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WIRELESS AND AUTOMATIC BOMB DETECTION AND DISPOSAL ROBOT

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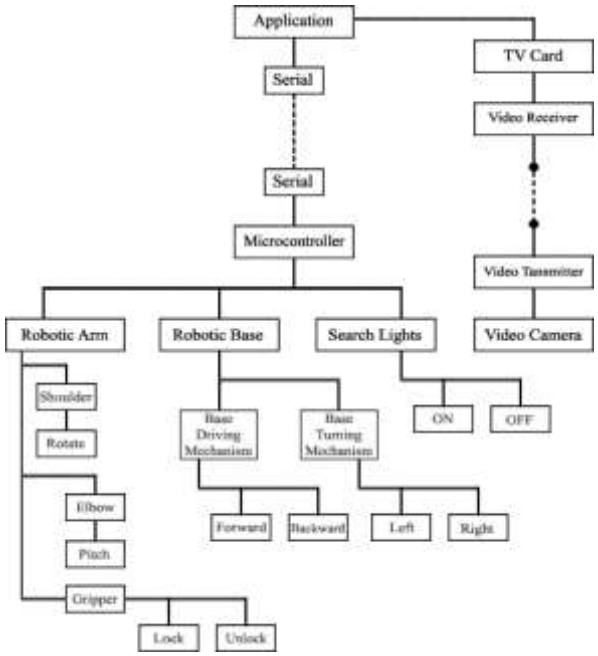
Abstract - *This paper introduces a peculiarly dignified bomb detection and disposal robot. The main goal of the project is to provide safety to the bomb disposal squad by providing an extra line of defense, provide a remote monitoring and controlling application for analysis of a suspicious packet (or bomb), allow the user to manipulate the packet using the robotic arm, to provide visual feedback from the site of the packet, to provide a very user-friendly control application. We hear daily and also read in newspapers about the death of soldiers and civilians at the bomb sites due to mishandling or during diffusion of the bomb. The robot will provide a feedback about the bomb site and its vicinity and will tell us about the suspicious site some important information like the number of people in vicinity, video and audio recording of the bomb site etc.*

Key Words : D.C. Motor, Robotic Arm, Metal Detector, Wireless Camera, Colpitt's Oscillator, Atmel 89c51.

1. INTRODUCTION

The Wireless Bomb Disposal Robot uses a control application, at the user end to control the robot remotely using Wireless technology. The bomb technician controls the robot using this application. Input from the user is transmitted serially over an RF link to the Robot, where it is received, identified and relayed to the appropriate module.The input to the system is from the user, this input is first processed at the control application, serially transmitted over a Radio Link. This input is then received at the robot and processed again, the output of the system is the processed signal to the appropriate module, this module can be a motor of the base of the robot or the robotic arm. The project has been designed keeping in view the current law and order situation in India and throughout the world. Everyday hundreds of trained personnel are either injured or lose their lives while defusing bombs. This can be reviewed by the countless number of news items appearing daily in newspapers around the world. These include the TOI of 19th JAN 2010 [1].



1.1 Components Used

- **ATMEL 89C51**:-

This is the brain of the robot. The 89C51 is an Atmel version of the Intel's very famous 8051 microcontroller. Its purpose is to generate the control signals required to control different parts of the system.

- **Stepper Motor** :-

Stepper motors provide open loop, relative motion control. Open loop means that, when you command the motor to take 42 steps, it provides no direct means of determining that it actually did so. The control is relative, meaning that there is no way to determine the shaft position directly. You can only command the motor to rotate a certain amount clockwise or counter-clockwise from its current position. These "commands" consist of energizing the various motor coils in a particular sequence of patterns.

- **D.C Motor** :-

DC motors consist of rotor-mounted windings (armature) and stationary windings (field poles). In all DC motors, except permanent magnet motors, current must be conducted to the armature windings by passing current through carbon brushes that slide over a set of copper surfaces called a commutator, which is mounted on the

rotor. The commutator bars are soldered to armature coils. The brush/commutator combination makes a sliding switch that energizes particular portions of the armature, based on the position of the rotor.

2. WORKING OF A METAL DETECTOR

This circuit is most useful for security checking. Metal Detector available in the market are quite expensive. This metal detector can be used to detect slightly big size metallic objects. It used a sensing coil. This coil should be kept near metallic objects for detection. Input of Circuit is a week colpitt's R.F. range Oscillator. Sensing coil forms parts of tuned oscillator.When coil is brought near a metallic object magnetic energy is observed and Oscillator fails to work. Then final transistor conducts and buzzer is activated. Use a 9 volts battery. After connecting battery, adjust the 4.7k preset till circuit just stop sounding.

PARTS LIST:-

- **RESISTORS** :- R1,R4 – 56K, R2 – 3K3, R3 – 22K, R5 – 2K7, R6 – 22K, R7,R9 – 680E, R8 – 15K, P1 – 5K.
- **CAPACITORS :-** C1,C6 – .1PF (104) 100 KPF, C2 – 1KPF (102).001PF, C3 – 220PF, C4 – 270PF/100V, C5 – 12KPF/ 100V (.012/25V), C7 – 100/25V.
- **TRANSISTORS :-** Q1,2,3,4 – BC 547 PH.
- **DIODES : -** D1,2,3,4 – IN 4148.
- **MISCELLANEOUS :-**LED1 – 5MM Red LED, COIL1 – Metal Detector Coil, Buzzer – VK 27 CT (S), Supply – 9v Snapper, PCB – VK 557 PCB.

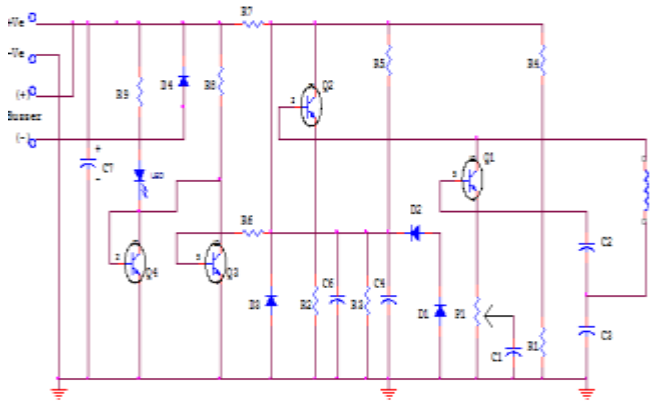


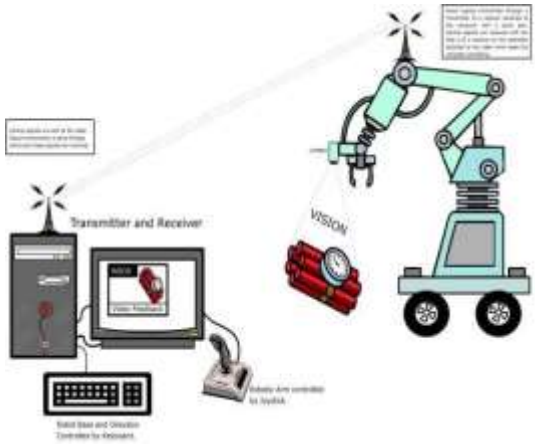
Figure -1: Circuit Diagram of a Metal Detector

3. CONCLUSIONS

The Wireless Bomb Disposal Robot has been designed in such a way that it can cater to the needs of the bomb disposal squad, the military, the police and also for the personnel who handle radioactive materials. It has countless applications and can be used in different environments and scenarios. For instance, at one place it can be used by the bomb disposal squad, while at another instance it can be used for handling mines. While another application can be to provide up to date information in a hostage situation.

Fig. 5 A Brief Layout of The Project

4. ACKNOWLEDGEMENT



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