

LOGIC DESIGN KEYLESS AUTO ENTRY SYSTEM

Project Ilmiah is presented in partial fulfillment for the award of the
Bachelor of Electrical Engineering (Hons.)
UNIVERSITI TEKNOLOGI MARA



FREDERICK GUNTOBON
Faculty Of Electrical Engineering
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM,
SELANGOR DARUL EHSAN.
NOVEMBER 2000

ACKNOWLEDGEMENT

I would like to take this opportunity to express my gratitude to my project supervisor, Pn. Kartini Bt. Salam, for her guidance, patience, encouragement, inspiration, support, cooperation and constant guidance has help me to successfully complete the project and this thesis. My appreciation also goes to lecturers and computer laboratory assistants and friends for their willingness to cooperate and assistance throughout the completion of this project.

I would also like to express my thank to Mr. Lamomy John from OYL Electronics Sdn Bhd and many more who has given me invaluable suggestion and advice which benefits me in troubleshooting the project.

Last but not least , I would like to extend my gratitude to my parents James and also goes to the rest of the family Nick, Sann, Cella, Noel, Valentine, Auntie Onong and Nina Fong for all the moral support they have provided me in all my years on educational pursuits. Thank you so much for your supports.

ABSTRACT

This project is on digital logic design and circuit analysis. The keyless auto entry system that would allow a car owner to enter a numeric combination code on a push-button keypad to activated electronic mechanism for unlock the car door. The hardware design comprises of code entry keypad, setup panel, code checker, sleep circuit and control unit.

TABLE OF CONTENTS

CHAPTER		PAGE
	ACKNOWLEDGMENTS	i
	ABSTRACT	ii
	TABLE OF CONTENTS	iii
	LIST OF FIGURES	vi
	LIST OF TABLES	viii
I	INTRODUCTION	1
	1.1 Introduction	1
	1.2 Project Requirement	1
	1.3 Function and Operation Overview of Each Module	3
	1.4 Objectives	4
	1.5 Project Schedule	5
2	LITERATURE REVIEW	7
	2.1 Introduction	7
	2.2 Fundamental of Boolean Algebra	7
	2.2.1 Switching Functions	8
	2.3 Electronic Logic Gates	8
	2.3.1 Basic Functional Components	8
	2.4 Analysis of Combinational Circuits	14
	2.4.1 General	14
	2.4.2 Truth Table	14
	2.4.3 Timing Diagrams	14
	2.4.4 Karnaugh Maps	16
	2.5 Modular Combinational Logic	17
	2.5.1 Encoder	17
	2.5.2 Multiplexer/Data Selector	18
	2.5.2.1 Standard MSI Multiplexer	18
	2.5.3 Comparators	20

CHAPTER I

INTRODUCTION

1.1 Introduction

Many times, an automobile owner has walked up to his or her car and discovered that the keys have been locked inside the car. To solve this problem, a desirable feature would be a keyless entry system that would allow a car owner to enter a numeric combination code on a push-button keypad to unlock the car door [1- 3].

For safety reasons, such a system would have to be designed to minimize the possibility of a thief discovering the code by trial and error, as can be done fairly easily with many combination locks. Several things could be done to **make** it more difficult to determine the correct code experimentally. One is to make the length of the code unpredictable so that the thief would not know how many digits to enter. A further deterrent to thieves would be to automatically disable the system for several minutes if two or three incorrect attempts have been made to open the lock [4].

Most modern digital circuit design projects require the use of computer-aided design method and tools. For this reason, CAD tools are used for the design and simulation. Therefore in this project Mentor Graphic, OrCAD, Electronic Workbench and Protel were used.

1.2 Project Requirement

The keyless auto entry system is operated by a five-button keypad. To keep this project manageable, only four numeric buttons (1,2,3,4) are used. The entry code is a user-defined sequence of four, five, six or seven digits. A RESET button is available; to be used in event an error is made while entering