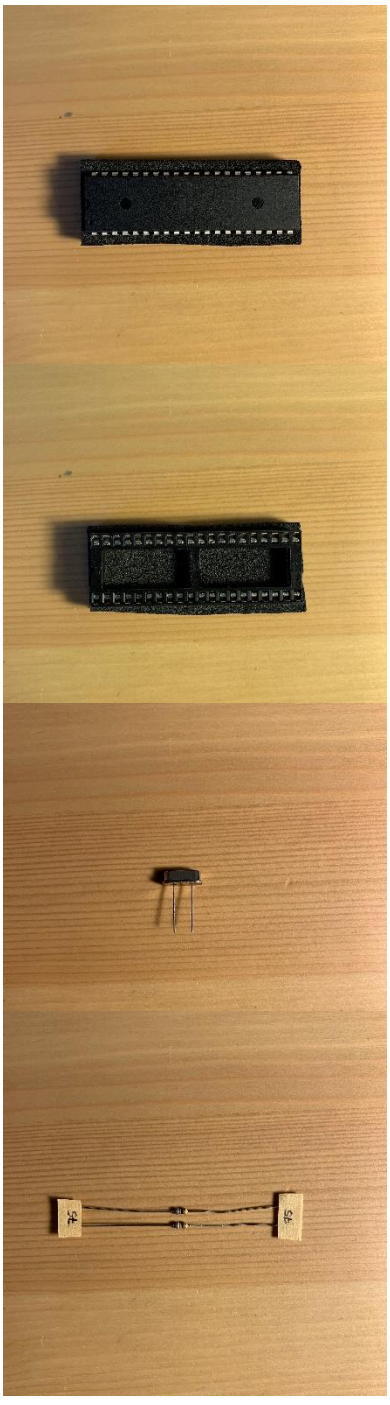
To build the DISCIPLINE 65% through hole kit you will need the following (not included):

- Soldering iron and solder wire (kester 63/37 .031 inch leaded solder recommended)
- Phillips head screwdriver
- Flush side cutters (diagonal cutters)
- Screw-in stabilizers (because there is no plate, plate mounted stabilizers are not supported)
    - 3x 2u stabilizers
    - 1x 6.25u or 7u stabilizer (depending on bottom layout choice)
- PCB-mount (5 pin) MX-style switches
- Keycaps for MX switches
- USB Type-C cable

Recommended (not included):

- No-clean flux paste (HIGHLY recommended to prevent bridging on USB pins)
- Solder wick (to remove solder bridges if they occur)
- Solder sucker (to remove solder from holes if a mistake is made and component needs to be reinserted)
- Aluminum feet to angle keyboard if desired

Included components:



Atmega32A

40-pin IC socket

16mhz crystal

2x 75R resistor

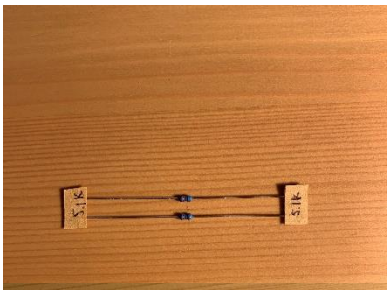
2x 22pF capacitor

2x 0.1uF capacitor

4.7uF capacitor

2x 1.5K resistor

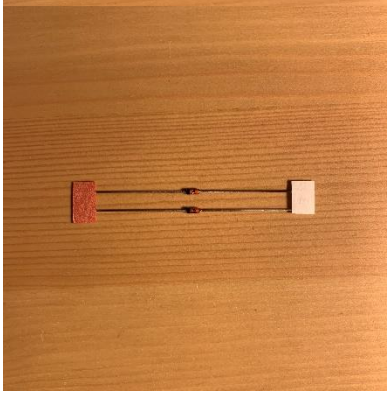
Included components (continued):



2x 5.1K resistor

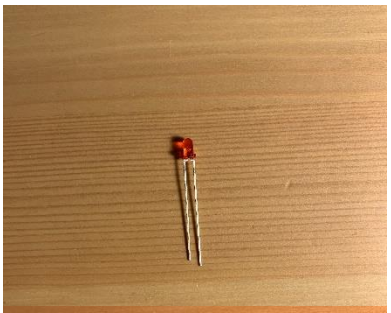
10k resistor

68x 1n4148 diode



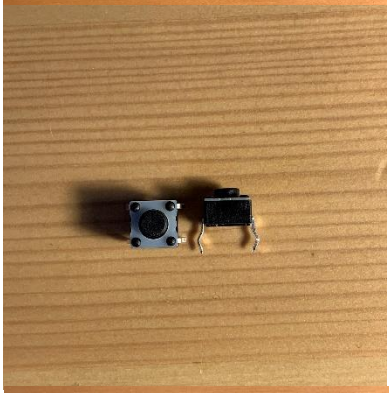
2x Zener diode 3.6V

KEEP SEPARATE FROM 1N4148 DIODES

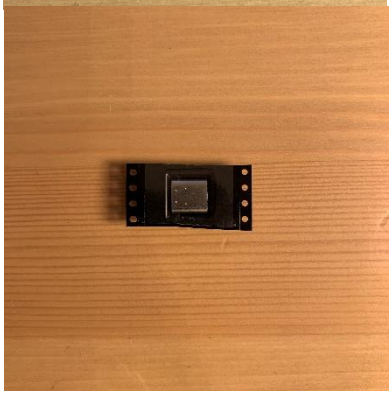


3mm led

6 pin header



2x 6mm pushbutton



usb type-c port

PLEASE SEE SOLDERING INSTRUCTION

Included components (continued):

resettable fuse (5.1mm)

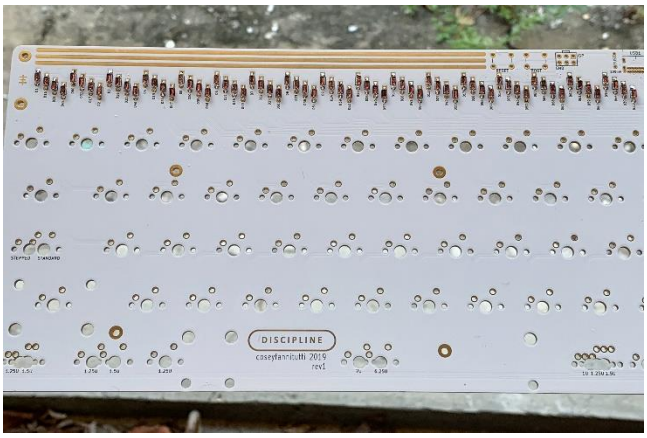
20x m2 mm screw

10x m2 5mm standoff

4x m2 9+3mm standoff

Continue for build guide.

Build Guide:

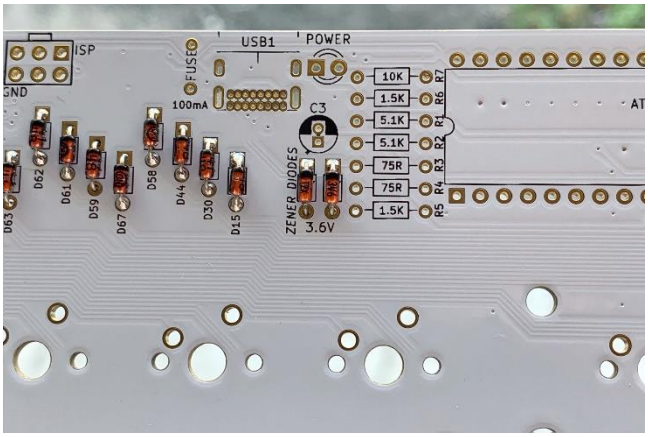


STEP 1

68x 1N4148 diodes

THIS PART HAS A SPECIFIC ORIENTATION – Black bar on diode will point upward and line up with the square pad.

Place diodes, folding down the legs to hold them in place as you go. Solder and clip the legs.

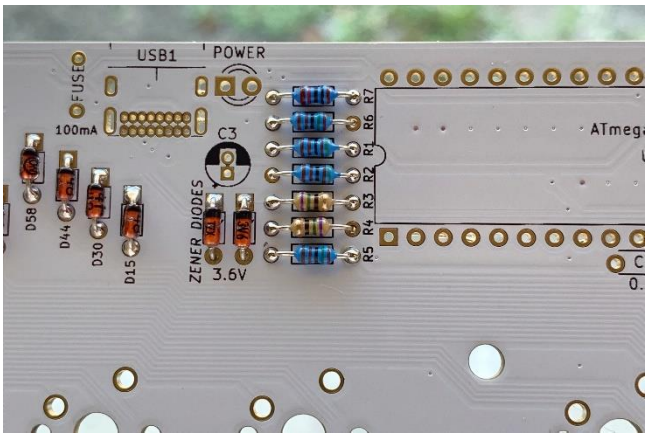


STEP 2

2x 3.6V Zener diodes

THIS PART HAS A SPECIFIC ORIENTATION – Black bar on diode will point upward and line up with the square pad.

These two diodes will be separated from your other diodes. They are NOT interchangeable. Use same method for soldering.

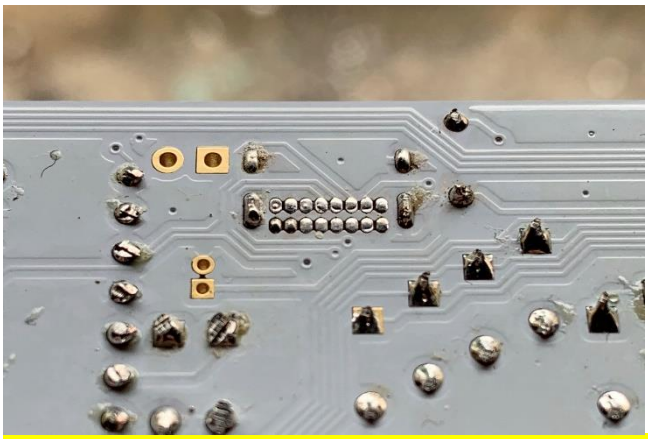


STEP 3

Resistors: 1x 10K, 2x 5.1K, 2x 1.5K, 2x 75R

THESE PARTS DO NOT HAVE A SPECIFIC ORIENTATION.

Insert and solder using the same method you used in steps 1 and 2.



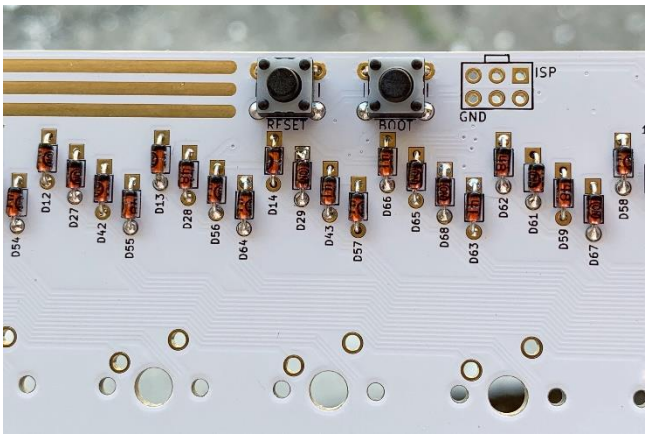
STEP 4

1x USB Type-C port

Insert and flip board over. Use a small piece of tape to hold if having trouble keeping in place. Solder only one of the bottom legs. Remove tape if present. Heat up soldered pad and press down to ensure the port is flush and even before soldering the other three legs. **IMPORTANT NOTE BELOW:**

For the small pins you are going to use a different technique than the rest of the components. If you have no-clean flux available apply it across the pins now. If not, having solder wick is recommended in case a bridge occurs. This step is possible without flux, but using it is highly recommended and will make the process much easier.

Apply a small amount of solder and drag your iron across the pins. Repeat until all holes are filled as pictured above.

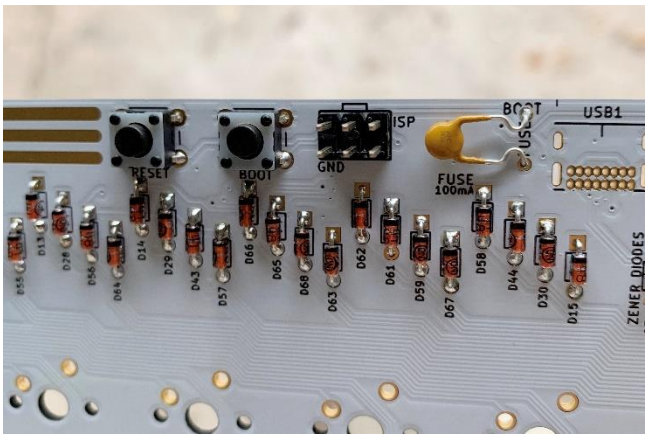


STEP 5

2x 6mm pushbutton

NO SPECIFIC ORIENTATION

Insert and solder BOOT and RESET switches



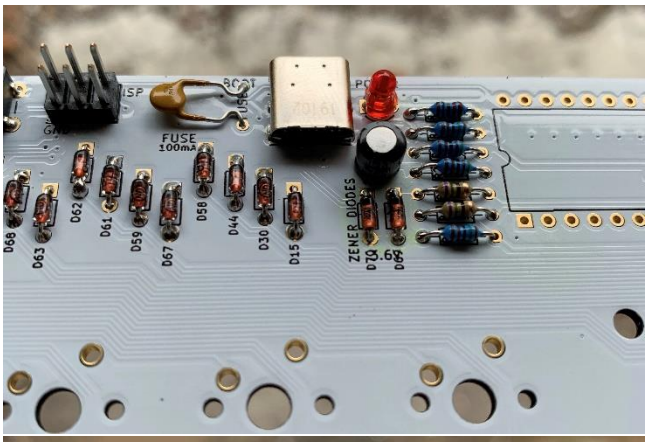
STEP 6

1x 6-pin header, 1x 100mA fuse

Longer side of header on top side of board.

For header, solder only one pin. Then heat up pin and press down to align flush with pcb before soldering the rest of the pins. Use rag or glove to protect hand from heat.

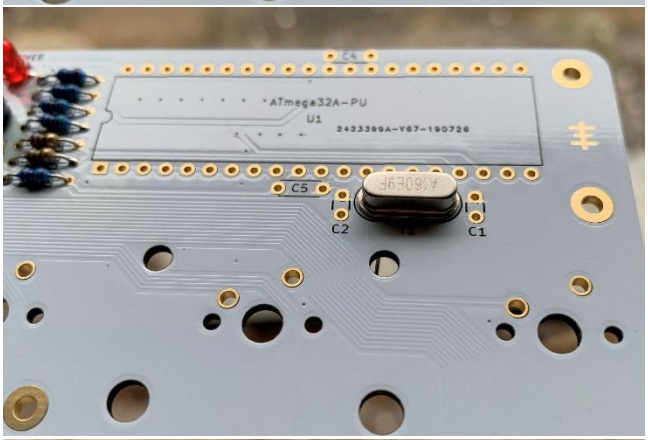
Fold down fuse after soldering as pictured.



STEP 7

1x 3mm LED – THIS PART HAS A SPECIFIC ORIENTATION – Short leg and flat side of LED lines up with square pad

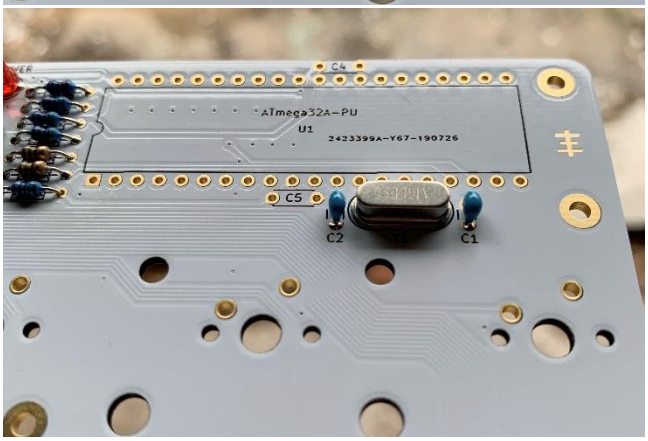
1x 4.7uF capacitor – THIS PART HAS A SPECIFIC ORIENTATION – Longer leg goes to square pad and white mark will be pointing upward.



STEP 8

1x 16mhz crystal

NO SPECIFIC ORIENTATION

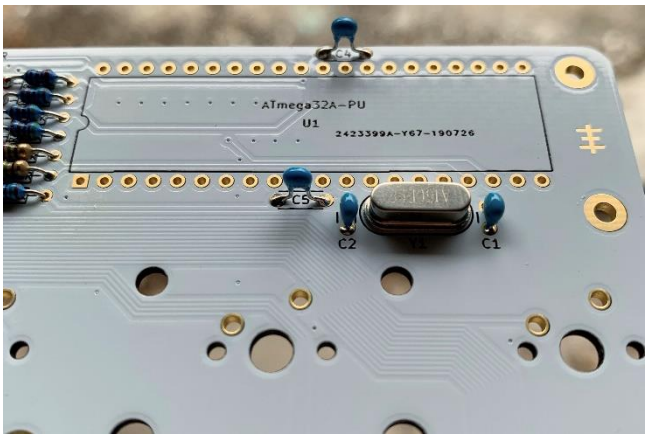


STEP 9

2x 22pF capacitors

NO SPECIFIC ORIENTATION

These capacitors are the smaller blue capacitors with straight legs.

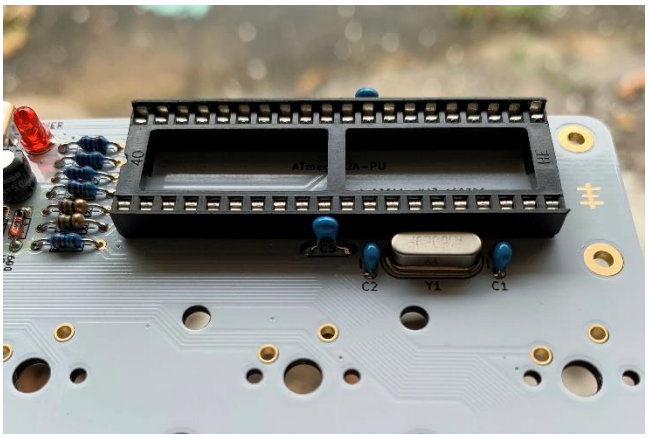


STEP 10

2x 0.1uF capacitors

NO SPECIFIC ORIENTATION

These capacitors are the larger blue capacitors with winged/wider legs.



STEP 11

1x 40-pin IC socket

1x ATmega32A

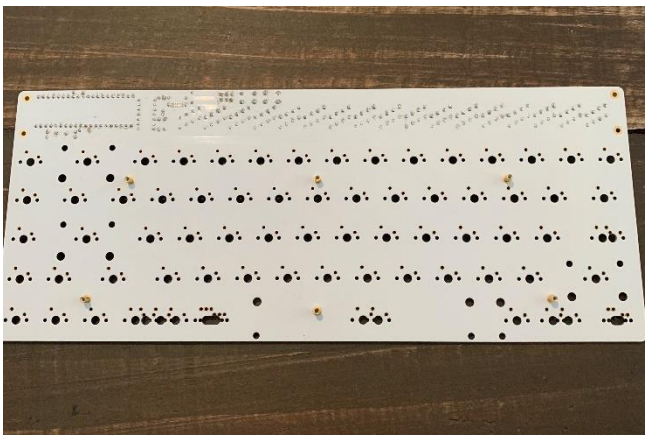
Take note of notches marked on the PCB, socket, and microcontroller for proper orientation.

Do not insert microcontroller before soldering the socket to the PCB.

Solder two opposite corners of the IC socket. Reheat and press down on each to ensure socket is flush with PCB. Solder the rest of the pins.

Insert microcontroller into socket, with the notch on the left side. You may have to GENTLY bend the pins slightly inward for proper alignment with the socket.

With a white PCB leftover flux may be very visible after soldering. This is fine but may be unsightly for some, though it will be hidden. If you would like to clean it place a rag over soldered area. Lightly cover with isopropyl alcohol and rub to loosen leftover flux. Use dry end of rag to dry and wipe away.



STEP 12

6x M2 4mm screws

6x M2 5mm standoffs

Before soldering switches install the 6 lower standoffs to the bottom of the PCB.

STEP 13

Switches and stabilizers not included

Screw in stabilizers.

Install and solder switches.

STEP 14

4x M2 4mm screws

4x M2 5mm standoffs

4x M2 9+3mm standoffs

Install standoffs to the top four holes with the 9+3mm standoffs on top and the 5mm standoffs on the bottom of the PCB. Screw in acryilic guard with 4x 4mm screws.

STEP 15

10x M2 4mm screws

2x aluminum feet (not included)

Install aluminum feet (if desired) and use remaining 10x screws to attach bottom plate.

STEP 16

2-4x rubber bumpons

Install rubber bumpons near corners as evenly aligned as possible to avoid wobble. If using aluminum feet you will not need bumpons in the top corners.

Your build is complete and ready to use