OVERVIEW

The project done in class was to create a name plate out of wood, using the computer program MasterCam and the milling machine. The purpose of this lab assignment was to understand the concept and gain experience using equipment used in real life work situations. To collect information on this project, Professor Mason gave out a paper with instructions on how to run the milling machine, to use when we were ready to start, and powerpoint instructions on how to create the MasterCam document and code on blackboard.

Procedure/Steps/Drawings

The equipment used for the lab project were: computer, MasterCam program, and the Milling machine.

The procedure for this project was to construct the part and toolpaths in the program MasterCam in the computer lab first. Following the directions on blackboard, the list starts off by creating a rectangle with the measurements of 9x2.5”, making offsets and XForm translations on the Z axis creates a 2D part. Next, you create a 3 Point Arc on both ends of the part, so the surface will be an arc when finished. After putting the part in the Top View in MasterCam, you create the letters you wish to put on the nameplate, along with font and location.

Before creating toolpaths, a tool containment for the rectangle/box must be made. The machine type being used would be the Mill, then change the stock type. Y=2.5, X=9.0, and Z=0.75. Move the arrow location to the top edge of the part. Next, create the toolpath using pocket toolpaths, selecting chain and inside, by clicking on the letters, you will get to choose the tool, which will be a 1/8” ball endmill. To create a finish projected toolpath, putting the part into isometric view and click on any part of the surface. The tool for this would be the same one as before, 1/8” ball endmill, this will create the arc on the top surface. By clicking any where on the surface after going to finish parallel toolpath, then clicking on the box around the letters, using again the 1/8” ball endmill.

Holding down the shift key and clicking operations 2 and 3, the top of the toolbar contains the virtual milling process. By clicking the Configure button on the Verify option, it will change the stock setup value. After pressing Play, it will run the procedure and show the finish product. Going
back to the main screen, on the toolpath toolbar clicking on G1 will post the G code and M code.

The last part in making this project, is to cut the wood to the correct size - length, width, and height- upload the G and M code to the computer connected to the milling machine. Once loaded, and the wood should be placed on the machine using double sided tape. The machine must be zeroed, the spindle has to be warmed up, before the program can run. Once the program is running, someone has to hold a vacuum to get the excess wood. The final product is pictured below.

**Data Collection**

The measurements used for this project were given, which was the nameplate was to be made on a 9x2.5” piece of wood. The type of wood used is some light colored maybe oak. (See picture above). Therefore, the table saw had to be used to cut the wood to the right size.

**Conclusion**

This activity was, needless to say, a lot of fun. The objective of this lab was completed and done accurate. The most difficult part of the exercise was making the step over correct. Even when I did, my letters were chipped and a big scratch was put in my wood. The lab is directly related to the course material we have been going over in class.

**Technical Article Correlation**

Article Information:
Techno Inc. CNC Router Systems
Title: CNC Articles
Web: [http://www.techno-isel.com/H850/PDF/Articles_124.PDF](http://www.techno-isel.com/H850/PDF/Articles_124.PDF)

CNC Routers provide 400% productivity gain for woodworking manufacturing. When Champion Safes used power tools to produce racks for its gun cases, each person could only produce enough parts for 20 o 30 safes per day. To increase productivity, the company invested in
a computerized numerical control (CNC) router that works unattended to produce parts of any shape, simple or complex, based on a computer program. The Techno’s LC series CNC routing system provides a number of critical features that allow it to deliver accuracy and long-term reliability of a level that has previously only been available from machines at a much higher cost.