MAURI ORA, 1973, 1: 13-15

AN ANIMAL COUNTER USING A CAMERA AND TRIGGER SYSTEM

T.J. CARRYER,

Department of Zoology, University of Canterbury,
Christchurch, New Zealand.

ABSTRACT

A light beam system for triggering a camera, suitable for counting and identifying animals using a 'run', is described.

INTRODUCTION

A problem encountered by many zoologists is that of obtaining animal movement data. The system described here was devised to count and identify tagged opossums (*Trichosurus vulpecula*) using a 'run' at night. An animal crossing a light beam triggers a 35 mm motor-drive camera.

TRIGGER SYSTEM

The trigger system consists of a light source and photosensor placed about 2 m apart across the opossum run.

Light source: In the prototype the light source consisted of a 6 volt projector-type bulb (operated at 3 volts), focused with a condensor, through a red filter, onto the sensor. This produced a low intensity red beam, though any light beam, including infrared for an 'invisible' beam, would be satisfactory.

Photosensor: This consists of a light dependent resistor (L.D.R.) mounted at the base of a 600 mm length of 20 mm diameter grey P.V.C. tube. Interruption of the light beam produces a resistance change in the L.D.R. which triggers an electronic switch.

CIRCUIT OPERATION

The circuit is shown in Fig 1, i. With the L.D.R. (PCC1) illuminated, a resistance of 20 kilohms is obtained. Occlusion of the light beam increases this to approximately 1 Megohm. This reduces the bias voltage from the voltage divider $CC1/R_3$ to the base of TR_1, turning TR_1 off. R_3 is used to set the bias voltage at 550 to 600 mV for the unilluminated state. When TR_1 stops conducting, the base bias of TR_2 increases, making TR_2 conduct. This develops a potential across R_5, firing the 'Schmitt Trigger' TR_3 and TR_4. The brief pulse generated here turns on TR_5 which switches the 'load'.

If a switch-on time of 5 sec to 1 min is required to operate a movie camera, then the Schmitt Trigger Circuit can be changed

to give a longer pulse (Fig 1, ii); the greater the value of C_{102}, the longer the pulse.

In the prototype the relay in the motor drive unit powered by the 12 volt motor drive supply at 20 MA, produced the load. However, any electromagnetic device, relay or counter, can be used here. If a higher voltage than the 9 volt regulated supply is required to operate the load, an external supply of up to 50 volts DC can be used (Fig 1, iii) and for higher current requirements TR_5 can be changed to a high power NPN type.

The inclusion of the 'Schmitt Trigger' was considered necessary to prevent a high current drain through the load, should the light beam remain broken for any length of time.

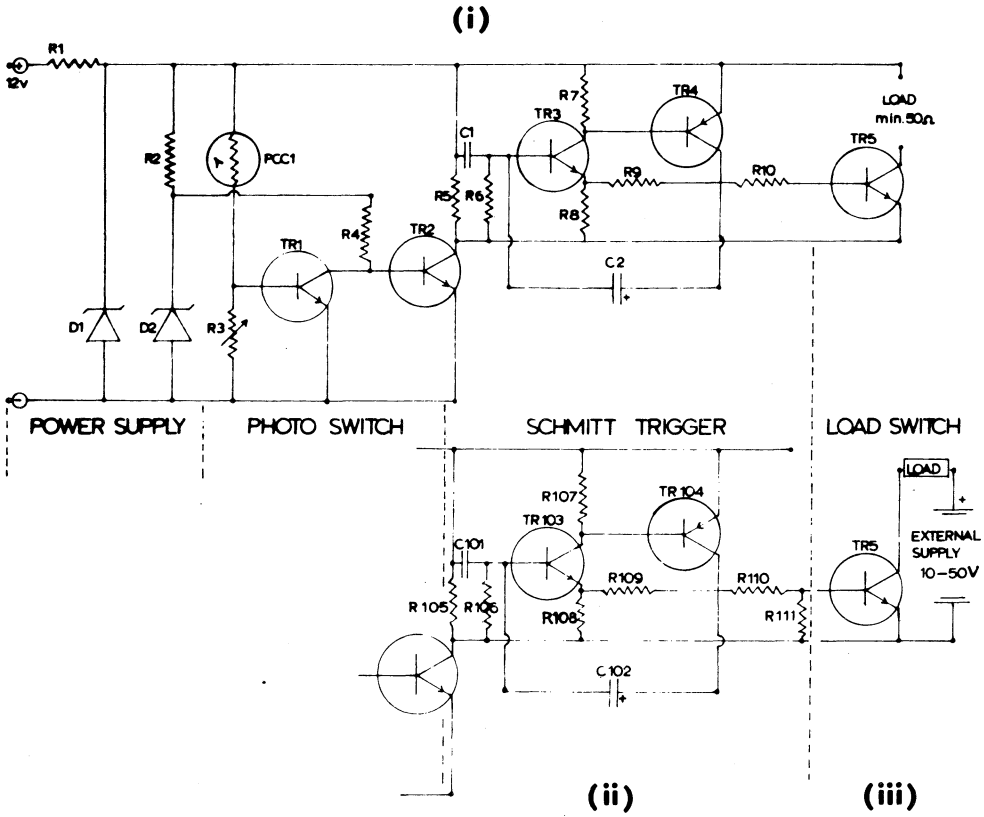

Fig. 1. Light activated relay driver.

COMPONENTS

R_1	12 ohm 1/2 watt	C_1	0.05 microfarad Mylar 50
R_2	5.6 kilohm 1/2 watt	C_2	12 " Electro 25
R_3	100 " Trimpot		
R_4	33 " 1/2 watt	D_1	1S3009A 9 volt Zener diode
R_5	4.7 " " "	D_2	1S2039A 3.9 volt Zener diode
R_6	1.2 " " "		
R_7	2.2 " " "	TR_1	BC109 TR_{103} BC109
R_8	1 " " "	TR_2	BC107 TR_{104} AC128
R_9	1 " " "	TR_3	AC127
R_{10}	100 ohm " "	TR_4	AC128
R_{105}	470 kilohm	TR_5	BC107
R_{106}	3.9 Megohm		
R_{107}	2.2 kilohm	C_{101}	0.05 microfarad Mylar 50
R_{108}	12 "	C_{102}	2.2 " Electro 250
R_{109}	12 "		
R_{110}	680 ohm	PCC1	LDR Phillips
R_{111}	680 "		