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FINAL REPORT:

WIRELESS POWER TRANSFER USING TESLA COIL

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ABSTRACT

Tesla coil is essentially an high-frequency air-cored resonant transformer. Tesla coil is invented by a Serbian scientist named Nikola Tesla in 1891. The Tesla coil is one of Nikola Tesla's most famous inventions. Tesla coil is generally used to generate high voltage at high frequency. The generation of output voltage is different from the operation of standard transformer. The secondary voltage of Tesla coil is not depending on the turn ratio but depending on the ratio of capacitance and inductance of the primary and secondary circuit. The components of Tesla coil are high voltage transformer, primary capacitor, primary coil, spark gap, secondary coil and top load. Spark gap is a switch that triggers the resonant of Tesla coil. Tesla coils are unique in the fact that they create extremely powerful electrical fields. Large coils have been known to wirelessly light up florescent lights up to 50 feet away, and because of the fact that it is an electric field that goes directly into the light and doesn't use the electrodes, even burned-out florescent lights will glow. This project is to wirelessly light up fluorescent lights, to see with our own naked eyes how the tesla coil work and how the wireless power transfer works. In designing Tesla coil, the parameters need to determine first before the actual construction. The parameters and calculations of Tesla coil are determined by the aid of software such as Tesla Map. Tesla coil is considered as an old invention and it barely can be seen but its theory of operation is applied on the modern application such as spark gap radio transmitters, medical x-ray, violet ray and particle accelerators.

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CHAPTER 1

INTRODUCTION

1.1 Background of Study

Tesla coil is a type of resonant transformer invented by one of the greatest electrical engineer of our time, Nikola Tesla around 1891. It is used to produce high voltage which Tesla used to test a way to conduct wireless electricity. The idea was to build the largest possible Tesla coil with a high enough voltage in order to ionize the whole Earth's atmosphere so that it can conduct electricity in order to obtain free electricity. However, after many experiments and frustration, he figured out that this cannot be made. This invention however, is not merely a failure. In 1901, an Italian electrical engineer named Guglielmo Marconi used up to 17 of Mr. Tesla's patent including the Tesla coil which have been modified to pursue his famous invention, the first radio transmitter in which the basic construction consist of Tesla coil with a large wire antenna on top instead of the small sphere or toroid that Tesla used.

Nikola Tesla used to think that he can provide free electricity to the world by the invention of Tesla coil. To his dismay, this cannot be done and will require millions of dollars and such a long time to secure the technology. However, the invention of Tesla coil alone can helps in reducing the cost in terms of cables used. It is widely known that cables used are very expensive and by wireless power transfer using Tesla coil, we can reduce costs associated with maintaining direct connectors.