Project :-Metal detector using 555 timer IC

# Components required:-

|  |  |  |
| --- | --- | --- |
| Serial no. | Component required | quantity |
| 1. | 555 TIMER IC | 1 |
| 2. | ELECTROLYTIC CAPACITOR(1MF) | 1 |
| 3. | ELECTROLYTIC CAPACITOR(2.2MF) | 1 |
| 4. | ELECTROLYTIC CAPACITOR(10MF) | 1 |
| 5. | INSULATED WIRE(USED IN FAN WINDING) | 1 |
| 6. | RESISTOR(47K) | 1 |
| 7. | SPEAKER OR BUZZER | 1 |

**DESCRIPTION:-**

The 555 IC timer here acts as a square wave generator and it generate pulses with frequencies audible to human.

The capacitor between pin2 and pin1 should not be changed as it is need to generate audible frequencies.

In the circuit there is an RLC circuit formed by 47K resistor, 2.2µF capacitor, and 150turn inductor.

This RLC circuit is the metal detection part. Now as mentioned earlier in previous section, a metal core inductor has a high inductance value over a air cored one.

Remember the coil wound here is a air cored one, so when a metal piece is brought near the coil, the metal piece acts as a core for the air cored inductor.

By this metal acting as a core, the inductance of the coil changes or increases considerably.

With this sudden increase in inductance of coil the overall reactance or impedance of the RLC circuit changes by a considerable amount when compared without the metal piece.

At first when there is no metal piece the signal fed to speaker causes some audible sound.

Now with the reactance change around the RLC circuit the signal sent to speaker will no longer be the same as before, because of this the sound produced by the speaker will be of different to the first one.

So whenever a metal is brought near the coil, the impedance of RLC changes making the signal to change resulting in variation to sound generated in speaker.



