

## Computer 'back-up' supply

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ONE OF the problems of running a microcomputer without auto-battery back-up is that, if the mains fails (usually after entering a long program), you lose the lot and have to re-enter it from the start. It only takes the 5 V supply to disappear for a few milliseconds for the damage to be done.

After being caught once (and once was enough), I designed the supply shown here.

A switch-on the full-wave rectifier (D1-4) supplies regulator IC1, which gives 5 V after steering diode D7. D5 raises the output of IC1 to compensate for the drop across D7. Diode D6 raises the output of IC2 to compensate for D8.

The collector of Q1 is normally held low, initially by C4 and R5 while C1 and C2 are charging to the full supply potential, and then by base bias network RV1, R2, R3. The low at Q1 collector holds SCR1 off via R6. The Ni-Cad

batteries are trickle-charged by R1-LED1; LED1 lights up to indicate that the batteries are charging and becomes reverse biased to prevent battery discharge when the unit is switched off.

If the mains fails or is switched off, either by accident or on purpose, the current flowing into Q1 base via RV1 and R2 decreases to zero. Long before the supply to IC1 has become too low to maintain the 5 V rail, Q1 will have turned off and fired SCR1. This allows the batteries to supply IC2, a second regulator which takes over from IC1 before the microcomputer supply is interrupted. LED2 is turned on via R7 to give an indication that the batteries are being discharged.

If the mains should now come back on, LED1 will again light to indicate mains presence, but LED2 stays on until the reset button is pressed to switch off SCR1.

When you wish to switch the unit off, first switch off the mains and then press the reset button to turn off SCR1. In this condition there is no drain from the batteries so the unit can be left for weeks without detrimental effect. Ni-Cads of 4 Ah rating were used to give a 9.6 V supply. Two units have been built and both have proved 100% reliable.

If a supply of less than 1 A is required, 7805 regulators can be used and D7, D8 can be replaced by 1 A devices. The transformer and rectifier diodes should be rated in accordance with the current required. RV1 should be set to middle position and then adjusted for best operation. If battery voltages greater than 9.6 V are used, R7 must be increased in value and R1 decreased. The transformer, bridge rectifier, IC1 and C1-3 may be available in your original supply, in which case it will only be necessary to modify it to the circuit shown in the diagram.

