R O M E O

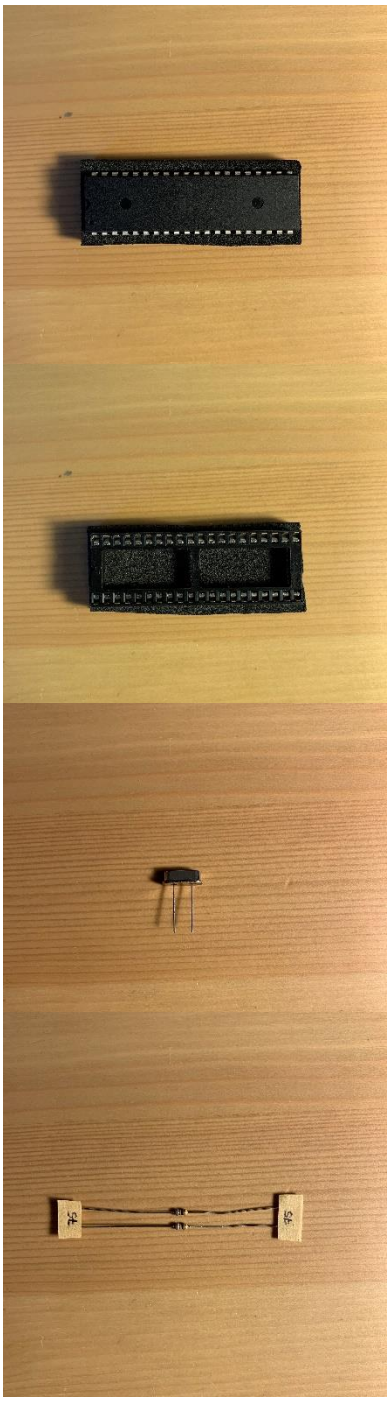
To build the ROMEO through-hole kit you will need the following (not included):

- Soldering iron and solder wire (kester 63/37 .031 inch leaded solder recommended)
- Phillips head screwdriver
- Flush side cutters
- Screw-in stabilizers (plate mounted stabilizers are not supported)
    - 1-4x 2u stabilizers (depending on bottom row layout)
    - 1x 6.25u (if standard size spacebar is desired)
- 41-44x MX-style switches (plate mount or pcb mount)
- 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:



Atmega328P

28-pin IC socket

16mhz crystal

2x 75R resistor

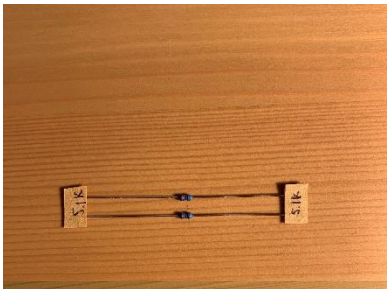
2x 22pF capacitor

2x 0.1uF capacitor

4.7uF capacitor

2x 1.5K resistor

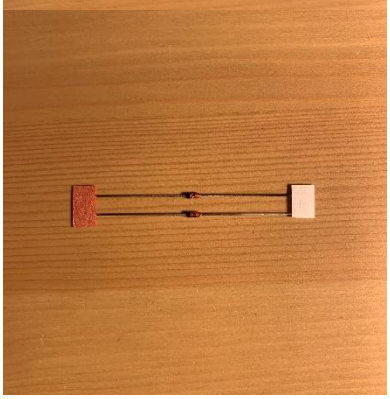
Included components (continued):



2x 5.1K resistor

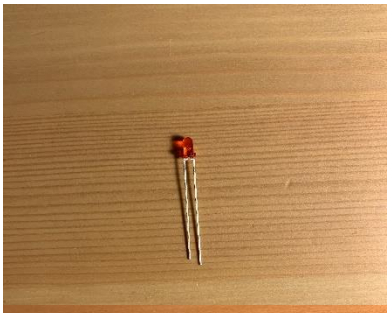
10k resistor

44x 1n4148 diode



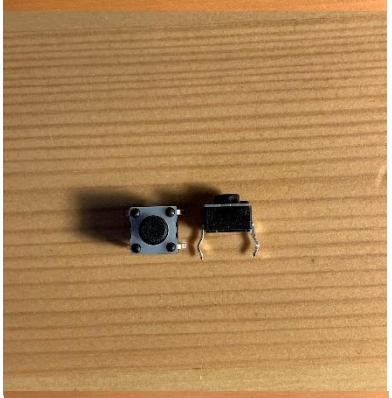
2x Zener diode 3.6V

KEEP SEPARATE FROM 1N4148 DIODES

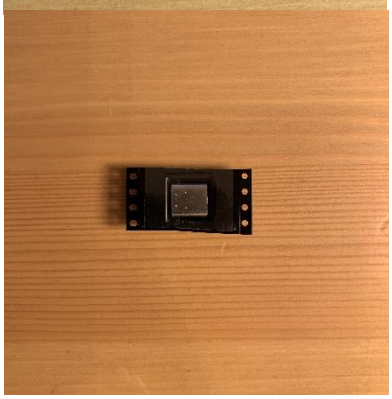


3mm led

6 pin header



2x 6mm pushbutton



USB Type-C port

PLEASE SEE SOLDERING INSTRUCTION

Included components (continued):

500mA resettable fuse (5.1mm)

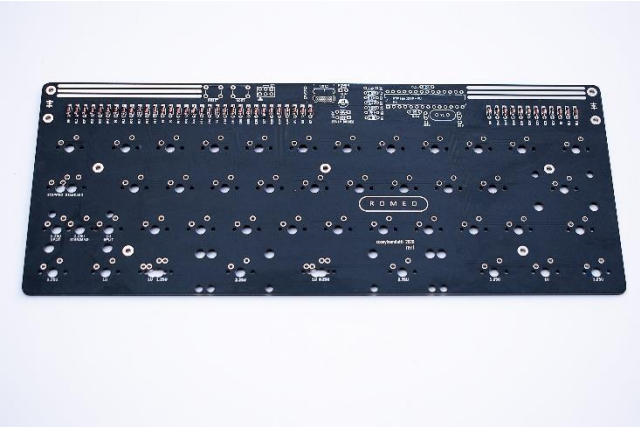
18x m2x4mm screw

9x m2 6mm standoff

4x m2 10+3mm standoff

Continue for build guide.

Build Guide:

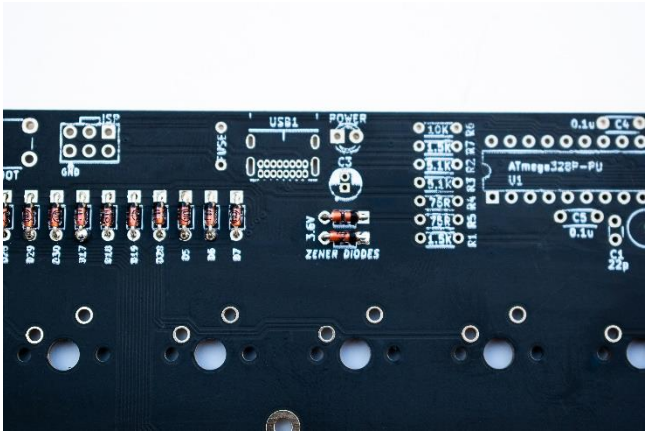


STEP 1

44x 1N4148 diodes

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

Diode bender not necessary. Bend legs straight down as close to diode as possible and insert. Solder and clip the legs.

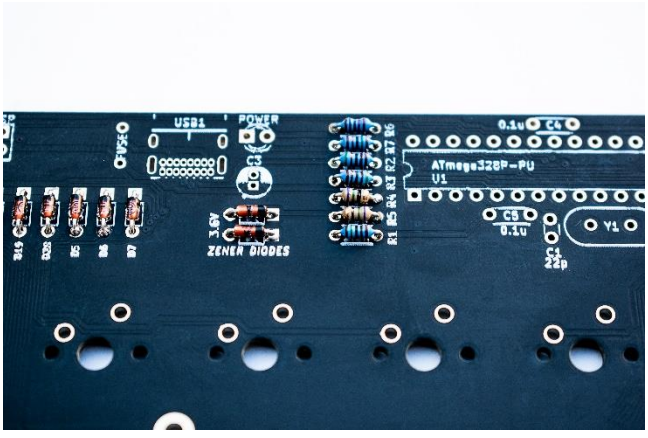


STEP 2

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.

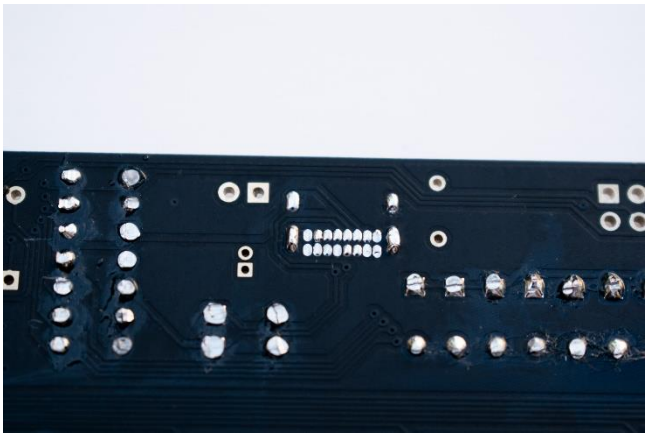


STEP 3

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

THESE PARTS DO NOT HAVE A SPECIFIC ORIENTATION.

Insert based on labeled resistor value and solder using the same method you used in steps 1 and 2.



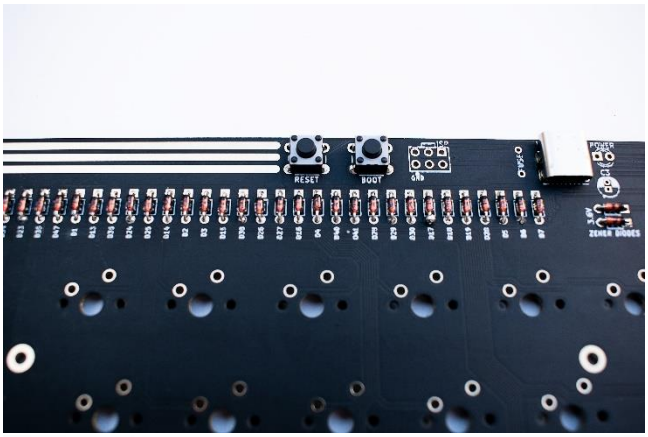
STEP 4

1x USB Type-C port

Insert and flip board over. Solder only one of the large bottom legs. 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. Apply no-clean flux paste across all pins. This step is possible without flux, but using it is highly recommended and will make the process much easier. Proceeding without flux for this step is not recommended.

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

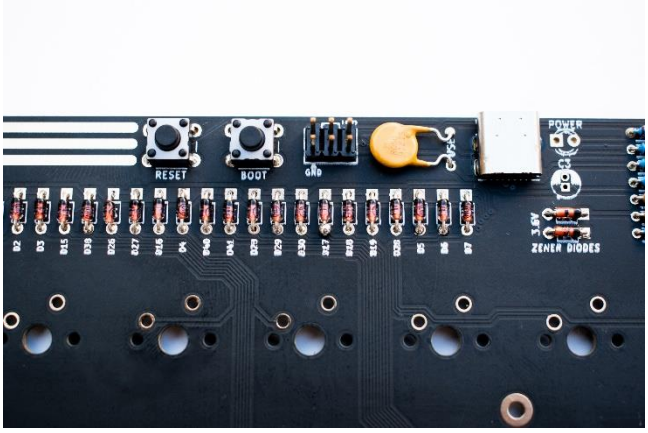


STEP 5

2x 6mm pushbutton

NO SPECIFIC ORIENTATION

Insert and solder BOOT and RESET switches



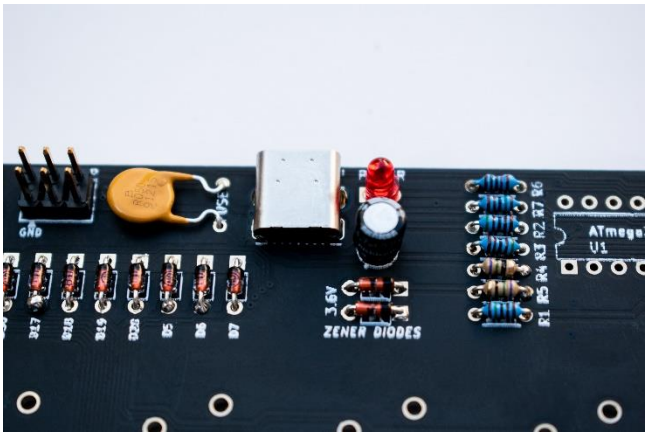
STEP 6

1x 6-pin header, 1x 500mA fuse

Longer side of header is the top side.

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.

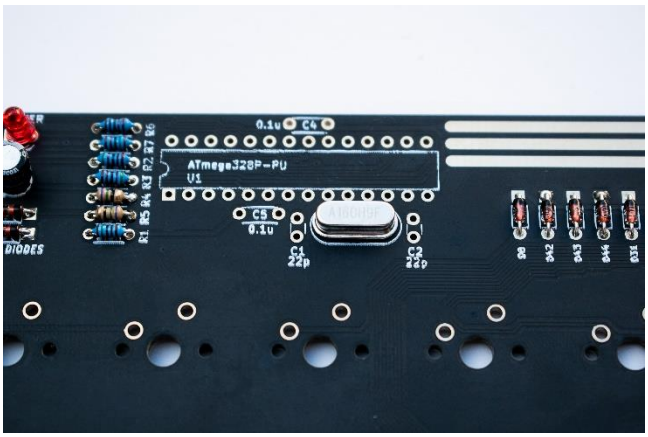
Fold down fuse after soldering as pictured.



STEP 7

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

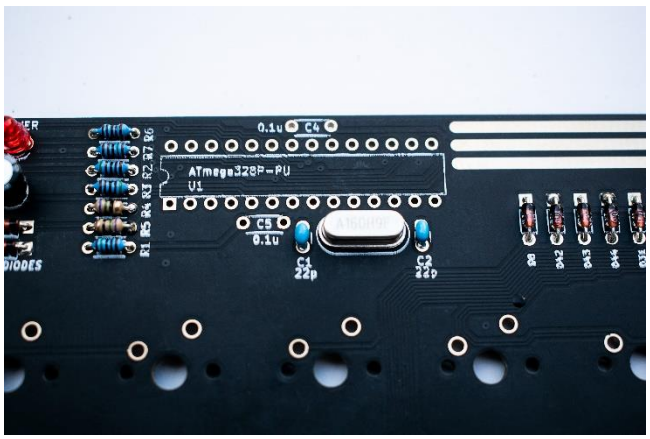
1x 4.7uF capacitor – THIS PART HAS A SPECIFIC ORIENTATION – Longer leg goes to square pad and white mark on capacitor will be pointing upward.



STEP 8

1x 16mhz crystal

NO SPECIFIC ORIENTATION

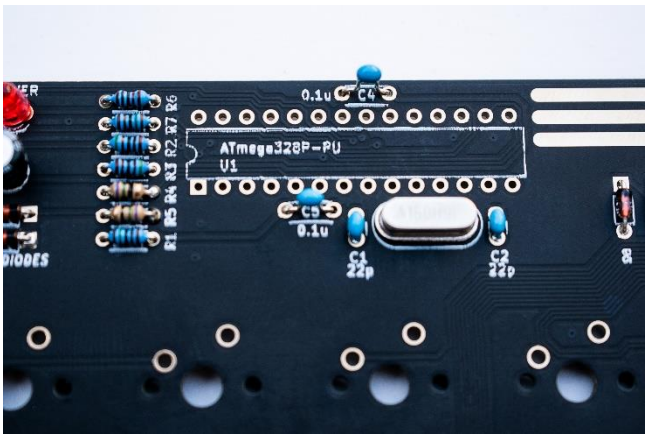


STEP 9

2x 22pF capacitors

NO SPECIFIC ORIENTATION

These capacitors are the smaller blue capacitors with straight legs.

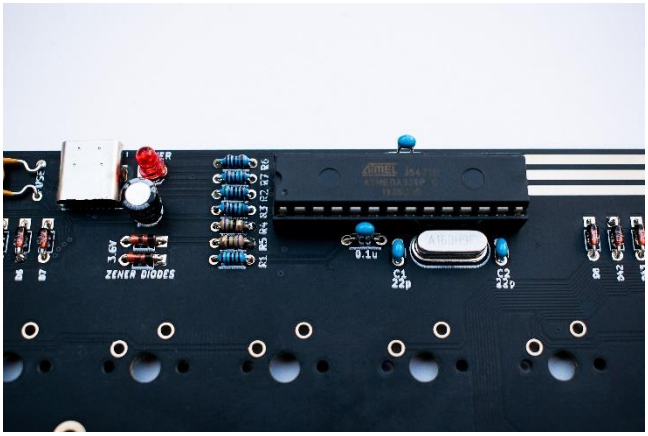


STEP 10

2x 0.1uF capacitors

NO SPECIFIC ORIENTATION

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



STEP 11

1x 28-pin IC socket

1x ATmega328P

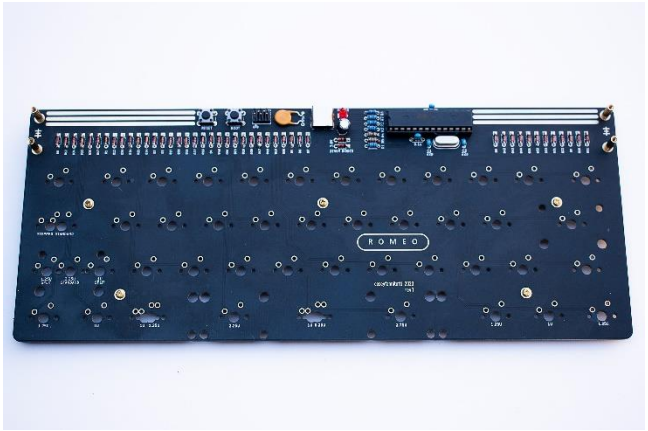
Take note of notches marked on the PCB, socket, and microcontroller for proper orientation.

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.

Leftover flux may be very visible after soldering. This is fine, but some may find it unsightly, though it will be hidden. If you would like to clean it place a lint free cloth or electronics wipe over soldered area. Lightly cover with isopropyl alcohol and rub to loosen leftover flux. Use dry end of cloth to dry and wipe away.



STEP 12

5x M2 4mm screws

4x M2 10+3mm standoffs

9x M2 6mm standoffs

INSTALL THESE SCREWS AND STANDOFFS BEFORE SOLDERING SWITCHES

STEP 13

Ensure you have completed Step 12 before proceeding.

Switches and stabilizers not included.

Screw in stabilizers.
Place plate over stabilizers.
FR-4 plates are slightly flexible and may need a little help staying flush with the switches when inserting the first row. Once the first row is inserted the rest should be able to be inserted normally.

Install and solder switches.

STEP 14

Line up and place foam on bottom side of board.

STEP 15

9x M2 4mm screws

2x aluminum feet (not included)

Install aluminum feet (if desired) and use 17x screws to attach bottom plate. 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.

STEP 16

4x M2 4mm screws

Install acrylic guard.

DO NOT OVERTIGHTEN. OVERTIGHTENING CAN STRIP THE SCREW THREADING. TIGHTEN ONLY UNTIL SLIGHT RESISTENCE IS FELT.

Install keycaps (not included)

Your ROMEO is complete and ready to use