

ALARM DIALLER

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**Fakulti Kejuruteraan Elektronik Dan Kejuruteraan Komputer
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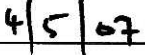
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“I, hereby declare that this thesis entitled, Alarm Dialler is a result of my own research idea except for works that have been cited clearly in the references.”

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Special dedication to my loving mom Puan Japura Durus, my father Jovencio Valdez, all my siblings, my kind hearted supervisor Prof. Abdul Hamid Hamidon, and my dearest friends.

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ABSTRACT

Alarm Dialler is a system that allows individual or house owner to be informed directly through telephone when there is an alarm triggered at home or at the office. Then, when there an alarm is triggered, the telephone number send to the auto dialler modem and a call is made. The owner than is informed of triggered alarm. This will allow the owner to take necessary actions.

ABSTRAK

Projek Alarm Dialler adalah satu projek yang membolehkan individu atau tuan rumah mendapat maklumat dengan cepat sekiranya 'security alarm' di rumah ataupun pejabat berbunyi walaupun berada di tempat yang lain. Tuan rumah akan menerima isyarat dengan lebih cepat. Dengan itu tindakan yang sepatutnya akan dapat dilakukan secepat mungkin. Ini akan dapat mengelakkan keadaan yang tidak diinginkan daripada berlaku. Contohnya kecurian atau pun pecah rumah.

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CHAPTER I

INTRODUCTION

1.1 Objective

The aim of this project is to design and construct a circuit that will ring the owner's telephone or mobile phone when the burglar alarm is triggered. When a house is broken into, a burglar alarm will ring. The house owner, at a different location, will be informed through his telephone automatically.

By designing and constructing this project, it gives added value to the conventional intruder alarm.

Other objective of this alarm system is to alert police and fire departments to the occurrence of events requiring fast response of public safety personnel. The time spent by public safety personnel in responding to alarms, when no such response is actually required, is substantial, costly and wasteful. For example; when there is power failed in a hospital. The technician will automatically inform through his telephone within the second the alarm triggered.

1.2 Scope of Project

The scope of this project is to design a system through which the automatic dialler will call a telephone number when an alarm is triggered.

1.3 Research Methodology

This project employs a PIC (microcontroller). This PIC is used to store several telephone numbers. This number will be programmed into the PIC and will be dialled the moment the PIC triggered. So, it is important to learn how to store a telephone number in the PIC. It is also important to know how to trigger the PIC to call the stored telephone number when alarm is triggered. To call the telephone number, this project uses a modem. So, it is also important to know to connect the circuit with a modem.

To achieve the project objective, the following steps are considered important.

1. Review necessary circuits for the project.
2. Understand the circuit operation.
3. Understand the working operation of a telephone dialler.
4. Understand on how a dialling is done.
5. Understand why use PIC in the project and not other method.
6. Familiar with one of the PIC programming.
7. Construct the circuit.
8. Construct the PIC programming.
9. Do simulation or testing for the circuit.
10. Complete the construction and packaged.

1.4 Problem Statement

Nowadays many of homes are fitted with burglar alarms. Many of these alarms, especially low-cost self-installed ones, do not have the facility to telephone the owner when the alarm occurs. If the house owner is unfortunate enough to be away from home and have an unwanted visitor, he is dependent on someone making the effort to contact him. This will probably happen well pass the time the incident occurred. With this alarm dialler system, the house owner will be notified within the second of an alarm occurring, through a call to his telephone. The house owner can then take the necessary actions such as asking his neighbour to look out for him, telephone the police or switch off the alarm in case it was false.

1.5 Report Structure

This report contains five chapters that explain details about this project. The first chapter is introduction of the project. This chapter contain project introduction, project objectives, project scope, problem statement and research methodology.

The second chapter is literature review about alarm dialer. This includes basic information about other devices that include to makes this system works. For example, telephone system and modem. Telephone system include in this chapter because this system will use a telephone line to call a telephone number. In order to make and answer a call, modem is used. Therefore, brief information about modem also include in this chapter. It is important to understand the concepts involve and how this system works.

The third chapter is about the components used in the project. This chapter gives information about hardware and software involves in order to makes this project works. This chapter also give information about a circuit and the main components used. The components are PIC (microcontroller), Opto-coupler, Voltage Regulator and MAX232 RS232 Transceiver.

The fourth chapter is Project Methodology. This chapter will figure out a few tests that been conducted. This is to make sure the components and other devices involves are in good condition function. The testing procedures, devices and method used to generate the expected results will include in this chapter.

The fifth chapter is result of Alarm Dialler. This chapter consist of an outcome for this project. It is also shows results, possible problems and solution for the problems occurred.

The last chapter is about project application of the project, discussion and conclusion of the project. This chapter also contain of suggestion to improve this project for future works. The overall conclusion of this project is showed.

CHAPTER II

ALARM DIALLER

2.1 Alarm System

Alarm system means any mechanical or electrical system used for the detection of smoke, fire, hazardous materials, or unauthorized entry into a building . Other uses could be for alerting others of a medical emergency, or the commission of an unlawful act within a building or other facility and which is designed to emit an outside audible alarm or transmits a signal or message when actuated. Alarm systems include direct dial telephone devices, audible alarms and proprietor alarms. Alarm systems specifically exclude telephone call diverters and systems designed to report environmental and other occurrences that are not intended to alert, or cause others to alert, public safety personnel.

Alarm system is a system that signals the occurrence of some undesirable event. Having a security alarm system at home may decrease the chances of a burglary. Even if the alarm system does not keep a burglar from breaking in, it may cause the burglar to stay a shorter amount of time.

Nowadays many alarms is applied with an auto-dialler system or also known as Alarm Dialler Systems. Alarm Dialler can be fitted to many security systems such as burglar alarm, smoke/fire alarm, emergency and information alarm, car alarm and other applications. An auto-dialler will activate once the system has been triggered.

For example use as emergency alarm in a hospital. When there is failure system occurs, the engineers or related persons can be informed in seconds the failure occurred. In other hands, this system able to give information to the related person on what is going on even they are far away. These types of alarms dial pre-programmed numbers if the alarm is tripped. From there, the security service is contacted which in turn contacts the homeowners, local police or fire departments.

In car alarm application, the owner will receive a call within seconds of alarm occurring. Nowadays, the car alarm still does not have the facilities to telephone the owner when an alarm occurs.

Normally, most of people are concern about their longings or house properties when they are away from home. Thus, nowadays many of homes are fitted with burglar alarms. Many of these alarms, especially low-cost self installed ones, don't have the facility to telephone the owner when the alarm occurs. This project is to improve the burglar alarm that doesn't have the facility to telephone the owner when an alarm occurs.

This project is implemented using a modem, PIC microcontroller and a simple circuit. It thus includes both hard ware and soft ware programming.

2.2 The Telephone System

A telephone number is a sequence of decimal digits that uniquely indicates the network termination point. The number contains the information necessary

to identify the intended endpoint for the telephone call. Telephone numbers are often assigned to lines that have other devices connected such as faxes, modems, subscribers and network services. Each such endpoint must have a unique number within the public switched telephone network.

Most countries use fixed length numbers (for normal lines at least) and therefore the number of endpoints determine the necessary length of the telephone number. It is also possible for each subscriber to have a set of shorter numbers for the endpoints most often used. These "shorthand" or "speed calling" numbers are automatically translated to unique telephone numbers before the call can be connected. Many systems also allow calls within a local area to be made without dialling the local area code.

Most telephone networks nowadays are interconnected in the international telephone network, where the format of telephone numbers is standardized by ITU-T in the recommendation E.164, which specifies that the entire number should be 15 digits or shorter, and begin with a country prefix. For most countries, this is followed by an area code or city code and the subscriber number, which might consist of the code for a particular telephone switch. ITU-T recommendation E.123 describes how to represent an international telephone number in writing or print, starting with a plus sign ("+") and the country code. When calling an international number from a fixed line phone (mobiles generally allow the + to be entered directly) the + must be replaced with the international call prefix chosen by the country the call is being made from.

The format and allocation of local phone numbers are controlled by each nation's respective government, either directly or by sponsored organizations. Before a telephone call is connected, the telephone number must be dialled by the calling party or caller. The called party might have equipment that presents caller ID before the call is answered.

2.2.1 Telecommunication (Direct Dialling)

Direct dial is a means of placing a long distance telephone call in which the person making the call dials the number directly rather than going through an operator. It is the least expensive means of making a telephone call, as compared with operator-assisted telephone calls, such as long distance calls made at a pay phone, collect or person-to-person calls. Figure 2.2.1 shows how direct dialling is working.

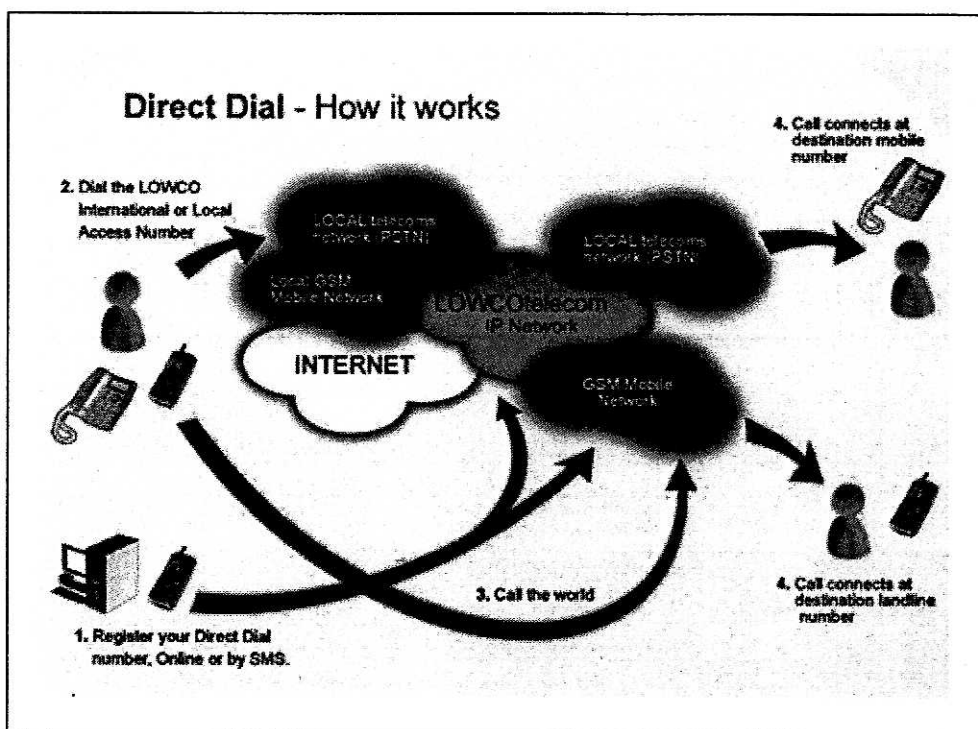


Figure 2.2.1: How direct dialling working

Direct Distance Dialing (DDD) is a telecommunications term for a network-provided service feature in which a call originator may, without operator assistance, call any other user outside the local calling area. DDD requires more digits in the number dialed than are required for calling within the local area.

Direct-dial service is a versatile easy to use local access service, tailored towards busy people on the move. This low cost high quality void calling service is unique in so far as users can enjoy the speed and convenience of direct dialling without having to enter a pin for every call. DDD also extends beyond the boundaries of national public telephone networks.

2.2.2 Auto Dialler

An auto dialler is an electronic device that can automatically dial telephone numbers to communicate between any two points in the telephone, mobile phone and pager networks. Once the call has been established (through the telephone exchange) the auto dialler will announce verbal messages or transmit digital data (like SMS messages) to the called party.

A regular PC, desktop or laptop, can be turned into an auto dialler. In order to connect a PC with a telephone line, a telephony board is needed. Popular telephony boards are those from Dialogic and many traditional auto diallers are based on Dialogic cards.

Traditionally there are major advantages to using telephony cards over simple modems, including detecting touch tones and transferring calls directly through to the caller.

In recent years, with the advancement of computer software technology many hardware-based telephony capabilities for auto dialling can be implemented in software. Voice modems are much less expensive and some computers have them pre-installed already. Touch tones and call transfer, among many other telephony cards features, are available in voice modem based auto dialling solutions. For auto diallers, there are not many advantages in telephony cards over simple voice modems.

2.3 Modem

Figure 2.3(a) shows a basic connecting for modem. Modem is a device that converts or transmitting usually digital data over telephone wires by modulating the data into an audio signal to send it and demodulating an audio signal into data to receive it. Despite the availability of several all-digital transmission networks, the analogue telephone network remains the most readily available facility for voice and data transmission. Since terminals and computers transmit data using digital signalling, whereas telephone circuits are designed to transmit analogue signals used to convey human speech, a device is required to convert from one to the other in order to transmit data over telephone circuits. The term modem is a contraction of the two main functions of such a unit, modulation and demodulation. The device is also called a data set.

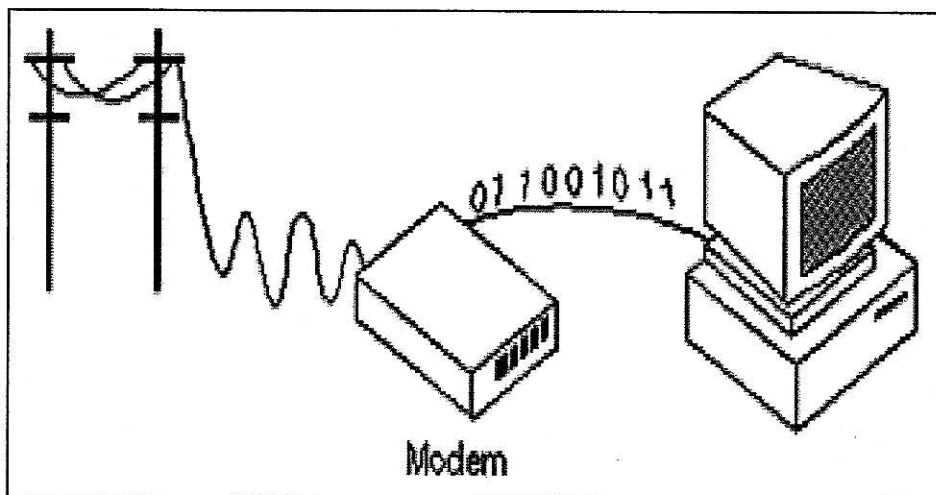


Figure 2.3 (a): Basic connecting for modem.

In its most basic form a modem consists of a power supply, transmitter, and receiver. The power supply provides the voltage necessary to operate the modem's circuitry. The transmitter section contains a modulator as well as filtering, wave-shaping, and signal control circuitry that converts digital pulses (often input as a direct-current signal with one level representing a digital one and another level a digital zero) into analogue, wave-shaped signals that can be transmitted over a telephone circuit. The