COURSE:

BASIC ELECTRONICS

INSTRUCTOR:

SIR USMAN ARAB

ACADEMIC YEAR SUMMER -18

PROJECT REPORT OF METAL DETECTOR

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PROJECT REPORT OF BASIC ELECTRONICS

PROJECT NAME:

METAL DETECTOR

Group Members:

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Components:

- 555
- 47 kΩ resistor
- Two 2µ2 F capacitor
- 10 µF capacitor
- PCB
- 9 V battery
- Switch
- Battery
- Connector
- Some wires
- Buzzer
- Copper wire, 0.2 mm in diameter

Tools:

- breadboard and wires, pliers, tweezers, pliers for making holes
- soldering iron and soldering
- wire sharp knife, ruler, pencil and pair of compasses
  hot glue

DESCRIPTION:

Metal detectors work by transmitting an electromagnetic field from the search coil into the ground. Any metal objects (targets) within the electromagnetic field will become energized and retransmit an electromagnetic field of their own. The detector's search coil receives the retransmitted field and alerts the user by producing a target response. Minilab metal detectors are capable of discriminating between different target types and can be set to ignore unwanted targets.

1. Control Box

The control box contains the detector's electronics. This is where the transmit signal is generated and the receive signal is processed and converted into a target response.

2. Search Coil

The detector's search coil transmits the electromagnetic field into the ground and receives the return electromagnetic field from a target.

3. Transmit Electromagnetic Field *(visual representation only - blue)*

The transmit electromagnetic field energizes targets to enable them to be detected.

4. Target

A target is any metal object that can be detected by a metal detector. In this example, the detected target is treasure, which is a good (accepted) target.

5. Unwanted Target
Unwanted targets are generally ferrous (attracted to a magnet), such as nails, but can also be non-ferrous, such as bottle tops. If the metal detector is set to reject unwanted targets then a target response will not be produced for those targets.

6. Receive Electromagnetic Field *(visual representation only - yellow)*
The receive electromagnetic field is generated from energized targets and is received by the search coil.

7. Target Response *(visual representation only - green)*
When a good (accepted) target is detected the metal detector will produce an audible response, such as a beep or change in tone. Many Minilab detectors also provide a visual display of target information such as an ID number or 2 dimensional displays.

CIRCUIT DIAGRAM: