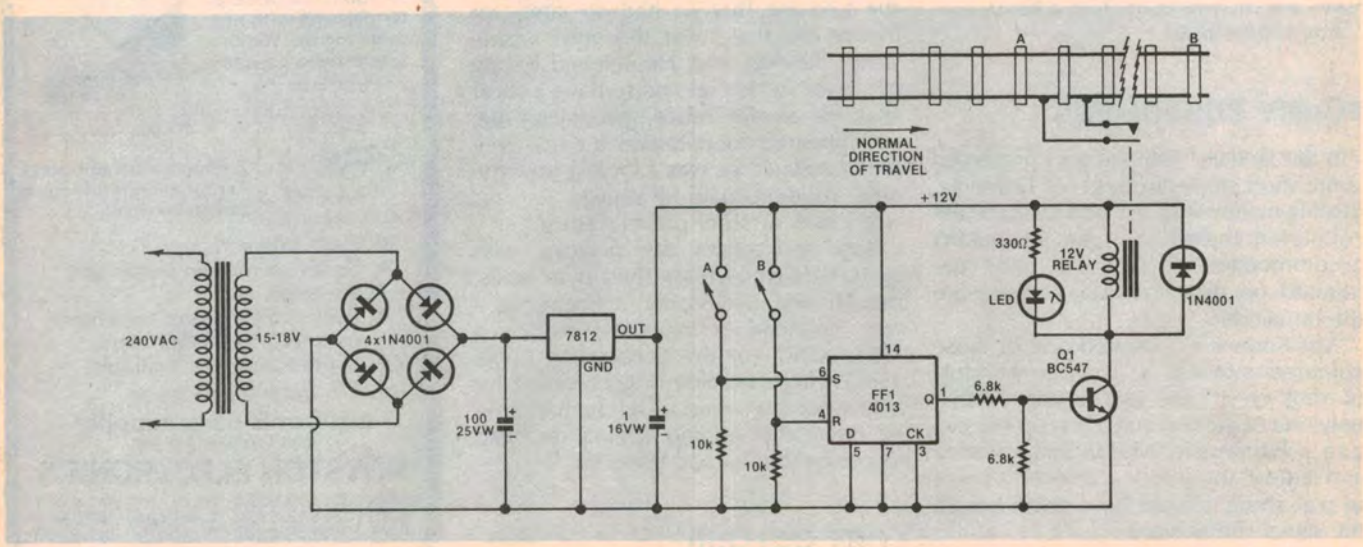
Circuit & Design Ideas

Interesting circuit ideas from readers and technical literature. While this material has been checked as far as possible for feasibility, the circuits have not been built and tested by us. As a consequence, we cannot accept responsibility, enter into correspondence or provide constructional details.

Model railway signal override system



Most model railway layouts use signalling systems which create a dead section of track beyond any signal set at "stop", thus halting an approaching train automatically. But this presents a problem when it is desired to use the dead section for shunting, with a train moving briefly into it from the opposite direction.

The accompanying circuit solves this problem. A train approaching from left to right, against a signal, will meet a dead track, while a train moving from right to left will energise the track, but for its own use only.

Train-sensing contacts, such as reed switches, are located at each end of the section (A and B) and connect to the "set" and "reset" terminals respectively of flip-flop FF1. A train travelling from right to left will activate contact A, set the flip-flop, and drive its output high.

This will turn on transistor Q1, close the relay, and energise the track. When the train leaves the track, to the right, it will be left energised, but a train approaching from the left will activate contact B, reset the flip-flop and de-energise the track.

The series LED and 330Ω resistor provide visual indication that the section of track has been energised. The power supply is conventional and consists of a bridge rectifier driving a 3-terminal +12V regulator IC (7812).

From "Elektor", December, 1982.

Power failure indicator

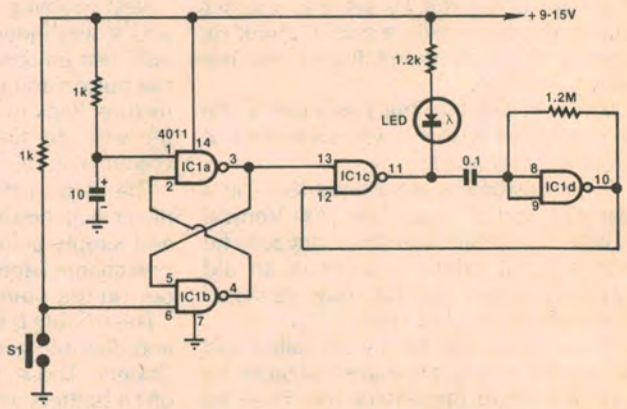
The purpose of this simple circuit is to indicate, after power has been restored, that there has been a power failure, no matter how momentary. Such an indication can be important in the case of mains-operated clocks, or any other device which requires adjustment after a mains failure.

The circuit is built around a single 4011 quad NAND gate IC. IC1a and IC1b are wired as an RS flip-flop, while IC1c form a standard two-gate CMOS oscillator. The oscillator runs at about 5Hz and is enabled (ie, it runs) whenever pin 13 of IC1c is high.

Pin 13 is controlled by the flip-flop. WHen power is first applied, pin 1 of IC1a is held low by the 10ΩF capacitor. Since pin 2 is also initially low, pins 3 and 13 will go high, thus enabling the oscillator which flashes the LED at a 5Hz rate.

If switch S1 is now pressed, the reset pin (pin 6) is pulled low and pins 4 and 2 are forced high. At the same time, pin 1 will have gone high due to rapid charging of the 10μF capacitor via the 1kΩ resistor, with the result that pin 13 goes low. This disables the oscillator and turns off the LED, a condition that prevails while ever power is maintained.

If the power fails, the same sequence of events will occur when it is subsequently restored. The LED will continue to



flash to indicate the power failure until the circuit is reset by switch S1.

The circuit requires a power supply of 9-15V dc, and this must be derived from the supply to the device being monitored.

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