Next Wave Commemorative Chess Board

Design by Rick Frazier

Next Wave Automation is celebrating the 10th Anniversary of their "CNC Shark" by building a unique chess set. This unique set will be revealed one project each month, starting with a chess board, followed by individual pieces. 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 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. Don't use them directly until you review them for your machine. You can 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 you have recalculated for your own machine and tools, reset the preview, and then preview all toolpaths again to visually verify the project outcome. Then create the tap file for your machine using the correct post processor. Now you're ready to make your own Next Wave Automation 10th Commemorative Chess Board.

Next Wave Automation 10th Anniversary Chess Board

For this project we will be building an end grain Next Wave Automation Commemorative chess board. You will find a material list, tool list, videos and the V-Carve files to complete the project.

Project material list:

15 bdft Walnut (1 inch thick)

6 bdft Hard Maple (1 inch thick)

2 bdft Mahogany (1 inch thick)

3 bdft Poplar (1 inch thick)

Epoxy and White pigment

Polyurethane Clear

Project Tool List:

1/4" upcut straight bit

1/4" 60º V-Carve Bit

1 1/2" Flat/Planing bit

1/4" upcut round nose bit

Pocket Hole jig

Project CNC Files:

Chess Board Trim 1.crv

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Machining the materials:

You will need 12 pieces of walnut,
1"x 2 1/2"x 24"
You will need 12 pieces hard maple,
1"x 2 1/2"x 24"
Take the walnut, glued together in groups of three. Take the hard maple, glue together in groups of three. You should end up with 4 walnut groups and 4 hard maple groups, clamp them together let them set and dry. See Figure below.

Building the playing field:

Plane down all of the segments to 2"thick. Take care to make this as exact as you can. Now glue the segments together alternating walnut and hard maple. When this dries you can clean off the excess glue. Plane down to a thickness

of 2 ". Take care to make this as exact as you can.

Now it is time to cut the slab into 1 1/8" thick, end grain segments, cut more than you need to accommodate for mistakes and grain matching.
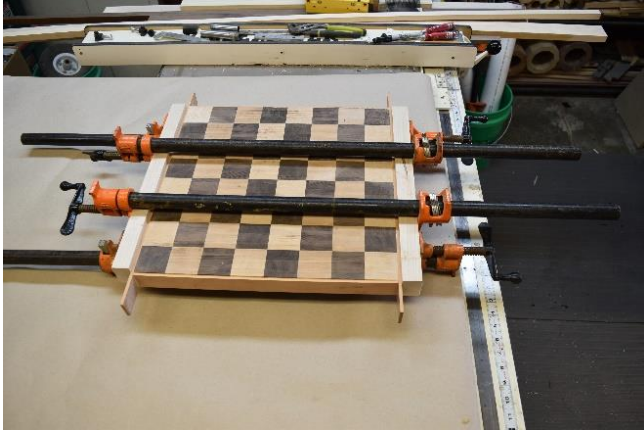

Take 8 of the end grain segments and glue them together to get a checker board pattern. Be careful to line the seams up. This is where careful machining of the segments will make a difference. After the glue has dried, you can now glue on the 3/8" thick mahogany border.

The Board should look like the Figure below.

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Surfacing the playing field:

Put the chess board field it in your CNC machine as flat as possible. Load the Surface Playing Field.tap file into the CNC machine and cut the field flat. Take a .010" cut, off the playing field; take more than one pass if needed. Turn the field over and repeat the surfacing process.

Playing Field Trim:

Glue up, cleanup and plane 4 Walnut boards 2½"x1½"x24" and 4 Poplar Boards 3"x3/4"x24".

Cut to the following sizes.
Cut 2 walnut boards to 21 ¾"
Cut 2 walnut board to 16 ¾ "
Cut 2 poplar boards to 16 ¾"
Cut 2 poplar boards to 10 ¾"

Cutting playing field dado:

Pick the best side of the playing field for the top. On the bottom side of the playing field cut a 3/8"x1/2" dado. This is for the playing field to set into the trim base.

Glue and pocket screw as shown below. Make sure that the bottom of the walnut borders is

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flush with the bottom of the poplar. This should leave a pocket for the playing field.


Machining the playing field trim:

It is really important that we get an accurate layout of the trim on the machine's X and Y axis. First face the trim using the file Surface Playing Field.tap file. After the walnut part of trim is leveled, now machine the pocket for the playing field, using the file, playing field pocket.tap. This will give us the correct depth of the pocket for the playing field.

We are ready to cut the profile on the walnut part of the trim using the file Board 1 trim profile.tap. Now run the file on the walnut part of the trim.

After we have the profile, the leveling and the pocket of the playing field done, we are ready to put the numerals and letters on. Using the file,

Board trim letter and numbers.tap cut the letters and numbers. Cut out the playing field trim with file Board Trim Cutout.tap
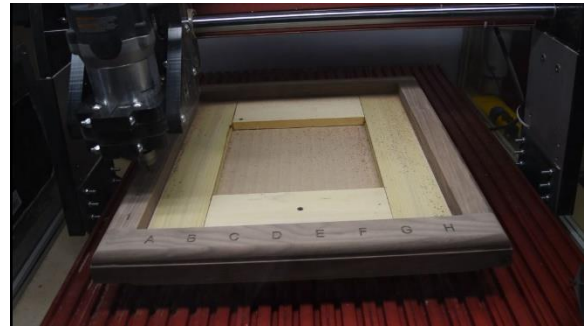
Filling in the letters and numbers:

To fill in the letters and numbers, put a coat of sealer on the walnut trim before applying the mixture of epoxy and white pigment. Mix the white pigment and epoxy mixture and carefully fill the cavities of the letters and numbers. Wait to dry and sand flush.

Assembly and finish:

Take all the components and prep for finish.

Sand everything down to with a 240 grit sandpaper. Apply polyurethane then sand the polyurethane with 400 grit sandpaper between coats to scratch surface. Sand with 800 grit sandpaper, before polishing.

Apply 4 tabs of clear silicone in the pocket of the trim, carefully centering the playing field in the pocket. Let the silicone dry.

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This is the Playing field for the chess pieces. The chess pieces will be revealed in the following months.