

MATLAB Based Bomb Detecting and Diffusing Robot

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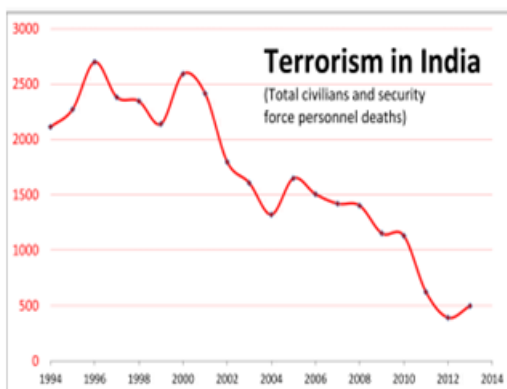
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Introduction:

A common definition of terrorism is the systematic use or threatened use of violence to intimidate a population or government for political, religious, or ideological goals. Terrorism in India, according to the Home Ministry, poses a significant threat to the people of India. Terrorism found in India includes ethno-nationalist terrorism, religious terrorism, left wing terrorism and narco terrorism.



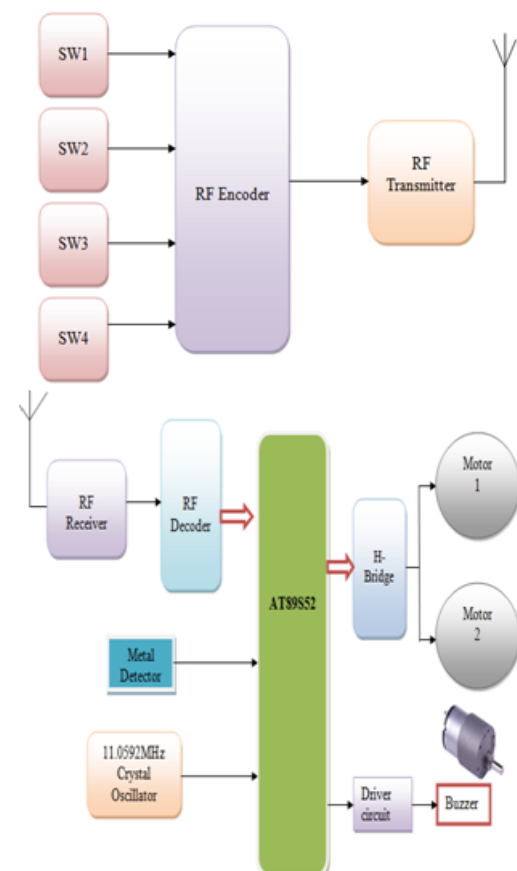
Abstract:

The project aims in designing a Robot to help a human being from a calamity which is capable of moving inside the cave or mine according to the user commands given from PC through Matlab. The robot is operated through PC using wireless Zigbee technology.

Existing Method:

This robot is controlled by a RF remote. This can be moved forward and reverse direction using DC motors. Also this robot can take sharp turnings towards left and right directions. This project uses AT89S52 as its controller. A high sensitive induction type metal detector is designed using colpitts oscillator principle and fixed to this robot.

When the robot is moving on a surface, the system produces a beep sound when metal is detected. The RF modules used here are Transmitter, Receiver, RF Encoder and RF Decoder. The four switches are interfaced to the RF transmitter through RF Encoder. The encoder continuously reads the status of the switches, passes the data to the RF transmitter and it transmits the data. At the receiver end RF decoder takes the data bit wise and moves the robot accordingly.



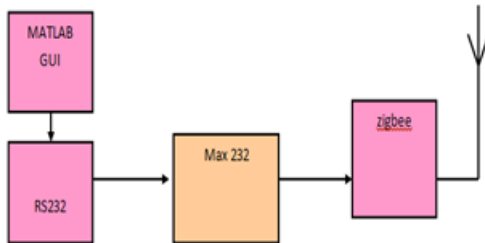
Drawback:

Here only the explosives are detected and then a buzzer alert is given to intimate others. There is no diffusing.

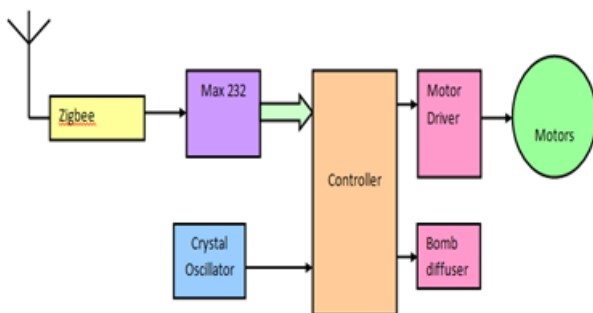
Proposed Method:

The controlling device of the whole system is a Microcontroller. Whenever the user presses a button from the keyboard of the PC, the data related to that particular button is sent through Zigbee module interfaced to PC. It is capable of detecting land mines in its path. This data will be received by the Zigbee module in the robot system and fed this to Microcontroller which judges the relevant task to the information received and acts accordingly on the robot. The Microcontrollers used in the project are programmed using Embedded C language. The robot has a metal detector, which detects the bomb and diffuses it using the cutter. The Buzzer indication is found when the metal is detected.

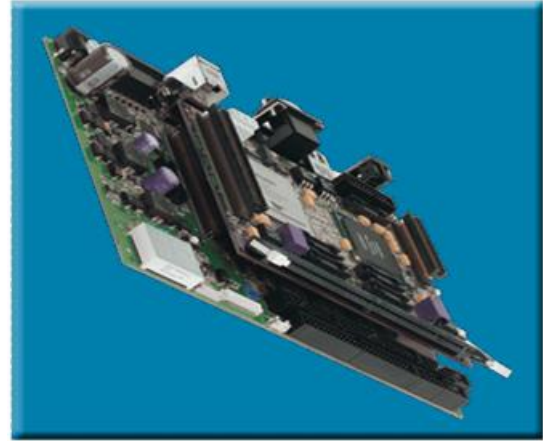
Block Diagram: Transmitter



Block Diagram: Receiver



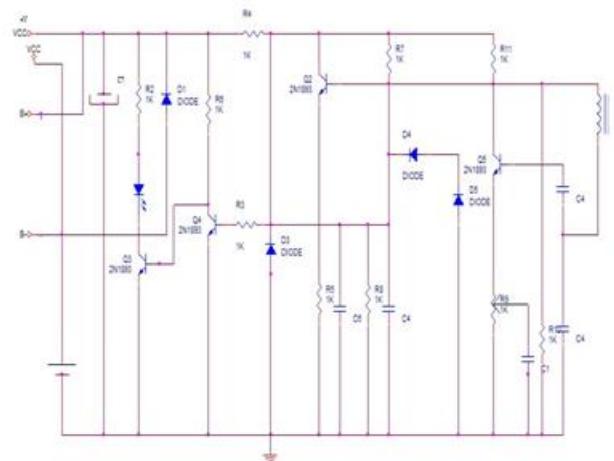
Arm Processor:



ARM7TDMI Processor Core:

- Current low-end ARM core for applications like digital mobile phones
- TDMI
 - T: Thumb, 16-bit compressed instruction set
 - D: on-chip Debug support, enabling the processor to halt in response to a debug request
 - M: enhanced Multiplier, yield a full 64-bit result, high performance
 - I: Embedded ICE hardware
- Von Neumann architecture

Metal Detector:

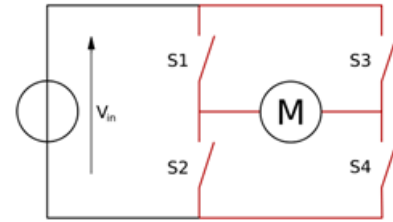
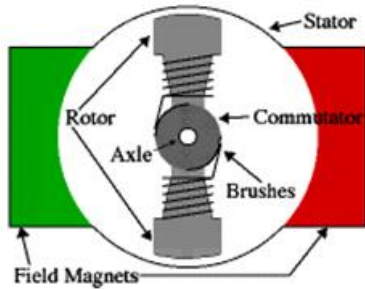


DC Motor:

An electric motor is a machine which converts electrical energy into mechanical energy.

Principles of Operation:

In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. As you are well aware of from playing with magnets as a kid, opposite (North and South) polarities attract, while like polarities (North and North, South and South) repel. The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion.

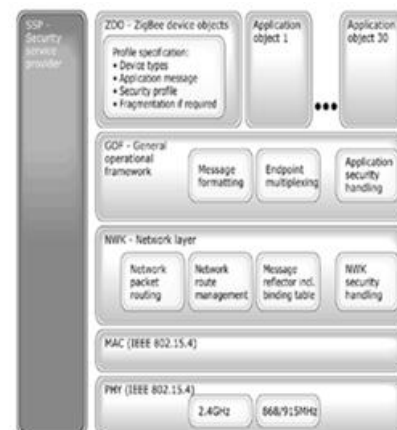


ZigBee module. The €1 coin, shown for size reference, is about 23 mm (0.9 inch) in diameter. ZigBee is a specification for a suite of high level communication protocols using small, low-power digital radios based on the IEEE 802.15.4-2003 standard for wireless personal area networks (WPANs), such as wireless headphones connecting with cell phones via short-range radio. The technology defined by the ZigBee specification is intended to be simpler and less expensive than other WPANs, such as Bluetooth. ZigBee is targeted at radio-frequency (RF) applications that require a low data rate, long battery life, and secure networking. The ZigBee Alliance is a group of companies that maintain and publish the ZigBee standard.

ZIGBEE TECHNOLOGY



ARCHITECTURE:



Applications of Zigbee:



Advantages:

Low cost implementation Efficient Human effort is reduced.

Conclusion:

We have implemented a metal detecting robot in the stream of Embedded system and Matlab using LPC2148 to save the life of people.

The real burning problem of the world is the terrorist attacks. In this proposed work, we introduced to provide a solution.

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A highly enlightened person honored as Master of Technology in Digital Electronics and Communications Systems from Gurunanak Institute of Technical Campus, Hyderabad, with initial award as Bachelor of Technology in Electronics and Communication Engineering from Mahatma Gandhi Institute of Technology, Hyderabad. With her research full knowledge, a paper for International Journal has been published along with having a presence in an International Conference and also is entitled under the membership of Indian Society for Technical Education (ISTE). Her total career experience as of today is of 6 years as an Engineering Teacher and is currently sited as an Assistant Professor in Electronics and Communication Engineering stream at Siddhartha Institute of Engineering and Technology, Ibrahimpatnam, Hyderabad.



Dr.D Subba Rao

Is a proficient Ph.D person in the research area of Image Processing from Vellore -Tech University, Chennai along with initial degrees of Bachelor of Technology in Electronics and Communication Engineering (ECE) from Dr. S G I E T, Markapur and Master of Technology in Embedded Systems from SRM University, Chennai. He has 13 years of teaching experience and has published 12 Papers in International Journals, 2 Papers in National Journals and has been noted under 4 International Conferences. He has a fellowship of The Institution of Electronics and Telecommunication Engineers (IETE) along with a Life time membership of Indian Society for Technical Education (ISTE). He is currently bounded as an Associate Professor and is being chaired as Head of the Department for Electronics and Communication Engineering discipline at Siddhartha Institute of Engineering and Technology, Ibrahimpatnam, Hyderabad.