

AUTO AIMING PROGRAMMABLE GUNNING SYSTEM

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ABSTRACT

In today's world enemy warfare is an important factor in any nation's security. The national security mainly depends on army (ground), navy (sea), air-force (air). To control the border effectively, countries must deploy an effective detection system that enables real-time surveillance of border integrity. Events such as border crossings need to be monitored in real time so that any border entries can be noted by border security forces and destinations marked for apprehension. There are many concerns regarding the safety of these soldiers. By using RF module and PIR / Ultrasonic sensor we can monitor authorized or not and provide wireless information system for monitoring the situation in the border.

Keywords: Alarm, Camera, PIR Sensor, RF ID, Ultra sonic sensor.

1.INTRODUCTION

Border patrol systems have recently achieved interest to address the concerns about national security. In our proposed method, there are two units, one is transmitter unit and the second one is receiver\control unit. If anyone tries to cross the border, the PIR sensor senses the motion of the person and sends a signal to the near security station. The camera captures the image on the monitor. After sensing the image official can send control signal received by the receiver circuit. In the control unit the microcontroller activates the relay driver which drives the load such as LED, alarm.

To monitor the border in real-time with accuracy and minimize the need for human support, multiple surveillance technologies, which complement each other are required. To address the challenges still facing by the existing surveillance techniques, we introduce Border security robot, a new border patrol system framework based on hybrid wireless sensor networks, which can accurately detect the border intrusion with minimum human involvements. Border security robot utilizes the PIR sensor for human detection and a metal detector for explosive detection. Also a wireless camera is used to continuously monitor the border. The signal generated by the sensor is filtered to filter out unwanted frequencies. Filtered signal is amplified and fed to the Schmitt trigger to shape the pulses. The output of the Schmitt trigger is used to trigger the monostable multivibrator. The high out of the monostable drives a relay via a relay driver. The relay in turn activates the alarm.

PIR (passive infrared) detector coupled with an electric light is now widely used for intruder protection.. The PIR detector used in this circuit reacts to fast temperature variations caused by the movement of people or animals in an enclosed space... Wireless Sensor Network (WSN) has been emerging in the last decade as a powerful tool for connecting the physical and digital worlds. The sensors on the devices extract physical information from the environment, such as temperature through a temperature sensor, pressure through a barometer, noise through a microphone, and even an image through a camera or thermal camera. The collected data then are sent over to the control command for further processing. There has been a great interest to utilize WSN for military applications and especially in border protection.

II. BLOCK DIAGRAM

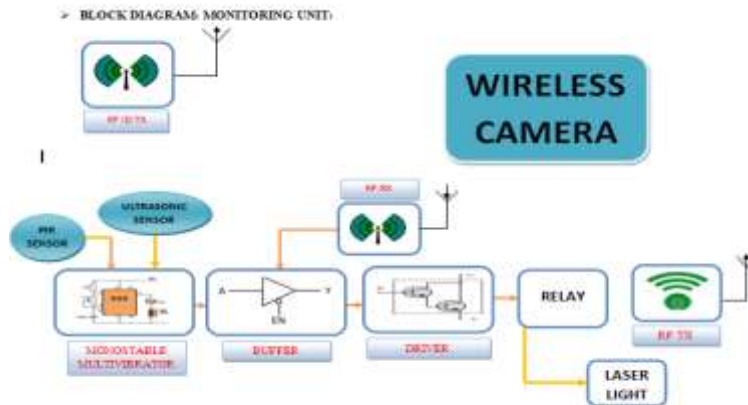


Figure 1:Block diagram Monitoring Unit.

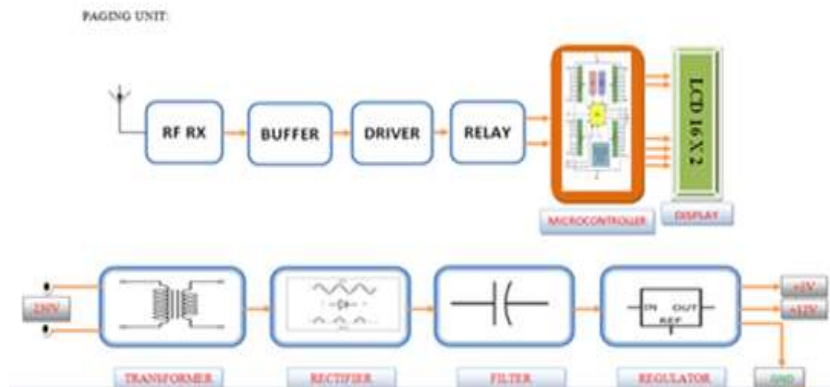


Figure 2: Block diagram Paging Unit

There are two units, fig 1 is the transmitter unit and the fig 2 is the receiver unit. This project is developed for the soldiers to find out the border and to check whether the person is authorized or unauthorized. The main modules in this project are RF transducer, controller unit and LCD display.

In fig 1, the transmitter will be there in border area. The transmitter module has two inputs. One is PIR sensor, which is used to detect the persons. And the second is RF receiver, which is used to detect whether the person is authorized or unauthorized with the help of RF transmitter. If PIR senses a person and RF receiver receives a signal from the RF transmitter, then the controller analyses the signal and indicates the person is authorized via LCD display.

In fig 2 the LCD display displays either authorised or unauthorised depending upon the input received from the transmitter unit. Then the controller will indicate the person is unauthorized with the help of buzzer and displays on the LCD display. The commander will take appropriate action based on the information received at the receiver end.

III. MAIN COMPONENTS OF THE CIRCUIT AND THEIR DESCRIPTION

BUFFER AND DRIVER

Buffers does not affect the logical state of a digital signal (i.e. logic 1 input results into logic 1 output whereas logic 0 input results into logic 0 output). Buffers are normally used to provide extra current drive at the output, but can also be used to regularise the logic present at an interface. And Inverters are used to complement the logical state (i.e. logic 1 input results into logic 0 output and vice versa). Also Inverters are used to provide extra current drive and, like buffers, are used in interfacing applications.

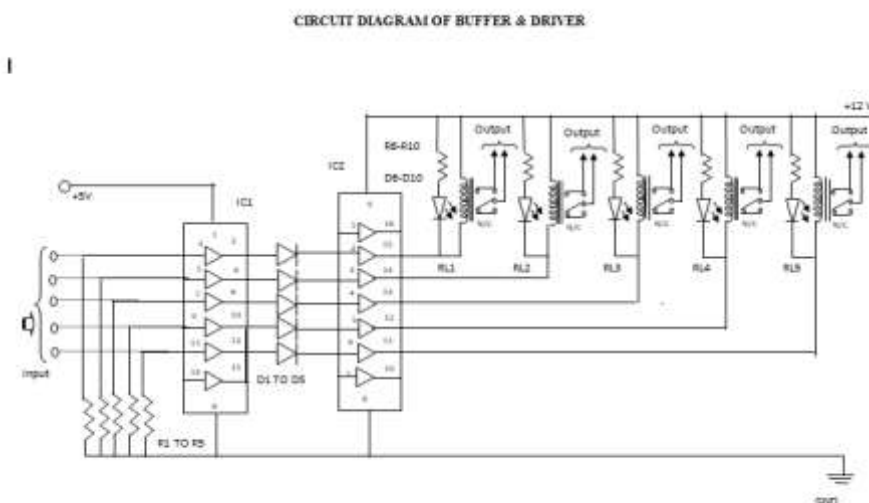


Figure 3: Circuit diagram of Buffer and Relay

PIR SENSOR:

A PIR-based motion detector is used to sense movement of people, animals, or other objects. They are commonly used in burglar alarms and automatically-activated lighting systems. They are commonly called simply "PIR", or sometimes "PID", for "passive infrared detector".



Figure 4: PIR Sensor

PIR sensors allow you to sense motion, almost always used to detect whether a human has moved in or out of the sensors range. They are small, inexpensive, low-power, easy to use and don't wear out. For that reason they are commonly found in appliances and gadgets used in homes or businesses. They are often referred to as PIR, "Passive Infrared", "Pyro electric", or "IR motion" sensors.

ULTRA SONIC TRANSMITTER AND RECEIVER:

The work of this circuit is to Transmit the 48 Kilo Hertz Ultrasonic waves towards the US Receiver. And this is achieved by an Astable Multivibrator whose clock producing range is between 11 Kilo Hertz to 55 Kilo Hertz.

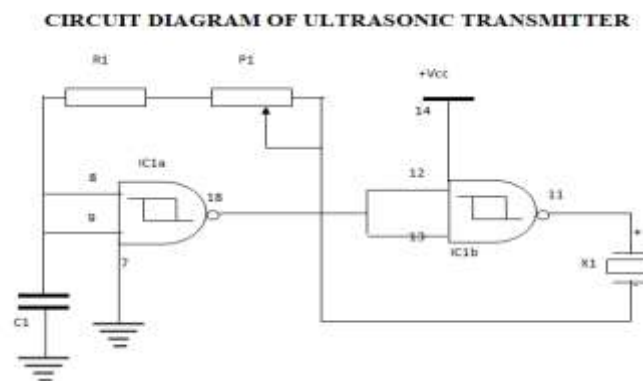


Figure 5: Circuit diagram of Ultrasonic Transmitter

Fig 5 comprises of following parts: Pre-amplifier, Buffer, Driver. The circuit uses transistors, op-amps and Darlington pair to perform its function. Since all the three sections are closely related with each other, all of them are inherited in single circuit. Events such as border crossings need to be monitored in real time so that any border entries can be noted by border security forces and destinations marked for apprehension. The NAND Gate

CMOS IC1 is used to construct the Astable Multivibrator circuit. The IC1's pin-14 is connected to +Vcc and pin-7 is to ground of the power supply. The RC Time constant is generated by the components P1,R1 and C1. The Preset P1 is used to fine tune the Ultrasonic wave's frequency to the desired value, that is 48 Kilo Hertz in this case. The Crystal X1 provides the initial and reference clock pulses to the circuit. Both the NAND gates two inputs are shorted and hence used as buffers.

IV.RESULTS



Figure 6:Monitoring unit

Figure 6 shows the monitoring unit consisting of PIR sensor,ultrasonic sensor,step down transformer,monostable and astable multivibrator.When either PIR\ultrasonic sensor or both detect the moment then the led will glow indicating the presence of either human or animal.



Figure 7:Firing circuit

Figure7 firing is done on the unauthorised person using laser lightIn this case the motion of the human is detected by yhe PIR sensor but the RF ID given to the authorised person does not matches indicating that the person is unauthorised and this is shown through the led light falling on the person.



Figure 8:Unauthorised detection

Figure 8 shows that an unauthorized person is detected.in case the moment of person is detected by PIR sensor but the person does not have the RF ID given for the identification of soldier then in such case the LCD will display “unauthorised detection”and the buzzer will be activated in the control room.



Figure 9:Authorised detction

Figure 9 shows the detection of authorised peson, that means the moment of he person is detected by the PIR sensor as well as the RF ID of the person matches with the one given to the individual soldier.

V. CONCLUSION

In this security system PIR sensor has been used which is low power, low cost, pretty rugged and are easy to interface with Microcontroller and other devices. This security system can be implemented in places like where there is need of continuous monitoring. The sensor which senses the change by generating small electrical signal and controller calls for RFID tag to match. If it is not get matched then it display a message as “unauthorized” and also alarm signal is generated. The sensitivity range for detecting motion of the system is about 3 to 4 feet. This method of security control system reduces man interference in security monitoring and it can also implement in border area and prohibited area. In this security system PIR sensor has been used which is low power, low cost, pretty rugged and are easy to interface with Microcontroller and other devices. This security system can be implemented in places like where there is need of continuous monitoring. The sensor which senses the change by generating small electrical signal and controller calls for RFID tag to match. If it is not get matched then it display a message as “unauthorized” and also alarm signal is generated. The sensitivity range for detecting motion of the system is about 3 to 4 feet. This method of security control system reduces man interference in security monitoring and it can also implement in border area and prohibited areas.

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