

ZEUS

8-bit modular computer

ASSEMBLY TIPS

- 1) Make sure you have: flux, pointy tweezers, tin and solder. Side cutters could be usefull aswell.
- 2) Prepare alcohol, tooth brush, cotton discs and sticks for PCBs cleaning.
- 3) You can solder TH diod (included) between corresponding CPU socket and PLD-40R solder spots instead of SMD one on CPU module. Don't forget to consider polarity of the diod.

THROUGH HOLE SOLDERING

To solder through hole component at the stage component is not fixed yet by solder joints you should install the component and fix it with your left hand fingers. Then apply flux on two opposite corner pins, form considerable droplet of liquid tin on soldering iron tip. Then touch the pin with the tin droplet and wait until pin is heated through and tin spreads. Repeat with the opposite fluxed pin. If needed add some more tin to that pins afterwards to form beautiful coneshape solder joint. At this stage component is firmly fixed but you still can adjust it's attitude by melting one of the solder joints while applying corresponding force.

In case your component is already fixed, just form moderate droplet of liquid tin on soldering iron tip which is enough to provide good thermal contact of soldering iron with the pin. Then touch the pin with the tin droplet and start feeding fresh tin to the heated pin with your left hand.

SMD SOLDERING

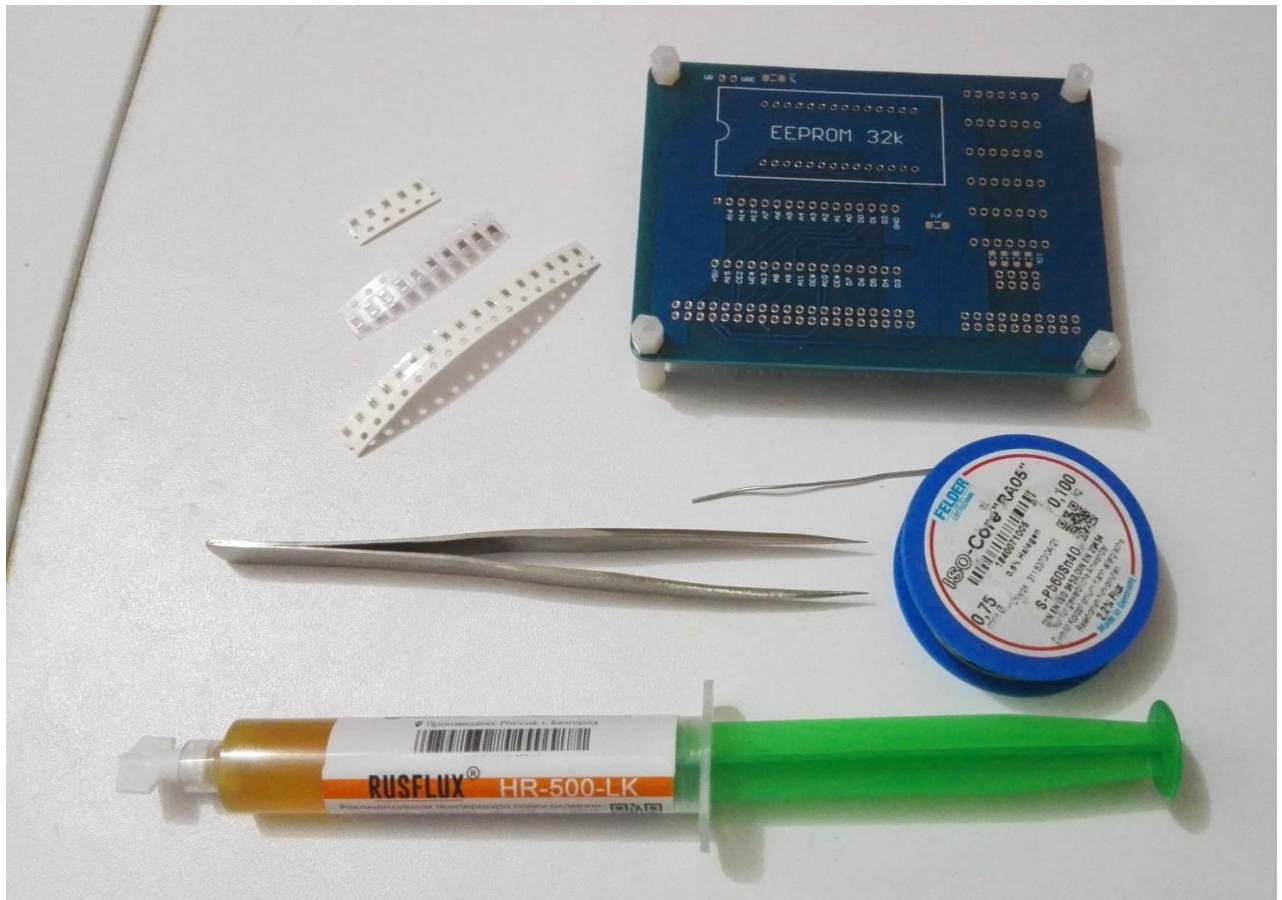
There are folowing SMD components in the kit: ceramic capasitors (10x 1uF), resistors (20x 10k(1002), 5x 1k(1001)) and Shottky diods (2x SMD, 1x TH).

In order to solder SMD chip component with use of soldering iron instead of hot air, follow the steps:

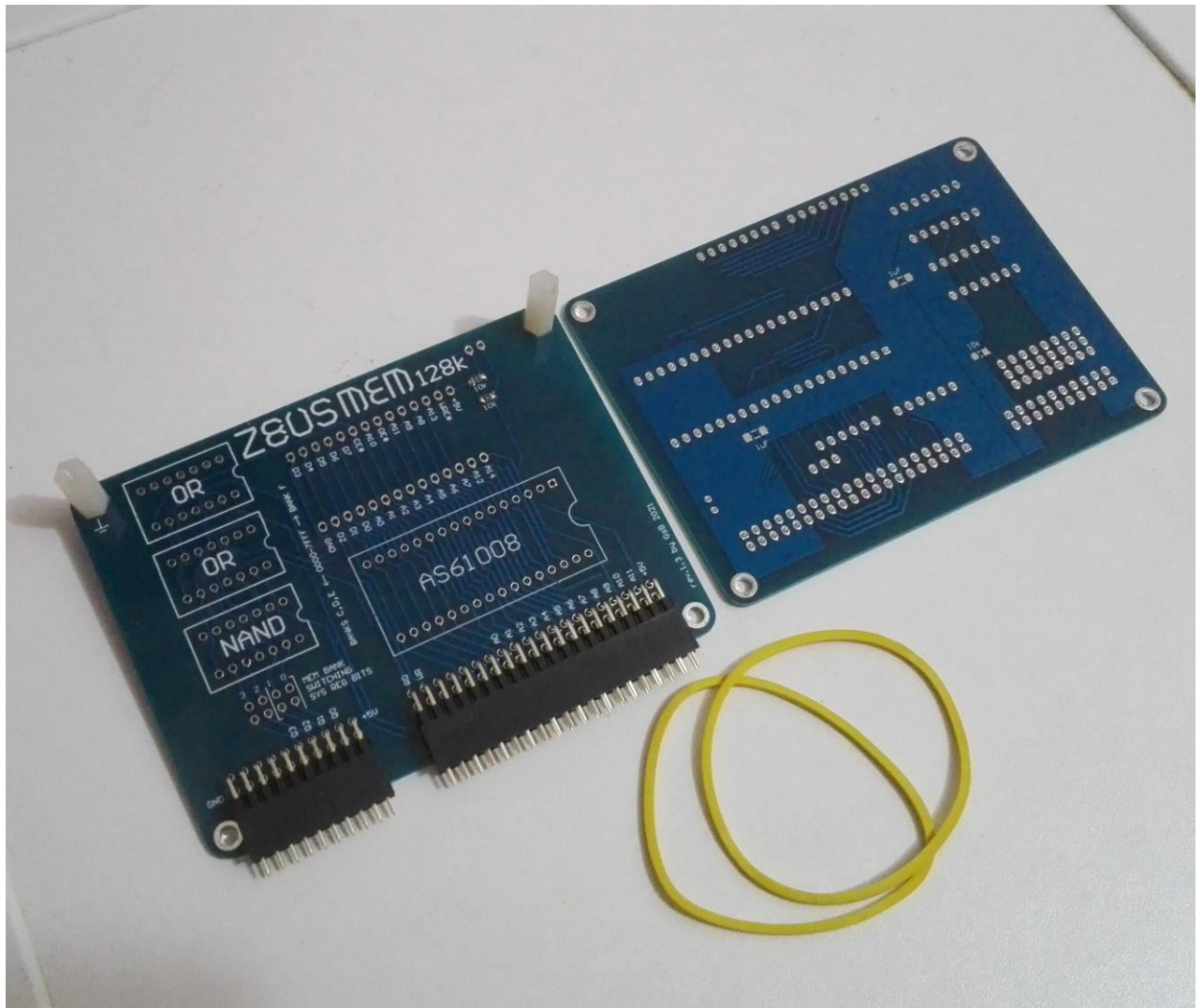
- 1) Use some alcohol to clean SMD footprint on the PCB.
- 2) Apply some flux on the footprint pad you are going to solder the first.
- 3) Cautiously open SMD component blister above the PCB. And place fallen component in the footprint with tweezers.
- 4) Fix SMD component in desired position with tweezers, form a tin droplet on soldering iron tip and touch with it the surface of fluxed footprint pad. As soon as the pad is heated through, tin spreads all over the footpint pad and the SMD component adjacent pad. Untill both pads are soldered you can still adjust component attitude by heating the only solder joint and manipulating component with tweezers.
- 5) As soon as first solder joint has solidified and component needs no adjustment, you can put tweezers away, flux another pad and solder it the same way but without help of tweezers.

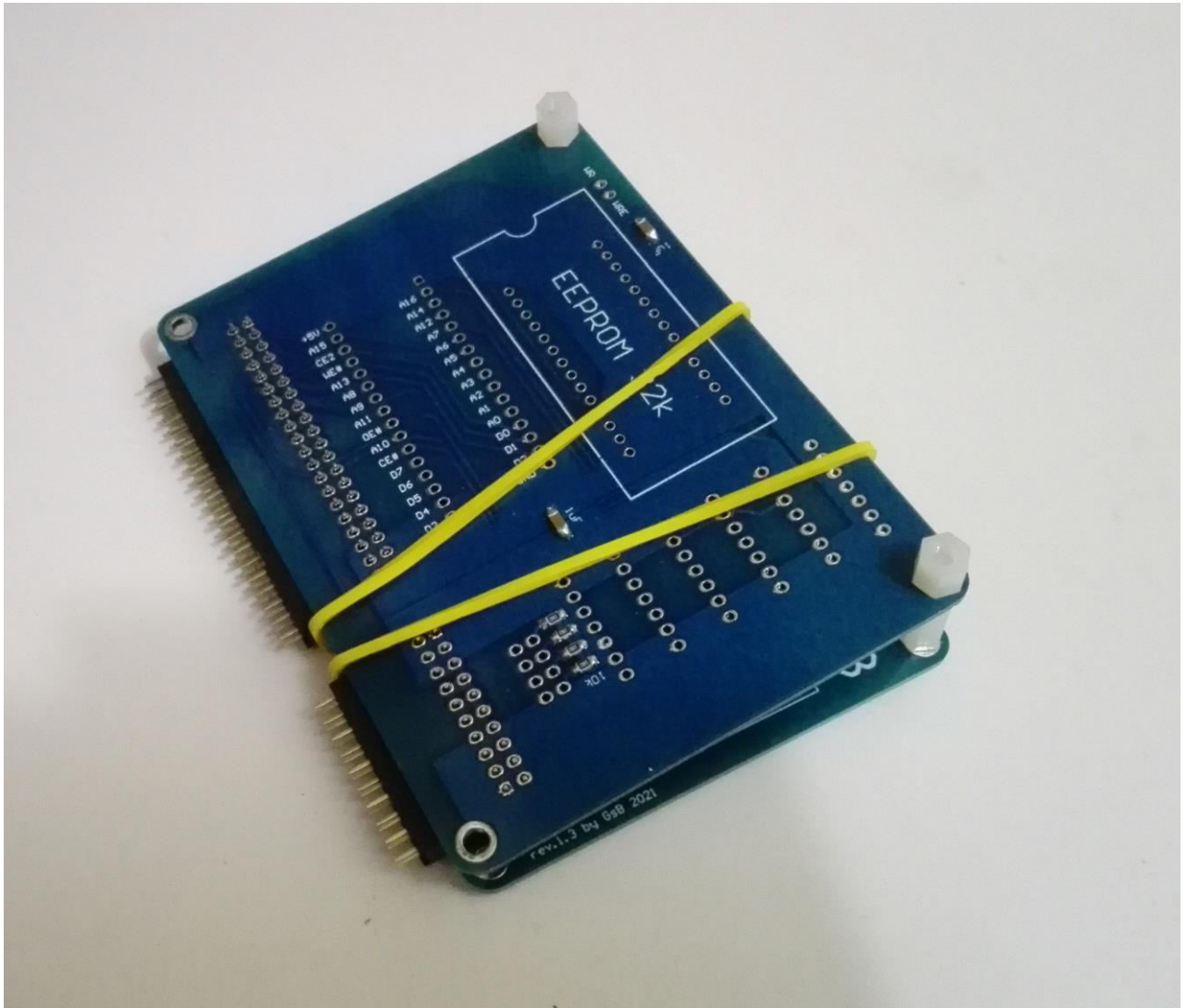
ASSEMBLY STEPS

1) Solder SMD components on all the PCB modules. Use plastic spacers to reduce heat loss and make soldering process more handy.



2) Unmount bottom (adjacent to backboard header) spacers from the module PCB. Connect the pair of corresponding PBD (female) and PLD-R (male) headers. Make a "sandwich" with two module PCBs and connected headers.

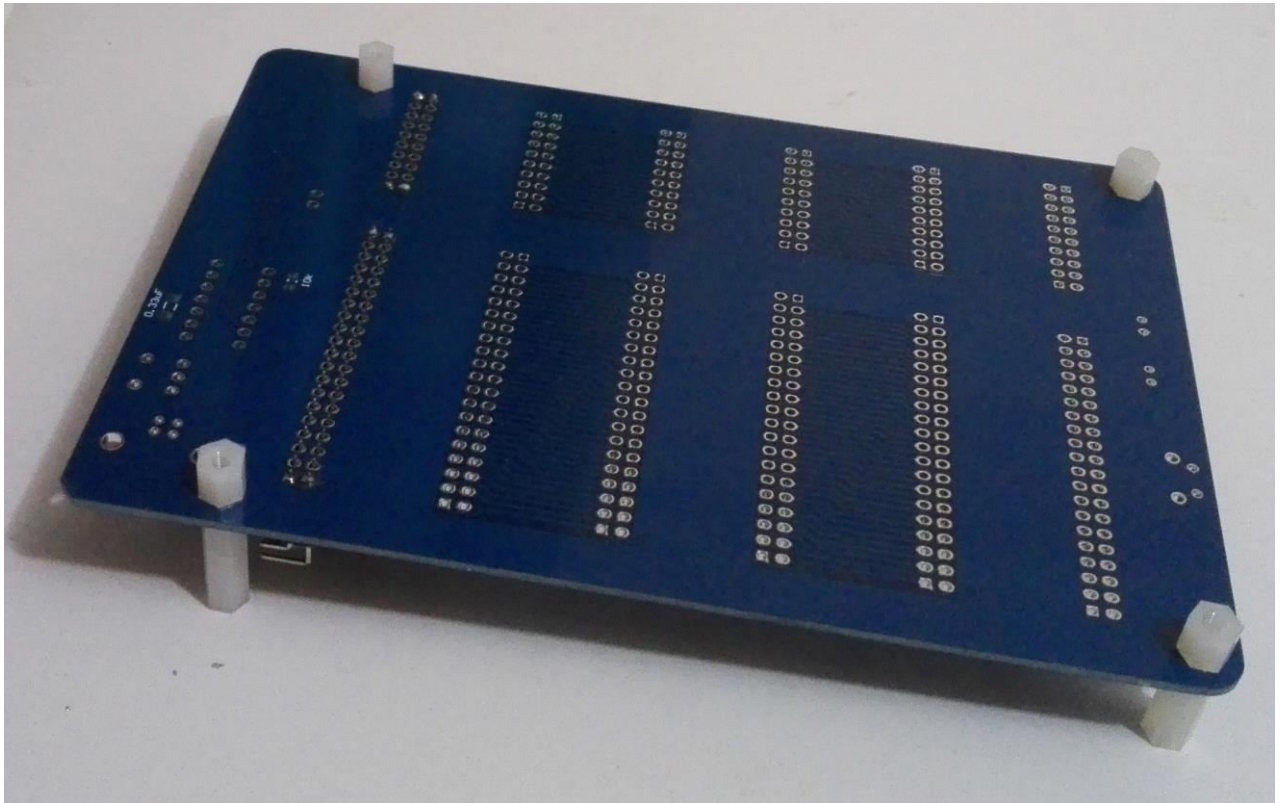




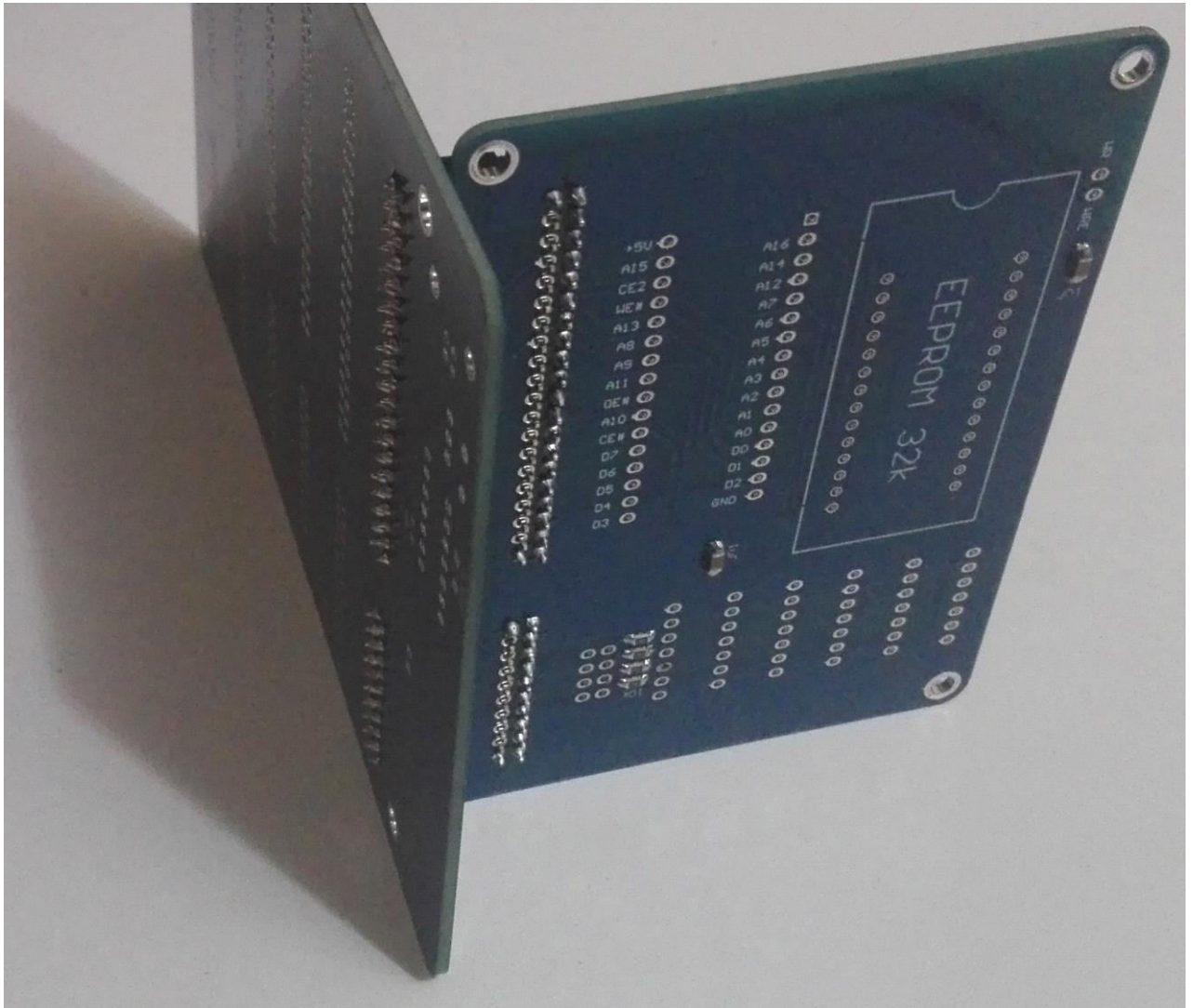
Use this PCB "sandwich" as a mean of perfect alignment of the first pair of PBD headers during soldering it to the backboard PCB. Solder 4 edge pins for each PBD header. You can still fix some gaps and shifts by applying corresponding force vector and melting corresponding solder joints with your soldering iron.



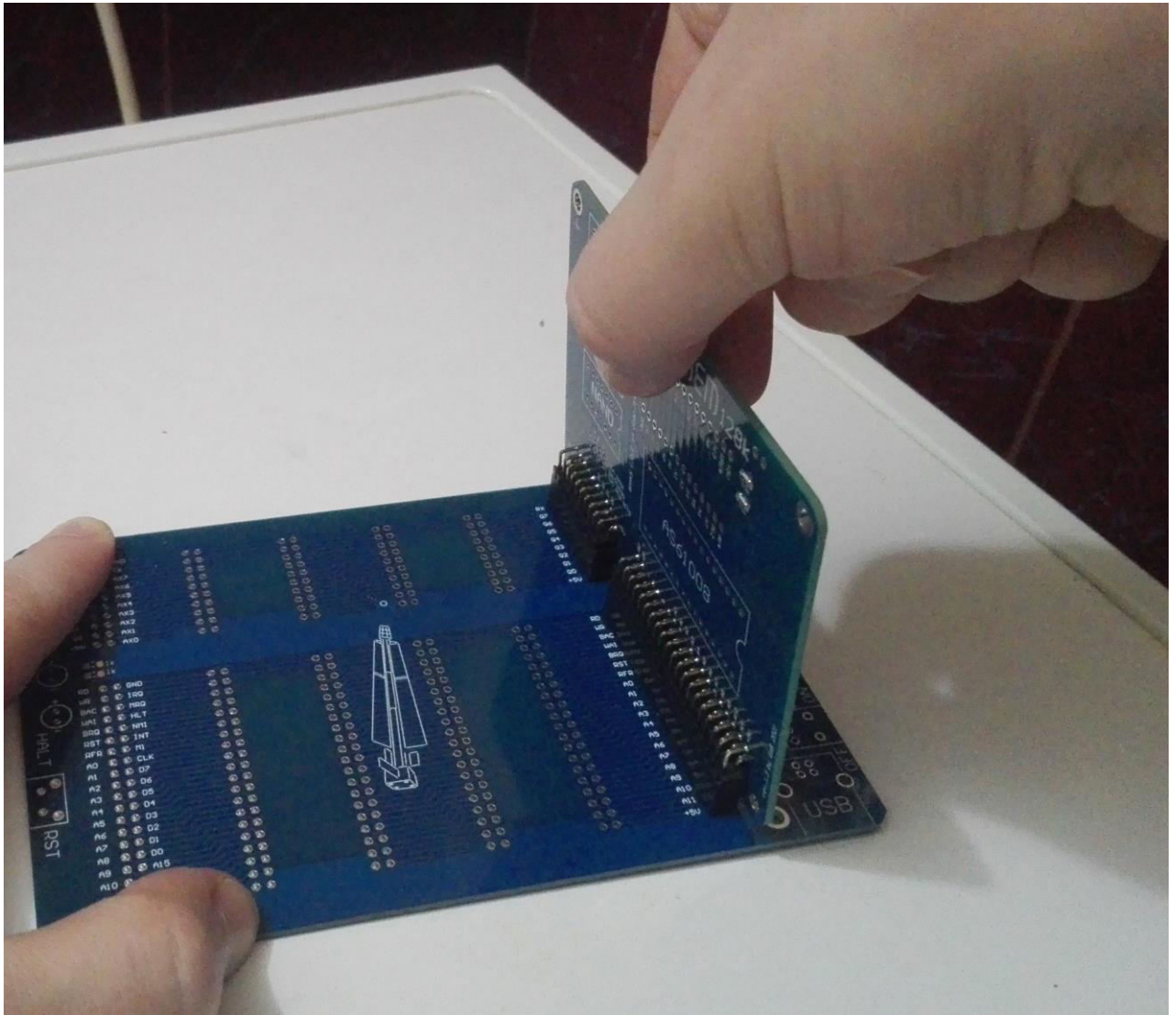
If alignment looks good dismantle PCB "sandwich", mount 20mm and 15mm spacers on the backboard, flip the backboard and solder the rest of PBD headers pins with comfort.



3) Put the module PCB back on PLD-R pins, flip this build on it's side. Align module and solder edge pins. If alignment is good solder external (reachable) row of PLD-R pins.

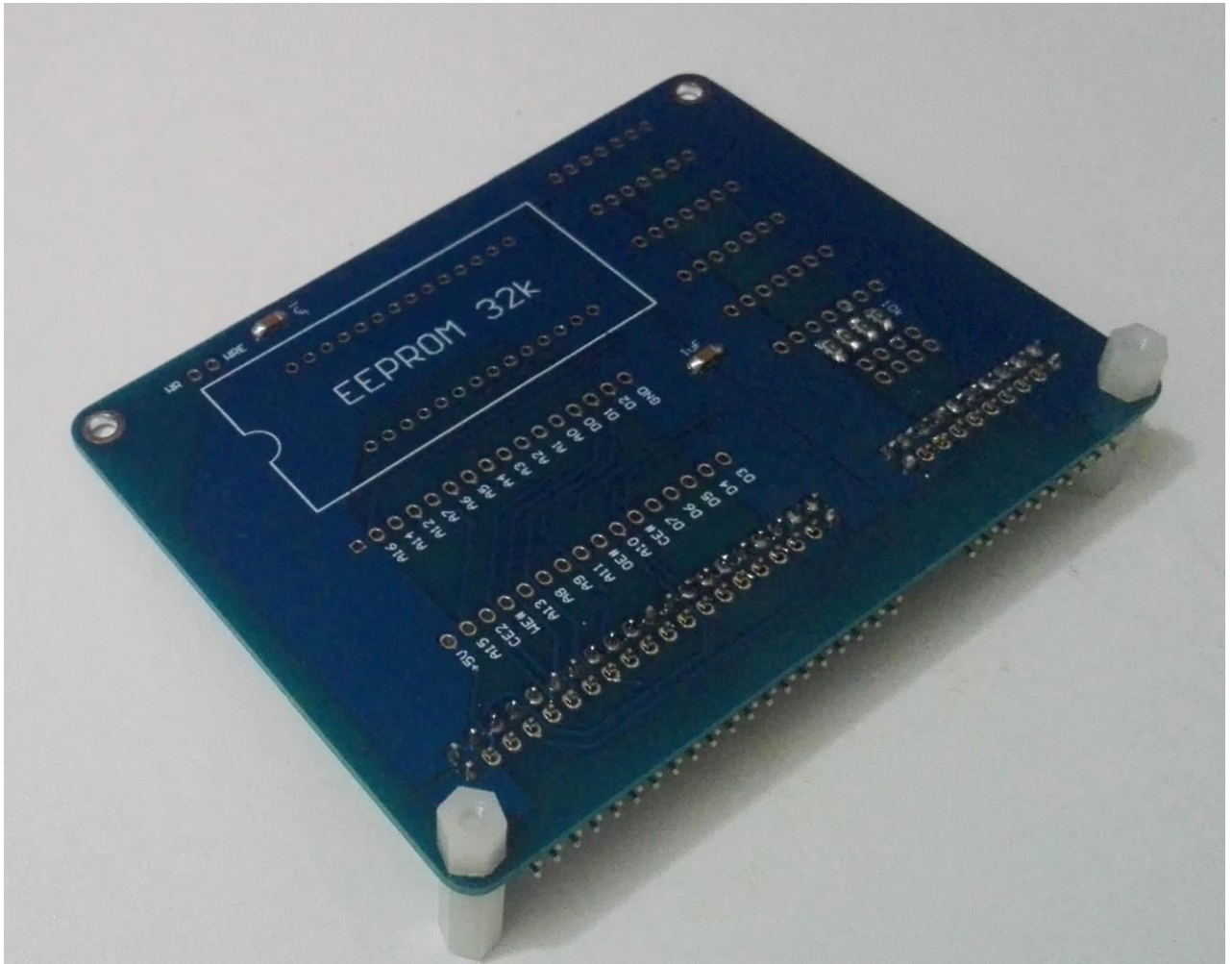


(!)Extract module by applying small pulling-up force and swaying module side-to-side ACROSS the headers watching pins come out of it by themselves. Do not try to sway modules along the headers or else you'll end up with bent male header pins.

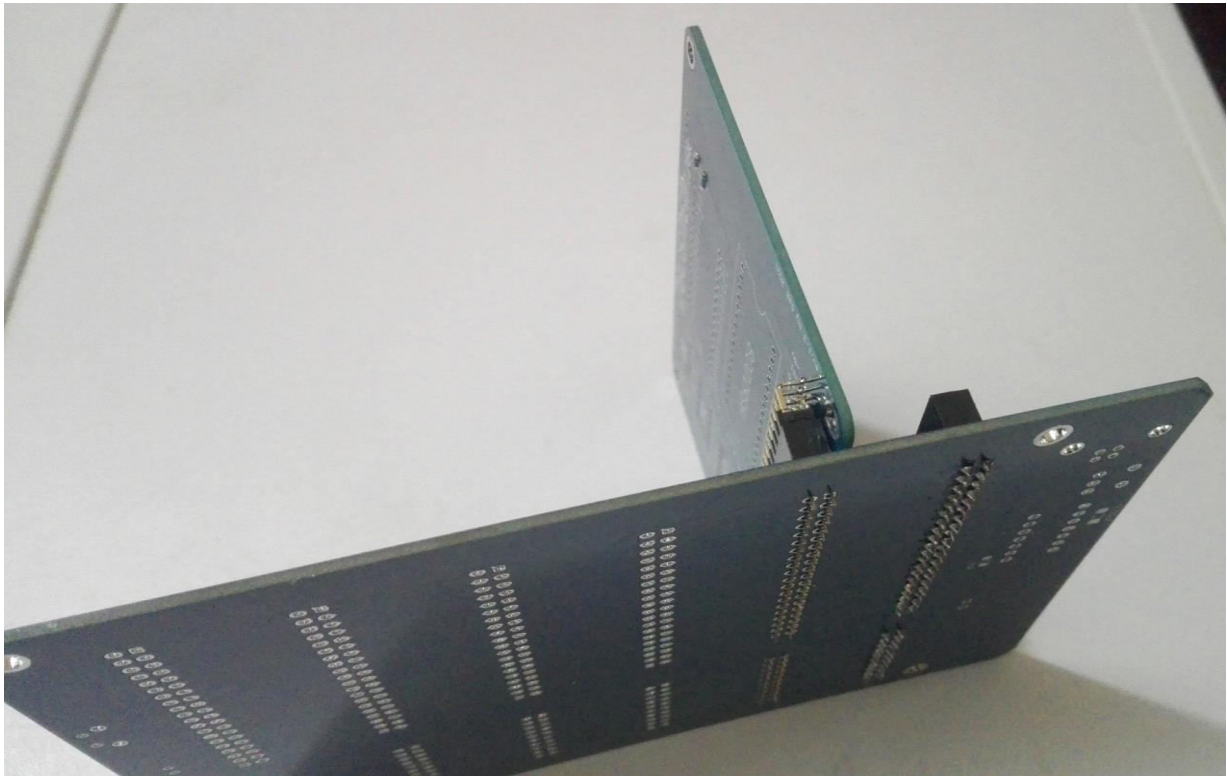


As soon as the module is successfully extracted solder the rest of PLD-R headers pins.

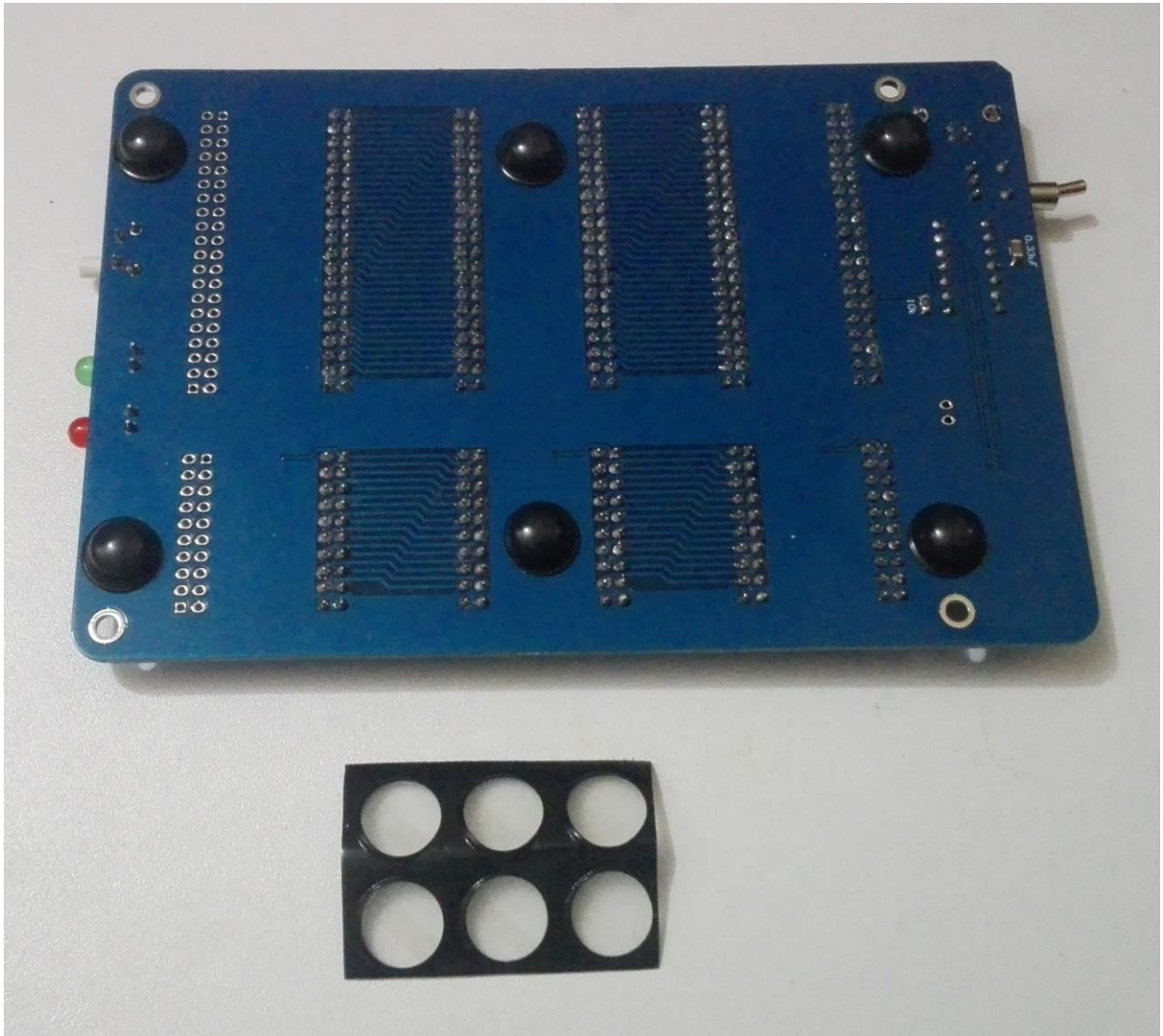
Insert another pair of PLD-R headers in backboard's PBD header, put another PCB module on them and solder it the same way as the first module. Repeat for the rest of modules, so at this stage all the modules should have SMD components and PLD-R headers soldered.



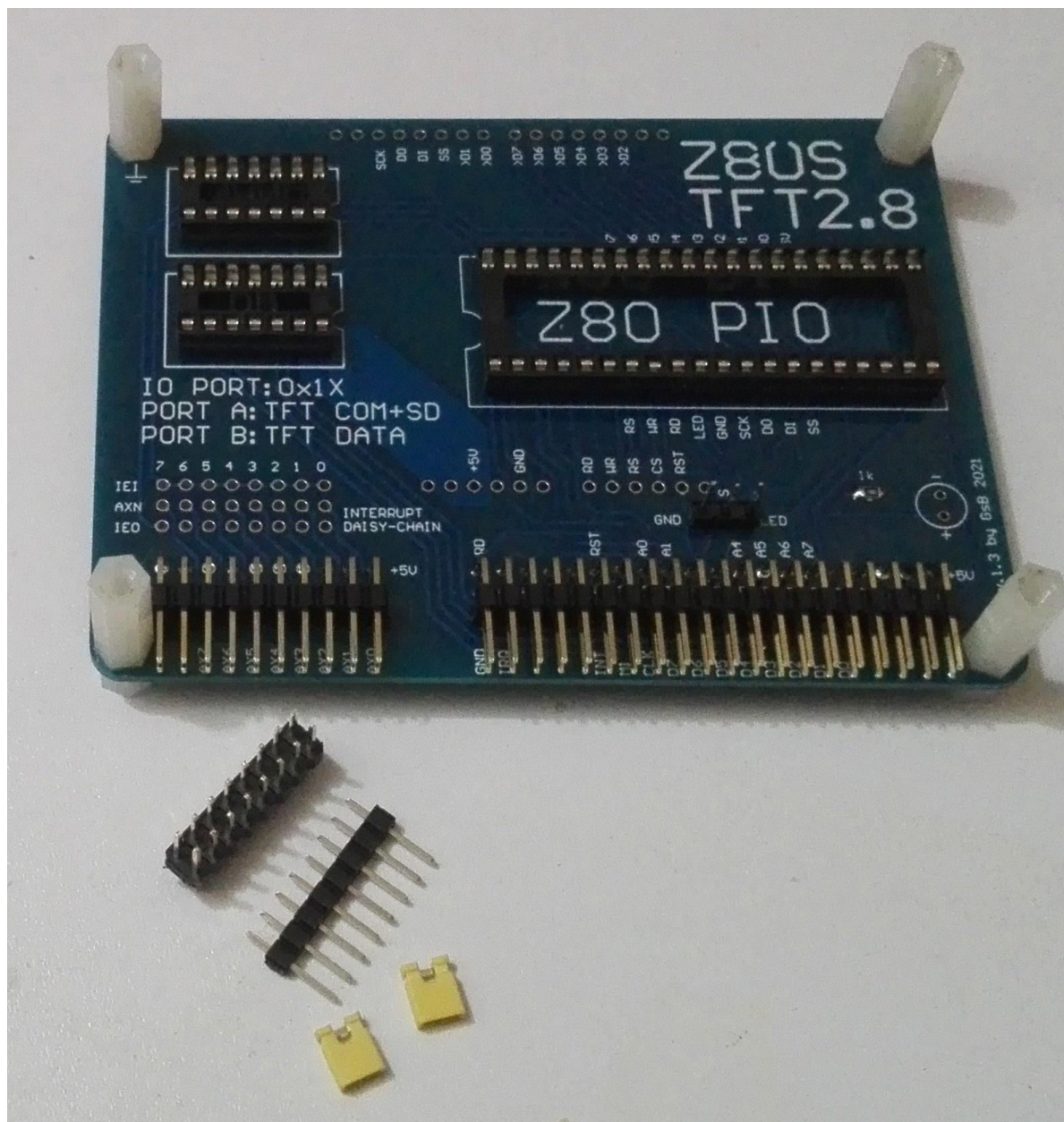
4) Use any module with soldered PLD-R headers as a mask to solder first 5 of 6 backboard headers by putting PBD headers on the module PLD-R headers and soldering PBD headers to the backboard the way you did it at step 2. It would be the best to solder header 5 the next after header 1 as it would let you to insert another module in previously soldered header 1 and flip the build backboard up without extraction of module before PBD header soldering completion which in turn provides better conditions for soldering of many pins at once on backboard bottom.

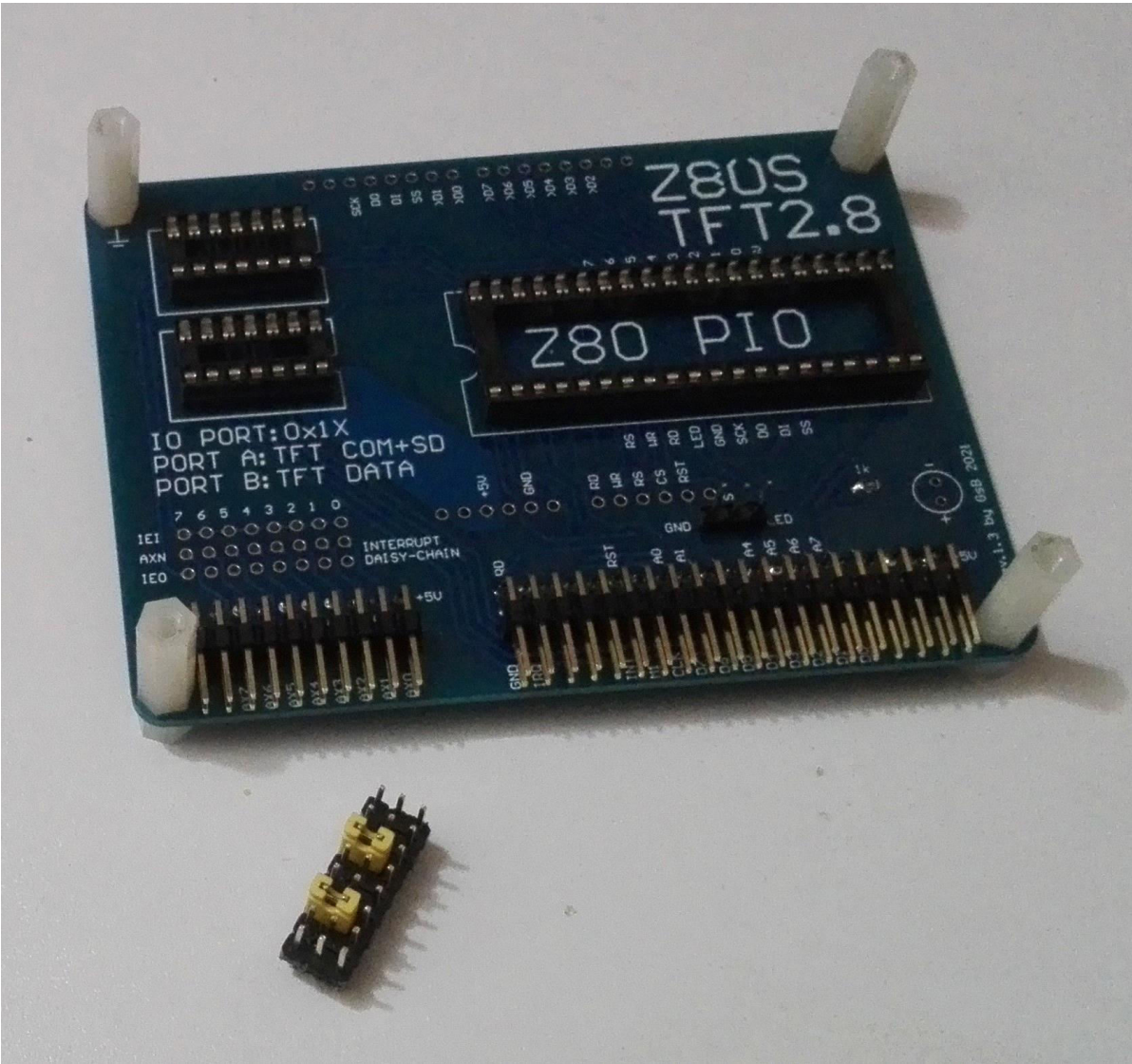


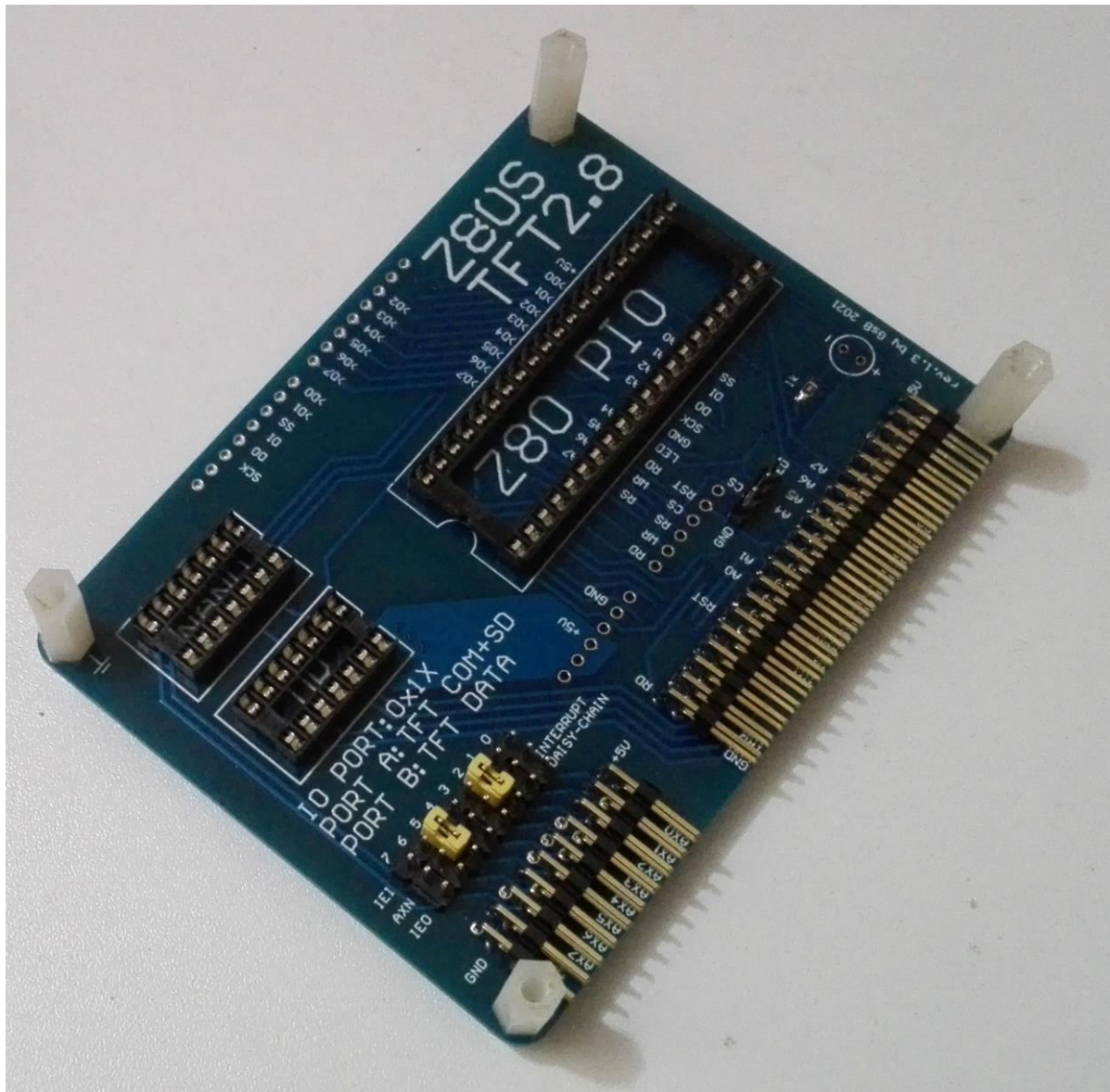
5) Solder the rest of components on backboard PCB beginning from the smallest (SMD components). It would be good choice not to install the last one pair of backboard headers (unless you already have 6 modules to install) in order to have handy access to the buses with standard multimeter probes. Clean bottom surface of backboard PCB from flux residuals with use of alcohol, tooth brush and cotton discs and sticks. Place 6 rubber feet on the backboard bottom surface.



6) Take PIO or SIO module. Use a couple of jumpers to join PLD-16 and PLS-8 pin headers and place them into interrupt daisy-chain jumpers footprint holes. Solder a couple of PLD-16 corner pins only. Take off jumpers and PLS-8 header in order to have easy access to both rows of PLD-16 header and solder the rest of the pins. Add PLS-8 header back and solder it too (without jumpers).







7) Take your TFT shield and put 2xPBS-6 and 2xPBS-8 headers on it. Solder headers pins to PIO module. This approach guarantees your TFT shield perfectly fits the module.

