

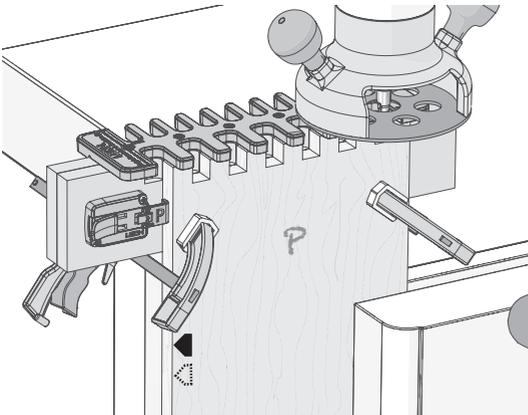
## B975 User Guide

# CHAPTER 5 Routing Box Joints

**Note:** Routing Procedures for 3/4" and 1/2" joints are identical. This chapter shows steps for 3/4" joints.

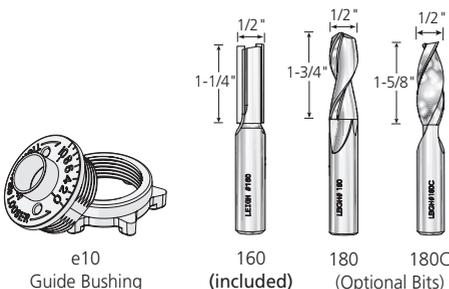
### IMPORTANT SAFETY NOTE

Before using your Leigh B975, you must have completed the preparatory steps listed in the previous pages, including reading the jig safety recommendations in Chapter 2.



**5-1 Getting Started** The steps in this chapter show the jig used on a workbench. For router table operation, see Chapter 7.

**5-2 Parts Required** 3/4" and 1/2" box joints are routed with the included Leigh No.160 1/2" straight bit and the Leigh e10 guide bushing (eBush). **No other bit diameter and guide bushing combination may be used.** Maximum board thickness for both joint sizes is 13/16" [20.6mm]. Depth of cut can be increased beyond the board thickness for raised joints. **Note:** Optional 1/2" diameter spiral upcut bits may also be used.



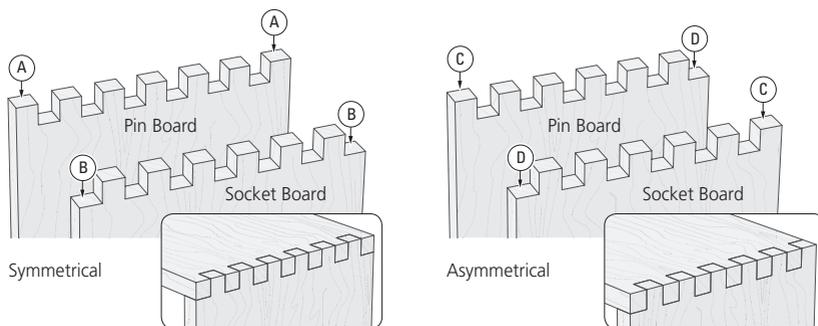
### Bit Cutting Depth

Bit Diameter	1/2"
Item No. Carbide Tipped	160
Item No. Spiral HSS (Optional)	180
Item No. Spiral Solid Carbide (Optional)	180C

Depth of Cut	0"	1/4"	1/2"	3/4"	13/16"
0"					
1/4"					
1/2"					
3/4"					
13/16"					

**5-3 Joint layout** Review the drawings below. **Symmetrical** joints have pins (A) on both edges of the pin board, and sockets (B) on both edges of the socket board. **Asymmetrical** joints have a pin (C) on one edge and a socket (D) on the other edge of each board.



**5-4 Board Width Selection** Board widths are 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 the full width of the jig: 9-11/16" [246 mm]. Routing box joints on wider boards will be covered in Chapter 6.

#### Symmetrical Board Widths for 3/4" Box Joints

Total Pins & Sockets	3	5	7	9	11	13
Inches	2 3/16"	3 11/16"	5 3/16"	6 11/16"	8 3/16"	9 11/16"
Millimeters	56	94	132	170	208	246

#### Asymmetrical Board Widths for 3/4" Box Joints

Total Pins & Sockets	4	6	8	10	12
Inches	2 15/16"	4 7/16"	5 15/16"	7 7/16"	8 15/16"
Millimeters	75	113	151	189	227

#### Symmetrical Board Widths for 1/2" Box Joints

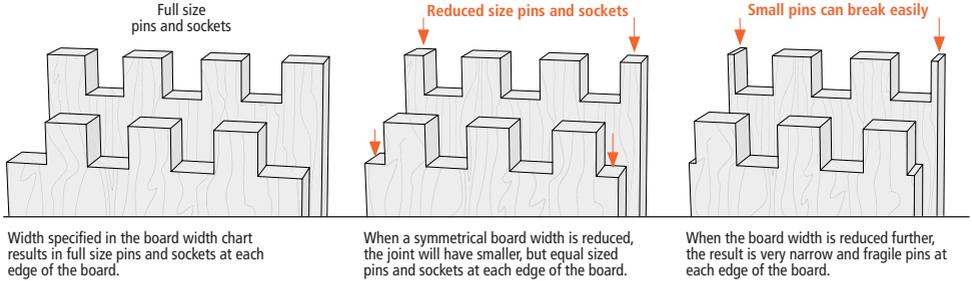
Total Pins & Sockets	3	5	7	9	11	13	15	17	19
Inches	1 7/16"	2 1/2"	3 1/2"	4 1/2"	5 9/16"	6 9/16"	7 5/8"	8 5/8"	9 5/8"
Millimeters	37	63	89	115	141	167	195	219	245

#### Asymmetrical Board Widths for 1/2" Box Joints

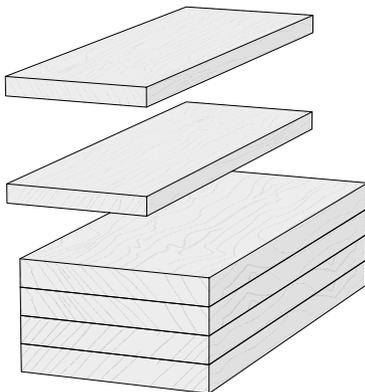
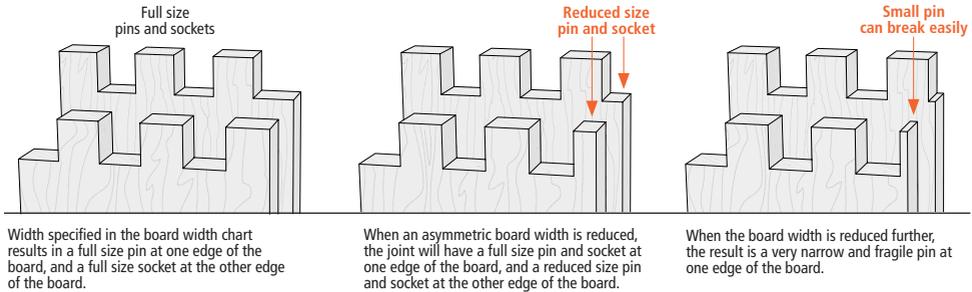
Total Pins & Sockets	4	6	8	10	12	14	16	18
Inches	1 15/16"	3"	4"	5 1/16"	6 1/16"	7 1/16"	8 1/8"	9 1/8"
Millimeters	50	76	102	128	154	180	206	232

**5-5 Board Width Selection** Board widths indicated in the chart will produce full size pins and sockets at each board edge, for symmetrical or asymmetrical joints. Symmetrical joint board widths may be reduced as required, resulting in smaller but equally sized pins and sockets at each board edge. If board widths are reduced for asymmetrical joints, one edge of the board will have a full size pin and socket while the other board edge will have a smaller pin and socket. This may result in an unattractive joint.

**Symmetrical**



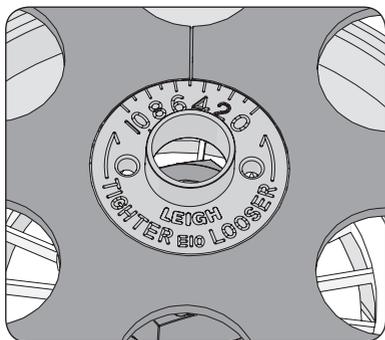
**Asymmetrical**



**⚠ IMPORTANT:** Read this chapter before routing any boards.

**5-6 Making a Box** Prepare four similar boards 3/4" thick × 5-3/16" wide by about 12" long [19mm×133mm×305mm], and two test boards, about 4" [100mm] wide and the same thickness.

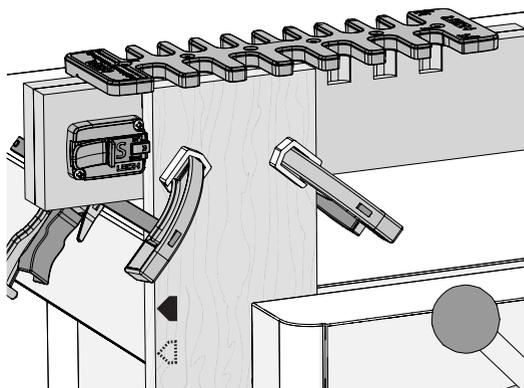
Note: Boards of different thicknesses may also be joined.



### 5-7 Routing a Test Fit Joint

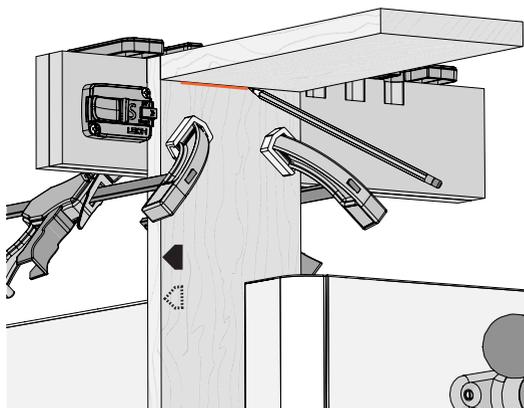
Test joints are always routed with the eBush set at the 5 position.

Retighten the eBush nut after each guide bushing adjustment.

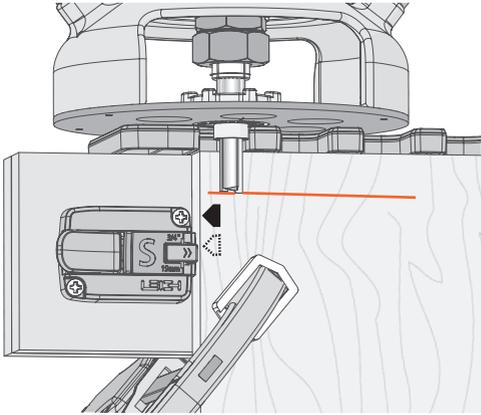


**5-8** Clamp one of the test boards in the vice. Using the 3/4" side of the jig, position the left end of the jig over the test board and clamp in place.

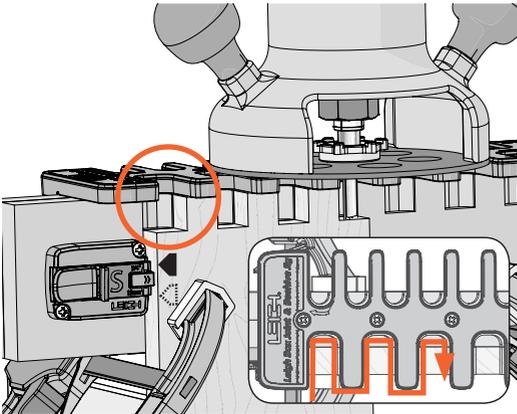
Board alignment is not important when routing a test fit.



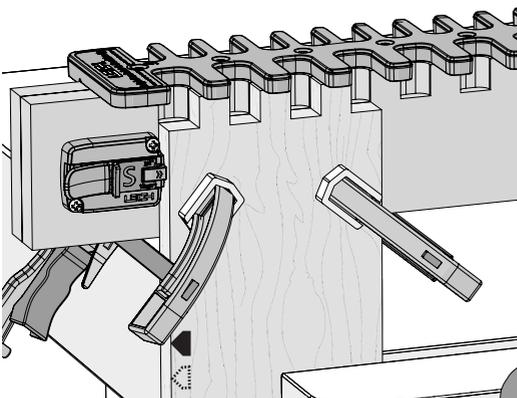
**5-9** Socket and pin boards may differ in thickness. Always use the mating pin or socket board to determine depth of cut. Hold it flush under the template and mark a line on the board, indicating depth of cut.



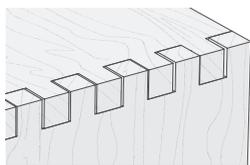
**5-10** Place the router on the jig and adjust the tip of the bit up or down until it's at the center of the line. Rotate the bit and collet to ensure it spins freely and does not contact the eBush.



**5-11 Rout the first test board.** Hold the router firmly as you rout straight in and out of each template opening. Be sure the e10 guide bushing touches the left side of the template opening on the way in, and the right side on the way out. **Do not rotate the router.**



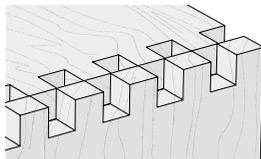
**5-12** Remove the jig from the first test board and repeat the process for the second test board.



TOO LOOSE



TIGHTEN



TOO TIGHT



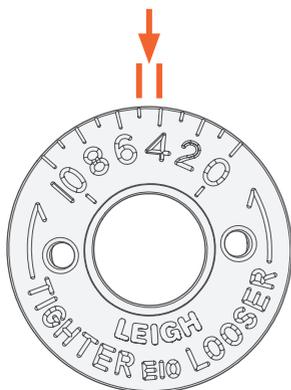
LOOSEN

### 5-13 Joint Fit Adjustment

Assemble the test boards. If the joint is too loose, use the pin wrench and turn the eBush to a higher number **and rout two fresh board ends.**

If the joint is too tight, turn the eBush to a lower number **and rout two fresh board ends.**

One or two test cuts should produce a perfect fit.



**5-14** Each increment on the eBush changes the joint glue line fit by 0.002" [0.05mm]. Half an increment, a mere 0.001"!

**Retighten the eBush nut after each guide bushing adjustment.**

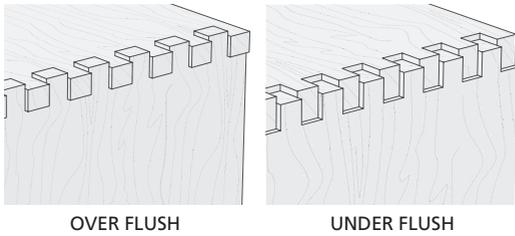
### SAMPLE



June 7, 1/2" joint  
Maple, 160 bit

**5-15** Use these eBush diagrams to record the settings you used to achieve perfect joint fit. The first eBush is simply an example of how to record your setting.

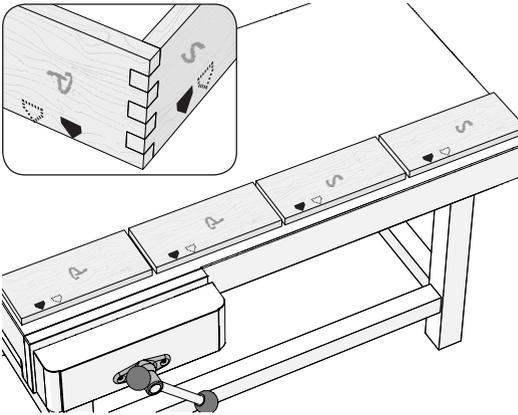




**5-16** Joint flushness is determined by the depth of cut.

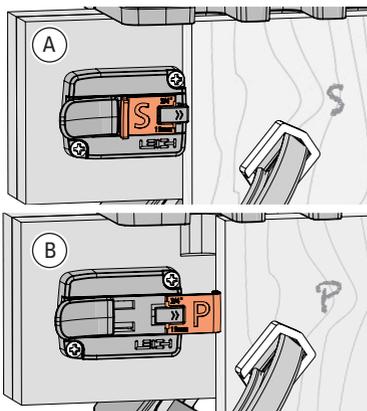
If the joint is over flush, raise the bit to decrease the depth of cut.

If the joint is under flush, lower the bit to make a deeper cut.

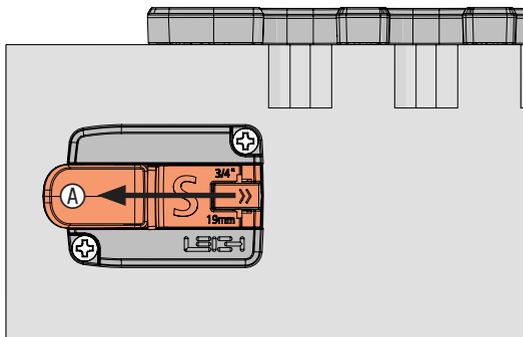


**5-17** Lay out the four boards for the box. Mark an **S** (socket board) on two of the boards and a **P** (pin board) on two boards.

Also mark the common board edges that will go against the side stop. These edges will align at the top or bottom edge of the box when assembled.

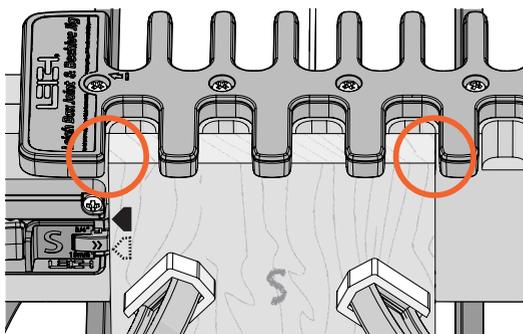


**5-18 Side Stop Positions** The side stop is used to position the pin and socket boards. Put the socket board stop in the **S** position **A** for all socket boards. The pin board stop is put in the **P** position **B** for all pin boards.



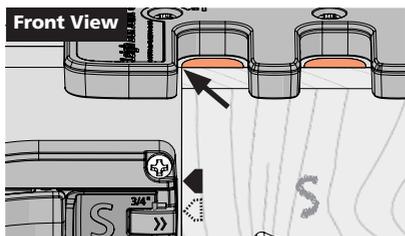
### 5-19 Routing the Socket Board

With the  $\frac{3}{4}$ " side of the template facing you, lift the thumb lock (A) and move the socket board stop fully to the left. Lock it in position.



### 5-20 Symmetrical Joints

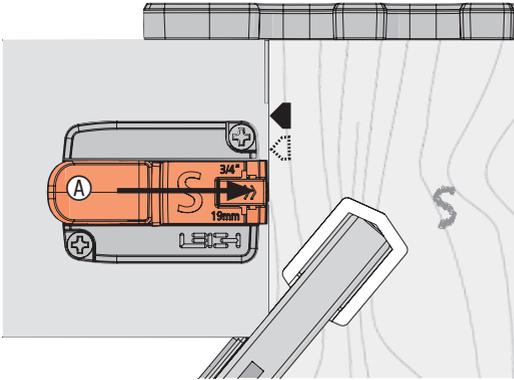
Clamp the first socket board in the vice. With the left edge of the board in the first template opening, position the jig over the socket board, leaving equal amounts of the board showing at each edge. Clamp the jig in place.



### 5-21 Asymmetrical Joints

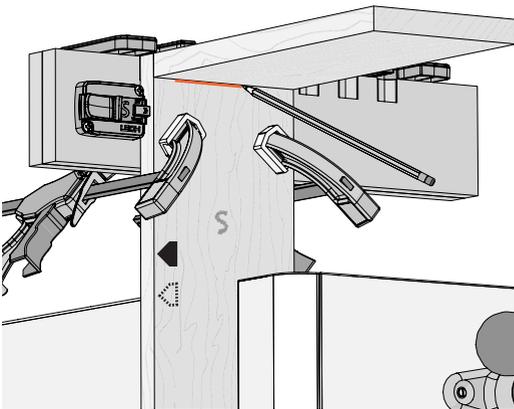
Clamp the first socket board in the vice. With the left edge of the board in the first template opening, position the jig over the socket board.

**Note:** Asymmetrical boards cannot be centered under the template. With the side stop fully retracted, align the left edge of the board with the left edge of the groove in the beam.



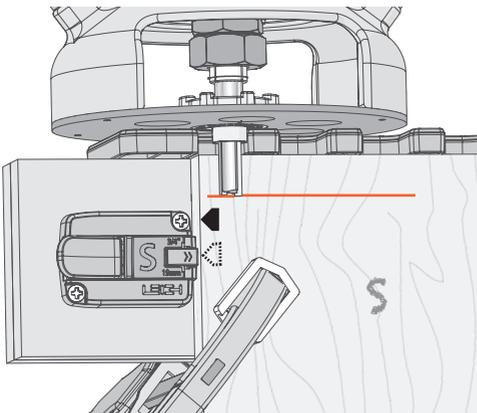
**5-22** For both joint types, lift the thumb lock (A), and move the socket board stop to the right until it touches the board. Press the thumb lock to lock it in place.

The side stop remains locked in place for all socket and pin board routing.

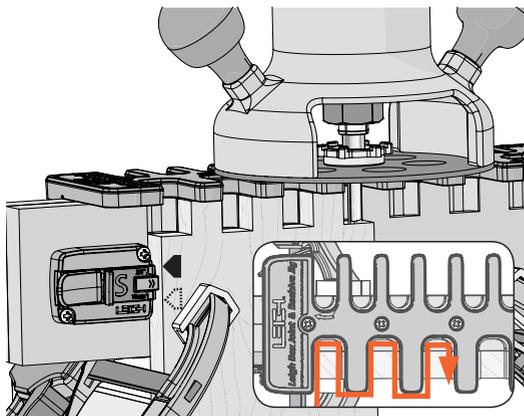


**5-23** Socket and pin boards can be different thicknesses. Always use the mating pin or socket board to determine depth of cut.

In this case, hold the pin board flush under the template and draw a line on the socket board, indicating depth of cut.

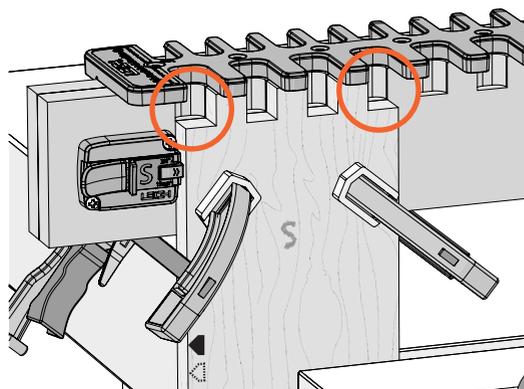


**5-24** Place the router on the jig and adjust the tip of the bit up or down until it's at the center of the line. Rotate the bit and collet to ensure it spins freely and does not contact the eBush.



**5-25** Hold the router firmly, as you rout straight in and out of each template opening.

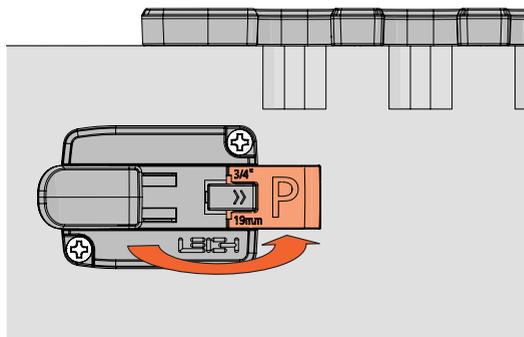
Be sure the  $\epsilon 10$  guide bushing touches the left side of the template opening on the way in, and the right side on the way out. **Do not rotate the router. Keep the router handles parallel to the jig while routing.**



**5-26** There will now be a full socket at each edge of the socket board.

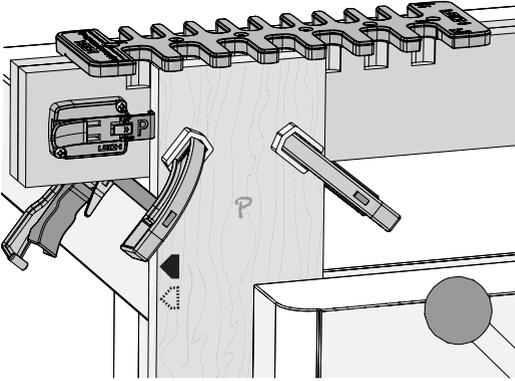
Turn the socket board end for end, keeping the same board edge against the side stop.

Rout the other end of the board. Repeat for the second socket board and remove the jig from the socket board.

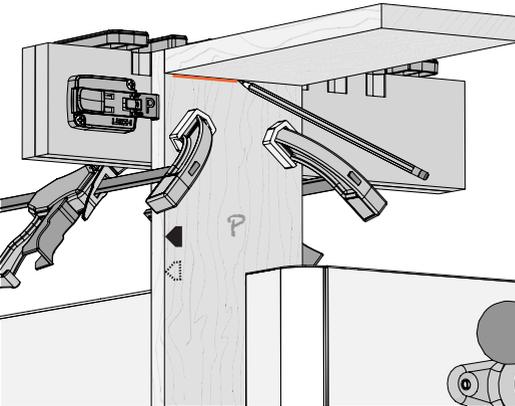


### 5-27 Routing the Pin Board

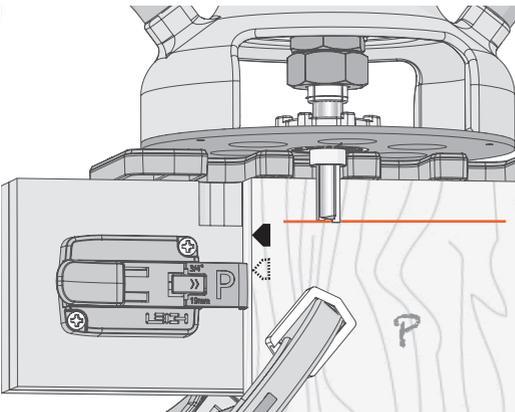
The pin board must be offset relative to the socket board. Do not release the thumb lock. Simply flip the pin board stop to the **P** position.



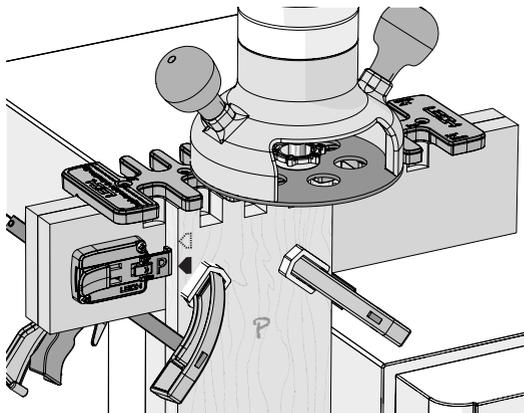
**5-28** With the side stop set, position the jig over the pin board, and slide it over until the side stop touches the board edge. Clamp in place.



**5-29** Use the socket board to mark the depth of cut. If all your boards are the same thickness, the depth is already set.

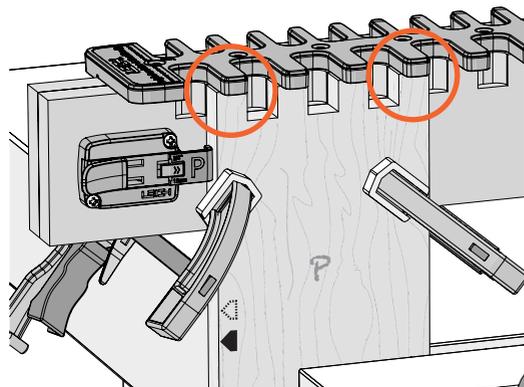


**5-30** Place the router on the jig and adjust the tip of the bit up or down until it's at the center of the line.



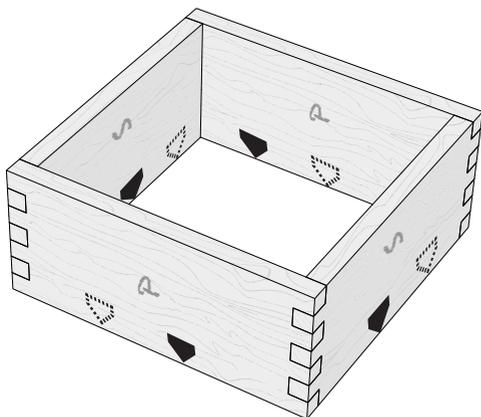
**5-31** Hold the router firmly as you rout straight in and out of each template opening. Be sure the e10 guide bushing touches the left side of the template opening on the way in, and the right side on the way out.

**Do not rotate the router.**



**5-32** There will now be a full pin at each edge of the board.

Turn the pin board end for end, keeping the same board edge against the side stop, and rout the other end of the board. Repeat for the second pin board.



**5-33** Assemble the box, keeping the marked board edges aligned. ■