Entry And Passage Door Router Bit Set

Congratulations on your purchase of Freud's Entry & Interior Door Router Bit System. This unique set allows you to build high quality 1-3/4" thick exterior doors or 1-3/8" thick interior doors, plus beautiful sidelights and transoms in almost any size or style.

Safety Tips

Creating your own entry or passage door is a fun and rewarding woodworking project that enables you to add curb appeal or distinction to any door of your home. As with any woodworking project, however, your first concern must always be safety. To get the best performance and results from your Freud cutting tools, observe these safety recommendations for EACH operation:

- Make sure that you are well rested before working with power equipment.
- Do not use power equipment if you have consumed any drugs or alcohol. If you are taking prescription medication, check with your physician to ensure it is safe for you to operate power equipment.
- Never use a router bit that is damaged or dull.
- Always turn off and unplug the router before removing and installing router bits.

⚠ **WARNING:** Failure to obey these warnings could lead to serious bodily injury or death:

- Use router bits with a router only
- Carbide is a very hard and brittle material. Slight shocks can damage the carbide. Before each use, check that the bit is sharp and free from damage. DO NOT use the bit if it is dull, broken, cracked or if any damage is noticed or suspected
- Before each use, make sure that at least 80% of the router bit shank is inserted into the collet. The end of the bit shank should be at least 1/8" from the bottom of the collet.
- Before each use, ensure that the collet has been tightened and that the work piece is secure.
- Read and obey all warnings and instructions contained in the router's user's manual, and for any accessory that is used. If you do not have the correct user's manual, obtain one from the manufacturer before using the router bit.
- Always wear eye protection or a full face shield complying with current ANSI Standard Z87.1
- Keep body, clothing and hair clear of spinning bit. Do not wear loose hanging clothing or jewelry.
- Use a router table and fence wherever possible. Be sure all guards are in place.
- Bits over 1-1/2" in diameter must only be used with the router mounted in the table.
- Use multiple passes when removing large quantities of material.
- Never use bit on router that will exceed maximum recommended RPM of bit.
- If you have any questions regarding your router bits, please call Freud Customer Service at 800-472-7307. In Canada call 800-263-7016.
- Before making any structural alterations to your home, consult a licensed general contractor, licensed architect or professional engineer.
- Be sure to consult your local building authority before proceeding with your door project.
- Keep these instructions in a safe place for future reference.

⚠ **WARNING:** Always unplug router before changing bits or making adjustments.

Routing the Door, Sidelight and Transom Parts

1) Routing rail ends with stub tenons:
a) Install the rail bit into the router collet. The rail bit has two cutters separated by a ball bearing.

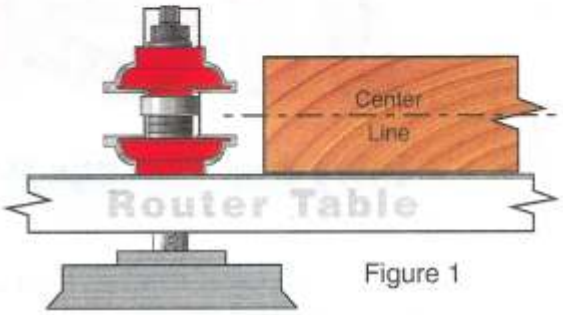

Figure 1

b) Setting the bit height and making a test cut:
• Set the height of the bit so that it is vertically centered in your stock, as shown in Figure 1.
• Use a straight edge to align the router table infeed and outfeed fences with the bearing on the bit.
• Be sure that the fence is parallel to the miter gauge track.
• Make a test cut across the end of a test piece of stock by using a miter gauge to feed the stock perpendicularly across the cutter.

Tip 1: Make the opening between the infeed and outfeed fence as narrow as possible (without touching the cutter) to provide maximum support.
Tip 2: Use a backer board on the sled or miter gauge to reduce the chance for blow-out at the back end of the cope cut.

c) Fine tune the cutter height as needed to center the profile in the workpiece:
• If the profile is below the center of the workpiece, raise the bit slightly.
• If the profile is above the center of the workpiece, lower the cutter slightly.
• Hold the test cut stock against the cutter to ensure that the end of the tongue was touching the cutter bearing when the cut was made.

d) Making the rail end cuts:
• With the good or "face" side of the rails facing down; make the rail end cut on each end of all rails.

2) Routing rail ends with long tenons:
a) Removing the top section of the Rail Bit and setting the fence:
• Engage the router's shaft lock or use a wrench to hold the router shaft.
• Use the included ¼" hex wrench to remove the upper portion of the rail bit, as shown in Figure 2. Do not change the height of the router or the lower section of the router bit!

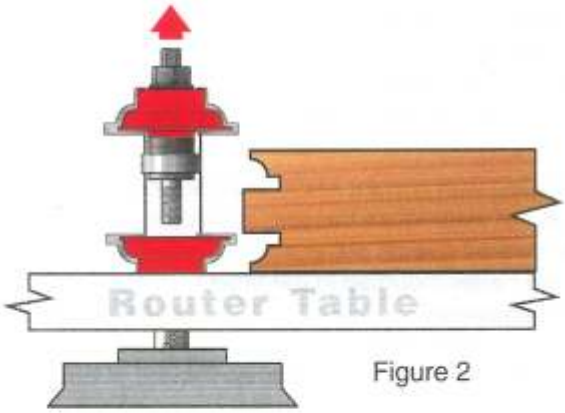

Figure 2

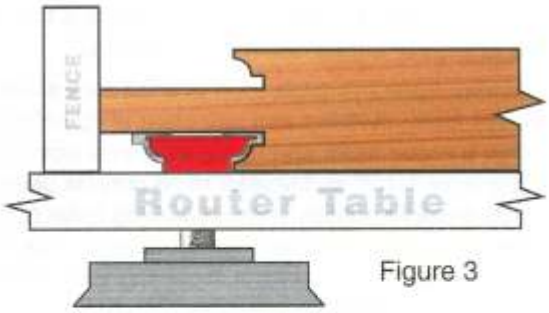

Figure 3

• Thread the flathead screw included with your set into the base of the rail bit. This will prevent dust and chips from falling into the threaded hole. Tighten the screw securely.
• Long tenons should be routed in multiple passes. Begin by moving the fence back 1/2" from the position used for the stub tenons.
• Be sure that the fence is parallel to the miter gauge track

b) Making the first cuts for long tenons:
• Use a miter gauge, and with the good or "face" side of the rails facing down; make the rail end cut on one side of each end of all rail parts that are to have long tenons.
• Turn the stock over and make the rail end cut on the other side of each rail.

c) Completing the cuts for the long tenons (Figure 3):
• Repeat steps 2a and 2b until the tenon is the desired length.
• Remove the flathead screw from the threaded recess in the lower portion of the rail bit.
• Thread the upper portion of the rail bit back into the lower portion of the rail bit and tighten with the included ¼" hex wrench.
• Remove the rail bit from the router and store it safely.

3) Routing profile on stiles and rails:

Note: Because door and sidelight stiles and transom rails are very long and heavy, you must take extra care in the set up of your router table. Be sure that the router table is stable and will not tip over in use and provide support for the work piece on both the infeed and outfeed side of the table. Adjustable roller stands are an excellent choice for infeed and outfeed support. Use two or more featherboards, such as Freud #BF3510, to hold the workpiece down on the table and in against the fence.

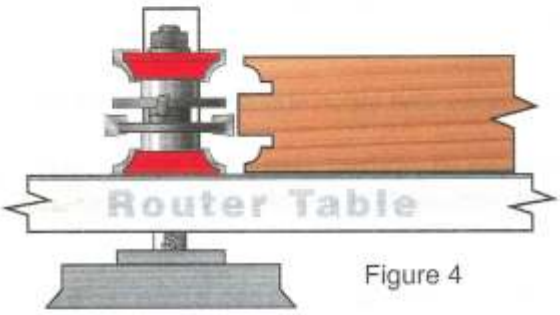

Figure 4

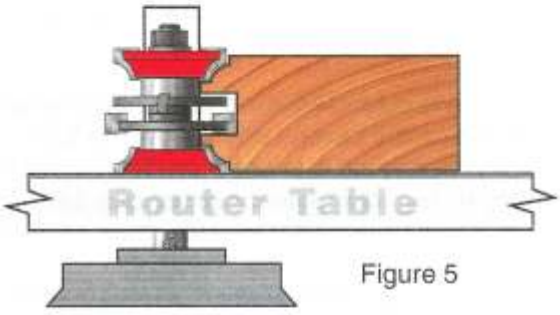

Figure 5

a) Install the stile cutter. The stile cutter has two profile cutters separated by two groove cutters and two bearings.

b) Setting the cutter height and making a test cut:
• Use one of the completed rail end cuts with a stub tenon on the end of your rails as a guide to set the cutter height.
• The top of the groove cutter and the top of the tongue on the rail end cut should be perfectly aligned as shown in Figure 4.
• Make the cut in two passes, setting the fence to remove 1/2 of the stock on the first pass.
• Make a cut along one edge of a test piece of stock.
• Use a straight edge to align the router table infeed and outfeed fences with the bearing on the bit, then make the second pass (Figure 5).

c) Fine tuning the cutter height:
• Test fit the rail end cut into the stile cut on the test piece. Both sides should be flush
• If the height is not right adjust the cutter up or down.
• Make another test cut and repeat the procedure until you achieve the correct alignment.

d) Making the stile or profile cuts:
• With the good side of the rails and stiles facing down, rout the stile profile on one edge of each rail and stile part. Mid rails and center stiles should be routed on both edges. Use two passes to make these cuts, just as you did when routing your test piece.

Tip: Before routing, mark which edges of each part should be routed.

4) Finish the mortise and tenon joints:

a) First, carefully "haunch" the tenons as shown in as shown in Figure 6. This step produces a stronger and more attractive joint and conceals the tenon within the end of the stile. Cut the haunched tenon with a band saw, jig saw or handsaw.

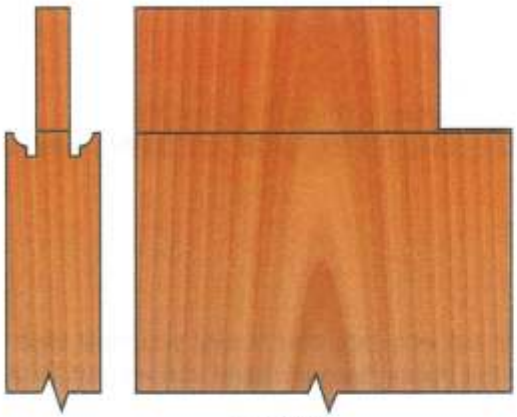

Figure 6

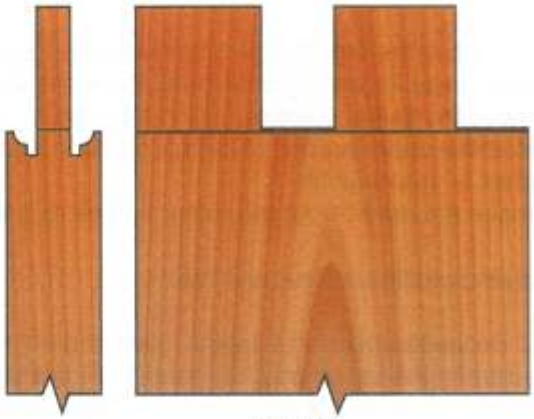

Figure 7

b) For wide tenons such as those in the bottom rails, divide the tenon into two parts as shown in Figure 7. Using a band saw, jig saw or coping saw, cut a 1-1/2" space between the tenons.

c) Lay out and cut mortises in the door stiles to accept the tenons. The tenon should fit snugly into the mortise. There are several ways to cut mortises:

- The easiest method is to use a mortiser or drill press mortising attachment. Use a 5/8" hollow chisel mortising bit for 1-3/4" exterior doors, or a 3/8" hollow chisel mortising bit for 1-3/8" doors. If your mortiser will not accept 5/8" chisels, make multiple cuts with a smaller chisel.

- If you don't have a mortiser or mortising machine, an alternative technique is to use a brad point bit or forstner bit (5/8" diameter for exterior doors, 3/8" for interior doors) in a drill press to remove most of the stock for the mortise, and then use a chisel to remove the remaining stock and to "square up" the mortise. Carefully center the brad point bit in the groove and drill only about 1/16" deeper than required for the tenon.

If your bits are configured for routing 1-3/4" thick exterior doors, follow these steps to reconfigure the bits for 1-3/8" interior doors:

On the rail or cope bit,

- Use a 1/2" wrench to loosen the nut on the top of the bit.
- Carefully remove the upper cutter and bearing. Make note of the position of the thin shims between the bearing and upper cutter.
- Remove the two 1/8" thick spacers.
- Replace the bearing, shims and upper cutter.
- Place the two 1/8" spacers on top of the upper cutter.
- Replace the nut and tighten securely.

On the stile or stick bit,

- Use a 1/2" wrench to loosen the nut on the top of the bit.
- Carefully remove the upper cutter, upper bearing and upper slot cutter. Make note of the position of the thin shims between the cutter, bearing and slot cutter.
- Remove the two 1/8" thick spacers.
- Replace the slot cutter, shims, bearing and upper cutter.
- Place the two 1/8" spacers on top of the upper cutter.
- Replace the nut and tighten securely.