Single Pass Half-Blind Dovetails

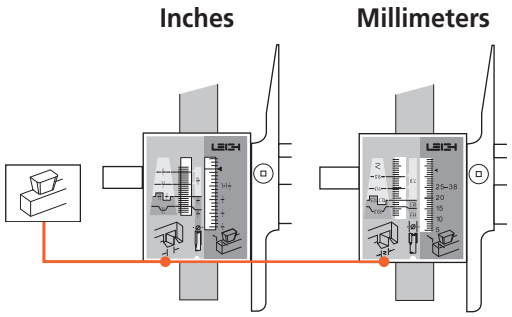
Why rout "single pass" dovetails on a variable spaced Leigh jig? Well, you just may need to reproduce or restore a late 19th or early 20th century drawer which has similar, machine made joints. Or, if you are making a lot of drawer boxes and are not so concerned with the traditional "hand cut look",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

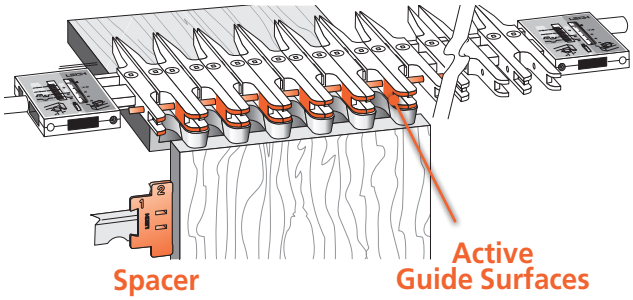
1 Only one mode is required:

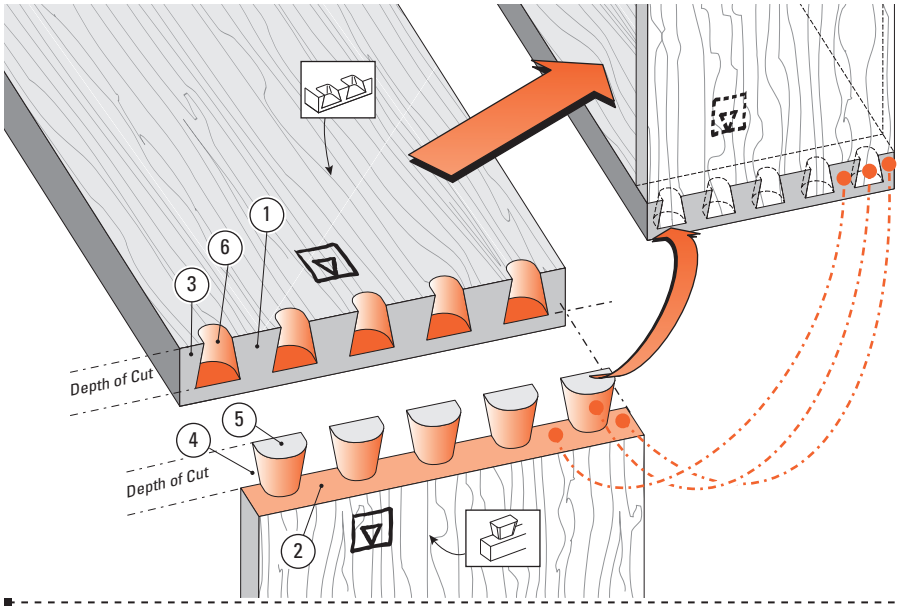
Half-Blind Dovetail Tails (HB TAILS) mode

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.





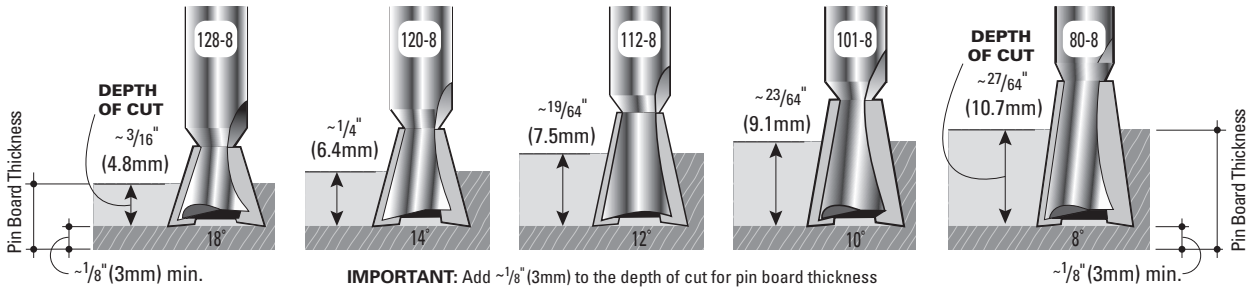


11-1 Single Pass Half-Blind Dovetails:

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.

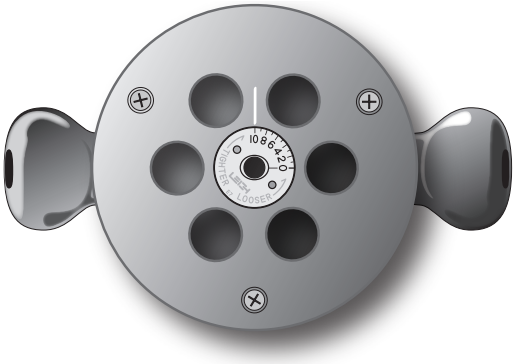
11-2 Cutting Depth for Single Pass Half-Blind Dovetails

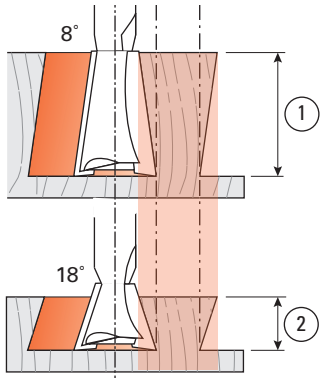


IMPORTANT: Add ~1/8"(3mm) to the depth of cut for pin board thickness
NOTE: See fig.11-9 on p.42 for range of tail board thickness
~ Symbol for approximately

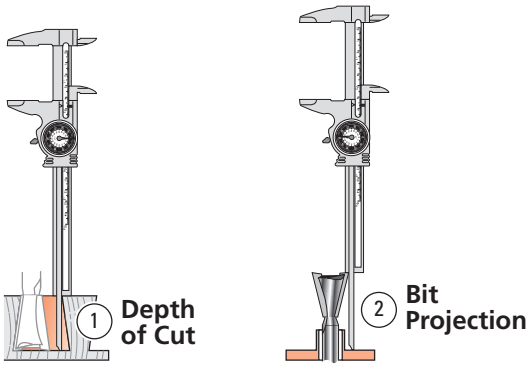
⚠ IMPORTANT! Bit depths of cut for "single pass" dovetails are not the same as for variably spaced joints.

- 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 10-3 to 10-5 for why.***
- 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" [6,35mm] see p.69).

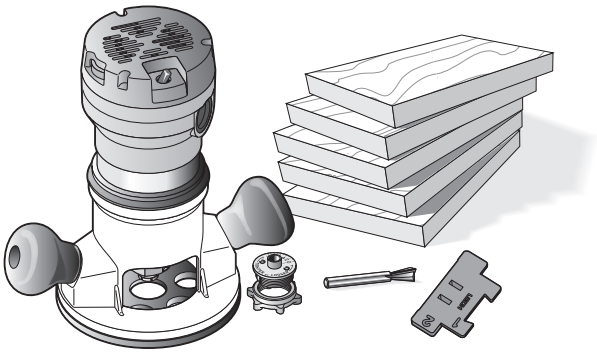




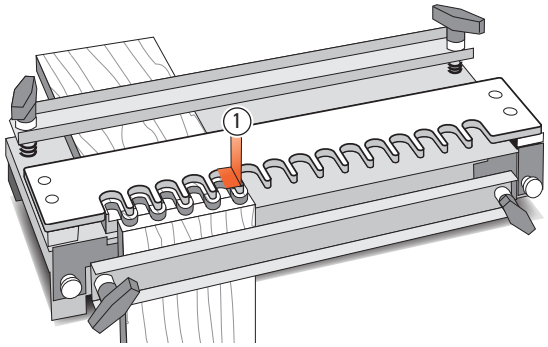
11-3 Bit Angle and Depth of Cut Half-blind pins and tails are routed with the **same** dovetail bit, the **same** guidebush, and the **same** depth of cut. A different depth of cut requires a different angled bit. Leigh offers five different angled dovetail bits for a range of cut depths. A lesser angle, say 8°, for a deeper cut ①; a greater angle, say 18°, for a shallower cut ②.



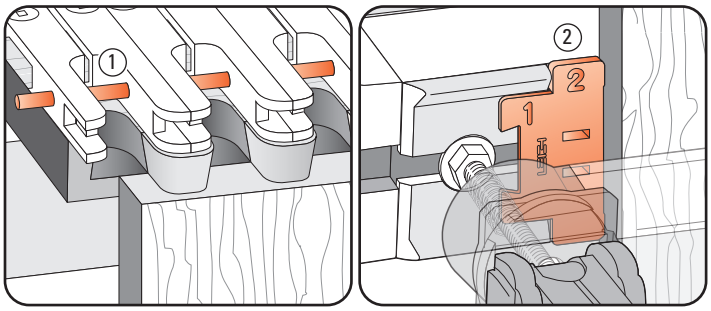
11-4 Cumulative plus/minus tolerances in routers, bits and guidebushes, make it impossible to state exact bit depth for first-time precision fit. All dovetail jigs require trial and error tests to attain a fine fitting joint. The good news; we give a starting depth for each bit. Test and measure the successful 'Best fit' depth of cut ① or bit projection ② and record for future first-time fits.



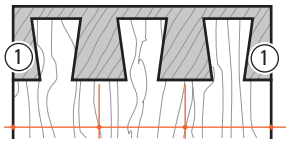
11-5 Routing a Test Joint You need a router, the **e7-Bush** set at No.10 (see chapter 3 for **e-Bush** instructions) and the 80-8 ½"[12,7mm] 8° dovetail bit. *Note:* The No.80-8 bit routs at a shallower ~½"[13mm] depth on single pass dovetails than on regular variably spaced joints. For this test, start with the No.80-8 bit projecting 15⁄16"[24mm] from the router base.



11-6 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].

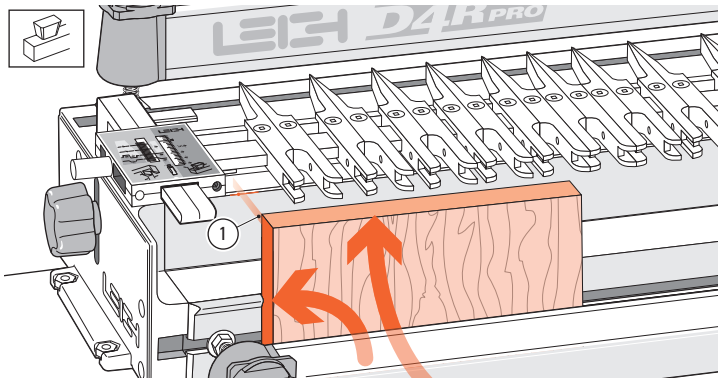


11-7 Stop Rod and Dovetail Spacer The stop rod is inserted in the fingers ① to convert them from deep tail sockets to a shallow fixed comb. The flexible stop rod is fed through the holes in the fingers from the "far" end of the jig. The **Dovetail Spacer** (note the dovetail shaped notch) snaps into the channel against the left-hand front side stop ② to correctly offset the drawer sides from the drawer fronts. After setup, the Spacer stays in place for the complete procedure.

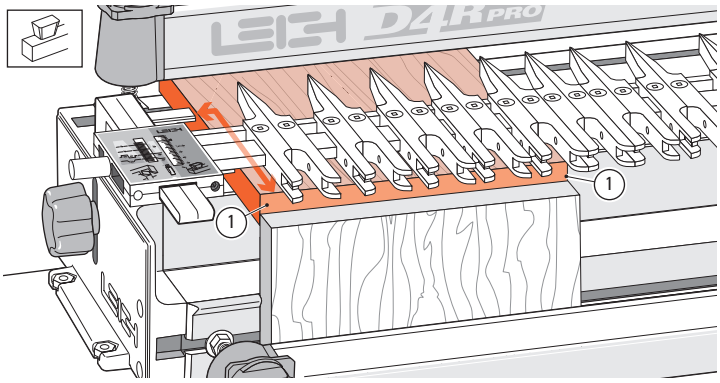


Single Pass Board Width Chart Add up to ¼" [6mm] or subtract up to 1/8" [3mm]	
2 3⁄16 [55]	8 11⁄16 [221]
3 ¼ [83]	9 ¾ [248]
4 ⅜ [110]	10 ⅞ [276]
5 7⁄16 [138]	12 [305]
6 ½ [166]	13 1⁄16 [331]
7 5⁄8 [193]	–

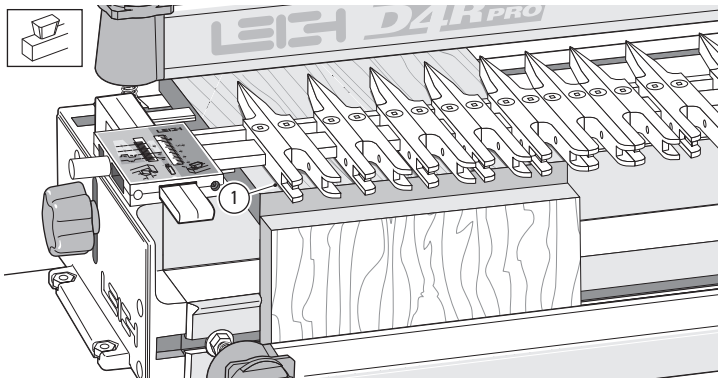
11-8 Board Widths To achieve equally sized half pins ① at each side on a fixed space joint, use the board width from the chart above. Alternatively, you can add up to ¼"[6mm] to the listed board width, or reduce it by ⅛"[3mm]. This chart covers boards up to a maximum width of 13 1⁄16"[331mm]. Example: the 12"[305mm] can be up to 12¼"[311mm] or as small as 11⅞"[302mm].



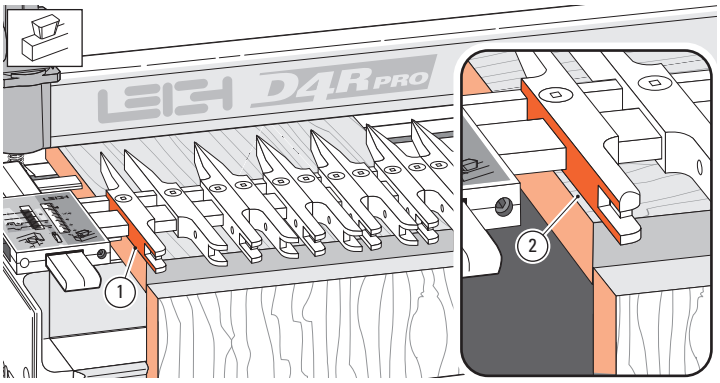
11-9 With the finger assembly raised in the HB Tails mode, clamp a drawer side in the front left side, against the side stop and the top end edge slightly above the jig body top ①.
Note: Drawer side (tail board) thickness can be from 7⁄16" to 9⁄16"[11mm to 14mm]. See 11-25 re drawer side thickness greater than 9/16".



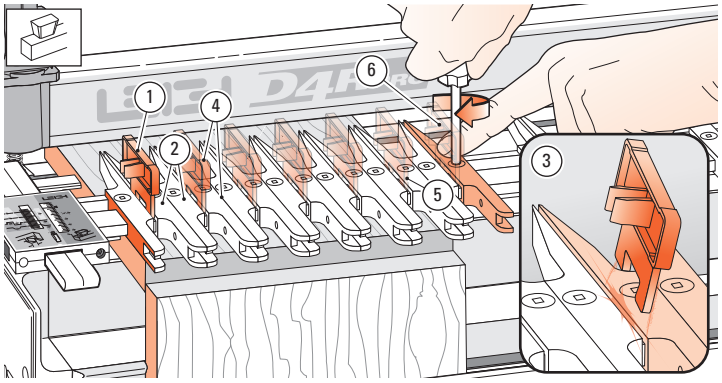
11-10 Place a sample drawer front from ⅝" to 1½" thickness [16 to 38mm] in the rear clamp. Clamp with the side edge against the left rear side stop, front end edge touching flush across the rear of the front board ①. Note: the ⅝" [16mm] minimum thickness can be reduced if using other shallower bit depths. ! *Board edges must be square.*



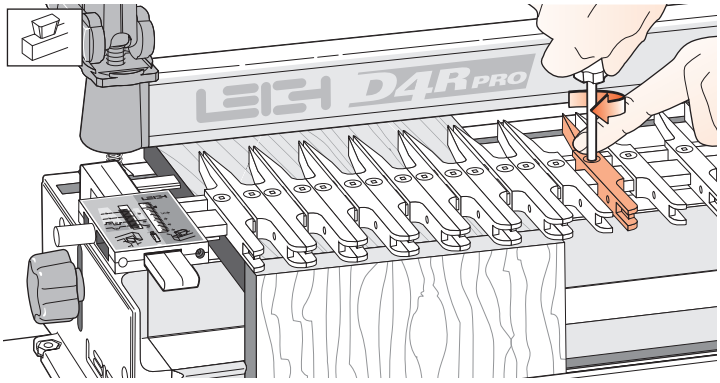
11-11 With the scale set on ½"[12,7mm], lower the finger assembly to about ⅛"[3mm] above the drawer front to ease adjusting the guide fingers ①. ***The scale is always set on the 1/2"[12,7mm] mark for single pass dovetails.***



11-12 With boards the same width as a board width chart size (Fig. 11-8), set the first guide finger flush against the board edge ① and tighten. If board width is greater than a chart size, set the first finger in from the edge by half the additional board width ②. If board width is narrower than a chart size, overhang the first finger by half the difference and tighten.

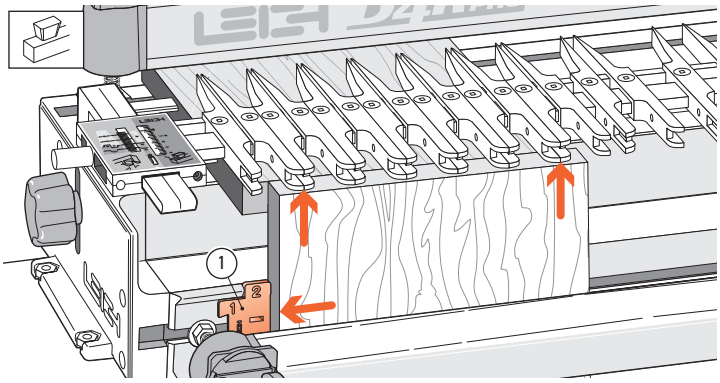


11-13 Set the dovetail spacer against the ***single*** guide finger with numeral **2** facing to the right ①. Move the next ***two*** fingers against the spacer and tighten ②. Remove and locate the spacer to the right of the tightened fingers. You should feel some friction removing it ③. Slide the next two fingers against the spacer and tighten ④. Repeat ⑤ across the board width plus two more fingers ⑥.

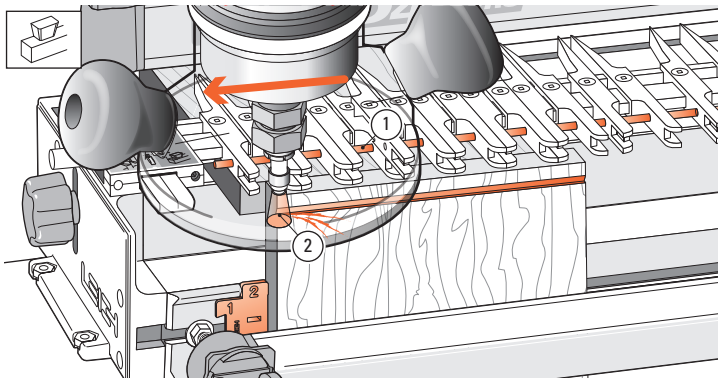


11-14 Move any spare fingers so that they will support the router and **tighten all loose fingers**.
Lower the assembly **flat onto the drawer front**.

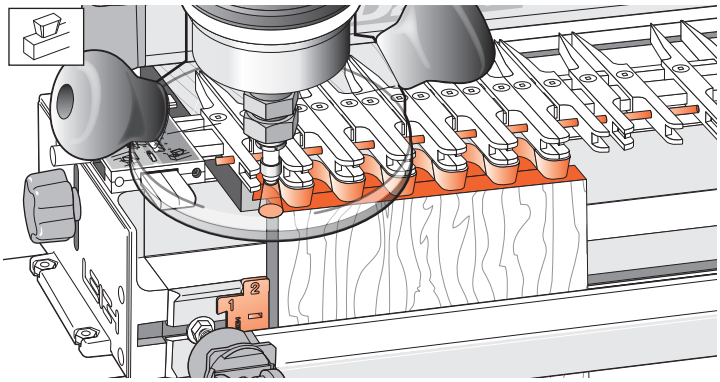
REMEMBER SAFETY!



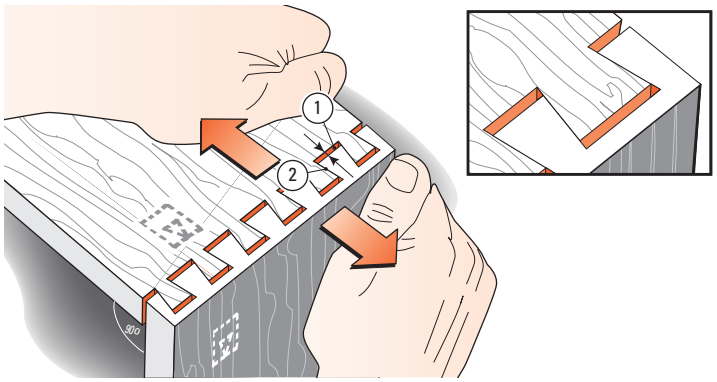
11-15 Unclamp the tail board from the front clamp and insert the dovetail spacer as shown against the side stop ①. Re-set the drawer side in the front clamp so that its top edge touches the guide fingers and is perfectly flush with the top face of the drawer front and the left edge is against the Spacer.
! *Board edges must be square.*



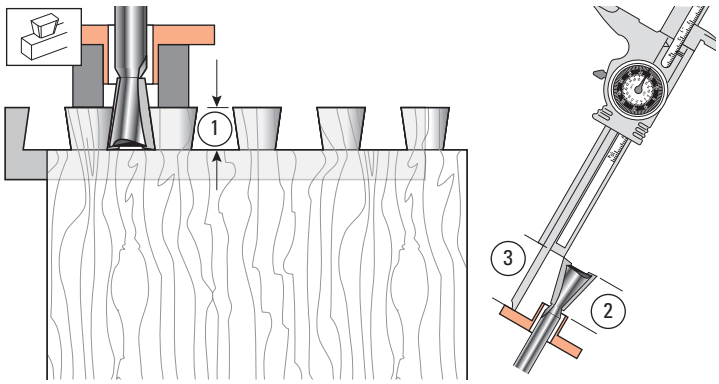
11-16 **Insert the Stop Rod through the holes in the fingers** ①. For the first light cut move the router from right to left. **Make sure you control it firmly, because it is driven in this direction by the bit. Only the tip of the bit should be cutting on the first cut** ②. This back, or climb routing, leaves a very clean shoulder when routing side grain.



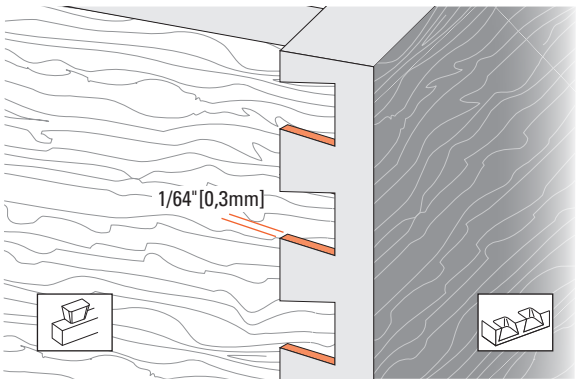
11-17 Now rout in and out from left to right. Follow the guides **in on the left of each finger opening to touch the stop rod and come out on the right**. The pins, tails and sockets are formed simultaneously.



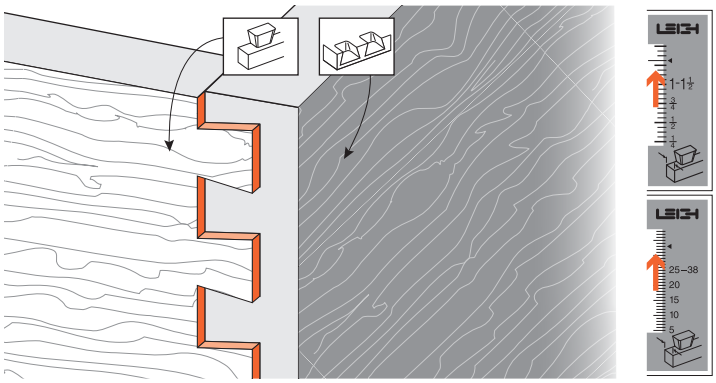
11-18 Remove the boards and test the joint for fit. If the joint is **loose**, as shown here, **lower** the bit by the same amount as the gap at the bottom of the pins ① when the pins are pulled against the socket sides ②. If the joint is too **tight, raise** the bit slightly. Test again. You cannot rout the same board ends again with a dovetail bit, so use two fresh ends for each test.



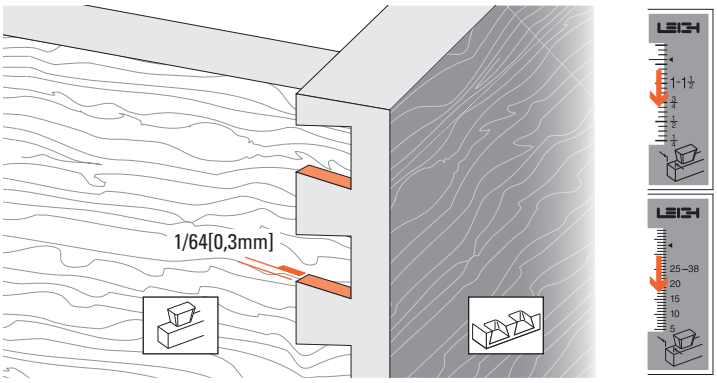
11-19 Keep the test tail board that fits well, and mark it with the number of the bit you used to rout it. For quick set-up next time, clamp this tail board in the jig as a *depth-of-cut gauge* ① to show how far to lower the bit. Better yet, measure the bit projection from the end of the guidebush ② or guidebush flange ③ and record this for fast set-ups in future.



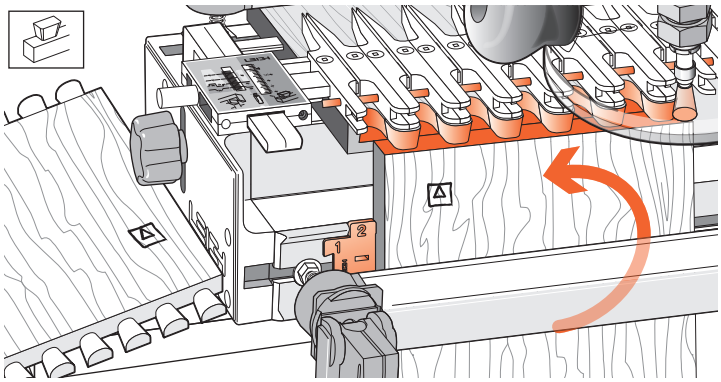
11-20 When you have the proper tightness of fit, check the flushness. The tails should be under flush to the pins by *no more than 1/64"[0,3mm] to allow for cleanup (exaggerated here)*. Any concentricity errors in the collet and guidebush on different routers will affect this tolerance.



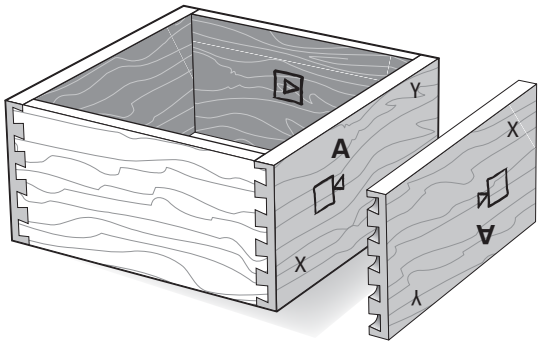
11-21 If the tails stand out from the pins, set the HB TAILS scale **away from the operator** by half the amount required.



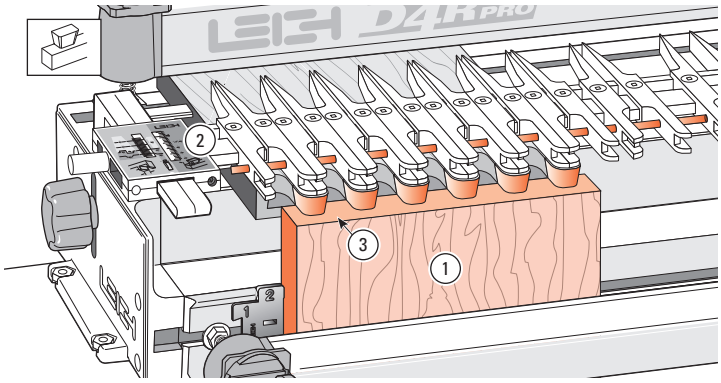
11-22 If the tails fit in too far past the pins ends, set the HB TAILS scale **toward the operator** by half the amount required.



11-23 To make a box, repeat the procedure four times, ensuring the drawer fronts, rears and sides are all rotated correctly in the jig, **keeping the inside face ⊡ of the boards away from the jig.**



11-24 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.

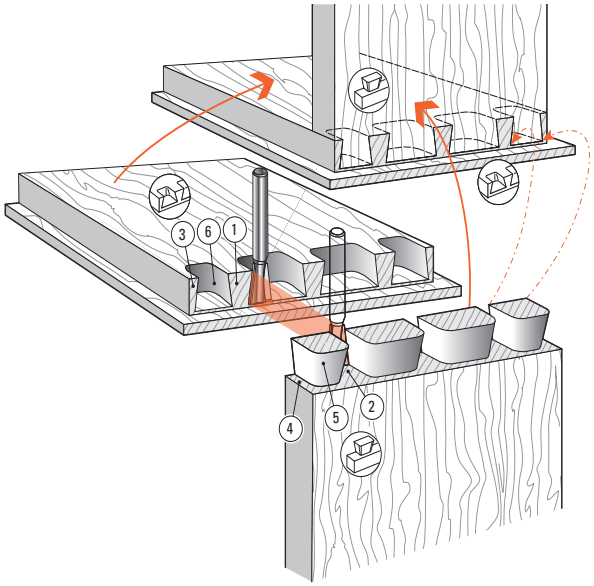


11-25 For tail (drawer side) boards thicker than 9/16" [14,29mm] ①, **set the scale to 1/2"**[12,7mm]② and leave the stop rod in place. **Do not** set the scale to the actual tail board thickness. With thicker boards, more of the inside portion of the tail board ③ will be routed away. Slight scale adjustments may be required for a flush fit. See figures 11-20 through 11-22.

Bit	Cutting Depth Increase per e-Bush Increment
80-8	0.014"
101-8	0.011"
112-8	0.009"
120-8	0.008"
128-8	0.006"

11-26 Hint: Increasing the Depth of Cut (see page 40) This is based on setting the eBush on 10. The depth of cut for each bit can be increased slightly by turning the eBush to a lower number. For example, if you turn the eBush from 10 to 9 you will have to increase the depth of cut by 0.014" [0,36mm] for the 80-8 bit. If you turn the eBush two increments to number 8 you will have to increase the depth of cut by 0.028" [0,71mm] and so on. ■

Rabbeted Half-Blind Dovetails



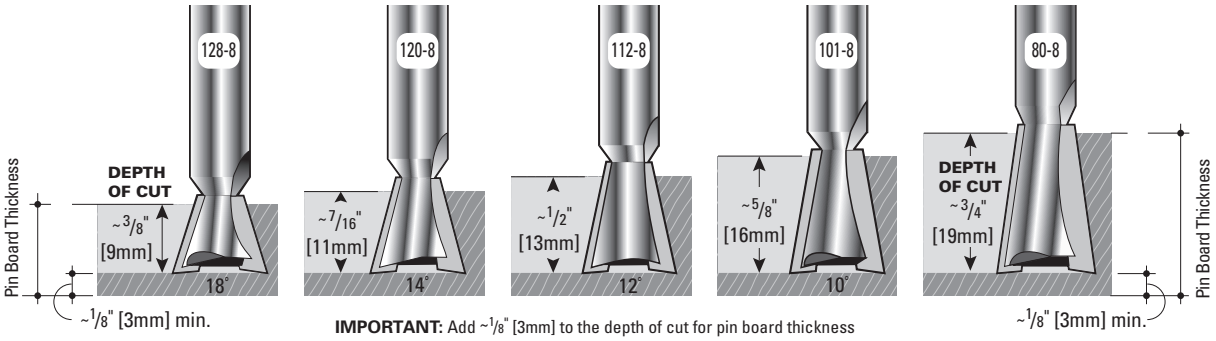
Before attempting rabbeted half-blind dovetails, first master the techniques of flush half-blind dovetails in chapter 10.

12-1 Rabbeted Half-blind 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.

12-2 Cutting Depth for Rabbeted Half-Blind Dovetails

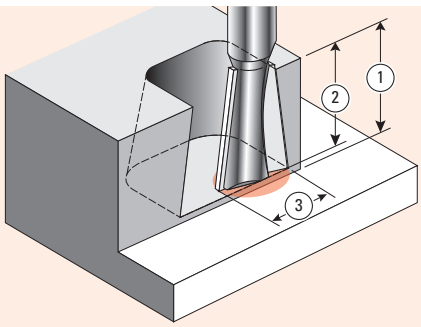


IMPORTANT: Add ~1/8" [3mm] to the depth of cut for pin board thickness
NOTE: See 10-35 chart on p.38 for range of tail board thickness
~ Symbol for approximately

⚠ Important! Read This About Rabbeted HB Depth of Cut

Bit selection is critical. You need to select a specific dovetail bit for your rabbeted half-blind dovetail project, depending on the rabbet depth you are using.

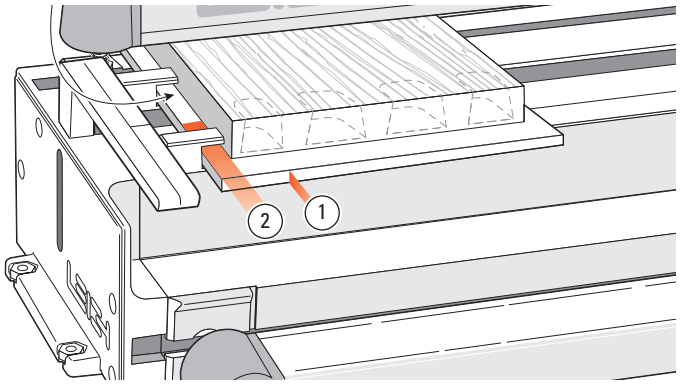
- Choose one of the five 1/2"[12,7mm] diameter dovetail bits shown above. See bit selection in Appendix II.
- Depth of cut must be as specified for each of the five bits illustrated above. *Exception: See fig.11-26. Note: No's 101-8, 112-8 and 128-8 are optional Leigh bits.*
- Raising the bit above its 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 change joint fit tightness. See 10-3 to 10-5 for why.
- Rabbeted Half-blind PINS and TAILS are routed with the same dovetail bit and must be at the same Depth of Cut.
- All half-blind dovetail bits work with the Leigh e7-Bush supplied with your Leigh jig or a standard 7/16"[11,1mm] outside diameter guidebush.



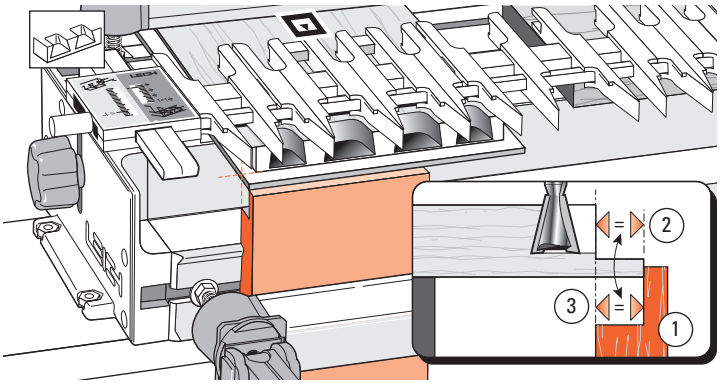
RABBET DEPTH ① determines the **maximum depth of cut** ② you can use. Select a bit with a depth of cut that is at least 1/16"[1,6mm] **less** than the rabbet depth.

Each dovetail bit will produce **only one depth of cut**.

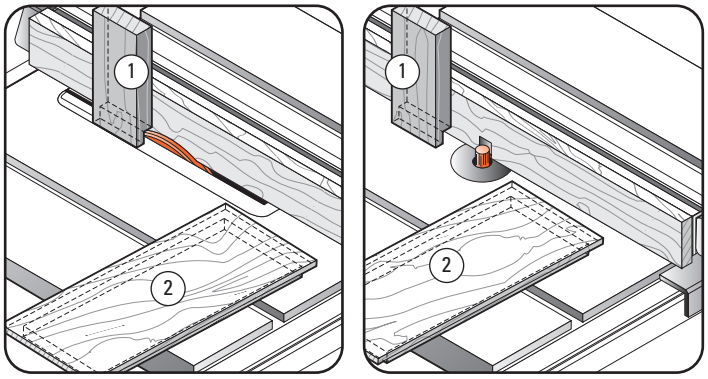
Only 1/2"[12,7mm]③ cutting diameter bits can be used for half-blind dovetails.



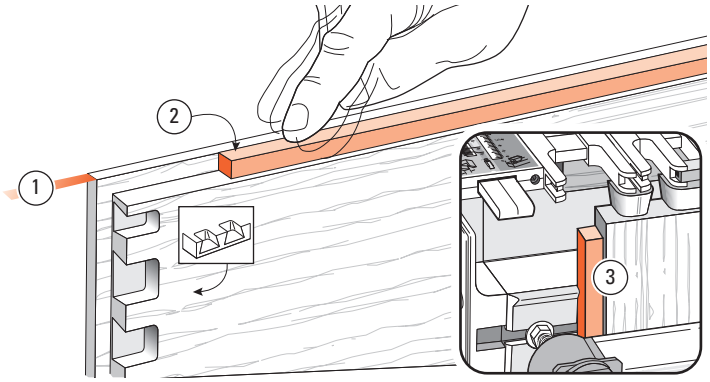
12-3 Provided the drawer front lip is ⅜"[9,5mm] or less in thickness ①, you can mount and rout rabbeted drawer fronts **and sides** exactly the same way as flush drawer fronts. If the lip is thicker or wider than ⅜"[9,5mm] ② *see 12-6 thru 12-8.*



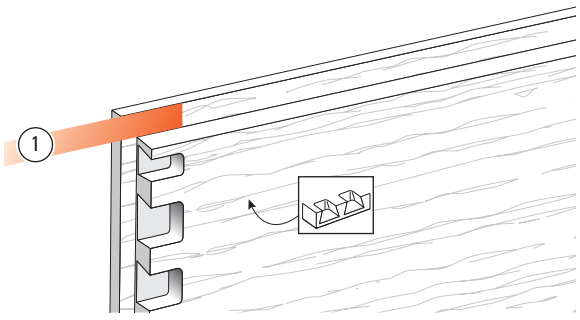
12-4 Rabbeted Pins *You will need to clamp a scrap stop block ① in the front of the jig out from the jig's front face by exactly the depth of the rabbet ②.*This brings the pin ends exactly in line with the front jig face ③, ensuring that the scale reading is accurate.



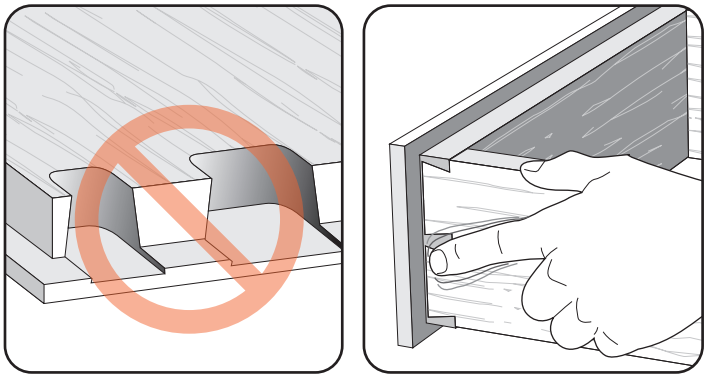
12-5 An easy accurate way to do this is to rabbet the end of a scrap piece ① vertically over a dado blade or router bit at the same time as you rabbet the drawer front (horizontally) ②.



12-6 If the lip **thickness** ① is greater than ⅜" [9,5mm], it will not fit under the side stop. Block the drawer side away from the front side stop by exactly rabbet depth (*see 12-3*). Make up a block ② and stick it to the jig face ③ with double-sided tape. Make sure it touches the side stop. This will offset the drawer side from the side stop by the width of the rabbet, and align the sockets with the pins.



12-7 If the rabbet **width** ① is greater than ⅜"[9,5mm], the drawer side must be offset from the front side stop by the depth of the rabbet **minus** ⅜"[9,5mm]. Make up a block to this measurement and stick it to the face of the jig, touching the front side stop. This will offset the drawer side away from the side stop and align the sockets with the pins.



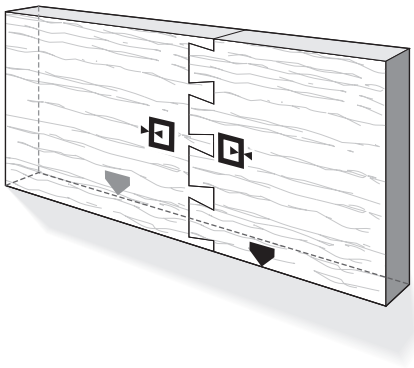
12-8 *Make sure you select a dovetail bit that has a working depth of cut less than the rabbet height.* Otherwise, you will rout into the rabbet.

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 10-28 to 10-30). ■

End-On-End Dovetails

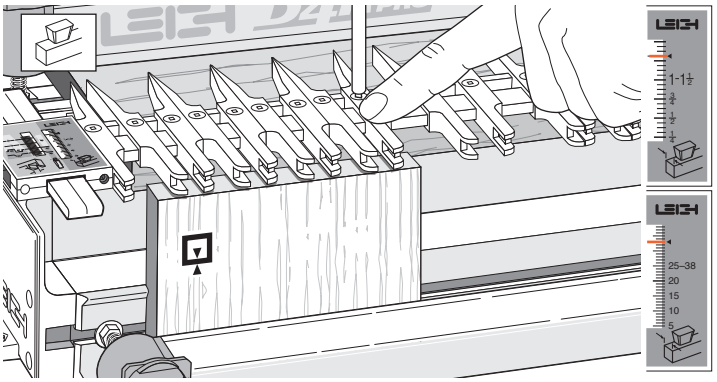
While you have the router set up for half-blind dovetails, it is a good time to try end-on-end dovetails.

⚠ ***If you have not yet routed half-blind dovetails or read through chapter 11, please do so now before attempting end-on-end dovetails.***

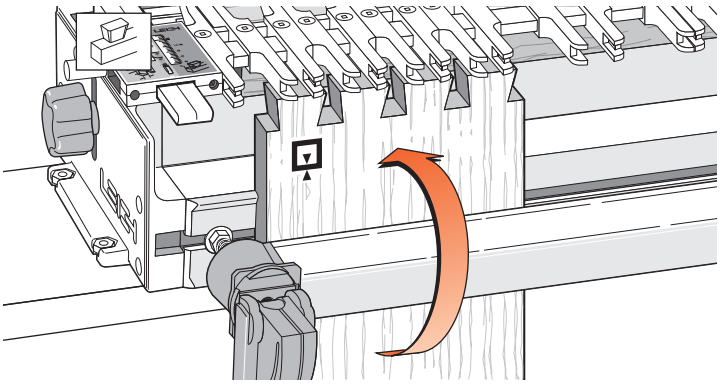


13-1 End-on-end dovetails are made in the same modes as half-blind joints, *but both boards are routed vertically in the front clamp,* alternately face side in and then face side out. Boards for end-on-end joints may be up to ¾"[20mm] thick.

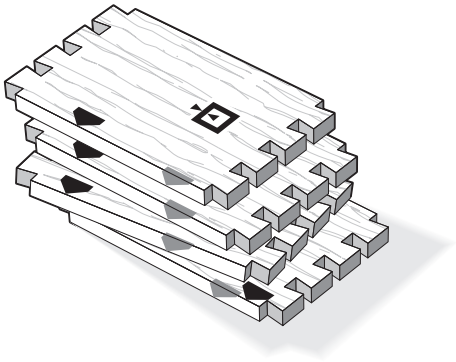
⚠ **Use only the guidebush, dovetail bits and depths of cut as specified in Chapter 10 or Appendix II.**



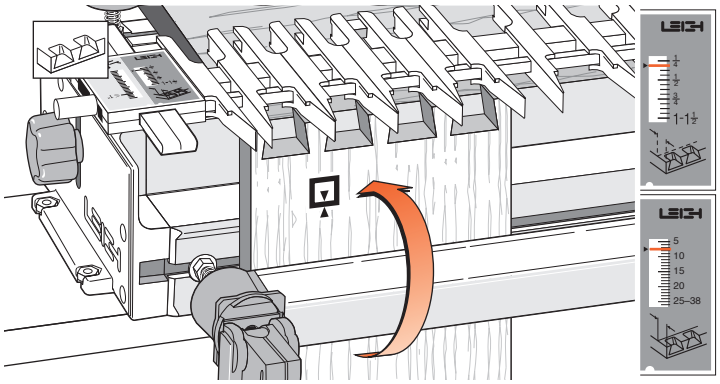
13-2 The end-on-end dovetail is laid out in the HB TAILS mode. There is a special mark on the scale for end-on-end dovetails. *Align the support bracket line with the small arrow as shown.* Adjust the guidefingers as required.



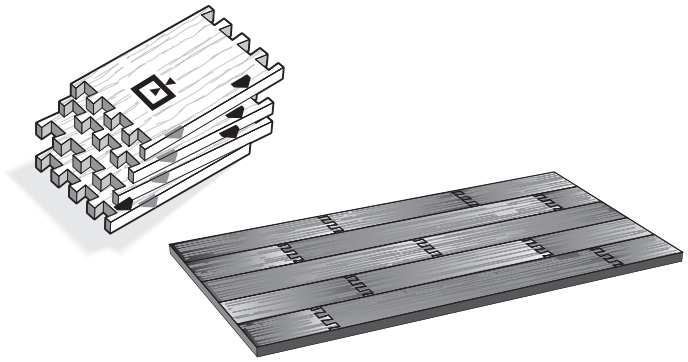
13-3 Rout the tails. Clamp end-on-end dovetail boards in the jig for routing one end face side in and one end face side out. *Keep the same edge against the side stop for both ends.*



13-4 Rout the tails on each end of the tail boards.



13-5 Rotate the finger assembly to HB PINS mode and again **set it on the small scale arrow** for maximum pin board thickness (¾"[20mm]). *There is no theoretical minimum thickness, but avoid thin board tearout, see 17-11.* Rout **pins** on each end of pin boards, **same edge against the sidestop for both ends.** *Narrow pins are illustrated (look like narrow tails), but guidefingers can easily adjust for even-sized tails and pins.*



13-6 Always assemble end-on-end joints keeping the edges of the boards that were against the side stop all in line.

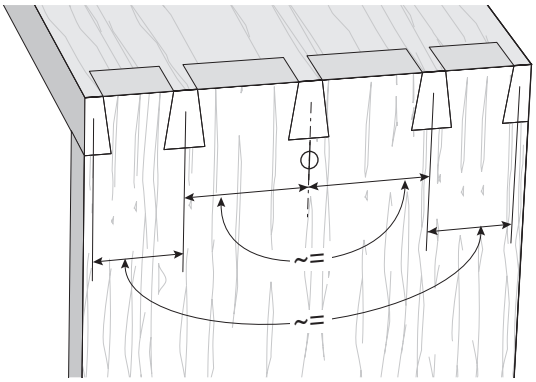
Applications for End-on-End Dovetails

As one example, you can make a flat, stable, and attractive chest lid by edge-jointing and glueing end-on-end dovetailed boards. ■

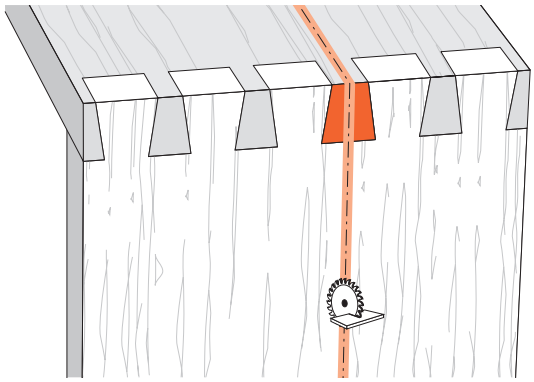
D4R Pro - CHAPTER 14

Asymmetric Dovetails

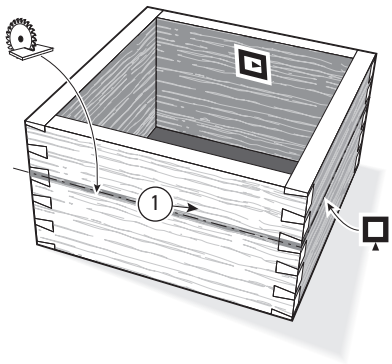
For certain procedures, you will need to use both ends of the Leigh D4R Pro jig. Asymmetrical joint layouts are one example. On the Leigh Jig, no joints will be truly symmetrical, but they can ***look*** *symmetrical. Apparent symmetry is only required for aesthetic reasons, and not for strength.* ***Be sure you have read and understood chapters 8 through 14 before attempting these procedures.***



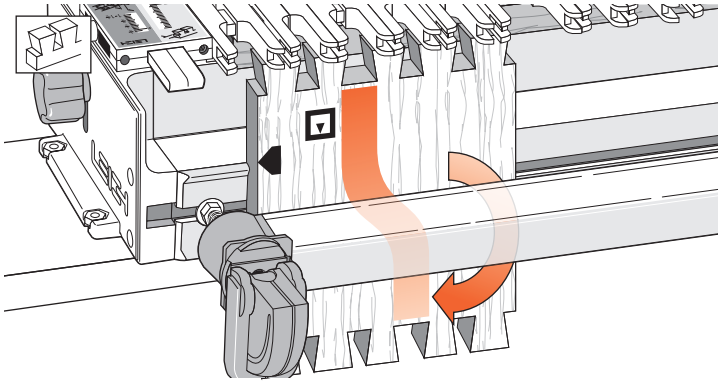
14-1 By *symmetrical* we mean a joint that looks or is approximately symmetrical about its center line but is probably not, and need not be precisely symmetrical. Using the Leigh jig, it is easy to cut a joint that looks symmetrical; the pins will always align perfectly with the tails cut at the same spacing. Remember, symmetry is only required for appearance, not for joinery reasons.



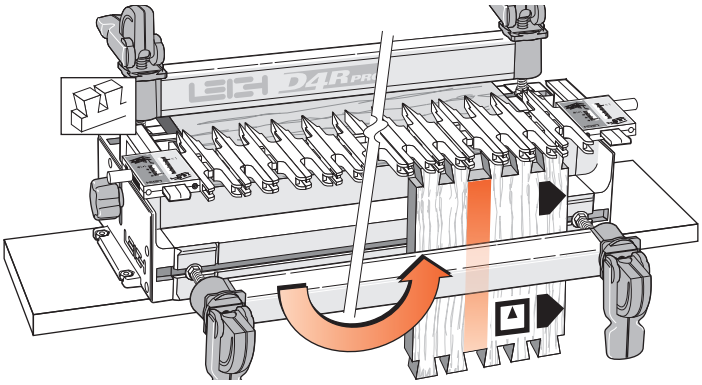
14-2 By *asymmetrical* we mean a deliberately uneven layout of pins and tails required by the project design. For example, asymmetrical joints may be used for blanket chests or boxes. One pin is made wider for a saw-cut allowance…



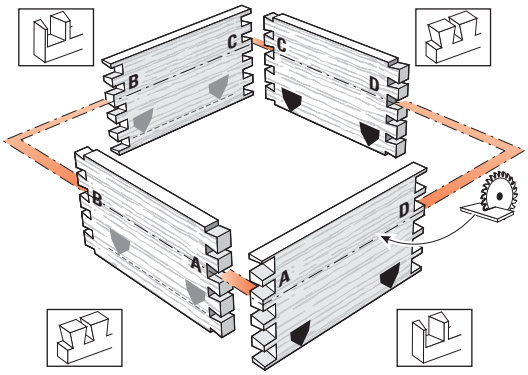
14-3 So the chest and lid half-pins all look the same width after the lid portion ① is cut off.



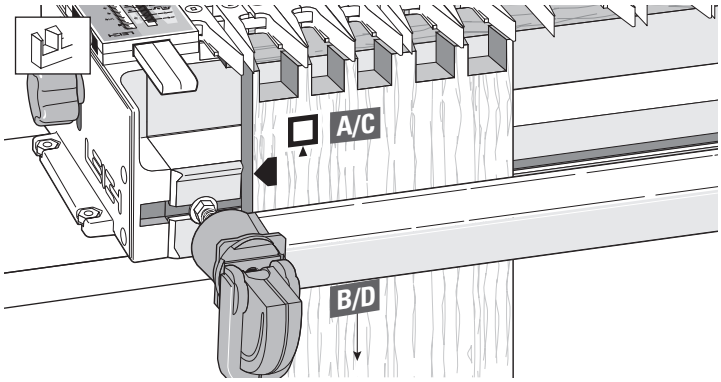
14-4 In the chest example you can see that if both ends of the board are cut under the same guidefingers, the wide sockets and pins at opposite ends will not line up. Remember, the same inside face ⊡ of the through dovetail tail board has to face away from the jig for each cut.



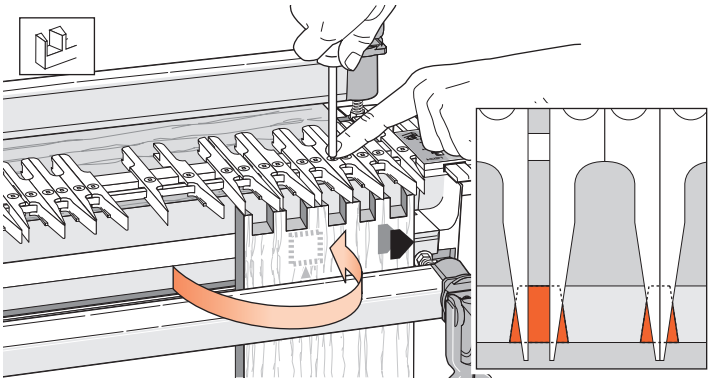
14-5 Deliberately asymmetrical joints must therefore be routed on both ends of the jig using two separate, **almost** mirror-image layouts.



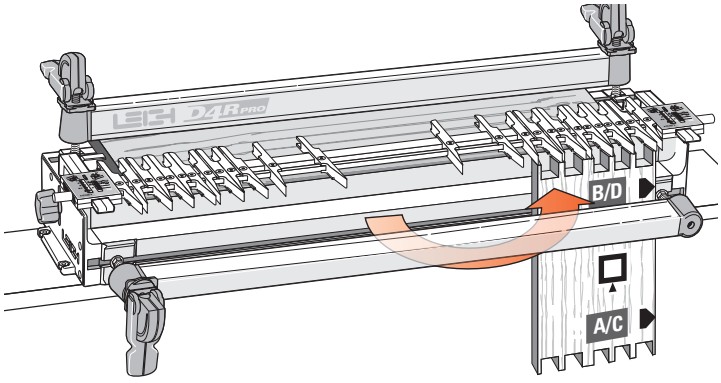
14-6 The layouts need not be exact mirror images because the parts that fit together will be made on the same end of the jig. For a typical blanket chest you would rout corners **A** and **C** on one end of the jig and corners **B** and **D** on the other end. As long as the side stop marks all face up (or all down), the box will go together.



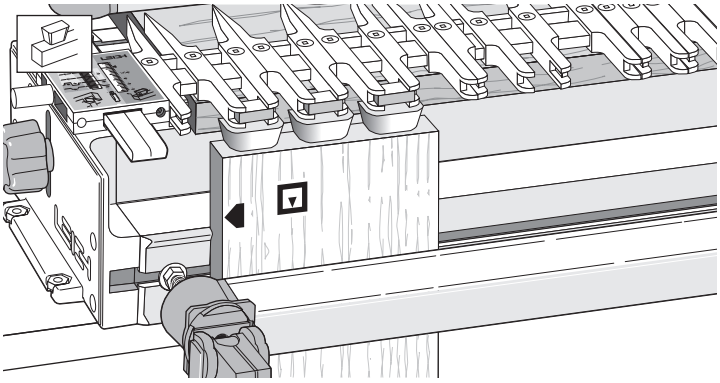
14-7 Here is an easy way to cut these near-mirror-image joints. Lay out the **A** and **C** corner joints in the usual way (i.e., in the TD PINS mode). Rout the **A** and **C** corners' tails and pins. Leave the guidefingers set and in the TD PINS mode.



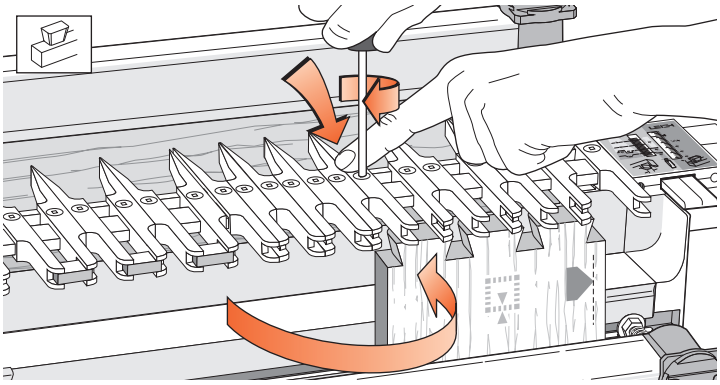
14-8 Simply flip a completed **A** or **C** pin board from one end of the jig (like turning a page) to the other end, and center each pair of guidefingers over a pin.



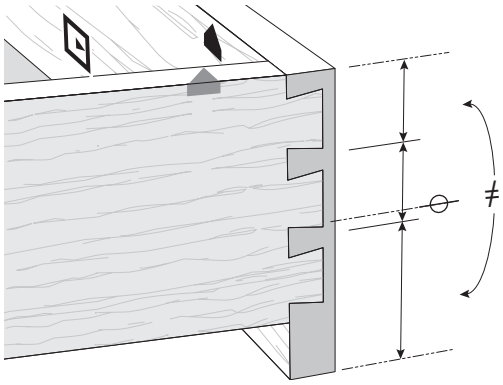
14-9 Now rout the **B** and **D** corners' tails and pins using this guidefinger pattern. When you assemble the case, the **A** and/or **C** ends will fit each other, and the **B** and/or **D** ends will also fit each other. Keep the boards inside face ⊡ inwards on the case and the side stop edges all turned the same way, and the parts are sure to match (see 14-6).



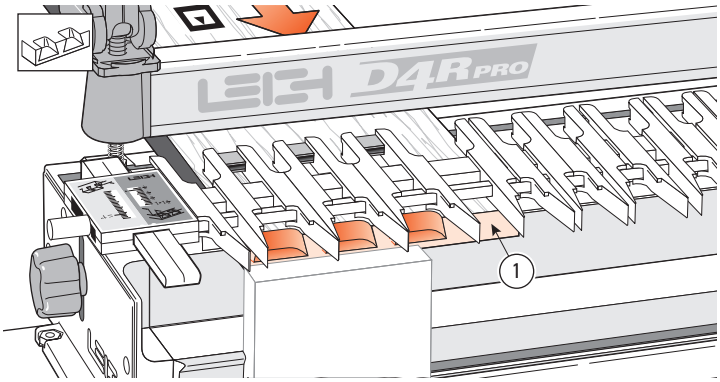
14-10 To transfer a **mirror image** asymmetrical half-blind joint…



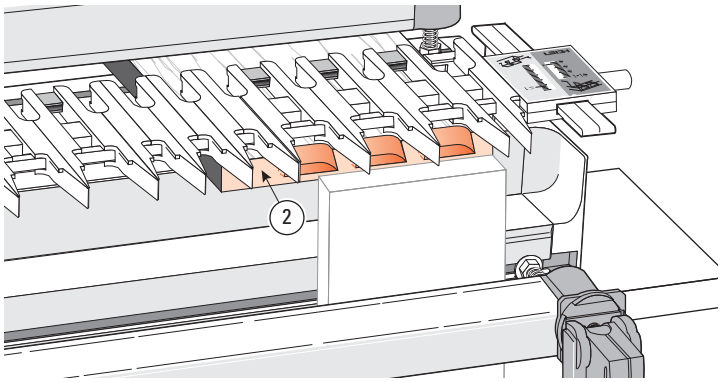
14-11 Turn the tail board (like turning a page of a book) to the other end of the jig. Position the guidefingers over the tails, then rout the tails for the other drawers.
This tail board layout may look symmetrical, but as the next illustration shows, it forms part of an asymmetrical joint.



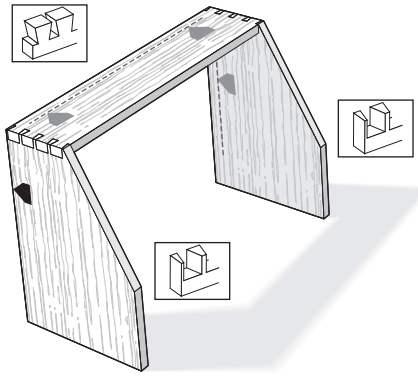
14-12 This common example of asymmetry is where boards are of a different width. In this case, a drop-front drawer, the drawer front bottom half-pin is much wider than the top half-pin. The top edges of the drawer front and sides are flush, so it makes sense to use these edges against the side stops at each end of the jig.



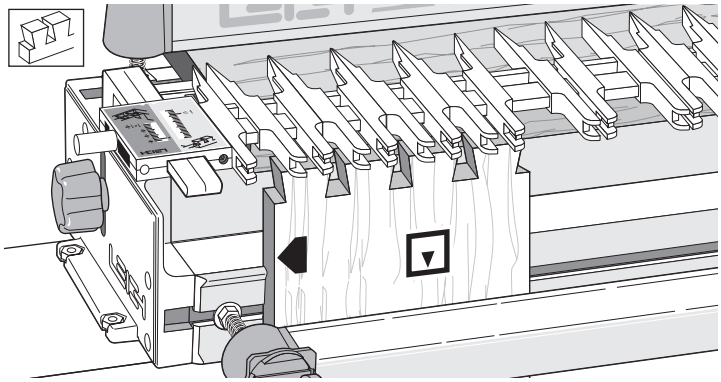
14-13 Mount the right end of the drawer front on the left end, but do not rout this opening ①.



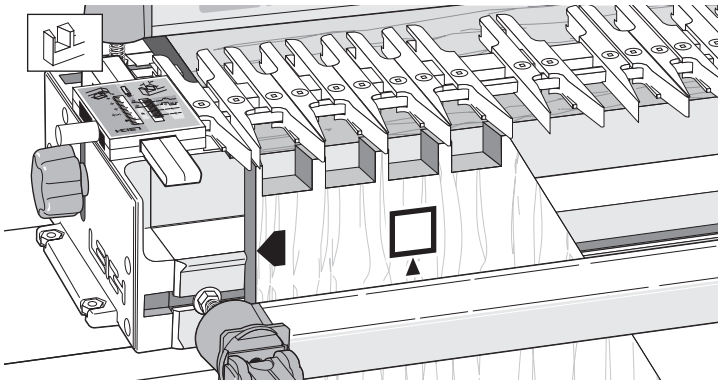
14-14 Mount the left end of the drawer front on the right end, using the **mirror-image** layouts on both ends, but do not rout this opening ②.



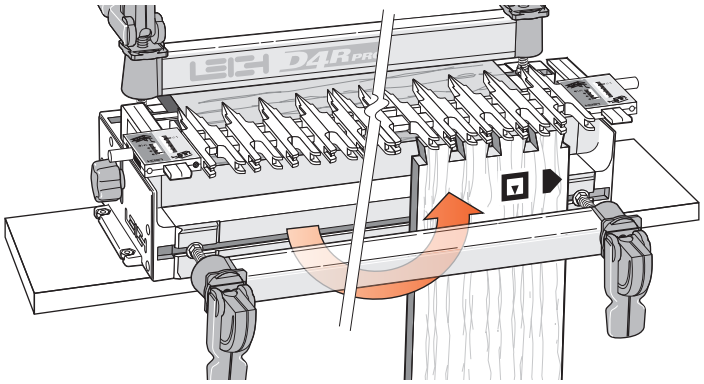
14-15 Both ends of the jig are also used for the top corners of a slant-front desk. The joints themselves may be symmetrical, but they must be routed on opposite ends of the jig because the sloped front will not register accurately against the fixed side stops.



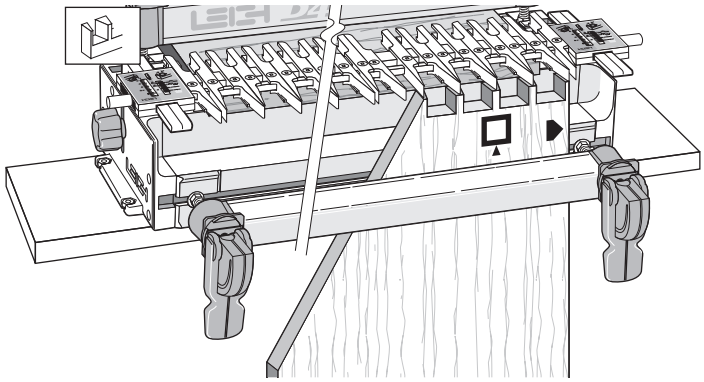
14-16 At the back of the desk both sides and top are flush, so the rear edges are set against the side stops. Place the left end of the top tail board against the left side stop ◀. Rout the tails.



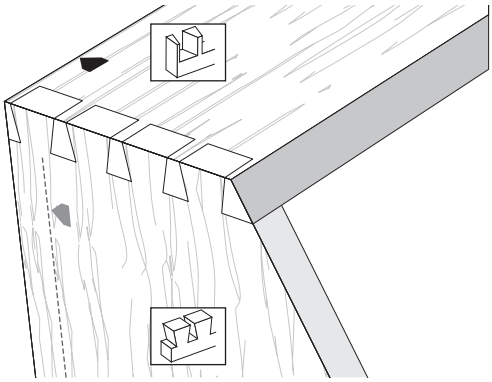
14-17 The left side of the desk goes against the left side stop ◀. Rout the pins.



14-18 Transfer the joint layout from left to right (as for 14-8 to 14-11) and place the right end of the top tail board against the right side stop ▶. Rout the tails.



14-19 Place the right side of desk against the right side stop ▶. Rout the pins.



14-20 *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 above.* ■

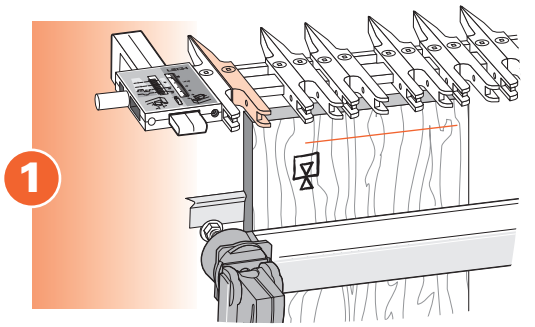
Box Joints

***IMPORTANT:* "Actual" Joint Sizes**

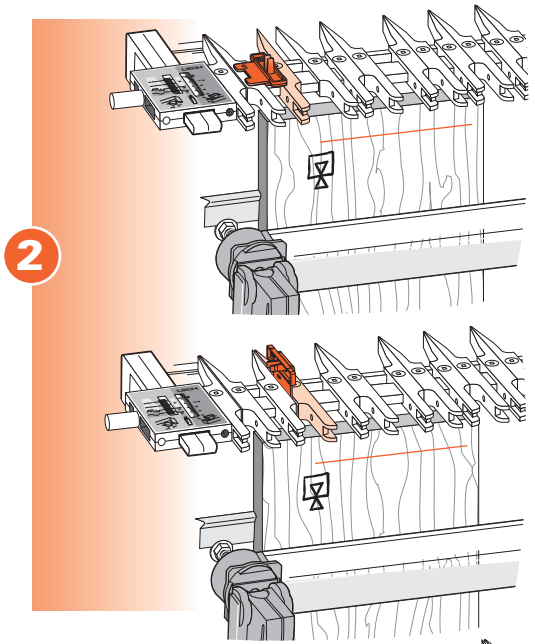
The D4R Pro finger assembly was originally designed solely for dovetailing. Adapting the assembly for box jointing was a serendipitous combination of luck (existing guides approximately the correct dimension) and clever design; the e7-Bush and Spacer. ***As a result, the nominal 3/8" and 3/4"[9,5 and 19mm] box joint sizes are closer to 25/64" and 49/64" [9,8 and 19,6mm] respectively.***

Concept of Operation

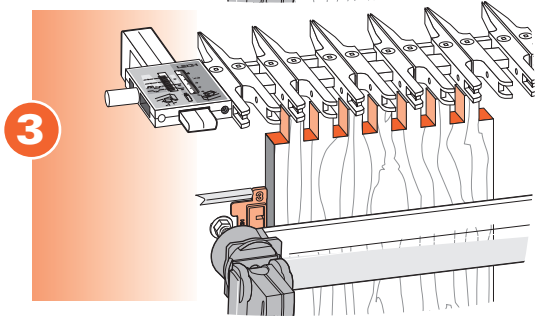
The first board is set against the side stop ①.



The Spacer is used to space the guide fingers ②.

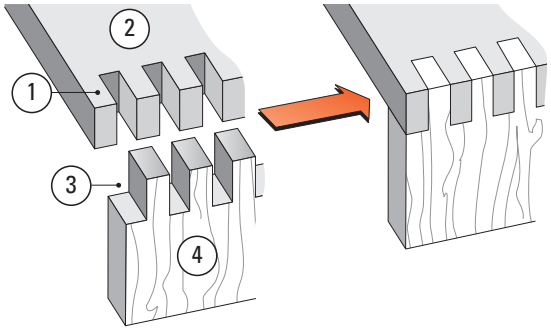


The Spacer is also used against the side stop ③ to accurately offset mating workpieces for correct board to board joint alignment.



Box Joints Terminology

① Pin
② Pin board
③ Socket
④ Socket board
The pins fit in the sockets.



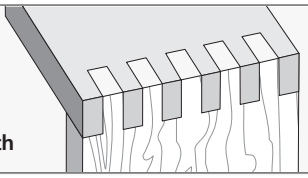
Board Width Selection

Choose a joint size in the chart below: 3/8"[9,5mm] or 3/4"[19mm]. Board width is determined by the total number of pins and sockets in the joint design and whether the joint is symmetrical or asymmetrical. Use this chart to determine board widths up to 16 7/32" [412mm] (limited by the number of guide fingers).

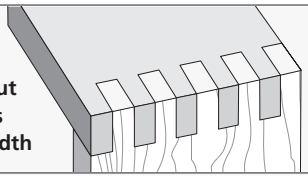
Symmetrical joints have a pin on each board edge. Total pins and sockets is always an odd number.

Asymmetrical joints have a pin on one board edge, and a socket on the other edge. Total pins and sockets is always an even number.

EXAMPLE
3/8" joint size
Symmetrical layout
11 sockets and pins
= 4 7/32" board width



EXAMPLE
3/8" joint size
Asymmetrical layout
10 sockets and pins
= 3 27/32" board width



Board Width - INCHES

	3/8"		3/4"	
	Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
1				
2				
3	1 1/8			
4		1 1/2		
5	1 29/32			
6		2 9/32		
7	2 11/16			
8		3 1/16		
9	3 15/32		2 9/32	
10		3 27/32		3 1/16
11	4 7/32			
12		4 5/8	3 27/32	
13	5			4 5/8
14		5 3/8	5 3/8	
15	5 3/4			6 5/32
16		6 5/32	6 15/16	
17	6 17/32			7 23/32
18		6 15/16	8 17/32	
19	7 5/16			9 1/4
20		7 23/32	10 1/32	
21	8 3/32			10 13/16
22		8 17/32	11 9/16	
23	8 7/8			12 11/32
24		9 1/4	13 1/8	
25	9 19/32			13 29/32
26		10 1/32	14 11/16	
27	10 13/32			15 7/16
28		10 13/16	16 7/32	
29	11 3/16			
30		11 9/16		
31	11 31/32			
32		12 11/32		
33	12 3/4			
34		13 1/8		
35	13 1/2			
36		13 29/32		
37	14 9/32			
38		14 11/16		
39	15 1/16			
40		15 7/16		
41	15 27/32			
		16 7/32		

D4R Pro

Board Width - MILLIMETERS

	9,5mm		19mm	
	Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
1				
2				
3	29		59	
4		39		78
5	49		98	
6		59		117
7	68		137	
8		78		157
9	88		176	
10		98		196
11	107		216	
12		117		235
13	127		255	
14		137		275
15	147		294	
16		157		314
17	167		334	
18		176		353
19	186		373	
20		196		393
21	206		412	
22		216		
23	225			
24		235		
25	245			
26		255		
27	265			
28		275		
29	284			
30		294		
31	304			
32		314		
33	324			
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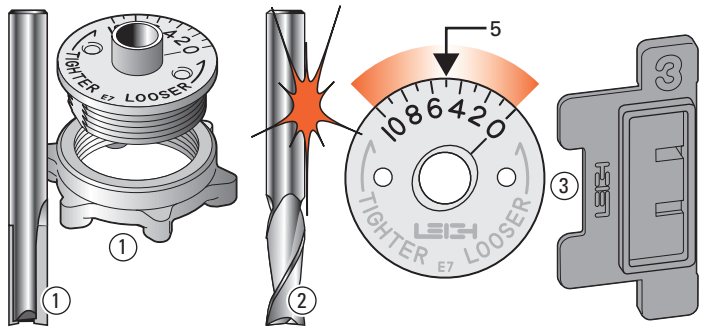
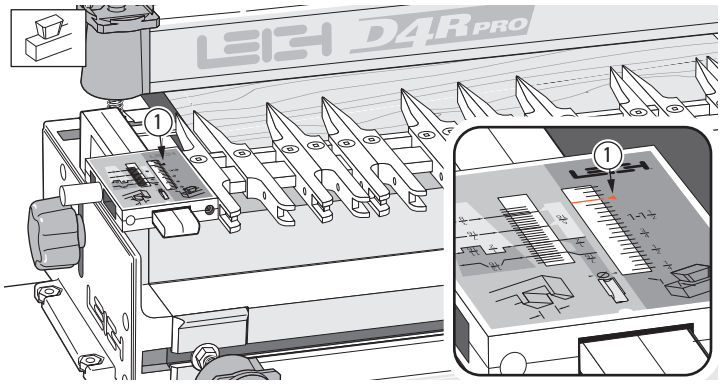
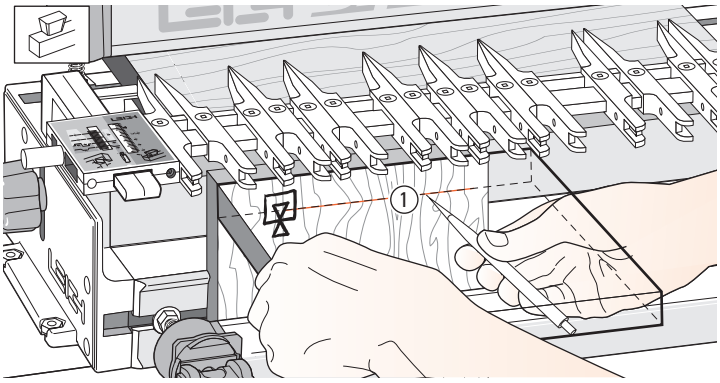
37	363			
38		373		
39	383			
40		393		
41	402			
		412		



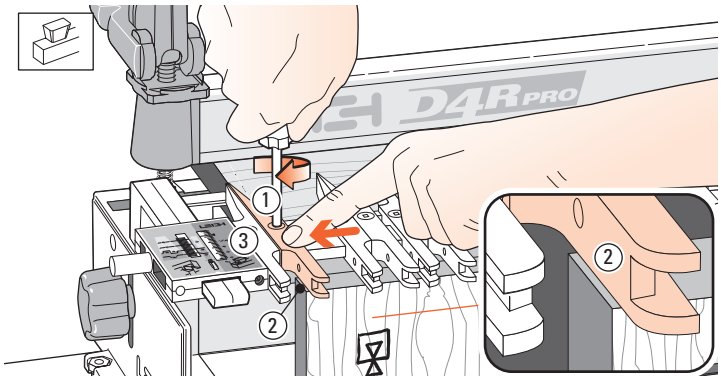
15-1 Bit and Guidebush selection Only the **e7-Bush** and the 5/16" bit ① that came with the D4R Pro are required for box joints. Spiral upcut router bits ② will cut cleaner than straight flute. Where metric size bits are available an 8mm straight or spiral bit may be substituted for the 5/16". Always start test routing with the **e7-Bush** set on "5". Note: the box joint Spacer ③ has a square notch.



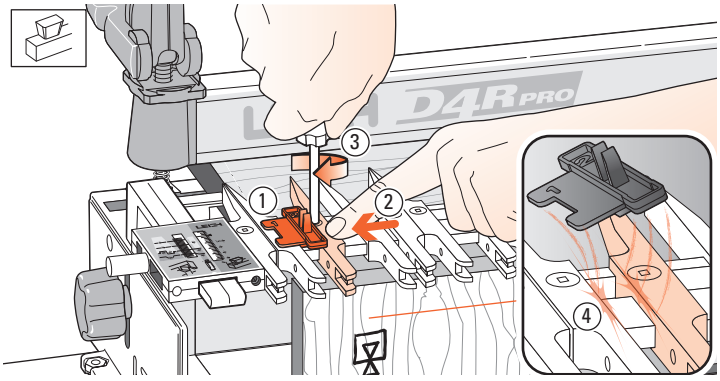
15-2 3/8"[9,5mm] Box Joints
Place the finger assembly on the support brackets in the HB TAILS mode, set the scales on the **small triangular arrow** ① and lower the assembly onto the spacer board. All box joints are routed in this position. Note: maximum board thickness is 1"[25mm].



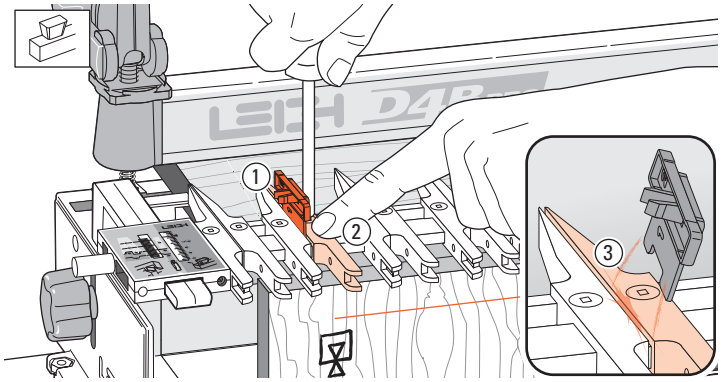
15-3 Clamp a test board in the front left clamp, against the side stop with the top edge flush under the guide fingers. The board may be clamped face side in or out ⊡. Mark and adjust the depth of cut to suit the thickness of the mating boards ①.



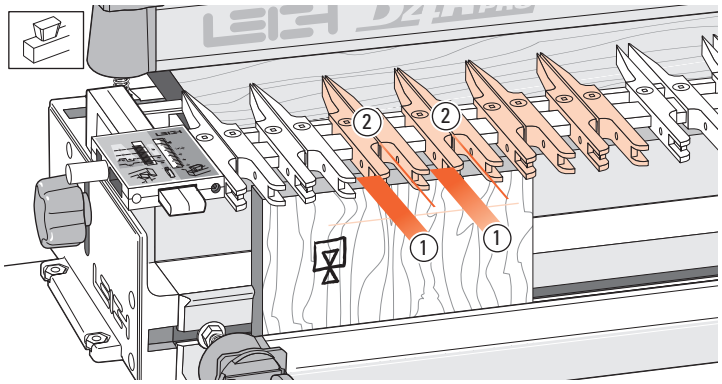
15-4 Raise the finger assembly about 1/8"[3mm] to allow ease of guide finger adjustment ①. Position the second guide finger 1/32"[1,0mm] in from the board edge ② and tighten the finger. The first finger stays against the scale block as a router support ③. *Note: Square ended boards are essential to achieve flush joint alignment.*



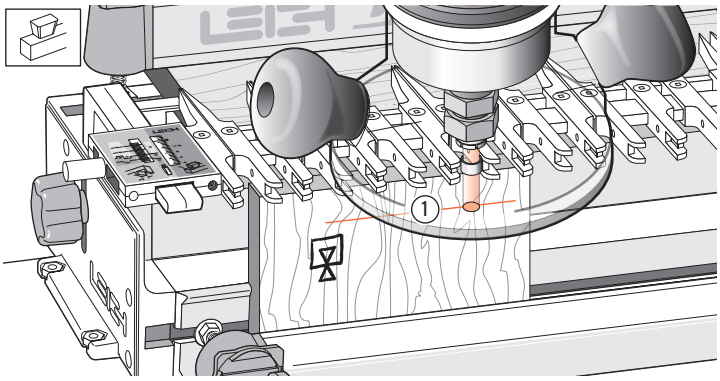
15-5 Place the Spacer on the finger bar to the right of the second finger, numeral **1** on top overlapping the locked finger ①. Move the next finger in to touch the Spacer ②. Hold the guide finger firmly against the Spacer and tighten the second finger screw ③. As you remove the Spacer you should feel some friction; this indicates that the guide finger is correctly spaced ④.



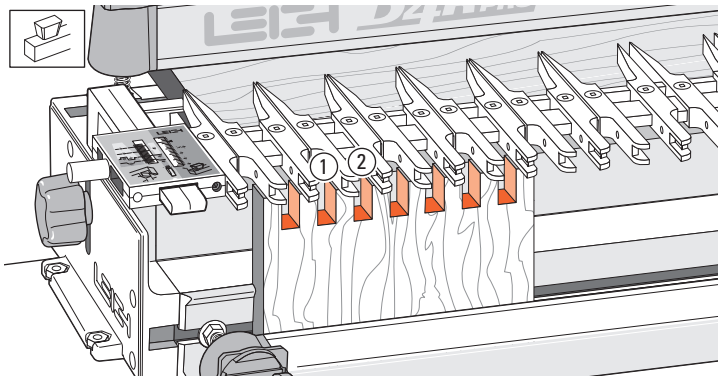
15-6 Now place the spacer vertically on the right hand side of the third finger; the prongs to the left ①. Hold the guide finger firmly against the Spacer and tighten the second finger screw ②. As you remove the Spacer you should feel some friction ③; this indicates that the guide finger is correctly spaced.



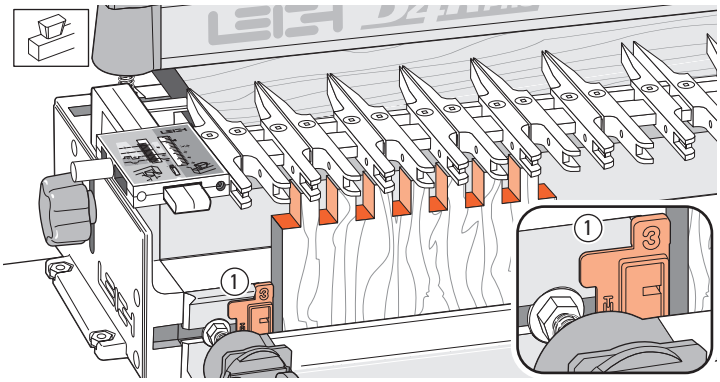
15-7 Repeat this procedure across the jig until there is at least one guide finger spaced past the right hand side of the work piece. Finger pairs should have a uniform ½"[12,7mm] space between them ①, and .054"[1,37mm] gap ② between fingers of the same pair. Tighten the unused guides.



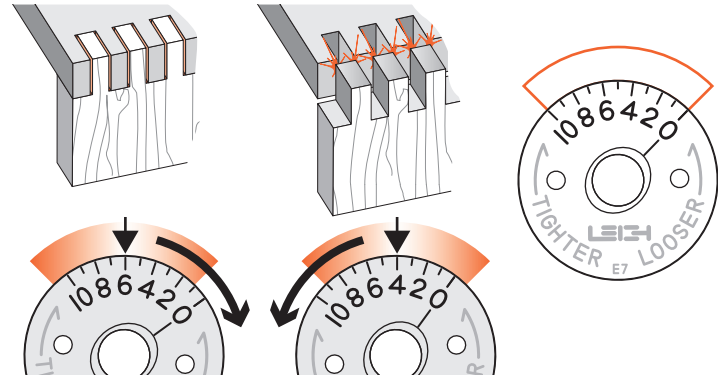
15-8 Lower the finger assembly onto the spacer board and double-check that the bit depth is down to the center of the pencil line ①. Make sure the collet does not rub on the guidebush.



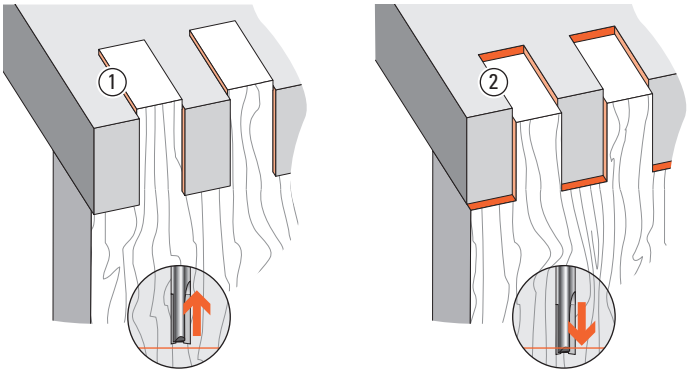
15-9 Rout one end of the scrap board. Rout into each finger opening ① and between each finger ②. Make sure to run the guidebush on both sides of each opening.



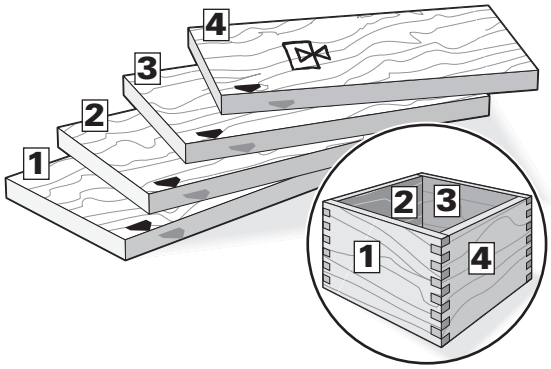
15-10 Remove the board and fit the box joint Spacer against the front side stop with the **number 3 showing** ①. Make sure it is fully home. Clamp the second test board with its side edge against the Spacer and its top edge touching the guide fingers. Rout this board. *Note: Square ended boards are essential to achieve flush joint alignment.*



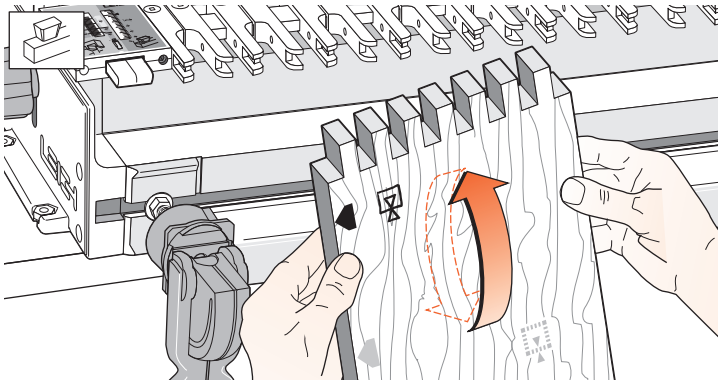
15-11 Test the boards for fit and flushness. If the joint is loose, turn the **e7-Bush** to a higher number and rout two more boards. If the joint is too tight, turn the **e7-Bush** to a lower number. Trial-and-error establishes the best **e7-Bush** setting. **Record it on this bush drawing** for a good result the next time. *Note: each increment adjusts glue line fit by 0.002"[0,05mm].* **Retighten the eBush nut after each adjustment.**



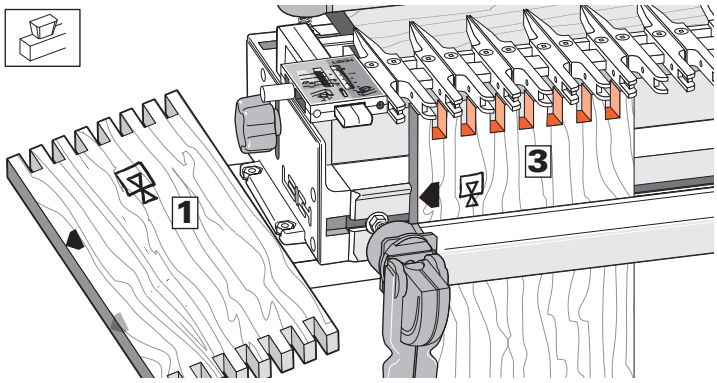
15-12 If the joint is over flush ①, raise the bit slightly. If it is under flush ②, lower the bit.



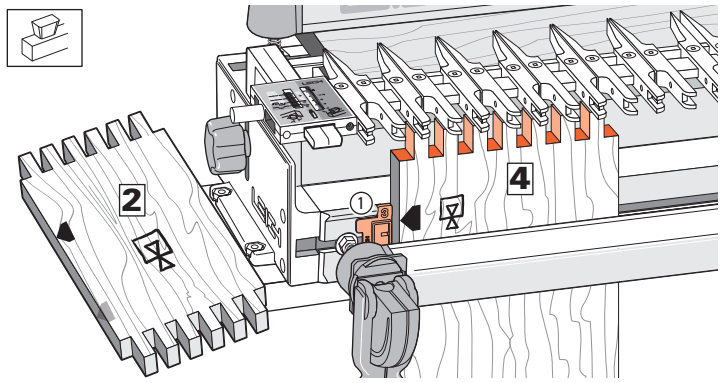
15-13 Lets make a box with 3/8" box joints..
Prepare four boards and number them ***1*** to ***4***. Then select the grain alignment and mark the common top (or bottom) edge ▶. Don't worry about face side selection; this can be done after routing.



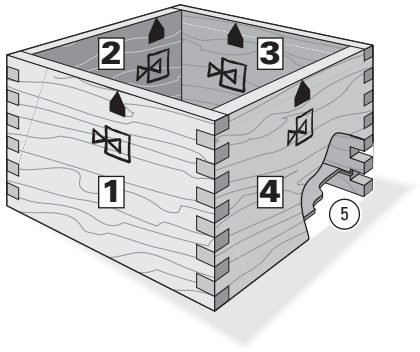
15-14 All box joint boards are clamped alternating face side in ⍈ and face side out ⍈ **always with the same side edge against the side stop** (or Spacer).



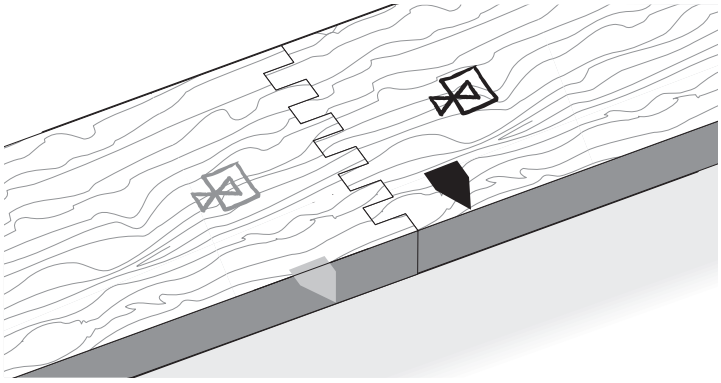
15-15 Rout both ends of boards ***1*** and ***3*** with their **edges against the side stop**. Be sure to keep the same edge to the stop.



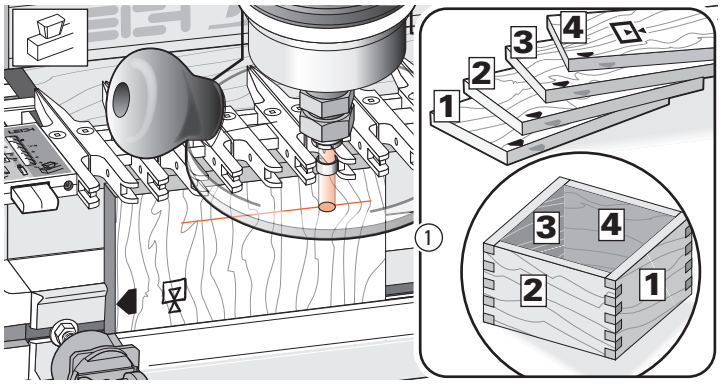
15-16 Rout both ends of boards ***2*** and ***4*** with their **edges against the Spacer** and the Spacer in the No.3 position.
Keep the same edges to the Spacer.



15-17 Keeping the marked side stop edges of all boards toward the top (or all to the bottom) of the box, select the preferred outside faces before routing the grooves ⑤ for the bottom.

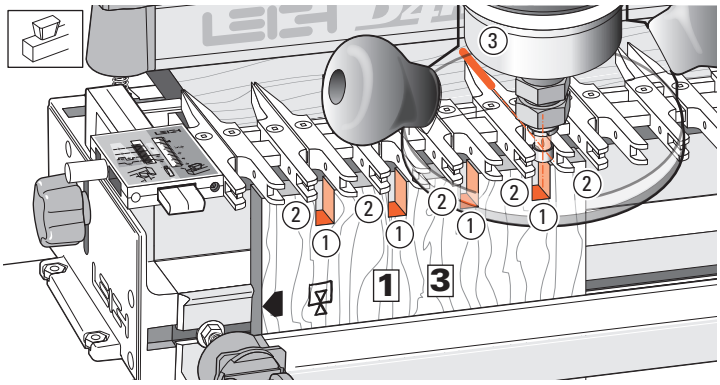


15-18 The same method will produce end-on-end joints.



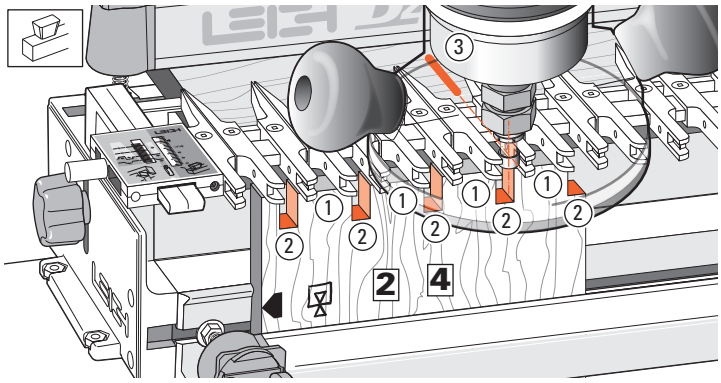
15-19 3/4"[19mm] Box Joints Set-up and space the guide fingers exactly as for ⅜"[9mm] joints. Start with the same **e7-Bush** setting. *See 15-2 thru 15-9.*

Prepare four boards **using the board width chart for ¾"[19mm] joints** and number them ***1*** to ***4*** around the box ① with the common edges marked.



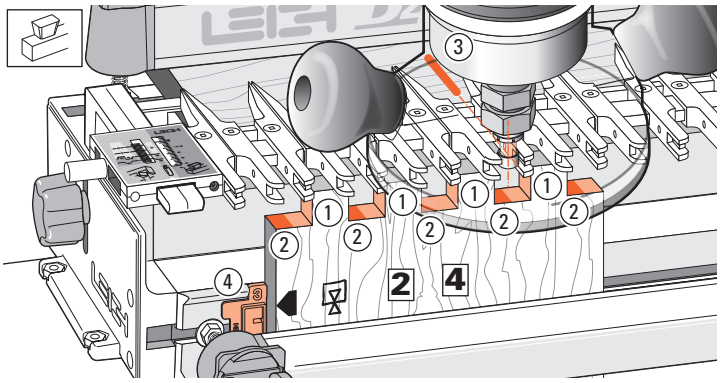
15-20 Rout both ends of boards ***1*** and ***3*** **but only rout between the guide finger openings** ① not between the finger sides ②. Keep the common edge against the side stop.

Hint: Mark the router base at the 12 o'clock position ③ and steer this mark along the **pointed ends of the fingers** at the rear of the assembly.

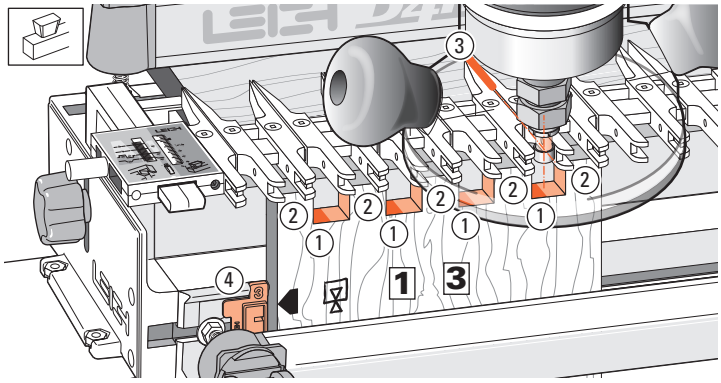


15-21 Now rout both ends of boards ***2*** and ***4***, with the common edge against the side stop **but only rout between the finger sides** ② not between the finger openings ①.

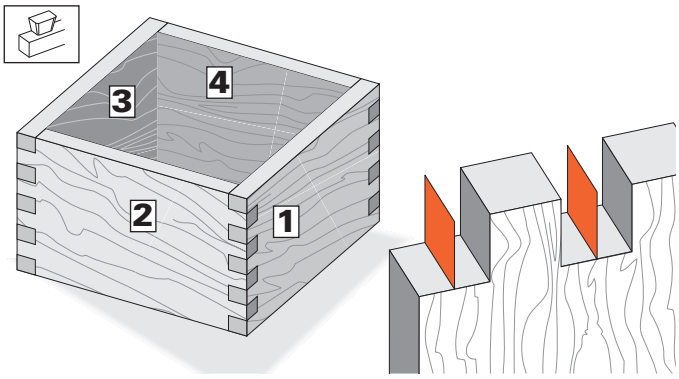
Hint: Now steer the base 12 o'clock mark **between the pairs of finger points** ③.



15-22 Remove the board and fit the Spacer to the side stop with number **3** showing ④. Now rout both ends of boards ***2*** and ***4*** again, with the common edge against the Spacer and **again …only rout between the finger sides** ②, not between the finger openings ①, steering the router mark between the pairs of finger points ③.



15-23 With the Spacer still in position rout both ends of boards ***1*** and ***3***, with the common edge against the Spacer and **only rout between the finger openings** ①, steering the router mark along the finger points ③.



15-24 Joint fit Check for joint fit as usual, and repeat testing if required. Theoretically, there will be nothing in the ¾"[19mm] sockets, literally a zero thickness wall, where the bit has passed by twice. However, routing tolerances can leave a very thin "wall" uncleared by routing. This can be quickly removed with a chisel or sandpaper. ■