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Mohd Bahamam.

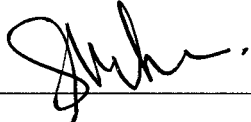
## **DESIGN OF SECURITY ACCESS DOOR SYSTEM**

**Mohd Fidaus Bin Mohd Bahamam**

**BEKE**

**2009**

“I hereby declare that I have read this report and in my opinion this report in term of content and quality requirement fulfils the purpose for the conferring of the Degree of Bachelor in Electrical Engineering.”

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**DESIGN OF SECURITY ACCESS DOOR SYSTEM**

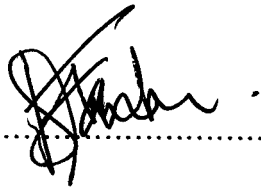
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**This Report Is Submitted In Partial Fulfillment Of Requirements For The Degree  
Of Bachelor In Electrical Engineering  
(Power Electronic and Drives)**

**Faculty of Electrical Engineering  
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**MAY 2009**

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Student : MOHD FIDAUS BIN MOHD BAHAMAM

Date : ..!!...MAY 2009

*Specially dedicated to*

*My beloved father and mother...*

*Mohd Bahamam bin Mohd Rajuli & Salbiah binti Hussein*

*My beloved brother and sisters ...*

*Mohd Amru, Mohd Wahidi, Muhammad Izzat and Rozana,*

*My inspirational motivator...*

*All my friends,*

*Thank you for everything...*

## ABSTRACT

This report addresses the designed of Security Access Door System. The use of Security Access Door System for security is very effective way to improve level of security and used methods password to accessing room. It is systematic and securable in its possible application. The designed of Security Access Door System is divided into three major part that is graphical user interface, interfacing computer and hardware part. In this project, it required user to enter just id number and password to access door. By entering id number and password is one level higher than usage card for the security system. Also include in this project is research, testing, analyzing build prototype and GUI system. Software part is using visual basic 6 as interface, password setting and database system. Link between software and hardware is computer interfacing used parallel port as device. When system all true in database, computer sent signal through computer interfacing and magnetic door will be energized and door will be opened to access private document room.

## ABSTRAK

Laporan ini dibuat sempena rekacipta projek bertajuk design of Security Access Door System. Kegunaan projek ini adalah untuk keselamatan dan bertujuan untuk meningkatkan lagi keselamatan dengan menggunakan kaedah kata laluan sebagai cara untuk memasuki bilik tertentu. Ianya merupakan satu system yang sistematik dan selamat apabila pengguna mengaksesnya. Projek Security Door Access System ini terdiri daripada tiga bahagian penting iaitu antara muka pengguna grafik, pengantaramukaan bahagian komputer dan perkakasan. Didalam projek ini, pengguna dikehendaki untuk memasuki nombor pengenalan dan kata laluan untuk memasuki pintu. Dengan penggunaan nombor pengenalan dan kata laluan ianya meningkatkan lagi tahap keselamatan ke tahap yang lebih selamat berbanding penggunaan kad akses untuk sistem keselamatan. Didalam projek ini juga merangkumi penyelidikan, peengujian, menganalisis dalam membina prototaip dan sistem GUI. Pada bahagian perisian, penggunaan visual basic 6 sebagai antara muka, penentu kata laluan dan sistem pangkalan data. Perisian dan perkakasan dihubungkan dengan pengantaramukaan komputer yang menggunakan litar port selari sebagai alat penghubung. Apabila seluruh sistem mendapat kebenaran dari pangkalan data, komputer menghantar data melalui pengantaramukaan komputer dan pintu magnetik berfungsi dan pintu akan terbuka untuk memasuki bilik dokumen persendirian.

## TABLE OF CONTENTS

CHAPTER	TITLE	PAGE
	TITLE PAGE	i
	ADMISSION	ii
	DEDICATION	iii
	ACKNOWLEDGMENT	iv
	ABSTRACT	v
	ABSTRAK	vi
	TABLE OF CONTENTS	vii
	LIST OF TABLES	x
	LIST OF FIGURES	xi
	LIST OF APPENDICES	xiii
1	<b>INTRODUCTION</b>	
	1.1 Project background	1
	1.2 Problem statements	2
	1.3 Objectives	2
	1.4 Project scope	2
2	<b>LITERATURE REVIEW</b>	
	2.1 Introduction	3
	2.2 Literature review	3
	2.2.1 First Study: An interdisciplinary approach For adding knowledge to computer security systems	3
	2.2.2 Second study: Ferroelectric Memories for Security and Identification Purposes	5
	2.2.3 Third study: Declarative GUI	6



**LIST OF TABLES**

<b>TABLE</b>	<b>TITLE</b>	<b>PAGE</b>
2.1	Pin description	9
3.1	Gantt chart	29
4.1	Data observe from circuit	42

## LIST OF FIGURES

<b>FIGURE</b>	<b>TITLE</b>	<b>PAGE</b>
2.1	The independence between security and knowledge-base system	4
2.2	Intelligent security	4
2.3	Operational perspective of bender memory	5
2.4	Program output	6
2.5	Data format for data line of DB-25	7
2.6	DB-25 connector for PC	8
2.7	Transistor	10
2.8	Pin-out diagram of the 555	12
2.9	Voltage regulator	13
2.10	Relay 12VDC	14
2.11	Magnetic lock mini	15
2.12	Parallel port circuit	16
2.13	Monostable multivibrator circuit	16
2.14	Power supply circuit	17
2.15	Output waveform at transformer	18
2.16	Output waveform at rectifier	19
2.17	Output waveform at capacitor	19
2.18	Output waveform at regulator	20
2.19	Menu bar	22
2.20	Form 1 in visual basic	22
2.21	Toolbox	23
2.22	Properties form 1	24
2.23	Form layout	24
2.24	Folder form 1	24
2.25	Form 1 code	25
3.1	Flow chart of methodology	27
3.2	Power supply circuit	31

3.3	Placing component	32
3.4	Soldering component	32
3.5	Testing circuit using oscilloscope	33
3.6	Sketch design prototype	34
3.7	Visual basic	34
3.8	Flow Chart GUI	35
3.9	Creating blank database	37
3.10	Inserting field name	37
3.11	Inserting ADODC	38
3.12	Build provider	39
3.13	Test connection form	39
3.14	Record Source	40
3.15	Set up properties	40
4.1	Parallel port circuit	42
4.2	LED green on show counting time	43
4.3	Active high condition	44
4.4	Active low condition	44
4.5	Waveform after step down voltage	45
4.6	Waveform on pin diode	45
4.7	Waveform at pin capacitor	46
4.8	(a) Voltage measured by multimeter, (b) 12V dc waveform	46
4.9	(a) Voltage measured by multimeter, (b) 9V dc waveform	47
4.10	Introduction form	48
4.11	Splash form	48
4.12	Main Menu form	49
4.13	Message box question	49
4.14	Admin password form	50
4.15	(a) Wrong password message box, (b) correct message box	50
4.16	Menu form	51
4.17	Data Information form	51
4.18	(a) Admin area form, (b) view id and password	52
4.19	Recording data form	53
4.20	Login form	53
4.21	Reason form	54

4.22	(a) Prototype door, (b) close up magnetic lock	55
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**LIST OF APPENDICES**

<b>APPENDIX</b>	<b>TITLE</b>	<b>PAGE</b>
A	Datasheet transistor	60
B	Datasheet timer 555	62
C	Coding Visual Basic 6	67

## CHAPTER 1

### INTRODUCTION

#### 1.1 Project Background

Security is the condition of being protected against danger, loss, and criminals. In the general sense, security is a concept similar to safety. The nuance between the two is an added emphasis on being protected from dangers that originate from outside. Individuals or actions that encroach upon the condition of protection are responsible for the breach of security. For adding more safety, password is one of the methods to make the system to be more secure. Password is a word or string of characters that is entered, frequently together with a user name, in a modern times usually into a computer system to log in, or to gain access to some resource. Passwords are a common form of authentication. Full security requires the password to be kept secret from those who not allowed to access. In addition, data base is required for data storage regarding the user password. Database is a structured collection of records or data which is stored in a computer system. The structure is achieved by organizing the data based on the database model. This project combines security methods that are password, database as engine and door as prototype. For the purpose of safety, security access door system is invention that can avoid all disputes from being happened. This project also includes jovial system that can be used by all kind of user. Therefore, old method for access door system can be replaced for more safety and securable environments through the design of security system.

## 1.2 Problem Statements

Currently, technology becomes crucial part in daily life. It will improve system in progressing security system. Security access door system is the system for replacing conventional system method. The conventional system has many problems including:-

1. Conventional system wasting time
2. Low level security
3. Manual process to enter room

These all process is manually operating and needs to be monitor in order to ensure the safety of the room. The whole systems for accessing room need to be transforming to the system which is more secure and reliable.

## 1.3 Objectives

The main objectives of this project are:

- i. To build GUI( graphical user interface) using visual basic 6
- ii. To build computer interfacing between PC and door system.
- iii. To build prototype of security door system that suitable to software
- iv. To design new security system that user friendly

## 1.4 Scope of Project

This project consists of a software and hardware part. The scopes of this project are as follow:

- i. Building database system by using MS access.
- ii. Design Graphical User Interface by using software Visual Basic 6. GUI can control and accessing direct to prototype.
- iii. Interfacing computer using parallel port and using simulation on Proteus 7 to simulate output and functional of circuit.
- iv. Build the security access door model using pine wood.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

This chapter reviews the project created to get the idea about the project design, conception and any information which is related to improve the project. There are many creations and innovations of projects that had been done by other people with difference concepts and designs. This chapter also covers the researches related to the subject. It will provide a clear understanding of the system and its design. Basically, this project is about the design security of access door system

#### 2.2 Literature Review

##### 2.2.1 First Study: An interdisciplinary approach for adding knowledge to computer security systems. [1]

*(Author: Maodo TOURE, 1994)*

The work that will be presented in this paper focuses on the use of Artificial Intelligence (AI) for certain computer security systems. These classes of security systems are called “Intelligent Security Systems”. Some previous works found AI is helpful for security systems as intrusion detection, virus detection, real time analysis of audit records and etc. However, because of the antagonism between security systems’ sensibility and knowledge bases’ flexibility and friendliness, the use of AI in security cannot be function effectively without a real discussion between AI and security. Namely, an interdisciplinary approach requiring two skills: Knowledge Engineering and security expertise. Figure 2.1 shows that the independence between security and knowledge-based system.



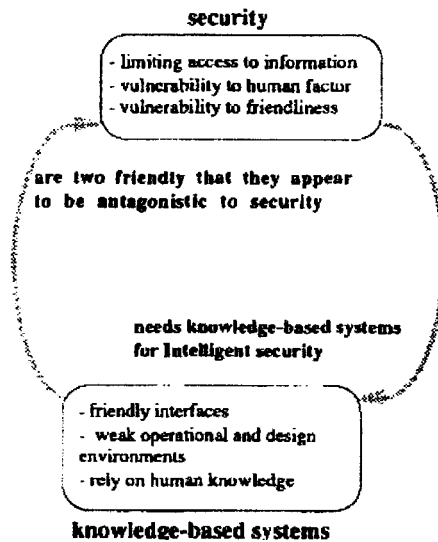


Figure 2.1: The independence between security and knowledge-based system

However, a clean and sound design of the security in underlying layers makes the design and work of the intelligent security becomes uncomplicated. In that sense, there is both a "covers a faults of" and "depends on security of" relations between the different security layers. In this work, the general aspects of our intelligent security approach rather than showing its application to a particular case, in a particular environment, with particular knowledge sources. In Figure 2.2 shows that connection between intelligent securities. These AI intelligent methods are most important design system that have security and make system more securable. [1]

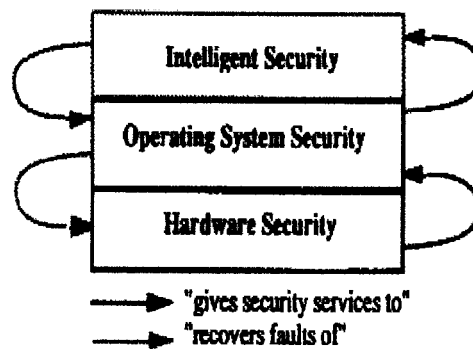


Figure 2.2: Intelligent security

### 2.2.2 Second study: Ferroelectric Memories for Security and Identification Purposes. [2]

(Author: Alvin B.Kaufman, 1990)

This paper discuss about identification card. Magnetically encoded cards are currently being utilized for train tickets and for door (access) keys to restricted areas. This implementation suffers from numerous serious deficiencies, of which the worst is the ease with which the magnetically coded information may be altered or copied. Alteration may be accidental or with intent to defraud. Security may be questionable depending upon the sophistication required to determine the encoded information. Ferroelectric encoded cards also provide information coding for security and identification, but this is not readily subject to compromise. The design encoded by Ferroelectric can be seen in Figure 2.3. These cards are immune to accidental modification of their encoded information and such information is not readily ascertained. As with all innovations, there are excellent attributes and those not so desirable.

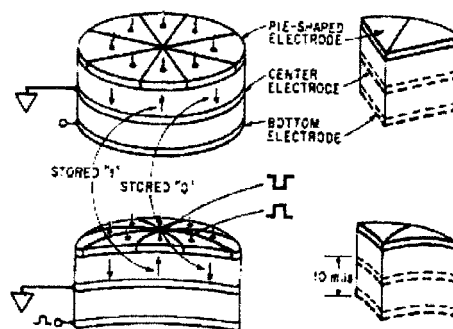


Figure 2.3: Operational perspective of bender memory

This is one of the example of safety system that been research before. Card system didn't last long when new technology acquired. This innovation open fresh inspiration to my project for develop and design new kind security that only use password as link to access door. [2]

### 2.2.3 Third study: Declarative GUI Programming in Microsoft Windows. [3] (Author: Panagiotis Louridas, 2007)

This paper discussed about Graphical User Interface (GUI). GUI programming is tedious and tough. Programmers must define an application's exact layout while also handling the user's actions, which fall under the rubric of events. This combination can easily lead to spaghetti code. It's especially worrisome when, as often happens, an application's most important part is the business logic behind it, not the user interface in front of it. To complicate matters further, an application might need different user interfaces one for standard Web browsers, another for mobile devices, and still another to support a parallel life as a desktop application. Special GUI designer tools ease the burden.

They let developers draw application forms, menus, dialog boxes, and other interface elements and automatically translate the models to the code that builds them. This code includes placeholders where developers place event-handling code. In essence, these are WYSIWYG tools for building GUIs. Unfortunately, these tools produce code that's nearly unreadable by human beings. A domain-specific language for building user interfaces offers a more transparent way for programmers to specify interface elements. A well designed DSL frees the GUI developer from having to work at too low a detail level. At the same time, it enforces a separation of concerns: the DSL describes the GUI, while an application programming language takes care of the code that handles the user-system interaction.

Despite criticism, Microsoft Windows is the dominant platform for desktop computing and the target of the vast majority of GUI programming. In what follows, we'll look at Microsoft's proposal for GUI declarative programming, along with the some related technologies that programmers have at their disposal. Example output GUI can be seen in Figure 2.4

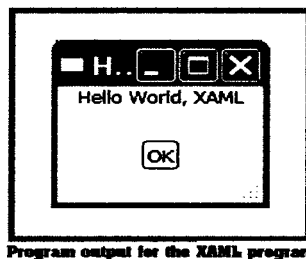


Figure 2.4: Program output

This project use visual basic 6 as the main language to build GUI. It easy to use cause it use simple coding and easy to interface between hardware. [3]

#### 2.2.4 Fourth study: A parallel port interface circuit for computer control applications involving multiple stepper motors.[4]

(Author: Mike J. Johnson and Guru Subramanyani, 1997)

This paper discussed about parallel port interface involving multiple stepper motor. A parallel port interface circuit was designed, fabricated and tested for programmable control of multiple stepper motors used in a robotic manipulator arm, and a linear position table. The robotic arm built in-house had four degrees of freedom through the use of four stepper motors, and the position table required one stepper motor for linear transmission. The interface circuit consisted of a tristate buffer driver, a decoder circuit, a phase sequence generator circuit, and a power output circuit.

They review that driven QBASIC program was developed for controlling the robotic arm and the position table. When the program is stopped, it displays the current position of the robotic arm and the position table. The entire circuit and the program worked accurately. Data format to DB 25 data's line is as in Figure 2.5.

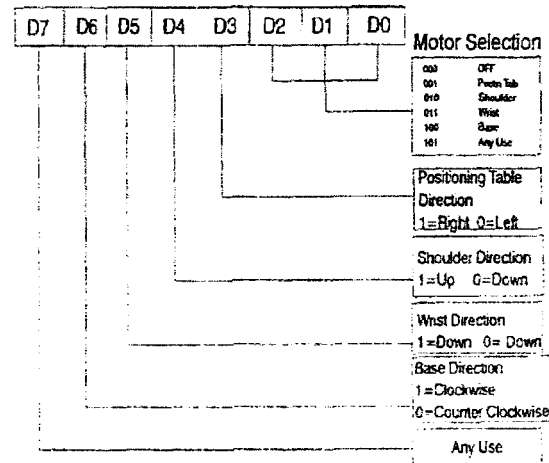


Figure 2.5: Data format for data line of DB-25

The parallel port interface circuit was designed using the DB-25 parallel port connector. The parallel port contains the data lines Do-D7, 5 status lines, and 4 bi-directional control lines. The data lines of the parallel port outputs an 8 bit control word, in the assigned special format in Figure 2.6. As the main port in this project, parallel port are

interfacing computer that not complicated. The system on parallel more efficient and data sent quicker than serial. Bi-directional can use input and output. It's more effective when system required forming input and output. [4]

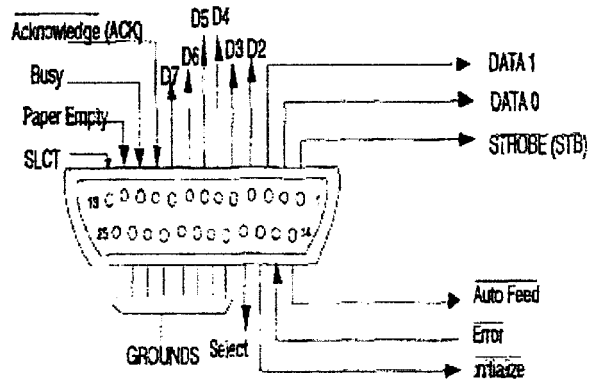


Figure 2.6: DB-25 connector for PC connector for PC

## 2.3 Theories

There are several components and circuits are used in this project. The components are DB-25 connector, transistor BC547, Timer 555, voltage regulator and magnet lock. The circuits are parallel port circuit and timer monostable multivibrator circuit.

### 2.3.1 DB-25 connector

The DB25 (originally *DE-25*) connector is an analog 25-pin plug of the D-Subminiature connector family (D-Sub or Sub-D). The DB25 is mainly used for serial connections, allowing for the asynchronous transmission of data as provided by standard RS-232 (RS-232C). It is also used for parallel port connections, and was originally used to connect printers, and as a result is sometimes known as a "printer port" (*LPT* for short). So to avoid confusion, DB25 serial ports on computer generally have male connectors, while parallel port connectors are DB25 female plugs.

Table 2.1: Pin description

Pin	Reg Bit	Description	Direction	Pin	Reg Bit	Description	Direction
1	/C0	Strobe	Output	14	/C1	Auto Feed	Output
2	D0	Data Bit 0	Output	15	S3	Error	Input
3	D1	Data Bit 1	Output	16	C2	Initialise	Output
4	D2	Data Bit 2	Output	17	/C3	Select	Output
5	D3	Data Bit 3	Output	18	-	Ground	-
6	D4	Data Bit 4	Output	19	-	Ground	-
7	D5	Data Bit 5	Output	20	-	Ground	-
8	D6	Data Bit 6	Output	21	-	Ground	-
9	D7	Data Bit 7	Output	22	-	Ground	-
10	S6	Acknowledge	Input	23	-	Ground	-
11	/S7	Busy	Input	24	-	Ground	-
12	S5	Paper End	Input	25	-	Ground	-
13	S4	Select In	Input				

At the Table 2.1 above, show that the function of each pin. Pin1 until pin9 function as output to linking with computer. Each representative pin a data namely D0 until D7. Pin10 until pin17 is the status pin. Status pin allow data feedback from hardware to computer. Pin18 until pin25 is the ground pin.

### 2.3.2 Transistor

A transistor is made of a solid piece of a semiconductor material, with at least three terminals for connection to an external circuit. A voltage or current applied to one pair of the transistor's terminals changes the current flowing through another pair of terminals. Because the controlled (output) power can be much larger than the controlling (input) power, the transistor provides amplification of a signal. The transistor as in Figure 2.7 is the fundamental building block of modern electronic devices, and is used in radio, telephone, computer and other electronic systems. Some transistors are packaged individually but most are found in integrated circuits. Transistors are commonly used as electronic switches, for both high power applications including switched-mode power supplies and low power applications such as logic gates.

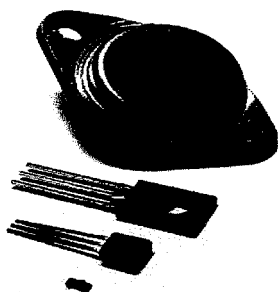


Figure 2.7: Transistor

### 2.3.3 Timer 555

The 555 is an integrated circuit (chip) implementing a variety of timer and multivibrator applications. The 555 gets its name from the three 5-kOhm resistors used in typical early implementations. It is still in wide use, thanks to its ease of use, low price and good stability.

The 555 timer is one of the most popular and versatile integrated circuits ever produced. It includes 23 transistors, 2 diodes and 16 resistors on a silicon chip installed in an 8-pin mini dual-in-line package (DIP-8). The 556 is a 14-pin DIP that combines two 555s on a single chip. The 558 is a 16-pin DIP that combines four slightly modified 555s on a single chip (DIS & THR are connected internally; TR is falling edge sensitive instead of level sensitive). Also available are ultra-low power versions of the 555 such as the 7555

and TLC555. The 7555 requires slightly different wiring using fewer external components and less power.

The 555 has three operating modes:

- Monostable mode: in this mode, the 555 functions as a "one-shot". Applications include timers, missing pulse detection, bounce free switches, touch switches, Frequency Divider, Capacitance Measurement, Pulse Width Modulation (PWM) etc
- Astable - Free Running mode: the 555 can operate as an oscillator. Uses include LED and lamp flashers, pulse generation, logic clocks, tone generation, security alarms, pulse position modulation, etc.
- Bistable mode or Schmitt trigger: the 555 can operate as a flip-flop, if the DIS pin is not connected and no capacitor is used. Uses include bounce free latched switches, etc.

The figure to the right shows the functional block diagram of the 555 timer IC. In either case, the pin connections are as follows:

1. Ground - Ground, low level (0V)
2. Trigger input - A short pulse high to low on the trigger starts the timer
3. Output - During a timing interval, the output stays at  $+V_{CC}$
4. Reset input - A timing interval can be interrupted by applying a reset pulse to low (0V)
5. Control voltage - Control voltage allows access to the internal voltage divider ( $2/3 V_{CC}$ )
6. Threshold input - The threshold at which the interval ends (it ends if  $U_{thr} \rightarrow 2/3 V_{CC}$ )
7. Discharge - Connected to a capacitor whose discharge time will influence the timing interval
8.  $+V_{CC}$  - +5 to +15 volts in normal use.