

Windup Torch info

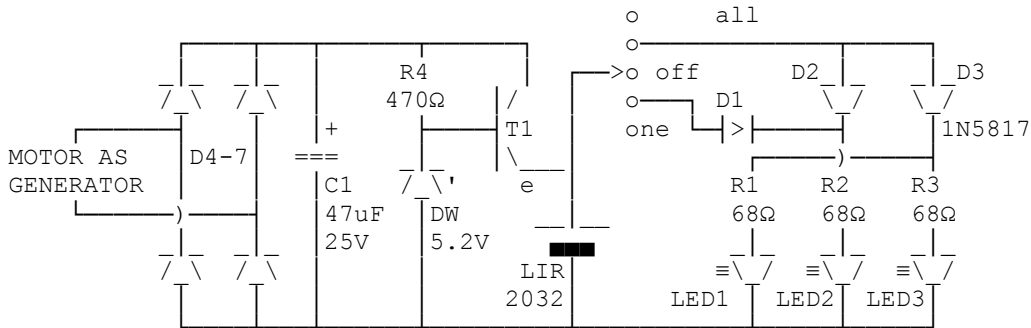
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(8 Bit ASCII Graphics use code page 437 or 850)

Not being one to leave a new toy unexamined, here is info I reverse engineered from one of these fairly cheap LED torches.

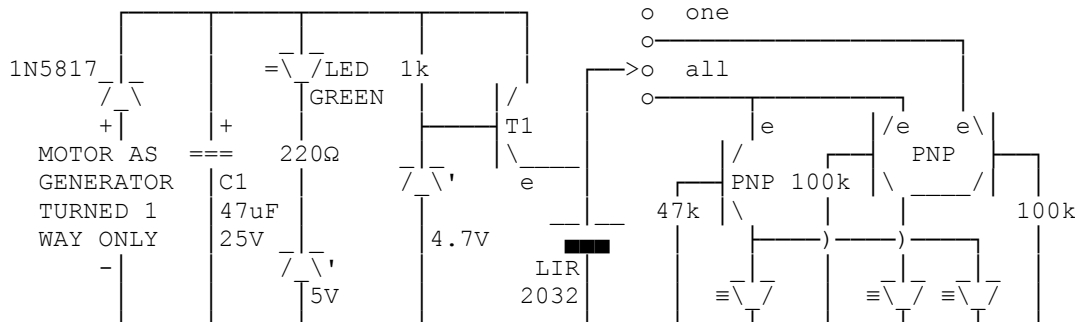


HOW IT WORKS

A small motor spin from a 4 gear chain from the crank handle. The motor generates over 5V & feeds a silicon bridge rectifier D4-7, which I guess is there just in case the rotation is reversed. This DC feeds C1 & powers up the zener DW to make T1 conduct current into the 3.6V Lithium Iron rechargeable button cell until the cell is fully charged & the voltage rises to cut off the current from T1's emitter. With normal winding speed this takes only 30-60 seconds.

A 4 way push action rotary switch powers the LEDs, either one or all 3 through low voltage drop steering diodes D1-3 to a current limiting resistor to the 2.6V Hyper-Bright white LEDs. The battery can light all 3 LEDs for more than 30 mins on one charge. The light output is quite feeble compared to a normal torch of the same size, but it is quite enough to read at night etc.

MY IMPROVEMENTS



1/ Constant current to LEDs. Almost constant LED current until the battery fails with 3 small PNP transistors. The 47k/100k values on the bases depends on the PNP transistor gain to give the right LED currents of 10mA MAX, values in the range 22k to 220k may be needed.

Replace the 3 LED 68 ohm with wire links & replace the 3 Schottky diodes with the PNPs mounted right down for minimum headroom, add the base Rs to nearby grounds.

- 2/ Bridge losses removed. Replace the 4 silicon diodes with 1 of the 1N5817 diodes. Make sure the generator is wired up for your favoured rotation direction. Swap 1 of the +ve rail diode for the 1N5817 & solder the motor -ve to the -ve rail. Note the free unloaded generator action if reverse wound.
- 3/ Battery Charged LED. First I found the original zener diode to be too high a voltage & the regulator never can in as the new 3.6V battery would not reach 4.5V to stop the current flow, so I replace the zener with a 4.7V one selected on test & also doubled the supply R to 1k. Then adding a GREEN LED with a 220 Ω to monitor the generator voltage with the original zener. In use it lights up when the handle is cranked hard & then easily when the battery is charged.

Why don't you write an interesting bul?

73 De John, G8MNY @ GB7CIP