

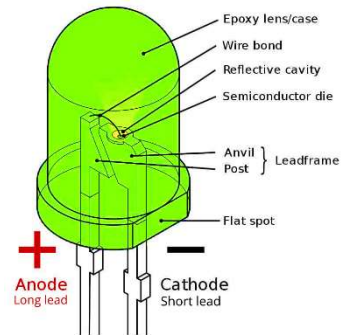
# JOTA – Brownsea Island



Part	Qty	Description	Check
Printed Circuit Board	1		
YX8018	1	Joule Thief Solar Charger	
Battery Clip	2		
47 uH Inductor	1	Tiny little component with two pads	
Red Port LED	1		
Green Starboard LED	1		

Not included in the kit are pieces of copper wire and insulation

## LED POLARITY



[Step 1] Snap in and solder the battery clips into these holes

[Step 2] Solder in the 2 LEDs, take care they are the correct way around. (the flat spot is facing inwards)

[Step 3] Solder in the SMD Inductor  
Apply solder to the pads first before applying more heat to the side of the inductor

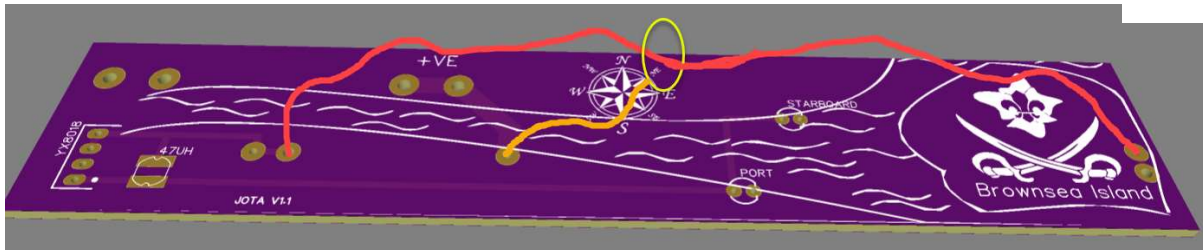
[Step 4] Solder in the Joule Thief YX8018. It only works one way round!

[Step 6] Make a track out of a piece of wire and connect it to these holes. Cover the last 1cm with insulation

[Step 7] make a loop out of wire and connect it to this point

## Top Tips

- Don't Rush It
- Read through the soldering tips document
- Remember your iron is hot. It could burn you, your neighbour or the power cord. Give yourself lots of room.
- Sticky tape a clothes peg to a block of wood to make a simple holder.
- Ask an adult if you have the components the right way round BEFORE you solder them in.
- Make sure your solder joints are nice "volcanos"
- Cut the legs off the component with side cutters, after you solder them
- Check you have not joined any solder pads together by accident BEFORE you power it up

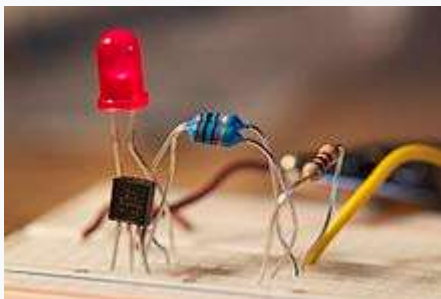


## How it a Joule Thief works

From Wikipedia, the free encyclopedia



A conventional joule thief, showing components and how they are connected.



A **joule thief** is a minimalist self-oscillating [voltage booster](#) that is small, low-cost, and easy to build, typically used for driving small loads. This circuit is also known by other names such as [blocking oscillator](#), *joule ringer*, *vampire torch*. It can use nearly all of the energy in a single-cell [electric battery](#), even far below the voltage where other circuits consider the battery fully discharged (or "dead"); hence the name, which suggests the notion that the circuit is *stealing* energy or "[joules](#)" from the source – the term is a [pun](#) on "jewel thief". The circuit is a variant of the [blocking oscillator](#) that forms an unregulated voltage boost converter. The output voltage is increased at the expense of higher current draw on the input, but the integrated (average) current of the output is lowered and brightness of a luminescence decreased.

## IALA buoyage system

In Australia, the system of buoys, beacons, marks and lights used is compliant with the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) Buoyage System 'A'.

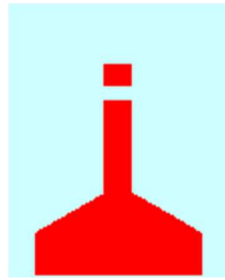
Each type of mark has its own colour, shape, top mark and light combination.

To navigate safely, you need to know each mark and its meaning.

### Lateral marks

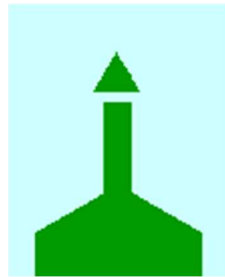
Lateral marks show the port (left) and starboard (right) sides of navigable waters or channels.

A port mark is red with a can-like shape.



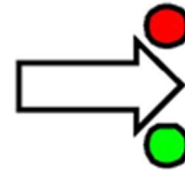
At night, a port buoy shows a red flashing light (when lit).

A starboard mark is green with a cone-like shape.



When a port and starboard lateral mark are opposite each other, travel between them. Sometimes they are not in pairs though. When there is a single lateral mark, the safe side to

pass depends on the direction of travel (or buoyage). The direction of buoyage is shown on charts by the symbol:



When travelling upstream or away from the sea:

- keep port (red) marks on your port-hand side (left)
- keep starboard (green) marks on your starboard-hand side (right).

When travelling downstream or towards the sea:

- keep port (red) marks on your starboard-hand side (right)
- keep starboard (green) marks on your port-hand side (left).