International Journal of Emerging Technology and Advanced Engineering
Website: www.ijetae.com (ISSN 2250-2459 (Online), An ISO 9001:2008 Certified Journal,Volume 3, Special Issue 2, January 2013)
National conference on Machine Intelligence Research and Advancement (NCMIRA, 12), INDIA.

"Mobile Operated Spy Robot"

(Spy Robot)

Dhiraj Singh Patel[1], Dheeraj Mishra[2], Devendra Pandey[3], Ankit Sumele[4], Asst. Prof. Ishwar Rathod[5]

Department of Electronics & Communication Engineering, Vindhya Institute of Technology & Science Indore (M.P.), India

Rajput.dhiraj8@gmail.coms[1], dmishra1103@gmail.com[2], dp33269@gmail.com[3], ankitsumele@yahoo.com[4],Ishwar.rathod.india@gmail.com[5]

Abstract

Main aim of our paperwork is to study development of the mobile operated spy robot. The robot is in form of a vehicle mounted with a web cam, which acquires and sends video to a TV or PC. The movement of vehicles are controlled by microcontroller. We can't forget 9/11 when 101 people including nine foreigners & 14 policemen have lost their lives while about 300 people were injured in the worst terror attack seen in country in which desperate man fired indiscriminately at people. Our idea is to make a robot to tackle the hostage situation & the worst conditions which cannot be handled by human being. Humans are moved out from direct exposure to potentially dangerous situations. Robotic system can perform many security and surveillance functions more effectively than humans. We are using Keil micro software vision for writing C-code for the robot SPI PGM software for transferring the hex files to microcontroller.

***Keywords*— Embedded System, DTMF, Microcontroller**

I. INTRODUCTION

A Robot is a virtual artificial agent. In practice, it is usually an electro-mechanical machine which is guided by computer, mobile or electronic programming, and is thus able to do tasks on its own.

Conventionally, wireless controlled robots use RF circuits, which have drawbacks of limited working range & frequency range, use of mobile phones can overcome this limitation .Here is a Mobile operated spy robot circuit which can be controlled by using mobile phone. It can capture audio and video information from the surroundings and can be send to a remote station through RF signal.

The Mobile operated spy camera robot has been designed in such a way that it can fulfil all the needs of military, police and also for personal security . It has countless application and can be used in different environments and scenarios. For instance, at one place it can be used by bomb disposal squad, while at another instance it can be used for handling mines. While another application can be to provided up to date information in hostage situation. The robot is made for purpose by military operation spy robot for navigator in forest. The mobile operated robot is a very small application of DTMF technology. Here, we are showing you the method of using the DTMF to operate robot because the robot is operated by mobile so the range of robot communication is not limited.

It just depends on the network of mobile and in the present scenario, the mobile network is everywhere.

DTMF: DTMF (Dual Tone Multi Frequency) better known as touch-tone is a system of signal tones used in telecommunication. Applications include voice mail, help desks, telephone banking, etc.

There are twelve DTMF signals, each of which are made up of two tones from the following selection: 697 Hz, 770 Hz, 852 Hz, 941 Hz, 1209 Hz, 1336 Hz, and 1477 Hz.

The tones are divide into two groups (low and high), and each DTMF signal uses one from each group. This prevents many harmonics from being misinterpreted as a part of signal.

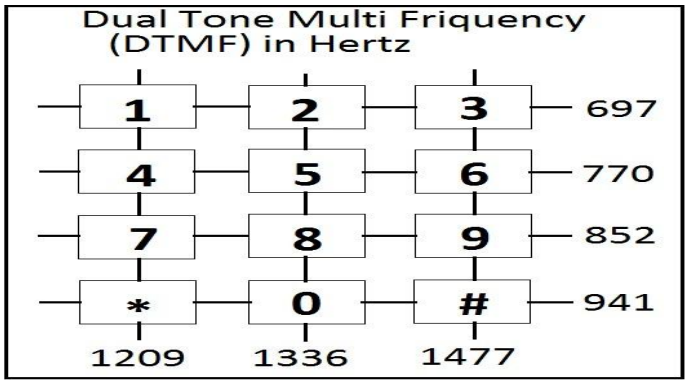


Fig.1 DTMF

International Journal of Emerging Technology and Advanced Engineering
Website: www.ijetae.com (ISSN 2250-2459 (Online), An ISO 9001:2008 Certified Journal,Volume 3, Special Issue 2, January 2013)
National conference on Machine Intelligence Research and Advancement (NCMIRA, 12), INDIA.

DTMF decoder: The DTMF tone is decoded by DTMF decoder that is CM8870 that gives a four bit data at the output of decoder. Now this four bit data can be used for making the decision as for e key pressed on the mobile keypad the data have different for a different key.

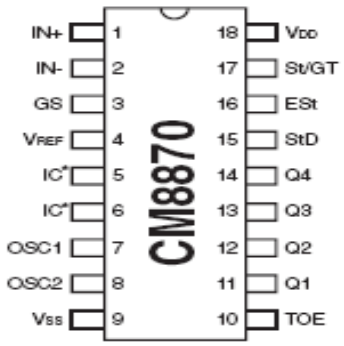
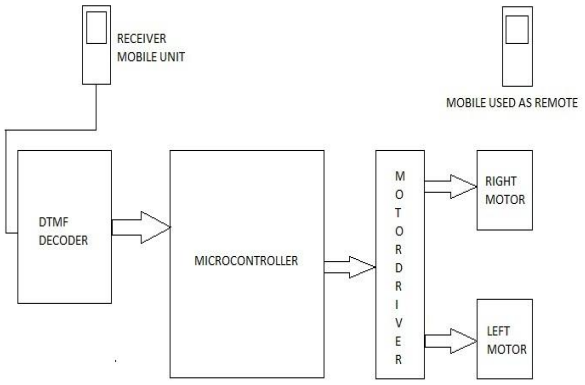


Fig.2. CM8870-18DIP RECEIVER (RC)

II. Block Diagram

Here is the block diagram of mobile operated spy robot, which consists of a transmitting mobile unit, DTMF decoder, microcontroller, motor driver and a receiver mobile unit.



III. Working

In this paperwork, the robot is controlled by a mobile phone that makes a call to another mobile phone attached to the robot. In duration of this call, if any key is pressed a tone corresponding to the key pressed is heard at the other end called 'Dual Tone Multiple frequency (DTMF) tone. The robot receives these tones with help of phone stacked in the robot.

The received tone is processed by the microcontroller with the help of DTMF decoder IC CM8870.

This ice sends a singles to the motor driver IC L293D which drives the motor forward, reverse...etc

The microcontroller output is not sufficient to drive DC motors, a high voltage and high current drivers are required. The L293D is a quadruple high current half H-driver designed to provide bidirectional drive currents of up to 600 mA at voltage from 4.5 V to 36V. It will become easier to drive dc motor with such driver

In this paperwork we are using a wireless CCD (CHARGE COUPLED DEVICES) camera. Now these types of cameras are commonly available in the market. It works on 12 V DC supply.

The 12 Volt DC supply is taken from battery placed in a robot. The camera has a receiver, which is placed on the remote station. Its output signals are in the form of audio and video. These signals are directly connected to a TV receiver or a computer through a tuner card.

IV. Components Used For Desired Result

- Microcontroller AT89C51
- Lcd 16*2 lampex
- Wireless CCD Camera
- Battery
- Resistors
- Diode
- DIP
- DTMF decoder IC 8870
- Motor driver IC L293D
- Crystal 11.0592 MHz

V. Mobile Operated Robot Program

Writing a C program for mobile operated spy robot is not a very difficult task we just have to take the basic block diagram in our mind that a microcontroller get the input and give the decision based on our program. Now from the DTMF decoder we will get the 4 bit data on the port2 of microcontroller 8051.

HARDWARE CONFIGURATION: Before writing the program we should know the hardware configuration of the circuit where the inputs and output's are connected and for what task we have to make the program.

INPUT'S: The microcontroller 8051 is connected with DTMF decoder as follow:-The port 1 is the input port where the DTMF data bits D0 to D3 are connected with P1.0 to P1.3

International Journal of Emerging Technology and Advanced Engineering
Website: www.ijetae.com (ISSN 2250-2459 (Online), An ISO 9001:2008 Certified Journal,Volume 3, Special Issue 2, January 2013)
National conference on Machine Intelligence Research and Advancement (NCMIRA, 12), INDIA.

Controller port	port pins	DTMF data
Port1	P1.0	D0
Port1	P1.1	D1
Port1	P1.2	D2
Port1	P1.3	D3

DTMF & MICROCONTROLLER CONNECTION

OUTPUT'S: The microcontroller 8051 is connected with motor driver as follow:-The port 2 is the output port and the pin connection is shown in below fig. For moving the motor's in forward direction we have to give 10 to the motor or (M1A=0 & M1B1) this condition makes the motor M1 in forward direction.

Controller port	port pins	Motor driver inputs
Port2	P2.0	M1A
Port2	P2.1	M2A
Port2	P2.2	M1B
Port2	P2.3	M2B

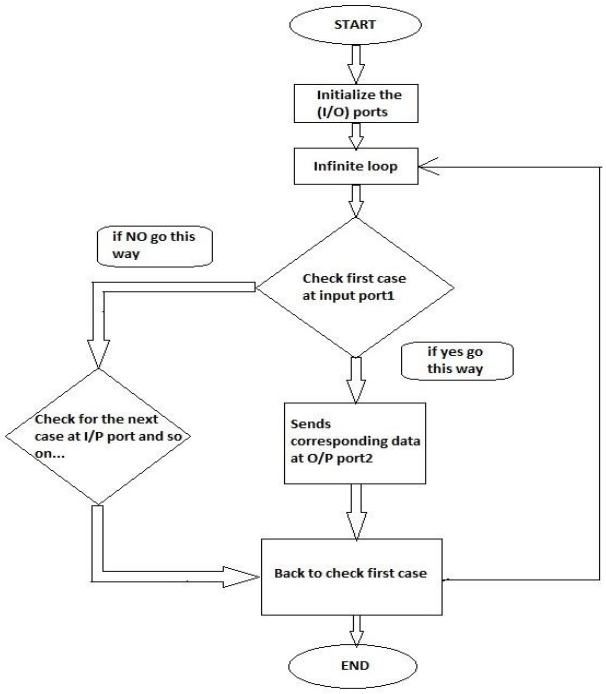
MOTOR DRIVER & MICROCONTROLLR CONNECTION

CREATING LOGIC: Now the main part of programming is to create a decision on the basis of some condition like e key 2 is pressed then send some data to the output port of microcontroller, Now I'll create data according to my project, you can create your own. For example we are using the key 2,4,6,8 &5 for controlling the robot.

Key press	D3D2 D1D0 (binary)	DTMFdata(Hex) at port1	Output data at M1A,M1B, M2A,M2B	Output data atport2	Operation
2	0010	0xf2	1010	0x03	Forward
4	0100	0xf4	1000	0x08	Right
6	0110	0xf6	0010	0x02	Left
8	1000	0xf8	0101	0x05	Back
eke	Xxxx	0xxx	0000	0x00	Stop

DECISION BASED ON CONDITION

FLOW CHART: Programming is an art which includes some step's the flow chart is also a step of programming we can make the program without a flow chart but for making an efficient and error free program then we should use this step flow chart of the program is shown below.



C PROGRAM FOR MOBILE OPERATED ROBOT:

****.....
.....
.....**********

```
# include<reg51.h>          //header file for 8051 microcontroller
Void Main()
{
P1=0*ff;        //initialize as an input port
P2=0*00;        //initialize as an output port
While(1)        //infinite loop
.
.
.
.
.
.
.
.
```

International Journal of Emerging Technology and Advanced Engineering
Website: www.ijetae.com (ISSN 2250-2459 (Online), An ISO 9001:2008 Certified Journal,Volume 3, Special Issue 2, January 2013)
National conference on Machine Intelligence Research and Advancement (NCMIRA, 12), INDIA.

```
.
.
.
.
.
P2=0*00;
}
}
```

VI. Major Advantages

Spy robot is the robot that have ability to spy and to survey the environment or situation at certain place using wireless camera. The visual gathering from the spy robot can be recorded and viewed by human directly. This project will build a spy robot that has ability to detect obstacle and stop moving. others this project will build a robot with wireless visual system that the user can observe and control the situation via computer and mobile.

From a performance standpoint, the perceived benefits of a robotic security or surveillance capability are numerous and well documented:-Humans are removed from direct exposure to potentially dangerous situation; Robotic systems can perform many security and surveillance functions more effectively than humans; Giving us information that humans can't get;

They can perform tasks faster than humans and much more consistently and accurately; they can capture moments just too fast for the human eye to get; they can entertain us and help us in certain tasks.

VII. Applications

Robots have wide-ranging commercial implications. Robots are extensively in the automotive industry, primarily for welding, painting and material handling applications. The electronics, aerospace, metalworking and consumer goods industries are also major robot users, and army in spying and in security based applications uses this type of robot, or useful at hostage situation, search and rescue.

VIII. Result

With help of this paper, the mobile operated spy robot will be formed in which DTMF & microcontroller (AT89C51) were used in motion of Robot through programming in microcontroller. In this paperwork we used CCD Camera which captured audio & video information from surrounding & had been sent to a TV receiver. It has ability to detected obstacles & stop moving.

User handled via computer & mobile in any situation & anywhere. Humans are moved out from direct exposure to a potentially dangerous situation. They performed tasks which can be used by military or police & can also be used for personal security.

IX. Future Enhancement

Integrated factory automation systems, to which robot technology is key, affect nearly all types of manufacturing. In the near future, productivity and competitiveness in these industries will depend in large part on flexible automation through robotics. And further future enhancement are:-Compact design, Quick movement, Improved reliability, Night vision camera, Replacement of transmitter with low power transmitter & receiver with highly sensitive to reduce the power consumption or Robotic arm can be attached.

X. Conclusion

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. While another application can be to provide up to date information in a
Hostage situation.

References

[1] The 8051 Microcontroller and Embedded System: using Assembly and C,2nd Edition,ISBN:9780131194021 by Mazidi, Muhammad Ali.(2008)

[2] AT89C51 detail, available http://www.ic--on-line.cn/iol_AT89S51/PdfView/103030/

[3] DTMF Decoder datasheet,available http:// http://www.8051projects.info/exp11.asp

[4] Motor driver ic- datasheet available httt:// http://www.engineersgarage.com/electronic-components/l293d-motor-driver-ic

[5] http://www.8051projects.net/tags/keil-microvision-3

[6] http://www.circuitstoday.com/remote-operated-spy-robot-cir

[7] By Scott Mackenzie, the 8051Microcontroller and Embedded system.

[8] IEEE Xplore http://ieeexplore.ieee.org/search/searchresult.jsp?newsearch=true&queryText=spyrobot&x=0&y=0

[9] http://www.datasheetcatalog.com/datasheets_pdf/L/2/9/3/L293D.shtml

[10] keil micro vision, available in http:// http://www.keil.com/c51/