

MEMORANDUM FOR THE RECORD

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IMPENETRABLE BOX (IBOX)

By

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**PENGAKUAN DAN PENGESAHAN LAPORAN
PROJEK PENYELIDIKAN I DAN II**

Adalah ini diakui dan disahkan bahawa laporan penyelidikan bertajuk:

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TABLE OF CONTENTS

<u>Title</u>	<u>Page</u>	
TITLE PAGE	i	
THESIS VERIFICATION AND APPROVAL FORM	ii	
ACKNOWLEDGEMENTS	iii	
TABLE OF CONTENTS	iv	
LIST OF TABLES	v	
LIST OF FIGURES	vi	
LIST OF ABBREVIATIONS/ SYMBOLS	ix	
LIST OF APPENDICES	x	
ABSTRACT	xi	
ABSTRAK	xii	
CHAPTER 1	INTRODUCTION	
1.1	Introduction	1
	<i>1.1.1 Hardware</i>	3
	<i>1.1.2 Software</i>	8
1.2	Problem Statement	12
1.3	Objectives	13
1.4	Scope of study	13
CHAPTER 2	LITERARTURE REVIEW	
2.1	Security system	14
2.2	Password and improvement	15
2.3	Microprocessors and its applications	17

CHAPTER 3

METHODOLOGY

3.1	Overview	19
3.2.	Building a prototype using Motorola Application Board	20
3.3	Understanding the built-in system in 68K Application Board	21
	3.3.1 <i>68K Motorola Microprocessor</i>	21
	3.3.2 <i>LCD</i>	22
	3.3.3 <i>Stepper motor Circuit</i>	24
	3.3.4 <i>LED</i>	25
	3.3.5 <i>Buzzer</i>	25
3.4	Writing a source code for IBOX	26
	3.4.1 <i>Building a program flowchart</i>	26
	3.4.2 <i>Writing a source code in Notepad</i>	30
3.5	Assembler	33
3.6	Downloading a list file	37
	3.6.1 <i>Hyper Terminal</i>	37
	3.6.2 <i>Testing the communication link</i>	38
	3.6.3 <i>Downloading a sample program</i>	40
3.7	Executing the program	42
3.8	Testing the prototype	43
3.9	Project finished and succeeds	44

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1	Choose Features	45
4.1	State A: Set the password	46
4.2	State B: Lock or unlock the door	51
4.3	State C: Change the password	62

CHAPTER 5	CONCLUSION AND RECOMMENDATIONS	
5.1	Conclusion	73
5.2	Recommendations	74
	5.2.1 <i>IMPENETRABLE BOX (IBOX)</i>	74
	5.2.2 <i>PITA</i>	74
REFERENCES		77
APPENDICES		79
Appendix A	Software	79
A1	Choose features	79
A2	State A: Set password	80
A3	State B: Lock / Unlock	83
A4	State C: Change password	90
A5	HEX code	100
Appendix B	List of Prices	102
CURRICULUM VITAE		103

LIST OF TABLES

<u>Tables</u>	<u>Page</u>
3.1 Bit assignment function for I/O signals	22
3.2 Pin out of 68K Motorola Microprocessor	23
3.3 Registers for the stepper motor	24

LIST OF FIGURES

<u>Figures</u>	<u>Page</u>
1.1 A computer keyboard	3
1.2(a) A Main System Board of Motorola 68K Microprocessor Board	4
1.2(b) An Application Board of Motorola 68K Microprocessor Board.	5
1.3 Liquid Crystal Display (LCD)	6
1.4 Stepper motor	6
1.5 An array of colored LED	7
1.6 A piezoelectric buzzer	8
1.7 Source code is written in Notepad	9
1.8 Source code is edited in MS-DOS Editor	10
1.9 X68K file is opened in Command Prompt window	11
1.10 A LINK file	11
1.11 A Hyper Terminal window	12
3.1 Flowchart of process to be done to build IBOX	19
3.2 A prototype of IBOX	20
3.3 Pin out of 68K Motorola Microprocessor	21
3.4 Layout of 16X2 LCD	23
3.5 Layout of stepper motor circuit	24
3.6 Circuit diagram for an array of LEDs	25
3.7 A layout of buzzer circuitry	25
3.8 A flowchart for 'CHOOSE FEATURES' menu	26

3.9	A flowchart for STATE A: SET PASSWORD	27
3.10	A flowchart for 'STATE B: LOCK/ UNLOCK'	28
3.11	A flowchart for 'STATE C: CHANGE PASSWORD'	29
3.12	A Notepad window	30
3.13	Some of the 68K Microprocessor instruction list	30
3.14	A source code is written in Notepad in assembly language.	31
3.15	An assembly file is saved in a folder.	31
3.16	A Command Prompt window used to access to MS-DOS	32
3.17	A MS-DOS Editor window used to edit source code.	32
3.18	X68K and LINK file is copied to the folder	33
3.19	X68K file is accessed in Command Prompt window	34
3.20	A new object file with an *.obj extension created in the folder	34
3.21	LINK file is accessed through Command Prompt window.	35
3.22	A list file with an extension of *.s28 created in the folder.	35
3.23	A list file consist instructions written in hexadecimal code for machine language.	36
3.24	A Hyper Terminal window	37
3.25	A Hyper Terminal window is opened	38
3.26	A 'Connection Description' window is built.	38
3.27	A 'Connect To' window opened to be set up	39
3.28	The properties for COM 3 are set up	39
3.29	A Terminal Emulator (TE) prompt is opened	40
3.30	List of main menu offered	41
3.31	Main menu and sub menu for Program Control menu	41
3.32(a)	Downloading a list file.	41
3.32(b)	A list file is chosen to be downloaded	42
3.33	Downloading file process is done	42
3.34	The list file is being executed	43

3.35	A Motorola 68K Microprocessor Main Board system and Application Board	44
4.1	LCD displays ‘CHOOSE FEATURES, A: B: C’.	45
4.2	Button A on the computer keyboard is pressed	46
4.3	LCD displays ‘STATE A’ and ‘SET PASSWORD’	46
4.4	LCD displays ‘ENTER PASSWORD’ and waiting for input	47
4.5(a)	Four characters are key- in as password	47
4.5(b)	LCD displays ‘*’ for every character key-in.	47
4.6	Button ‘ENTER’ is pressed if four characters have been pressed.	48
4.7(a)	LCD displays ‘CONFIRM PASSWORD’ and wait for input.	48
4.7(b)	LCD displays ‘CONFIRM PASSWORD’ and wait for input	48
4.8(a)	LCD displays ‘CONFIRM PASSWORD’ and ‘*****’ for password characters	49
4.8(b)	‘ENTER’ button is pressed.	49
4.9	LCD displays ‘PASSWORD MATCHED AND SAVED’.	49
4.10(a)	LCD display ‘CONFIRM PASSWORD’.	50
4.10(b)	Wrong password is entered	50
4.11(a)	LCD displays ‘CONFIRM PASSWORD’ and ‘*****’.	50
4.11(b)	‘ENTER’ button is pressed	51
4.12	‘LCD displays ‘ENTER PASSWORD’ again.	51
4.13	‘Button ‘B’ on the keyboard is pressed.	52
4.14	‘LCD displays “STATE B’ and “LOCK/UNLOCK’.	52
4.15	‘LCD displays “INSERT PASSWORD’ and wait for password to be inserted.	52
4.16(a)	‘The password set in State A is inserted	53
4.16(b)	‘The “ENTER’ button is pressed	53

4.17	The LCD display 'LOCK:+, UNLOCK	54
4.18	A minus, '-' button is pressed to unlocked and opened the IBOX door	54
4.19(a)	Stepper motor will run anti-clockwise to open and unlock the door	54
4.19(b)	LED on D0 and D2 will blinking continuously until motor stop.	54
4.20	"DOOR UNLOCKED" and "SHUT IF FINISH" is being displayed on LCD	55
4.21	Button '+' is pressed to close and lock the door	55
4.22(a)	Stepper motor run clockwise to closed and lock the door	56
4.22(b)	LED on D1 and D3 will blinking continuously until motor stop	56
4.23	LCD displays a message, which is 'DOOR LOCKED, PROP IS SAFE'.	56
4.24(a)	LCD displays a message, which is 'INSERT PASSWORD'	57
4.24(b)	Incorrect password is entered, for example '4444'	57
4.23(c)	'ENTER' button is pressed.	57
4.25	An LED, D0 will light on, indicates an incorrect password is entered	57
4.26(a)	LCD displays a message, which is 'INSERT PASSWORD'	58
4.26(b)	Incorrect password is entered, for example '4444'	58
4.26(c)	'ENTER' button is pressed	58
4.27	Two LED, D0 and D1 will light on for the second time incorrect password entered	59
4.28(a)	LCD displays a message, which is 'INSERT PASSWORD'.	59
4.28(b)	Incorrect password is entered, for example '4444'.	59
4.28(c)	'ENTER' button is pressed.	60

4.29	An LED, D0 will light on, indicates an incorrect password is entered	60
4.30	The LCD displays 'HIT RESET BUTTON ' message	60
4.31	SPACE BAR is pressed	60
4.32	Wrong key is entered.	61
4.33	All LED, D0-D7 will light on.	61
4.34	A buzzer is buzzed when all password entered is wrong	61
4.35	C' button on the computer keyboard is pressed	62
4.36	LCD displays 'STATE C: CHANGE PASSWORD'.	62
4.37	LCD displays 'INSERT OLD PASSWORD'.	62
4.38(a)	The password set in State A is inserted	63
4.38(b)	'ENTER' button is pressed.	63
4.39	LCD display 'INSERT NEW PASSWORD' message	64
4.40(a)	A new password is entered, for example '5555'.	64
4.40(b)	An 'ENTER' button is pressed.	64
4.41(a)	LCD displays 'INSERT NEW PASSWORD' and '*****'.	65
4.41(b)	LCD displays 'CONFIRM PASSWORD'.	65
4.42(a)	A new password is entered, for example '5555'.	65
4.42(b)	After password been inserted, 'ENTER' button is pressed.	66
4.43	A message written 'PASSWORD MATCHED AND SAVED' displayed on LCD.	66
4.44	A message written 'INSERT OLD PASSWORD' displayed on LCD.	66
4.45(a)	Incorrect password is entered, for example '4444'	67
4.45(b)	'ENTER' button is pressed.	67
4.46	An LED, D0 will light on, indicates an incorrect password is entered.	67
4.47(a)	LCD displays a message, which is 'INSERT PASSWORD'.	68
4.47(b)	Incorrect password is entered, for example '4444'.	68
4.47(c)	'ENTER' button is pressed.	68
4.48	Two LED, D0 and D1 will light on for the second	

time incorrect password entered	69
4.49(a) LCD displays a message, which is 'INSERT PASSWORD'	69
4.49(b) Incorrect password is entered, for example '4444'	69
4.49(c) 'ENTER' button is pressed.	69
4.50 An LED, D0 will light on, indicates an incorrect password is entered	70
4.51 4.51: LCD display a message 'HIT RESET BUTT'	70
4.52 SPACE BAR is pressed	70
4.53 If the key is wrong, for example 'ENTER'	71
4.54 All LED, D0-D7 will light on, indicates the box has been used by others.	71
4.55 Buzzer will be turned on.	71
4.56(a) A message written 'CONFIRM PASSWORD' displayed on LCD.	72
4.56(b) 'The password set before has to be inserted	72
4.56(c) A user must press the 'ENTER' button.	72
5.1 The hardware used in building IBOX.	73

LIST OF ABBREVIATIONS AND SYMBOLS

Abbreviation/ Symbol

DC	Direct current
IBOX	Impenetrable Box
I/O	Input/ Output
LCD	Liquid Crystal Display
LED	Light Emitting Diode
MCU	Microcontroller Unit
PITA	Projek Ilmiah Tahun Akhir
PCB	Printed Circuit Board
UMT	Universiti Malaysia Terengganu

LIST OF APPENDICES

<u>Appendices</u>		<u>Page</u>
Appendix A	Software	79
	A1- Choose Features	79
	A2- State A: Set Password	80
	A3- State B: Lock/ Unlock	83
	A4- State C: Change Password	90
	A5- HEX code for IBOX	100
Appendix B	List of Price for Hardware used	102

ABSTRACT

Aware on safety in the house, this project was undergone. The objective of this project to build a safe called Impenetrable Box (IBOX). A user can keep their precious and valuable things, properties or documents inside the IBOX without need to worry about theft, flood or fire. Motorola 68K Microprocessor Application Board is used for this project because it has all the important hardware, which is Liquid Crystal Display (LCD), Light Emitting Diode (LED), buzzer and Stepper motor. A source code can be written in notepad or MS-DOS editor. Then, this file is assembled using 68K and LINK files to generate object and list file respectively. A HyperTerminal window is used to download the list file into the microprocessor and execute the program. The operation of the system is based on password authentication, where a user must enter a correct password to do the features. The password is received from a computer keyboard and been display on the LCD. A user can only enter three wrong passwords before the buzzer sound. The number of wrong password entered is indicated by the number of glowing LED. There are three features that have been programmed, which are setting the password, locking or unlocking the door and changing the password. The advantages of this IBOX are no key needed and more character can be used as password. The disadvantages of this box are the limited characters to be used as password, that is only four characters and the number of entered password is thrice. Hopefully, in the future, this IBOX will be equipped with thumb print scanner and can do more features like displays the time and date.

ABSTRAK

Menyedari kepentingan keselamatan dalam sebuah rumah, maka projek ini dijalankan. Objektif utama projek ini adalah untuk membina sebuah peti simpanan yang dinamakan *Impenetrable Box* atau singkatannya IBOX. Seseorang pengguna boleh menyimpan barangan berharga atau dokumen penting ke dalam IBOX tanpa perlu khawatir tentang kecurian, banjir atau kebakaran. Papan Aplikasi Motorola 68K Mikroprocessor merupakan perkakasan terpenting dalam pembinaan projek ini kerana ia mempunyai komponen perkakasan lain seperti paparan cecair kristal (LCD), diod pemancar cahaya (LED), peringing dan motor Stepper. Kod *sourced* ditulis di dalam Notepad atau MS-DOS *Editor*. Kemudian, fail ini disusun menggunakan fail X68K dan LINK untuk mencipta fail *object* dan fail *list*. Tetingkap *Hypertreminal* digunakan untuk memuat turun fail 'list' dan menjalankan program yang telah diarahkan. Sistem ini beroperasi menggunakan sistem pengesahan kata laluan, yang mana seseorang pengguna mesti memasukkan kata laluan yang betul untuk menjalankan ciri-ciri yang dipilih. Kata laluan diperolehi daripada papan kekunci komputer, kemudian dipaparkan pada LCD. Seorang pengguna hanya boleh memasukkan tiga kata laluan yang salah sebelum peringing berbunyi. Bilangan kata laluan salah yang telah dimasukkan akan ditunjukkan oleh bilangan LED yang menyala. Terdapat tiga ciri utama dalam sistem ini, iaitu menetapkan kata laluan, membuka dan mengunci pintu IBOX dan menukar kata laluan. Kelebihan tentang sistem ini adalah tiada lagi masalah kehilangan kunci, bilangan karakter yang

digunakan sebagai kata laluan tidak terhad kepada nombor sahaja bahkan juga huruf. Keburukan kepada sistem ini adalah bilangan karakter yang terhad, iaitu empat nombor sahaja dan kebolehulangan jika tersalah kata laluan adalah sebanyak tiga kali. Harapan saya untuk menambahkan lagi ciri-ciri IBOX seperti paparan waktu dan kalendar dan juga dilengkapi dengan pengesan cap ibu jari.