

# Atari Punnik Console Build Guide and BOM

This guide is made to help you along the way with soldering and assembly and contains all the information you need to build and test your first Atari Punnik Console pocket synthesizer!

Important! Follow the step by step assembly (especially if this is your first diy kit) and if you are new to soldering we can recommend having a look at the ["Adafruit Guide to Excellent Soldering"](#) PDF from their webiste.

Here you find the BOM (Bill of Materials)

## Step by step soldering guide

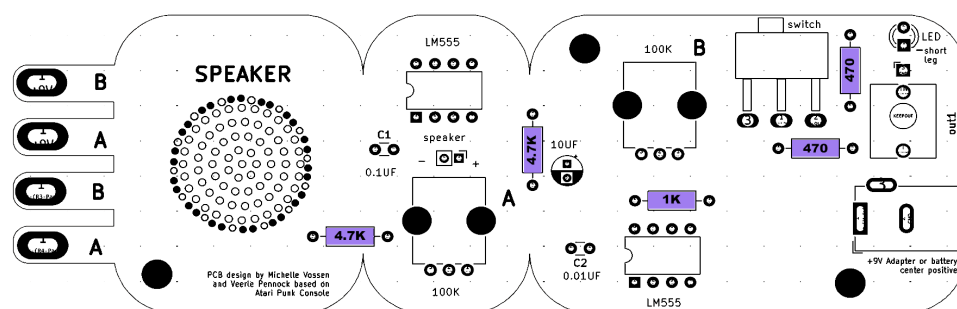
When soldering a PCB-DIY kits, we start with putting in smaller components first that lay flush against the pcb and save the big components for last.

### Resistors

You can identify resistor values in two ways:

1. colour band on the resistors mean what value it is
2. use a Multimeter to measure the resistance value

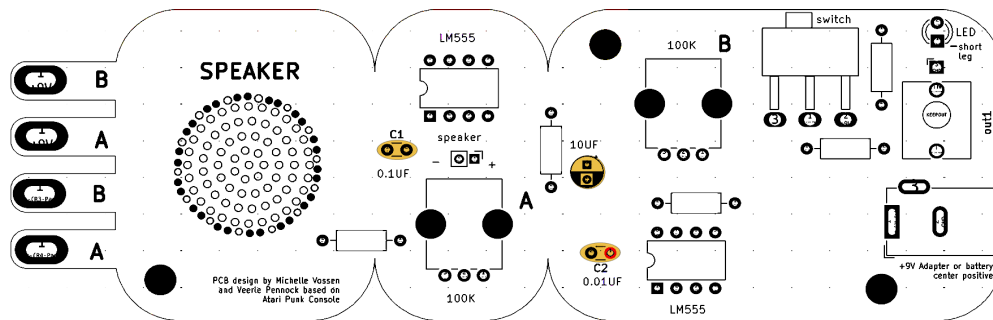
Amount	Value	Colour Code
2	470 $\Omega$	Yellow-Purple-Black-Black-Brown
2	4.7 K	Brown-Brown-Black-Purple-Gold
1	1K	Brown-Black-Black-Brown-Brown



### Capacitors

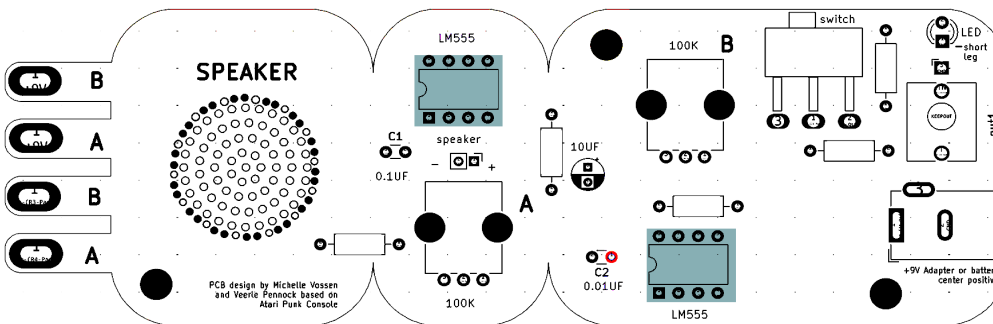
In the kit you find 2 different types of capacitors. The ceramic capacitors look like small orange disks and do not have polarity. The Electrolytic capacitors have polarity: the short leg (with row of minus symbols) is the negative side, and the long leg is the positive side. On the PCB the positive side of the electrolytic capacitor is marked with a small + symbol.

Amount	Value	Code
1	0.01nF	104
1	0.1uF	103
1	10uF	black with 10uF text (POLARIZED!) long leg in + hole, short leg in white pad



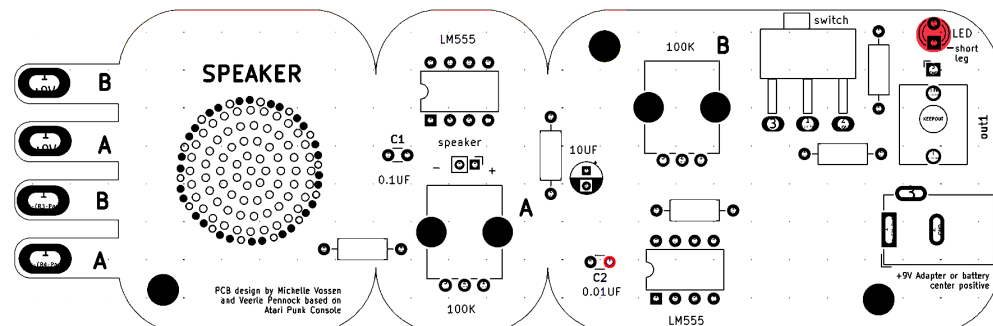
## IC CHIPS

Solder the IC chip sockets according to the pcb layout, keep in mind the dented side of the socket is on the same side as the silkscreen on the board. Don't put the 555 TIMER chips in just yet! We save that for last.



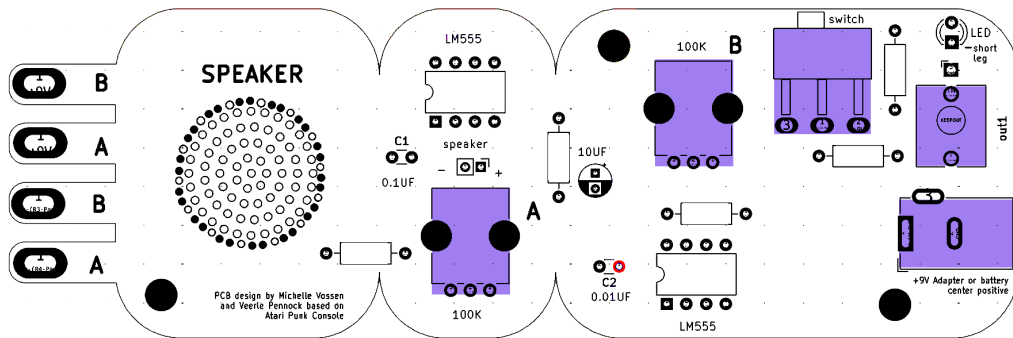
## LED

Next up we solder in the LED, this will be our power indicator for the Atari Punknik console, and also here polarity is important! The long leg of the LED is the positive side. On the PCB the short leg side is marked with the text "short side".



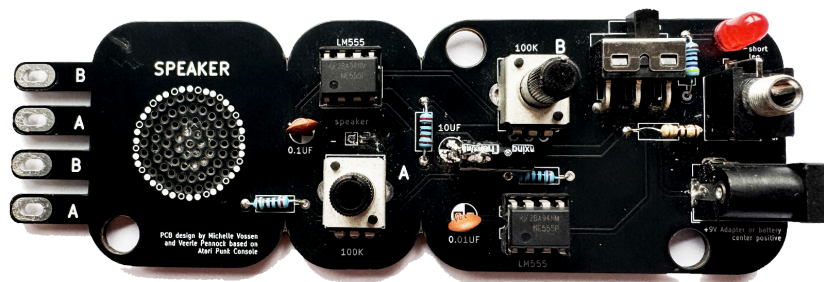
## HARDWARE COMPONENTS

After we have soldered the smaller components, we will be moving on to the bigger hardware components such as the 3 pin power switch, audio output jack, potentiometer knobs and the power socket. The 3 pin power switch is a bit stubborn to solder but should be able to just fit through the pcb. Make sure all components are flush against the pcb before soldering, you can also use the front panel as support and guide when flipping the pcb over.



## 555 TIMERS and External Speaker

Last but not least you can insert the 555 timer chips into their sockets and connect the optional speaker to the points labelled "speaker" with red wire to (+) and black wire to (-). Follow the User Manual for further steps.

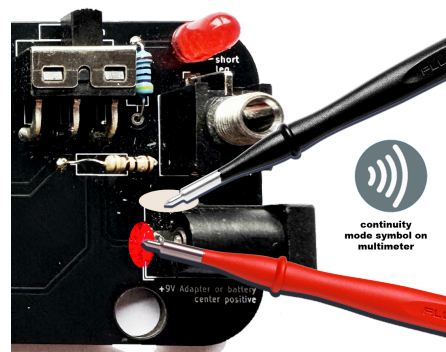


## Atari Punnik Console User Manual

### Testing the circuit

Before we're launching the Atari Punnik Console, we will do a simple "short circuit" check. Give your PCB one last look on the bottom side, are all solder joints alright? Are components not touching each other?

To double check a circuit for shorts, we can use the multimeter in *continuity-mode*, as we like to say "DR.Bibber" mode. When touching the red and black leads of the multimeter, to the power connector barrel jack side and output solder pad, there should be **no beep!** This would indicate a direct connection between ground (side of the barrel jack) and the tip of the barrel jack that is the + voltage input.



## LET'S MAKE SOME NOISE!

### Power

If all looks well and no shorts have been detected, it's time for powering the APC using a 9V battery to barrel jack connector, a 9V DC adapter or battery pack. The APC can also run on a powerbank if you solder a USB connector (mind the wiring) to a male barrel jack.



9V Battery



usb to barrel jack



5-9V DC Adapter

### Power Safety

The best method during prototyping is to power the APC via 9V battery, since there will be no connection to the mains power sockets. A DC block can also work that you use for your phone to charge and is recommended to use after prototyping stage since it is longer lasting for installations or live sessions then when using battery's that are only single use.

If you are planning to use a **DC adapter**, make sure to check the polarity of the **adapter!** (+/-) on the sticker. Some adapters such as those for most guitar pedals, have a reversed polarity. They will say: 9V, but have the + and - on different terminals of the DC plug!

### Connecting Sensors

When you have correctly powered your APC but no sound is coming out yet, this is because we have not connected the end leads together to complete the electronic circuit. The sensors are in series with the rest of the circuit, therefore when no sensors are connected we are missing connections to make the sound!

For connecting sensors we use a set of Alligator clips.

We have 2 sensor options: Sensor A and Sensor B.

1. connect an alligator clip with one end to **A** on the board, and the other end to another **A**. (Team A)
2. do the same with **B** to **B**. (Team B)
3. Make sure there are no alligator leads going from A to B and vice versa.
4. Check extra that the table or location where you put the APC on, is free of electronic debris, components clippings or conductive materials, since they can short out the circuit!
5. Connect the battery to the APC
6. Connect the audio jack out
7. Flip the switch
8. Now the Atari Punnik Console should play sounds!



## Sensor Types

Now in between the first and second A - you can add any conductive resistance material, this can be an **E-textile** sensor, a variable resistance **light sensor** or your **own body resistance**! You can add multiple conductive materials after each other or create parallel pathways.



## TROUBLESHOOTING!

### Battery or chips overheating

When you power the APC and the battery is getting very hot, then this means something is wrong in the circuit that causes the IC chips or the battery to short circuit! Follow the troubleshoot 101 below.

### LED is powered, but no sound

This can happen if there is a path missing in the signal flow, this can be between the sensor points, or it can be that one of the soldering points is soldered, but is not making good contact. Follow the troubleshoot 101.

#### *Troubleshoot 101:*

- Check if there is electronic connections that we don't want, such as pads accidentally soldered together
- Double check the polarity of the electrolytic capacitor
- make sure the 555 timer chips are sitting right in their sockets, are all legs in? is the chip pressed down?
- Check if your sensor leads are not shorting together.
- Check the polarity of your power source.

Then re-power the board and see if the problem is gone, otherwise follow the troubleshoot 101 again. Sometimes if you feel stuck, leave it for a day or two and get back to it later with fresh eyes.