WAR FIELD SPYING ROBOT WITH FIRE FIGHTING CIRCUIT: A MODEL

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ABSTRACT

This research paper is based on War Field Spying Robot which is made by using different technologies and sources. This paper is basically based on a project which is made by me. The main purpose of this paper is to describe how this war spy robot is made, what are the sources or technologies used to make this robot and how this robot is helpful in so many ways. Basically the project is designed to develop a robotic vehicle named War Field Spying Robot using RF technology for remote operation attached with smart cell phone having IP web cam application for monitoring purpose. The robot along with smart cell phone can wirelessly transmit real time video and will give confidential information regarding opposite parties. An 8051 series of microcontroller is used for the desired operation. The commands are sent to the receiver, at the transmitter side with push buttons, to control the movement of the Robot to move forward, backward and left or right. Two DC motors are interfaced, at the receiving side to the microcontroller, which control the movement of Robotic vehicle. A smart cell phone with IP web cam application is mounted on the robot body for spying purpose even in complete darkness by using infrared lighting. This will send the videos wirelessly at the transmitter side (laptop). This is kind of robot can be helpful for spying purpose in war fields and in order to minimize the attacks like 26/11 in Mumbai in future. It can also be helpful where living beings cannot reach.

Key Words: Robot, War Spying robot, RF Module, IP Web Cam (Smart Cell Phone), Technologies used, Different sources

I. INTRODUCTION

1.1 What is Robotics?

It is a field of Engineering that covers the mimicking of human behaviour. Robotics includes the knowledge of Mechanical, Electronics, Electrical and Computer Science Engineering. It is the branch of technologythat deals with the design, construction, operation, and application of robots well as computer systems for their control, sensory feedback, and information processing.

1.2 What is Robot?

The word robot comes from the Slavic word robota, which means labour. A robot is usually an electro-mechanical machine that can perform tasks automatically. It is defined as an industrial machine that replaces the human to work in hazardous and unsafe condition. It is also defined as a machine that removes the mines in war all on its behalf.Basically a Robot means

•   An automatic industrial machine replacing the human in hazardous work.

- An automatic mobile sweeper machine at a modern home.

- An automatic toy car for a child to play with.

- A machine removing mines in a war field all by itself and many more.

1.3 What is War Field Spying Robot?

As its name suggests it is a robot which is used for the purpose of spying on enemy territories. This is kind of robot can be helpful for spying purpose in war fields. This can be used in various places like

- At the time of war where it can be used to collect information from the enemy terrain and monitor that information at a far secure area, and safely devise a plan for the counter attack.

- Tracking locations of terrorist organizations and then plan attack at suitable time.

- Making a surveillance of any disaster affected area where human beings can't go.

- Patrol the surroundings with sharp camera-eye.

- Send video and data captured to the server wirelessly.

- Easy control by a remote through wireless network.

- Mobile in all directions with miniature size.

1.4 IP Webcam Application

IP Webcam is defined as Internet Protocol Webcam. This application plays a very important role in this. This application is used to send and receive the data. Smart phone is placed at top of the receiver side and it made a video of enemy area and wirelessly sends to the laptop that is at other end.

II. OBJECTIVES

➢ To describe how this war field spying robot is made.

➢ The sources or technologies used to make this robot.

➢ To explain how this robot is helpful in so many ways.

III. WORKING

3.1 Hardware Requirements in the Project

8051 Microcontroller, Encoder, Decoder, Push Buttons/Switches, RF(tx-rx), Resistors, Antenna, Diodes, NPN Transistor, IR emitting Diode, LED's (Light Emitting Diode), Crystal Oscillator, Electrolytic Capacitor, Operational Amplifier(firefighting circuit)

3.2 Circuits of War Field Spying Robot

This robot includes two types of circuit that are

➢ Transmitter circuit

➢ Receiver circuit

The block diagram and circuit diagram of both the transmitter and receiver are explained further in the paper.

3.3 Block Diagram of Transmitter and Receiver
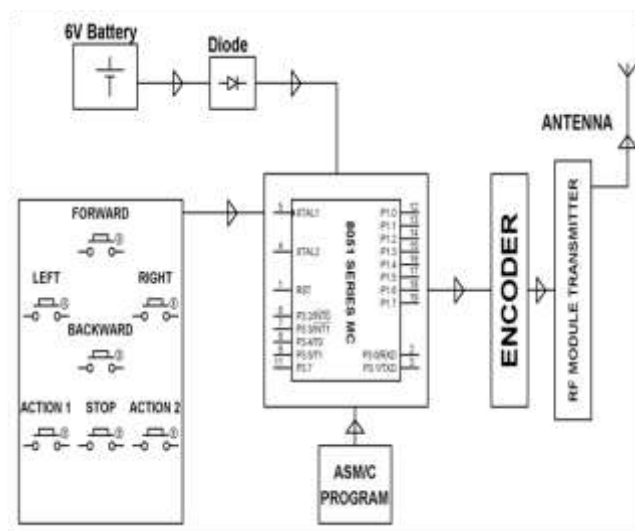
➢ **Transmitter**

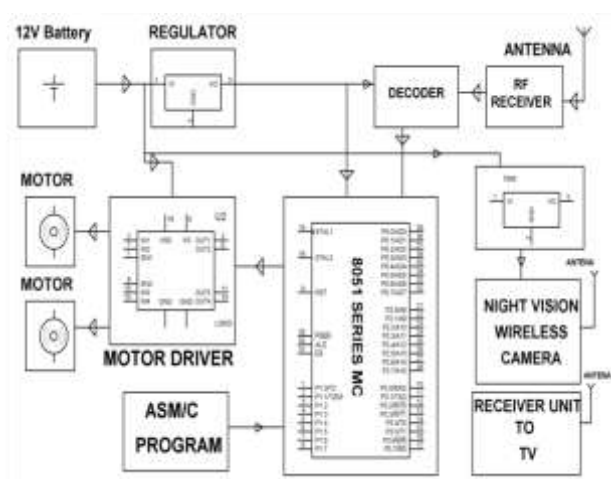**Fig. 1. Represents the Block Diagram of Transmitter**

➢ **Receiver**

Fig. 2 Represents the block diagram of Receiver

3.4 Apparatus used at Transmitter Side

- HT12E/DIP18 --- Encoder / Dual in package (18 pin)
- Push buttons/Switches
- Resistor
- 433 MHZ RF module (Transmitting module)
- L7805 --Voltage regulator
- 9 V DC supply

3.5 Apparatus used at Receiver Side

- 433 MHZ RF module(receiver)
- 8051 Microcontroller
- HT12D/DIP18--- decoder/dual in package 18 pins
- Switches/dual in package 8 pins
- L7805--- Voltage Regulator
- Battery--- 12 V power Supply

- IN4148--- diodes
- NPN transistor
- Motors

IV. THEORY OF OPERATION

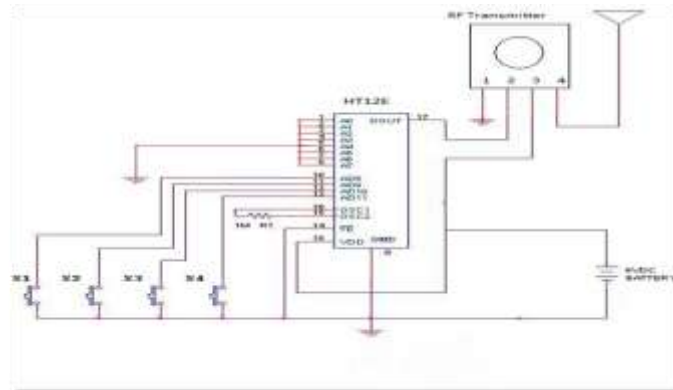### 4.1 Operation at Transmitter Side

Fig.3. Represents the Circuit Diagram of Transmitter

In the transmitter circuit firstly we grounded the pin no. 1-9 of encoder than pin no. 10,11,12,13 are connected to push buttons or switches through resistors and then grounded it. The parallel input is provided to the encoder through the switches. The encoder encodes the parallel input into serial data which is obtained at pin 17 of the encoder than the Pin no. 14 (Transmission Enable) is Grounded (Active Low).than we connect pin 15 and 16 (Oscillator input and output) through a resistor. The external 1 ohm resistor connected at the pins 15 and 16 is used to generate oscillations in the encoder of a particular frequency. So the 4 bit serial data is fed to the transmitter module at the same frequency. Pin 17 (Serial data output) is connected to 2ndthe serial data wirelessly to the RF receiver at the receiving end. Once the data reaches the data pin i.e. pin no 2 of the RF Module then the data is transmitted through it, the transmission of data is through a very high frequency carrier, the data is further transformed into a suitable type and then it is transmitted out through antenna connected to the RF Module pin no 4 than to Pin 18 we supplied with 9 V DC voltage through a battery. Than the receiver antenna picks up the serial data sent by the transmitter. Antenna is connected to one of the pins of the receiver. And this data is further processed through the receiver module.
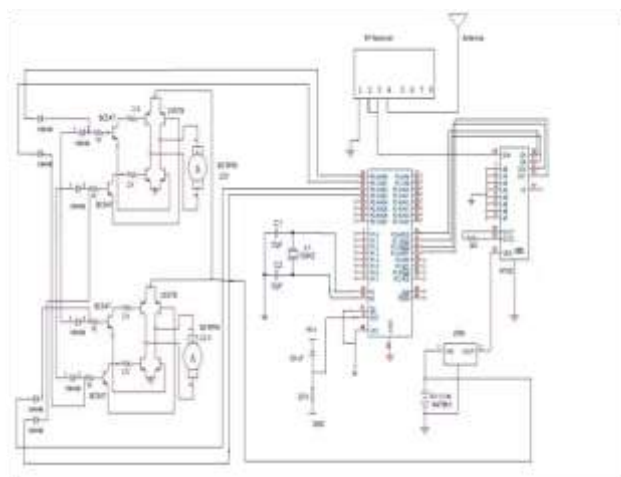
4.2 Operation at Receiver Side

Fig. 4 Represents the Circuit diagram of receiver

Pin no. 1-8 (Port 1) are not used and are left unconnected of microcontroller than its Pin 9 (Reset Pin) is supplied with an active high through a capacitor. A resistor is also connected in series which is further Grounded. Pin no. 10-13 (Port 3) is used as input port and is connected to output pins (Pin no.10-13) of the decoder. The output from decoder is given as input to the microcontroller which in turn executes the program. Its Pin 18 and 19 is used to connect a crystal oscillator to provide the clock signal to the microcontroller and are further Grounded through capacitors. Its Pin 20 is Grounded than the Pin no. 21-28 (8 bit Address Pins: Port 2) is not used and is left unconnected. Pin 29 and 30 are left unconnected. Its Pin 31 (External Access Enable) is given a +5 V power supply. Microcontroller Pin 32-39 (Port 0) is used as output port. Pin 36-39 are individually connected to the bases of four NPN BC547 transistors through diodes and resistors. The output from these pins determines the current flow to the base of the transistor. These four NPN transistors regulate the current flow to the further connected transistors. The eight NPN transistors form two H-bridges. The input to base of each transistor determines the On/Off state of each transistor which in turn determines the direction of rotation of DC motor connected to the collector of the transistors. Pin 40 is supplied with +5 V power Supply than the Pin no. 1-8 (8 bit Address pins for input) of decoder are Grounded. Pin no.9 is also grounded. Decoder Pin No. 10, 11, 12 and 13 (4 bit Data/Address pins for output) are connected with Microcontroller input port (port 3). The output from decoder instructs the microcontroller to execute the program. Decoder Pin 14 (Serial data input) is connected to 2nd received and converted into parallel data by the decoder. The serial data received at data in pin i.e. pin no 14 is internally converted in parallel form and the 4 bit data available at the 4 data out Pins of the decoder is similar to the status of data at data in pins of the encoder. The decoder IC will provide the data to the micro controller unit and the micro controller unit will recognize the signal and will respond accordingly as per the program fed into it. Decoder Pin 15 and 16 (Oscillator input and output) are connected through a resistor. Pin 17 is unused (Data Pin) of RF receiver. The serial data is Pin 18 is supplied with 5V DC voltage through a voltage regulator. The input to the voltage regulator is 12 V DC supply through a battery.

4.3 Fire Fighting Circuit

It is attached to the robot so that it can detect the fire and there is small fan that is attached to the robot so that it can be used in extinguishing fire.

4.4 Apparatus used in firefighting circuit

- Thermistor (heat sensor)
- LM358 (op amp)
- Fan
- Potentiometer
- Variable resistor
- Wires

V. APPLICATIONS

Spy Robot is readily usable in many fields of application, some being scientific, military and many more. The explanation of some of the applications is as below:

5.1 Military

In military, the wireless camera has been used as their first line force to survey the enemy location from their base. By using this robot, they can save their soldier live because before they move to enemy location they

already know the enemy situation and percentage of their win in the war will be increased. The main objective behind making this robot is to provide little or small help to our police department and army.

It can be used for spying purposes to get the confidential details of anybody from remote area without making our life in danger.

At the time of war where it can be used to collect information from the enemy terrain and monitor that information at a far secure area, and safely devise a plan for the counter attack.

These robots can be used to keep an eye on the border area to detect any criminal activity and alert the military of any intruders.

5.2 Disaster Affected Area Surveillance

The spying robot can be used at the time of natural disasters such as earthquake to monitor the affected areas. The robot can reach the places which is not accessible to human beings. The wireless camera will send the live video streaming to the receiver which is monitored by human being. The bodies trapped under buildings can be detected and many lives could be saved.

5.3 Underground Tunnel/ Mines Surveillance

This robot can be used for tunnels surveillance with wireless video communication system. The underground mines are usually rugged and it is very difficult for human beings to reach there and collect the information. Since the camera used with the robot has the ability to capture videos even in darkness (Night Vision), the detailed information of tunnel and mines can be easily monitored even if there is dark inside.

5.4 General Surveillance

The robot can be placed at various shopping malls, jewellery shops etc. for surveillance purpose. This will help to keep a check on all visitors and in case of any mishappening, the recorded videos can be used as a significant help to identify the culprit.

5.5 Fire Fighting

The robot also possesses a fire fighting system which can detect fire (or smoke) and can extinguish the fire itself.It can be used at oil mine fields which are usually inaccessible to humans and are prone to catch fire. These robots can be used to detect and extinguish fire at such places. Can be used in extinguishing fire where probability of explosion is high. For e.g. Hotel kitchens, LPG/CNG gas stores, etc.

It can be used in record maintaining rooms where fire can cause loss of valuable data.

VI. ADVANTAGES

6.1 Speed

Robots may be used because they are FASTER than people at carrying out tasks. This is because a robot is really a mechanism which is controlled by a computer - and we know that computers can do calculations and process data very quickly.

6.2 Hazardous Environment

Robots may be used because they can work in places where a human would be in danger. For example, robots can be designed to withstand greater amounts of heat, radiation, chemical fumes than humans could.

6.3 Repetitive Tasks

Sometimes robots are not really much faster than humans, but they are good at simply doing the same job over and over again. This is easy for a robot, because once the robot has been programmed to do a job once, the same program can be run many times to carry out the job many times. And the robot will not get bored as a human would.

6.4 Efficiency

Efficiency is all about carrying out tasks without waste. This could mean not wasting time not wasting materials not wasting energy.

6.5 Accuracy

Accuracy is all about carrying out tasks very precisely. In a factory manufacturing items, each item has to be made identically. When items are being assembled, a robot can position parts within fractions of a millimeter.

6.6 Adaptability

Adaptability is where a certain robot can be used to carry out more than one task. A simple example is a robot being used to weld car bodies.

If a different car body is to be manufactured, the program which controls the robot can be changed. The robot will then carry out a different series of movements to weld the new car body.

VII. CONCLUSION

As we all know, these days India is sick off massive terror attacks, bomb explosions at plush resorts. To avoid such disasters Technological power must exceed Human power. Human life and time are priceless. So we took an initiative to design a model of an apt robot that can be widely used so as to avoid terror attacks, to ensure more security at the border and high density areas. Even every nation needs its own defence system for their integrity and security. In such a way construction of these robots will carry nation's name, fame globally.

The Wireless spy camera Robot has been designed in such a way that it can fulfill the needs of the military, the police and armed forces. It has countless applications and can be used in different environments and scenarios. For instance, at one place it can be used by the armed forces, military purposes, while at another instance it can be used for spy purposes. Another important application is to provide up to date information in a Hostage situation.

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"He has eight International Publications and one Conference."