Advance Guard Security System with Wireless Communication

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Abstract:- This paper presents Safety and Security is a critical issue nowadays and many new innovations come out these days with the integration of security features into emerging wireless communication. Wireless communication is the transfer of information between two or more points that are not connected by an electrical conductor. The Advance Guard surveillance solution provides wide area detection and tracking system, covering both the perimeter and the area within a secure site. It uses a Passive Infra Red Radiations as a concept of radar to scan the area and advanced tracking algorithms to follow intruders. The system includes a wireless camera which shows the location of people or vehicles to a control room operator as they move within the site. Map locations are updated once a second. CCTV cameras can be controlled to automatically follow a threat and thermal cameras can be included as part of the system if required. Advance Guard operates in all weather and light conditions and can detect a variety of targets including people, vehicles or boats over water.

Keywords:-Passive Infra Red Radiation (PIR); Infra Red Radiation (IR); Radio Frequency (RF); Printed Circuit Board(PCB); Peripheral Interface Circuit(PIC).

I. INTRODUCTION

This project is done for the coastal areas security purpose. The advance guard surveillance solution provides wide area detection and tracking system covering both the premier and the area within a secure site. Our system is made to float over the seashore at regular intervals for the purpose of shriveling. Whenever any ship enters the particular area, then our project will detect its authorized or unauthorized. Not only it detects the vehicles but also the boat, people over water.[1] This system includes wireless camera which shows the location of the people or vehicle to a control room operator as they move within site. Advance guard operates in all weather and light conditions can detect a variety of targets including people, vehicles or boats over water.[2] Wireless communication is the transfer of information between two or more points that are not connected by an electrical conductor.[3][4] The testing device is made to float at desired distance from the shore With the support of the PIR sensor which is fixed to the Stepper motor which supports 360 degree rotation, the device detects the moving object first.[5] Secondly, the Radio Frequency communication device confirms whether the detected object is Authorized/Unauthorized.[6] Thirdly, the video camera which is fixed to another Stepper motor focuses the object wherever it goes and sends the Data and the Video information to the control room. [7][8]The control room consists of control panel which has a RF communication receiver that receives data from the testing device from the sea.[9] The control panel consists of an alarm system to identify the address of the testing device. It also consists of a video communication receiver and a monitor to visualize the live recordings of the object detected. It gives a security for the coastal areas and it will provide updated in formations. Moreover live movement of objects and illegal vehicles movement will be observed.

II. PROPOSED APPROACH

In Existing they were using Ultrasonic Sonogram and Ultrasonic Waves which are higher frequency waves to detect objects. There we cannot monitor the objects. Another system is using GIS/GPS tool. In this system is it highly expensive

Now in proposed system we are modifying that the security system by using PIR/IR sensor. In this system we can monitor the objects and can detect exactly where the object and their angle of movement which is shown in Fig 1. Here we are using ID receiver where as it receives licensed frequency from other ships. The project consists of three modules.

- The control room.
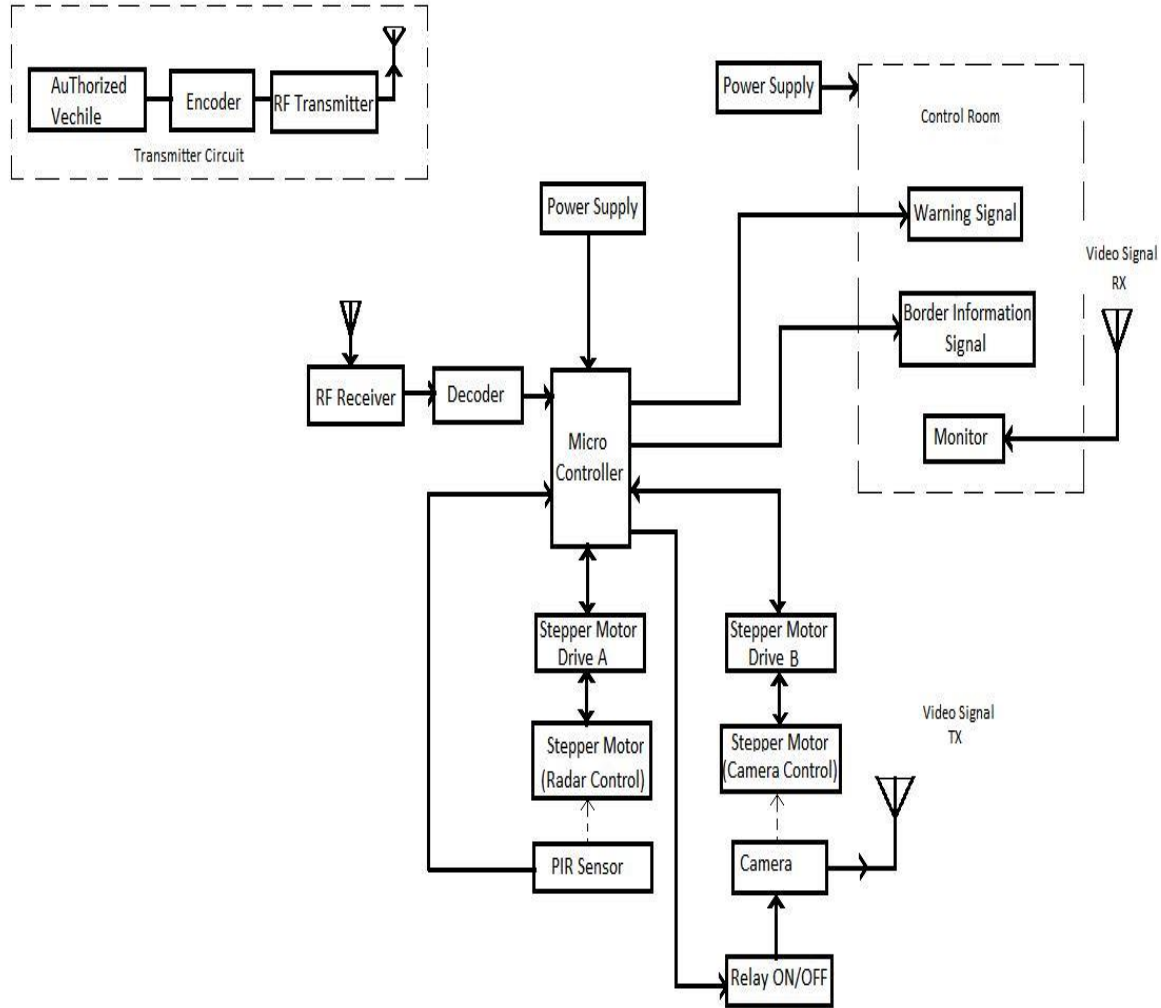- The testing device
- The subject under test.

Fig 1:- Block Diagram of Proposed Model

A. The subject under test

The subject could be any moving object in the seashore that is categorized into Authorized or Unauthorized sea vehicles.

B. The testing device

The testing device is made to float at desired distance from the shore With the support of the PIR/IR sensor which is fixed to the Stepper motor which supports 360 degree rotation, the device detects the moving object first. The Radio Frequency communication device confirms whether the detected object is Authorized/Unauthorized. The video camera which is fixed to another Stepper motor focuses the object wherever it goes and sends the Data and the Video information to the control room.

C. The Control Room

The control room consists of control panel which has a RF communication receiver that receives data from the testing device from the sea. The control panel consists of an alarm system to identify the address of the testing deviceIt also consists of a video communication receiver and a monitor to visualize the live recordings of the object detected.

III. HARDWARE AND SOFTWARE

A. Microcontroller

Microcontroller are designed for embedded application, in contrast to the microprocessor used in personal computers or other general purpose applications. The Microcontroller is programmed with the required program to

accept the data from the wireless transmitter, interpret it calculate the path in terms of spatial orientation and five logical values to the Motor driver.

This microcontroller is a 40 pin IC, which is shown in Fig 2.This microcontroller is erasable and can be used more than 100000 times. Microcontroller converts high level language to machine language. Microcontroller works on the standard 5v supply. IC's are semiconductor. The supply is floating voltage when it is off. Hence pull down condition occurs.
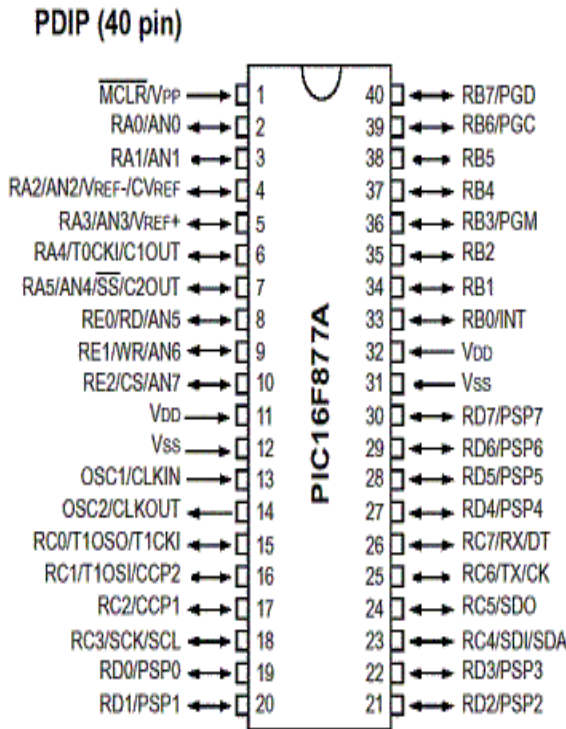

Fig 2:- Model Of40 Pin IC Mircocontroller

B. PIC Simulator IDE

PIC Simulator IDE is powerful application that supplies PIC developers with user-friendly graphical development environment for Windows with integrated simulator (emulator), Basic compiler, assembler, disassembler and debugger.PIC Simulator IDE currently supports the following microcontrollers from the Microchip PIC micro 12F and 16F product lines.
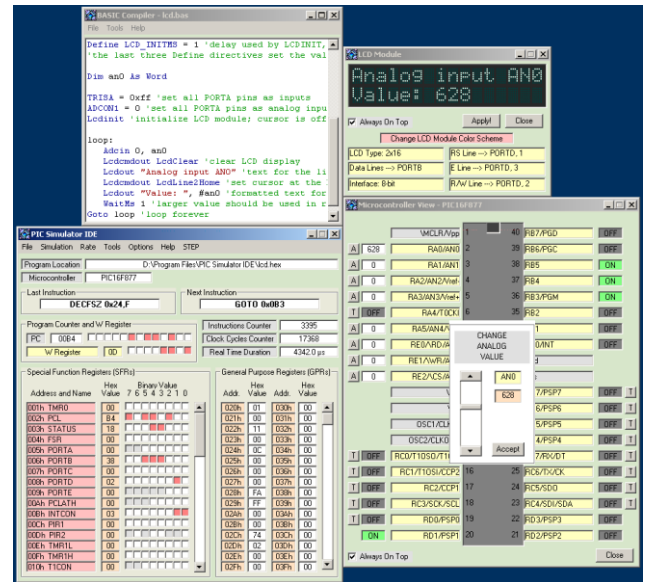

Fig 3:- Simulation Of the PIC Simulator

C. Stepper Motor

A stepper motor is an electromechanical device which converts electrical pulses into discrete mechanical movements. The shaft or spindle of a stepper motor rotates indiscrete step increments when electrical command pulses are applied to it in the proper sequence. The motors rotation has several direct relationships to these applied input pulses. The sequence of the applied pulses is directly related to the direction of motor shafts rotation.

Fig 4:- Model of Stepper Motor

The speed of the motor shafts rotation is directly related to the frequency of the input pulses and the length of rotation is directly related to the number of input pulses applied. A stepper motor can be a good choice whenever controlled movement is required. They can be used to advantage in applications where you need to control rotation angle, speed, position and synchronism. Because of the inherent advantages listed previously, stepper motors have found their place increase the number of steps per revolution of the motor, or in other words to provide a smaller basic (full

step) stepping angle. The permanent magnet stepper motor contains an equal number of rotor and stator pole pairs.

IV RESULT ANALYSIS

The model of the control room circuit is shown in Fig 5. There is the transmitter and trans receiver to detect the authorized/unauthorized vehicles and object. And a live visualization of the unauthorized vehicles will be observed from the control room.
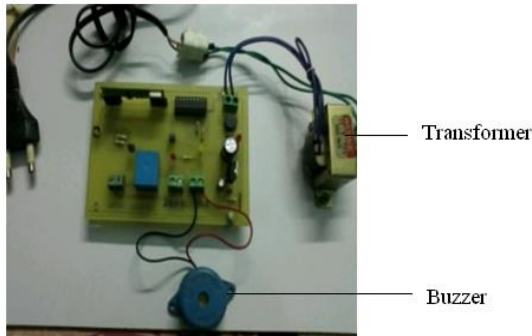

Fig 5:- Model of The Control Room

The model of the test device circuit is shown in Fig 6. On top of the Stepper motor , camera will be fixed which will be able to rotate 360 degree rotation.
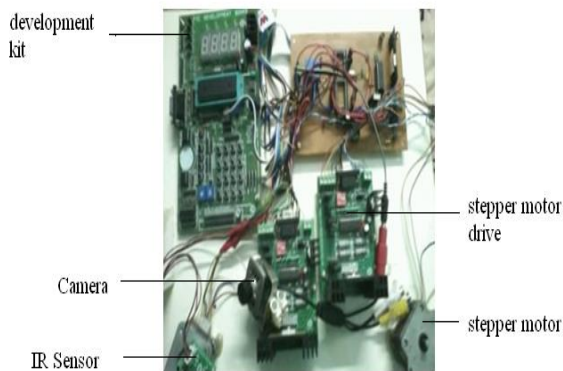

Fig 6:- Model of Test Device

The camera will focus the unauthorized vehicles and sends the Data and the Video information to the control room. It can also Used in Sea port and Sea shores for security purposes. It Can be used in any places where the safety and security system is needed. It Can be used in marine sport activities where automatic video recording is achieved focusing the moving players.

V. CONCLUSION

Thus we conclude that, In this system we can monitor the objects and can detect exactly where the object and their angle of movement. This system is highly securable for coastal areas. This security system is run on specific instrument that give alert to the coastal area people over the control room. So when the enemies come through the coastal way even it's a ship or boat or any moving object, that information will be given to the control room. Even if the testing device gets damaged by the enemies, even that information also will be given to the control room. Our testing device not only detects one ship or one object, it can do multi tasking at a time, means it can view two or more objects since the camera and the sensor is of 360 degree rotation.

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