



OVERVIEW

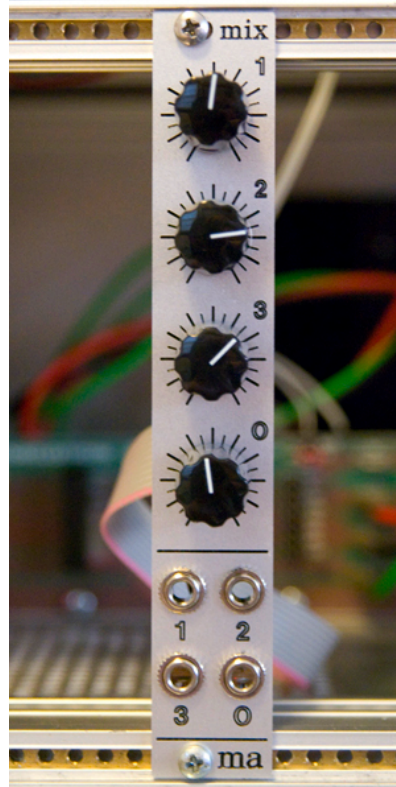
For the most recent version of this document please visit www.thonk.co.uk

For all technical support please visit <http://bit.ly/WusO5b> on Muffwiggler.

The Manhattan Analog 'mix' is a 4hp Eurorack module designed primarily for clean, high-quality audio mixing. It is DC-coupled so that it retains utility as a CV mixer when necessary.

Under the hood it's a dead-simple op amp mixer with three unipolar inputs and an output, which can be switched between uni- and bi-polar operation with a jumper on the board. The inputs use audio-taper pots and the output is linear to facilitate both modes of operation.

It is reverse-power-protected and is completely skiff-friendly at just over 1.25" deep [33mm.] The module consumes 25mA of current, 12.5 from each rail.



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

TOOLS REQUIRED

Soldering iron, pliers, wire strippers, small flat head screwdriver and diagonal cutters AKA snips AKA side-cutters.



BILL OF MATERIALS

# incl'	Description	Info
1	MA Mix Aluminium Panel	
1	MA Mix PCB	
1	Power ribbon cable	
4	3.5mm Jacks	Panel mounted
3	50k audio pots, Alpha 9mm	
1	50k linear pots, Alpha 9mm	
4	Knobs	
1	IC – LME49720	In foam in pink anti-static bag
1	8 Pin IC socket	
1	16p Euro header	Power connector
1	3 Pin header and shunt	
2	Ferrite Bead	
2	1N4001 diode	D1, D2 – In anti-static bag with IC.
2	22uF electrolytic capacitor	
2	100nF ceramic capacitor	C3, C4
1	20pF ceramic capacitor	C5
6	47k resistors, 1% metal film	R1, R2, R3, R4, R5, R7
1	470R resistors, 1% metal film	R6
2	Pieces of wire	

I have provided roughly 50% more wire than you should require for a single build. However, do take care to use it efficiently.



BUILD INSTRUCTIONS

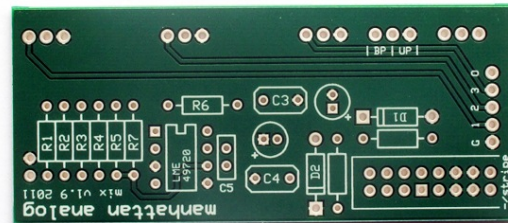
1.

Start by emptying **Bag A** 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.



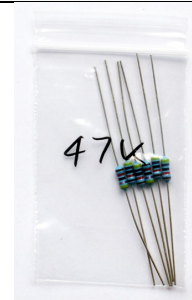
2.

We're going to start with all the PCB mounted components.



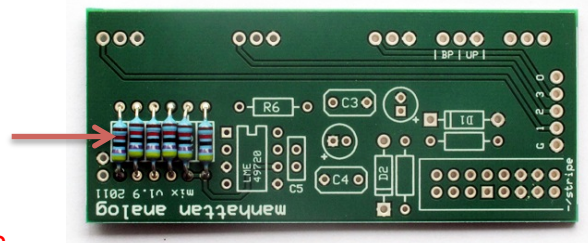
3.

Identify the bag of six 47K resistors.



4.

Solder the six 47K resistors into positions R1, R2, R3, R4, R5 & R7



NOTE Save at least one of the leads you cut off the resistors until later, we're going to use it when we come to the panel jacks.



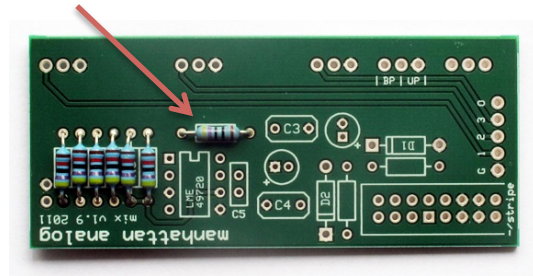
5.

Identify the bag containing one 470R Resistor. This is the only resistor you should have left.



6.

Solder into position R6.



7.

Remove the two 1N4001 Diodes from the anti-static bag. Keep the IC chip safely in the bag for the time being and put to one side. The IC chip should not be installed until right at the very end.

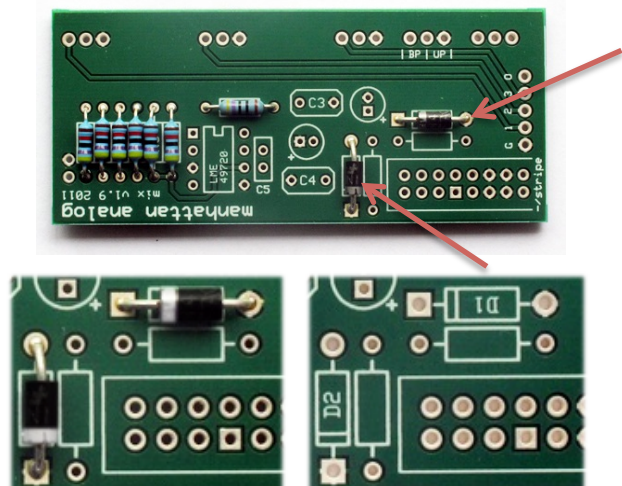


8.

Solder the two diodes into position D1 and D2 as shown.

TAKE CARE it's vital you make sure they are orientated correctly. In the case of the particular diodes shown in the image, the silver stripe is aligned with the 'boxed' end of the silkscreen.

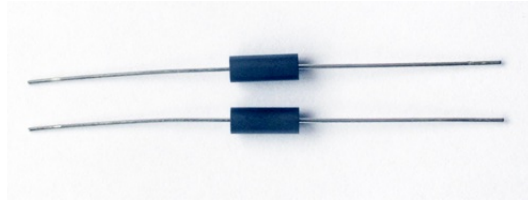
TAKE CARE Diodes can be damaged with excessive exposure to the soldering iron. Take care to not heat them for longer than 5 seconds if possible.





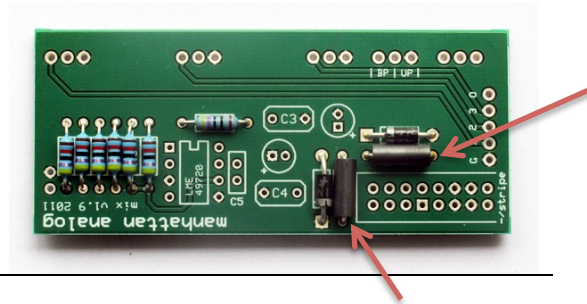
9.

Identify the two ferrite beads, these are graphite/dark grey coloured with no markings. They are bigger than the diodes.



10.

The Ferrites are soldered in the two unmarked positions adjacent to the diodes.



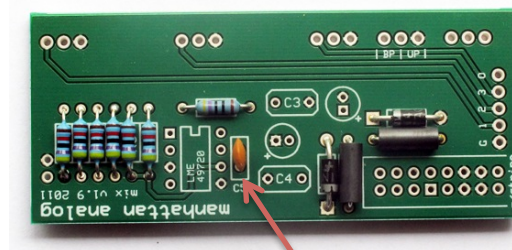
11.

Identify the single 20pF ceramic capacitor



12.

Solder into position C5, this capacitor is not polarized so it can be soldered in either direction.



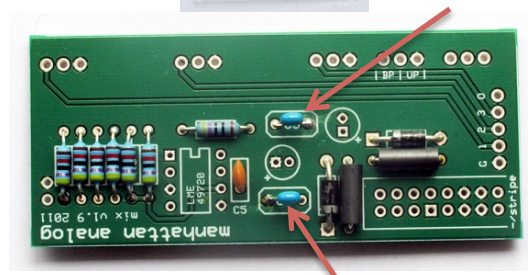
13.

Identify the two 100nF ceramic capacitors.



14.

Solder into positions C3 and C4 as shown, these capacitors are not polarized so can be soldered in either direction.





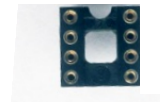
15.

You should have used up all the components in Bag A apart from the IC chip, which is the very final component we will place. So it's time to move onto **Bag B**



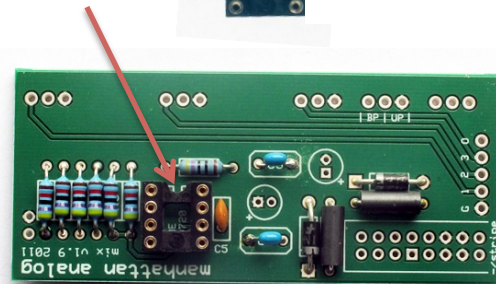
16.

Identify the 8 pin IC socket



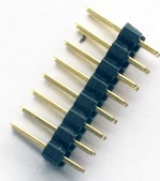
17.

Solder into place as shown. Be sure that the 'notch' in one end of the socket is aligned as shown. It matches the shape on the PCB.



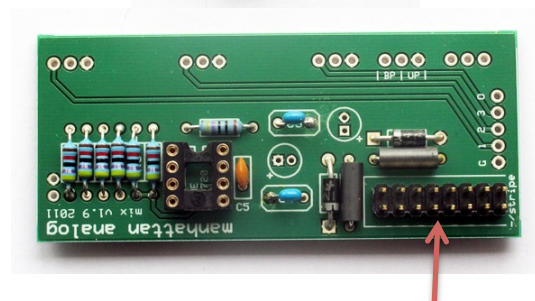
18.

Identify the 16 Pin power connector.



19.

Solder into place as shown.

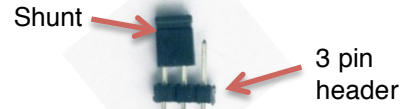




20.

Identify the 3 pin header and shunt.

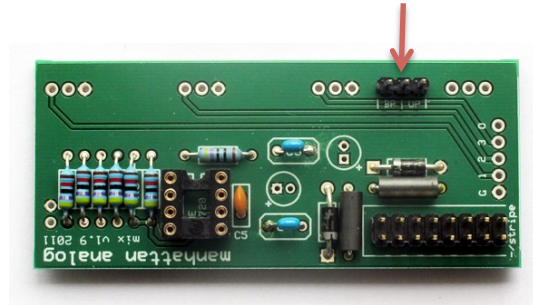
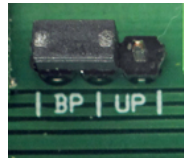
Remove the shunt and put it to one side. Don't lose it!



21.

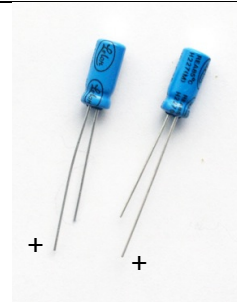
Solder the three pin header into place.

Once soldered put the shunt back into the BP position as shown.



22.

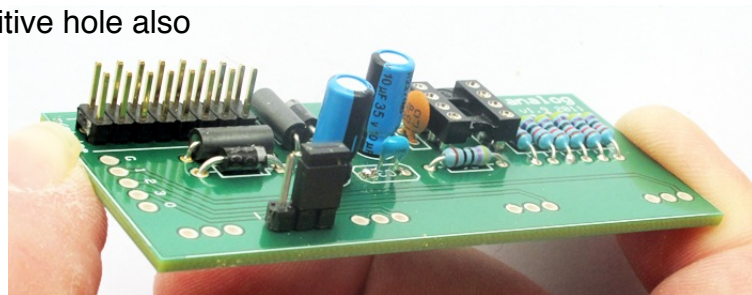
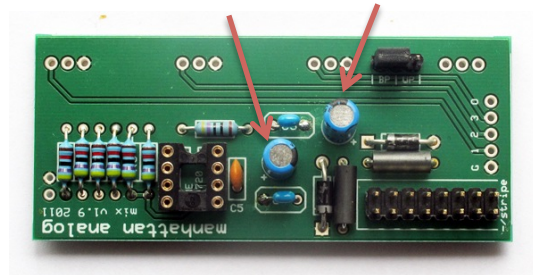
Next identify the two Electrolytic Capacitors. Note the positive lead which is longer. The negative lead is also identified by a black stripe on the cylindrical body of the capacitor.



23.

Solder into place as shown.

TAKE CARE The orientation of these components is vital, the longer positive leg goes into the hole closest to the + sign on the PCB. On this particular PCB the positive hole also has a square pad.



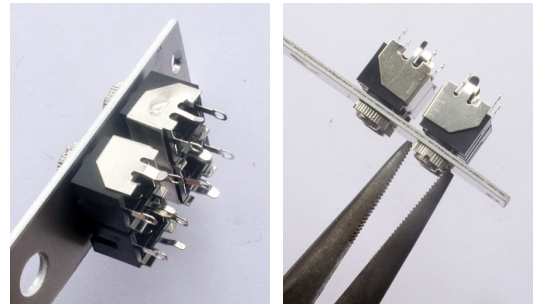


24.

We've finished with the PCB for now so you can put it to one side. Next take the front panel and remove the protective plastic covering.

Now mount the 4 jacks. Make sure you orient them as shown with the metal faces all inward and the plastic faces outward.

There is no need to over-tighten the nuts, once the jack is flush and the nut is touching the panel you shouldn't need to tighten much more than about 45 degrees. If you just keep tightening the barrel will just start spinning.



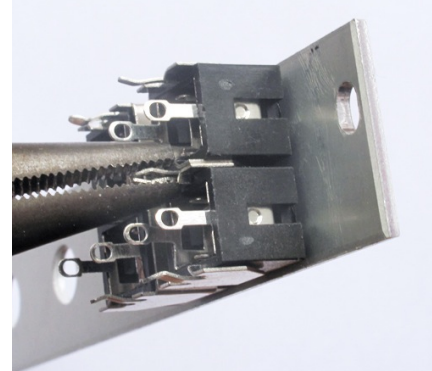
TAKE CARE As shown in the image on the top right, if you tighten the nuts with long nosed pliers make sure you leave a gap between the end of the pliers and the faceplate - otherwise you will scratch the plate.

Some people put masking tape or electrical tape onto the ends of the pliers to protect the plate.



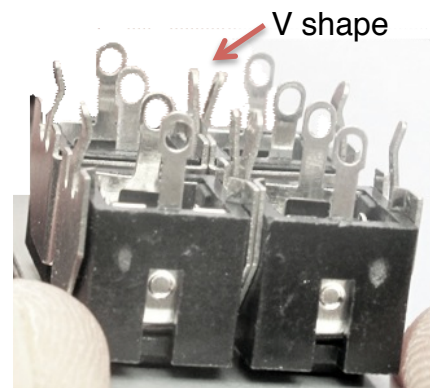
25.

Next use long nosed pliers to squeeze the two tabs together that meet where the jacks touch. You just need to roughly squeeze the kinked shape out of them.



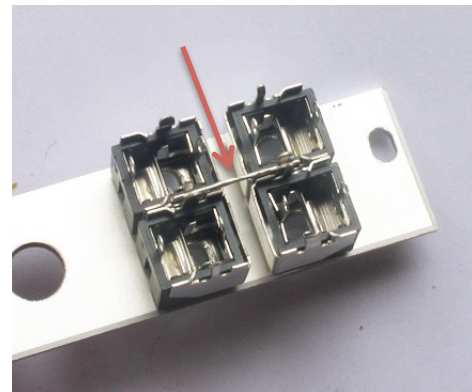
26.

Now just splay the tabs out so they are in a V shape.



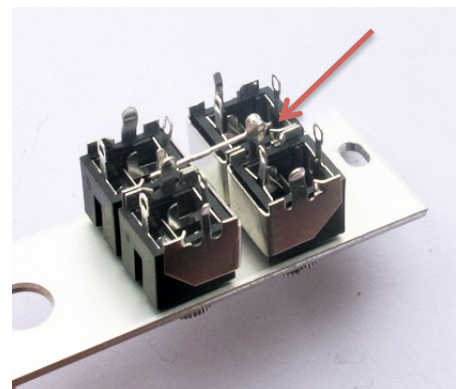
27.

Take one of the resistor leads you put to one side earlier, trim it to length and lay it between the two sets of jacks as shown. It's supported in the two V sections you created.



28.

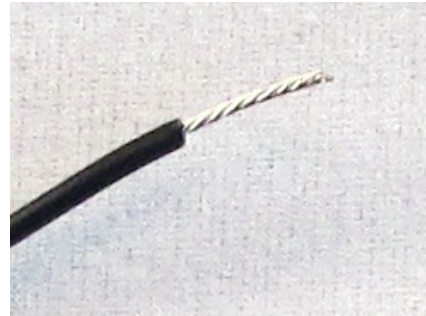
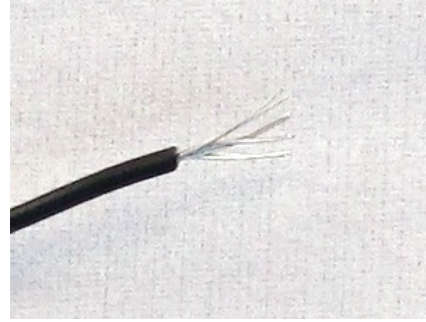
Solder the end at the bottom of the panel.





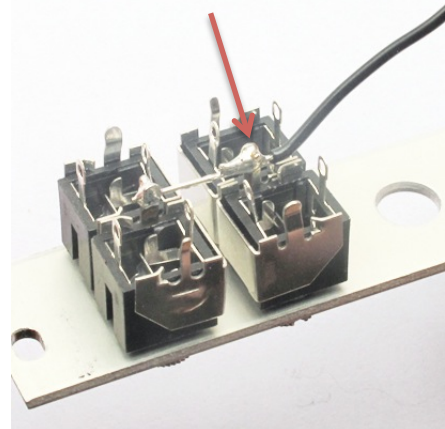
29.

Take the supplied black wire, strip one end, twist and tin with solder.



30.

Solder the wire and other end of the repurposed resistor lead as shown. You now have a single wired ground connection for all four pins.



31.

Put the front panel down and identify the four potentiometers. Remove the washers and nuts and put them to one side

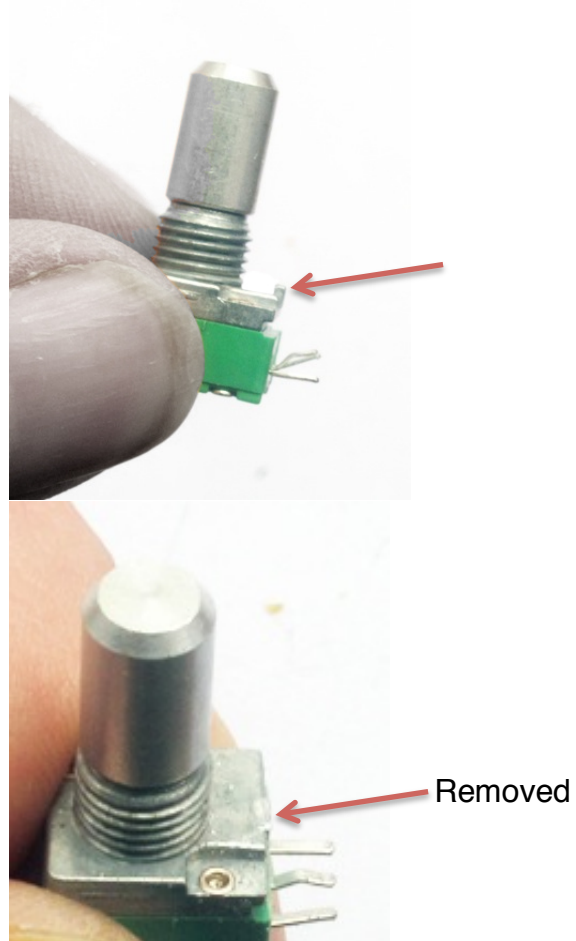




32.

Ideally you should remove this small rectangular tab that protrudes from the top face of the main body of the pot.

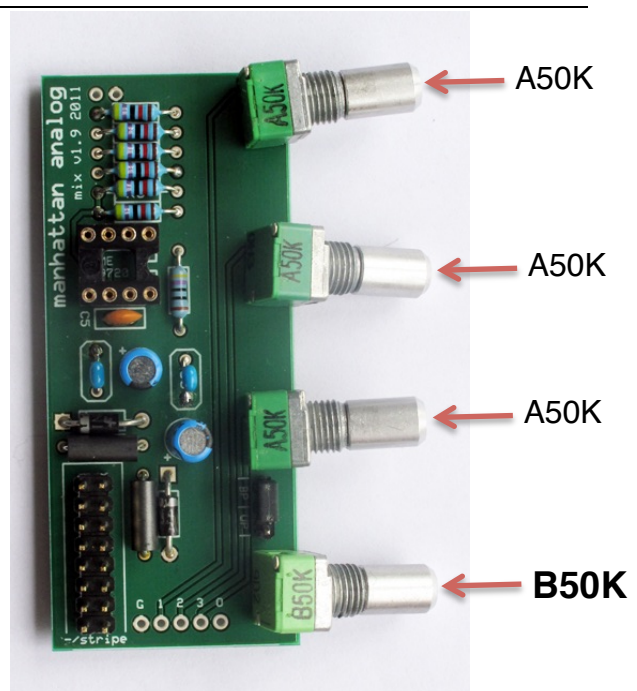
This can be removed using a small file. You need to take care not to damage the thread on the pot.



33.

Next put the four pots into their correct positions but **DO NOT SOLDER** yet.

Note the correct positioning of the three A50K pots (Audio or Log taper) and the single B50K pot (Linear taper).

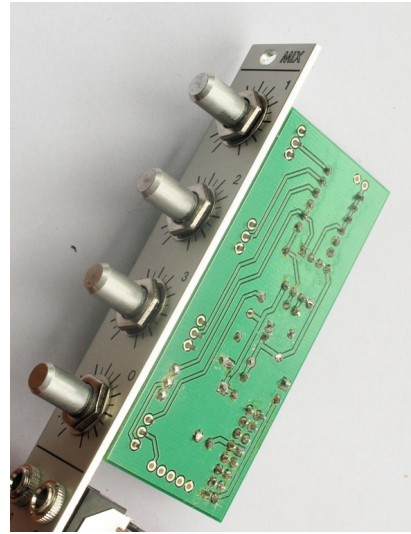




34.

With the pots still unsoldered, put the panel into place, put the washers on and hand tighten the nuts.

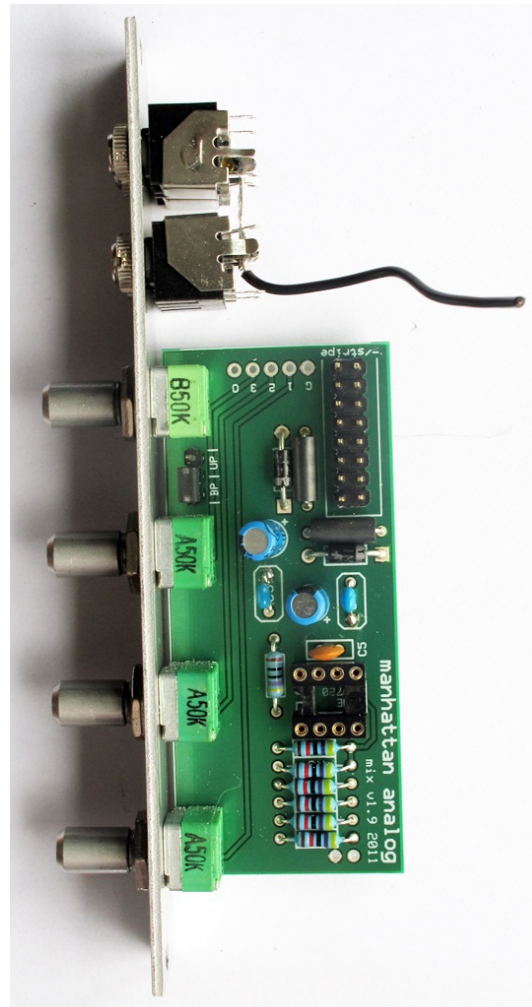
Assembling like this ensures that you don't end up needing to bend or stress any soldered joints to get the panel to fit.



35.

You can now solder the 12 pot terminals to the PCB. Once they have cooled you can tighten the 4 pot nuts with pliers. Again there is no need to tighten to the limit of your strength.

You should be left with something looking like this.

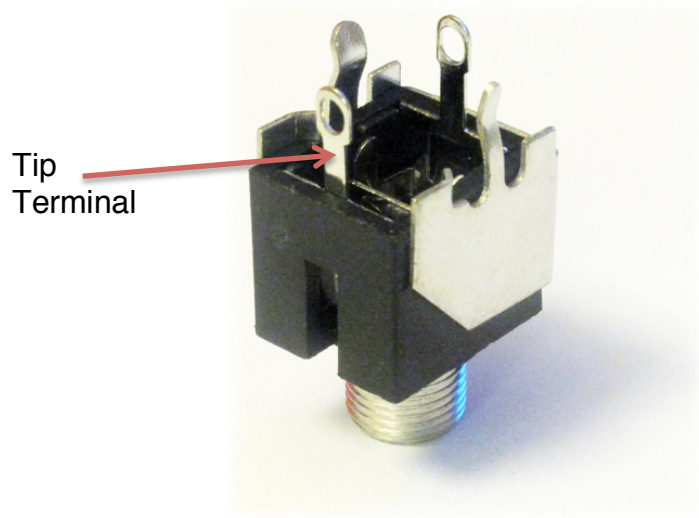
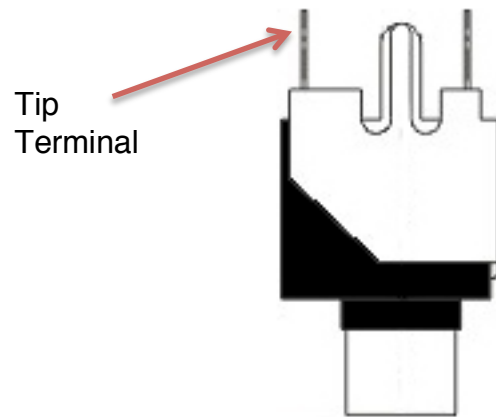




36.

Next you are going to make the 4 wired connections from the PCB to the 'Tip' terminals of the Jacks.

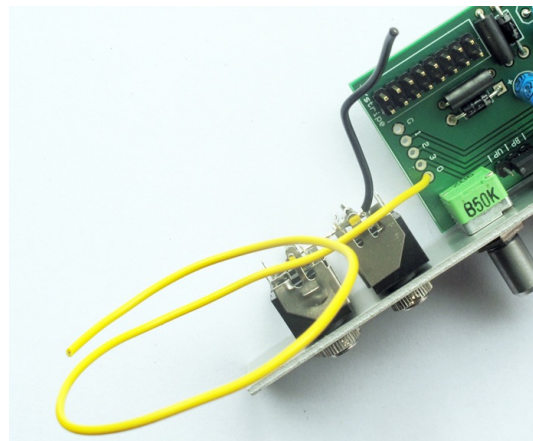
Each Jack has 4 terminals, the 'Tip' terminals are the ones on the single plastic face of the Jack.



37.

Start by stripping, twisting and tinning the section of coloured wire.

Solder one end into the '0' hole on the PCB.

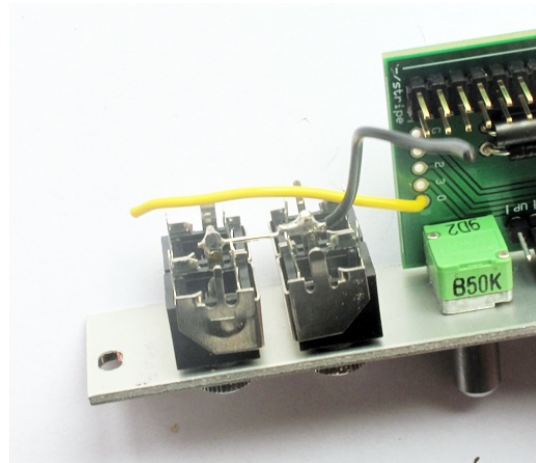




38.

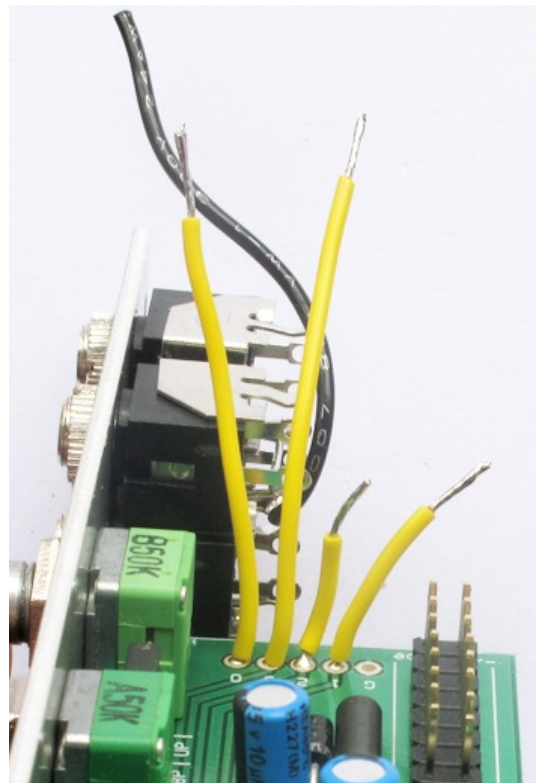
Extend the wire to the Tip terminal on the '0' Jack (check the front panel to make sure you get the right Jack).

Don't stretch the wire so it's completely tight, leave it so there is still some curve and give in it, and then cut so you still have at least 5-10mm longer than you need to easily reach the jack



39.

Repeat this step for the next four wires, then strip and tin all the ends, you should be left with something looking like this.

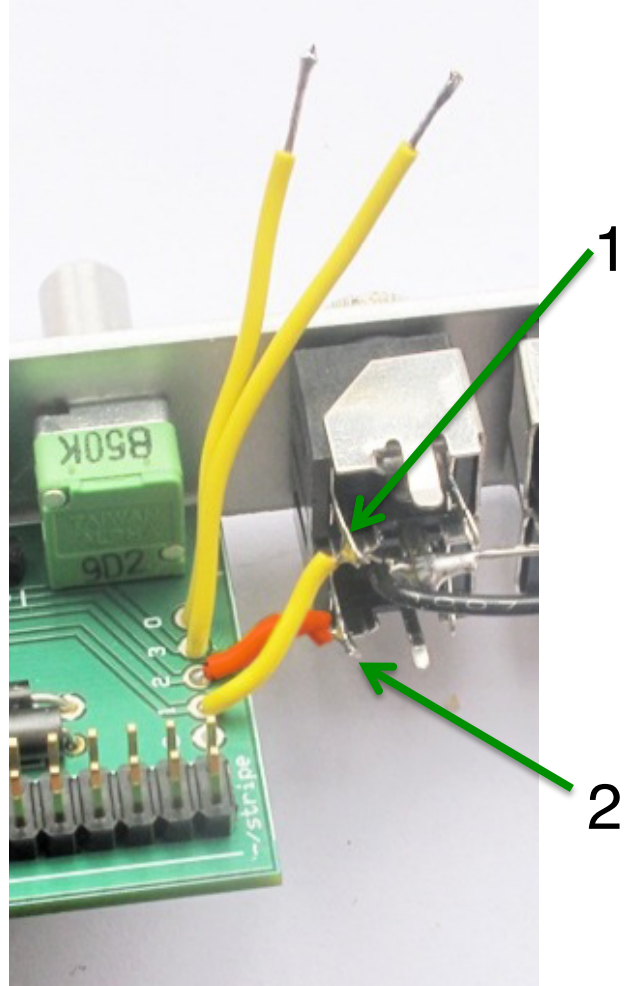




40.

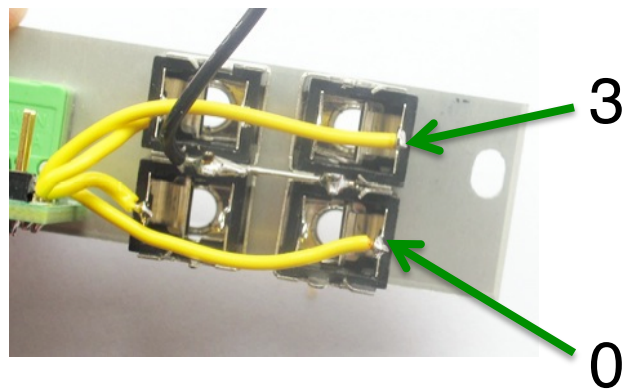
Start by soldering the two shorter wires for '1' and '2'

I've changed the colour of the '2' wire to red, just to make it easier to see.



41.

Now solder the tip terminals of Jacks '3' and '0'

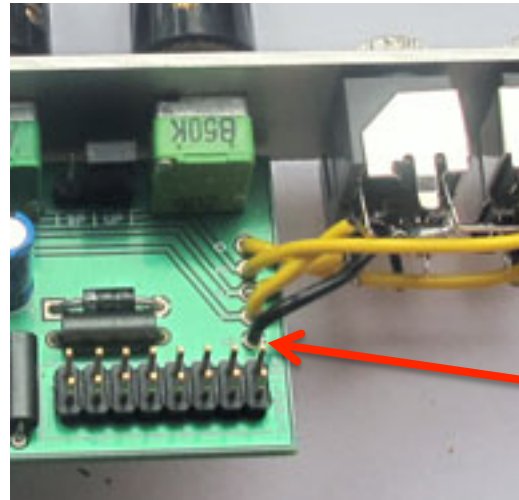




42.

Finally solder the Ground connection, the black wire to the 'G' hole on the PCB.

You have finished all the wiring.



G

43.

Now grab the IC chip from the pink anti-static bag.



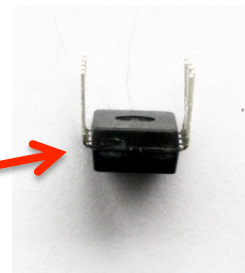
44.

The IC legs will be splayed out, you need them to be roughly perpendicular to the body.

The safest way to do this is to just gently bend all 4 legs inwards with a pair of pliers.



Legs perpendicular to body of IC

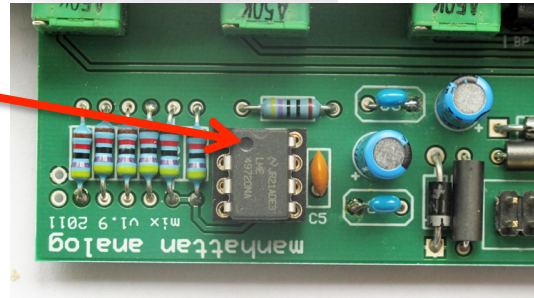
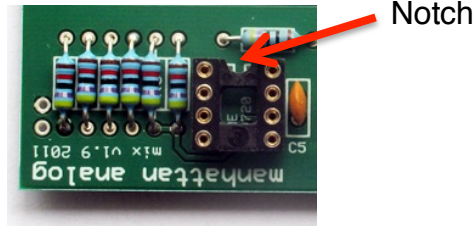




45.

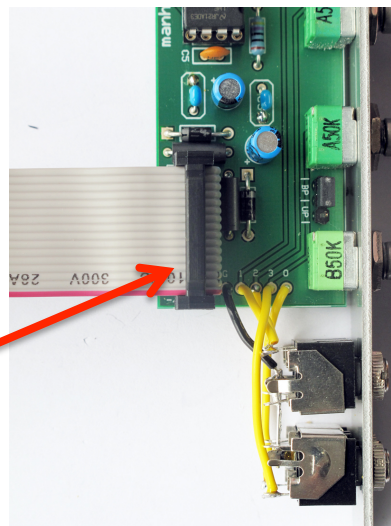
Install the IC as shown.

TAKE CARE The circular indentation in the chip must be orientated as shown, at the same end as the 'notch' in the IC socket.



46.

TAKE CARE - Finally install the power cable, insuring the red stripe is as shown, matching the -12v labeling on the PCB that reads **-/stripe**



47.

Plug the module into your power busboard in your case (after powering your case **OFF** first naturally)

Again make sure that the red stripe on the cable is aligned to the -12v end of the header.

TAKE CARE!

Power on your case and you should now be ready to mix.... THE END.

For technical support please use <http://bit.ly/WusO5b> on the Muffwiggler forum.