Joule Thief Charger

by **botronics** on December 12, 2008

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intro: Joule Thief Charger

Let your dead battery give life to another! An open circuit Joule Thief can put out 50 or more volts. Enough to charge a AA or AAA Nicad or NiMH rechargeable battery.

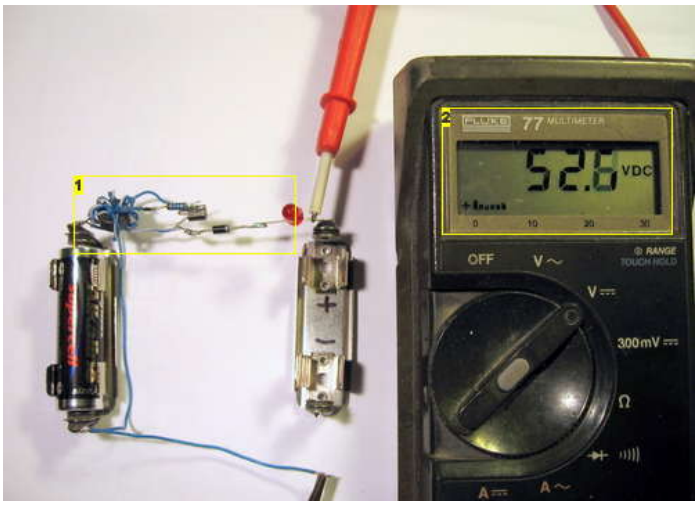


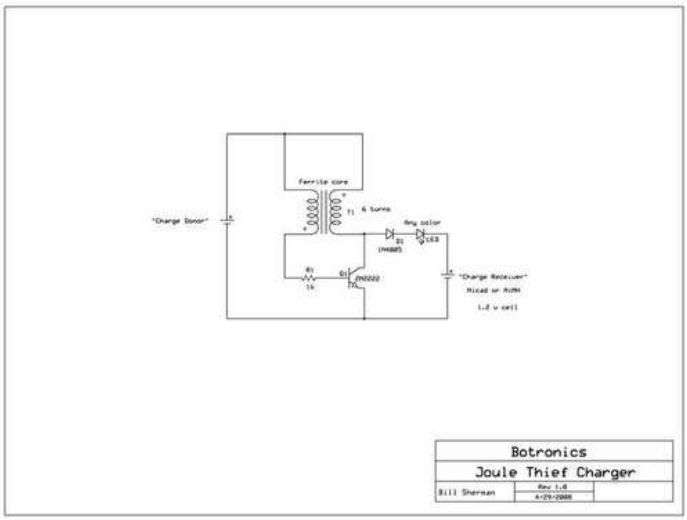
Image Notes
1. Joule thief circuit
2. 52.6 volts being produced by the Joule Thief.

step 1: Make the Charger

Use this schematic to build a standard Joule Thief circuit with the added diode.

My joule thief uses twisted network wire passed through a small ferrite core. I use 6 turns of wire. You can find a core from a burned out compact fluorescent bulb. You can see how others have wound the coil and built the Joule Thief, since so many have done so. Just add a diode and LED in series with the charging battery. The LED is useful as a charge indicator.

A high-speed schottky diode would be the most efficient. The 1N4005 was handy at the time and works.



step 2: Open Circuit Voltage

I got a voltage of 52.6 volts coming out of the joule thief circuit without any connection to a load.

More than enough voltage to charge a rechargeable battery.

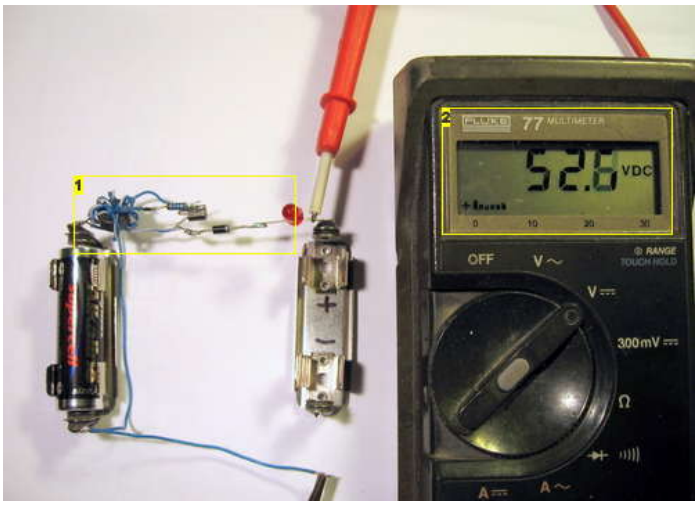


Image Notes
1. Joule thief circuit
2. 52.6 volts being produced by the Joule Thief.

step 3: Charge Current

I measured 9.33 milliamps into a shorted load. This is the charging current to the cell.

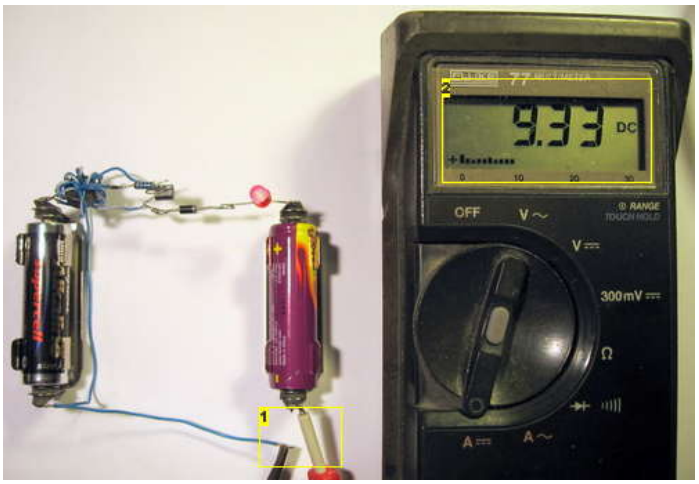


Image Notes
1. The meter on the right is measuring current through the cell
2. Charge current 9.33 milliamps

step 4: Charger in action

The donor cell on the left has a voltage of 1.057 volts. This battery is charging the battery on the right.

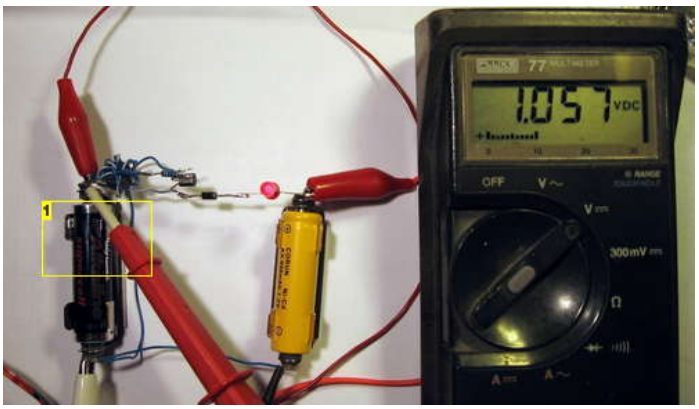


Image Notes
1. Donor Cell

step 5: Charging up

The receiving cell voltage is 1.375 and is getting a steady charge.

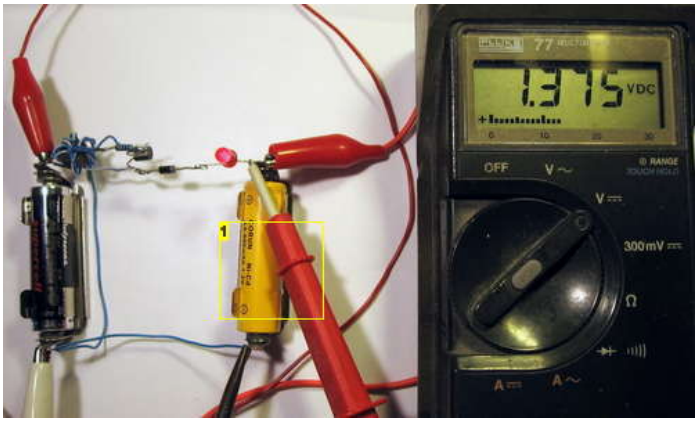
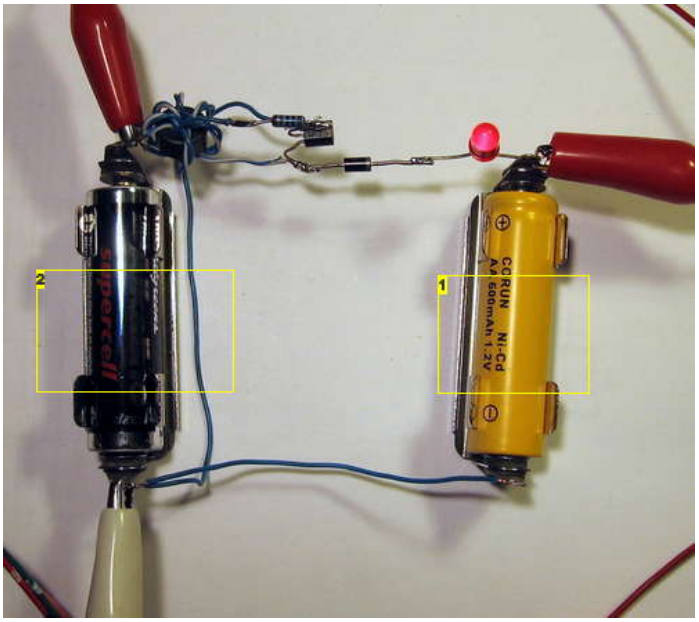


Image Notes
1. Receiving cell

step 6: Plotting the results

I connected My two channel data logger and monitored the voltages of both batteries overnight. The life force from one cell goes to the other. Its like the Alien Healing Device from Babylon 5.

Steps 7 and 8 show the results using Excel.



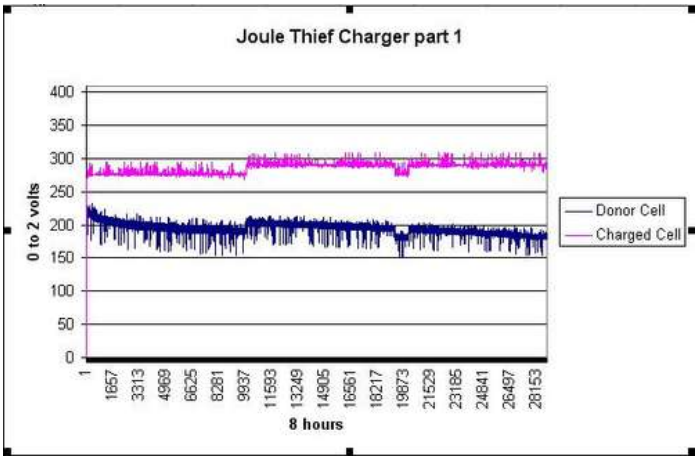
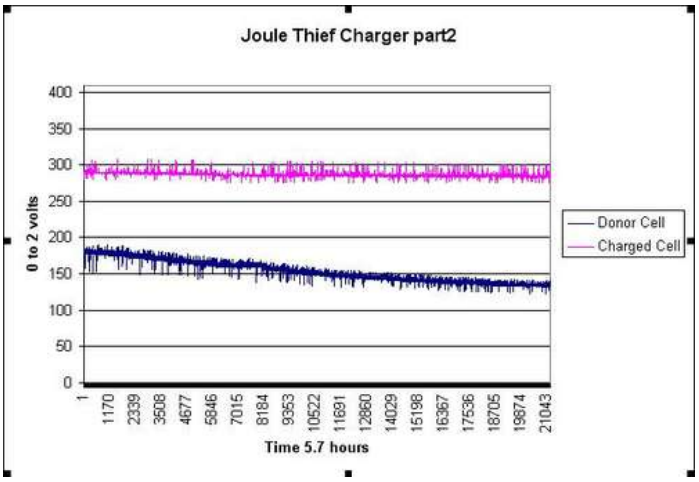


Image Notes
1. Nicad receiving a charge.
2. "Donor Cell" giving life to the other battery.

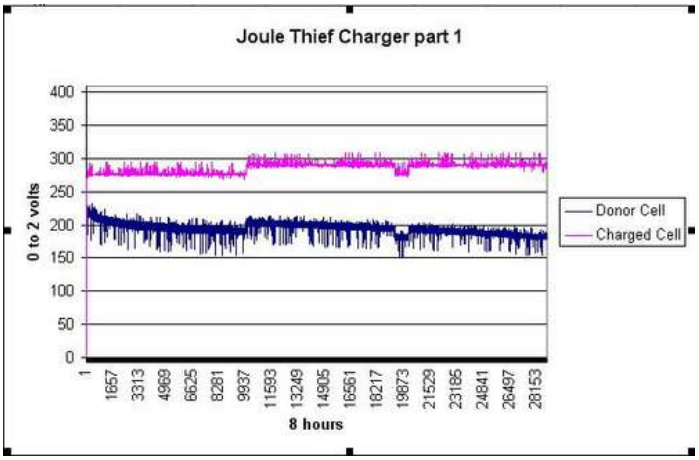


step 7: First 8 hours

Top red trace is the cell being charged. The cell voltage has stabilized and is accepting a charge.

Bottom blue trace is the donor cell. Notice how the voltage is slowly dropping off. The life force of the donor cell is slowly slipping away.

The Joule thief output jumped between two voltages and is a bit steppy. Nothing is perfect.



step 8: Last Chart

The final 5.7 hours before I stopped recording data.

The charged cell is still receiving a charge and the donor cell now has dropped to about .62 volts. The Joule Thief is still running.