

# Ideas for experimenters

These pages are intended primarily as a source of ideas. As far as reasonably possible all material has been checked for feasibility, component availability etc, but the circuits have not necessarily been built and tested in our laboratory. Because of the nature of the information in this section we cannot enter into any correspondence about any of the circuits, nor can we produce constructional details.

Electronics Today is always seeking material for these pages. All published material is paid for — generally at a rate of \$5 to \$7 per item.

## Battery Condition Indicator

This simple circuit loads the battery under test and then checks to see if the output voltage is above 80% of its specified value. The resistor, R1, draws a steady load current ( $I_{load}$ ) and the total current drawn from the battery is thus  $I_{load}$  plus  $I_{LED}$ . The zener voltage is selected so that the LED will not light when the battery voltage drops below the required value.

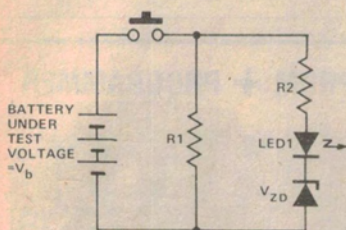
$$R_1 = 0.8 \times V_b / I_{load}; V_{zd} = 0.8 \times$$

$$V_b - V_{led}; R_2 = (V_b - V_{zd} - V_{LED}) /$$

$$I_{LED} \text{ (max)}$$

$V_b$	$R_1$	$R_2$	$V_{zd}$
3	270	68	0.7*
4.5	390	100	2.1*
6	470	120	3.3
9	820	180	5.6
12	1k	220	8.2
18	1k5	390	13.0

\* For these low zener voltages, use one or more silicon diodes in series, forward biased.

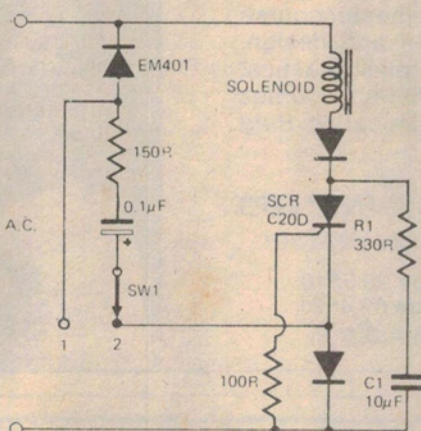


## Supply Protector

For those expensive (computer) boards, place a 1W (or bigger) zener diode across each supply rail, with a voltage rating 1–2V above the rail voltage. A 6.2 V one will be ideal for a 5 volt rail, for example. It doesn't cost much and when you drop the 50 V supply leads across the 5 V rail (accidentally), the zener will protect the circuit and in the case of gross overload will go short (usually). You blow a 50c zener instead of \$50 of ICs.

## TO-3 Template

Sometimes it's a bit tricky trying to mark out the holes for a TO-3 case on a heat sink. If, however, you keep a blown TO-3 device (and most people will have plenty of those!), then by removing the cap and the leads it will form a useful template for centre-punching the holes.



## Impulse Power

This circuit is often used in electrically powered stapling machines, impulse hammers etc. and causes load current to flow through the load for one complete half-cycle of the ac supply whenever SW1 is actuated (i.e. moved from its normal position [1] to energise-load position [2]). The circuit is arranged so that the SCR is always triggered at the beginning of a positive half-cycle of the ac supply, even though the switch may be closed randomly at any time during the previous two preceding half-cycles.

Resistor R1 and capacitor C1 should be chosen so that their series combination supplies just sufficient holding current for the SCR for one complete half-cycle.