



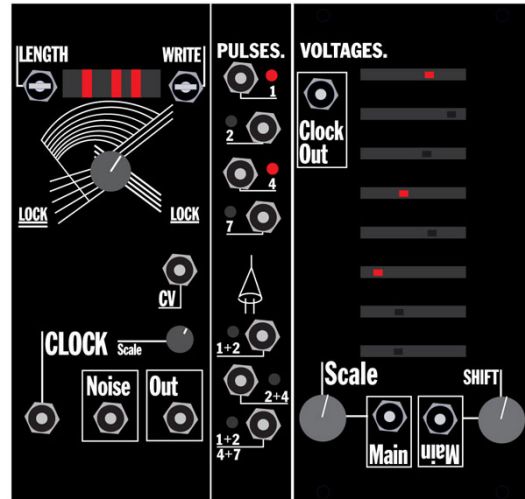
OVERVIEW

For the most recent version of this document please visit www.thonk.co.uk

For all technical support please visit <http://bit.ly/17CetJb> on Muffwiggler.

This document is an alternative to the build documentation available on the Music Thing Modular website.

http://musicthing.co.uk/modular/?page_id=323



All Think kits are sold under our standard [Terms and Conditions](#).

DIY INSTRUCTIONS

This document gives detailed instructions that assume you have purchased a complete kit from www.thonk.co.uk. It also assumes no previous knowledge of electronics. To learn to solder try http://youtu.be/l_NU2ruzyc4

Watch and understand that whole YouTube video! If you're not achieving the results shown in the video then you need to buy new tools or seek advice. You will not end up with a working module otherwise.

TOOLS REQUIRED

Soldering iron, pliers, wire strippers, small flat head screwdriver and diagonal cutters AKA snips AKA side-cutters. A Digital Multimeter is always helpful for checking for bad solder joints and continuity. Think sell a range of inexpensive tools [here](#).



BACKPACK BUILD INSTRUCTIONS

1.

Start by emptying the **BACKPACK** bag into a bowl or container. This makes it much easier to pick parts as you need them and you're less likely to lose anything.

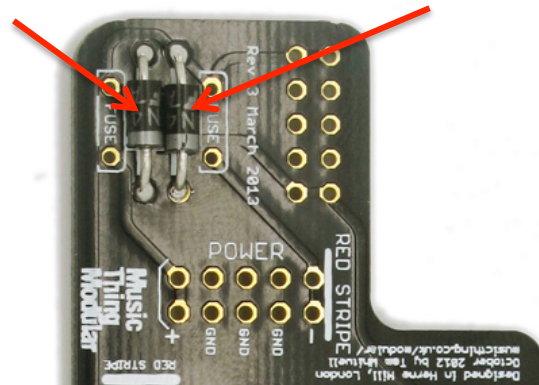


2.

Start by taking the two black and silver diodes from the protective ESD bag and solder into place. Note that the silver end of both diodes faces the Music Thing Modular logo on the PCB.

NOTE: Correct orientation is vital.

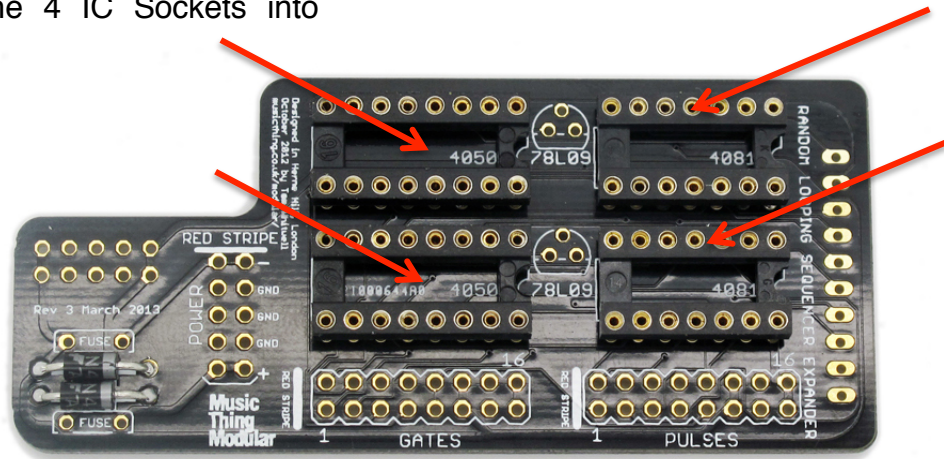
NOTE: Diodes can be damaged by excessive heat from the soldering iron, solder quick, do not let the tip rest on the lead for more than 5 seconds.





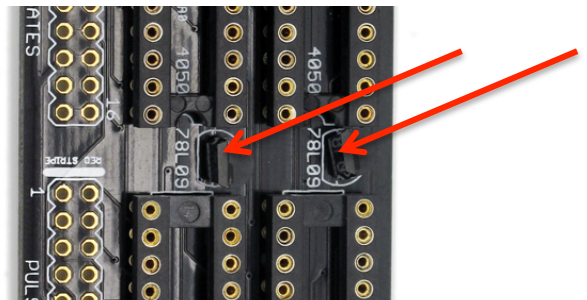
3.

Next solder the 4 IC Sockets into place.



4.

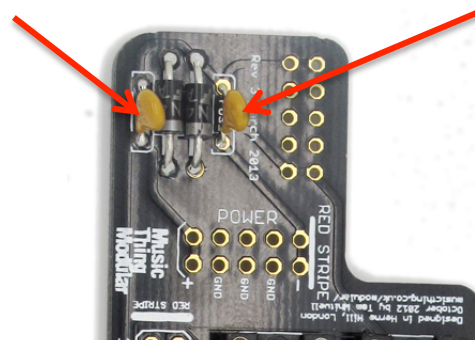
Take the two 78L09 regulators out of the protective ESD packaging and solder into place. The middle leg needs to be bent outwards slightly to fit. The flat face on the components should align with the flat edge on the silkscreen on the PCB.



NOTE: Correct orientation is vital.

5.

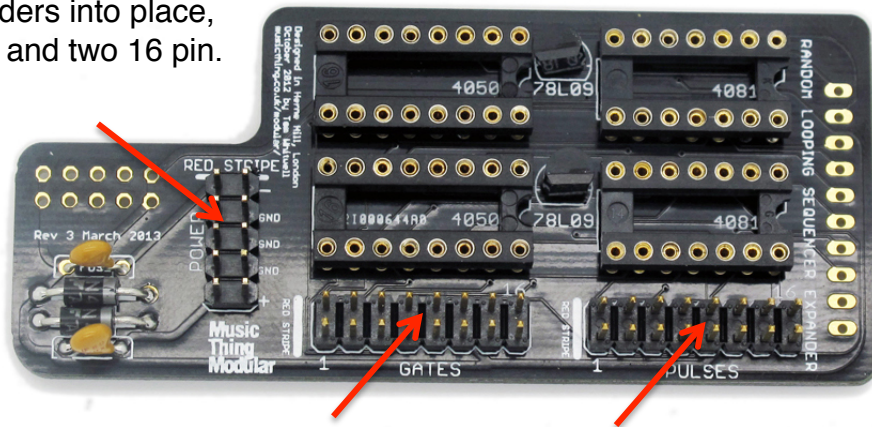
Solder the two orange polyfuses into place next to the diodes. The orientation on these is not important – either way is fine.





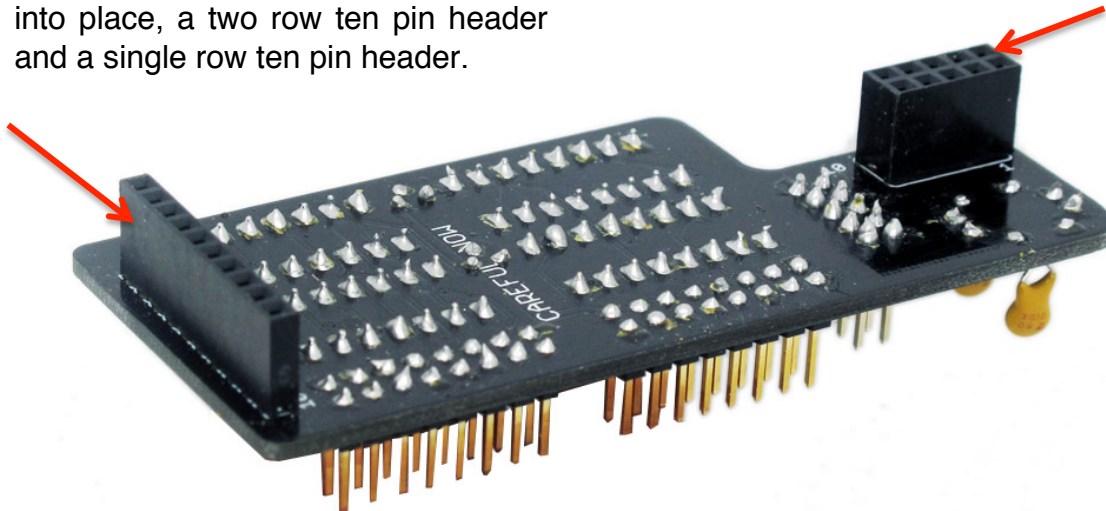
6.

Solder the 3 headers into place,
the single 10 pin and two 16 pin.



7.

Now flip the board over and solder
the two black plastic female headers
into place, a two row ten pin header
and a single row ten pin header.

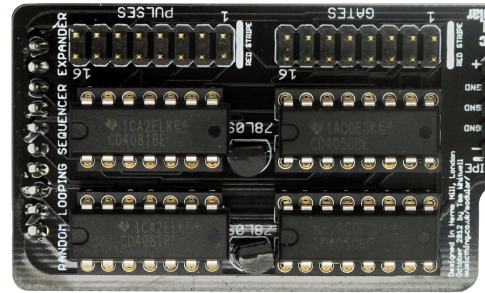




8.

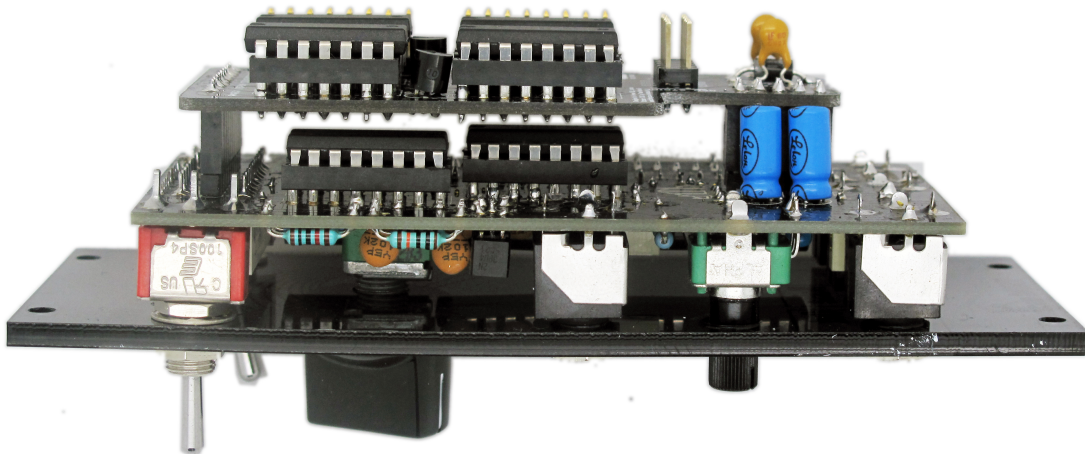
Now insert the four ICs as shown, make sure the notch in the top of the IC matches the notch in the socket.

NOTE: Correct orientation is vital.

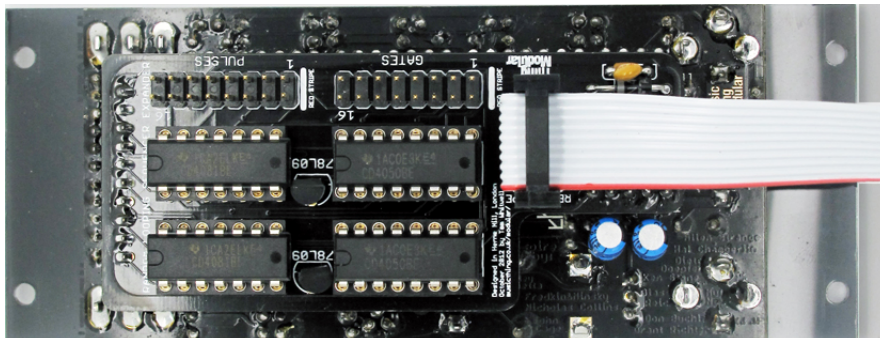


9.

Now take your Turing machine module, remove the power cable and fit the backpack into place like so.



Plug the original power cable into the backpack with the red stripe as shown.



This is a good point to just quickly test your Turing Machine with backpack attached. It should operate completely normally.

The only difference right now is that your Turing Machine is now also protected from having the power cable connected backwards! You don't want to be aggressively testing that feature though!

You're now ready to move onto building the expander modules, PULSES and/or VOLTAGES.



PULSES BUILD INSTRUCTIONS

10.

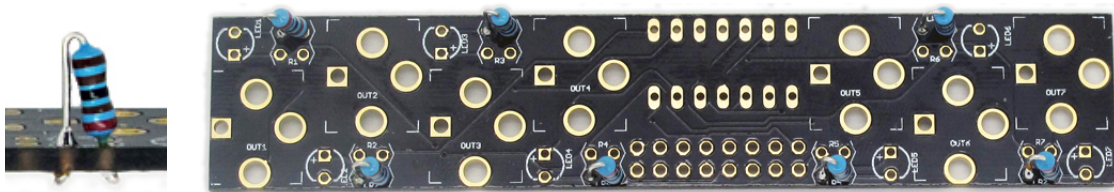
Start by emptying the **PULSES** bag into a bowl or container. This makes it much easier to pick parts as you need them and you're less likely to lose anything.

It's advised to paint the front panel **AFTER** the electronic construction is complete.



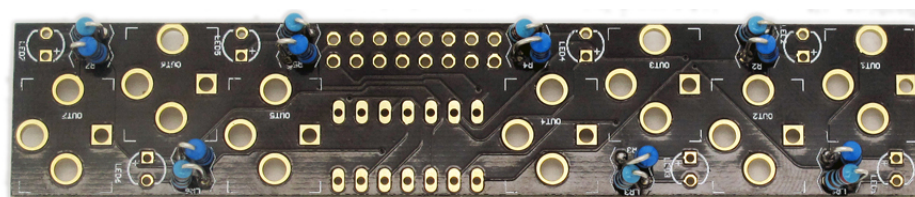
11.

Start with the seven 2.1K Resistors in positions LR1-LR7. These are the resistors on the **outside** edge of the board. These resistors are mounted vertically as shown below.



12.

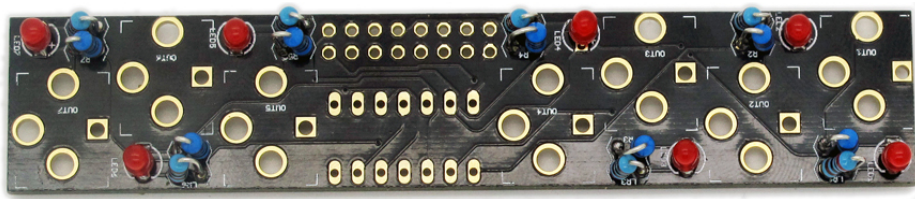
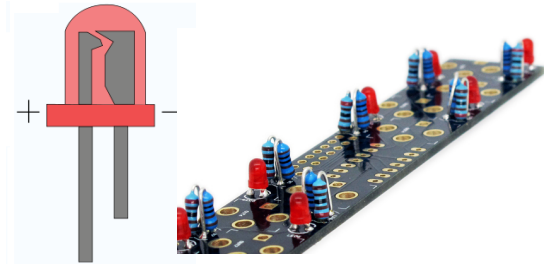
Next solder the remaining seven 1K Resistors in positions R1-R7. These are the resistors on the **inside** edge of the board. These resistors are also mounted vertically as shown below. They should be soldered in a mirrored formation. If fitted neatly there should be no chance of shorting with the paired resistor.





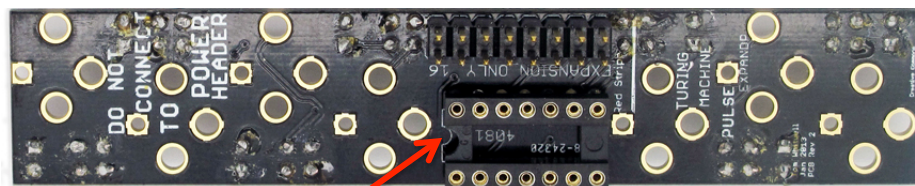
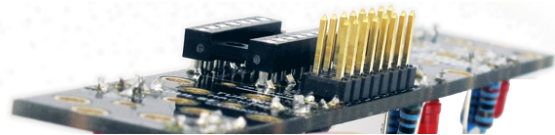
13.

Next solder the 7 red LEDs into place. The long lead/leg on the LED is the positive terminal, the Anode. This should go into the hole marked with a +.



14.

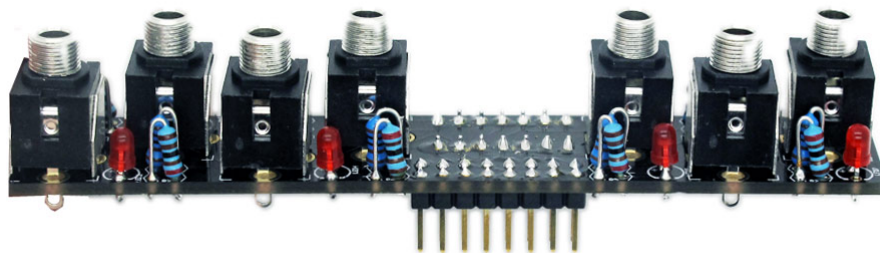
Now flip the PCB over and solder the IC socket and Expansion header into place.



TAKE CARE: Ensure the notch in one end of the IC Socket is aligned with the silkscreen outline on the PCB.

15.

Now put the seven jack sockets into place on the PCB but **DO NOT SOLDER YET.**

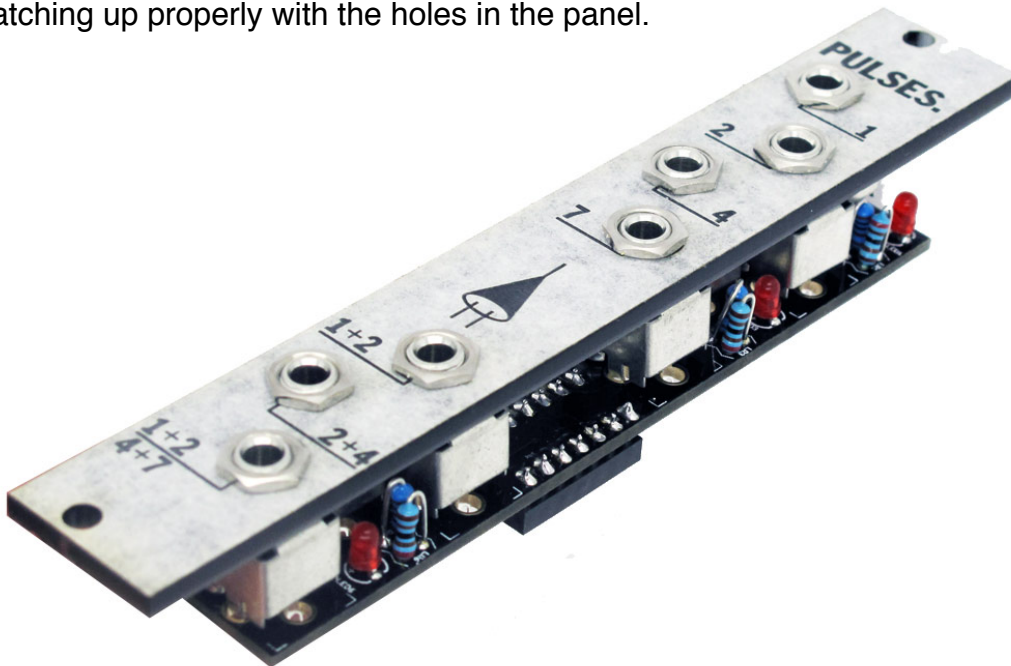




16.

With the jacks still **NOT** soldered, temporarily put the front panel on and hand tighten the nuts.

Make sure the PCB is parallel to the frontpanel and all the jacks are properly seated, then solder all 4 terminals on all 7 jacks. It's best to solder like this with the panel loosely in place as it eliminates the possibility of your jacks not matching up properly with the holes in the panel.

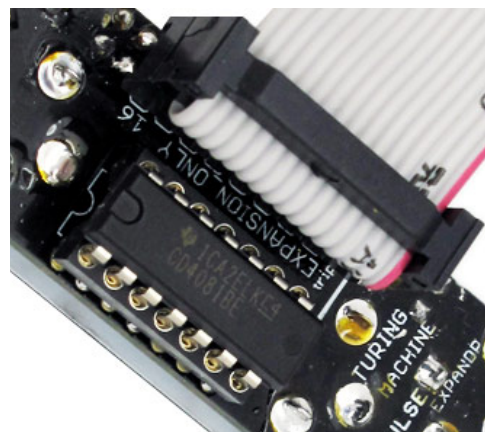


You can now remove the panel for painting later.

17.

Insert the IC as shown, with the indentation in one end of the IC matching the notch in the IC Socket.

**NOTE: CORRECT ORIENTATION
OF IC IS VITAL TO AVOID
DAMAGE.**





18.

Next you should test your PULSES module by hooking up to the BACKPACK which is fitted to your Turing Machine.

Use the 16 pin ribbon cable and attach to the top PULSES header on the BACKPACK. Ensure you correctly orient the red stripe of the ribbon cable on both modules.

Your PULSES expander is now ready for use.

