

**Design and Construction of a Tesla Coil with Difference Top Load
Shape**

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UNIVERSITI TEKNOLOGI MARA
MALAYSIA**



FADHLI BIN FADZIL

2011806042

Faculty of Electrical Engineering

UNIVERSITI TEKNOLOGI MARA

40450 SHAH ALAM, SELANGOR DARUL EHSAN

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ABSTRACT

A Tesla coil is a type of resonant transformer circuit invented by Nikola Tesla around 1891. It is used to produce high voltage, low current and high frequency. This project focuses in innovating the design and constructs a small scale Tesla coil which produces a high voltage but low current and produce high frequency. It is important to increase students knowledge on how to generate a large force from small entry. The TeslaMap Version 6.2 software was used to design the parameters. There are five basic components of Tesla coil such as the power supply, primary capacitor, primary coil, secondary coil and top load. By using TeslaMap Version 6.2, it is ease in reducing time to calculate all the parameters of this Tesla coil. In addition, spark gap is used as a switch in Tesla coil. The switch allows the primary capacitor circuit capacitance to charge and discharge. There are five basic fundamental design parameters that need to be determined, which are output characteristic of high voltage transformer, size and dimension of primary coil, secondary coil, top load and size of primary capacitor. However, the expected result of this project to design and produce the high voltage from low input voltage could be achieved at last.

TABLE OF CONTENTS

Table of Contents

DECLARATION	i
APPROVAL	ii
ACKNOWLEDGEMENT	iii
ABSTRACT	iv
LIST OF SYMBOLS OF ABBREVIATIONS	viii
CHAPTER 1 INTRODUCTION	1
1.1 Background of Study	1
1.2 Problem Statement.....	1
1.3 Project Objective.....	1
1.4 Scope of Project	1
1.5 Outline Thesis	2
CHAPTER 2 LITERATURE REVIEW	5
2.1 Introduction	6
2.2 Nikola Tesla	6
2.3 Theory of Tesla Coil.....	7
2.4 Components of Tesla Coil	8
2.4.1 High Voltage Power Supply.....	8
2.4.2 Primary Capacitor	9
2.4.3 Primary Coil.....	10
2.4.4 Secondary Coil.....	12
2.4.5 Spark Gap.....	13
2.4.6 Top Load.....	14
CHAPTER 3 METHODOLOGY	15
3.1 Flow Chart	16
3.2 Design of Tesla Coil	17
3.2.1 High Voltage Power Supply.....	18

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

The electrical energy is important in the world. With the electrical energy, people easy to do their work and life. Tesla coil is a type of resonant transformer circuit invented by Nikola Tesla [1]. Tesla coil has been used to conduct innovative experiments in x-ray, electrical lightning, and wireless energy transfer for electrical power transmission, industries and also for educational purposes [2].

This research is about producing high voltage from low voltage and high frequency but low current. The basic parts to design Tesla coil is power supply, primary capacitance, secondary coil, top load and primary coil [3]. Tesla coil consists of basic components which are transformer, capacitor, resistor, coil, semiconductor and some additional part as a safety for this project [4].

Tesla coil will be designed and constructed to determine the electrical discharge that occurs. Using the TeslaMap program, it will reduce the time to calculate and design the parameters of the Tesla coil.