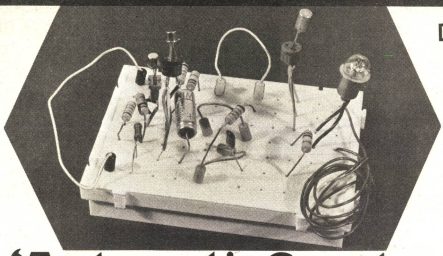
S-DeCnology



DAVID GIBSON

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THIS MONTH

'Automatic Courtesy Light'

Throughout this series, electronics has been employed to amuse, assist or entertain. The circuit shown in **Fig. 1** must surely come under the heading of 'useful'.

The basic idea is that a momentary contact is made which causes a light to switch itself on. After a predetermined period, the light automatically switches itself off. It remains off until there is another contact (this need only be for a fraction of a second) when it will again illuminate and, after a set period, switch off again automatically.

It is envisaged that numerous uses could be found for an automatic courtesy light. For example, the bell push on a front door could form the contacts. When pushed, the light would come on just long enough for the keyhole to be found.

Circuitry

At first sight, the circuit of Fig. 1 may look unfamiliar and yet careful examination will show that it is merely a multivibrator connected for mono-stable operation. Transistors Tr2 and Tr3 form the mono-stable. Note the absence of a capacitor which (in an astable) would be inserted in place of R6.

The result is that the mono-stable normally remains in one state: with one transistor on and the other off. By making a momentary contact across S-DeC holes 65 and 70, it causes Tr2 to switch on and Tr3 to switch off. The result is that Tr1 now conducts and lights the lamp LP1 in its collector lead.

This new stable state is not permanent however. It only lasts for a finite time which is dependent upon the value of the resistor pushed into S-DeC holes 4 and 14; and on the value of the capacitor C1. After a time (which depends on these C1/R5 values) the circuit will automatically revert to its original state. It will remain in this state until the contacts are again shorted. See **Fig. 2** for component layout.

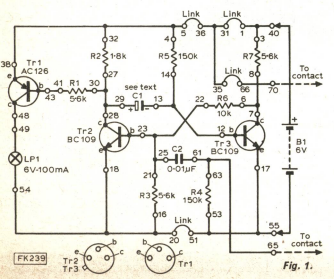

Fig. 1.

Components

Variation of R5/C1 gives a measure of control over the timing period during which lamp LP1 is on. Using the values shown, the lamp remains on for a period of 15 seconds. Changing the value of C1 to 330μF increased the 'on' period of LP1 to approximately one minute. Varition of R5 might be useful in some applications but it suggested that the minimum value of resistance should be 47kΩ. It is possible to use a potentiometer for R5 but in this event a 47kΩ resis-

you will need . . .

R1 5·6kΩ	C1 100μF (see text)
R2 1·8kΩ	C2 0·01μF
R3 5·6kΩ	Tr1 AC126
R4 150kΩ	Tr2 BC109
R5 150kΩ	Tr3 BC109
R6 10kΩ	LP1 6V 100mA bulb
R7 5·6kΩ	B1 6V battery
One S-DeC	Three transistor holders

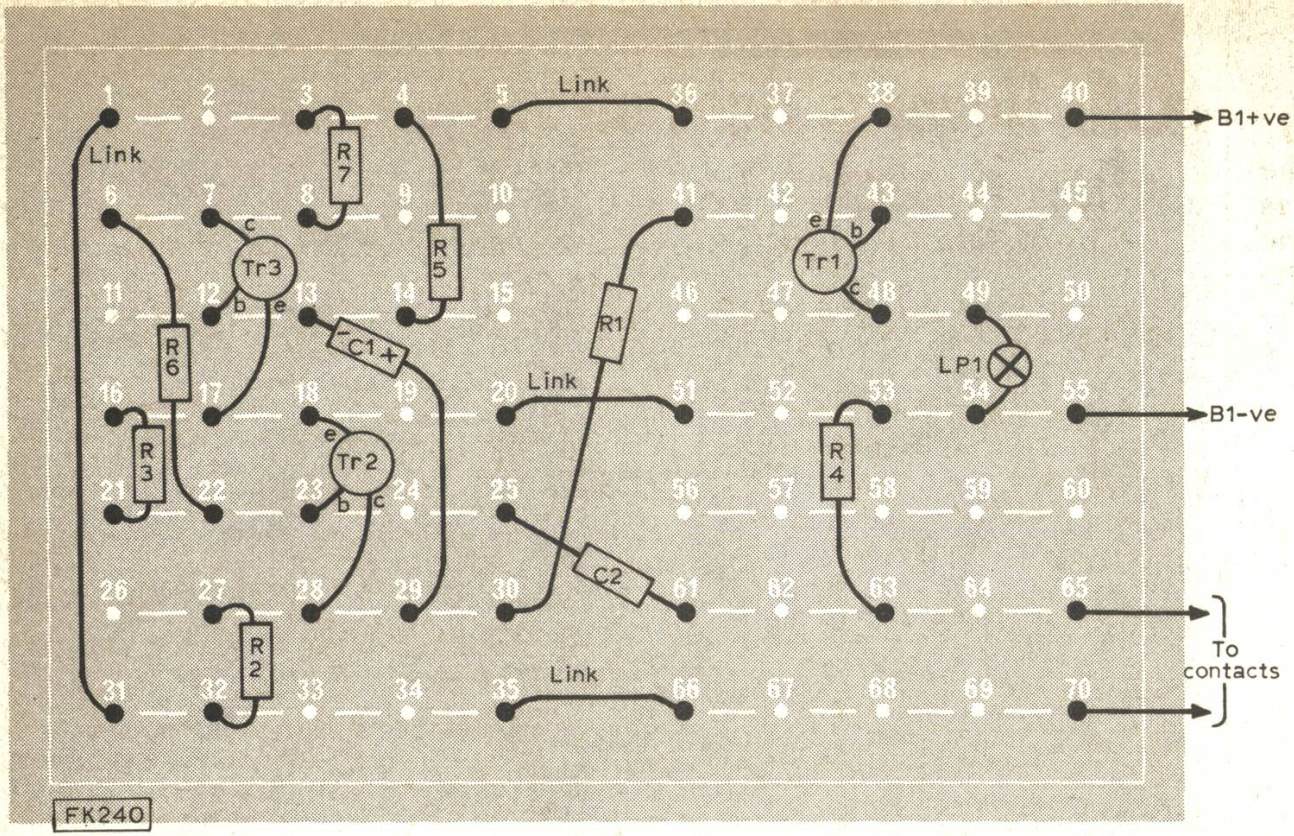

Fig. 2: The S-DeC layout for this month's project shown actual size. Alternative transistor types may be used to those shown in the circuit. However, make sure that their leadout configurations are in accordance with the layout. Also note that Tr1 is a PNP type while the others are NPN.

tor should be wired in series with the pot, thus ensuring a minimum value at all times.

Lamp LP1 should not be rated at greater than 100mA, and 6V should be considered the ideal voltage for general use with the circuit. If the light is to be on for only short cycle times, say not longer than 15 seconds, then up to 12V may be used. With 6V applied and a 330μF capacitor for C1, the quiescent current drawn by the total circuit was barely 1·25mA. Using a 4·5V battery, this dropped to approximately 0·9mA.

Contacts

The contacts which short together momentarily can be the bared ends of the wires from S-DeC holes 70 and 65. These might be fixed to a door (or whatever) in such a way that when the door opened the two bared ends brushed against each other. For other applications any type of switch or bell-push would be suitable, and a reed switch with magnet should be an elegant and reliable method. ●