

Wireless Remote Surveillance And Recording System With Hierarchical Level Customizations

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Abstract:

Surveillance is a key aspect in security in today’s world. Though highly needed, it is also one of the most dangerous part of the security establishment. Cheap technology is available but not employed to reduce the growing dangers of physical surveillance. The project is designed to develop a robotic vehicle using RF technology for remote operation attached with wireless camera for monitoring purpose. The robot along with camera can wirelessly transmit real time video with night vision capabilities and at the same time be remotely controlled.

Keywords: Security, Surveillance, Radio frequency, Wireless communication

I. INTRODUCTION

Surveillance has become an expensive process. All major MNCs are relying on the insecurity of governments in terms of safety. The cost of surveillance has gone through the roof while the technology hasn’t changed a lot. Lack of funds with defense establishments to procure these expensive equipment has compromised security. My aim is to bring an inexpensive alternative to physical surveillance that is both efficient and safe and is customizable for application in various fields.

The architecture can be customized in to various levels depending on the operational hierarchy. Several such surveillance systems can be grouped to fulfill different applications

II. ARCHITECTURE

The proposed system will have three major blocks.

1. Wireless camera system
2. Vehicle for movement
3. Remote Controller- Transmitter

The wireless camera system has a camera which scan all common video frequencies in between 50Mhz to 30Ghz. It is non-line of sight system which is crucial for security agencies, not effected by light and has a long range of about 100m. It has inbuilt microphone and recording facility is inbuilt.

Vehicle is the platform on which the camera system is mounted. It has tank treads instead of tires and uses 12V 7Ah Lead acid recyclable battery. Its major functions are moving forward, backward left and right. It is extremely small and light which is a big advantage for security personnel. It has a PCB board with required components including 8051 micro controllers and RF receiver module

Remote controller Transmitter is a PCB transmitter which has an RF transmitter module, microcontrollers and push buttons to send movement instructions like forward, backward, right left and stop to the vehicle platform

Additionally, an output screen is required with audio-video input available in which the receiver antenna can be plugged to view the camera feed.

III. LEVELS OF HIERARCHY CUSTOMIZATION

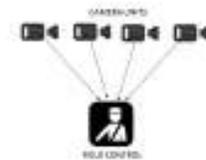


FIGURE 1.1 LEVEL 1 HIERARCHY

1. Level one: One field control personnel getting video feed from four camera units.



FIGURE 1.2 LEVEL 2 HIERARCHY

2. Level two: The feed from “on the field” goes to a camp site when company control is established

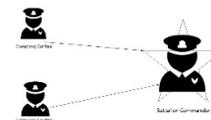


FIGURE 1.3 LEVEL 3 HIERARCHY

- Level three: Several such Company controls report to a Battalion control



FIGURE 1.4 LEVEL 4 HIERARCHY

- Level four: Several Battalion controls report to a command operations

The final architecture will look like -



FIGURE 1.5 FINAL SEGMENTED ARCHITECTURE

IV. BLOCK DIAGRAMS

1. TRANSMITTER

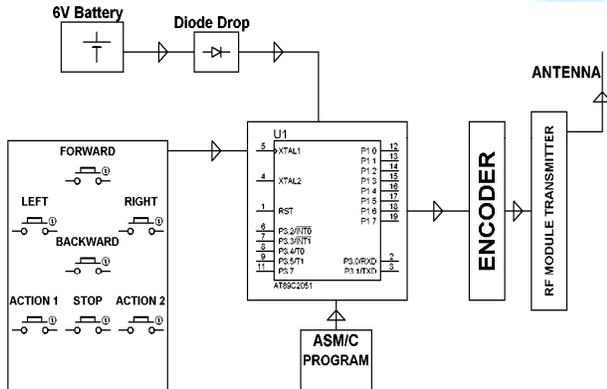


FIGURE 1.6 BLOCK DIAGRAM OF TRANSMITTER

2. RECEIVER

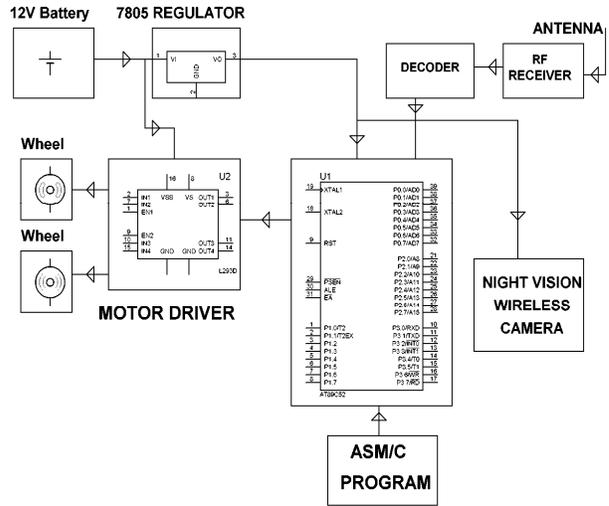


FIGURE 1.7 BLOCK DIAGRAM OF RECEIVER

V. DETAILED CIRCUIT DIAGRAM

Detailed circuit diagram of the connections of the transmitter and receiver along with the camera is given: -

1. TRANSMITTER

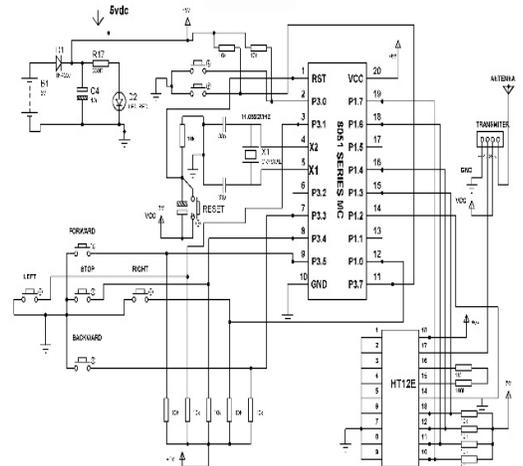


FIGURE 1.8 CIRCUIT DIAGRAM OF TRANSMITTER

2. RECEIVER

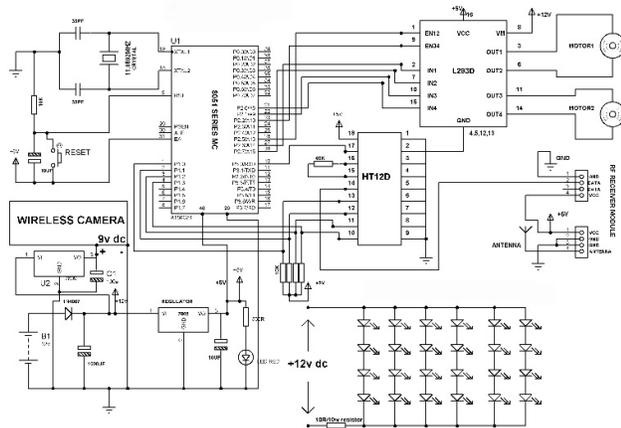


FIGURE 1.9 CIRCUIT DIAGRAM OF RECEIVER

VI. FABRICATION

After formulating the circuit diagrams of both transmitter and receiver sections the PCB was fabricated, components tested and components soldered. A final round of testing was done to check if all components were working and the finally wireless remote surveillance system was fabricated.



FIGURE 2.0 WIRELESS REMOTE SURVEILLANCE SYSTEM

VII. CONCLUSION

The Wireless Remote Surveillance System with Hierarchical Level customizations provides a cheap, efficient alternative to existing overpriced surveillance technology. Its high customizability makes sure that it can suit a large number of applications and can cater to any surveillance demand, ensuring round the clock security/

VIII. REFERENCES

- [1] “The 8051 Microcontroller and Embedded systems” by Muhammad Ali Mazidi and Janice Gillispie Mazidi , Pearson Education.
- [2] A Review Paper on Zigbee (IEEE 802.15.4) Standard-Parneet Dhillon Dr. Harsh Sadawarti ,Research

Scholar,CSE,RIMT , Mandigobindgarh, PTU Director, RIMT Mandigobindgarh, PTU

[3] On The Use Of Ieee 802.15.4/Zigbee For Time--Sensitive Wireless Sensor Network Applications ,Ricardo Augusto Rodrigues da Silva Severino,Outubro de 2008

[4] ATMEL 89S52 Data Sheets

[5] www.atmel.com

[6] www.beyondlogic.org

[7] www.wikipedia.org

[8] www.howstuffworks.coM

[9] www.alldatasheets.com