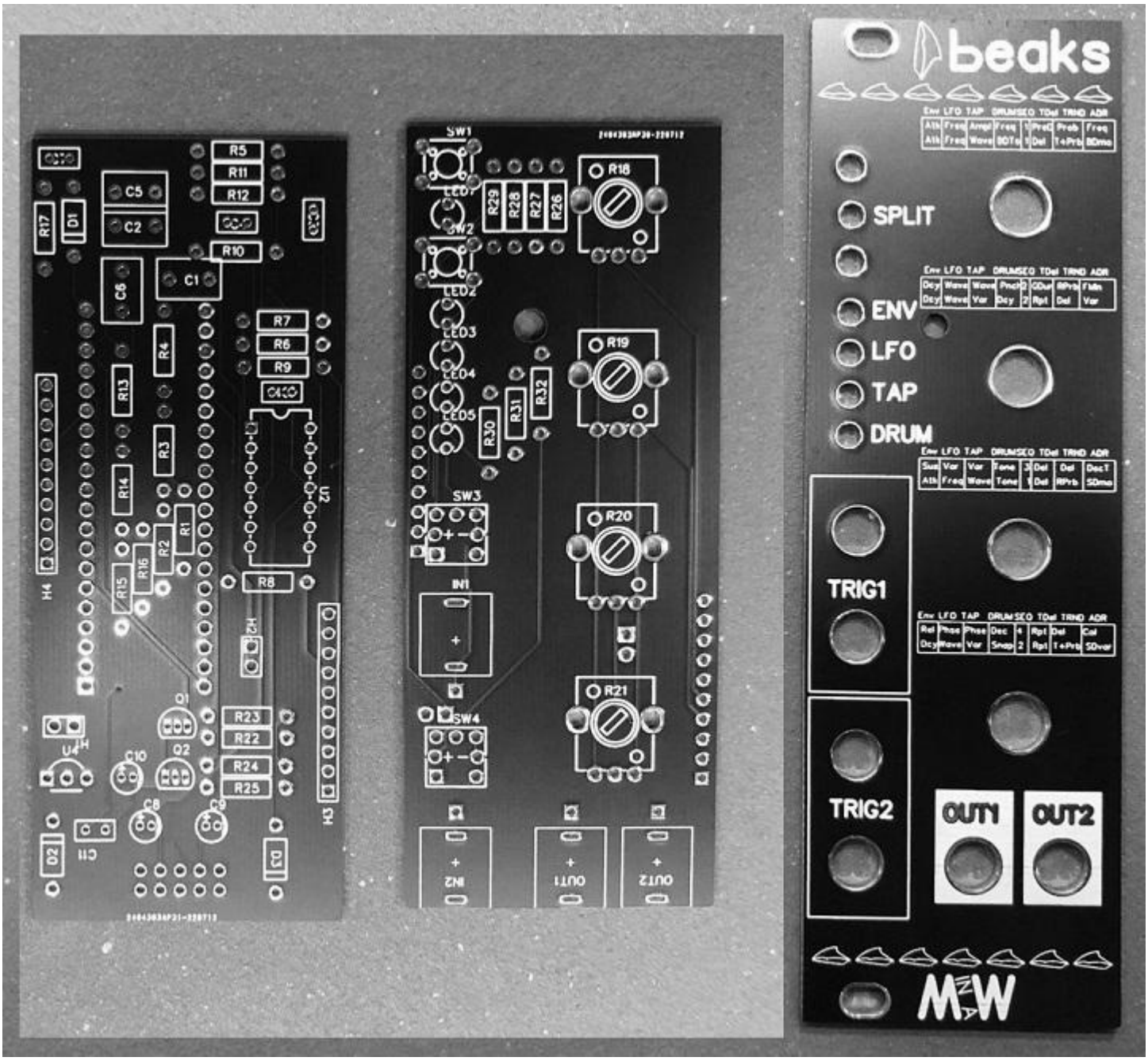
Beaks Through Hole Peaks



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Features

- Through hole version of Mutable Instruments Peaks module (https://mutable-instruments.net/modules/peaks/)
- Acts as
  - ADSR
  - LFO
  - Tap LFO
  - Drum
  - 4 step Sequencer
  - Trigger Delay
  - Trigger Randomizer
  - Drum Synth
- Buttons
  - (2) Manual Triggers - lighted buttons
- Inputs
  - (2) Trigger
- Outputs
  - 2 PWM Outputs
- Knobs
  - Parameters - mode dependent
  - Mode controls knob function
    - Split (2 knobs each)
    - Twin
    - Expert

Credits/Resources

- Beaks Through-hole on Kristian Blåsol's Tindie (https://www.tindie.com/products/Sourcery/beaks-a-throughhole-pwm-version-of-mi-peaks/)
- Kristian Blåsol's GitHub (https://github.com/SourceryOne/Beaks/)
  - Beaks Schematics (https://github.com/SourceryOne/Beaks/blob/main/Schematics_Beaks0.3.pdf)
- Mathias Levy's Github (https://github.com/matias-levy/peaks)
  - Backup of firmware (https://github.com/land-boards/lb-boards/tree/master/SYNTHS/Docs/Modules/Mutable%20Instruments/MI%20Beaks%20(Peaks)/Software)

Original Peaks

- Mutable Instruments Peaks page (https://mutable-instruments.net/modules/peaks/)
- 8 HP
- 25mm depth
- +12V@60 mA, -12V@2mA

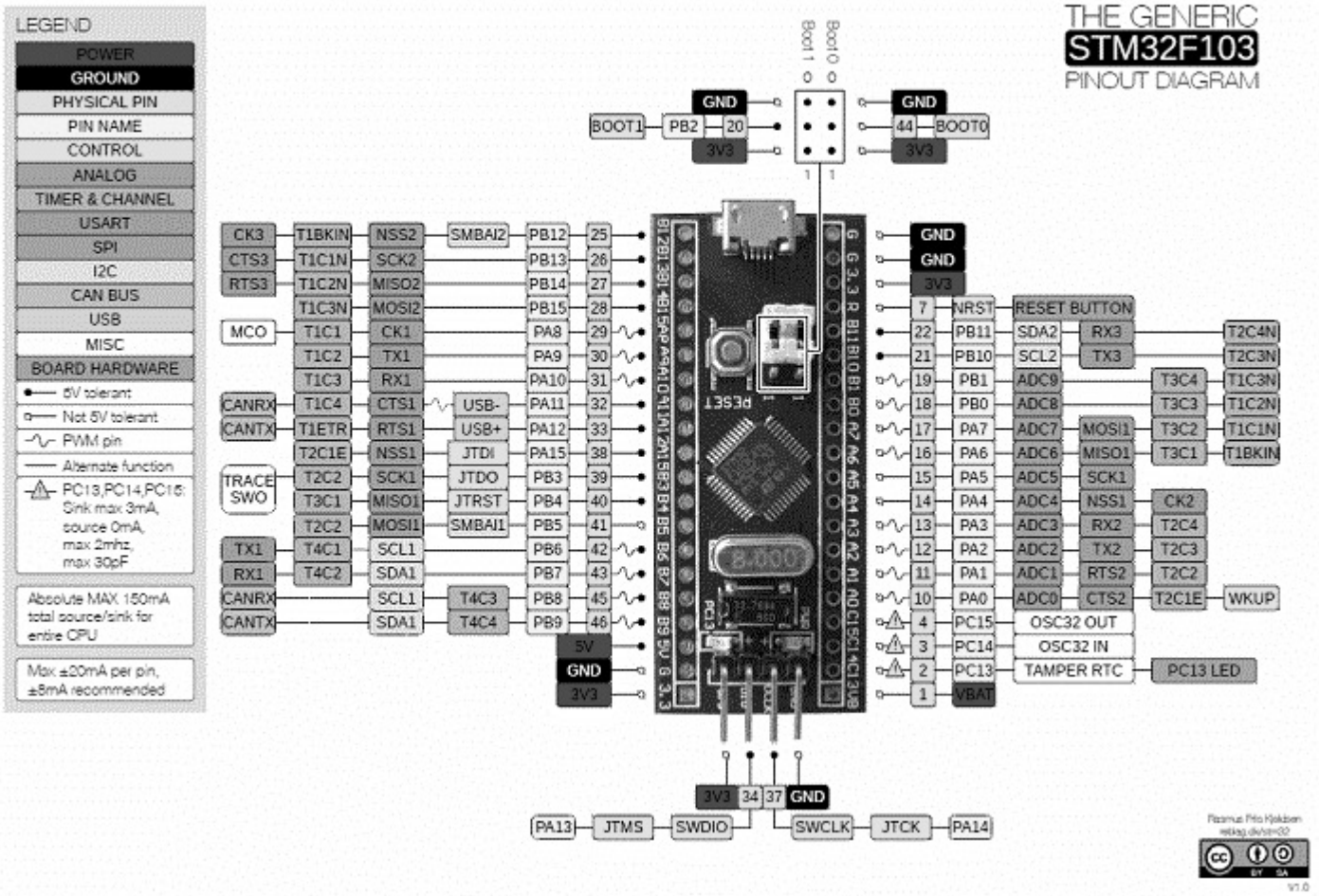
Original Peaks Features

- A SWISS-ARMY KNIFE FOR PERCUSSIVE PATCHES
- Peaks is a dual-channel module – making it very useful for duophonic patches or for controlling/synthesizing the kick/snare rhythmic backbone of a patch.
  - Peaks provides 4 different functions in a small 8-HP package: ADSR, LFO / Tap tempo LFO, and drum synth.
  - Their common point?

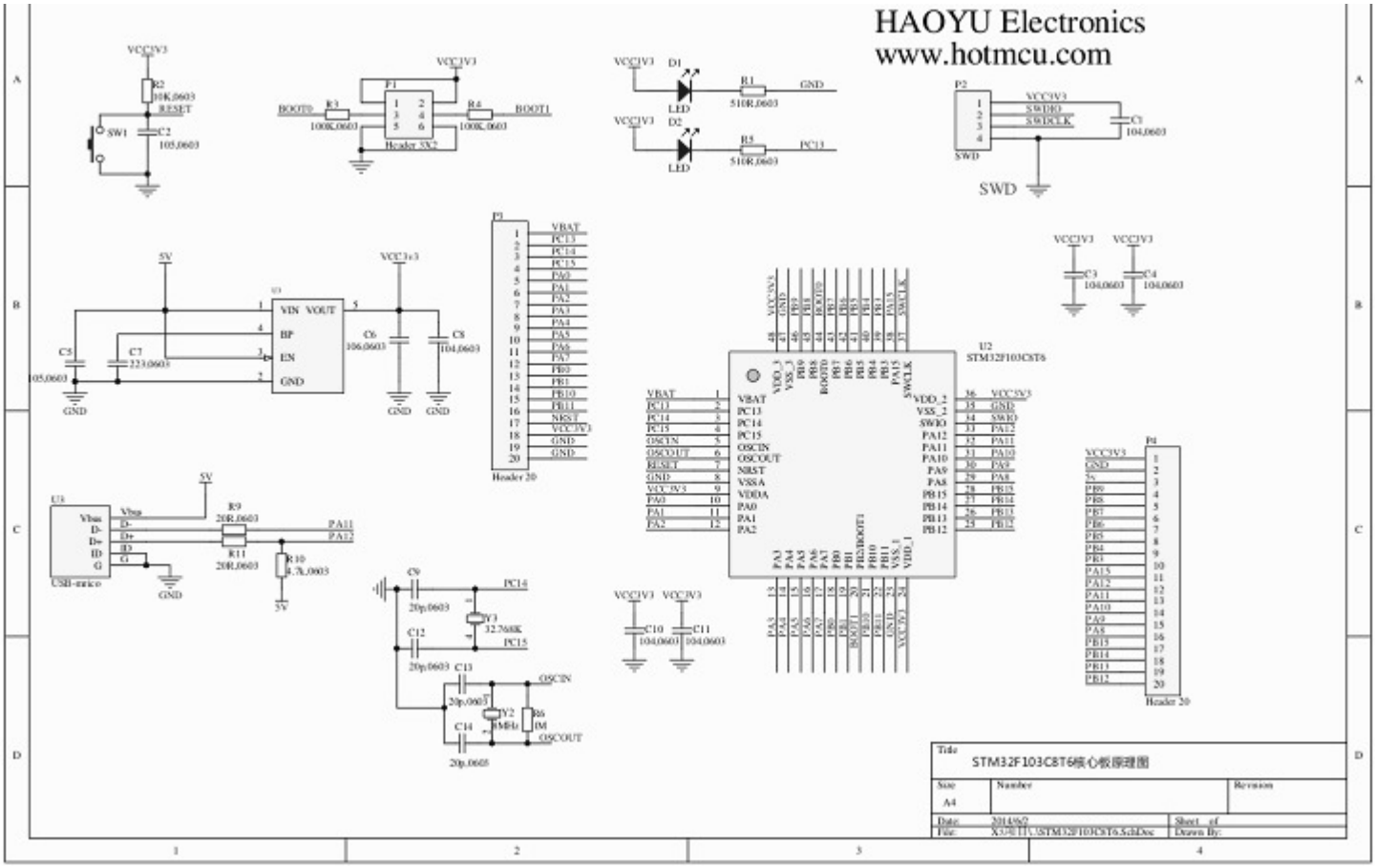
        - They are all about generating an audio or CV signal in response to a trigger, and are all focused on rhythmic works.
- Four in one…
- ADSR envelope generator
    - Segment durations ranging from 0.2ms to 8s.
    - Quartic attack, exponential decay, exponential release.
- LFO and tap-tempo LFO
    - 0.03 Hz to 160 Hz.
    - 5 basic waveforms: square, triangle, sine, stepped, random.
    - Waveform variations and morphing for each of these: PWM, slope, folding/harmonics, step size, interpolation.
    - Phase at reset control.
    - Tap LFO can lock onto irregular rhythms.
- Drum synth
    - Channel 1: 808 kick model with extra parameters (tune, punch).
    - Channel 2: 808 snare model with extra parameters (tune, decay).
    - Channel 2: A specific combination of settings transform the snare into a modelled 808 hi-hat.
- Control modes
    - Twin: Channel 1&2 share the same parameters but can be triggered independently.
    - Split: Channel 1 is edited by knobs 1&2, channel 2 edited by knobs 3&4, with a simplified 2-parameter control scheme.
    - Expert: Channel 1&2 are completely independent.
- Specifications
    - Inputs: 100k impedance, threshold at 0.6V.
    - 16-bit CV/audio generation with 48kHz sample rate.
    - Output level: 0 to +8V for envelopes, 10Vpp for LFOs and drum signals.

STM32 "Blue Pill"

- "Blue Pill" Pins



- "Blue Pill" Schematic



Videos

Mutable Instruments Peaks Overview

Mutable Instruments - Peaks

Mutable Instruments - Peaks *EASTER EG...

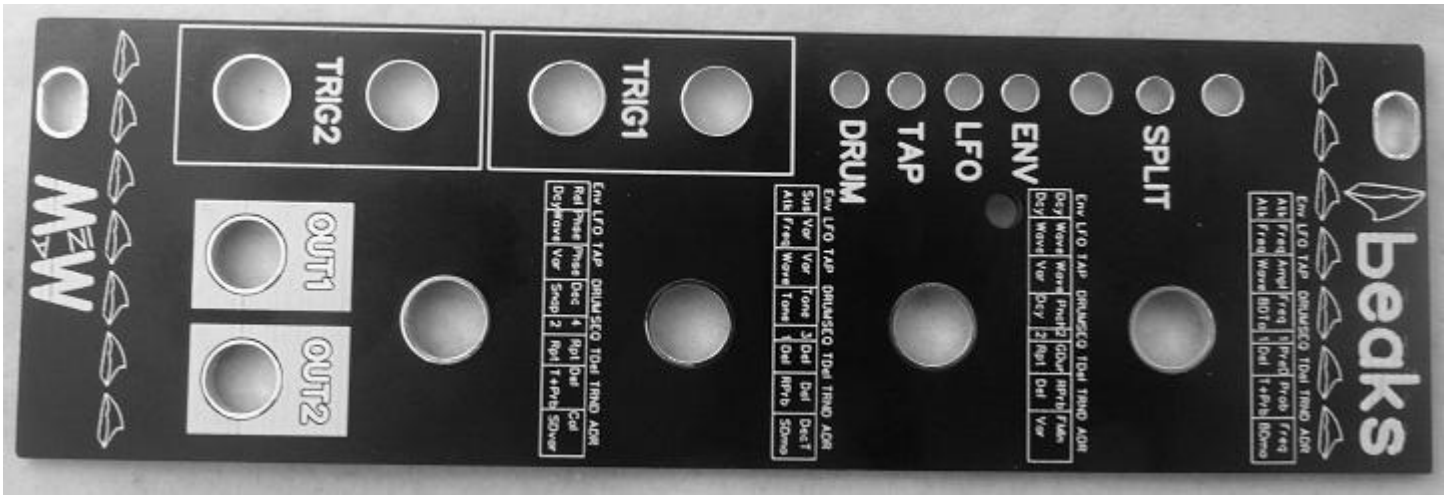
Mutable Instruments - Peaks Speaks!

Mutable instruments peaks drum mode

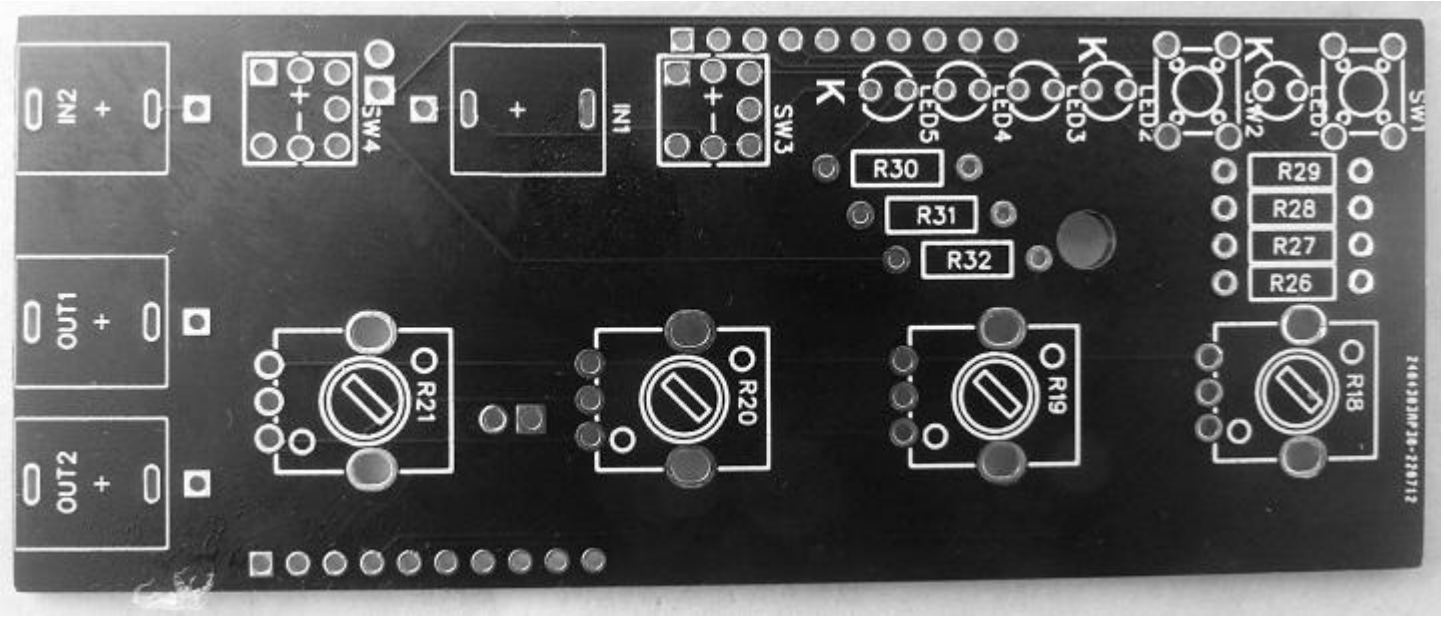
Mutable Instruments Peaks w/Dead Man'...

Build PCB Pictures

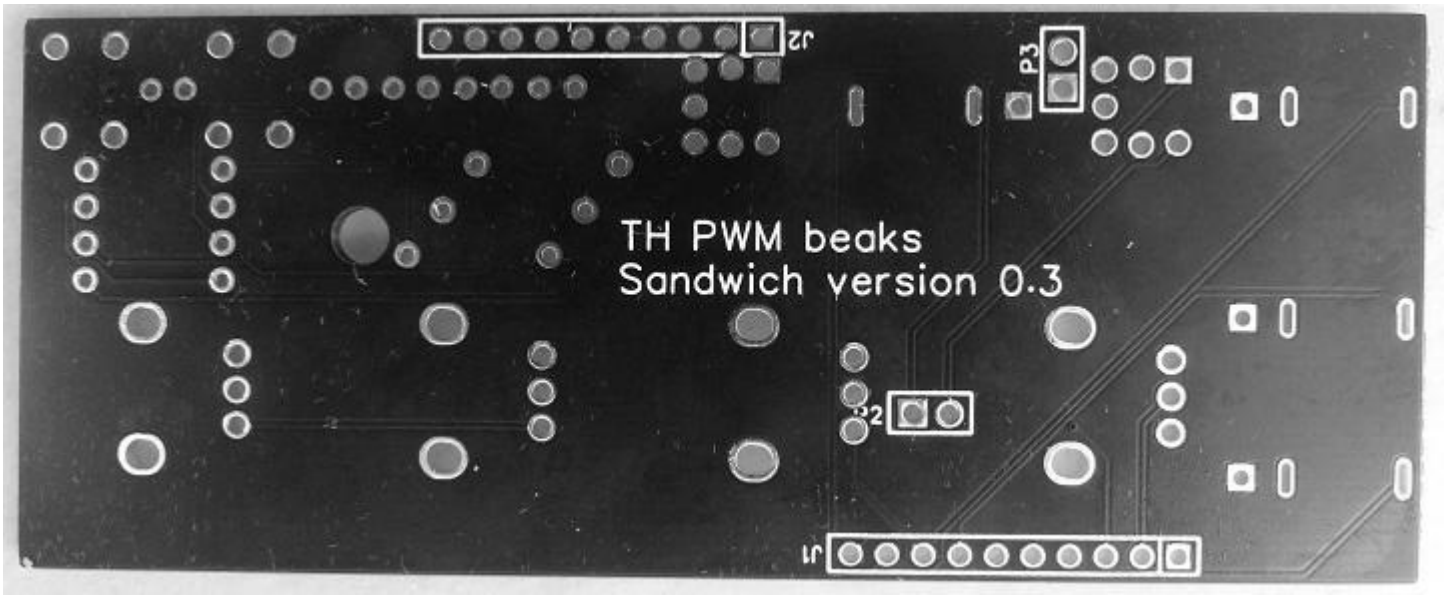
- Front Panel - Front view



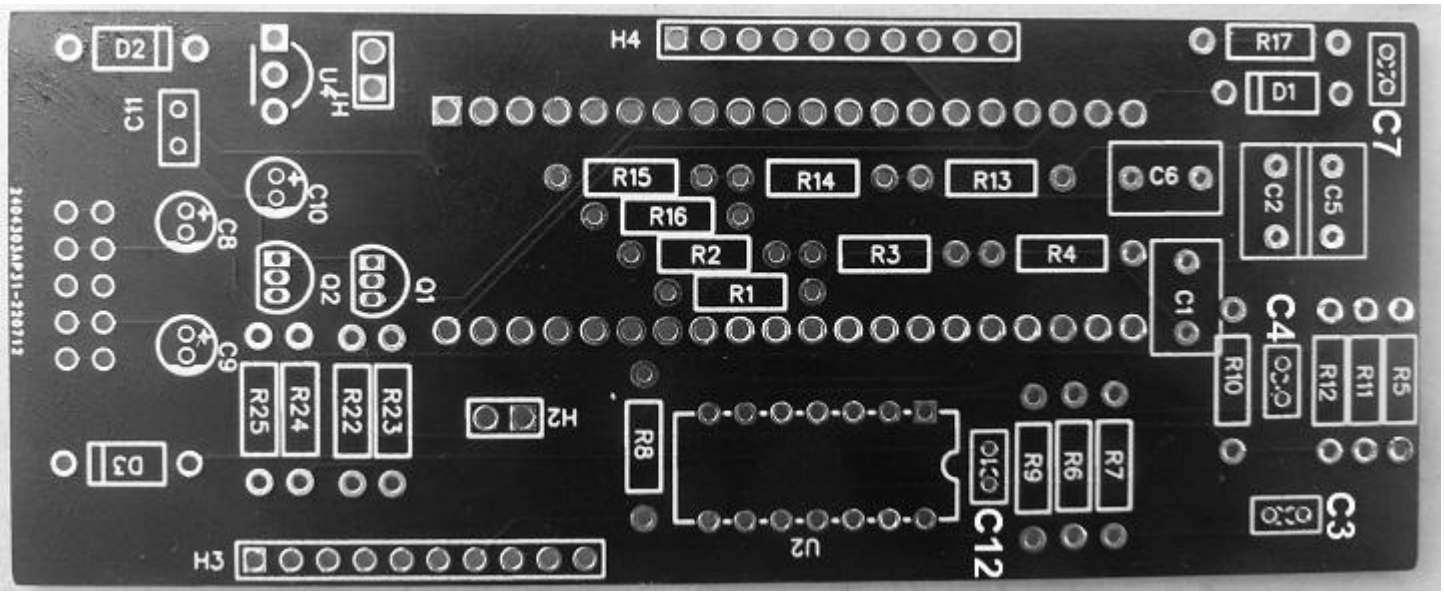
- Controls Card - Front view



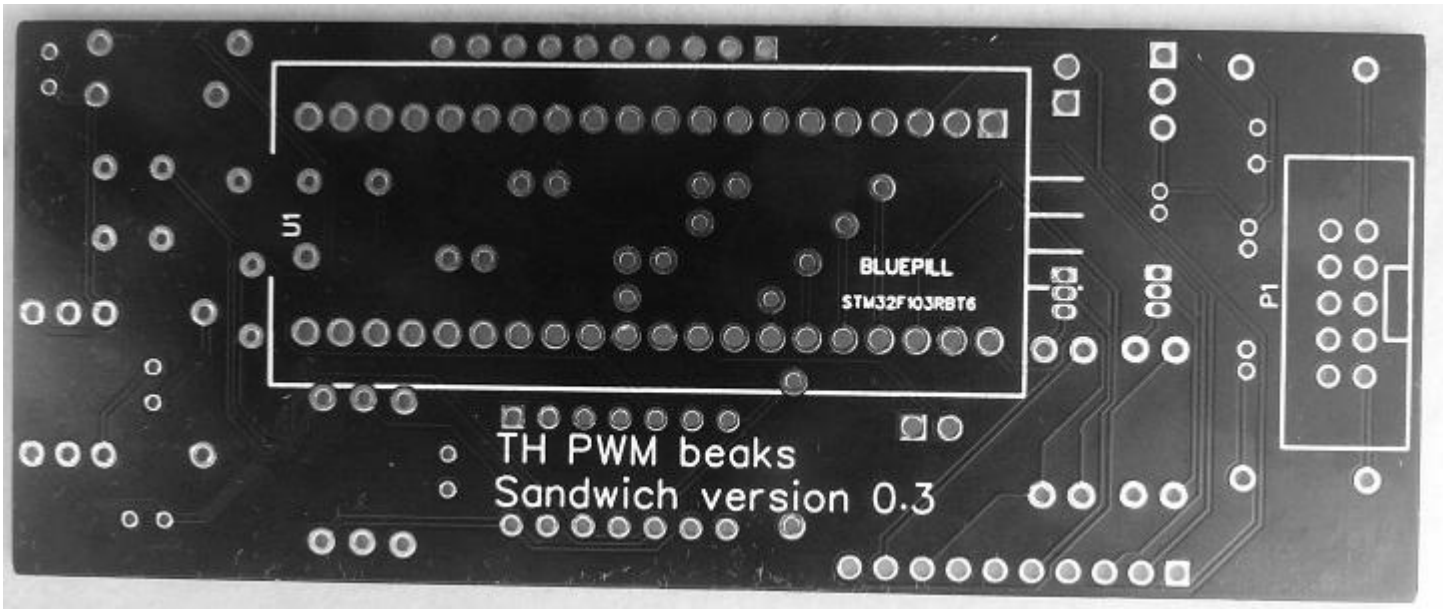
- Controls Card - Rear view



- Processing Card - Front view



- Processing Card - Rear view



Build Notes

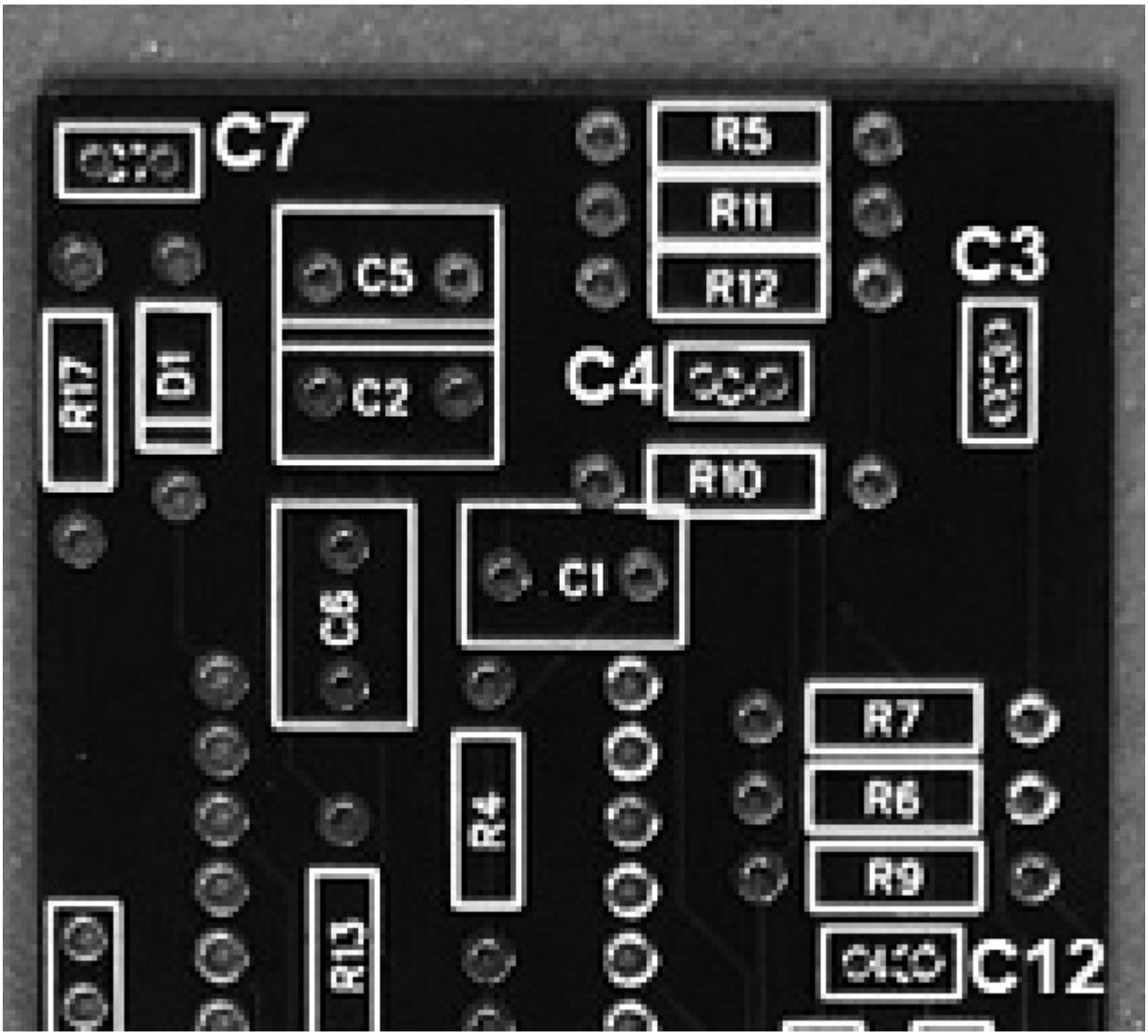
- Get the PCB set with panel and both PCBs for 9$ at Kristian's Tindie store (https://www.tindie.com/products/Sourcery/beaks-a-throughhole-pwm-version-of-mi-peaks/)
  - Tindie store (https://www.tindie.com/stores/Sourcery/)
  - (Or) Download the Gerber files (https://sound-force.nl/?page_id=3179) - sound-force page
- Front panel gerber by MyModularJourney (https://github.com/MyModularJourney/Braids)
- Braids illustrated. all the waveforms explained (http://www.vo1t.com/Euro//BraidsIllustrated1.8.pdf)
- Discord where you find the mi-th-braids channel and much more (https://discord.gg/pZtVheVCTW)
- Gilet / Mutable Instruments Github for all her modules (https://github.com/pichenettes/eurorackEmilie) - SMT version
- Modular in a Week playlist (https://www.youtube.com/playlist?list=PLyE56WXw0_5Q5QGMEXWmskuhojKyRdA3T)
- Support Kristian's work on Patreon (https://www.patreon.com/SourceryOne)
- Kristian's Discord server (https://discord.gg/pZtVheVCTW) - See mt-th-braids channel

Parts List Notes

- Parts List has JLCPCB part numbers
- SW1, SW2 - JLCPCB C620311 (https://jlcpcb.com/partdetail/Usakro-UK_B0202_G14160/C620311) - Tactile Switch, 6mm, 14mm
  - Ordered on Ebay (https://www.ebay.com/itm/223492387652?var=522247396254)
- SW3, SW4 - JLCPCB C501573 (https://jlcpcb.com/partdetail/Diptronics-ML6H2T2RQA/C501573) - Illuminated switch (ordered along with PCB]
- LEDs have Green body when off, but light up in yellow when illuminated
- Can use 100K pots?
  - The pots are used to set levels into the STM32 analog pins
- 5pcs Red Common Cathode 7 segment display (https://www.aliexpress.us/item/2251801139870562.html?aff_fcid=3b9fa86eb0554ff29ba0a6b77c812cbd-1668328660760-01745-_DFPvQEB&tt=CPS_NORMAL&aff_fsk=_DFPvQEB&aff_platform=shareComponent-detail&sk=_DFPvQEB&aff_trace_key=3b9fa86eb0554ff29ba0a6b77c812cbd-1668328660760-01745-_DFPvQEB&terminal_id=27d42930204b4f3ca90005888e7c8cd4&afSmartRedirect=y&gatewayAdapt=glo2usa4itemAdapt&_randl_shipto=US) - **MAKE SURE TO CHOOSE COMMON CATHODE**
- Get a STM32 Programmer here (https://www.aliexpress.us/item/3256801435312142.html?aff_fcid=19e3c157d442455d96274e2a86d0207e-1668328775090-01714-_Ddyuri3&tt=CPS_NORMAL&aff_fsk=_Ddyuri3&aff_platform=shareCo

mponent-detail&sk=_Ddyuri3&aff_trace_key=19e3c157d442455d96274e2a86d0207e-1668328775090-01714-_Ddyuri3&terminal_id=27d42930204b4f3ca90005888e7c8cd4&afSmartRedirect=y&gatewayAdapt=glo2usa4itemAdapt&_randl_shipto=US)

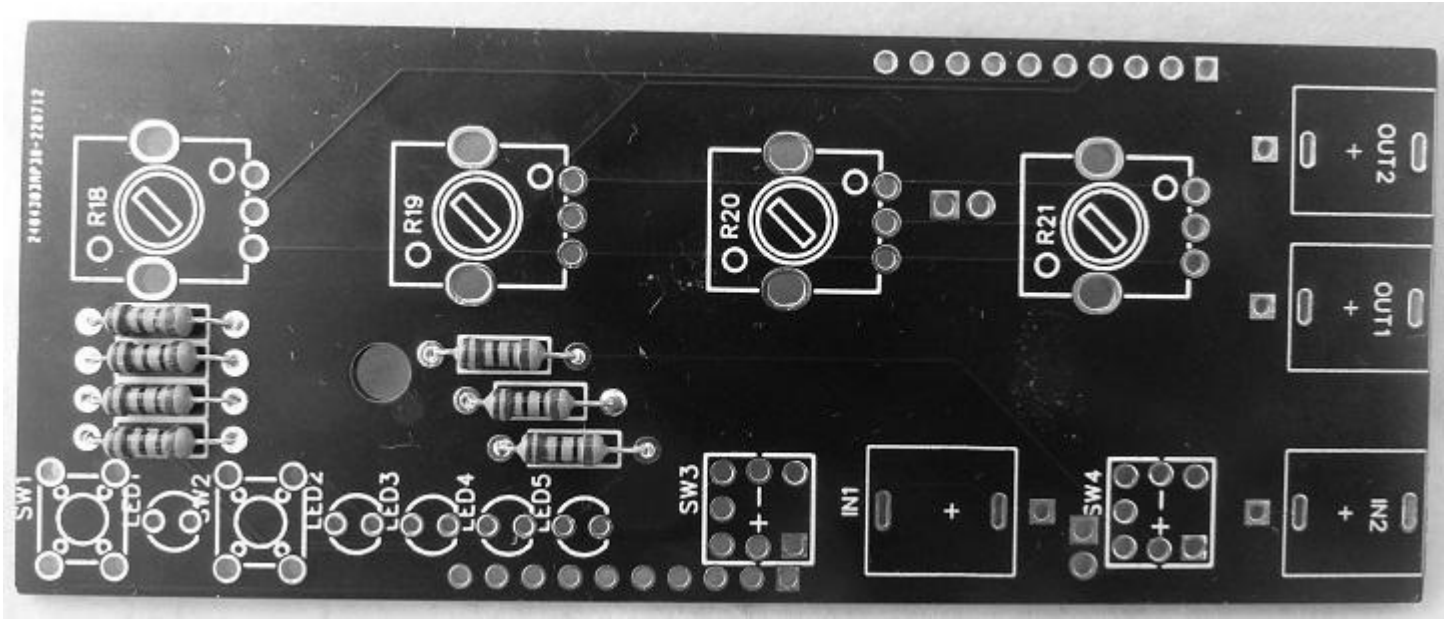
    - The STM32F103C8T6 is the 64kb version and thus too small but SOMETIMES they are 128kb
- STM32F013CBT8 (128kb version) on ebay... not that many to choose from :/
- Added cap ref des C3, C4, C7, C12



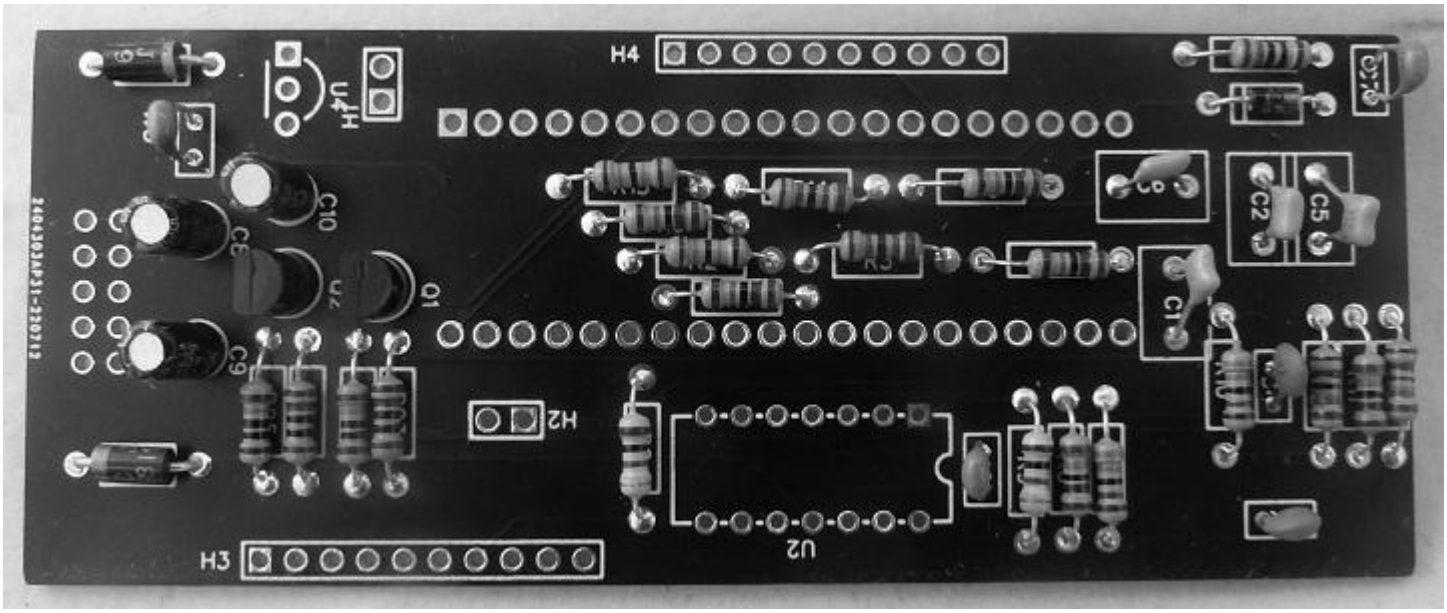
- LEDs go Kathode down

Build Pictures

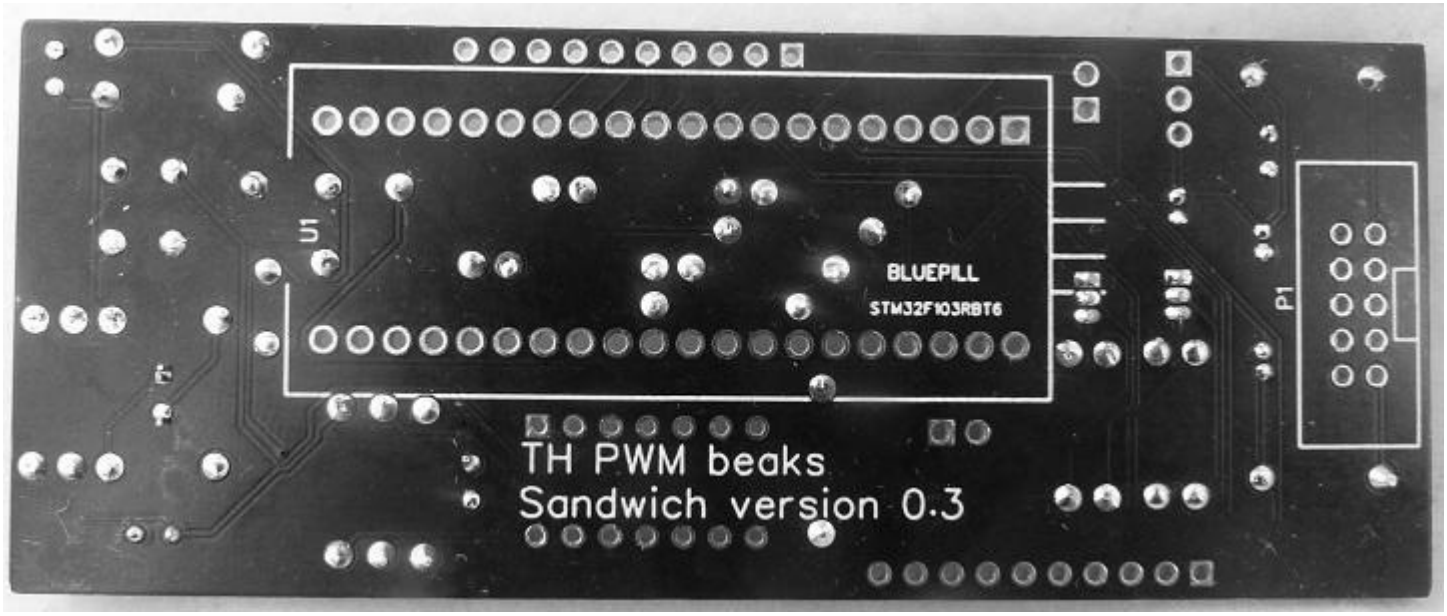
- Controls card with resistors



- Analog Front side card with resistors, transistors, and caps



- Analog Rear side card with resistors



- 12.5mm Shaft pots and Jacks on controls card mounted to Front Panel