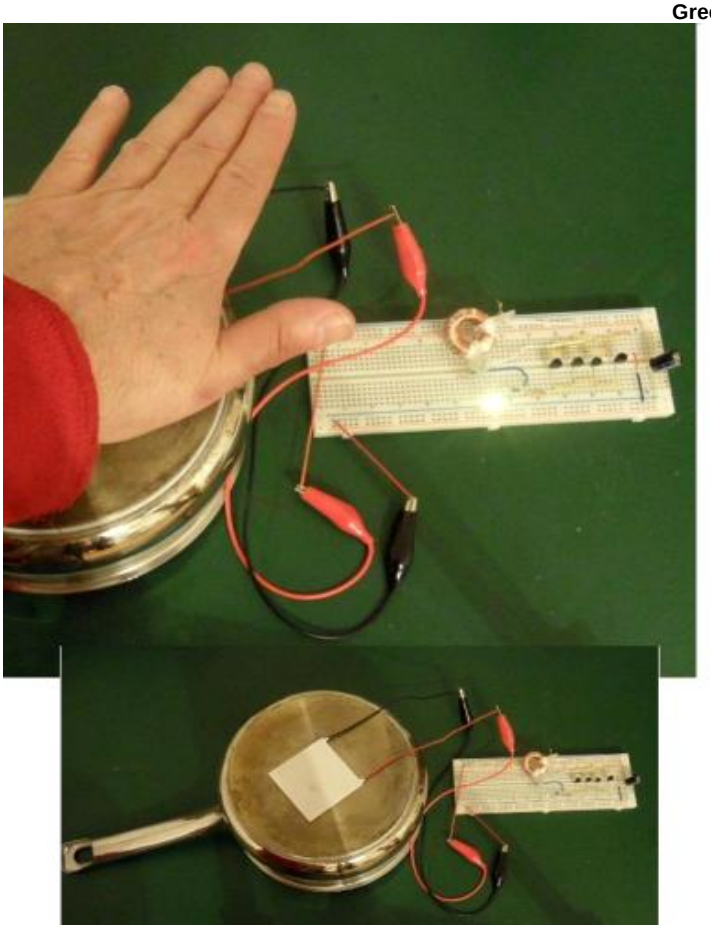
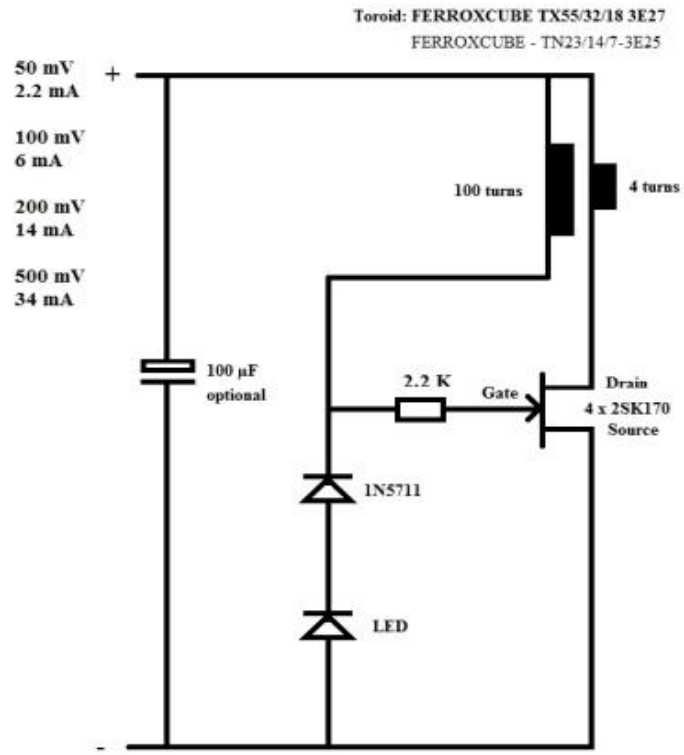
Joule and Peltier Diagrams

attached a photo of my Peltier Element Test (4 transistors 2SK170 in parallel, steel cooking pan at room temperature about 22° Celsius, Peltier Element 50 mm x 50 mm).

Greetings, Conrad



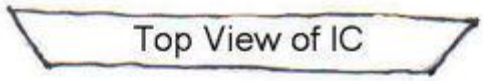


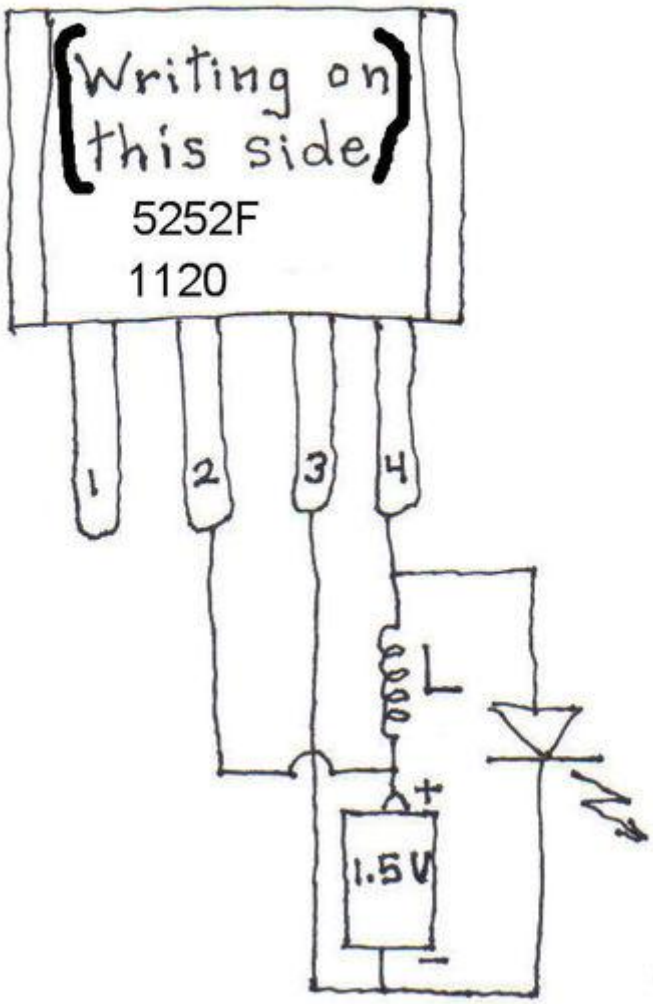
Joule Theif Circuit

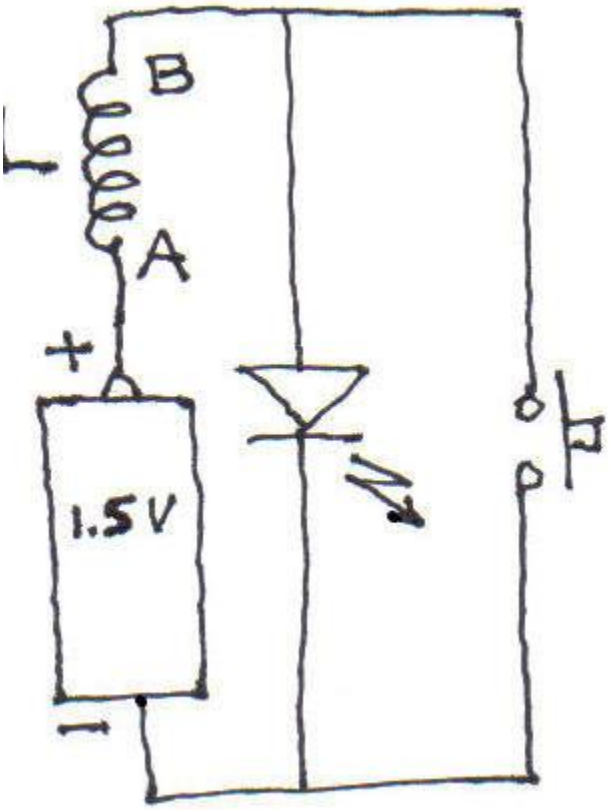
Although the IC "Joule Thief" seems to work with my crude, handwound coil on a nail, I actually use a very small 330 (orange-orange-brown) inductor that has the size and appearance of a small 1/2 watt resistor.

The coil or inductor is 12 feet of 24 gage wire wrapped (200 turns) around a 1/4 inch diameter soft iron nail.
With the QX5252F IC connected as shown, Pin 4 on the IC very rapidly connects and disconnects to Pin 3, the negative on the battery, causing the LED to repeatedly flash similar to the crude "Joule Thief" already mentioned. But here the LED flashes so rapidly that the LED appears completely ON, more so than some florescent lights that have a flicker to them.

p 5:

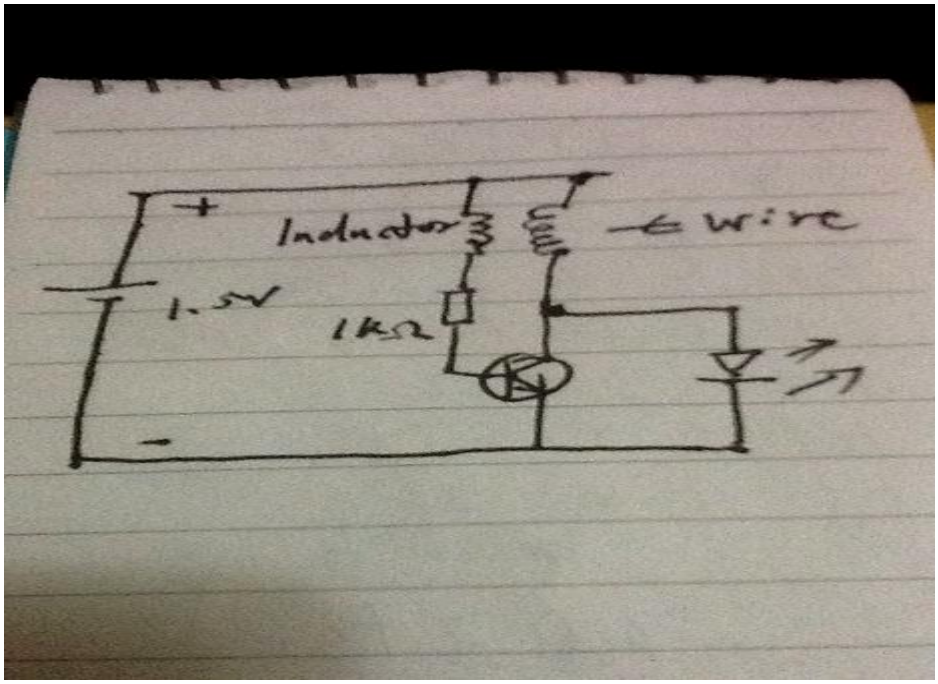






Next
BOM
2. resistor
3.
4. 20cm
5. LED x 1

Diagram:
1. Npn transistor x 1 (any kind)
1k ohm x 1
Inductor 330uH x 1 (can try any value)
of copper wire (I cut from a CAT5 cable)
6. Battery 1.5v x 1



Instead of using a toroid,I wrap the copper wire 8 to 10 turns on the inductor as captured.

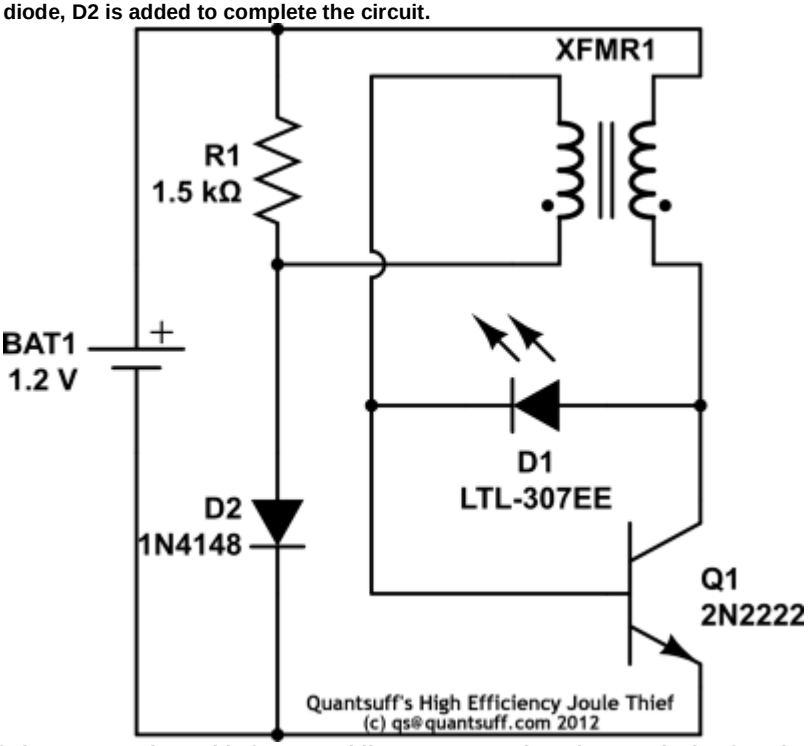
Connect transistor, resistor and LED as captured, then connect the inductor between resistor and battery positive end, and the copper wire between Collect end of transistor and battery positive end. That is it. Connect the 1.5v battery and see.

The tricks are:
- increase no of turns of the coil to make LED light up more
- any value of inductor will do as long as it makes the transistor circuit oscilates so the transistor open and close frequently
- any npn transistor will do but if the circuit makes the transistor hot, you need to consider the "heat sink" if you are going to let the LED run for longer time

Step 2: The Diagram

Inductor below

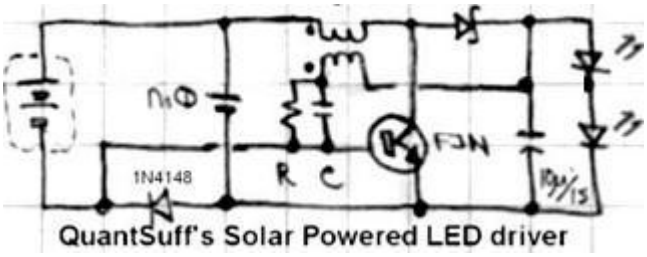
Next Circuit:
The LED itself is now connected between the highest and the lowest voltage points of the 2 coils. A diode, D2 is added to complete the circuit.



The addition of D2 represents an added drain of about 0.7mA, but aside from providing a return path to the LED, it also functions as a rudimentary power regulator by maintaining the voltage to the transistor's base just at its conducting point, regardless of input voltage. This allows the circuit to operate over a much wider voltage range, from 2-volts to around 0.9-volt with much better current (and brightness) regulation. As built, this circuit will operate down to just below 0.6v.

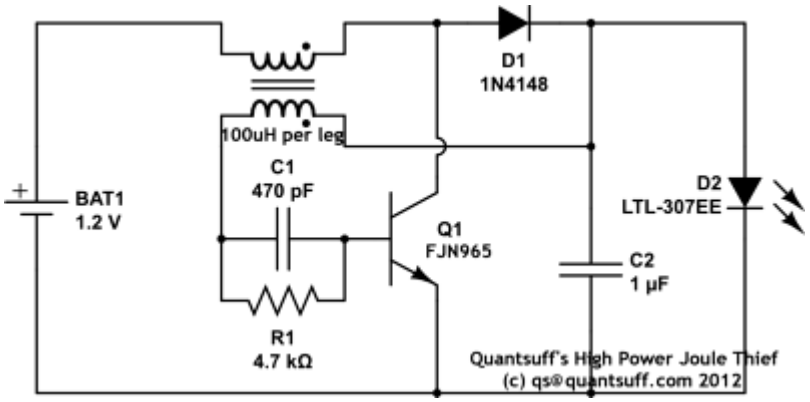
Next circuit:

Another take on the Solar Garden Light. With the addition of a solar cell, a simple diode, and some clever rearrangement of our circuit, we can devise a circuit which will charge a NiCd battery when it is light and automatically turn itself on after night falls. *Can you explain how it works?*



Next circuit:

ANOTHER APPROACH is to take our basic circuit and derive the base drive from a rectified LED output. This ensures that there is more than enough drive to saturate the transistor.



When power is applied, current flows from the battery through the diode, the resistor to the Base, starting the oscillation. After that, the LEDs act as a zener to maintain a relatively stable supply to the base.

The circuit requires a higher starting voltage to overcome the Vf of the diode, so it is useful to have a Schottky here. But once started, the circuit will run until the battery drops to Vce, which could be 0.3V or even less!

Another advantage to this circuit is that its output is fairly well regulated from 1 to 2 Volts and it is readily adaptable to 2- or even 3-cell circuits, because the base drive is less dependent on input voltage than other designs

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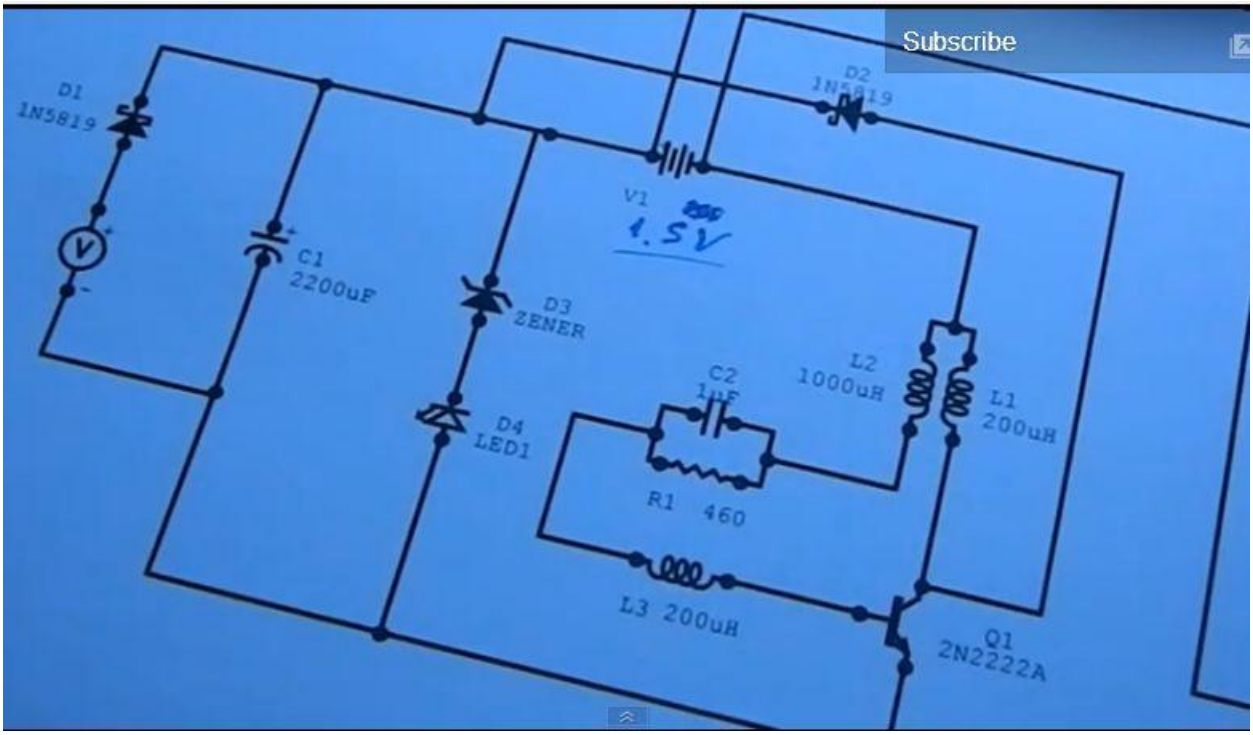
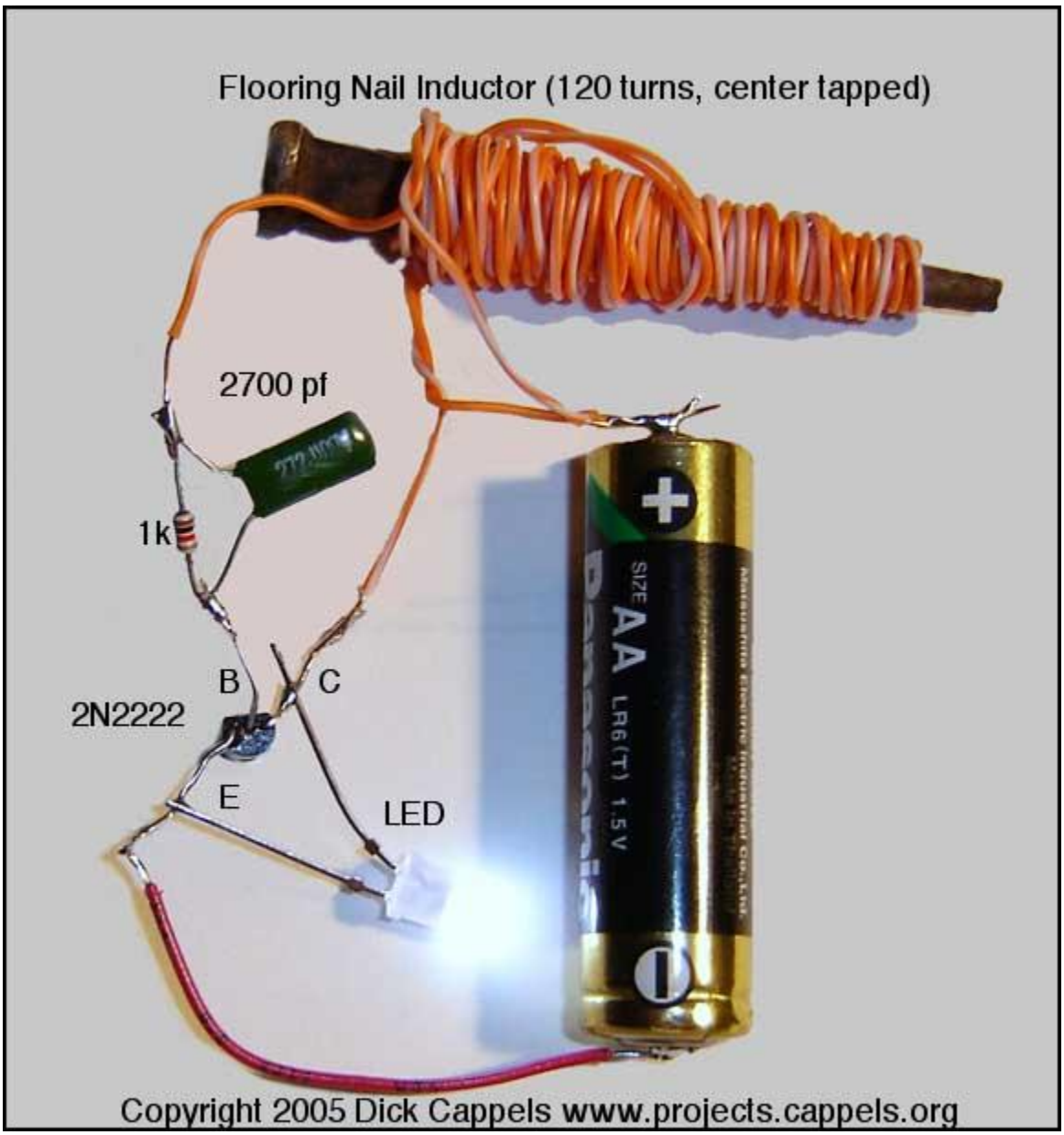
Next circuit

.The charging one is charging the battery using the method that I found the most efficient method to use, not using the collector-emitter, but placing the battery in series with the coils.This is my first project using a solar panel and a charging joule thief without toroids or wounded air-coils. Using just inductors works very very nice.
This circuit also uses a drive circtui shown later in video:



Video for above:

https://www.youtube.com/watch?v=IPW53ExXFcg

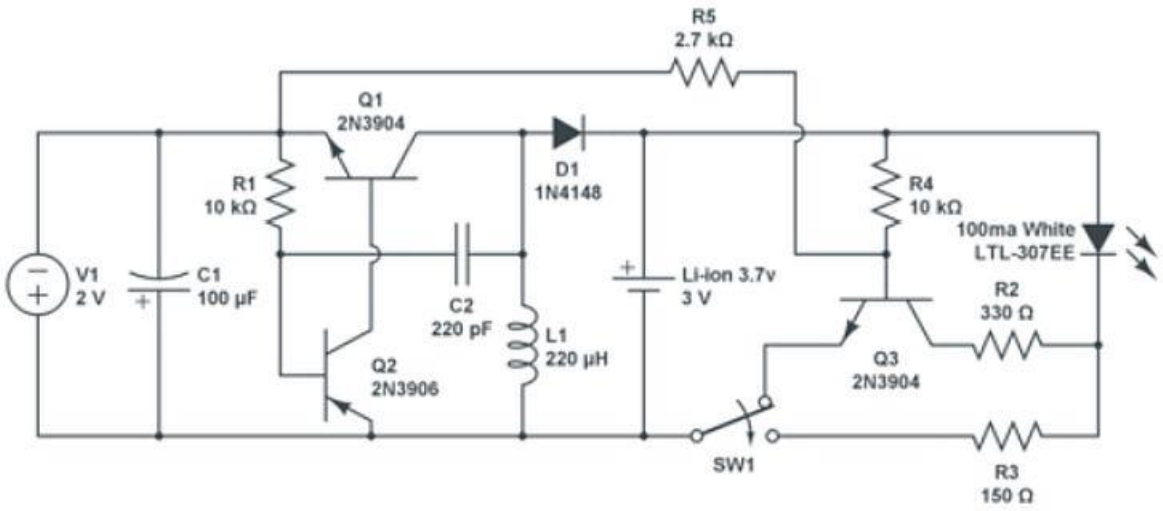


Next circuit:

This circuit maximizes the output from a garden-light solar cell to charge a 3.7v Lithium-ion cell (or 3 NiMH cell in series).

Q3 switches the light on after dark and also acts as an over-charge safety by switching the LED on when the battery reaches full charge.

NOTE: The reversed polarities for the Solar cell and the Capacitor C1 is NOT a misprint! The circuit uses L1 to invert the polarity and boost the input to charge the Lithium cell.



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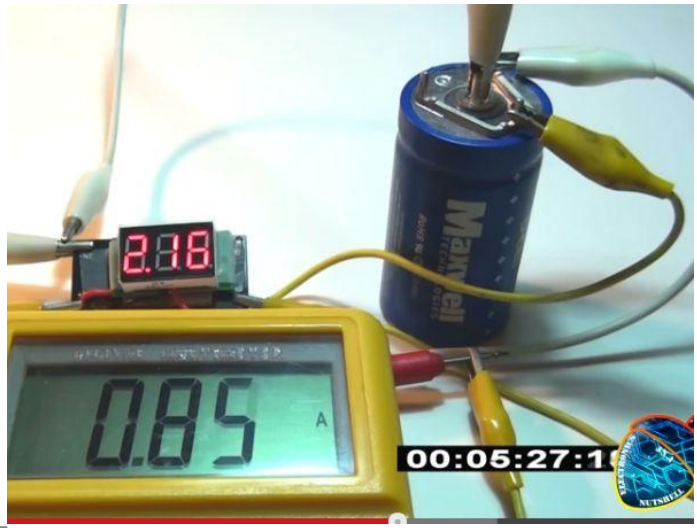
If you happen to have another use for the solar cell, on-off switch and battery, as I do, this comes very cheap for LED + driver circuit. You can simply cut the wires from the solar cell and just leave them like that. Replace the battery with the one of your choice (or keep the one from the solar garden light) and you're ready.
The "charging circuit" is usually a simple blocking diode to the AA-sized NiCad battery, and that wastes output from the solar cell on days with less than peak direct sunlight. (The battery is only going to charge until it reaches the same voltage as the cell minus the drop through the diode.)

Next circuit:

Another joule thief uses the following: powered by 1.5v AAA battery, 2N3055 transistor, 1k ohm resistor, 2-50 turns #24 magnet wire coil, 8mm blue LED

Placing a battery in series with the coils helps charging



Above is supercap charging polarity.
Charging wires are the two white wires. The bottom darker wire below is not a charging wire