555 Timer IC project, 70-0225

This project can be built to produce one of two configurations: Astable and Monostable.

- For the **Astable configuration**, please refer to pages 1 and 2.
- For the **Monostable configuration**, please refer to pages 3 and 4.

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Astable configuration.

This connection produces a continuous rectangular wave at the output. The frequency of this wave is controlled by R1, R2, VR2 and C1. The amplitude of the output waveform is between 0V and the positive supply.

When set to a low frequency (1Hz) the LED will flash, at higher frequencies the LED will appear to be on all the time.

This type of waveform generator can be used to drive small piezo sounders.
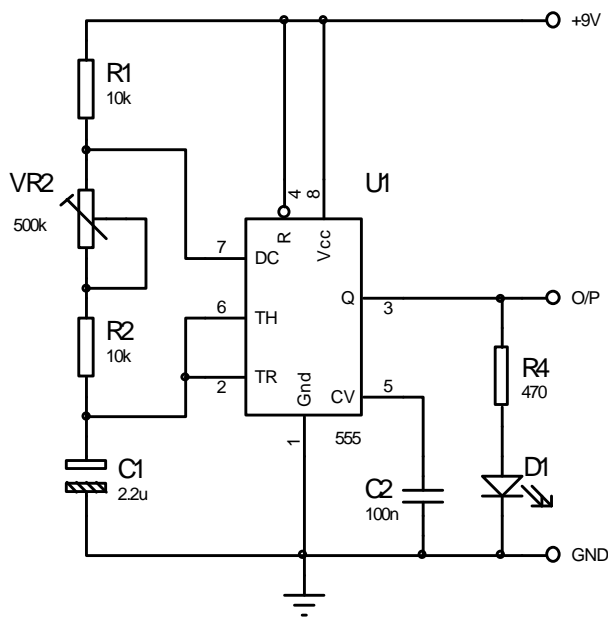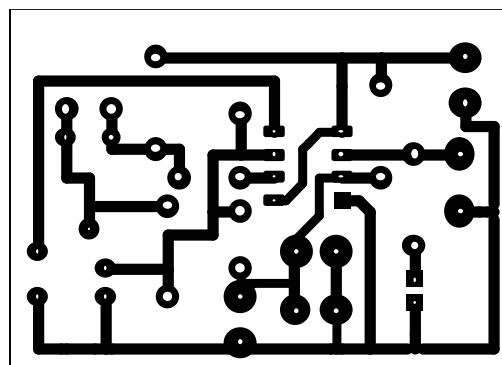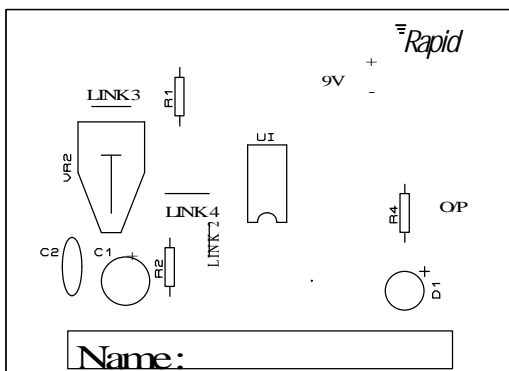

Astable (Links 2 & 4)

The output frequency of this astable is given by

$$F = \frac{1}{0.7(R_1 + 2(R_2 + VR_2))C_1}$$

VR_2 will vary the frequency.

If the output frequency is to be fixed then VR_2 is replaced with LINK 3 and the output frequency is given by: -

$$F = \frac{1}{0.7(R_1 + 2R_2)C_1}$$

Assembly. This circuit is for 1Hz. To assemble this circuit follow the procedure on page 2.

Procedure

1. Identify all the components and the wire you will use for the links.
2. Place and solder Links 2 and 4. Then Resistor R1, R2 and R4.
3. Now place and solder VR2 and the IC socket.
4. Finally place and connect C1, C2 and D1. Connect the battery clip.
5. Now insert the IC into the socket.
6. Check the circuit works by connecting the battery. The LED should flash, to adjust the flashing rate adjust VR2.

Component List

| Reference	Description	Rapid Order Code
R1 and R2	10kΩ 0.25W	62-0394
R4	470Ω 0.25W	62-0362
C1	2.2μF 63V	11-0210
C2	100nF 25V	08-0235
U1	NE555	82-0336
IC Socket	8 pin DIL	22-0150
D1	Red LED	55-1790
VR2	500kΩ preset	51-6431
PCB	555 PCB	70-0230
Battery clip	PP3 clip	18-0094
Link 2, 3 ,4	22swg tinned copper wire	
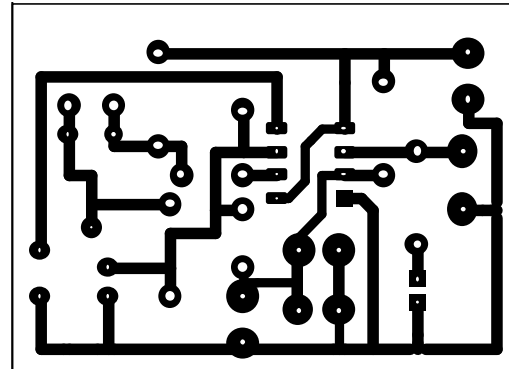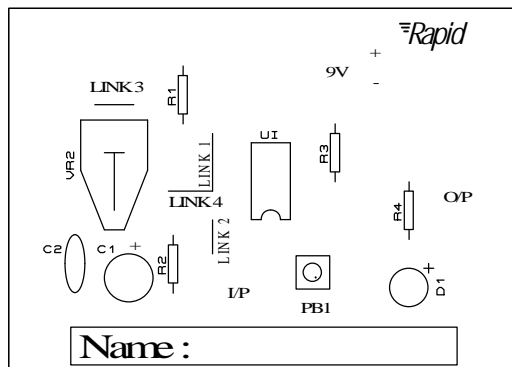
Complete PCB and layout

Monostable configuration.

This connection produces a time delay when the circuit is activated. The time that the output is positive controlled by R1,R2,VR2 and C1. The output voltage is 0V when the timer has timed out and the positive supply during the timed period.

When set to a long time delay (1 second or more) the LED will stay on for the duration of the time delay. At shorter time delays the LED will appear to be off all of the time.
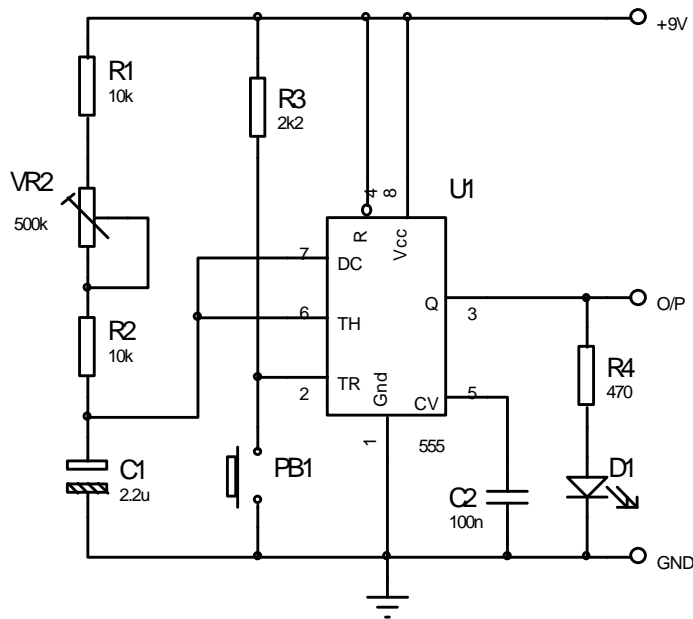
MONOSTABLE   (LINK1)
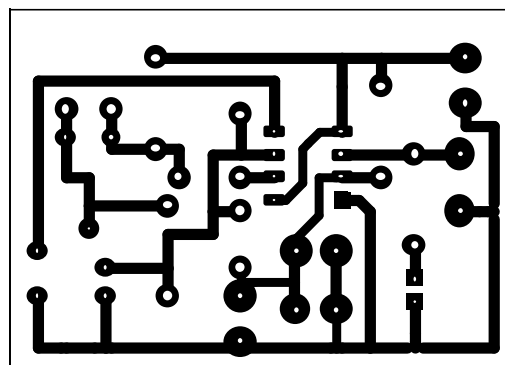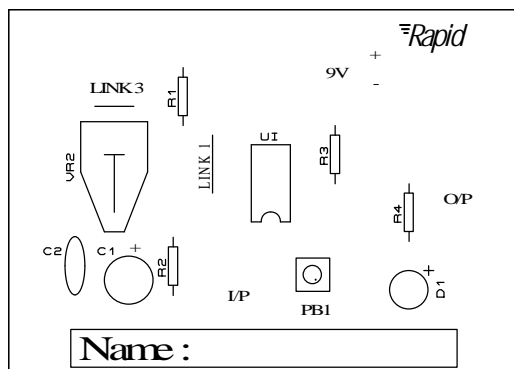
The time delay of this monostable is given by :

$$T = 0.7(R_1 + R_2 + VR_2)C_1$$

VR_2 will vary the time delay.

If the output time delay is to be fixed then VR_2 is replaced with LINK 3 and the output delay is given by: -

$$T = 0.7(R_1 + R_2)C_1$$

Assembly.   This circuit is for a 1second time delay. To assemble this circuit follow the procedure on page 2.
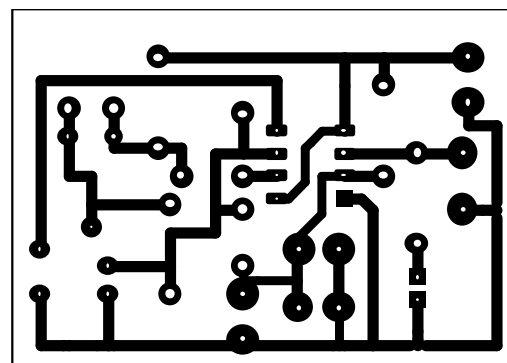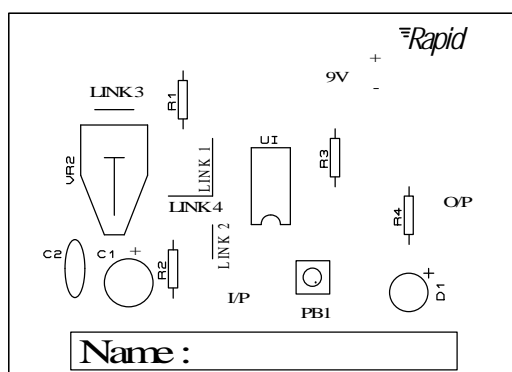
Procedure

1. Identify all the components and the wire you will use for the links.
2. Place and solder Link 1. Then Resistor R_1, R_2, R_3 and R_4.
3. Now place and solder VR_2 the IC socket and the push button.
4. Finally place and solder C_1, C_2 and D_1. Connect the battery clip.
5. Now insert the IC into the socket.
6. Check the circuit works by connecting the battery. The LED should light for about 1 second when the push button is momentarily pressed. To adjust the time delay, adjust VR2.

If longer delays are needed then change the 2.2μF to 10μF or 22μF.

Component list

Reference	Description	Rapid Order Code
R1 and R2	10kΩ 0.25W	62-0394
R3	2.2kΩ 0.25W	62-0378
R4	470Ω 0.25W	62-0362
C1	2.2μF 63V	11-0210
C2	100nF 25V	08-0235
U1	NE555	82-0336
IC socket	8 Pin DIL	22-0150
D1	Red LED	55-1790
VR2	500kΩ preset	51-6431
Push button	SPST tactile switch	78-0620
PCB	555 PCB	70-0230
Battery clip	PP3 clip	18-0094
Link 1, 3	22swg tinned copper wire	

Complete PCB and layout