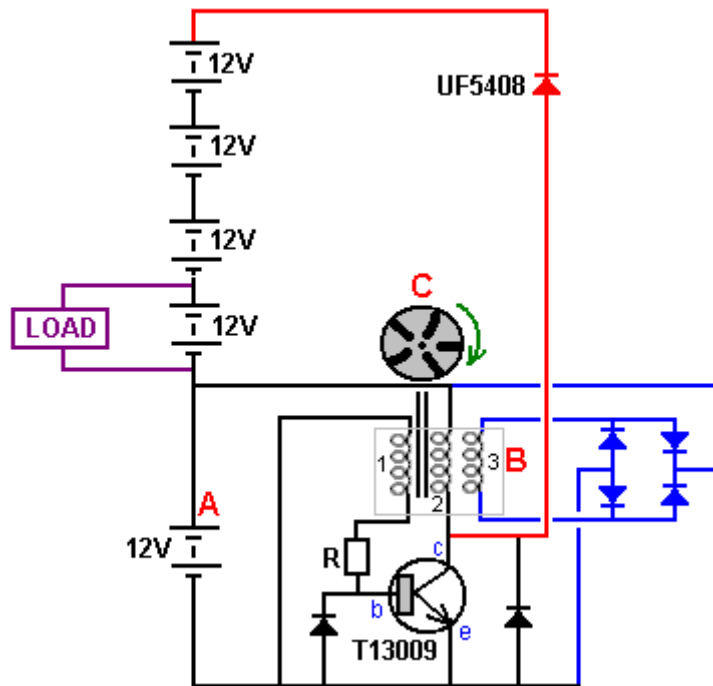


Chapter 19: A Small Self-Powered Generator

A free-energy developer working in South Africa where it is difficult to find electronic components, has very kindly shared the details of his compact self-powered generator so that you can build one if you choose to do so. Using a small inverter, the output of the prototype is 40 watts at mains voltage and frequency and the generator is a small table-top unit which is not difficult to build. The generator uses five small 12-volt 7 Amp-Hour lead-acid batteries like this:



While this sounds like a lot of batteries, bear in mind that this is a generator which has a continuous electrical output, day and night and the batteries never have to be charged – a bit like a solar panel which works at night as well as during the day. Even if you are not familiar with electronics circuit diagrams (chapter 12 can fix that for you if you want), please try to follow along as we run through the circuit diagram and explain how the generator works. This is the circuit diagram:

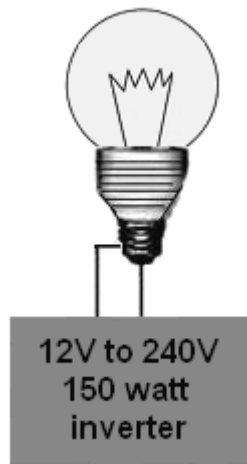


The battery marked "A" powers the circuit. A rotor "C", containing five magnets is moved so that one of the magnets passes near the coils. The coils set "B" has three specially-wound coils and the magnet moving past those three coils generates a small current in coil number "1" which then flows through the resistor "R" and into the

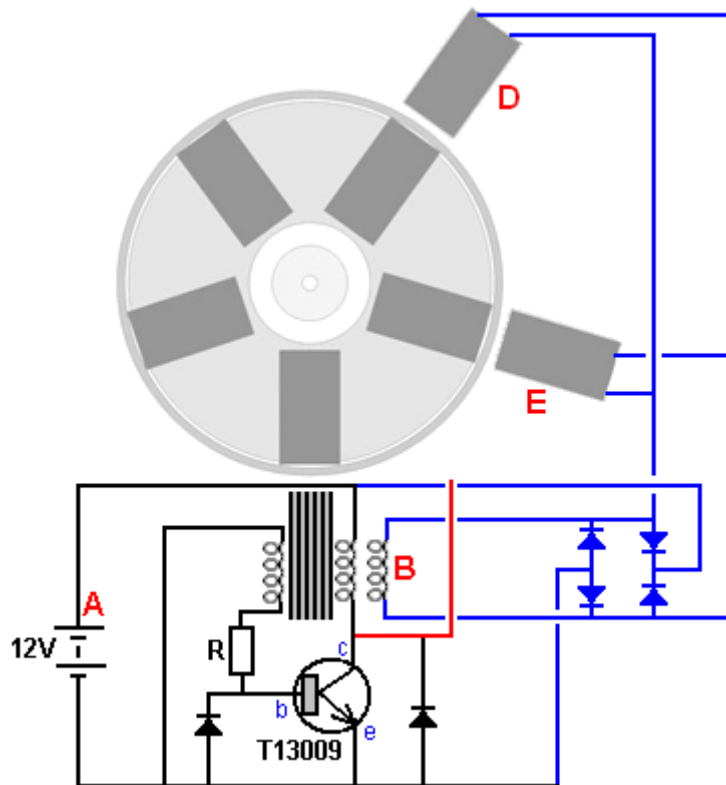
base of the transistor, causing it to switch on. The power flowing through the transistor coil “2” causes it to become a magnet and that pushes the rotor disc “C” on its way, keeping the rotor spinning. It also induces a current in the winding “3” and that current is rectified by the blue diodes and passed back to charge battery “A”, replacing the current drawn from that battery.

When the magnet in rotor “C” passes away from the coils, the transistor switches off, moving its collector voltage very quickly up to the +12 Volt line, starving coil “2” of current. Because of the way that coils are, the coil drags the collector voltage on up and it would reach 200 volts or more if it were not connected through the red diode to all five batteries which are connected in one long chain. The batteries will have a combined voltage of just over 60 volts (which is why a powerful, fast-switching, high-voltage T13009 transistor is being used). As the collector voltage passes the voltage of the battery chain the red diode starts conducting, passing the available energy in the coil into the battery chain. That current pulse passes through all five batteries, charging all of them. The higher voltage caused by so many batteries means that higher power is fed into all the batteries from coil “2”. Loosely speaking, that is the generator design.

In the prototype, the load for long-term testing was a twelve volt 150-watt inverter powering a 40-watt mains light bulb:



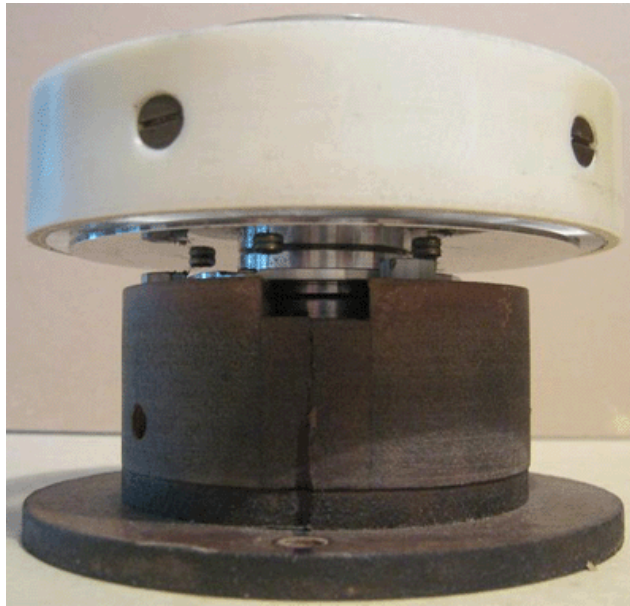
The basic design shown above was then modified by the addition of two additional pick-up coils:



Coils “B”, “D” and “E” are all triggered at the same time by three different magnets. The electrical energy produced in all three coils is passed to the four blue diodes to produce a DC power supply which is used to charge

battery "A" which powers the circuit. That additional input to the drive battery and the addition of two more drive coils to the stator, makes the system operate securely as self-powered, maintaining the voltage of battery "A" indefinitely.

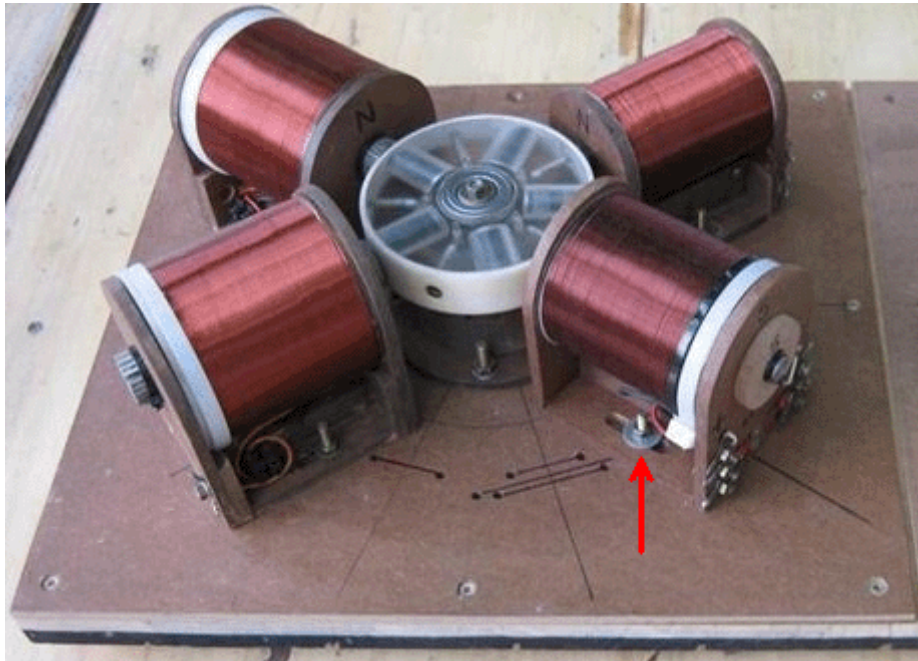
The only moving part of this system is the rotor which is 110 mm in diameter and is a 25 mm thick acrylic disc mounted on a bearing taken from an old computer hard disc drive. The arrangement looks like this:



In the pictures, the disc looks to be hollow but in actual fact it is solid, very clear plastic. The disc has been drilled at five evenly spaced points around the circumference, that is, at 72 degree intervals. The five main holes drilled in the disc are to take the magnets which are sets of nine circular ferrite magnets, each 20 mm in diameter and 3 mm thick, making each stack of magnets 27 mm long and 20 mm in diameter. The magnet stacks are positioned so that their North poles face outwards. When the magnets have been installed, the rotor is placed inside a strip

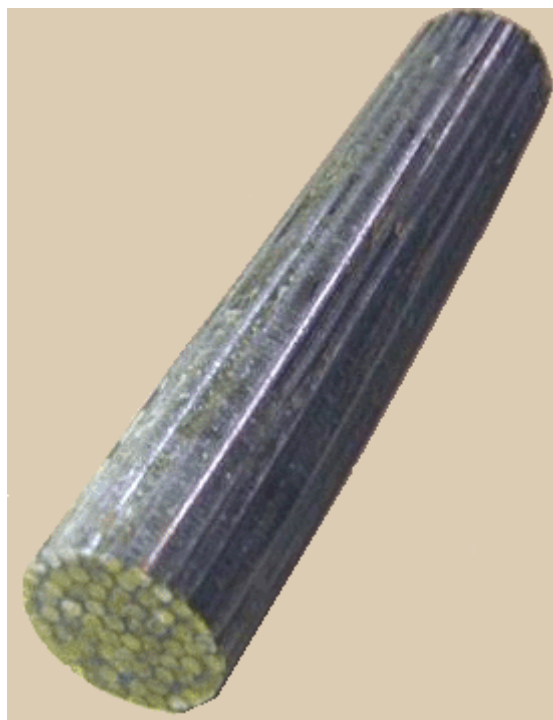
of plastic pipe which prevents the magnets escaping when the disc is spun rapidly. The plastic pipe is secured to the rotor using five bolts with countersunk heads.

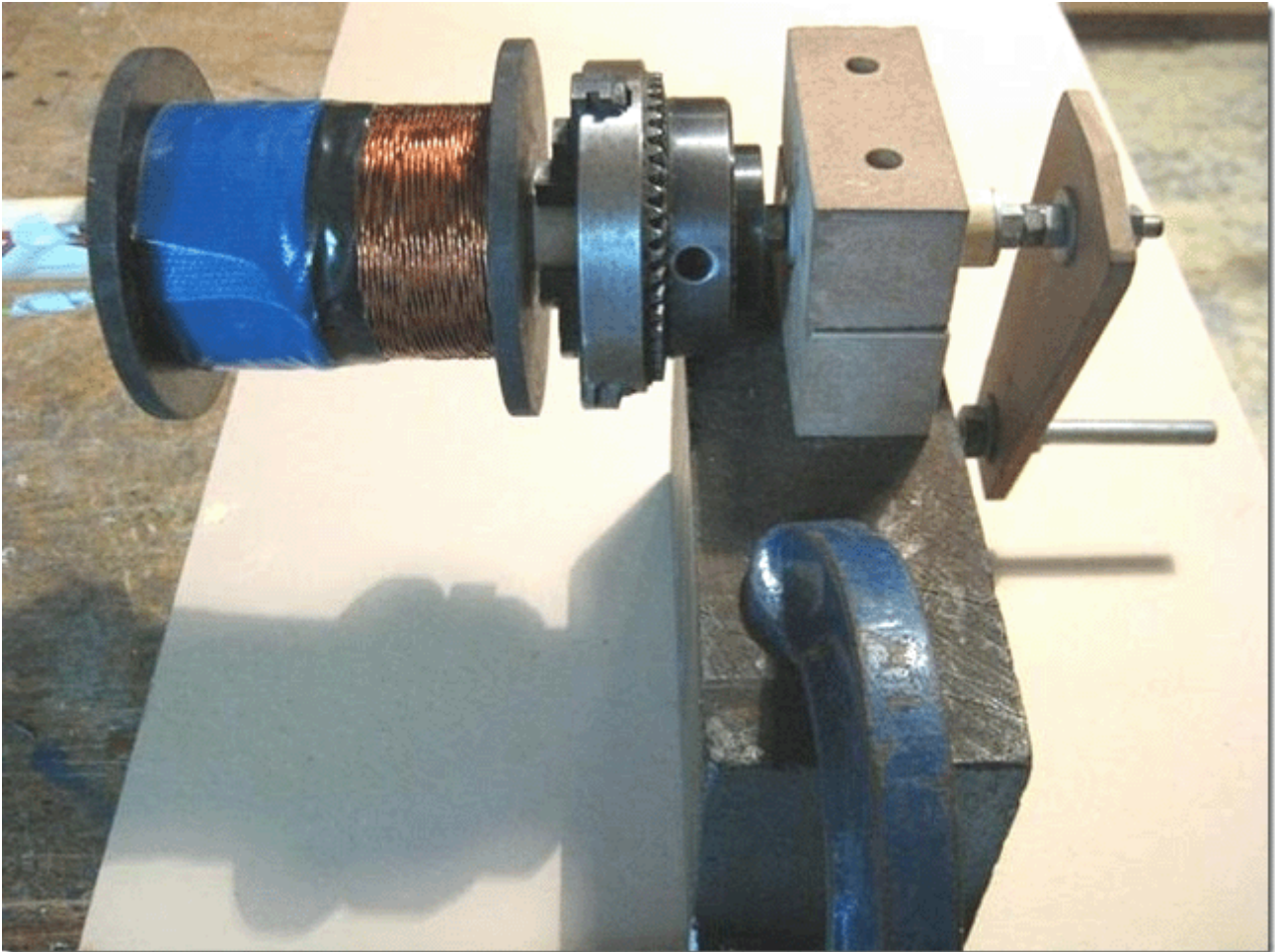
The gap between the rotor and the coils can be set as anything from 1 mm to 10 mm as the coils have slotted mounts as can be seen from this picture of an earlier version of the generator:



Notice the way that the coil mounts allow the distance between the coils and the rotor to be changed. The working gap between the rotor and the coils can be adjusted so that the performance can be maximised by finding the most effective gap.

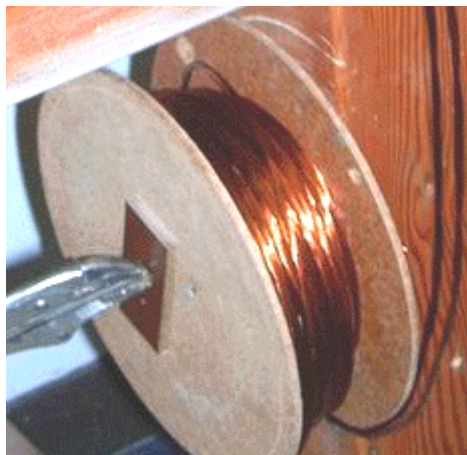
The spools of the coils are 80 mm long and the ends are 72 mm in diameter. The centre shaft of each coil is made of a length of plastic pipe with a 20 mm outer diameter and an inner diameter of 16 mm. giving a wall thickness of 2 mm. After being wound, that inner diameter is filled with a series of welding rods with their welding coating removed, and which are then encased in polyester resin although a solid bar of soft iron is a good alternative:





The three strands of wire which form coils "1", "2" and "3" are 0.7 mm diameter wire and they are twisted together to become a "Litz" wire before being wound into the coil "B". This produces a much thicker composite wire strand which is easy to wind accurately on to the spool. The winder shown above uses a chuck to grip the coil core for winding, but any simple winder will work well.

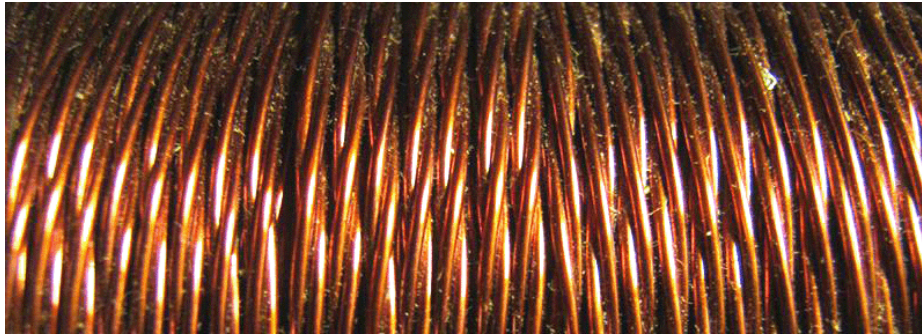
The developer does the Litzing by stretching out three strands of wire, each coming from a separate 500 gram reel of wire. The three strands are clamped at each end with the wires touching each other at each end and with three metres between the clamps. Then, the wires are clamped in the middle and 80 turns applied to the middle. That gives 80 turns for each of the two 1.5 metre lengths held between the clamps. The twisted wire is wound on to a makeshift reel to keep it tidy as this twisting has to be repeated 46 more times as the entire contents of the reels of wire will be needed for this one composite coil:



The next 3 metres of the three wires is now clamped and 80 turns applied to the central point, but this time the turns are applied in the opposite direction. Still the same 80 turns, but if the last length was 'clockwise' then this stretch of wire will be turned 'counter-clockwise'. This alternation of direction gives a finished set of twisted wires

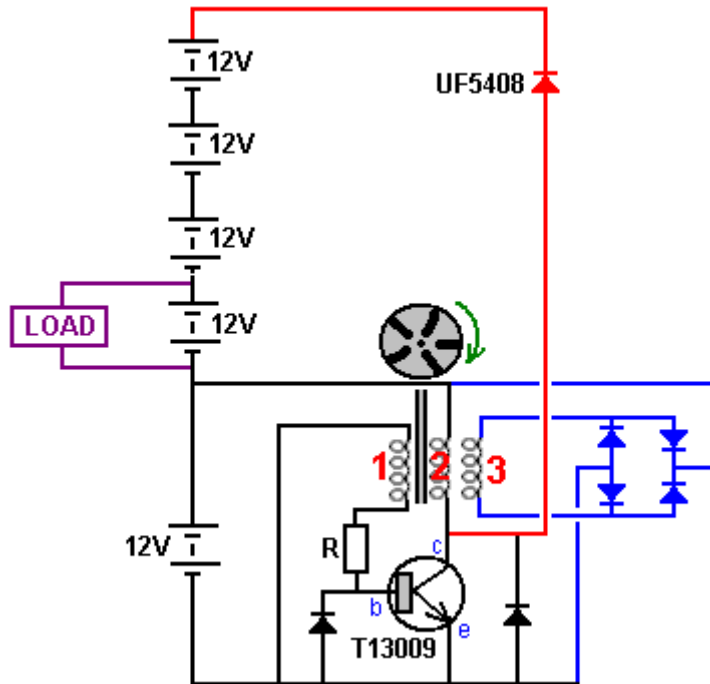
where the direction of twist reverses every 1.5 metres along the length. That is the way that commercially produced Litz wire is made, but I seriously doubt that the resulting performance is any better than if the direction of wind was never changed and the twisted wire had the same direction of twist along its whole length.

This very nice twisted group of wires is now used to wind the coil. A hole is drilled in one spool flange, right beside the central tube and core, and the start of the wire fed through it. The wire is then bent sharply at 90 degrees and fed around the shaft of the spool to start the winding of the coil. The wire bundle is wound carefully side by side along the length of the spool shaft and there will be 51 turns in each layer and the next layer is wound directly on top of the first layer, moving back towards the start. Make sure that the turns of this second layer sit exactly on top of the turns beneath them. This is easy to do as the wire bundle is thick enough to make positioning very easy. If you prefer, a single thickness of white paper can be placed around the first layer, to make it easier to see the second layer as it is wound. There will be 18 of these layers to complete the coil, which will then weigh 1.5 kilograms and in 2016 prices in the UK, the wire in this coil will cost £45 and the winding looks like this:



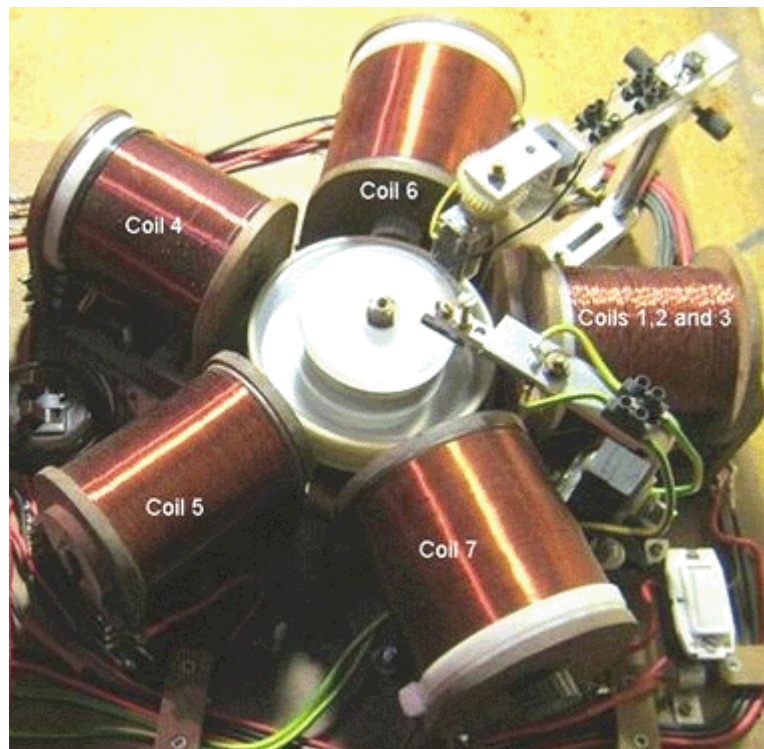
This completed coil now contains three separate coils in very close proximity to each other and that arrangement is excellent when one coil is powered up, for inducing energy in the other two coils. This winding now contains coils 1,2 and 3 of the circuit diagram. There is no need to concern yourself with marking the ends of each strand of wire as a simple ohmmeter will tell you which two ends have a winding between them.

Coil 1 is used as the trigger coil which switches the transistor on at the right instant. Coil 2 is the drive coil which is powered by the transistor, and Coil 3 is the first of the output coils:



Because of the coils which were already to hand during the development of this highly successful system, coils 4 and 5 are simple helical-wound coils which are wired in parallel with drive coil 2. They boost the drive and they are necessary. Coil 4 has a DC resistance of 19 ohms and coil 5 a resistance of 13 ohms. However, investigation is underway at present to determine the best coil combination for this generator and it is probable that the additional

coils will be the same as the first coil, coil "B" and that all three coils are connected in the same way and the driving winding in each coil driven by the one powerful, fast transistor. The present arrangement looks like this:

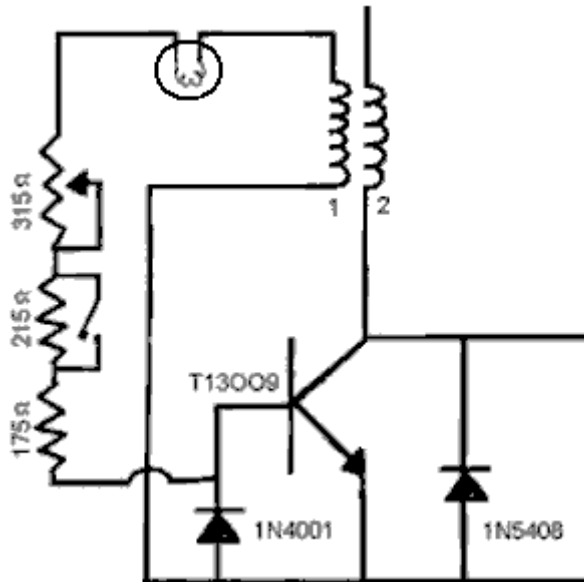


The two gantries can be ignored as they were only for investigating alternative ways of triggering the transistor and they are no longer used.

At this time, coils 6 and 7 (22 ohms each) are extra output coils connected in parallel with output coil 3 which is 3 strands each with 4.2 ohm resistance. They can be air-core or have a solid iron core. Testing indicates that the air-core version works slightly better than having an iron core. These two coils are wound on 22 mm diameter spools and each has 4000 turns of 0.7 mm (AWG # 21 or swg 22) enamel or shellac insulated solid copper wire. All of the coils are wound with this size of wire.

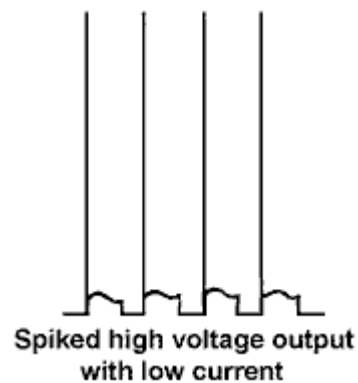
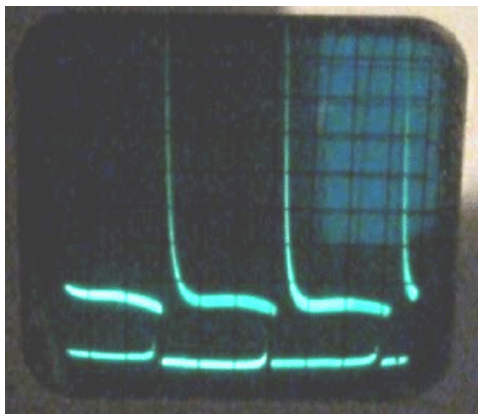
With this coil arrangement, the prototype has run continuously for three weeks, maintaining the drive battery at 12.7 volts all the time. At the end of the three weeks, the system was stopped so that it could be altered and tested with a new configuration. In the configuration shown above, the current flowing from the driving battery into the circuit is 70 milliamps, which at 12.7 volts is an input power of 0.89 watts. The output power is either 40 watts or close to it, which is a COP of 45, not counting the fact that three additional 12V batteries are being charged at the same time. That is very impressive performance for the circuit. However, those three additional batteries could probably sustain identical loads, raising the output to 160 watts or COP=180 without any changes at all, but at this time, that has not been tested and the circuit is undergoing other tests and modifications. Even using a 24V inverter across two of the four batteries should give an enhanced output with 80 watts of usable power.

The drive method has been used so often by John Bedini, that the developer decided to try out John's method of tuning for maximum performance. For that, the transistor's base resistor shown as "R" in the circuit diagrams was altered to this:

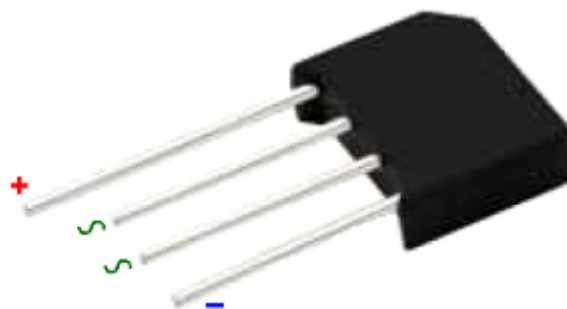


This arrangement allows the value of the base resistor to be adjusted over a wide range, and car's rear light bulb gives a visual indication of the current flow into the transistor. This is an important adjustment and the current flowing into the base of the transistor can be very high. For that reason, the resistors shown need to be heavy duty wire wound types and they get very hot until the optimum adjustment is found. At that "sweet spot" as it is known, the current flowing into the base of the transistor reaches its minimum value and the magnetic drive in the coil group reaches its maximum value, and at that most efficient adjustment, the resistors and transistor become cool and stay that way continuously afterwards.

For people already familiar with electronic circuits, the waveform produced by the magnets spinning round in the rotor is the classical battery-charging pulse waveform which looks like this:



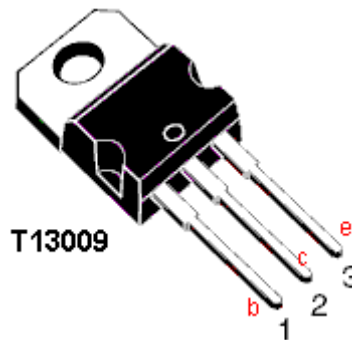
The four blue diodes shown in the circuit diagram are contained in a single plastic package as just one component called a "diode bridge". This particular one has the reference number RS405L which can handle voltages up to 600 volts and a constant current of 4 amps. It can also handle short current surges up to 200 amps which might be significant in this circuit with its very sharp charging voltage pulses. The component looks like this:



It is connected into the circuit like this:



The other major component in the circuit is the transistor which has the reference number T13009. It looks like this:



This is a fast switching transistor able to handle 400 volts and 12 amps of continuous current or 24 amps in brief pulses. The base current can be up to a massive 6 amps, power dissipation 100 watts and a current gain probably between 20 and 40 in this circuit.

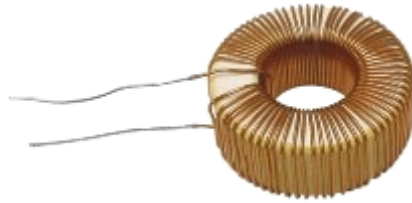
Let me stress that the unit described above is self-powered, drawing its energy from the surrounding environment and as shown it outputs 40 watts of power continuously day and night, day after day. To confirm this, the prototype was run continuously for three weeks. In common with almost all inventors or developers, there is a major inclination to experiment further, and so that three weeks shows remarkable restraint on the part of the developer. If you want to build a replication and don't have any friends who know electronics and so could help, then a tutorial on the details of how to build these things is available as a free download from: <http://www.free-energy-info.com/Chapter12.pdf> and it shows methods of construction and explains what you need to know in simple terms.

The description of this self-powered generator is now complete and built as described, it is a genuine self-powered device which you can replicate and use. The development and refinement continues and will be shown here when the circuit has been optimised.

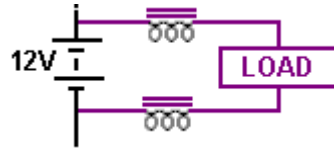
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While further investigation continues on the excellent design described above, here are some suggestions and comments from me. Please understand clearly that these are merely my comments which have not been tested out on the build above. In other words, these are my suggestions and are generally **untested** ideas which can safely be ignored. However, there may be some ideas here which you might feel are worth investigating.

Firstly, the load as well as the batteries, receives the pulsing output from the circuit. That may be beneficial, allowing additional output power. However, it is more normal practice to use one or two chokes to protect the load from those voltage spikes. These chokes can be just simple turns of wire on an iron core or they could be commercially available chokes. The one shown here, which has only 48 turns of wire, can handle continuous currents of up to 10 amps:

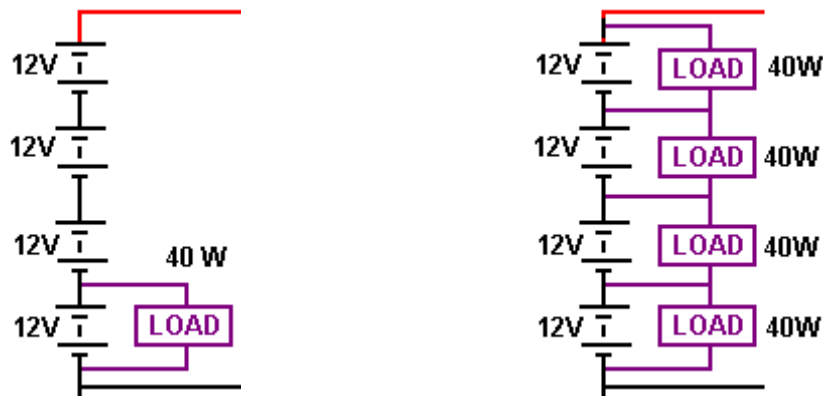


The load could be buffered from the spikes like this:

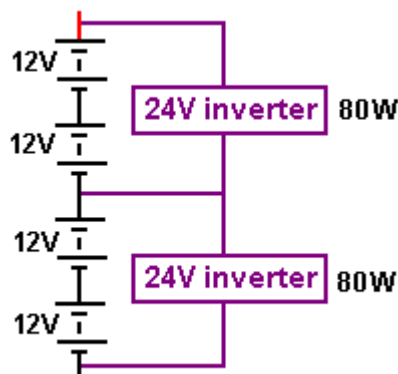


This arrangement allows the voltage spikes to flow through the battery chain but opposes the spikes when they flow towards the load. The "LOAD" shown in purple can be whatever low-current equipment you want, such as a fan, a mobile phone charger, a radio, an LED light, a small inverter, or whatever. Forty watts doesn't sound like much, but my workspace is very brightly lit with 39 watts of LED lighting which has the equivalent light output of three 100-watt mains-powered incandescent bulbs

Also, remember that the circuit has four identical batteries in that section and if one battery can provide 40 watts of continuous output power, then it seems probable that the other batteries could do the same and that **might** provide a total of 160 watts of continuous free power, giving a COP=180 result:



Also, while it was a 12-volt inverter used with the prototype, that was because it was to hand during the testing. That suggests that if a 24-volt inverter were used:



then because of the doubled input voltage, for the same current draw, 80 watts of mains power should be available from each inverter. Twenty-four volt inverters are quite common as they are used by lorry drivers and lorries ('trucks') generally have 24-volt electrical systems.

Nowadays, there is a very wide range of 12V equipment intended for use with a car battery, or even with a 5-volt USB computer socket. For example, LED lighting is very efficient and popular and the 12-volt LED arrays provide very effective lighting. I have tested those LEDs and found some unexpected results, using a lux meter to measure the light output as the human eye is very bad at assessing how bright a light is. What I found was:

Using two LED arrays side by side in a light box, the figures for voltage / current draw / light produced using 1.2-volt NiMH batteries were:

9 batteries 11.7V 206 mA 1133 lux: 2.41 watts 470 lux per watt (the manufacturer's intended performance)

8 batteries 10.4V 124 mA 725 lux 1.29 watts 562 lux per watt

7 batteries 9.1V 66 mA 419 lux 0.60 watts **697 lux per watt** (a very realistic performance level)

6 batteries 7.8V 6 mA 43 lux 0.0468 watts 918 lux per watt

This is very revealing information, showing that one of these LED arrays fed with just 33 milliamps can produce very impressive 210 lux lighting at a wide 160-degree angle of illumination. To put that another way, feeding five LED arrays with 9 volts, generates a very acceptable 1000-lux lighting level for just 165 milliamps which is only 1.5 watts. That is spectacular performance.

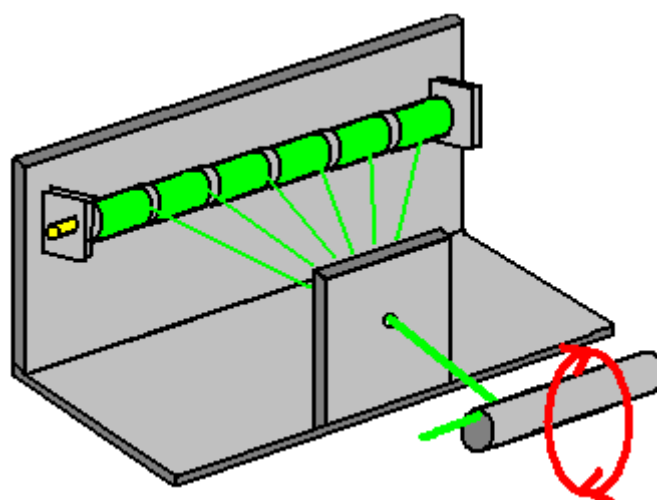
So, if we wanted to use LED array lighting with this 40-watt generator, we could just use the 4-battery output voltage of about 51.2 volts. If we wanted to use the very acceptable lighting produced around the 9-volt per LED array, due to its less dazzling light, increased LED area and near zero heat generation, then we could use five LED arrays in series, giving each array 10.24 volts and producing about 1725 lux per set of five LED arrays drawing 300 milliamps. Using three sets of five LED arrays, with a massive 5000+ lux, the current draw would be less than 1 amp, or about 30% of the available power.

These LED arrays look like this:



and come in two different types, one called "day white" or "cool white" with a wavelength of around 5500K to 6500K and a type called "warm" with a frequency of about 2700K to 3200K. You can mix these so that you get both frequency ranges and my preference is for about one third of the units being the so-called "warm" variety. Lighting this intense, needs a cover of frosted plastic which is light, protective and which spreads the light out to an even less concentrated illumination.

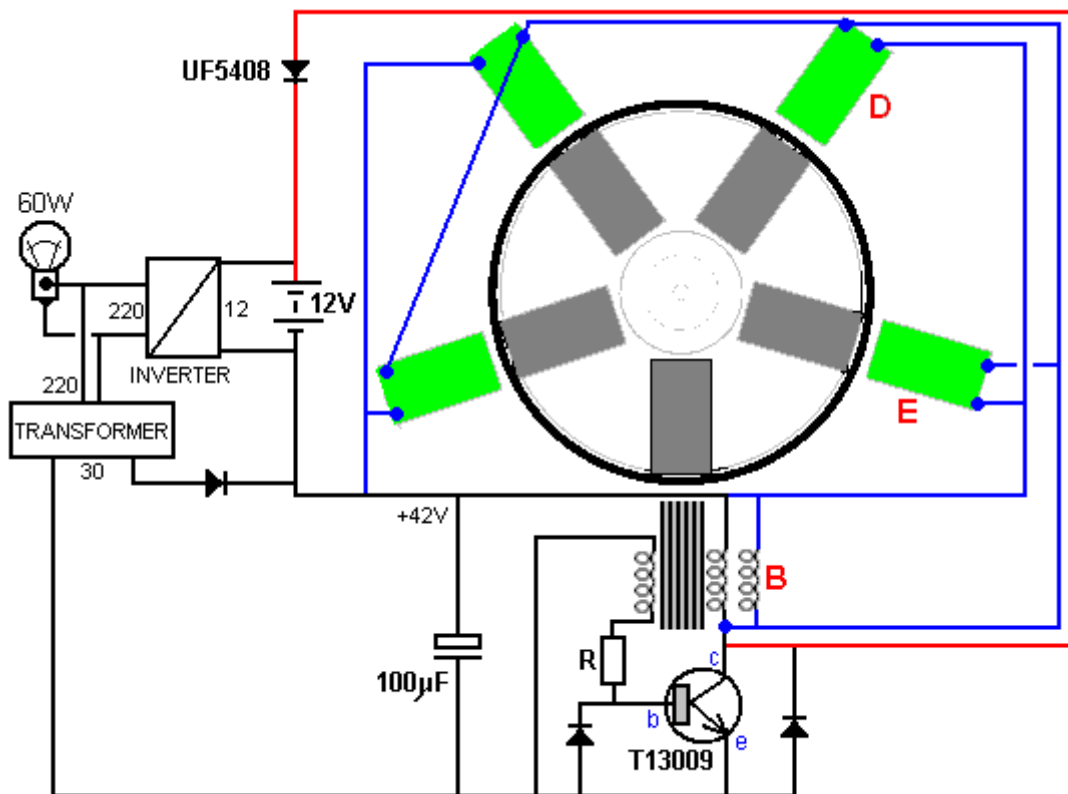
One other point concerns the production of the Litz winding of the wire strands before the coil is wound with the Litzed wire. The developers method of clamping 3-metre lengths of wire and twisting those lengths individually works very well but is rather tedious to do. I would suggest a very simple arrangement which might work more easily:



The idea here is that the reels of wire are mounted on a simple horizontal bar, shown in yellow, and each spool has its wire fed through a hole in a front panel. If the hole is a bit large, then an ordinary plastic spring clamp can be mounted on the board so that its jaws grip the wires just after they come through the hole. The group of wires passes through a small hole drilled near the end of the coil tube and then the tube is rotated (using both hands to get a continuous rotation) to twist the wires into a Litz bundle. When sufficient turns have united the wires into a spiral, the coil tube is rotated to form the coil. Then, another length of the wires is pulled through and the next section of wire is Litzed in the same way and the coil winding continued. The length of wires pulled through is a matter of personal choice, but I would suggest perhaps 300 mm. If desired, a simple spring clamp can be mounted on the coils side of the outlet board, to hold the wires against the winding and twisting. I would suggest that the coil former is rotated so that the wire bundle feeds on to the top of the coil former. That is the easiest to see and control when winding and it is called “counter-clockwise” winding or just “CCW”.

The T13009 transistor is not readily available in some parts of the world. If you have to use a substitute, then its switching speed, voltage rating and current rating are probably the most important factors to match. The switching speed is difficult to assess but after a 2.5 microsecond delay, the switch off time is 110 nanoseconds. The voltage rating is 400V (although that is probably not used in this application with its 60V load, and the current rating is 12 amps continuous and 24 amps for pulses, it has a 100 watt dissipation rating. Other manufacturers use different designations and it is likely that your local supplier may call this transistor the MJE13009.

Again, our thanks go to the developer for freely sharing this most important circuit which he developed and for his future modifications, the first of which is shown here:



In this arrangement, coil “B” is also pulsed by the transistor and the output from the coils around the rotor is now directed to the output inverter. The drive battery has been eliminated and a low-power 30V transformer and diode run from the inverter output as replaces it. Spinning the rotor generates sufficient charge on the capacitor to get the system running without a battery. The output power has now risen to 60 watts which is a 50% improvement. The three 12-volt batteries have also been eliminated, and the circuit can run with just one battery. Continuous power output from a single battery which never needs to be recharged is a very satisfactory situation.

Patrick Kelly
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<http://www.free-energy-info.co.uk>
<http://www.free-energy-devices.com>