IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, May 2022
Impact Factor: 6.252

RF Controlled Vehicle with Metal Detection

Wrushali Deshmukh[1], Dhananjay Kedare[2], Neelam Jadhav[3], Kirtesh Shinde[4], Prathamesh Dhage[5]
Lecturer, Department of Electronics & Telecommunication[1]
Students, Department of Electronics & Telecommunication[2,3,4,5]
Bharati Vidyapeeth Institute of Technology, Navi Mumbai, Maharashtra, India
wrushali.deshmukh@reddifmail.com, dkedare0000@gmail.com, neelamjadhav337@gmail.com,
kirteshshinde2002@gmail.com, prathameshdhage03@gmail.com

Abstract: *The project is intended to cultivate a robotic vehicle that can sense metals ahead of it on its path similar to detecting 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 doubted land mine ahead. For controlling the movement of robot either to forward, backward & right or left commands are sent to the receiver by using push buttons of the transmitter. 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 sufficient range (up to 200 meters) with proper antenna, while the receiver decodes before serving it to another microcontroller to drive DC motors via motor driver IC for necessary work. A metal detector circuit is attached on the robot body and its operation is carried out automatically on sensing any metal underneath. The instant the robot senses this metal it produces an alarm sound through buzzer. This is to aware the operator of a probable metal ahead on its path. Further the project can be enhanced by mounting a wireless camera on the robot so that the operator can govern the movement of the robot remotely by observing it on a screen.*

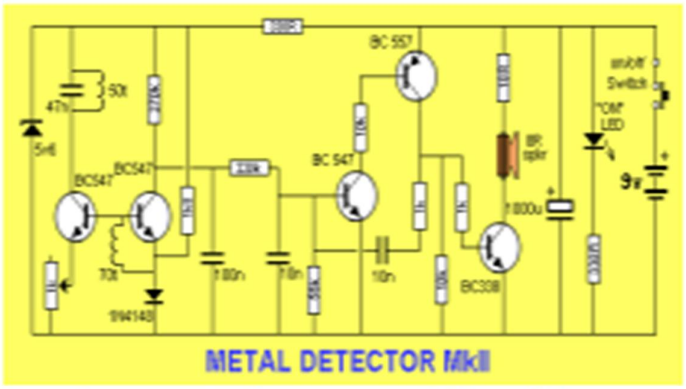
Keywords: Buzzer, Land mines, Microcontroller, Metal Detector circuit, RF Technology.

I. INTRODUCTION

The project is intended to cultivate a robotic vehicle that can sense metals ahead of it on its path similar to detecting land mines. The main purpose of this project is to use radio frequency bands for remote control of robot using radio frequency technology. It comprises of a control unit along with a metal detector circuit that produces alarm sound with a metal detector circuit that produces alarm sound warn the user behind it about land mine or a metal object ahead. An encoder-decoder chips HT12E & HT12D is used for the preferred operation, as this uses radiofrequency signal for the movement of robot, transmitter circuit transmits signal through the air and the receiver communicate to the transmitter through these signals from the air. This robotic vehicle makes use of the transmitter and receiver at 433.92 MHz i.e. at radiofrequency that is available at low cost hence making it very beneficial. The radio frequency based control is more useful as compared to the infrared based control that limits the operating range to only a few meters of distance. Command for controlling the movement of the robot either to move forward, backward and left or right etc. are sent to receiver circuit by using the push buttons of the transmitter circuit. For the movement of the vehicle, at the receiving end two motors are interfaced to the microcontroller. The RF transmitter acts as a RF remote control that has the advantage of sufficient range (up to 150 meters) with proper antenna, while the receiver decodes before serving it to another microcontroller to drive DC motors via motor driver IC for necessary work. A metal detector circuit is attached on the robot body and its operation is carried out automatically on sensing any metal beneath. The instant the robot senses this metal it produces an alarm sound through buzzer. This is to aware the operator about a probable metal (eg: land mines or presence of metals) onward on its path. Further the project can be enhanced by mounting a wireless camera on the robot so that the images around the robot will be transmitted to remote place and user can monitor the images and metal detection alarms on Television.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, May 2022
Impact Factor: 6.252

II. SCHEMATIC DIAGRAM



III. ALGORITHM

1. Running vehicle passing over the land-mine fields with detector.
2. Send alarms, Detect on ground fields, Detect photo of area.
3. Make fusion of sensors.
4. Make summation of alerts, Detect alerts count.
5. Stop robot and start destroying mine.

IV. WORKING

This robotic vehicle works on radiofrequency based transmitter and receiver circuit. The commands required to operate the robot is transmitted by the transmitter circuit and the receiver circuit receives these instructions through radio frequency communication channel present between them and moves the robot conferring to the received commands. A metal detector circuit is placed to the receiver side interfaced to the controller. Thus the robot's movement stops and buzzer starts ringing whenever any metal is detected. The working of metal detector circuit is as, when the electromagnetic field is transmitted from the search coil into the earth, metals in the electromagnetic field will become fortified& resend an electromagnetic signal of their own. The metal detector consists of a search coil which receives the re-transmitted field &aware the user by producing a reaction of the metal. Mine lab metal detectors are accomplished by discriminating between dissimilar types of targets and can be fixed to ignore unwanted metal objects.

V. RESULT

In the model, as we have placed One metal detector circuits on the front part of the vehicle and we have prototype of AP landmines placed on the ground like mine field. So basically, the working of this model that, Whenever the robot or landmine detector passes over the landmine fields, a signal is given from metal detector to the operator placed on the out of the landmine field, because of which the operator on the other end gets alerted and can demine the mine carefully

VI. CONCLUSION

This project presents a metal detecting robot using radio frequency communication with wireless audio transmission and it is designed and put into maneuver with Atmel 89C51 MCU in embedded system field. The robot is moved in finicky track using switches and the Beeping sound is generated. Experimental work has been carried out cautiously. The outcome shows that higher effectiveness is indeed achieved using the embedded system. The proposed method is demonstrated to be highly favorable for the security intention and industrial purpose. The mine sensor endeavor at a constant speed without any problem notwithstanding its extension, meeting the specification required for the mine recognition sensor. It contributes to the enhancement of detection rate, while upgrading the operability as verified by completion of all the detection job as scheduled. The tests confirmed that the robot would not pretense any performance problem for setting up of the mine detection sensor.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 2, Issue 2, May 2022
Impact Factor: 6.252

REFERENCES

[1]. Raj Kamal, "Embedded Systems", Pearson Education Publications.
[2]. Mazzidi, "8051 Microcontroller and Embedded Systems", Prentice Hall Publications, 2nd Edition,2005.
[3]. Edwin S.Grosvenor and Morgan Wesson," Alexander Graham Bell: The Life and Times of the Man Who Invented the Telephone ", New York, Abrams, 1997.