CNC Laser Cutting Machine

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***Abstract* –**

# Introduction

In the industry, a widely used component for cutting and engraving materials is a CNC laser cutting machine. The machine operates by using a high-energy infra-red laser light beam. A focusing lens is attached to the laser in order to concentrate the energy into single focal point, thereby vaporizing and melting the material of interest. In order to alter the position of the laser into a desired location, a mechanic of motion known as CORE X-Y drives the positon of both the x and y axes. By rotating both stepper motors in different directions the position of the horizontal bar can shift between left and right, and opposite direction drives the machine up and down. In order to detect the dimensions of the object for better precision a camera is mounted on the CNC to accurately engrave and cut the desired material. These specific features of the CNC Laser Machine will then be controlled by a single microcontroller which provides a command for the whole system. The implementation of this project will be divided into three different parts: Rough Draft Design, Design Construction, and finally Design Testing/Debugging.

# Design Draft

* 1. *Brainstorming*
  2. *Operational Chart*
  3. *Project Breakdown/TimeLine*
  4. *Material Costs*

# Design Construction

1. *Mechanics (Core X-Y Axes)*
2. *Hardware (Laser Diode)*
3. *Software (CNC/Microcontroller Implementation)*
4. *Software (Computer Vision System)*

# Design testing/debugging

1. *Mechanics (Core X-Y axes)*
2. *Hardware (Laser Diode)*
3. *Software (CNC/Microcontroller Implementation)*
4. *Software (Computer Vision System)*

# Risk Assessment

1. *Mechanics (Core X-Y axes)*
2. *Hardware (Laser Diode)*
3. *Software (CNC/Microcontroller Implementation)*
4. *Software (Computer Machine Vision)*

# References

[1] http://www.hydram.co.uk/technical/laser-cutting-tech/