Atari Punkr

Assembly and User Guide

AtariPunkr is an adjustable stepped tone generator. AtariPunkr provides hours of fun everyone!

Powered by:

9V Battery

Outputs:

Mylar Speaker (Included)
Stereo Output (3.5mm Jack)

ubld.it

Support: http://ubld.it/punkr

Manual: v1.0

Kit Version: v1.0

Tool Checklist

1. Soldering Iron

We recommend the Hakko FX888 or similar iron with a chisel tip.

2. Wire Cutters

Small cutters for clipping excess wire leads after soldering.

3. Solder

Electronic solder is used for soldering parts to the PCB.

4. Multimeter

Multimeter for verifying component values and adjusting the circuit.

5. Wire Strippers

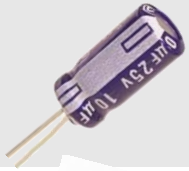
18 AWG Wire Strippers for removing insulation from wires.

CAUTION

EYE PROTECTION REQUIRED BEYOND THIS POINT

STEP 1: Check the BOM

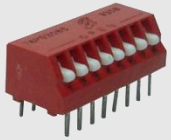
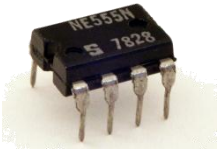
BOM is short for Bill of Materials. Check each line item as you verify the required quantity of components.

☑	Line	Designator	Description		Required	Kit Qty
☐	1	B1	9V Battery Holder		1	1
☐	2	C1, C5, C6	0.1uF 50V Disc Capacitor		3	3
☐	3	C2	220uF 25V Electrolytic Capacitor		1	1
☐	4	C3	0.01uF 50V Disc Capacitor		1	1
☐	5	C4	10uF 25V Electrolytic Capacitor		1	1
☐	6	D1, D2, D3	3mm Green LED		3	3

STEP 1: Check the BOM (continued)

✓	Line	Designator	Description		Required	Kit Qty
☐	7	J1	2 Pole 5mm Terminal Block		1	1
☐	8	R1, R4, R8	100K Ohm Linear Potentiometer		3	3
☐	9	R2, R5	2.2K Ohm 1/4 W Resistor		2	2
☐	10	R3, R7, R9, R11,R14,R15	1K 1/4W Resistor		6	6
☐	11	R10	10K 1/4W Resistor		1	1
☐	12	R12	1K Ohm Linear Potentiometer		1	1
☐	13	R13	4.7K Ohm 1/4W Resistor		1	1

STEP 1: Check the BOM (continued)

✓	Line	Designator	Description		Required	Kit Qty
☐	14	U1	556 Timer		1	1
☐	15	U2	CD402BCN Binary Counter		1	1
☐	16	U3	8 Position Dip Switch		1	1
☐	16	U4	555 Timer		1	1
☐	17	U5	1/8” (3.5mm) Stereo Jack		1	1
☐	18	U6	Momentary Tactile Switch		1	1
☐	19	U7	1P3T Switch (off – on – button)		1	1

STEP 1: Check the BOM (continued)

☑	Line	Designator	Description		Required	Kit Qty
☐	20	Speaker	1W Mylar Speaker		1	1
☐	21	Tape	Double Sided Tape		2	2

Note: Left over wire cut from the Battery Holder will be used to wire the Mylar Speaker.

STEP 2: Inserting the first component

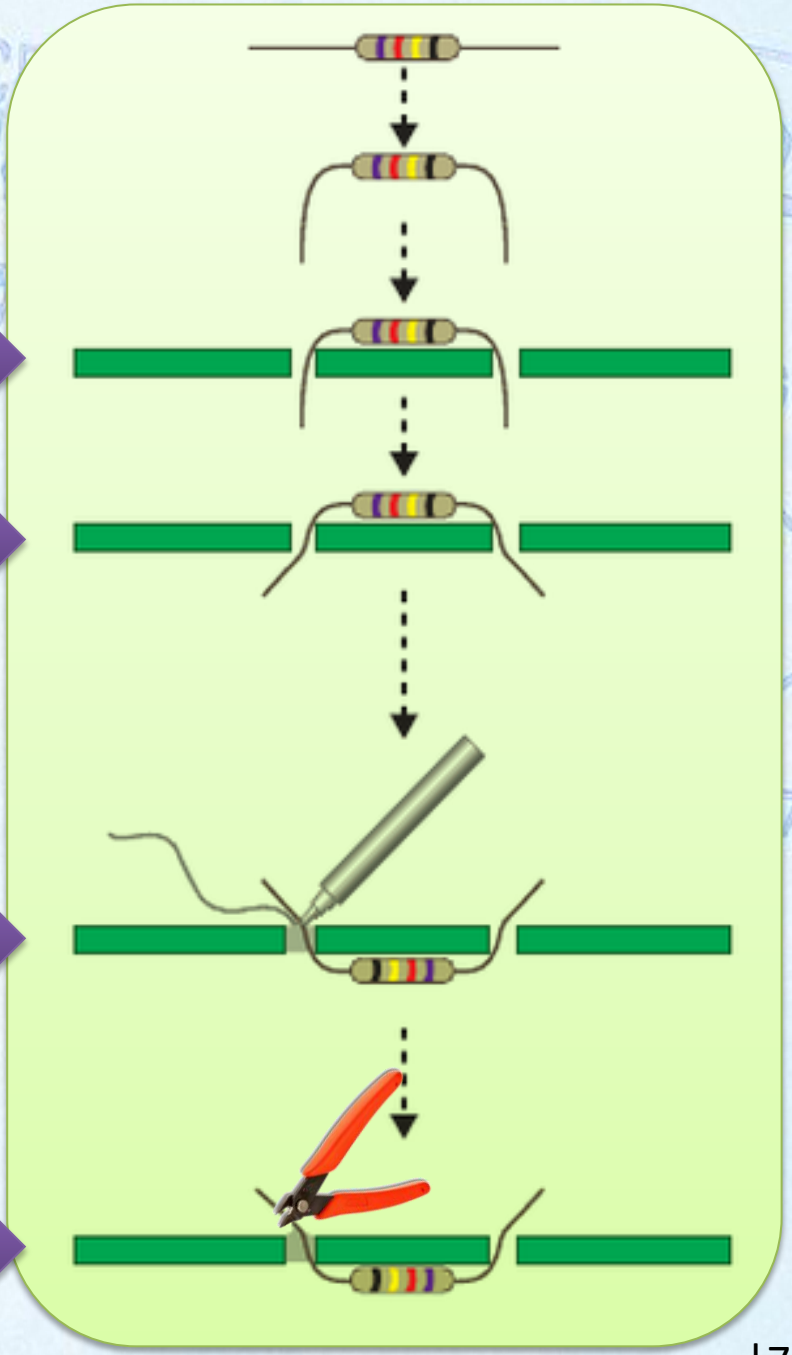
Before we locate the first component let's take a minute to review the proper way to insert and solder the components to your circuit board.

Insert the components into the circuit board.

Bend the component leads to hold the component in place while soldering.

Flip the board and solder the component leads .

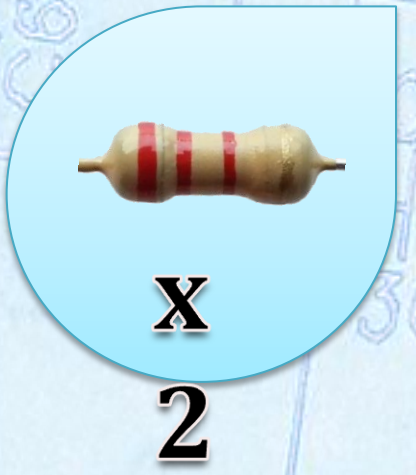
Trim the component leads at the top of the solder joint.

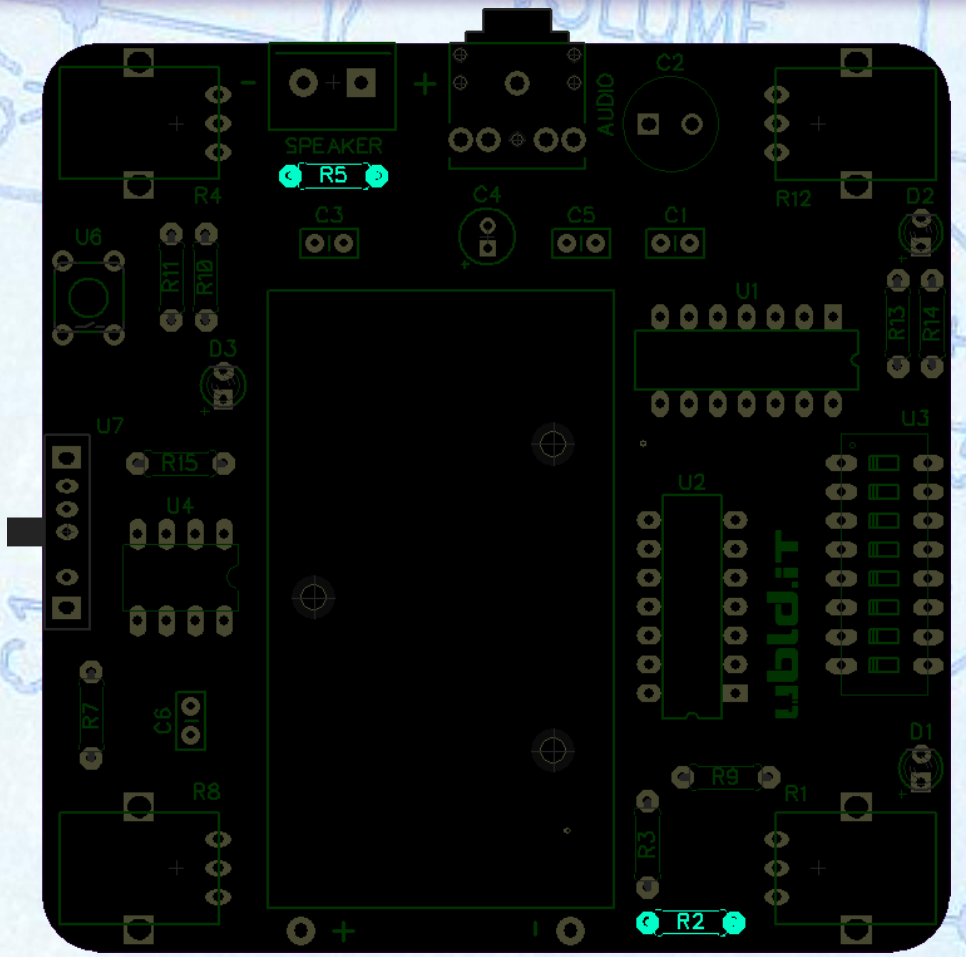


STEP 2b: Inserting the first components

Solder the 2.2k Ohm ¼ Watt Resistors into R2 and R5.

The first components to locate is are two 2.2k Ohm ¼ Watt Resistors (line #9).



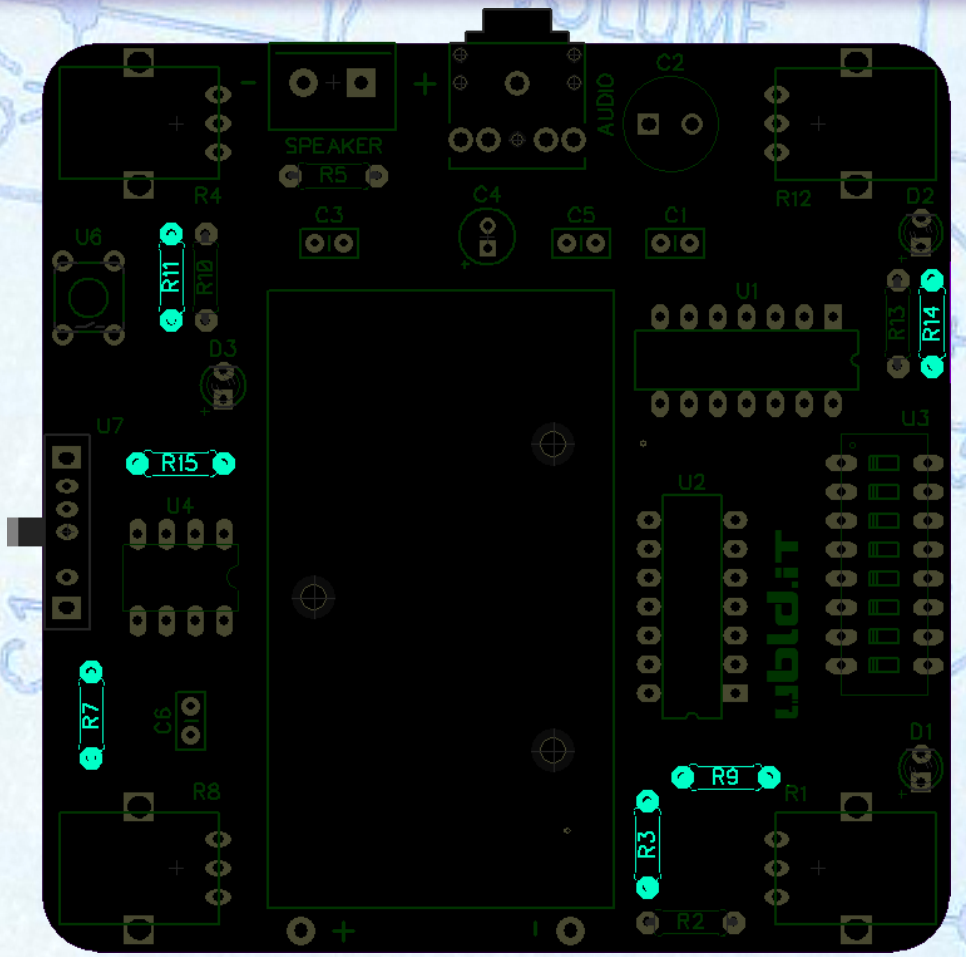


Axial Lead Resistors such as the ones used in this kit are color coded. Compare the resistor you are installing to the images shown in each step. Also double check the values with a multimeter on the ohm setting.

STEP 3: Insert the 1k Ohm Resistors

Solder the 1k Ohm ¼ Watt Resistors into R3, R7, R9, R11, R14, R15

Locate six 1k Ohm ¼ Watt Resistors (line #10).

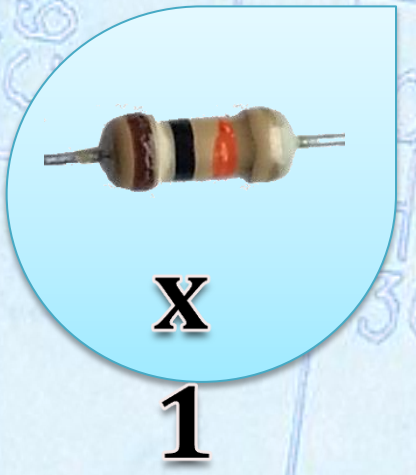


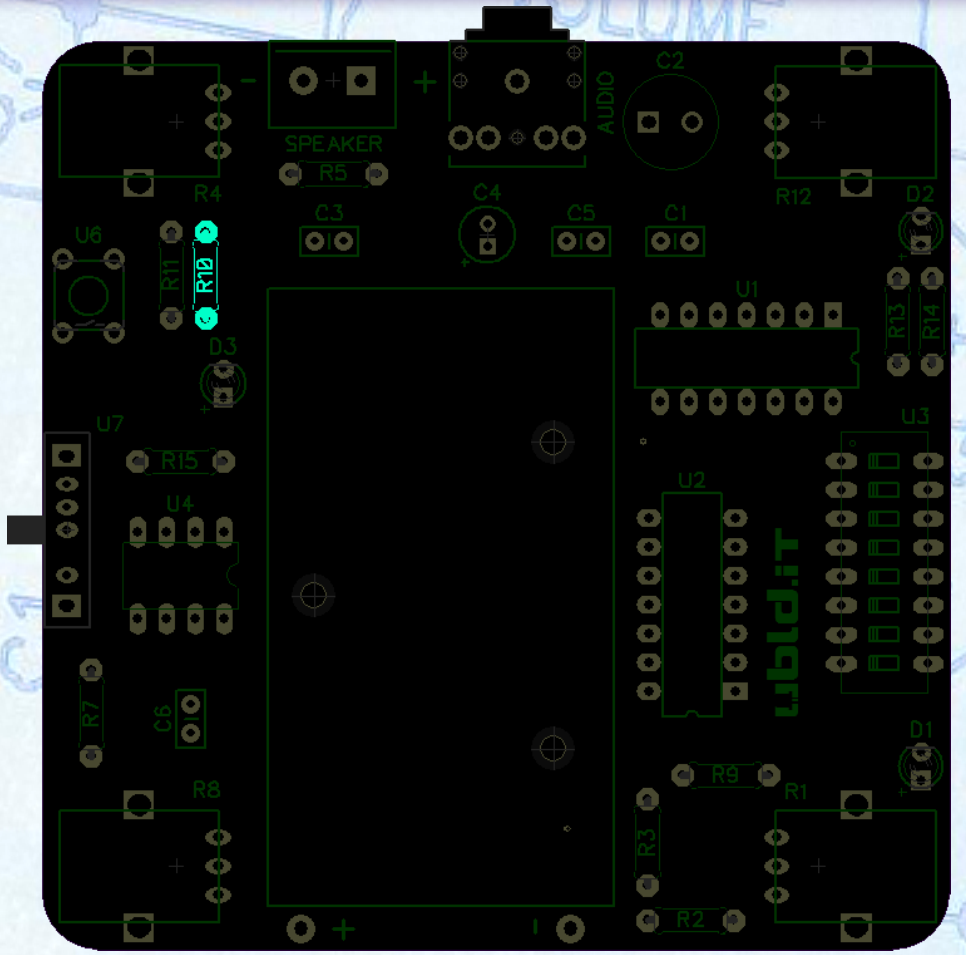
Take pride in your work. Take your time to bend all the components leads to 90 degree angles using needle nose pliers.

STEP 4: Insert the 10K Ohm Resistor

Solder the 10K Ohm ¼ Watt Resistor into R10.

Locate one10K Ohm ¼ Watt Resistors (line #11).



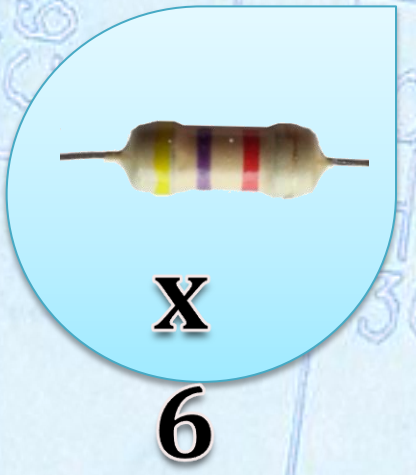


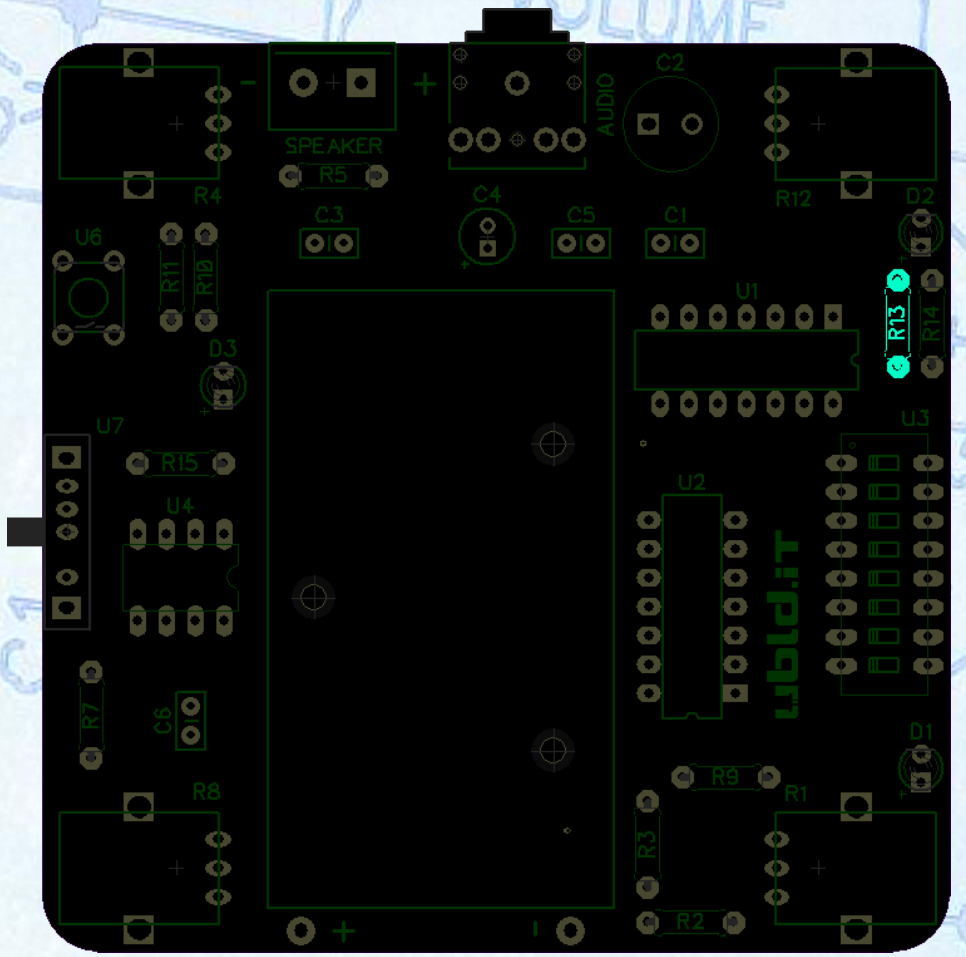
It's not necessary for resistors, but inserting them all in the same direction will make your board look that much better. Use the last band (tolerance band) as a reference for the orientation.

STEP 5: Insert the 4.7K Ohm Resistor

Solder the 4.7k Ohm ¼ Watt Resistors into R13.

Locate one 4.7k Ohm ¼ Watt Resistors (line #13).

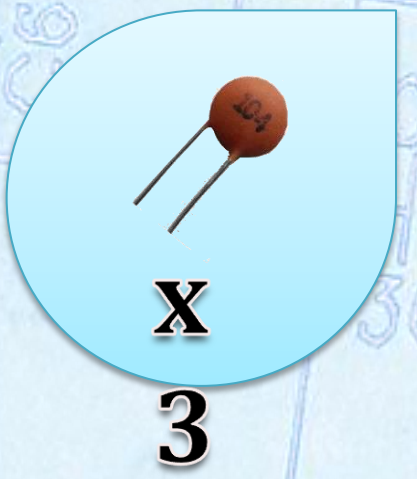




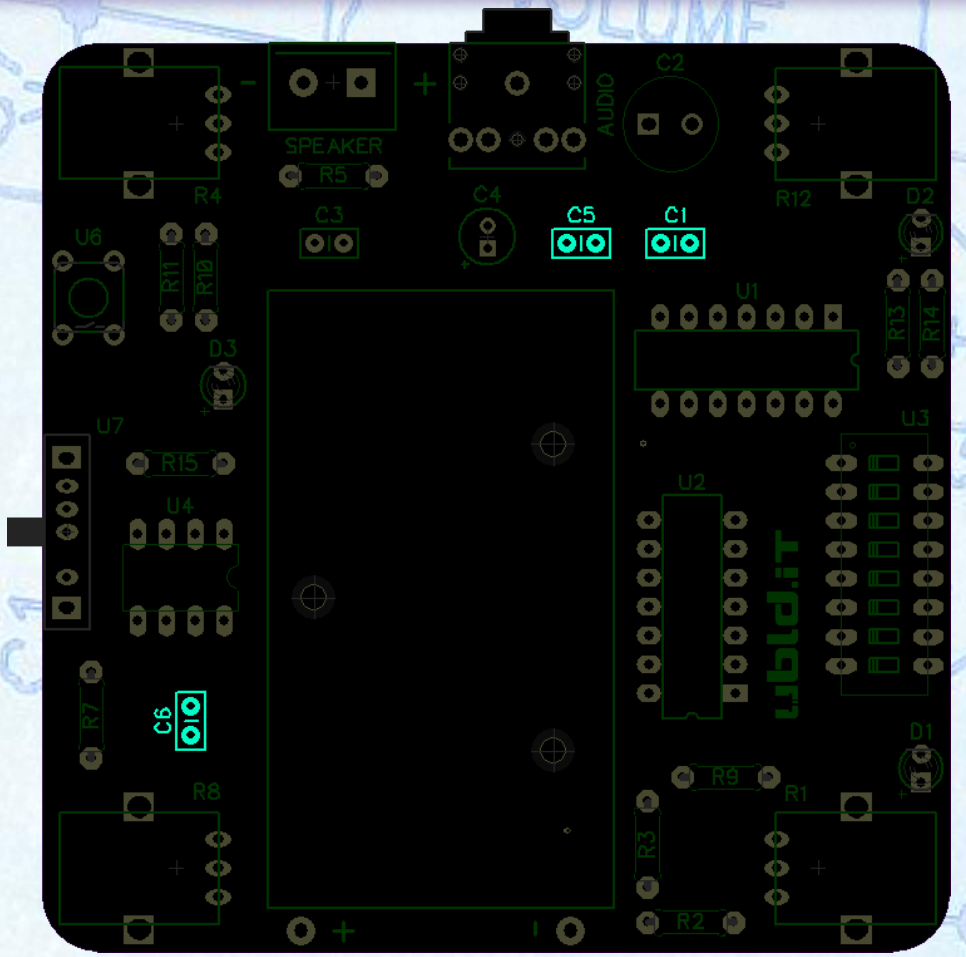
For better looking solder joints use Kester #2331-ZX water soluble flux pen on every pad before applying solder. Flux removes oxidation and allows heat to transfer from your iron to the pad.

STEP 6: .1uF 50V Disc Capacitors

Locate three .1uF 50V Disc Capacitors (line #2).



Solder the .1uF 50V Disc Capacitor into C1, C5, and C6

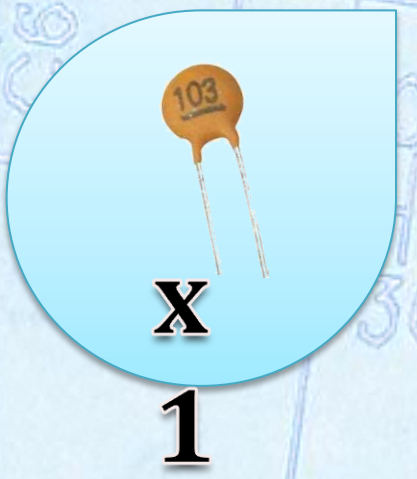


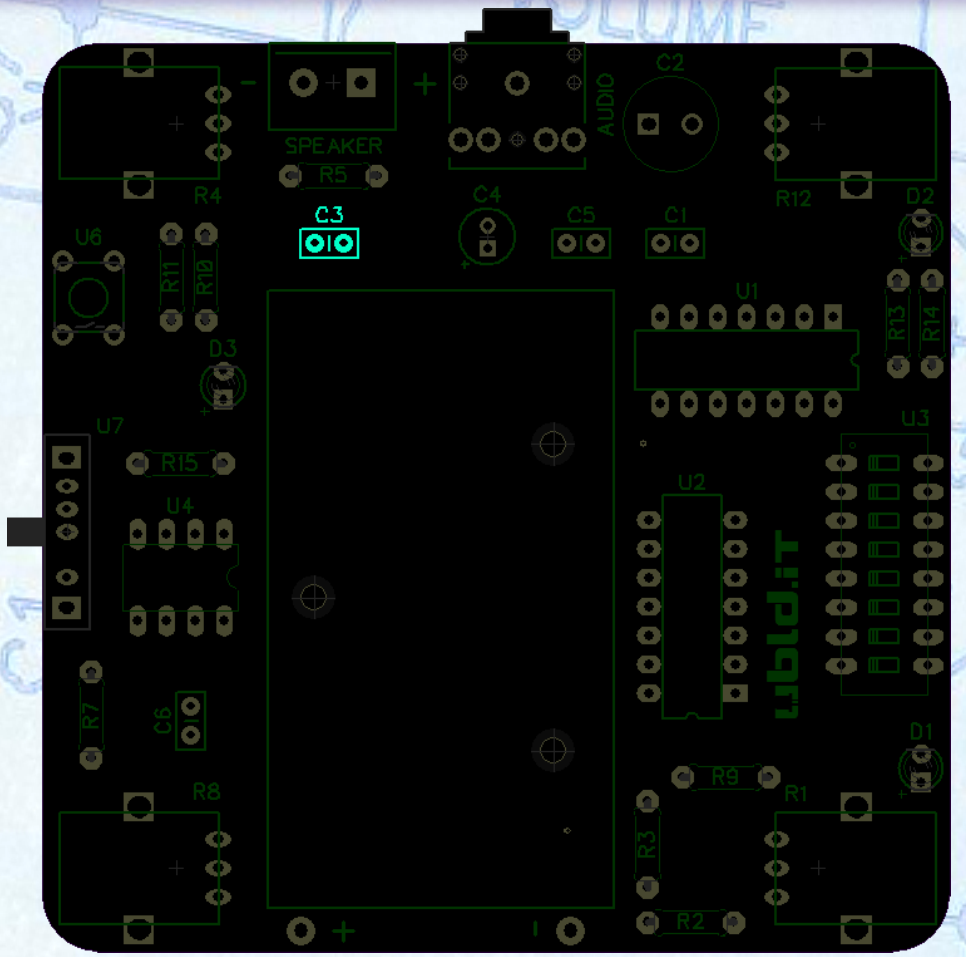
Ceramic capacitors are not polarized so orientation doesn't matter.

STEP 7: Insert the .01uF 50V Capacitor

Solder the .01uF 50V Disc Capacitor into C3.

Locate one .01uF 50V Disc Capacitor (line #4).



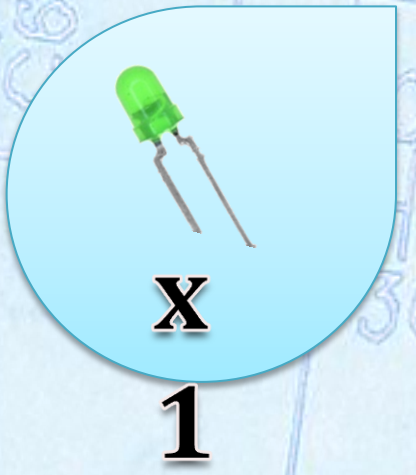


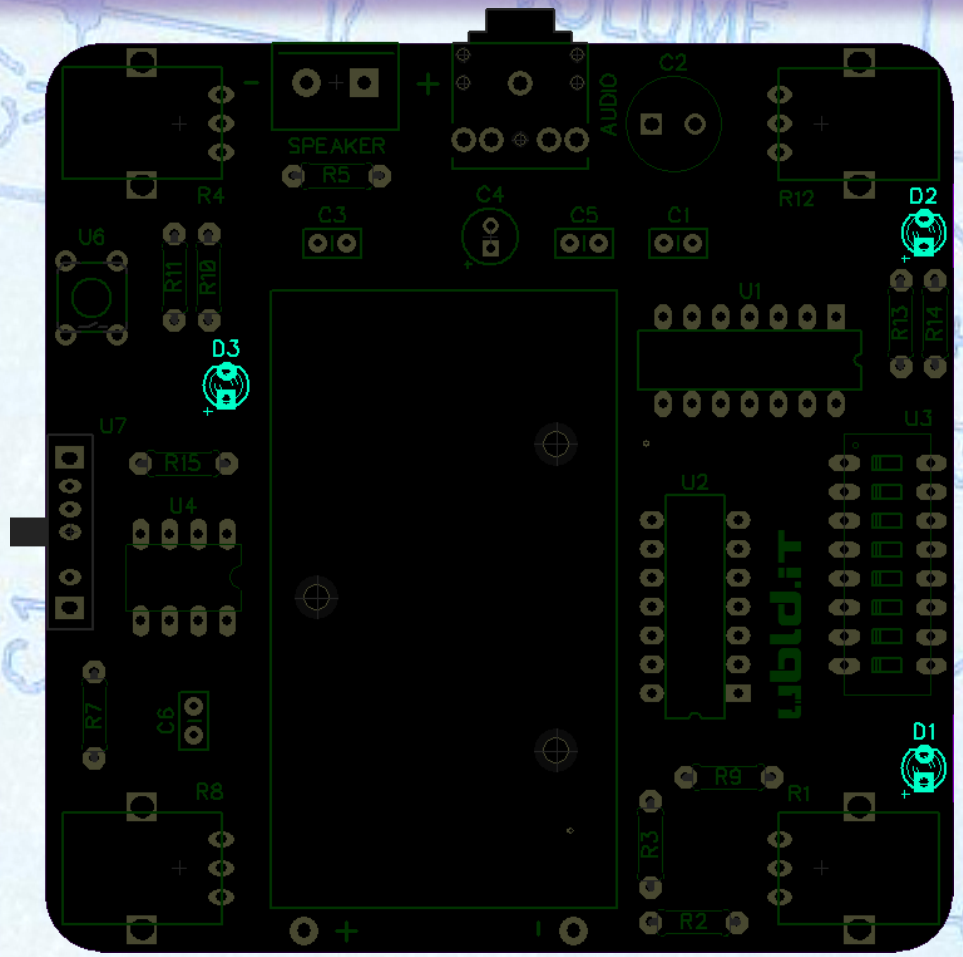
Capacitors store an electrical charge much like your body builds and stores static. It's also good to know that since a capacitor takes time to charge and discharge it's said that it opposes changes in voltage.

STEP 8: Insert the 3mm Green LEDs

Solder the 3mm Green LEDs into D1, D2, and D3. Pay attention or the orientation. The long leg is positive.

Locate three 3mm Green LEDs (line #6).



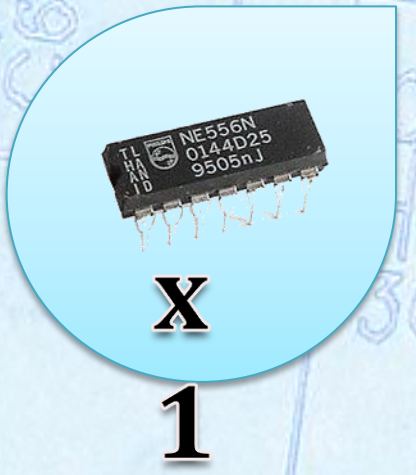


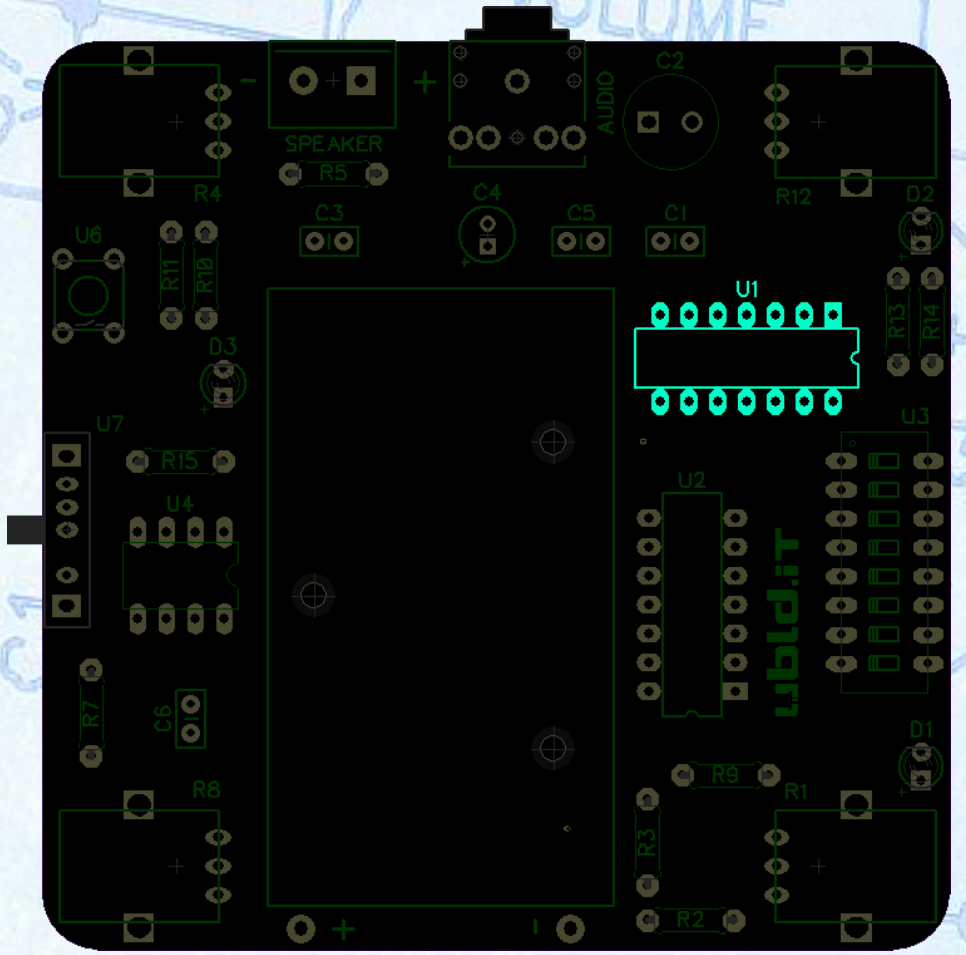
Diodes are polarized. The long leg of this LED is the positive (Anode) and the short leg is negative (Cathode).

STEP 9: Insert the 556 Timer

Solder the 556 Timer into U1.

Locate one 556 Timer (line #14).



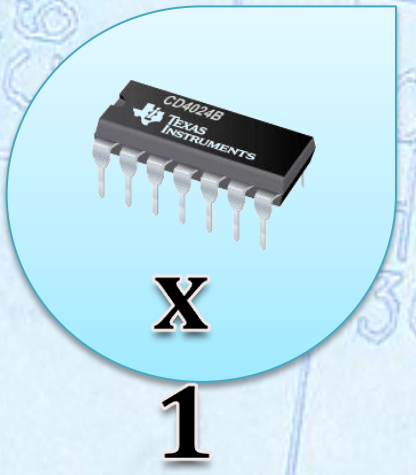


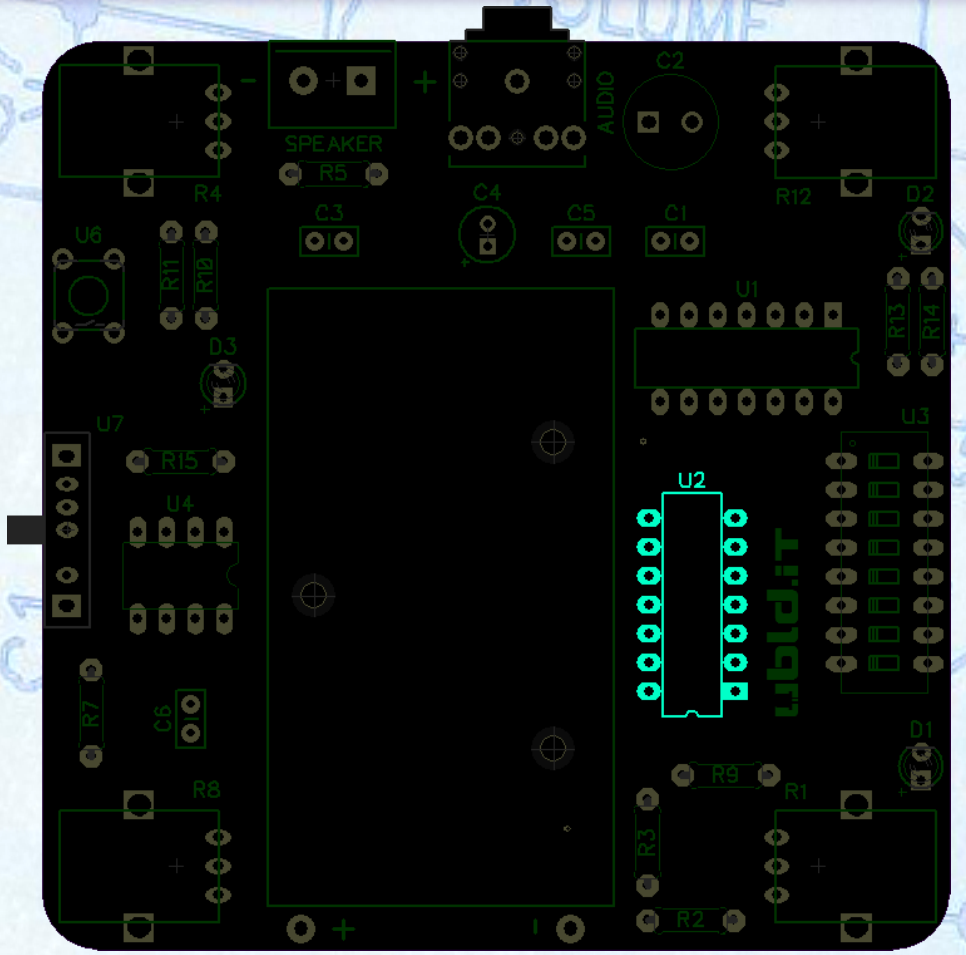
Pin one of the IC is marked with a small indentation in the package. Orient the package indentation with the silkscreen indentation.

STEP 10: Insert the CD4024BCN

Solder the CD4024BCN into U2

Locate one CD4024BCN (line #15).

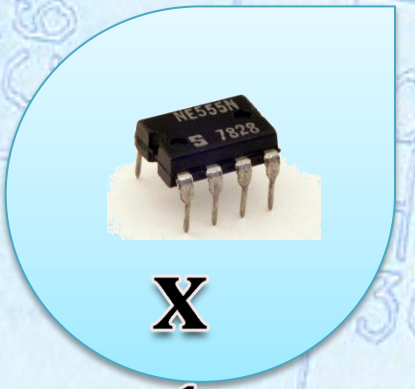




U2 is a 7-Stage ripple-carry binary counter.

STEP 11: Insert the 555 Timer

Locate one 555 Timer (line #16).



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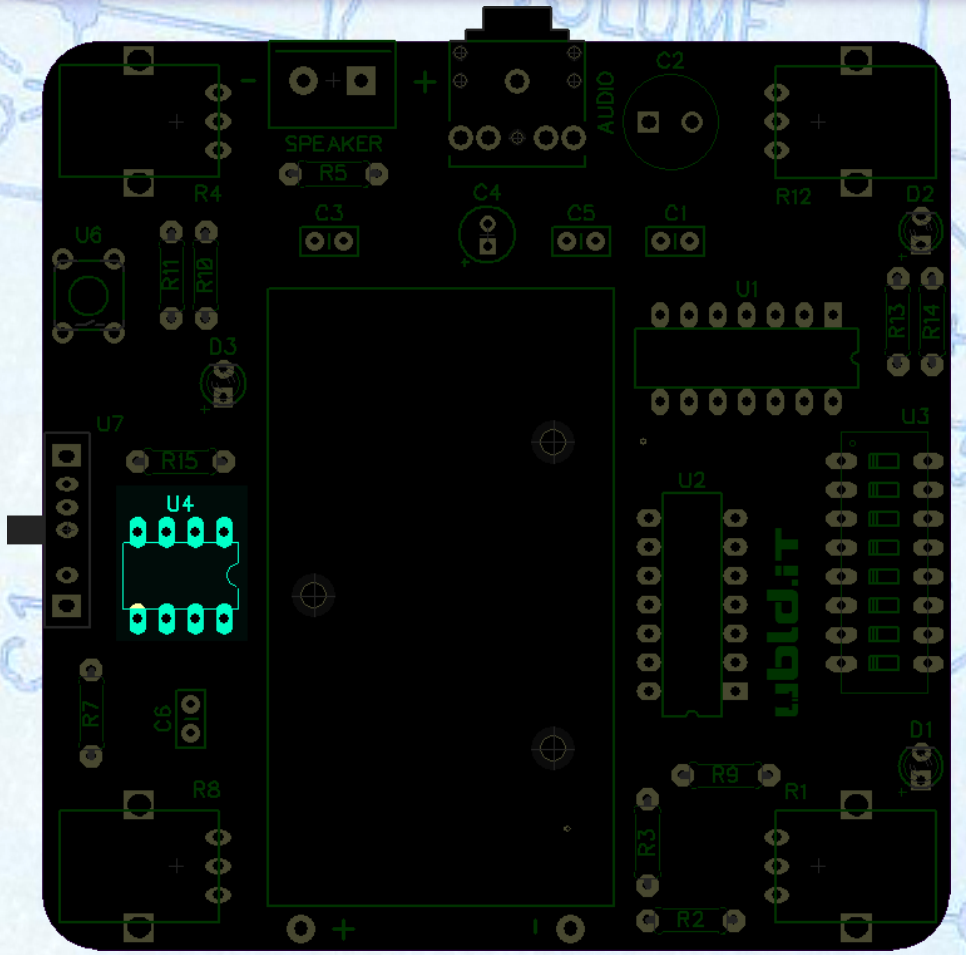
Solder the 555 Timer into U4

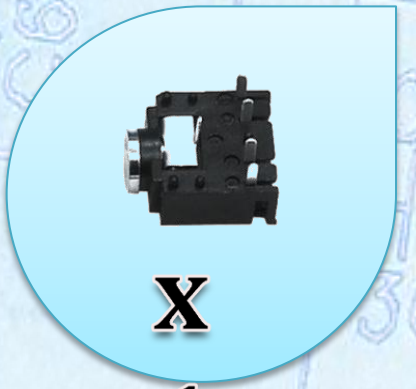


The 555 Timer is a iconic integrated circuit which is used in many beginner electronic circuits. Take some time and do a little homework on this IC.

STEP 12: Insert the 1/8” (3mm) Stereo Jack

Insert the 1/8” (3mm) Stereo Jack in the location marked AUDIO (U5)

Locate one 1/8” (3mm) Stereo Jack (line #17).



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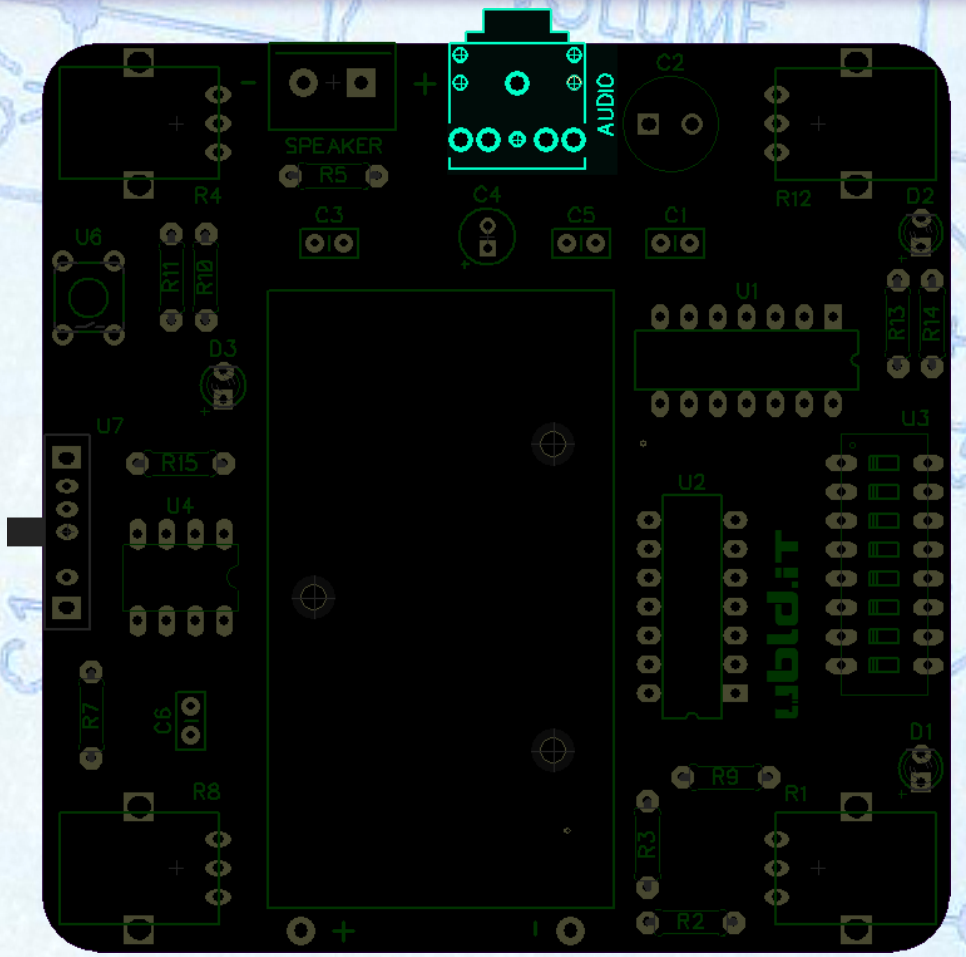
Unplug the Mylar Speaker while using the Stereo Output Jack.

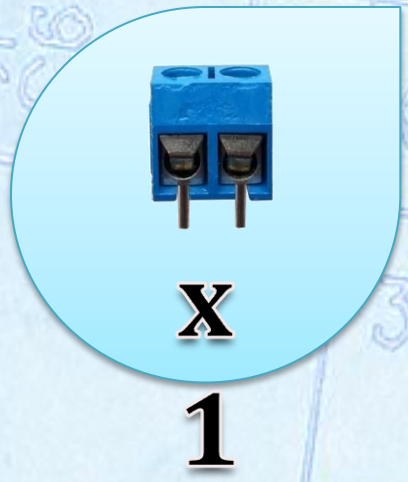


The stereo jack provides an output which can be fed into an Audio Amplifier. You are not limited to using the included Mylar speaker. Disconnect the Mylar speaker when using the AUDIO stereo out jack.

STEP 13: Insert the 2 Pole 5mm Terminal Block

Solder the 2 Pole 5mm Terminal Block in the location marked SPEAKER (J1)

Locate one 2 Pole 5mm Terminal Block (line #7).



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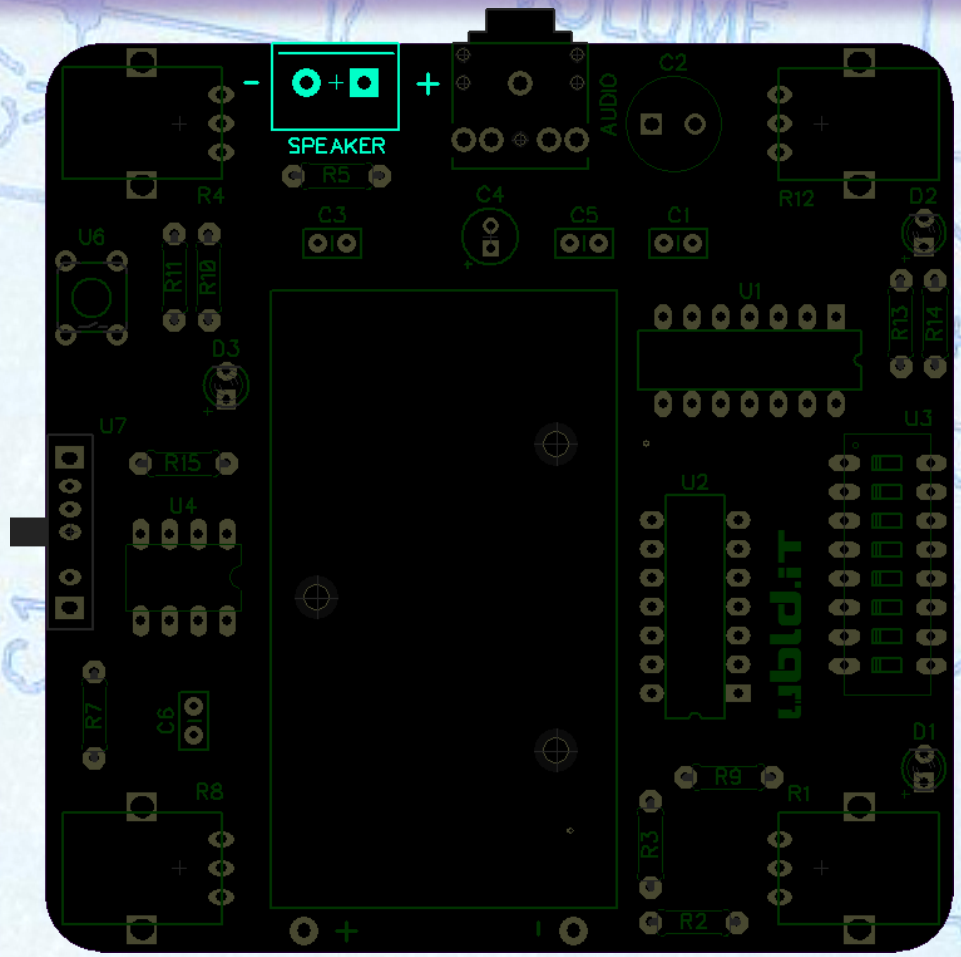
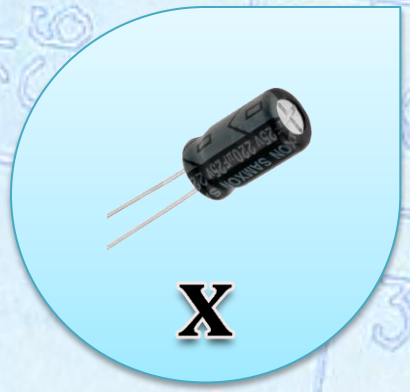


STEP 14: Insert the 220uF 25V Electrolytic Capacitor

Solder the 220uF 25V Electrolytic Capacitor into C2

Locate 220uF 25V Electrolytic Capacitor (line #3).



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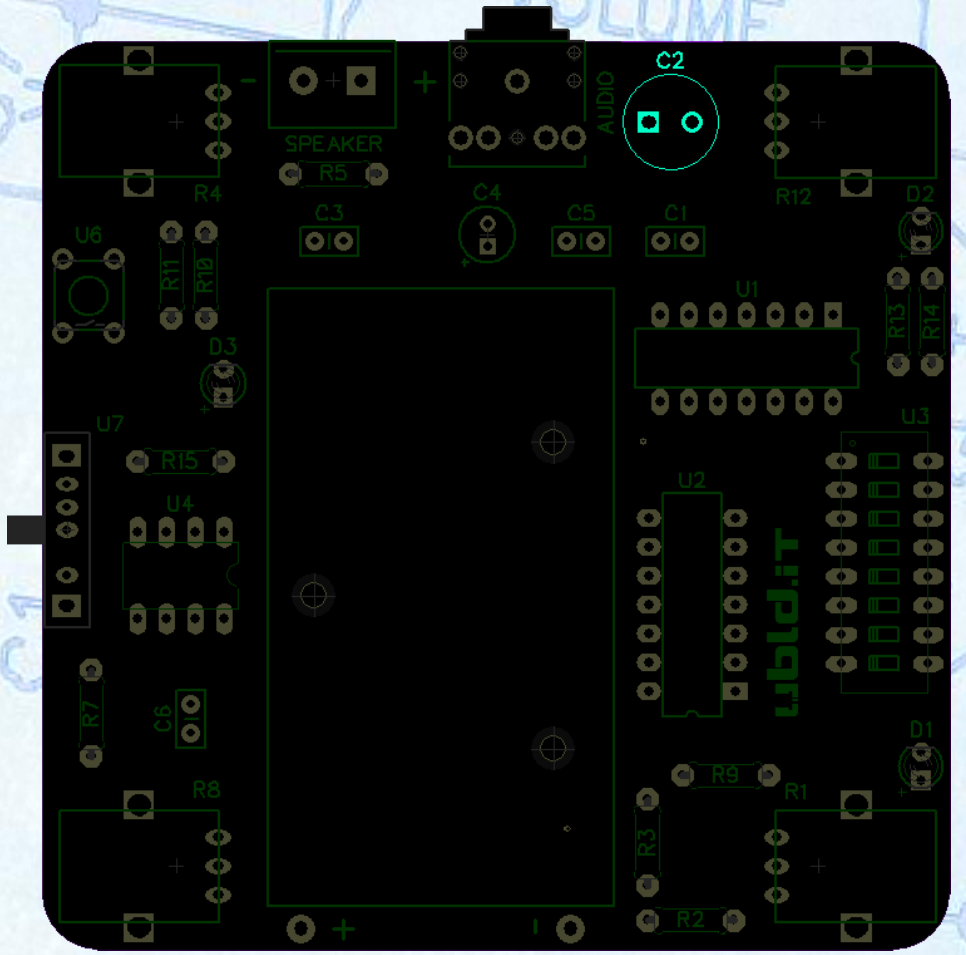
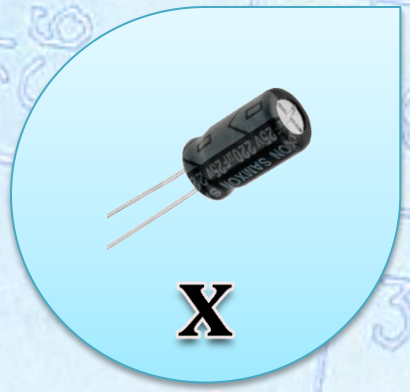


STEP 15: Insert the 10uF 25V Electrolytic Capacitor

Solder the 10uF 25V Electrolytic Capacitor into C4

Locate 10uF 25V Electrolytic Capacitor (line #5).



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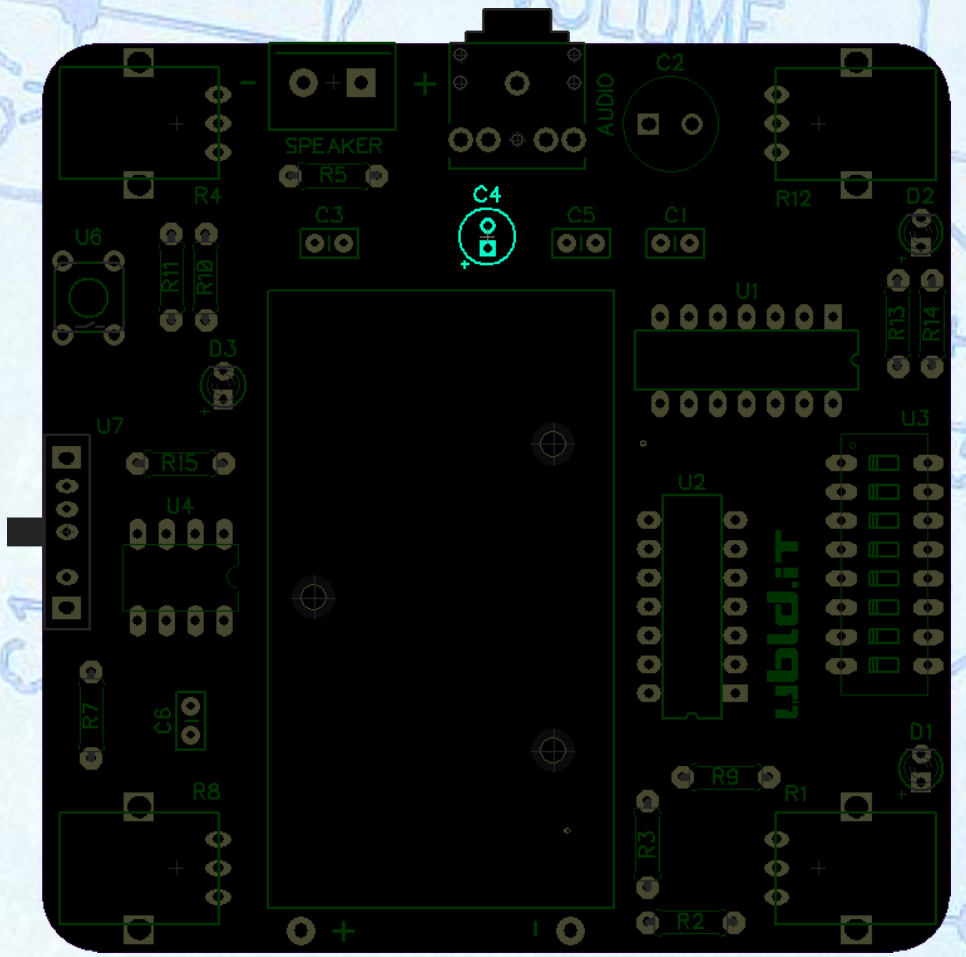

STEP 16: Clean the PCB

Now is a good time to clean the PCB.

If you have been follow along with this tutorial then you have inserted all of the components which can be completely submerged in Alcohol and/or Water.

Using a toothbrush and Isopropyl or Denatured Alcohol carefully clean away solder flux residue. Then rinse the board under water and continue scrubbing with the toothbrush.

Finally, use compressed air or a hair dryer to blow the board dry.

Repeat as needed until you have a clean PCB.

STEP 17: Insert the Momentary Tactile Switcch

Solder the Momentary Tactile Switch into U6

Locate one Momentary Tactile Switch (line #18).

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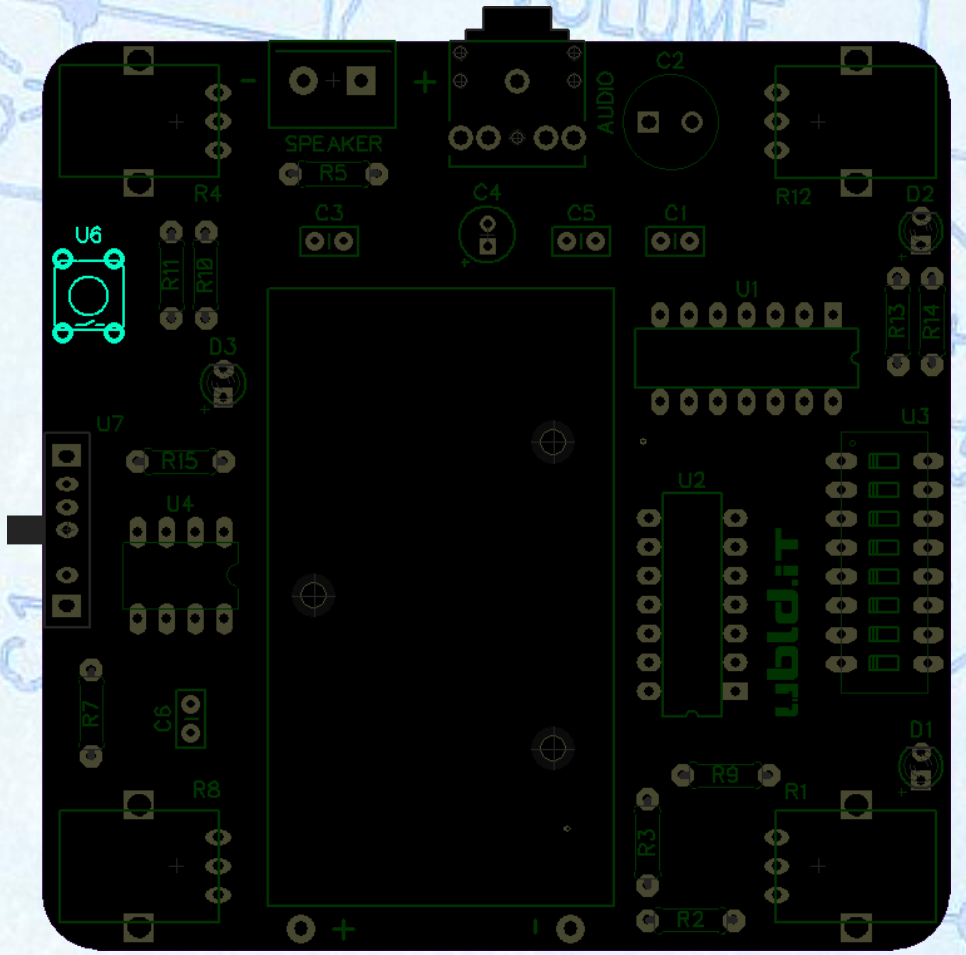
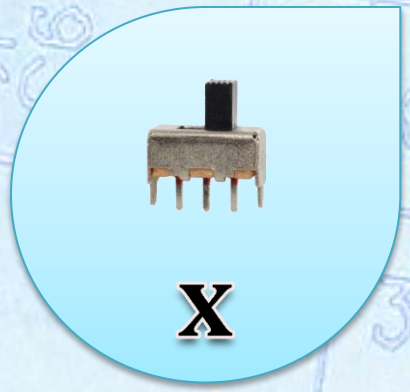


STEP 18: Insert the 1P3T Switch

Solder the 1P3T Switch into U7

Locate one 1P3T Switch (off-on-button) (line #19).



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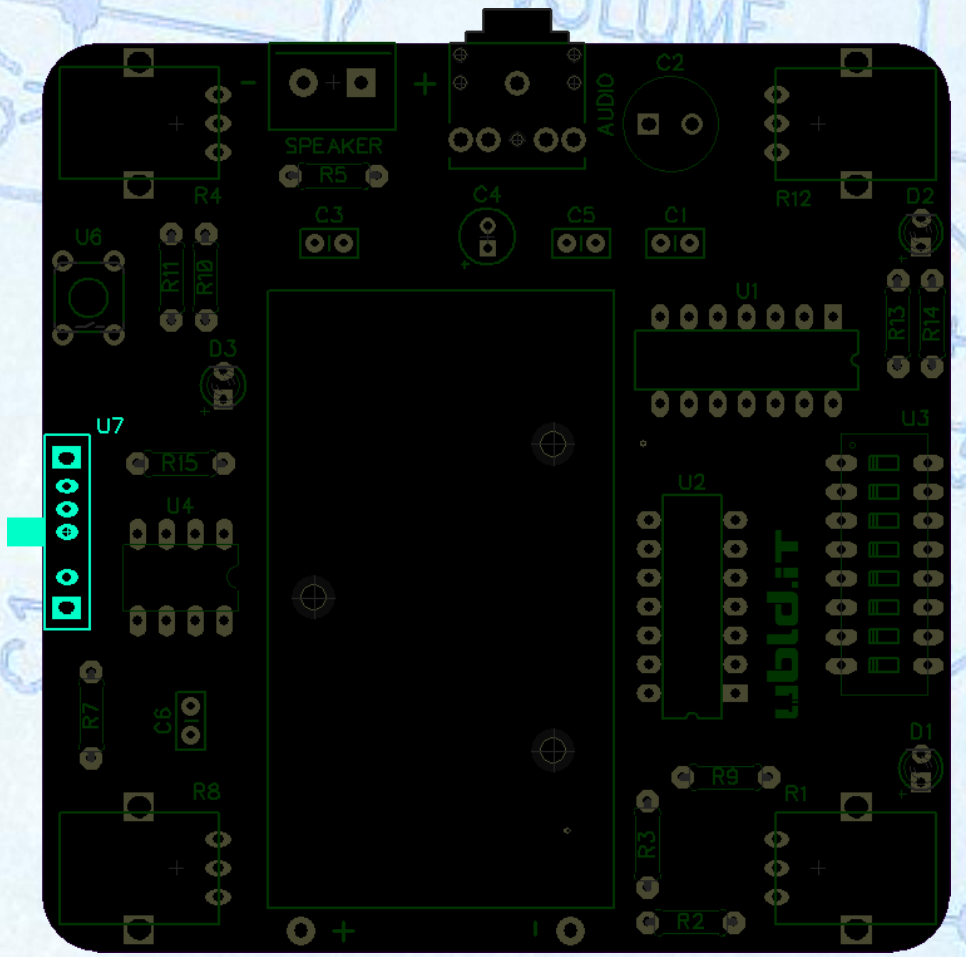
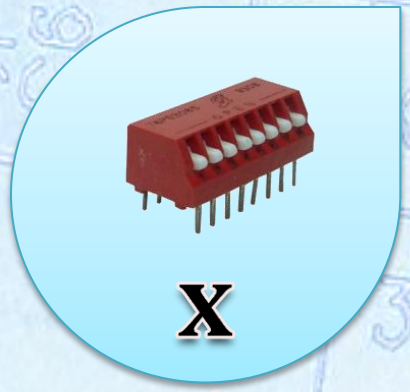


The 1P3T Switch has 3 positions. Off turns the device completely off. On provides continuous audio. And Button provides audio only when the U6 Momentary Switch is pressed.

STEP 19: Insert the 8 Position Dip Switch

Solder the 8 Position Dip Switch into U3

Locate one 8 Position Dip Switch.
(Line 16)



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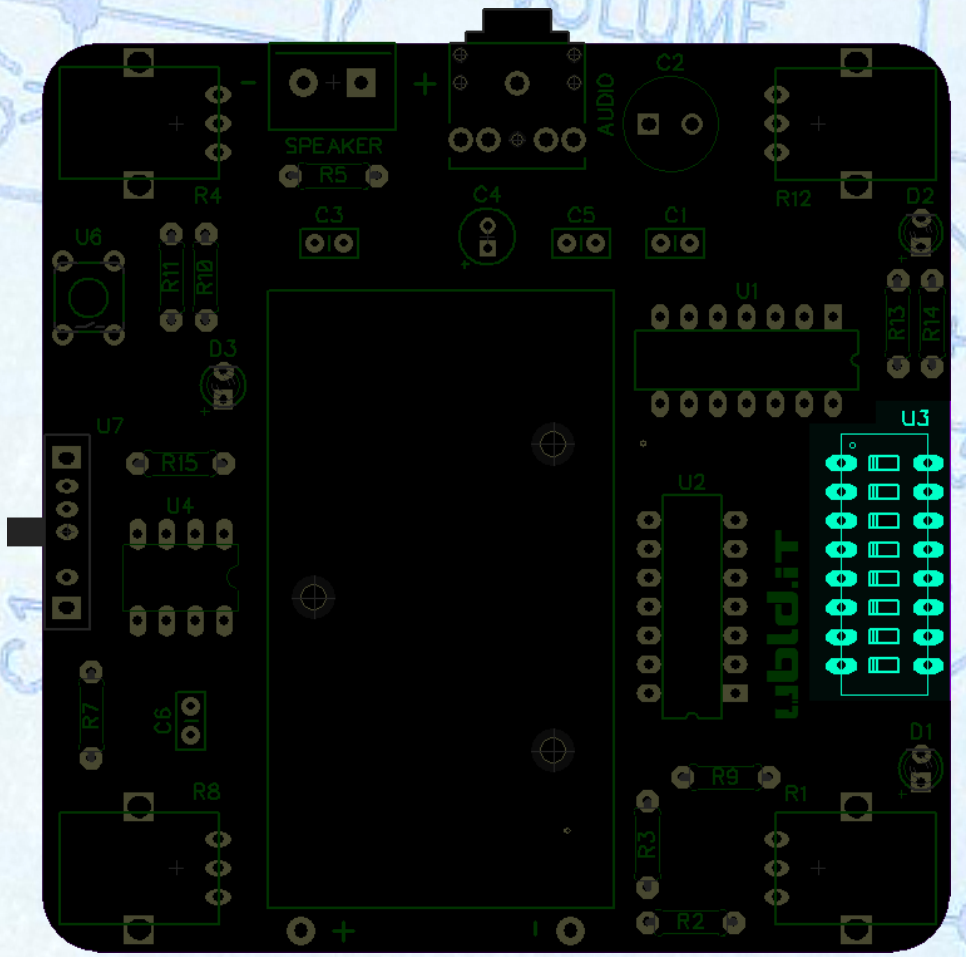

The 8 Position Dip Switch feeds the inputs of the 7-Stage Ripple-Carry Binary Counter (U2).

STEP 20: Insert the 100k Ohm Linear Potentiometer

Solder the 100k Ohm Linear Potentiometers into R1, R4, and R8

Locate three 100k Ohm Linear Potentiometers. (Line 8)

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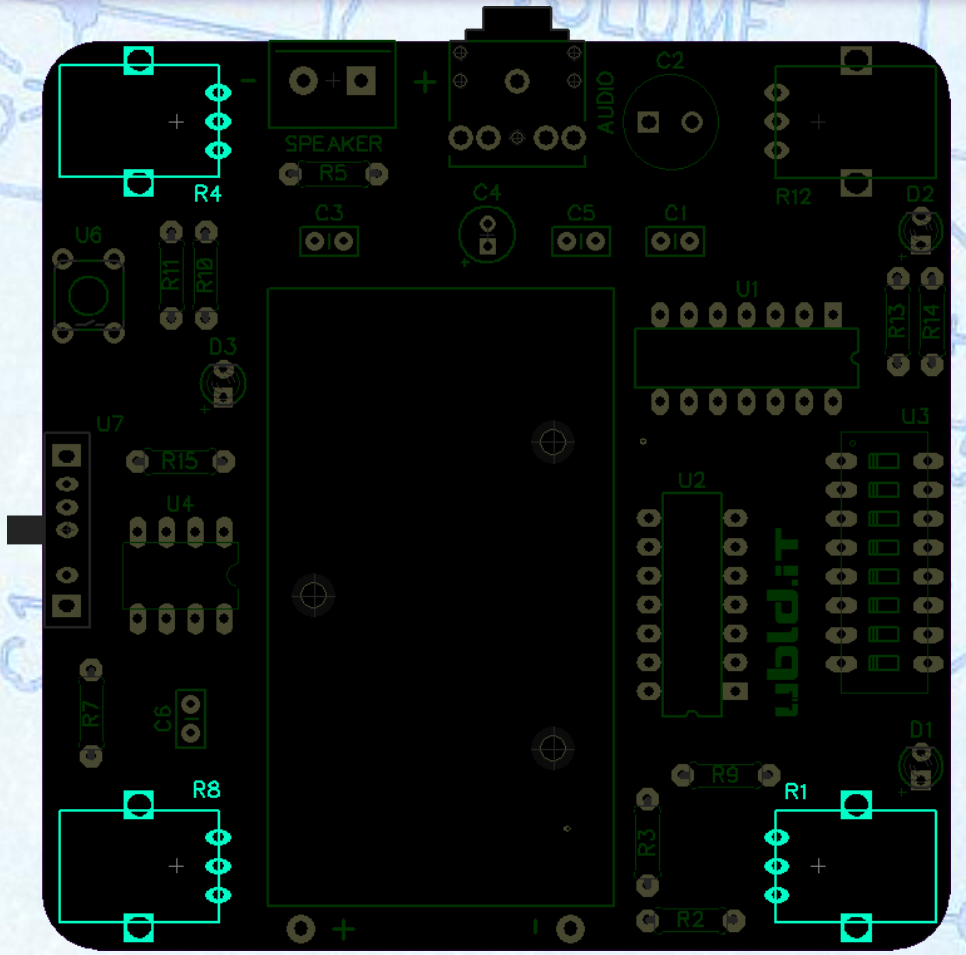

STEP 21: Insert the 1k Ohm Linear Potentiometer

Solder the 1k Ohm Linear Potentiometers into R12

Locate three 1k Ohm Linear Potentiometers. (Line 12)

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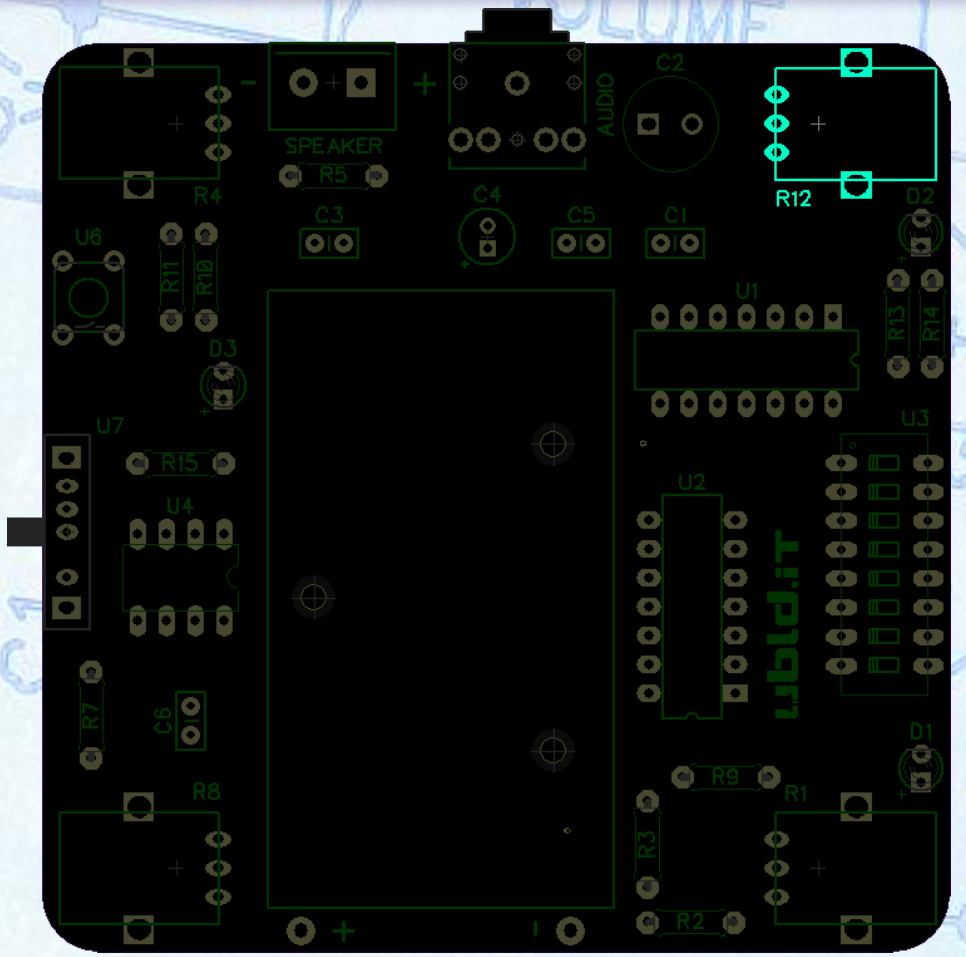

STEP 22: Insert the 9V Battery Holder

Install the Battery Holder at B1 using the double sided tape. Cut the wires long enough to reach the + and – solder holes . Save the scrap wires as you will need them for the Mylar Speaker in a later step.

Locate one 9V Battery Holder
(Line 1)

X

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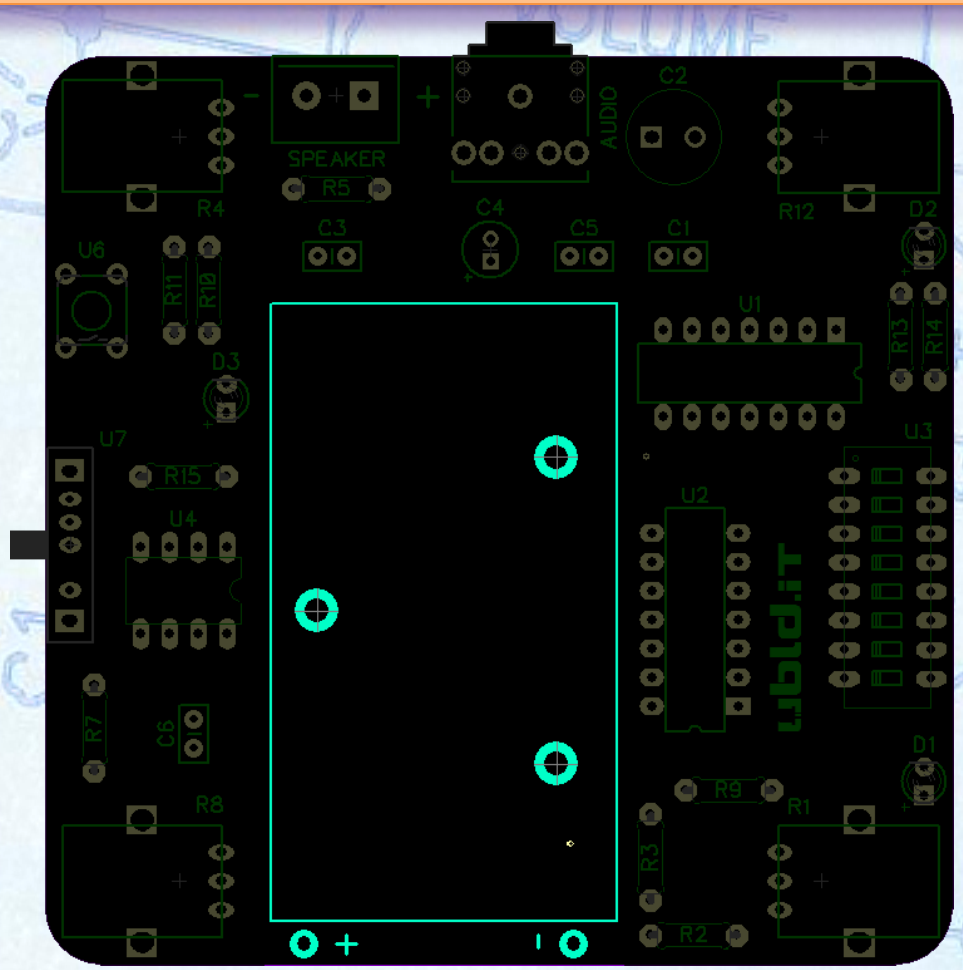
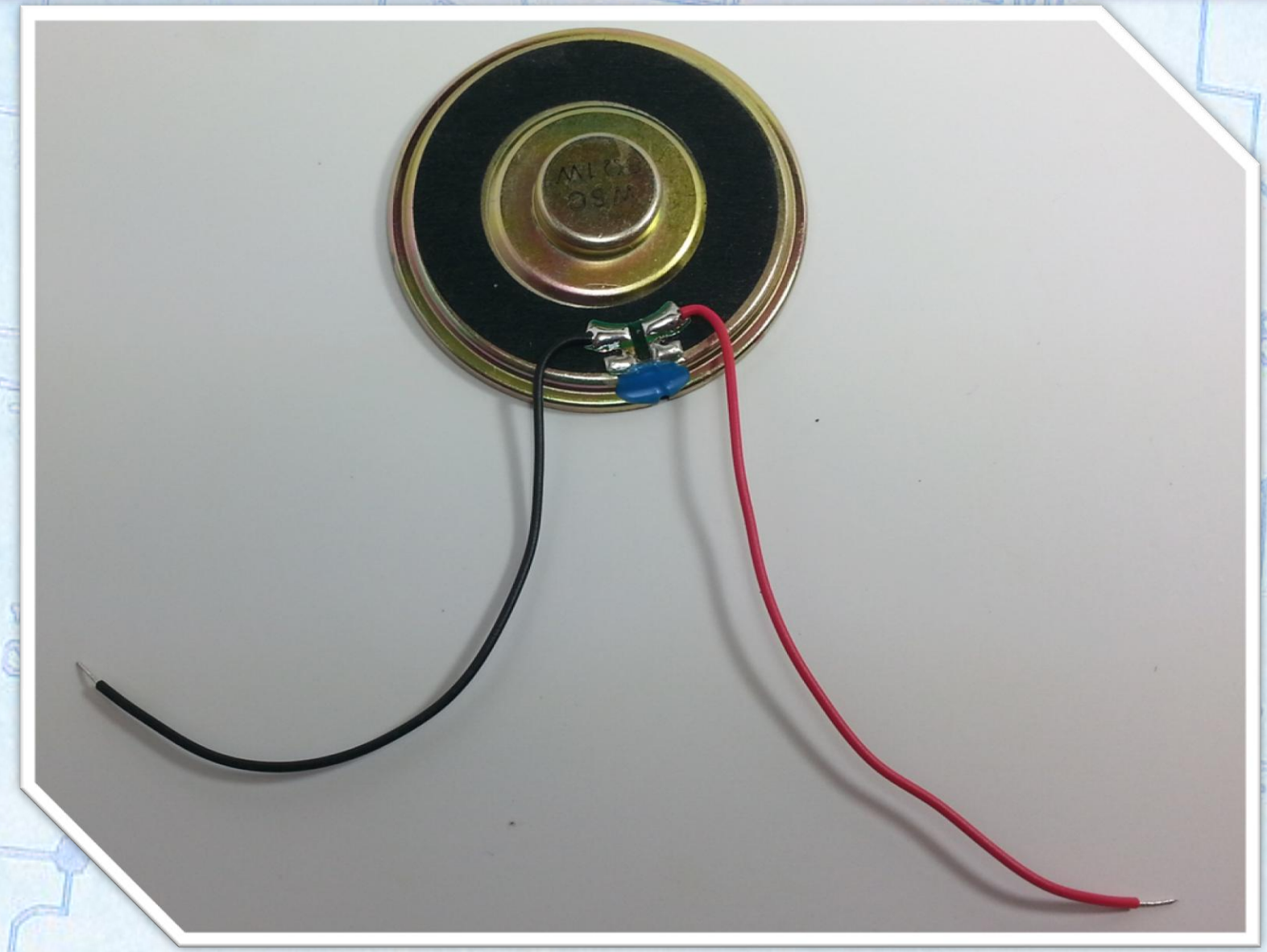


Warning: Make sure your battery is good. A low battery may fool you into thinking you did something wrong during the assembly.

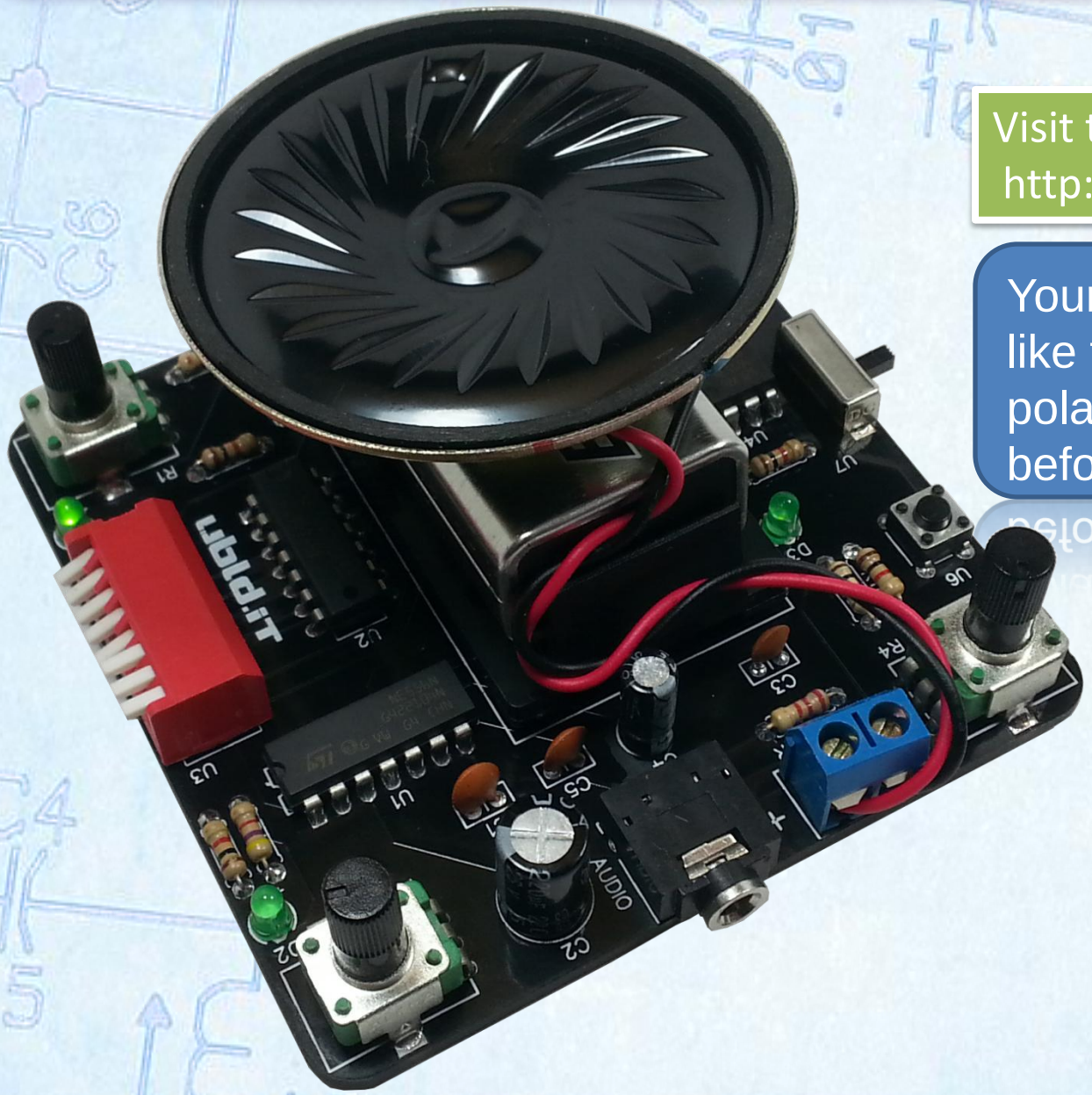
STEP 23: Soldering wires on the Mylar Speaker

Solder the scrap wire (from the previous step) to the Mylar Speaker as shown. Polarity does not matter.



Final Assembly

Insert a 9V Battery and place the speaker on the battery using double sided sticky tape to secure it. Finally insert the wires from the speaker into the 2 pole terminal as shown.



Visit the Community Support Forums:
http://ubld.it/punkr

Your final assembly should look like this. Double check all polarized component orientation before powering.