

# Design and Development of Computer Operated Car with Live Video

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**Abstract** - This paper describes design and implementation of Computer Operated Car with Live Video. The objective of the work is to control a car by the computer and to see live video. Input instructions from keyboard are operated on the hardware-software interfacing circuit, which let the car to take correct decision and move in the desired direction. A wireless VGA camera fitted on the top of the car provides the images of the surrounding and the obstacle which comes in the path of the car during its motion. The user controlling the car with the keyboard can change the direction of the car so as to avoid the obstacle. Microsoft VISUAL BASIC is used for creating GUI ( Graphical User Interface ) software template for the computer operated car. The proposed system was fabricated and tested. The practical results showed a good agreement with the theoretical one.

**Keywords** - Remote control car, wireless VGA camera ,Graphical user Interface(GUI) ,Visual Basic.

## 1. Introduction

Remote control empowers users to send commands from a distance to other consumer electronic devices. It means controlling the working of the device from a distance. Most of the remotes communicate to their respective devices via infrared (IR) signals and few via radio signals. In this work, the device is a remote controlled car .The user communicates with the car with the help of the keyboard of the PC to which the car is interfaced.

A wireless VGA camera is fitted on the top of the car. During the period of motion of the car, if obstacle comes in the path the camera detects it. Instantly the image is displayed over the computer screen. Then the user over there makes the car using the keyboard to move in such a direction so that it can avoid the obstacle. The images provided by the camera can be saved and analyzed for gathering information about remote areas where direct interference of human being is quite impossible. The block diagram of the system is shown in fig.1

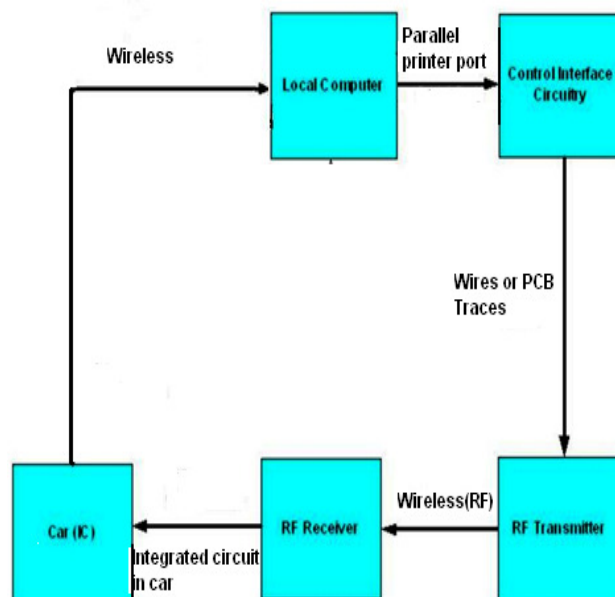
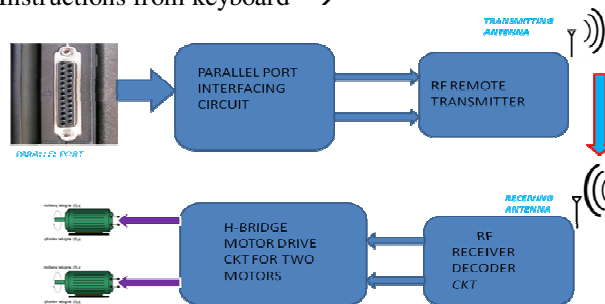


Fig.1 Block diagram of the system

## 2. Mechanism

The Simple diagram in fig.-2 illustrates the concept of the work.

Instructions from keyboard →



Images captured by VGA camera →



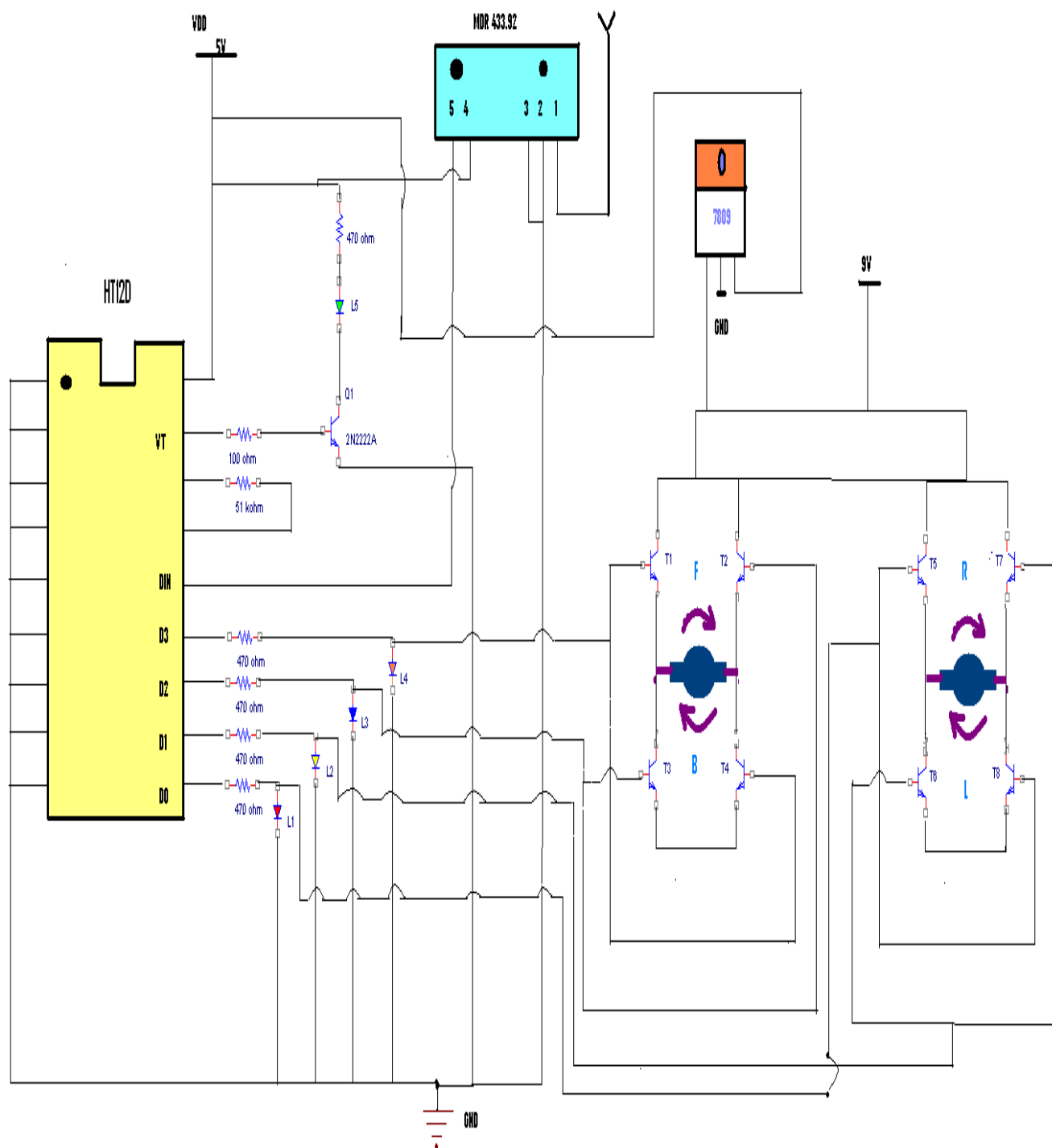


Fig.-4 Receiver circuit

## 4. System Design

The flowchart of the system is shown in fig.-5

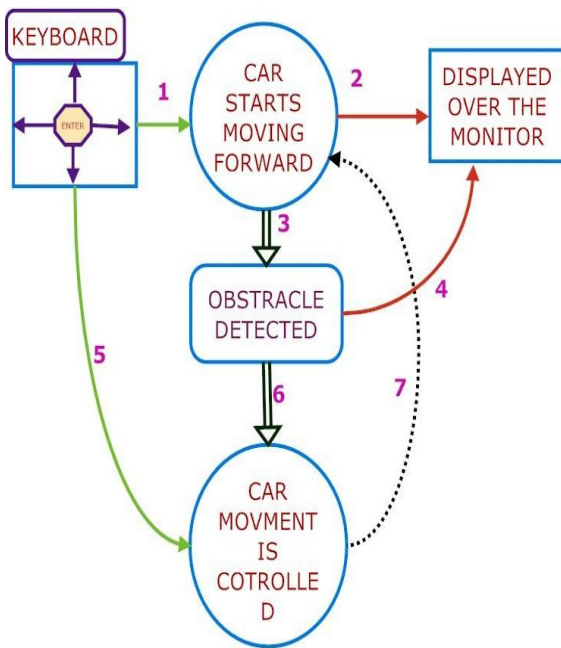


Fig.-5 Flow chart of the system

## 5. Working Principle

When the user intends to move the car in the desired direction with the help of keyboard of the computer, the corresponding pin of the printer port used for connecting the interfacing circuit to the central processing unit of computer becomes high. As a result, opto-coupler IC is turned on and encoder IC produces a output which is transmitted by transmitter circuit antenna. In the receiver side, the receiver receives the encoded transmitted output and decoder IC becomes high. As a result, transistors of the motor are turned on and the car starts moving in the desired direction. Table-1 shows the various direction of the car in the form of 4-bit.

## 6. GUI Software Design for Computer Control

Graphical User Interface (GUI) adds an interactive system for an user to easily control a design. GUI software is created in Microsoft Visual Basic 6.0. GUI software template developed for the computer operated car is shown in Fig. 6

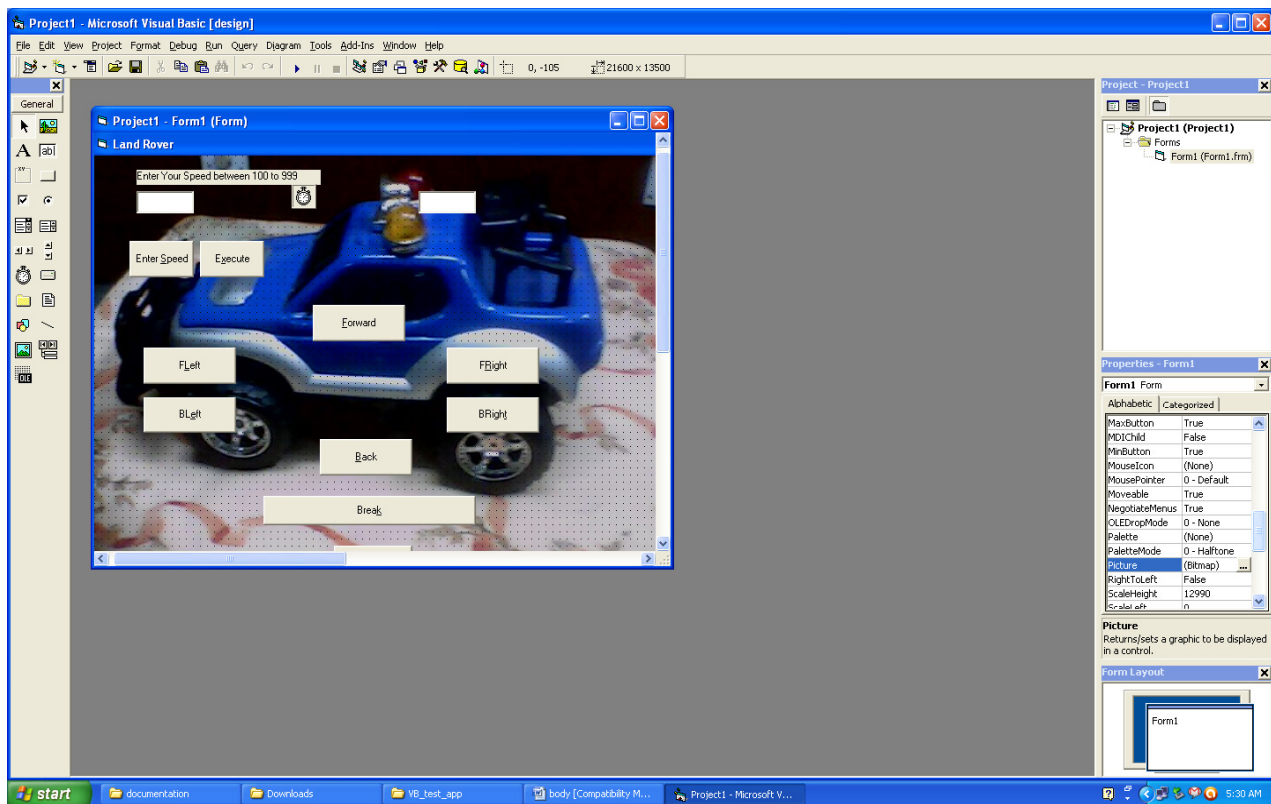


Fig.-6 GUI application for the computer operated car

Table-1: Various direction of the car in the form of 4-bit

DIRECTION	Data output pin of the printer port			
	D3	D2	D1	D0
Forward	1	0	0	0
Backward	0	1	0	0
Left	0	0	1	0
Right	0	0	0	1
Forward Left	1	0	1	0
Forward Right	1	0	0	1

## 7. Results

The remote control car containing wireless VGA camera fitted on the top of the car, is positioned on the ground where moving features are tested with direction buttons selected based on the obstacle displayed over the computer. The implementation of the design shows a promising result in avoiding the obstacle which comes in the path of the car during its motion.

## 8. Conclusions

In this work, a simple prototype of computer operated car as obstacle avoidance with live video has been designed and tested. The Graphical User Interface (GUI) software template is developed for the computer operated car using Microsoft VISUAL BASIC 6.0. The prototype designed with interfacing circuit and VISUAL BASIC worked properly. This work is done on a small scale with a small budget. The same concepts and ideas can be extended to a large scale with a large budget.

## References

- [1] Awab Fakih, Jovita Serrao, Cell Phone Operated Robotic Car. International Journal of Scientific & Engineering Research, ISSN 2229-5518.
- [2] Richard Bishop, "A Survey of Intelligent Vehicle Applications Worldwide", Proceedings of the IEEE Intelligent Vehicles Symposium 2000, October 3 – 5, 2000, pp. 25 – 30.
- [3] Khatib O. "Real-time obstacle avoidance for manipulators and mobile robots", The International Journal of Robotics Research 5(1) 1986 pp 90-98.
- [4] A. Finn and S. Scheduling, Developments and challenges for unmanned autonomous vehicles, Berlin, Springer-Verlag, 2010.
- [5] Baxter J. M. and Bumby J. R. "Fuzzy logic guidance and obstacle avoidance algorithms for autonomous vehicle control", Procs of the Int Workshop on Int Autonomous Vehicles (Southampton, UK), 1993, pp. 41-52.
- [6] Power Electronics: Converters. Application and Design, Mohan, Undeland, and Robbins, 1989, ISBN 0-471-61342-8, John Wiley & Sons, Inc., publisher.
- [7] Steven Holzner, Visual Basic 6 programming.
- [8] <http://www.mypptsearch.com/index.php>
- [9] <http://www.jaspreetcodezone.blogspot.com/>
- [10] <http://en.wikipedia.org/wiki/>

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