

Review on Long Range Solar Power Spy Robot

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Abstract

A Spy robot is a machine which can be controlled by the cell phone. The cell phone has twelve buttons to control the robot in four directions and also to perform other functionalities. This spy robot holding four technologies together, they are- Human Motion Detection using Passive Infrared Sensor, Metal Detection, Night Vision Wireless Camera and LED Flasher. PIR sensor detects the changes in the IR levels emitted by the humans. It can detect the levels of Infrared Radiations. Robot motion, Metal Detection, Night Vision Wireless Camera and LED Flasher is done by DTMF Technology. The system used two mobile phones, one to control the robot that sends DTMF commands via call to another mobile phone mounted on the robot vehicle. A DTMF decoder, metal detector and LED Flasher are interfaced with the microcontroller of 8051 family.

Keywords: *AT89S51 microcontroller, DTMF decoder, buzzer, PIR sensor, solar panel*

INTRODUCTION

A Robot is usually an electro-mechanical machine which is guided by wireless remote or laptop. Here, we are using the mobile phone as the remote. Spy robot can capture audio and video information from the surroundings and send to a controlling station through DTMF signal. By the use of cell phone controller, the spy robot will

move to desired destination and spy images around the robot in this project.

PROPOSED SYSTEM

It is an embedded system which we used to provide security using several technologies. We are using long range solar power spy robot to provide security which reduces man efforts.

Features of Proposed System

1. Night Vision using Wireless Camera.
2. Human Motion Detection using Passive Infrared Sensor.
3. LED Flash Indicator.
4. Metal Detection.

Night Vision using Wireless Camera

Night vision cameras enable you to protect your valuable assets by capturing video evidence of theft, vandalism and any other unauthorized activity that occurs in low-light conditions where standard security cameras would not work. Today's night vision security cams feature an impressive array of advanced features to make after-hours video surveillance easy, effective and accurate. Night-useful spectral range techniques can sense radiation that is invisible to a human observer. Human vision is confined to a small portion of the electromagnetic spectrum called visible light. Enhanced spectral range allows the viewer to take advantage of non-visible sources of electromagnetic radiation (such as near-infrared or ultraviolet radiation). Some animals such as the mantis shrimp can see using much more of the infrared and/or ultraviolet spectrum than humans [1–4].

Human Motion Detection using PIR Sensor

PIR sensor detects the changes in the IR levels emitted by humans. The presence of human body creates a sudden change in the IR profile of the surrounding that is sensed by the pyro electric sensor. Here, the microcontroller continuously monitors the output from the sensor module and provides a signal on when it goes active. With the help of the signal, we can identify the motion of human which was detected by the sensor. At the same time microcontroller sends a signal to controlling station through wireless communication to indicate the detection. It is very cheap, affordable, efficient, portable and easy to use [5–8].

Robot Motion using DC Motor

It allows operating a robot irrespective of the distance of the person operating it. In order to make the robot move, the system uses two mobile phones, one phone control the robot that sends DTMF commands to another mobile phone mounted on the robot vehicle. A DTMF decoder interfaced with the microcontroller of 8051 family receives the commands, with the help of motor driver operates the vehicle movement. Thus, according to the commands sent from the phone two DC motors enables the vehicle movement through motor driver IC. The

data commands will make the robot to either go in forward, backward, left or right direction. A battery is used as a power source. Thus, with the help of DTMF technology, the user can now operate a robot from any distance via a phone call. When a phone call is made, the receiver phone just needs to receive the call and then wait for user commands sent through keypad. The receiving process can be manual or automated. Here, it is automated. The system even includes a spy wireless camera which is used to capture the area wherever the robot goes. All the area captured by this camera can be viewed in PC for reference [4].

LED Flash Indicator

Basically, a spy robot is used for spying, tracing and detecting the targets and used for security purposes. Here, in the spy robot

LED Flash Indicator is used to indicate the place and position of the robot to the unknown person. In case, if the person which is unknown about the working robot is passed near from the robot and vice versa then there are some chances of damaging of robot.

Metal Detection

The metal detector helps to detect metal and indicate via electrical signal. A metal detector is an electronic instrument which detects the presence of metal nearby. Metal detectors are useful for finding metal inclusions hidden within objects, or metal objects buried underground. They often consist of a handheld unit with a sensor probe which can be swept over the ground or other objects. If the sensor comes near a piece of metal this is indicated by an electrical signal.

BLOCK DIAGRAM

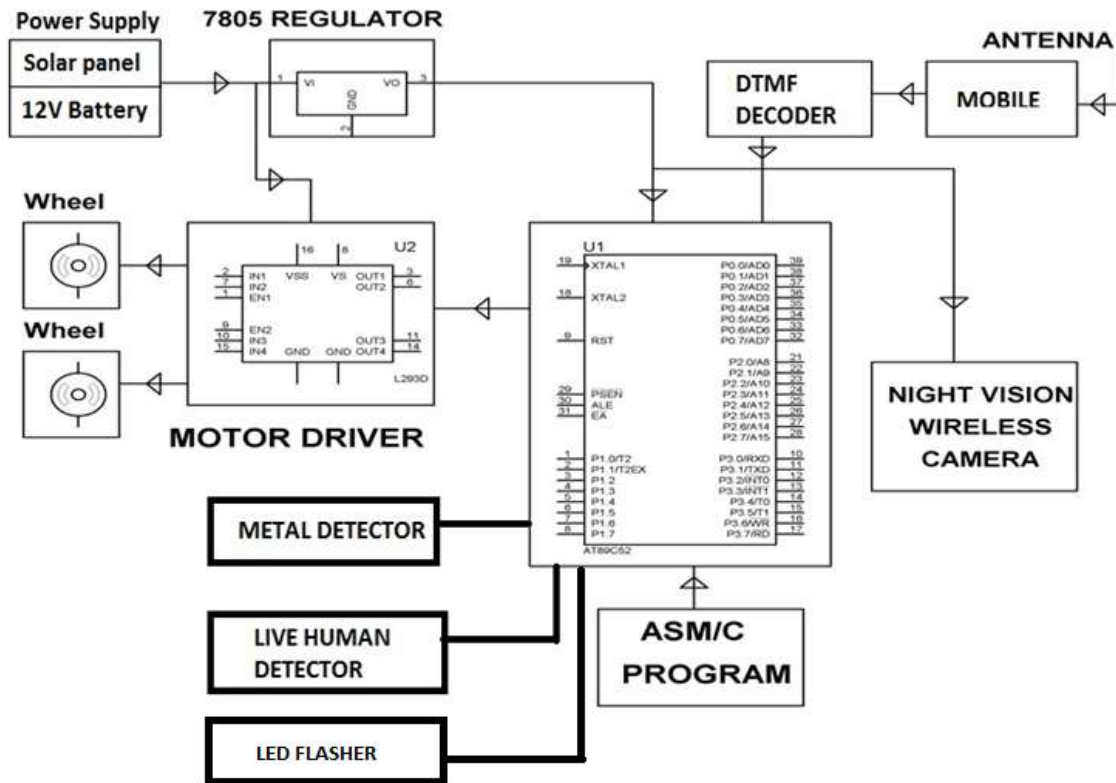


Fig. 1: Block Diagram of Proposed System.

All the operations are controlled by micro-controller, which takes input from a DTMF module. When the button is pressed from the mobile connected to DTMF module then the corresponding task is done by the controller to which it is programmed. The power supply used here is a dual power supply, i.e., solar panel and battery. The solar panel is used to charge the battery as well as drive load at day time while at night it is operated by the battery. It also has a night vision camera which is used to detect object at night period of time. Below is the flow chart of the expected working of the robot.

FLOW CHART

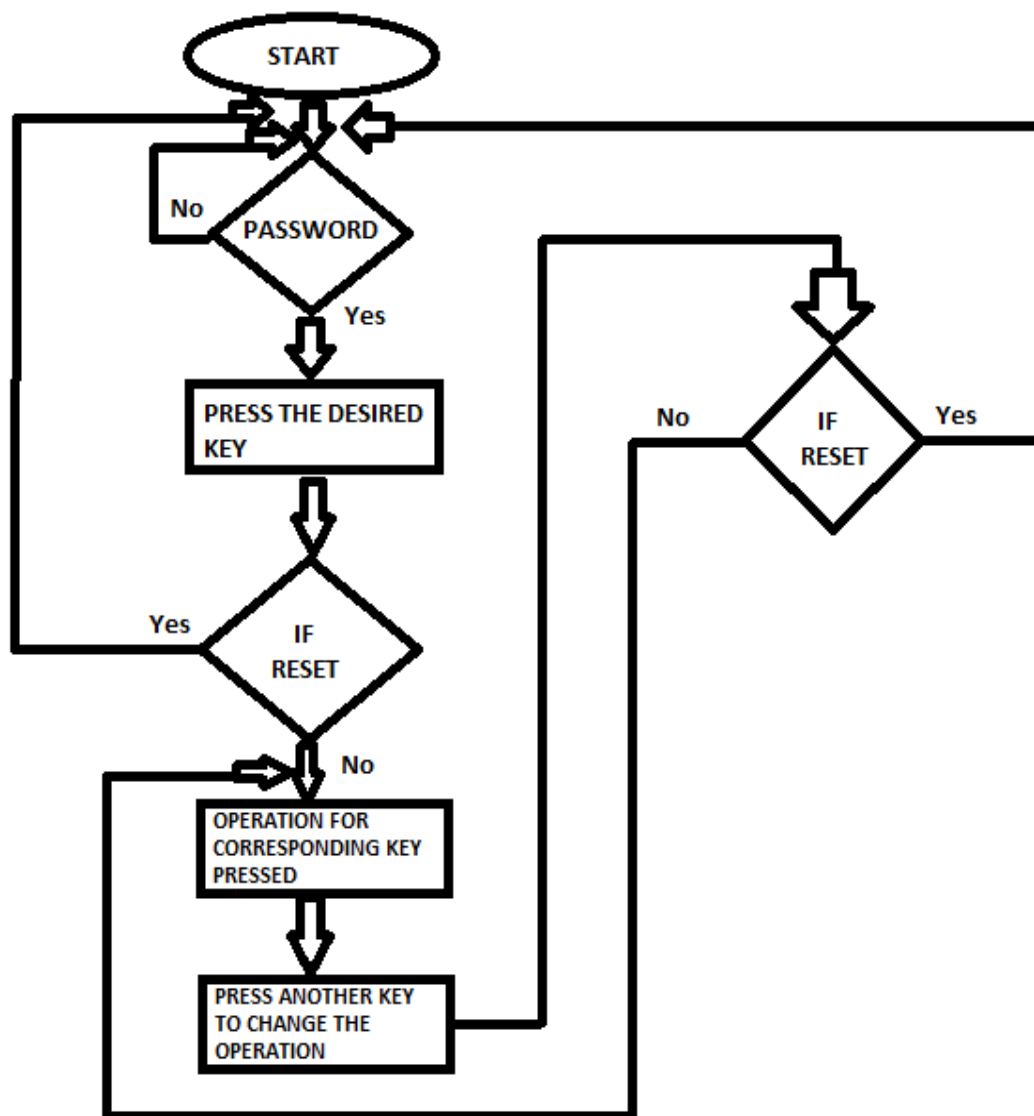


Fig. 2: Flow Chart of Proposed System.

EXPECTED RESULTS

According to the research and the working till now this spy robot is expected to work in the night due to night vision camera. Also, it will perform the activities like metal detection, human detection and LED Flasher. The complete working of the robot is controlled by a DTMF technology through a cell phone [4]. Every button of the phone indicates different operations. Also, the robot is password protected and can be reset by pressing a button programmed for it. The motion of the robot is operated by four buttons, i.e., to move forward, backward, left and right.

CONCLUSION

The main motive of the spying robot was to make it user friendly. The spy robot can easily move, capture images and wirelessly transmit them, thus, giving the organization intimation about the dangers and situations in the work field or area under consideration. The robot will move depending on the motor direction based upon the input we give through transmitter (remote) section. DTMF signals are used as control signals. By using these signals encoding is done and signal is sent through the transmitter. At the receiver end, these decoded signals are given as input to drive

the motor. The robot is used for short distance surveillance thus ensuring the security of the region. This helps the organizations to view the things accurately that are currently happening in the surrounding area and to plan ahead accordingly. With the available facilities and infrastructures provided we are successful in designing a cost-effective system which accomplishes the required application. Implementation of wireless technology in the project enables the handling of the robot efficiently without manual intervention.

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