

Through Dovetail Procedures



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In these instructions for using the Leigh Superjig dovetail Jig, we recommend using certain bits and board sizes just because they are easy to work with. When you have cut some practice joints and gained confidence in your ability to get the results you want, feel free to use the bit selection charts on the following page and in Appendix II, to plan whatever dovetail routing you need for your projects.

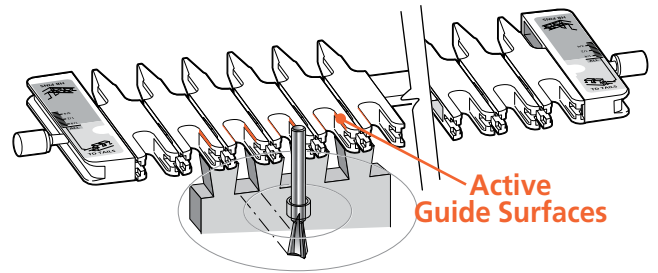
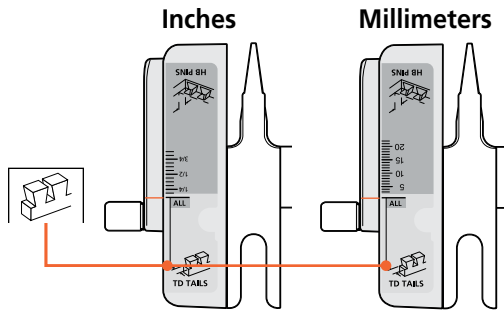
Concept of Jig Operation – THROUGH DOVETAILS

All Super Jig Through Dovetail tail bits have an 8° angle. This angle matches the 8° angle cast into the pin end of each guide finger. Start with the Finger Assembly in the TD TAIL mode and follow these steps on your jig. Grasping the simple basic concept of operation will now greatly assist you in understanding the instructions. *Note that the active guide surface (against which the guidebush runs) is indicated in red in these illustrations. Note: The e7 eBush is always set to 10 for through dovetail routing.*

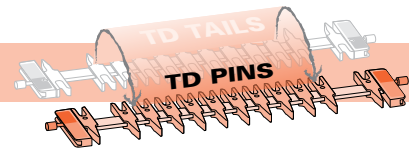
1 Start in Through Dovetail Tails (TD TAILS) mode

MODE ICONS

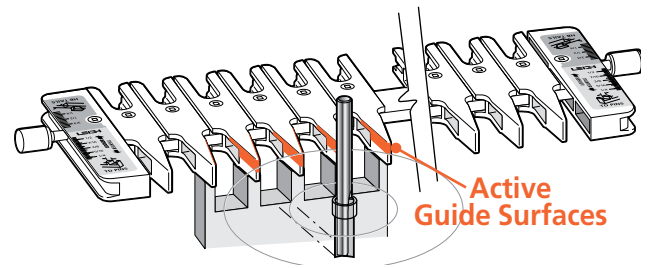
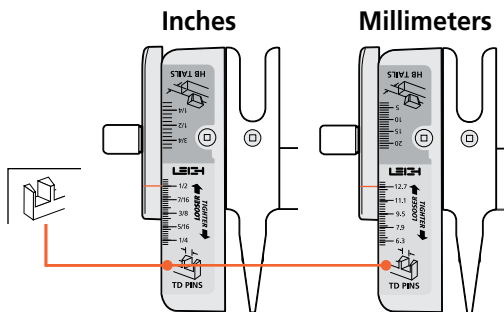
Illustrations in this user guide include the correct mode icon for the current instruction. The icons are also used in the instruction text.



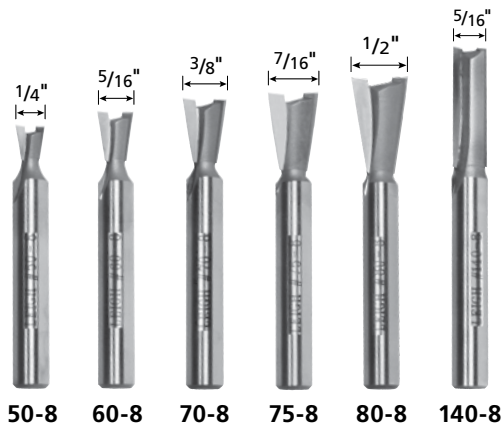
2 ROTATE the finger assembly toward you 180°



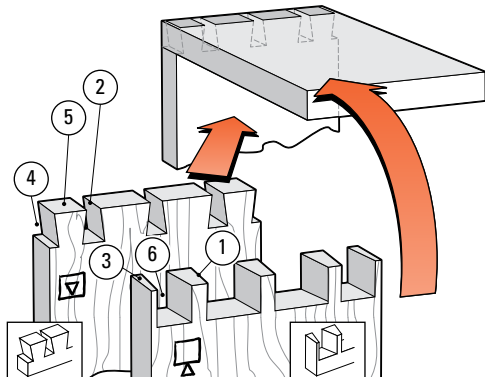
3 Now the Finger Assembly is in Through Dovetail Pins (TD PINS) mode



Through Dovetail Bit Selection



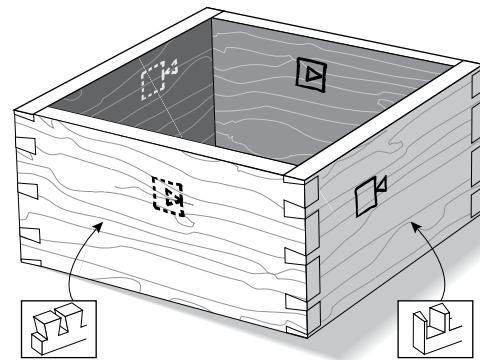
| THROUGH DOVETAIL BIT CUTTING DEPTH | | | | | | |
|--|------|-----------------------------|------|------|------|-------|
| All through dovetail bits have 8° angles. All carbide bit heights are slightly greater than maximum depth of cut listed. | | | | | | |
| Bit No. | 50-8 | 60-8 | 70-8 | 75-8 | 80-8 | 140-8 |
| Depth of Cut | 1/8" | [Diagram showing cut depth] | | | | |
| | 1/4" | [Diagram showing cut depth] | | | | |
| | 3/8" | [Diagram showing cut depth] | | | | |
| | 1/2" | [Diagram showing cut depth] | | | | |
| | 3/4" | [Diagram showing cut depth] | | | | |
| | 5/8" | [Diagram showing cut depth] | | | | |
| | 7/8" | [Diagram showing cut depth] | | | | |
| | 1" | [Diagram showing cut depth] | | | | |



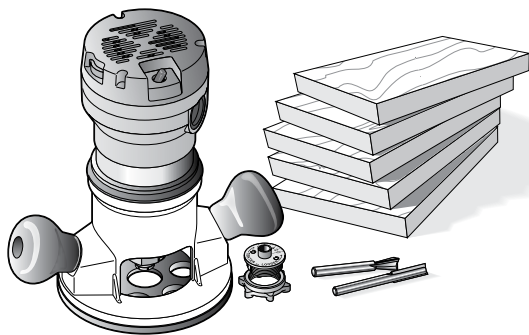
8-1 Through Dovetail Terminology:

- ① Pins
- ② Pin sockets
- ③ Half-pins
- ④ Half-pin sockets
- ⑤ Tails
- ⑥ Tail sockets

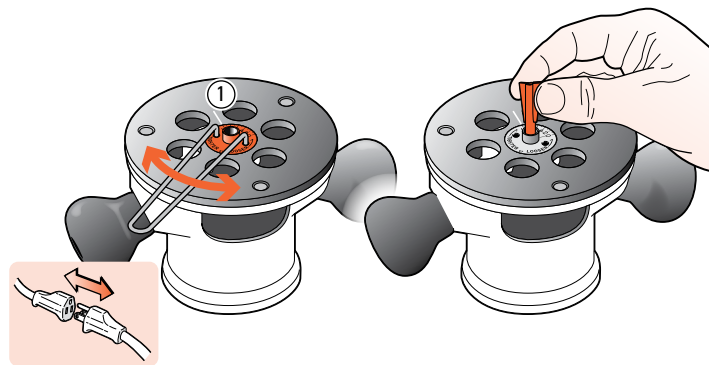
The pins fit in the pin sockets. Joints should almost always end each side with half-pins.



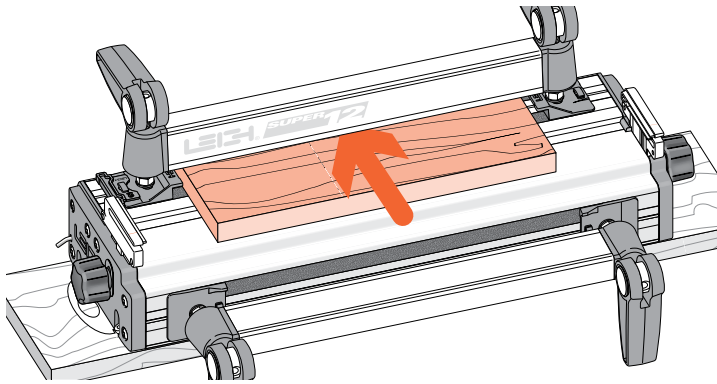
8-2 Let's look at how to make a simple square box. When you assemble the finished pieces with the faces properly oriented, then any one of the pin ends will fit any one of the tail ends. In fact, the box can be put together in six different ways.



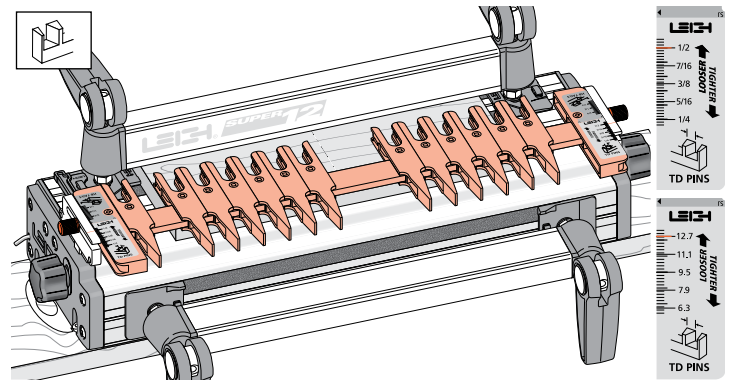
8-3 For this trial you need five identical boards $\frac{3}{4}$ " x $5\frac{1}{2}$ " [20x140mm] x about 8" [200mm] long. Mark inside faces for two tailboards and outside faces for three pinboards (one pinboard is a spare). Use the e7-Bush, the No. 80-8 $\frac{1}{2}$ " [12,7mm] x 8° dovetail bit and 140-8 $\frac{5}{16}$ " [7,9mm] straight bit (all included with Superjig). *Note: $\frac{13}{16}$ " [20mm] is maximum through pin board thickness.*



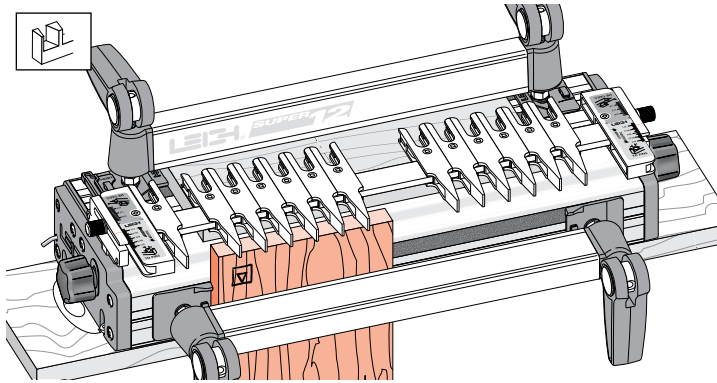
8-4 Fit the E-7 guidebush to the router. Align the No. 10 mark with the base mark ①. No guidebush adjustment is required with through dovetails. If you have a router that is incompatible with the e-Bush, you can use a standard $\frac{7}{16}$ " [11,1mm] guidebush (min. depth $\frac{1}{4}$ " see page 67) for through dovetails. Then fit the supplied 80-8 dovetail bit to the router.




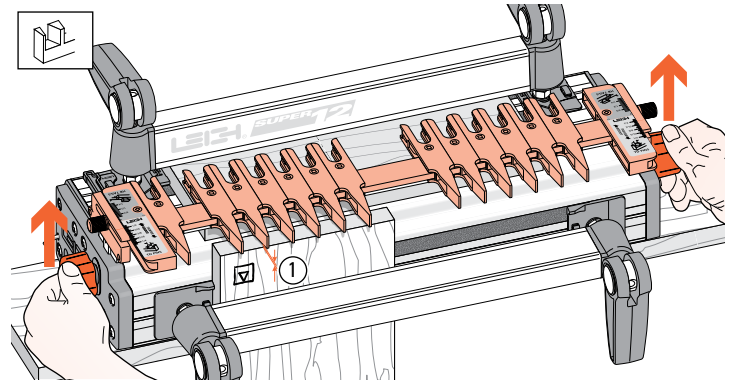
8-5 Clamp the finger support board in the rear clamp. See Chapter 1, section 1-12.




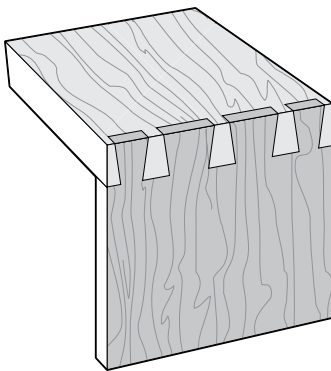
8-6 Place the finger assembly on the support brackets in the TD PINS mode, flat on the spacer board, and with the scale set on the $\frac{1}{2}$ " [12,7mm] setting for now. Don't worry about the scale's specific meaning now. Each scale's use will be fully explained in the appropriate section.



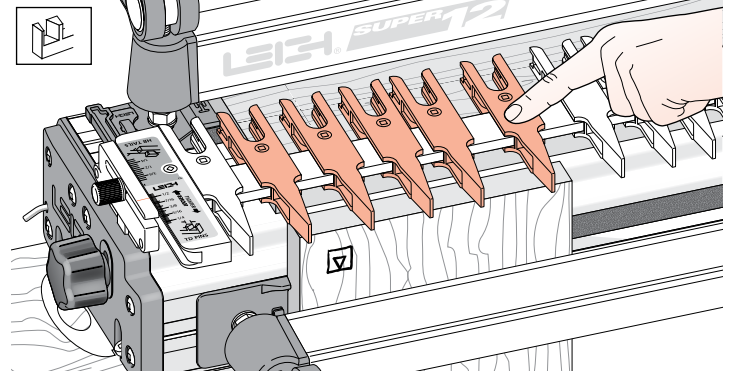
8-7 Clamp a tail board against the left front side stop, top edge touching flush under the guidefingers, inside face  away from the jig body. Although you will cut tails first, adjust the guidefinger layout in TD PINS mode. The adjustment screws are on top in this mode, and it's easier to visualize the finished joint pattern.



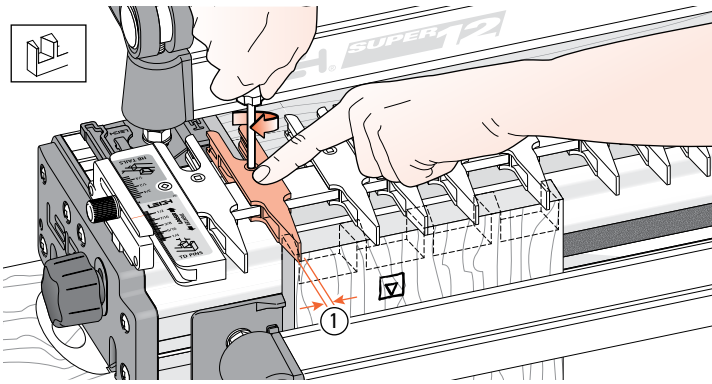
8-8 Loosen the support bracket knobs and raise the finger assembly about $\frac{1}{16}$ " [2mm]  above the boards, then re-tighten the knobs. This will allow easy and accurate guidefinger adjustment.



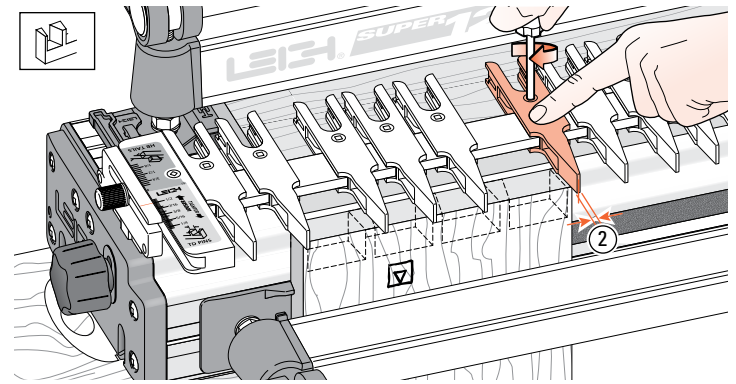
8-9 This joint layout is just a suggestion for this trial. It has a typical, traditional **symmetrical** pin layout, with half-pins at each edge. The Superjig however, allows for infinite dovetail spacing. Also, boards of different thicknesses can be joined to each other as shown in this illustration. Before attempting an **asymmetrical** joint layout, see chapter 12.



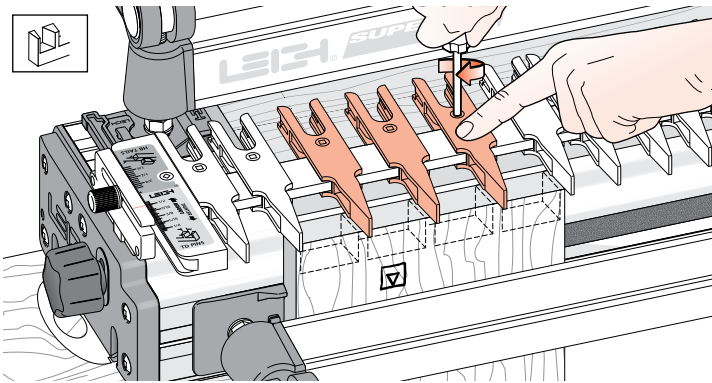
8-10 Ignoring the extreme outer guidefinger next to the scale (it just supports the router), loosen the next five guidefingers and slide them over the top of the workpiece.



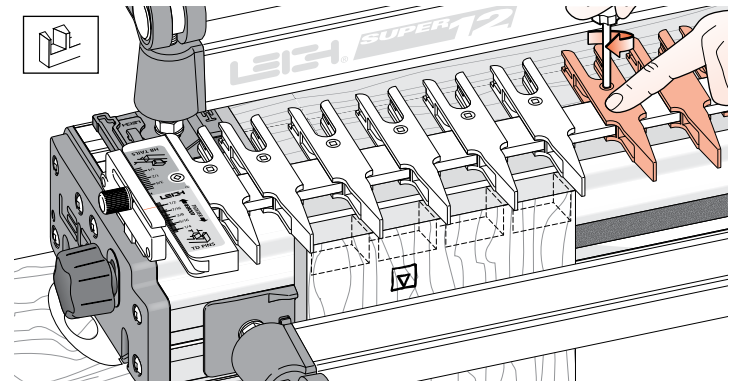
8-11 Lock the leftmost guidefinger with its center-line about $\frac{1}{8}$ " [3mm] ① in from the left edge of the board to form a half-pin.



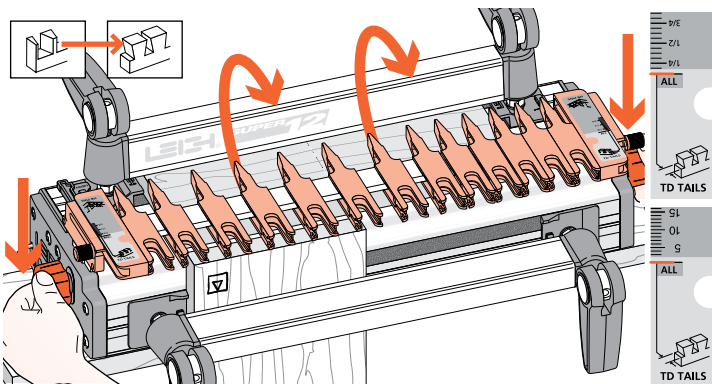
8-12 Leave three guidefingers over the board. Lock the rightmost guidefinger with its center-line about $\frac{1}{8}$ " [3mm] ② in from the right edge of the board to form the other half-pin. Judge this distance by eye: it need not be exact. The sockets and pins will align automatically.



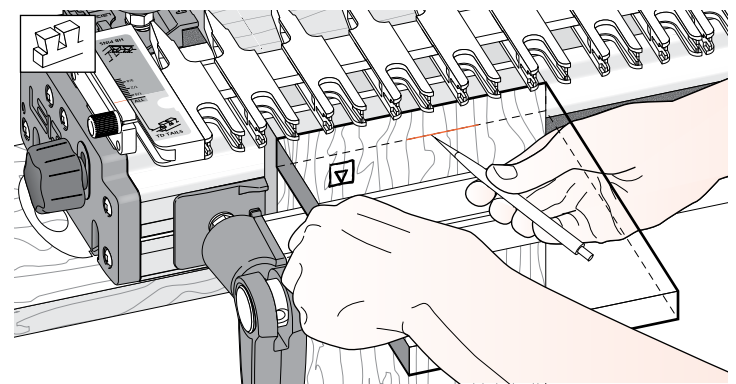
8-13 Space and lock the three remaining guidefingers as shown. Again, judge it by eye. If it looks right on the jig, the finished joint will look right.



8-14 Tighten any other loose guidefingers.



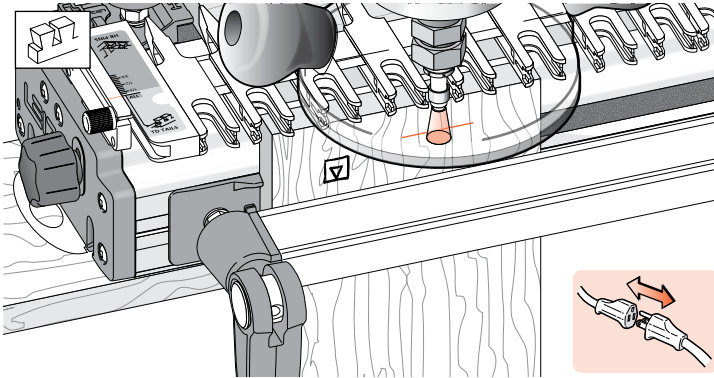
8-15 Rotate the finger assembly to TD TAILS mode, and set it to the "ALL" position on the scale. Lower the finger assembly onto the spacer board and tighten the support bracket knobs. All TD tails are routed at this "ALL" setting. (This setting allows the dovetail bit to pass completely through all tail boards.)



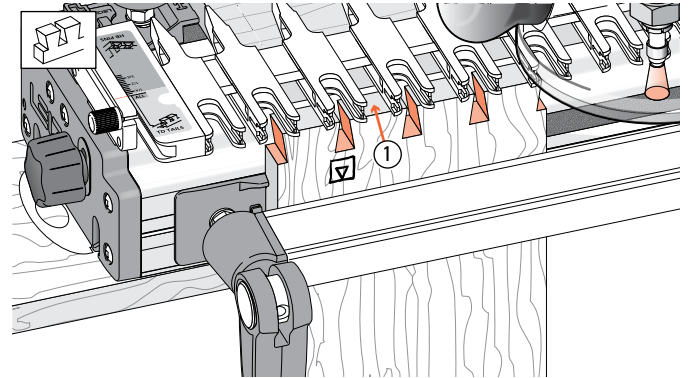
8-16 Place the end of a *pin board* horizontally flush under the guidefingers and mark a thin pencil line partly across the tail board.



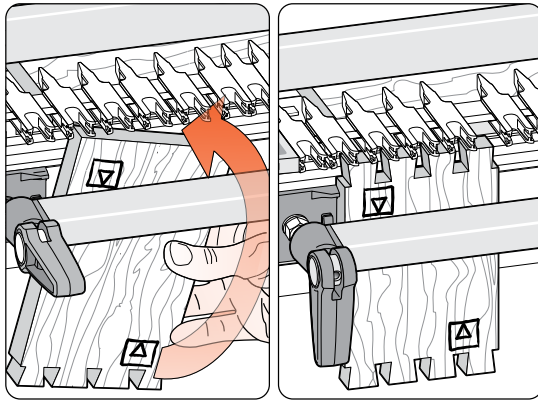
REMEMBER SAFETY!



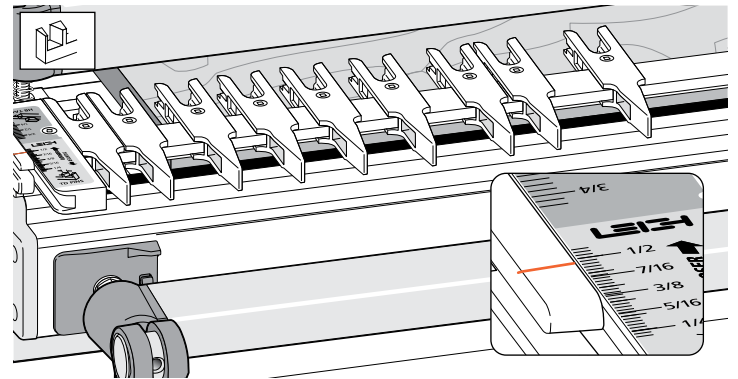
8-17 Place the router on the finger assembly and adjust the router until the dovetail bit tip is level with the center of the pencil line. *Note: This means the pin socket will be half a thin pencil line deeper than the thickness of the pin board, leaving minimal cleanup after assembly.* Check to make sure the bit rotates freely.



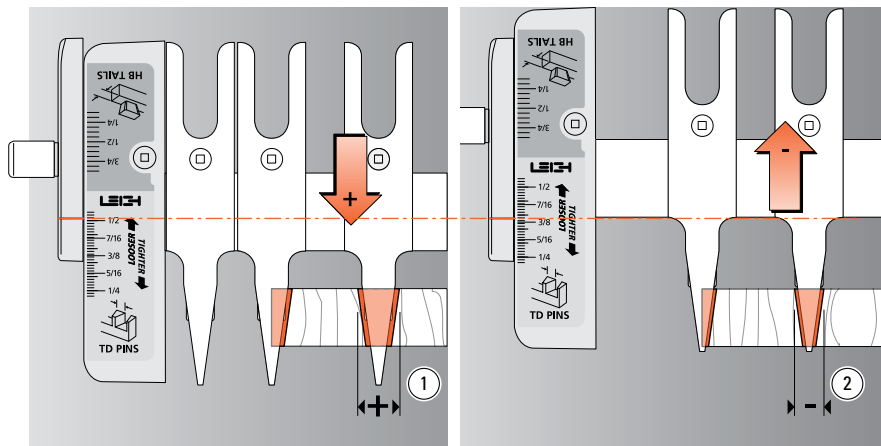
8-18 Plug in the router and rout out the half-pin and pin sockets. Use only light side pressure on the guide fingers. Make sure to run the guidebush along both sides of the finger opening. Take care not to rout unwanted sockets where there are gaps between pairs of fingers ①. Rout only between the rounded guidefinger tips. See Hints and Tips Chapter 15.



8-19 Before removing the routed board from the jig, check by eye and touch to make sure no parts have been missed. Release the clamp and reverse the tail board in the jig, keeping the same inside face ▽ away from the jig body. Rout the other end of this tail board and both ends of the second tail board in the same fashion.

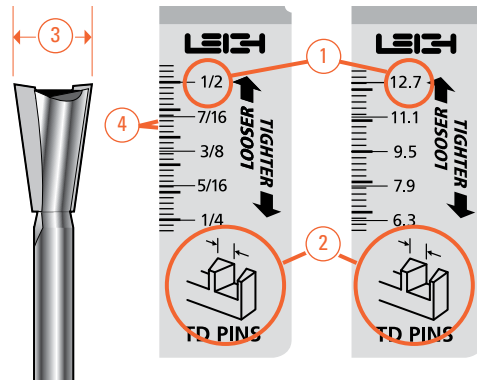


8-20 Rotate the finger assembly to TD PINS mode and set it on the 1/2" [12,7mm] mark ①. Do not change the guidefinger layout.



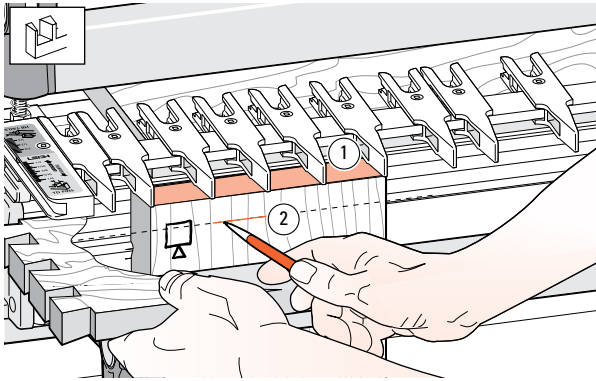
8-21 Finished Joint Tightness


The tightness of the finished joint is determined in TD PINS mode. The farther out toward the operator the finger assembly is set, the larger the pins will be ①. Moving the finger assembly in will make the pins smaller ②.



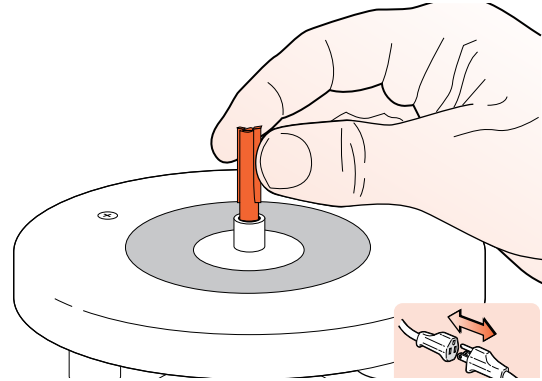
8-22 How the TD PIN Scales Work

The dimensions on the TD Pin scale ① indicate the major width of the pin to be routed ②. This matches the size of dovetail bit just used to rout the tails ③. The increment lines on the scale ④ are spaced so that moving the finger assembly by one increment changes the joint glue-line gap by just 0.005" [0,125mm]. Even better, a one quarter division movement changes the fit by 0.00125" [0,03mm], a tiny one and a quarter thousandth of an inch! Once you achieve the desired joint fit, simply record the setting using the illustrations at the end of this chapter.

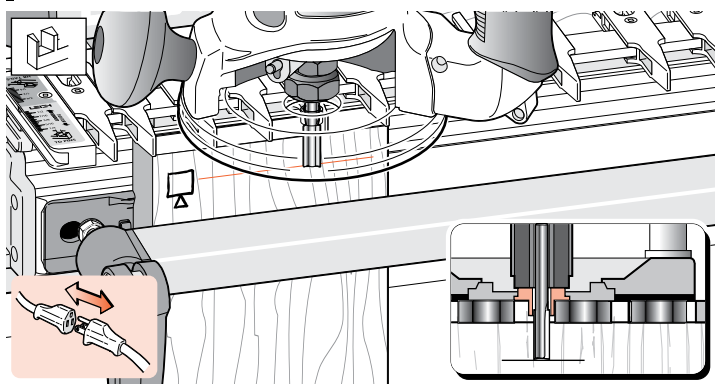


8-23 Clamp a test pin board against the left hand side stop, outside face  away from the jig, with the top end flush under the guides ①.

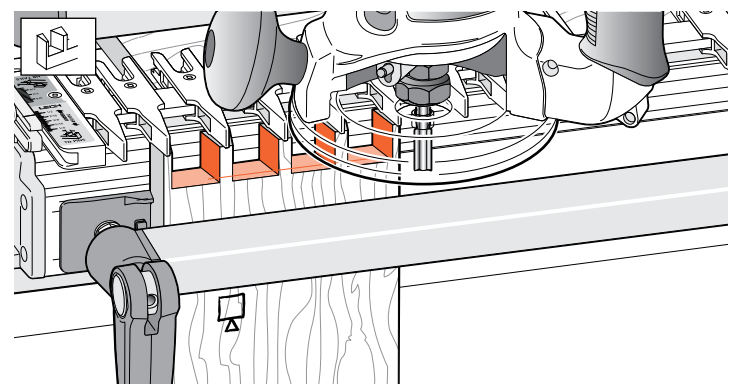
Place the side edge of one of the finished *tail boards* horizontally flush under the guidefingers and mark a thin pencil line part way across the pin board ②.



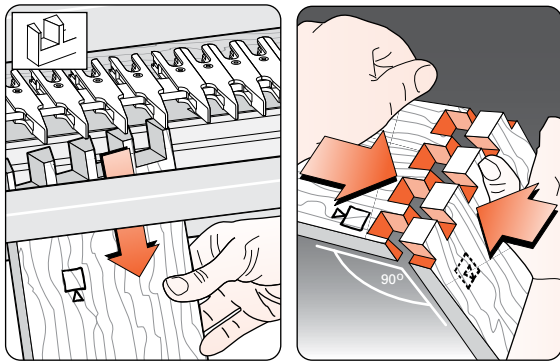
8-24 Unplug the router and remove the dovetail bit. Mount the included No. 140-8 straight bit to the router.



8-25 Place the router on the finger assembly and adjust the router until the bit tip is level with the center of the pencil line. Check to make sure the bit rotates freely.

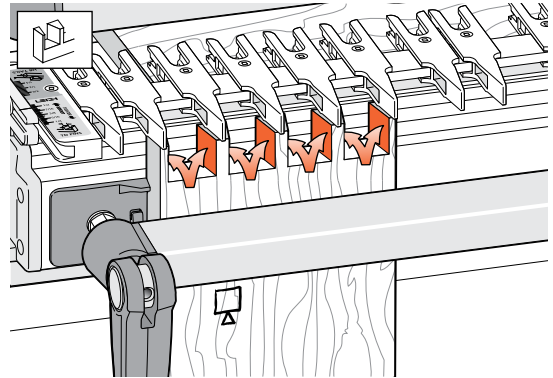


8-26 Rout out the waste between the pins. Check to make sure no parts have been missed. See Chapter 15 "Hints and Tips" on how to minimize tearout.

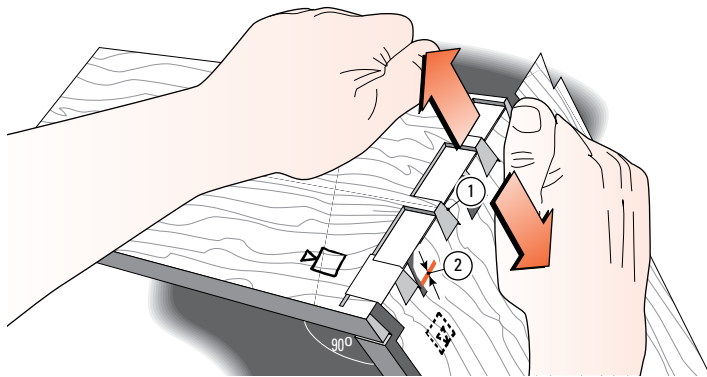


8-27 Remove the test pin board from the jig and test it for fit in one of the tail boards.

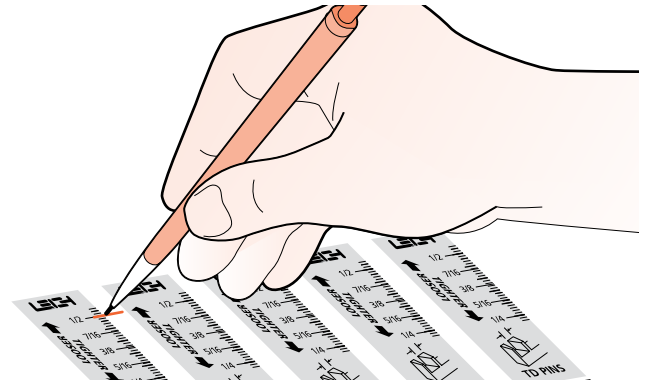
Make sure the outside faces outward on both pieces. A firm push fit is perfect, perhaps a tap with the heel of your hand. Having to use a mallet means the joint is too tight to take glue.



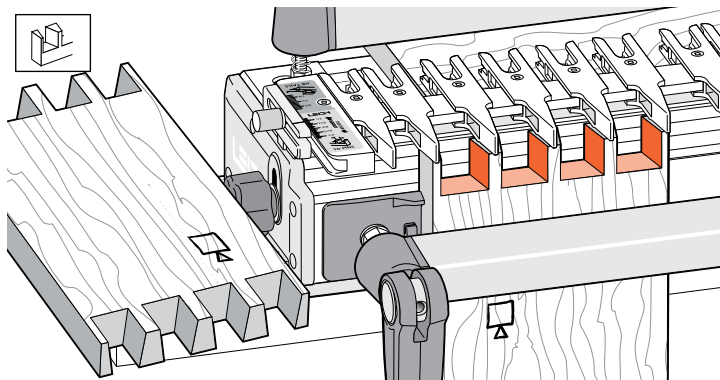
8-28 If it is too tight, move the finger assembly in (away from you) by one division on the scale. If it is only a little tight, adjust the scale by only half a division. Replace the same pin board back in the jig, carefully aligned against the same side stop. Rout off the sides of the pins and test it again for fit. Repeat as necessary to get a good fit.




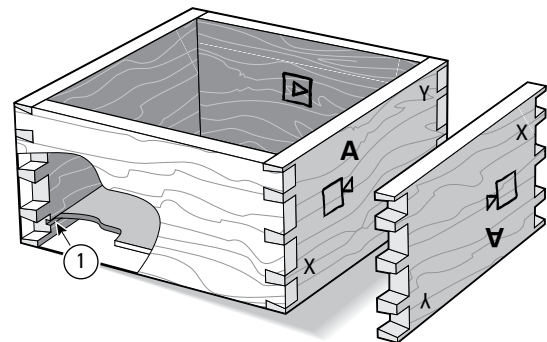
8-29 If the joint is loose, pull the pin board so that the angled sides of the pins and sockets jam tight together ①. The gap at the bottom of the pins ② is the amount you will have to move the finger assembly out (toward you). Reset the finger assembly and test again on the other end of this board.





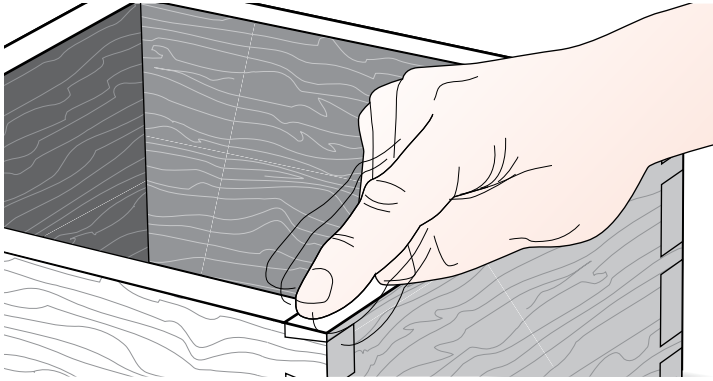
8-30 Once the correct fit is achieved, mark the final TD PINS scale setting on the pull-out or on one of the scale prints at the end of this chapter. Very slight variations to the scale setting may be necessary with different wood species or hardness. You can also note this on the Quick Reference pull-out card.



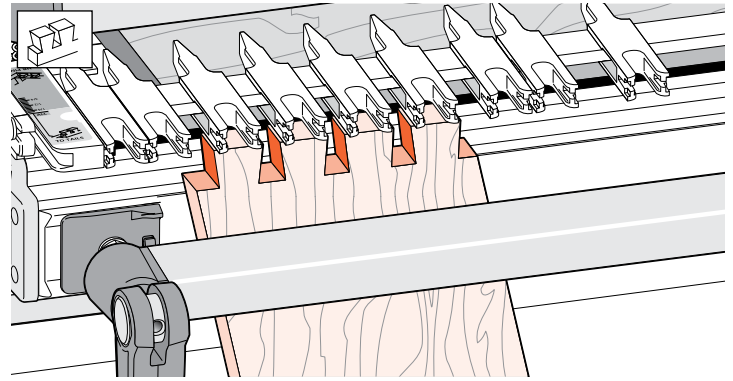
8-31 Rout all four ends of the pin boards, keeping the outside face  outwards. (With luck you may not have used the fifth board.)



8-32 Assemble the box, making sure the tail boards face the proper way, i.e. tail boards inside face in ; pin boards outside face out . Provided you haven't already routed out the drawer bottom grooves ①, it doesn't matter which edge of any of the boards are at the top or bottom, the box will still fit together i.e. pin board "A" can be up either way.

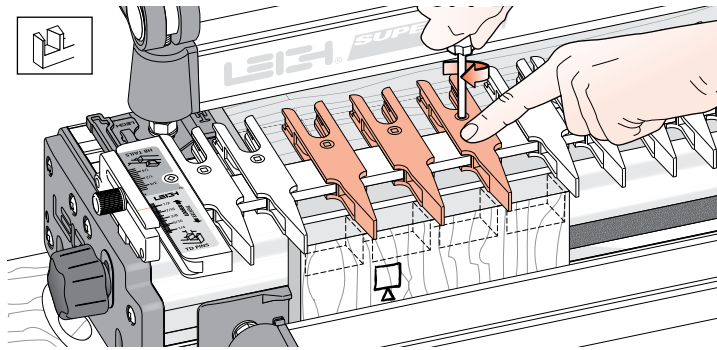


8-33 The box should be square and in plane. If it is not in plane (i.e., the side edges of each board are not in line), then either the ends of the boards are not square, the board widths are not exactly equal, or there is a concentricity problem (see 7-2 to 7-9).

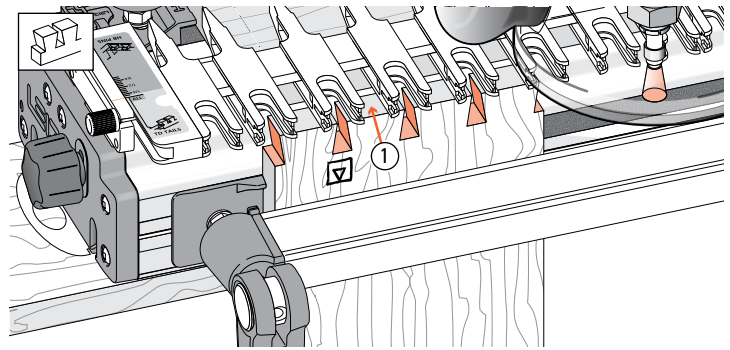


8-34 To form angled dovetails, refer to the Technical bulletin “How to Rout Angled Through Dovetails on your Leigh Jig”. You can download a printable file of the bulletin from our website In Support section of leightools.com Super Jigs / D1600 Scroll down and select How to Rout Angled Through Dovetails. ■

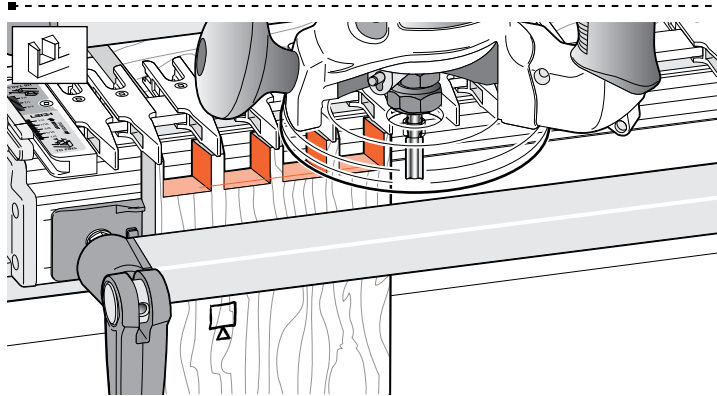
QUICK REFERENCE REMINDERS



8-QR1 Through dovetails are laid out in TD PINS mode with the finger assembly slightly raised above the spacer board and the pin board. The outside face of the TD pins is away from the jig body.

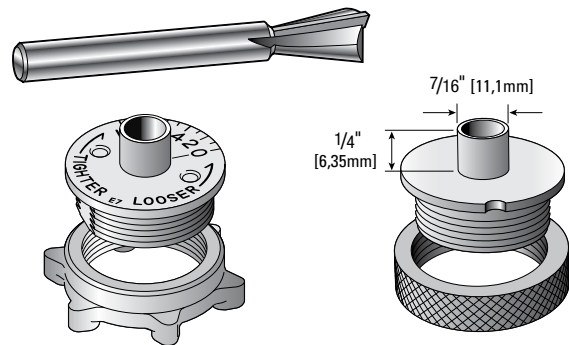


8-QR2 TD tail boards are clamped vertically in the jig. The inside face of the TD tails is away from the jig body. The finger assembly is in TD TAILS mode, set on the "ALL" setting. There is only one setting in this mode.



8-QR3 The finger assembly is in TD PINS mode, with the scale set to a recorded setting (see detailed fit instructions, 8-24 to 8-30). TD pins are cut with a straight bit; the only time a straight bit is used in dovetailing.

This is the only one of the four main modes that puts the outside face of the board away from the jig body.



8-QR4 Through dovetail tails are always routed with an 8° dovetail bit to match the 8° guidefinger. All through dovetail routing on the Superjig is done with the Leigh e7-Bush, or any 7/16" [11,1mm] diameter bush (min. barrel length 1/4" [6,35mm]). See page 68 for more on routers and guide bushings.

| Thickness of Tail Board | Thickness of Pin Board | Dovetail Bit | Straight Bit | Guidebush Diameter |
|-------------------------|------------------------|--------------|--------------|---------------------------------------|
| up to 13/16" [21] | 1/2" - 13/16" [12-20] | No.80-8 | No.140-8 | e7-Bush or 7/16" [11,1] diameter bush |
| up to 13/16" [21] | 3/8" - 5/8" [10-16] | No.75-8 | | |
| up to 13/16" [21] | 1/4" - 1/2" [6-13] | No.70-8 | | |
| up to 13/16" [21] | up to 3/8" [10] | No.60-8 | | |
| up to 13/16" [21] | up to 1/4" [6] | No.50-8 | | |

Numbers in brackets are millimeters

8-QR5

Here is a quick reference selection chart for through dovetail bits. Please study the bit selection specifications in Appendix ii for full details of each through dovetail bit. Note: 13/16" [20mm] is the maximum through dovetail pin board thickness. Boards as thin as 1/8" may be routed and joined using through dovetail bits 50-8 and 60-8, along with straight bit 140-8

The Leigh e7-Bush or a straight barrel 7/16" OD guide bush are the only guide bushes that can be used with Super Jigs. ■

