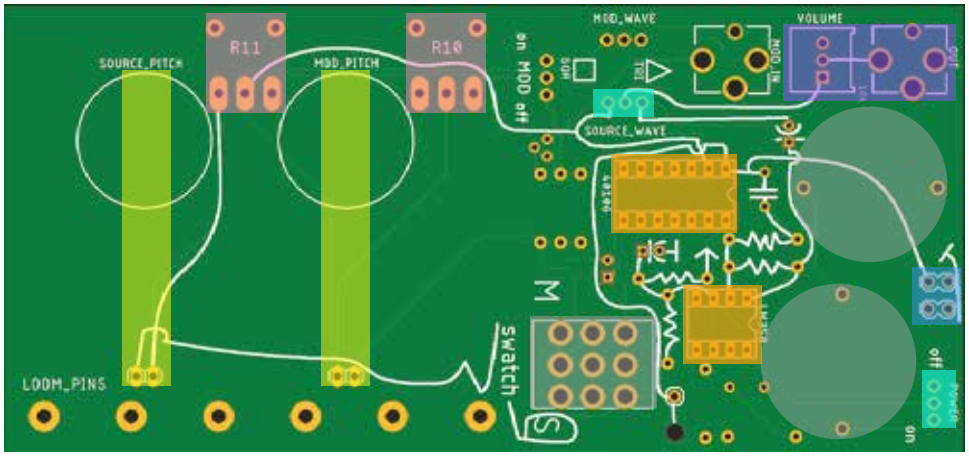
Solder - Square Wave



Gather the following parts and solder them to the board starting with R11 and R10. Solder each part to the location of the same color. Continue down the list until all parts are attached.
When done, you have enough parts to test and listen to a square wave. Head to page 2 and follow the steps.

FRONT OF BOARD

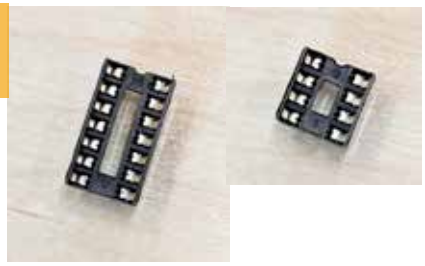
- R11, R10 - Dial potentiometers
- 40106 and LM358 sockets
- Force sensing resistors (FSR)
- Power and Source Wave switch
- Female headers
- Volume trimpot
- 1/8” Main out mono jack
- Swatch switch

BACK OF BOARD

- 3 Volt battery holders

2 x

1 x



2 x

2 x

2 x

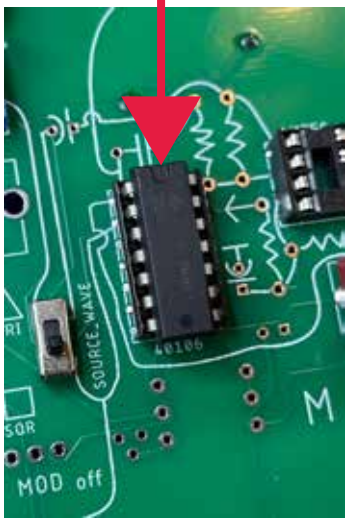
1 x

1 x

1 x

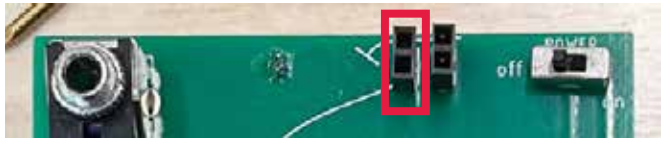
BACK OF BOARD

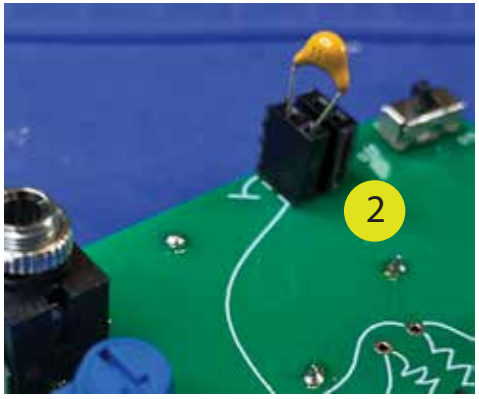
2 x



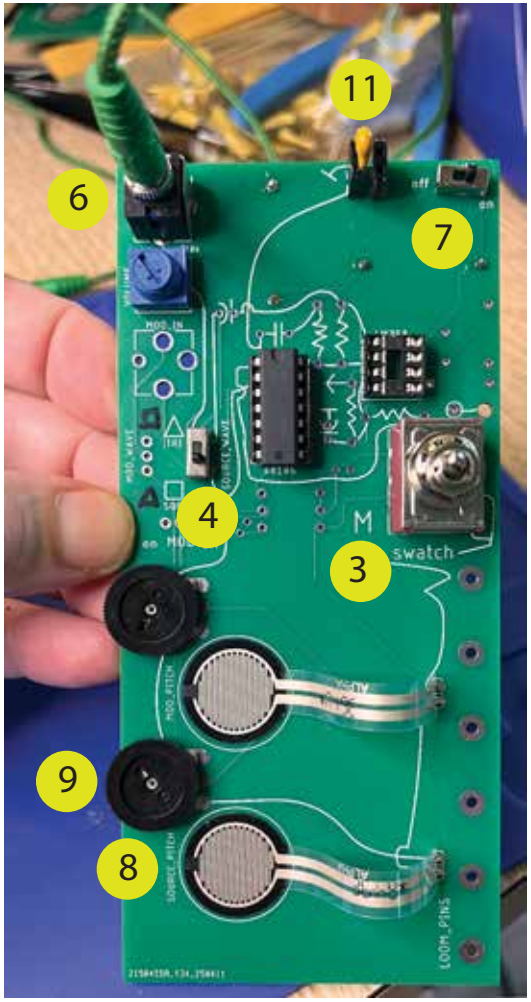
1. Plug the 40106 IC into the socket Make sure the notch is on the opposite side from the 40106 printed on the board.

40106 IC





2. Put a 1uF capacitor into left set of headers.
3. Switch the Swatch switch to M
4. Switch the Source_Wave switch to SQR
5. Put batteries in
6. Plug cable into OUT and into a speaker with an Aux In
7. Turn Power switch On
8. Press the Source_Pitch FSR to play a squarewave and to change pitch
9. Turn R11 dial pot to set the high frequency
10. Turn Off when done



Next up is soldering the LM358 op amp and the rest of the components. This will allow you to listed to the triangle wave and start knitting your sensor.

11. Change the capactior value to change the range of the source oscilloscope's freqency.

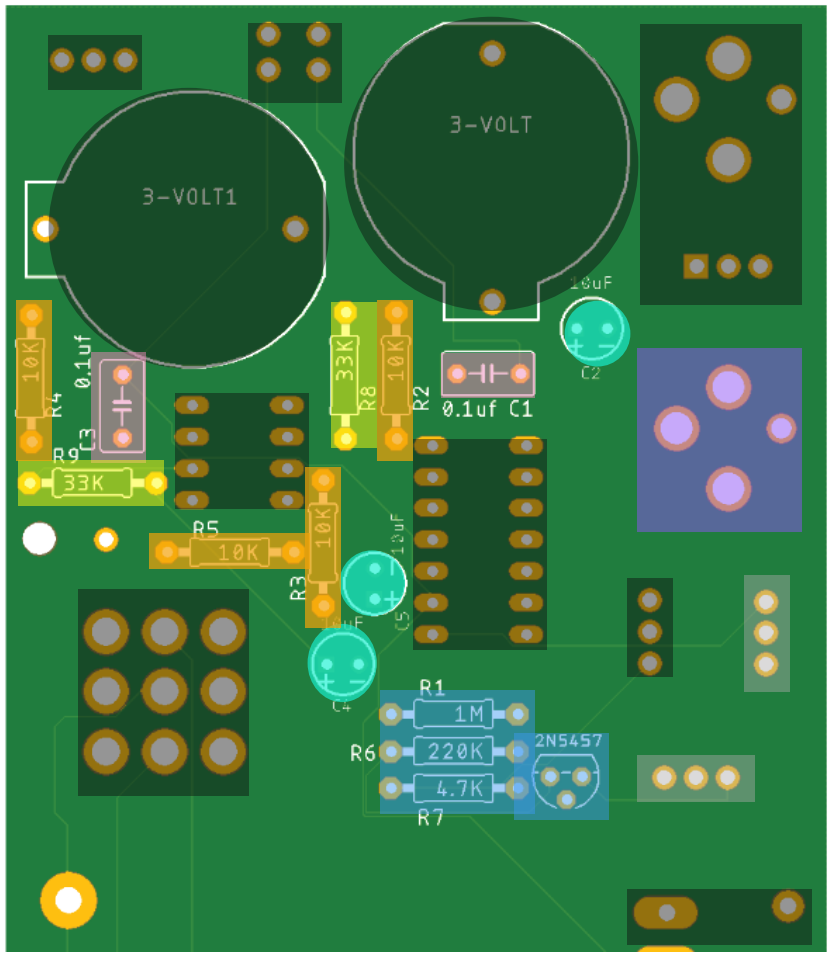
Video of changing the capacitor: https://vimeo.com/1083209426?share

Solder - Triangle Wave and Mod Oscillator and Input

BACK OF BOARD

- C1, C3 - 0.1uF
- R2, R3, R4, R5 - 10K
- R8, R9 - 33K
- C2, C4, C5 - 10uF
- R1 - 1M, R6 - 220K, R7 - 4.7K, 2N5457
- 1/8” Main out mono jack
- Mod Wave and Mod On/Off switch

BACK OF BOARD



2 x 

4 x 

2 x 

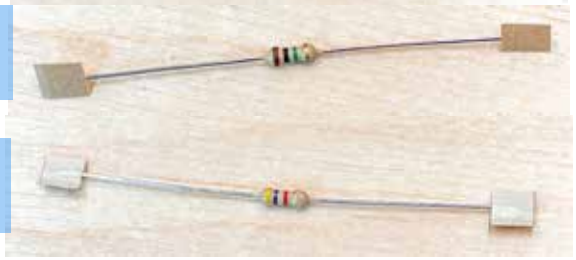
2 x 

3 x 

1 x 

1 x 

1 x 

1 x 

1 x

Solder - Pins and Alligator Lead

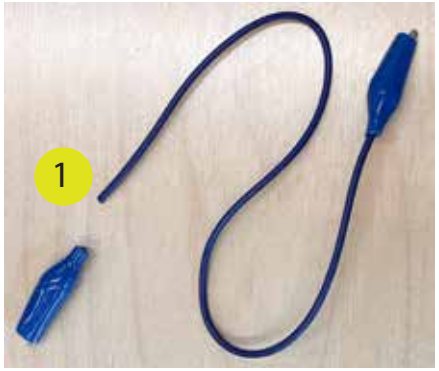
FRONT OF BOARD

- C1, C3 - 0.1uF
- R2, R3, R4, R5 - 10K

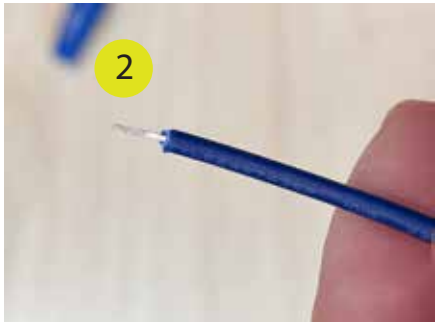
6 x

1 x

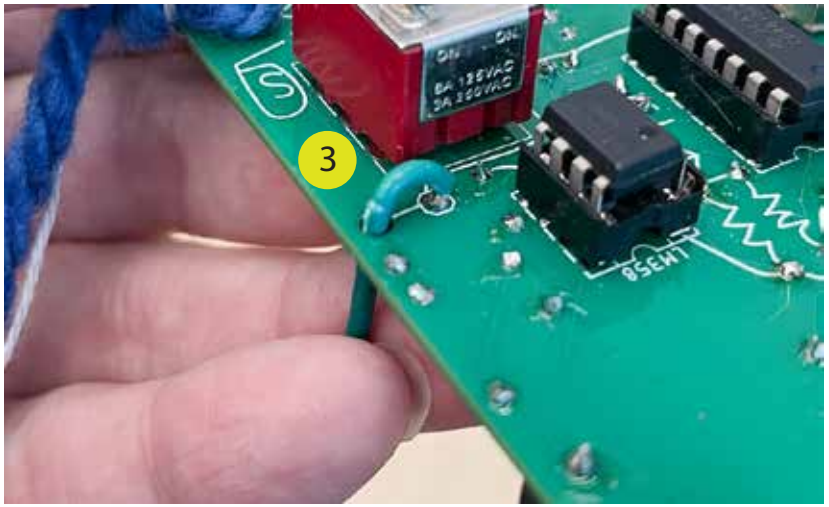
1. Cut off one alligator clip keeping the full length of the wire.

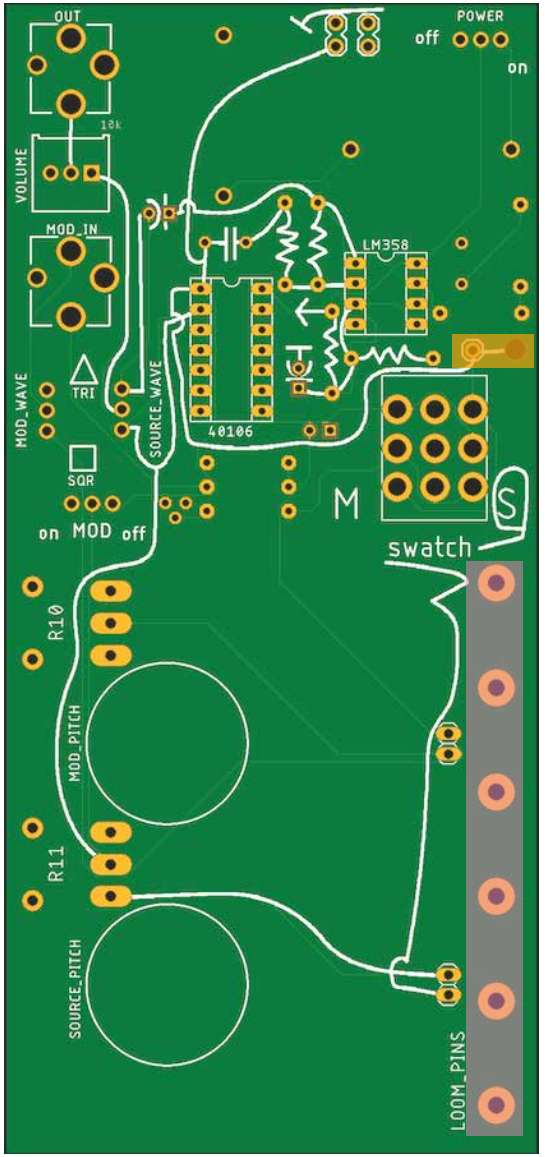


2. Strip the end.



3. Through the drill hole, push the end up from bottom to front, bend and insert the stripped end into the hole and solder.



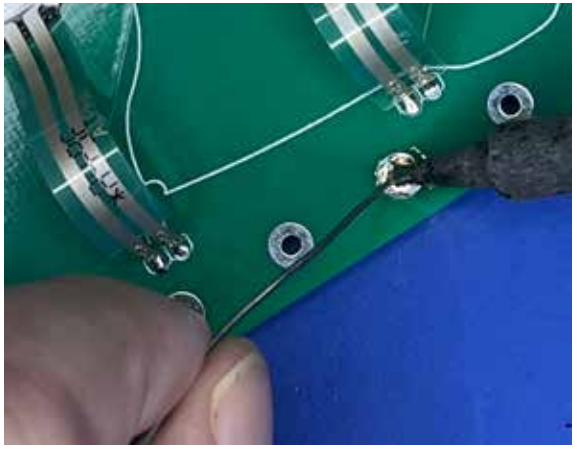


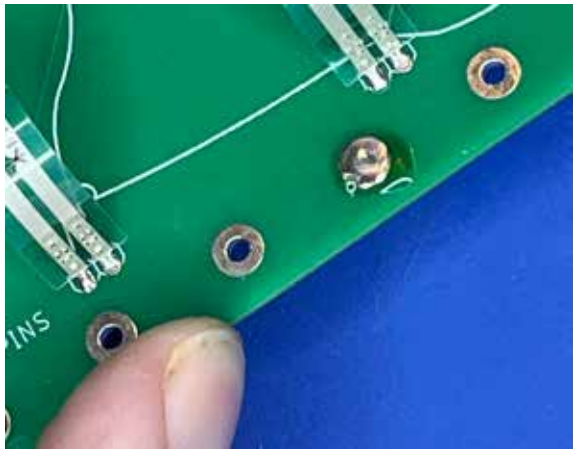
Follow the steps and videos on the next page to solder the pins.

Soldering a pin to the board

Video of tinning a pin: https://vimeo.com/1081964564?share

1. Tin the pin pad. Drop a good amount solder onto the pad covering the hole.



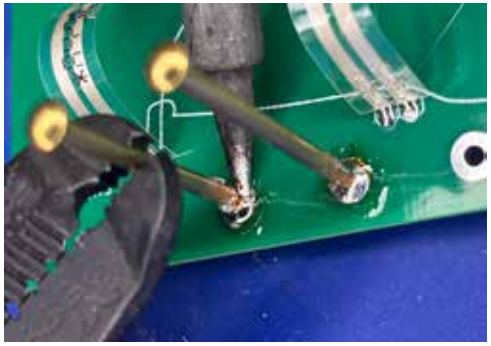


2. Tin the end of the pin. It's ok if it looks messy as long as a blob of solder sticks to it.

Soldering a pin to the board

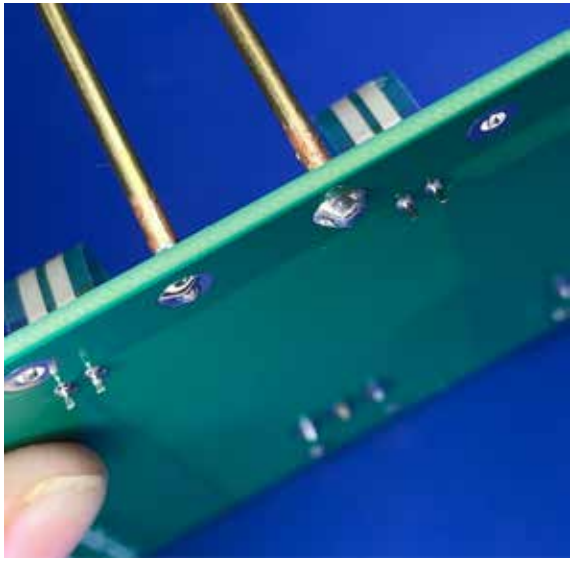
Video of soldering pin: https://vimeo.com/1081963459?share

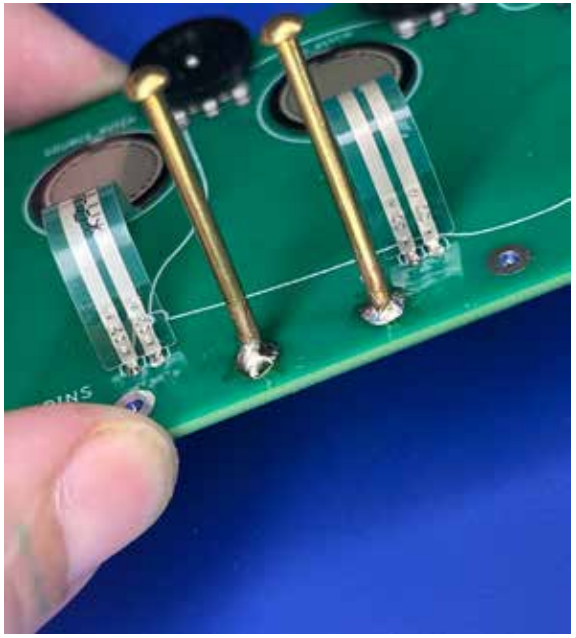
3. Heat up the pad, use pliers to pick up the pin and place the tip of the pin in the hole while the solder is flowing.



4. Continue applying heat to the pad and where the pin touches the pad to bring the solder up the pin. Hold the pin until the solder cools.

5. Once cooled, push the pin with the pliers to see if it's connected. If not, hit is with some heat again or consider adding more solder to the pin or pad if there isn't enough to go around. There should be solder covering the seam on the top and it's ok if there is a small amount of solder coming from the bottom.





Making a knitted sensor

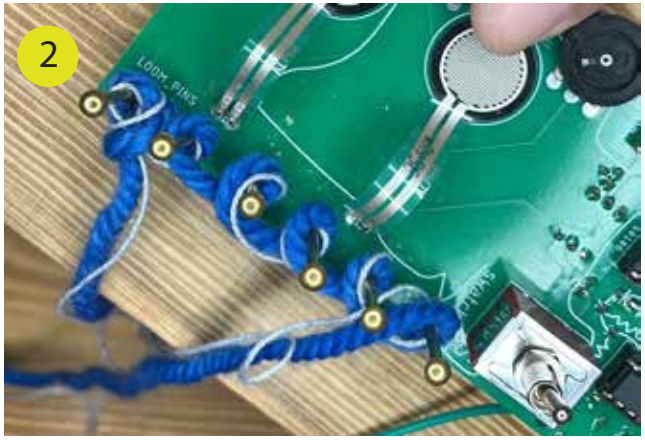
1. Make a slip knot.

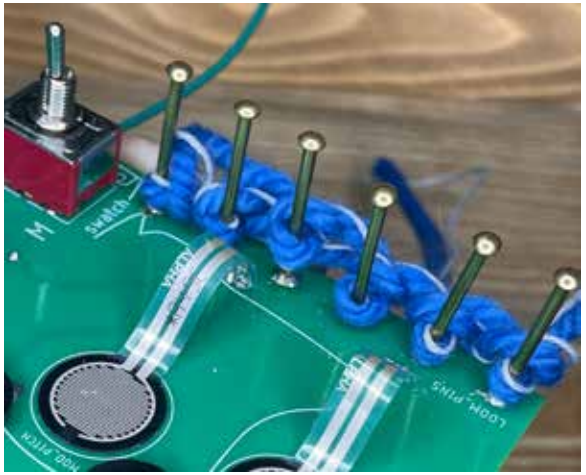
Make sure to keep both yarns together.
https://vimeo.com/1083712137?share
https://youtu.be/oj21JDDSrgM?si=NK0ujaEZNWDLlbYI

3 yards of regular yarn doubled up with resistive yarn.

2. Cast on.

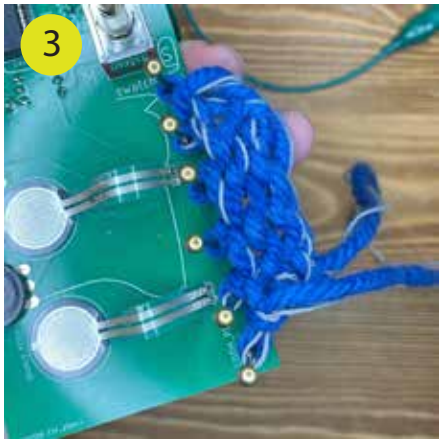
To cast on, use the e-wrap cast on method.
https://vimeo.com/1083712137?share
https://knittingboard.com/ewrap-cast-on-page/

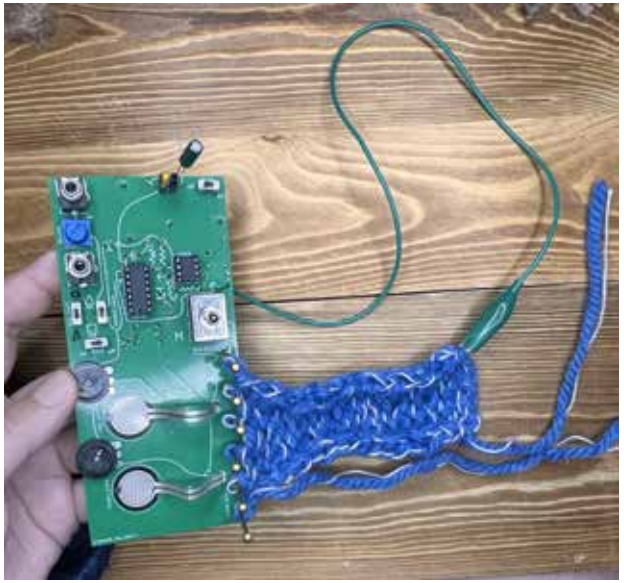




3. Knit using the e-wrap stitch

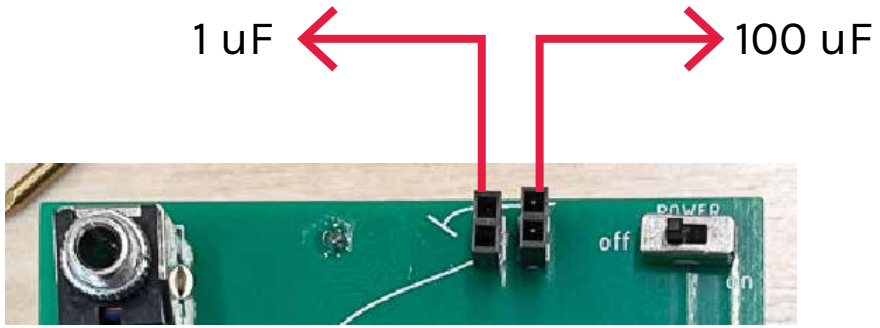
Use the ewrap knit stitch to continue knitting on the 6 pins. The swatch length will grow with each round of stitches. When the swatch gets to a length you are happy about clip the alligator teeth to the end making sure to connect with the resistive yarn.
https://vimeo.com/1083724845?share





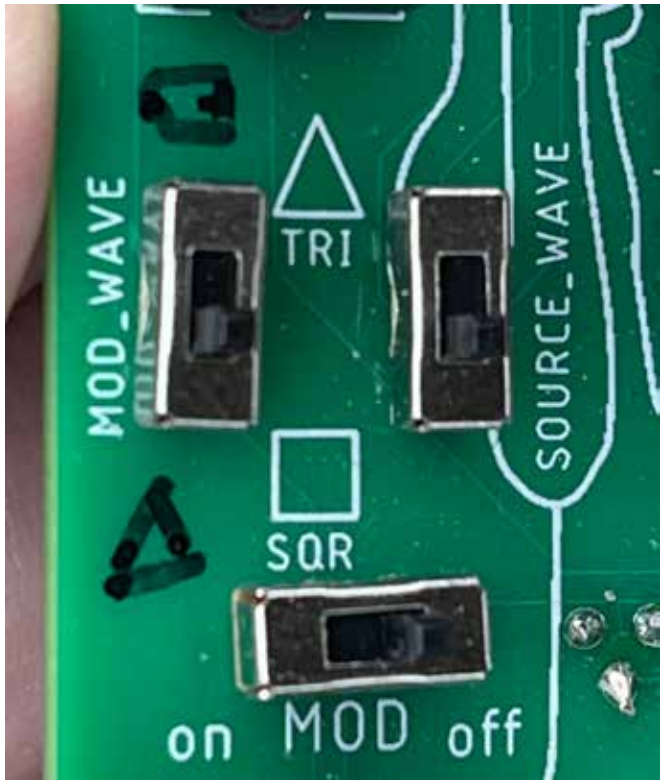
Knitted Noise

Square wave modded by triangle wave. Knit swatch changing pitch/speed of mod oscillator.



When everything is soldered up, put a 1 uF capacitor in the far left headers and a 100 uF capacitor in the right set of headers.
Move all the switches to the following places:

- Power switch to Off
- Swatch switch to M
- Mod switch to Off
- Mod_Wave to triangle
- Source_wave to SQR

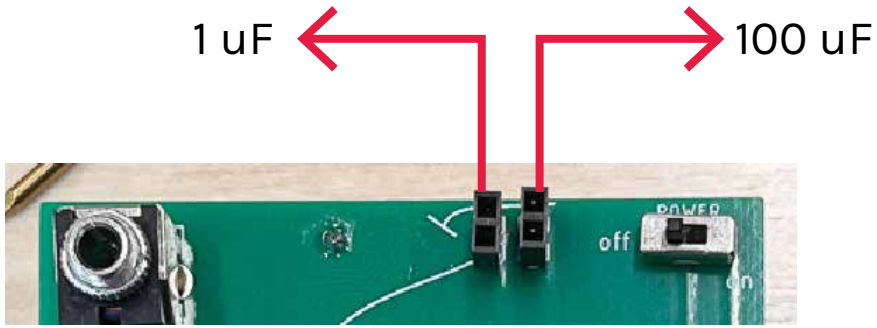


1. Plug cable into OUT and into a speaker with an Aux In
2. Turn Power switch On
3. Turn the Mod switch to On
4. Press the Source_Pitch FSR to play a square wave and to change pitch
5. Press the Mod_Pitch FSR to modulate the source wave with a triangle wave
6. Stretch the knitted sensor to change the pitch/speed of the modulating wave.

https://vimeo.com/1083987566?share

Knitted Noise

Triangle and square modded by square wave. Knit swatch changing pitch/speed of mod oscillator.



Move all the switches to the following places:

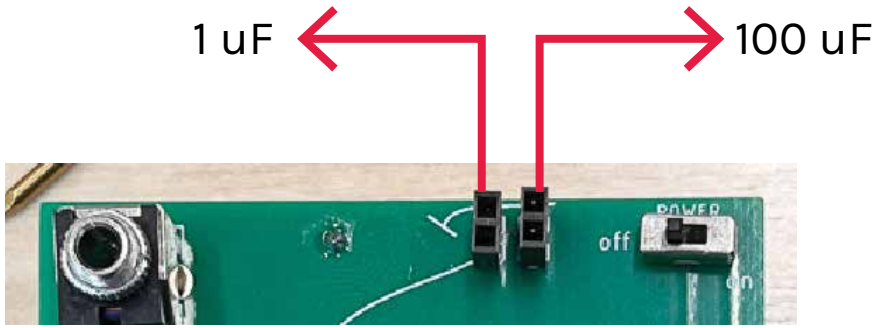
- Power switch to Off
- Swatch switch to M
- Mod switch to Off
- Mod_Wave to square
- Source_wave to SQR

1. Plug cable into OUT and into a speaker with an Aux In
2. Turn Power switch On
3. Turn the Mod switch to On. You may hear the oscillator start up once the mode switch is on and Mod_Wave is set to square.
4. Press the Source_Pitch FSR to play a square wave and to change pitch
5. Press the Mod_Pitch FSR to modulate the source wave with a square wave
6. Stretch the knitted sensor to change the pitch/speed of the modulating wave.
7. Turn the Source_Wave to TRI and turn the volume up on the board and your speaker if available.

https://vimeo.com/1083998388?share

Knitted Noise

Triangle and square source wave. Knit swatch changing pitch of source oscillator.



Move all the switches to the following places:

- Power switch to Off
- Swatch switch to S
- Mod switch to Off
- Source_wave to TRI

1. Plug cable into OUT and into a speaker with an Aux In
2. Turn Power switch On
3. Press the Source_Pitch FSR to play a triangle wave and to change pitch.
4. Turn up the volume on the board and the speaker if available.
5. Stretch the knitted sensor to change the pitch of the source wave.
6. Turn the volume down and turn the Source_Wave to SQR to hear a square wave.

https://vimeo.com/1084002393?share

Knitted Noise

Created by Lara Grant
lara-grant.com
https://github.com/laraCat/knitted-noise/
2025