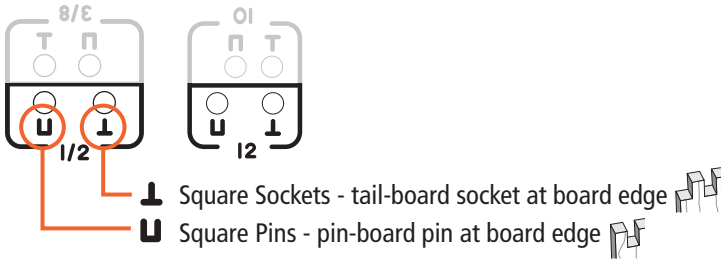
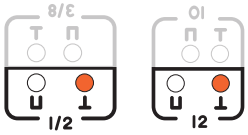
CHAPTER 3

Operation Concept and Basic Template Functions

Template Modes

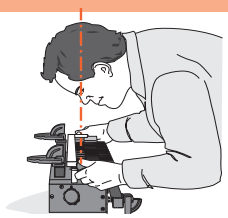
Template pin hole icons denote the type of joint and edge finish from each position.





Throughout the manual, the proper pin location for each step is highlighted with red in an inset. Only the front (active) pinholes will be shown.

Scale Modes

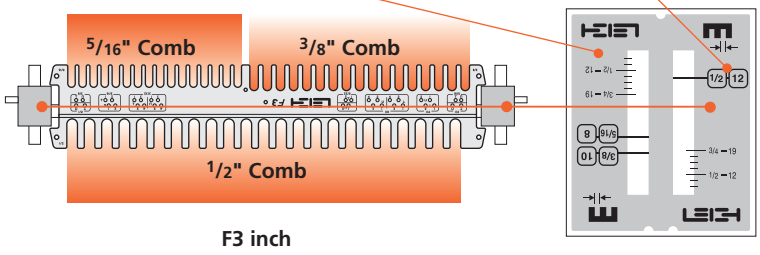


Reading scales from directly overhead improves setting accuracy.

F3

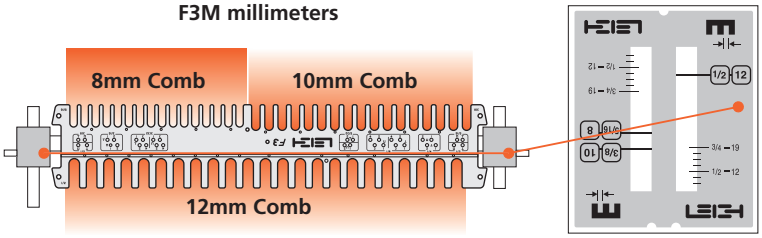
The inactive scale is always on the left side of each scale assembly and is upside down.

The active scale is always on the right side of each scale assembly.



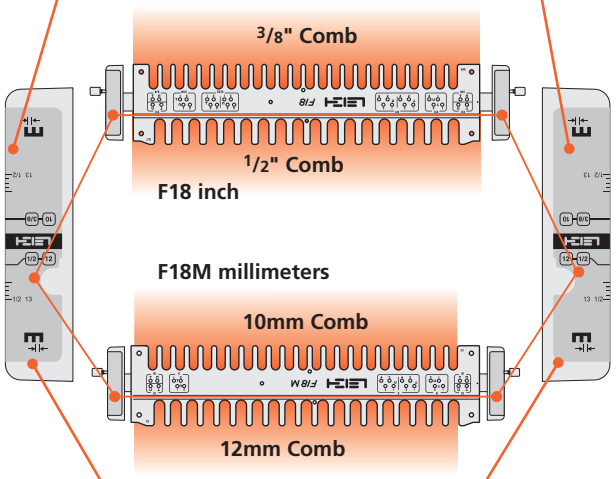
F3 inch

F3M millimeters

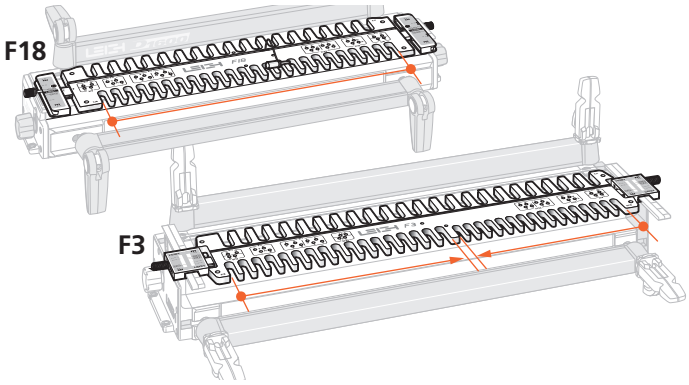


F18 and F24

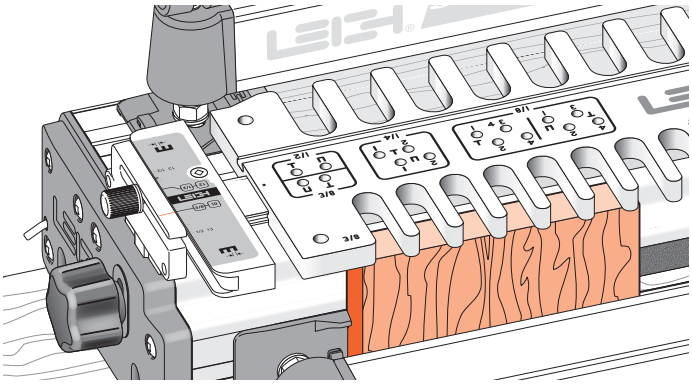
The inactive scale is always upside down.



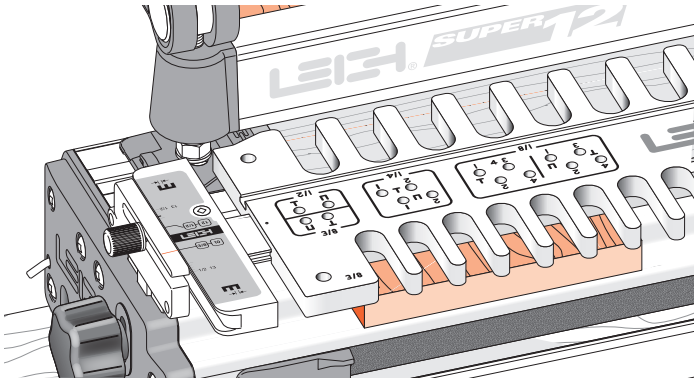
The active scale is always right side up and toward you.



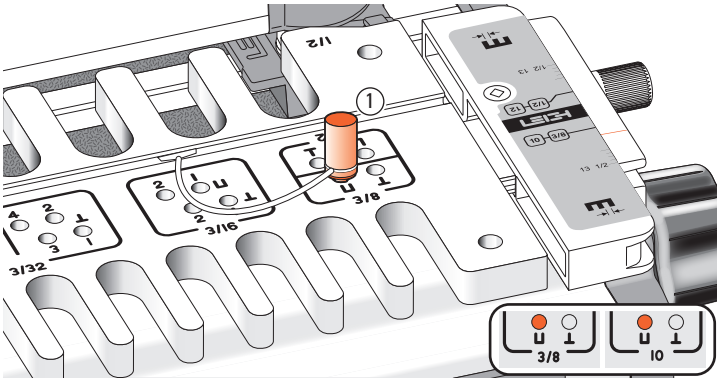
3-1 The *active* comb (the one you wish to use) is positioned toward you at the front of the jig. Depending on the Template model and comb size selected, the active comb may start at either the right, or left-hand side of the jig. **Combs that are the full width of the template always start at the left side.**



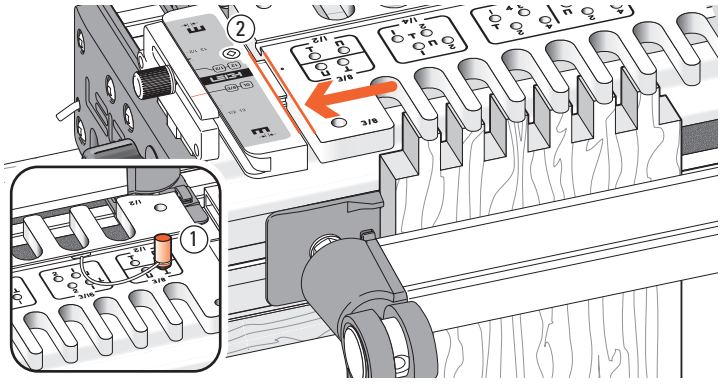
3-2 Clamp your work pieces against the front side stop or...



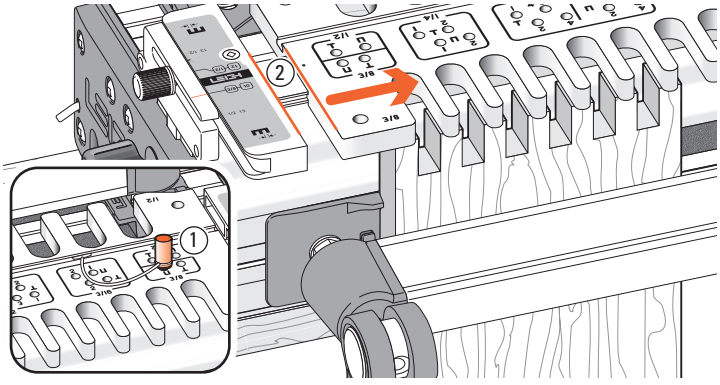
3-3 ...the mating rear side stop, depending on which procedure is to be used.



3-4 The template control pin engages the template to the template bar using precisely positioned holes ①. The active template pin holes are always at the opposite end of the template , out of the way of the router. Most illustrations will have an inset showing the correct template pin hole position for the procedure.



3-5 Mating joints routed under the same comb have to be offset to achieve correct joint alignment. On Leigh templates the offset is achieved by moving the template left or right by half the pitch of the comb. This movement is controlled by the template pin, at the other end of the template ①. *Note that the template is close to the scale* ②.



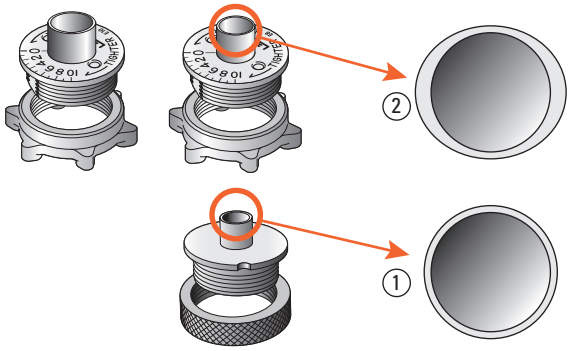
3-6 In this illustration, the template is moved to the right by half the comb pitch and positioned by the template pin ① to rout the mating half of the joint in 3-5. *Note the increased gap between the scale and template* ②. ■

CHAPTER 4

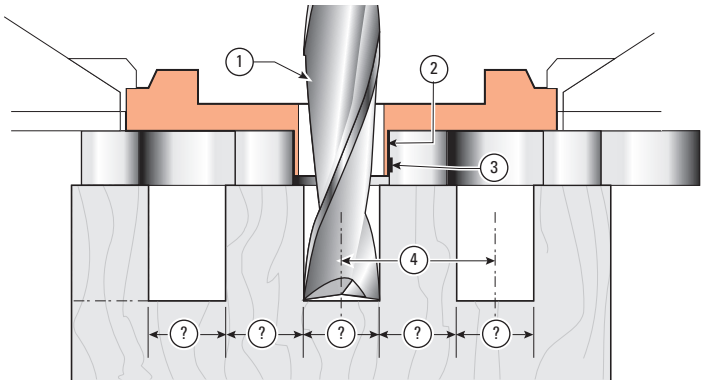
The Leigh e-Bush Guide Bushing

The guidebush is the vital link between router and jig. Leigh's innovative e-Bushes provide precise fit adjustment for your router when using F3, F18 and F24 Templates.*

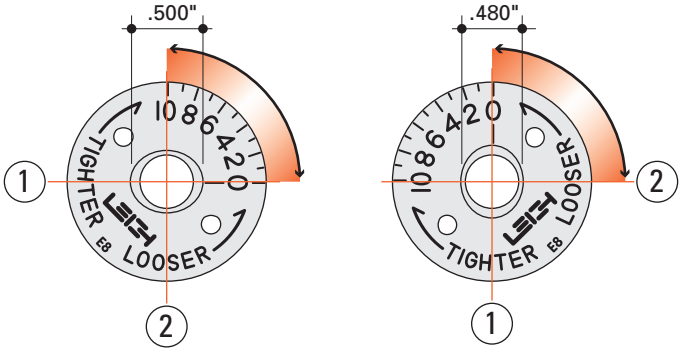
**e7, e8, and e10 e-Bushes are supplied with the F3 Finger Joint Template. e8 and e10 e-Bushes are supplied with each F18 and F24 Finger Joint Template.*
U.S. Patent No. 8,256,475. UK Patent No. GB2443974. Patent Pending in Canada.



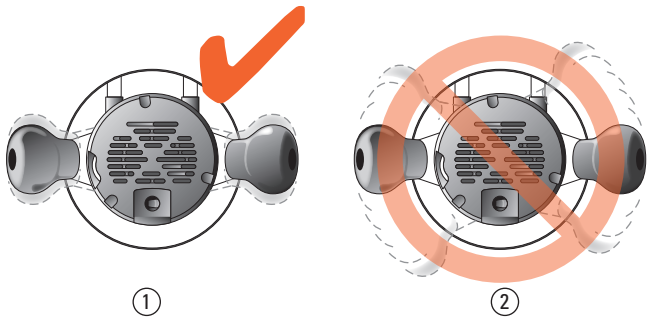
4-1 Unlike plain circular template guidebushes ①, the **e-Bush** is elliptical ②. This innovation effectively changes the guidebush "active diameter" when it's rotated, and provides benefits not possible with a plain round guidebush. The F18 and F24 Templates include two Leigh **e-Bushes***: **e8** for ⅜"[10mm] combs, and **e10** for ½"[12mm] comb; the F3 includes those plus the **e7** for 5⁄16"[8mm] comb.



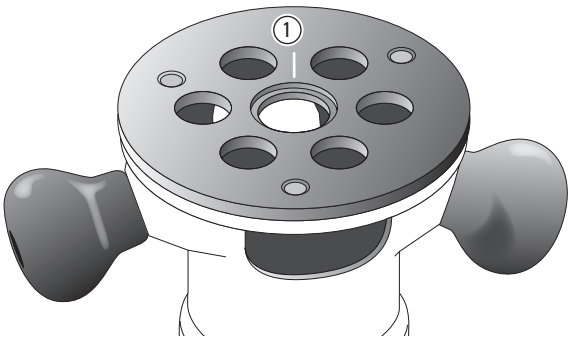
4-2 Joint Fit and Joint Pitch Box joints routed with standard sized straight bits ① and standard sized guidebushes ② against straight guide surfaces ③ on pitch centres exactly two times the bit diameter ④ will guarantee a loose fitting joint. Bits, guidebushes and templates are manufactured with necessary plus/minus tolerances and the router will have some degree of run-out, or "wobble".



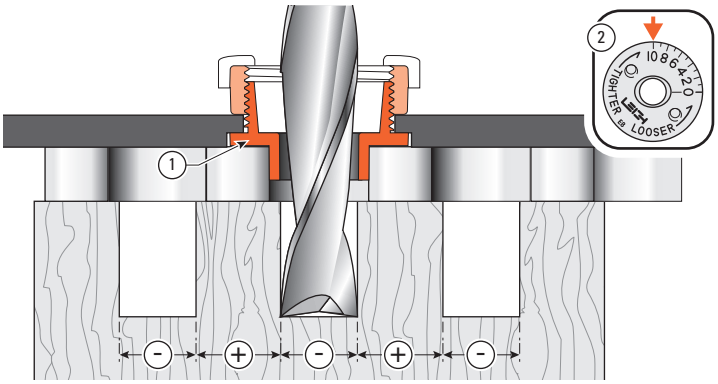
4-3 The **e-Bush** (e8 illustrated) fits to the router base or to a guidebush adaptor in the base. *See Appendix I.* The ellipse or oval shape major axis ① is ~.500", and minor axis ② ~.480" [12,7 x 12,2mm]. Turning the e-Bush 90 degrees in the router base changes the active guide size by .020"[,50mm] providing infinite adjustment and recordable settings for perfectly fitting box joints.



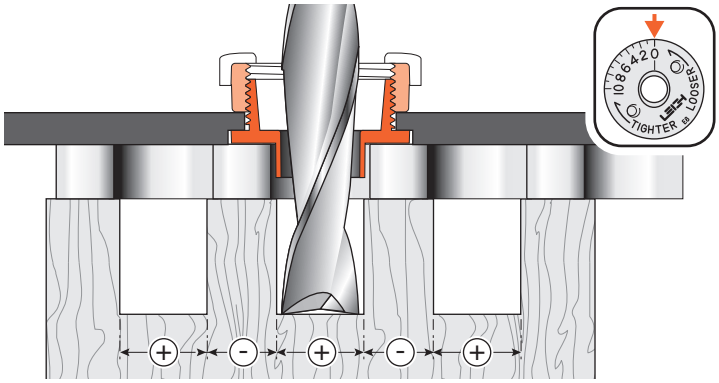
4-4 Here's how it works. In normal use, the operator does not rotate the router more than a few degrees either way ①. In fact, because of potential bit-to-bush eccentricity problems it is advisable to minimize router rotation on jigs ②.



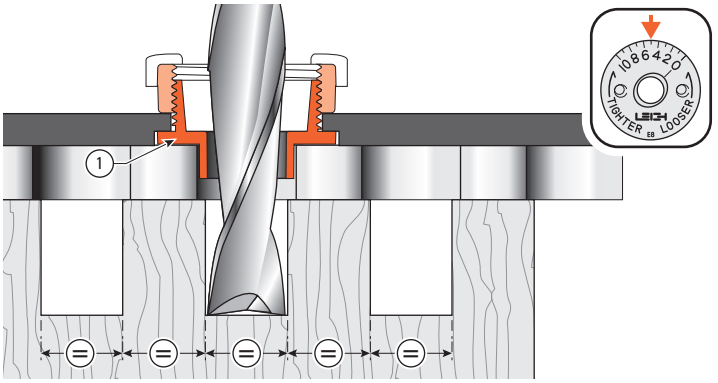
4-5 Establish the orientation in which you normally hold and operate the router on the jig. Now, up-end the router in the same orientation. Make a small scratch line or permanent ink mark on the router base or e-Bush adaptor at the 12 o'clock position ①.



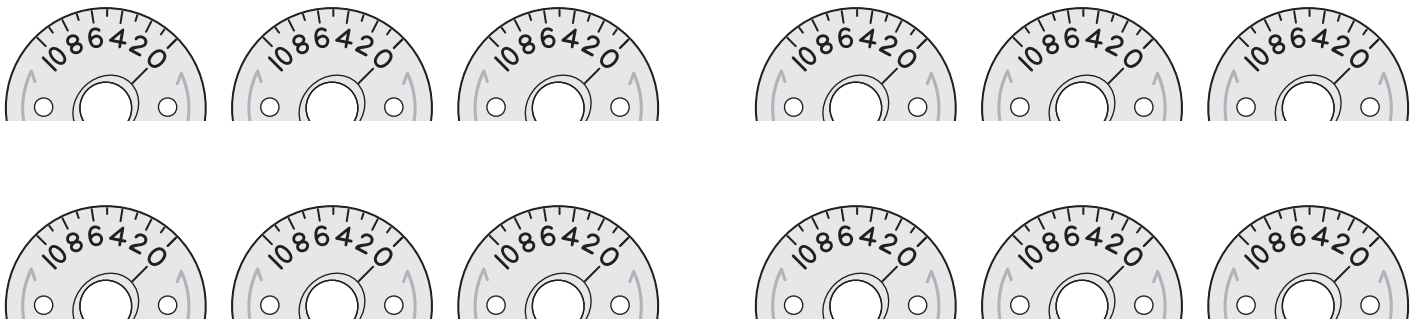
4-6 With the **e-Bush** ① turned to "10" in the base ② the active "diameter" is increased, allowing less side-to-side movement, and resulting in smaller sockets and larger pins. A tight fit! *Scale and movement are exaggerated in this sequence of illustrations.*



4-7 Turning the **e-Bush** to zero allows more side-to-side router/bit movement, and more wood removal, producing larger sockets and smaller pins, and thus a loose fit.



4-8 A few trial-and-error test cuts and **e-Bush** adjustments will allow you to establish the correct pin and socket sizes for a perfect fit. **Note: One division of the e-Bush changes the joint glue–line interface by two thousandths of an inch, that is, 0.002" or 0,050mm.**

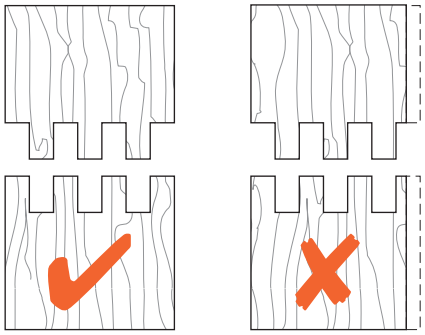


4-9 When you have the best joint fit, mark the setting in pencil here. Different wood hardness may require slightly different settings, so also note the wood species. Use the same bit next time. ■

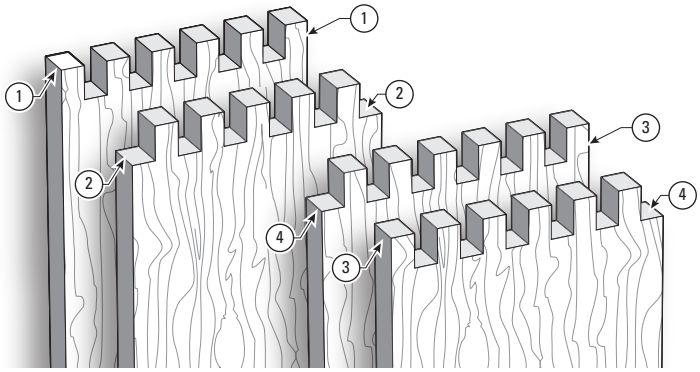
CHAPTER 5

Board Width Selection

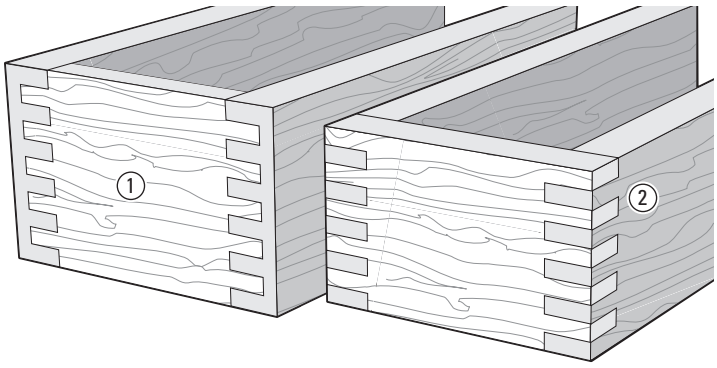
Board widths are determined by the number of fingers you want in your design and whether the joint is symmetrical or asymmetrical. This chapter makes it easy to determine appropriate widths for the Leigh Finger Joint Templates.



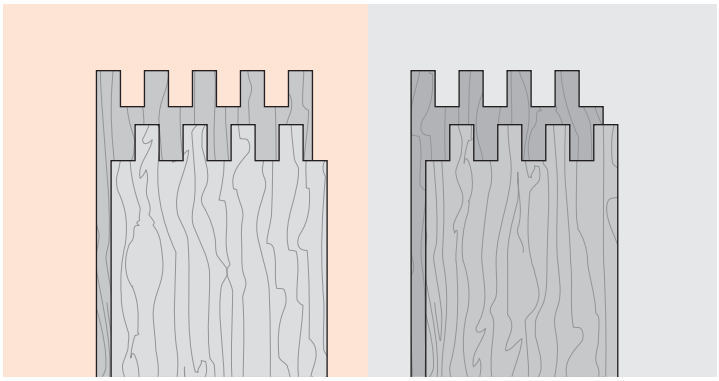
5-1 Board Widths and Joint Symmetry
Unlike the infinitely variable Leigh Dovetail Jig, a fixed template cannot accommodate any width of board and still produce a neat and even finish on both side edges of a joint. The boards must be cut to specific widths, depending on the pitch of the comb.



5-2 Symmetrical joints have pins ① on both side edges of one board and sockets ② on both side edges of the mating board. Asymmetrical joints have a pin ③ on one side edge and a socket ④ on the other side edge of each board.



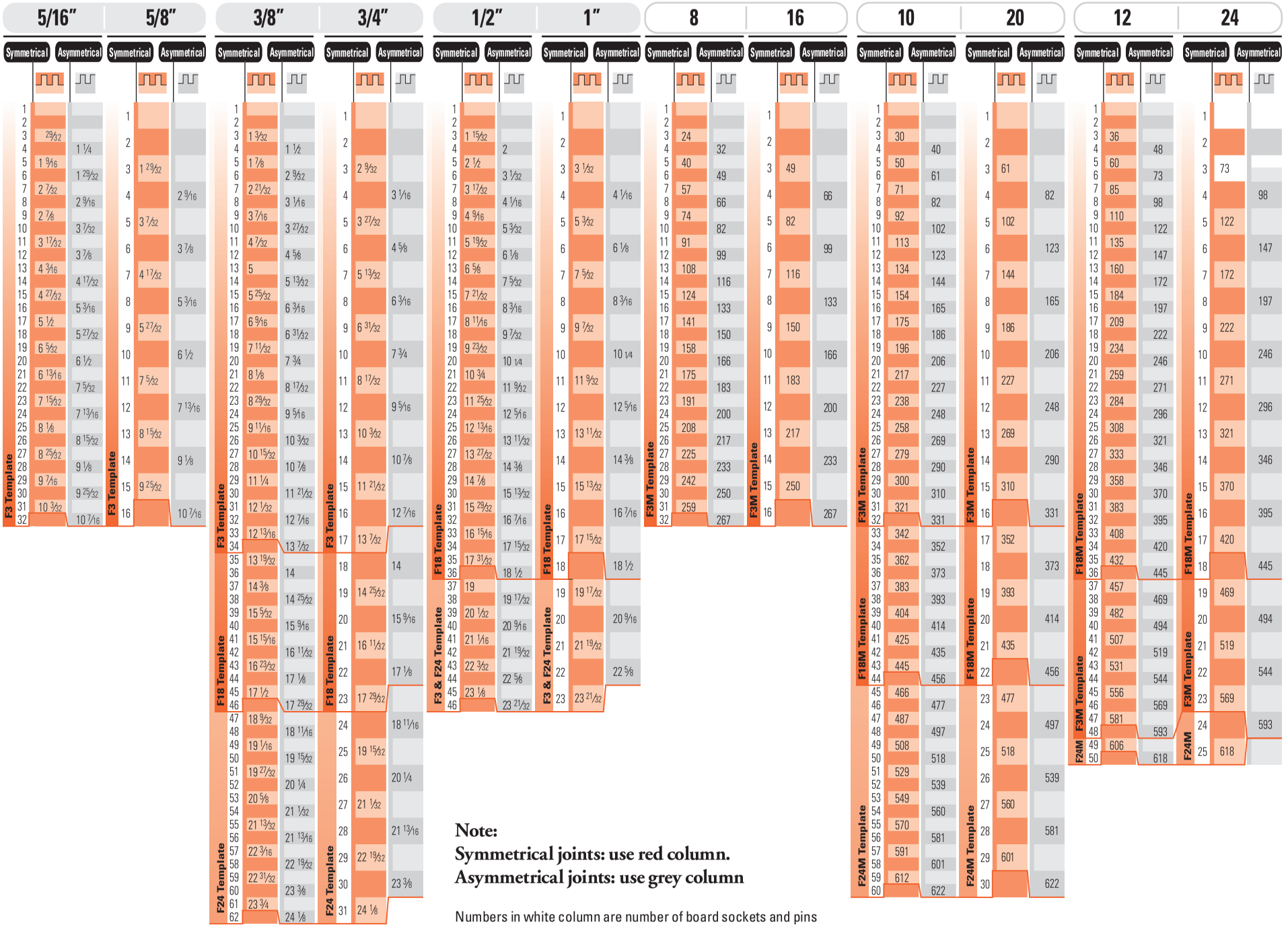
5-3 Symmetrical joints are essential for half-blind corners ①. However, ordinary box joints may be asymmetrical and look okay ②.



5-4 ⚠ **The comb pitches on the Leigh Finger Joint Templates are all 2 times the bit diameter plus 1/32"[0,75mm], so you cannot simply use bit diameter to calculate board widths. See the board width charts on Page 12.** For symmetrical square joints use board widths in red column. For asymmetrical square joints use widths in grey column.

Board Width - INCHES

Board Width - MILLIMETERS

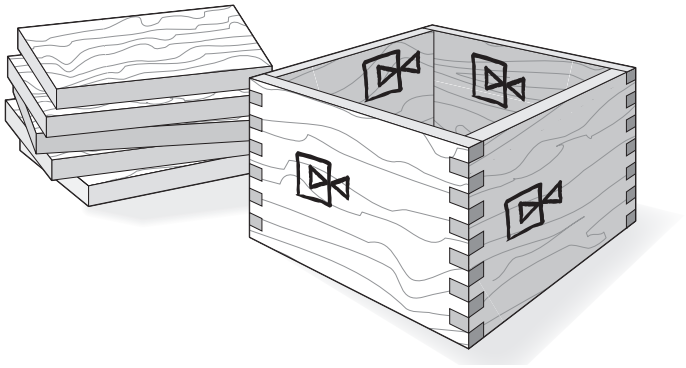


Note:
Symmetrical joints: use red column.
Asymmetrical joints: use grey column

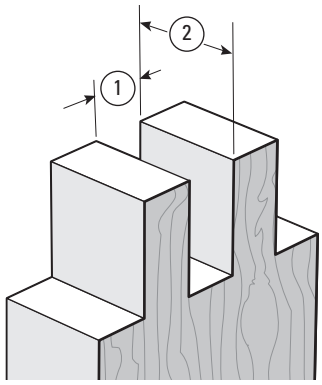
Numbers in white column are number of board sockets and pins

CHAPTER 6

Box Joint Procedures

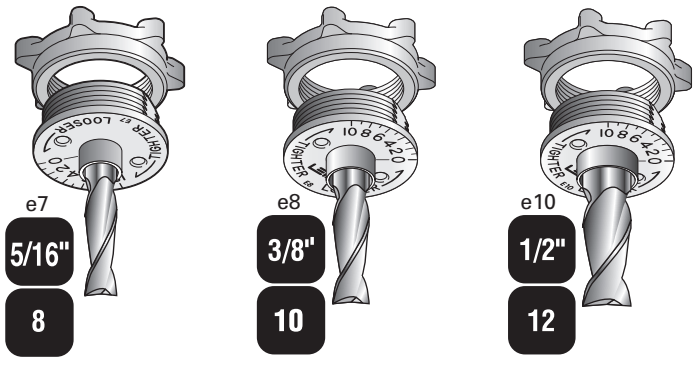


6-1 Always use scrap boards to test for fit. Scrap width and thickness is not critical. Let's rout some simple box joints. These general instructions apply to any of the comb sizes. Rout single corners to test joint fit. *Note: This chapter combines instruction for joint procedures and joint fit. Follow through step by step the first time, but there is also a "quick fit test" method; see 9-2.*



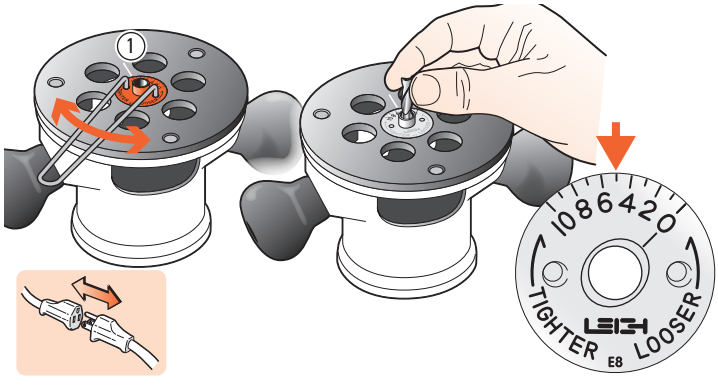
6-2 Bit and e-Bush Selection

There are no hard and fast rules for sizing of pins and sockets for box joints; but typically the sockets ① are one half to one quarter of the board thickness ②. Generally, the smaller the bit, the greater the strength because of the greater gluing area.

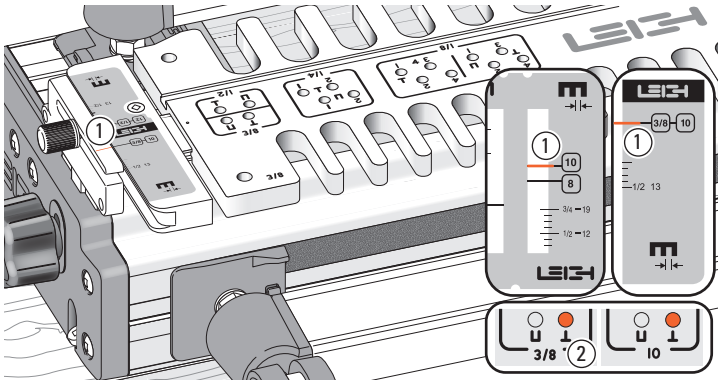


6-3 Select the correct **e-Bush** and bit combination for the comb size to be used. The bit size is the same as the designated comb size.

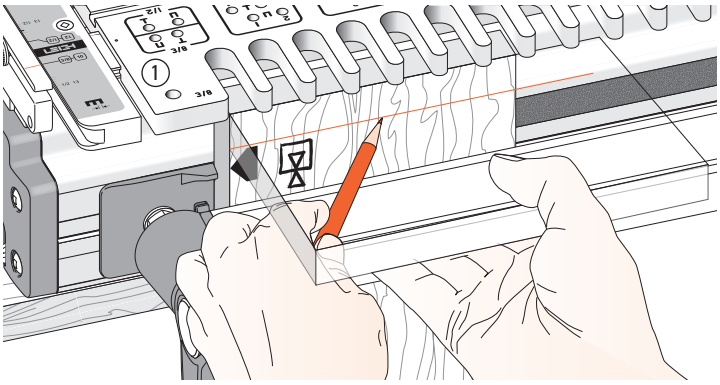
For smaller and larger size box joints see chapter 8.



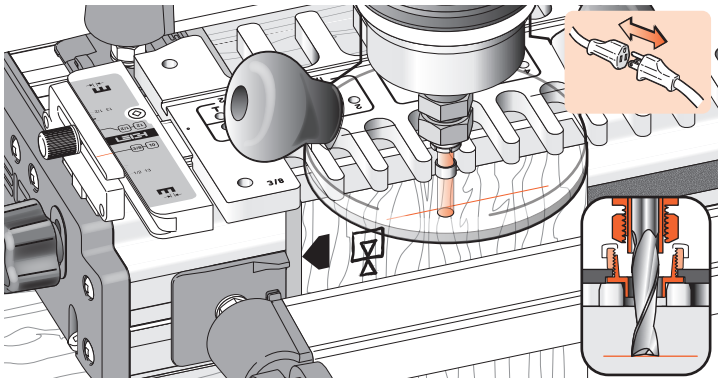
6-4 Always start test routing with the **e-Bush** ① set on "5". Fit the selected bit (that matches the **e-Bush** and comb size) to the router and tighten securely.



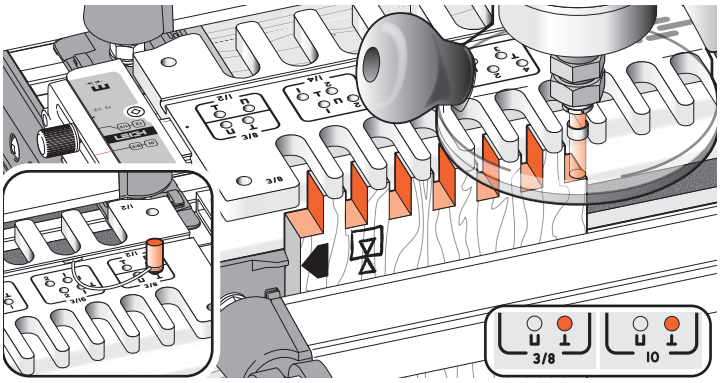
6-5 Set the scale on the comb size to be used (example here; ⅜"[10mm] comb ①. Position the template with the template pin in position ⊥ ②. *Remember, position the template pin at the opposite end of the template out of the way of the router.*



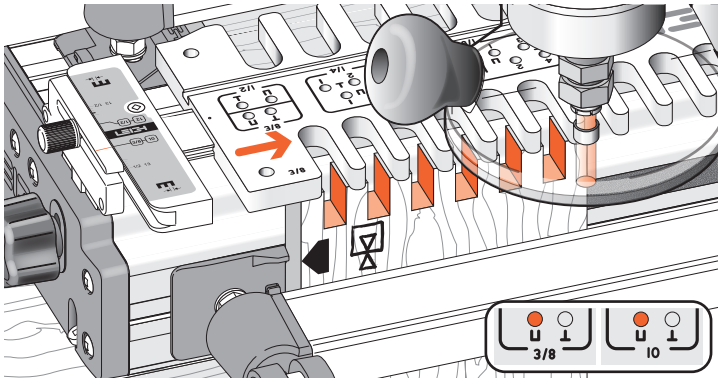
6-6 Clamp the workpiece against the left-hand side stop; end edge flush under the template. Either face can be out ⊡. Mark and adjust depth of cut to suit the board's thickness. Use the board to be joined to mark the depth of cut. Templates have pin holes ① on the left end to allow routing wide boards at the right hand end or a different comb size.



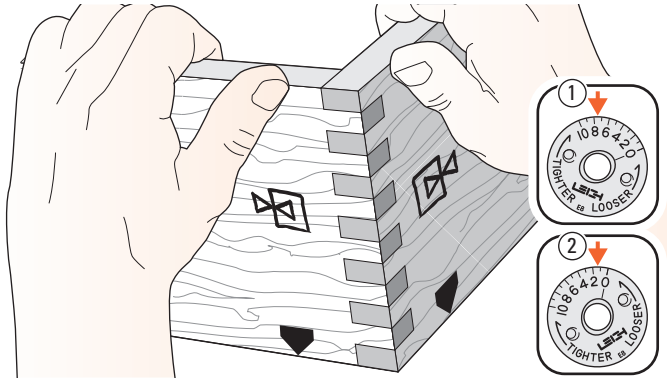
6-7 Adjust the bit to cut at the centre of the pencil line. Make sure the collet will not rub on the guidebush.



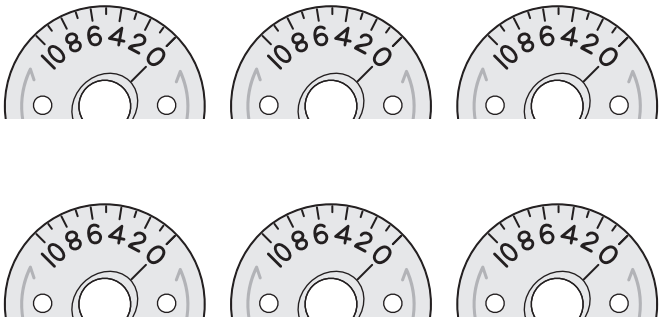
6-8 Rout one end of a scrap board. Make sure to touch the guidebush on both sides of each template opening.



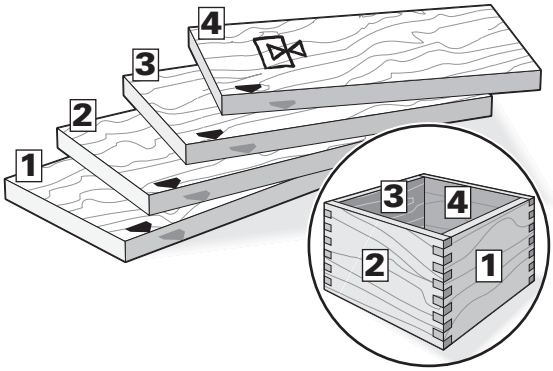
6-9 Remove the template pin and move the template to position ⊔, then refit the pin. Rout the mating board.



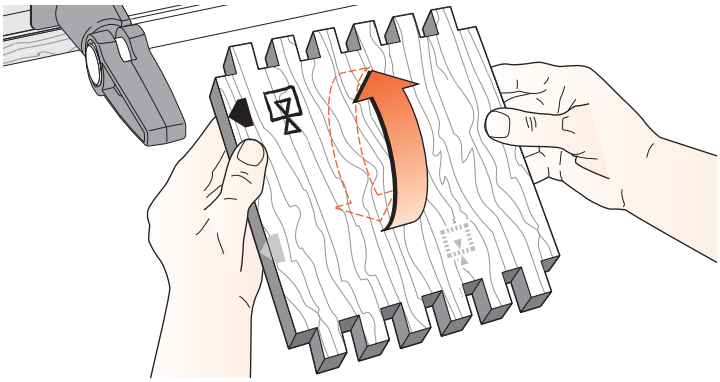
6-10 Test the two boards for fit. Adjust the **e-Bush** by trial and error and rout more pairs of test boards to achieve the desired fit. Remember, turn the **e-Bush** "up" to a higher number for a tighter joint ① and "down" for a looser joint ②.



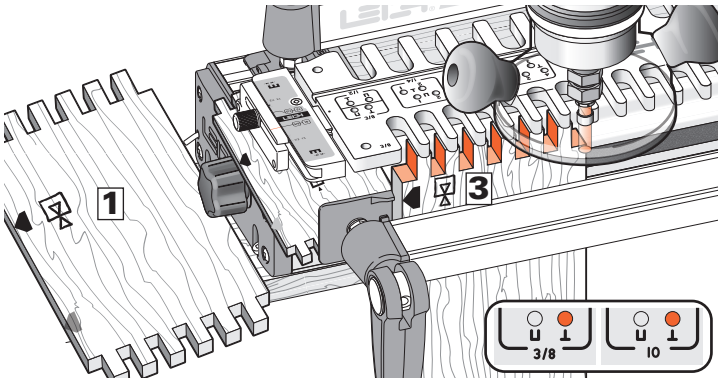
6-11 When the fit is just right, mark the **e-Bush** setting here or on page 10 for future reference.



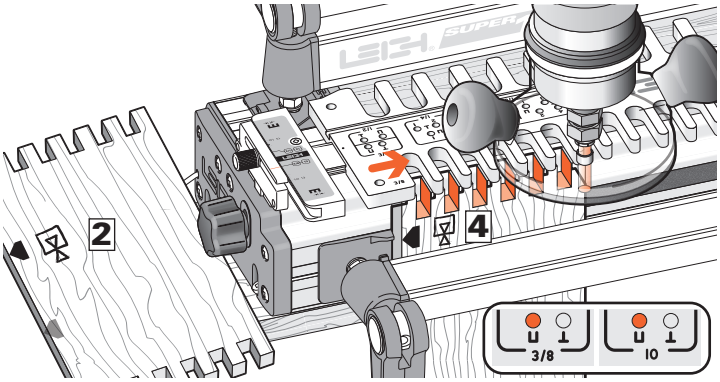
6-12 Let's make a box.
Prepare four boards and mark them ***1***, ***2***, ***3***, and ***4***. Then select the grain alignment and mark the common top (or bottom) edge. Don't worry about face side selection, this can be done after routing.



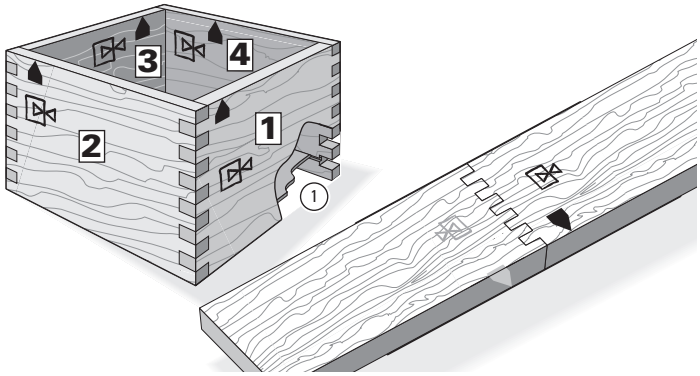
6-13 All square box joint boards (for boxes or end-on-end joints) are clamped alternately face in and face out ⊡, always with the same side edge against the side stop.



6-14 Rout both ends of boards ***1*** and ***3*** in position ⊥. Be sure to keep the same edges to the side stop.



6-15 Rout both ends of boards ***2*** and ***4*** in position ⊔. Keep the same edges to the side stop.



6-16 Keeping the marked side stop edges of all boards toward the top (or bottom) of the box, select the preferred outside faces before marking and routing the grooves ① for the box bottom. Remember, box joint corners need clamping from both directions, or use strap clamps and blocks.
The same method will produce square end-on-end joints. ■