Wildlife Observation Robot Using RF

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Abstract: Here the wildlife observation robot with night vision capability system makes use of RF remote joystick to operate the robot on which the night vision camera is being mounted 360 deg. This allows the user to control the robotic vehicle wirelessly and get required angled of these wild animals. This video is recorded and can be viewed on PC for reference later. So wildlife observers can now safely get close footage of wild animals by operating this robotic vehicle without any threat from a safe distance. This system consists of an 8051 family microcontroller CPU unit used for processing user sent through the RF transmitter circuit. These signals are received by the RF receiver mounted on the robot. The microcontroller then processes this data and passes on signals to driver motors to control the robot. The driver motors now in turn operate the motors by providing required signal outputs to drive the vehicle movement motors. Also when the microcontroller receives the camera directional change signal, it then forwards this signal to the camera motor in order to achieve required camera angle. Thus this wildlife observation robot with night vision capability system helps to get a closer view of wildlife with the help of RF remote joystick.

Keywords: RF module, motor driver L293D, Night vision camera, dc motor, night vision.

I. INTRODUCTION

Project makes use of this innovative system in order to get close footage of wild animals using 360 deg cameras. As with the help of this system the user doesn't have to go close to the wild animals in order to get the close footage of movement of animals. Here the wildlife observation robot with night vision capability system makes use of RF remote joystick to operate the robot on which the night vision camera is being mounted 360 deg. This allows the user to control the robotic vehicle wirelessly and get required angled of these wild animals. This video is recorded and can be viewed on PC for reference later. So wildlife observers can now safely get close footage of wild animals by operating this robotic vehicle without any threat from a safe distance. This system consists of an 8051 family microcontroller CPU unit used for processing user sent through the RF transmitter circuit. These signals are received by the RF receiver mounted on the robot.

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II. LITERATURE REVIEW

Usage of sensor networks in monitoring, tracking and detection of different wildlife species is a common practice that is carried on. For small animals and birds, RF tags are used to track their motion using radio telemetry [1].

Mine Rover- It was developed in 2005 abandoned mines-remnants of old west mining booms –closely guard their secrets in the forgotten corners of Arizona's backcountry. What's concealed just around that bend in the tunnel are the inevitable questions those hikers and others ask when they stumble across these slumbering relics. Those can be dangerous questions[2]. Crumbling walls and ceilings that threaten to collapse at the slightest touch; hidden vertical shafts; poisonous gases; wildlife lurking inside are just some of the dangers that prevent the non suicidal from exploring. Still the question remains: what's inside They've built an 18 inch long, radio controlled rover to do the looking for them .it's equipped with a power full search light to explore the mines dark recesses and a pan and tilt video camera to send images back to their laptop computer. Jessica Dooley and Keith Brock made the ground rover to tour a mine [3].

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III. SYSTEM DESCRIPTION

The basic block diagram of wildlife observation system using RF system is shown in the above figure. Mainly this block diagram consists of the following essential blocks. 8051 series Microcontroller

RF Module
Antenna
Motor driver IC
Wireless Camera

- **Transmitter**

It consists of an RF transmitter module with encoder and joystick. It requires 9v power supply to operate. With the help transmitter section we can control our robot. to move left, right, forward ,backward this section is used. Transmitter also transfers command from four buttons to receiver. Transmitter can control the camera direction which is placed on the robot.

- **Receiver**

This section has consists of main spy robot. The night vision camera placed on this section at 180 degree. In this there are three servo motors are require two for moving robot and one for the moving camera. Microcontroller 8051 interface with RF receiver requires 12v battery supplies to operate. RF receiver receives RF commands from the transmitter and decodes it using decoder & performs as requires. To drive motors we require motor driver ic.The movement of animals captured by camera is then displayed on the PC for reference.

The transmitted signals are received by the receiver decoder module placed away from the source of transmission. The system allows RF communication one way communication between two nodes, namely, transmission and reception. The RF module has been used in conjunction with a set of four channel encoder and decoder ICs. Here HT12E & HT12D have been used as encoder and decoder. The encoder converts the parallel inputs (from the remote joystick) into serial set of signals. These signals are serially transferred through RF to the reception or receiver. The decoder is used after the RF receiver to decode the serial format and retain the original signals as outputs [5].
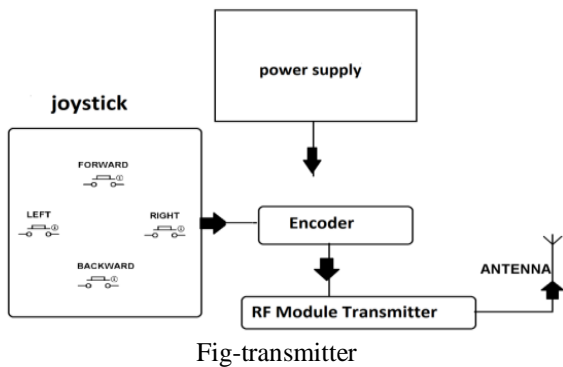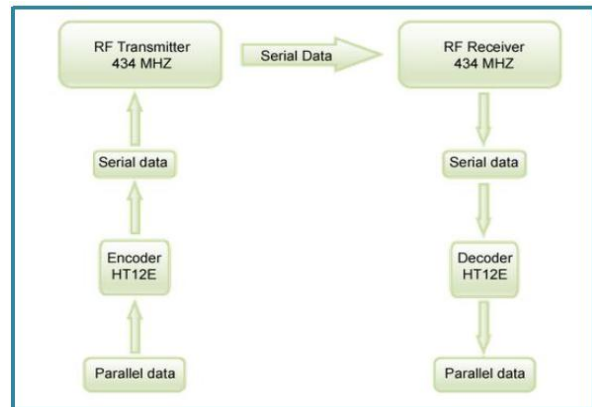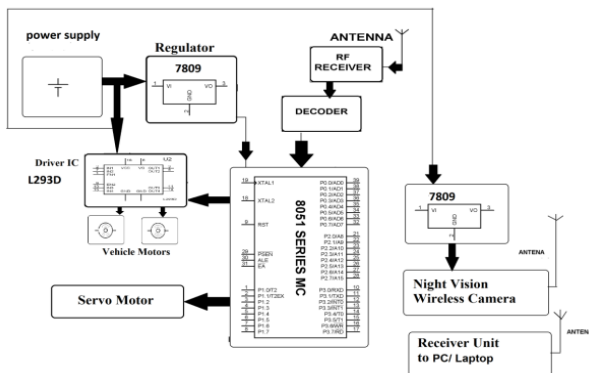

Fig-transmitter

Fig-receiver

- RF module

This radio frequency (RF) transmission system employs Amplitude Shift Keying (ASK) with transmitter/receiver (TX/Rx) pair operating at 434 MHz The transmitter encoder module takes serial input and transmits these signals through RF.

Motor driver IC L293D

- **Features**

Wide Supply-Voltage Range: 4.5 V to 36 V
Separate Input-Logic Supply
Internal ESD Protection
High-Noise-Immunity Inputs
Output Current 1 A Per Channel (600 mA for   L293D)

- **Applications**

Stepper Motor Drivers
DC Motor Drivers
Latching Relay Drivers

DC MOTOR

A DC motor is a mechanically commutated electric motor powered from direct current (DC). The stator is stationary

in space by definition and therefore its current. The current in the rotor is switched by the commutate or to also be stationary in space. DC motors have a rotating armature winding but non -rotating armature magnetic field and a static field winding or permanent magnet. Different connections of the field and armature winding provide different inherent speed/torque regulation characteristics. The speed of a DC motor can be controlled by changing the voltage applied to the armature or by changing the field current. Modern DC motors are often controlled by power electronics systems called DC drives[6].
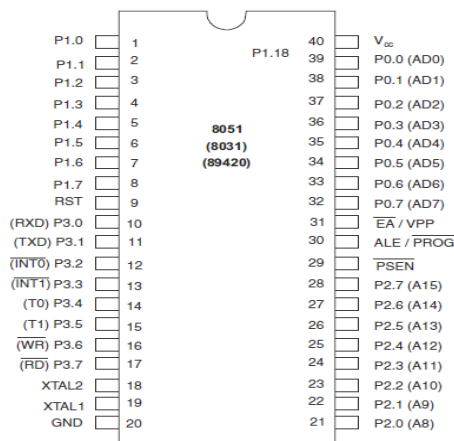

Fig-DC motor

MICROCONTROLLER 8051

Microcontroller (MC) may be called computer on chip since it has basic features of microprocessor with internal ROM, RAM, Parallel and serial ports within single chip. Or we can say microprocessor with memory and ports is called as microcontroller. This is widely used in washing machines vcd player, microwave oven, and robotics or in industries. Microcontroller can be classified on the basis of their bits processed like8bit MC, 16bit MC. 8 bit microcontroller means it can read write and process 8 bit data. Ex. 8051 microcontroller. Basically 8 bit specifies the size of data bus. 8 bit microcontroller means 8 bit data can travel on the data bus or we can read, write process 8 bit data.

Pin diagram of 8051

• Features of 8051
Fully TTL Compatible.
4 8bit bidirectional I/O ports.

8K Bytes of Programmable Flash Memory.
4.0V to 5.5V Operating Range.
256 x 8-bit Internal RAM.
32 Programmable I/O Lines.
Three 16-bit Timer/Counters.
Eight Interrupt Sources.
Full Duplex UART Serial Channel.
Low-power Idle and Power-down Modes.

IV. CONCLUSION

In this project we have conclude that the close footage and secure data can be obtain without any threat. Wildlife observation robot is more reliable system than older system to obtain movement of animals.

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