

**ACCIDENT DETECTOR THROUGH CELLULAR PHONE  
(TRANSMITTER)**

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## DEDICATION

### *Dedicated To*

For my parents; En Yusuff Bin Chik And Pn Chek Norlia Binti Isahak, my sister; Yuslinda Binti Yusuff and other of my family.

### *And to*

For My Supervisor; En Mohd Sa'ari Bin Mohamad Isa and my all members and friends.

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Thanks to Allah for pleasure, with the grace of god and her haven I can finish this report PSM 1 with achievement.

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To all my family especially my parent En Yusuff Bin Chik and my mum Pn. Che Norlia Binti Isahak, and my sister Yuslinda Binti Yusuff thanks for the all support from starting until complete this final project.

Also, not forgotten to all my members and friend for everlasting support, motivation and any kind either direct or indirect of ideas.

May ALLAH bless you

## ABSTRACT

This thesis provides the reader about cellular phone technologies to detect a vehicle accident. All commands from this project will transmit the data from the accident to receiver. The data is about time, location, type and level for the accident after receiving the all data, then the data can receive and the continues action will obtain. Vehicle owner can decide to install this project at any location that they want. For the first stage, the fixed location is at front and back at the vehicle. This project will function automatically if have any accident and it articulate with a battery wiring at that vehicle.

The approaches used to achieve this project are through literature survey respecting software and hardware. These approaches are very important to analysis, identify and evaluate a technical issue with accident detector system reliability, effectiveness and performance about this project. It also can analyze the system performance for project goal achievement confirmation by comparing it to the theoretical or expected results (analytical skill).

Generally cellular phone is useful for SMS communication. It is because this technology a proactive and can be stored for references. After receiving the SMS, the received data will be analyzed by the personal program programming and then the receiver will take a action obtain.

## ABSTRAK

Tesis ini memberi maklumat secara terperinci kepada pembaca mengenai teknologi yang menggunakan telefon bimbit dalam mengesan kemalangan sesuatu kenderaan. Projek ini berupaya menghantar maklumat mengenai kemalangan yang berlaku kepada pengguna kepada penerima untuk diberikan tindakan selajutnya. Maklumat yang dihantar adalah melibatkan masa, lokasi, jenis dan sebagainya. Pemilik kenderaan yang memasang projek ini di lokasi-lokasi yang telah ditetapkan sebagai pengesan adalah di bahagian hadapan dan belakang kenderaan tersebut. Ia berfungsi secara automatik jika sekiranya berlaku kemalangan dan disambung melalui pendawaian bateri kenderaan tersebut

Pendekatan yang telah dilaksanakan dalam menjayakan projek ini ialah menggunakan kaedah kajian secara ilmiah mengenai perisian ataupun program komputer dan juga perkakasan komponen. Pendekatan ini adalah perlu untuk menganalisa, mengenalpasti dan menilai isu-isu teknikal mengenai sistem pengesan kemalangan yang boleh dipercayai dan efektif dalam perlaksanaannya.

Biasanya, telefon bimbit yang digunakan untuk berkomunikasi dengan menggunakan system pesanan ringkasan SMS. Ini adalah kerana system pesanan ringkas ini lebih proaktif dan boleh disimpan sebagai rujukan. Lantaran daripada itu, teknologi ini digunakan untuk membanguanan projek ini. Setiap maklumat akan dihantar melalui SMS terus ke telefom bimbit. Selepas menerima SMS tersebut, penerima maklumat akan membuat analisis dan tindakan yang seterusnya akan diambil.



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## **CHAPTER I**

### **PROJECT INTRODUCTION**

#### **1.1 INTRODUCTION**

Accidents can occur at any time and can involve any type of vehicle. Most of the time the victims are badly injured and need immediate medical attention. Due to this reason, the outcome of such accidents is very tragic, in worst cases the outcome is even death. Taking all this, the project that would be very useful in cases of a vehicle accident is decided to be considered. The new technology to automatically detect and characteristic potential injury-causing vehicle crashes and then provide dispatchers with information about the crash event for the information about level the accident, time and location that accident will occur. The all information will be sent through SMS to another mobile phone or a Personal Computer and the received data will be analyzed by the personal computer program.

This equipment was designed to be easily installed in vehicles had an accident. The design integrated a pressure sensor, analog to digital converter (ADC), programmable integrated circuit, global system mobile (GSM) and cellular communication equipment (mobile). Whenever an intense collision occurs, the detector or pressure sensor mounted on the car will give the accident condition which processes through PIC interface. The major accident data signal in SMS or data form is then will be transmitted to the service provider whose will take the necessary action according to accident indicator.

## 1.2 OBJECTIVES

This project had been build for everyone in the world. With the information concerning the accident will transmit can rapid to save the human life. It means a lot to those who does need them. To success in this project there are a few objective that have to achieve:

1. Identify and evaluate technical issues with accident detector system reliability, effectiveness and performance.
2. To design and develop the main subsystem or blocks for transmission part for accident detector system.
3. To study about software programming, using Microsoft Visual Basic Language for transfer information.
4. To learn and practice technical skills to overcome problems occurred in implementing the project.
5. To analyze the system performance for project goal achievement confirmation by comparing it to the theoretical or expected results(analytical skill)

## 1.3 SCOPE OF WORK

To archive the project objective there are certain scope that must been done. The scope can be divided into several parts. The scopes are:

1. Programming or software implementation- develops a programming to control and construct the project. It will be use a C Language Programming.
2. Hardware implementation-to develop this project, with suitable hardware equipment.
3. Test and analysis-a test and analysis will execute at the end of the final project and compared to theoretical result to ensure that system satisfies the objective of project.

## 1.4 PROBLEM STATEMENT

During the first phase of the project, it very difficult to found the suitable circuit. I serving an internet and refer many books but the circuit stay not found. For solve this problem, I found the circuit by part and unite it.

This project also need to design and tested using lab equipment and prototype implementation. There are many processes will be used such as etching, soldering and testing circuit. Therefore, want do this process student needs high concentration for avoid any mistake.

For writing a software program to allow all the components to communicate with each other is quite difficult at the first stage. This problem will be solved by further research into the individual components software output.

## 1.5 THESIS STRUCTURE

This thesis will be divided into 5 Chapter to provide reader to understand the whole of project.

- Chapter I : Covers at the overview of the project
- Chapter II : This part about the medium to get information for develops project.
- Chapter III : It will cover up all the project methodology and a process this project implementation to achieve goal. Also hardware and software technical details are explained in this part.
- Chapter IV : Contains the development and implementation of the whole project and also the results gained.
- Chapter V : It's about the whole contents of this thesis and project. By the end of this chapter, there are some proposal and discussion for this project.

## **CHAPTER II**

### **LITERATURE REVIEW**

#### **2.1 INTRODUCTION**

This chapter will focus based on the basic concepts and theories about to development and implementation of the project. It also can perform a researches and previous work based on upon the generation of mobile communication system. Through the literature review for this project, it can identify and evaluate technical issues about automated collision system reliability.

#### **2.2 CONCEPT OF PROJECT DEVELOPMENT**

Today, many human use a cellular phone for facilitate her/his life. Cellular phone users to communicate with each other routinely use the Sort Message Service (SMS). Typically, such person to person messaging is used to say hello or prompt someone for something or arrange a meeting or tell someone something. Such messages are usually originated from the cellular phone keypad.

When the information to be communicated is short or it would take long to have a full conversation or someone is traveling overseas or not available to take a voice call, SMS is an ideal messaging medium. For example, network operators typically charge the same to send a short message to someone in the same room as

they do to someone traveling overseas with their cellular phone. Because short message are proactively delivered to cellular phone that are typically kept in the user's pocket and can be stored for later reference, SMS is often more convenient than email or data to communicate amongst and mobile groups of people.

In this project, the commands will transmit the data from the accident to the receiver. The data is about time, location, type of accident and each other. After receiving the all data can receive and the continuous action will obtain.

### **2.3 BENEFITS OF THIS PROJECT**

There are a few benefits about this project. The benefits are:

1. During this project, the processes for rescue the victim are quick because receiver gets information with exact and rapid.
2. It can make effortless to the police for do statement about the accident because the information that SMS provided generally concerning location, time, type of accident and each other.
3. Send information very fast, accuracy and truly.
4. Use a new technology based on generation mobile communication.

### **2.4 CELLULAR SYSTEM**

#### **2.4.1 Introduction**

Before we continue with this project, first we must understand the concept of cellular system and how it work. In cellular concept development, we can divide it into two stages.

First stage was early stage. In early stage, a large coverage with single, high-powered transmitter is used to transmit data. In this time there are no frequency re-use due to interference because we had many frequency left that we can use (radio is

a new thing and only military used frequency in a large scale). In this time Frequency allocation such as co-channel interference is limited.

The second stage was modern stage. The concept of modern cellular concept is to replace single, high power transmitter (large cell) with many, low power transmitter (small cell). Base station will provide a radio access between mobile user and MSC (mobile switching center). Area to be covered by base station is a fairly small geographical zone call cell. Cell a represent by hexagons. Each base station is given a total number of channel available in it system. Neighboring base stations an assigned with a different group of channel to avoid interference between base stations. With this system, channel can be reused as long the interference can be avoided. This interference can be occurring as long as it kept below acceptable levels. The reason of using low power transmitter is frequency re-use can be implemented.

Base station in adjacent cell using a different group of channel and it is different with the neighboring cell. This can be archive because the antenna of the base station is design to archive the desired coverage in within particular cell. By limiting the coverage area to just in boundaries, same group of channel can be use by a different base station that are separated in a distance that enough to avoid interference. The design process of selecting and allocating the channel group for all of the cellular base stations within a system is what we call frequency reuse or frequency planning. With help from picture above we can fully understand what frequency reuse. Group of cell we call it cluster. In figure 2.1, it use cluster 7. In one cluster every cell used a different frequency. Cell with same letter use a same set of frequency.

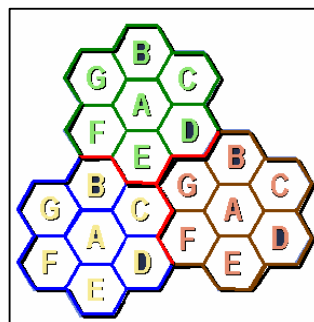


Figure 2.1: Cluster With A Frequency Reuse Cell

Each cell has its own BS (base station). This BS will communicate with MSCs (Mobile Switching Center). Then MSCs are inter-connected to PSTN (Public Switching Telephone Network) through local and transit exchange for outgoing call to and incoming call from fixed line telephone.

#### **2.4.2 Advantages And Disadvantages Of Cellular Phone**

Everything in this world has its good side and bad side. Same goes with cellular system. It has its advantages and disadvantages. We can list some of its advantages as follows:-

- i. We can communicate without boundary at anytime, anywhere (as long as we had a coverage from the base station)
- ii. We do not need a fibrous wires that always annoying
- iii. We can move around while we were on call without limit.

This cellular phone concept also has its disadvantages too. First it has a major problem with noise and interference such as:-

- i. Environmental effects.
- ii. Large amounts of noise.
- iii. Leakage from adjacent channels and distant transmitters on the same channel.
- iv. Multi-path fading (Raleigh) and Doppler effect

Second is signal coverage such as:-

- i. Essential for deployment of wireless networks.
- ii. Influenced by the radio frequency of operation, transmitted power and the terrain.

## **2.5 SHORT MESSAGING SYSTEM (SMS)**

### **2.5.1 Introduction of Short Messaging System (SMS) Text Mode**

The Short Message Service SMS, as defined within the GSM 900 / 1800 / 1900 digital mobile phone standard has several unique features.

A single short message can be up to 160 characters (7 bit coded) or 140 characters (8 bit coded) of text in length. Those 140 / 160 characters can comprise of words or numbers or an alphanumeric combination. Non-text based short messages (for example, in binary format) are also supported. More about that binary mode you will find at the link PDU mode.

The Short Message Service is a store and forward service, in other words, short messages are not sent directly from sender to recipient, but always via an SMS Center (SMSC) instead. Each mobile telephone network that supports SMS has one or more messaging centers to handle and manage the short messages.

The Short Message Service features confirmation of message delivery. This means that unlike paging, users do not simply send a short message and trust and hope that it gets delivered. Instead the sender of the short message can receive a return message back notifying them whether the short message has been delivered or not. The default factory parameter of this acknowledge from the transmitter of a SMS to the receiver of a message by most GSM modem is OFF, so that people will get no confirmation from the receiver. If turn it on, then get an conformation that the SMSC has got the message and after the delivery of the short message to the receiver it will get an additional, second message (SMS backward) that the message is delivered to the a GSM phone or modem. In this automatic generated message is the data and time of the delivery coded. The acknowledge, the coding scheme the time of storage of a short message in the SMSC and a lot of more will be set with the command AT+CSMP.

If want to understand the 3 parameters of this command, it's have to understand the SMS in PDU mode. An other important command is AT+CNMI. It tells the GSM modem how to handle an incoming short message.