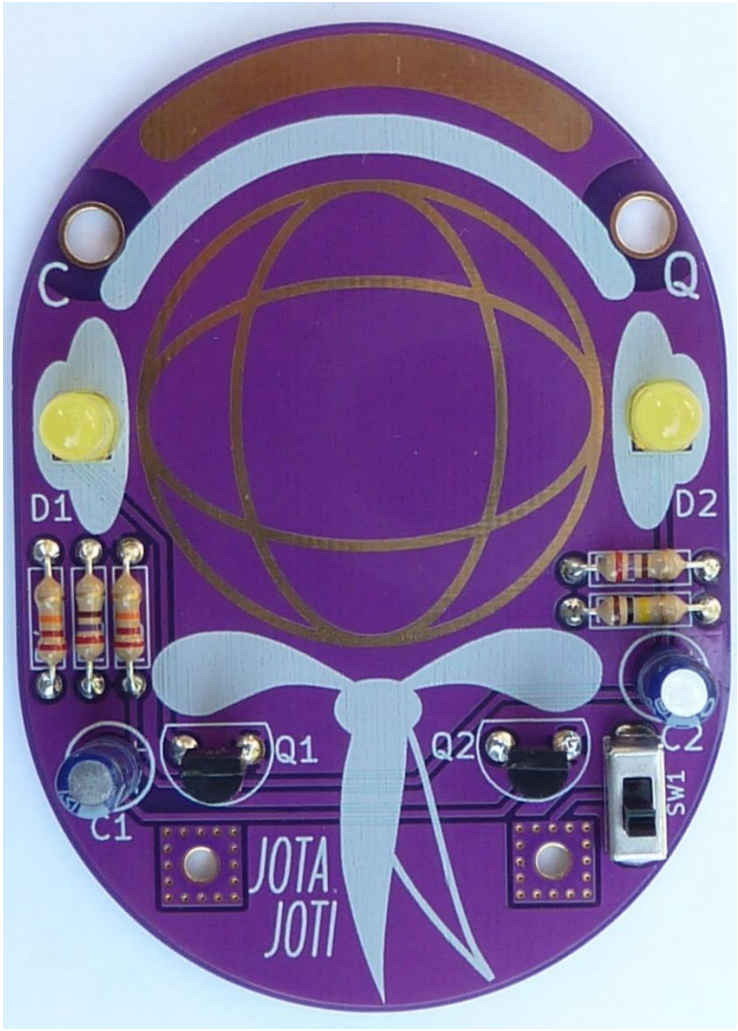
E-Badge

Building description E-Badge.



A project from the Service Kring JOTA-JOTI.

Do you like the E-Badge, do you have nice ideas?
Let us know, read on the last page how.

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Note:

In contrast to a number of previous years, all documentation surrounding our building kits has been included in one large document. This, in addition to the building description, also includes all background information and other facts.
We would like to advise the guidance during soldering, to read this complete document in advance. It is sufficient to print only pages 4 and 5 for the building itself.
TIP: Putting together a copy for the construction activity itself is not only fun but also useful.

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Introduction:

It appears, and we only applaud, that soldering activities are not only restricted to the JOTA-JOTI but that there are also, for example on group weekends, international camps and schools , there is soldered soldierly,. Because of the continuing demand for simple electronics projects, we have released a very simple kit for the second time that can be made by everyone, even by the smallest, in a short time. We called that kit “E-Badge”.
Have fun with the construction and use of the E-Badge!

Contents of the construction package:

The table below can be used to check the contents of the kit. Soldering tin and a CR2032 battery have to be added by yourselves, this battery is, for example, cheap at several shops.

Component	Value	QTYl	Pos. op board	Remarks
Transistor	2N3904	2	Q1, Q2	Mind the correct seating
Capacitor	10 µF	2	C1, C2	Mind the correct seating
LED	yellow, 5 mm	2	D1, D2	Mind the correct seating
Resistor	270 Ω	2	R1, R2	red, purple, brown, gold
Resistor	22 KΩ	2	R3, R4	red, red, orange, gold
Resistor	100 KΩ	1	R5	brown, black, yellow, gold
Switch	slide	1	SW1	Slide switch
battery holder	CR2032	1		CR2032 (big button cell)
Board		1		

Component numbering and component values:

Board txt	Component	Board txt	Component
Q1	2N3904	R1	270 Ω
Q2	2N3904	R2	270 Ω
C1	10 µF	R3	22 KΩ
C2	10 µF	R4	22 KΩ
D1	LED yellow	R5	100 KΩ
D2	LED yellow	SW1	Slide switch
			battery holder

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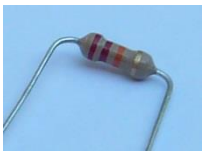
Description of the E-Badge:

It is easiest to mount the components from low to high. All resistors are mounted horizontally. For this, bend both wires at an angle of 90 degrees, taking into account the distance between the holes on the PCB. Insert the resistors through the PCB and carefully bend the wires slightly apart at the bottom of the PCB. The print can now be turned over to solder without the resistors falling out of the PCB. After soldering, cut off the remaining wires just above the soldering, also for all other components with longer legs such as the LED and the capacitor.



Tip 1: The balls at the beginning of the line can be coloured in to indicate which parts have already been assembled.
Tip 2: When in doubt about the mounting of a component, look at the photo of the built-up board. Once soldered wrongly, repair can sometimes be very difficult.
Tip 3: A component bending tool can be convenient for the resistors.

Assembly sequence:

You can also start mounting the battery holder to practice soldering

Mount the following resistors in sequence

- R1, R2: 270 Ω (red, purple, brown, gold)
- R3, R4: 22 KΩ (red, red, orange, gold)
- R5: 100 KΩ (brown, black, yellow, gold)

- Mount transistors Q1 en Q2.
  Pay attention to the drawing on the PCB..

- Mount LED D1 and D2.
  ATTENTION: this may only be mounted in one way. The long leg is at the top of the headphones. The short leg is on the side of the scarf. If you look at the print with the text "JOTA JOTI" readable then the long leg is above and the short leg is below.
  See photo on the right.

- Mount the slide-switch SW1.

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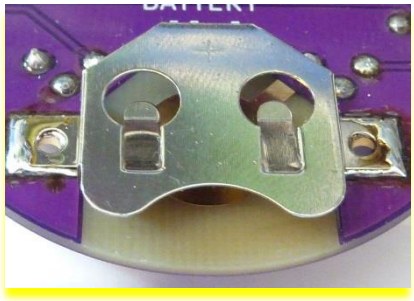
Mount electrolytic capacitor C1 and C2
ATTENTION: this may only be mounted in one way. The long leg should be in the hole on the PCB where + is. The minus pole is marked on the capacitor on the housing.

- Mount the battery holder for the button cell, it is soldered on the back of the print. Carefully place the battery holder in place and solder it to the sides. The easiest way is to first tinplate the print and the soldering edges of the battery holder. Then hold the battery holder in place and heat on one side until it stays in place. Then properly solder the other side and then properly solder the first side. To keep the battery holder in place while soldering you can insert a cocktail stick through the holes.
  NOTE: The closed side of the battery holder must point upwards, see the photo on the right.



- Carefully place the button cell (CR2032 battery) in the holder by sliding it in from below. The plus side must go up. You don't have to worry about the battery falling out, it is firmly attached.
- The E-Badge is now ready for use.

Note:

You can write your name in the curved golden square at the top of the print, then no one will take your E-Badge off!
 You can solder a safety pin on the rectangular gold square on the back so that you can pin your badge on!

Operation:

The operation is very simple, when you turn the switch on, both LEDs will flash alternately.
The holes at the C and Q can be used to put a piece of string through so that you can hang the badge on for example during an evening game or a campfire. These can also be used for something else. If you connect these holes with a wire, the LEDs suddenly flash faster. By adjusting the resistance between the points you can adjust the speed of the flashing a bit. The holes in the C and Q are 4 mm, where a banana plug can be inserted.

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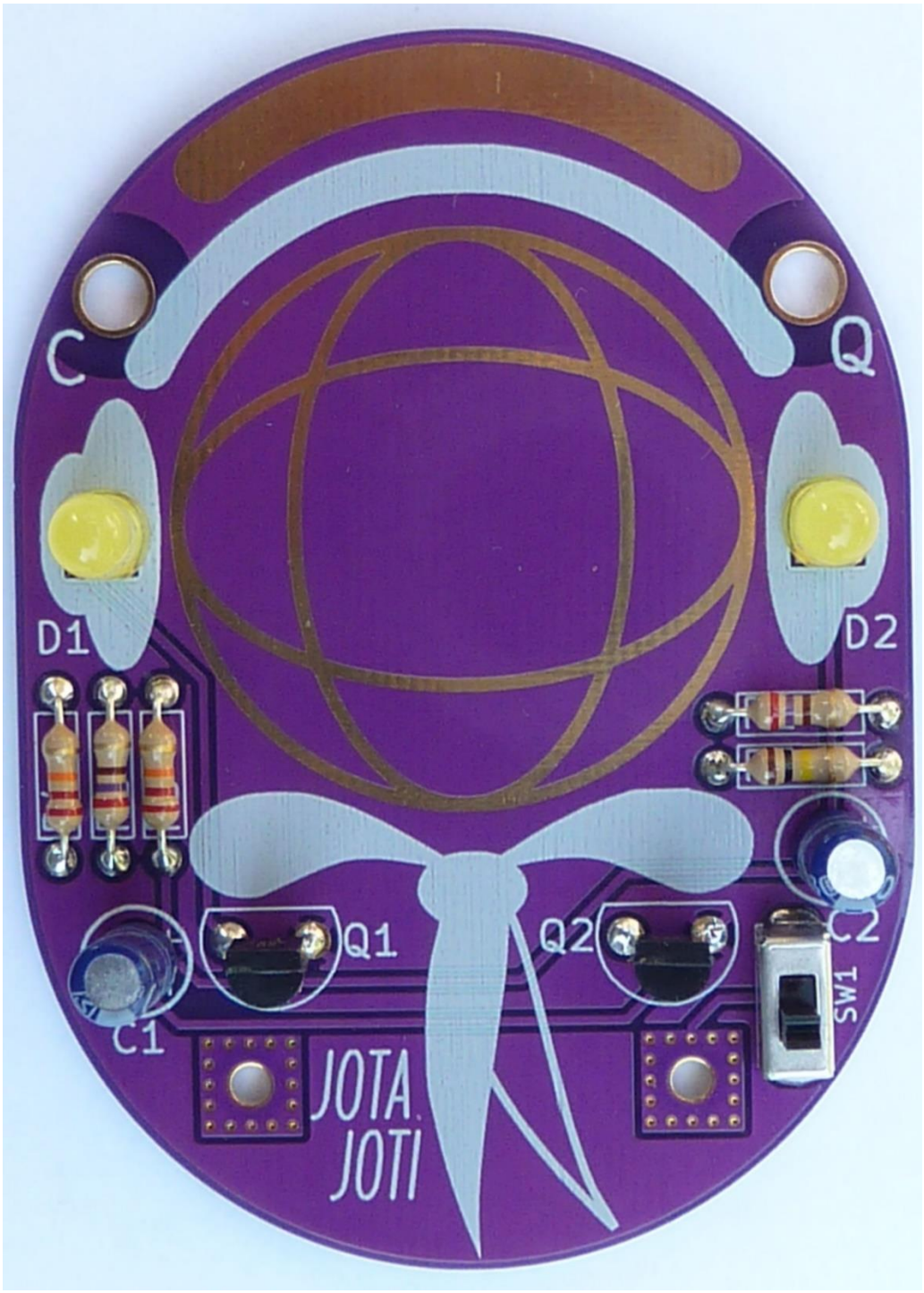
Built-up board:



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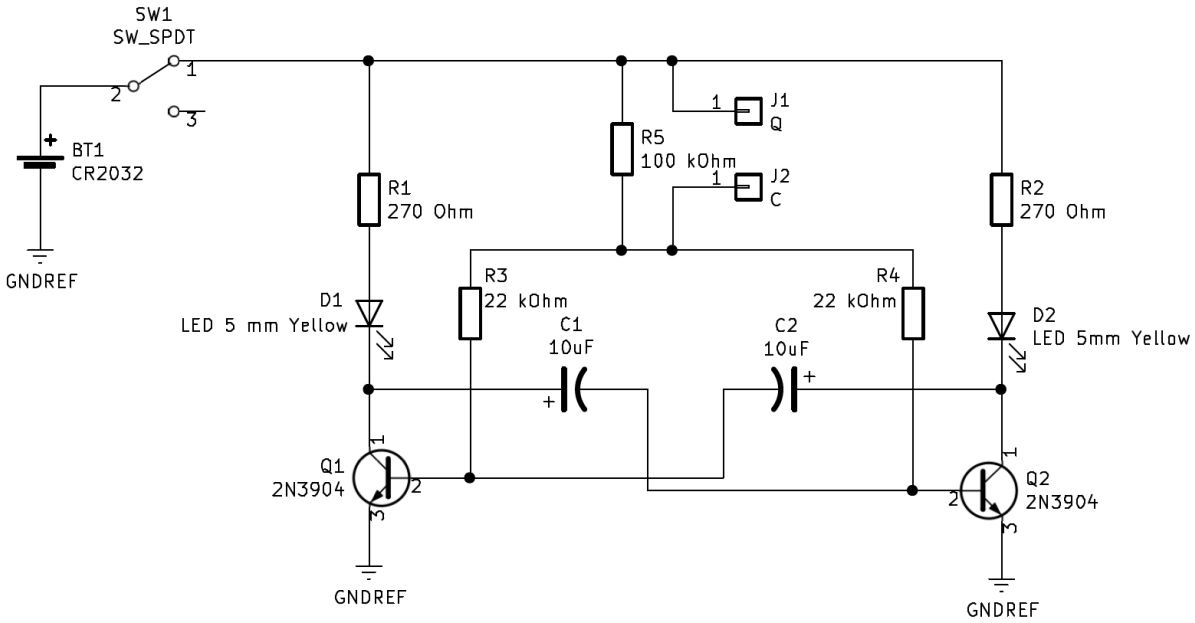
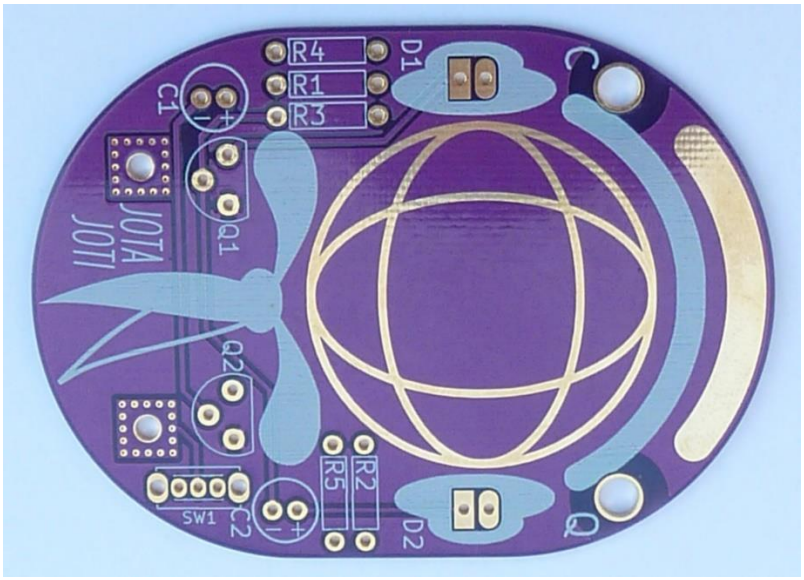
Scheme:



Components setup :



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Soldering with children:

There are at soldering with children some pitfalls imaginable, by avoiding this, it is likely that the new little project is successfully completed.
The following items we see in the field:

• The making of the soldered connection takes (much) too long, a good soldered connection is made in about 3 seconds. Approximately 1.5 seconds for pre-heat (with a little solder to the tip for good heat conduction), attach solder, solder and remove the soldering iron. Children do not have this skill yet and the materials are heated for too long and thus too hot.
• Children often tend to put solder on the soldering iron and then "stick" the solder on the board, the flux is already burning and poor soldering is the result. In an attempt to get it right, the solder connection heats up too long, causing component failures etc..
• Temperature-controlled soldering irons are set at too high a temperature, for leaded solder around 320° C is a good temperature for soldering.
• NON-controlled soldering irons often have to high power, and the pin temperature can reach 450 - 500 °C. A iron with a power of about 15 to 20 W is for this purpose the most suitable.
• The assistant has previously not read the manual and do not know exactly what to do.
• There is too little guidance in relation to the number of participants. Certainly the youngest children, many need much guidance. A directive is to go aim for one attendant on one beaver, with cubs / gnomes one supervisor per soldering (2 scout members per soldering station). With older Scouts go for one supervisor on four members. As the members are more experienced this can be adjusted of course.
• It is advisable to have besides the solder guidance, one supervisor who controls the PCB with components build on it and (if applicable) places the IC's ect. This trouble-shooter can also look at mail functional PCB that do not work right away.

Feedback:

Do you have comments or would like to give you feedback about the E-Badge?
Do you have 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 fun building but also enjoy the E-Badge!