

UNIVERSITI TEKNOLOGI MARA

**DEVELOPMENT OF MINI-CNC
ENGRAVING MACHINE**

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ABSTRACT

Computer Numerical Control (CNC) machine is a machine that is pre-programmed with a computer software that dictates the movement of the cutting tool to fabricate a certain parts or prototype. For introduction, the machine that will be fabricated for this project is a small-scale CNC Engraving Machine. Its function is to cut, shape and create different parts and to also engrave on a material such as PCB. The purpose of making this machine is to help people fabricate the parts that they needed to use in small number. The main objective of this project is to design the mini-CNC engraving machine using SolidWorks and to fabricate the project as a proof of concept. The expected results for this project are to help people that make small or DIY project at home to fabricate the parts by themselves and they did not have to reach out to a company that specialize in CNC machining and pay large amount of money to fabricate the parts that they needed.

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CHAPTER ONE

INTRODUCTION

1.1 Background of Study

When a CNC system is turned on, the intended cuts are programmed into the software and sent to the appropriate tools and machinery, which do the prescribed dimensional jobs in a manner like a robot. Even if there is a chance of errors when a CNC machine is instructed to cut in more than one direction at once, the code generator within the numerical system in CNC programming frequently treats mechanisms as if they are faultless. The part programme, a set of inputs, specifies where a tool should be placed in a numerical control system. Programmes are entered onto numerical control machines using punch cards. Contrarily, tiny keyboards are used to input CNC machine programmes into computers. A computer's memory is where CNC programming is stored. Programmers write and edit the actual code. As a result, CNC systems have far greater processing capacity. The best part is that CNC systems are far from static because updated programmes may be introduced to older ones by modifying the code.[7]

But the problem with the CNC machine is that it is too big and hard to handle. The machine required a skilled person to operate it smoothly. CNC machine has special language that is used to control the it called G-code. Moreover, it would be a waste if the person wanted to do a small-scale project with a big CNC machine.

There are a lot of mini-CNC machine that is available on the market. It can be controlled easily using our own computer and it is also small enough for a person who wanted to do a small-scale project. However, there are some weaknesses from the design of the machine such as lack of cover to prevent burr from flying all over the place. To overcome this, the current design can be improved to elevate the user's experience. The aim of this project is to enhance the current CNC engraving machine that is available on the market. To do this, the chosen concept will be rendered and modelled using SolidWorks 2019. A prototype will be fabricated as a proof of concept by the end of Final Year Project 2.