

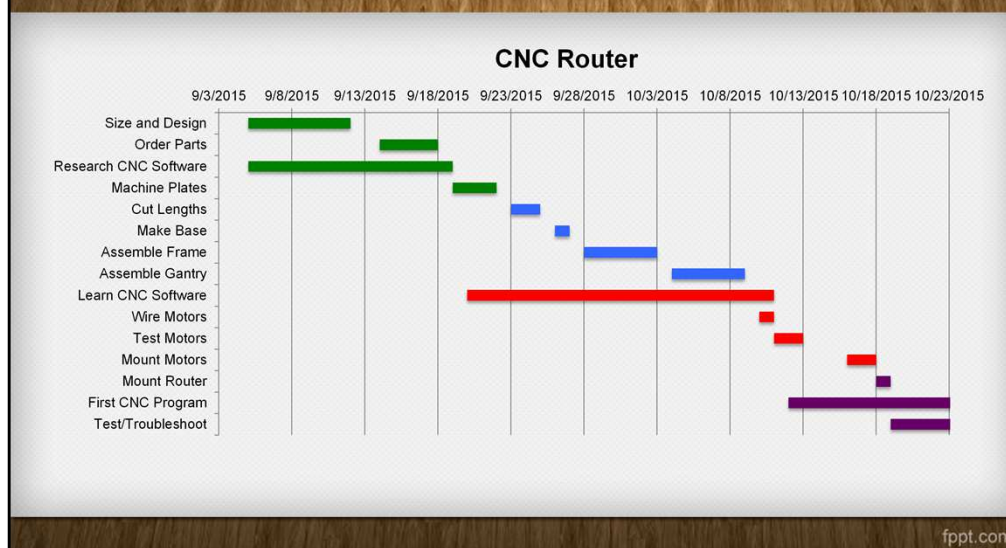


# Gantt Chart Project

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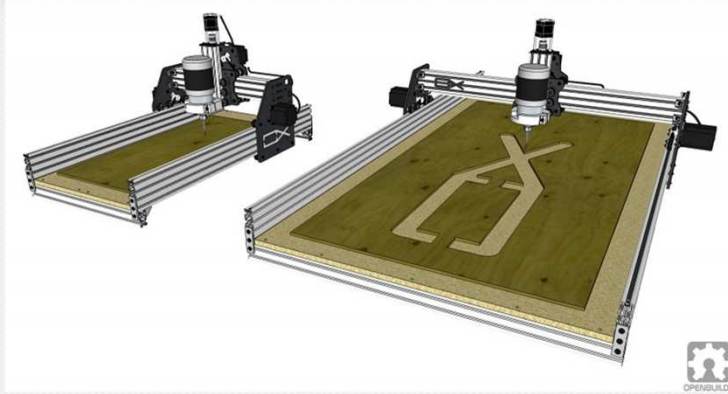
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# Gantt Chart



This project will review the timeline to build a DIY CNC router for woodworking. While it is possible to complete this project in a shorter time frame, provisions have been allotted for other projects, work and family obligations.

# Size and Design



CNC routers are able to be built to almost every size. Size limitations and cost will need to be considered while designing. 3D modeling software will be utilized to compile a bill of materials. This step is estimated to take seven days. The overall budget for this project will be \$1,000.

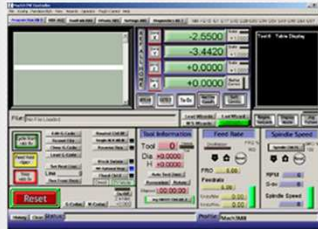
# Order Parts



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The components will need to be ordered utilizing several vendors. From the rails that make the frame, stepper motors and related controls, to the wheel kits that allow the gantry to move back and forth and up and down. A complete BOM will be created to ensure the correct amount of all supplies will be ordered. This step is estimated to take four days.

# Research CNC Software



Mach3

VCarve | PRO & DESKTOP

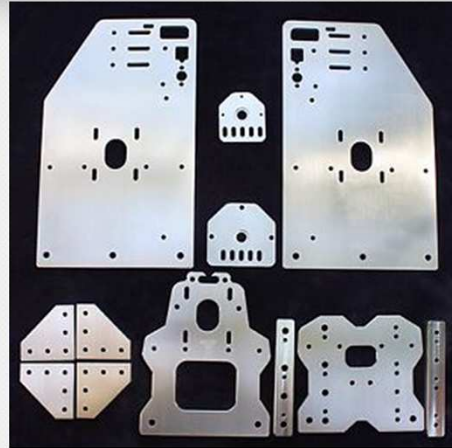


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There are several different computer programs available to control the CNC router. They all communicate differently with the controllers for the motors. There are free ones and packages that can cost up to several hundred dollars. This research will take about two weeks and will be performed concurrently with the build and design and parts ordering.



# Machine Plates



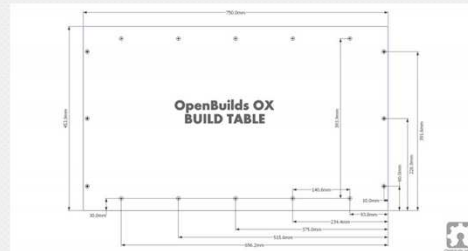
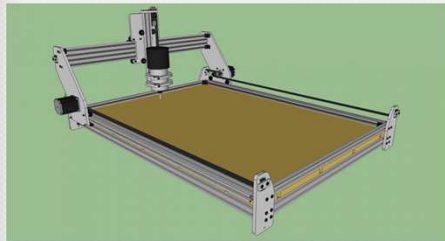
Several plates will have to be machined from  $\frac{1}{4}$ " aluminum. Fortunately my workplace will allow me to EDM these parts if I purchase the raw material. There are two side plates that hold the gantry and motor mounting plate along other miscellaneous plates that connect the V-slot channel together. This step is estimated to take three days.

# Cut Lengths



The V-Slot channel will be cut to the different lengths according to the plans. There are 4 V-Slot channel sizes and different lengths of the different sizes will be required. It will be essential to keep careful track of what size channel needs to be cut to what length. Recently it has been noted that some of the channel sizes have not been available on various websites. To avoid paying extra shipping charges most of the items will be ordered together, so if this stock needs to be backordered, this part of the project may be delayed by the estimated time of the back order. It is possible that the company the order was placed with will send out partial orders for the same shipping charges. If not, then this will allow more time to research or learn the operating software. This step is estimated to take two days, once the product is in hand.

# Make Base



A base will be needed to support the pieces that will be machined. This will be made from MDF board. There will be various holes that will be required in order to clamp down the work pieces as well. This step is estimated to take one day.



# Assemble Frame

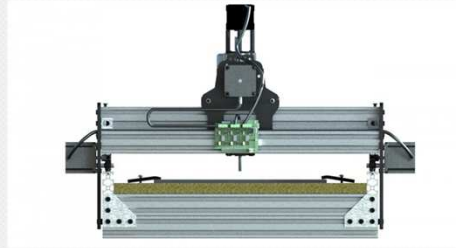


The frame will then need to be assembled. This is the step that will determine if all the pieces of V-slot were cut correctly. The locally machined smaller plates will also be used. This step is estimated to take five days.

# Learn CNC Software

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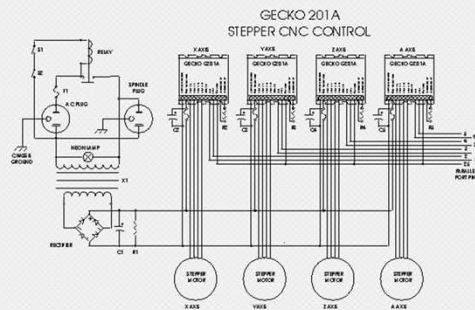
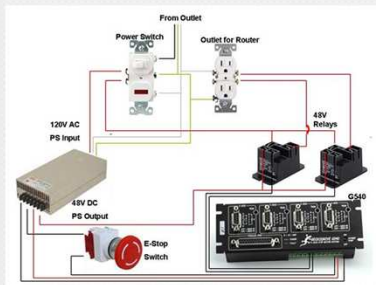
# Assemble Gantry



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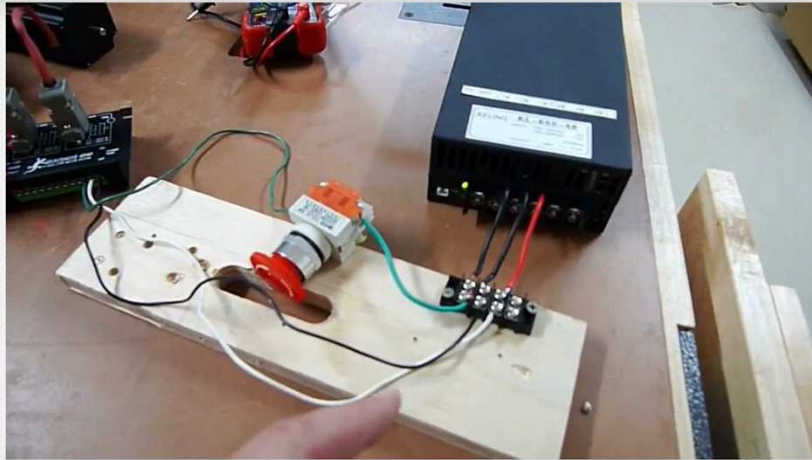
The gantry is now assembled. This is what the router mounts to and allows the up and down motion. This also allows the X and Y movement on the work surface. This step is estimated to take five days

# Wire Motors



There are four separate motors that need to be wired to the main controller. With each motor having multiple wires, it will be challenging to keep track of each wire. This step is expected to be time consuming and five days have been allocated.

# Test Motors

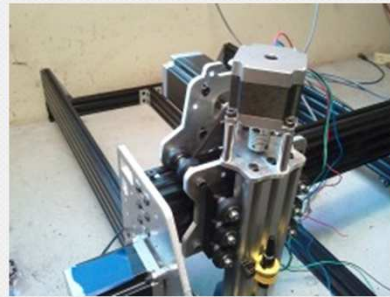
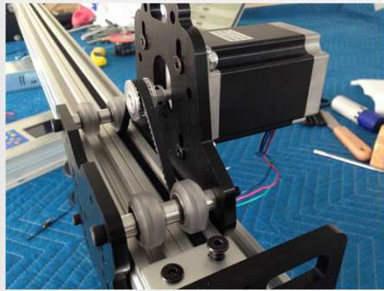


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Now it is ready for the initial test. Motors will be connected to their respective controller one at a time and then to the main power source for testing. This will be beneficial if trouble-shooting becomes necessary. This step is estimated to take two days.

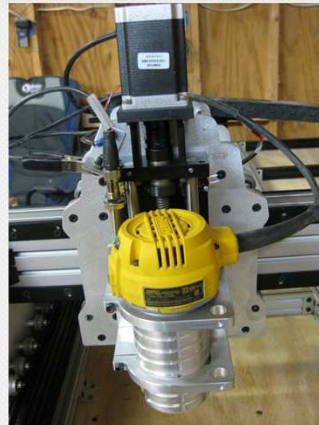
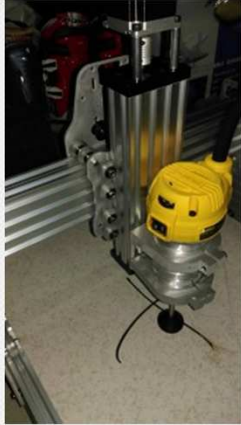


# Mount Motors



After all the motors have been tested and the wiring is complete, it is time to mount them in their respective locations. There will be one for the Z-axis (up and down) and one for the X-axis (along gantry). There will be two motors for the Y-axis that travels the length of the assembly. One day has been allocated for this.

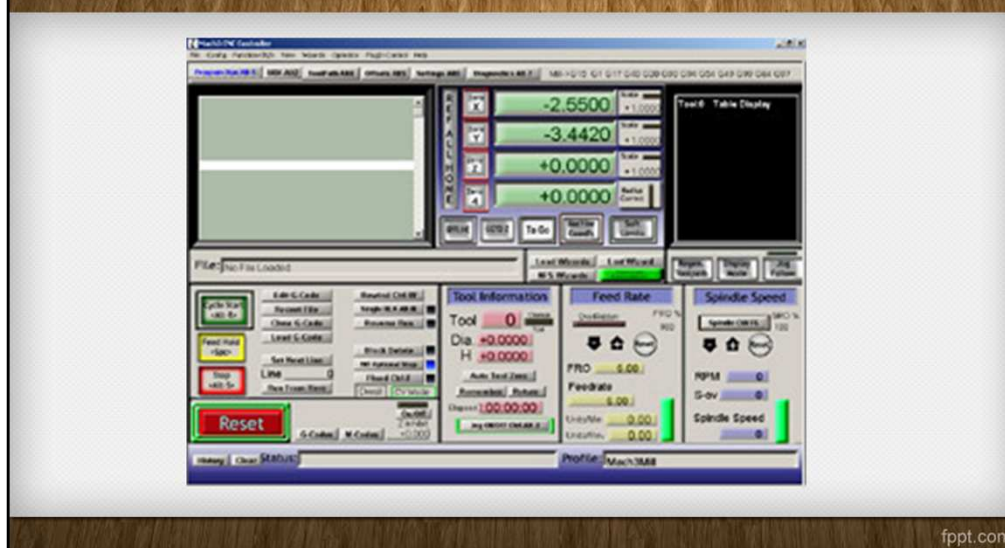
# Mount Router



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After everything has been assembled and tested it is time to put mount the router. This is the heart of the assembly and will do all the cutting so a solid mount is critical. Various bits can be interchanged in the router to provide different cutting patterns as required for each specific project. This step is estimated to take one day.

# First CNC Program



The program needs to be written for the first cut. The first program is the pre-requisite for the testing and troubleshooting stage. Twelve days have been allocated, but the majority of this time is expected to be utilized for the Testing and Troubleshooting stage that that will happen concurrently.

# Testing and Troubleshooting



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Testing will consist of small steps. Many smaller test pieces will be created to make sure each axis runs smoothly and correctly. This step will be performed without a cutter in the router. After all of the test runs complete successfully, a cutter will be installed and the first cut will be completed. Now the fun can begin!

# Acknowledgements



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Many of the pictures have come from the Open Builds website. They have given me the inspiration to step out in faith and try to build my own CNC router and I know if I have any questions along the way they will be there to assist me in my venture.