EVERYTHING THAT MOVES ALARM

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"I certify that, I have gone through the report and in my opinion this report is completely suitable whether in its scope and quality for Bachelor of Electronics Engineering (Computer Engineering) with Honors certification."

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Date : 28/4/06

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Fakulti Kejuruteraan Elektronik dan Kejuruteraan Komputer
Kolej Universiti Teknikal Kebangsaan Malaysia

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"I certify that I have not plagiarized the work of others or participated in unauthorized collusion when preparing this report except some of the paragraphs and summaries which I detailed the source. "

Signature : .....

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Date : 28/4/2006

For my beloved parents, grandparents and family

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May GOD bless you…

Subramaniam a/l Amirthalingam

ABSTRACT

A security system known as "Everything that moves Alarm" is a combination design of hardware and software. This design can be applied anywhere and it can be utilized for any environment and also it is an easy application system. The specialty of this system is, it can be "ON" by using our normal hand phone and we will get feedback from the operational of the alarm system. The system is firstly built in a hardware design for the motion detector and the connector of the detector to the input of the system by using the RJ 45 cable connector to the hardware from the computer. This *Motion Detector* is trigger by using Short Message System (SMS) technology, where control takes place by means of SMS (Short text Messages Service). When the motion detector receives a predefined text message, the circuit automatically recognizes it as a command, and switches the output accordingly. Besides switching the port on, the user can pulse it for a short period (e.g. *"Reboot remote server"*).The Short Message System (SMS) function is created by using the Visual Basic C++ software and this software is using a special command for the Nokia brand phones and it is specified for it. By introducing this technology, the system can be fully controlled by the devices.

ABSTRAK

Dalam zaman yang serba canggih ini, keperluan semasa meningkat dengan sangat tinggi. Salah satu keperluan yang meningkat ialah, keperluan keselamatan menjaga rumah yang serba canggih tanpa masalah. Sebuah sistem sekuriti "Everything that's moves alarm" diperkenalkan untuk memenuhi keperluan tersebut. Sistem tersebut adalah kombinasi daripada penggunaan perisian dan perkakasan elektronik, serta ia boleh digunakan di semua tempat. Keistimewaan sistem tersebut ialah, sistem sekuriti itu boleh diaktifkan dengan menggunakan teknologi SMS dari telefon bimbit biasa kita dari mana jua kita berada. Apabila sistem menerima teks ucapan dari telefon bimbit, ia akan mentafsirkan teks itu mengikut arahan yang dikehendaki dan mengeluarkan keluaran untuk mengaktifkan sistem sekuriti. Teknologi SMS itu diaktifkan dengan menggunakan perisian Visual Basic C++ dengan gabungan perisian telefon bimbit Nokia.Teknologi tersebut akan mengawal sepenuhnya perkakasan elektronik sistem sekuriti.

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SHORT FORM CONTENTS

SMS	Short Messaging System
PC	Personal Computer
PCB	Printed Circuit Board
LED	Light Emitting Diode
PSTN	Public Switch Telephone Network
GSM	Global System for Mobile Communication
BZ	Buzzer
AC	Alternative Current
D	Diode
IC	Integrated Circuit
R	Resistor
PVDF	Polyvinylidene Fluoride
DC	Direct Current
CMOS	Complementary Metal-Oxide Semiconductor
TTL	Transistor - Transistor Logic
I/O	Input / Output

CHAPTER I

PROJECT INTRODUCTION

1.1 INTRODUCTION

A security system known as "Everything that moves Alarm" is a combination design of hardware and software. This design can be applied anywhere and it can be utilized for any environment and also it is an easy application system. The specialty of this system is, it can be "ON" by using our normal hand phone and we will get feedback from the operational of the alarm system. The system is firstly built in a hardware design for the motion detector and the connector of the detector to the input of the system by using the RJ 45 cable connector to the hardware from the computer.

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1.2 PROBLEM STATEMENTS AND PROJECT OBJECTIVES

1.2.1 Problem:

i) Most of the houses or machine appliances are only uses sensor detection in the doors to prevent any misuse.

ii) Using a switch system, to "ON" detector.

iii) Most security product is fully wired and easily can be deactivated.

1.2.2 Objective:

i) To create a hardware system of a motion detector which is known as an *Ultrasonic Motion Detector* and it is function on detect human or beast. when it is moving.

ii) Develop a software system which will work as the intermediate or interface between the phone and the motion detector and this system will fully control the motion detector.

iii) Develop a motion detector which is fully controlled by Short Messaging System (SMS) technology.

1.3 SCOPES OF WORK

The scopes of the motion detector device is only detects motion of movement from 3.5 to 6 meters away and as the device detects movement, a red Light Emitting Diode (LED) lights. The device is "ON" via Short Messaging System (SMS) and the Short Messaging System circuit is design specified for the electronic devices. Phones that can be used only, Nokia models, such as model 8850, 8210 and 3610 and it's using RJ 45 serial cable as a connector. Intermediate for the phone and detector is a computer with a modem and function by an interface and the firmware can only run in Windows 98.

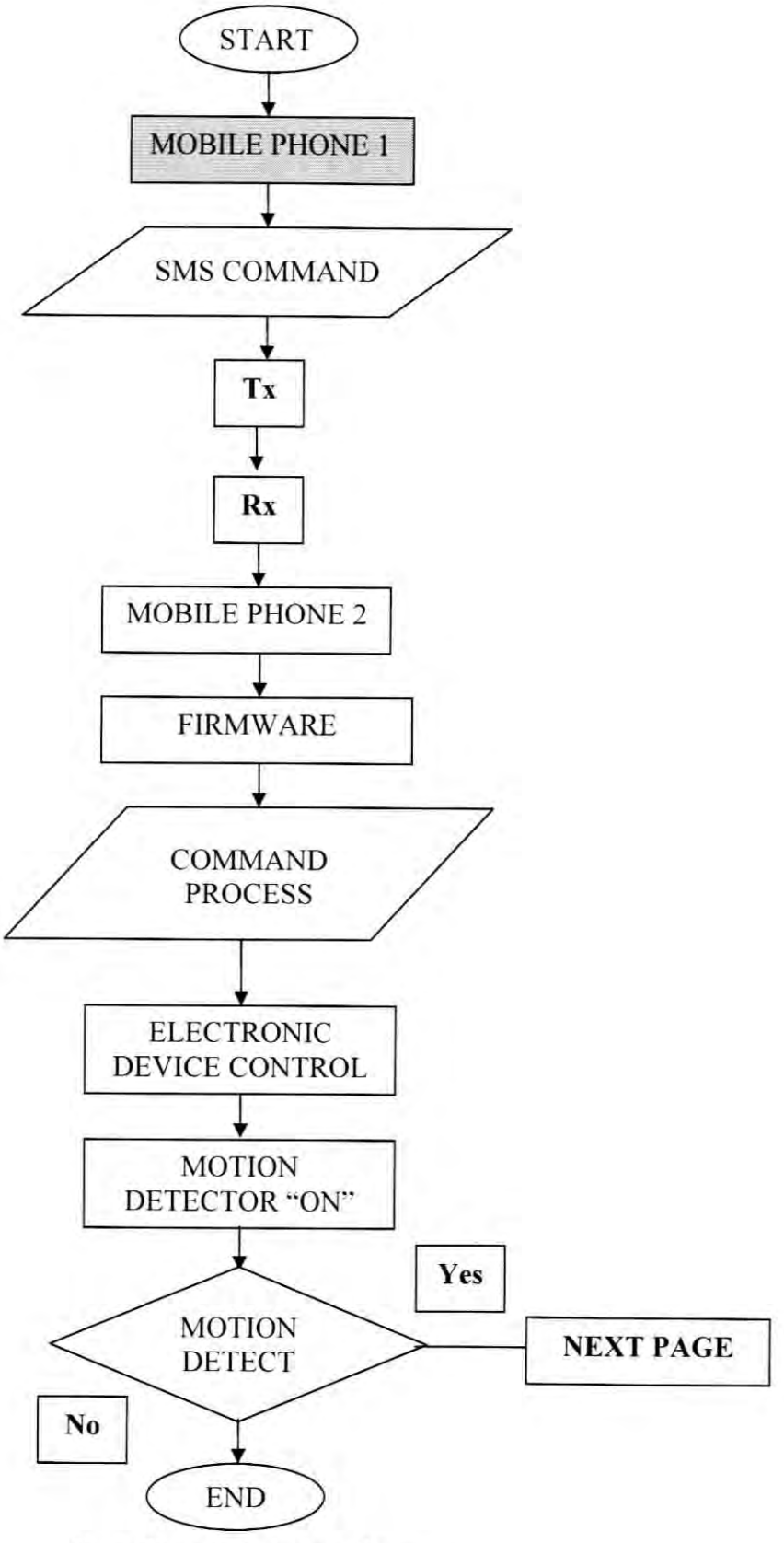
1.4 PROJECT METHODOLOGY

The SMS message used to "ON" the detector is sent from a mobile phone 1, to mobile phone 2, which is connected to the PC. Then the SMS message passes through the mobile network or PSTN (or both) and finally reaches at the receiver. The Mobile phone is connected through serial port by a cable. As the serial port receives the SMS, the program will run the command and passes through the message to the Data Pin status of the PC parallel port. Parallel port will send the data to a hardware system; electronic device control and it will function according to the command that receives and operate the motion detector. If the motion is detect any motion it will "ON" the alarm and at the same time it will feedback again to the sender.

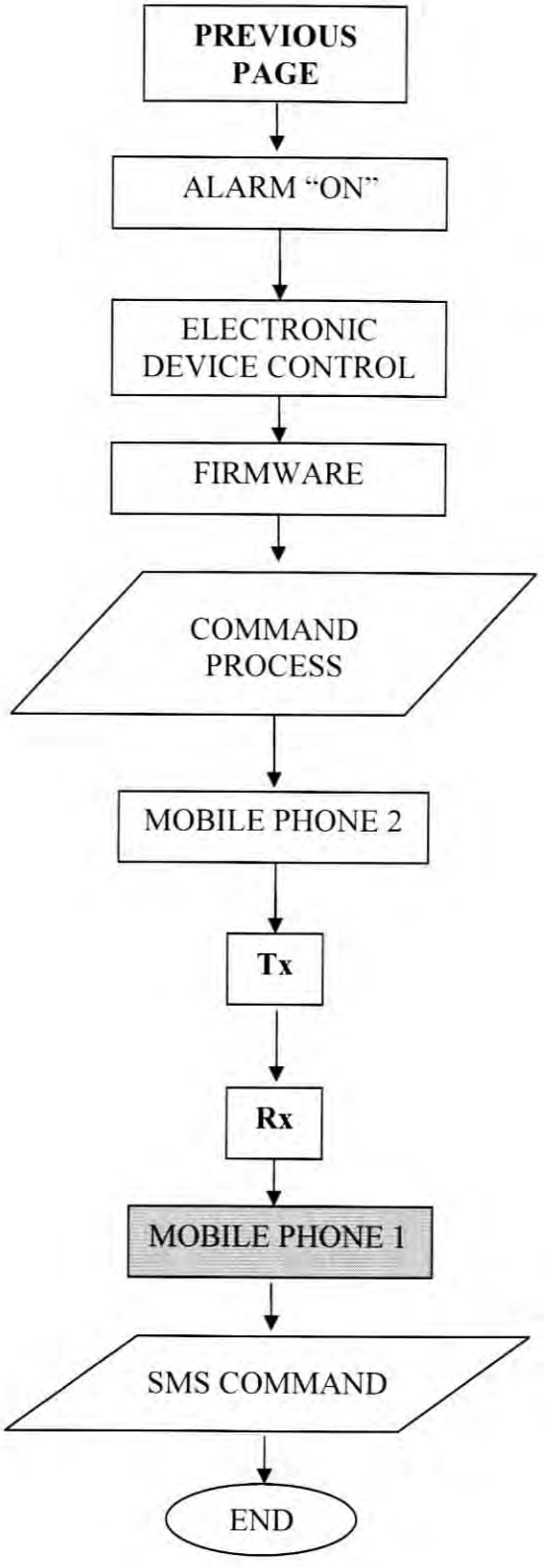
1.5 EXPECTED RESULTS

To create a security system known as ultrasonic motion detector which can detect human movement. This system consists of two point, software and hardware. The software will work as interface between the phone and motion detector and is fully controlled by Short Messaging System (SMS) technology.

1.6 FLOW CHART



Flow Chart 1.1: Project Flow



Flow Chart 1.2: Project Flow Continue

CHAPTER II

HARDWARE

2.1 ULTRASONIC MOTION DETECTOR

2.1.1 Circuit Description

The schematic for the Ultrasonic Motion Detector is shown in Fig. 2.2. A 12-volt DC supply directly provides from power source to the circuit. The transmitter section of the Detector is basically a crystal-controlled relaxation oscillator built around a 4069 hex inverter, IC2. One of the 4069 sections, IC2-c, along with resistors R21 and R22, and capacitors C11 and C12, "pings" the 40-kHz crystal into sustained oscillation. The remaining 4069 sections act as linear buffers to drive a 40-kHz ultrasonic transmitting transducer, BZ2. The receiver section of the circuit is made up of four AC-coupled stages, each built around one of four sections of a TL 084 op-amp IC1. In the first stage, the input voltage developed across R1 and R2 is modulated by a 40-kHz, ultrasonic receiving transducer, BZ1, and is then fed to IC1-a, where it is amplified. The receiving transducer detects any reflected sound

produced by the transmitting transducer, BZ2. If there is no movement, the resulting envelope signal is just a straight line: diode D1 and resistor R8 operate as a negative peak detector to recover the envelope signal. In the second stage, which is built around IC1-b, the recovered signal is again amplified. The time constant of IC1-b is quite slow so that the envelope can be followed; the output of the second stage is a DC level that represents the strength of the envelope. If there is movement, the envelope will reflect it in the form of a positive or negative signal. At the input to the third stage a differential amplifier built around IC1-c there are two diodes, D2 and D3. They detect both positive and negative pulses. When there is no movement, the voltage at pin 7 of IC1-b is half the supply voltage and neither D2 or D3 can conduct. The voltage at pin 8 of IC1-c is then low. If the signal rises above +0.7 volt (a silicon diode's breakdown voltage), D3 conducts causing the output on pin 8 to go high. If the signal falls below 0.7 volt, D2 conducts, which also causes the output to go high. Thus we have a window detector. It detects voltages that move both below and above a given range. The fourth stage, built around IC1-d, is set up as a monostable flip-flop. That stage converts any signal that gets through the filter into a pulse substantial enough to turn on transistor Q1. When Q1 conducts, LED1 turns on and an output signal is provided to drive a separate relay or any other device connected to the circuit. The time constant of the monostable flip-flop is about half a second and is set by C8 and R18. Diode D4 is used to separate the charge and discharge time constants. It lets the circuit switch on immediately when movement is detected, but allows about a half-second delay for the reset.