

# RF Based Night Vision Spy Robot Using PIC Controller

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## Abstract

*Most of the spy robots are remotely controlled robots, equipped with camera, transmitting video data to the troop. They are made to small and compact enough to easily transport. Humans are moved out from direct exposure to potentially dangerous situations. Robotic System can perform many security and surveillance functions more effectively than humans. In this project a movable robot with a remote controller by using PIC 16f877a. This robot based on PICs microcontroller. In remote control system, radio frequency modules are used for transmitting and receiving signals.*

**Key Words:** PIC Microcontroller, RF Module, Night Vision Camera, DC Motor

## 1. INTRODUCTION

The night vision spy robot is used for spying of an information, the word spying means collecting an information secretly against any organization which work terrorally or observing movements of an enemy. In this robotic vehicle, two pic microcontrollers are used namely pic 16f877a, one is used at receiver circuit and another is at the transmitter. By using transmitter, commands are transmitted to the robotic vehicle, according to that commands the robotic vehicle will move forward, backward, left and right. There are four dc motors are used for the movement of vehicle. The RF based night vision camera which is mounted on the robotic vehicle, will capture an image and send these images to the IR receiver which is connected to the T.V. or laptop and we can see these images on the laptop or T.V. We can keep watch remotely by using these camera we can see at night also. so it is very useful for surveillance purpose.

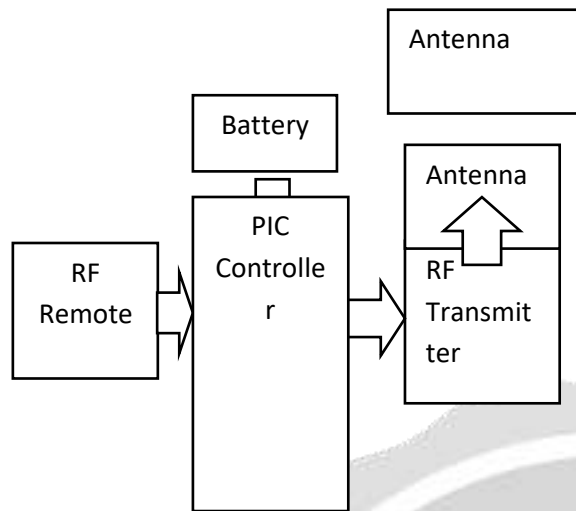
## 2. LITERATURE REVIEW

[1] Swapnil Mishra (2017), in their paper they made Night Vision Camera Technology based Robot used in war field. This robot can transmit real time motion pictures with night imaginative and can not be identified by the enemies in conflict area.

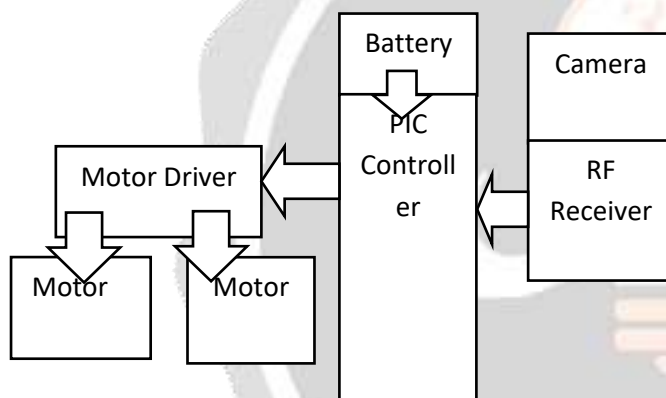
[2] Wai Mo Mo Khaing (2014), in their paper Wireless Controlled Spy Robot by using PIC Microcontroller. A LCD display is mounted on remote controller to check the user commands. This robot is designed for detection and surveillance purpose.

## 3. BLOCK DIAGRAM

The proposed system is based on PIC Controller. A 5V supply is given to the PIC. This project is divided into two parts transmitter and receiver. It consists of RF remote, two PIC controller, RF transmitter, RF receiver, antenna, motor driver IC L293D, two DC motors and night vision camera. A night vision camera is mounted on robotic vehicle. Commands are given by using RF remote which is transmitted via RF transmitter through antenna to robotic vehicle. At receiver side, RF receiver receives that commands. According to that commands PIC will generate the output which is not sufficient to drive the motor. So for that motor driver L293D is used to boost the output of PIC to drive the DC motor. According to that command motor will rotate and camera will monitor the surrounding area.



**Fig.1:** Transmitter Block Diagram

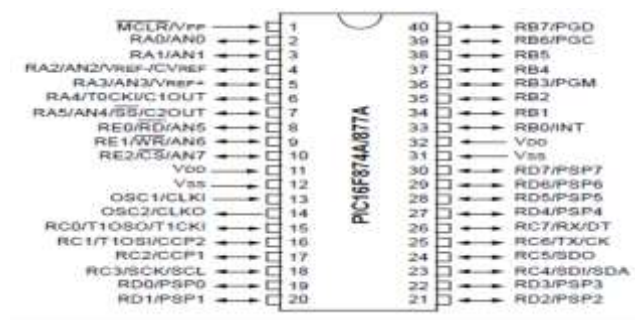


**Fig.2:** Receiver Block Diagram

### 3.1.POWER SUPPLY

The PIC16F877A need +5V DC, this specification dictates the use of a low-cost regulator LM7805. The LM7805 requires an input voltage of at least 7.5V in order to guarantee regulation, so the unregulated power supply should supply at least this voltage under worst-case current consumption.

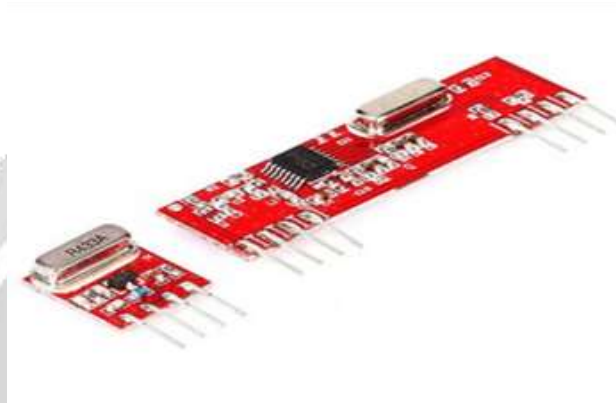
### 3.2.PIC MICROCONTROLLER



**Fig.3:** Pin Diagram of 16F877A

PIC microcontroller of series 16F877A is used in the proposed model. PIC16F877A is a small piece of semiconductor integrated circuits. The package type is of the integrated circuits is DIP package. DIP stands for Dual Inline Package for semiconductor IC. This Package is very easy to be soldered onto the strip board. However, using a DIP socket is much easier so that this chip can be plugged and removed from the development board. PIC16F877A IC can be reprogrammed and erased up to 10,000 times. Therefore, it is very good for new product development phase. It is very popular because PIC 16F877A is very cheap. Apart from that it is also very easy to be assembled. Additional components necessary to make the IC work are just a 5V power supply, Crystal oscillator and two 22pF capacitors. Some of the features are listed below: (i) All single-cycle instructions except for program branches, which are two-cycle (ii) Operating Speed: DC-20 MHz clock input DC- 200 ns instruction cycle (iii) Up to 8K x 14 words of Flash Program Memory, up to 368 x 8 bytes of Data Memory (RAM), Up to 256 x 8 bytes of EEPROM Data Memory (iv) Pin out compatible to other 28-pin or 40/44-pin has PIC16CXXX and PIC16FXXX Microcontrollers.

### 3.3.RF MODULE



**Fig.4: RF Module**

RF module are very small in dimension and have wide operating voltage range i.e .3v to 12v. Basically the rf module are 433Mhz RF transmitter and receiver modules. The transmitter draws no power when transmitting logic zero while fully suppressing the carrier frequency thus consume significantly low power in battery operation. when logic one is sent

Carrier is on to about 4.5mA with a 3volts power supply. The data is send serially from the transmitter which is received by the tuned receiver. Transmitter and receiver are duly interfaced to two microcontrollers for data transfer.

### 3.4.NIGHT VISION CAMERA



**Fig.5: Night Vision Camera**

It is a wireless night vision camera having an output frequency range of 900MHZ-1200MHZ. It's name is MACHSMART wireless camera having the radio frequency of 1.2GHZ. It is a weatherproof camera ,it requires 12v dc supply. It is having wireless transmission and reception facility. It having an output power of 50mv-200mv. The wireless camera having a RF receiver ,by using this receiver ,pictures or video recorded by camera can easily visible on laptop or T.V.

### 3.5.DC MOTOR



**Fig.6:** DC Motor

DC motor is a class of electrical machine that convert electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic, to periodically change the direction of current flow in part of the motor. The DC motor used in this system, is of 30rpm. It requires 12v DC voltage. It can rotate clockwise, anticlockwise direction according to the programming. It is high quality low cost DC motor geared motor. It has steel gear and pinions to ensure longer life and better wear and tear properties. The whole assembly is covered with a plastic ring.

### 3.6.DRIVER IC L293D



**Fig.7:** Driver IC L293D

L293D is a typical motor driver or motor driver IC which allows dc motor to drive on either direction. L 298D is a 16 pin IC which can control a set of two DC motors simultaneously in any direction. It means that you can control two DC motors with a single L293D IC. Dual H – bridge motor driver integrated circuit. It is the pin diagram of a L293D works on the concept of H-bridge. H-bridge is a circuit which allows the voltage to be flown in either direction. As you know voltage need to change its direction for being able to rotate the motor in clockwise or anticlockwise direction, Hence H-bridge IC are ideal for driving a DC motor.



## 7.REFERENACE

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- [2] Department of Mechatronic Engineering, Mandalay Technological University Mandalay, Myanmar ,Wireless Controlled Robot By Using PIC Microcontroller ,International Journal of Science, Engineering and Technology Research.

