

# 3-WAY (SOUND LIGHT MANUAL) PHOTO FLASH TRIPPER

## FOR NOVEL STOP-ACTION EFFECTS

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**S**OME exciting and different photographic effects can be obtained with a strobe flash rigged to trigger from stimuli independent of the normal shutter switch. The photoflash tripper described here can initiate and delay the flash cycle with a sound or light stimulus or by completing an electrical circuit. For example, after the tripper receives a sound stimulus, a delay starts. Then, after a preset time, the flash fires and exposes the picture.

**About The Circuit.** The common part of the flash timer is the delay circuit consisting of *SCR1*, *SCR2*, and *Q4* (see schematic). The cycle is begun by firing *SCR1* via a sound input at *SPKR*, light at *LDRI*, or mechanical trip wires connected to terminal strip *TS1*.

When *SCR1* fires, it applies voltage from battery *B1* to the *R10/C5* circuit, and *C5* begins to charge through *R10* at a rate determined by the value of the resistor. (The lower the value of *R10*, the shorter the charging time.) When *C5* has charged sufficiently to forward bias the emitter junction of *Q4*, a rapid rise in the current between the *B1* and *B2* terminals of *Q4* generates a positive pulse across *R11*.

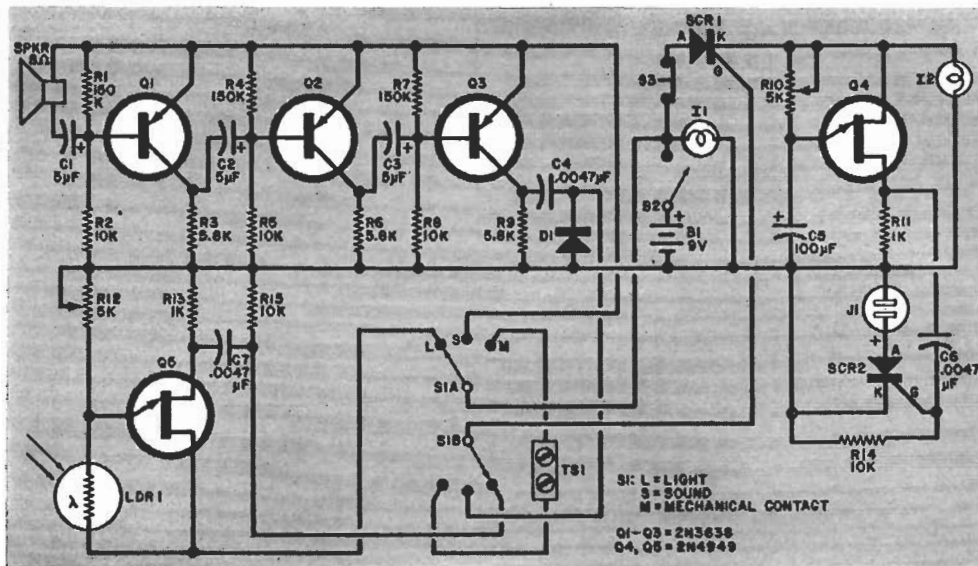
This positive pulse is applied to the gate

of *SCR2*, causing it to conduct current (from inside the flash unit connected to the tripper via *SO1*) and fire the electronic flash. After the cycle is complete, the circuit is reset to its initial conditions by momentarily depressing and releasing pushbutton switch *S3*.

Placing *S1* in position L (light) powers the *Q5* circuit and sets the system up for light tripping. Light falling on light-dependent resistor *LDRI* causes the circuit to trip. Potentiometer *R12* serves as a sensitivity control.

When *S1* is placed in position S (sound), power is applied to the audio amplifier circuit consisting of *Q1* through *Q3*. The speaker (*SPKR*) at the input of *Q1* is used here as a microphone. When a popping or other sharp sound is picked up by this microphone, a pulse is produced which is amplified sufficiently to trigger *SCR1* into conduction and start the timing cycle which, ultimately, fires the flash unit.

The final position of *S1* is marked M for mechanical contact. In this position, neither the light nor the sound circuits is powered. A pair of wires, terminated in a switch or left bare, is connected to terminal strip *TS1*. To start the timing cycle, the switch at the end of the wires need only be mo-



### PARTS LIST

B1—Six 1.5-volt AA cells in series  
 C1-C3—5- $\mu$ F, 15-volt electrolytic capacitor  
 C4,C6—0.0047- $\mu$ F ceramic capacitor  
 C5—100- $\mu$ F, 25-volt electrolytic capacitor  
 D1—1N4001 silicon diode  
 I1,I2—Miniature 10-volt panel lamp  
 J1—Camera shutter jack (includes length of cable)  
 LDR1—Light-dependent resistor (Clairex No. CL704 or similar)  
 Q1-Q3—2N3638 transistor  
 Q4,Q5—2N4949 unijunction transistor  
 R1,R4,R7—150,000-ohm,  $\frac{1}{2}$ -watt resistor  
 R2,R5,R8,R14,R15—10,000-ohm,  $\frac{1}{2}$ -watt resistor

R3,R6,R9—5800-ohm,  $\frac{1}{2}$ -watt resistor  
 R10,R12—5000-ohm linear-taper potentiometer  
 R11,R13—1000-ohm,  $\frac{1}{2}$ -watt resistor  
 S1—Double-pole/3-throw non-shorting rotary switch  
 S2—Spst switch (part of R10)  
 S3—Normally-closed pushbutton switch  
 SCR1,SCR2—Silicon controlled rectifier (1 ampere, 200 volts)  
 SPKR—8-ohm, 2 $\frac{3}{4}$ -in. diameter speaker  
 TS1—Two-lug, screw-type terminal strip  
 Misc.—Bakelite or metal utility box; perforated board and solder clips; battery holder; pointer knobs (2); rubber grommet (for J1 cable exit hole); hookup wire; solder; hardware; etc.

The delay circuit, composed of two SCR's and Q4 is triggered by signals from either the audible input through speaker, light striking LDR1, or a switch action at TB1.

mentarily closed or the bare wires momentarily touched together.

The time lag between the firing of SCR1 and the completion of the cycle with the firing of SCR2 can be varied by adjusting potentiometer R10.

**Construction.** The circuit of the photoflash tripper is very simple, lending itself nicely to almost any type of chassis assembly. Just be sure that you observe proper polarity and basing connections.

When you mount LDR1 in the chassis box you have chosen for your project, make certain that there is an access hole for the light to fall on the active element of this component. A good mounting method is to use an ordinary plastic pill container, its inside surfaces painted flat black, to hold the LDR.

When you wire the shutter cord into the tripper (this cord is terminated in J1), make certain that it is properly polarized. If it is improperly wired, the photoflash will not trigger because current flow through SCR2 is unidirectional.

**How To Use.** Photography with the tripper requires the use of "red blind" ortho film. This permits the setup to be made in an area illuminated by only a dark red safe light.

Immediately before action begins, open the camera's shutter and leave it open until after the flash has fired. Setting the amount of delay required for any given filming sequence will have to be determined by trial and error. You can estimate how much delay is required by observing the event in total darkness.  $\diamond$