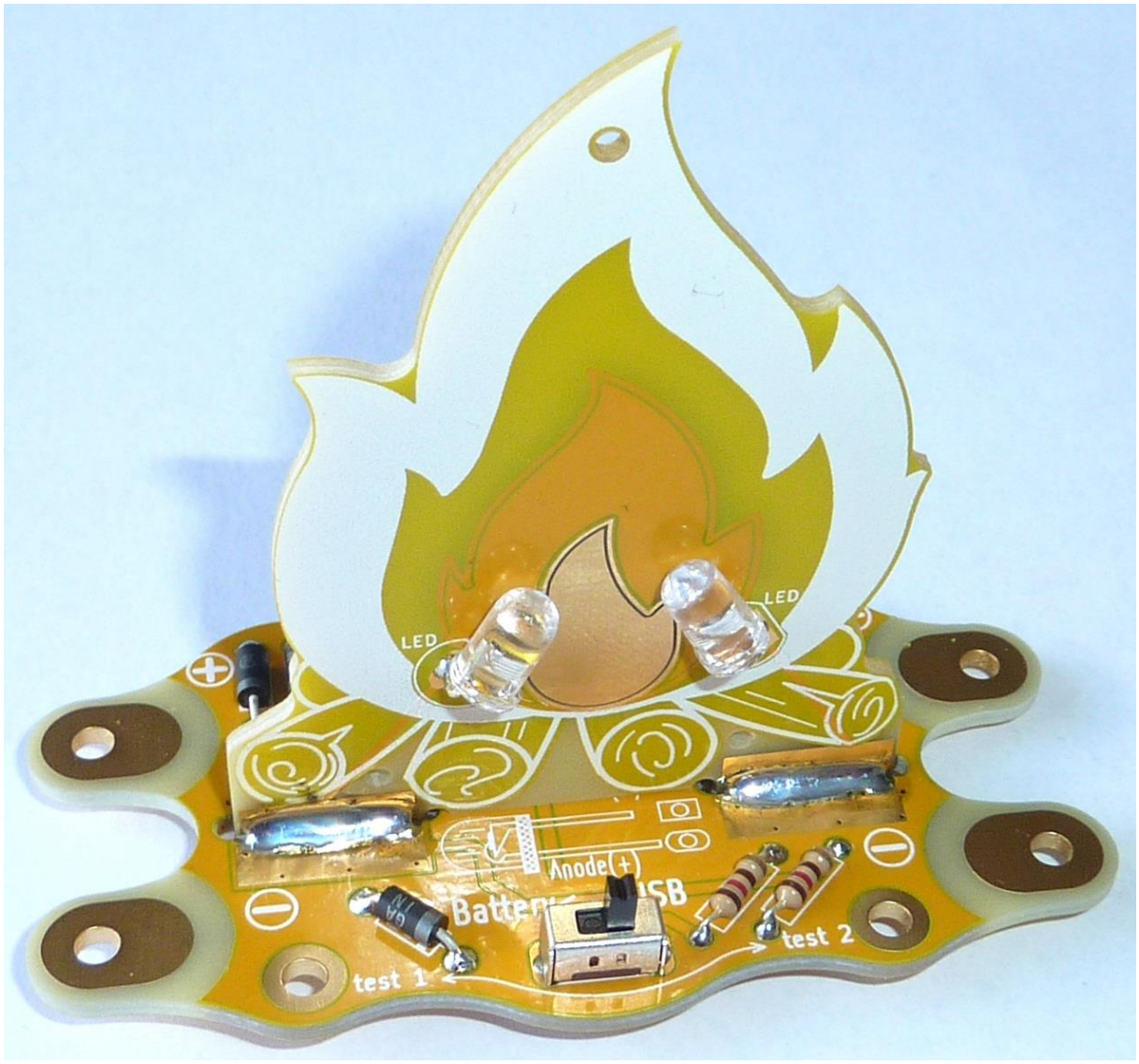
Campfire XS

Manual Campfire XS kit.



A project of the Service Kring JOTA-JOTI.

Do you like your Campfire XS, do you have any great ideas?
Let us know, find out how on the last page.

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Contents

Note: (on how to use the manual)

We would like to advise the guidance during soldering to read this entire document carefully in advance. It suffices to print only pages 4 and 5 for the purpose of building itself .

TIP: Assembling a copy yourself before the construction activity is not only fun, but also useful.

Introduction:

It turns out, and we can only applaud this, that soldering activities are not only limited to the JOTA-JOTI, but that there is also a lot of soldering on group weekends, summer camps and schools, for example. Because of the continuing demand for electronics projects, we think we have released a nice kit. With sufficient guidance, soldering can even be done with children from the age of 5. For tips see the chapter "Soldering with children" on page 10. For more kits, check out kitbuilding.org. The XS in the name of the kit stands for Xtra Small and Xtra Safe, so it is a very small and safe campfire!

Have fun building the Campfire XS!

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Contents of the kit:

The table below can be used to check the contents of the kit. Solder and a CR2032 battery must be supplied by yourself.

Component	Value	Number	Place on Board	Comments
Resistance	120 ohms	4	R1, R2, R3, R4	brown, red, brown, gold
Diode	1N4007	3	D1, D2, D3	Pay attention to orientation
LED	flashing LED	2	LED	On Flame Print
Slide switch		1	SW1	
Battery holder	CR2023	1	BT1	
Circuit board		2		

Component numbering and component values:

Print PCB	Component	Board	Print PCB	Component	Board
R1	120 ohms	base	SW1	Slide switch	base
R2	120 ohms	base	BT1	Battery Holder	base
R3	120 ohms	base			
R4	120 ohms	base	LED	flashing LED	flame
D1	1N4007	base	LED	flashing LED	flame
D2	1N4007	base			
D3	1N4007	base			

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Building description of the Campfire XS:

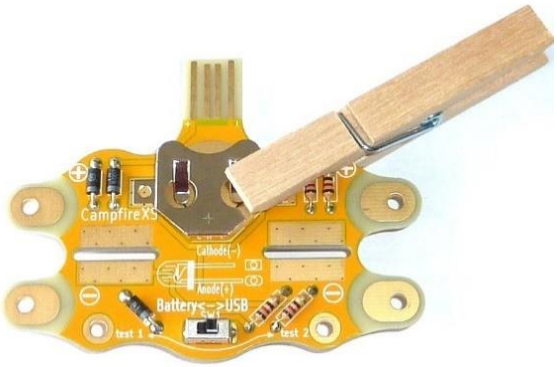
We assemble the parts from low to high and we start with what we will call the base PCB. The resistors and diodes are mounted horizontally. To do this, bend both wires at an angle of 90 degrees, taking into account the distance between the holes on the PCB. Insert the resistor or diode through the PCB and carefully bend the wires at the base of the PCB slightly apart. The PCB can now be flipped over for soldering, the resistor or diode will stay in place on the PCB. After soldering, cut off the wires just above the soldering. Do the same for all other components with longer wires. If in doubt about the correct placement, look at the photos.

Tip 1: The dots at the beginning of the line can be colored to indicate which parts have already been assembled.

Tip 2: When in doubt about the assembly of a component, look at the photo of the built PCB, once soldered incorrectly, repair can sometimes be very difficult.

Tip 3: For the resistors, a component bending jig can be of great service.

Base PCB mounting sequence:



Assemble the resistors:

- R1, R2, R3, R4: 120 Ω (brown, red, brown, gold)

Assemble the diodes:

- D1, D2, D3: 1N4007 (black oblong)

Pay close attention to the placement (see white ring on the PCB).

Assemble the switch:

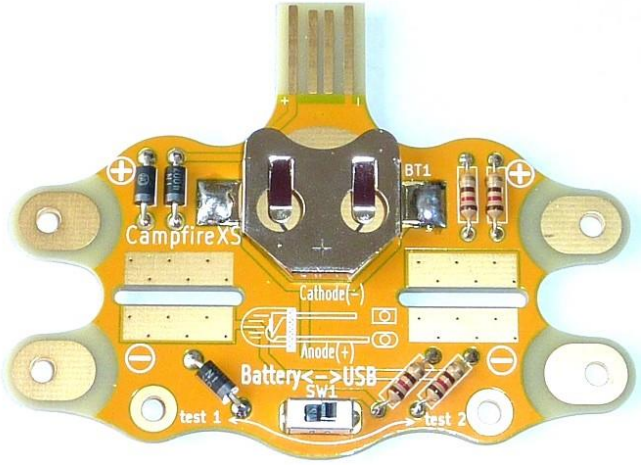
- SW1: Slide switch

Assemble the battery holder:

- BT1: Silver-coloured.
- Pay close attention to the placement! See drawing on the PCB.

TIP: If necessary, the battery holder can be held in place with a wooden peg during soldering (plastic melts).

If you've done everything right, the PCB will now look just like the picture.



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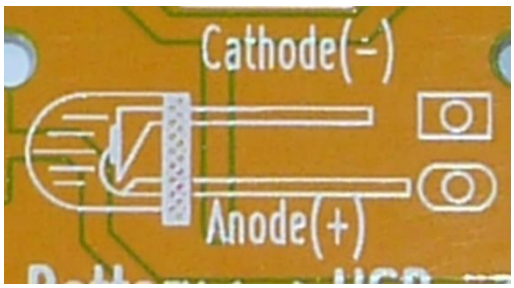
Flame PCB assembly sequence:



Only 2 parts need to be soldered to this PCB, namely the two LEDs. These are the 2 transparent parts with a convex side and 2 wires on the other side. **Pay close attention because these can only be mounted in one way!**
With the flame PCB, it doesn't matter on which side you solder the LEDs, as long as you make sure that the long wire goes into the hole with the rounded corners. The short wire comes in the hole with the rectangle around it. This is also drawn on the base PCB. The PCB can be mounted with the tip pointing to the right or to the left. If you solder the LEDs on the back, they shine through the PCB, which also gives a nice effect!

Install the two LEDs:

- Bend the wires so that the LEDs lie flat on the PCB.
  Before bending, first check whether the LEDs are inserted into the PCB in the right way.
- Now place the LEDs on the PCB and solder them in place.

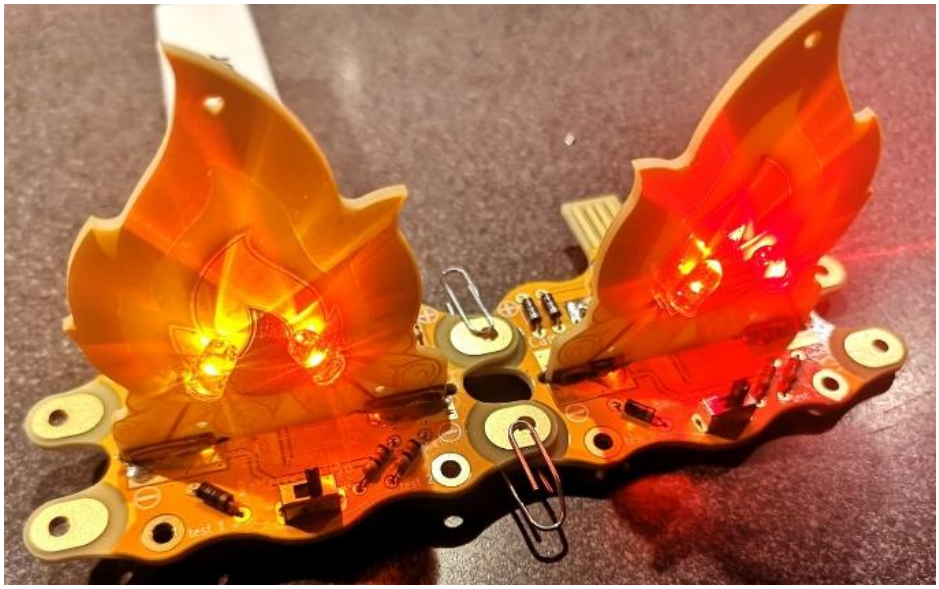
The two PCBs can now be soldered together.
Place the flame PCB upright in the base PCB and solder one copper surface. By heating the solder again, the flame PCB can be straightened or shifted slightly if necessary. When the PCBs are properly positioned, they can be permanently soldered on. Solder should be applied on 4 surfaces at the top and 4 surfaces at the base.

- Slide the battery (CR2032) into the battery holder, pay attention to the **+** and **-**!

The Campfire XS is now ready for use!

Using the Campfire XS:

With the slide switch, the Campfire XS can now be turned on and off when used with a battery, the Campfire is off when the switch is in the "USB" position. In this position, the Campfire XS can be plugged into a USB-A female connection of, for example, a power bank, USB-A extension cable or a computer. The campfire will then work on this power source. You can use an old power bank for this, maybe not good enough to charge your phone anymore but your Campfire XS will work on it for a long time. The PCB does not fit in a USB-A male connection!



When used with a battery, not **with USB**, the Campfire can also be switched on by connecting the contact holes on the PCB marked with "Test 1" and "Test 2" with a wire.

The holes on the sides of the PCB can be used to connect multiple Campfires together when using a power bank, for example. To daisy-chain the Campfires, the PCBs can be clamped together with a paper clip, with small paper clips or with (mini) clothespins. Another option is to use pieces of electrical wire, possibly equipped with alligator clips. **Note:** unlike batteries, the "**+**" must be connected with a "**+**" and the "**-**" with a "**-**".

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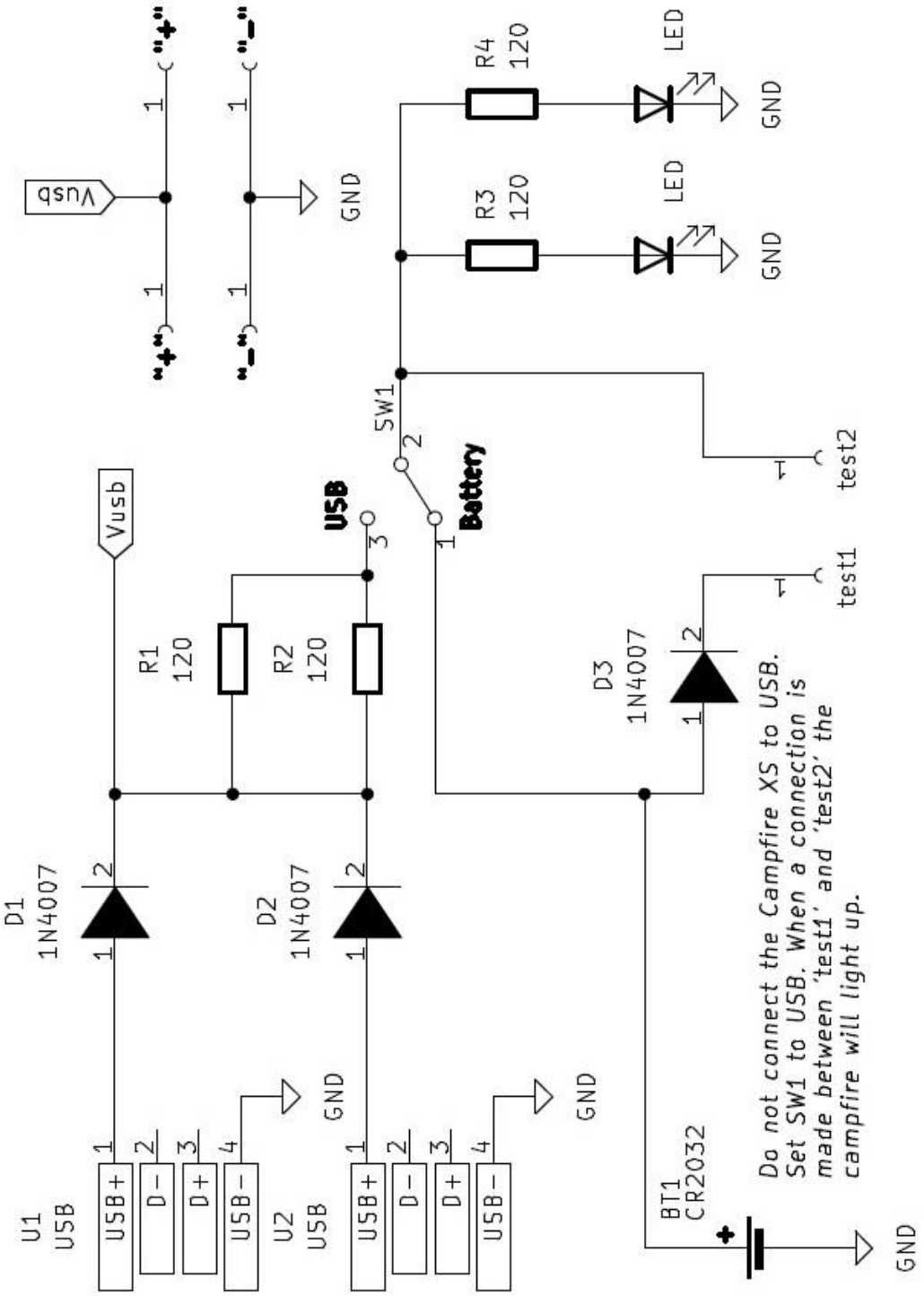
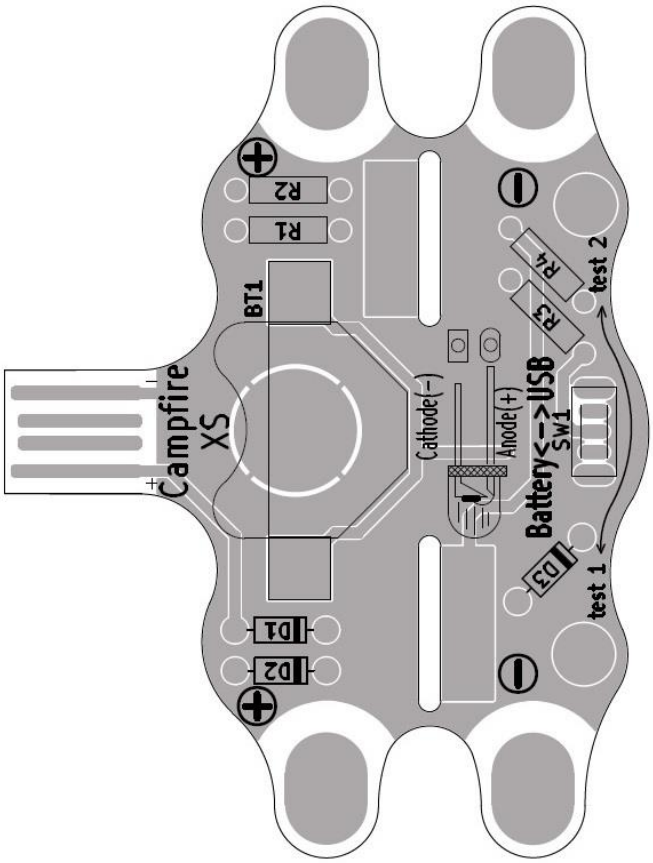
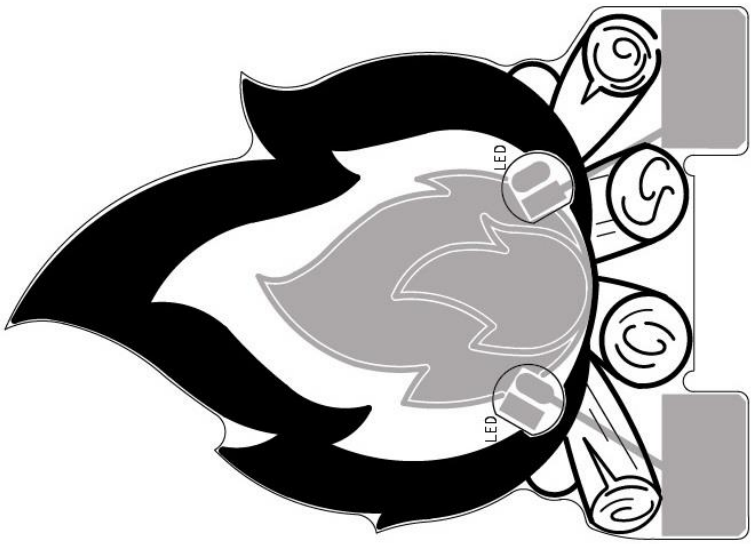
Scheme:



Component setup, not to scale:





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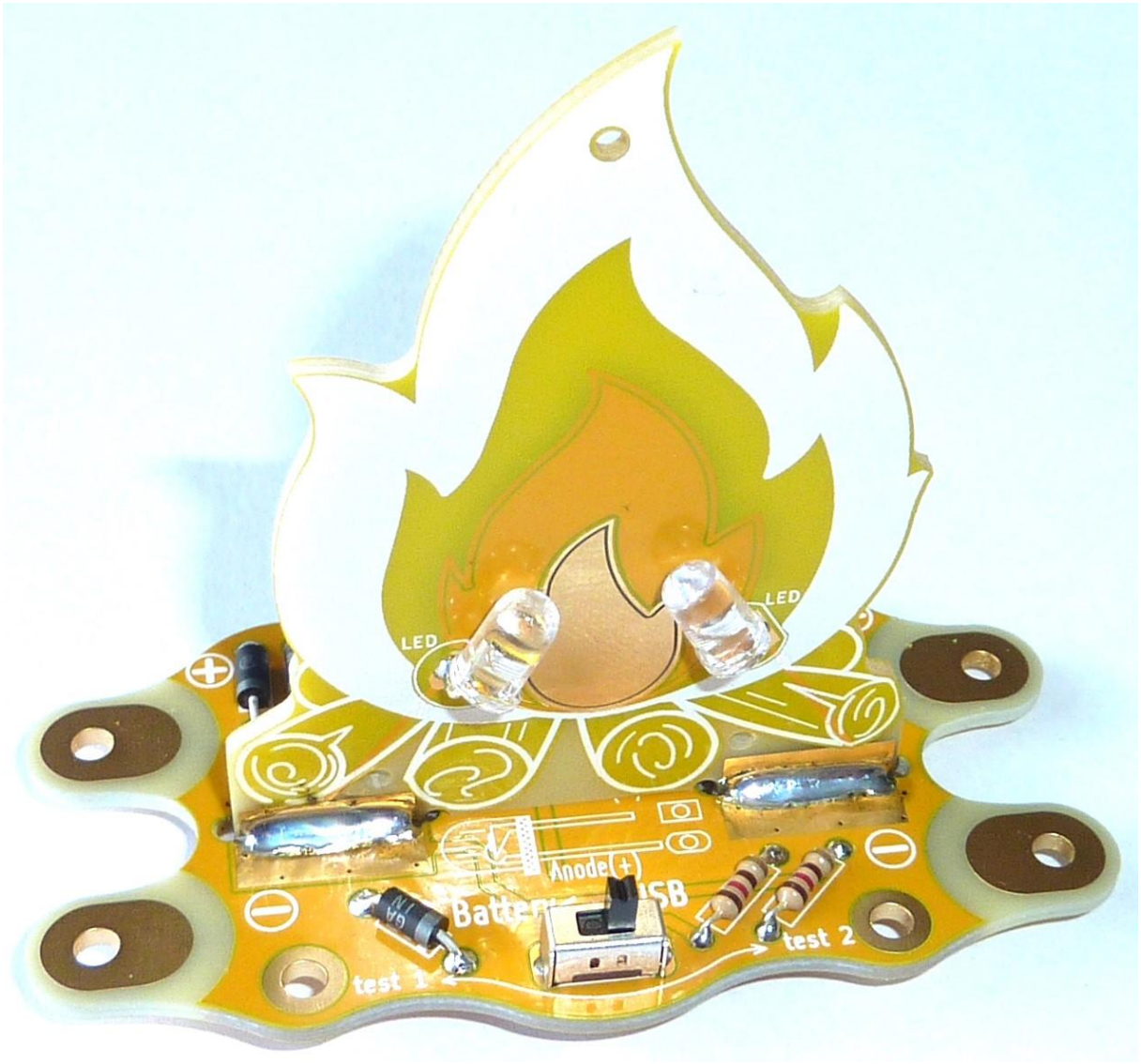
Assembled kit:



Soldering withkids:

There are a number of pitfalls when soldering with kids, by avoiding them the chance that the project will be completed successfully increases.

We regularly come across the following things:

- Making the solder joint takes (way) too long, normally a solder joint is made in about 3 seconds. Preheat for about 1.5 seconds (with a little solder at the tip for good heat conduction), add solder, remove solder and soldering iron. Children do not yet have this skill and the materials are heated for too long and get too hot.
- Children often tend to put solder on the soldering iron and then "stick" it on the PCB, the flux is already burned and a bad soldering is the result. In an attempt to get it right, the soldering site is then heated for an extra-long time with the risk of defects of components, etc.
- Temperature-controlled soldering irons are set to a temperature that is too high, for lead-based soldering about 320 °C is a good temperature for soldering.
- Non-temperature-controlled soldering irons often have too high a power, and the pin temperature can reach 450 – 500 °C. A bolt with a power of about 15 – 20 W is most suitable for this type.
- The supervisor has not read the manual beforehand and does not know exactly what needs to be done.
- There is too little guidance compared to the number of participants. Especially the youngest children need a lot of guidance. A guideline is to assume 1 supervisor on 1 beaver, for cubs/gnomes 1 supervisor per soldering station (2 scout members per soldering station). For Scouts and parent 1 supervisor for 4 members. Of course, as the members become more experienced, this can be adjusted.
- In addition to the solder guidance, it is advisable to have one supervisor who checks the PCBs and (if applicable) places the ICs, etc. In the quiet moments, he can also focus on prints that do not work immediately.

Feedback:

Do you have any comments or would you like to give feedback about the Campfire XS?
Do you have any comments or questions about the Service Kring JOTA-JOTI?
Please contact us via the contact form on the site www.kitbuilding.org.

On behalf of the Service Kring JOTA-JOTI, we wish everyone a lot of building fun with the Campfire XS!