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Independent Design Abstract

For my independent design study project, I plan to build an automatic headlamp control for a 12-volt automotive headlamp system. This project will work to implement an automotive system where when the vehicle is on, illumination of the headlamps will be controlled automatically via a daylight sensor. If daylight is not detected, the headlamps will turn on after a user set delay. This will prevent headlamps from coming on prematurely when driving through shade for a moment. Once headlamps are on, if daylight is detected, another timer will begin for a user set time before the headlamps are shut off.

Detection of light will be handled via an ultraviolet (UV) sensor of choosing. The output voltage from the UV sensor will be input to a comparator, and if below a user chosen threshold, will activate an initial delay circuit. If the given-on delay has completed, a secondary timer circuit, relay, and headlamps will activate.

If the headlamps are on and voltage from the UV sensor to the comparator goes above the user chosen threshold (senses daylight), power to the initial and secondary timer circuits and the relay will be removed. When power is removed from the secondary timer circuit, a pulse will be sent out via a discharging capacitor to the trigger of the secondary timer circuit. This will begin a timer countdown that will keep the relay activated, being as a 555 switches faster than an automobile relay does. With the relay remaining active while the timer is counting down, the headlamps remain on and active.

If during the countdown to turn the headlamps off sensed light is removed, power will be restored to the circuit and the turn off sequence will be aborted.