Instructions for Nadoom's speccherry+ keyboard rev 3

Hello, hope this documentation helps, any suggestions please email me 😊

Bill of materials

Ref	Qty	Value	Footprint
DPDRx , PDRx	21	10K	Resistor_SMD:R_0805_2012Metric_Pad1.20x1.40mm_HandSolder
IC4066x	8	4066	Package_SO:SOIC-14_3.9x8.7mm_P1.27mm
J2	1	Conn_01x08_Male	Connector_PinHeader_2.54mm:PinHeader_1x08_P2.54mm_Horizontal
J3	1	Conn_01x05_Male	Connector_PinHeader_2.54mm:PinHeader_1x05_P2.54mm_Horizontal
Power1	1	Conn_01x02_Male	Connector_PinHeader_2.54mm:PinHeader_1x02_P2.54mm_Horizontal
Switches	58	5 pin MX Switch	ZX-Spectrum:zx-cherry-small-key (5 pin MX Switch of your choice

Additional Info

Ribbon Cable

You can get a set of ribbon cables with DuPont connectors (male and female) from amazon, looks really nice:

DollaTek 635 PCS 2.54mm Pin Headers IDC Cable Kit Pitch JST SM 1 2 3 4 5 6 Pin Housing Connector Dupont Male Female Crimp Pins Adaptor Assortment Set

Arduino nano 3 footprint

This in not implemented yet and is not required.

Power

The 4066 IC's need 5V power in order for them to function. I have tapped into the 5v+ of the joystick port that is present on the harlequin.

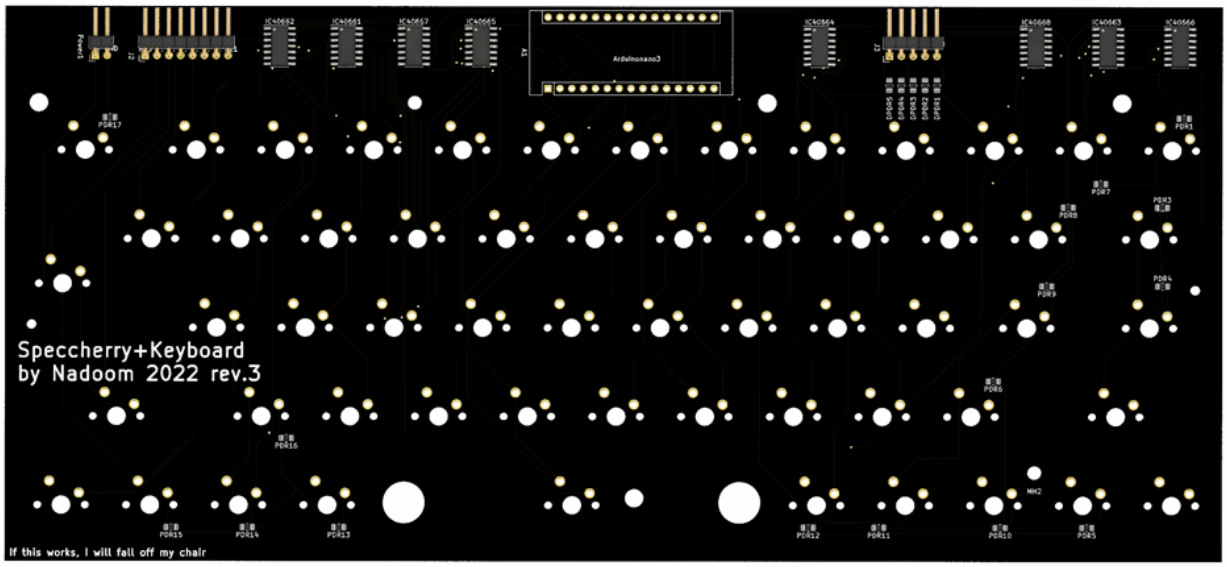
Data and address ribbons

These ribbons and pins are directly inline and ordered the same as the pins on the spectrum+ motherboard so you should install them in this order (see pic at end of doc) , On my harlequin I installed Pin headers in place of the membrane sockets, but prior to that I actually use pins headers which I pushed into these into the sockets to convert them into something that a dupont connector can connect too

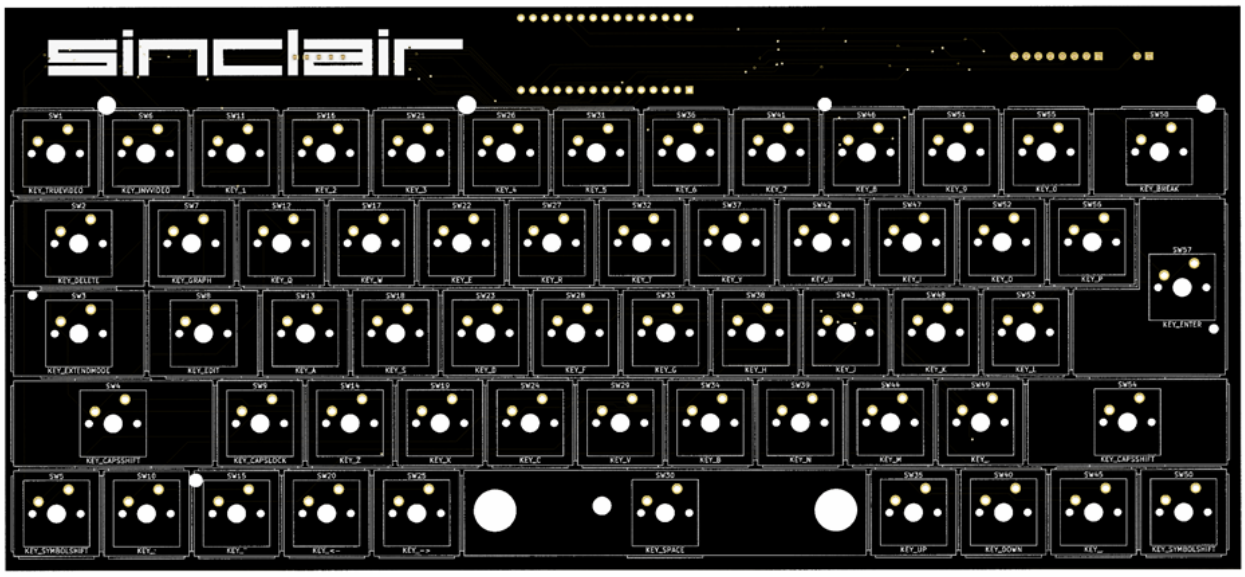
Renders

This should help you out with the placement of components.

Rear view:



Front view:



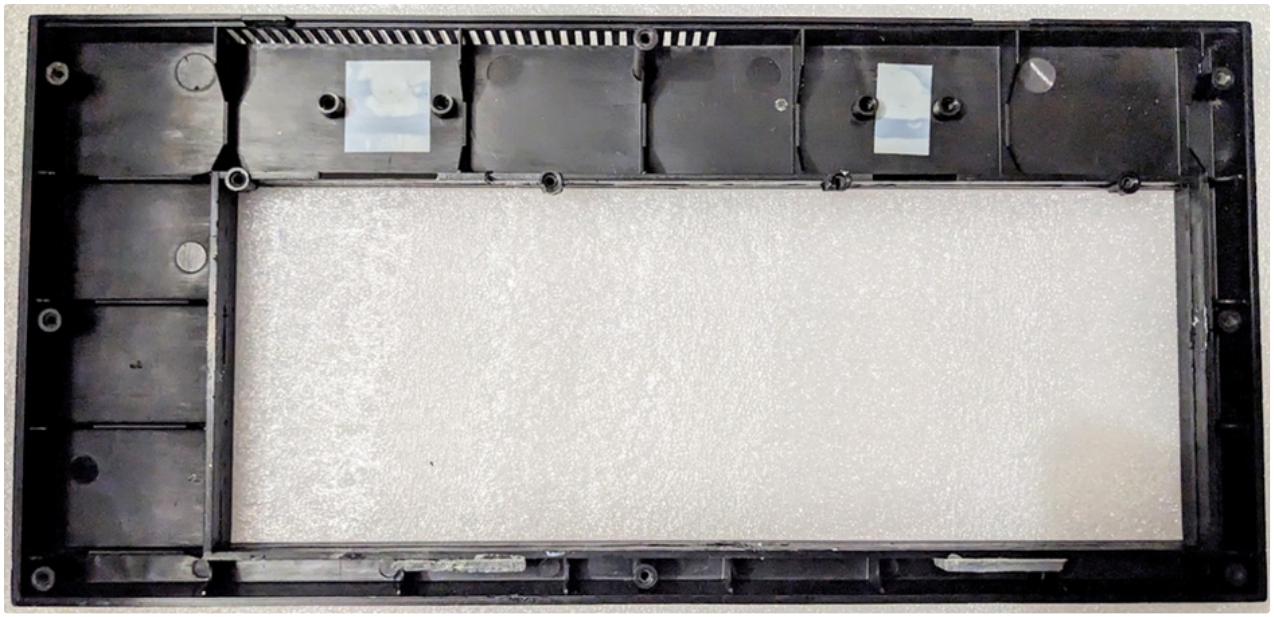
Installation / Case modification

To install this keyboard, you will need to cut out the back of the keyboard area of the spectrum+.

Cutting

IMPORTANT: You need to leave the 4 screw holes at the back the keyboard intact as these are used to attach the keyboard PCB securely to the case.

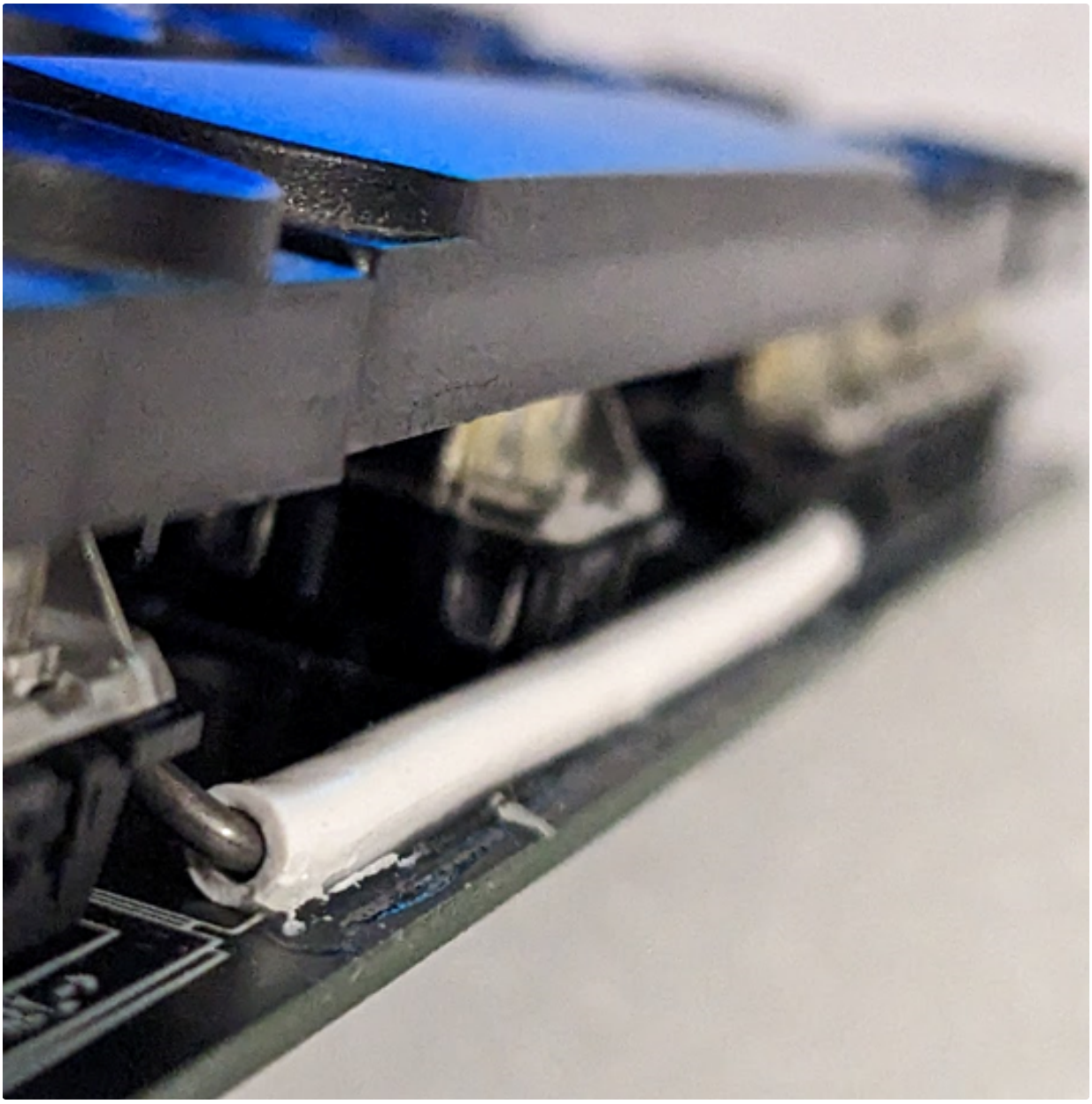
The rest of the screw headers will need to be removed to allow the keys to press properly, you can add plastic inserts to the bottom to secure the position of the keyboard, but these will not be necessary as the bottom part of the case will naturally push the PCB in position and hold it there.



Adding your keys

You can use either the original keys or any set of cherry keys you want. Add these before inserting the keyboard into the case. The original spectrum keys fit once they are on they are very secure.

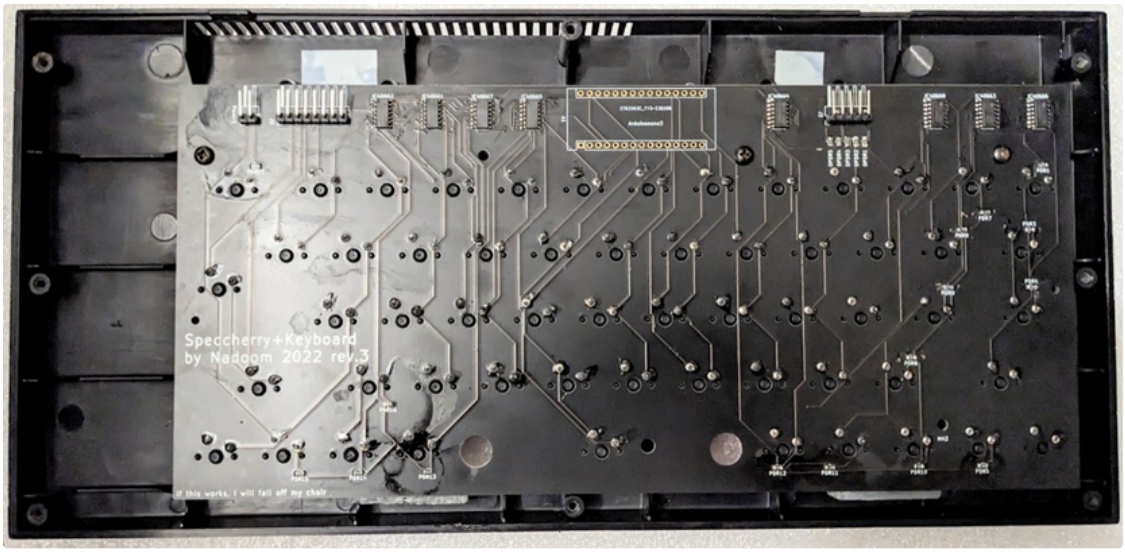
The stabiliser for the spectrum space bar can also be installed, the PCB already has spaces to allow the plastic arms of the space bar to descend into the holes either side. To install this I used the outer plastic shielding of telephone wire which I fed the metal stabiliser through and then glued this to the PCB, it works well enough.



Fixing the PCB in place

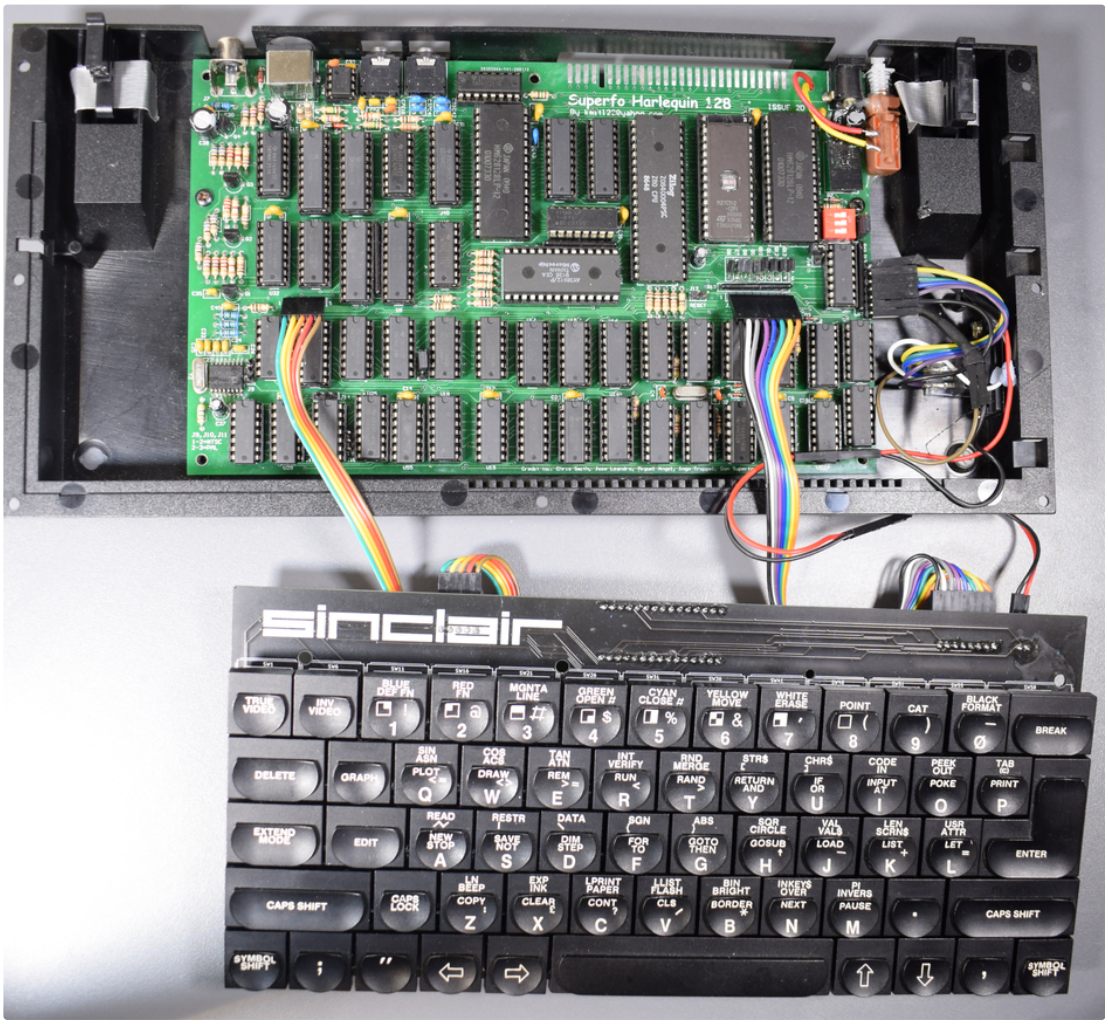
To fix the PCB in place I advise you use the following pattern that is top left and 2 on the top right, avoiding the middle left hole. There is a PCB trace that is a bit to close to comfort , if you use a plastic washer you can probably install a screw here without any issue.

Regarding the grey 3d printed parts at the bottom of the image: I originally thought that there need to an be L shaped bracket to hold the PCB on to the top case, but actually the bottom case comes right up under here so will do the job for you. You could put some selotape there to hold it there temporarily to avoid strain on the screws though.



Wiring

I would suggest you use ribbon cable, and DuPont connectors. finding the appropriate connectors and flat ribbon with the correct pitch is not easy. You can ‘upgrade’ your spectrum to use a pin header and use DuPont connectors as I have used here.



Feet

Once it is installed you might have to cut one of the plastic springy feet as it touches the Keyboard PCB and prevents the case from screwing together.

Any questions?

If you need any help you probably know where to find me, but if not, my email address is:

nadeem.backus@gmail.com

I will do my best to help you, but obviously I don’t take any responsibility for any damage caused, I have tested this revision on my own harlequin 128 2D and my original spectrum 48K.