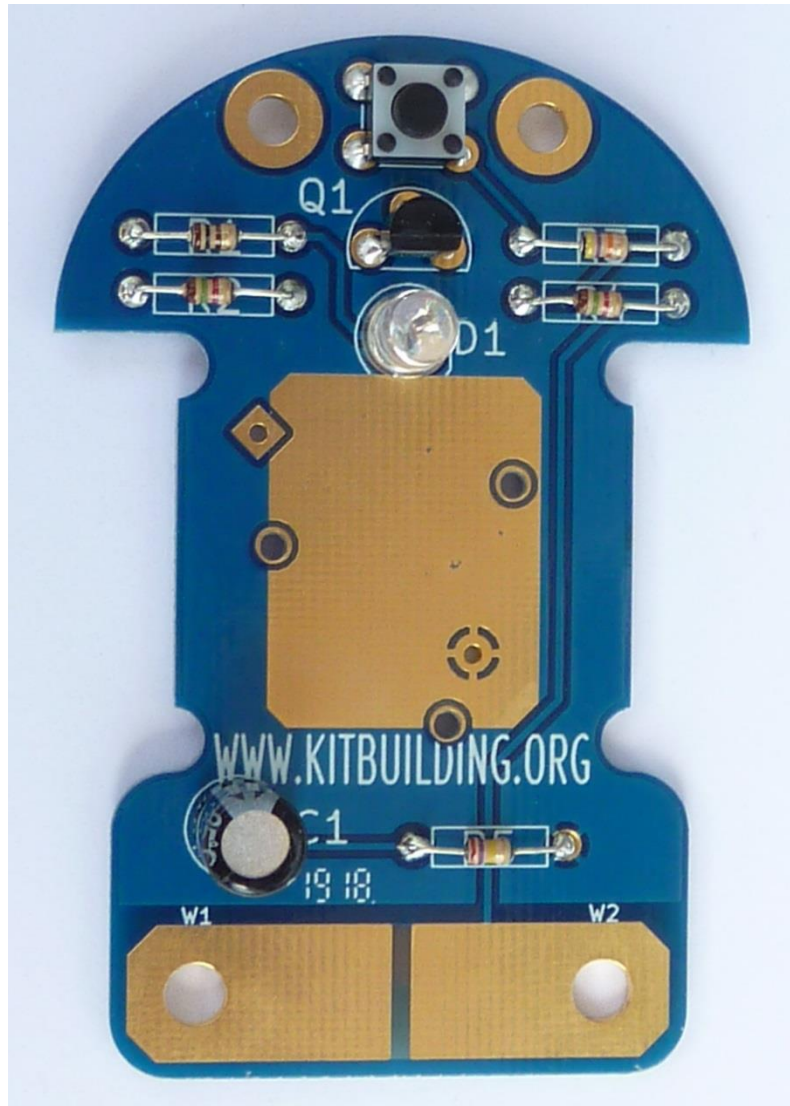


Lantern



Building description Lantern kit.



A project from the Service Kring JOTA-JOTI.

**Do you like the Lantern, do you have nice ideas?
Let us know, read on the last page how.**

Lantern



Note:.....	2
Introduction:.....	3
Contents of the construction package:	3
Component numbering and component values:	3
Description of the Lantern:	4
Assembly sequence:	4
Operation:	5
Built-up board:	5
Scheme:	6
Components setup :	7
Compleet opgebouwde print:	8
Soldering with children:	9
Feedback:	9

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.

Lantern



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 solderily. Because of the continuing demand for simple electronics projects, we have released a very simple kit this time that can be made for everyone, even by the smallest, in a short time. We called that kit "the Lantern".

Have fun with the construction and use of the Lantern!

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	Qty	Pos. on board	Remarks
Resistor	100 Ω	1	R1	brown, black, brown, gold
Resistor	1,5 K Ω	2	R2, R4	brown, green, red, gold
Resistor	47 K Ω	1	R3	yellow, purple, orange, gold
Resistor	270 K Ω	1	R5	red, purple, yellow, gold
Capacitor	220 μ F	1	C1	Mind the polarity
LED	yellow, 5 mm	1	D1	Mind the polarity
Transistor	BC33725	1	Q1	Mind the correct seating
Switch	pushbutton	1	S1	
Battery holder	CR2032	1	BT1	CR2032 battery holder (big button cell)
Board		1		

Component numbering and component values:

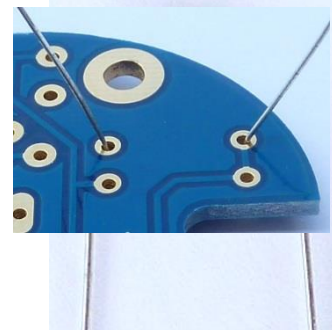
Board txt	Component
R1	100 Ω
R2	1.5 K Ω
R3	47 K Ω
R4	1.5 K Ω
R5	270 K Ω
C1	220 μ F
D1	LED yellow
Q1	BC33725
S1	switch
BT1	batteryholder

Lantern



Description of the Lantern:

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. When in doubt about the correct placement, look at the photos of the built copy.



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:

Mount the following resistors in sequence::

- o R1: 100 Ω (brown, black, brown, gold)
- o R2,R4: 1.5 K Ω (brown, green, red, gold)
- o R3: 47 K Ω (yellow, purple, orange, gold)
- o R5: 270 K Ω (red, purple, yellow, gold)

o Mount switch, S1.

o Mount transistor Q1.

Pay attention to the drawing on the PCB.

- o Mount LED D1.

ATTENTION: this may only be mounted in one way. The short leg comes on the side of the text "D1" on the PCB. You will then see that the flat side of the LED is exactly as indicated on the PCB. It can also be mounted flat against the PCB so that the copper surface acts as a reflector.

Lantern



o Mount electrolytic capacitor C1.

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..

o Mount the battery holder for the button cell, look at the drawing on the print.

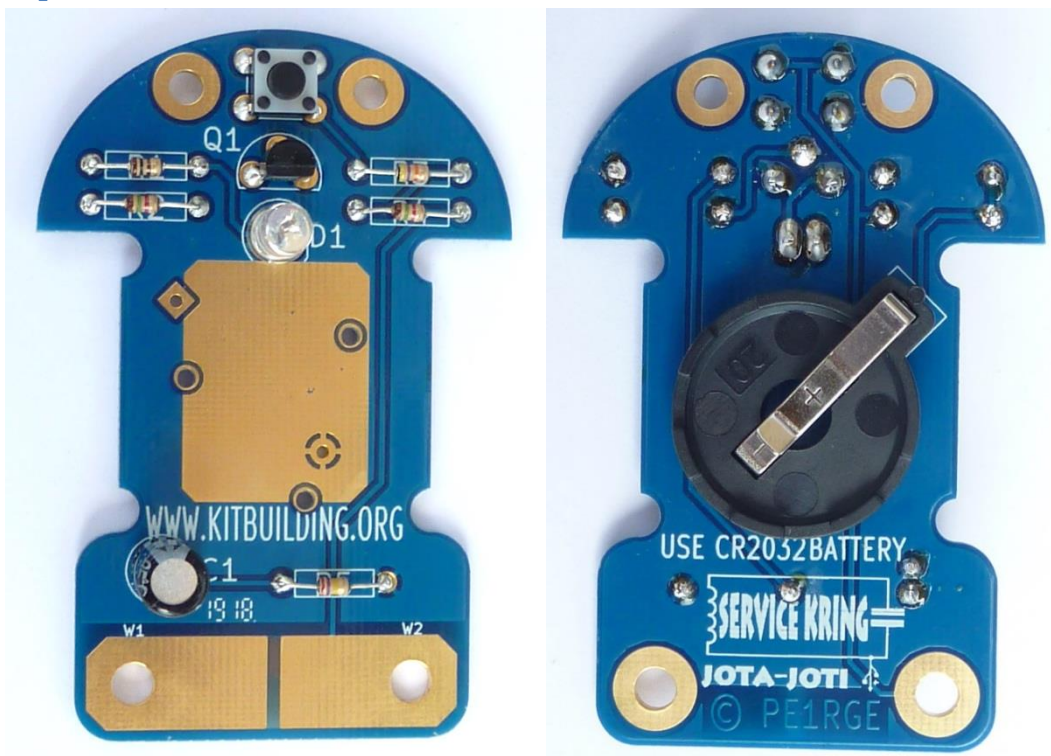
ATTENTION: this is mounted at the bottom of the PCB and soldered at the top.

o Carefully place the button cell (CR2032 battery) in the holder, the plus is indicated on the metal tab (see photo). The lantern is now ready for use. This type of battery is not very short-proof, so check the PCB well before the battery is installed.

Operation:

The operation is very simple, when you press the switch the LED turns on and after a while slowly goes out. There are also two copper surfaces on the PCB (W1 and W2), for example, a switch or a morse key can be connected. This allows the LED to be switched off and on. These can also be touched with a slightly damp finger. The LED then lights up and stays on for a while, how long depends on the resistance of your finger and how long you have touched the contacts. The holes in the copper surfaces are 4 mm, in which a banana plug can be inserted.

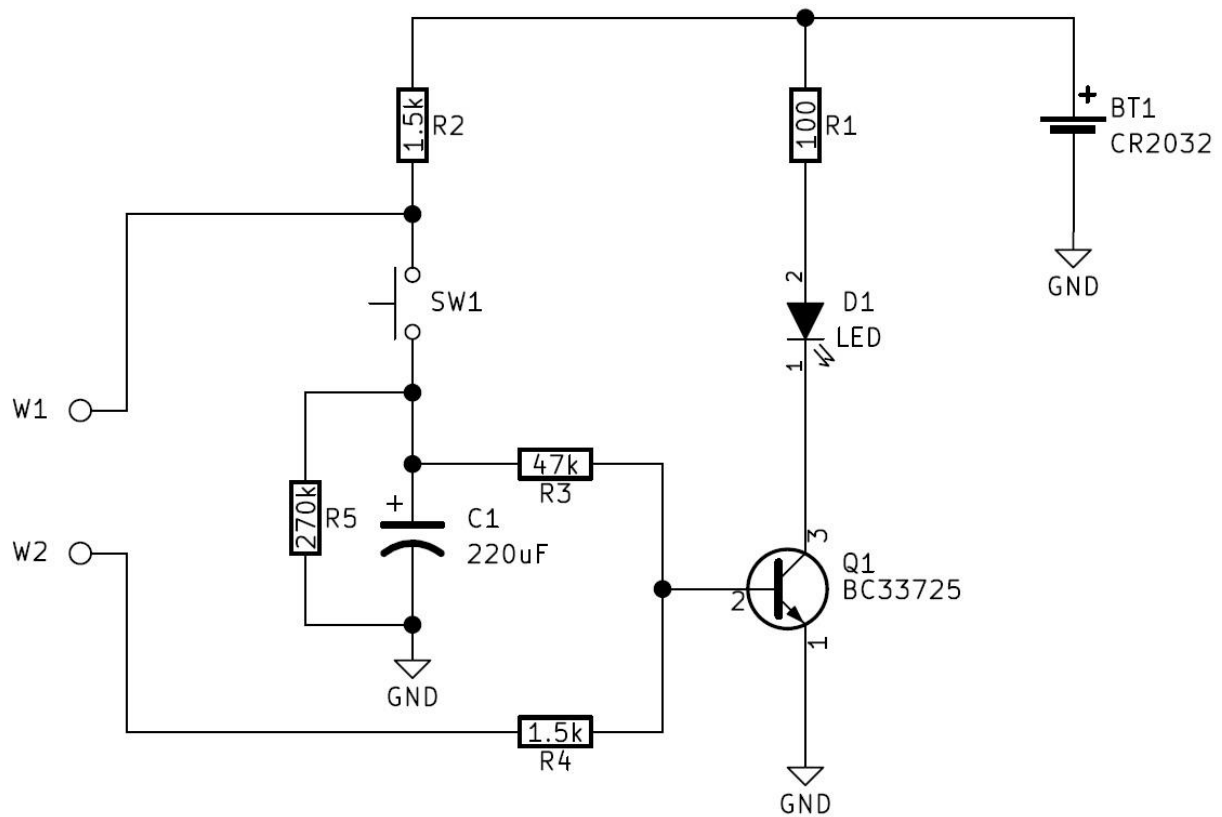
Built-up board:



Lantern



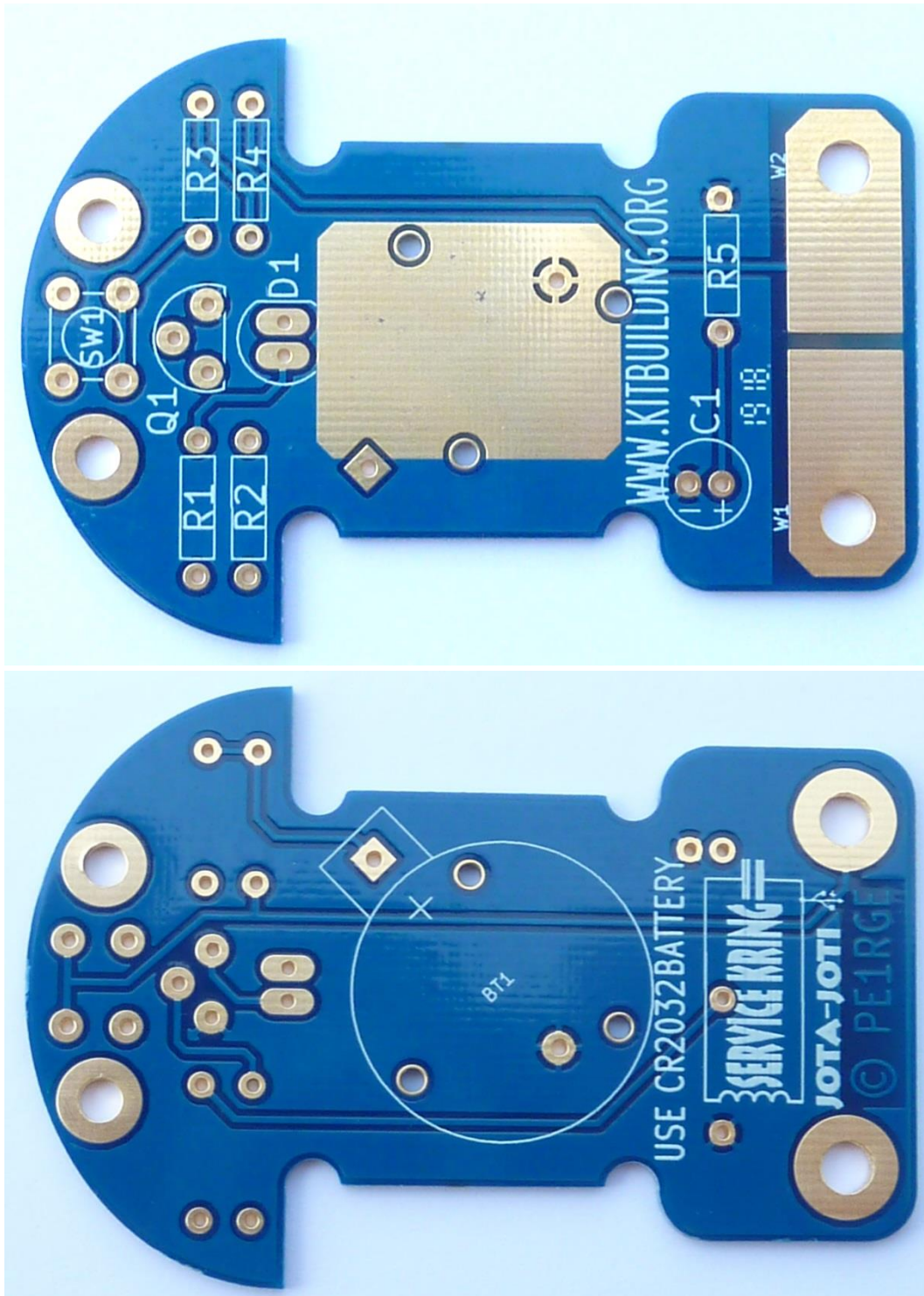
Scheme:



Lantern



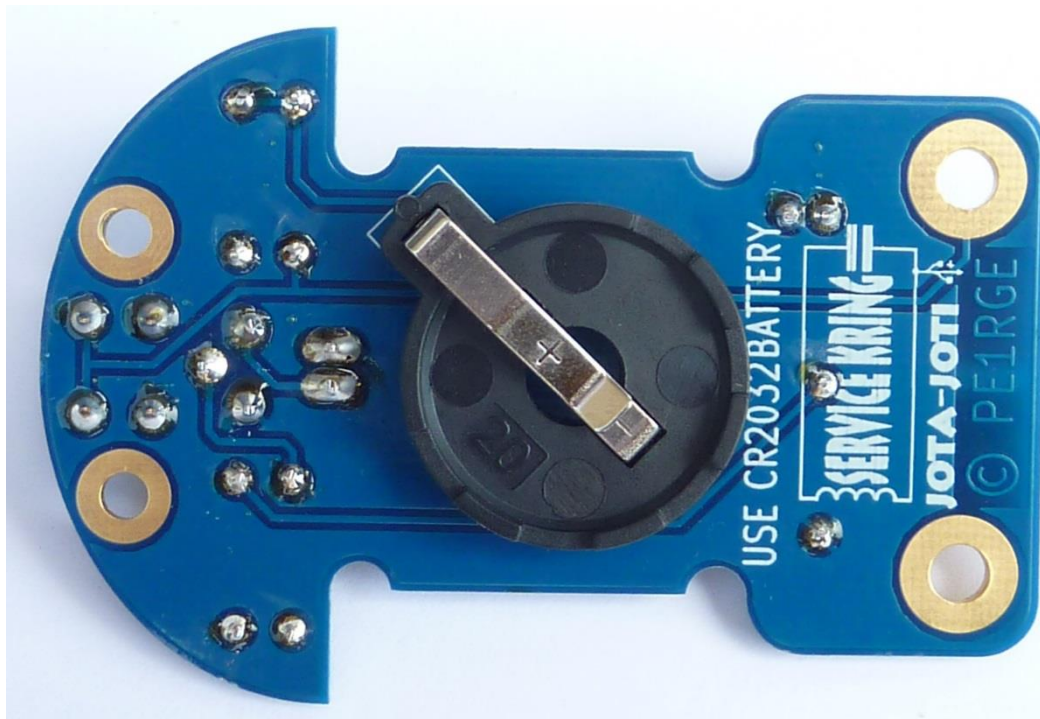
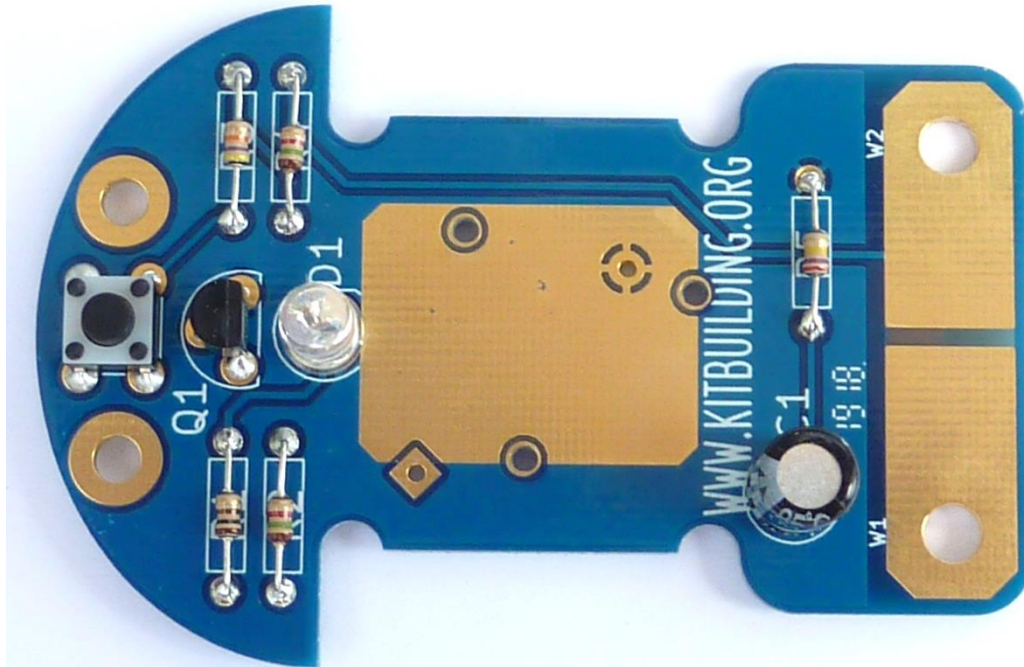
Components setup :



Lantern



Completely built PCB:



Lantern



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 too 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 Lantern?

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 Lantern!