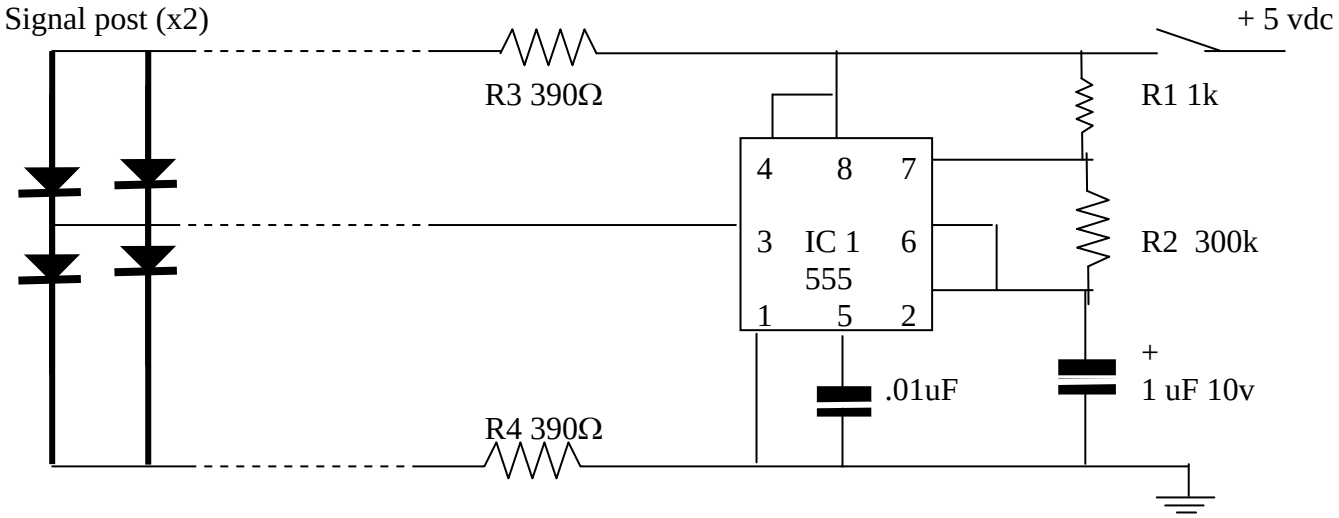
IRREGULAR FEATURE

Crossing lights

I was recently commissioned by the D & S Railroad to electrically modify a set of railroad crossing lights that they had acquired for their display layout. When I saw the lights in question it was quite obvious why they needed modifying. They were a set of Model Power crossing lights part number 1681, these are quite well detailed and made with a mixture of brass and plastic parts, unfortunately they are let down by very poor wiring. On the box they are promoted with “includes 2 way prewired switch” while this statement is true, it fails to mention you have to keep switching back and forth to make them flash and that you can only have both lights on, on one post and both off on the other as opposed to the 12 inches to the foot gauge where each post has one light on and one off!

I began by removing the globes, wiring and the plastic bases then I soldered a wire to the bottom of the brass post on the inside and then fitted and wired red LEDs as they will outlast globes use less power and run cooler they are also shorter and therefore nearer to the right size. Because the circuit that I was going to use runs a little different from the usual, the wiring of the LEDs had to be different too in that the LEDs were connected in series, the anode / cathode junction being soldered to the top of the brass post to make the third wire connection for control (see diagram).



The circuit works by charging, via R1 and R2 then discharging via R2, the electrolytic capacitor connected to pin 2 of IC1 a 555 timer. The chip then converts this charge and discharge cycle to a square wave output on pin 3 at rail voltage (5 volts peak to peak) this is fed to the junction of the LEDs and when high prevents the top LEDs conducting while supplying power for the bottom LEDs, conversely when low provides an earth path for the top LEDs and holds the bottom LEDs off. The flash frequency (how fast the LEDs flash) and duty cycle (the ratio of on to off time) are set by R1, R2 and the electrolytic capacitor. The circuit will work on any supply from 4.5 to 16 volts dc as long as it is smooth; the only changes are to R3 and R4 as these protect the LEDs. For 12 volts change R3 and R4 to 560Ω.
The on / off switch could be replaced with a detector to turn on the flashing lights as a train goes by, but I’ve run out of space so that will have to be the subject of a future issue.

Catch you down the track...Tony Mikolaj.