

**DEVELOPEMENT OF HIGH VOLTAGE DIRECT  
CURRENT ( DC ) GENERATOR WITH SOLID STATE  
DEVICES**

**This thesis is presented to fulfill the requirements of Advance Diploma In Electrical  
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**Adnan bin Ahmad  
Din bin Isa**

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**Department of Electrical Engineering  
School of Engineering  
MARAs Institute of Technology  
40450 Shah Alam  
Selangor  
MALAYSIA**

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## **ABSTRACT**

The application of the solid state devices to generate high d.c. voltage direct current has developed significantly in the electrical power engineering. The advantages of using the solid state in the circuit in generating high voltage are the equipment will be reduced in size, light in weight, inexpensive and less dangerous.

In this project, the idea is to get the dc high voltage direct from 3 pin ac power supply. The voltage is rectified by bridge rectifier and then applied to a saturable core inverter in which a self-sustaining oscillation occurs in the power transistor with a very high frequency. At the same time, the application of dc voltage into the saturable core inverter will cause the flux to be saturated in the core of flyback transformer . The switching off of the power transistor will cause the flux fall and cut the entire secondary winding of the flyback transformer to generate an oscillation high voltage oscillating signal.

The scope of works to be covered in this project are :

- To design and construct an adjustable high d.c.voltage equipment.
- To perform a close study on output characteristic produced by flyback transformer such as rise time, fall time, repetition rate etc.

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## **1.0 INTRODUCTION**

When we discuss about high voltage we normally assume that the voltage is of a.c. type. The system can be seen so as the part of the Grid System that supply electricity to our house. In this project the main concern of high voltage is HVDC. Till now researchers and experimenters keep on doing research in developing the new technique for the advancement in dc high voltage technology. High voltage engineering such as Laser Engineering, Nuclear Particles Accelerator and Diagnosis System have a tremendous discovery. Engineers and researchers have developed more techniques and new findings that made high voltage equipment more sophisticated and reliable with less dangerous too.

In this project the development of high voltage equipment is purposely used for experiments and applications. This equipment is a laboratory source of dc high voltage that can be adjusted from as low as 35 kV to 250 kV. Its application mainly for research in accelerating ion particles in the surrounding air. It also acts as an equipment that producing external ion winds to provide the energizing source for small particles accelerator of special interests such as for the defence program of Star Wars. This type of device is developed for energy initializing of particles intended for further accelerator in linear accelerator, cyclotron etc.

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