

MYSTERIUM

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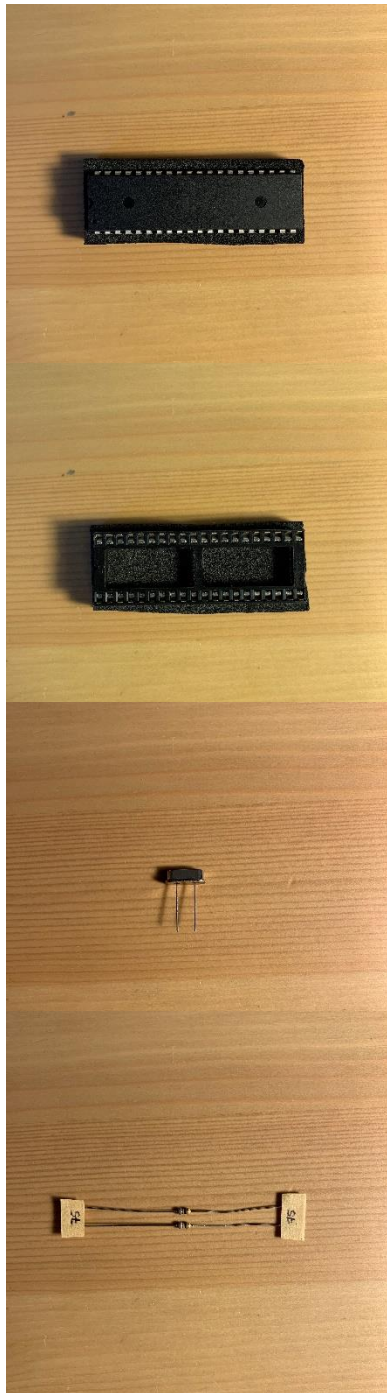
To build the MYSTERIUM through-hole kit you will need the following (not included):

- Soldering iron and solder wire (kester 63/37 .031 inch leaded solder recommended)
- Phillips head screwdriver
- Flush side cutters (small)
- Screw-in stabilizers (plate mounted stabilizers are not supported)
 - 3-4x 2u stabilizers (ANSI layout - 4x / ISO layout - 3x)
 - 1x 6.25u or 7u stabilizer (depending on bottom row layout)
- 86-88x 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)

Included components:



Atmega32A

40-pin IC
socket

16mhz crystal

2x 75R
resistor



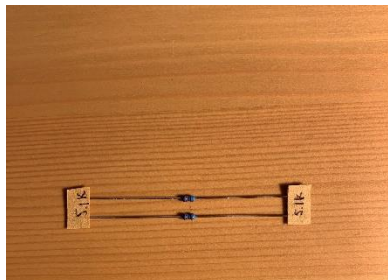
2x 22pF
capacitor

2x 0.1uF
capacitor

4.7uF
capacitor

2x 1.5K
resistor

Included components (continued):



2x 5.1K
resistor

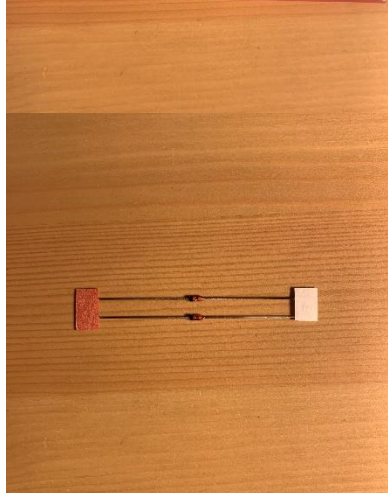


10k resistor



90x 1N4148
diode

**There will be
2x extra or 3x
if not using
ISO layout.**



2x Zener
diode 3.6V

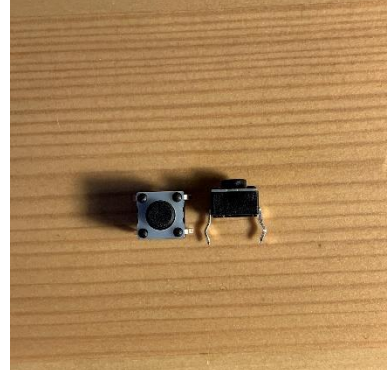
**KEEP
SEPARATE
FROM
1N4148
DIODES**



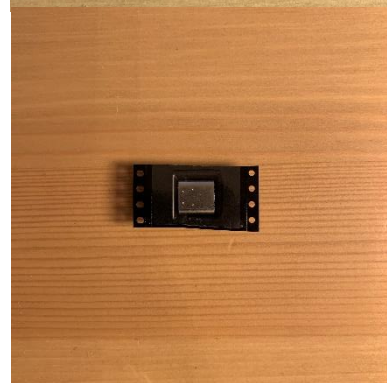
3mm led



6 pin header

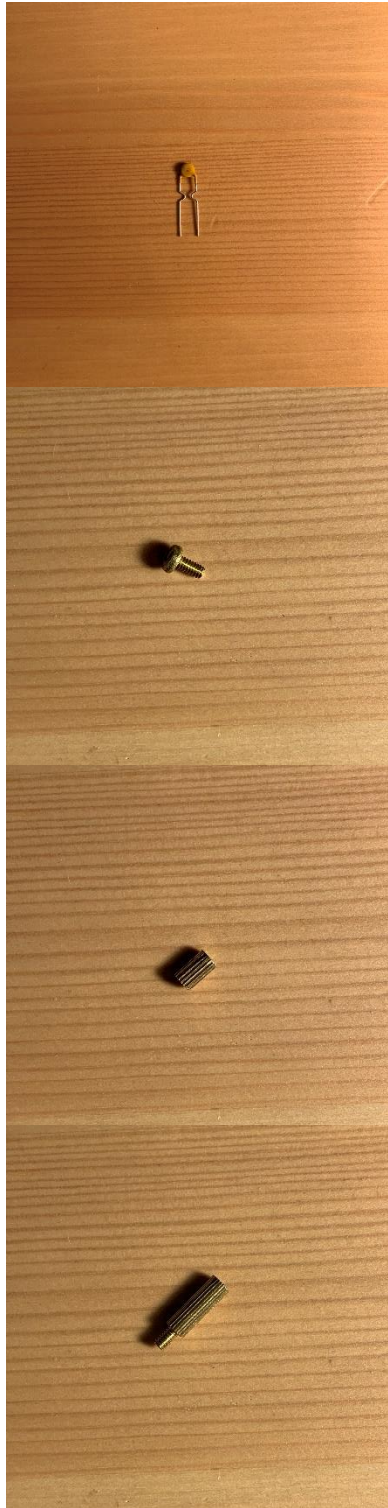


2x 6mm
pushbutton



USB Type-C
port

Included components (continued):



500mA resettable fuse (5.1mm)

DO NOT MIX CONTENTS OF PCB AND ACRYLIC FOOT SCREW/STANDOFF PACKS

These packs have different size standoffs and screws

“PCB” SCREW/STANDOFF PACK

- 22x M2 4mm screws
- 12x M2 6mm screws
- 17x M2 6mm standoffs
- 12x M2 10+3mm standoffs

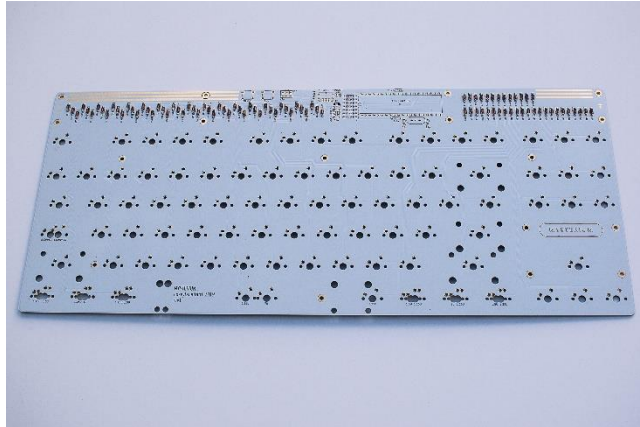
ACRYLIC “FOOT” SCREW/STANDOFF PACK

USE THE “FOOT” PACK ONLY FOR STEPS 15-16

- 8x M2 6mm screws
- 4x M2 8mm standoffs

Continue for build guide.

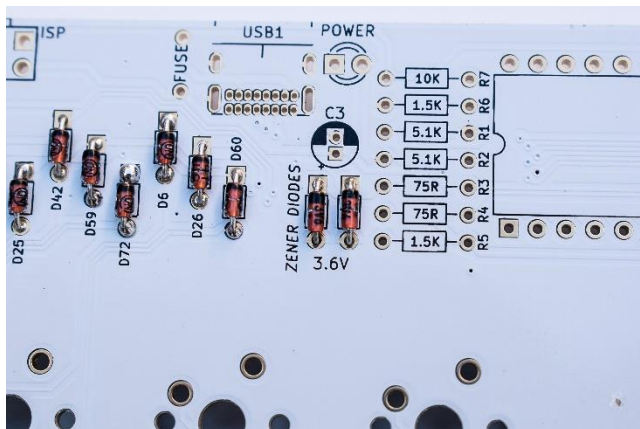
Build Guide:



STEP 1

87-88x 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. D98 marked “ISO” near left shift switch position only needed for ISO layout.

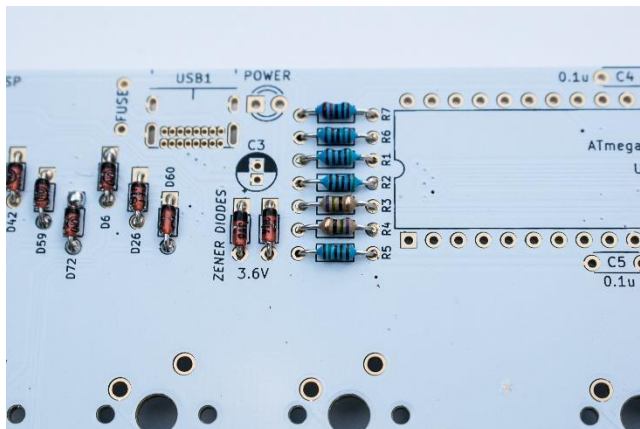


STEP 2

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.

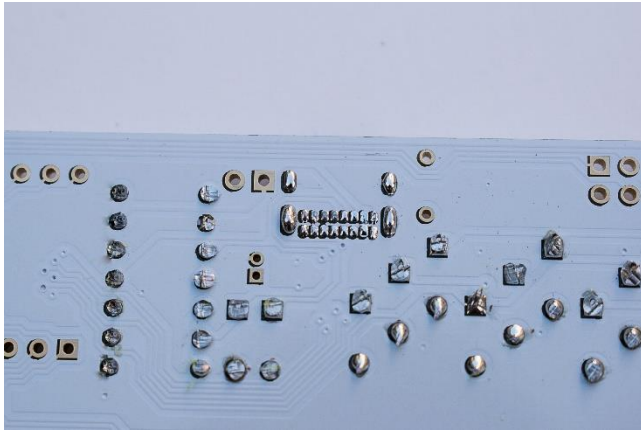


STEP 3

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.



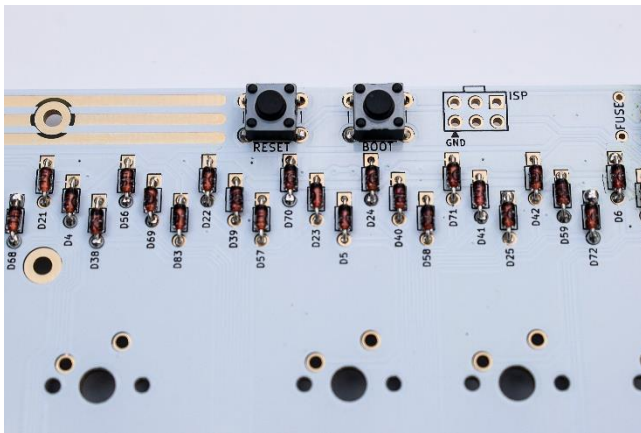
STEP 4

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.

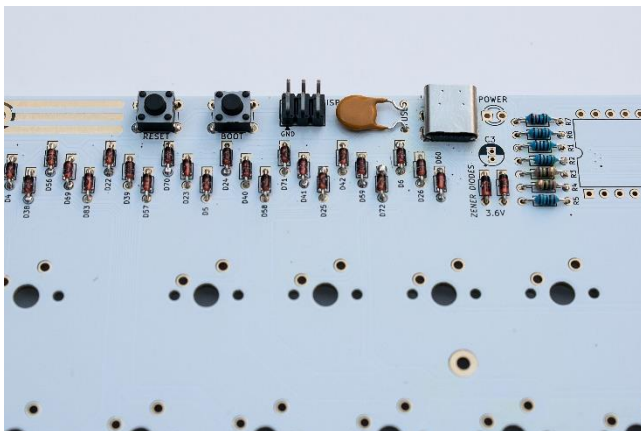


STEP 5

2x 6mm pushbutton

NO SPECIFIC ORIENTATION

Insert and solder BOOT and RESET switches



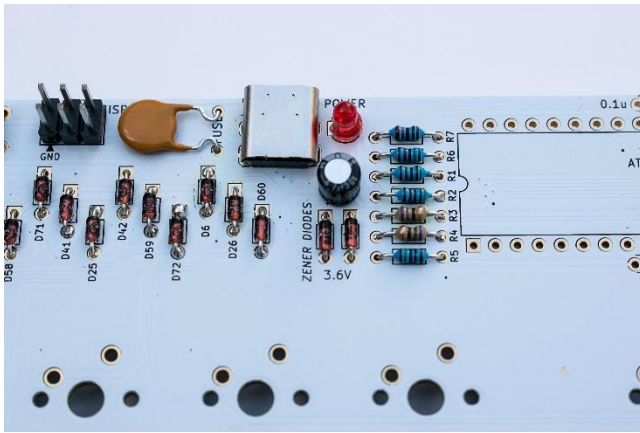
STEP 6

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.

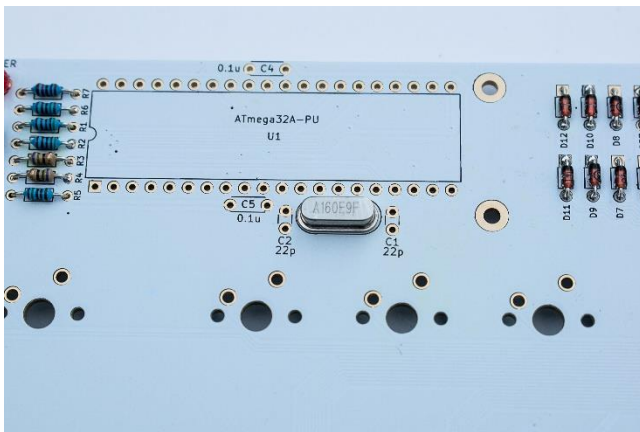
Fold down fuse after soldering as pictured.



STEP 7

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

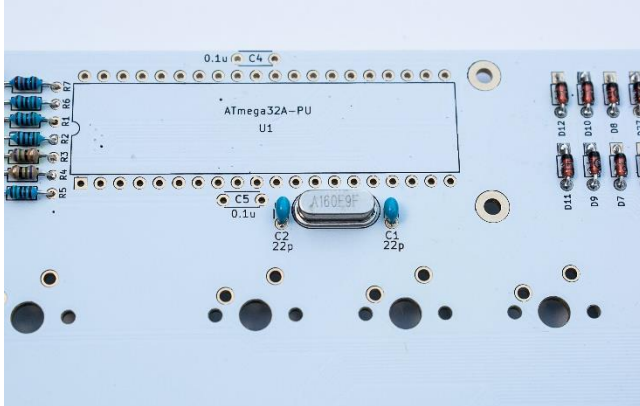
1x 4.7uF capacitor – THIS PART HAS A SPECIFIC ORIENTATION – Longer leg goes to square pad and white mark on capacitor will be pointing upward.



STEP 8

1x 16mhz crystal

NO SPECIFIC ORIENTATION

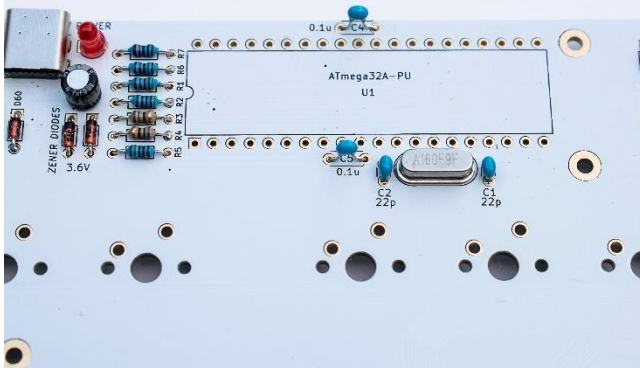


STEP 9

2x 22pF capacitors

NO SPECIFIC ORIENTATION

These capacitors are the smaller blue capacitors with straight legs.

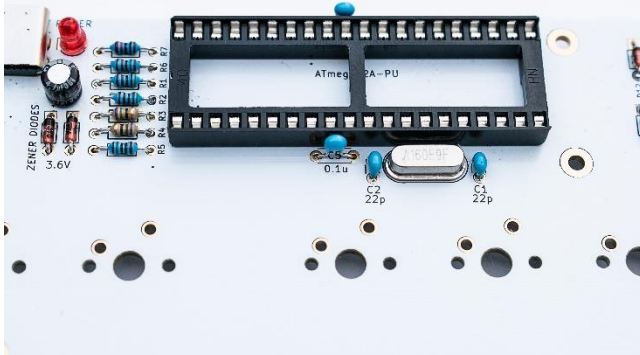


STEP 10

2x 0.1uF capacitors

NO SPECIFIC ORIENTATION

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



STEP 11

1x 40-pin IC socket

1x ATmega32A

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

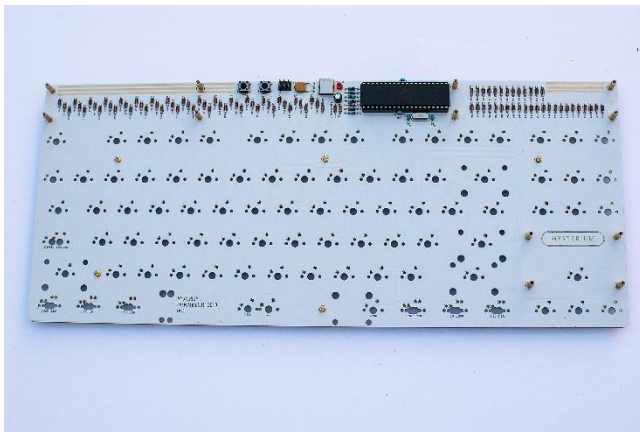
Do not insert microcontroller before soldering the socket to the PCB.

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.

It is highly recommended before proceeding to test your PCB for functionality at this point before soldering your switches.

You may use a key tester such as the one included with VIA to test your keys by shorting the switch pads with tweezers or a bent diode leg salvaged from this build.



STEP 12

6x M2 10+3mm standoffs (top acrylic)

6x M2 4mm screws (top side)

12x M2 6mm standoffs (bottom side)

INSTALL THESE SCREWS AND STANDOFFS BEFORE SOLDERING SWITCHES



STEP 13

Ensure you have completed Step 12 before proceeding to solder switches.

Switches and stabilizers not included.

Screw in stabilizers.

Place plate over stabilizers.

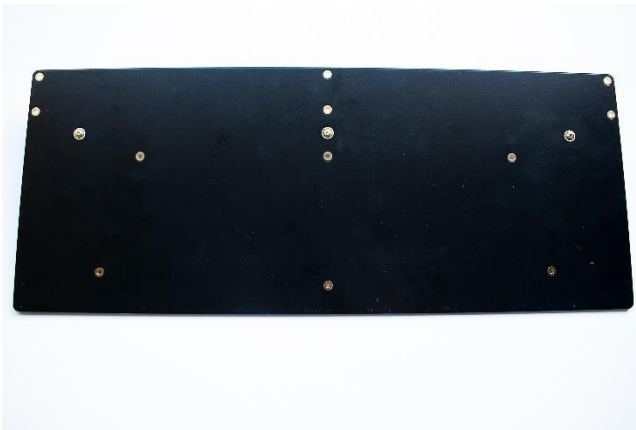
FR-4 plates are slightly flexible and may need a little help staying flush with the switches when inserting the first row. Once the first row is inserted the rest should be able to be inserted normally.

Install and solder switches.



STEP 14

If using foam, line up and place foam on bottom side of board.



STEP 15

USE "FOOT" SCREW PACK FOR STEPS 15-16

4x M2 6mm screws

3x M2 8mm standoffs

Insert smaller screws into the holes marked with black or white ring (depending on PCB color) and install standoffs to bottom side.



STEP 16

4x M2 6mm (longer) screws

Stack acrylic pieces for the foot from LARGEST TO SMALLEST (side with 4 notches points downward)

Screw in with 4x 6mm screws



STEP 17

17x M2 4mm screws

Use 12x screws to attach bottom plate. Install 2x rubber bumpers near bottom corners as evenly aligned as possible to avoid wobble. Place 2x bumpers on acrylic next to the left and right screws.



STEP 18

12x M2 6mm screws

Install acrylic guards.

DO NOT OVERTIGHTEN. OVERTIGHTENING CAN POSSIBLY CRACK ACRYLIC. TIGHTEN ONLY UNTIL SLIGHT RESISTANCE IS FELT.

Your MYSTERIUM is now complete and ready for keycaps.

