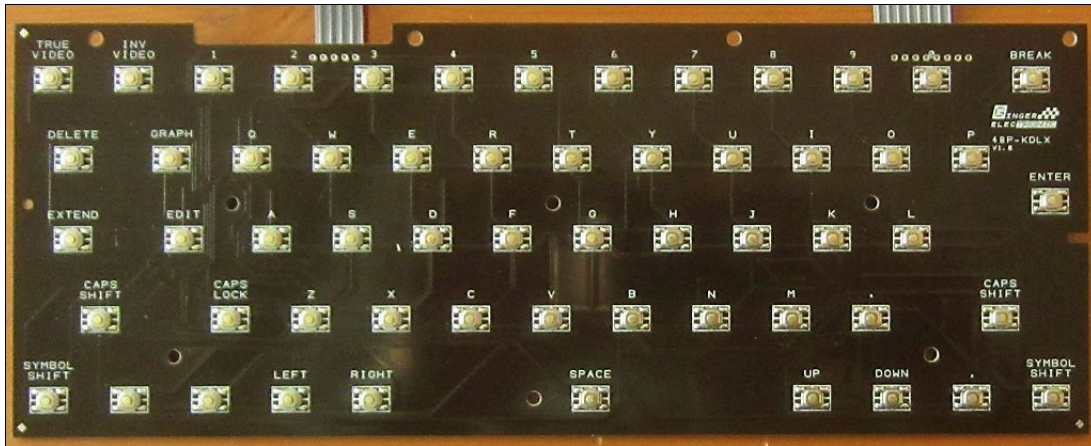


48P-KDLX

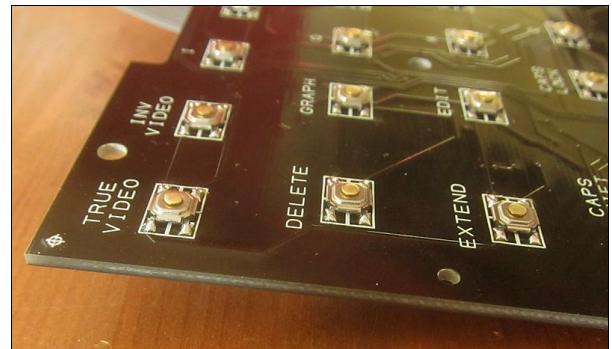
48P-KDLX is a replacement keyboard for ZX Spectrum+ and ZX Spectrum 128k version and replaces the keyboard membrane including the back plate. It's main benefit is easy typing with professional SMD tactile switches for a very sensitive keyboard feeling with a perceptible and audible click and long life. The operating life of the long life switches are specified with minimum 500.000 clicks.

This keyboard improves the typing even in case the back plate is baggy and give bad contact together with newer and harder keyboard membranes. The way to press the keys are shortened due to the height of the tactile switches with 1.5mm and promise a more reliable contact and faster typing.

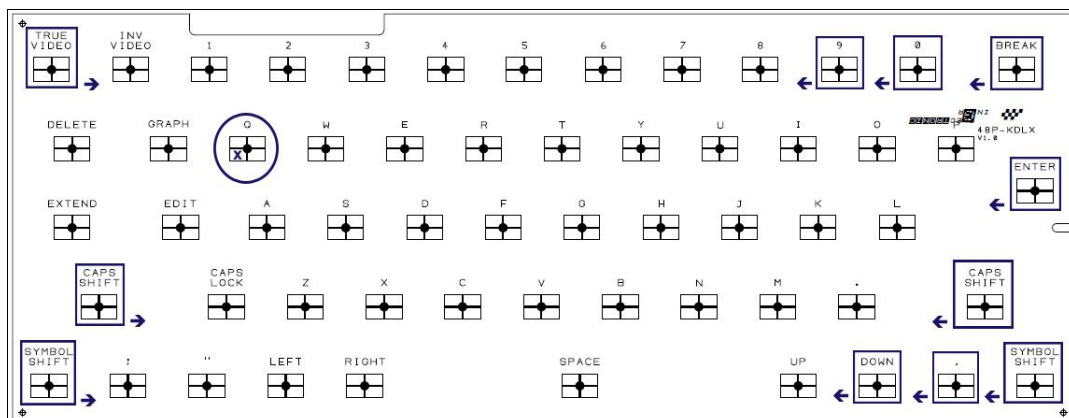


The following instructions are for the self construction kit only. If tactile switches are not included you should use switches from ALPS of type SKQGAFE010 verwendet werden. The 58 keys should be fixed with solder tin in one corner only and the keys should be placed centered on the pads.

The printed box and the hair cross in the middle should be a good help for adjusting the keys in the right position. A few keys at the borders should not be centered but moved to the center of the board about 1mm (0.04 inches).

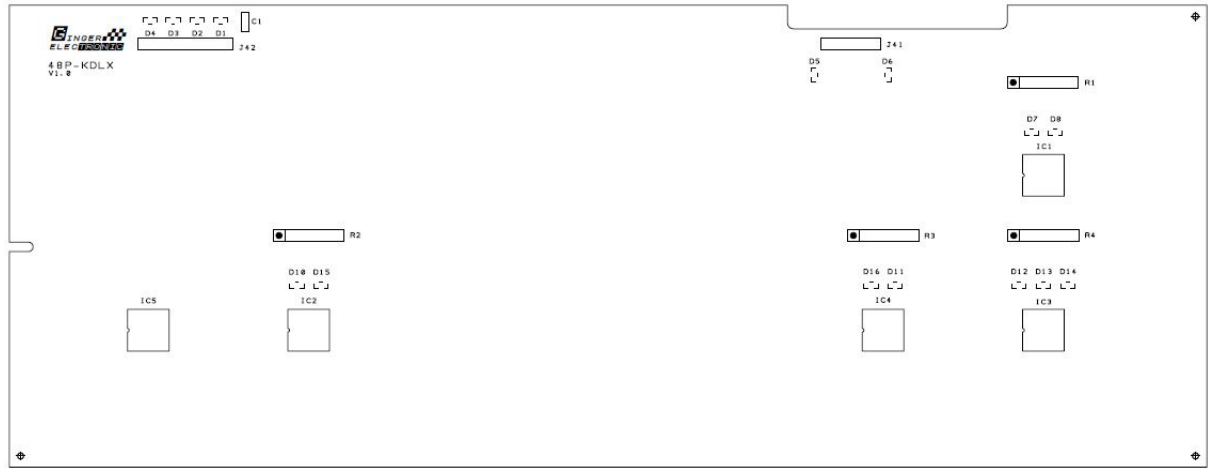


The keys to move are marked in the drawing below with an additional box around the key and an arrow indicating the direction to move. One leg of the key for the letter „Q“ should be removed or bended up which position is marked with an X. It is recommended to solder this key and the keys to move first. After all keys can be mounted centered. Precise work (position) is important for a good working keyboard.

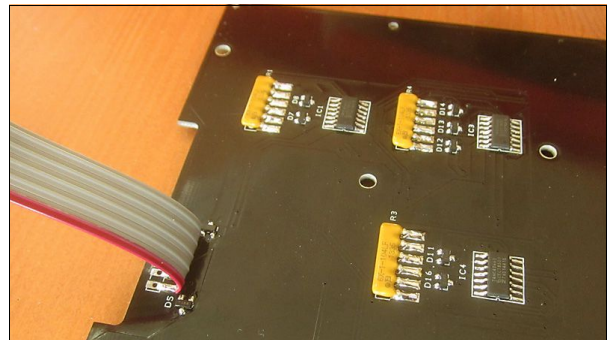


All key positions are measured properly but to be safe and proof your work you may screw the board to the case (including the rubber mate) to test the correct position. There should be a perceptible and audible feedback when pressing the keys. If this is only present when pressing only the left or right side of the key (not the center) than the key could be improved while moving it a bit more to the side with no reaction.

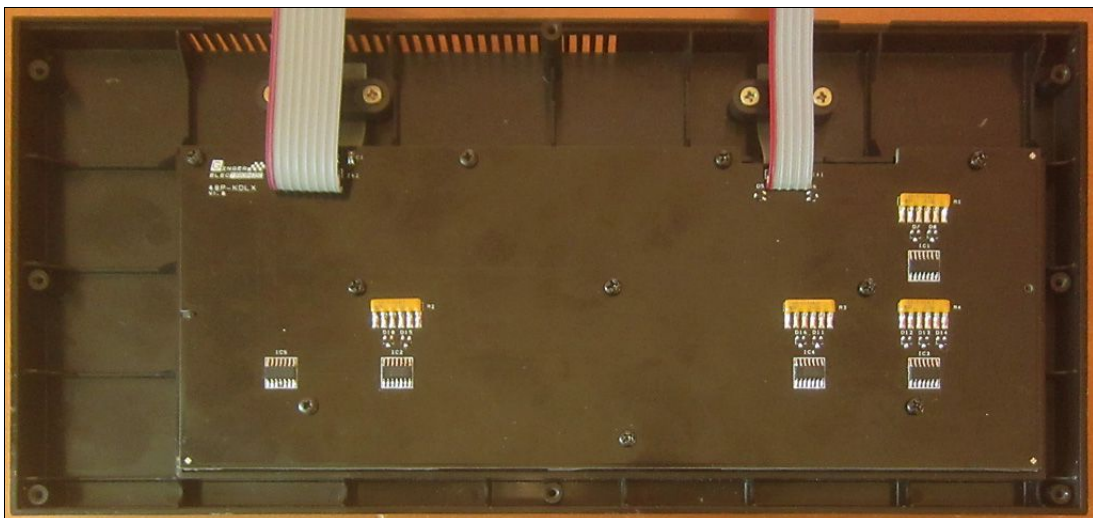
Finally all other legs of the keys should be soldered properly except the removed or bended leg of the switch for „Q“. Afterwards the keyboard should be turned and the rest of components soldered. First solder IC1-5 and after the diodes which are provided with two different types.



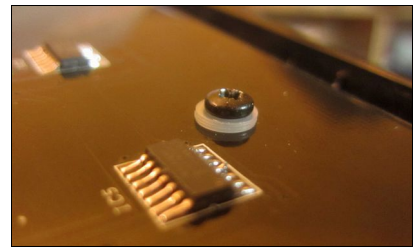
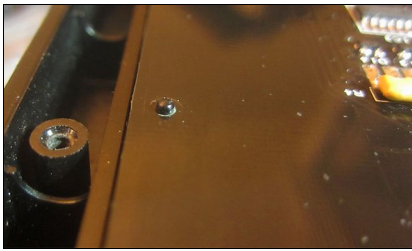
The 4 diodes D1-D4 (BAT54A) should be soldered first. Their position is at the 8 pin flat cable connector. The other 11 diodes of type BAT54C can be soldered at the remaining positions and the capacitor C1. Finally the resistor arrays and the flat cables are soldered flat on the corresponding pads. Take attention for the mark (circle/point) at the resistor arrays.



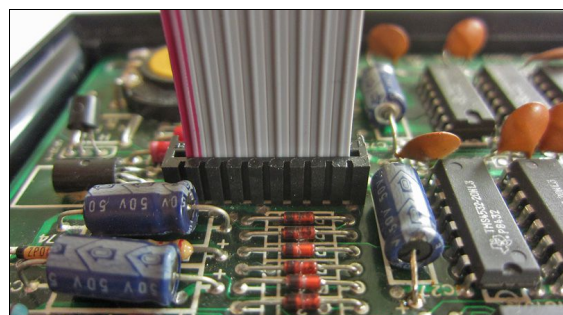
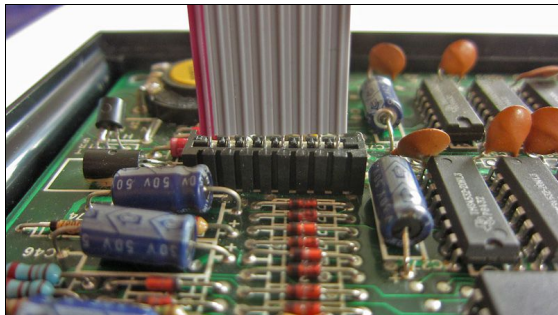
At last the finished keyboard can be screwed on the upper case of the ZX Spectrum+. The back plate and the keyboard membrane are removed first and the cable relief of the membrane which is used mainly to give a good contact between the membrane parts.



The flat cables should not be fixed with these cable reliefs as the length could be too short when mounting all together. The back plate remains removed. Prior to mounting the board you should check the taps on the left and right side to sit correct in the small hole and the long hole like shown at the pictures below.

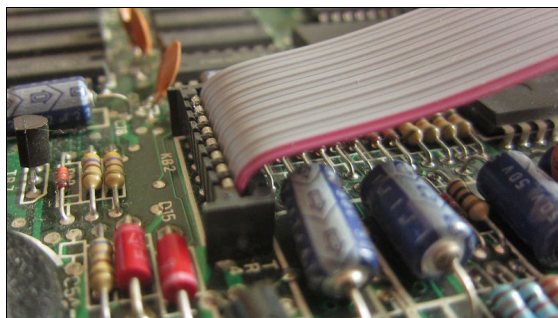


Depending on the version of ZX Spectrum+ you have to use 2 plastic washers to fill a distance of about 1mm (for the original Sinclair model with a plastic back plate). The Spectrum+ was manufactured from Samsung in licence as well with a thinner metal plate. For this model you don't use the plastic washers. The keyboard 48P-KDLX replaces keyboard membrane AND back plate.



The jumper cables should be bended first in a soft curve to fit into the case and then slightly but precisely moved into the connector till they latch. The wires are thick enough to be hold from the MOLEX connector but won't wide their contacts too much – so a classic membrane can be used at a later time again to keep all original and reverse this modification.

All keys should be tested for function before closing the case completely. If there are problems while pressing keys please check carefully the cable jumpers if they fit good into the MOLEX connectors and if they are really in the middle of the connectors and deep enough and contacts are straight and not bended.



Good luck during construction and replacement and hopefully good joy with this keyboard.