

Hand Gesture Based Survivellence Robot

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Abstract: -- In the past decade, robotic systems have been used with increased popularity for explosive ordnance (EOD) missions. Advances in robotic technology have made it possible for robots to perform functions, previously only possible by human workers wearing a blast suit. The primary advantage to using robotic systems for explosive ordnance disposal is the reduced risk to humans. Currently, EOD robots are able to traverse a variety of terrain, collect and destroy certain explosives and provide improved reconnaissance capabilities to law enforcement and military agencies. Although far from perfected, these robots are saving lives by finding and disposing of explosives without the need for direct human contact reliable robotic platform. The key features of the robot include a hand gesture interface which provides additional sensor feedback and enhanced visual awareness compared to existing systems, an on-board three degree of freedom manipulator arm providing an enlarged workspace, and a dexterous gripper allowing for the removal of detonators. The flexible and modular robot design utilizes commercial off the shelf components for ease of maintenance and repairs. The robot provides a safe distance threat assessment and increased capacity for explosive ordnance disposal, improving the effectiveness of bomb disposal teams. The robots low-cost, hand gesture operation and ease-of-maintenance promote its widespread appeal, thereby saving the lives of both law enforcement personnel and civilians. Robot will detect the position of the bomb by using GPS module. The user just needs to wear a gesture device which includes a sensor. The sensor will record the movement of the hand in a specific direction.

Index Terms: GPS, sensor, wireless communication, GSM, EOD Robots.

I. INTRODUCTION

Here we are going to construct a Robot which is used for bomb detecting and disposal purpose. Use wireless camera for video feedback so operator can operate more efficiently. The operation of robot is controlled by using wireless hand gesture module so it can provide more range of operation. Also construct a basic bomb diffusing robot which can handle simple tasks like cutting wires, flip on switches, lift light objects, etc. and a simple autonomous robot to help in the transit of the bomb. Also gives video feedback to us so effective handling of robot can be possible. This paper details the design and implementation of an intelligent explosive ordnance disposal (EOD) robot to provide law enforcement agencies with a cost effective and Due to this more security will provide to bomb disposal squad. Also it is more applicable for police, nuclear radioactive material handling, also for military purpose. We are going to interface the camera so For the future purpose that images capture by camera of bomb will be more useful. Here we use robotic arm which have 180 degree of freedom so operation of robot handling will be more softly. We are going to use stepper and Dc motors as actuator, Robot base will rotate 360 degree, elbow, shoulder and gripper also will move according to their directions 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 main goal of the project is to provide safety to the bomb disposal squad by providing an extra line of defence. 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.

II. INTRODUCTION

We are going to interface of camera so for future purpose that images capture by camera of bomb will be more useful. Here we use robotic arm which have 180 degree of freedom so operation of robot handling will be more softly.

2.2 Need of work

To construct a basic bomb diffusing robot which can handle simple tasks like cutting wires, flip on switches ,lift light objects, etc. and a simple autonomous robot to help in the transit of the bomb. Also gives video feedback to us so effective handling of robot can be possible.

2.3 Review of literature survey

“Design and Implementation of a Bomb Diffusing

Surveillance Robot using RF Technology” is paper by Reddy Pannala; DR. R.V. Krishnaiah is an author of this paper, this paper published in 2013. Advantages of this project are a robot that can be controlled by hand gestures and by a RF remote. This project is much useful for mines detection, surveillance applications. In this project RF module is use so that range is very small. “Bomb Detection and Diffusion in Planes by application of robotics”, Prashant Limje, Shailesh Khakale is a author of this paper, this paper published in 2013. Advantage of his project is, they have idea dynamic3D videogame is realized: the paper provides the reference for the mission to find and retrieve a bomb placed inside an airplane. But it is Difficult to achieve reliability. “Hand Gesture Recognition Bomb Diffusing Surveillance Robot” is paper of Sagar Radive, Neha Lokhande, Apoorva Kamat, Shubhrojit Chakraborty, Vishal Pande National Conference on Emerging Trends in Engineering & Technology 2012the hand gesture recognition makes the robot more user friendly but also there is need of Improvising the range of wireless communication so as to be able to put to a wider use. A Multipurpose Robot for Military Tribute to the Defense Ministry is paper of V. Prasanna Balaji & H. Goutham, International Journal on Theoretical and Applied Research in Mechanical Engineering (IJTARME), 2013 this also helps on remote bomb detonation and automatic bomb detection. Our robot also has terrain climbing facility so that it can be used in hilly regions. Future aim is to reduce the response time to a greater extent.

The outcomes of literature survey are followings
 : For more user friendly operation video camera is beneficial.
 : Due to wire range may decrease so we are going to use RF module.
 : For more soften operation we will use 5-DOF.

III. OUTCOMES OF LITERATURE SURVEY.

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 Due to wire range may decrease so we are going to use RF module.
 For more soften operation we will use 5-DOF

IV. FIGURES

4.1 Block Diagram

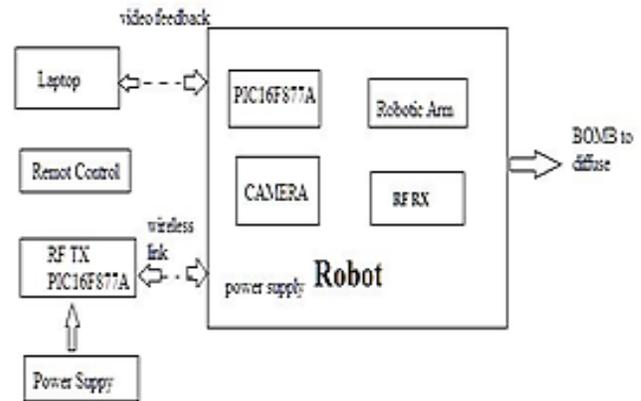


Fig 4.1 Block diagram of project

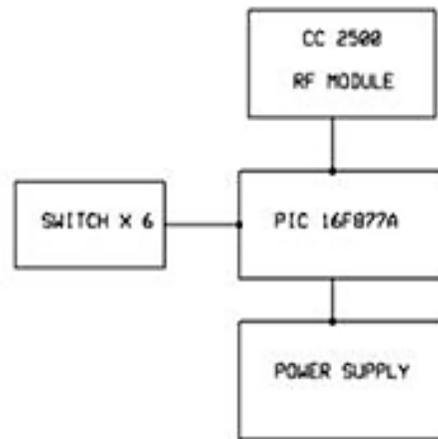


Fig 4.2 Block diagram of Transmitter

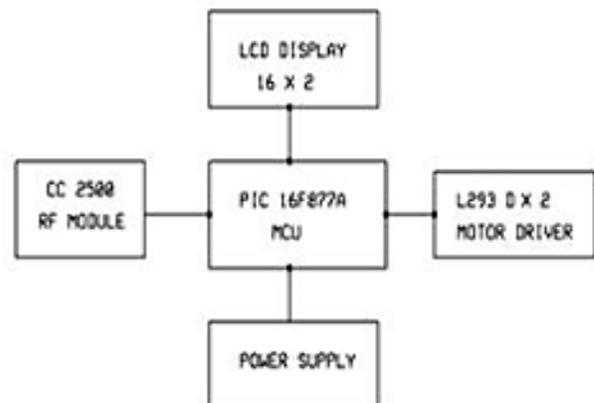


Fig 4.3 Block diagram of Receiver

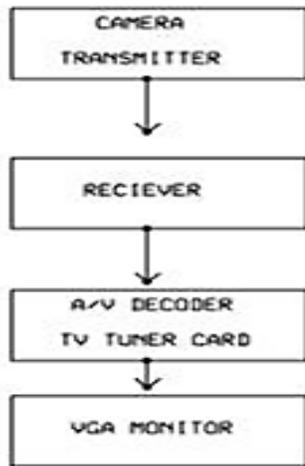


Fig 4.4 Block diagram of camera

V. CIRCUIT DIAGRAM

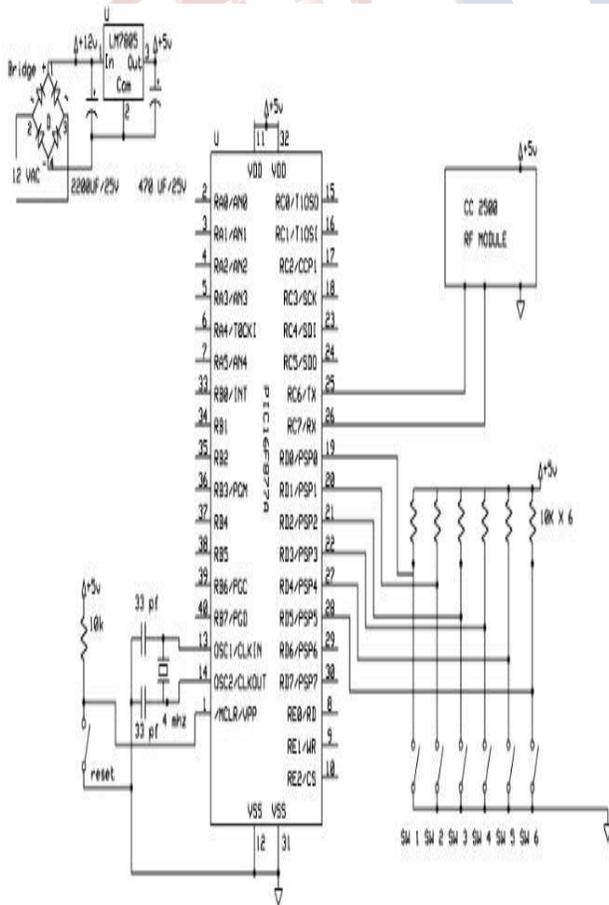


Fig.5.1 Circuit diagram of transmitter section

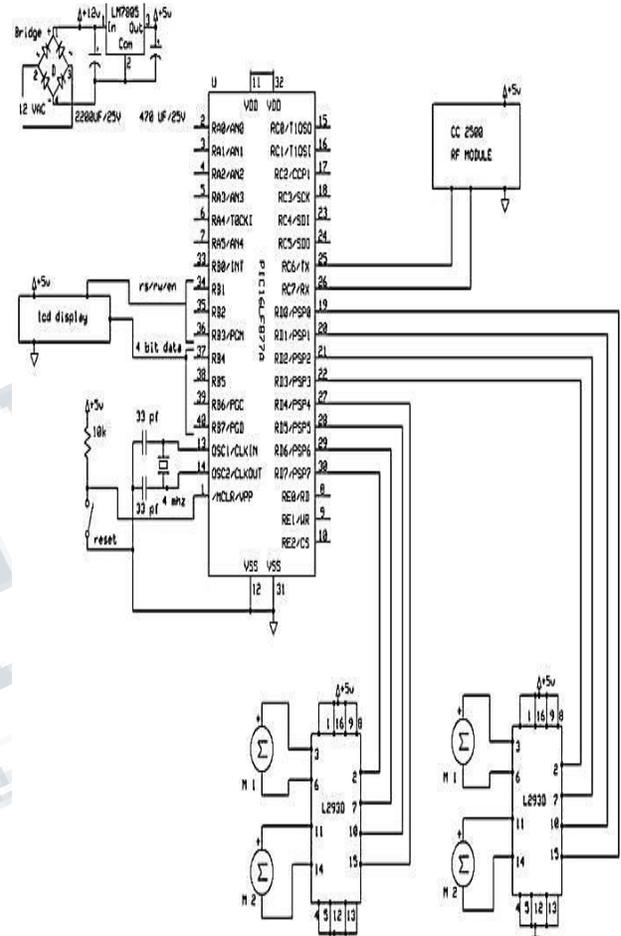


Fig.5.2 Circuit diagram of receiver section

VI. IMPLICATION (SOCIAL IMPACT)

The main idea of this robot is to provide the bomb disposal squad with safety and security from the risks that they face every day. The bomb disposal squad of has metal detectors and other equipment for bomb detection and disposal, but they have to risk their lives by approaching the bomb or the suspicious packet without any safety and precautions. Our robot provides an extra layer of protection to the bomb disposal squad by allowing them to check and analyze a suspicious packet before actually approaching it for disposal. Wireless robots reduce or eliminate a bomb technician's time-on-target. Provide video feedback to operator so more safety to bomb disposal squad.

VILHARDWARE USED

- 7.1 PIC microcontroller
- 7.2 base of robot
- 7.3 robotic arm
- 7.4 Switches
- 7.5 DC motors
- 7.6 Battery
- 7.7 wireless camera
- 7.8 Wireless Transmission module (Hand gesture module)
- 7.9 pc/laptop

7.1 PIC Microcontroller

- : Flash Memory: 14.3 Kbytes (8192 words)
- : Data SRAM: 368 bytes
- : Data EEPROM: 256 bytes
- : Self-reprogrammable under software control
- : In-Circuit Serial Programming via two pins(5V)
- : Watchdog Timer with on-chip RC oscillator
- : Programmable code protection
- : Power-saving Sleep mode

7.2 RF module



VIII. DESCRIPTION

The CC2500 is a low-cost 2.4 GHz transceiver designed for very low-power wireless applications. The circuit is intended for the 2400-2483.5 MHz ISM (Industrial, Scientific and Medical) and SRD (Short Range Device) frequency band. The RF transceiver is integrated with a highly configurable baseband modem. The modem supports various modulation formats and has a configurable data rate up to 500k Baud.

8.1 Wireless Camera



Fig 7.2 Wireless Camera

8.2 Key Features:

- Image sensor-CMOS
- Signal system-PAL/CCIRNTSC/EIA
- Horizontal resolution-380 TV line
- Scan Freq.-PAL/CCIR:50HZ/NTSC/ELA:60
- Antenna-50ohm SMA
- Demodulation mode-FM
- Transmission power supply-DC 9V
- Receiving Freq.-1.2G/2.4G

IX. PROBLEM STATEMENT

To construct a basic bomb diffusing robot which can handle simple tasks like cutting wires, flip on switches, lift light objects, etc. and a simple autonomous robot to help in the transit of the bomb. Also gives video feedback to us so effective handling of robot can be possible.

REFERENCES

- [1] "Design and Implementation of Bomb Diffusion Sing Surveillance Robot using RF Technology" Reddy Pannala, DR. R.V. Krishnaiah, International Journal of VLSI system Design and communication system 2013.
- [2] "Hand Gesture Recognition Bomb Diffusing Surveillance Robot", Sagar Randive, Neha Lokhande, Apoorva Kamat, Shubhrojit Chakraborty, Vishal Pande, National Conference On Emerging Trends in Engineering & Technology 2012.