Vondriska Woodworks
Door Making/Rockler Woodworking and Hardware

With the right set up and a few tricks, it's easy to make raised panel doors on the router table.

Door part formulas

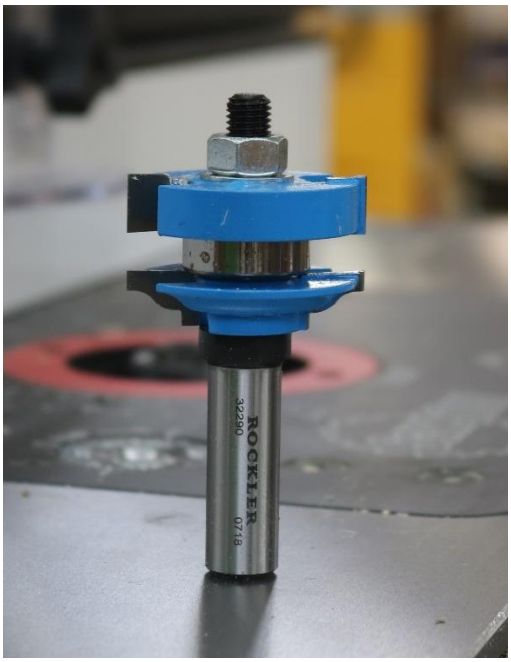
Length of stiles = height of opening + (2 X the overlay)

Length of rails = width of opening + (2X the overlay) – (2 X the stile width) + (2 X the tongue length)

Tongue length varies from manufacturer to manufacturer. Measure it for your bits.

Overlay amounts are commonly 1/4", 3/8", or 1/2". The gap on inset doors is 3/32" per side, which must be subtracted instead of added where overlay is referenced on the formulas.

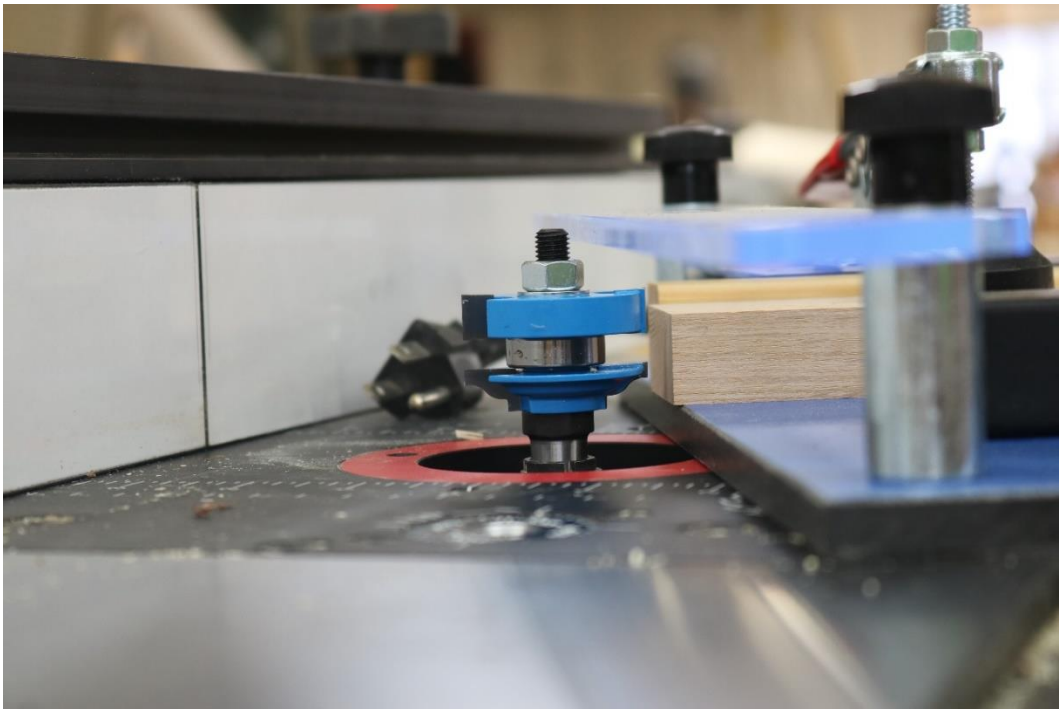
Be sure to unplug the router anytime you're making changes or adjustments to the router or router table.



Door frames are made with cope and stile bits. The cutter on the left does only the end grain cuts on the rails. The cutter on the right is for the long grain cuts on all the parts.

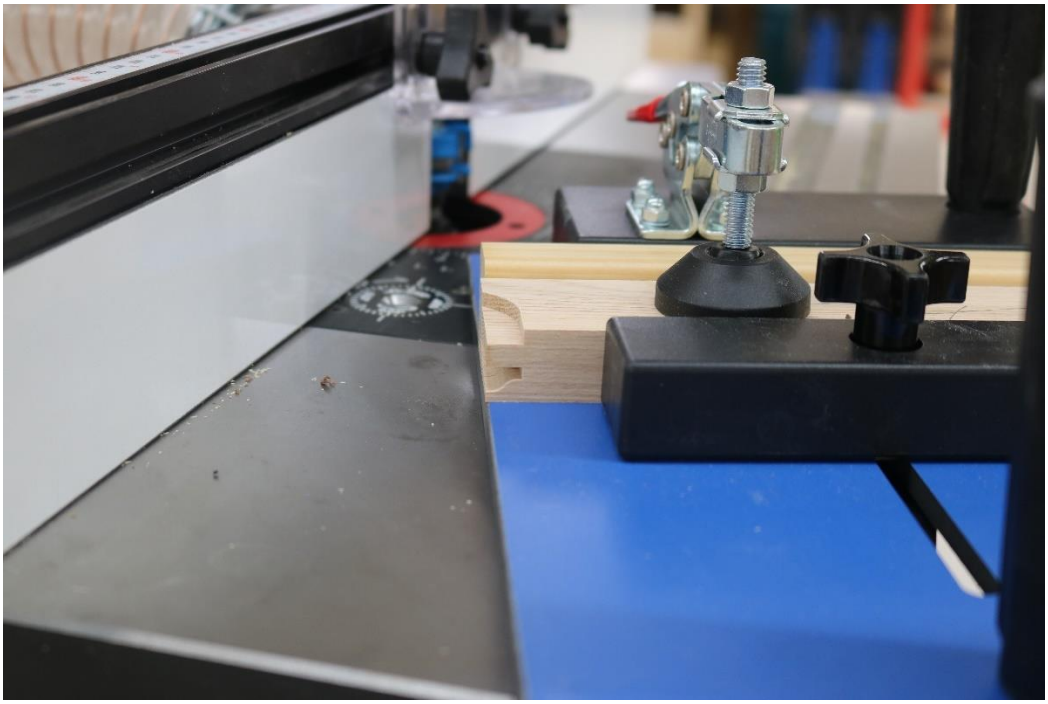
Using a felt tip marker draw a number 1 on the end grain cutter, and a 2 on the long grain cutter to remind you that you'll always use the end grain cutter first.

Cope the end grain

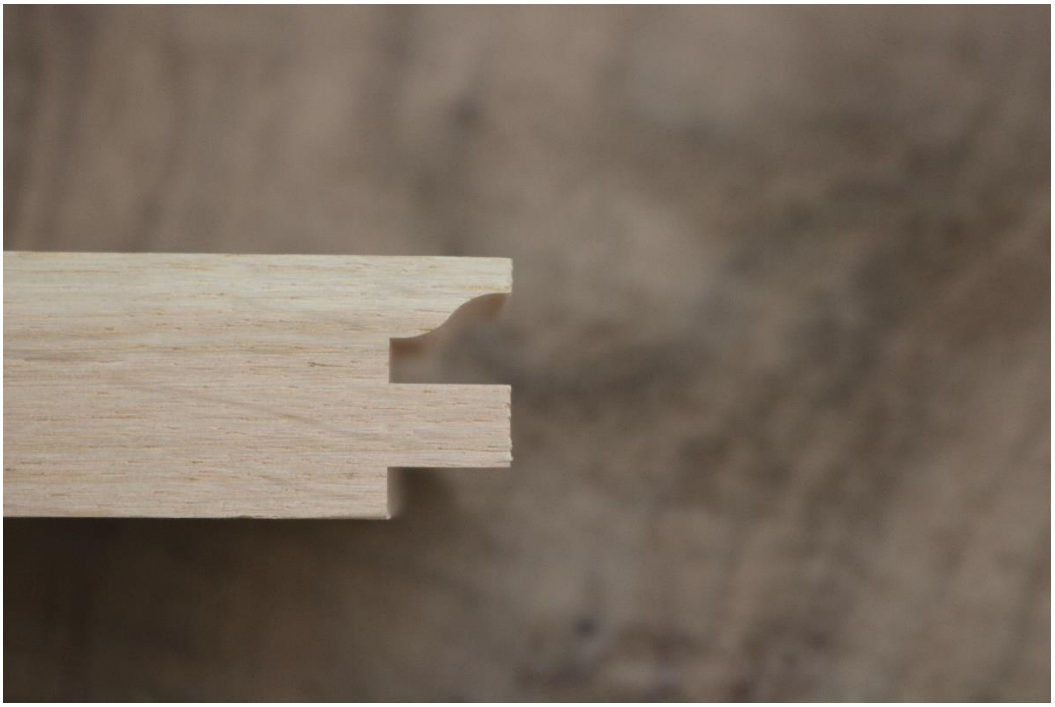


With a test piece in the coping sled, set the height bit number 1, the end grain cutter. Set this by eye, shooting for a balance between the lip on the front of the rails and the shoulder on the back.

Position the fence by spanning the opening in the fence with a straight edge and aligning the fence with the ball bearing on the bit.



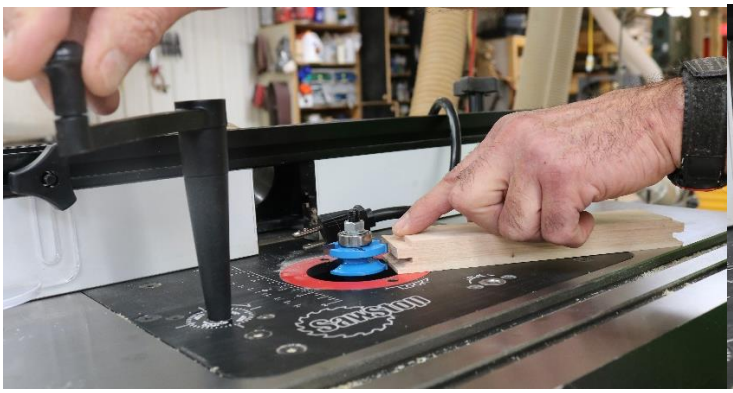
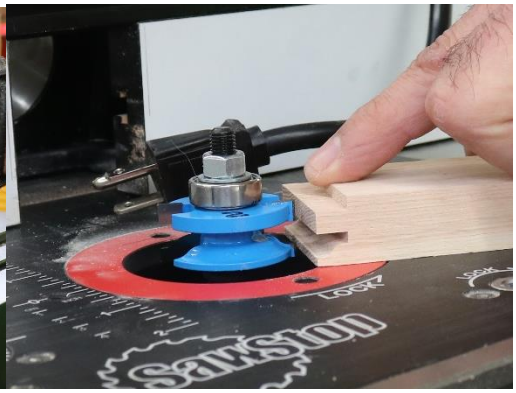
Cut your test piece, but don't cut all the way through it and into the backer.



When the height of the end grain cutter is right, the lip on the front of the door should be about 3/32" thick, and the shoulder on the back about 3/16" deep. Save a correctly cut test piece and use it to set the height of the bit the next time you make doors.

Mark the back faces of all your door parts. Using the coping sled, machine both ends of all the rails with the back, the marked face, up.

Make the long grain cuts

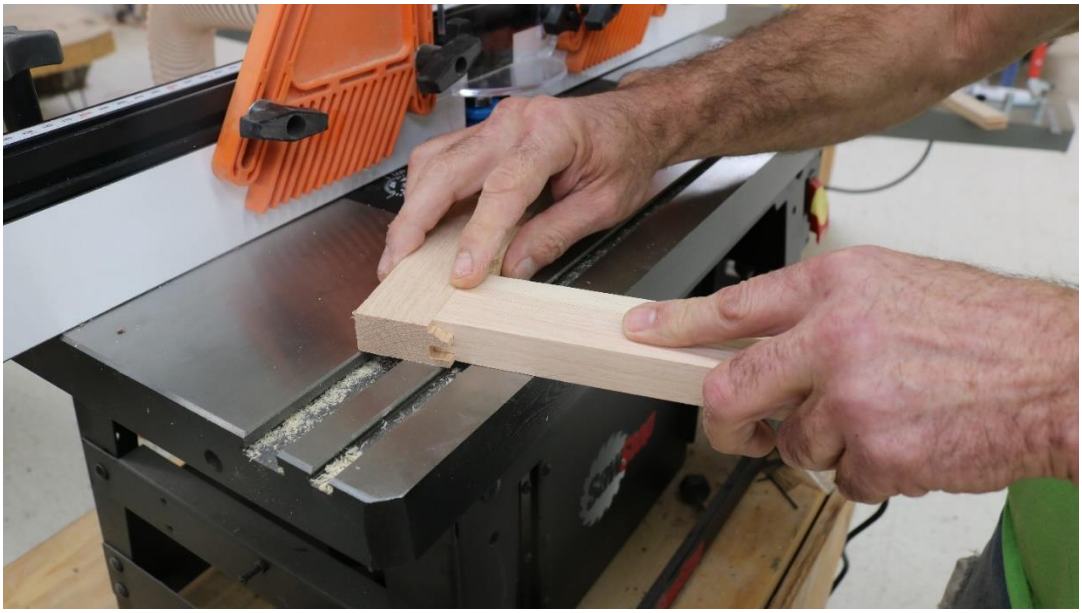



Install cutter number 2, the long grain cutter. Set its height by making the top of the carbide on the groove cutter even with the top of tongue on the end of the rail.

Make the face of the fence even with the ball bearing on the bit.

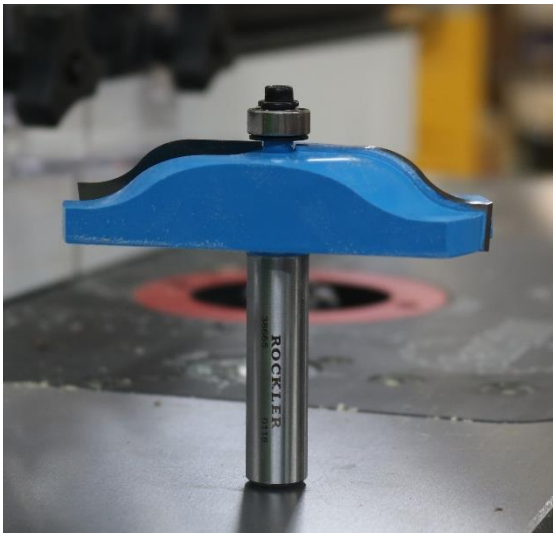
Add feather boards.

Cut a test piece and check your work. Use a push stick that allows you to put horizontal pressure, not vertical pressure, on the pieces. This helps prevent them from tipping and ruining the cut, especially on long pieces.

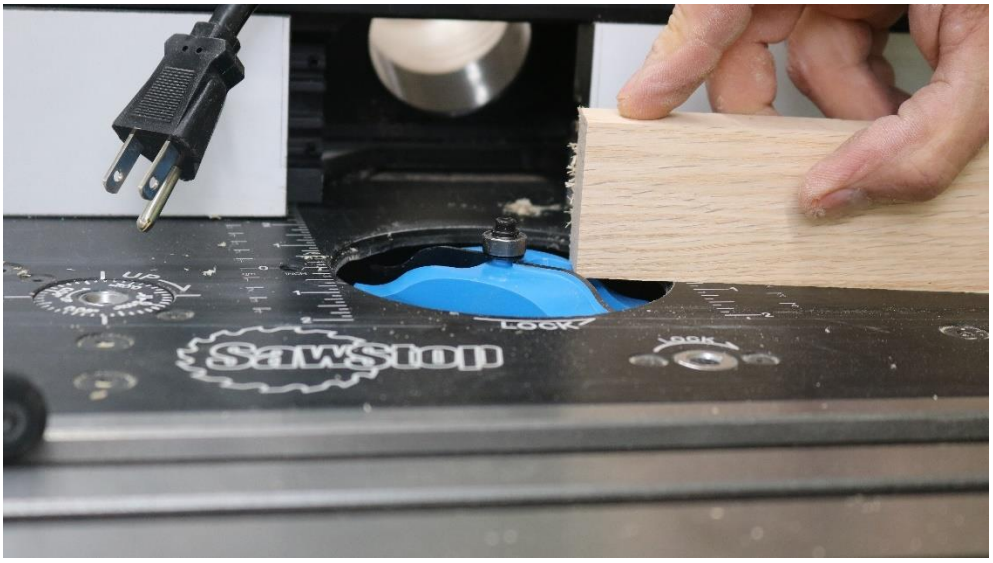


When the height of the long cutter is right, the face of the rail will align with the face of the mating piece. Don't worry about making it absolutely perfect. If there's a slight "fingernail catch" between the faces don't sweat it. It'll easily sand off later. When the height is right, do the long grain cut on all your door parts, keeping the marked face up.

Raise the panel



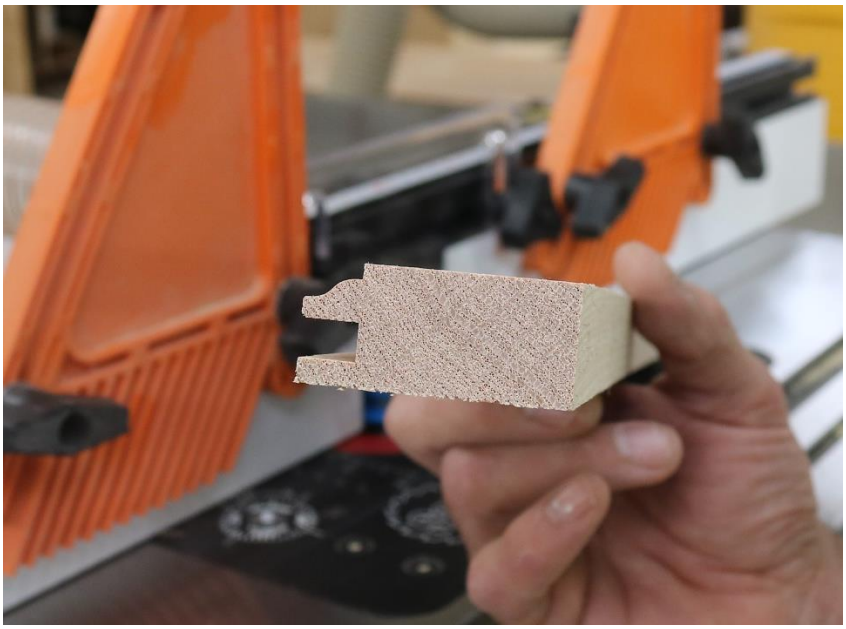
Before installing the large diameter panel raiser, lower the rpm of the router. Use the speed chart (Sources) to get the speed right.



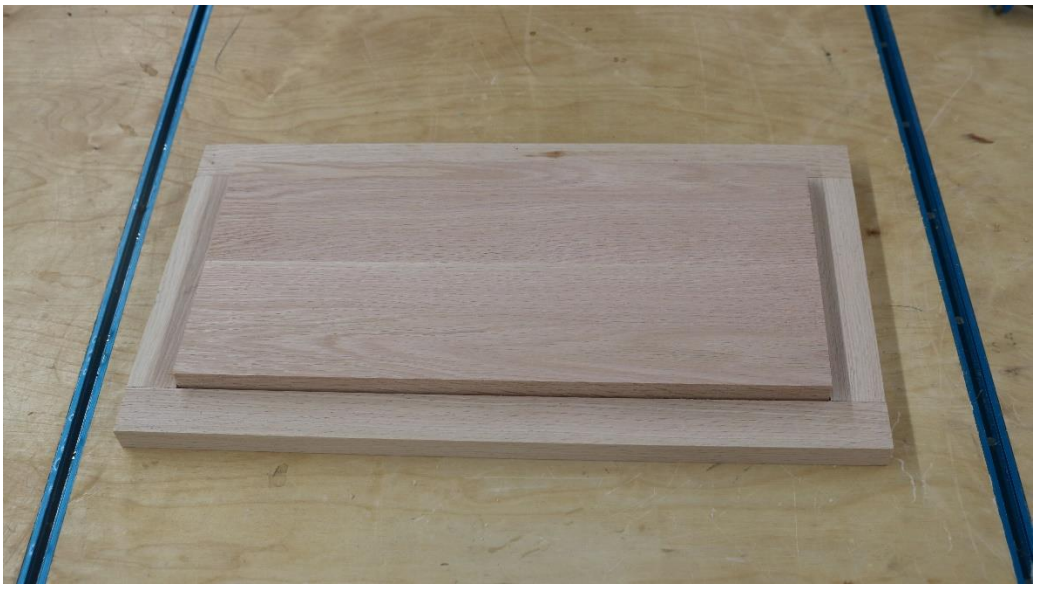
Set the height of the bit so its highest point is 1/8" above the table surface. Use a block of wood as a straight edge to gauge this.

Make the face of the fence even with the ball bearing on the router bit.

Measure for the panel. The panel should be smaller than the groove to groove distance to allow for expansion and contraction.



On many cope and stile sets the shoulder on the front of the frame aligns with the groove in the frame. This makes it easy to measure for panels. Dry fit the door and measure from shoulder to shoulder.



If your panel fits in the shoulders on the front of the frame, it'll fit in the grooves. Mark the back face of the panel.

Raise the panel, making multiple light passes, with the marked face up. Cut in this sequence; end grain, long grain, end grain, long grain. This sequence allows the long grain cuts to clean up any chipping on the exit side of the end grain cuts. Raise the bit, make another pass, raise the bit make another pass….until the edge of the panel fits the groove in the frame.

There are various approaches to raising panels. If the panel is the same thickness as the frame you will probably need to cove cut the back side of the panel; top panel here. If the panel is thinner than the frame you can skip the back cut.

Assemble your door. Don't glue solid wood panels into the frame. This prevents them from expanding and contracting. Use Space Balls to prevent the panel from rattling in the frame.

Sources

Router Bit Diameter	Maximum Speed (RPM)
Up to 1"	22,000 - 24,000
1" – 2"	18,000 – 22,000
2" – 2-1/2"	12,000 – 16,000
2-1/2" – 3-1/2"	8,000 – 12,000

IsoTunes Pro hearing protection Amazon.com

Ogee Cope and Stile set Amazon.com

Ogee 3-1/2" panel raising bit Amazon.com

Feather boards Amazon.com

Push stick Amazon.com

Push pad Amazon.com

Space Balls Amazon.com