Design Development and Construction of Landmine Detection Robot

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ABSTRACT
Now a day in places like Ukraine and Russia we know that land mines are causing serious threat to the lives of civilians. A land mine is an explosive device that designed to destroy or disable enemy and hided under or on the surface of ground, especially in mine-affected countries like Ukraine and Russia. Most land mines are laid on just below the surface of ground and are activated by pressure or trip-wire. Usually most of the land mines will contain many metallic parts, which can be made use of in their detection. The mines which are embedded amid the war time may stay undetected. As the name suggests detection is done using Metal Detector and hence can be done further away from the mine carefully. Mine detection robot will go from this path where solders passing the roads in mine areas. This is the method in which special purpose of robot are use to find landmines without setting foot into the ground offering safe and efficient way of landmine detection. There are some methods for detection of land mines, such radar bullets, Biological method and mechanical method. These methods are dangerous and risk is involved to life of solider. A safe method for detecting land mines is "Landmine detection robot"
Keywords:- Metal Detector, Bluetooth Module, LCD


I.   INTRODUCTON

In warfare most of causalities are done by buried landmines. The unexploded landmines take several lives even after end of a conflict. Brutal properties of landmines is once it is active, it can be functional for a very long time. Hence there is always a risk of fatal damage and injury causing death. Landmines became effective weapon in warfare as it is cheap and easy to build. Basically, it consists of explosives along with some triggering mechanism. Triggering may be caused by weight. There are several types of landmines depending upon weight it needed to get triggered. When ready, they are buried at shallow depth in soil and hence not easily get spotted with bare eyes

This project presents a review of all the existing and latest techniques devised forth detection of landmines. Electronics has paid an important role in the development and efficient use of some of these techniques Few techniques that a mechanical methods. Working, advantages and limitations of each technique are discussed The performance of the detection system can be enhanced by using multiple technique

BLOCK DIAGRAM
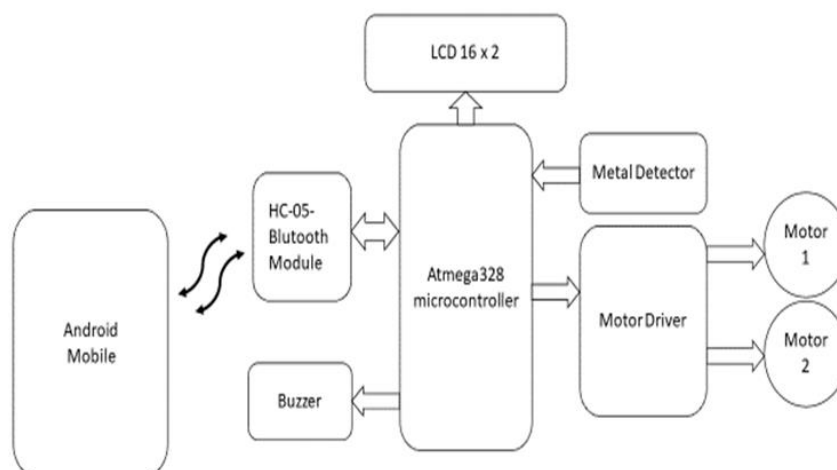
COMPONENT USED

- **Microcontroller Atmega328**

ATmega328 is commonly used in many projects and autonomous systemswhere a simple, low-powered, low-cost micro-controller is needed Node MCU is an open source IoT stage. It incorporates firmware which keeps running on the ESP8266 Wi-Fi Scow fromExpressive Systems, and equipment which depends on the ESP-12 module.

- **HC05 Bluetooth module**

The HC-05 is a class 2 Bluetooth module designed for transparent wireless serial communication. It is per-configured as a slave Bluetooth device. Once itis paired to a master Bluetooth device such as PC, smart phones and tablet, its operation becomes transparent to the user. HC-05 has red LED which indicates connection status. When it gets connected to any other Bluetooth device, its blinking slows down to two seconds. This module works on 3.3 V. It is used to connect 5V supply voltage as well since the module has board 5 to 3.3 V regulator

- **L298 motor driver**
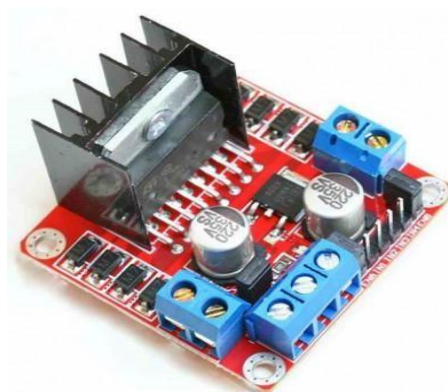
The Motor Driver is a module for motors that allows you to control the working speed and direction of two motors simultaneously This Motor Driver is designed and developed based on L293D IC. L293D is a 16 Pin Motor Driver IC. This is designed to provide bidirectional drive currents at voltages from 5 V to 36 V.

- **12volt DC geared motor 100 RPM**

A DC engine is any of a class of turning electrical machines that changes over direct flow electrical vitality into mechanical vitality. The most widely recognized sorts depend on the powers delivered by attractive fields. About a wide range of DC engines have some interior system, either electromechanical or electronic, to intermittently alter the courseof current stream in part of the engine.

- **Metal detector module**
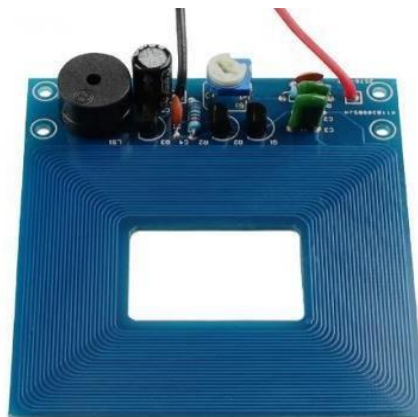
A metal locator is an electronic instrument which recognizes the nearness of metal close-by. Metal identifiers are valuable for discovering metal considerations covered up inside articles, or metal items covered underground. They frequently comprise of a handheld unit with a sensor test which can be cleared over the ground or different articles. In the event that the sensor draws close to a bit of metal this is demonstrated by a changing tone in headphones, or a needle proceeding onward a pointer. Normally the gadget gives some sign of separation; the closer the metal is, the higher the tone in the headphone or the higher the needle goes.

Another basic sort are stationary "stroll through" metal indicators utilized for security screening at passageways in detainment facilities, town halls, and airplane terminals to identify covered metal weapons on an individual's body.

II. RESULT
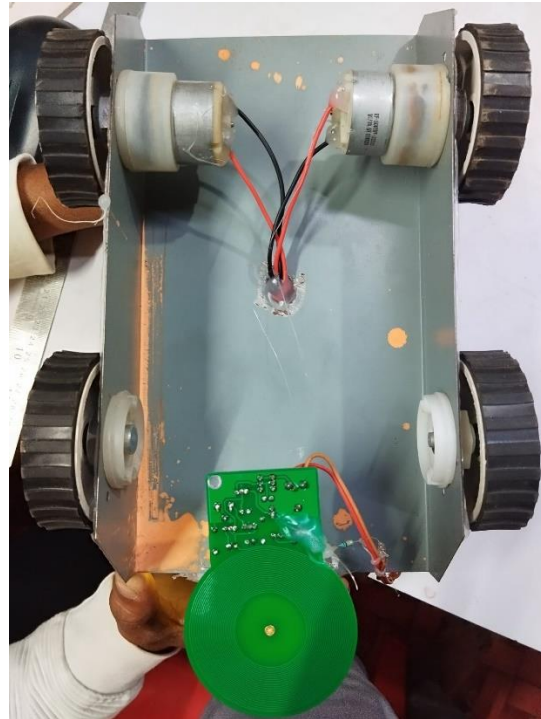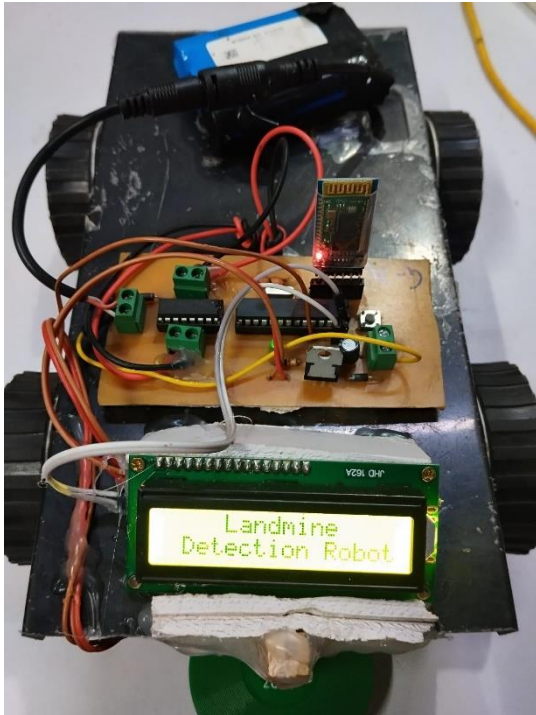
ADVANTEGES

Minimize the major threat to lives. and cause economic problems.Minimize   manual error of finding landmine.
Controlled over remotely via Bluetooth technology.
Gives alarm when landmine is detected and stop robot automatically untilLandmine is defused

DISADVANTAGES

Due to the Bluetooth technology is used to control the robot the range of controlling is limited to 50 meters

III. CONCLUSION

As we know Land mine is a harmful device held in under the earth surface to threat the human lives.
By developing this robot, we conclude that by use of the robot we can minimizes this threats
This robot is very useful to saves all the human beings and with the help of the robot it requires less man force.
The Landmine detecting robots are designed to cover maximum possible area of landmine field for detection of landmines.
 The detected landmines along with scanned and leftover area are represented on a visual map with accuracy in millimeters.

REFERENCES

[1]. P. Panigrahi, A. Barik, Rajneesh R. & R. K. Sahu, "Introduction of Mechanical Gear Type Steering Mechanism to Rocker Bogie", Imperial Journalof Interdisciplinary Research (IJIR) Vol-2, Issue-5, ISSN: 2454-1362,2016.
[2]. Jaradat M A, Bani Salim M N and Awad F H (2012), "Autonomous Navigation Robot for Landmine Detection Applications", 8th InternationalSymposium on Mechatronics and its Applications (ISMA), April, pp. 1-5.
[3]. Muhammad Zubai,Mohammad Ahmad Choudhry," Land mine detecting robot capable of path planning",IEEE journal,22 febraury 2011.Brian D. Harrington and Chris Voorhees, "The Challenges of Designing the Rocker- Bogie Suspension for the Mars Exploration Rover", Proceedings of the 3fh Aerospace Mechanisms Symposium, Johnson Space Center, May 19-21, 2004.
[4]. R.Siegle,"Land mine detection" IEEE instrumentation and measurementmagazine,vol:5,issue:4,Jan 2020.
[5]. D. S. Chinchkar, S. S. Gajghate," Design of rocker bogie mechanism",IARJSET, vol.4,pp 46-49,Jan 2017.