

THT BRAIDS

This is a build-doc for the THT Braids from Sound-Force. I will mainly discuss the things I noticed while building my own module.

Part 1: Stuff

Start with printing the bill of materials from the Sound-force website.

https://sound-force.nl/?page_id=3179

1.1 Lists

Most parts can be found on my Reichelt partslist:

<https://www.reichelt.de/my/1780156>

Please double-check if my list is missing any parts. Note that the jack sockets, potentiometers, displays and encoders are missing from the list. If you're Dutch (zoals ik) I would recommend getting these from Vanallesenmeer or Musikding.

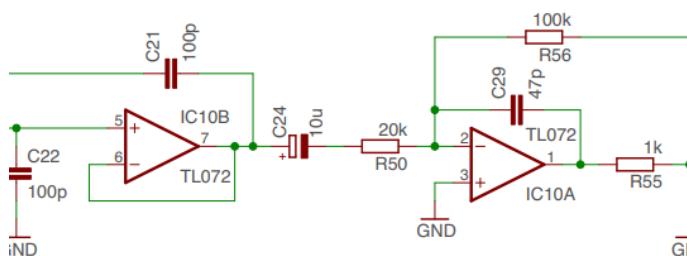
1.2 STM

The STM-module can be bought from Robodyn, via Aliexpress. Sound-Force has some info on which one you need to buy. I got the APM32 NO SOLDER. Make sure it says 128KB.

1.3 The NP Elco

There's an electrolytic capacitor on the main board which isn't polarised.

The bill of materials say "MCNP16V106M5X11", which is a special blue cap. After a lot of head scratching and searching I still couldn't find one. But then I looked at the schematic:



C24 is the NP cap, but it's shown here to be a normal electrolytic cap.

Long story short, I put a normal electrolytic cap on the board and it works fine.

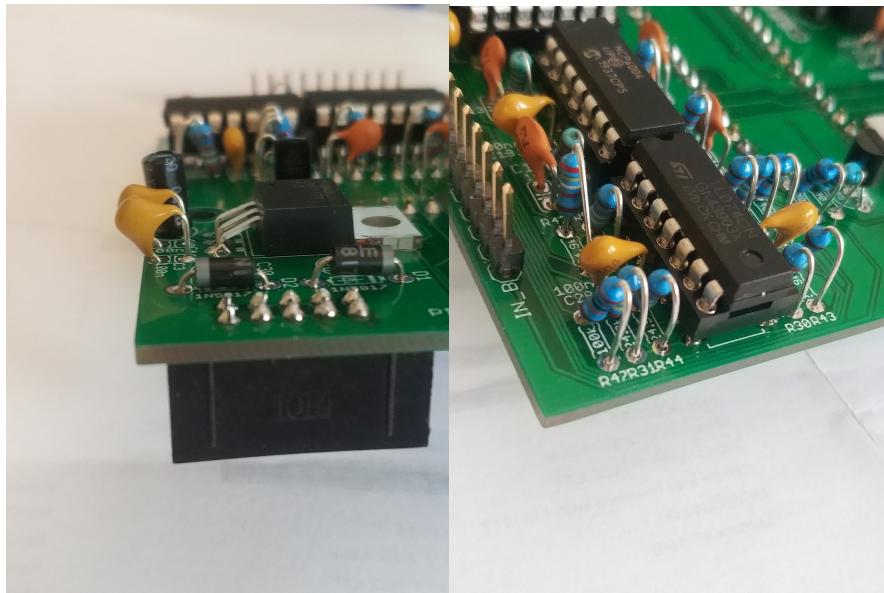
Part 2: Building

There isn't a whole lot to say about this part, except:

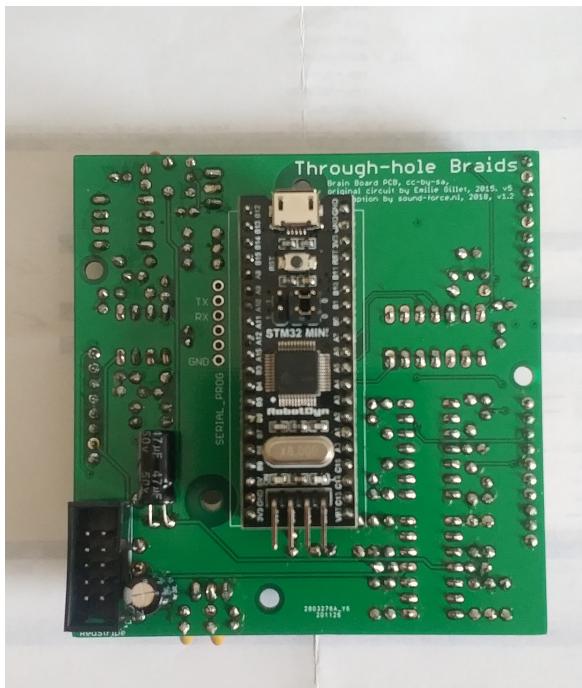
- Don't rush. Check the orientation of your ICs, Elcos and transistors.
- Start with the small parts. resistors, diodes, IC-sockets, ceramic caps, headers, transistors, elco's.
- Connect the male and female headers together before soldering them on the boards.
- Check for shorts on the powerheader before plugging it in.

2.1 Tipi resistors

Pro tip: if it don't fit, make it fit.

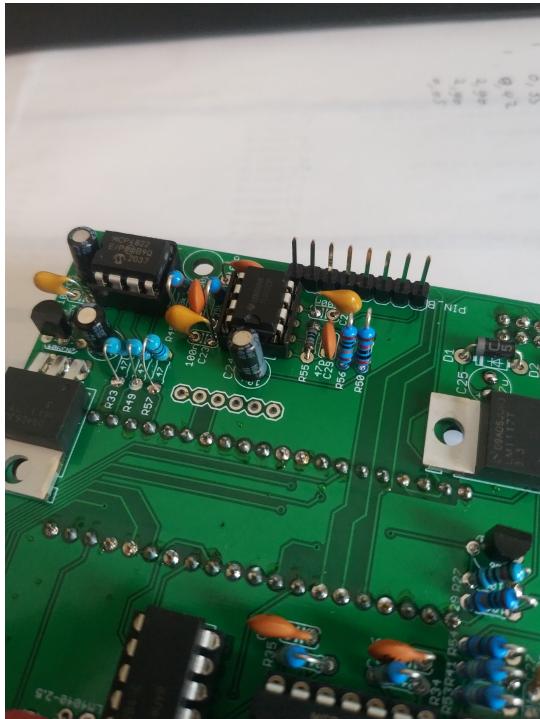


1.2 Main board, backside



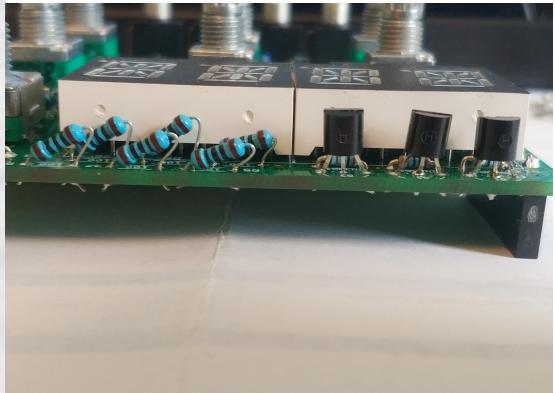
Notice the electrolytic caps on this side. The silkscreen for these caps is on the other side of the board. At first I soldered these on the front, but soon found out they were too tall. The replacement of these caps went a bit messy, so don't be like me and solder them on the back! Mind the polarity, though.

1.3 That elco, again



This is how I soldered C24.

1.4 Control board



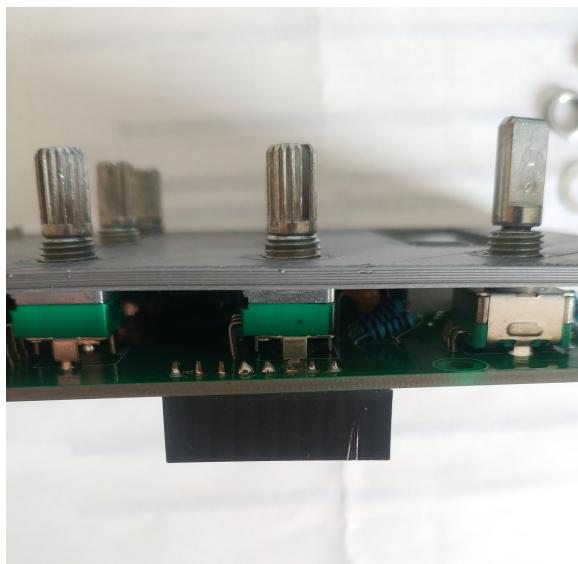
Note that the components shouldn't be taller than the display.

Standard synth DIY rule: Don't solder the jacks, pots, encoder and displays until you've attached the front panel.

The displays need to be lifted a little in order to touch the panel. Sticky tape might work, but I'm not sure.

1.5 Female headers

The control board and main board connect with three headers: 10, 9 and 8 pins each. I only have three female 10pin headers. So I removed the unused pins and let the rest stick out. Like this:



1.6 3D-printed panel

I usually 3D-print all my front panels. I made a very minimalist panel for this module. It's on my Github if you want to print one for yourself.

<https://github.com/BurningForceKin/ModularSynthStuff/tree/gh-pages>

If you want to use a laser cutting machine, you can find the vector-files here:

https://github.com/pichenettes/eurorack/tree/master/braids/hardware_design/panel

Part 3: Programming

This is by far the least fun part of this adventure. There are several ways of doing this. Either with a ST-Link or UART connector. I went for the UART path. (apparently the USB port on the STM32 isn't for programming. At least, that's what I found)

Start by going to the ST website and download ST Flash Loader Demo.

<https://www.st.com/en/development-tools/flasher-stm32.html>

You'll probably need to fill in some form before they let you have it, though. I got an error message everytime I submitted the form, so I made an account. Anyway, find the application called STMFlashLoader Demo.

Take your STM32 out of the module and connect it using a USB to TTL connector (that's the UART connector) Make sure it's a 3V3 type.



Connect it to the downwards-facing legs on the STM32 like this:

3V3 to 3V3

GND to GND

TX to A10

RX to A9

Before programming make sure the jumpers on the top of the STM32 are set to programming mode.

Operating mode:

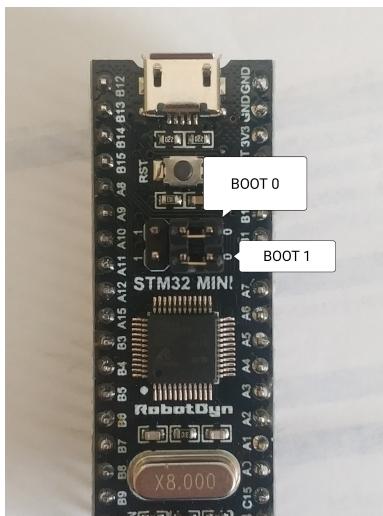
BOOT 0 = 0

BOOT 1 = 0

Programming mode:

BOOT 0 = 1

BOOT 1 = 0



Next, you should download the original Braids firmware and the Sound-Force firmware. You'll need to install the original firmware first and then replace it with the one from Sound-Force.

Go here: <https://github.com/hadesbox/eurorack-with-binaries>

Download the entire thing via the green button. Then navigate to /Build/Braids_Bootloader/. The .hex file is the one you'll need to inject into the STM32.

The Sound-Force firmware is easy to find on the webpage.

Now everything should be connected to your computer. Run STMFlashLoader Demo and flash the STM32 with the original firmware. Select the COM port, hit next. It should say "target is readable". Hit next. Select STM32F1_Med-density_128K. Next. Select braids_bootloader.hex from the "Download from file" area. Don't check any of the boxes. Hit next and it will download to your STM32.

Now do that again, but with the Sound-Force firmware.

Put the STM32 back in Operating mode, in your Braids and fire it up!

It should work. If not, reflow all the solderjoints, reprogram the chip, check for shorts or missing parts. I can only help you so far, so I suggest you check on forums or Facebook groups if other people have the same problem.

But if it does work: yeay! Have fun!

See ya,
David