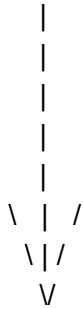


NEEDLES v2.5 DIY Build Instructions

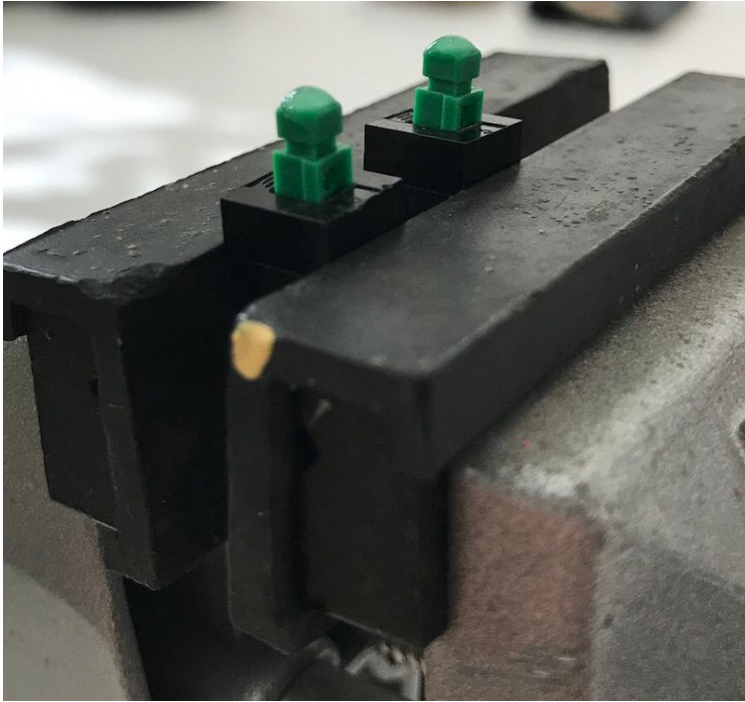
Hi, thanks for building this module. Please go through this entire doc prior to building, especially the pictured steps below. Some components need some prep before soldering and some should be soldered with the panel screwed in so that they align correctly and are the correct height off the PCB. I solder in this order starting with SMD:

- All IC's (both sides of pcb)
- Resistors
- Caps
- Thru-hole headers (facing the bottom)
- Upload software
- Check 3.3v
- Keyboard/Octave switches (After gluing caps. Must be flush with PCB. Solder one leg, then while pressing down on the switch, heat the leg again to make sure switch is flush with pcb. Solder the rest of the legs.
- The rest of the components following the pictured tips below:

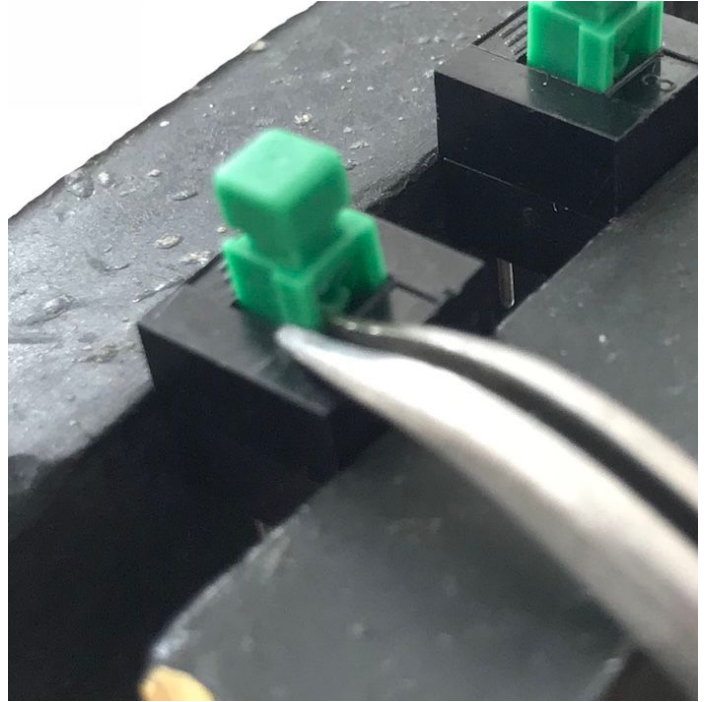
SCROLL DOWN



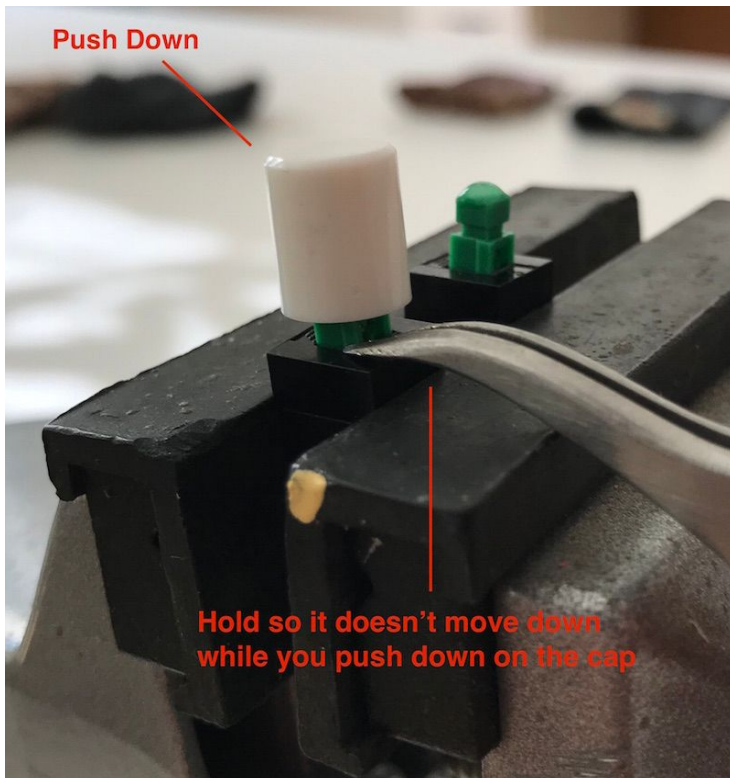
Gluing Caps is the most annoying step. Do this before soldering switches to the PCB. Dap a little epoxy or other [strong plastic glue](#) to the top (not too much!)



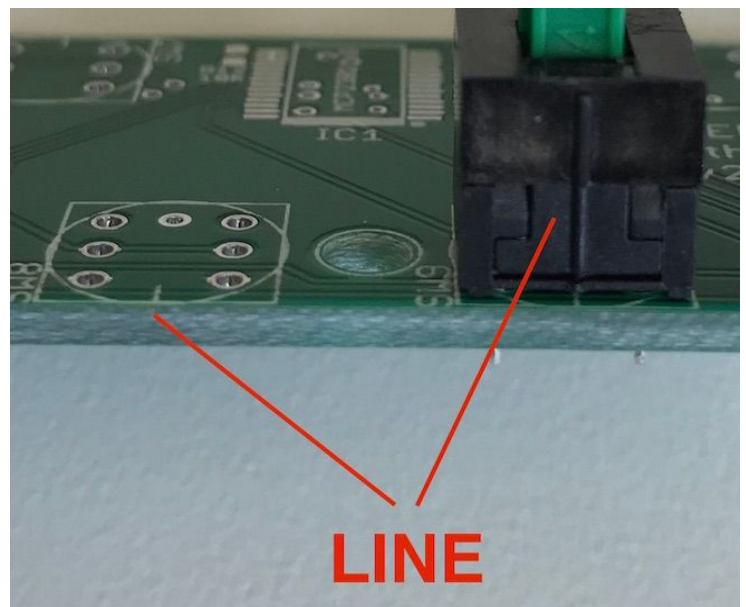
Then, while holding the green part of the switch with some needle pliers.... (one side of green is indented)



Push down on the cap until you feel it snap in place. Takes some tries. Careful not to break the switch. Repeat 19 more times (-:

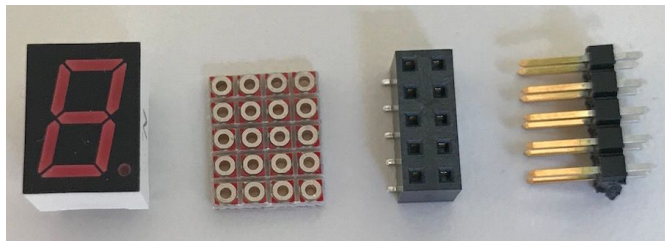


For consistency solder switches with lines aligned to silkscreen lines on PCB:

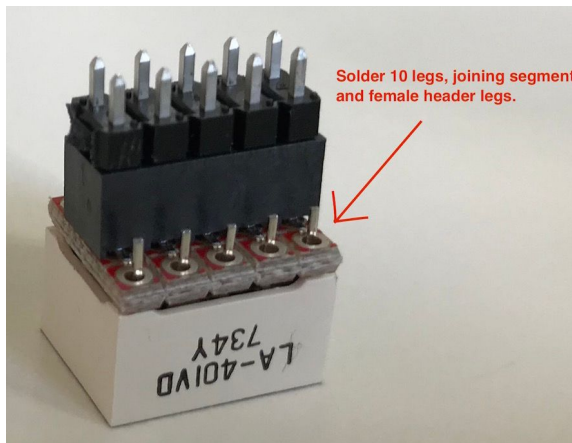


Led Segments. You might think of a different technique. It's possible to skip the female headers and just solder the male headers to the perf board. Play around with it if you like.

Locate parts and repeat these steps for both segments. I sent the perf board thingies with the pcb



Stack parts. Solder the 10 legs, joining segment and male headers together. Making sure all the pieces are perfectly flush! Solder one leg, then while pressing down, heat the leg again to make sure it's all flush. Solder the remaining legs.



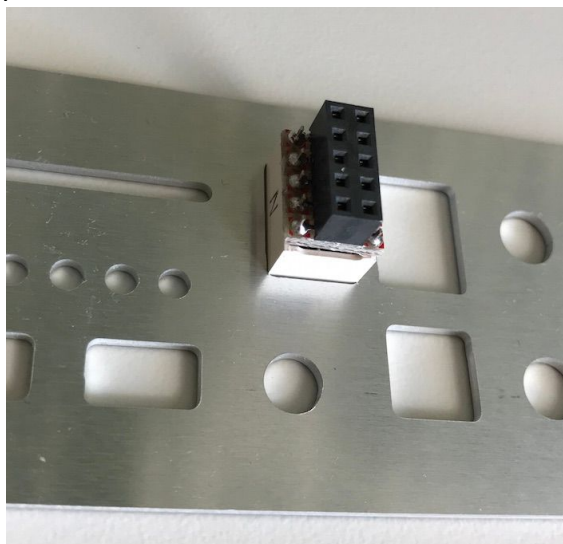
Remove 10 pin header:



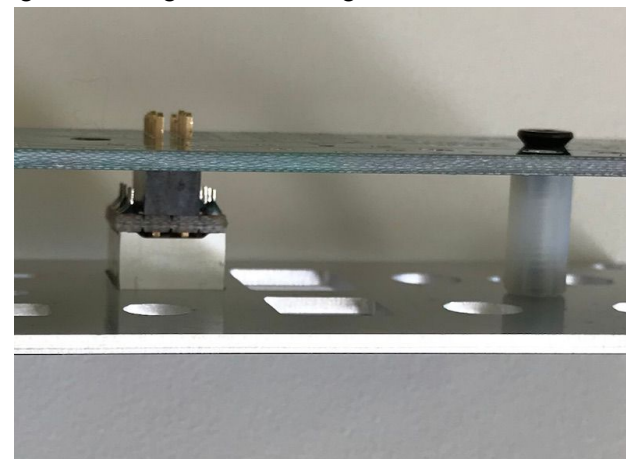
Take out 10 header pins from the male header.



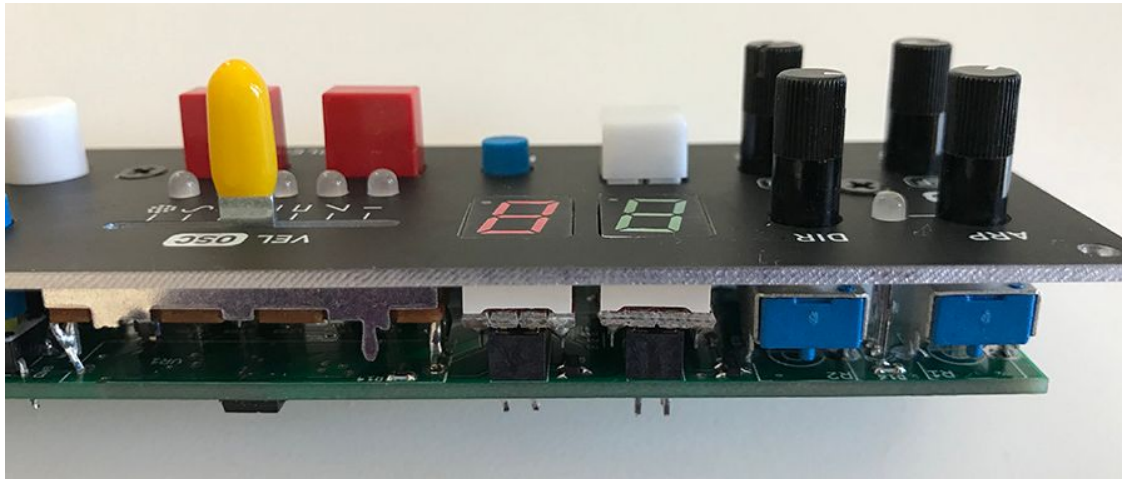
Push segment gently into panel so it's flat with the panel front:



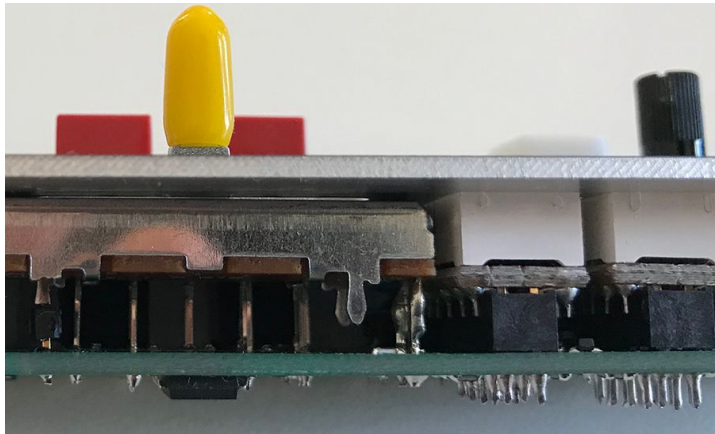
Secure panel to PCB. Insert the loose headers you removed one by one into the segment's female header. Make sure again the segment is sitting flat, and solder headers.



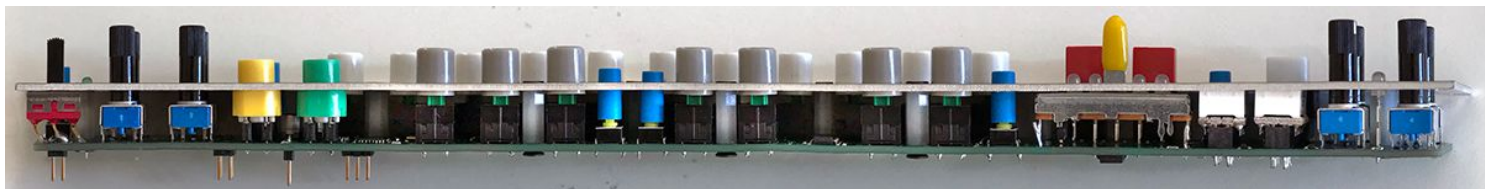
Segment view:



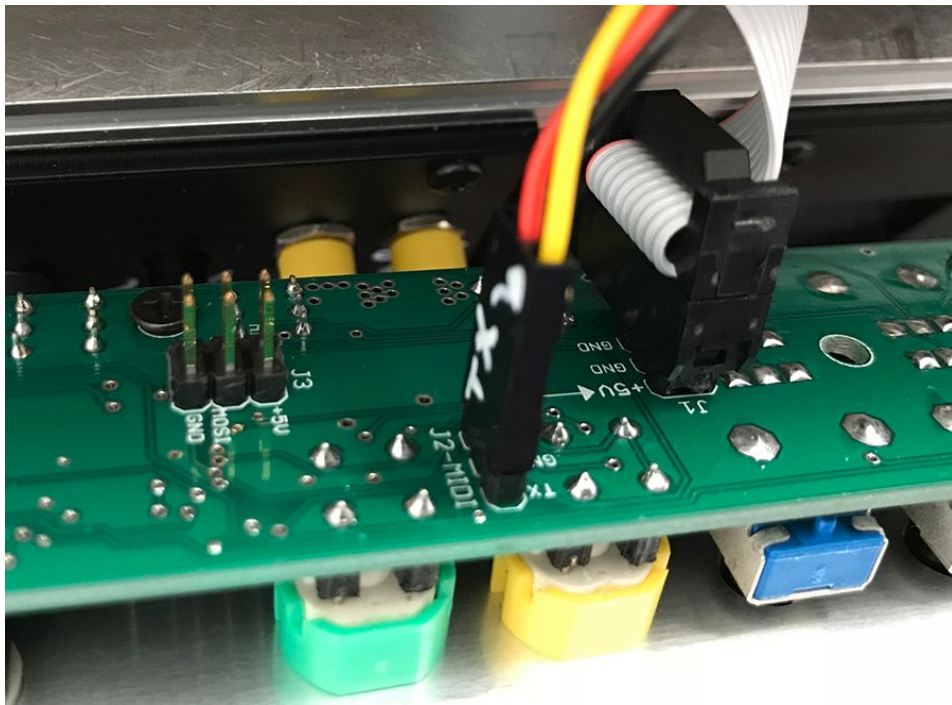
The slider should be raised and aligned with the panel cutout. I use single headers to extend the legs.



I also raised the REST, TIE and SLIDE switches. Make sure they are oriented correctly before soldering. They have one flat side, that matches the silkscreen.



Back of PCB. Servo motor cable going to Yarns MIDI IN. Power says +5V but you can give it +12V.

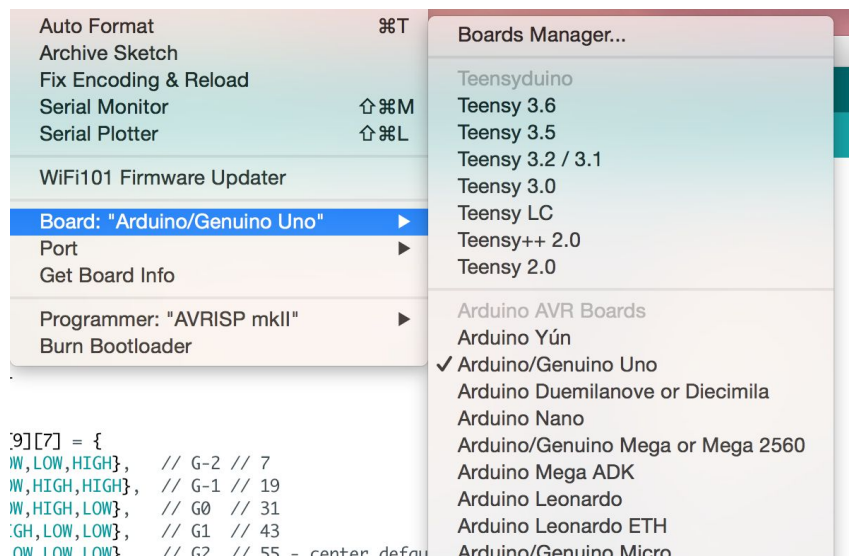


I solder MIDI wires to the back of Yarns. You could make a little 1U panel with a MIDI jack and connect to the front:

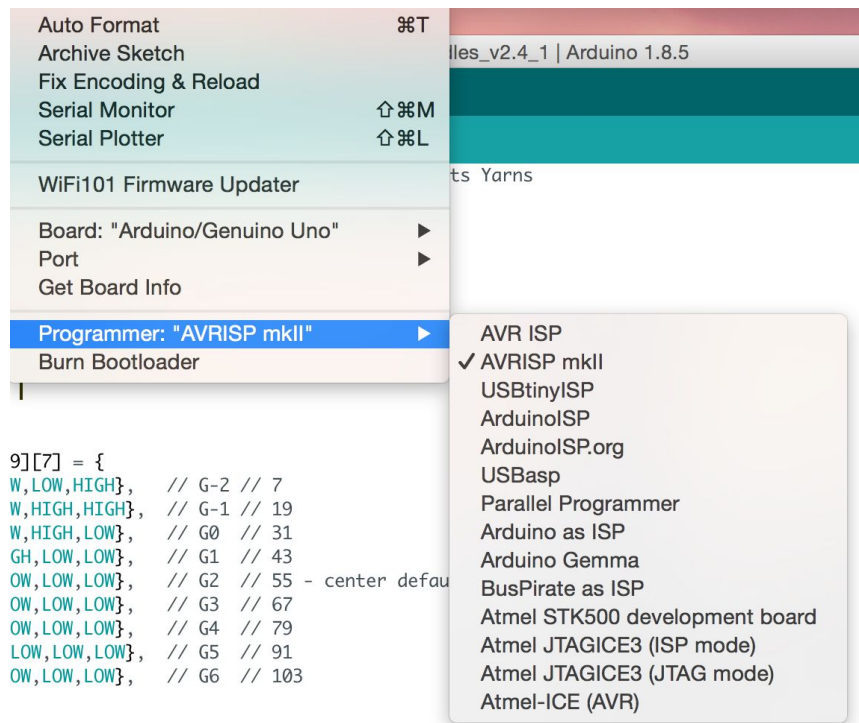


Software:

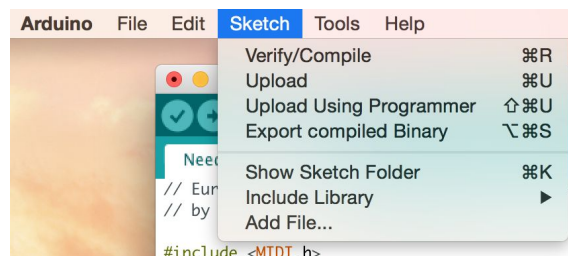
Written in Arduino. Download "Needles_v2.4_2.ino" located in the Software folder. Download two libraries for Arduino using the Library Manager or directly - the [MIDI Library](#), and [Adafruit MCP23017 Library](#). Place them in the correct folders. Connect your programmer to the ICSP Header. (I use an Olimex AVR ISP MKII). Choose Arduino/Genuino UNO Board (Ensures the correct fuses are set)



Choose your programmer:



And upload from "Sketch---> Upload Using Programmer".



You're done!! See the Needles User Guide for reference on what every button and function can do and test that everything works.

Programmer and MIDI Library:



Library Manager

Type Contributed Topic Communication midi

AppleMIDI by lathoub
AppleMIDI protocol for Arduino RTP-MIDI (also known as AppleMIDI) is a protocol to transport MIDI messages within RTP (Real-time Protocol) packets over Ethernet and WiFi networks. It is completely open and free (no license is needed), and is compatible both with LAN and WAN application fields. Compared to MIDI 1.0, RTP-MIDI includes new features like session management, device synchronization and detection of lost packets (with automatic regeneration of lost data). RTP-MIDI is compatible with real-time applications, and supports sample-accurate synchronization for each MIDI message. (from <https://en.wikipedia.org/wiki/RTP-MIDI>)
[More info](#)

ArduinoIHC by Jens Østergaard Nielsen
A Library for connecting to the IHC Controller data in/out. Supports simulated In/Out-put modules for IHC, and the IHC Temperature/Humidity protokol.
[More info](#)

MIDI Library by Forty Seven Effects Version 4.3.1 **INSTALLED**
MIDI I/Os for Arduino Read & send MIDI messages to interface with your controllers and synths
[More info](#)

Close

Checking voltages:

BLACK PROBE TO GND

CONNECT POWER HERE
+5V or +12 V

RED PROBE TO +5V

3.3V should come out of the regulators center leg and supply 3.3v to the circuit.

When you plug 12V it travels to the regulator