

Dirty 'Faraday' Generator JR 22 (4th ed.)

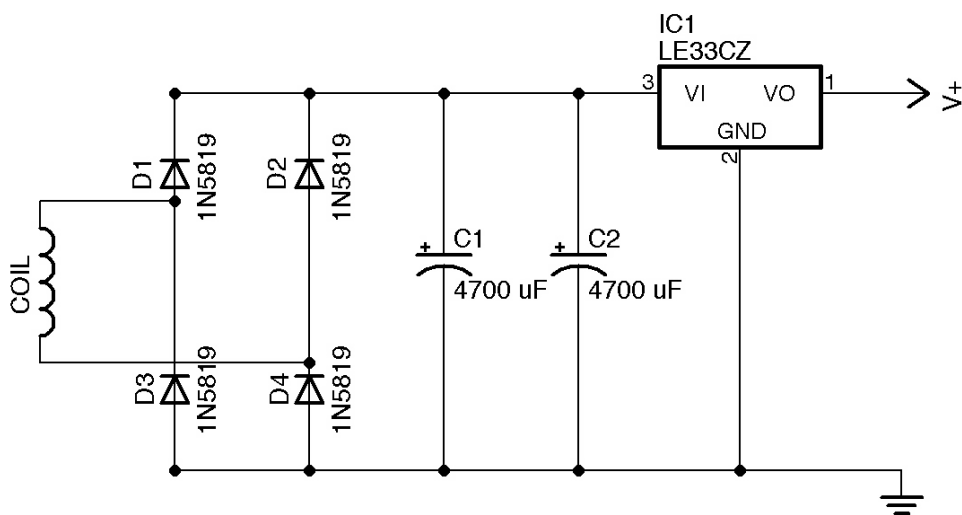
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For making the Dirty 'Faraday' Generator see Gadre 2006.

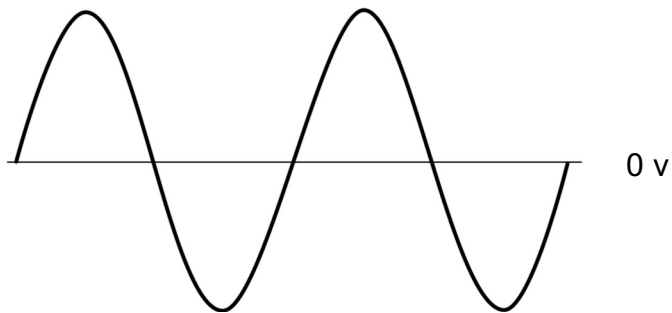
With reference to the Gadre article, use two neodymium magnets 20 x 10 mm with approximately 1500 turns of enamelled copper wire gauge 36 swg spanning circa three inches in the middle of a tube. Alternative tubing maybe used: in the UK denture cleaning or vitamin C tablet packaging are ideal. To wind the coil, first make a fixture to hold the tube in a drill. A cork with a bolt through it works well. Mark the cork so it is possible to count the revolutions/turns. The two magnets need to just pass through the coil. Experiment with using 'buffers/stops' at the ends of the tube: for example, a wine bottle cork cut in half, with each half at either end of the tube, or foam. The coil around the tube can be secured with tape or heat shrink tubing.

Schematic to convert Alternating Current (AC) to regulated Direct Current (DC)

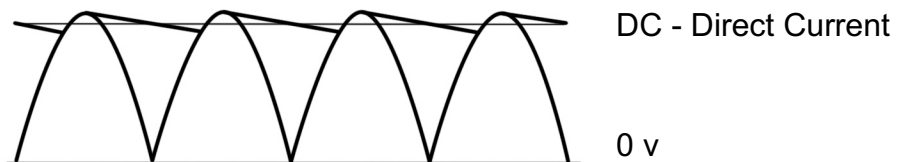


A bridge rectifier using four diodes is used to convert alternating current (AC) to rippled direct current (DC). The ripple is then smoothed using 'smoothing' capacitors. This circuit includes a 3.3 volt regulator (LE33CZ). For an unregulated power supply this regulator may be omitted. Alternative regulators may be used: for example, a 5 volt regulator (LP2950CZ-5).

AC - Alternating Current



Direct Current, DC Ripple, Smoothing Capacitors



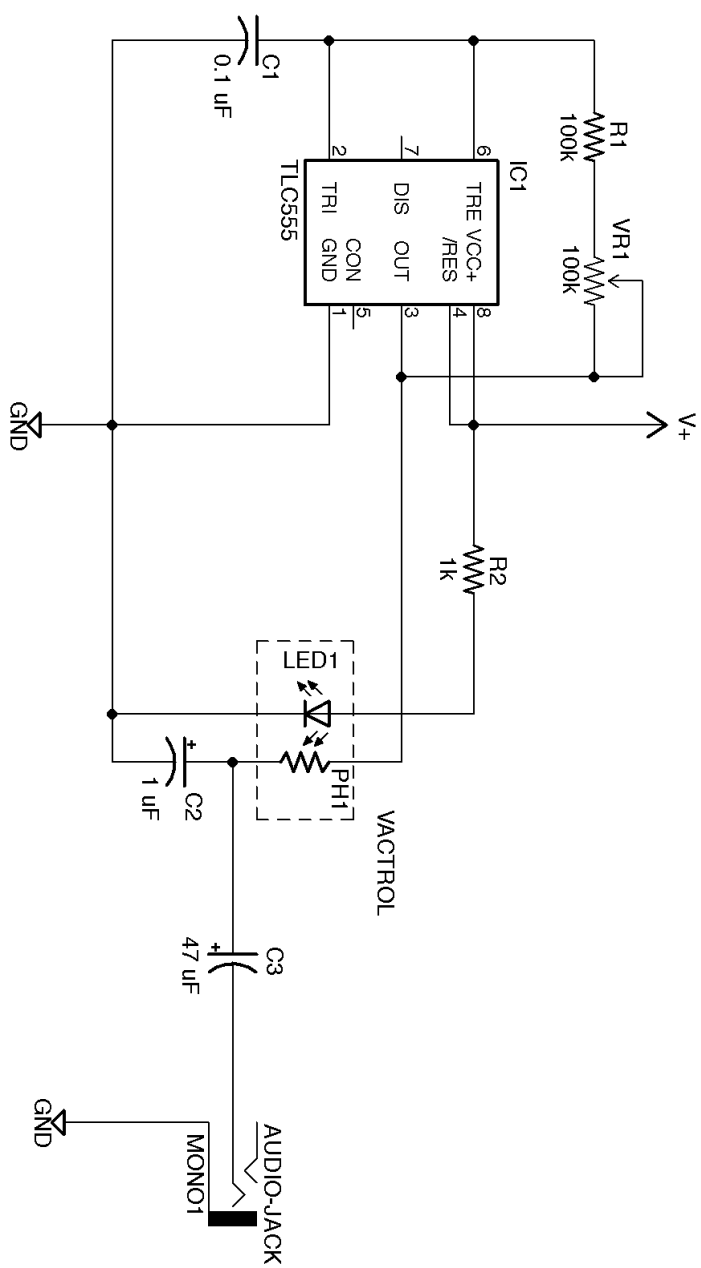
References

Dhananjay Gadre, Power Generator for Portable Applications, Circuit Cellar magazine, October 2006.

Hare, J.P., 2002. "Physics on a Shoestring: The Shake-A-Gen," Journal of Physics Education, volume 37, p.436-439. Available at: <http://www.creative-science.org.uk/gensimple1.html>

Richards, John. "Getting the Hands Dirty," Leonardo Music Journal (18) 2008.

Appendix 1: Charge/Discharge Synth Schematic



Charge/Discharge Synth (Notes)

The synth is designed to respond directly to a varying unregulated direct current. There is a direct correlation between the amount of current generated by the performer via the Dirty 'Faraday' Generator and the resulting sound. The circuit design is based on a single oscillator using a low power CMOS 555 IC. The advantages of using a CMOS IC over a regular 555 timer is that the CMOS IC works at a very low current and voltage and avoids a sudden drop out of sound as the capacitors discharge: a smoother decay is created.

The oscillator changes from triangle to square wave as more current is generated: the sound becomes brighter. With more current the pitch of the oscillator becomes sharper (rises) and there is also an increase in amplitude. The way in which the circuit responds is analogous to a wind instrument where more energy (blowing harder) results in a richer harmonic content.

The DIY VACTROL is made by placing a LED and LDR (light dependent resistor) together wrapped in tape: sealed from external light.