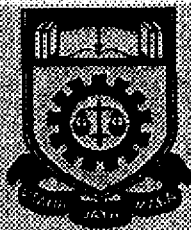


**TO STUDY THE DESIGN OF HYBRID CIRCUIT BREAKER (HCB)
FOR DOMESTIC INSTALLATION**
(To Design Earth Leakage Circuit Breaker Incorporating Overvoltage Protection)

**Thesis presented in partial fulfilment for the award of the
Bachelor of Electrical Engineering (Hons) of
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ABSTRACT

The propose HCB is a combination of conventional Earth Leakage Circuit Breaker (ELCB) and some power electronics devices to provide better protection to user and their appliances. ELCB is a protective device commonly used in domestic homes. It protects human life against the incident of any leakage current to ground, by breaking (tripping) the electrical system. In the case of overvoltage, ELCB cannot detect and as a result of a long duration overvoltage some electrical appliances are bound to fail. Therefore the objective of this project is to design a hybrid circuit breaker or 'HCB' so it can detect both, earth leakage current and overvoltage as well. At the end of the project, it is hope that this device could be further studied, developed and produced / manufactured so that it can help mankind to protect human lives and their properties.

CONTENTS

| | |
|---|-----|
| Declaration | i |
| Acknowledgement | iii |
| Approval | iv |
| Abstract | v |
| Chapter 1 | |
| 1.0 Introduction | 1 |
| 1.1 Why this study being done | 1 |
| 1.1.1 Scope of study | 2 |
| 1.2 Analysis of overvoltage cases | 2 |
| 1.2.1 What is Neutral Floating | 3 |
| 1.2.2 Example of floating neutral cases | 6 |
| 1.3 Problem statement and project question | 7 |
| Chapter 2 | |
| 2.0 Hybrid Circuit Breaker (HCB) concept | 9 |
| 2.1 The principle operation of ELCB | 10 |
| 2.1.1 The test button | 12 |
| 2.1.2 Application of test button in HCB | 12 |
| Chapter 3 | |
| 3.0 HCB components and circuit analysis | 14 |
| 3.1 Transient suppression device | 14 |
| 3.1.1 Metal oxide varistors (MOVs voltage dependent resistor) | 15 |
| 3.1.2 Propose design using MOV | 16 |
| 3.2.0 Thyristor control circuit | 17 |
| 3.2.1 SCR 'crowbar' overvoltage protection | 17 |

CHAPTER 1.

1.0 INTRODUCTION

1.1 WHY THIS STUDY BEING DONE

This project study come to attention after it was noticed that when overvoltage occur in some areas especially in remote areas, there were no protective devices that could protect the consumer appliances such as television, hi-fi set, florescent lamp, fans and end up in extensive damages. Even though most domestic consumer have Earth Leakage Circuit Breaker (ELCB) installed on their system, but this device can only protect human life against the incident of any leakage current to ground, by breaking (tripping)) the electrical system. In the case of overvoltage, ELCB cannot detect and as a result of a long duration overvoltage some electrical appliances are bound to fail. Based on the statistic from Jabatan Bekalan Elektrik & Gas (JBE), Malaysia, Kawasan Utara it was reported that from 1993 to 1996 some 51 cases of overvoltage occurred involving more than 150 consumers which cause damage to their properties. Estimated losses for each consumer is about RM200 to RM1000.[1]

Since right now as required by law all domestic consumer's installation must have ELCB as a protective device, it will be a great improvement if we could combine the conventional Earth Leakage Circuit Breaker (ELCB) with some power electronics