TOUC SENSITIVE FAN

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MEI 2009

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This Report is submitted in Partial Fulfillment of Requirements for The Degree of Bachelor in Electrical Engineering (Industrial Power)

Faculty of Electrical Engineering

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"I hereby declared that this report is a result of my own work except for the excerpts that have been cited clearly in the references."

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Name : **RAZIF BIN SIDEK**

Date : **12 MEI 2009**

Dedicated to my beloved parent, lecturers and friends .....

ACKNOWLEDGMENTS

Assalamualaikum warahmatullahi wabarakatuh,

First and foremost, thanks to Allah the Almighty for blessing me to complete my Project Sarjana Muda 1. I would like to express my appreciation to my supervisor, En. Hidayat Bin Zainuddin because of the kindness heart to accept me as one of the student under his supervision. Special thanks also dedicated to his for all comments, idea, and a guideline begin from the first day I start doing this project.

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ABSTRACT

This project is conducted to construct a touch sensitive fan using an electronic device (touch switch) that able to control a circuit by simply touching a sensor. This switch is a very easy project to build and will respond to the slightest touch of hand on its sensitive plate. This circuit is adding up with a regulator act as to regulate the speed of the fan from low to high level. In Malaysia or even in this world this purpose of circuit is mostly used for lamp but this project will convert it for fan as a contribution to the new invention of technology. The result for this project is to give the convenience to the consumer in a daily life.

ABSTRAK

Projek ini dijalankan untuk membina satu model kipas mudah sentuh (Touch Sensitive Fan) menggunakan satu peranti elektronik iaitu suis mudah sentuh (touch switch) yang berkeupayaan untuk mengawal sesuatu litar dengan hanya menyentuh pengesan (sensor). Suis ini adalah satu projek yang mudah untuk dihasilkan dan boleh bertindak dengan hanya menyentuh sedikit sahaja pada tempat sensitive (sensitive plate) yang terdapat pada kipas ini. Litar ini ditambah dengan satu pengubah arus (regulator) yang membolehkan ia untuk menambah kelajuan pada kipas dari paras kelajuan yang rendah kepada paras kelajuan yang tinggi. Di Malaysia mahu pun di luar negara, kegunaan bagi litar ini biasanya adalah untuk menghidupkan lampu tetapi projek ini akan menukar fungsinya untuk menghidupan kipas sebagai satu sumbangan kepada percambahan teknologi terbaru.Hasil daripada kejayaan projek ini akan memberi kemudahan kepada pengguna dalam kehidupan seharian.

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CHAPTER 1

INTRODUCTION

1.1 Project Background and Problem Statement

A touch sensitive fan [1] is one that is activated by human touch rather than a flip, pushbutton, or other mechanical switch. These lamps are popular as desk and nightstand lamps. Switches that are sensitive to human touch as opposed to switches that must be flipped or pushed to make and break a mechanical connection have been around for many years. They certainly have advantages, and the most important is the fact that dirt and moisture cannot get into the switch to gum it up or damage it. Over the years, many different properties of the human body have been used to flip touch-sensitive switches.

This project is conducted to construct a touch sensitive fan using an electronic device (touch switch) that able to control a circuit by simply touching a sensor. This switch is a very easy project to build and will respond to the slightest touch of hand on its sensitive plate. This circuit is adding up with a regulator act as to regulate then speed of the fan from low to high level.

Touch sensitive fan is a new design for the touch sensitive switch which uses a sensor to on the fan. In Malaysia or even in this world the purpose of this circuit is mostly used for lamp but this project will convert it for built a fan as a contribution to the new invention of technology. Nowadays the consumer wants to live in a conducive and modern lifestyle.

This fan is a very easy project to build and will respond to the slightest touch of hand as well as the consumer desire. Before that the method and the implementation of this project should examine attentively so that any mistake start from the beginning until the end of this project will goes smoothly and readily. Several stages need to follow as preliminary study, design and simulation, circuit construction and modifying and prototype testing. The probability of attainment of the project desired depends on the selection of the component and the connection of circuit. Beside, this project has ability to sell in local market by looking to its potential. In the other hand it can be one of the best products among them.

1.2 Project Objectives

There are three objectives that need to be accomplished in order to make this project successful which are:

1) To simplify the usual way to switch on the fan.
2) To construct a touch sensitive fan using a magic switch.
3) To create a new idea in producing electric equipment.

1.3 Project Scope

The scope of this project is to construct a circuit to build a touch sensitive fan. This project is add up with a regulator to add the speed of the fan by twice and three times tapping the fan.

1.4 Thesis Outline

Chapter I is basically the introduction and the literature review. In this chapter also include problem statement/hypothesis, project objectives and scope/limitation of the project. Besides, the project objectives and project scope will be explained in detail so that a better

view of the project can be obtained. The project methodology is the most important part that will describe the flow of the project, will be mention and elaborated details in this chapter.

In Chapter 2, the materials, methods, all relevant experimental, descriptive, theoretical and analytical techniques used in the project are discussed. The relevant type of components that have been chosen to be used in constructing the circuit will also explained in detail to give the first impression how the circuit will function. This chapter also includes the concept of the touch switch that usually applied to the equipment in the way to life the circuit on. The several steps to switch on the fan will be shown to as the practical to use this product.

In Chapter 3, all the results are visually and textually represent project findings. Visual representation of results: graphs, tables, diagrams and charts. This chapter also includes some calculation and appropriate graph.

Chapter 4 provides a general discussion on the results of the project, stressing the significance and implications of the findings of the project undertaken. Contributions of project findings to the field of study also highlighted.

In the last chapter, there will be a summary and conclusion of the entire work, including methods, results and major conclusions and recommendations arising from the work. Weaknesses, shortcomings and strengths of the project are also presented.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

The touch switch is a one of the best way to switch on the electric equipment. In this chapter we will discuss about application of touch switch and types of touch switch.

2.1.1 Application of Touch Switch

Many application or purpose of touch switch. The example application of touch switch is to on the lamp. The lamp[2] is activated by simply touching the switch, rather than flipping a switch. This application commonly used for nightstand lamp because it is so easy to turn them on in the dark condition.

2.1.2 Types of Touch Switch Circuits

2.1.2.1 Type 1

Here are a number of circuits that turn on a device when the touch-pad is touched.

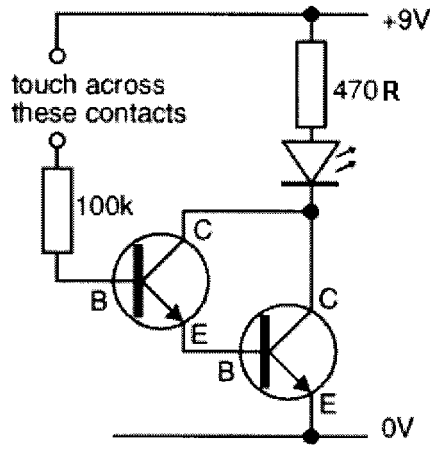
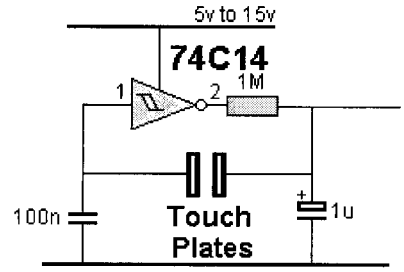


Figure 2.1 Simple Touch Switch

The circuit above is the simplest Touch Switch. It is called a "super-Alpha pair" and is actually identical to a single transistor with a very high gain. Putting a finger on the touch pads turns the top transistor ON and this transistor turns on the bottom transistor. When the finger is removed, the circuit consumes less than a microamp.

2.1.2.2 Type 2

The following circuits show a "flip-Flop" effect. The circuit changes state, each time the touch pads are touched.



TOGGLE TOUCH SWITCH

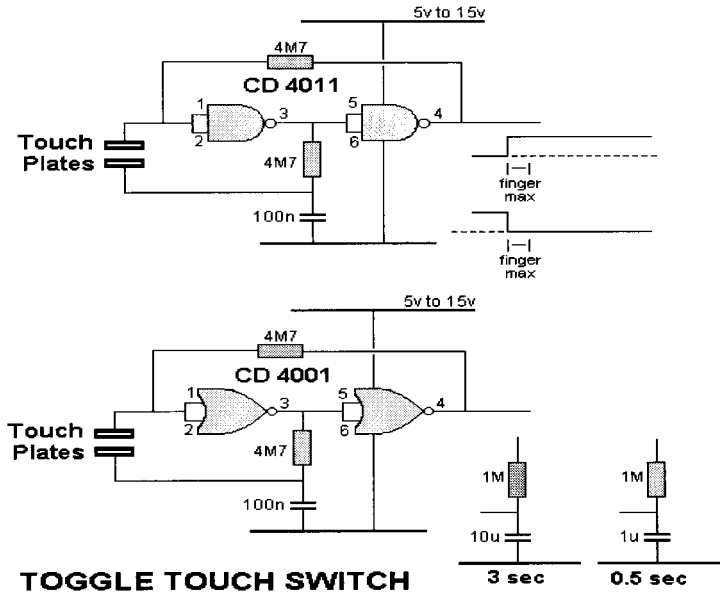


Figure 2.2 Toggle Touch Switch

If a finger is kept on the touch plates in any of the toggle circuits above, the circuit will oscillate ON, OFF, ON, OFF at a low frequency. The frequency of 3 sec, 0.5 sec has been identified in the top circuit.

2.1.2.3 Type 3

These circuits[3] have two touch plates. One touch plate turns the circuit on and the other plate turns the circuit off.

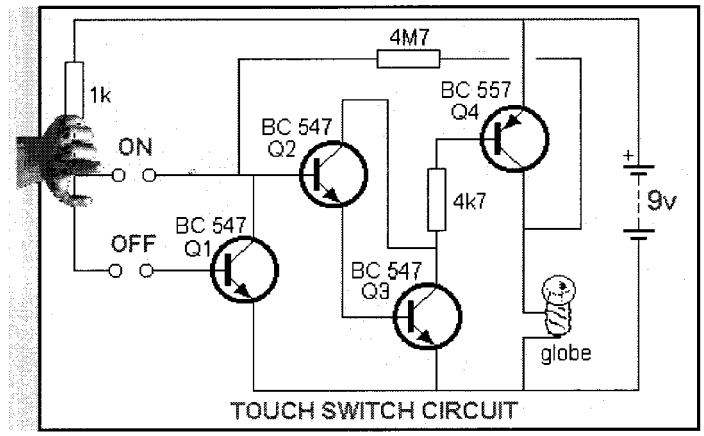


Figure 2.3 Touch Switch Circuit

The touch-pads deliver current from the power rail to the input of the circuit, via a moist finger. The finger acts as a very high vale resistor. Note the 4M7 feedback resistor that keeps the circuit on when the finger is removed.

CHAPTER 3

MATERIALS AND METHODS

3.1 Introduction

In this chapter, the construction and how the circuit work can be explain clearly. All the step in construct the circuit will be describe one by one until the circuit will easily build. After that we will discuss how this circuit will work to make sure we can start to finish this project by installing the main part.

3.2 Overview of Project Methodology

In order to complete this project, a necessary project planning should be arranged. For this project, there are several steps should be taken to achieve the project's scope and objectives. Basically, Project Methodology defines the planning process flow and principles that are essentials guide to produce a well planning project. Besides, selected approach or methodology will be described the activities that may do in every stage.

The flow chart that describes the methodology for this project is shown in the figure 3.1.

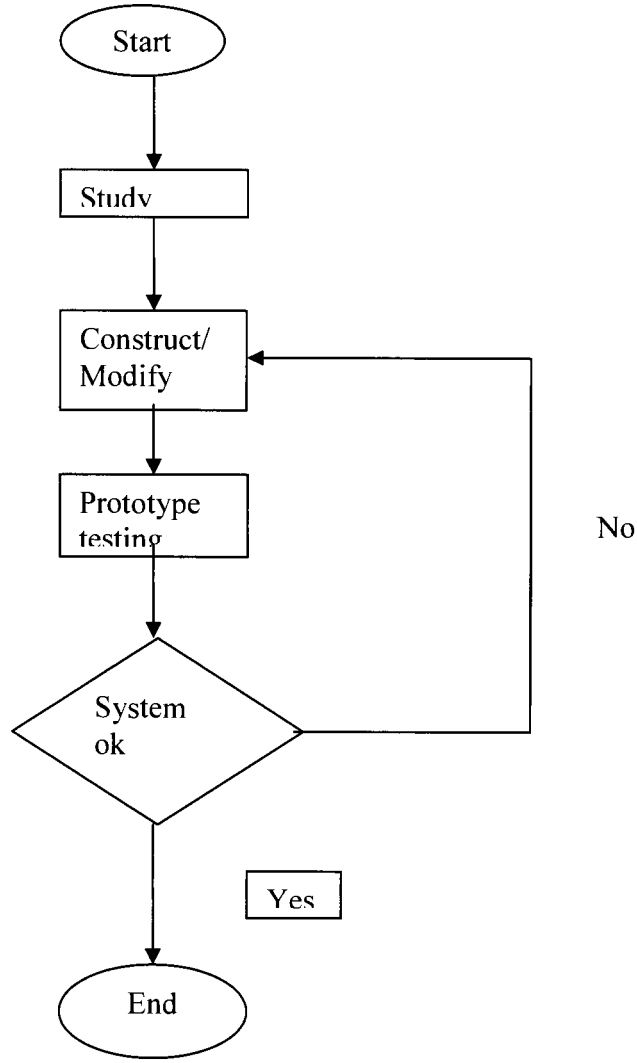


Figure 3.1 Flow chart of the project methodology

Project Methodology

1) Preliminary of Touch Switch

The important things that need to do first are to learn about the overall idea of the project. Many things that should be covered include making sure that all the components such as transistor diode, resistor, IC, and relay are easy to get.

2) Hardware Construction.

The main stage is to construct the hardware part. This is the critical part because at this stage, we need to confirm all the component needed and start to build the prototype.

3) Prototype Testing and Improvement.

Final stage is to test and further improve the prototype.

3.3 Hardware Construction

3.3.1 Construction of Circuit

First of all let us consider a few basics in building electronic circuits on a printed circuit board. The board is made of a thin insulating material clad with a thin layer of conductive copper that is shaped in such a way as to form the necessary conductors between the various components of the circuit. The use of a properly designed printed circuit board is very desirable as it speeds construction up considerably and reduces the possibility of making errors. Smart Kit boards also come pre-drilled and with the outline of the components and their identification printed on the component side to make construction easier.

To protect the board during storage from oxidation and assure it gets to you in perfect condition the copper is tinned during manufacturing and covered with a special varnish that protects it from getting oxidized and makes soldering easier. Soldering the components to the

board is the only way to build your circuit and from the way you do it depends greatly your success or failure. This work is not very difficult and if you stick to a few rules you should have no problems. The soldering iron that you use must be light and its power should not exceed the 25 Watts.

The tip should be fine and must be kept clean at all times. For this purpose come very handy specially made sponges that are kept wet and from time to time you can wipe the hot tip on them to remove all the residues that tend to accumulate on it. Do not file or sandpaper a dirty or worn out tip. If the tip cannot be cleaned, replace it. There are many different types of solder in the market and you should choose a good quality one that contains the necessary flux in its core, to assure a perfect joint every time. Do not use soldering flux apart from that which is already included in your solder.

Too much flux can cause many problems and is one of the main causes of circuit malfunction. If nevertheless you have to use extra flux, as it is the case when you have to tin copper wires, clean it very thoroughly after you finish your work. In order to solder a component correctly you should do the following:

Clean the component leads with a small piece of emery paper. - Bend them at the correct distance from the component body and insert the component in its place on the board. You may find sometimes a component with heavier gauge leads than usual, that are too thick to enter in the holes of the p.c. board. In this case use a mini drill to enlarge the holes slightly. Do not make the holes too large as this is going to make soldering difficult afterwards. Take the hot iron and place its tip on the component lead while holding the end of the solder wire at the point where the lead emerges from the board. The iron tip must touch the lead slightly above the p.c. board.

When the solder starts to melt and flow wait till it covers evenly the area around the hole and the flux boils and gets out from underneath the solder. The whole operation should not take more than 5 seconds. Remove the iron and let the solder to cool naturally without blowing on it or moving the component. If everything was done properly the surface of the