DESIGN A METAL DETECTOR BY USING THE BEAT FREQUENCY TECHNIQUE

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ABSTRACT

Nowadays, many different types of metal detector are available ready built, some of which provide advanced functions and are microprocessor controlled. The intention is not to emulate the performance and features of this unit as top of the range detector often complex and costly. Several methods can be used in order to detect metal. This project is to conducting a metal detector which the metal detector can detect any metal by using the concept of beat frequency oscillator (BFO). This prototype consists of an oscillator producing an alternating current that passes through a coil producing an alternating magnetic field. The purpose to do this prototype is to make an easier to human for example to helps soldiers to find bombs or landmines that had been buried in the soil.

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INTRODUCTION

1.1 INTRODUCTION

A metal detector is one of the sensor to detect any metal object such as the metal object on the beneath soil which is the metal that hidden from human view. The detection of metals has become more important than ever before. Everyone is subjected to such detection, for example at airports. The metal detector works in the same sort of ways as geophysics, but instead of using the Earth's own electrical and magnetic fields.

For detection of nonmagnetic metals, it is based on positioning a conducting sample in an AC magnetic field. According to Faraday's law, the AC field creates an EMF and eddy currents in the sample. The eddy currents modify the magnetic field in the sample. For a sample of simple geometry the changes in the magnetic field can be used for contactless determinations of the electrical resistivity of metals and semiconductors.

Nowadays, the development in technology created are many possible ways of detect metal, such as visual sighting, thermal image camera monitoring, radar detecting and beat frequency oscillator. This metal detector was developed based on Beat Frequency Oscillator (BFO) principle whereby a metal object in a close proximity to a search coil modifies the frequency of an oscillator. Several techniques have been developed for detecting the eddy currents induced in a conducting sample. Of these, the beat frequency oscillations technique is very simple and sensitive. It is easy to explain this technique and to use it in a demonstration of detecting metals using common and inexpensive equipment