



Motor car light controller

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This circuit reminds you if you have left the headlights on after turning of the ignition. It will automatically turn the lights off if you do not deactivate the circuit.

The first thing to note about the circuit is that power is supplied via the headlight switch, so if the lights are off no power is supplied to the unit.

However this is not sufficient to turn on the lights, owing to the position of RLY 1. This is held up via the ignition switch, via D1 and D4. So both switches must be made to allow the lights to be turned on.

Now look at the latch comprising Q1 and Q2. In its initial state Q2 is on and Q1 off. Consider what happens when the ignition switch is opened. A

spike will be induced onto pin 2 of IC1 by the capacitor C1, which has 0 V across it. This starts the timer, IC1. Q2 stays on, and Q1 off, but note that only Q2 base emitter current flows in D3.

IC1 is a fifty second monostable. Its pin 3 will go high, providing 12 V for the relay and pulling up pin 4 on IC2. It also turns on Q5. IC2 is a 1 Hz bistable, so as long as IC1 stays on it will oscillate, driving Q4 and thus the light L1. At the end of fifty seconds pin 3 goes low, the relay drops out and circuit operation ceases.

However, if PB1 is operated during this time the latch changes state. The collector of Q1 goes up to 12 V, supplying sufficient current to operate the

relay via D4. The circuit can remain in this position indefinitely, unless supply is interrupted by operating the headlight switch, or the latch is toggled by turning on the ignition again.

Lastly, consider the effect of Q3. If this transistor is on it connects IC1 and IC2 in a loop that prevents either from running. IC1 pin 3 is connected to IC2 pin 4, and IC2 pin 3 is effectively connected to IC1 pin 4. This means that the timer section of the circuit cannot run if power is supplied via either D1 (i.e. ignition is on) or D3 (i.e. PB1 operated). Apart from its effect on circuit control, this has the added advantage of making the timing independent of noise in the motor car supply.