

'Light' Switch

Switches which are operated by the level of illumination present have quite a number of uses. They can be arranged to trigger by either the presence of light, or its absence. The former will be of use for certain types of warning indicator, slave flash, or garage. The latter method will apply to automatic child's night light, and where a house lamp is to be switched on when daylight fails.

The circuit in Figure 44 is arranged to be switched on by the presence of light. The light dependent resistor LDR (ORP12 or equivalent) has a very high resistance in darkness, this falling as illumination increases. When the gate of TR1 is sufficiently positive due to the reduced value of the LDR, source current through R4 results in the resistor R5 and base of TR2 moving positive. The emitter potential of TR2 can be set by VR1, so that current in the relay coil is negligible until the LDR is illuminated. VR1 allows the illumination level at which the relay operates to be set for the purpose required. The relay contacts are connected to the circuit to be controlled.

The 2N3819 and similar general purpose FETs will be suitable for TR1, and TR2 can be the BC108, or similar NPN transistors. A supply line of other than 9v can be used.

'Dark' Switch

It will have been noted that the circuit in Figure 44 could be used to complete a circuit when light fails, if those relay contacts were used which are held open by light falling on the LDR, as described. This would however leave the relay in an energised condition, so it is preferable to modify the circuit, so that the winding is energised when illumination has dropped to some prearranged level.

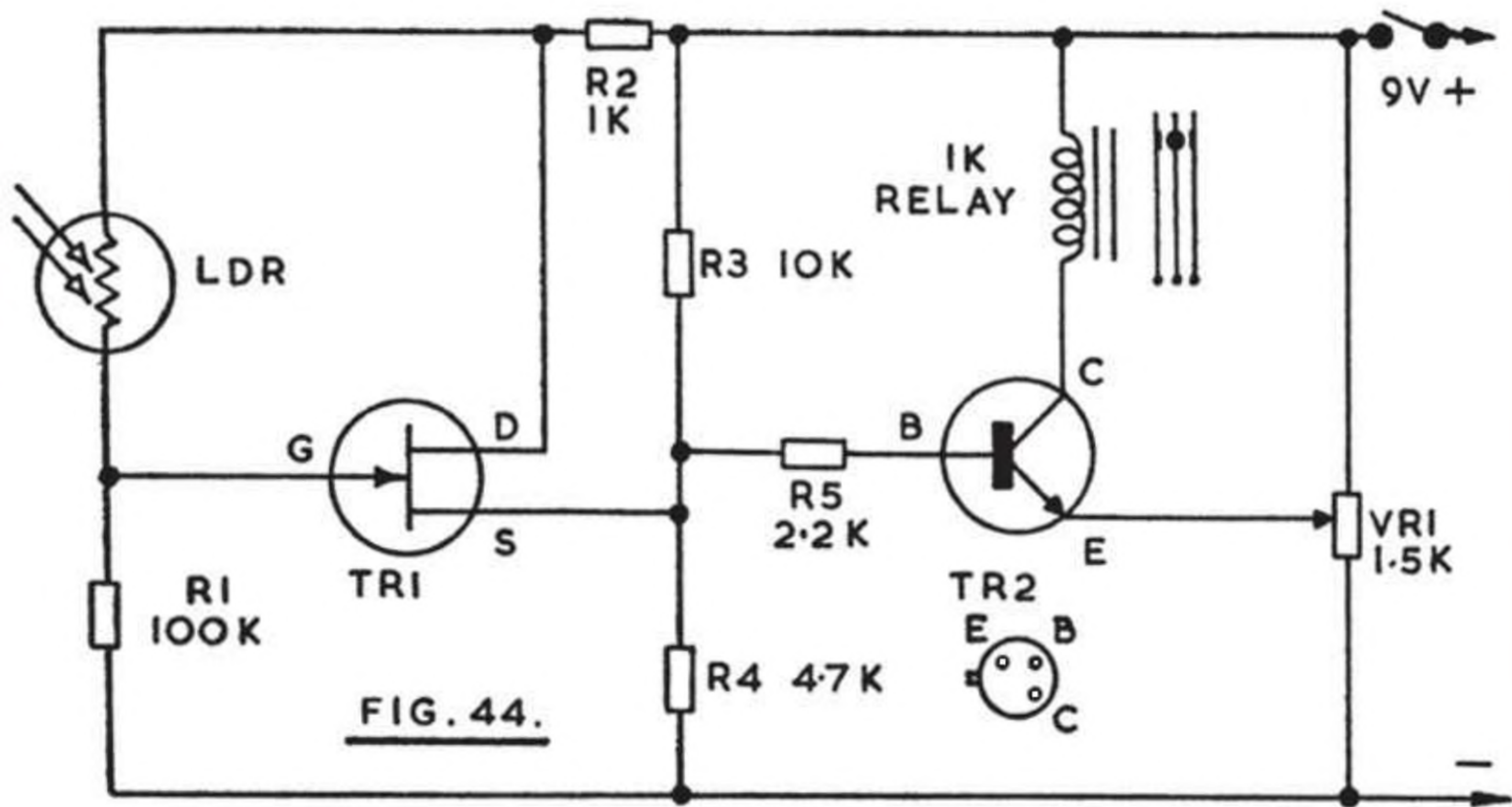


FIG. 44.

This may be done by changing the positions of R1 and the LDR, so that R1 is from TR1 gate to R2, and the LDR is from gate to negative line. With the LDR illuminated, its resistance is low, so that the gate of TR1 is held negative. When light begins to fail, the LDR resistance rises, and current through R1 can now initiate the operation of the relay, in the manner explained. Once again, VR1 allows the circuit to be adjusted so that the relay is energised when light reaching the LDR has dropped to some chosen level.

If failing light is arranged to switch on a household or other lamp, the location of this needs to be arranged so that it does not illuminate the LDR, or the latter can be shielded to avoid erratic operation.