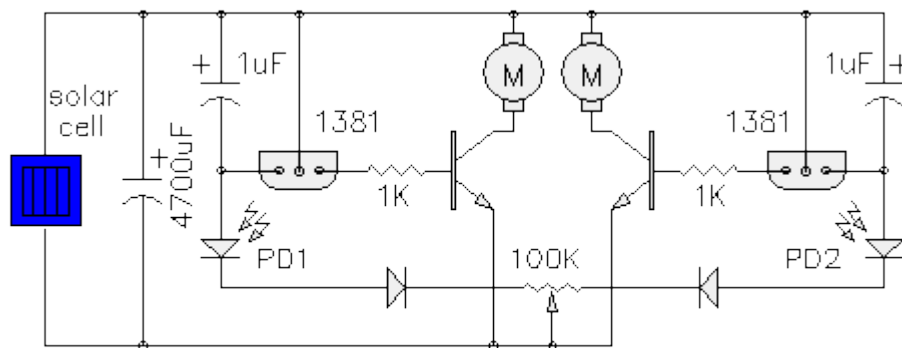


THE "MILLER POPPER"

Bryan Yeung and Wilf Rigter took the Miller solarengine circuit, and turned it into an efficient photopopper circuit:



Miller type Photo Popper – Wilf Rigter

Here's Wilf's description of the circuit:

The 1uF timing caps should be adjusted to give the right discharge duration.

The series 1N4148 diodes may not be required. For those not familiar with the photopopper and Miller SE operation, it works as follows:

The main caps charges up until the voltage reaches the trigger of the 1381 which is equal to the rated trigger level plus the photodiode photovoltaic voltage (~.5V) plus the 1N4148 forward voltage (~100mV@5...) plus the voltage drop (@5uA) across each leg of the 100K pot.

The pot can therefore be used to match the 1381 trigger levels.

The PD photovoltaic voltage is proportional to the light level. The SE whose PD has the lower light level will have a lower combined trigger level and will fire first.

Once the SE is triggered two things happen:

1. The ground pin current drops to about 1uA lowering the SE reset voltage (increased hysteresis).

2. The ground pin voltage becomes negative with respect to 0V as the main storage cap discharges.

The voltage across the 1381 is now equal to the timing cap and is independent of the main capacitor voltage. While triggered, the 1381 supply current is just 1uA and the reset time (when the 1381 turns off) is determined by the size of the timing capacitor. With 1uF the reset time is about one second. When the 1381 turns off, the 1381 ground pin current jumps to 5uA and starts to discharge the timing capacitor more quickly until voltage rise on the main capacitor voltage catches up and the cycle repeats.

Source: http://www.solarbotics.net/library/circuits/bot_popper_miller.html