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Multipurpose Robot

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***ABSTRACT*— Multipurpose robots is a remotely controlled robots (radio frequency) as well as DTMF controlled. They are made to small and compact size, enough to easily transport. In this paper, the project supposes a movable robot with a remote controller by using ATMEGA 16 microcontroller. The spy robot is made up of a wireless camera, an antenna, batteries and four movable wheels. The ATMEGA 16 controller used to remotely control along wireless system using an R.F. module and also by using DTMF module. Camera is used to capture information surrounding the robot. A 16*2 alphanumeric LCD display is mounted on controller to view user command. Radio Frequency and DTMF modules signals are used in wireless remote control system for transmitting and receiving wireless logic signals to control the motors of the robot control system. The L293D IC is used to drive the DC motors. In this paper, Remotely Operated Robot is a small robot designed for spying, surveillances in any hazardous conditions and inspection purposes.**

***KEYWORDS*— ATMEGA 16 microcontroller, R.F. module, DTMF module, 16*2 LCD display, L293D IC, 4X4 keypad, DPDT switch**

I. INTRODUCTION.

The device is basically functional on the principal of general purpose D.C. Motor to which an Atmega 16 MC is embedded by an I/O port. The L239D IC is used to drive the motors. The ATMEGA 16 is the heart of the circuit. It is a 16 port microcontroller. The device is mobile as it has DPDT switch in it and it also has the IR sensors to objectify the path through which it is propagating. The RF module is of 434 MHz so that it can remotely access during any condition. This robot is a dual controlled robot, one is remote controlled using RF module and DTMF (Dual Tone Multi Frequency). This robot is a password protected, the user must enter the correct password to access it. There are two options RF controlled and DTMF controlled. The user has to select any one of the options. There is 4*4 keypad to give any input, enter password or to select any options. The 16*2 alphanumeric LCD is used to display the options and movement of the robot. The dual tone multi-frequency (DTMF) is an in-band telecommunication signalling system using the voice- frequency band over the telephone lines between telephone equipment and other communications device and switching centre. The DTMF telephone keypad is a 4*4 matrix of push button in which each row represents low frequency and each column represents the higher frequency. Pressing a key sends combination of rows and column frequency.

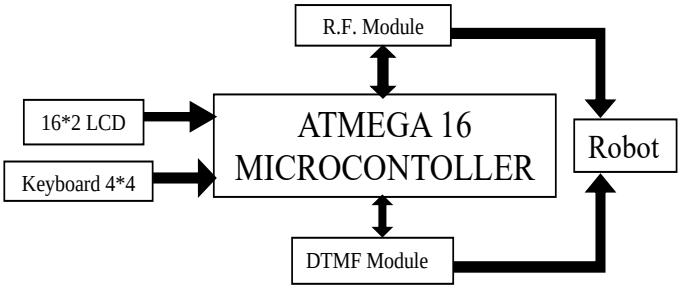


Figure 1: Overview Block Diagram of the System

II. METHODOLOGY

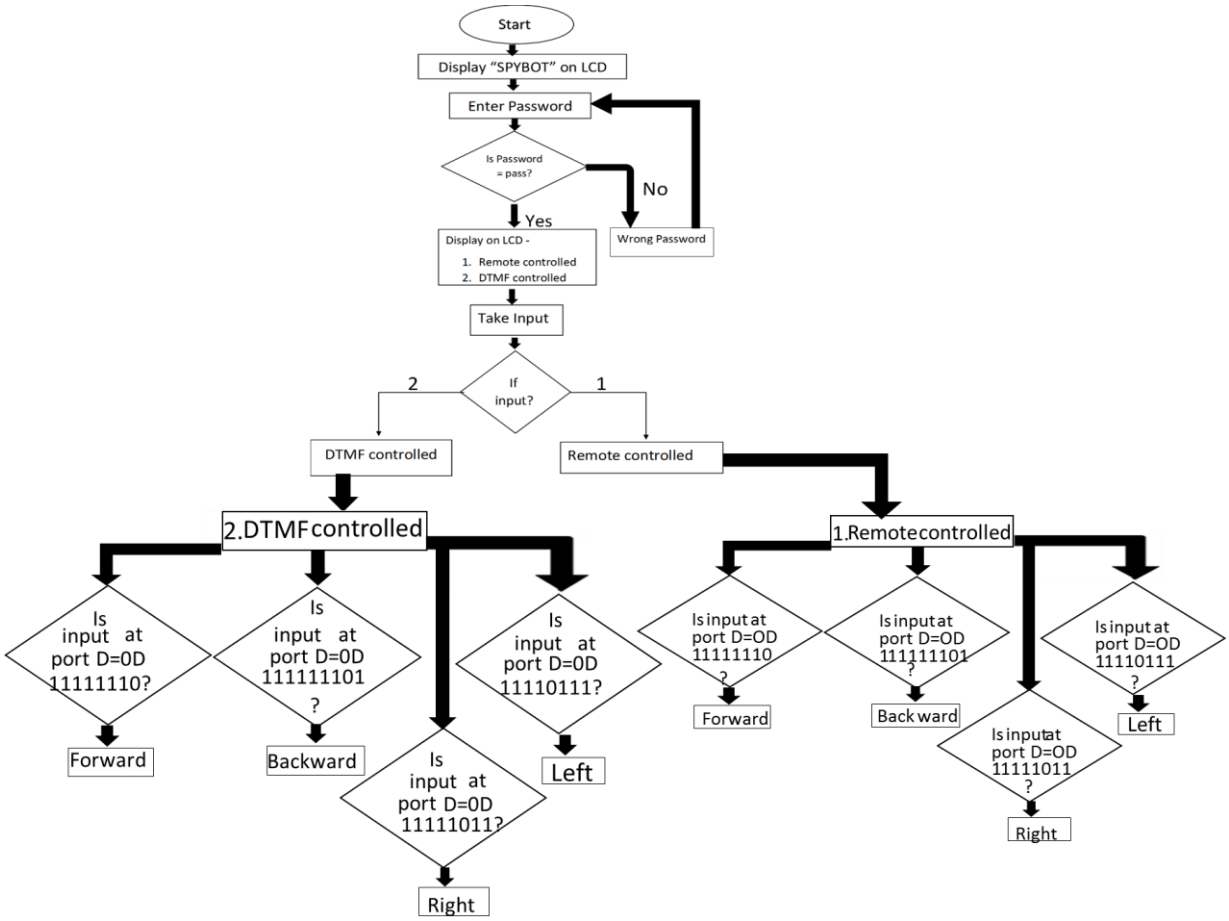
This part introduces our approach of creating a system of a Multipurpose Robot which is password enabled with Radio Frequency (RF Module) and DTMF (Dual Tone Multi Frequency) controlled function.
The block diagram consists of five parts as follow:

- ATMEGA 16 Microcontroller.
- 16*2 alphanumeric LCD
- 4X4 keypad

- RF and DTMF module
- DPDT switch
- L239D motor diving IC

III. FLOWCHART

The Flowchart used for the Model and complete working is being given below -:



IV. ALGORITHM

The algorithm for the program is given below-:

Step 1-: Display "SPYBOT" on to the LCD screen.
Step 2-: Enter the correct password
Step 3-: If the password is correct (pass) then display on LCD screen

1. Remote Controlled, 2.DTMF Controlled or display "Wrong Password". Then again re-enter correct password

Step 4-: Take input 1 for remote controlled and 2 for DTMF controlled.
Step 5-: For 1.Remote Controlled if the input at port D=
0b `11111110` then move forward, if input is=
`0b11111101` then move backward, if input=
`0b11111011` then move right, if input =
`0b11110111` then move left.
Step 6-: For 2. DTMF controlled if the input at port D=
0b 00101111 then move forward, if input is=
0b 10001111 then move backward, if input=
0b 01101111 then move right, if input =
0b 01011111 then move left.

V. WORKING

The working of the robot is explained below-:

- The port A is initialized for interfacing the keyboard. All the key are connect to this port. Port A0-A6 is connected to the keypad.
- The port B is used for interfacing the LCD. Port b0-b7 is connected to the LCD.
- The port C is the output port. It is connected to the L239D motor driving IC. It controls the movement of the robot and displays the result in the LCD. Port C0, C1, C6 and C7 are used.
- The port D is the input port. According to the given input the robot will move forward, backward, left or right. Port D0-D7 are used as the input port.

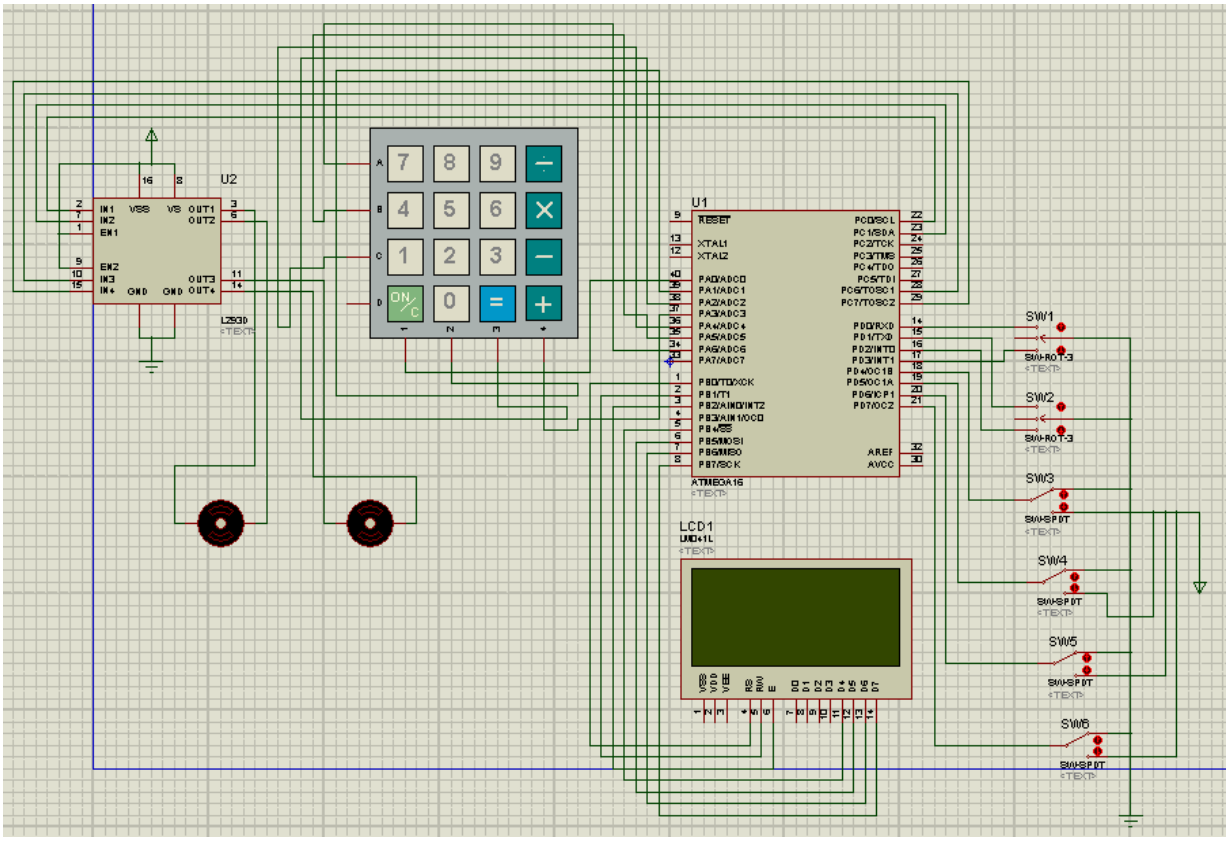


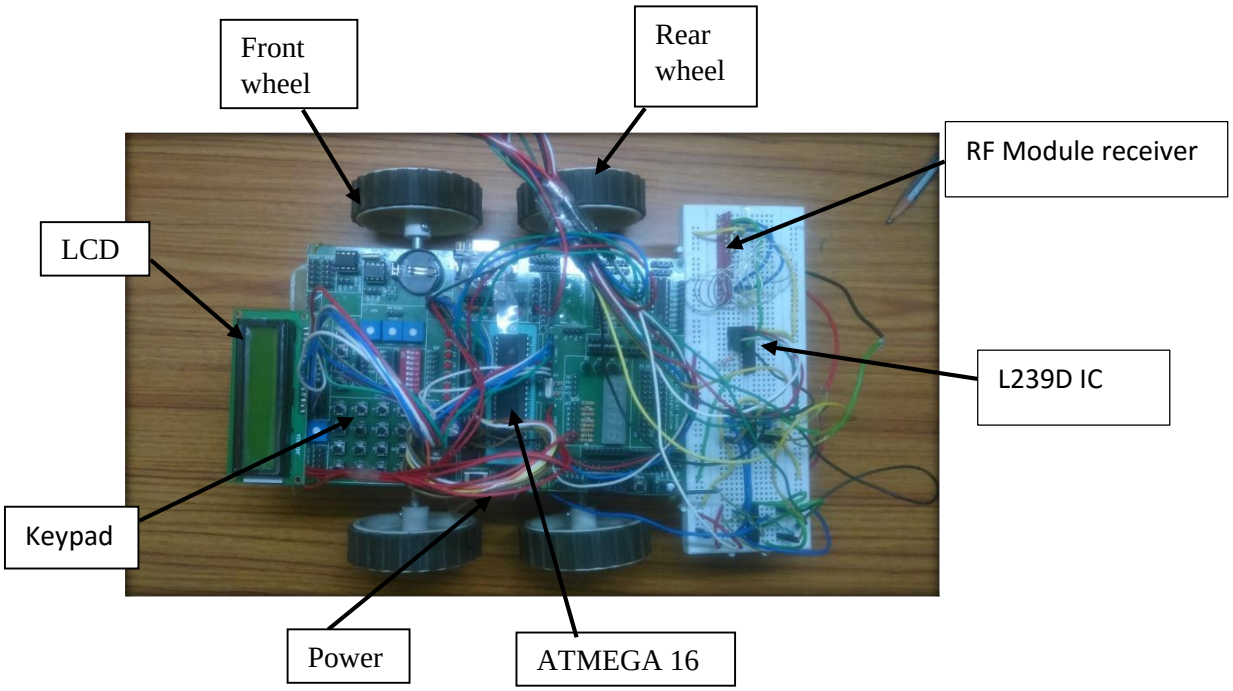
Figure 2: Circuit diagram of the complete robot System

VI. OVERVIEW OF THE ROBOT

1) PASSWORD ORIENTED

2) DUAL CONTROLLED

3) Top view of the robot



VII. FURTHER EXTENSION

This operation system is the multipurpose robot with wireless remote control. Instead of DC motors which drives the wheels stepper motors can also be used. The multipurpose robot can be commanded directly by laptop keyboard without using remote controller. For the advance of robot, it can be built a robot with wireless visual system that the user can observe and control the situation via computer or mobile. We can also implement leg based locomotive which could help us to move in any uneven surface.

VIII. CONCLUSION

This type of robot can perform difficult and repetitive works for humans. It can have a very risky job and such dangerous job could be done by using small spy robot. But it is useful to check and look out the places where dangerous poison gases have. This robot can also be used in searching people who are in building destroyed by the earthquake. Because of the wireless camera is installed in robots, it can be used remotely to enter and exit dangerous place that human cannot. When the user controls by remote controller, the spy robot will move to desired destination and spy images around the robot. It can also be used during fire break out condition, where we can send this robot to find where there are more people trapped thus it would save our time and accordingly we can send our fireman to save as more lives as possible. The robot is not quite huge one and designed to be easy in transportation. For the whole system, the required power is supplied by Lead acid batteries which connected the voltage regulator.

Acknowledgment

We would like to express our regards and special thanks to our institute “Sikkim Manipal Institute of Technology” (SMIT), for providing the facilities to complete our project. This list will go incomplete without the special reference of Mr. J.S Tamang sir who has inspired us and helped us in all possible way in completing our project.

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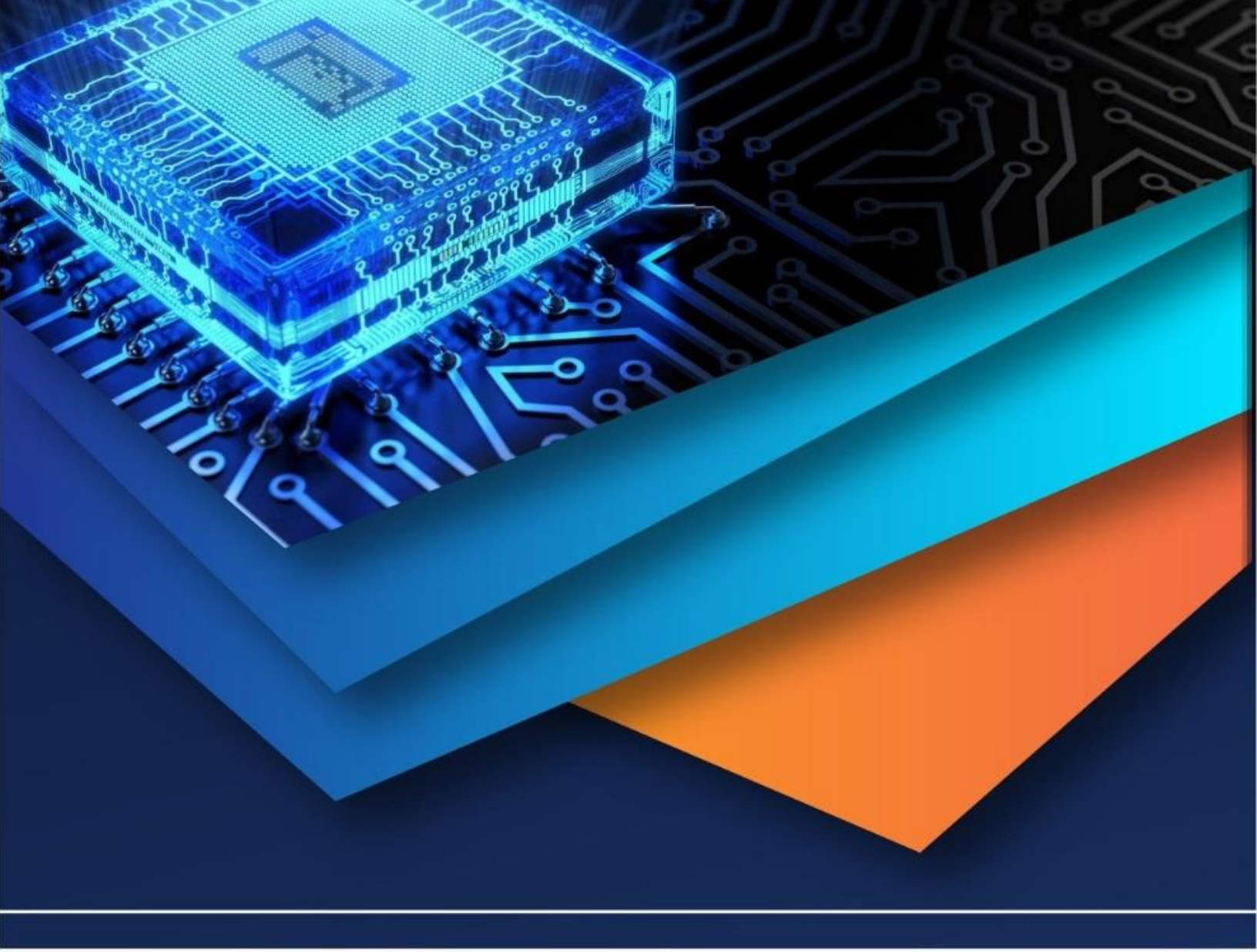

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