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PC based remote control car / Mohammad Fahmy Uzair.

**PC BASED REMOTE CONTROL CAR**

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**May 2006**

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This Report is Submitted in Partial Fulfillment of Requirements for the Degree of  
Bachelor in Electrical Engineering (Industry Power)


Fakulti Kejuruteraan Elektrik  
Kolej Universiti Teknikal Kebangsaan Malaysia

April 2006

I declare that I have read this report and say that this project fulfill its scope and quality  
to be awarded with the  
Bachelor of Electrical Engineering Degree (Industry Power)

Signature : .....  
Supervisor : Encik Shahrudin bin Zakaria  
Date : ..... 4/5/2006

I hereby declare that this is my work unless the summary and paragraph stated the source of the material.

Signature : .....  .....

Name : Mohammad Fahmy bin Uzair

Date : ..... 4.5.2006 .....

For my loving mother, father, family and friends

And

Encik Shahrudin bin Zakaria

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## **ABSTRACT**

This project will enable the user to control a remote control car using a computer. The Visual Basic 6.0 is chosen because of its easiness to use and suitable for the project. The many uses of this software are also the reason this software is suitable for this project.

To make the car more enjoyable to control, a wireless camera will be attached to the car. This will allow the user to see from the car's perspective view and control it without the obstacle such as wall.

This project will also provide fun and enjoyable experience when it is completed. Also, the knowledge obtained and the skills learned when working on the completion of the project will be useful in future projects or works.

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## ABSTRAK

Projek ini membolehkan pengguna mengawal kereta kawalan jauh menggunakan sebuah komputer. Program Visual Basic 6.0 digunakan kerana ia mudah digunakan dan sesuai untuk projek ini. Ia juga mempunyai kepelbagaian dalam penggunaannya.

Untuk memberi keseronokan kepada projek ini, sebuah kamera wayarles akan dipasang pada kereta kawalan jauh itu. Ini membolehkan pengguna dapat melihat pemandangan mengikut perspektif kereta itu.

Projek ini memberi keseronokan dan kepuasan apabila ia telah disiapkan. Projek ini juga akan memberi pengetahuan dan kemahiran yang akan berguna apabila menghadapi alam pekerjaan nanti.

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**LIST OF ABBREVIATIONS**

<b>ABBREVIATION</b>	<b>DEFINITION</b>
LED	Light Emitting Diode
dll	Dynamic Link Library

**LIST OF APPENDICES**

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Introduction to the Project

This project involves controlling a remote control car using a computer as an interface. This project involves the use of both hardware and software. The software is that chosen to be used in the project is Visual Basic 6.0. The hardware involves using a parallel port, a video card, a wireless camera, a remote control car and a circuit to control the signal sent through the parallel port.

The overview of this project can be explained more easily using the block diagram below.

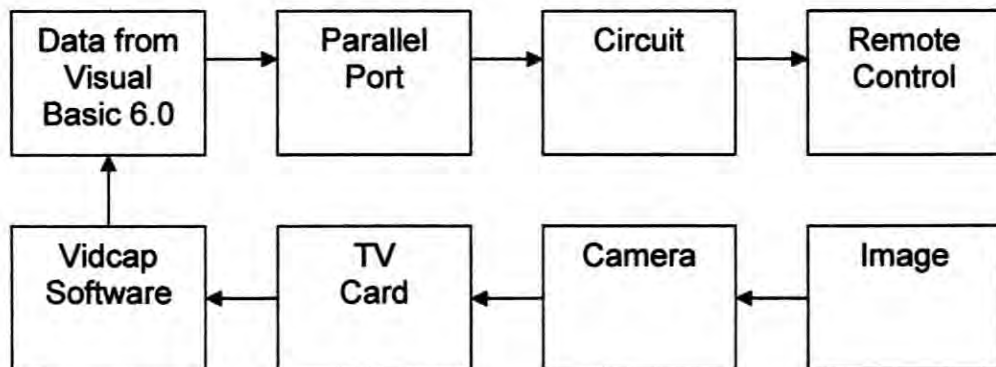


Figure 1.1: Block Diagram for Project



## 1.2 Objectives and Project Scope

The project involved in controlling a remote control car using a computer through the Visual Basic 6.0 software. This project will also include the use of a circuit as hardware.

The main objectives of this project are;

- 1) To write a program using Visual Basic 6.0 software that can be used to control the car.
- 2) To build a circuit so that the computer can interface with the car's remote control.
- 3) To attach a wireless camera to the car and interface it to the computer so that the images taken from it can be displayed at the computer.

When all objectives are completed, the car can be controlled using the computer with the help of the Visual Basic 6.0 software. The Visual Basic program can also display the images taken using the camera.

## 1.3 Report Outline

In this project report there have 5 chapters altogether. Chapter 1 gives some brief introduction about this project and also the objectives and scope of this project. This chapter also includes the report outline for this project, project background and also some problems statement of this project.

The literature review in order to get an idea about the project will be discussed in chapter 2. In this chapter, it reviews the related works that have been done by other people all over the world.

Then in chapter 3 it consists five main sections where this chapter is the main part of this report. The four main sections are:

- a) Testing the inpout32.dll Driver
- b) Writing the Program for the Project
- c) Building the Circuit for the Project
- d) TV Card and Software Installation
- e) Merging the Two Visual Basic Program

Chapter 4 will discuss the final result of the project and recommendations of improving the project while chapter 5 will summarize the project and its benefits.

#### **1.4 Project Background**

In the fourth year in the Bachelor of Electrical Engineering course, each student is to complete different types of project. I have chosen a project that has caught my attention. The title for the project is 'PC Based Remote Control Car'. This project will involve both software and hardware applications. The software that will be used for this project is Visual Basic 6.0 and the hardware is a circuit that interfaces the computer and the car's remote control.

The project will enable the user to control a remote control car using a computer. The Visual Basic 6.0 is chosen because of its easiness of use. The variety uses of this software are also the reason this software is suitable for this project.

To make the car more enjoyable to control, a wireless camera will be attached to the car. This will allow the user to see from the car's perspective view and control it behind the obstacle such as wall.

This project will also provide fun and enjoyable experience when it is completed. Also, the knowledge obtained and the skills learned when working on the completion of the project will be useful in future projects or works.

### **1.5 Problem Statement**

- 1) The normal remote control car cannot be controlled efficiently if there is an obstacle that blocks the view of the person who controls it such as wall. The use of the wireless camera will enable the person who control the car see by the car's perspective view. It will enable the person to control the car without the hindrance of view. Also the user will be relaxed when controlling the car.
- 2) After this project is completed, additional program may be installed and written. This will enable the car to move according to written program in the software. The remote control car can now be an intelligent robot.

### **1.6 Project Planning**

To ensure the project can be executed smoothly, a project planning must be done. This is to ensure all the information and items needed for the project can be attained. The plan will also provide guideline for completing it;

The plans for the project are;

- Research the information needed to complete the project.
- Learning how to write program using the Visual Basic 6.0 software.
- Obtaining the necessary items for the project.
- Testing the Visual Basic 6.0 software.
- Writing the program for the project.

- Testing the written program.
- Building the circuit for the project.
- Installation of the wireless camera.
- TV card installation.
- Interfacing the wireless camera with the computer.
- Testing the software and hardware of the project.
- Writing the final report for the project

To summarize the whole process, Table 1.1 shows the Gantt chart for the project;

**Table 1.1: Gantt Chart for the Project**

List major activities involved in the proposed project. Indicate duration of each activity to the related month(s).													
Project's Activities	2005							2006					
	J	J	A	S	O	N	D	J	F	M	A	M	J
Project selection		■											
Project Proposal			■										
Research for information			■	■	■								
Learning the Visual Basic 6.0 software				■	■								
Writing the program for the project					■	■							
Building the hardware						■	■	■					
Installation of wireless camera							■	■					
Troubleshoot both software and hardware								■	■	■			
Final Report											■		

## CHAPTER 2

### LITERATURE REVIEW

The interface between the computer and the car's remote control will involve the use of a computer's parallel port. The data from the Visual Basic 6.0 program will be sent through the parallel port to the circuit.

#### 2.1 Visual Basic 6.0 Program

Visual Basic is a high level programming language evolved from the earlier DOS version called BASIC which means Beginners' All purpose Symbolic Instruction Code. It is a fairly easy programming language to learn. The codes in Visual Basic do not differ much from the normal English Language. Different software companies produced different versions of Basic, such as Microsoft QBasic, QuickBasic, GwBasic, IBM Basic A and the others.

Visual Basic is a visual and events driven Programming Language. These are the main differences from the old Basic. In Basic, programming is done in a text-only environment and the program is executed sequentially. In Visual Basic, programming is done in a graphical environment. It is because users may click on a certain object randomly, so each object has to be programmed independently to be able to respond to those actions. Therefore, a Visual Basic Program is made up of many subprograms, each has its own program codes, and each can be executed independently and at the same time each can be linked together in one way or another. [12]

There are five main steps in creating a Visual Basic Application;

- Create a visual interface
  - create a form (VB term for a window)
  - add controls to fulfill the requirements of the program
  - edit the properties of each control
- Write the underlying code
  - write additional functions and procedures to control the program and the controls
  - associate this code with control events
- Debug the program
- Create an Executable File
- Test the program in different environments

## **2.2 The Parallel Port**

A port contains a set of signal lines that the CPU sends or receives data with other components. We use ports to communicate via modem, printer, keyboard, mouse etc. In signaling, open signals are "1" and close signals are "0" so it is like binary system. A parallel port sends 8 bits and receives 5 bits at a time. The serial port sends only 1 bit at a time but it is multidirectional so it can send 1 bit and receive 1 bit at a time.

### **2.2.1 Introduction to the Parallel Port**

The parallel port is normally located at the back of the computer. A typical computer will use D-Type 25 Pin Female connector. The parallel port has 4 control lines, 5 status lines and 8 data lines. It can send 8 bits of signal and receive 12 bits of signal.

In computers, ports are used mainly for two reasons: Device control and communication. We can program the computer parallel ports for both. Parallel ports are mainly meant for connecting the printer to the computer in the old days when the USB port is not yet invented. But we can also program this port for many more applications beyond that.

Parallel ports are easy to program and faster compared to the serial ports. But main disadvantage is it needs more number of transmission lines. Because of this reason parallel ports are not used in long distance communications because it will increase the cost. In serial ports, there will be two data lines: One transmission and one receive line. To send a data in serial port, it has to be sent one bit after another with some extra bits like start bit, stop bit and parity bit to detect errors. But in parallel port, all the 8 bits of a byte will be sent to the port at a time and an indication will be sent in another line. There will be some data lines, some control and some handshaking lines in parallel port. [5]

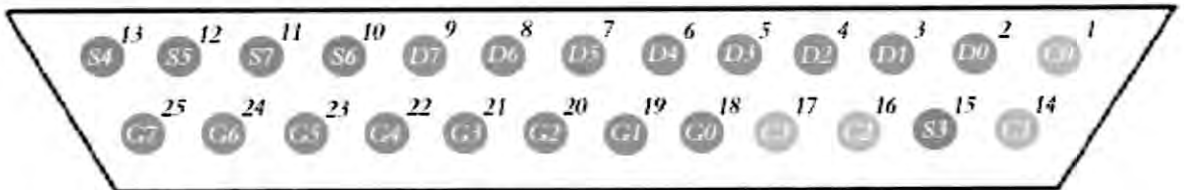


Figure 2.1: A D-Type 25 Pin Female connector

Each of the parallel port's pins has its own uses. But in this project, only pin number 2 to 5 and grounds pin that will be used. It is because the remote control has only four commands; FORWARD, BACK, RIGHT and LEFT. These mean only four output pins that can send data will be used (Pin 2 to control FORWARD; Pin 3 to control BACK; Pin 4 to control RIGHT and Pin 5 to control LEFT).

Table 2.1 shows all the pin in the D-Type 25 Pin Female connector parallel port and their particular uses.

**Table 2.1: Parallel port's pins uses**

<b>Pin no (D-Type 25)</b>	<b>SPP signal</b>	<b>Direction</b>	<b>Register</b>
1	nStrobe	In / Out	Control
2	Data 0	Out	Data
3	Data 1	Out	Data
4	Data 2	Out	Data
5	Data 3	Out	Data
6	Data 4	Out	Data
7	Data 5	Out	Data
8	Data 6	Out	Data
9	Data 7	Out	Data
10	nAck	In	Status
11	Busy	In	Status
12	Paper In/Paper Out	In	Status
13	Select	In	Status
14	nAuto-Linefeed	In / Out	Control
15	nError / nFault	In	Status
16	nInitialized	In / Out	Control
17	nSelect Printer / nSelect-In	In / Out	Control
18-25	Ground	Ground	