

How to install the Trackpoint module in the MS ergonomic keyboard.

2021-12-05 preliminary



1. Parts list

1.1. Keyboard:

Microsoft Ergonomic Keyboard LXM-00018 or LXN-00018

1.2. Trackpoint module:

Replacement keyboard for ThinkPad X100 X100E X120 X120E

(I bought this keyboard at Aliexpress.)



Or you can try another module with help of these web sites.

https://deskthority.net/wiki/TrackPoint_Hardware

<https://github.com/joric/jorne/wiki/Trackpoint>

1.3. MCU:

Arduino Beetle or Compatible



1.4. PCBs:

I made three PCBs.

PCB for the MCU

PCB for the 8 pos FFC connector

PCB for the 4 pos FFC connector

1.5. Screw:

M2 x 0.25(fine pitch) x 4 mm x 2 pcs

1.6. FFC connectors:

1.0 mm pitch 8 pos x 1pcs (e.g.)Molex Easy-On 200529

1.0 mm pitch 4 pos x 1pcs (e.g.) Würth Elektronik 686104183522

1.7. Miscellaneous electronics components:

4.7 k ohm resistor x2

100 k ohm resistor x1

2.2 u F capacitor x1

Some wires

1.8. USB connection

USB A female connector

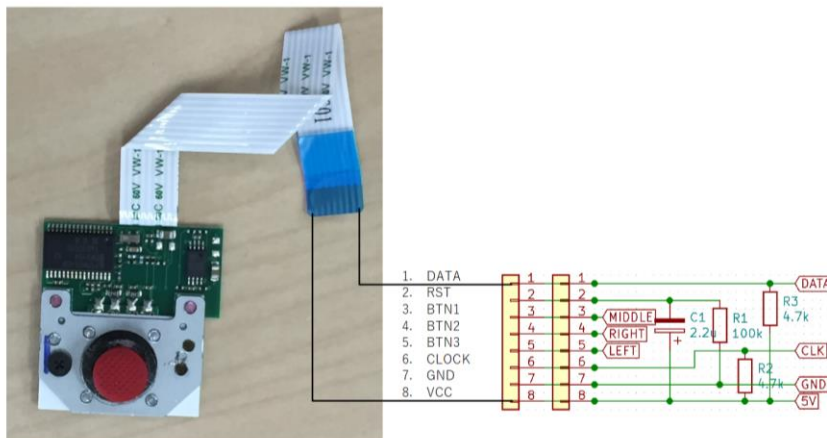
USB HUB board



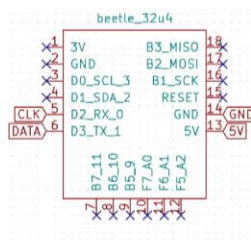
1.9. TrackPoint cap (optional)

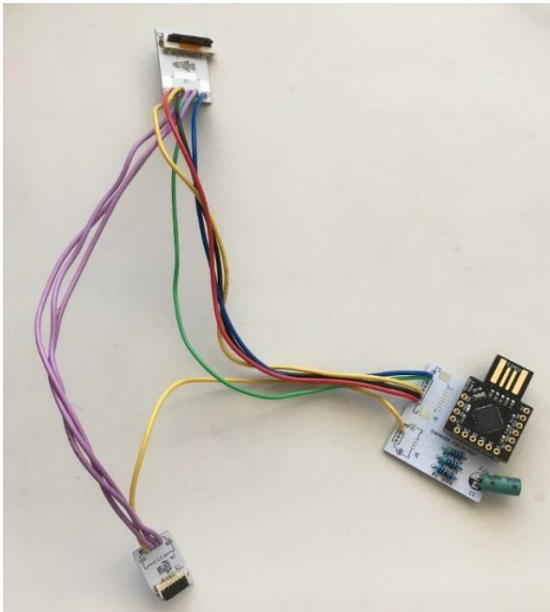
<https://www.etsy.com/listing/707617816/low-profile-softrim-type-3d-printed-caps>

2. Circuit diagram



No. 1 & 2 are
Dummy.





3. Disassemble and Modify the keyboard of ThinkPad X100

3.1. Remove the Trackpoint module from the keyboard by removing the four screws



3.2. Remove all keycaps

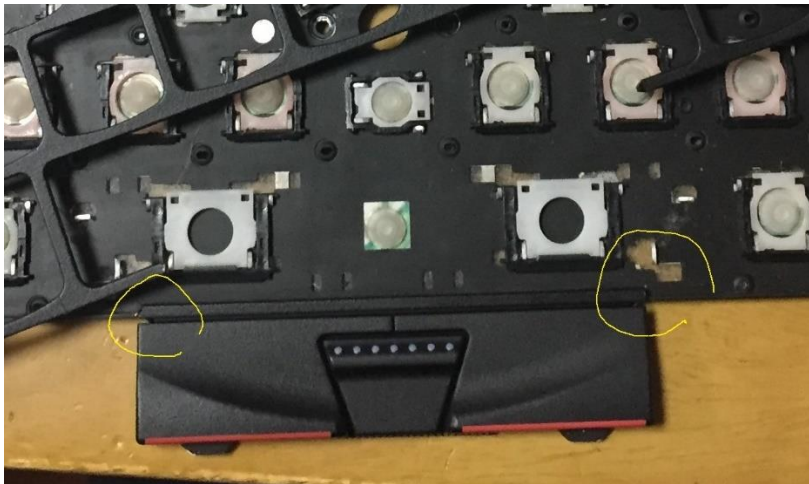
Basically, you can remove the caps from upper or left hand side excluding "G", "B", "↑", and "↓".



3.3. Remove the plastic frame



You should cut here (the yellow circles).



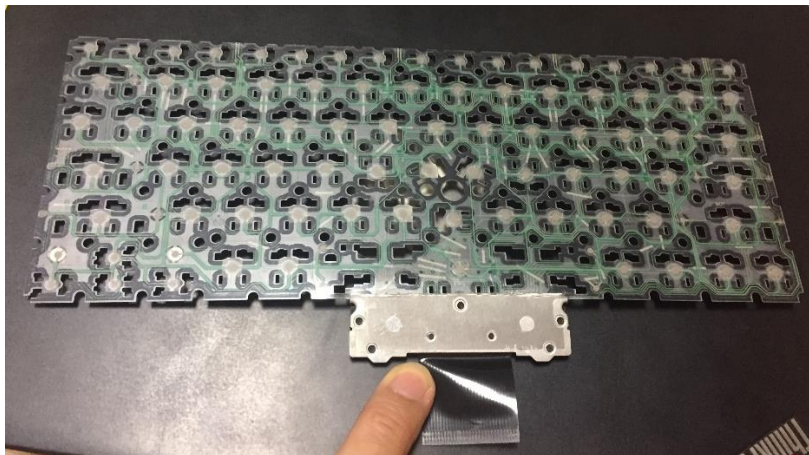
3.4. Remove all Pantographs

Using a small screwdriver.

<https://youtu.be/yqRD0rOfuKo>

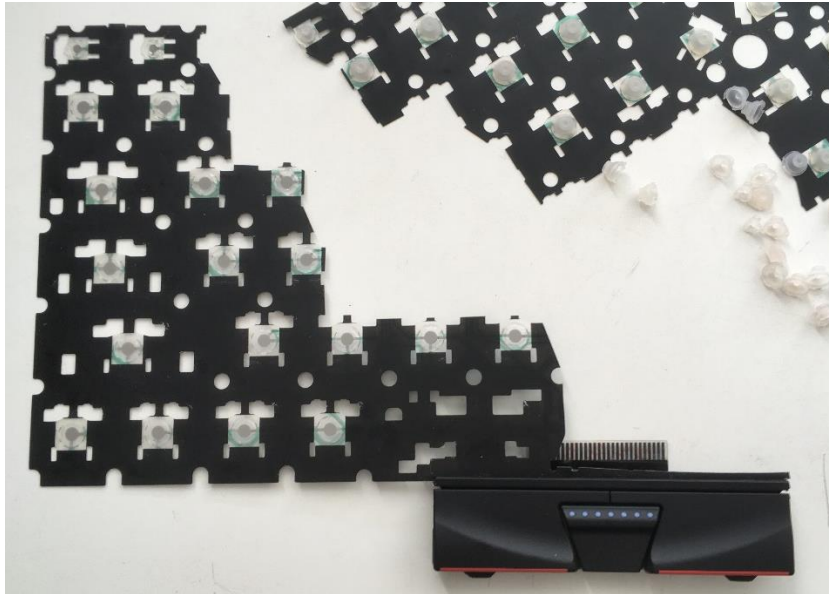
3.5. Cut the unnecessary large part of the steel plate

Be careful not to damage the FPC sheet.



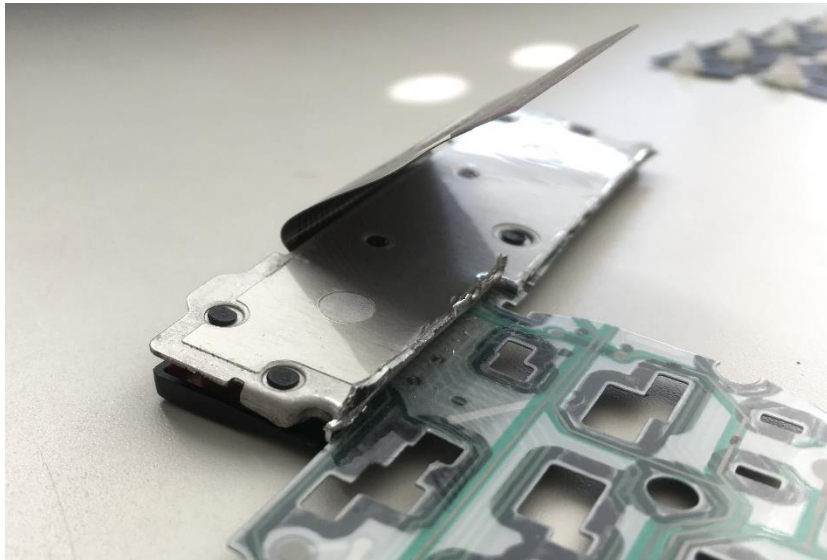
3.6. Cut the unnecessary part of the FPC sheet.

And remove the membrane cups.



We need this area of the FPC, because the GND line is running around, if this is the US keyboard of X100.

3.7. Treat the edges of the steel plate to avoid damaging the FPC sheet



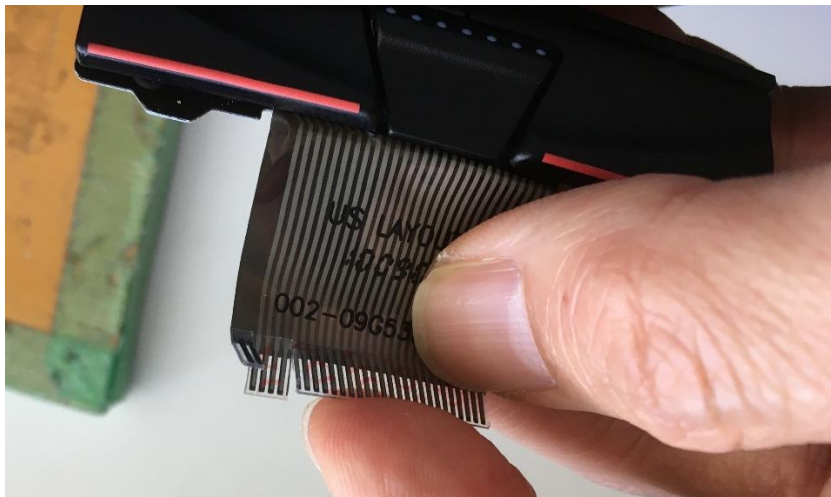
3.8. Round the remaining FPC



3.9. Bend the switch plate for a good feeling



3.10. Cut the FPC terminal and take out pins 3 to 6



4. Disassemble and Modify the MS ergonomic keyboard



4.1. Remove 5 screws under the rubber feet.



4.2. Remove the palm rest

It is a bit hard. I'd destroyed several claws.



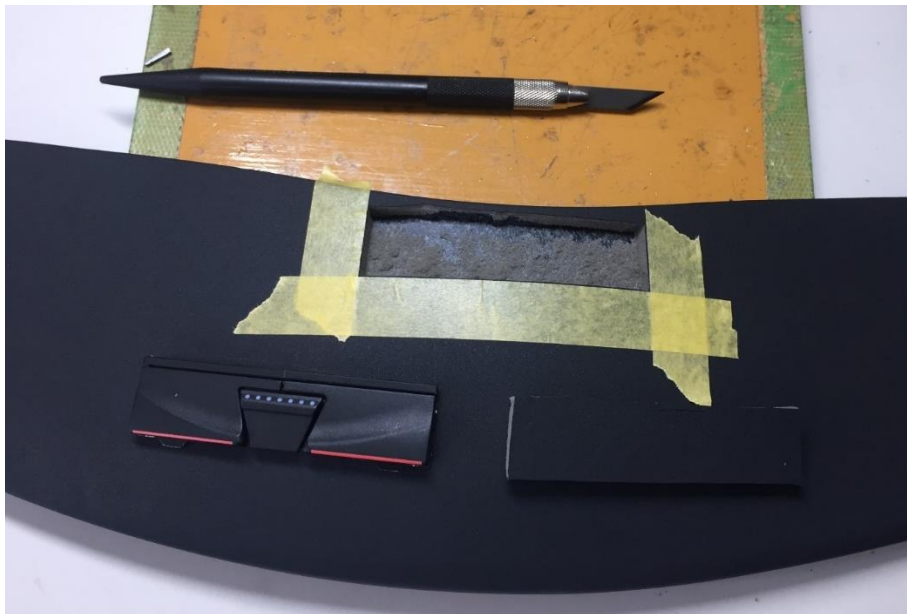


4.3. Remove some keycaps over the screws

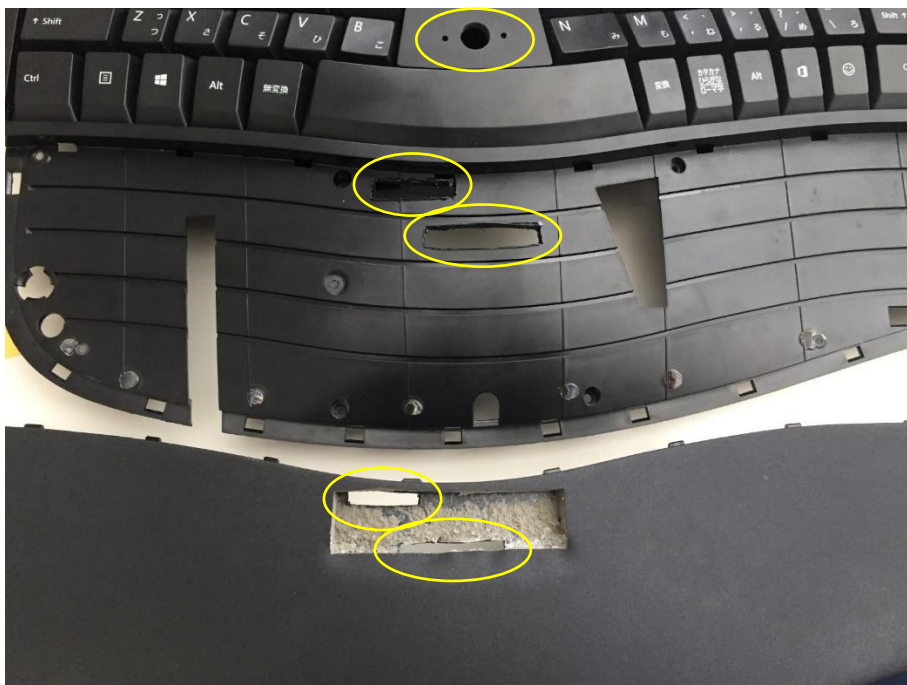




- 4.4. Remove all screws over the top
Then, you can open the keyboard.
- 4.5. Cut the urethane mat for putting the Trackpoint switches
It should be a bit larger than the switch plate.

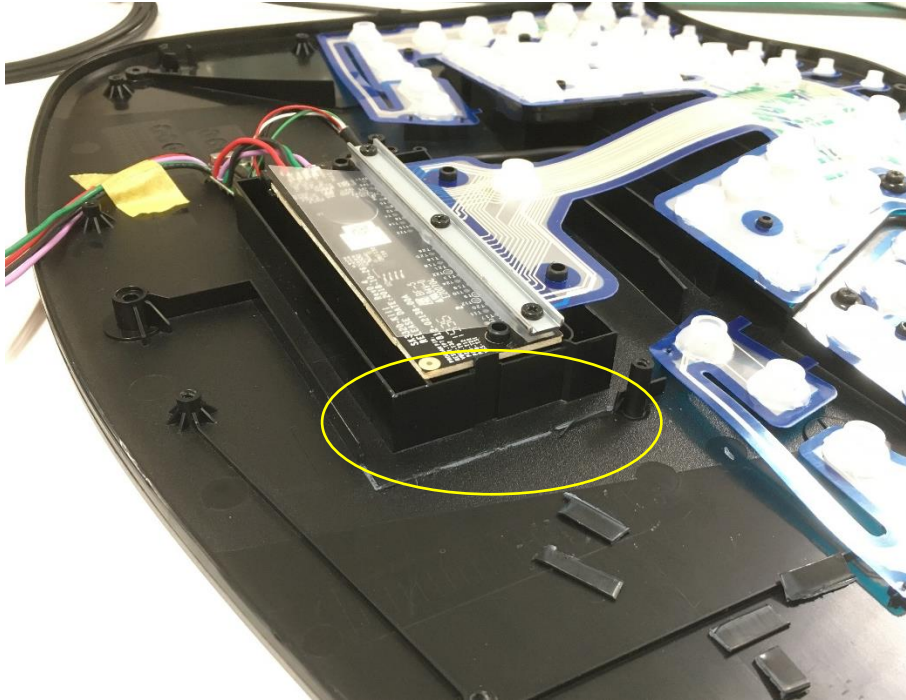


- 4.6. Make some holes



4.7. Remove this portion

For making space for putting the MCU.

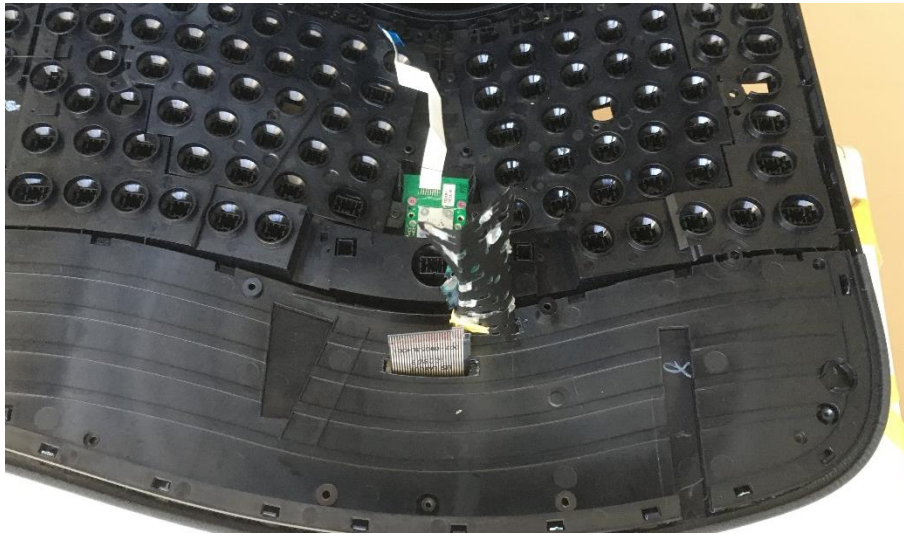


5. Install the components

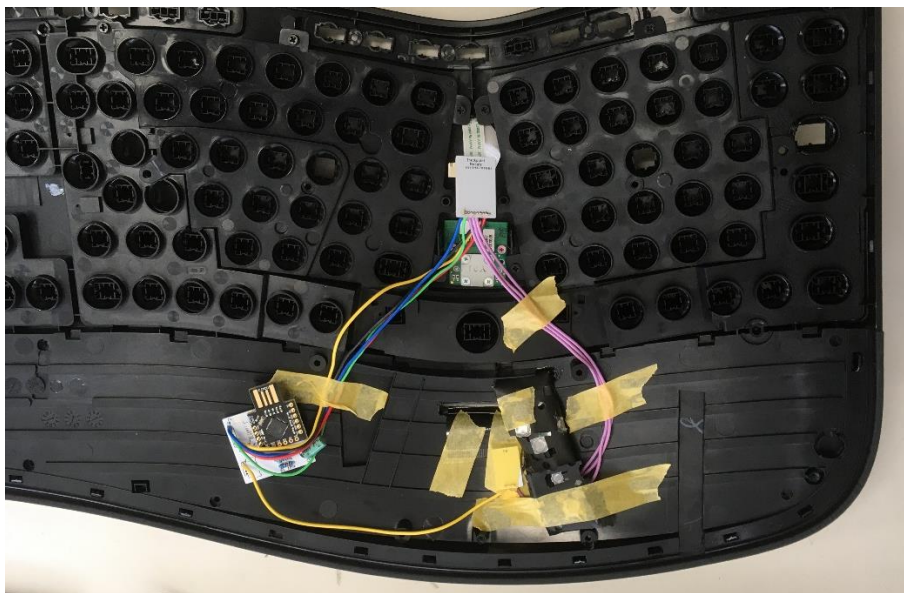
5.1. Install the Trackpoint switch on the palm rest



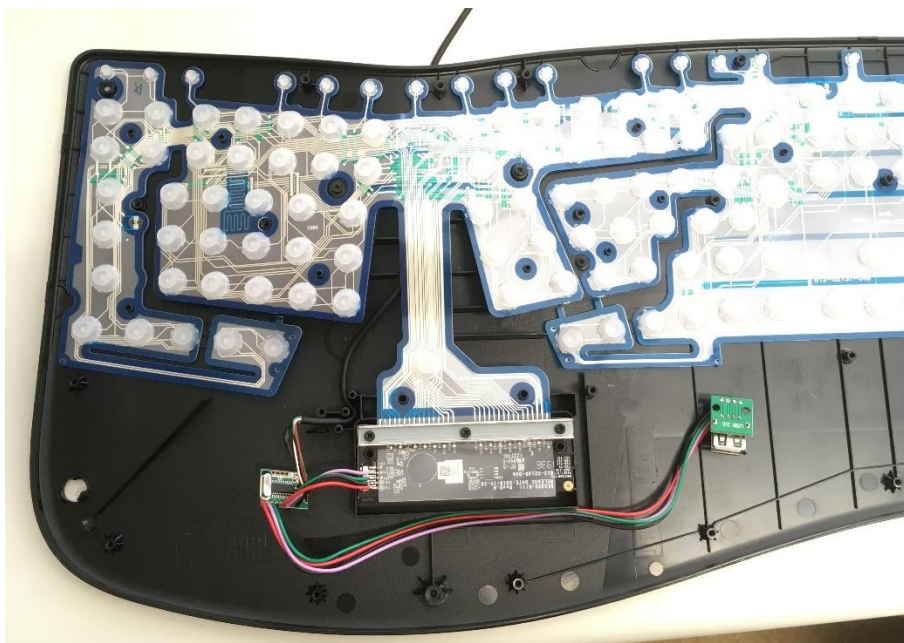
5.2. Fix the palm rest and the Trackpoint module on the keyboard upper case



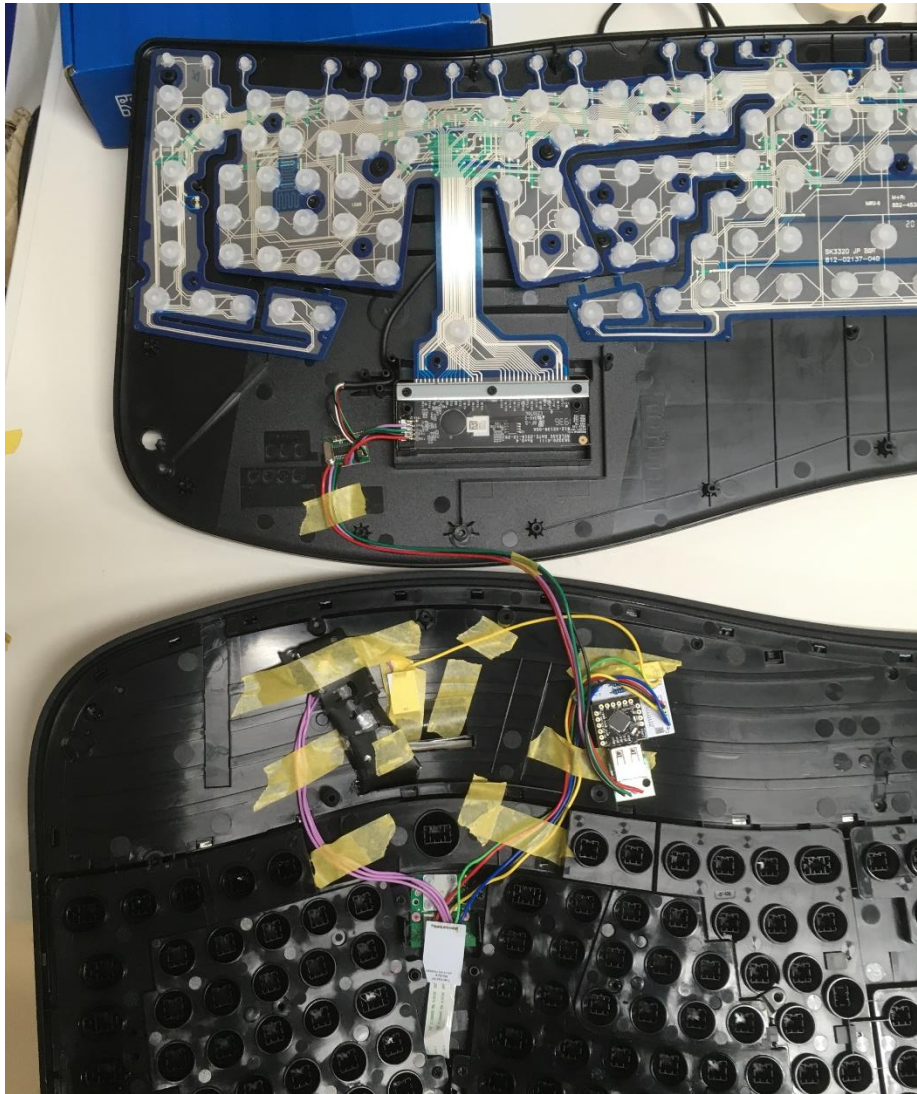
5.3. Connect the MCU circuit



5.4. Insert the USB Hub between the MS keyboard PCB and output on the keyboard lower case



5.5. Connect the MCU to USB hub



6. Install the software in the MCU