

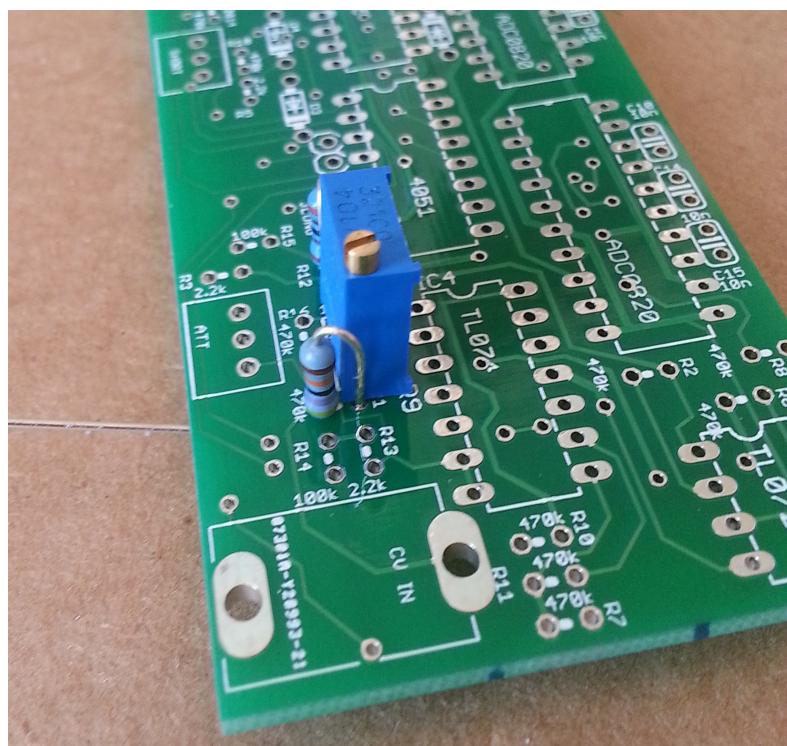
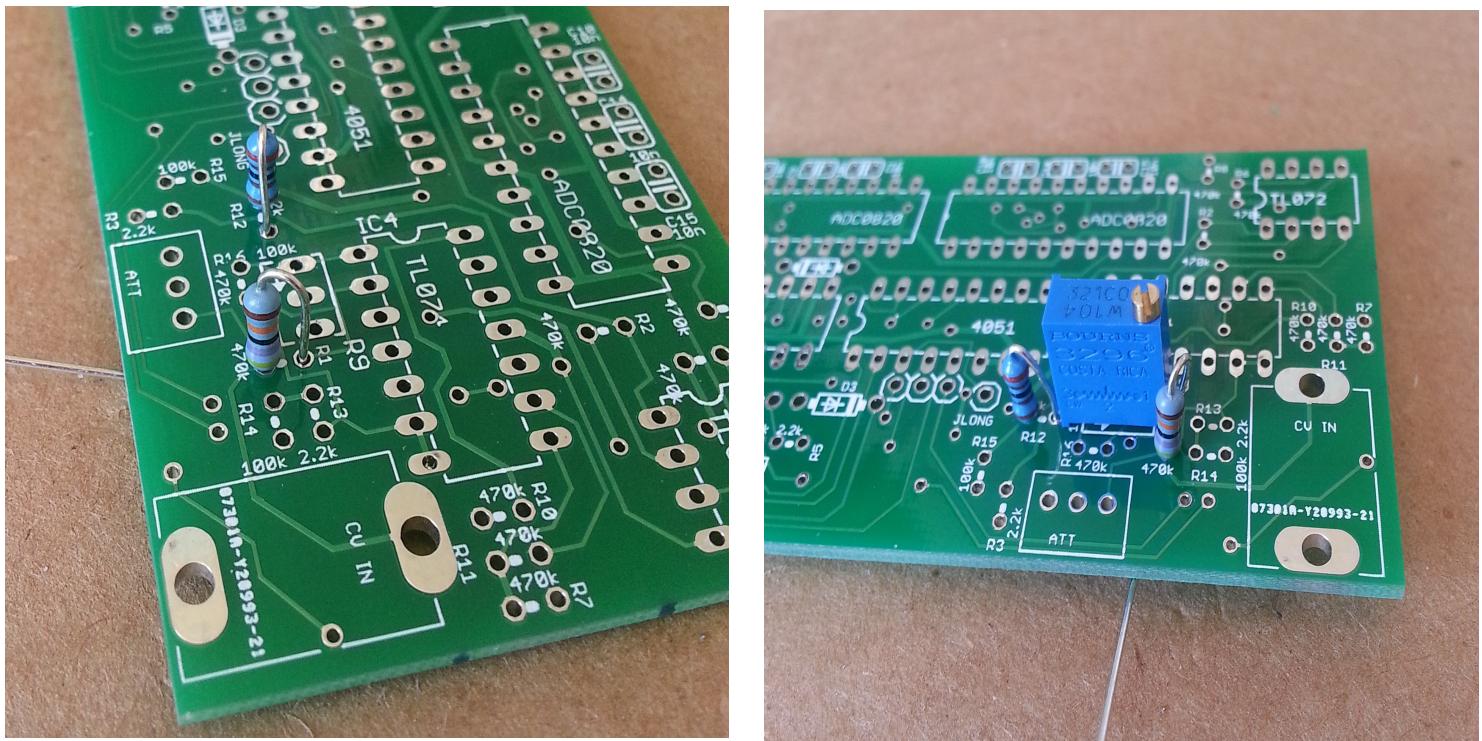
So you're building a Bytes expander, that's great! Follow the steps in this guide and it should be a piece of cake. Of course if you have any questions, you can check in with the build thread at:

<http://www.muffwiggler.com/forum/viewtopic.php?p=1646194#1646194> . Please only send me an email if you have asked your question on the build thread and no one could answer the problem. My email is: circuitshaman23@gmail.com

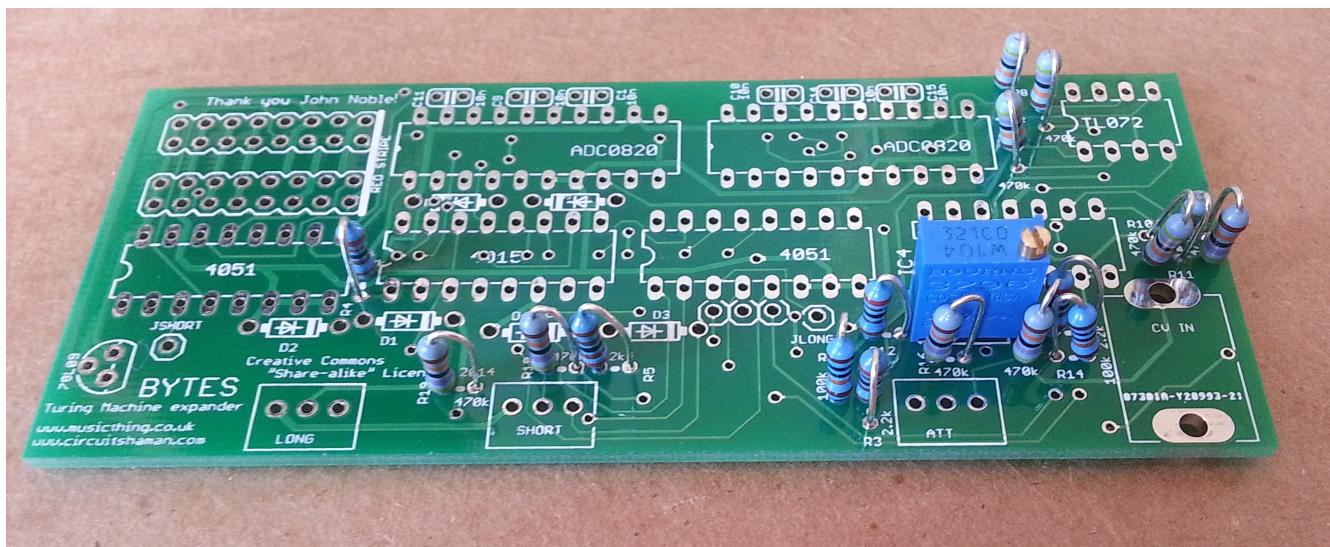
Lets begin:

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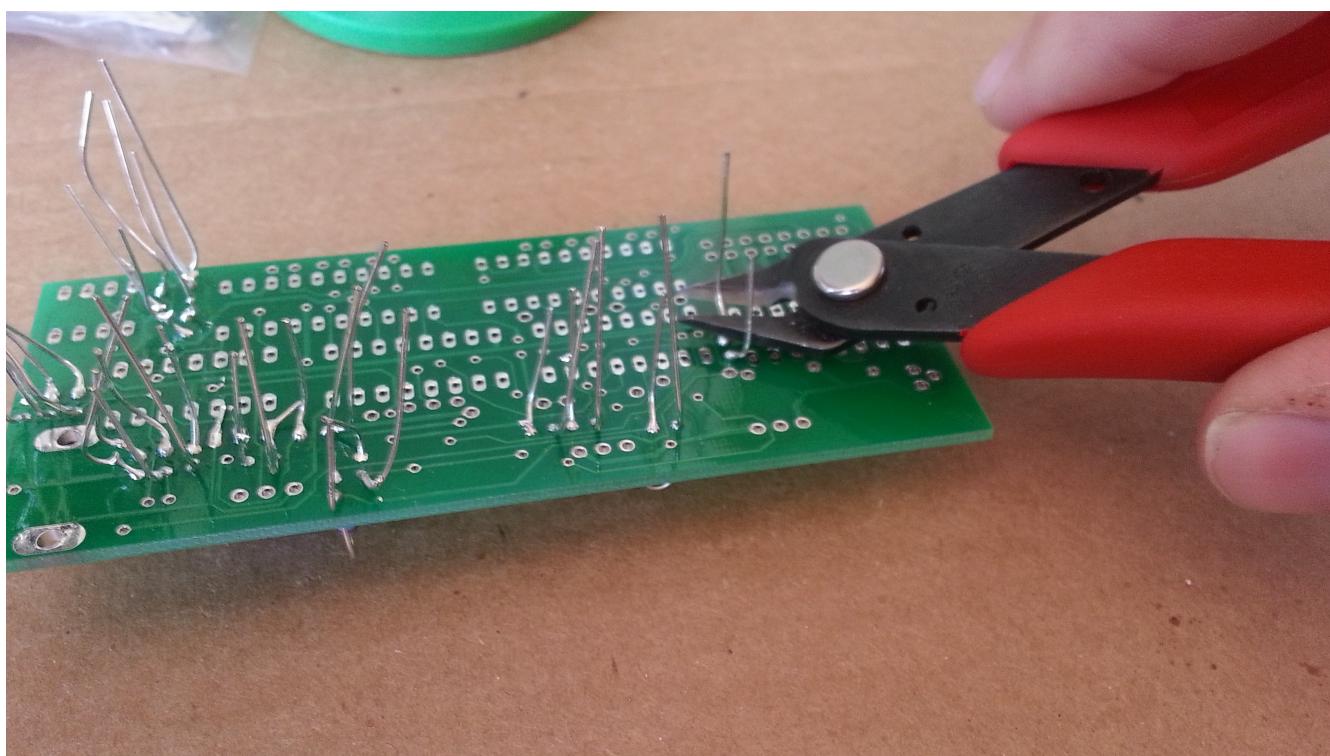
First off, there are some resistors that are very close to the trimmer and so they need to be inserted in a specific direction. Please do this FIRST as it will be a pain to desolder them and you may rip up a trace and it will be awful. Check the orientation in the pictures below and solder these parts right away. If you are unsure that you have things in the right direction just put in the trimmer and see if the body of the resistor is keeping it from going in.



Next populate the rest of the resistors:

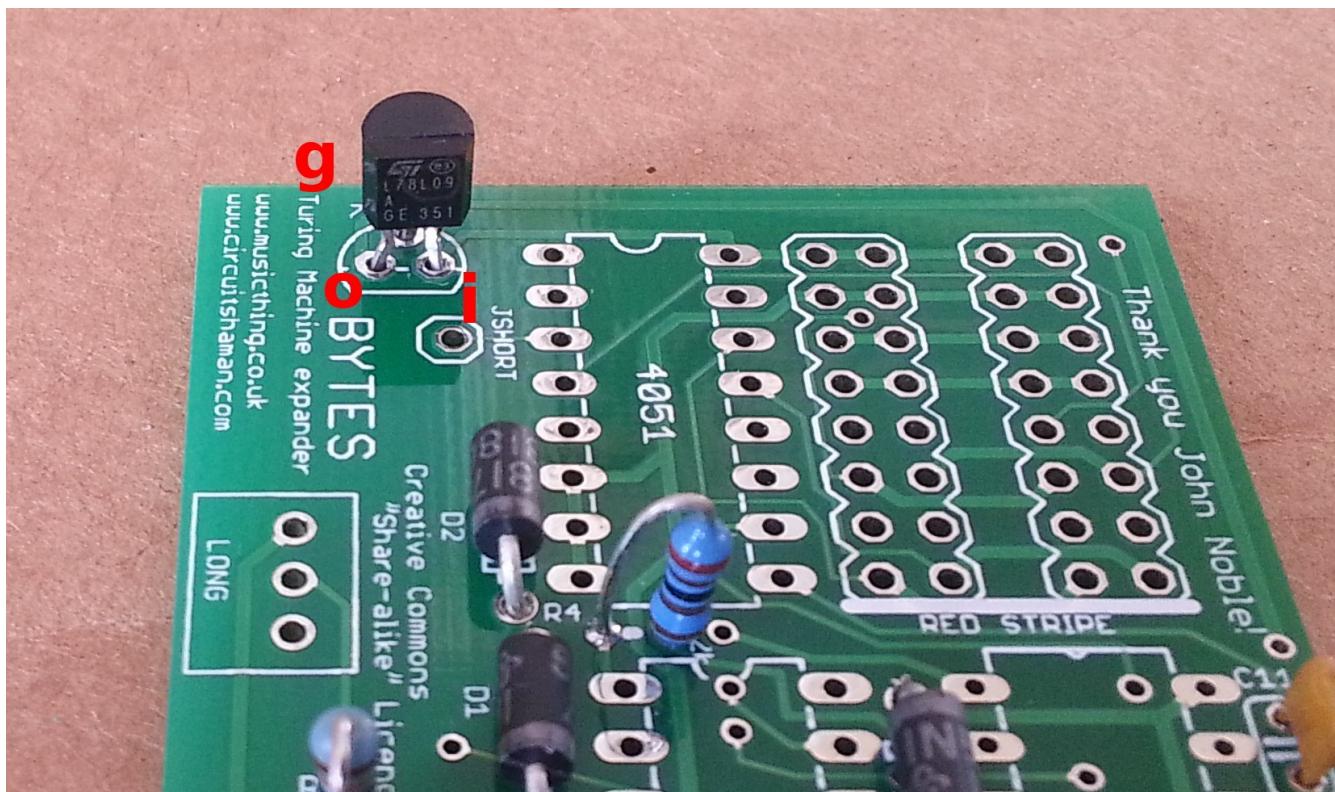
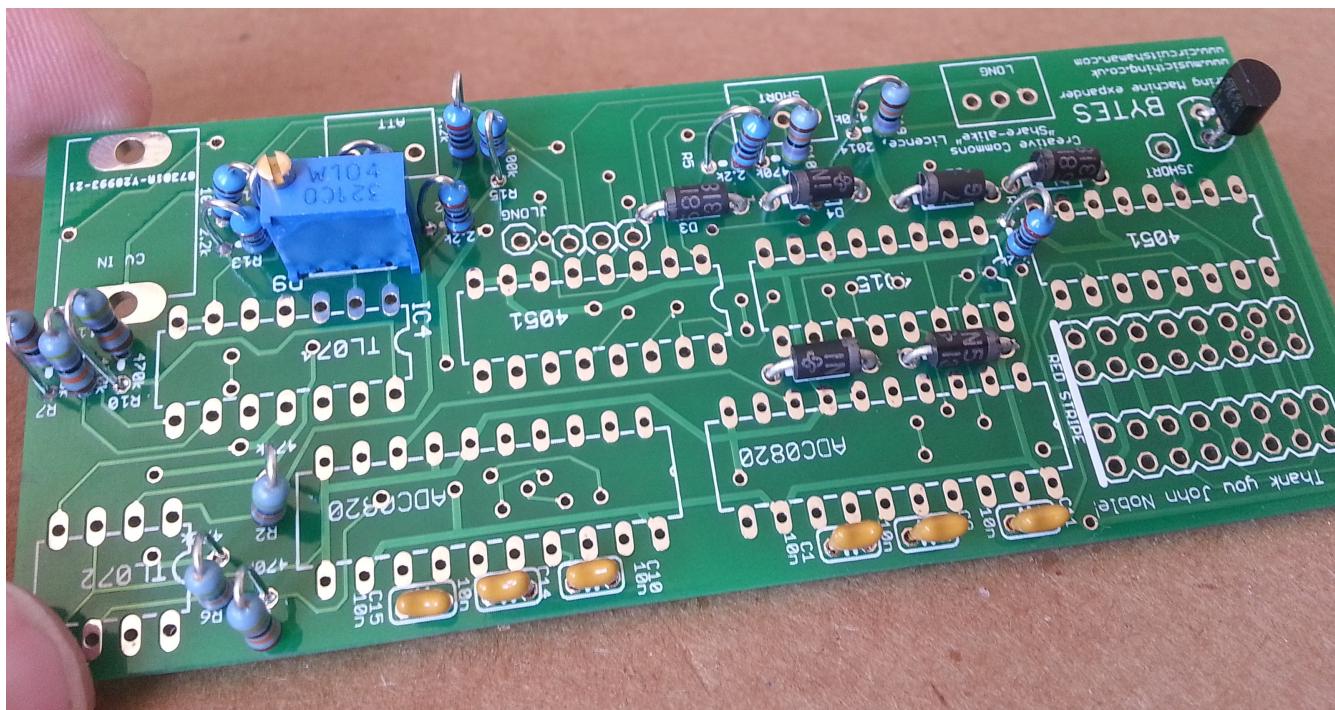


Then chop off the leads like so:



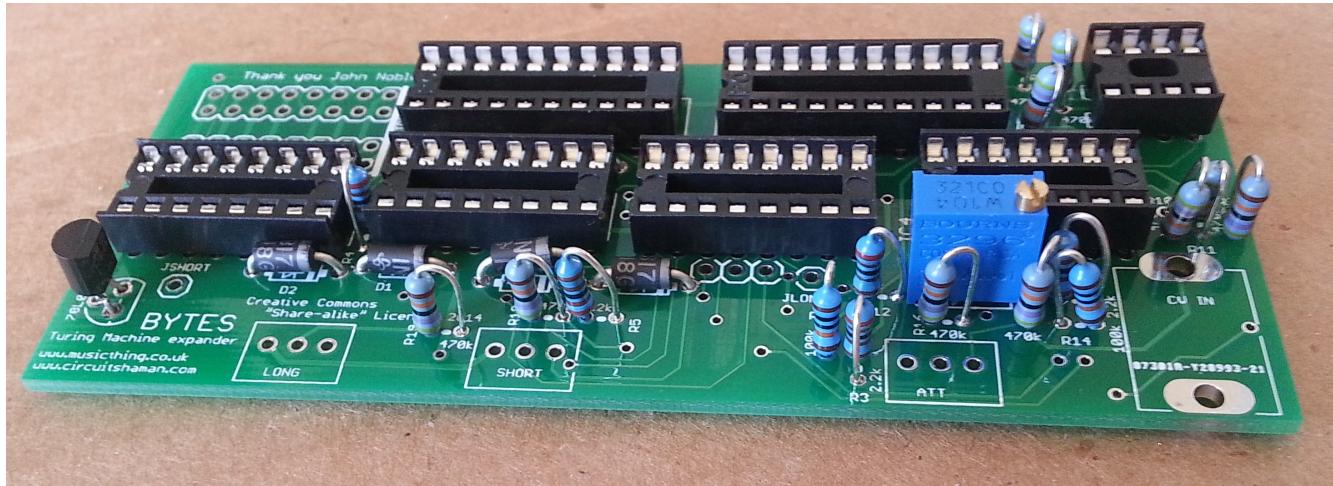
Double check to make sure that nothing is touching that shouldn't be.

Now populate the board with the diodes, the voltage regulator and the caps. Again solder, clip the leads, and check for solder bridges/ bad connections.



In case you need it here is the pin layout of the regulator I used. Ground is the middle pin in the back of the picture.

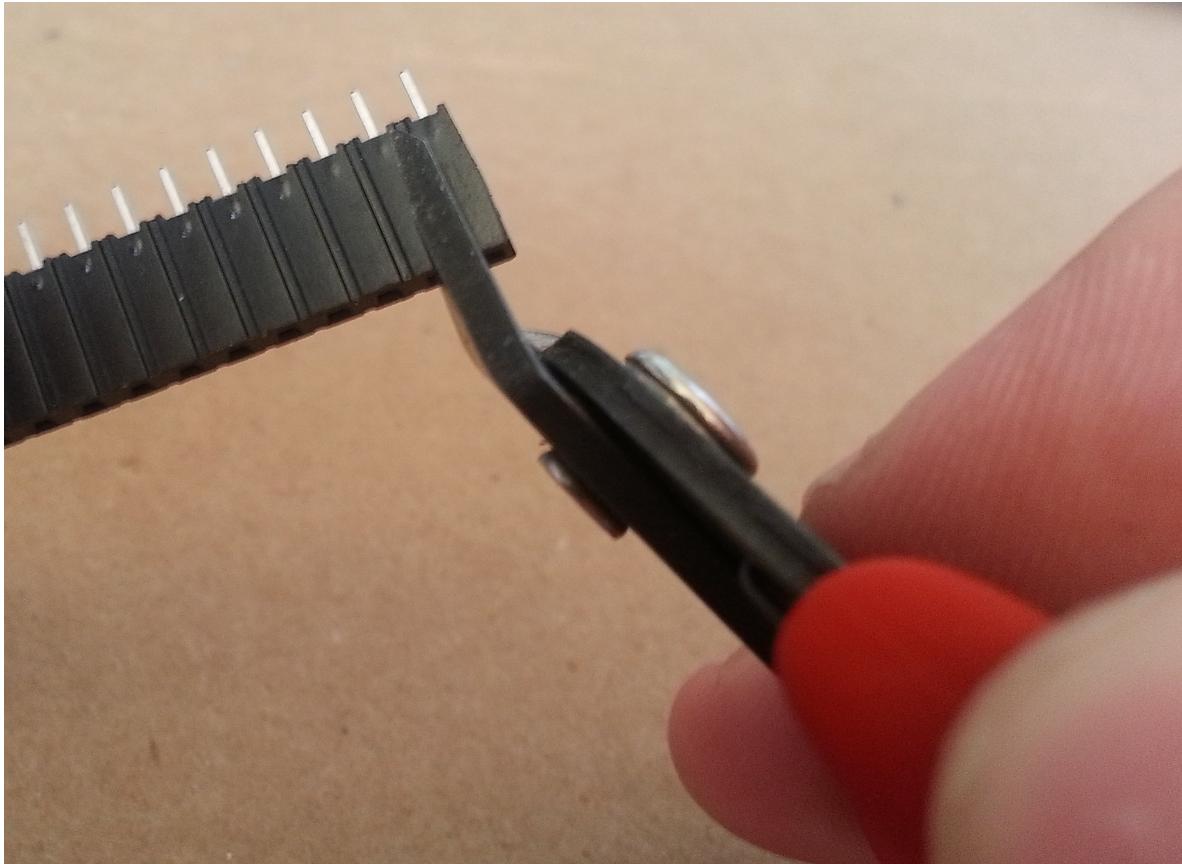
Next come the IC sockets. Check to see that they are all facing the right way. The curve in the socket should match the curve on the PCB. They all face the same direction incase you get confused.



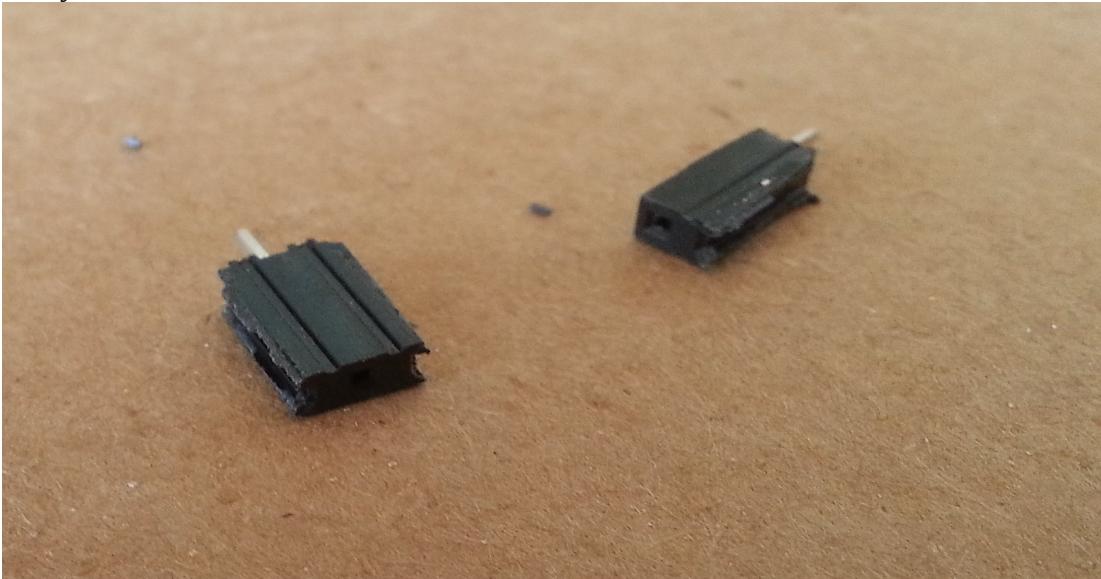
GO TAKE A BREAK! You just finished a lot of soldering and the stuff coming up can be tricky. You will work better if you are fresh. Go have some tea, do something away from the screen for a bit. You will thank yourself later!

OK back to business. Here we are going to cut a few single header sockets out of the longer 40-pin header sockets. Make sure that you have a sharp cutter tool for this as it can be a real PITA getting the socket to break cleanly. You may have to try a few times before getting something satisfactory.

I usually sacrifice an extra space on the side of wherever I am cutting and just cut half-way through the next position, essentially breaking one socket to leave the other intact.

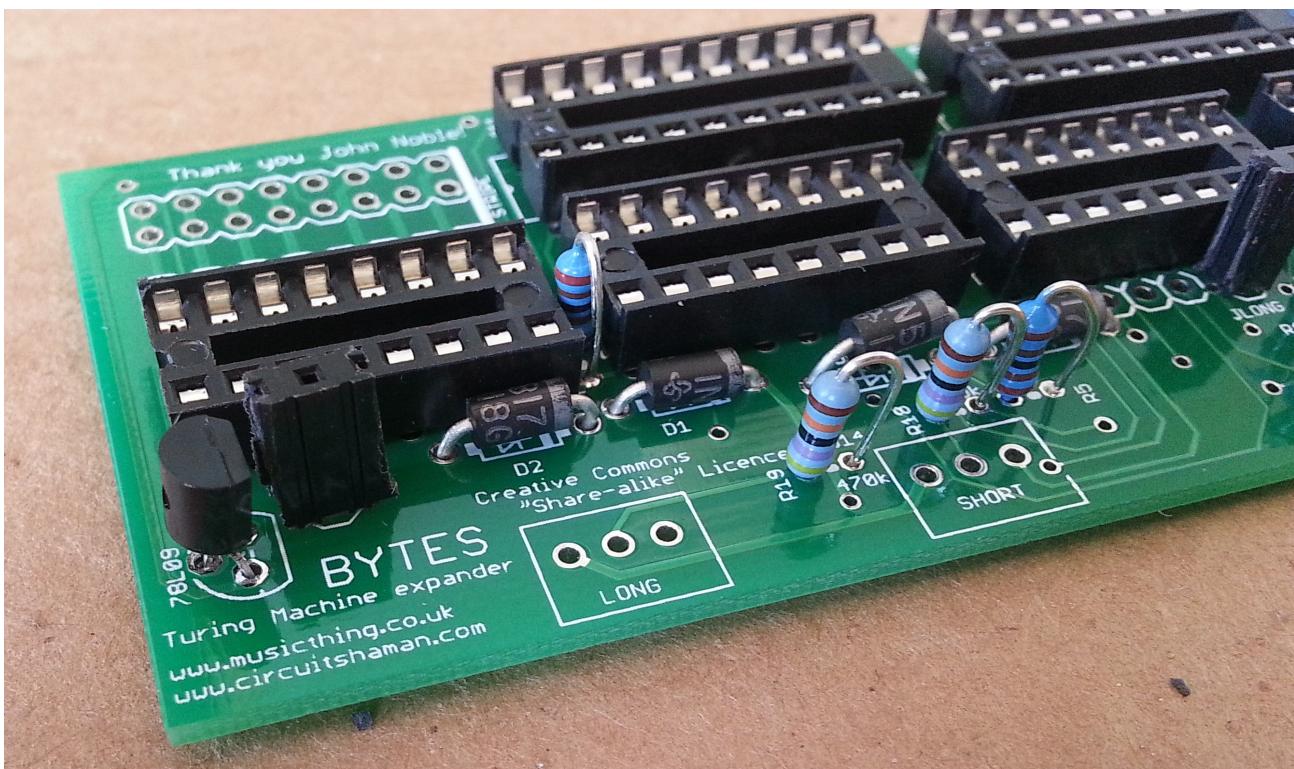
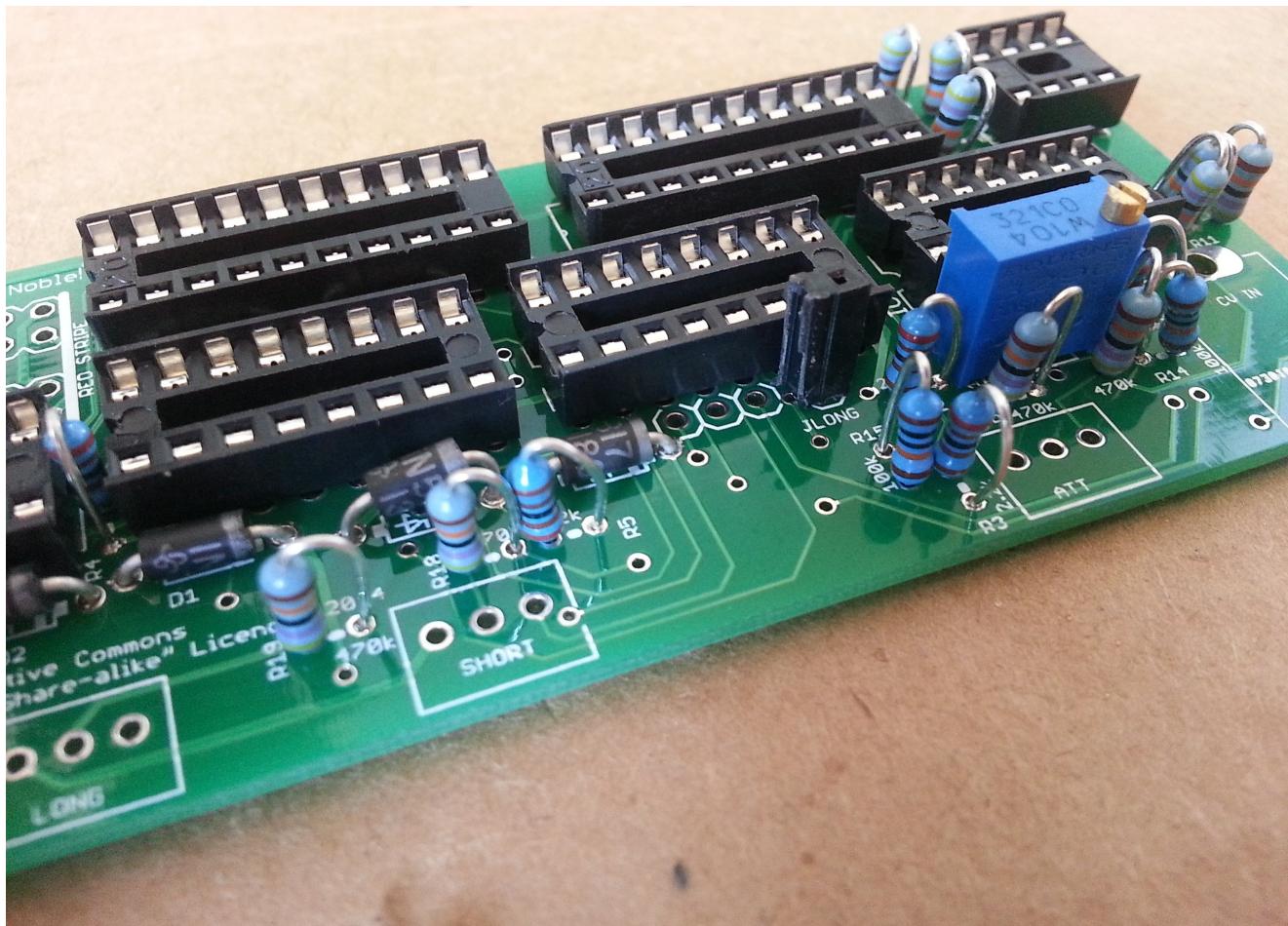


Here is what your results should look like:

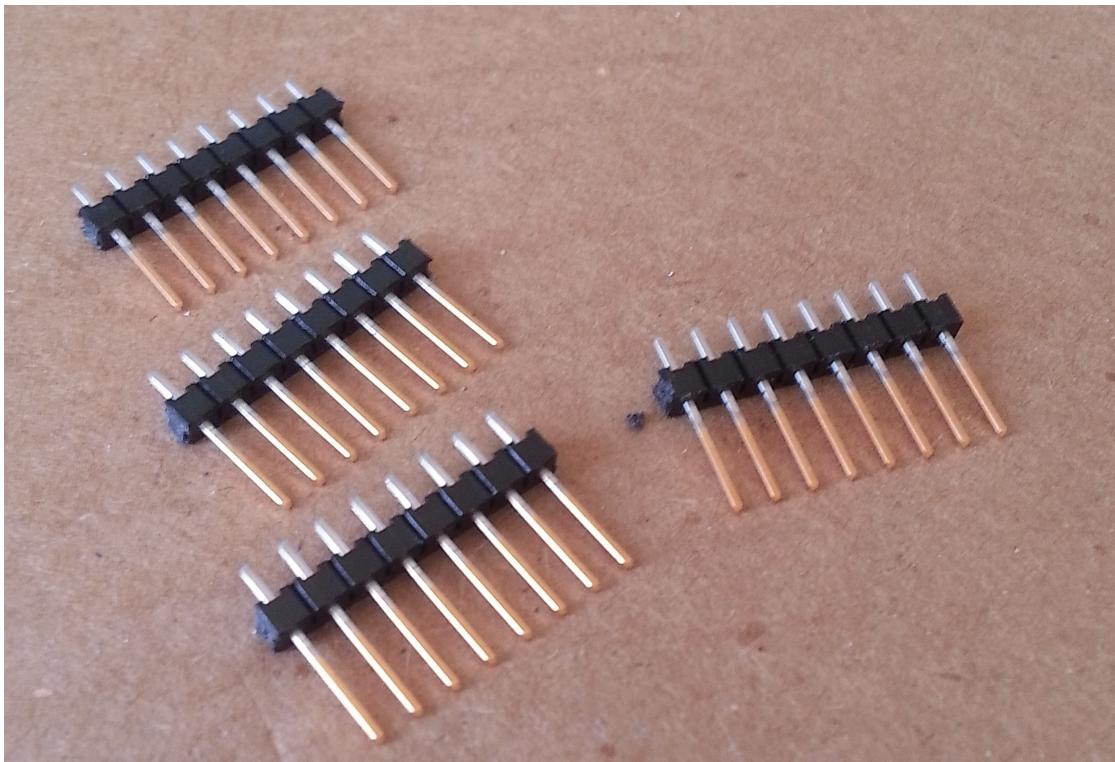
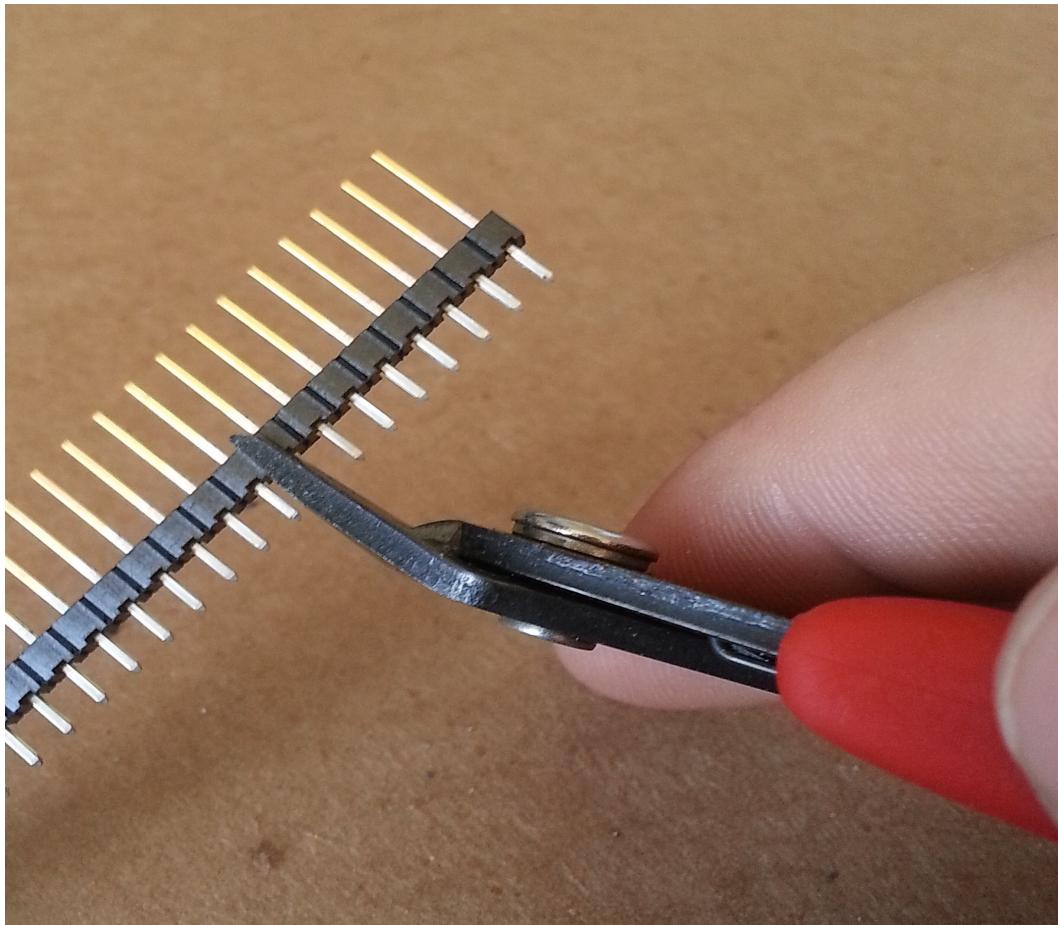


Please only trim the sides if you know what you are doing, it makes no functional difference.

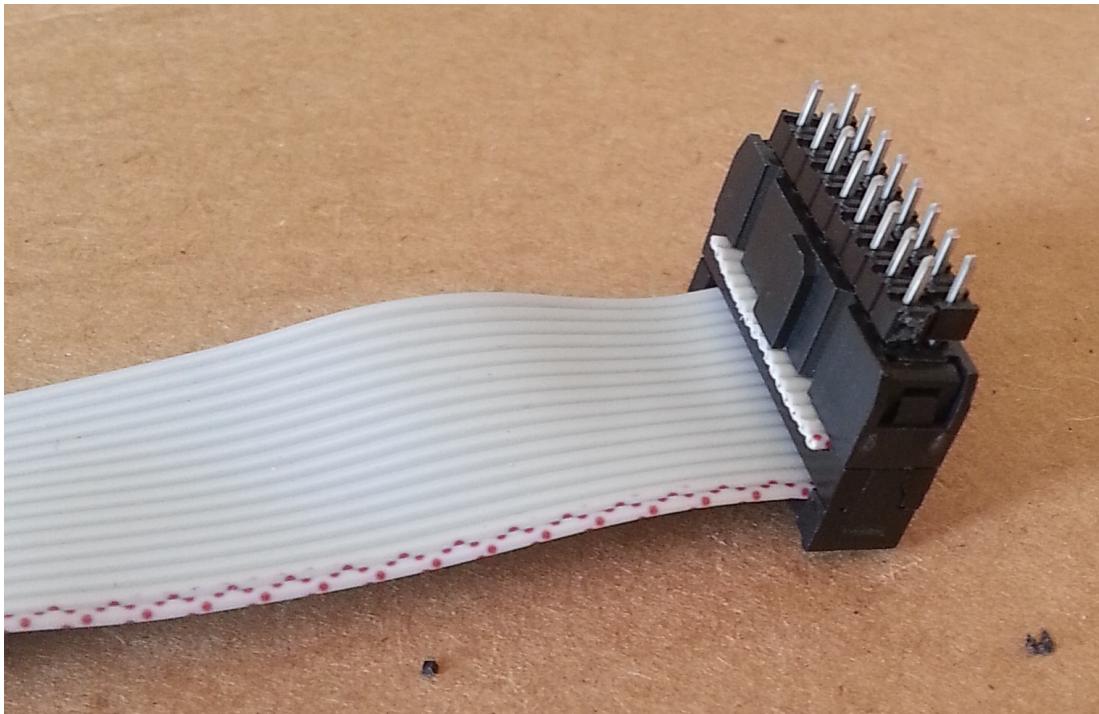
Solder the header sockets you just cut into the 2 positions marked “JSHORT” and “JLONG” in your PCB. They should be towards the voltage regulator and slightly above the trimpot.



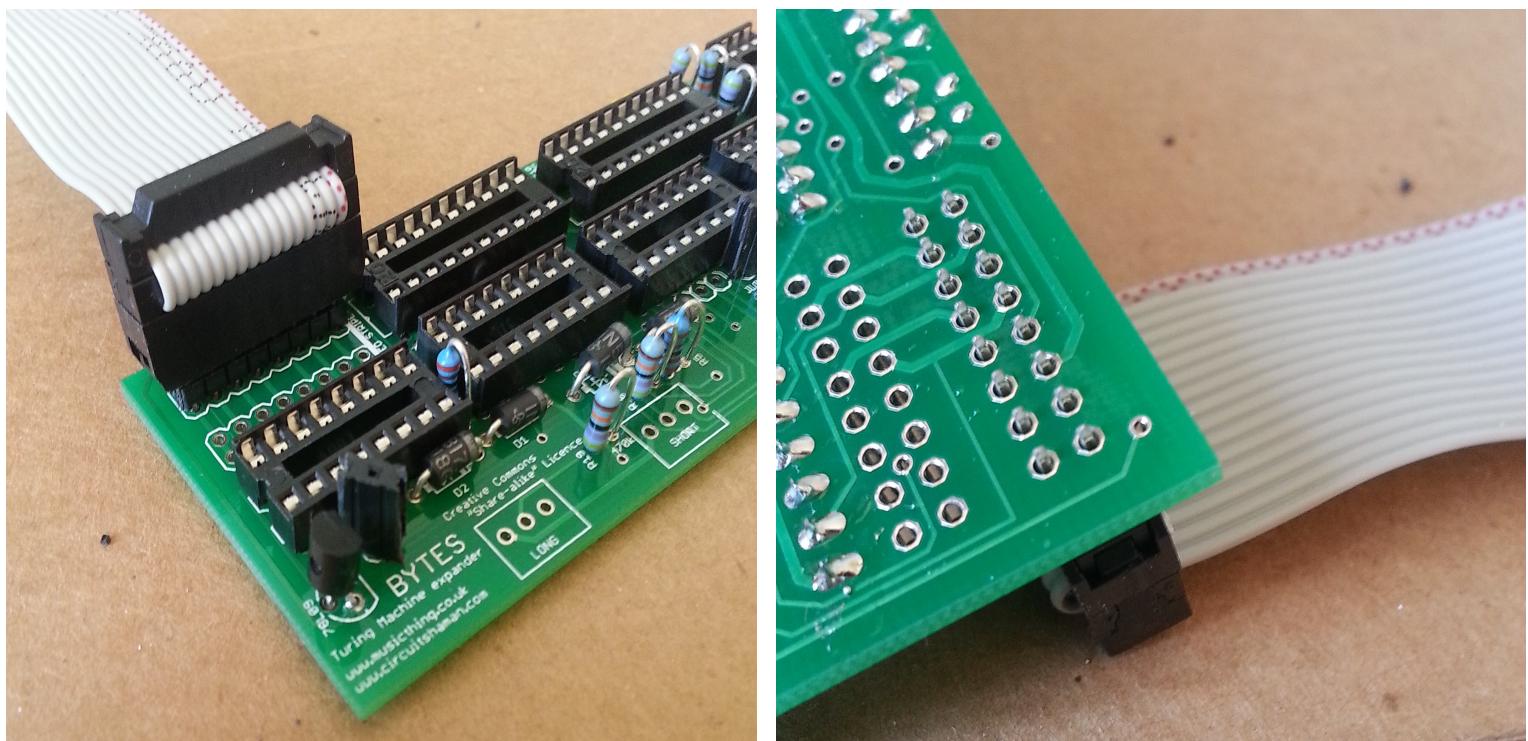
Next we will be cutting ourselves some power connector headers. Go ahead and cut x4 8-pin segments from the larger 40-pin breakaway header strip.



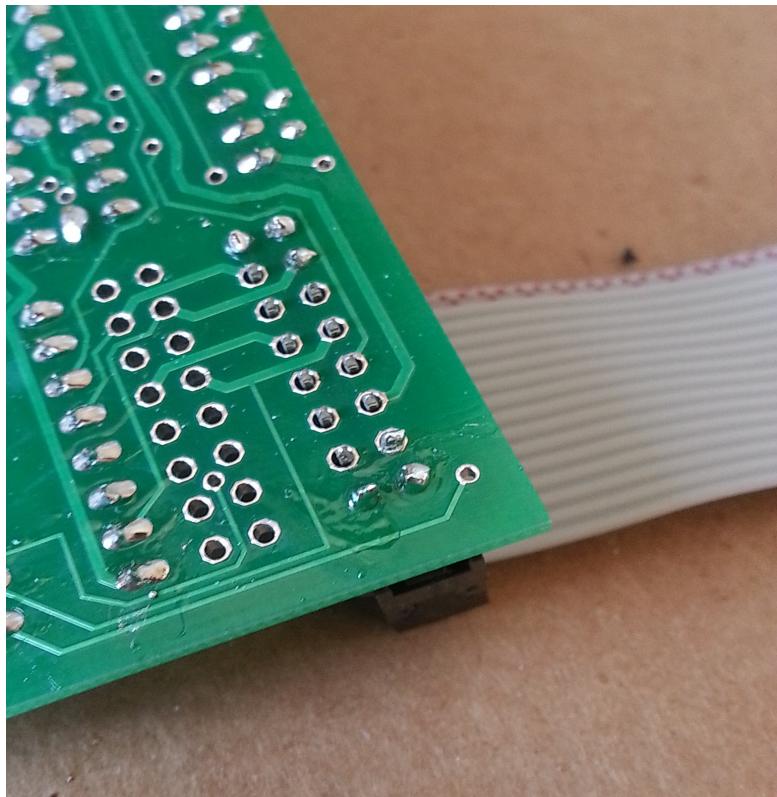
Next, grab an unused 16-pin IDC power connector and place 2 of the header segments you just cut into it as if it were going to plug in to the board.



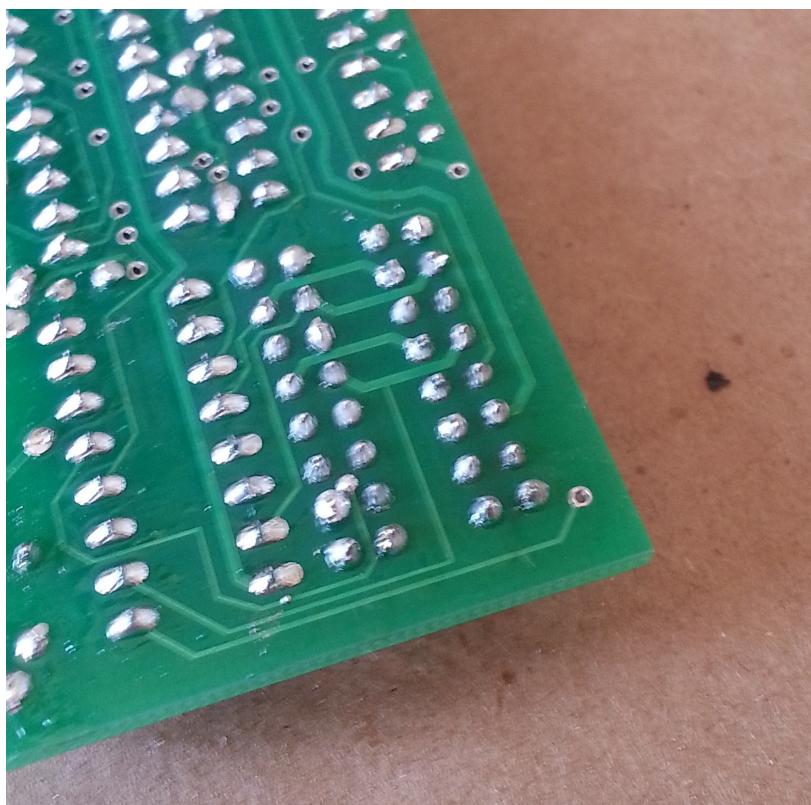
Plug this into the space where the expander headers will go in the PCB. Then flip this upside down. Do not solder yet.



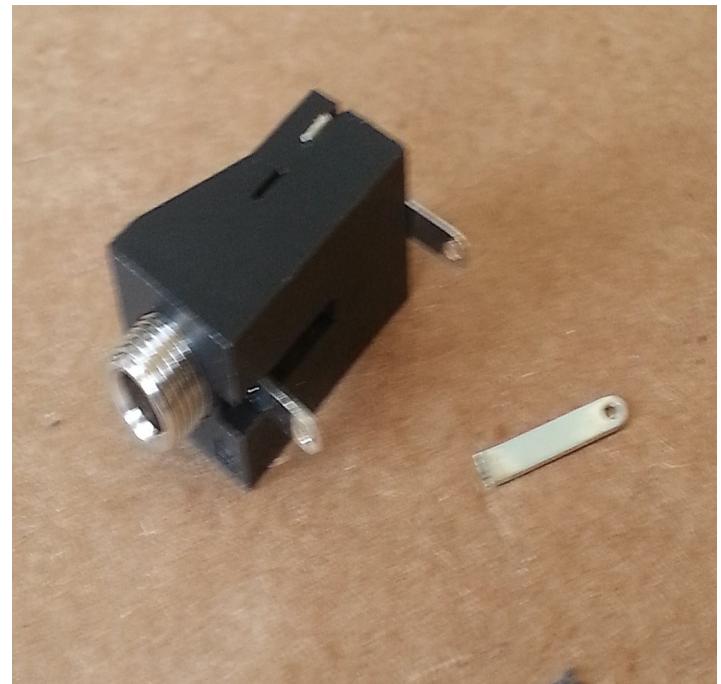
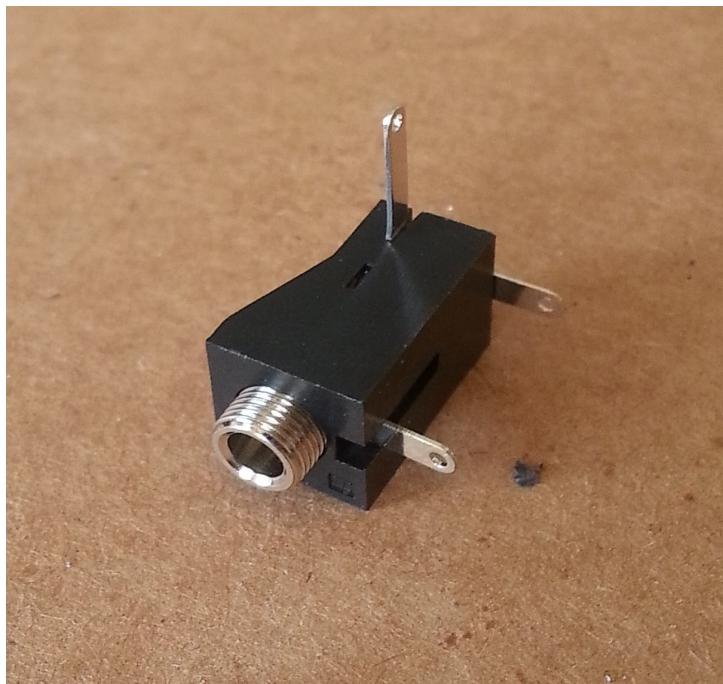
Start by soldering the corner pins of the headers to keep them in place.



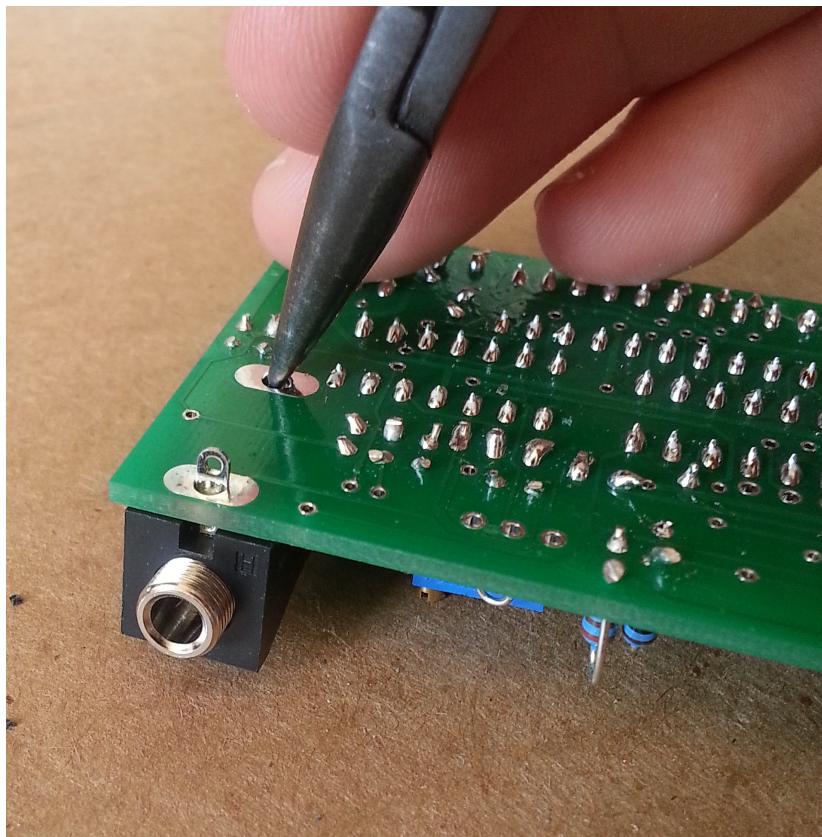
Then solder the rest of the pins. Repeat this process for the other expander socket.



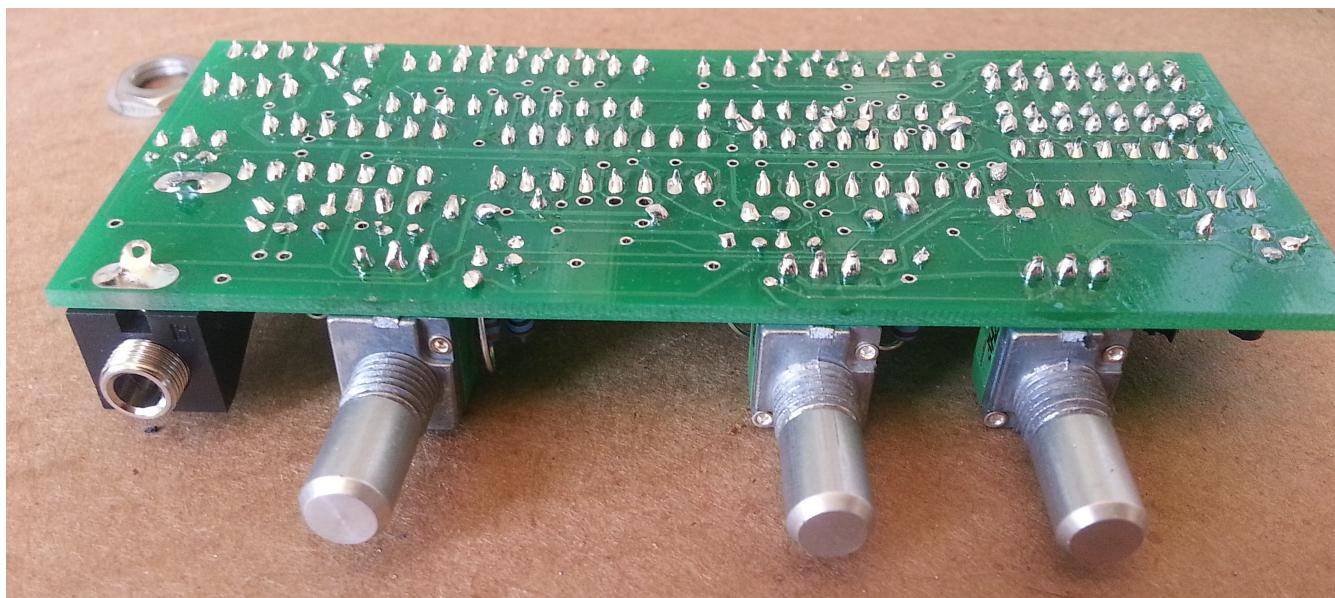
Next take your 3.5mm (1.8") jack and bend the solder lug on the side, then cut it off.



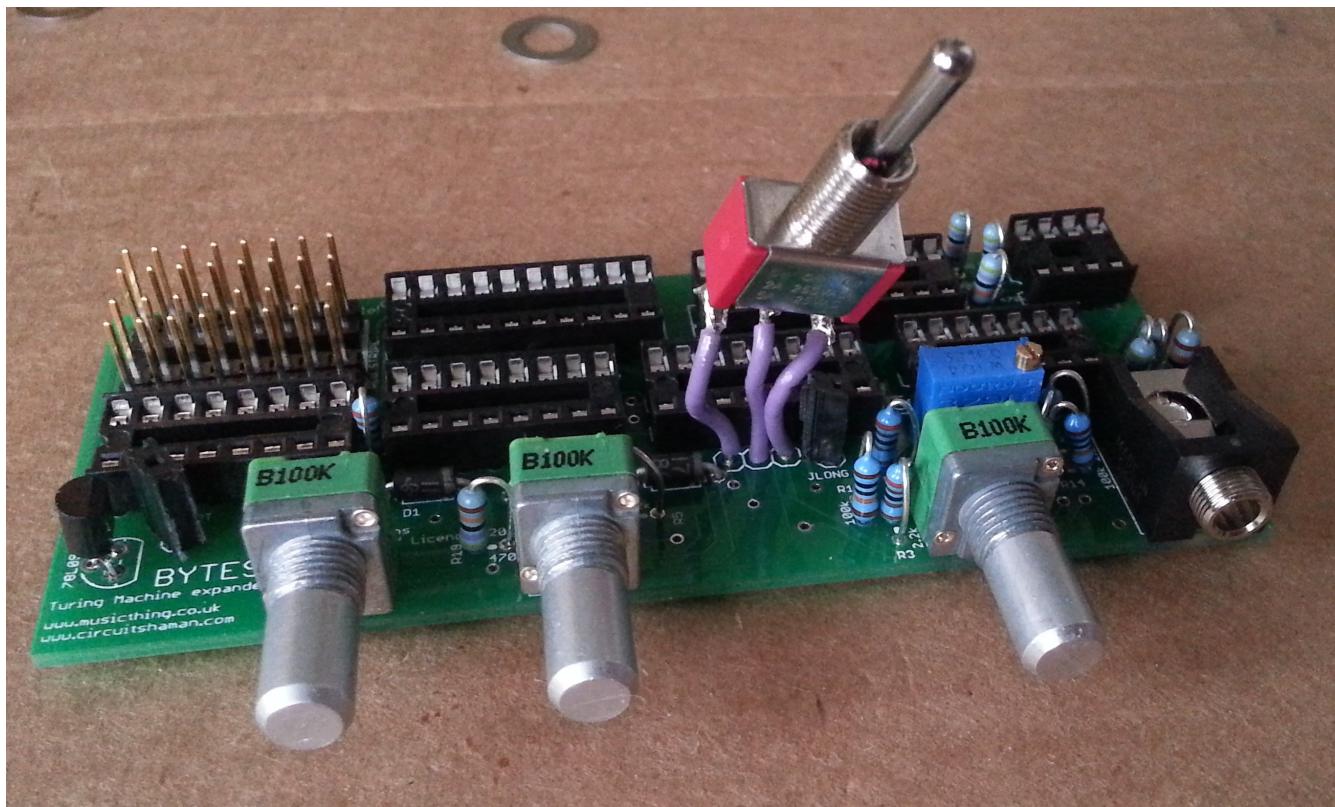
Put the jack into the PCB. You may have to pull through the back lug as that hole is a tight fit for some reason. Ok ok stop laughing.



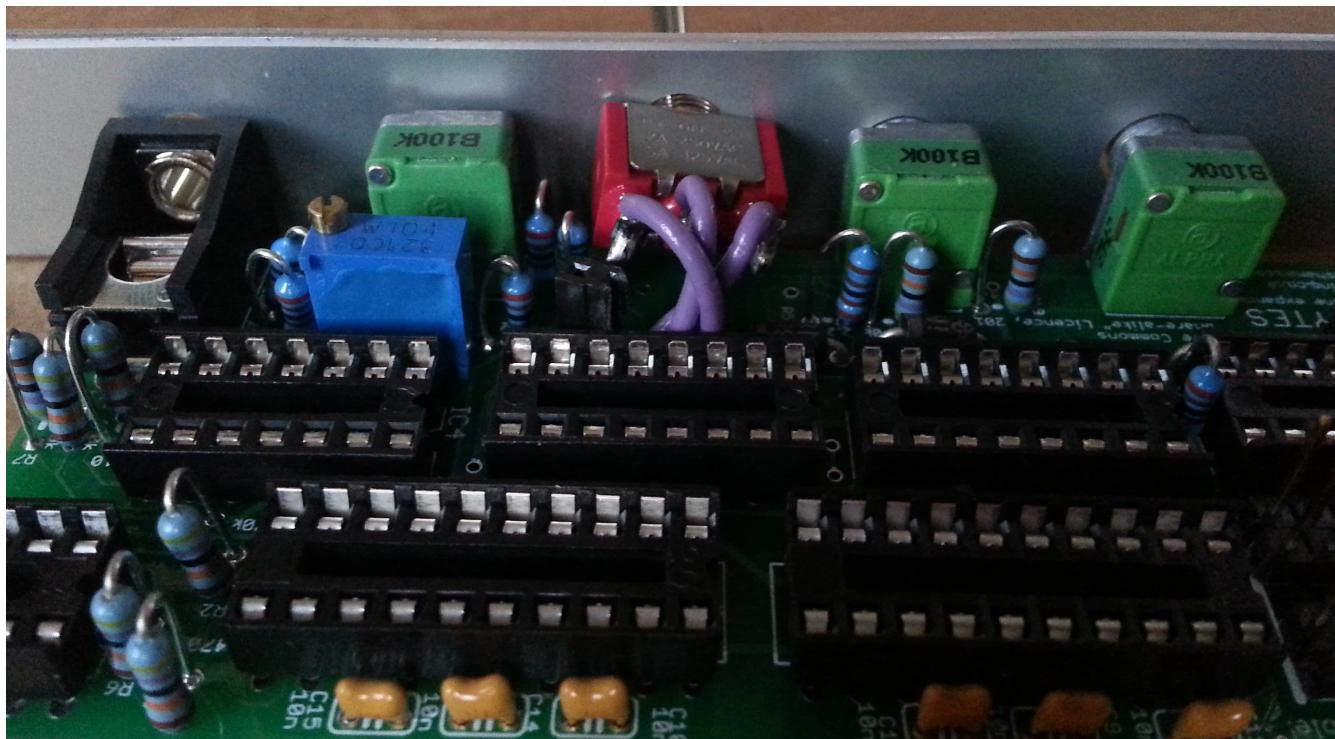
Solder the pots.



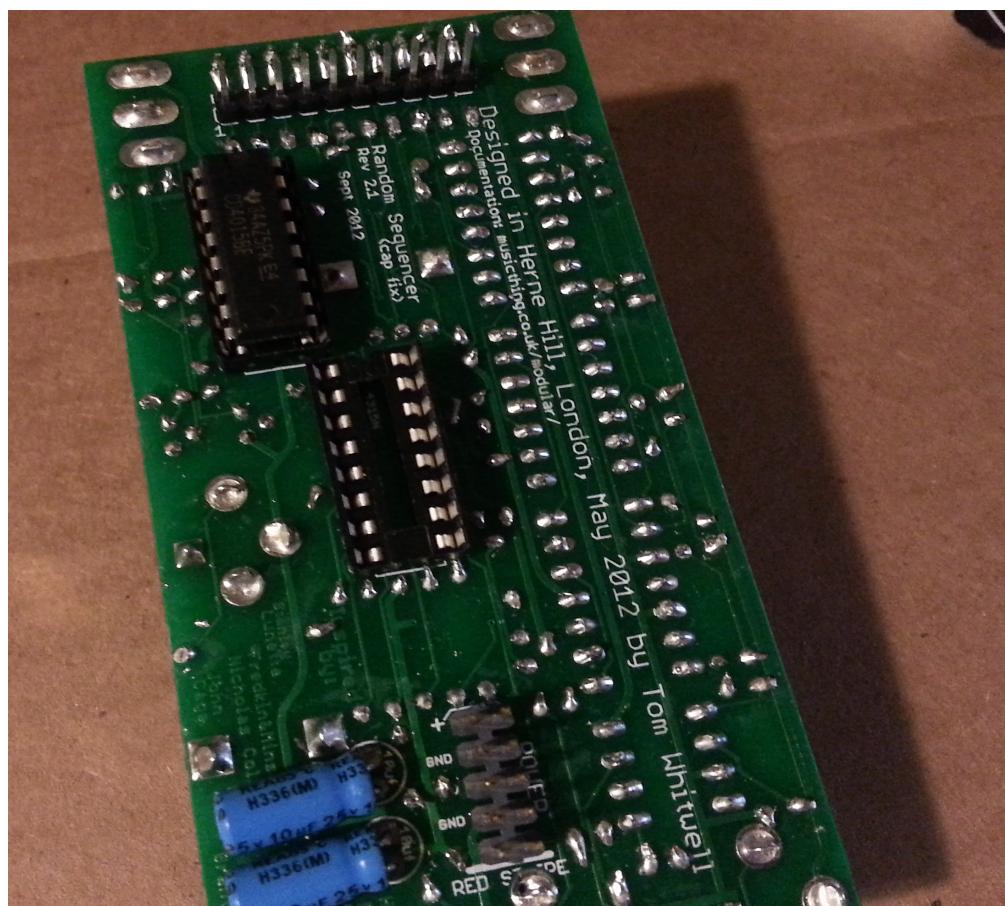
Then solder the switch. You have to panel wire this, sorry. I highly suggest using braided wire. Make the length at 1" – 1.5" so that you have some slack when you bend the switch over (see further images on next page to see what I mean.)



Now when you put the switch into the panel (which I usually do first when mounting the panel) you need to flip it around so that the pins are swapped. No matter how many times I double checked the stupid switch I always seem to get it flipped around. Hopefully you left yourself enough slack to do this.



Once you mount the panel tighten the nuts on the pots/ jack/ switch and put on your knobs. Then place in all of the chips, being careful to check their orientation. You will have to remove the lower 4015 from your main turing machine board and bring it over to the Bytes expander. I have no idea what will happen if you leave the other chip in and have a chip in the Bytes expander but I expect at best it will work normally and at worst you will FRY YOUR WHOLE SYSTEM!!! Just kidding you might just get some malfunctions in the Bytes loop but just to be safe remove that chip.





There you have it! A complete Bytes expander. Isn't it glorious? Now to modify your Turing Machine to work with the Bytes expander, please visit this link:

INSERT LINK

And then to correctly mount the Bytes expander to the Turing Machine, check this link:

<http://www.circuitshaman.com/2014/08/how-to-hook-up-your-bytes-expander.html>

And of course if you just want to learn more about how the Turing Machine works, check out Tom's original and very detailed explanation:

<http://musicthing.co.uk/modular/wp-content/uploads/2012/05/random-sequencer-documentation-v2-1.pdf>

Also my manual for how to use the Bytes expander once it has been all set up (as well as an explanation of how it works) can be found here:

INSERT LINK

Aaaand if you want to see where this all came from check out the original Buchla module:

<http://buchla.com/shop/266e-source-of-uncertainty/>

Thanks for reading!

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