

**TECHNOLOGICAL UNIVERSITY (MAUBIN)**

**DEPARTMENT OF ELECTRONIC ENGINEERING**

**TRAFFIC LIGHT**

**BY**

**DAW LAY LAY NEW**

**Assistant Instructor**

**Department of Electronic Engineering**

# TRAFFIC LIGHT

A traffic light system is a very useful system to control the car complexity. It is the device that indicates the car to go or stop.

## Objective

By constructing this project, we have...

1. to know the electronic components
2. to know how to test and install these components
3. to know how to operate traffic light

## Equipment Required

- Multi-meter
- Soldering Gun
- Lead Coil
- Sucker
- Screw Driver
- Cutting Device
- Tools box
- Project Board
- Battery
- Connection wire

## Components Required

### 1. Resistor

1 K $\Omega$  (8 Nos)

2.2 K $\Omega$  (8 Nos)

2.7 K $\Omega$  (1 No)

470 K $\Omega$  (1 No)

### 2. Variable resistor

220 K $\Omega$  (1 No)

### 3. Capacitor (electrolytic)

10  $\mu$  F/16V (1No)

4.7  $\mu$  F/16V (1No)

## 4. Capacitor (mylar)

333(0.033 $\mu$  F) (1No)

## 5. Diode

1N4148 (15 Nos)

## 6. Transistor

C945 (or) Any n-p-n Transistor (6 Nos)

## 7. LED

Red color (4 Nos)

Yellow color (4 Nos)

Green color (4 Nos)

## 8. IC

555 Timer (1No)

4017 Counter (1No)

## 9. Battery

9 V (1No)

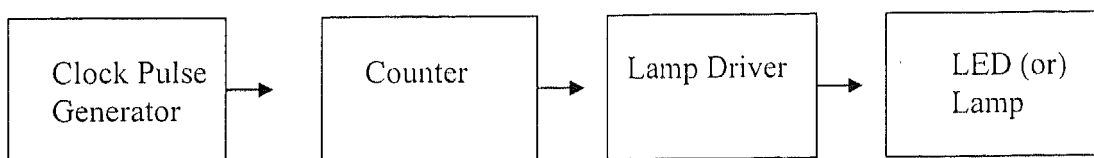
## 10. Others

Circuit board (1No)

Copper wires (few pieces)

Operation

In this circuit, there are four basic parts to operate. These four parts are described following by block diagram. This circuit is simple, but very useful.



Most digital circuits need clock signal to operate necessary function property. Clock pulse generator produces clock signal which is square wave to drive circuit. Square wave can be symmetrical in which the high level period and low level period are equal or unsymmetrical in which the period are not equal.

In this circuit IC 1 (555), the astable mode acts as the clock. The value of  $R_a$ ,  $R_b$  and  $C_1$  determine the time period, according to the relationship;

$$T = 0.693 ( R_a + R_b ) C_1$$

The IC2 (4017) decade counter acts as a counter. The outputs Q0, Q1, Q2 and Q3 are summing with the switching diodes 1N4148. The outputs Q5, Q6, Q7 and Q8 are summing too. The first period, the LED G1, G3 and R2, R4 will be “on”, the LED will be “off”. The second period, the LEDs G1, G3 are “off” and Y1, Y3 will be “on”. The LEDs R2, R4 will continue “on”. The third period, the LEDs G2, G4 and R1 and R3 will be “on” and other LED “off”. The fourth period, the LEDs Y2, Y4 will be “on” and the LEDs R1, R3 will continue “on”. If so, the decade counter IC2 (4017) will count from the first period.

In this circuit, the switching diodes (D1 to D14) are used to protect the output shock of the IC2 (4017). The LEDs are three colors in Red, Yellow, and Green. Moreover, you can change the delay time of the output of the IC1 (555) by adjusting the Rb.

The output of the IC2 can not accept over 200 mA. So we use the transistor as the LEDs driver.

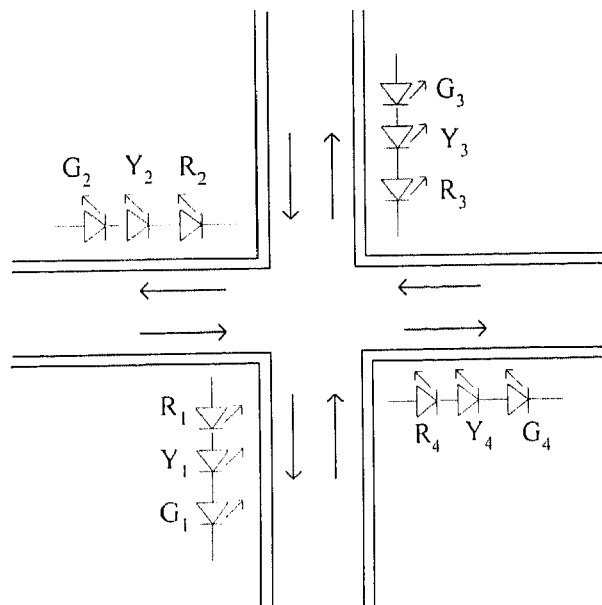


Fig: A Typical Road Crossing Model

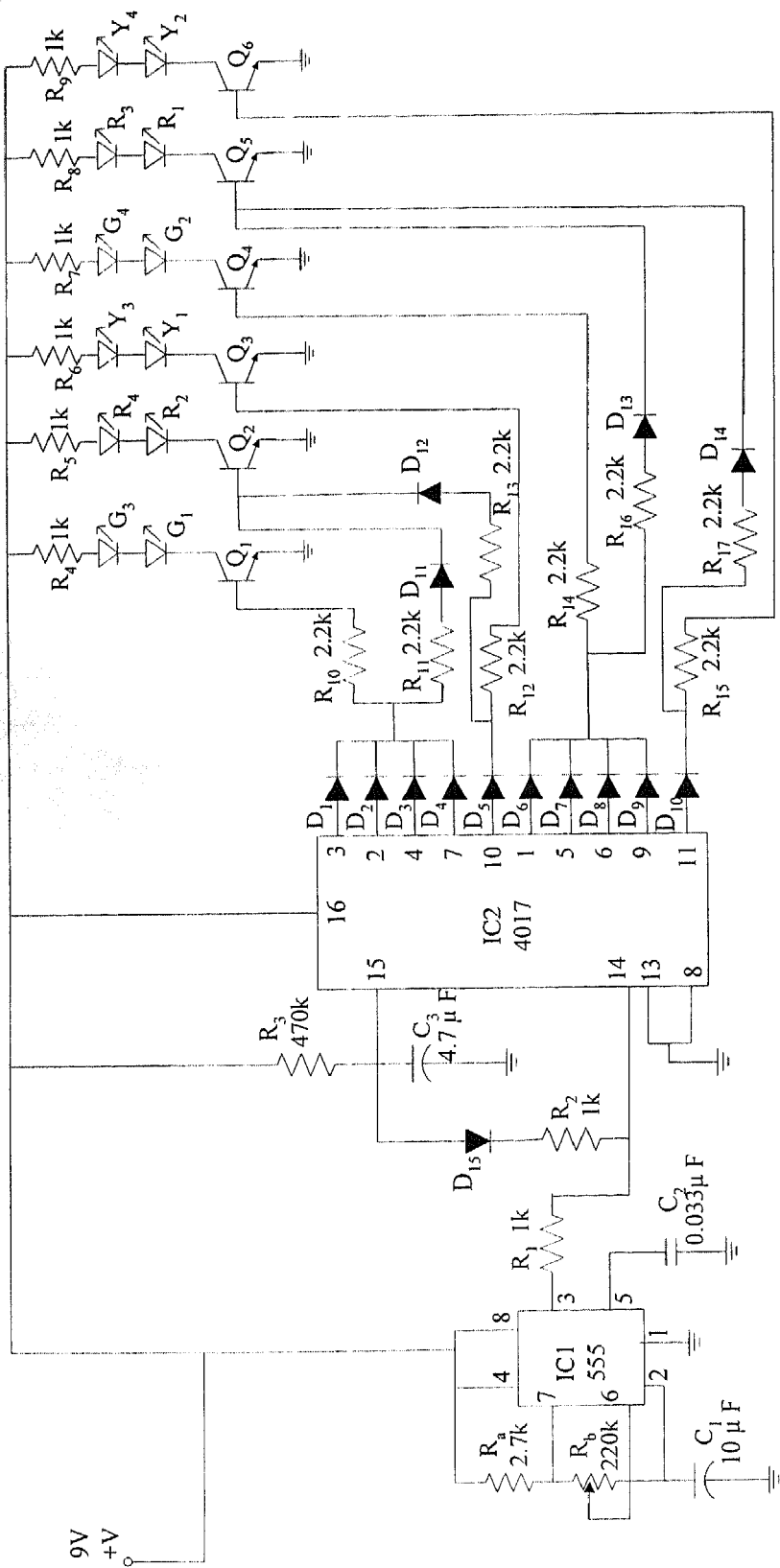


Fig: Circuit diagram of Traffic Light