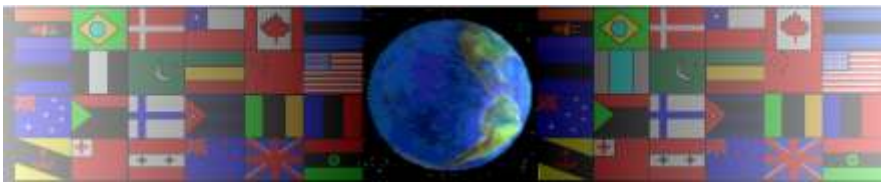
THE 555 IC

On behalf of The World Association of Technology Teachers

W.A.T.T.

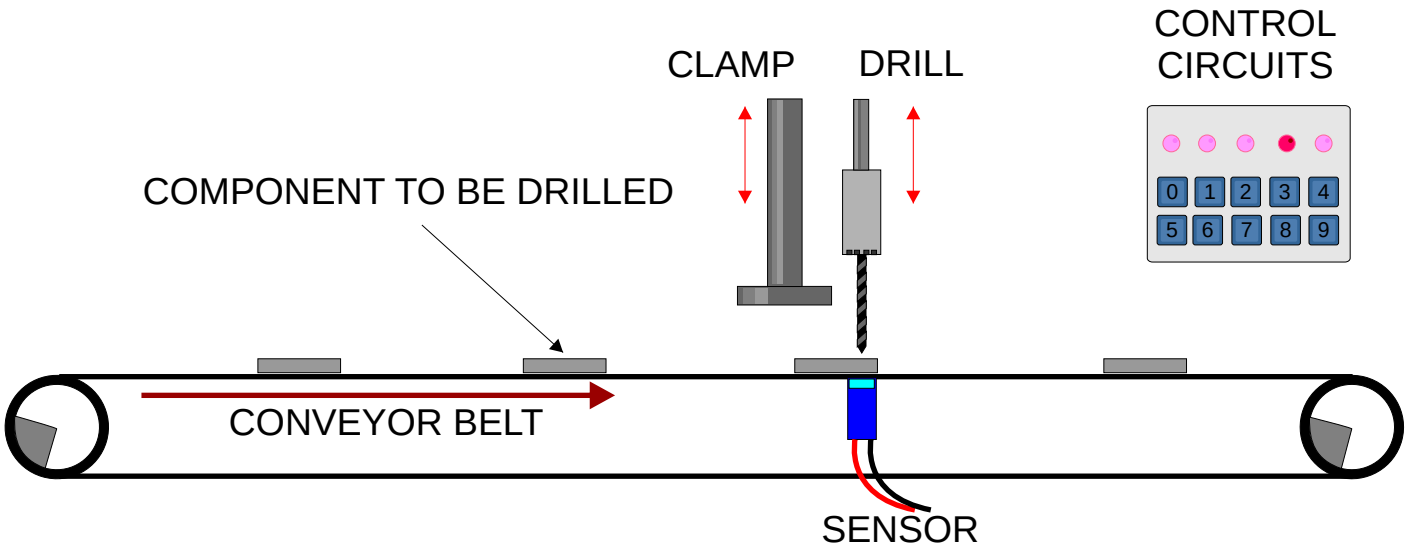


World Association of Technology Teachers

This exercise can be printed and used by teachers and students. It is recommended that you view the website (www.technologystudent.com) before attempting the design sheet .

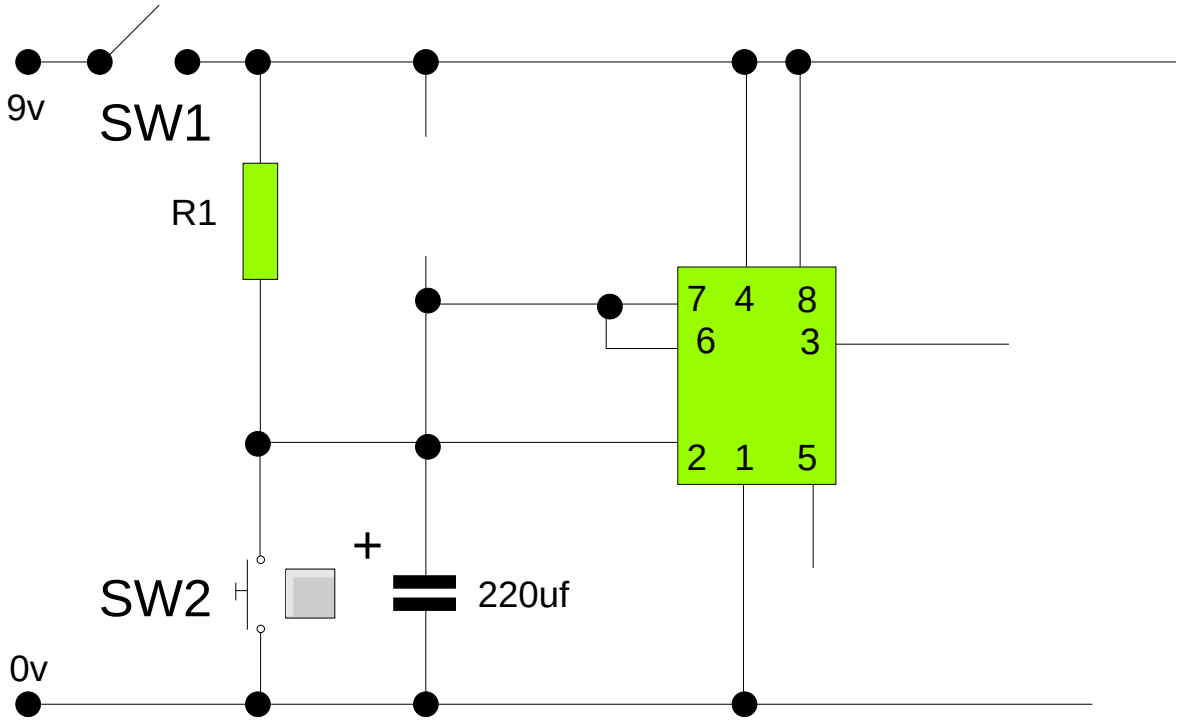
EXAMINATION QUESTION

1. The following question is based on the 555 monostable circuit. The circuit shown is part of a production line and controls the timing sequence. The automated production line is shown below. Parts / components move along the production line where they are sensed, clamped down, drilled and then released, moving down the production line again. The 555 monostable circuit controls the timing of the entire production line.



The timer circuit is found inside the control circuit box. The incomplete circuit diagram is found below. Add the following components to complete the timer circuit:

A. 0v and 9v supply
B. A variable resistor for altering the length timing sequence.
C. A buzzer that sounds during the timing sequence.



D. Explain how your completed circuit works.

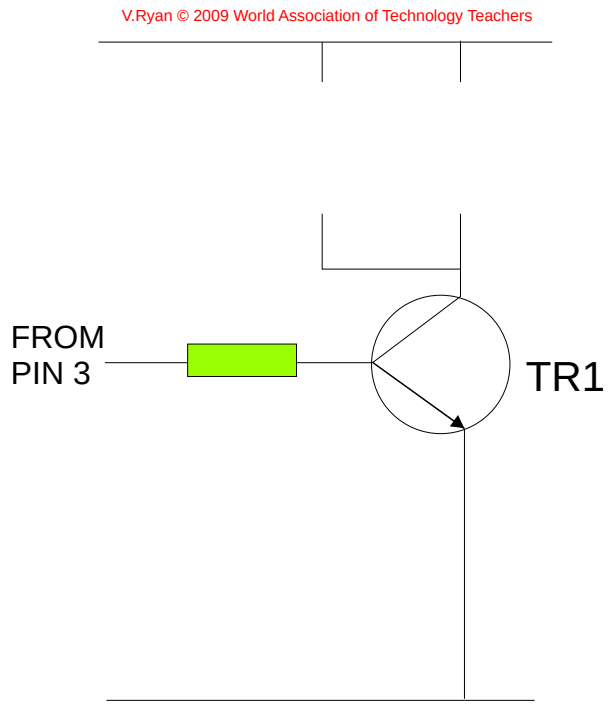
2. What is the role of the variable resistor and capacitor?

3. The 555 timer is an IC. What does IC mean?

4. The 555 timer has a DIL layout. What does DIL mean?

5. It has been found that the sound emitted by the buzzer is too low. A circuit designer has suggested that a relay be added. The circuit also needs protecting by the addition of another component placed in parallel with the relay. (See layout below)

Complete the circuit diagram by adding the relay and a suitable additional 'protecting' component.



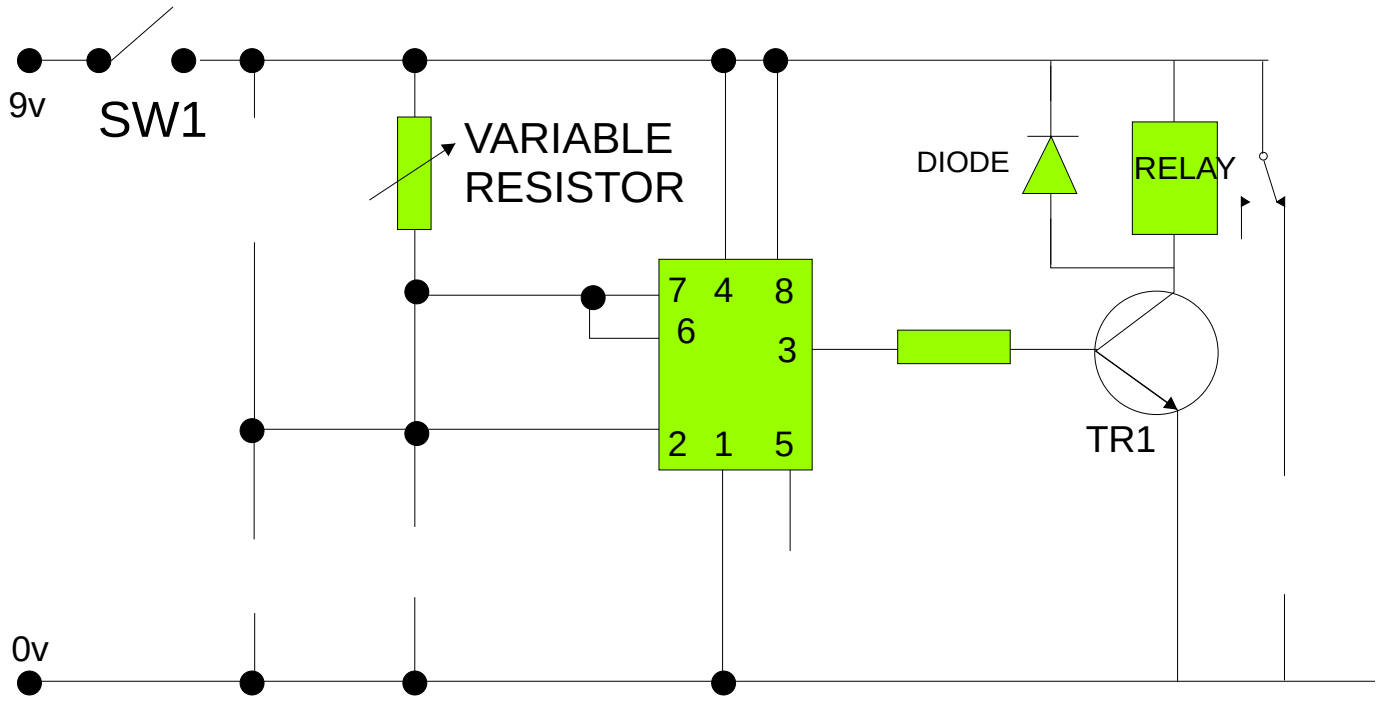
6. Name the component that protects the circuit and explain how it does this.

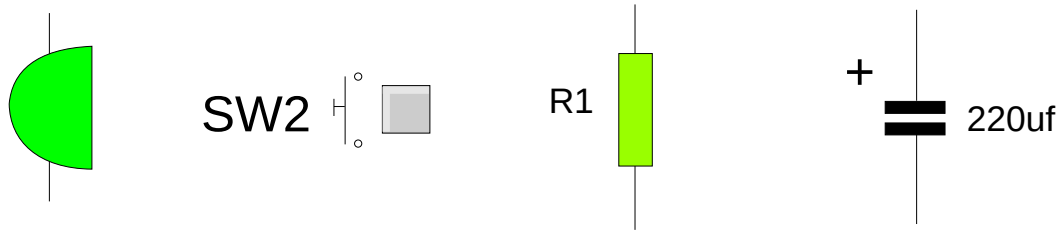
NAME: _____

How the component protects the circuit.

7. What is back EMF ?

8. The incomplete timer circuit is shown below. Some components are missing. Draw the missing components in the correct positions, adding suitable labels. The missing components are shown below the circuit diagram.





BUZZER SWITCH BUZZER CAPACITOR

9. In the space below explain how the entire circuit works. Include an explanation of the key components and their role in the circuit.