METAL DETECTOR ROBOTIC VEHICLE

ABSTRACT

The project is designed to develop a robotic vehicle that can sense metals ahead of it on its path similar to sensing land mines. The robot is controlled by a remote using RF technology. It consists of a metal detector circuit interfaced to the control unit that alarms the user behind it about a suspected land mine ahead. An 8051 series of microcontroller is used for the desired operation.

At the transmitting end using push buttons, commands are sent to the receiver to control the movement of the robot either to move forward, backward and left or right etc. At the receiving end two motors are interfaced to the microcontroller where they are used for the movement of the vehicle. The RF transmitter acts as a RF remote control that has the advantage of adequate range (up to 200 meters) with proper antenna, while the receiver decodes before feeding it to another microcontroller to drive DC motors via motor driver IC for necessary work. A metal detector circuit is mounted on the robot body and its operation is carried out automatically on sensing a any metal underneath. As soon as the robot senses this metal it generates an alarm sound. This is to alert the operator of a possible metal (eg: land mine) ahead on its path.

Further the project can be enhanced by mounting a wireless camera on the robot so that the operator can control the movement of the robot remotely by watching it on a screen.

HARDWARE REQUIREMENTS:
8051 series Microcontroller, RF Tx-Rx, LED, Crystal, Resistors, Capacitors, Diodes, Voltage Regulators, Metal Detector, DC Motors, Motor Driver, Encoder, Decoder, Push Buttons.

SOFTWARE REQUIREMENTS:
Keil compiler
Language: Embedded C or Assembly
BLOCK DIAGRAM TRANSMITTER

6V Battery → Diode → Antenna

FORWARD
LEFT
RIGHT
BACKWARD
ACTION 1
STOP
ACTION 2

8051 series MC

Assembler/Program

RF Module Transmitter

BLOCK DIAGRAM RECEIVER

6V Battery → Diode → Motor

Motor

8051 series MC

Metal Detector

Motor

9V Battery