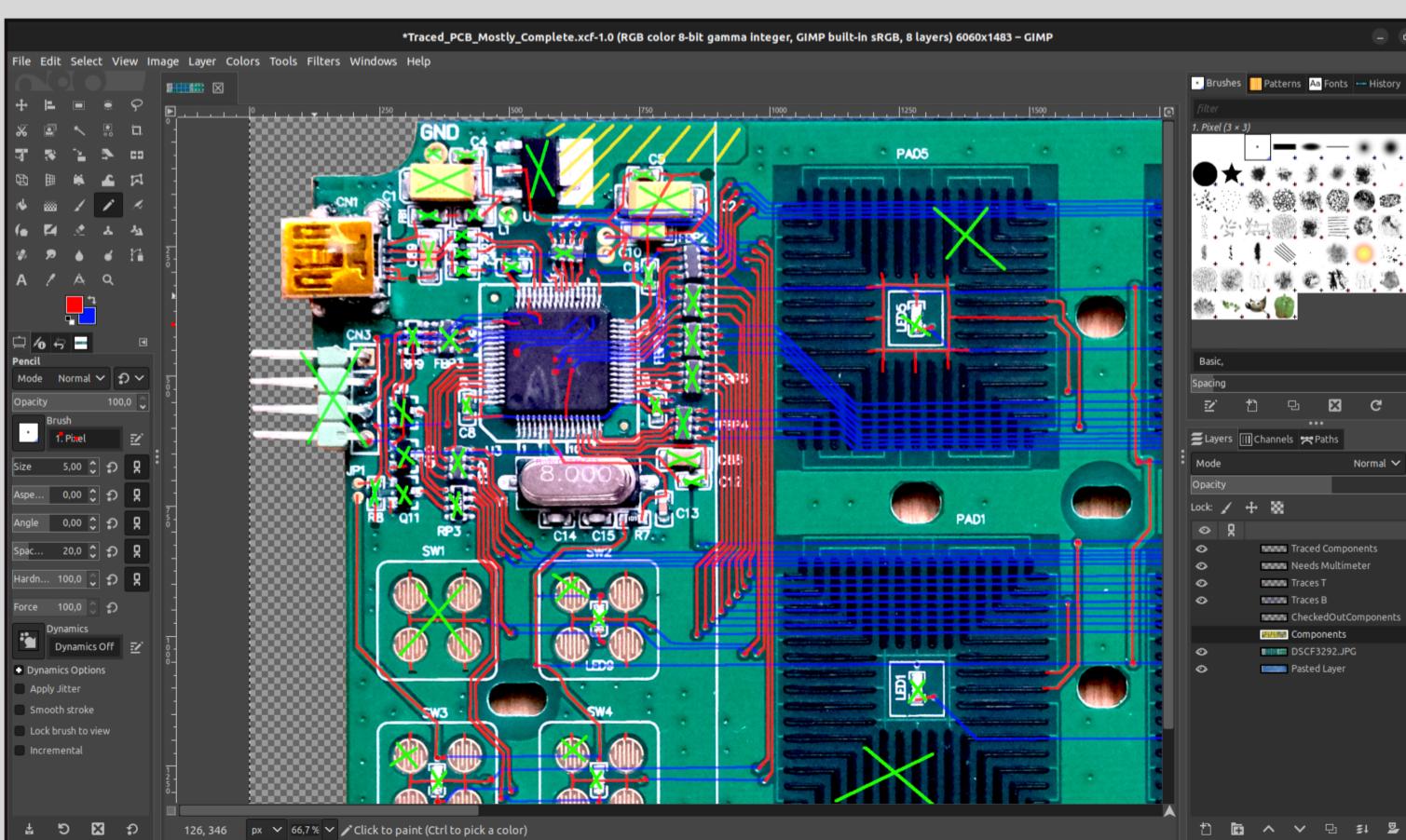
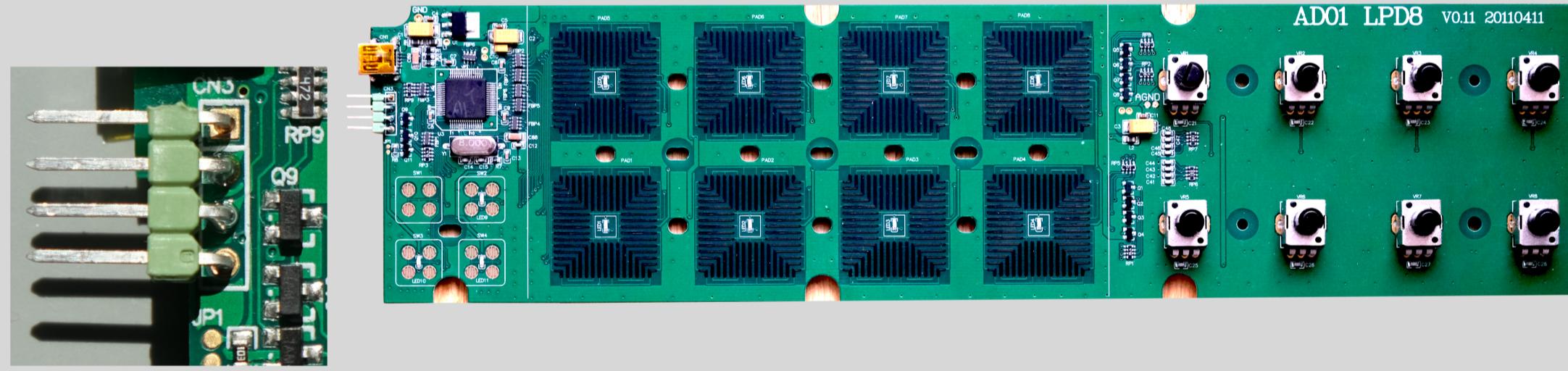


1. Hardware

The LPD8 utilizes only a two-layered PCB, making it simple to reverse engineer the PCB with the help of a multi-meter and a couple of high-res photos. To reverse engineer the PCB, all components were first placed into a KiCAD schematic. High-resolution images of the PCB were then visually traced in Gimp while simultaneously applying the connections to the components in the KiCAD schematic. The brain of the LPD8 is a STM32F10x (x = 2 or 3 as both have been used). The F1 series was announced in 2007. That must've made them pretty new tech back when the LPD8 was developed at AKAI. Its main job is to read and process the analog values provided by the pads and knobs, and output them as some corresponding MIDI action via USB. One thing that was rather generous by AKAI is that they have left a unpopulated header for the STM's SWD interface. The pressure pads have been implemented by using traces which alternate between 3.3V and the designated ADC input on the STM32, accompanied by a grounded resistor to create a voltage divider. Between the PCB and the rubber pads lies a slim plastic film coated with resistive material. When the pads are pressed, this film reduces resistance between the alternating traces. In essence, the pads function as pressure-sensitive variable resistors. Working in tandem with the subsequent series resistor, this setup forms a voltage divider, enabling pressure to be measured as a voltage at the ADC. The knobs are implemented using potentiometers. Not much going on here...



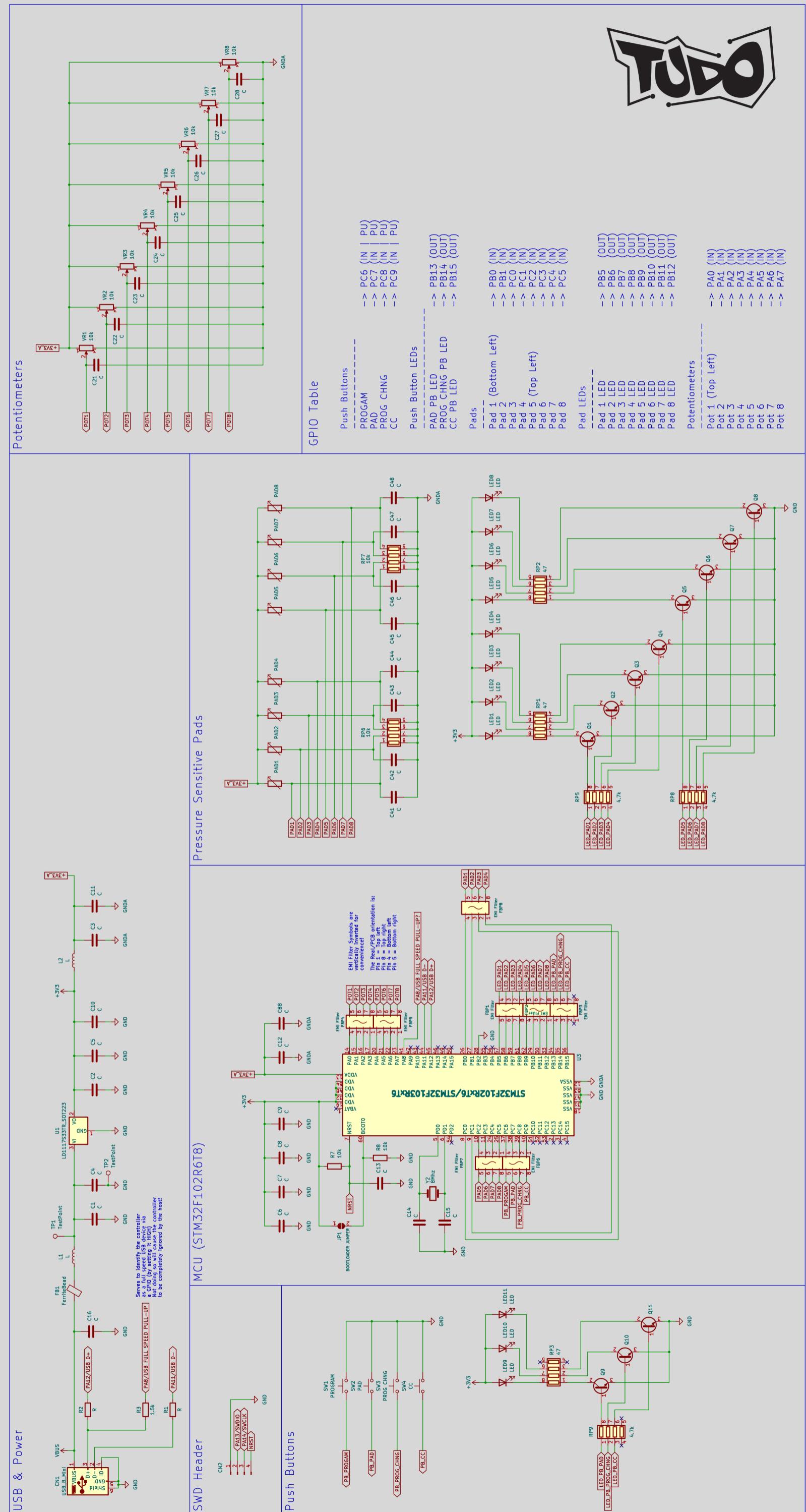
3.3V
ADC PIN

AKAI Professional LPD8 Schematic (Reverse-Engineered)

PCB MODEL/REVISION: AD01 LPD8 V0.11 20110411

Reverse-Engineered by: Patrick Pedersen <ctx.xda@gmail.com>

NOTE: Schematic currently lacks a lot of component values and may contain mistakes!



TUDO