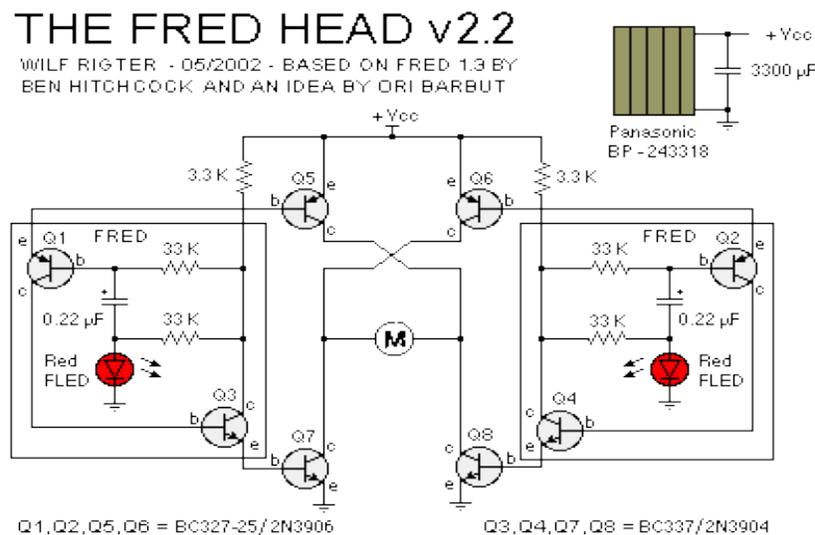


BEAM HEAD CIRCUITS – FLED BASED HEADS

To create a simple, solar-powered, light-seeking head design (and in particular, to create a head design that could be based on a FRED photo popper kit with a particularly artistic PCB). This concept was discussed on the BEAM list on-and-off for some time, finally splitting into two circuit lineages -- one based on FRED, and a simpler non-FRED (but still FLED-based) design.

The FRED-based lineage culminated (at least so far) in Wilf Rigter's FRED Head v2 circuit:

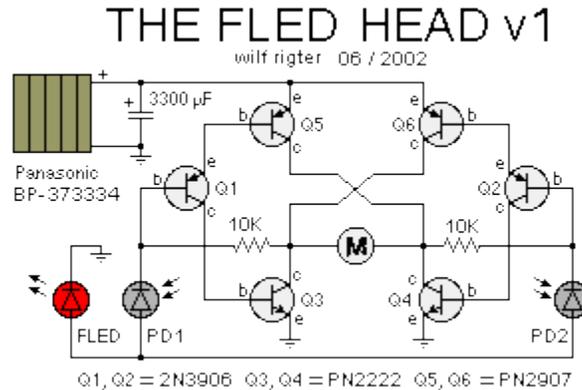


Here's a compilation of Wilf's explanations of the circuit:

The FRED Head evolves the design in the direction of a FLED-triggered 3 state flip-flop based on Tilden's H-bridge. Note that in the original FRED SE, the FLED current flows through the motor, but with bidirectional drive, the motor is no longer connected to Vcc. So now the FLED 33K resistors must be connected directly to the Vcc. The additional base-emitter drop of Q5 and Q6 raise the trigger level by 0.6V. On the other hand, the Q1, and Q2 base resistors are now isolated before the circuit triggers and Q1,2 will be much more sensitive to the capacitively coupled FLED pulses. The 3K resistor was replaced with a 33K which should be more efficient with small motors. If too sensitive, add some 100K resistors from the Q1 and Q2 bases to Vcc. Experiment with smaller Q1 and Q2 base resistor values for larger motors.

I am not happy with the FRED trigger mechanism now that I understand its behaviour better. It does not seem very directional and draws a fair bit of current prior to triggering. It certainly is not as predictable as a 1381 trigger but a bit of randomness can make life more interesting especially for roving photovores.

Meanwhile, the non-FRED path has resulted in (yet) another Wilf Rigter circuit -- the FLED Head:



Wilf's description of the circuit is as follows:

It is based on a combination of Tilden's H-bridge and the FLED SE. I have tested it with various motors, and it works well even in moderate light. It triggers at about 2.6V every 15 seconds with a 100W lamp at 2 feet. Should be easy to adapt to photo popper design as well. You can also power this circuit from a 3V-9V battery with a suitable series resistor (100-1500 ohm). With the 9V battery you can also put a regular LED and 1K resistor in series with the battery as a kind of pummer.

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