



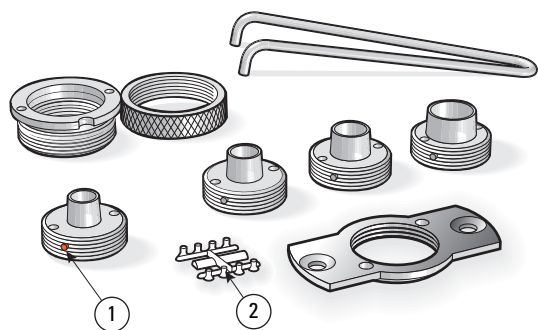
F2, F1600 **CHAPTER 4**

The Variable Guidebush System (VGS)

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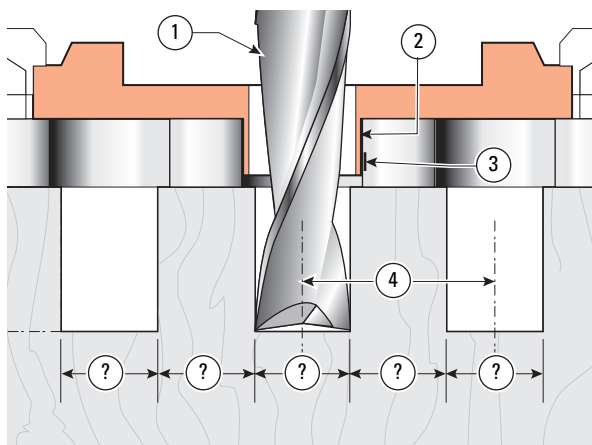


4-1

The F series Templates come complete with the Variable Guidebush System (VGS), with one bush for each comb size of your chosen template, i.e. either three or four bushes. Each of the tapered bushes is drilled ① to accept a nylon thread-insert ② (eight of them on a “tree”). See 4-7 to fit.

⚠ Do not use the VGS on Leigh Dovetail Jigs or M2 Mortise Guide Finger accessories; they are only for templates.

Here’s why the VGS is necessary...

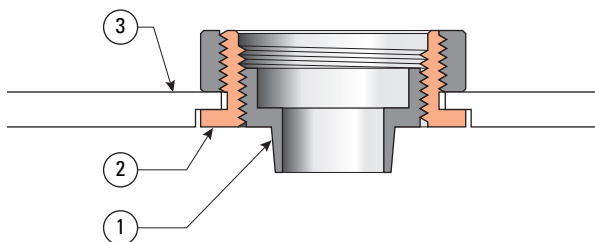


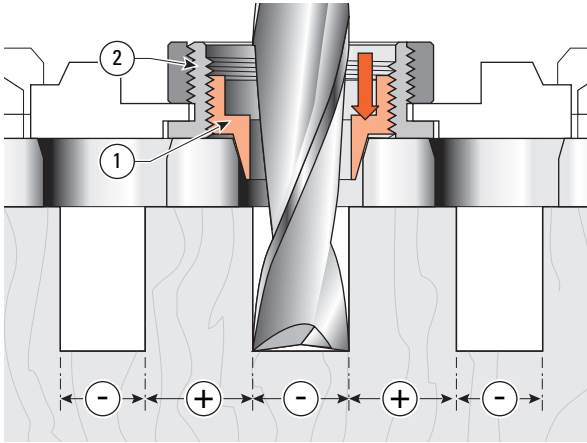
4-2 Joint Fit and Joint Pitch

Box joints routed with standard sized straight cutters ① and standard sized guidebushes ② against straight guide surfaces ③ and on pitch centres exactly two times the cutter diameter ④ can be guaranteed to result in a loose fitting joint. Cutters, guidebushes and templates are all manufactured with necessary plus/minus tolerances and the router will have some degree of run-out, or “wobble”.

4-3

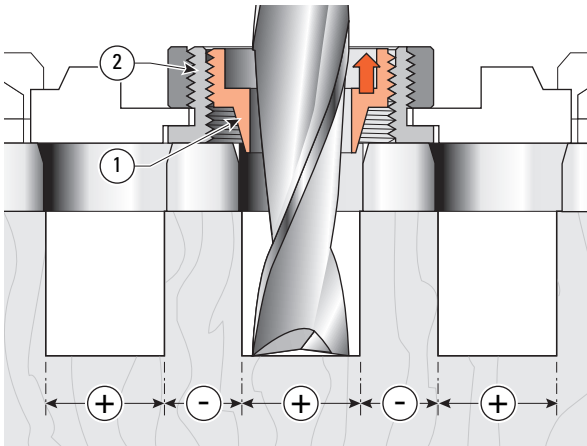
However, the Leigh VGS bush has a tapered barrel ① threaded into a holder ② which in turn attaches to an adaptor or directly to the router ③.





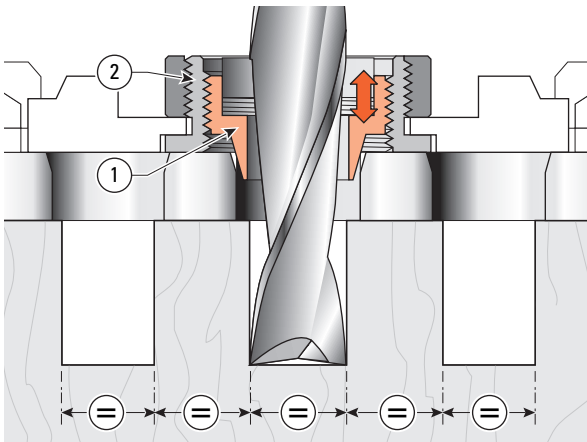
4-4

With the VGS tapered bush ① screwed down in the holder (away from the router) ② the active bush diameter is increased, allowing less side-to-side movement, and resulting in smaller sockets and larger pins. A tight fit! *Guidebush angle, scale and movement are exaggerated in this sequence of illustrations.*



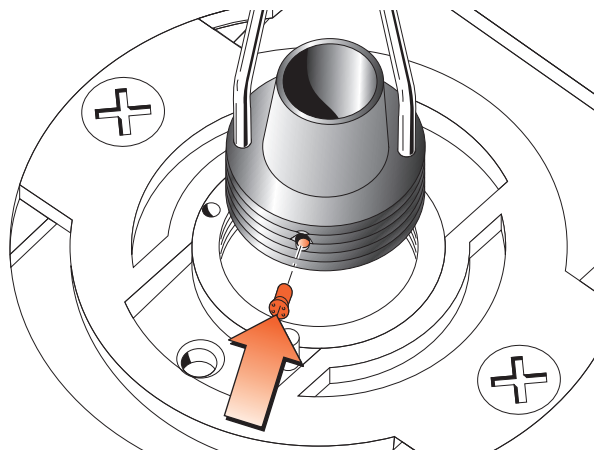
4-5

Raising the bush (screwing the bush into the holder) allows more side-to-side router/cutter movement, and more wood removal, producing larger sockets and smaller pins, and thus a loose fit.

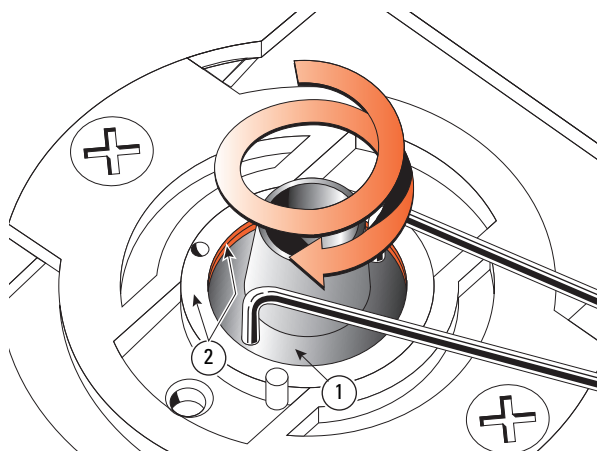


4-6

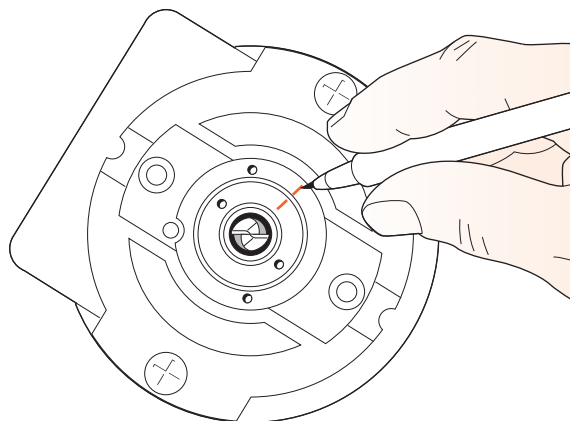
A few trial-and-error test cuts and VGS adjustments will allow you to establish the right pin and socket sizes for a perfect fit. **Note: One eighth of a turn of the variable bush changes the joint glue-line interface by one thousandth of an inch, that is, 0.001" or 0,025mm.**

**4-7**

Fit the holder to the router first. Before fitting a variable bush to a holder, fit one of the small nylon thread inserts to the hole in the side of the thread. Leave the insert on its “tree” and push into the hole. Then snap off the “tree”. Once threaded into a holder, the insert will become trapped and should not fall out when the bush is removed. However, wrap some scotch tape around the bush whenever it is removed to prevent this. The four inserts and four spares will last a long time.

**4-8**

Always start test routing with the bush flange ① turned one to one-and-a-half turns farther into the router than the holder flange ②.

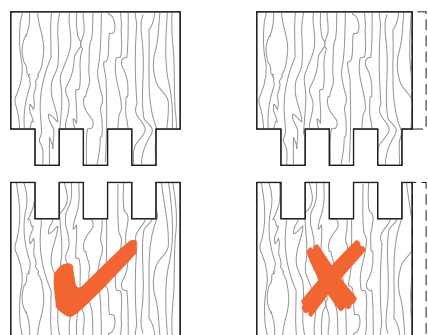
**4-9**

When you have the best joint fit, mark the bush and holder with permanent ink for future reference. Use the same cutter next time. ■

F2, F1600 **CHAPTER 5**

Board Width Selection

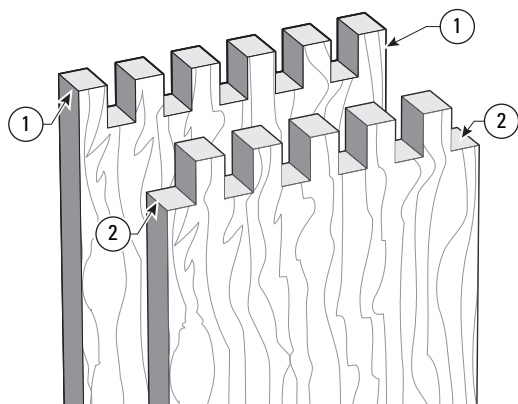




5-1 Board Widths and Joint Symmetry

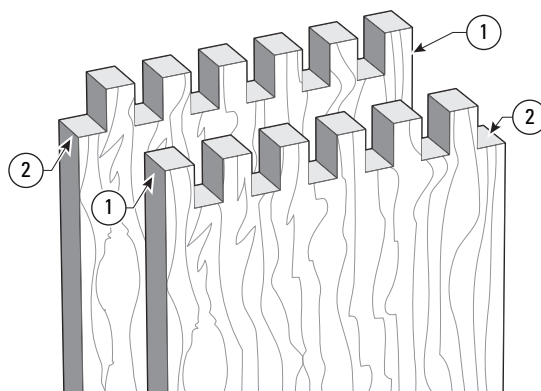
Unlike the infinitely variable Leigh Dovetail Jig, a fixed template cannot accommodate any width of board and still produce a neat and even finish on both side edges of a joint. The boards must be cut to specific widths, depending on the pitch of the comb.

⚠ The comb pitches on the Leigh Finger Joint Templates are all 2 times the cutter diameter plus 0.016" [0,40mm], so you cannot simply use the cutter diameter to calculate board widths; you must use the board width charts on P 32-33.



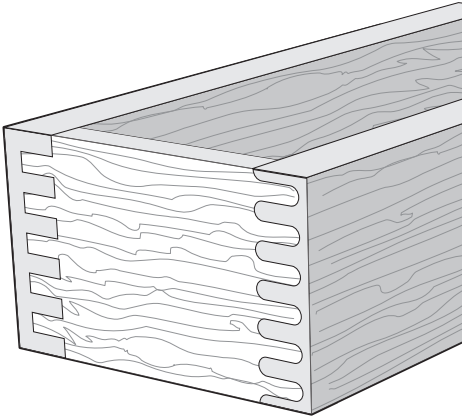
5-2

Symmetrical joints have fingers ① on both side edges of one board and sockets ② on both side edges of the mating board.

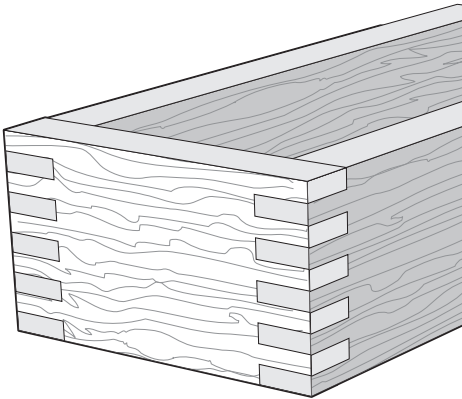


5-3

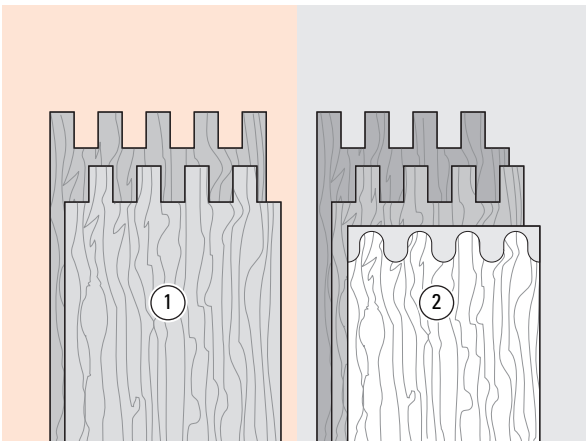
Asymmetrical joints have a finger ① on one side edge and a socket ② on the other side edge of each board.



5-4
Symmetrical joints are essential for half-blind corners (and rounded finger joints on the F2 or F2M).



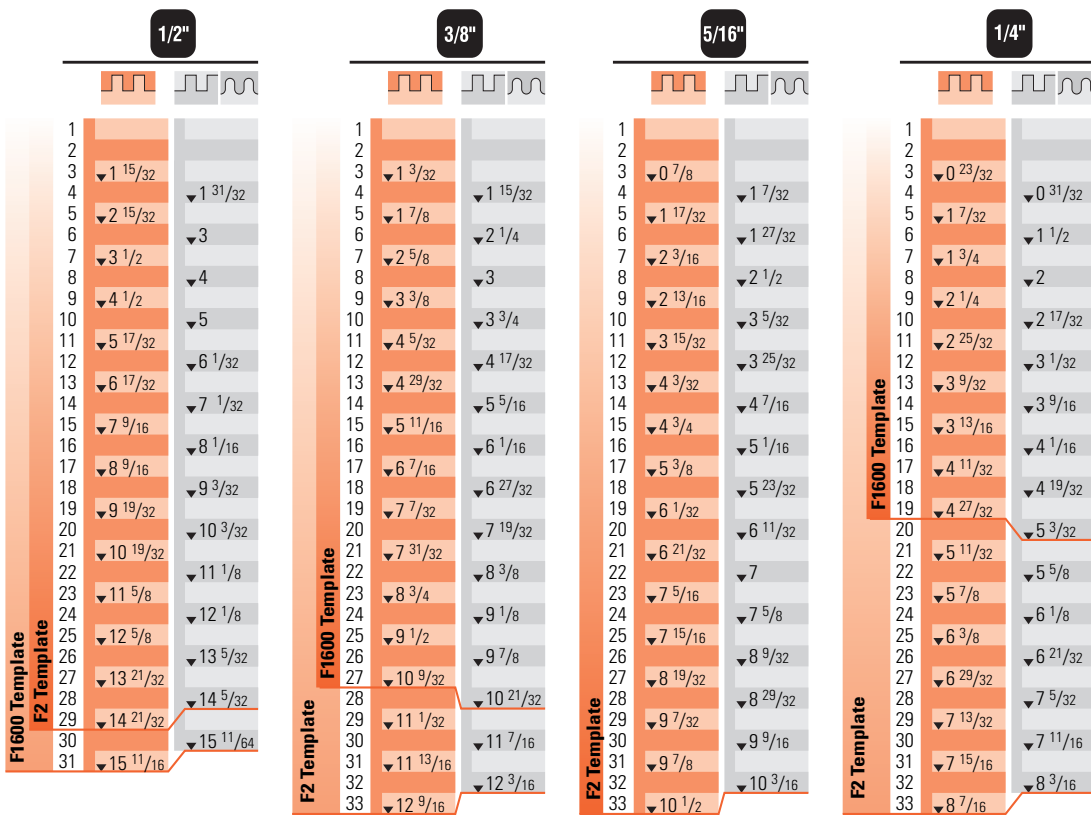
5-5
However, ordinary box joints may be asymmetrical and look okay.



5-6
Note: Because the Leigh VGS allows for fit adjustment on template size, the pitch widths have been made slightly greater than the nominal pitch, i.e. slightly more than two times the cutter diameter. To make symmetrical square joints ①, use the board widths in red. For asymmetrical square joints and symmetrical round joints ②, use the board widths in black. Inch board widths are on page 32. Millimetre board widths are on page 33. ■

BOARD WIDTH CHART (INCHES)

Note: Rounded Joints cannot be made with F1600



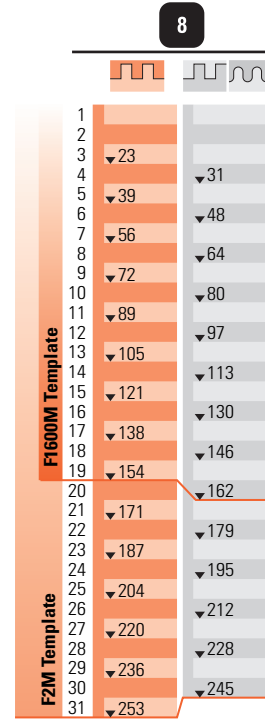
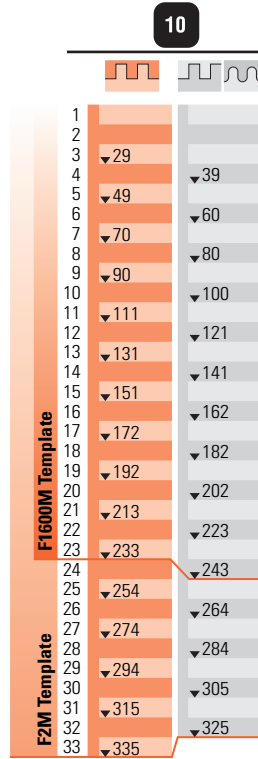
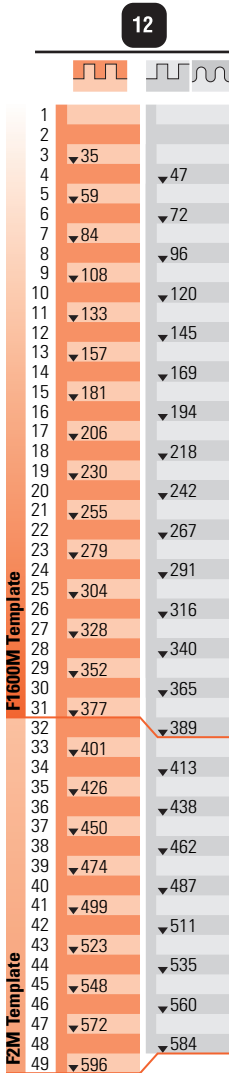
Numbers in white column are number of sockets and pins

Note: Use to the nearest 1/32" for width selection.

To make symmetrical square joints, use the board widths in the red column. For asymmetrical square joints and symmetrical round joints, use the board widths in the grey column.

BOARD WIDTH CHART (MILLIMETRES)

Note: Rounded Joints cannot be made with F1600



Numbers in white column are number of sockets and pins

Note: Use to the nearest millimetre for width selection. To make symmetrical square joints, use the board widths in the red column. For asymmetrical square joints and symmetrical round joints, use the board widths in the grey column.

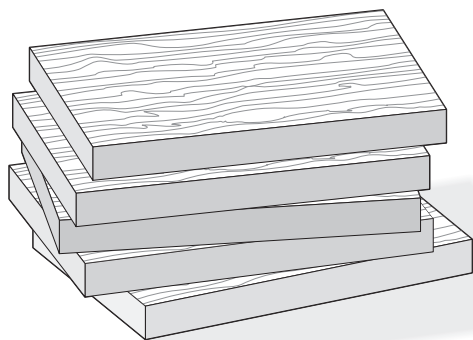
Box Joint Procedures

Throughout this user guide, jointing procedures are illustrated with the F2 template mounted on the D4R jig.

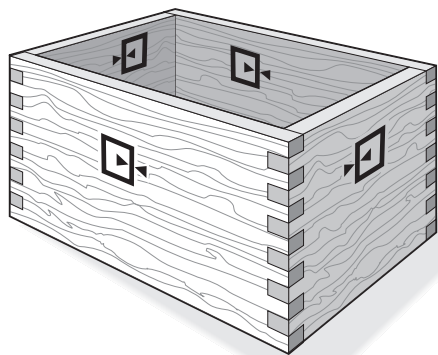
The procedures for using the F1600 are the same. Movements and settings illustrated in each step are identical, whether performed on the F2, F2M, F1600, or F1600M.

See page 4 for the physical differences between the F2 and F1600 series' jigs.

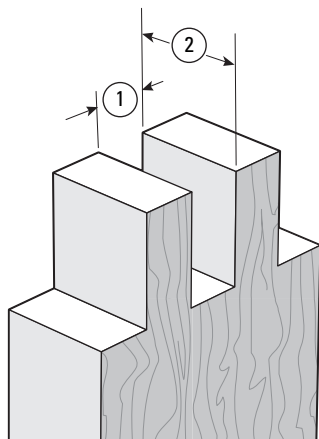


**6-1**

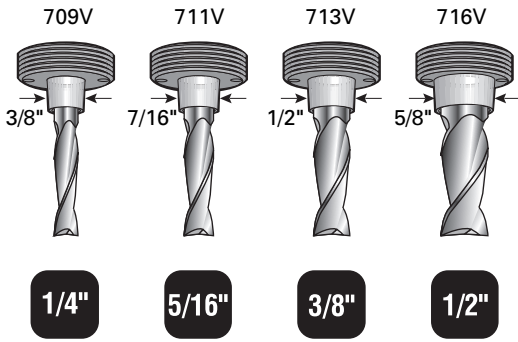
Always use scrap boards to test for fit. Width and thickness of the scrap boards is not critical.

**6-2**

Let's rout some simple box joints. These general instructions are the same for any of the four comb sizes. Because the templates fit two types of Leigh jig, the illustrations show the left-hand side of a "generic" Leigh jig; you could be working on the right-hand side. Rout only single corners to adjust the 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 11-3.*

**6-3 Cutter and Guidebush 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 cutter, the greater the strength because of the greater gluing area.



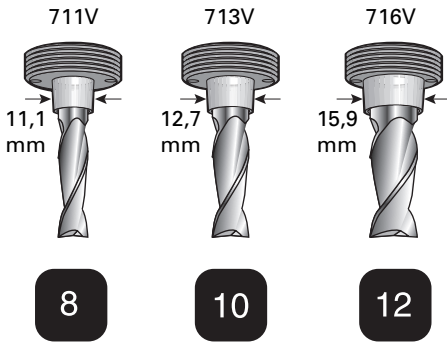
6-4

Select the correct variable bush and cutter combination for the comb size to be used. The cutter size is the same as the designated comb size.

For smaller size box joints see chapter 10.

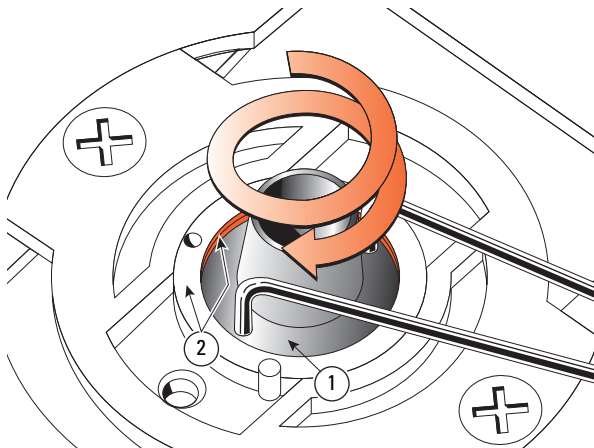
Depending on the model, the inch template can use up to four sizes of cutter and guidebush.

The nominal (mean) diameter of each bush is shown for reference.



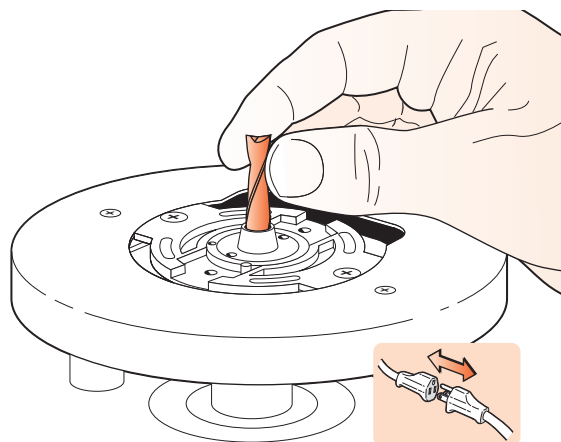
6-5

The millimetre template can use three sizes of cutter and comes with three guidebushes.



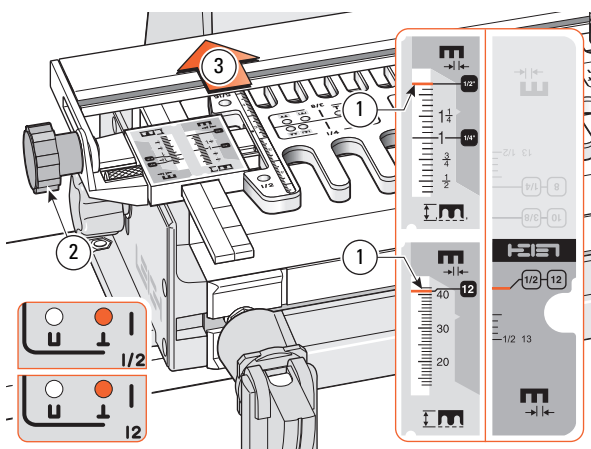
6-6

Always start test routing with the bush flange ① turned one to one-and-a-half turns farther in than the holder flange ②.



6-7

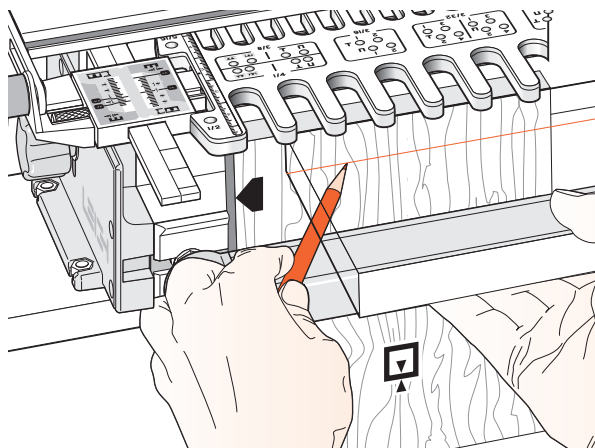
Fit the selected cutter (that matches the bush) to the router and tighten securely.



6-8

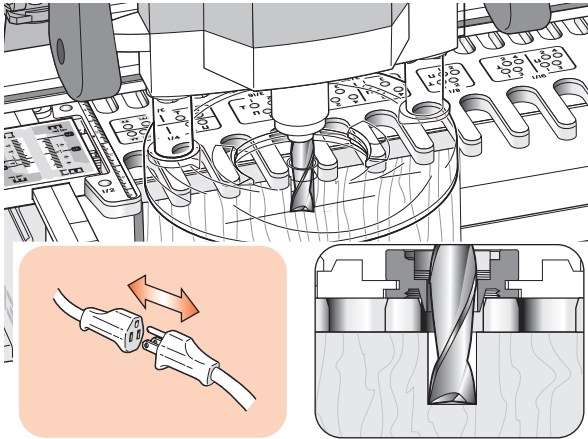
F2: Loosen fence knobs ② and move fence ③ to rear and re-tighten knobs ②. Note: The fence is only used for rounded finger joints. If the fence is in the way of a large router base, simply lift and lock the fence so the router base can slide under it.

F2/F1600: Set the scale on the comb size to be used (example here; 1/2" [12mm] comb ①). Position the template with the template pin in the ↓ position. Remember, the template pin is always positioned at the opposite end of the template.



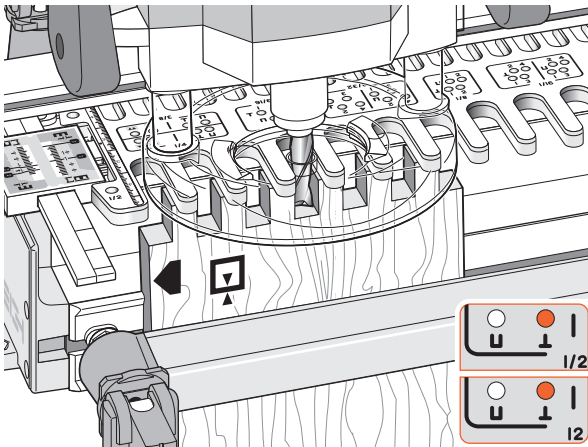
6-9

Clamp the workpiece against the side stop, with the end edge flush under the template. The board may be clamped face side in or out □. Mark and adjust the depth of cut to suit the thickness of the boards. Use the board to be joined to mark the depth of cut.



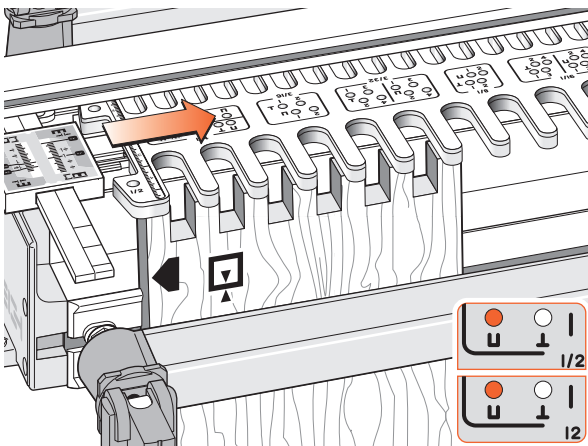
6-10

Adjust the cutter to cut down to the centre of the pencil line. Make sure the collet will not rub on the guidebush.



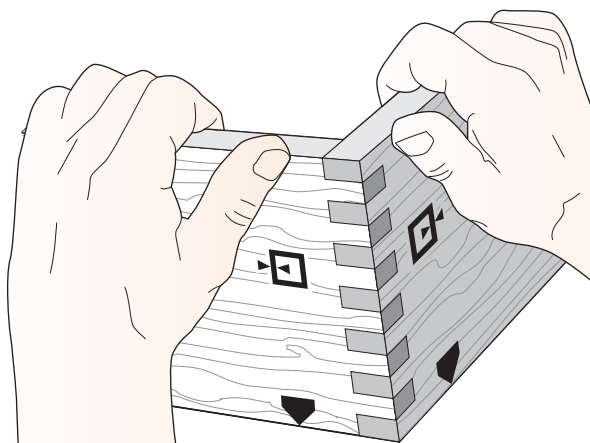
6-11

Route one end of a scrap board. Make sure to touch the guidebush on both sides of each template opening.

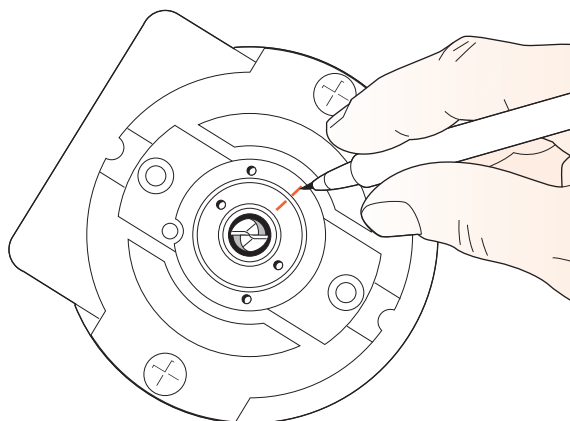


6-12

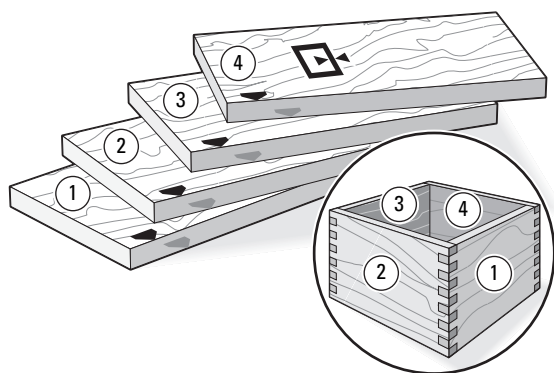
Remove the template pin and move the template to the **U** position, then refit the pin. Route the mating board.

**6-13**

Test the two boards for fit. Adjust the height of the variable guidebush by trial and error and rout more pairs of test boards to achieve the desired fit. Remember, turn the variable bush out for a tighter joint and turn it in for a looser joint.

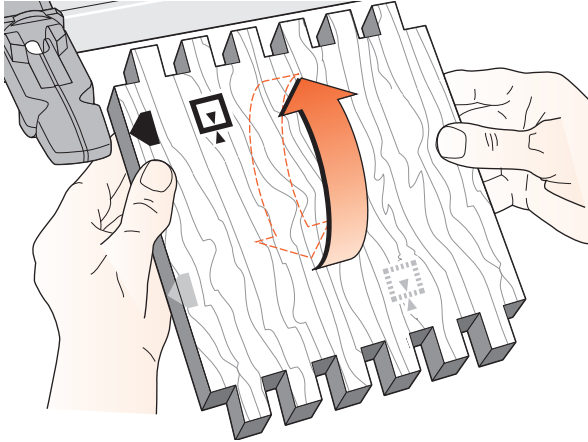
**6-14**

When the fit is just right, mark the bush and holder with permanent ink for future reference.

**6-15**

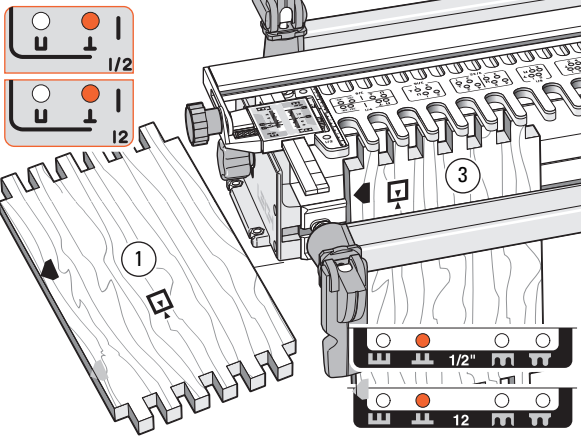
Let's make a box.

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.



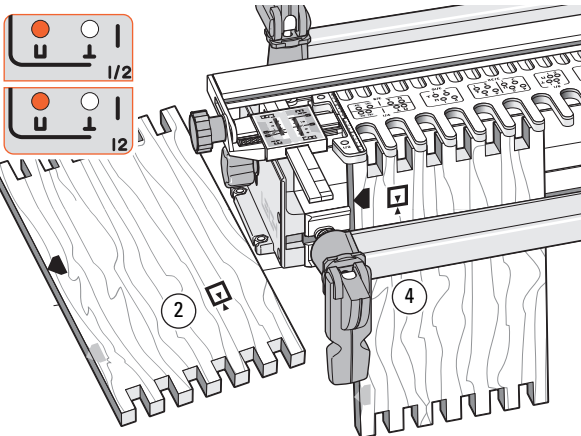
6-16

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



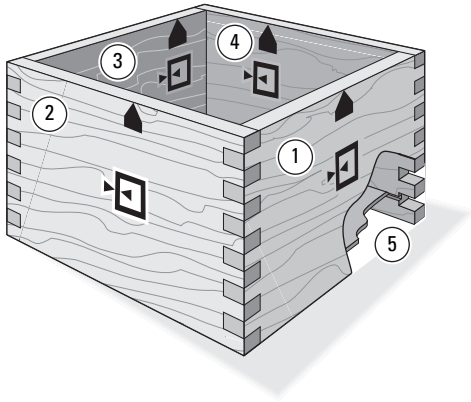
6-17

Rout both ends of boards 1 and 3 in position \downarrow . Be sure to keep the same edges to the side stop.

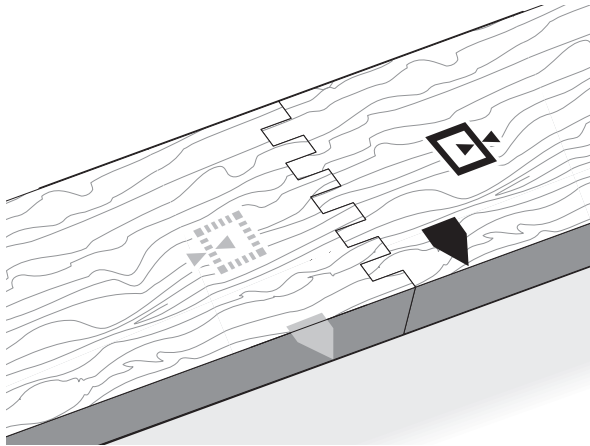


6-18

Rout both ends of boards 2 and 4 in position \downarrow . Keep the same edges to the side stop.

**6-19**

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 ⑤ for the box bottom. Remember, box joint corners need clamping from both directions, or use strap clamps and blocks.

**6-20**

The same method will produce square end-on-end joints. ■