

PIC BASED REAL TIME DIGITAL CLOCK AND CALENDAR DISPLAY

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To my parents, family members, supervisor, lecturers, and all my friends

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ABSTRACT

“PIC Based Real Time Digital Clock and Calendar Display” is chosen for the PSM project to improve the current clock used in the national car. Moreover, the clock with calendar system has not been used in the national car and the current Liquid Crystal Display (LCD) with the supporting component is expensive, so the usage is limited in the automotive industry. Thus, the concept is to design and build a stand-alone LCD module that displays the current time and date, where cheapest solution is sought (least amount of component used) while still maintaining the quality aspect. Furthermore, this project uses PIC16F873 as the microcontroller, which will be the main component in the hardware part. Two buttons is used to set the date and time. The importance of this project is to update the consumer with time and date which can replaced the 7 segment display used in car. It has simple design and cheap. It is also suitable to be used day and night because of the LCD backlight. It can be used in other application such as the desktop computer.

ABSTRAK

“PIC Based Real Time Digital Clock and Calendar Display” ini dipilih sebagai projek PSM untuk menggantikan sistem jam yang terdapat di dalam kereta nasional. Tambahan pula, sistem jam dengan kalendar tidak digunakan di dalam kereta nasional dan LCD semasa dengan komponen sokongan adalah mahal, maka penggunaannya adalah terhad di dalam industri automotif. Oleh itu, konsep projek ini adalah untuk merekabentuk dan membina satu modul LCD yang akan memaparkan masa dan tarikh, di mana kos yang paling murah dicari (jumlah terkecil komponen digunakan) dengan masih memelihara aspek kualiti. Projek ini akan menggunakan PIC16F873 sebagai mikropengawal yang akan menjadi komponen utama di dalam bahagian perkakasan. Dua butang akan digunakan untuk mengubah waktu dan tarikh. Kepentingan projek ini adalah ia akan digunakan untuk mengemaskinikan pengguna dengan masa dan tarikh, menggantikan ‘7 segment display’ yang digunakan di dalam kereta, Ia mempunyai rekabentuk yang ringkas dan murah. Ia juga sesuai digunakan setiap masa dan boleh digunakan dengan aplikasi lain seperti komputer.

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LIST OF ABBREVIATION

PIC	-	Programmable Interface Controller
LCD	-	Liquid Crystal Display
LED	-	Light Emitting Diode
VFD	-	Vacuum Fluorescent Display
RAM	-	Random Access Memory
ISIS	-	Intelligent Schematic Input System
PCB	-	Printed Circuit Board
ARES	-	Advanced Routing and Editing Software
UV	-	Ultraviolet

CHAPTER I

INTRODUCTION

This chapter discusses the overview of project, the aim and the specific objectives of the project, problem statement and scope of project.

1.1 Overview of Project

This project is to design a real time clock with calendar system. The system is designed based on Peripheral Interface Controller (PIC) microcontroller by Microchip. Liquid Crystal Display (LCD) is used to display the clock and calendar function which is connected to the PIC. The PIC is use to continually update the LCD with time and date. The control panel consists of push buttons that is used to adjust the clock and calendar; the on/off slide switch is used to on/off the clock. A reset push button is used to reset the PIC. A mode button is used to choose the column of the time and date. The aim of this project is to build the cheapest digital clock and calendar that uses the least amount of components and will be proposed to be incorporated in the national car.

1.2 Objectives of Project

The objectives of this project are:

- 1) To program a PIC microcontroller that will execute the real time clock with calendar system using LCD.
- 2) To implement knowledge of C language by using MPLAB to the project.
- 3) To produce a stand-alone LCD module that displays the current time and date.
- 4) To design a low cost product so that it can be incorporate in the national car.
- 5) To use the cheapest PIC chip in the project with the least supporting components.

1.3 Problem Statement

Since the present LCD with the supporting component is expensive, the usage of it in automotive industry is limited. Moreover, the calendar system is rarely used in national car. So, the cheapest solution is sought. Thus, a PIC based digital clock with calendar system is needed to encounter this problem in lowering the cost while still maintaining the quality aspect.

1.4 Scope of Project

This project is divided into two phases which are:

Phase 1: Software and Simulation Development

The software for PIC programming is based on MPLAB and Proteus for the simulation.

Phase 2: Hardware and Circuit Development

The hardware part is concentrated on building the circuit and fabrication on the PCB circuit. Lastly the least amount of components is used to lower the cost.

1.5 Thesis Outline

Chapter 1 presents an overview of project, the aim and objectives of the project, problem statement, scope of project and thesis outline.

Chapter 2 covers the literature review on the background study, current similar products with disadvantages and overview of microcontroller.

Chapter 3 describes methodology, the hardware and software development,

Chapter 4 presents the results from simulation and analysis of the project.

Chapter 5 is the conclusion and the suggestion for future improvement of project.

CHAPTER II

LITERATURE REVIEW

The main objective of this chapter is to review the literature regarding of clock and calendar system and it basics theories.

2.1 Background Study

There are many types of clock available in the market. The most common is the analog and the digital clock but for this project, the digital clock is developed. To represent the time, most digital clocks use a seven-segment LED, VFD, or LCD display for each of four digits. Other element that can be included in the display is the time as AM or PM. For this project, LCD display is used.

2.2 Current Similar Products with Disadvantages

To accomplish this project, many aspects need to be surveyed and considered before starting the project:

- The current clock used in the national car such as Proton and Perodua;



Figure 2.1 Proton Saga BLM



Figure 2.2 Proton Satria Neo

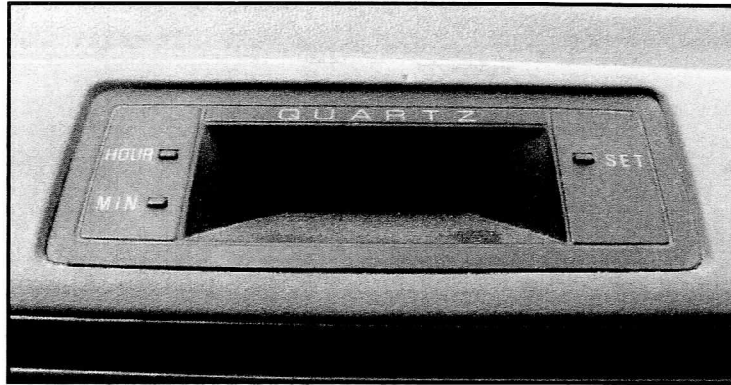


Figure 2.3 Proton Saga First Generation



Figure 2.4 Perodua Kancil First Generation

The above pictures show that currently, there is no implementation yet on the usage of calendar in the national's car clock. So, by developing clock and calendar display, it can be proposed to be incorporated in the national car in the future. The clock and calendar system is developed using microcontroller based on the Microchip's PIC16F873.