DESIGN AND FABRICATION OF RELIABILITY TEST FIXTURE (HOOK BUTTON STROKE)

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BORANG PENGESAHAN STATUS TESIS ◆

JUDUL: DESIGN AND FABRICATION OF RELIABILITY TEST FIXTURE (HOOK BUTTON STROKE)

SESI PENGAJIAN: 2009/2010

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MUHAMAD IZZAT BIN HASLAN

Report submitted in partial fulfilment of the requirements for the award of Diploma in Mechanical Engineering

Faculty of Mechanical Engineering
UNIVERSITI MALAYSIA PAHANG

14 DECEMBER 2009

SUPERVISOR'S DECLARATION

I hereby declare that I have read this project report and in my opinion this project report is sufficient in terms of scope and quality for the award of Diploma in Mechanical Engineering

Signature :

Name of Supervisor : MR MOHAMMAD ZAIRI BIN BAHAROM

Date :

STUDENT'S DECLARATION

I hereby declare that the work in this report is my own except for quotations and summaries which have been duly acknowledged. The report has not been accepted for any diploma and is not concurrently submitted for award of other diploma.

Signature :
Name : MUHAMAD IZZAT BIN HASLAN
ID Number : MB07077
Date :

ACKNOWLEDGEMENT

I would like to express my gratitude and appreciation to all those who gave me the possibility to complete this report. Special thanks is due to my supervisor Mr. Mohammad Zairi Bin Baharom whose help, stimulating suggestions and encouragement helped me in all time of fabrication process and in writing this report.

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Many thanks go to the all lecturer and supervisors who have given their full effort in guiding the team in achieving the goal as well as their encouragement to maintain our progress in track. My profound thanks especially goes to my family, mak and abah, my siblings and also to all my classmates, especially to my friends for spending their time in helping and giving support whenever I need it in fabricating my project.

ABSTRACT

The objective of the report is about the solution of the problem that Panasonic Comunication Malaysia in Johor Bahru faced on running the test for the Hook Button Stroke for Integrated Telephone System (ITS) model. As usual, this telephone usually was put in any position like on the desk, hanging on the wall, and others. For that case, this test must be done to improve the quality for this telephone model. Nowadays, the company just run their test by hand and ruler, no specific device for it. For that reasons, this project were done to make sure and to solve this problem. With this device, hopefully it can help in make it sure the test can be running with more efficient and effective besides can improve the quality of the product to be market either in local and international market fields.

ABSTRAK

Objektif laporan ini adalah untuk mengatasi masalah yang dihadapi oleh atas *Hook Button Stroke* pada sistem telefon bersepadu (*Integrated Telephone System*). Seperti kebiasaannya, telefon jenis ini biasanya diletakan dalam keadaan posisi yang pelbagai seperti di atas meja, pada dinding, dan sebagainya. Oleh yang demikian, ujian ini perlu dijalankan untuk meningkatkan kualiti ke atas penggunaan telefon ini. Pada waktu kini, pihak Panasonic menjalankan ujian ke atas *hook button stroke* ini dengan menggunakan tangan dan pembaris sahaja, tiada alat yang lebih khusus untuk ujian ini. Dengan sebab itu, projek ini diusahakan untuk memastikan dan mengatasi masalah yang dihadapi oleh pihak Panasonic. Dengan adanya alat ini, diharap ianya dapat membantu dalam memastikan ujian ini dapat dijalankan dengan lebih berkesan dan lebih efisyen disamping dapat meningkatkan mutu kualiti produk tersebut untuk dipasarkan di pasaran tempatan dan antarabangsa.

TABLE OF CONTENTS

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

This chapter explained about the background of the project, project statement, project objective, project scope and the project flow that has been conducted. Besides that, this chapter includes the explaination of project flow and progress project by following the flow chart and Gantt chart duration of time and also the arrangement of project report.

1.2 BACKGROUND OF THE PROJECT

Nowadays, the telephone especially for telephone at home and office, sometimes they put the telephone in variety position. They could be put on the table, hang on the wall, or any position. So if the telephone had been used by someone, sometimes they are not put the receiver on right position and it will be the line telephone is still connected. It will cause the bills will unexpected increase. So to solve this problem this test must continuously do to get the ideal measurement for this hook button stroke. Commonly at Panasonic Communication Malaysia in

Johor Bahru, they use hand and ruler to run this test and this will cause the imprecise test result. So I was be given a task to design and fabricate a device to solve this problem.

1.3 PROJECT STATEMENT

The project is to design and fabricate a test device for the Integrated Telephone System (ITS) product. The device is specializing to conduct the Hook Button Stroke for ITS product - Panasonic KX-TS500 telephone model.

1.4 OBJECTIVE

The objective of this project is to design and fabricate a Hook Button Stroke for ITS model.

1.5 SCOPE

The project scope is the guideline and the limited of the project, which are;

1.5.1 The project is focused on the measurement on the Integrated Telephone System (ITS) - Panasonic KX - TS500 telephone model.

1.5.2 Focused on measurement of the depth distance of Hook Button Stroke when it pressed to connect and reconnect the telephone line.

1.6 PROJECT FLOW

Figure 1.1 shows the flow chart process for this project.

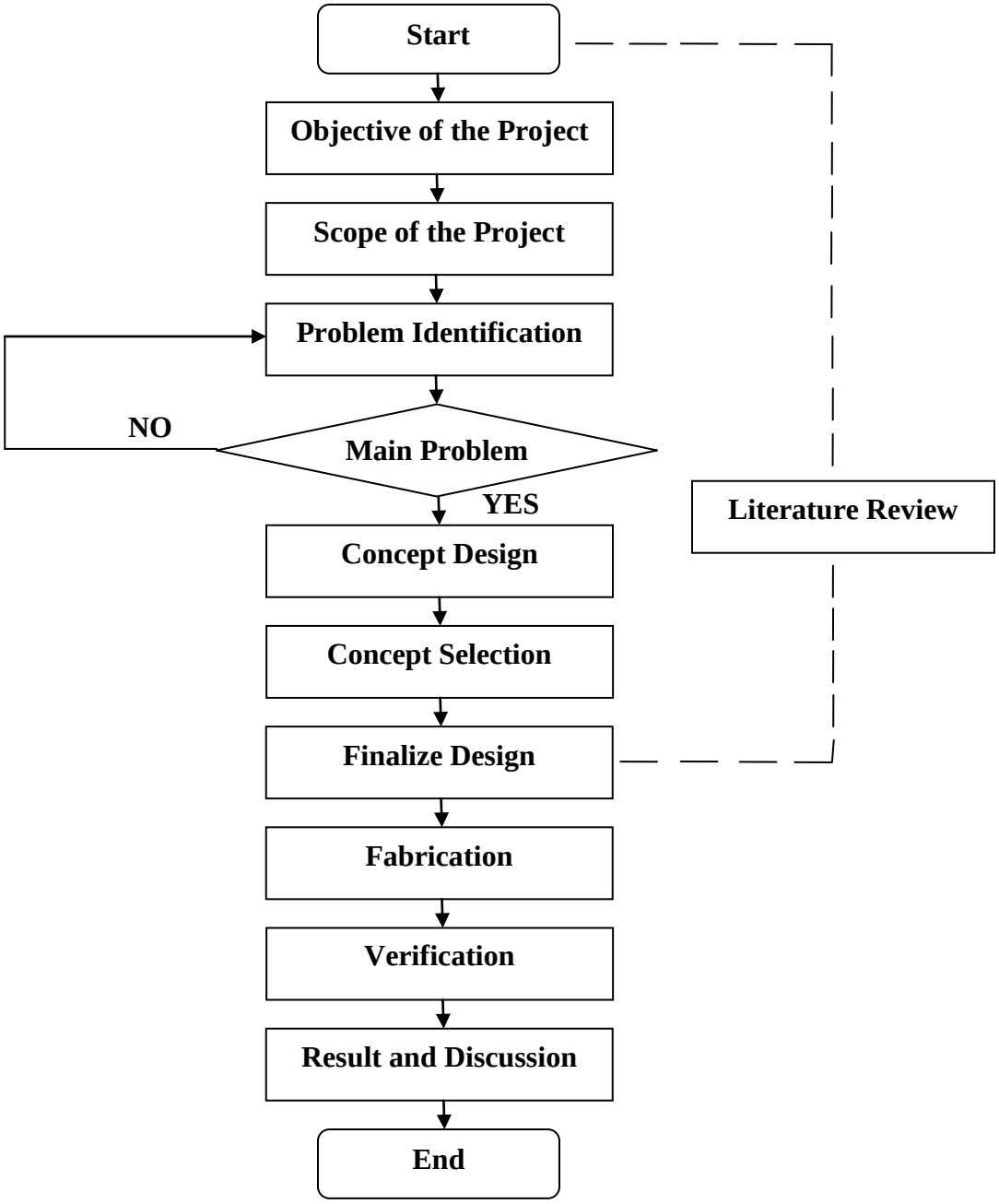


Figure 1.1: Project Flow Chart

Figure 1.2 and 1.3 below shows the Final Year Project (FYP) planning and the progress Gantt Chart. It is also show the duration of time management the needed for each task that carried out during the study.

ID	TASK	WEEK													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Title confirmation	→													
2	Literature review	→	→	→	→	→	→	→	→	→	→	→	→	→	
3	Problem Identification	→	→	→	→	→	→								
4	Concept Design					→	→	→							
5	Concept Selection						→	→	→						
6	Prepare for Mid Presentation						→	→	→						
7	Mid Presentation									→					
8	Fabricate Product									→	→	→	→	→	
9	Prepare for Final Presentation											→	→	→	
10	Final Report								→	→	→	→	→	→	
11	Final Presentation														→

Figure 1.2: FYP Planning Gantt Chart

ID	TASK	WEEK													
		1	2	3	4	5	6	7	8	9	10	11	12	13	14
1	Title confirmation	→													
2	Literature review		→	→	→	→	→	→							
3	Problem Identification	→	→	→	→	→	→								
4	Concept Design	→	→	→	→	→	→	→							
5	Concept Selection					→	→	→							
6	Prepare for Mid Presentation					→	→	→							
7	Mid Presentation								→						
8	Fabricate Product									→	→	→	→	→	→
9	Prepare for Final Presentation														→
10	Final Report								→	→	→	→	→	→	→
11	Final Presentation														→

Figure 1.3: FYP Progress Gantt Chart

1.7 PROJECT REPORT ARRANGEMENT

Chapter 1 is the introduction chapter for this project. It is discussed about the project background, objective project, project scope, and the flow of the project.

Chapter 2 is about the literature review of the project, including the related information about the hook button stroke sample and products. It also includes the historical view for the hook button stroke experiments. Besides that, it also includes the information about Panasonic Company and also about the telephone Panasonic KX-TS500 model.

Chapter 3, it is about the methodology of the project starting by the designing process until the product is complete. It is also include the info and data about the project likes how the experiment are running and working. Its also concludes about the method and application when the product will fabricate and also the analysis and data for simulation model.

Chapter 4 is about the result analysis for all the analysis that been conducted for the proposed system. It will be compared with the existing model and system to see any improvement on the product. It also consist of analysis for any improvement suggestion for the new design or system that been proposed.

Chapter 5 is the latest chapter for this report. It covers all the overall analysis result of this project. Besides that, a few suggestions for the further study in the future to increase the productivity of this product also state in this chapter.

1.8 CONCLUSION

For this chapter, we can conclude that the all the process to produce the product must using the Mechanical Engineering terms and tools. Besides that, to make the flow of the project moving smoothly, we must plan and follow the planning and time schedule to finish the project on time. In real occupational and real world also, we have to plan and follow our job planning smoothly.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

This chapter will explain about the research of the project that has been chosen and explained about the Integrated Telephone System – Panasonic KX-TS500 telephone model features and specification. It also explained about the related application and function from the other products that were existed before that used in this project. Besides that, it is included about the Panasonic Company and the company information.

2.2 COMPANY PROFILE

Best known by its Panasonic brand name, Group & Global Headquarters, Panasonic Corporation based in Osaka, Japan is a worldwide leader in the development and manufacture of electronic products for a wide range of consumer, business, and industrial needs.

In Malaysia, Panasonic Malaysia Sdn Bhd (PM) has a long standing presence for more than 30 years since it was first established on 29 March 1976 by the name of Matsushita Sales & Service Sdn Bhd (MASCO) with all home appliances and audio visual products under National brand. In 1992, MASCO was renamed National Panasonic Malaysia Sdn Bhd (NPM) promoting National brand for home appliances and Panasonic brand for audio visuals and in the same year

NPM achieved a new milestone of breakthrough 1st billion sales. From 1 October 2003, as a global brand unification movement of Panasonic worldwide, NPM was officially called Panasonic Malaysia Sdn Bhd (PM) promoting one brand Panasonic for all products range.

Panasonic Malaysia is a company engaged in the business of sales, service and marketing for the Panasonic brand of electrical and electronic consumer and business solutions. Through our wholly owned subsidiary, Panasonic Systems Engineering (PSE) we offer professional expertise in integrating system solutions from design, supply, installation, training and maintenance of professional electrical and electronic equipments and products.

PM is supported by a wide dealer network of more than 140 Panashops and over 750 authorised dealerships. To maintain customer's satisfaction, PM has a total of 8 Panasonic Service Centres and 236 dedicated Panasonic Service Networks throughout Malaysia. Today, its operation has rapidly expanded with a total of 11 branch offices nationwide employing a total workforce of more than 400 in Panasonic Malaysia and its subsidiary, and achieving a total sale of RM1.3 billion as of FY2006.

(Source; http://www.panasonic.com.my/web/aboutpanasonic/corporateprofile)

2.3 PANASONIC KX-TS500

2.3.1 Introducing

The KX-TS500 from Panasonic is a basic corded phone designed for users who don't need a lot of bells and whistles. A corded phone with single line operation, the KX-TS500 is call waiting compatible (requires a subscription) and requires no batteries to operate. Handset and ringer volume controls allow you to adjust levels to your liking, and you can switch between tone and pulse dialing modes. A redial button lets you quickly dial the last outgoing number,

while the flash button provides access to call waiting. The KX-TS500 is wall-mountable, allowing you to keep countertop space free from unnecessary clutter.

Figure 2.1: Integrated Telephone System – Panasonic KX-TS500 model
Source: http://www.vargastelecom.com/tiendausa/images/mid_pankxts500-wht.jpg
(12 Nov 2009)

2.3.2 Features

KX-TS500 haves five colors. The KX-TS500 comes in black, white, red, dark blue and grey. Choose one that adds a splash of color to your office, or the one that makes the best match with your office decor. It also can wall mountable. Then mount the KX-TS500 right on the wall, and enjoy its convenient features without giving up a lot of desk space.

This dials the number you most recently dialed. If you need to make a follow-up call or the line was busy the first time, just press the redial button. For the function of Timed Flash is which supports Call Waiting, ensures that a caller is not accidentally cut off while on hold.

It also haves electronic volume control. Even in mid-conversation, you can adjust the receiving volume of the handset to any of 6 levels. 3-Step Ringer Selector for ringer volume can be set to Off, Low, or High. Set it to off when you don’t want to be disturbed during a meeting. Switchable Tone/Pulse Settings of the KX-TS500MX can be switched between tone (pushbutton) and pulse (rotary), ensuring that it will work on either type of telephone line.

2.4 Vernier Height Gauge

A height gauge is a measuring device used either for determining the height of something, or for repetitious marking of items to be worked on. The former type of height gauge is often used in doctor's surgeries to find the height of people.

These measuring tools are used in metalworking or metrology to either set or measure vertical distances; the pointer is sharpened to allow it to act as a scriber and assist in marking out work pieces.

They may also be used to measure the height of an object by using the underside of the scriber as the datum. The datum may be permanently fixed or the height gauge may have provision to adjust the scale, this is done by sliding the scale vertically along the body of the height gauge by turning a fine feed screw at the top of the gauge; then with the scriber set to the same level as the base, the scale can be matched to it. This adjustment allows different scribersor probes to be used, as well as adjusting for any errors in a damaged or resharpened probe.

Figure 2.2: The left height gauge has the vernier scale, while the right one is an electronic height gauge with a digital readout.

Source: http://en.wikipedia.org/wiki/Height_gauge (12 Nov 2009)

There are two types of height gauges, *Vernier height gauges* and *electronic height gauges*. The vernier height gauge has the additional refinement of a vernier scale for greater accuracy in reading or setting the tool. The electronic height gauge has a digital readout that gives the height.

Figure 2.3: Vernier height gauge adjusters, close up view

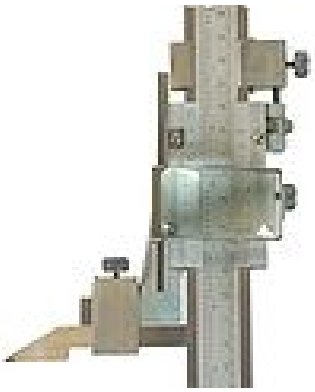


Figure 2.4: Vernier height gauge, close up view

Figure 2.5: Electronic height gauge, close up view

(Source: http://en.wikipedia.org/wiki/Height_gauge (12 Nov 2009)

2.5 JOINING METHOD

Joining involves in assembly stage. Commonly used method to join metal part is Metal Inert Gas (MIG) welding.

Figure 2.6: Metal Inert Gas (MIG) Welding

Sources: Wikipedia, Metal Inert Gas (MIG) Welding

2.5.1 Metal Inert Gas (MIG) Welding

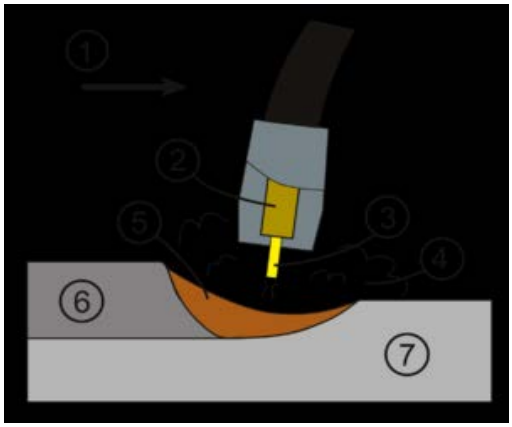
MIG (Metal Inert Gas) or as it even is called GMAW (Gas Metal Arc Welding) uses an aluminum alloy wire as a combined electrode and filler material. The filler metal is added continuously and welding without filler-material is therefore not possible. Since all welding parameters are controlled by the welding machine, the process is also called semi-automatic welding.

The MIG-process uses a direct current power source, with the electrode positive (DC, EP). By using a positive electrode, the oxide layer is efficiently removed from the aluminum surface, which is essential for avoiding lack of fusion and oxide inclusions. The metal is transferred from the filler wire to the weld bead by magnetic forces as small droplets, spray transfer.

There are two different MIG-welding processes, conventional MIG and pulsed MIG:

a) Conventional MIG uses a constant voltage DC power source. Since the spray transfer is limited to a certain range of arc current, the conventional MIG process has a lower limit of arc current (or heat input). This also limits the application of conventional MIG to weld material thicknesses above 4 mm. Below 6 mm it is recommended that backing is used to control the weld bead.

b) Pulsed MIG uses a DC power source with superimposed periodic pulses of high current. During the low current level the arc is maintained without metal transfer. During the high current pulses the metal is transferred in the spray mode. In this way pulsed MIG is possible to operate with lower average current and heat input compared to conventional MIG. This makes it possible to weld thinner sections and weld much easily in difficult welding positions.



MIG weld area. **(1)** Direction of travel, **(2)** Contact tube, **(3)** Electrode, **(4)** Shielding gas, **(5)** Molten weld metal, **(6)** Solidified weld metal, **(7)** Workpiece

Figure 2.7: Schematic of Metal Inert Gas (MIG) Welding

Sources: Wikipedia, Metal Inert Gas (MIG)

GMAW is frequently referred to as MIG welding. MIG welding is a commonly used high deposition rate welding process. Wire is continuously fed from a spool. MIG welding is therefore referred to as a semiautomatic welding process.

2.6 GRINDING PROCESS

Grinding is a finishing process used to improve surface finish, abrade hard materials, and tighten the tolerance on flat and cylindrical surfaces by removing a small amount of material. Information in this section is organized according to the subcategory links in the menu bar to the left.

In grinding, an abrasive material rubs against the metal part and removes tiny pieces of material. The abrasive material is typically on the surface of a wheel or belt and abrades material in a way similar to sanding. On a microscopic scale, the chip formation in grinding is the same as that found in other machining processes. The abrasive action of grinding generates excessive heat so that flooding of the cutting area with fluid is necessary.

Figure 2.8: Grinder

Sources: Tradevv, Grinder (2005)

2.7 DRILLING

Drilling is easily the most common machining process. One estimate is that 75% of all metal-cutting material removed comes from drilling operations. Drilling involves the creation of holes that are right circular cylinders. This is accomplished most typically by using a twist drill, something most readers will have seen before. The chips must exit through the flutes to the outside of the tool. As can be seen in the figure, the cutting front is embedded within the work piece, making cooling difficult. The cutting area can be flooded, coolant spray mist can be applied, or coolant can be delivered through the drill bit shaft.

2.7.1 Drill Press

A typical manual drill press is shown in the figure below. Compared to other powered metal cutting tools, a drill press is fairly simple, but it has evolved into a versatile necessity for every machine shop.

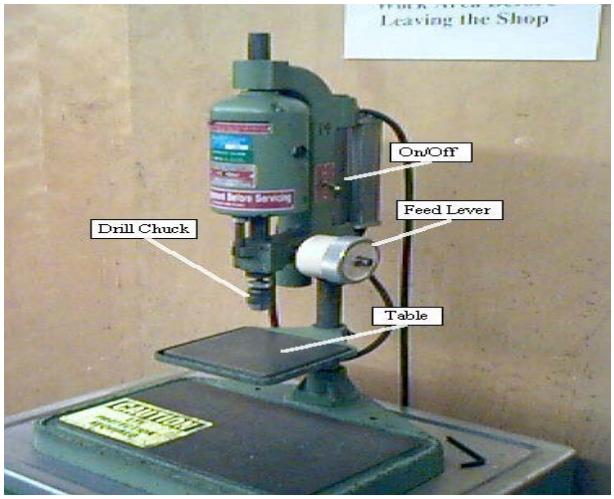


Figure 2.9: Drill Press Machine

Sources: Engineering Dartmouth, Drill Press Machine (2004)

2.8 CONCLUSION

For this chapter, we can conclude this chapter as a body of text that aims to review this project of current knowledge. Besides that, this chapter shows the project guidelines to generate this project successfully. From this chapter, it can give more information about the project base on the design of the project and also about the company review. By this chapter, we will understand more about the project deeply.

CHAPTER 3

DESIGN CONCEPT AND SELECTION

3.1 INTRODUCTION

This chapter will include the design concept of the project which is the idea of the design that I had design (concept design 1 until final design). It is also include the concept variants that used in designing process until I found the final design concept that I will choose as my product design.

3.2 Concept Design

In designing the concept design of the product, I was proposing three types of concept. All of the concepts, I was design the concept by doing the sketching process first. Below are the concepts that I was design by sketching process.

3.3 CONCEPT SELECTION

For this project generate three concept selections. From the three concept, choose one of the best concept form concept variants as a final design. From the existing ideas, three concepts that had been chosen to be considered as the final ideas, which are:

Concept A

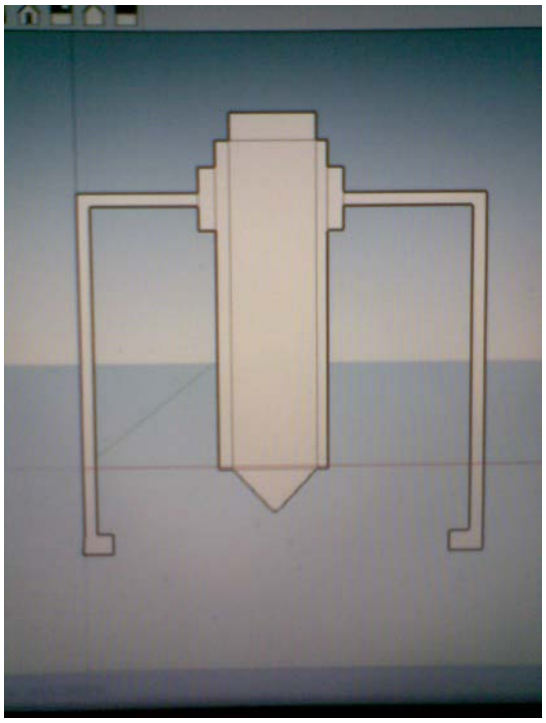


Figure 3.1: Concept A

This concept is an idea from the concept of the syringe. It has a mark on it for measuring. So I think this concept can be used in designing my product. In this concept I just added the concept by putting the clamper to clamp the telephone when running the test. The way to use it is by pressing the top of the product as same as the function of the syringe.

But in this concept there had cause many problem. It is not strength when use it because of the clamper is quite small and low stability.

Concept B

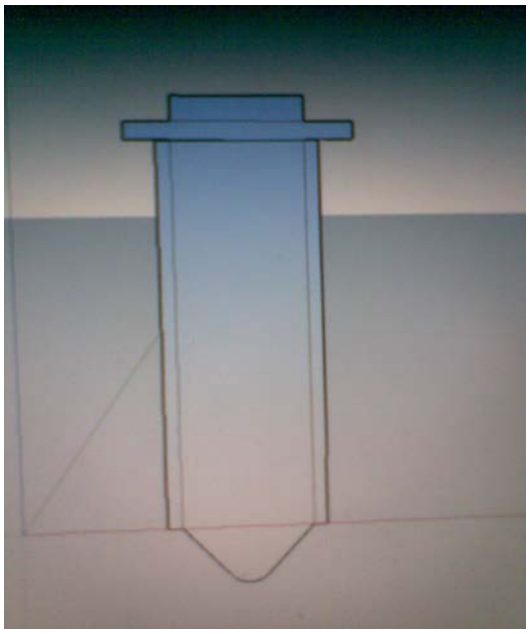


Figure 3.2: Concept B

For concept B, the idea is as same as the concept A but there has some difference where the Concept B has no clamper part. It because I think this concept more easy to used and also easy to keep anywhere. The way to use it is also as same as the Concept A but no clamping part. It totally by hand used.

But there had cause many difficulty to use it when testing process. It has quite difficult to straight the hand during measuring process. It can cause the imprecise measurement.

Concept C

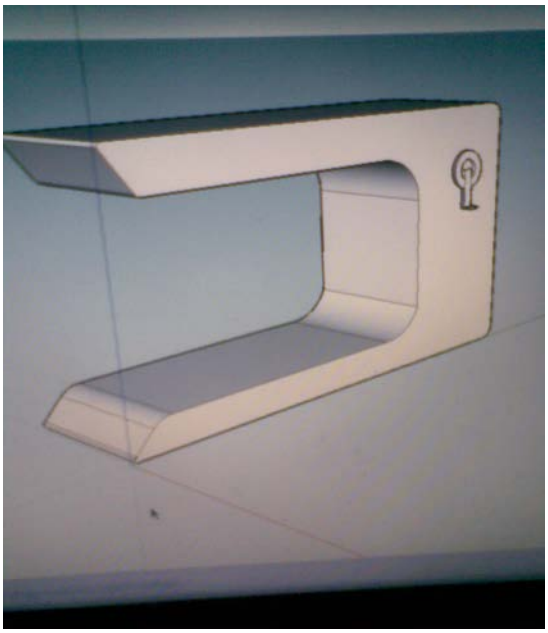


Figure 3.3: Concept C

Concept C is the advance design than the others. It is included the idea on the fishing rod and also the sew machine. The way to use it is by rolling the reel behind the device. Then the string will move downward and press the hook button stroke. The measurement will start when the touch steel is touch the button and will be pressed until the button connecting the telephone line.

3.4 CONCEPT VARIANTS

	CONCEPT VARIANS		
SELECTION CRITERIA	**A**	**B**	**C**
ease to use	-	+	+
manufacturing ease	-	-	+
comfortable	+	-	+
long life	-	+	+
safety	+	-	-
PLUSES	2	2	4
MINUSES	3	4	1
NET	-1	-2	3
RANK	2	3	1
CONTINUE	YES	NO	YES

Figure 3.4: Concept Variants

NOTES: + = better than - = worse than o = same as

Final design is Concept C because getting the top ranking in concept variants process. Therefore, Concept C is the best concept to be produced.

3.5 FINAL DESIGN

In my presentation on mid semester project presentation, I was choose the concept design C as my final concept design. But after the panel and my supervisor gave me the addition ideas and examples concept for my design, I was redesigning the Concept Design C without changing the main function, its objective and its scopes. Below is my new design after redesign the Concept C:

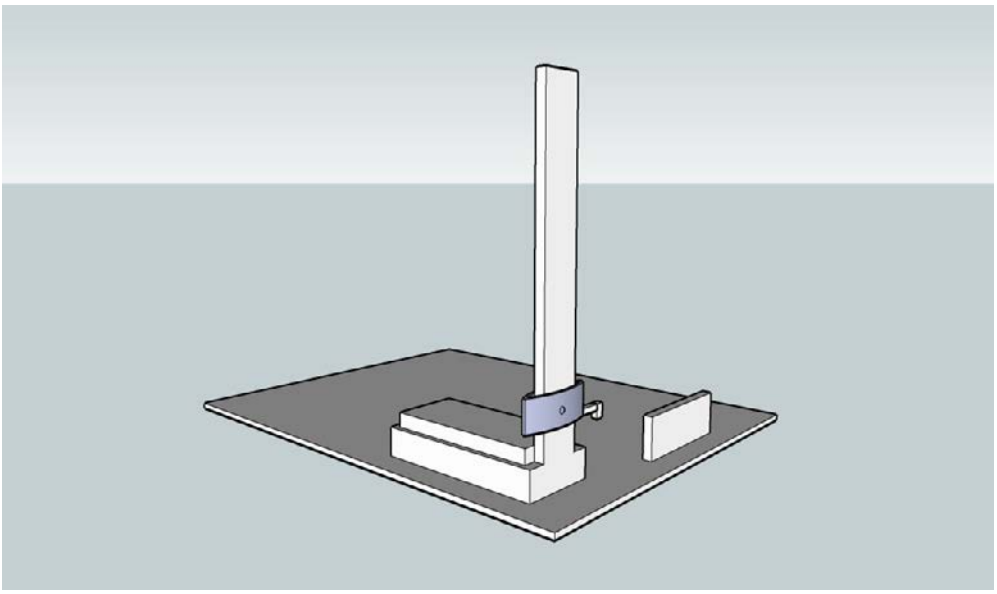


Figure 3.5: Final Concept (after redesign)

This design was the new design after the mid semester presentation. The concept is from the function of the vernier height gauge. The slider can be move upward and downward during the measuring process. The base of the product was design for the comfortable feel during the test. The wall (aluminium sheet) was designed to make the telephone not sliding during the test. The aluminium sheet (base part) is for the stability and flat surface for the test.

3.6 CONCLUSION

For conclusion, design concepts and methods of selection design concept are very important to make sure the product that will producing be a good product and fulfill the customer needed. Other that, the materials that we will use for this project can be listed properly. So, the product will become more effective and more relevant.

CHAPTER 4

FABRICATION PROCESS

4.1 INTRODUCTION

In this chapter will discussed about the methods of fabricate that used in this project. It is included the list of methods and the fabrication steps with it explanation and reason.

Bill of Materials (BOM), also included in this chapter. This part will discussed about the type of materials that used in this project, the quantity and the costing to produce this product.

4.2 BILL OF MATERIALS

Bill of Materials is a one of the step to list down the materials that had been selected for this product. It is also to make sure the product that will produced become a good and affordable product. Look at the Appendix part for reference of the Bill of Materials of the product.

4.3 METHODS OF FABRICATION

4.3.1 Fabrication Process

After designing phase, comes the fabrication process. This process is about the using of the material selection and makes the product base on the design and by following the design dimension. Many methods can be used to fabricate a product, like welding, cutting, drilling and many more method. Fabrication process is totally difference then manufacturing process in term of production quantity. Fabrication process is a process to make only one product rather than manufacturing process that focus to large scale production. In the project fabrication process needed to make the base plate, framework of display board and display board. Fabrication process was used at the whole system production. This was include part by part fabrication until assembly to others component.

4.3.2 List of Process Involved

In order to produce the product from the final design, fabrication process needs to be done first. The fabrication process starts from dimensioning the raw material until it is finish as a desired product. The processes that involved are:

Measuring: Materials are measured to desired dimensions or location.

Cutting: Marked materials are then cut into pieces.

Drilling: Drilling involves the creation of holes that are right circular cylinder.

Welding: Welding is the process of permanently joining two or more metal parts, by melting both materials.

Grinding: Grinding process used to improve surface finish, abrade hard materials, and tighten the tolerance on flat.

Finishing: Any rough surface cause by welding spark were grind to give smooth and safe surface using grinding machine followed by painting process.

4.4 FABRICATION PROCESS

Figure 3.6 shows the flow of the fabrication process for this project.

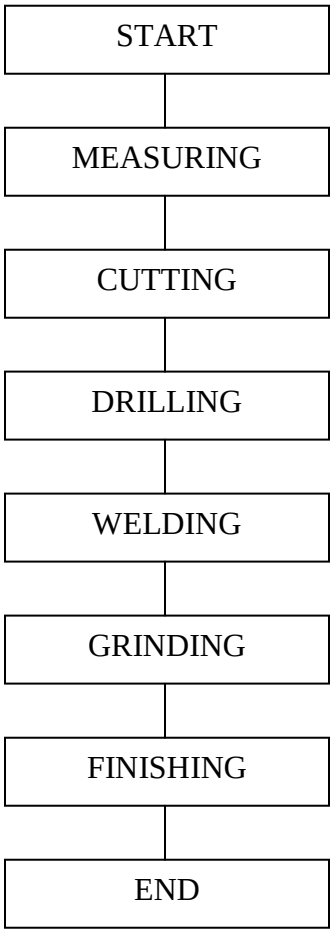


Figure 4.6: Fabrication Flow Steps

4.5 PROCESS OF FABRICATION

Figure 4.7: Measurement Process

Figure 4.8: Cutting Process

Figure 4.9: Drilling Process

Figure 4.10: Welding Process by using MIG weld type

Figure 4.11: Grinding and Finishing Processes

4.6 CONCLUSION

In this chapter, we can conclude that the project flow is very important to make sure the project is running smoothly. Besides that we used the Mechanical Engineering methods to conduct this project. So, we must obey the planning steps to make sure the process going smoothly and will be finished on time.

CHAPTER 5

RESULT AND DISCUSSION

5.1 INTRODUCTION

This chapter will discuss about the running test of the product. This is including the Standard of Procedure (SOP) for running the product during the testing process. It is also included the analysis of the project. Besides that, the project problem and the problem during fabrication process also will be discussed in this chapter. It is also included the Bill of Materials of the product.

5.2 RUNNING TEST

5.2.1 Standard Operation Procedure (SOP)

Standard Operation Procedure (SOP) is a specific procedure or set of procedures so established. Other that, SOP also can be defined as an established procedure to be followed in carrying out a given operation or in a given situation.

(Source: http://www.thefreedictionary.com/standard+operating+procedure, 13 Nov 2009)

TEST DEVICE : Hook Button Stoke MAIN FUNCTION : Measuring	NO : H01 CODE : 5565-08-02
MADE BY : Final Year Project (PTA) , 2009 ADDRESS : Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang	
ENGINEER : En. Muhamad Izzat Bin Haslan TECHNICIAN : En Naqiuddin Salleh	APPROVED BY : En Mohamad Zairi Bin Baharom DATE : 4 November 2009

BASIC OPERATION/METHOD

Method before operate/running the Test Device :

1) Make sure the test is running on the flat surface.
2) Put the telephone at the prepared place.
3) Slide the slider to the hook button stroke. Touch and set the measure at zero.
4) Press the slider ; at the same moment hear the sound at the telephone holder until the sound is silent (means the button is already connected the line).
5) See the depth of the slider movement as it measurement (in mm).
6) Repeat the process by changing the slider movement to measure the height of the button to reconnect the telephone line.

LIST SAFETY/PPE (personal protection equipment): 1. Safety boot (if needed)	PREVENTION (during testing) - The eye must parallel with the measurement to prevent ralaxs (mistaken measurement)

PRECAUTION:

Anything happened/broke during the test please refer to the engineer or technician

REMARK:

Do not use/handle machine personally if not fully know the function.

Get Engineer/Technician required before any action taking if problem occurred.

Figure 5.1: Standard Operation Procedure (SOP)

5.3 TEST ANALYSIS

For this project, the main analysis is to see the length movement of the slider (to measure the depth and height) when it pressed the Hook Button Stroke to connect or reconnect the telephone line.

5.4 PROJECT PROBLEM

During the project, there had many problems that I had faced. Below is the problem that I had found:

Literature Review: The concept and ideas review for this project are not very wide because it is not widely modified by the manufacturer. Students should come with their ideas on the project.

Designing & Sketching: Because of the idea were from the student directly, so there are no references that can be referred. All the drawing and dimension need to generate by student itself.

Fabrication Process: Students need to be given more time to finish fabricating their product because of slackness of skill and training, the joining finishing was not so god but yet can still reliable.

Material Preparation: Some of the needed material needs to buy at the city. University should prepare the material or either provides the place where the material can be obtained from.

Budget Preparation: It is not so effective to use student's money to get the materials. University should provide budget at first stage so that student's expenses are not interfere.

5.5 PROBLEM DURING FABRICATION PROCESS

In fabrication process, there had some problem that were faced. It is divided in two main problems there is:

5.5.1 Welding Process

During welding process, there had some difficulty to join all the part that want to join. It is because the materials that been used is mostly aluminium type. So, there were quite difficult to join it because the aluminium was easy to melting. When we were weld that part, it became melting and that cause unexpected hole. To solve this problem, it better to use the MIG weld type because that welder was not cause much damage on materials and also easy to use it.

5.5.2 Materials Selection

Mostly, the materials that used in this product are from aluminium type. So, it can cause some difficulty in producing this product especially during welding process. It is because the aluminium is quite easy to melt when giving high temperature on it. So, to solve this problem we should be welded the aluminium part little by little to make sure that it will not cause melting and produce unexpected hole on product.

5.6 CONCLUSION

As a conclusion, we must prepare the right procedure how to use for any product to make sure that people can know the right safety way to use. Besides that, we must know all the problems that faced during the progress of the project and also have it solution for future improvement on product. In reality life also we must know our short of for being improvement from bad to good.

CHAPTER 6

CONCLUSION AND RECOMMENDATION

6.1 INTRODUCTION

For the final chapter it represent about conclusion and recommendation for the project. In this chapter will discuss mainly about the conclusion of the project, concluding all the process that involved and also the benefit that got during the project period. Besides that this chapter also contains recommendation about the project. So for this recommendation it can make improvement about the project in the future.

6.2 CONCLUSION

In this project, a task to produce a new product (device) for testing the Hook Button Stroke for ITS model was given. During the progress of the project, there are many problems either during designing, fabrication and testing processes.

It is a usual cases if we in producing a new product. So, we must find the solution of all the problems. With this particular situation, we can learnt and improved many skills during this project period. That is included the improvement of my skill in using Mechanical Engineering (ME) methods and tools that was learnt before during studied in Universiti Malaysia Pahang (UMP).

Besides that, it can gain knowledge and ideas in designing and producing a new product and also confident into a high level in acting and public communication skill especially in English Language.

Lastly, I was finished my project through the objective of the project. The mission is successfully accomplished.

6.3 RECOMMENDATION

For this project, there was specified some of recommendation for future improvement. All of recommendations are to make the measuring process more precise. Below are some recommendation and ideas that had state:

(i) The product can be upgraded by using electronics circuit/devices.
(ii) The product can be adding the digital surveyor for measuring.
(iii)The product can be added with sensor.

Based on the progress of the project, so many things in facilities aspects can be improved especially in welding process. It is because the MIG welding machine doesn't have enough quantity for the student user. So the faculty especially must provide more welding machine for the student user because amount of student is increase by a year. Other that, the materials selection also quite slightly and cause difficulty to find the materials that wanted.

APPENDIX

Bill of Materials

Number	List of Methods	Quantity	Dimension (mm)
1	Alluminium sheet	1	300 x 400 x 2
2	Alluminium sheet	1	60 x 55 x 1
3	Alluminium sheet	1	50 x 36 x 1
4	Alluminium sheet	1	40 x 10 x 1
5	Alluminium sheet	1	30 x 10 x 1
6	Alluminium bar	1	35 x 5 x 300
Total		**6**	

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