

Designer Circuits

Triggered Flash Unit

By triggering an electronic flashgun using a sound operated switch, photographs of such things as a balloon bursting, the cork leaving a champagne bottle and objects splashing into water can be taken. Since electronic flashguns normally give an effective shutter speed of around a 1000th of a second, a "frozen" action photograph is obtained.

The photograph must be taken under fairly dark conditions so that the ambient light does not give an exposure if the camera's shutter is set to "B" and opened.

The circuit is based on operational amplifier IC1 which is used in the non-inverting amplifier mode. R1,2 are a negative feedback network which set the gain of the unit at about 500. RV1 (sensitivity) biases the non-inverting input to the negative supply rail. Ideally the input should be fed from a crystal or high impedance dynamic microphone, but the

unit will work quite well using a low impedance dynamic microphone or even a high impedance speaker as the signal source.

Q1 is used as a discrete emitter follower output stage which provides the relatively high trigger current required by the triac. R3 is a current limiting resistor. Under quiescent conditions the output of IC1 will be at virtually negative supply potential, and the triac, therefore, receives no gate current. When a signal is received by the microphone, positive going signals are amplified by IC1 to give an output that is a few volts positive. The triac then receives a strong gate bias, causing it to trigger and give a low resistance across its A1 and A2 terminals. These terminals connect to the flashlead

via a suitable socket (or flash extension lead with the unwanted plug removed) and the flashgun is, therefore, fired. The circuit operates almost instantly, giving very little delay between the commencement of the sound and the flashgun being triggered. Sometimes more interesting photographs can be obtained by introducing a small delay.

This can be achieved by moving the microphone a metre or two away from the object(s) being photographed.

The current consumption of the unit is approximately 4 mA. It is advisable not to advance RV1 much more than is absolutely necessary in order to give reliable triggering, as frequent spurious operation of the unit could otherwise result.

