Single Pass Half-Blind Dovetails

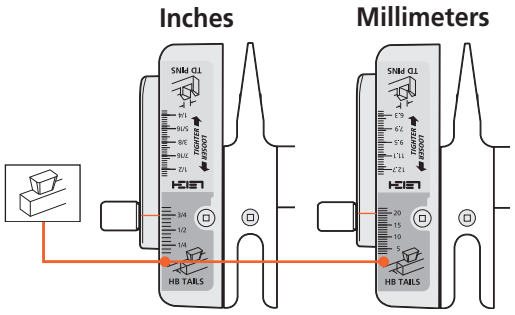
Why rout "single pass" dovetails on a variably spaced Leigh jig? Well, you just may need to reproduce or restore a late 19th or early 20th century drawer which has similar, machine made joints. Or, if you are making a lot of drawer boxes and are not so concerned with the traditional "hand-cut look", then routing both drawer fronts and sides together does go a little faster.

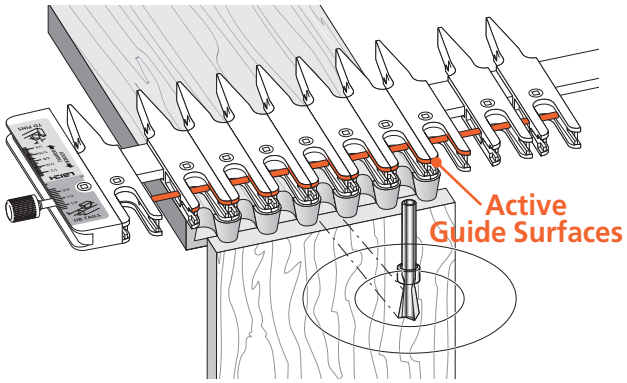
Only one mode is required:

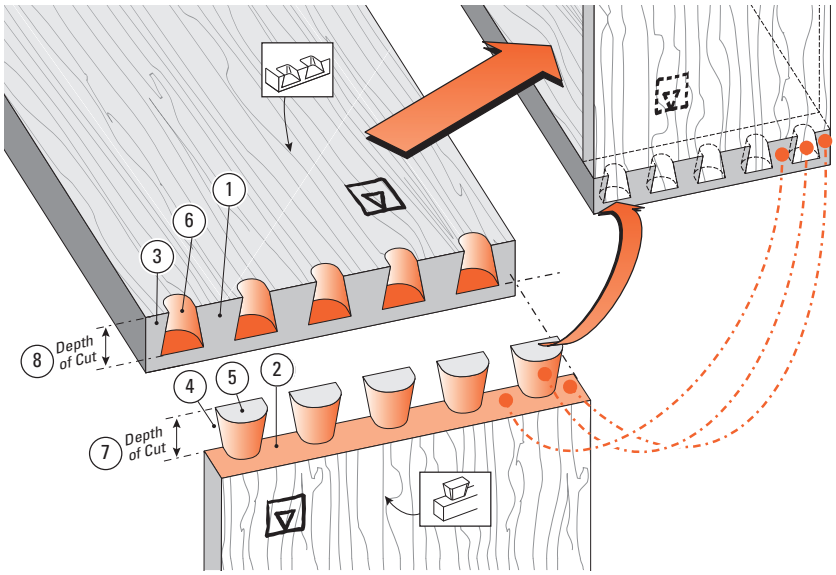
Half-Blind Dovetail Tails (HB TAILS) mode

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.





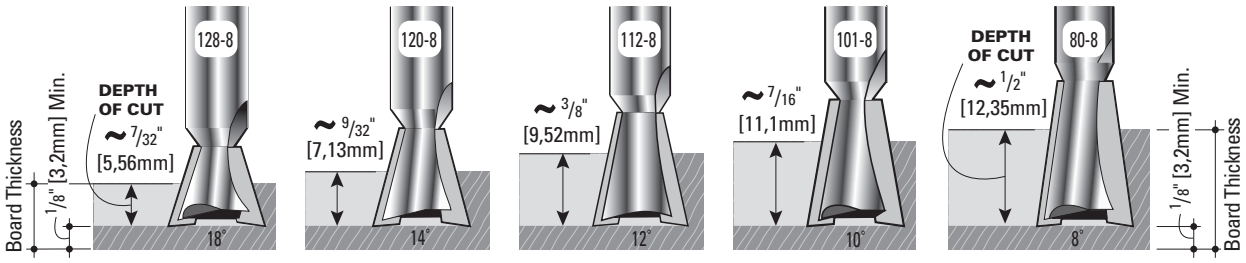


10-1 Single Pass Half-Blind Dovetail Terminology:

① Pins
② Pin sockets
③ Half-pins
④ Half-pin sockets
⑤ Tails
⑥ Tail sockets
⑦ Depth of Cut (tails)
⑧ Depth of Cut (pins)

The pins fit in the pin sockets. Joints almost always begin and end with a half-pin as shown.

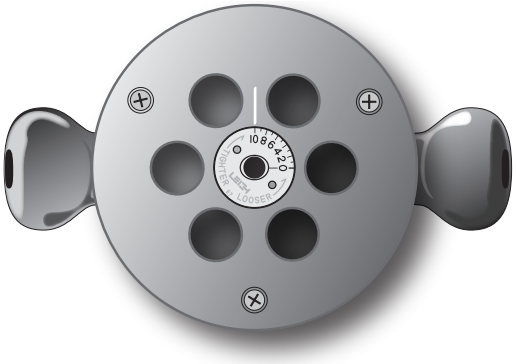
10-2 Cutting Depth for Single Pass Half-Blind Dovetails

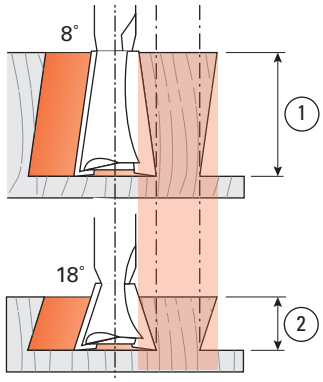


Note: Add at least ⅛"[3,2mm] to the depth of cut for board thickness. ~ Symbol for "approximately"

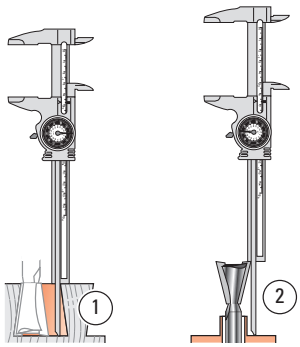
⚠ IMPORTANT! Bit depths of cut for "single pass" dovetails are not the same as for variably spaced joints.

- Depth of cut must be as specified for each of the five bits shown above. *Exception: See fig.11-26. Note: Leigh bits 101-8, 112-8 and 128-8 are optional.*
- Raising the bit above its specified cutting depth will result in loose joints and may damage the jig, bit and/or guidebush. A lower setting will result in tighter joints that may not fit together.
- Small Depth of Cut adjustments will allow for joint fit tightness. ***See why in Steps 9-3 to 9-5.***
- Choose one of the five, ½"[12,7 mm] diameter dovetail bits shown above.
- Fit the provided Leigh e7-Bush to the router as shown below and set at No.10, or use a standard 7⁄16"[11,1mm] guidebush (min. barrel depth 1⁄4" see page 67).

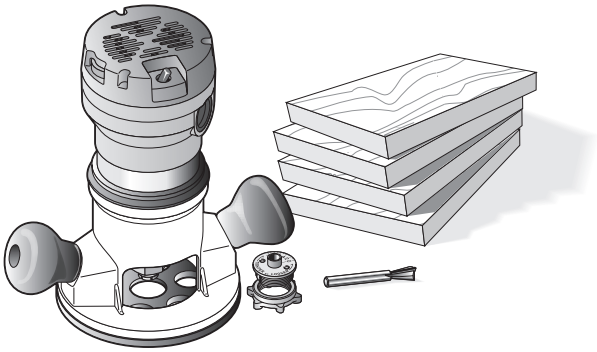




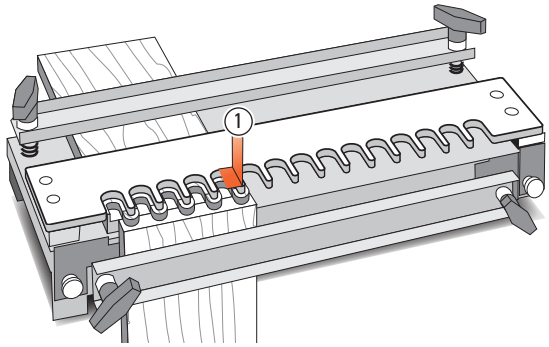
10-3 Bit Angle and Depth of Cut. Half-blind pins and tails are routed with the **same** dovetail bit, the **same** guidebush, and the **same** depth of cut. A different depth of cut requires a different angled bit. Leigh offers five different angled dovetail bits for a range of cut depths. A lesser angle, say 8°, for a deeper cut ①; a greater angle, say 18°, for a shallower cut ②.



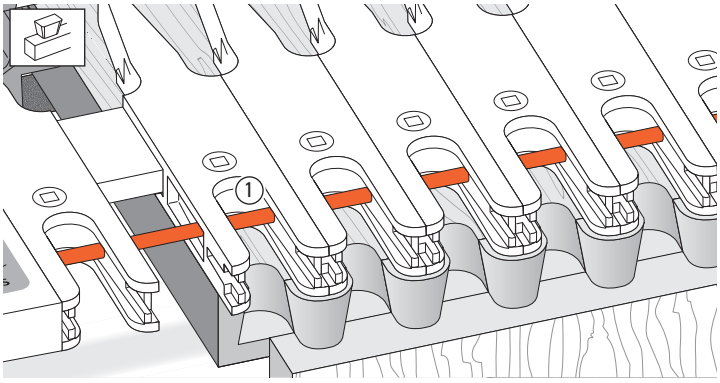
10-4 Cumulative plus/minus tolerances in routers, bits and guidebushes, make it impossible to state exact bit depth for first-time precision fit. All dovetail jigs require trial and error tests to attain a fine fitting joint. The good news; we give a starting depth for each bit. Test and measure the successful 'Best fit' depth of cut ① or bit projection ② and record for future first-time fits.



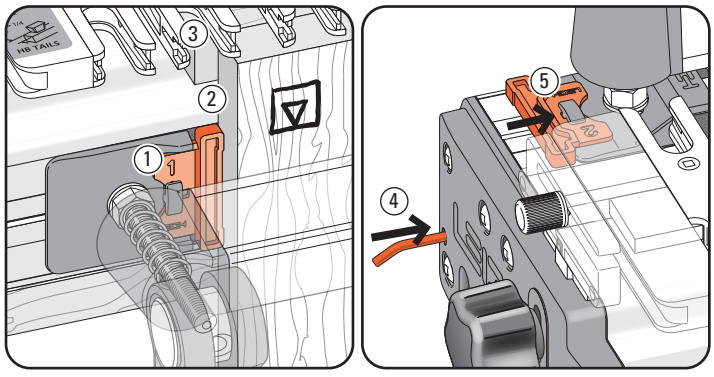
10-5 Routing a Test Joint You need a router, the e7-**Bush** set at No.10, the 80-8 ½"[12,7mm] 8° dovetail bit, two ¾"[19mm] thick pin boards and two ½" thick tail boards. The No.80-8 bit routs at a shallower ~½"[13mm] depth on single pass dovetails than on regular variably spaced joints. For this test, start with the No.80-8 bit projecting 1"[26mm] from the router base.



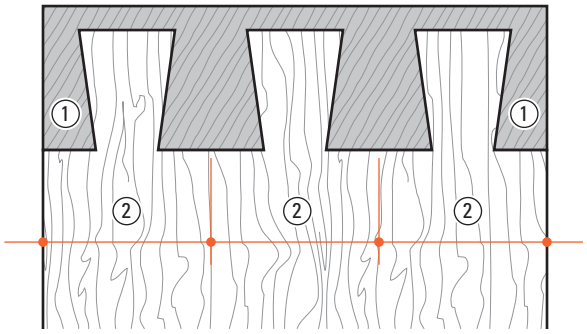
10-6 This is a typical fixed template comb type jig. The comb depth ① is usually dimensioned to suit the most popular drawer side thickness of ½"[12,7mm].



10-7 Superjig features two novel innovations.
A Stop Rod inserted through the fingers ① limits router travel to allow the deep tail socket guides to function as a simple shallow fixed comb.

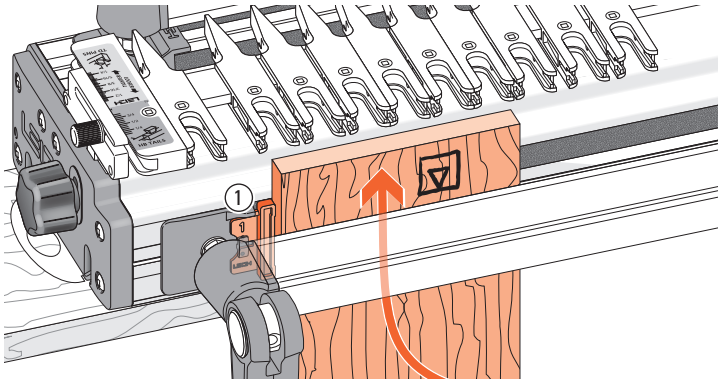


10-8 The Spacer in the #1 position, slipped into the left-hand front side stop ① correctly offsets drawer sides ② from drawer fronts ③. The Spacer stays in place for the complete procedure. The Stop Rod stores here ④ and the Spacer here ⑤.

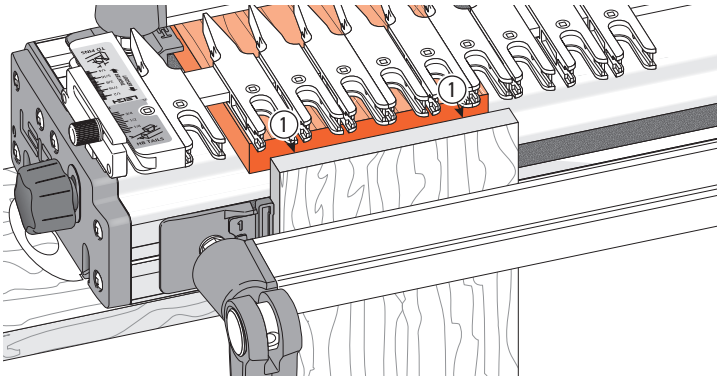


Board Width Chart Add up to ¼" [6mm] or subtract up to 1/8" [3mm]		
⅞ [22]	6 ⅛ [156]	11⅜ [289] (SJ-18)
1 ¾ [44]	7 [178]	12 ¼ [311]
2 ⅝ [67]	7 ⅞ [200]	13 ⅛ [333]
3 ½ [89]	8 ¾ [222] (SJ-12)	14 [356] (SJ-24)
4 ⅜ [111]	9 ⅝ [244]	
5 ¼ [133]	10 ½ [267]	

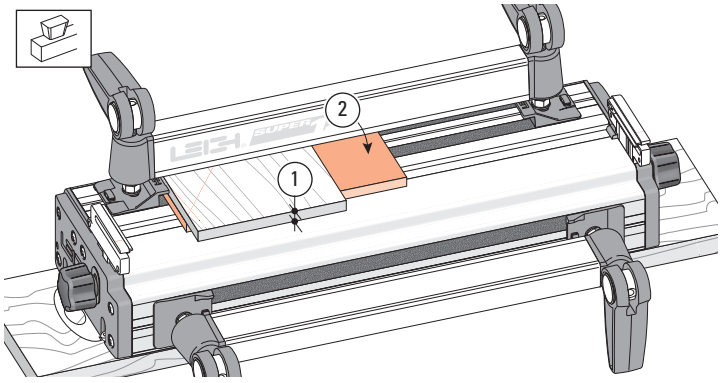
10-9 Board Widths: To achieve equally sized half pins ① at each side of a fixed space joint, use chart width plus up to ¼"[6mm], or chart width minus up to ⅛"[3mm]. This chart covers boards up to maximum width for each jig.
Example: the 7"[178mm] can be up to 7¼"[184mm] or as small as 6⅞"[175mm].
Note: This test joint is for ¾" thick drawer front, ½" thick drawer side and #80-8 dovetail bit. Scale settings and depth of cut will vary depending on bit selection and tail board thickness.



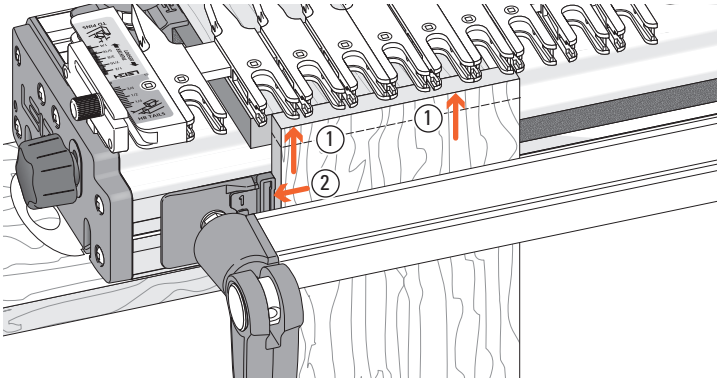
10-10 Slip the Spacer onto the left hand front side stop ①, *note: No 1 to the top*. With the finger assembly raised in the HB Tails mode, clamp a drawer side in the front left side, against the Spacer and the top end edge slightly above the jig body top.
Note: Drawer side thickness can be from 7/16" to 9/16"[6 to 14mm]. See 10-26 for Drawer Sides (Tail Boards) thicker than 5/8".



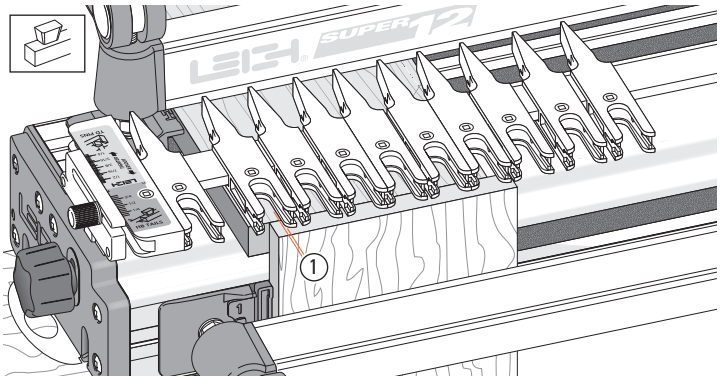
10-11 Place the drawer front (from ½" to 1" thickness [16 to 25mm]) in the rear clamp. Clamp with the side edge against the left rear side stop, front end edge touching flush across the rear of the front board ①. Lower the finger assembly to the drawer front.
! *Board edges must be square.*



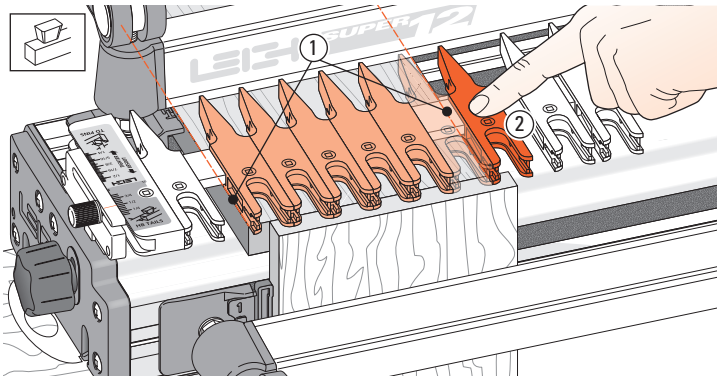
10-12 If you're mounting Thin Pin Boards:
Minimum recommended pin board thickness is ½"[13mm]. Remember, No.128-8 bits rout at ⅜"[9,5mm] deep. If you rout a pin board less than minimum thickness ①, you need to pack the board up from the jig body. We suggest a piece of ¼" to ⅜"[6 to 9mm] plywood for this purpose ②.



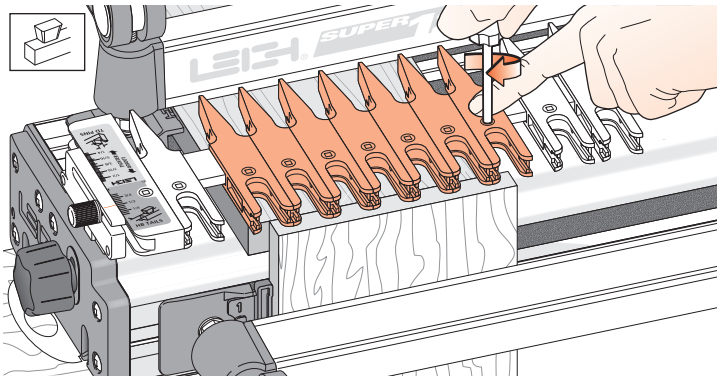
10-13 Re-set the drawer side in the front clamp so that its top edge touches the guide fingers and is **perfectly flush** with the top face of the drawer front ① and the left edge is against the Spacer ②.
! *Board edges must be square.*



10-14 With the scale set on ½"[12,7mm], raise the finger assembly about 1⁄16"[2mm] above the drawer front ①. The scale is always set on the 1/2" mark when using the stop rod. *See 10-26 for Drawer Sides (Tail Boards) thicker than 5/8".*

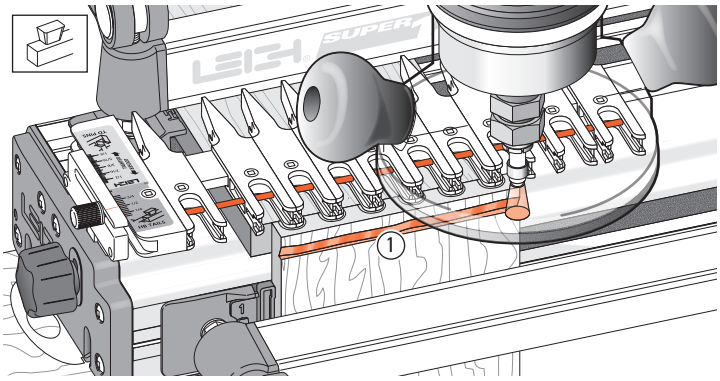


10-15 Slide across enough guide fingers to cover the **drawer front width**. Position fingers tight together and center the group of fingers on the board ①.
Depending on the exact board width, the outer fingers will either overhang, be inside, or flush with the board edges. Now add one more finger to the right of the group ② for routing the drawer side.

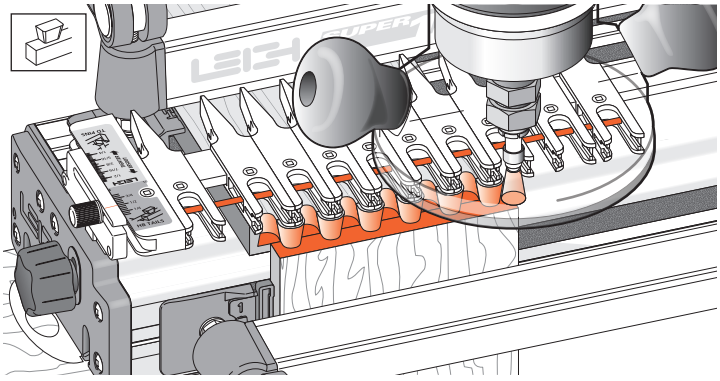


10-16 Tighten the finger's screws. Move any spare fingers so that they will support the router and **tighten all loose fingers**. Lower the assembly **flat onto the two work pieces**.

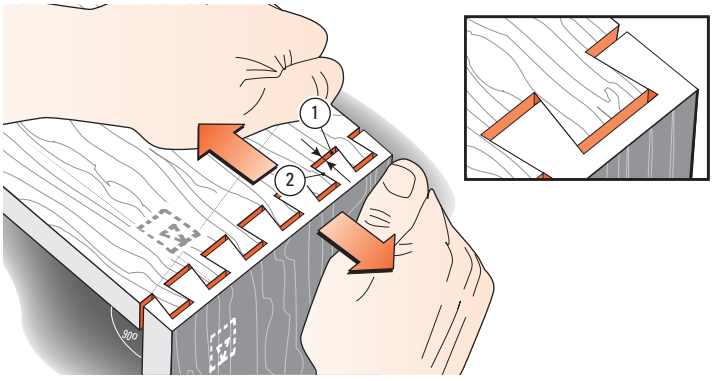
REMEMBER SAFETY!



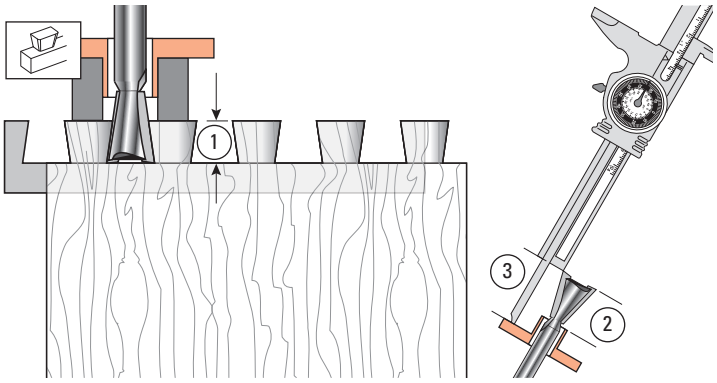
10-17 Insert the Stop Rod through the fingers.
For the first light cut move the router from right to left. **Make sure you control it firmly, because it is driven in this direction by the bit. Only the tip of the bit should be cutting on the first cut** ①. This back, or climb routing, leaves a very clean shoulder when routing side grain.



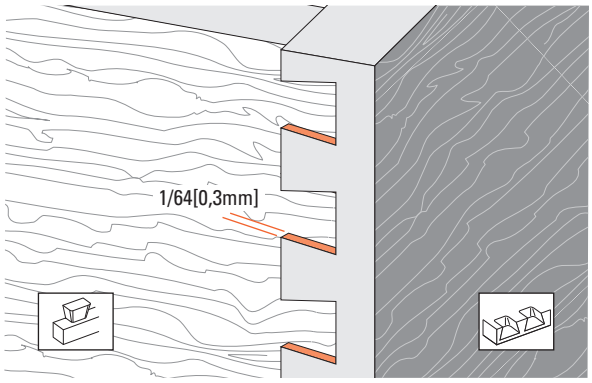
10-18 Now rout in and out from left to right. Follow the guides into each finger opening to touch the stop rod. The pins, tails and sockets are formed simultaneously.



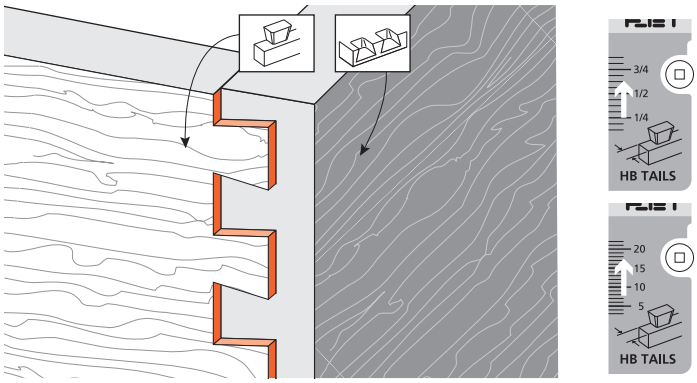
10-19 Remove the boards and test the joint for fit. If the joint is **loose**, as shown here, **lower** the bit by the same amount as the gap at the bottom of the pins ① when the pins are pulled against the socket sides ②. If the joint is too **tight, raise** the bit slightly. Test again. You cannot rout the same board ends again with a dovetail bit, so use two fresh ends for each test.



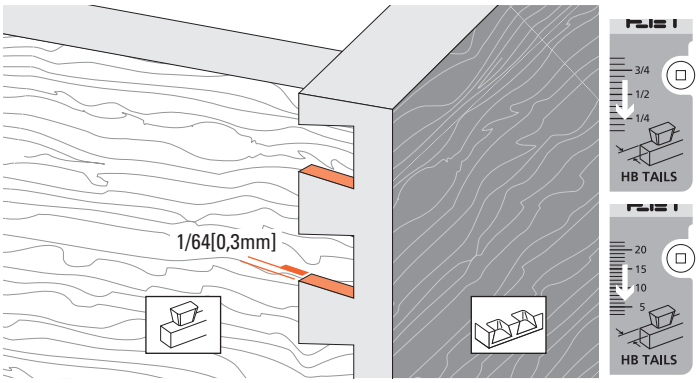
10-20 Keep the test tail board that fits well, and mark it with the number of the bit you used to rout it. For quick set-up next time, clamp this tail board in the jig as a *depth-of-cut gauge* ① to show how far to lower the bit. Better yet, measure the bit projection from the end of the guidebush ② or guidebush flange ③ and record this for fast set-ups in future.



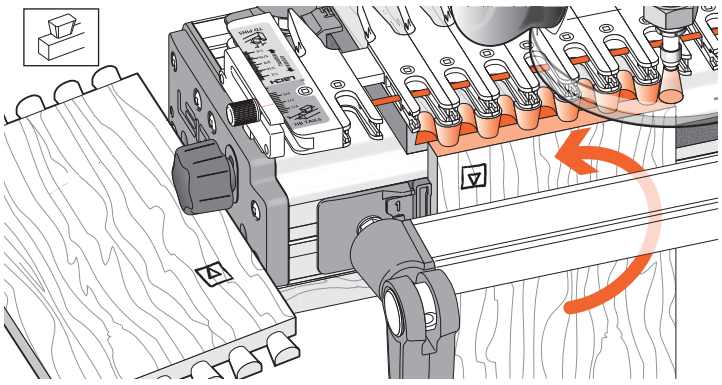
10-21 When you have the proper tightness of fit, check the flushness. The tails should be under flush to the pins by *no more than 1/64"[0,3mm] to allow for cleanup (exaggerated here)*. Any concentricity errors in the collet and guidebush on different routers will affect this tolerance.



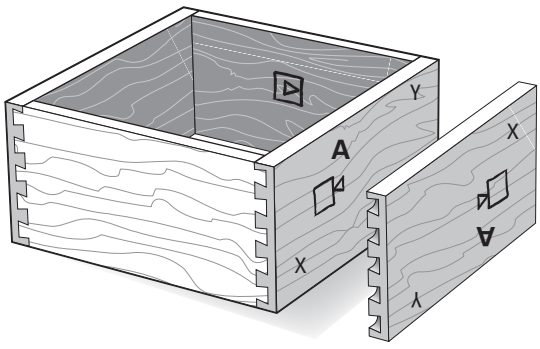
10-22 If the tails stand out from the pins, set the HB TAILS scale **away from the operator** by half the amount required.



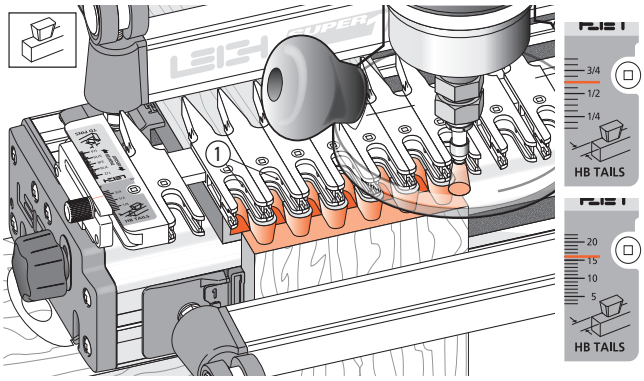
10-23 If the tails fit in too far past the pins ends, set the HB TAILS scale **toward the operator** by half the amount required.



10-24 To make a box, repeat the procedure four times, ensuring that the drawer fronts, rears and sides are all rotated correctly in the jig, **keeping the inside face ⊡ of the boards away from the jig.**



10-25 Assemble the drawer. As with through dovetails, it doesn't matter which edge of any of the boards are at the top or bottom, the drawer will still fit together e.g. pin board "A" can be up either way.



10-26 Tail Boards 5/8"[16mm] and thicker.

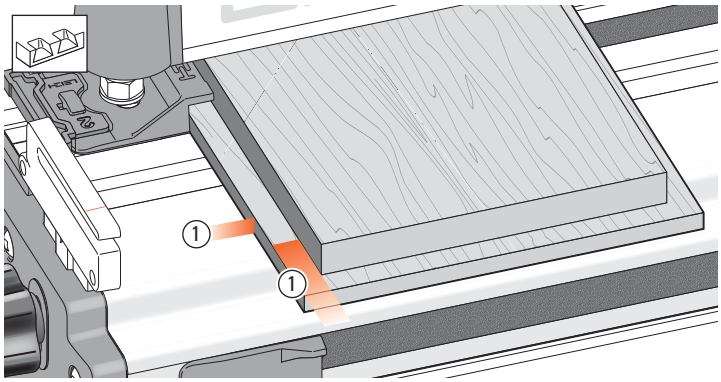
Use the same procedure to rout "single pass" dovetails with side thicknesses from 5/8" to 1"[16 to 25mm] **except**:

The stop rod is not used ① and the initial scale setting is 5/8"[16mm] for all boards ②. *Hint: Set the e7-Bush to lower than 10 for deeper cuts in drawer fronts.* ■

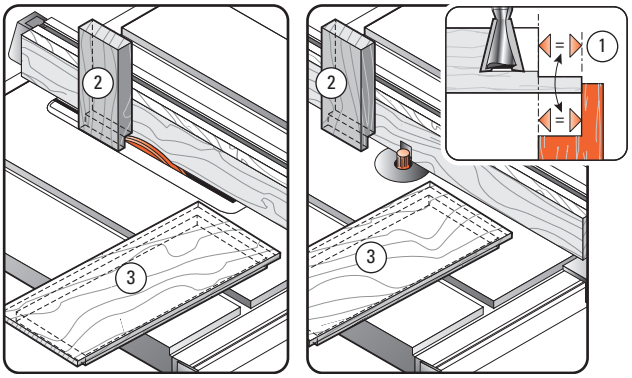
Rabbeted Half-Blind Dovetails

Before attempting rabbeted half-blind dovetails, first master the techniques of flush half-blind dovetails in Chapter 9, Variably Spaced Half-Blind Dovetails.

Note: Rabbeted half-blind dovetails cannot be routed in a single pass – the lip of a drawer front makes it impractical, as each piece would have to be routed separately, in which case it is easier to use the variably spaced method.

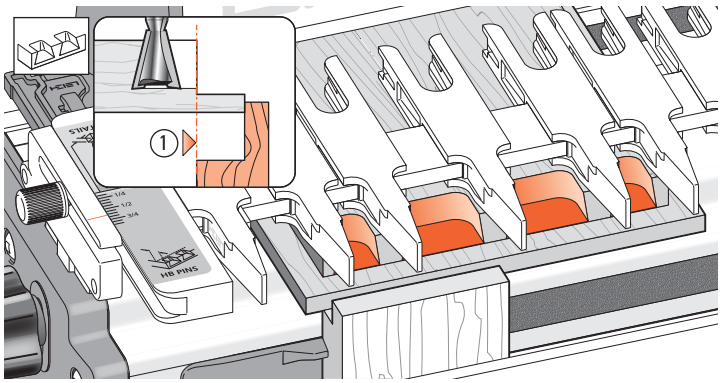


11-1 Provided the drawer front lip is ⅜"[9,5mm] or less in each direction ①, you can mount and rout rabbeted drawer fronts **and sides** exactly the same way as flush drawer fronts, except...

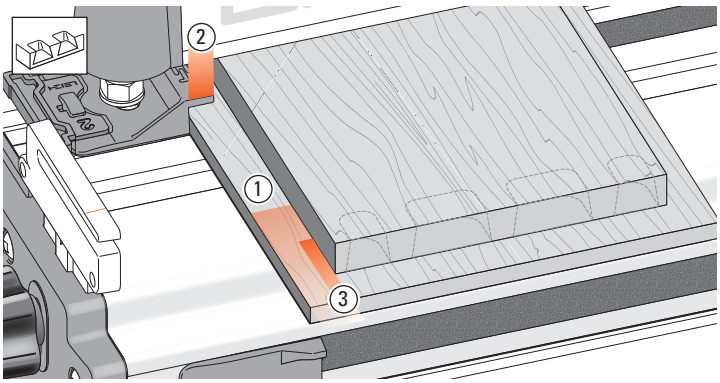


11-2 Rabbeted Pins *You will need to block the scrap stop in the front of the jig out from the jig's front face by exactly the width of the rabbet* ①.

An easy accurate way to do this is to rabbet the end of the scrap piece ② vertically over a dado blade or router bit at the same time as you rabbet the drawer front (horizontally) ③.

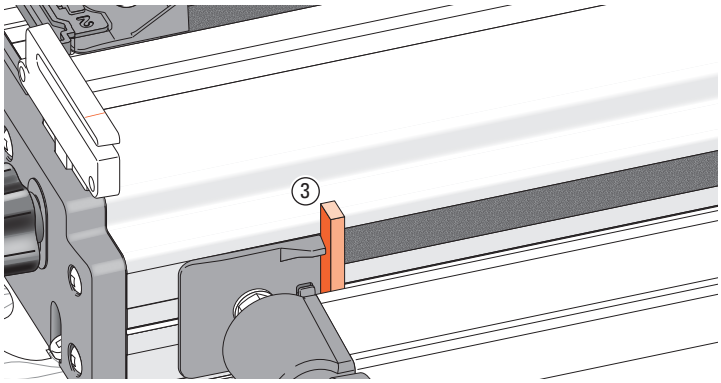


11-3 This brings the pin ends exactly in line with the front jig face ①, ensuring that the scale reading is accurate.

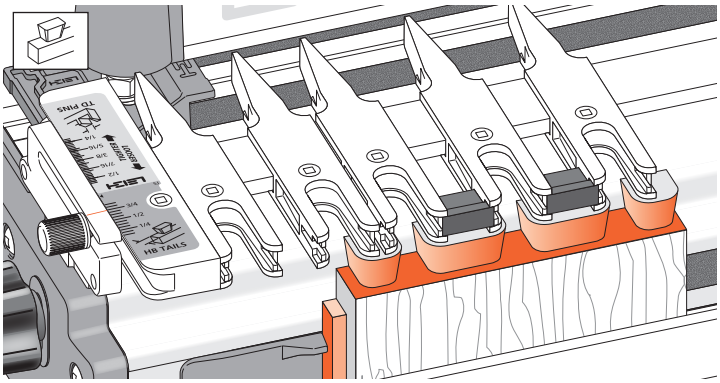


11-4 If the rabbet width ① is greater than the top side stop width of ⅜" ②, the drawer side (tailboard) must be blocked away from the front side stop (see 11-5) by exactly the width of the rabbet minus ⅜" ③. For example, a ⅝" rabbet ① would require the tailboard to be offset by an additional ¼" ③.

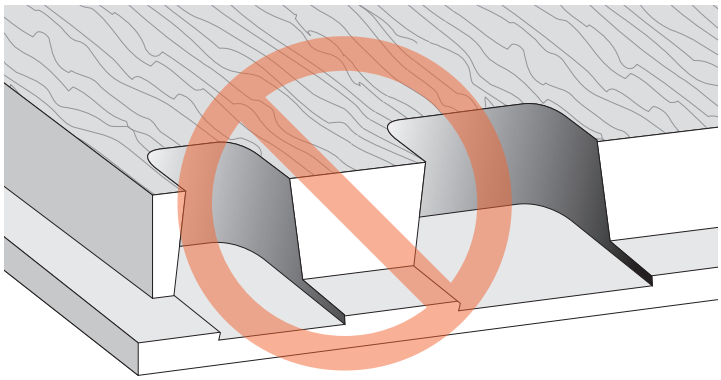
Make a spacer block of the required width and…



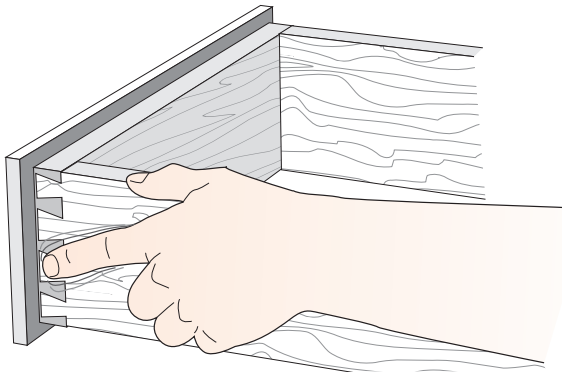
11-5 Stick the block ① to the jig face with double-sided tape, making sure it touches the side stop.



11-6 The drawer side will now be stepped in from the side stop by the width of the rabbet, bringing the sockets in line with the pins.



11-7 *Make sure you select a dovetail bit that has a working depth of cut less than the rabbet height.* Otherwise, you will rout into the rabbet.

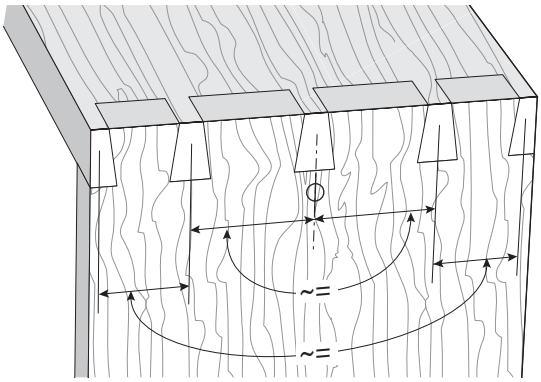


11-8 It is difficult to clean up the drawer sides and front corner after assembling a rabbeted drawer, so make sure the fit is flush before you complete the drawers *See 9-28 to 9-30.* ■

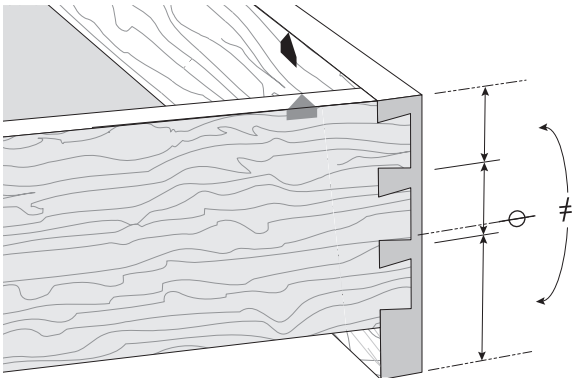
SUPERJIG - CHAPTER 12

Asymmetric Dovetails

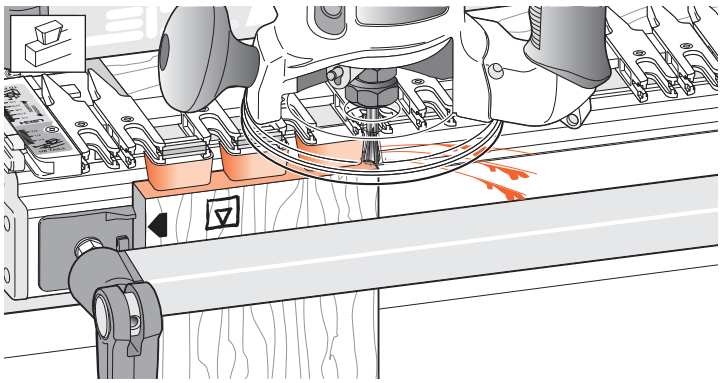
*For certain procedures, you will need to use both ends of the Leigh Superjig Jig. Asymmetrical joint layouts are one example. On the Superjig, no joints will be truly symmetrical, but they can **look** symmetrical. Apparent symmetry is desirable for aesthetic reasons, but is not required for strength. Be sure you have read and understood chapters 8 through 10 before attempting these procedures.*



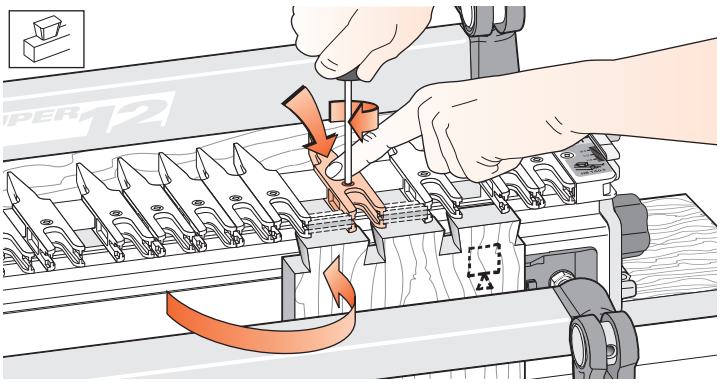
12-1 By *symmetrical* we mean a joint that looks or is approximately symmetrical about its center line but is probably not, and need not be precisely symmetrical. Using the Leigh jig, it is easy to cut a joint that looks symmetrical; the pins will always align perfectly with the tails cut at the same spacing. Remember, symmetry is only required for appearance, not for joinery reasons.



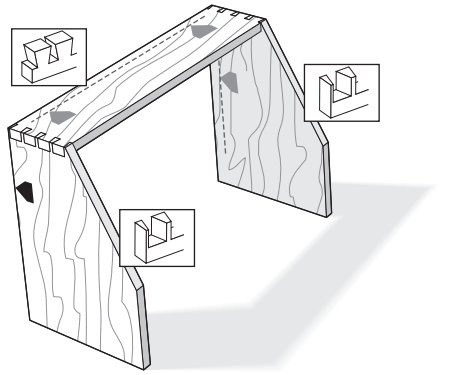
12-2 An *asymmetrical* joint has a deliberately uneven layout of pins and tails desired for a project design; for example, this drop-front drawer. The half-pin at the bottom of the drawer is much wider than the top half-pin. As the top edges of the front and sides are flush, it makes sense to use these edges against the side stops at each end of the jig. Here's how.



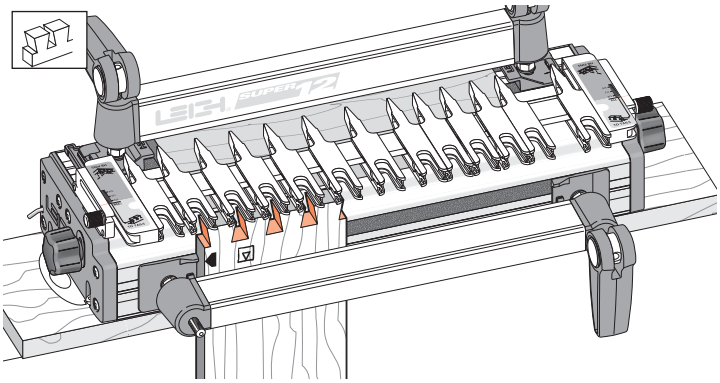
12-3 Mount the right-hand drawer sides and pins on the left end of the jig for routing, and…



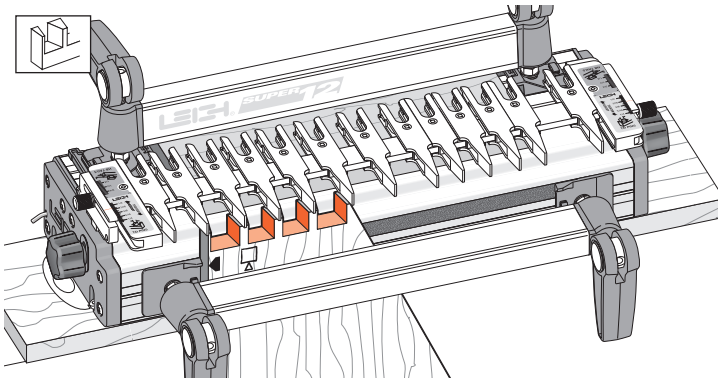
12-4 Turn one tailboard (like turning a page in a book) to the right end of the jig. Now lay out the fingers at the right end to match the sockets already routed. Now simply rout the left front corner (tails and pins) on the right side of the jig.



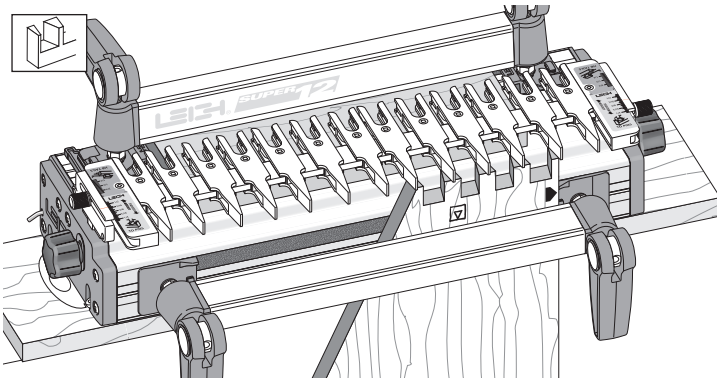
12-5 Another example of asymmetry is the top corners of a slant-front desk. The joints themselves may be symmetrical, but they must be routed on opposite ends of the jig because the sloped front edges will not register accurately against the fixed vertical side stops.



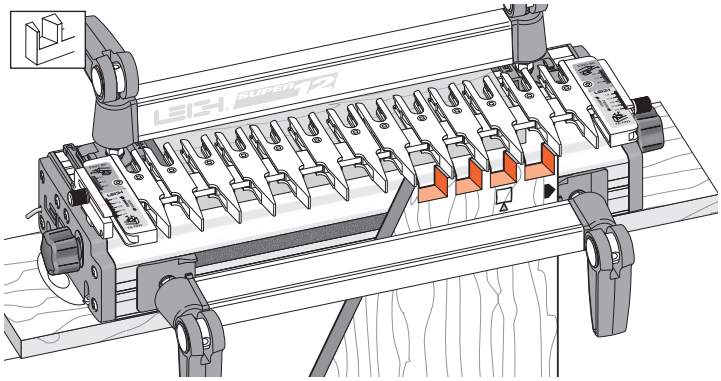
12-6 At the back of the desk both sides and top are flush, so the rear edges are set against the side stops. Place the left end of the top tail board against the left side stop ◀. Rout the tails.



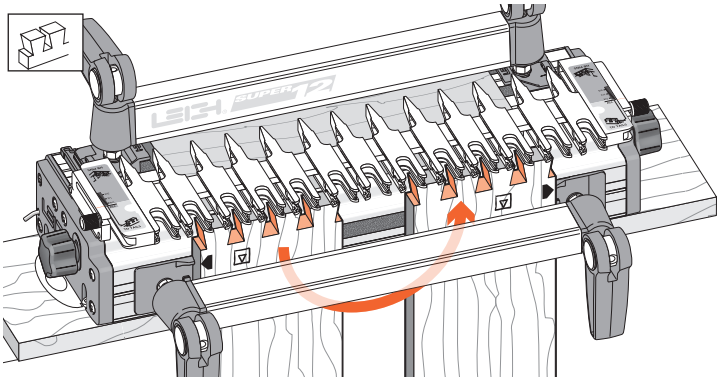
12-7 The left side of the desk goes against the left side stop ◀. Rout the pins.



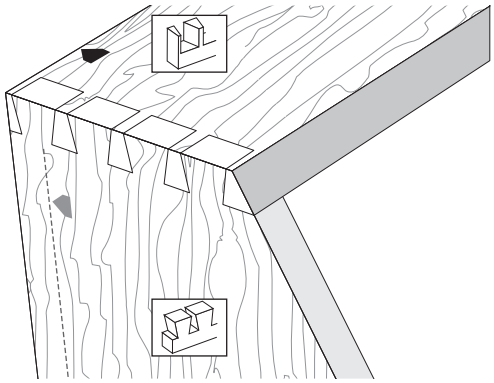
12-8 To lay out the joint at the right end of the jig, turn the left hand tailboard (like a book page) against the right side stop. Lay out the fingers over the pins you just cut.



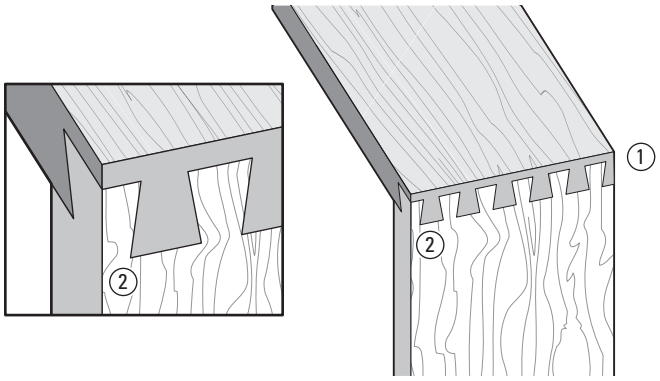
12-9 Place the right side of desk against the right side stop ▶. Rout the pins.



12-10 Rotate the finger assembly to TD Tails mode. Clamp the tailboard in the left side of the jig and rout the tails. Then rotate the board and clamp against the right side stop to rout the tails in the other end.

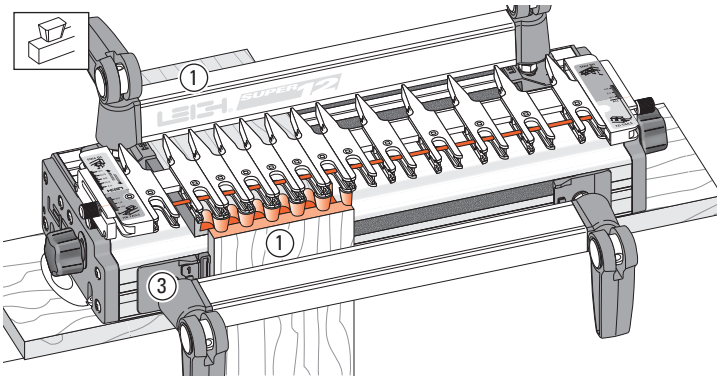


12-11 *Note: If, in the slant-front desk example, the pins were in the desk top and the tails in the sides, then all the parts would be routed in the opposite ends of the jig to those shown in the previous steps.*

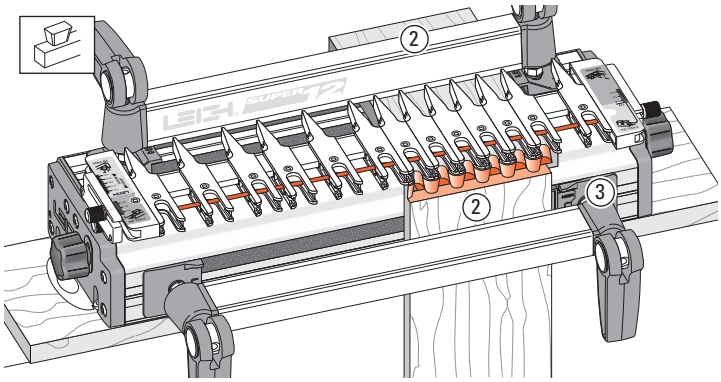


12-12 Asymmetric "Single Pass" Dovetails

Single pass dovetails become asymmetrical when a board width falls **between** joint pitch dimensions on the board width chart, page 40. Joint side edges will have a proper half pin on one side ① and an unattractive half-tail on the other ②. It is preferable to design drawer openings to suit the board width chart dimensions.



12-13 However, if this is not an option, the unattractive edge can be hidden from view at the bottom of drawers. Simply rout the right front and left rear drawer corners on the left side of the jig ①, and then…

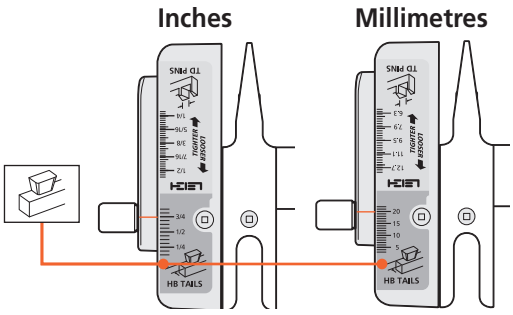


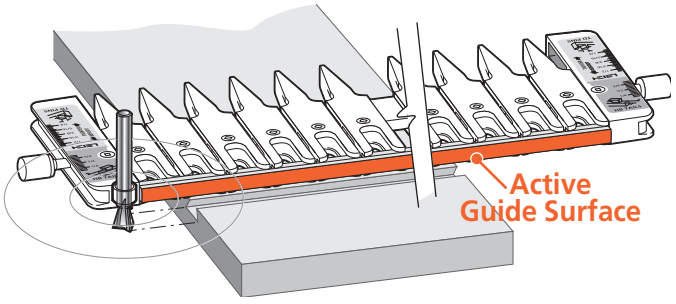
12-14 …the left front and right rear drawer corners on the right side of the jig ②. The Spacer is used to offset the drawer sides at both ends of the jig ③. ■

Sliding Dovetails

1 With the Finger Assembly in
HALF-BLIND DOVETAIL TAILS (HB TAILS) mode,
install the cross-cut fence

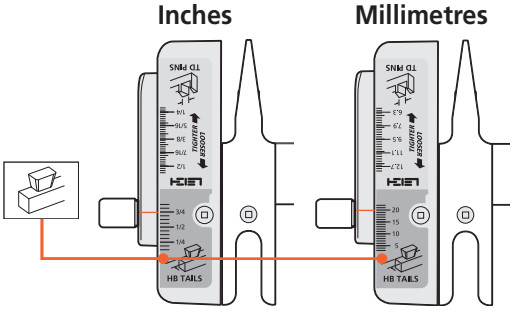
Sliding Dovetail slots are cut across the board face.

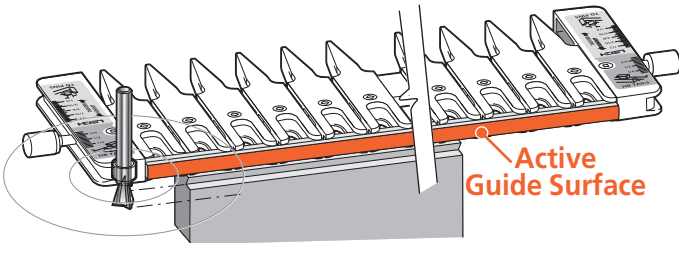


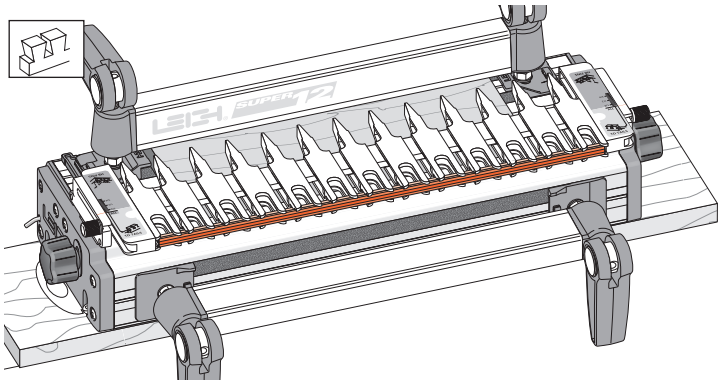


2 **KEEP** the finger assembly in the same mode

3 **Sliding Dovetail tails**
are cut across the board end edge

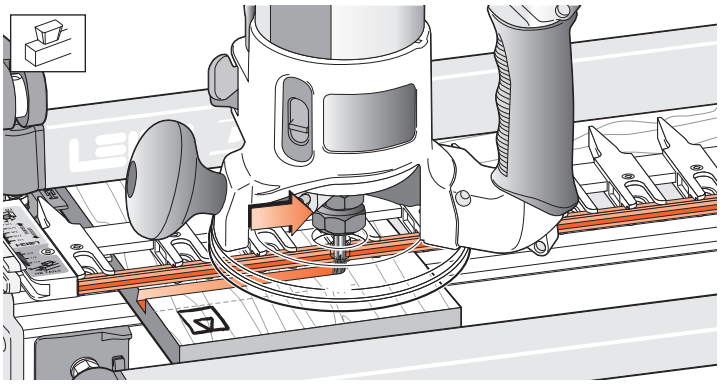




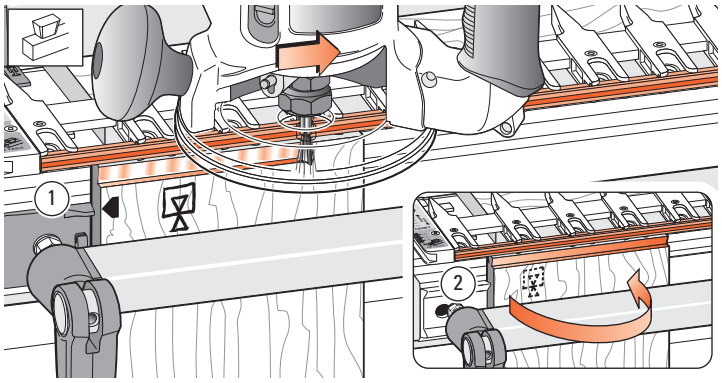


13-1 With the finger assembly in the HB TAILS mode, the cross cut fence fits into the recesses in the ends of the tail guides to allow routing of sliding dovetails.

Space the guides fairly evenly across the jig and firmly seat the fence into end of each guidefinger to ensure a straight cut.

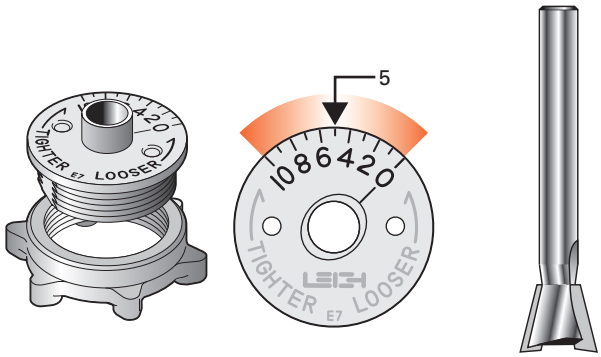


13-2 Using the cross cut fence as a guide surface for the guidebush, you can make lateral router cuts across the faces of horizontal boards (dovetail *slots*), and...

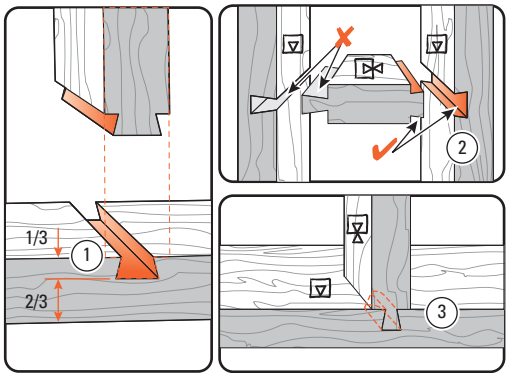


13-3 Across the top ends of vertical boards to cut the tails. First rout one side ①...

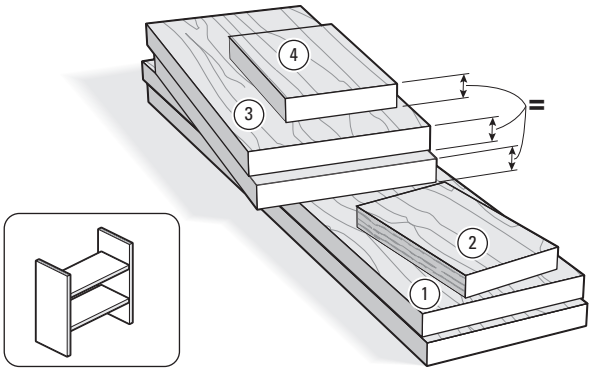
Then turn the board side-over-side to cut the other half of the tail ②.



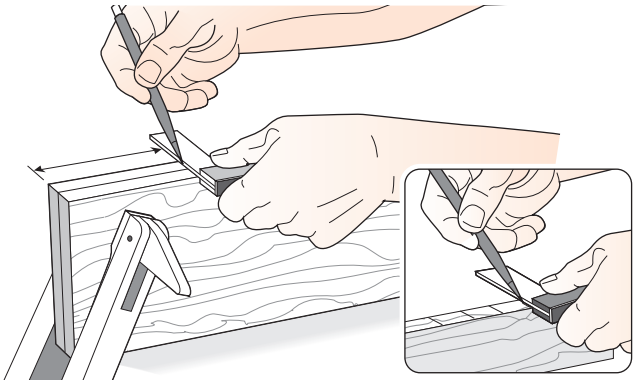
13-4 Turn the **e7-Bush** to "5" and use the No. 120-8, ½"x 14° bit for sliding dovetails. This **e7-Bush** setting will allow for fine fit adjustment later.
A standard ~7⁄16"[11,1mm] guidebush (min. depth 1⁄4" see page 67) can be used but without the fine adjustment provided by the **e7-Bush**.



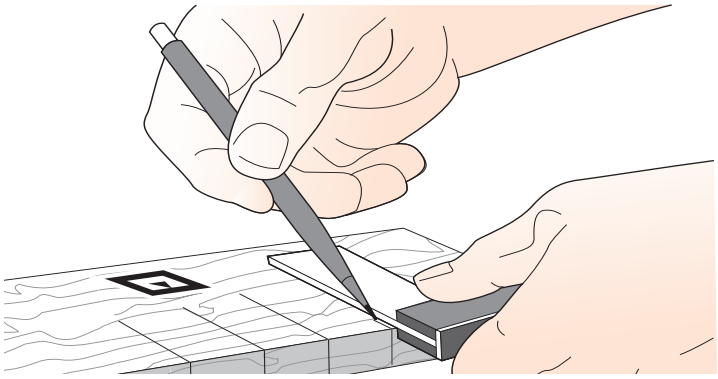
13-5 On a full width joint, *the slot depth-of-cut should be no more than 1⁄3 the board thickness* ①. If the tail board is a load-bearing horizontal member (e.g., bookshelf or step), make the tail fairly thick for good tail neck strength ②. Shorter sliding dovetails for less structural demand may be slightly deeper, with narrower profiles, especially if appearance is important ③ (e.g., where narrow rails join wider boards).



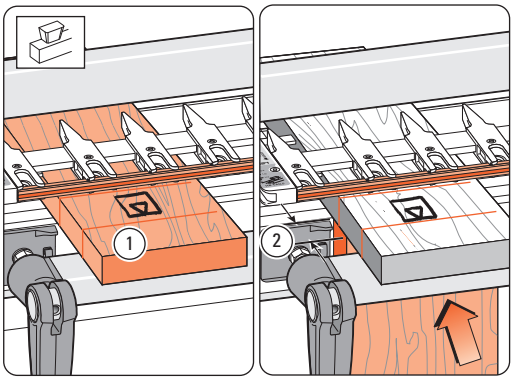
13-6 Use ¾"x5½"[20x140mm] softwood to make two slot boards ①, plus one narrow test slot board ②, two tail boards ③ and one narrow test tail board ④. The tail boards ③ and test tail board ④ must be exactly the same thickness. This will make two uprights and two shelves.



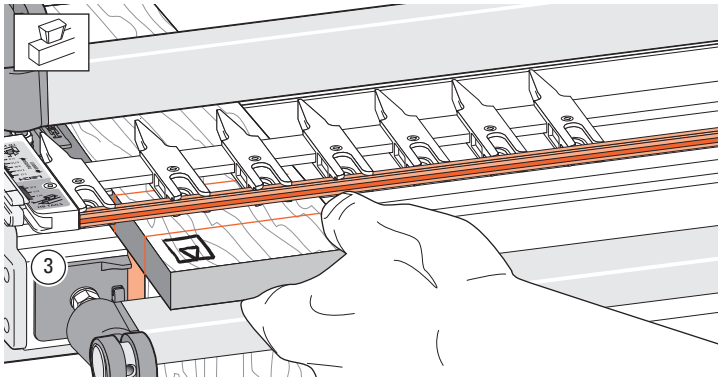
13-7 Marking Out: *Do not mark the slot positions on the board faces,* Mark the **edges** of both slot boards **together** for perfectly level shelves. Stay at least 7"[180mm] in from the ends for clamping on this test project. *13-25 describes how to rout close to both ends.* Mark the narrow test slot board in the same way at several closely spaced random spots. This board is used only for setup.



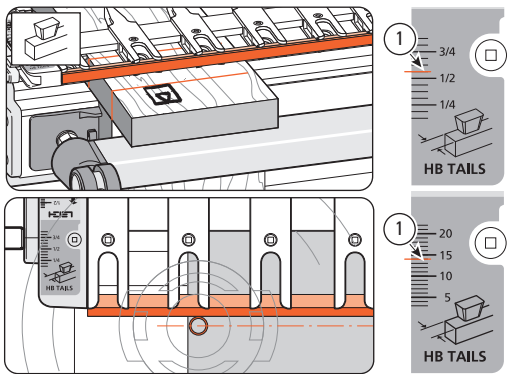
13-8 *On the test slot board only,* square the marks across the face.



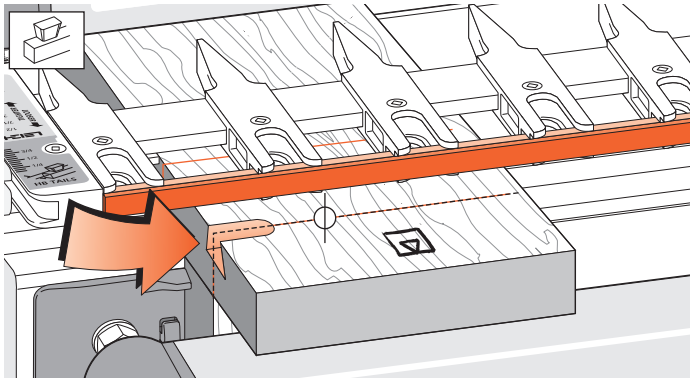
13-9 Mount the test slot board in the rear clamp, markings up ①. Mount a ¾"[20mm] thick ② square-ended board vertically in the front clamp against the side stop, with the top edge butting the underside of the test board *(yes, the 3/4"[20mm] thickness is important).*



13-10 Position and clamp the test board so that one of the edge marks is in line with the *outside edge* of the vertical board ③.

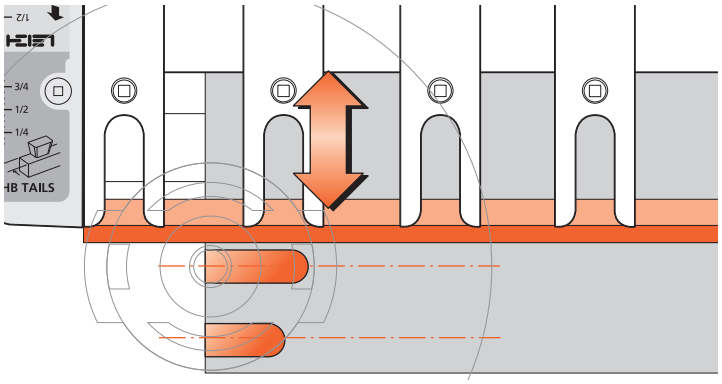


13-11 With the finger assembly (including the cross cut fence) on the support brackets in the HB TAILS mode, set the scale to 9/16"[14mm] ①. The routed slot will be close to centred on the slot line. *Make sure the finger assembly is level and sitting flush on top of the board.*

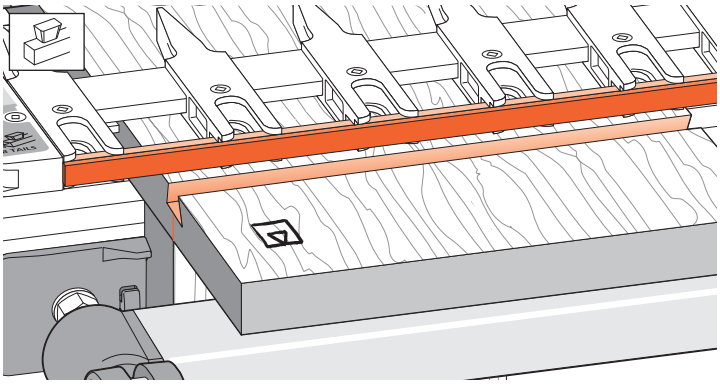


13-12 Adjust the bit so the cut depth is about 5/16"[8mm]. Rout from left to right maintaining light inward pressure of the guidebush on the fence. Rout in only about 1"[25mm] and back out again.

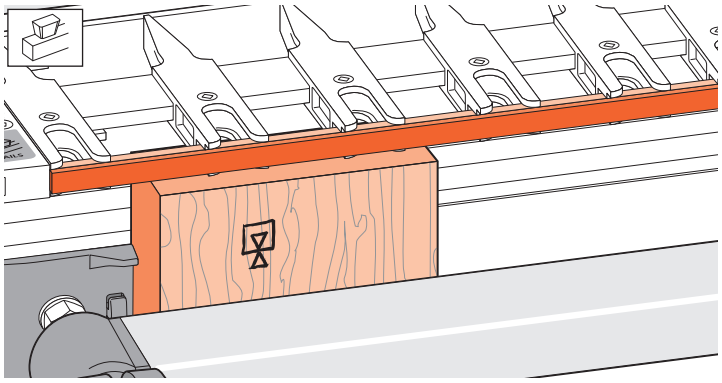
Do not lift the router.



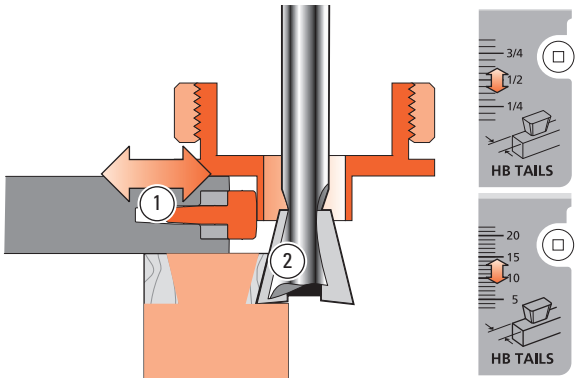
13-13 Check to see if this short slot is centred on the pencil line. If not, adjust the finger assembly in or out and re-test on the other lines as necessary until the slot is centred. Lock the finger assembly in this position and record the setting for future reference.



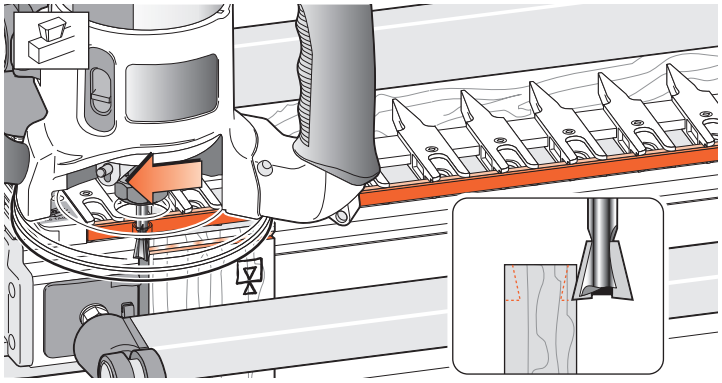
13-14 Now rout sliding dovetail slots in the two main slot boards with the boards in the horizontal position in the rear clamp, slot side, that is inside face ⊡ up.
The guidefingers must be flush on the board.



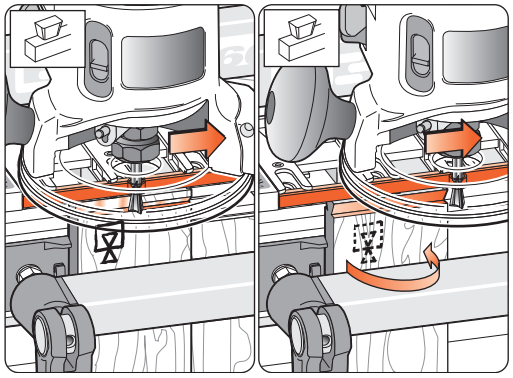
13-15 Replace the spacer board in the rear clamp, and with the finger assembly on the spacer board, mount a test tail board vertically in the front clamp, **flush under the guidefingers**. Either side can face out ⊡.



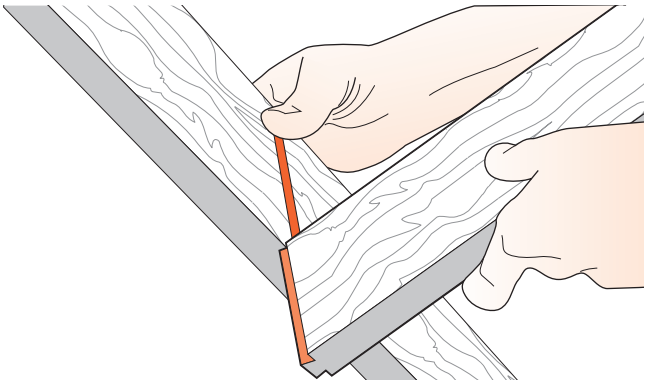
13-16 The HB TAILS scale is not designed for this mode, but it does allow you to make quick adjustments for tail size and joint fit on sliding dovetails.
Adjust and set the finger assembly ① so it is clear that the routed tail ② will be too large for the slot.



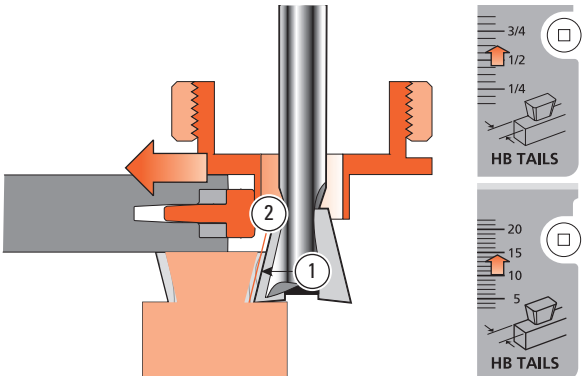
13-17 ⚠ Rout one side of the test tail board.
Make one light pass from right to left (climb routing). Make sure you control it firmly, because it is driven in this direction by the bit. Only the tip of the bit should be cutting on the first cut (see inset). This *back* or *climb* routing leaves a very clean shoulder in side grain.



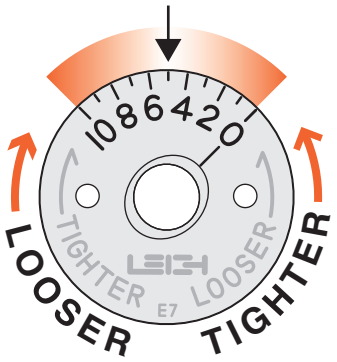
13-18 Finish left to right, with the guidebush touching the fence. Turn the test tail board around in the jig and rout the other side in the same manner.



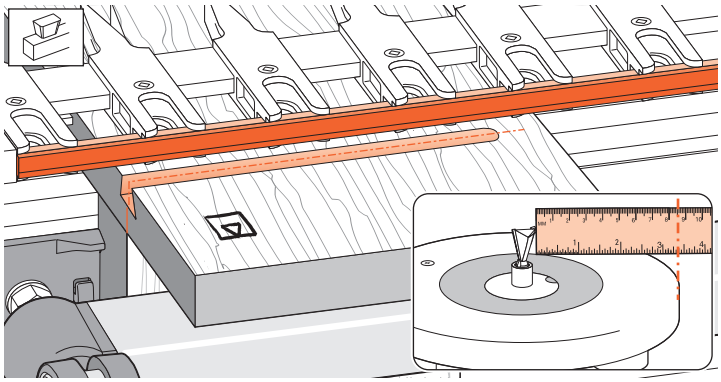
13-19 Test the joint for fit. The tail should be too big. If it is too small, adjust the finger assembly outward by at least half the difference and rout another test tail on the other end of this test board.



13-20 If the tail is too wide ① move the finger assembly in toward the jig by half the amount the tail is too wide ②. Rout the same test board again. Adjust and re-test until fit is slightly loose or slightly tight.

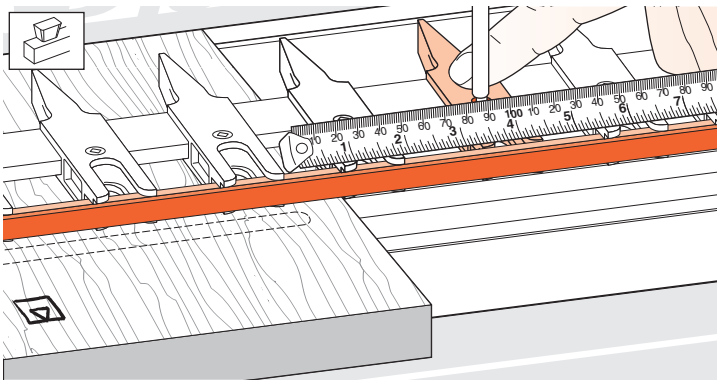


13-21 **Note: the e7-Bush adjustment for sliding dovetails works reverse to normal. Turn it down for tighter fit, up for looser.** Adjust the **e7-Bush** for a fine fit: If fit is loose, turn the bush lower; if fit is tight, turn it higher. When the fit is satisfactory, rout one end of a project tail board and test again. If the fit is good, rout all the other ends.

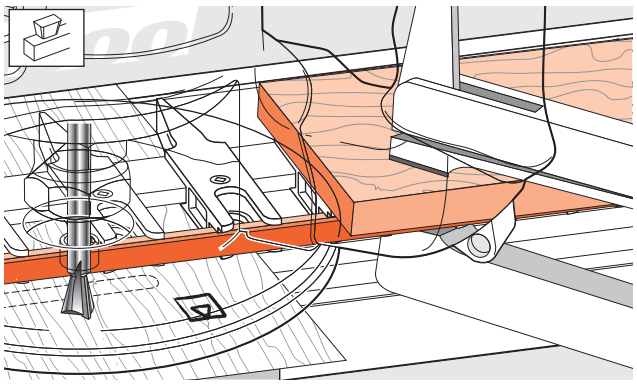


13-22 Stopped Sliding Dovetails
If a stopped sliding dovetail is called for...

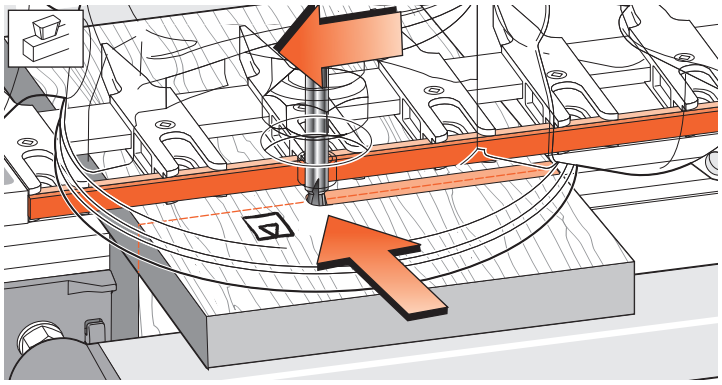
Measure from the outside tip of the dovetail bit to the edge of the router base.



13-23 Measure the same distance from where you want the slot stopped to a position on the finger assembly. Move a guidefinger to that point and mark the guidefinger with a felt pen as a visual router stop mark…



13-24 Or lightly clamp (**with a soft-jawed clamp**) a short board to the finger assembly to act as a router stop.



13-25 Dovetail slots preferably are routed from left to right because the bit's clockwise rotation pulls the guidebush against the fence. However; as when routing close to both ends of a board, it may be necessary to rout slots from right to left. **Bit rotation will tend to pull the router away from the fence. Feed slower and maintain constant guidebush pressure against the fence.** ■