

This circuit boosts the Peltier output up to 14 volts by using Joule Thief

Using a Joule Thief to Harvest Energy from a Candle

Today I made a compact thermal electric generator ( TEG ) using a thermal electric cooler ( TEC a.k.a Peltier device ) and a Joule Thief.

This TEC produces about 1.8VDC when heated on one side and cooled on the other (this setup uses a candle as the heat source and cooling is from ambient air). The advantage of using the Joules Thief circuit in this setup is that it will boost low voltages to higher usable voltages. The open circuit output voltage of the Joule Thief in this circuit was about 31V Peak. It takes about 14VDC to forward bias and light the four LEDs. The down side of this circuit is that there are conversion losses, but still it costs a lot less to buy one TEC then to buy nine of them and put them in series to get to the voltage required.

From the time I light the candle it takes ~36 seconds to light the LEDs, and they continue to get brighter from there. The LEDs stay lit for ~2 minutes after I blow the candle out, as the residual heat moves from the bottom heat sink through the TEC to the top heat sink, not shown in the video. Here is a video of the circuit in operation:

Here is a picture of the major components, from left to right: top heat sink, thermal electric cooler, Joule Thief, bottom heat sink, and candle. (to see full size images click images, then click image on following page, still have to figure out why you have to do this to get a full size image? )



TEC Generator



TEC Joule Thief Generator Components

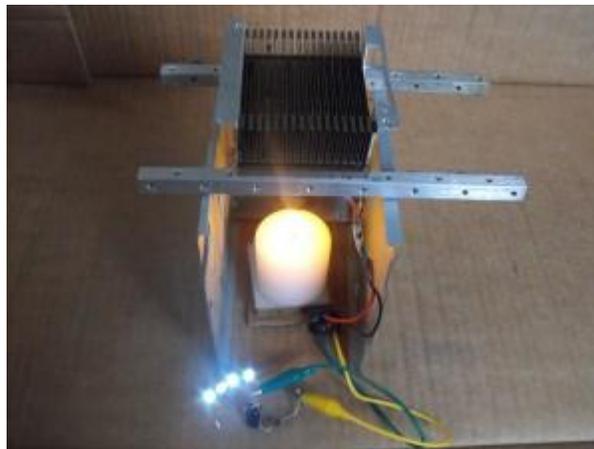
Here is a picture of the assembled cooler and heat sinks, I added several pieces of 12AWG solid wire and a 3/4inch copper coupler to direct the heat.

Here is a picture of the TEC Generator connected directly to a DMM without the Joule Thief boost circuit. The DMM is reading 1.792 VDC



TEC Generating 1.8VDC

And here the circuit is operation, producing ~14VDC to light four white LEDs. :

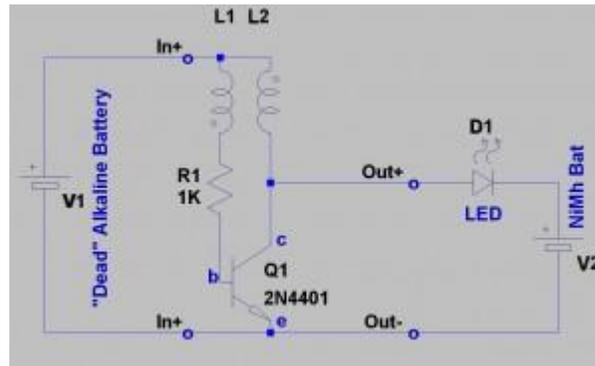
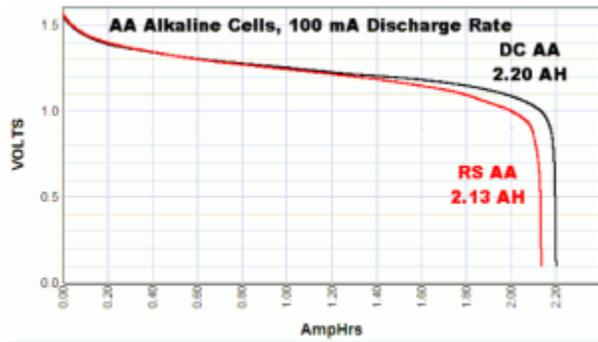


Joule Thief TEC Generator in Operation

Test this next circuit to see if it fully discharges a supercap and/or lithium ion battery:

Recover the last bit of energy from a “dead” alkaline battery. When your modern electronics gadget turns off because the alkaline batteries are “dead” it just means the voltage in the batteries has dropped below a usable level for that gadget, which depending on the electronics that voltage could be around 0.9 VDC to 1.2VDC per cell.

I found this nice graph on <http://www.powerstream.com/AA-tests.htm> that shows the discharge curve for alkaline batteries. You can see that when the alkaline battery is below 0.9VDC there is not much usable energy left, but if there is 1.2VDC left in the battery there is about 28% of the energy left in the battery.



AA Alkaline Battery Discharge Curve @ 100mA

So what can I do with this “dead” alkaline battery? I can use a Joule Thief to make a battery charger that

depletes the remaining energy from the alkaline battery and recharges a NiMh battery.

To make a Joule Thief battery charger is a quick and easy project. Here is the Joule Thief battery charger schematic:(to view full size images click image then click image on following page)

#### Joule Thief Battery Charger Schematic

I am in the process of building a battery charger this week and will put data about this project as I charge batteries. Some notes about using the Joule Thief to charge NiMh batteries:1) This probably is not the most efficient way to recover the energy, but hey it is quick, cheap, and easy to do. The batteries were going to the trash so I might as well try to recover the lost energy from them. 2) The LED in the schematic probably uses half of the energy that would be recovered, but it is the only good way to see if the circuit is still running. You could also modify the circuit and charge up to 4 NiMh batteries in series (of course this will reduce the charge current, since the boost voltage has to increase).

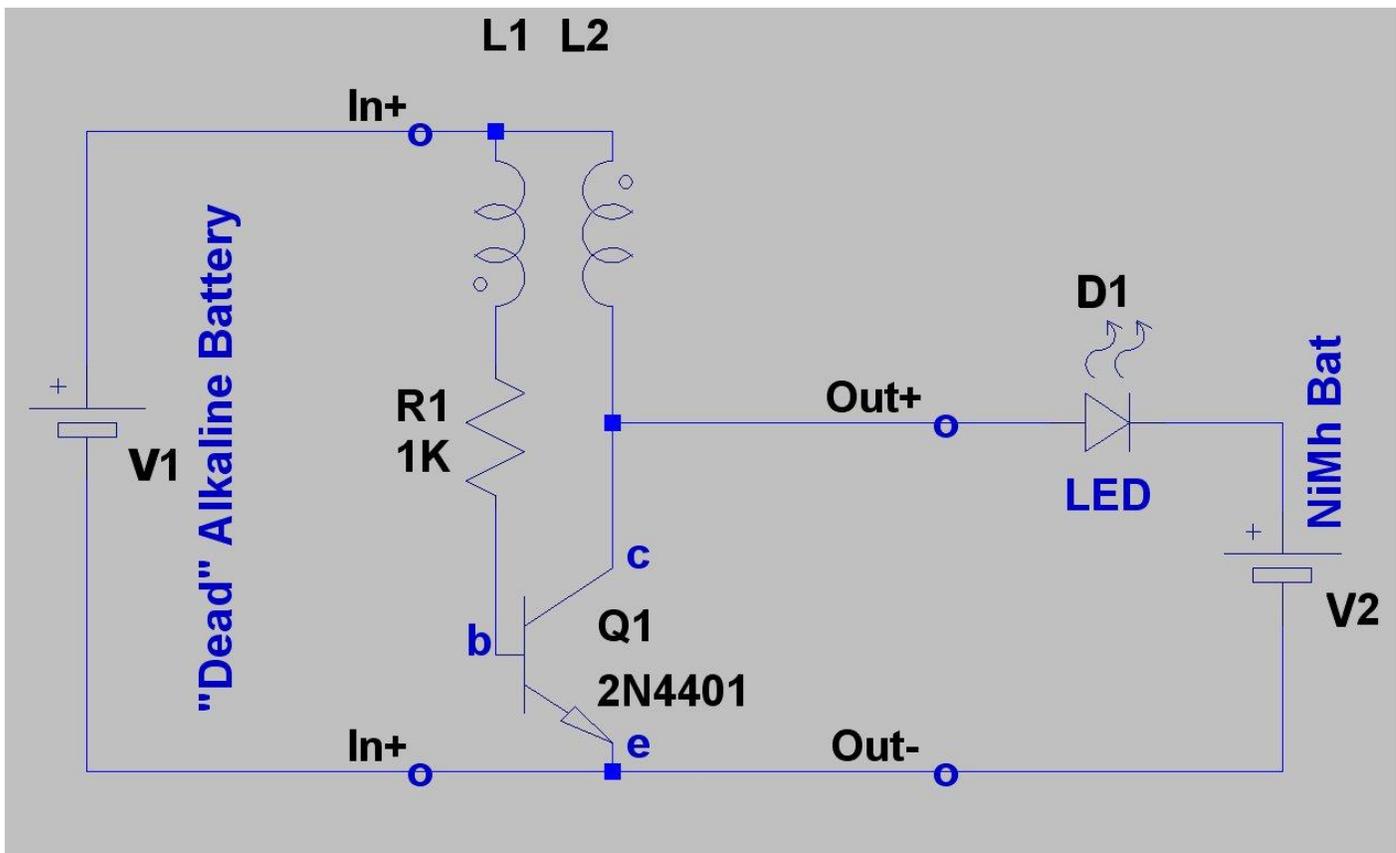
If you use a white LED the circuit can be used as a night light, but the white LED (3.5V forward voltage) will consume about 79% of the energy when you are charging one NiMh Cell. If you charge four NiMh batteries in series the white LED will consume about 41% of the charging energy, the LED will be dimmer since the current will drop. If you use a standard red LED (1.7V forward voltage) the LED will consume about 57% of the charge energy when you charge one NiMh cell, with four series NiMh cells the red LED will consume about 25% of the charge energy.3) This circuit, if built properly, will run the alkaline battery down to 350-400mV which will truly make it a dead battery.

4) As long as your NiMh battery has a high enough capacity you will not overcharge it with this circuit, provided you do not exceed its C/10 rating (capacity/10). I found this on <http://www.powerstream.com/NiMH.htm> “The cheapest way to charge a nickel metal hydride battery is to charge at C/10 or below (10% of the rated capacity per hour). So a 100 mA/Hr battery would be charged at 10 mA for 15 hours. This method does not require an end-of-charge sensor and ensures a full charge. Modern cells have an oxygen recycling catalyst which prevents damage to the battery on overcharge, but this recycling cannot keep up if the charge rate is over C/10. The minimum voltage you need to get a full charge varies with temperature—at least 1.41 volts per cell at 20 degrees C. Even though continued charging at C/10 does not cause venting, it does warm the battery slightly. To preserve battery life the best practice is to use a timer to prevent overcharging to continue past 13 to 15 hours.”

5) It can take several “dead” alkaline batteries to recharge a 1500mAH NiMh battery, before I experiment I am going to estimate that it will be somewhere between 6-15 batteries.

Update: I built the circuit to charge 4 batteries in series. The battery charger circuit was working great for several days until the charged batteries got up to around 5.4v then they started to discharge. I was really perplexed for a while as to why this was happening. I finally figured out what went wrong, the LED reverse breakdown voltage was somewhere around 5.4V and it ended up destroying the LED and discharging the NiMh batteries. I have a new circuit design that will be more efficient and will charge the batteries quicker.

I have ordered parts for the new higher power joule thief circuit. I will build some and try them out, if they work out well I will add them as a new high power joule thief kit.



High permeability toroid cores are so high that it can achieve somewhere between 3-5uH per each winding. This allows for us to make a High Power Joule Thief with just one winding on each side of the transformer. The new one winding Joule Thief is very stable, starts up at below 600mV, and runs very bright at 1.5VDC leaving spots in your vision if you happen to glance at the LED while it is on.

#### Joule Thief Kit 011AOW

Introductory price of 9.99

This is a high power Joule Thief Kit that includes a Cree 1Watt XLamp white LED. This new kit has a very high permeability core that allows you to make the transformer with just one winding of each wire, this greatly speeds build time of this kit. This kit does require surface mount soldering, it is a kit for a more advanced user. Warning these are class 2 LEDs per IEC 60825-1. These LEDs can damage your eyes!.

#### Kit Contains:

- \* 12 inches red magnet wire
- \* 12 inches green magnet wire
- \*1ea - 1.5A NPN TO-92 transistor
- \*1ea - high perm torroid
- \*1ea - 1/4watt axial resistor
- \*1ea - PCB
- \*1ea - Cree XLamp 1 Watt 50 Lumen white LED

These circuits run for 8 hours and up to 15 hours - this means the back EMF spike does work  
<http://www.youtube.com/watch?v=sOozKANlqsg>

Supercaps must not be overvoltage

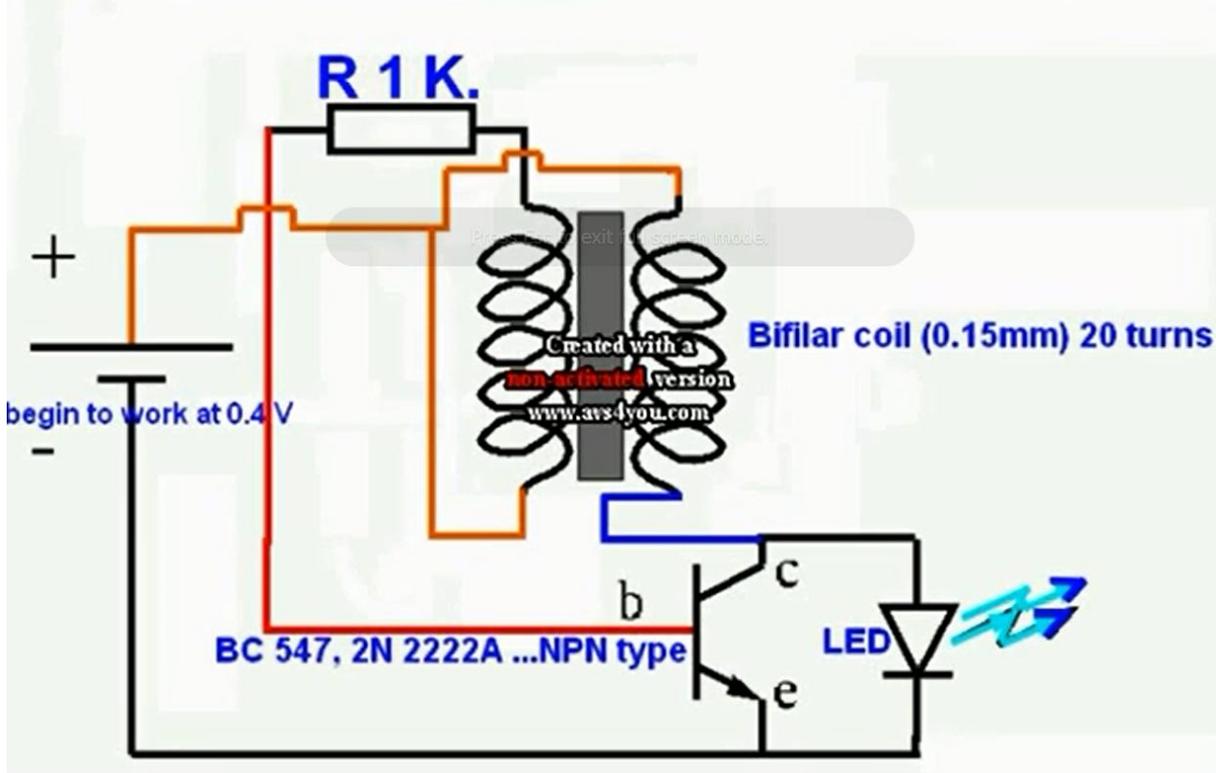
Today I made a compact thermal electric generator ( TEG ) using a thermal electric cooler ( TEC a.k.a Peltier device ) and a Joule Thief.

This TEC produces about 1.8VDC when heated on one side and cooled on the other (this setup uses a candle as the heat source and cooling is from ambient air). The advantage of using the Joules Thief circuit in this setup is that it will boost low voltages to higher usable voltages. The open circuit output voltage of the Joule Thief in this circuit was about 31V Peak. It takes about 14VDC to forward bias and light the four LEDs.

The down side of this circuit is that there are conversion losses, but still it costs a lot less to buy one TEC then to buy nine of them and put them in series to get to the voltage required.

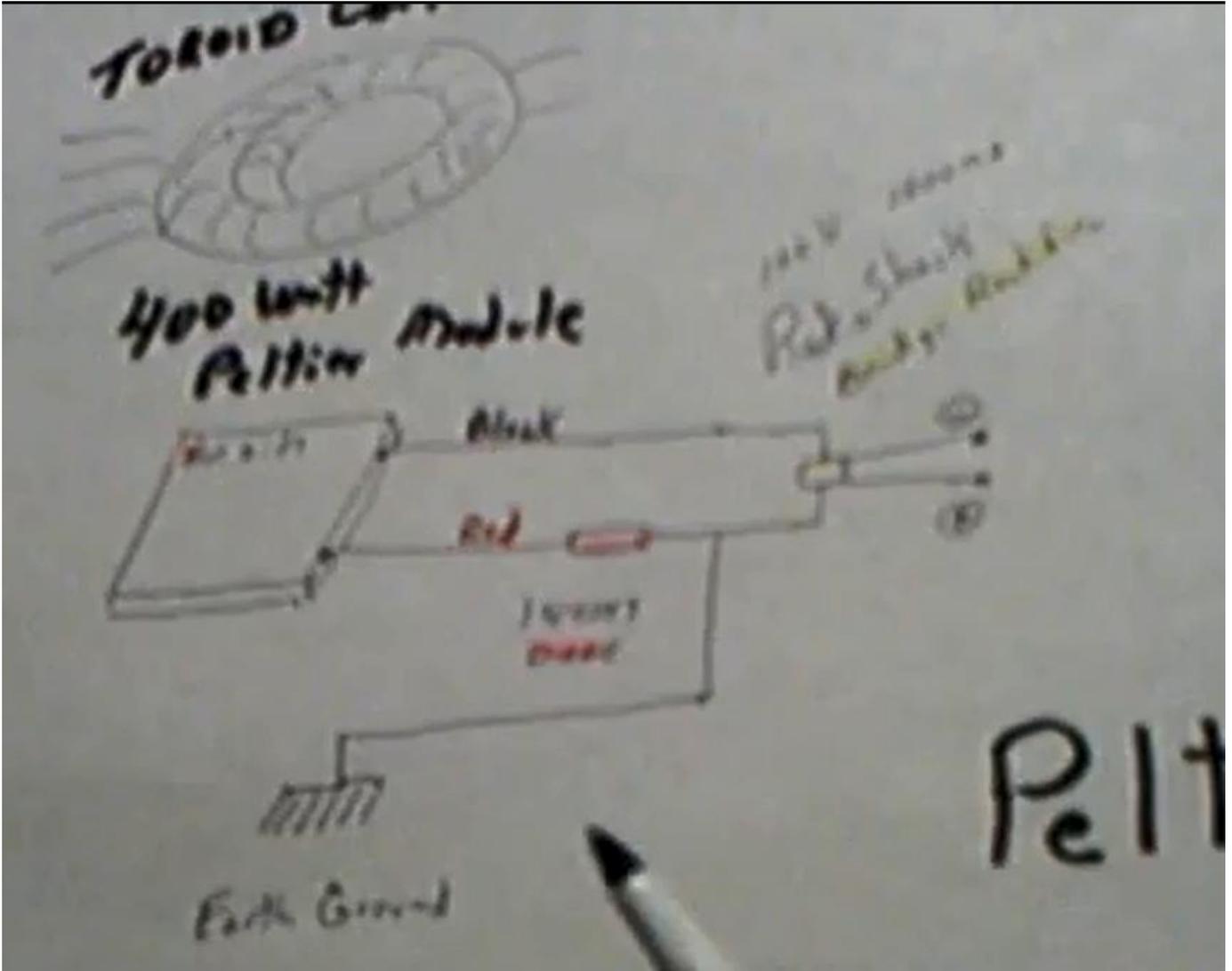
From the time I light the candle it takes ~36 seconds to light the LEDs, and they continue to get brighter from there. The LEDs stay lit for ~2 minutes after I blow the candle out, as the residual heat moves from the bottom heat sink through the TEC to the top heat sink, not shown in the video.

<https://www.youtube.com/watch?v=Ev3GnbhZfZy>



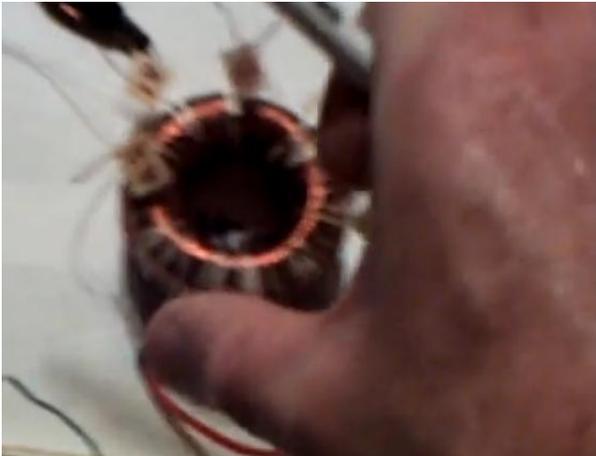
2 peltizers in series, a mini joule thief, total voltage started at 2.1 volts, than when joule thief added up to 7 volts  
Video: <https://www.youtube.com/watch?v=b4s-bkN5xoA>

A

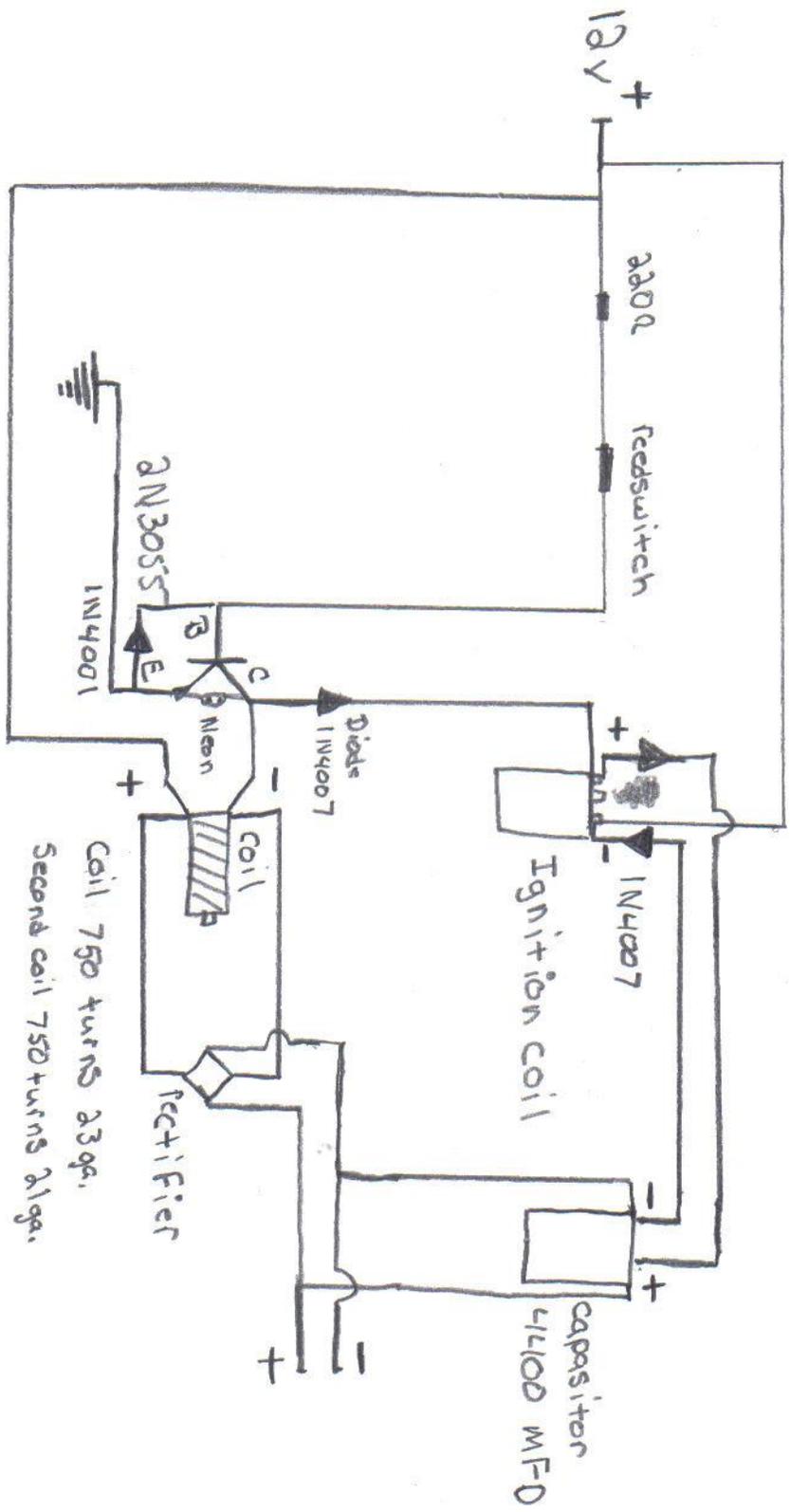


torroid coil is placed over a peltizer and the peltizer puts out power  
 A 400 watt Peltier module is shown here picking up energy from a 2" toroid coil used in the Slayer007 low voltage CFL Joule Thief circuit. The energy is captured in a 10uf 35 volt capacitor and then released through 3 white LEDs. The charging up of the capacitor is shown on a meter. An earth ground is also shown in and out of the circuit to show the improvement in efficiency of that additional connection. <https://www.youtube.com/watch?v=Ab-UKmkDj3o>

Big Torroid coil works via Induction. 400 wt peltier. Hot side up. 1n4007 diode high voltage possibly 400 Watt. The far upper right of the diagram shows it going to a bridge rectifier 100V , 1500 milliamp and teh ground is put as shown. Below is the size of the torroid



The end of the torroid coil has powerful induction energy – video with specifcics  
<http://www.youtube.com/watch?v=4lBdEuxlNfl>  
 2<sup>nd</sup> Video: <http://www.youtube.com/watch?v=rt3DMyanfWc>  
 In the video above, is a joule thief amplifies the energy. Bifilar coils work the best



Slayer007 G. Bluer

**From page 6:** Here is a new circuit based of my roter less pulse moter.  
This is a differant way of reusing your back emf to run the ignition coil for the cfl.

You can then collect the back emf of the ignition coil.

I found this way I get a LOT more power and use way less power.

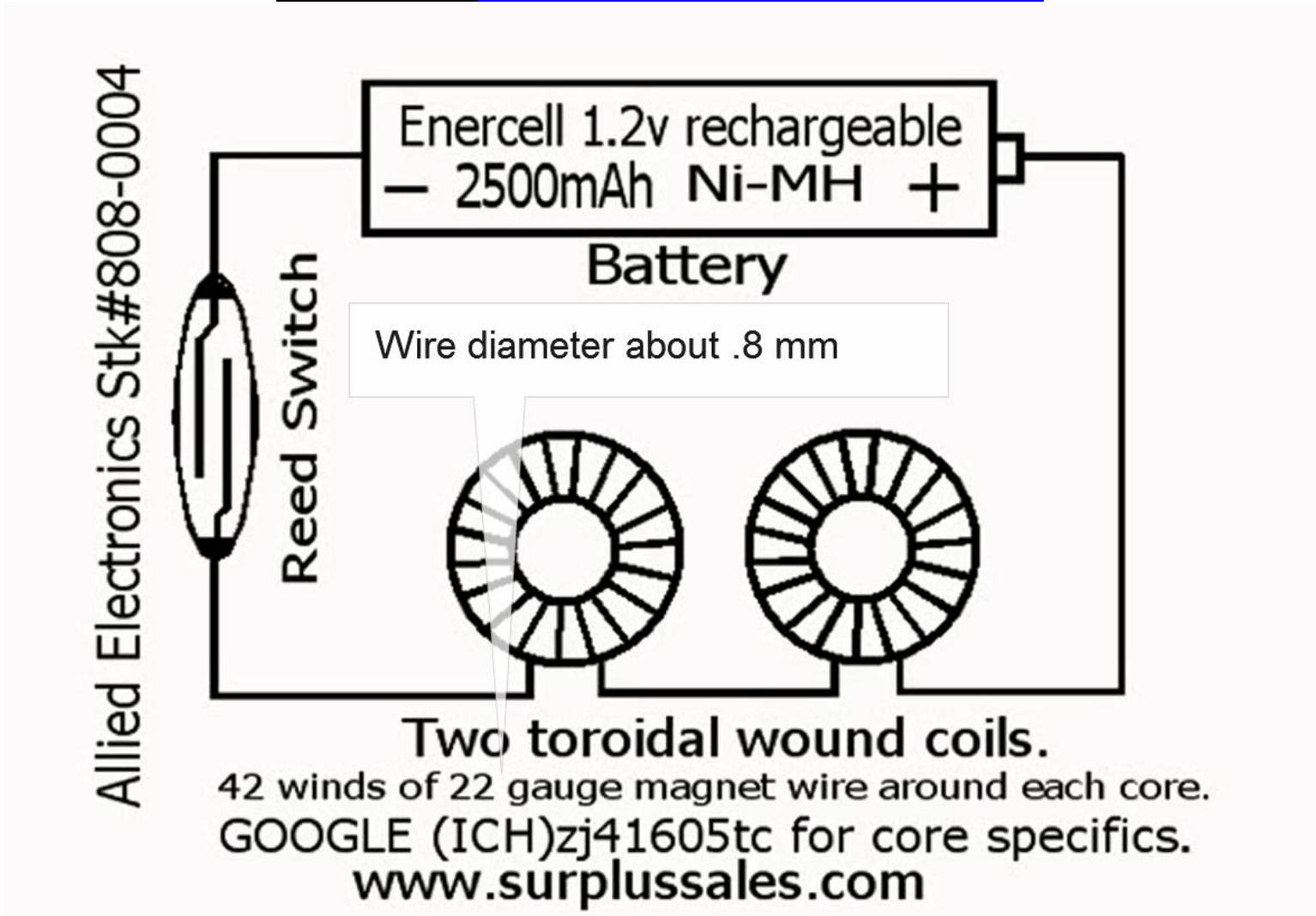
You can allso use more than one coil or try differant coils.

You can allso disconect the negative side of the ignition coil but still leave the negative side of the cap. and diode connected to +

and you still get a lot of power for 10 to 20 mill amps

This a replication of Slayer007's solid state Pulse Generator. It runs a modified CFL and charges at the same time.

Video for below: <http://www.youtube.com/watch?v=dLaOT-4Vyk>



## Wealth Vibration when not marketing for long periods

Here are 10 ways to surround yourself with luxury for a few dollars or less:

At good hotels or motels insist it grow

Spend an afternoon in the lobby or bar of your favorite luxurious hotel in your town or city. (I do this often!!)

Test drive a luxury car. (I'm planning on test driving an Aston Martin!)

Go to a high-end boutique and try on the well-made, beautiful clothes. They really DO feel different. (Soak in that wealth energy!)

Go to a high-end bar and order a fancy drink!

If you have beautiful gardens where you live (public or private), visit and take a walk. (This one is thing I do at least twice a month.

Find the top-of-the-line day spa in your area and book a facial, manicure or pedicure.

Go to a high-end gourmet market and treat yourself to something unique and upscale.

Take yourself to a concert hall or a beautiful theater. (These can be some of the most beautiful spaces. My favourite is the Royal Albert Music Hall)

If you live near the beach, find a resort near the beach and hang out in the restaurant, preferably one with an ocean view. (The ocean just oozes abundance!)

Love jewelry? Go to a high-end jewelry store and try on some bling. (Tiffany's anyone?)

**Sodium Hydroxide / LYE**

**Local**

**2211 NW Nicolai St**

**Portland, OR 97210**

**\$24.08**

**PH Calibration \$5.00 Local Pick up**

**American Agriculture**

**9220 SE Stark St**

Food Grade Lye: \$8.00 + shipping:

[http://www.amazon.com/Sodium-Hydroxide-Caustic-Ultra-Pure-powder/dp/B00IHP9NPI/ref=sr\\_1\\_20?ie=UTF8&qid=1399830615&sr=8-20&keywords=food+grade+sodium+hydroxide](http://www.amazon.com/Sodium-Hydroxide-Caustic-Ultra-Pure-powder/dp/B00IHP9NPI/ref=sr_1_20?ie=UTF8&qid=1399830615&sr=8-20&keywords=food+grade+sodium+hydroxide)

www.sacred-texts.com + salamanders wool + immortal etc.