PIC TAPE MEASURE

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Tajuk Projek : PIC TAPE MEASURE

Sesi Pengajian : 2004-2008

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DECLARATION

"I declare that this report entitled "*PIC Tape Measure*" was written by my own except as cited in the references."

Signature : 

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Date : April 2008

"I hereby declare that I have read this report and in
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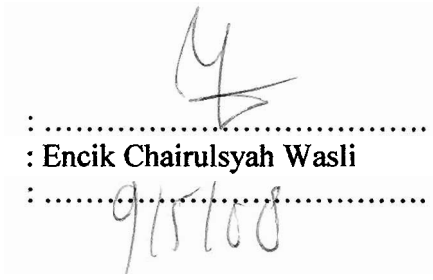

Signature : .....
Supervisor's Name : Encik Chairulsyah Wasli
Date : 9/5/08

To

My parents

Cw Zakaria & Halipah

My siblings,

Hasmaria, Halmi,Hasmariza,, Hazwani and Hanapi

For your infinite and unfading love, sacrifice, patience, encouragement and

Best wishes

ACKNOWLEDGEMENT

All praises and thanks be to Allah (S.W.T), who has guided us to this, never could we have found guidance, were it not that Allah had guided us.

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"THANK YOU

ABSTRACT

"Design of PIC Tape Measure" is a design used to measure distance object and record the result that is obtained. The concept in used for this project is that the LCD screen and will display the reading of distance reading and user can use switch button when measure value is taken. In the circuit, there have Send switch, Store, Mask and Recall. Besides that, the project use PIC16F84A microcontroller, which treated as the main component in hardware part, where the PIC will control operation the circuit while execute.

ABSTRAK

PIC tape measure di bangunkan bertujuan untuk mengesan jarak objek dan menyimpan nilai yang didapati ke dalam tape measure. Konsep yang digunakan dengan memaparkan keputusan bacaan ke paparan LCD dan dimana pengguna juga boleh menggunakan suis yang terdapat di dalam litar tersebut yang terdiri daripada suis "Send", "Store", "Mask" dan "Recall". Selain itu juga, projek ini juga menggunakan PIC 16F84A microcontroller yang merupakan sebagai komponen utama dalam litar ini, dimana PIC microcontroller akan mengawal segala operasi litar semasa dalam pemprosesan.

TABLE OF CONTENTS

LIST OF TABLE

LIST OF FIGURES

LIST OF ABBREVIATION

AC	Address Counter
A/D	analog to digital
CPU	Central Processing Unit
D/A	Digital to analog
DDRAM	Display data ram
DR	Data register
EEPROM	Electrically Erasable Programmable Read-Only Memory
I/O	Input/Output
LCD	Liquid Crystal Display
MCLR	Master Clear
OSC	Oscillator
PCB	Printed Circuit Board
PIC	Peripheral Interface Controller
PSM	Projek Sarjana Muda
RAM	Random-Access Memory
RC	Resistor-Capacitor
RS	Register selector
RISC	Reduced Instruction Set Computer
ROM	Read-Only Memory

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In this chapter introduction is made on some general information about PIC Tape Measure, basic block transmitter, receiver, problem statement, objectives and the scope of the project.

PIC tape measure is an efficient way to detect distance and check measure value that is stored in memory, where the device can record and recall 32 distance measurements, allowing several readings to be taken before copying them to paper. Besides that, the devices have four switches button and switch pressed while switching on

- Send – Basic correction mode.
- Store – EEPROM measurement clear (timing factors untouched).
- Mask – Mask correction mode.
- Recall – clear entire EEPROM data and set default timing factors.

The PIC microcontroller (IC2) is the mastermind that controls the whole operation. When prompted by the pressing of Send switch, the PIC transmits a series of

40 kHz pulses via the ultrasonic transmitting transducer TX. The pulses are accurately generated.

1.2 OBJECTIVE

The objective of this project is to create one device can detect distance something object further get keep stated information by using PIC 16F84A. Than that, information can in display by using LCD screen on circuit.

1.3 SCOPES OF WORK

While doing the project, the scope of work plays a very important role. In order to do in guideline method, student should fulfill the project requirement. The scope of this project is listed as below:

i. To study the basic idea and operation of PIC tape measure.
ii. To identify the suitable type of PIC microcontroller for the project and design the microcontroller board.
iii . To study the operation of ultrasonic transmitter transducer and receiver sensor and its implementation into circuit.
iv To develop between hardware circuit and software programming
v. To display the reading of distance value at LCD screen display.

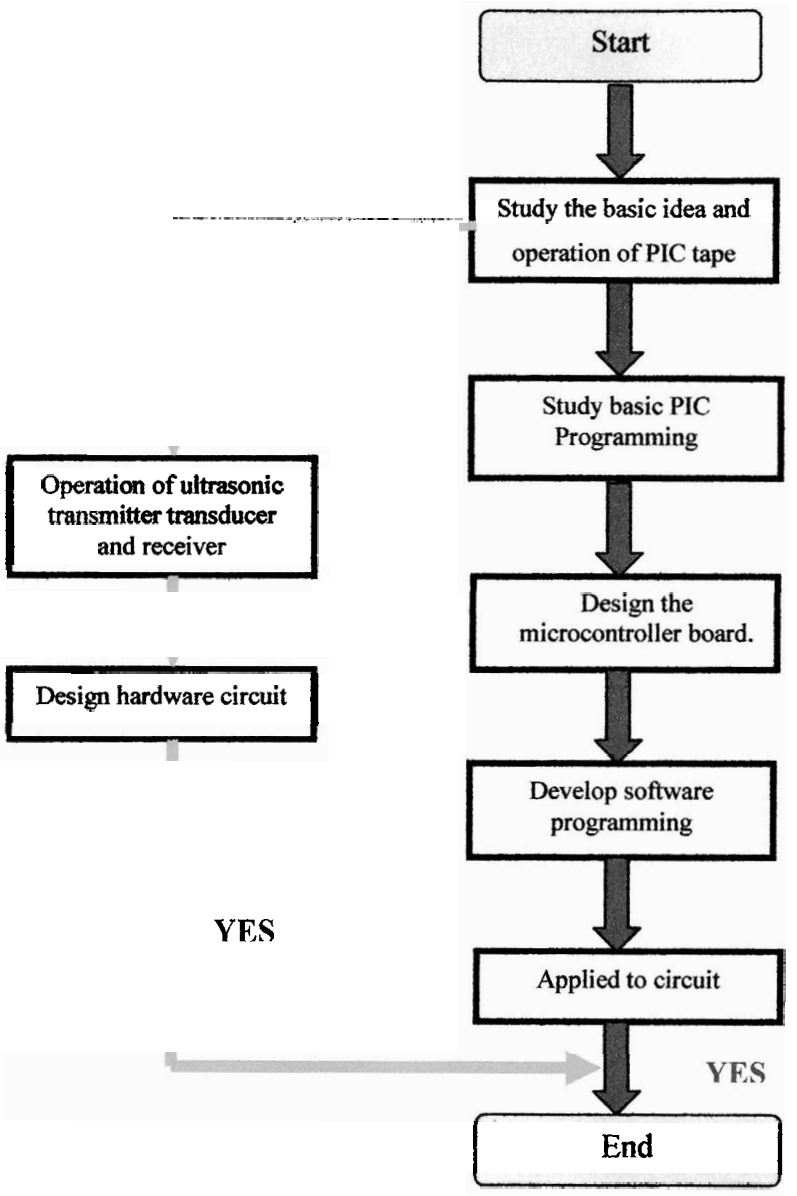

Figure 1.1: Flow chart of scope of work

1.4 PROBLEM STATEMENTS

Mostly job which involves measurement still using equipment manual to take reading something distance as ruler etc. This process indirectly will take long time before something reading obtainable.

Measurement manually very limited to specific location, where ideal when taking measurement in difficult to access locations and terms of security would be unsafe his example measurement in the place high. Besides that, reading take unable in keep and must writing manually before reading further taken.

Caused problem that, PIC tape measure is necessary to do process of measurement quickly and accurate without should do measurement manually. It also has the advantage to store information as many as 32 memories at one time.

1.5 REPORT STRUCTURE

The report overall consists of five chapters. Following is an each chapter description in this thesis.

Chapter 1 is delivering term of computerized room control. It also contains objective, scopes of works, and problem statement of the project.

Chapter 2 is a literature review on theoretical concepts applied in this project. The chapter consist explanation about what is PIC tape measure and differentiate with existing of tape measure system other. The type of PIC chosen, suitable components and sensor also been discussed.

Chapter 3 is Methodology. It is important part of the whole project because it shows out how is the project's activity developed for Chapter 3. Thus, it is divided in two parts, hardware development and software development, which involves the

overview of microcontroller, circuit and PCB fabrication. It also contains some of the reason why have chosen the hardware and a list of typical tools and approaches used in this project. For the software part, it discuss about the software development of the project. The process also stated from download the program into the PIC microcontroller through programmer board.

In Chapter 4, all the analysis result from the hardware and software experiments is included in the form of table, and discussion.

Chapter 5 is the last chapter that will be the summary of the whole project. The problems facing during work progress also will be discussed in this chapter. Beside it also concludes with some recommendations that can be implemented in future.

CHAPTER 2

LITERATURE REVIEW

2.1 TAPE MEASURE FOR DETECT DISTANCE

Tape measure is device that can record and recall 30 0r 32 distance measurements, allowing several readings to be taken before copying them to paper. These measurements are displayed on the X2 16-character 2 line LCD (liquid crystal display module). Meters are shown top left, followed by letters "mt", Feet and inches are shown bottom left, complete with letters of "ft" and "in".

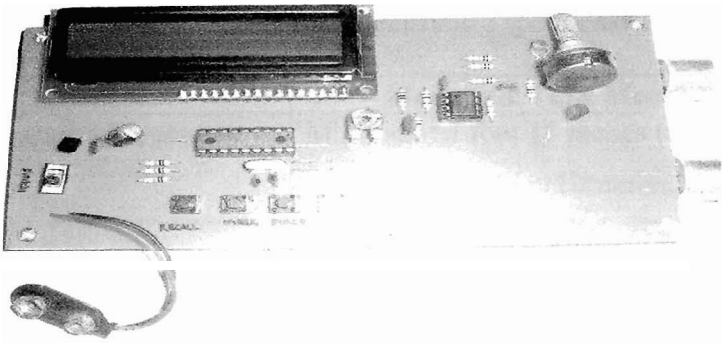

Figure 2.1: PIC Tape Measure

2.2 CURRENT SIMILAR PRODUCTS

Currently there are product in market with features of detect distance, but stated product sends out narrow beams of sound waves that bounce off solid objects back to the hand-held receiver. Custom electronics and a microprocessor then convert elapsed time into a distance measurement and display it on the LCD. When used with its electronic target, the Combo PRO model uses both sound waves and an infrared beam [8]

Figure 2.2: Electronic Tape measure

Table 2.1: Specification of Electronic Tape Measure

Model	Electronic Tape Measure
Range without the Target unit	Minimum: 1 foot 11 inches (0.60m) Maximum: 59 Feet(18Meters)
Range with Target unit	Minimum: 3 feet 3 inches(1 meter) Maximum: 246 Feet (75 Meter)
Accuracy	99.5% ± 1 cm
Main unit size	5 5/8" X 3" X 1 1/2 "
Target unit size	5 3/4 "X 2 3/4 "X 1 "
Price	$ 149.95

2.3 WHAT IS TAPE MEASURE?

Tape measure is the device can detect distance, where it uses transmitter detector and receiver to take reading and further display to LCD.

The device good is, user can detect distance easily without doing measurement. User can also adjust unit is wanted. The devices also afford to keep as many as 32 memories as savings. Besides that the devices has also function as recall, and mask.

2.4 MICROCONTROLLER

Microcontroller is an integrated circuit, which all the component of the microcomputer system combined together onto it. It is also represented a key impact technology for 21st century. Microcontroller provide inexpensive, programmable logic control and interfacing to external devices. The microcontroller's ability to store and run unique programs makes it extremely versatile. For example, a microcontroller is programmed to make decision (perform function) based on predetermined situations (I/O line logic) and selections. The microcontroller's ability to perform mathematic and logic functions allows it to mimic sophisticated logic and electronic circuit [4].

The basic microcontroller features contain of central processing unit (CPU), random access memory (RAM), read only memory (ROM), electrically erasable programmable read only memory (EEPROM), input/output (I/O) lines, serial and parallel parts, timers, and other built-in peripherals, such as analog to digital (A/D) and digital to analog (D/A) converters [4].