Project Tutorial

August Project: Custom Clock

Designs by Rick Frazier

Compatible with the Current Version of

VCarve | PRO & DESKTOP

Tick-Tock, it's time for you to have a custom clock in your shop. This Custom Clock features a chisel and hammer, clockface and an identification ribbon on an attractive shield. The sample was made using Walnut, Maple and Alder however, you might use woods of your own choosing. We recommend using any suitable hardwood. This is a nice project to do over a weekend. The finished dimensions of the clock are approximately 1.5" x 16" x 16."

The Instructions, crv. files and videos are found on Nextwave's Automation Website nextwaveautomation.com

This project is aimed at the woodworker with moderate to intermediate skills. You will need access to V-Carve 9.0 with updates, and the tools are listed below.

With the V-Carve software, open the project CNC files. Carefully review all the toolpaths and make necessary changes to suit your tools and machine. The toolpaths are currently set with tool, feeds and speeds that were used in designing the original project. Be sure to review them for your machine. Edit the tools and change the settings to fit you own machine and requirements. It is very important to recalculate all toolpaths after making any changes.

Once having made the necessary recalculations for your own machine and tools, reset the preview, and then preview all toolpaths again to visually verify the project outcome. Create the tap file for your machine by using the correct post processor. Once satisfied with your settings, save the tool paths using the appropriate Post Processor for your machine. Check tool paths by air cutting the project or use rigid foam board to run a sample tool path. If satisfied with the outcome, now you're ready to make your own Custom Clock!

Project material list:

2- 10"x5"x.75" Hardwood Blanks
1- 10'x6"x.75" Hardwood Blanks
1- 10"x5"x.5" Hardwood Blanks
1-16"x16"x.75 Hardwood Blanks"
Clear epoxy bar top coating
'Various grade of sandpaper
Spray Shellac
Clock kit and hands

Project Tool List:

¼" straight bit
¼" dia. 60^0 V-Carve bit
¼" ballnose bit
½" ballnose bit
½" straight bit
1/8" tapered ballnose bit
Sanding and finishing tools.

Project CNC Files:

Ribbon3.crv
Chisel3.crv
Claw Hammer3_1.crv
Clock Face New.crv
shield_2.crv

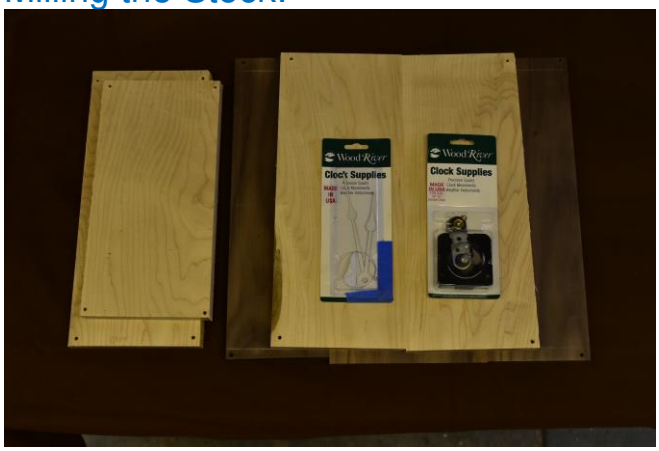
Video Files: found on nextwaveautomation.com

- Custom Clock Designing.mp4
- Custom Clock Machining.mp4

- Custom Clock Finishing and Assembly Part 1.mp4
- Custom Clock Finishing and Assembly Part 2.mp4

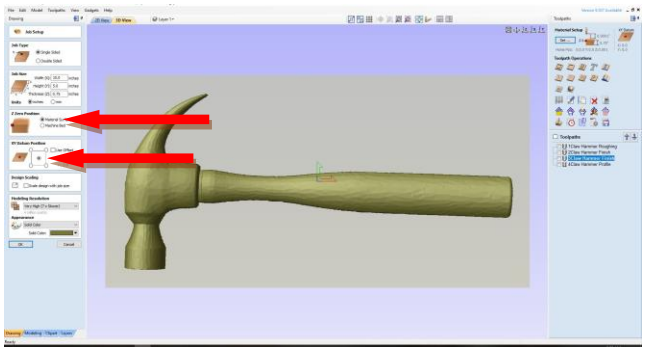
For more information on how to create the custom clock create tap files and how to modify the custom clock, watch the video Custom Clock Designing.

Milling the Stock:



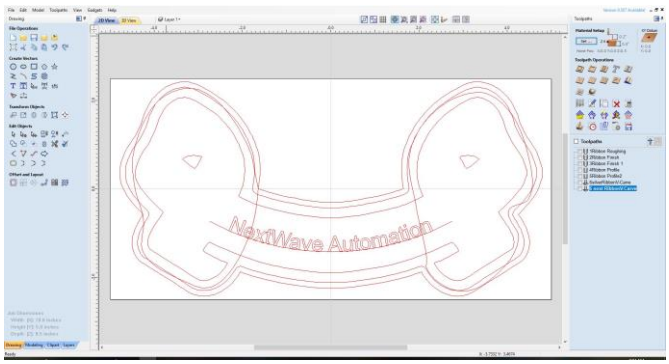
Mill all of you stock according to the material list. Use contrasting woods for the best effect. Clamp down to your blank to the spoil board I use screws in the corners. Now, you are ready for machining.

Step 1: Creating Tap Files:



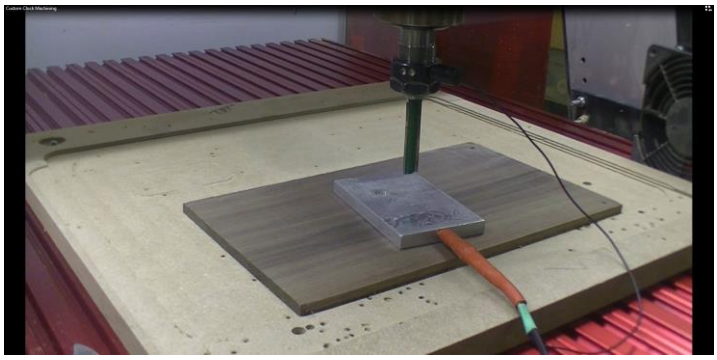
Make sure to have the following items checked in the Job setup menu to get the best results.

Zero position, Material Surface
XY position Center



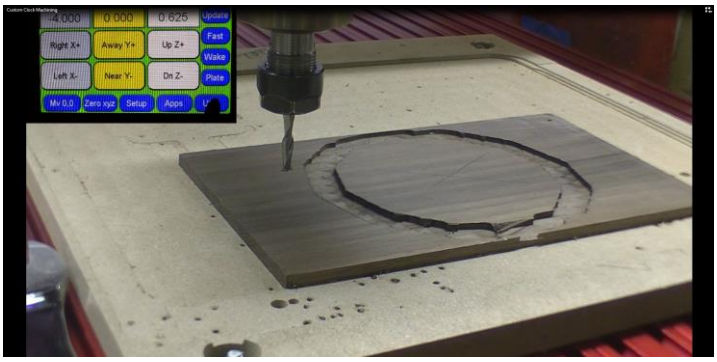
The first step in creating a tap file is to open a project file crv. Make necessary changes for styles and personal taste. Carefully review all the toolpaths and change to suit your tools and machine. Use the correct corresponding post processor to save the tap files. For this project you should be creating many tap files. When everything is prepared, go over to the tool path menu and save each of the tool paths. Each piece should have 3-6 tool paths.

Step 2: Machining the individual parts:

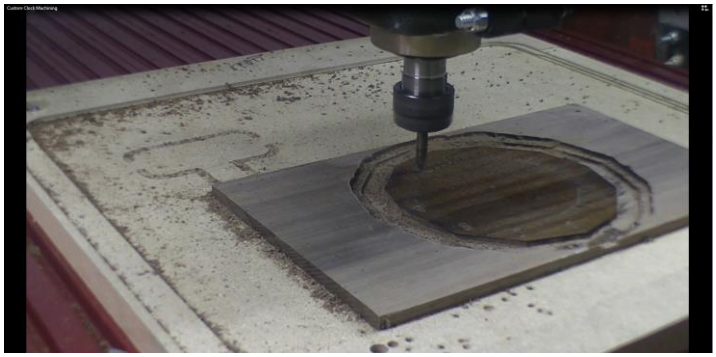


Mount the material so it is square with the X and Y axis. Secure in the corners with screw or clamps as in the figure above. Make sure the clamps or screws do not obstruct the bit during machining. Install the appropriate bit. Touch off the Z-axis on the “TOP of the Material” (see Reference Video).

Load the roughing tap file. Run the tap file with a router speed at 12,000 to 16,000 RPM.



Clean the fixture of all debris. Install a 1/4” bit. Touch off the Z-axis on the “TOP of the Material” (see Reference Video). Load the finish.tap file. Run the tap file with a router speed at 12,000 to 16,000 RPM.



Clean the fixture of all debris. Install a 1/4” 60o v-carve bit. Touch off the Z-axis on the “TOP of the Material” (see Reference Video). Load the V-Carve.tap file. Run the file with a router speed at 12,000 to 16,000 RPM.

Clean the fixture of all debris. Install a 1/4” bit. Touch off the Z-axis on the “TOP of the Material” (see Reference Video). Load the profile.tap file. Run the tap file with a router speed at 12,000 to 16,000 RPM
You will perform all of these tasks on all the individual parts.

Step 3: Machining the Shield and the clock works pocket:

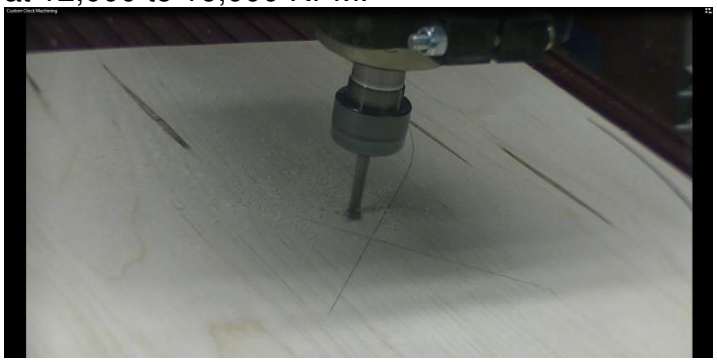
Machining the shield:
Vacuum the top of the fixture. Install the ¼ round nose bit. Touch off the Z-axis on the “TOP of the Material” (see Reference Video). Load the 1Shield Finish.tap file. Run the tap file with a router speed at 12,000 to 16,000 RPM.

Cutting V-carve:

Vacuum the top of the fixture. Install the ¼ 60o V-varve bit. Touch off the Z-axis on the "TOP of the Material" (see Reference Video). Load the 2 Shield Profile.tap file. Run the tap file with a router speed at 12,000 to 16,000 RPM.

Cutting Profile:

Vacuum the top of the fixture. Install the ¼ straight spiral bit. Touch off the Z-axis on the "TOP of the Material" (see Reference Video). Load the 3 Shield Profile1.tap file. Run the tap file with a router speed at 12,000 to 16,000 RPM.



Cutting the pocket:

Remove shield, flip the shield over (left to right). Vacuum the top of the fixture. Mount the shield. Install the ¼" straight spiral bit. Touch off the Z-axis on the "TOP of the Material" (see Reference Video). Load the 4Shield Pocket.tap file. Run the tap file with a router speed at 12,000 to 16,000 RPM.

Step 4: Removing the tabs, Epoxy inlay and Sanding the Custom Clock Parts:

Cutting Tabs:

Cut the Custom Clock Parts free from the blank by using a trim saw. Be careful some of the parts are fragile.

Epoxy Inlays:

Before completing epoxy inlays, always seal the project with a sealant the is compatible with the epoxy. This is so it seals the pores of

the wood and the paint or epoxy doesn't migrate. Mix the epoxy first then add the colorant. Thoroughly mix together. When applying make sure to fill all of the voids and eliminate all of the air bubbles. Allow to cure for 24 hours. Carefully sand flush with the top surface of the Custom Clock parts.

Sanding:

Using hand and machine sanding, sand with 120 grit sandpaper and remove any unwanted material from the detailed areas of the Custom Clock. Be careful not to oversand, it will take away features away on your Custom Clock. Sand everything down to with 240 grit sandpaper. Once satisfied with the sanding and detailing, of the Custom Clock prepare for finishing.

Step 6: Finishing the Custom Clock:

Clean and prep the Custom Clock for finishing. I tried a new finish, Alumilite Clear epoxy resin. This coating is resistant to chemicals and cures to a mirror like finish. It is a 1 to 1 mixing of part A and B. When mixing make sure you thoroughly mix the part A and B to avoid a mix that will not cure. Evenly coat the entire surface, letting it run over the sides. (see Reference Video). When you are satisfied with the surface, run you finger on the edges to smooth out. Use a propane torch to fan over the epoxy. This helps to release the bubbles form the epoxy. Allow to set for 24 hours. Coat the other side with polyurethane and you are done.

Hope you enjoy the making of this project. So, keep your creative juices flowing and come back next month for another cool project.

Happy Carving!
Rick Frazier