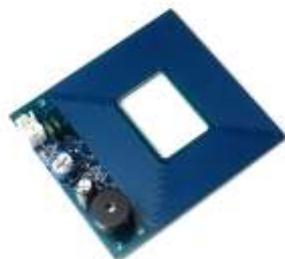


Metal Detector Module



DESCRIPTION

The Metal Detector Module is a basic but complete metal detector. Just add power and start finding treasure in your couch seat cushions.

PACKAGE INCLUDES:

- Metal Detector Module

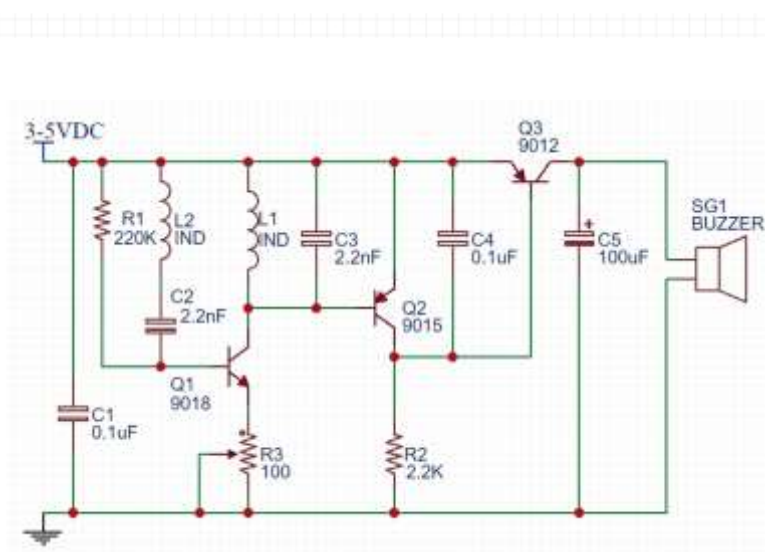
KEY FEATURES OF METAL DETECTOR MODULE:

- Built-in PCB trace detector coil
- Buzzer detection alert
- Sensitivity adjustment
- 3 to 5V operation

Virtually all metal detectors work on the same basic principal of using an oscillator that incorporates an inductor(s) as part of an oscillation circuit. That inductor is composed of wire windings in the sensor head (or in this case, it is PCB traces in a spiral pattern).

Any metal that comes into proximity with this inductor causes its electrical characteristics to change. That change affects the oscillator frequency or amplitude and that is what alerts us via a buzzer or some other user interface as to the presence of a metallic object.

This module implements a Colpitts oscillator using Q1, some of the capacitors and resistors and the 2 inductors (there is one on top of the board and one on bottom of board). The oscillator runs at around 300kHz. When metal comes near, the output transistors Q2 and then Q3 are biased on which results in the buzzer sounding.



The module includes a potentiometer R3 that allows for adjustment of the sensitivity. If the sensitivity is set too high, the buzzer will sound continuously. Turning the pot CCW just until the buzzer stops sounding when no metal is present will set the detector for maximum sensitivity.

There are 4 screw holes that can be used for mounting a handle of some type if desired.

Module Connections

To power the module, connect 3 to 5V to the **V+** break-out point and Ground to the **V-** break-out point. This will typically require soldering wires to these two points.

OUR EVALUATION RESULTS:

Metal detectors can be a very interesting area for experimentation with a lot of opportunity for adding functionality such as microprocessor control, LCD displays, larger more powerful inductor coils and more.

This module is basic but illustrates the general concepts of a metal detector and it is possible to hot rod it if you are so inclined.

In its current state, it can detect up to about 2" away depending on the size of the target. The weakest link on this module is the PCB traces that are used for the inductor because the PCB traces do not concentrate the magnetic flux like actual wire windings would and that limits the sensitivity.

TECHNICAL SPECIFICATIONS

Operating Ratings		
V _{cc}	Range	3.0 to 5V
I _(typ)	Without buzzer sounding	5mA
I _(typ)	With buzzer sounding	28mA
Sensitivity	Detection Distance	5cm (2") Typical
Dimensions		
	L x W (PCB)	65 x 60mm (2.5 x 2.4")