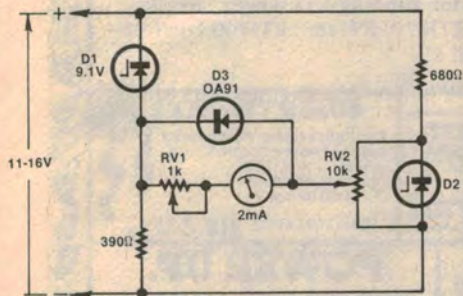


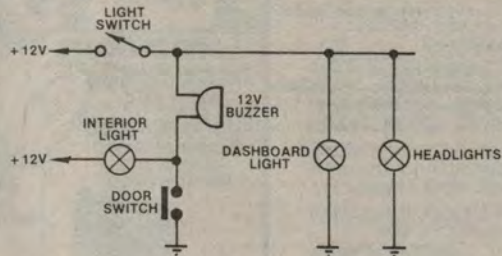
Expanded scale voltmeter



Sometimes an expanded scale voltmeter is desirable to monitor voltages over a restricted range. Such an application is a battery voltage monitor for a car or battery charger, with a range from 11 to 16 volts. A simple solution could use a zener diode in series with a moving coil meter but this results in a cramped, non-linear scale. The proposed bridge circuit allows a more linear expanded scale on a moving coil meter.

Zener diode D1 is selected to be about two volts less than the minimum voltage to be measured while zener diode D2 is chosen to be about two-thirds of the

Simple headlight reminder



Instead of using a relay and buzzer as suggested in these pages in September 1982, a buzzer alone will function as a headlight reminder. This is wired between the dashboard/headlight circuit and the chassis side of the interior light globe, as shown in the circuit.

This allows the engine to be switched off without sounding the buzzer while the doors are closed. Only when a door is opened will the buzzer sound, if the headlights are still on.

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value of D1. RV1 sets the precise voltage for zero scale deflection while RV2 sets full-scale deflection. D3 protects the meter against excessive downscale deflection when voltages less than the normal range are applied. The current through the zener diodes should be

limited to about five milliamps.

If the circuit is redesigned to suit a higher voltage range, care should be taken not to exceed the power ratings of the zener diodes.

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