A Shop Guide to Making
RAISED PANEL DOORS
on the Router Table

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This article is a compilation of techniques taught for years in cabinetmaking classes. There are plenty of different techniques for making Raised Panel doors, but the details presented here are sure-fire.

**Parts of a Door**
The frame of a Raised Panel Door is made up of the *Rails* (horizontal pieces) and the *Stiles* (vertical pieces), which surround the *Panel*. When the panel has an edge shaped to fit into the Rails and Stiles it is called a Raised Panel.

**Routers and Bits**
Two-piece matched bits are recommended for machining the Rails and Stiles, and Raised Panel Bits with Backcutters for creating the Panels. Two-piece matched bit sets consist of two separate cutters with perfectly matching profiles. The big advantage with matched bit sets is that all the frame parts are machined face down, which improves alignment. For shaping the panels, using raised panel cutters with backcutters shape the panel front and back at the same time, giving you a perfectly fitting tongue every time.

A 1.5 HP or larger router is sufficient for the end-grain and long-grain cutters, but the raised panel bits require something different. You need at least a 2 HP router, and you must slow down the speed to less than 13,000 rpm. The router must also accept 1/2”- shank bits.

A rigid router table and fence combo is a must-have for making raised panel doors. You will also require dust collection, eye and ear protection.
The Bits

**End-Grain Cutter (#1)**
Used on the Rails to produce a tongue. Mark this bit with a “#1”, because you’ll use this bit first.

**Long-Grain Cutter (#2)**
Used on all the parts to make the groove that receives the rail tongue and the panel. Mark this bit with a “#2”, because you’ll use this bit second.

**Raised Panel Cutter with Backcutter**
Produces a tongue that fits perfectly in the Rail and Stile pieces, as well as a decorative edge for the face of the panel.

Many Styles Are Available...

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Make End-Grain Cuts First

*Begin by routing the end-grain of the rails. Here’s a trick to help you remember to make the Rails before the Stiles: “R” comes before “S” in the alphabet!*  
*Only the Rails get this end-grain cut.*

1. **Set the Height**  
Set the height of the end-grain cutter with a 3/4” thick test piece. Note that the top of the cutter is even with the top of the wood. This is a good starting point. You can fine-tune the height after making some test cuts.

2. **Position the Fence**  
Position the fence so it is flush with the ball bearing on the bit. Check by bridging a straight edge across the fence opening so it lays flush against the fence and the bearing touches the straight edge.

3. **Cut a Test Piece**  
Don’t cut all the way through the test piece until the bit height is correct - see next step.

4. **Check Your Work**  
The height of the router bit determines the depth of the shoulder and the thickness of the lip. The lip should be about half as thick as the depth of the shoulder. Don’t move on to cutting your frame pieces until this setting is correct.

5. **Rout All the End-Grain Cuts**  
Choose the best side of the wood and keep the good side face-down. Mark the back of all the frame parts to help keep track of this. Rout both ends of each rail.
Make Long-Grain Cuts Second

After all the rails are done, you’re ready to make the long-grain cuts. The inside edges of both the Rails and Stiles receive this profile.

Switch End-Grain Bit (#1) to Long-Grain Cutter (#2) - **BE SURE THE ROUTER IS UNPLUGGED!**

6 **Set the Height**
Set the height of the long-grain cutter using one of your correctly machined rail pieces. The top of the groove cutter should line up with the top of the tongue on the Rail piece.

7 **Cut a Test Piece**
Use featherboards on the fence to help hold your work down while routing, and use a push stick to move it through. Again, machine the parts with the good side face down.

8 **Check Your Work**
Try fitting a Rail into the test piece. The faces of the two pieces should be flush, or nearly so. Even with the most careful setup there may be a slight difference in the faces from piece to piece - just enough to catch on your fingernail. This is the result of inconsistent hold-down pressure on the rail cut. If the difference is small - let it fly; a little sanding will smooth it out. If there’s a large difference, adjust the long-grain cutter up or down and make another test cut. When the fit is good, machine all the frame pieces with the good sides face down.
Now Make The Raised Panels

*With all the frame parts complete, it’s now time to create the panels. Cut the panels to size and install the Raised Panel Cutter - BE SURE THE ROUTER IS UNPLUGGED!*

9 **Align the Tongue**
Align the tongue of a correctly machined Rail piece with the gap in the Raised Panel bit. Line up the top of the tongue with the bottom of the backcutter.

10 **Make a Test Cut** *(again on 3/4" thick stock)*
Using the straight edge again, make sure the bit’s rub collar is 1/4” behind the fence. Make a shallow first pass on a test piece. Next, set the fence flush with the bit’s rub collar and make a second, final pass.

11 **Check Your Work**
Insert the test panel into one of your Stile pieces. Using a straight edge, check to see if the Panel and the Stile are flush on both sides. If there’s a gap, adjust the height of the Raised Panel bit and make more test cuts - always in 2 passes.

12 **Make Your Panels**
Once everything is flush, cut all the edges of your panels in 2 passes. Cut the end-grain first, then the long grain. This helps eliminate tear-out at the corners.
Assemble the Raised Panel Door

*Sand all your parts if necessary, prefinish the panel and test the fit once more. Now you’re ready for the final assembly.*

13 **Assemble the Door**

Here is the easiest sequence for assembling your doors: (work on a flat surface)

1. Place the first Stile on your clamps.
2. Brush glue on to one Rail and slip it into the Stile, being careful to keep the outside edges flush.
3. Slip the Panel into the groove. **DO NOT GLUE IN THE PANEL** - it needs to float independently of the frame.
4. Glue and install the second Rail.
5. Brush glue on the Rail ends and install the second Stile.

14 **Tighten the Clamps**

Gently tighten the clamps until you see each joint squeeze shut. It takes very little pressure. Measure each diagonal to be sure the door is square and press the door down onto the clamps to keep it flat. Do not over-tighten or the door will bow. If your door is not square, angle a clamp slightly to correct it.

When the glue dries, you’ve got yourself a great door!

Time-Tested Tips...

- *Make your first Raised Panel Door from inexpensive, easy to handle wood, like Poplar. Save the correctly machined parts as setup templates for your next Raised Panel project.*

- *Make some ‘just-in-case’ pieces as you make your frame parts - having extras saves time in the end.*