

CAR PARK CONTROLLER

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Universiti Malaysia Sarawak  
1998

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## BORANG PENYERAHAN TESIS

Judul: Car Park Controller

SESI PENGAJIAN: 1996/97

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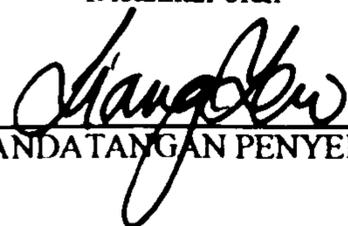
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This project report attached hereto, entitle "Car Park Controller" prepared and submitted by WONG KIN TIEW in partial fulfillment of the requirements for the degree of Bachelor with honours of Electronics and Telecommunications Engineering is hereby accepted.



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## **Car Park Controller**

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**Tesis Dikemukakan Kepada  
Fakulti Kejuruteraan, Universiti Malaysia Sarawak  
Sebagai Memenuhi Sebahagian daripada Syarat  
Penganugerahan Sarjana Muda Kejuruteraan  
Dengan Kepujian (Kejuruteraan Elektronik dan Telekomunikasi)  
September 1998**

*To My Loving Family*

## **ACKNOWLEDGEMENT**

The author wishes to express his sincere appreciation and gratitude to his supervisor, Mr. Ng Liang Yew, for his invaluable guidance, suggestions and constructive criticisms throughout the course of this study.

A sign of gratitude is also forwarded to National Link Sdn. Bhd, MBKS (Majlis Bandaraya Kuching Selatan) and DBKU (Dewan Bandaraya Kuching Utara) who have share their sincere view and information on car park systems.

The author also likes to render his sincere thanks to En. Wan Abu Bakar Ngah for his support, assistant and cooperation in carrying out the project.

Last not forgetting, all my friends especially Mr. Lee Kong Kiong who have been very helpful, and generous in contributing towards the success of this project.

## **Abstract**

**Car Park Controller (CPC) is a main traffic management system for a present and future car parking system. The purpose of doing this project is to apply the theories that we have learnt in the lecture hall and practice it by designing a simple control system. This system consists of Hardware section and Software section. The Hardware section shows a detector, an indicator and the interface of the whole system. Then the Software section is the controller and data processing center of the system. Within this paper I will explain and show a few of the hardware design and the testing results build this project. This paper also consists of the software that had been used to control the CPC version 1. Last but not least, I include my recommendations for the future of Car Park Controller**

## **Abstrak**

**Pengawal Tempat Letak Kereta (PTLK) adalah sistem pengurusan utama untuk tempat letak kereta masa kini dan masa akan datang. Tujuan projek ini adalah untuk menggunakan pengetahuan yang telah dipelajari dalam bilik kuliah dan menreka satu sistem kawalan yang muda. Dalam sistem ini, ia mengandungi dua bahagian iaitu bahagian Perkakasan dan bahagian Perisian. Bahagian Perkakasan mengandungi Pengesan, Penujuk dan Antara Muka untuk PTLK. Bagi Bahagian Perisian pula ia mengandungi Sistem Kawalan dan Sistem pemprosesan maklumat seluruh PTLK. Dalam laporan ini juga disertakan beberapa contoh rekabentuk Perkakasan dengan keputusan ujikaji perkakasan tersebut. Walau bagaimanapun, projek ini adalah PTLK versi pertama masih boleh diperbaiki. Akhir kata, dalam laporan ini juga mengandungi cadangan untuk masa depan PTLK.**

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## **Chapter 1**

### **Introduction**

Car Parking Control becomes very crucial now a day because of the increasing number of cars on the street. We can see from the statistic of the car related to year taken from the Statistic Department. In a busy market place/commercial center, car drivers racing to find their own car parking lot or a space worst to worst illegal parking. Therefore parking business become more and more popular and gives more benefic to the investors. Due to the need of the people, so the car parking space becomes a need for people. If we can do the booking of the car parking lot before we start our journey, it would be nice isn't it? That will give us convenient to have more arranged time for other tasks besides finding a parking space. Car parking database and record of the car parking is increasingly demanded at all the car parks. And that will be more especially in the busy town area.

The major task of this Car Park Controller function is the availability of the car parking lot. To get into this kind of situation we need a powerful car park management system so that every car parking lot will be well managed in a proper way. And all the booking can be done visually through the Controller. Currently, this is still very new to our country. However this technology is already been used in

other country such as UK and USA. Now it is the time for us to go into this technology and develop the system by our own.

In order to accomplish this task, the Car Park Controller at a minimum state should be able to handle the large database flow control and signaling control. As we understand, using a computer is a good database control program can easily do that kind of task.

Due to the usage of computer in our country is increasing dramatically and the prices of computer becoming gradually reasonable, therefore in this project I suggest using computer as our communication control center besides of using PLC system. Computer is very common equipment that we use in our daily live and it also provides a lot of facilities such as internet communication, printing and data storage. That will make the computer more suitable to become the controller proposes.

Beside that, programming is another important tools for engineers to make up the controller. So far, students only have opportunity to program the programming in arithmetic algorithm form. Not to a low-level language which can use for controlling purpose. In this project, I also have chanced to use the new software (C++ Builder™) to communicate in a low-level language.

The effects of the microprocessor component were profound, both on the marketplace and on engineering education. Designing engineers, accustomed to deal with signals and electronic systems suddenly began to group with programming and

other new computer-related technologies. The engineers have to deal with the computer as a basic design component and face the challenges of total system design that includes both hardware and software.

The invention of the IC (Integrated Circuit) so the cost of a component was strongly courses related to the cost of producing the component. It is natural that many of the computers that are based on the microprocessor related to this philosophy. New computer companies are based on the idea of cost/performance. With introduction of the computer as a commodity, we came to expect that new computer system would do more and cost less.

Due to the benefit that we can get from the computer, so I chose computer as my project processing center. We know that the Car Park Controller should be able to take a lot of incoming signal or data in state of outgoing data or signal. So, we need to use a more powerful communication port for this purpose. That is the Parallel port or Printer port of the computer.

What is the 'Parallel Port'? In the computer world, a port is a set of signal lines that the microprocessors or CPU uses to exchange data with other components. Typical uses for ports are communication with printers, displays, keyboards or just about any component or device except system memory. To order the parallel port to work as what we want it to do, we need to program the port communication flow by connecting the parallel port and the interface was connected to it.

The communication related to the interface that has been connected to it. In this paper I will discuss a design to cope with this kind of communication. Where the data from the switcher or sensor to the Car Park Controller and vice versa. That is the switcher or sensor detected the incoming or outgoing signal from the car park and send to Car Park Controller for further processing. Encoder is to encode the detected signal to the binary code, which can be easily analyzed by the Car Park Controller. Furthermore this paper will also suggest a way that, if the communication is long distance, we need to reduce the usage of copper wire by communicate in a serial form. In this system we need a Parallel to Serial and a Serial to Parallel converter at both end of the communication line in order to make this communication work more effectively. In this paper I will also show a design of a simple Parallel to Serial and Serial to Parallel converter in synchronous form. Therefore the clock is very important for the whole system.

Myself design most of the hardware circuit. However the circuit is not totally tested and working perfectly due to the lack of time to do further testing on the circuit. The software still has a lot of space to improve. However this is the first version of the Car Park Controller. The next version is still under construction, which is more capable and efficient.

## **Chapter 2**

### **Car Park Signage**

#### **2.1 Wickedness of the car park Signage**

Now almost everyday we visit the car park building, but we didn't notice the problem with the signage of the car park. The wickedness of the car park signage such as: -

##### **1. Positioning.**

Most of the car-parking center didn't arrange the signage position properly. The signage is very difficult to notice by the car driver. Example is the signal to the next floor normally it just draw on the side ward of the car park. And the position is very low to the floor. So that will give the difficulty to car driver to notice the signage especially when the car is queuing up.

##### **2. Coloring**

The car parking signage in the car park normally just colors with the white background and red or orange sign. Those kinds of colors are not the color for the signage in the car park. Red and orange is very difficult to notice at the night where the place does not have enough potential of light.

### **3. Size**

Size of the signage is very important. So the driver can notice the signage from a distance. Some of the car park just put a signage but not consider about the size of the car park signage too much. The driver will face difficulty to see the signage from certain distance.

### **4. Material**

Material of making up the signage also very important. If we using the signing material the car driver may not able to notice the signage when the car light is lighten on the signage due to the reflection of the light from the signage.

## **2.2 Suggested Way for Signage**

Where a building is designed in compliance, the attention of all users shall be drawn to the facilities available especially the disabled persons are made aware of existence of suitable provisions for them. The car park signage shall be permanently and conspicuously displayed to indicate the location of the various facilities in the building. We needed to consider for disabled persons, because there may have limitations in the movement of their head or a reduction in peripheral vision. So, signs positioned perpendicular to the path of travel are easiest for them to notices. Persons can generally distinguish signs within an angle  $30^{\circ}$  to either side of the centerline of their faces with out moving their head.

That is at approaches and entrances to car parks to indicate the provision of accessible car parking lot(s) for the user within the parking vicinity. The directional signs shall be displayed at any points where there is a change of direction in car park. This is to direct the user to the accessible parking lot(s).