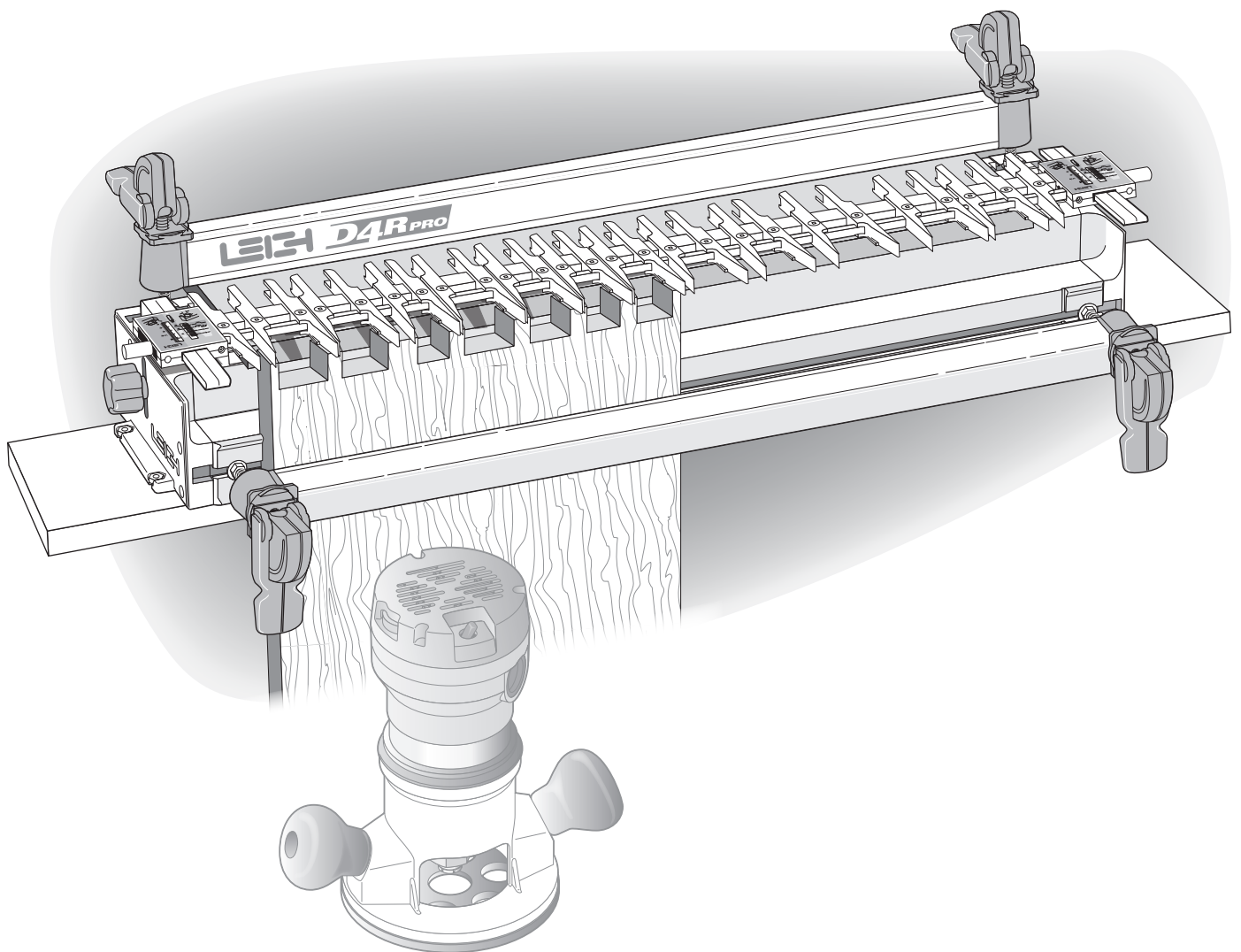


# **LEIGH D4R<sup>PRO</sup>** **User Guide**

*For the Leigh D4R Pro Dovetail Jig*



Dedicated Customer Support  
**1-800-663-8932**

**LEIGH**  
Joining Tradition with Today

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### Your New Leigh D4R Pro Dovetail Jig

*Congratulations! You now own the world's most useful and versatile dovetailing tool. The Leigh D4R Pro Dovetail Jig will help you rout an infinite variety of joints, and all of its major functions are described in detail in this guide. A very helpful DVD is also included, but the guide is essential reading.*

We recommend that you first assemble and mount the jig, carefully following the instructions in the first section of the guide. Then read the rest of the guide, following along with the basic functions and principles of operation, before you try to do any actual joinery routing. By all means, rout a few practice joints in scrap boards before you use the jig to rout a precious hardwood workpiece!

If you have any questions that are not answered in this guide, please contact Leigh customer support:

Tel: 1-800-663-8932 email: [help@leighjigs.com](mailto:help@leighjigs.com)

But remember: "If at first you don't succeed, read the instructions!"

\*See Appendix IV – Customer Support

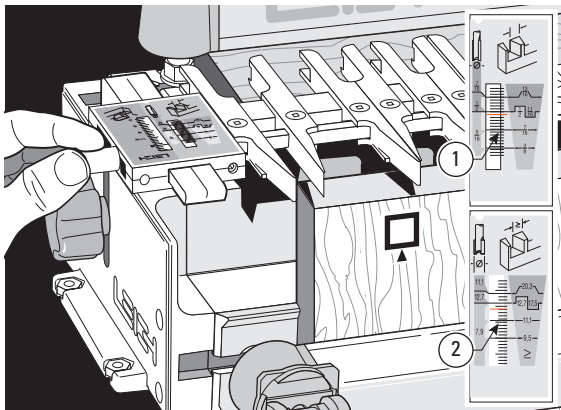
### Important! Inches and Millimeters

The D4R Pro jig can be ordered in inch or metric versions. They're identical except for the calibration scales. This Leigh English-language user guide shows measurements in both inches and millimeters, with "inches" first, followed by "millimeters" in square brackets.

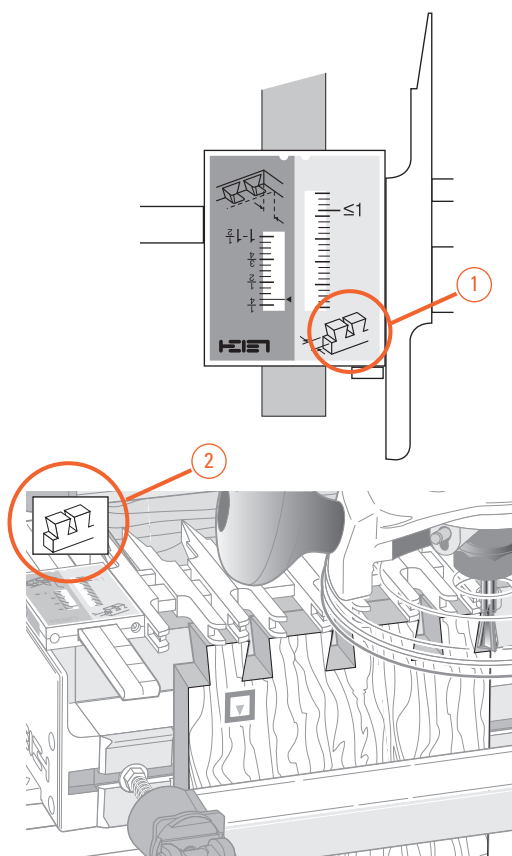
Example:  $\frac{3}{4}$ " x  $5\frac{1}{2}$ " x 8" [20 x 140 x 200mm]

Do not be concerned if the inch/millimeter equivalents are not exact. Just use the dimensions which apply to your jig.

To simplify the instructions, most jig illustrations show a jig considerably shorter than the standard 24" [610mm].



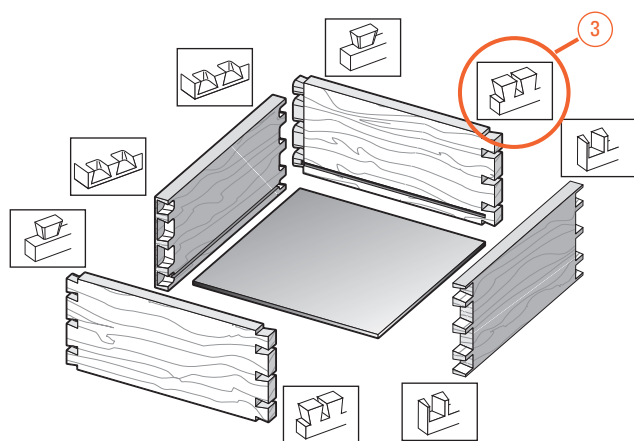
Where finger assembly scales overlay an illustration, the "inches" scale ① will be at the top, and "millimeters" scale ② at the bottom. Only the right hand "active" half of the scales are illustrated. For clarity, setting positions are indicated with a red line in the guide only. **On the jig, the lines are black.**



## Glossary of Symbols

To help you understand the instructions and illustrations in this manual, we have used a number of international symbols, plus a few special ones of our own. They are all explained below. **You needn't worry about memorizing these symbols now**, because they are repeated quite frequently in this user guide, and you will soon get used to them.

The Leigh jig's guidefinger assembly can be in any one of four joint modes, depending on what type of joint and which part of the joint you are routing. Each finger assembly scale has its own mode icon ①, identifying the joint part being routed. You will also find the joint mode icon in the top left corner of most illustrations ②, indicating which finger assembly mode to use.



Sometimes a joint mode icon will be used to identify a board ③.

These are the four joint mode icons:



**TD Tails**  
(tails for through dovetail joints)



**TD Pins**  
(pins for through dovetail joints)



**HB Tails**  
(tails for half-blind dovetail joints)

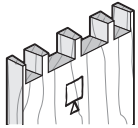


**HB Pins**  
(pins for half-blind dovetail joints)

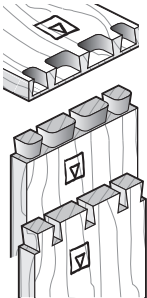


## Which Way Round Should the Board Go?

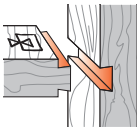
As virtually all dovetail joinery is used to make boxes, drawers and chests etc., we devised these simple (and hopefully intuitive) icons to indicate which side of a board faces inwards or outwards on the finished “box”, and which side of the board faces outward (toward you, the operator), when it is clamped in the jig.



⏏ This icon ⏏ indicates the “outside” of a board. All through dovetail pin boards are mounted in the jig with this “outside” face away from the jig (toward you, the operator).

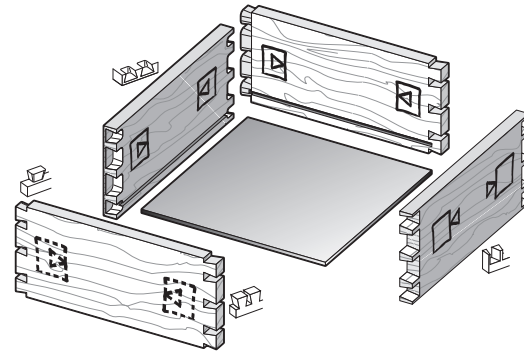
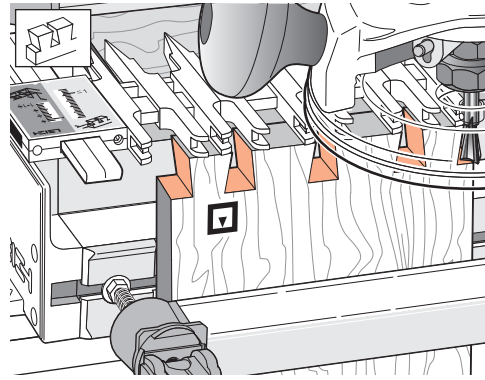


⏏ This icon ⏏ indicates the “inside” of a board. All half-blind pin and half-blind tail boards, and through dovetail tail boards, are mounted in the jig with the “inside” face away from the jig toward you, the operator.



⏏ This icon ⏏ indicates boards that are mounted both ways e.g. sliding dovetails and end-on-end dovetails.

⏏ Dotted line icons ⏏ indicate the “other” side of the board in the illustrations.



The following symbols indicate:



This edge against sidestop



This edge against sidestop



Sawcut allowance



Caution: use special care for this operation

①②③ Numbered References in text



Centerline of board or layout



Equals



Does not equal



Approximately

## Add **Leigh Accessories** to make your jig even more versatile.



### Finally, Dust-Free Routing and Superb Router Support!

A must-have! The VRS Vacuum & Router Support\* is the ultimate dust and chip collector. As an added bonus, the VRS adds full width router support to your D4R Pro. It's simple to attach and the collector adapts to most popular vacuum hose sizes.

#### Item VRSD24

\* US patent: USPN 7,507,060 B2  
UK patent: GB2446909



### Leigh Brand Bit Sets Offer Great Savings...and the Box Is Free!

Save over individual bit prices. Each top quality bit set includes a box with foam insert that accepts all shank sizes, and a handy bit chart in the lid to list out all the bit specs.

**Item 1607-8** 7-piece Bit Set

**Item 2411-8** 12-piece Bit Set

**Item 5116-8** 15-piece Bit Set



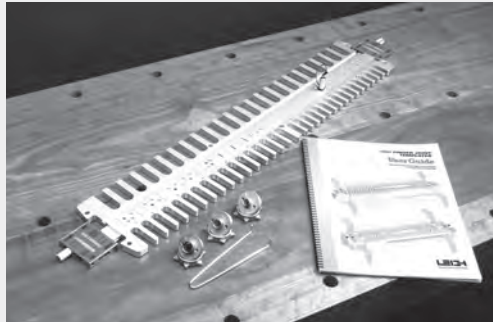
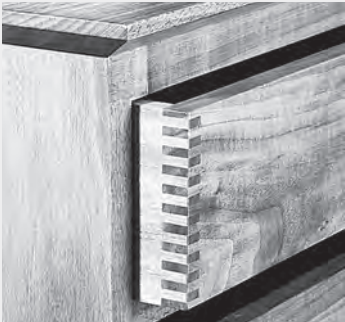
### Combine the VRS with a Bit Set for Exceptional Savings!

The D4R Pro Accessory Kit is the best deal going. Enjoy great savings on the 12-piece Bit Set and even greater savings when you combine it with the VRSD24 Vacuum & Router Support.

#### Item ACD24

Visit [www.leighjigs.com](http://www.leighjigs.com) for more details

## Optional Leigh Templates and Attachments



### Precise, Easy Finger Joints

Finger joints are very strong, aesthetically pleasing and easy to produce. Add an F3 Finger Joint Template\* to your D4R Pro Jig and rout perfect finger joints in minutes. Rout Box Joints from  $\frac{3}{32}$ " to 1".

#### Item F3

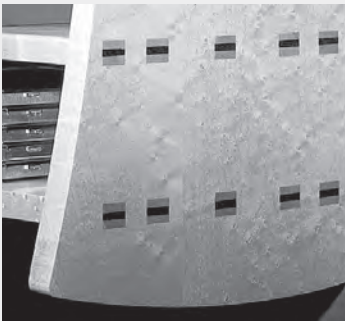
\* US Patent No. 5,711,356  
Canadian Patent No. 2,146,834  
European Patent No. 0698458



### Six Unique Isoloc Joints, Only from Leigh

The patented Isoloc joint gives any corner joint a very unique look. These one-of-a-kind patterns will really set your woodworking pieces apart from the rest. Great savings when you buy all three templates.

#### Items I1A, I1B, I1C and I13 (3 pack)



### Classic Multiple Mortise and Tenon Joints that Last

The Leigh M2 Attachment is the only one of its kind. The multiple mortise and tenon joint is ideal for "shelf to upright" construction and produces extremely strong joints that stand the test of time.

#### Item M2

## Need a Helping Hand? Use Leigh Hold-Down Clamps

Leigh Hold-Down Clamps are tough, versatile and immensely strong! They employ proven cam-action technology developed for the award-winning Leigh jigs, the D4R Pro and FMT. Bench clamps can be used in any size hole and surface clamps can be mounted on any flat surface, both on any angle. You can never have too many clamps!

Item BHDC1 Bench Mount

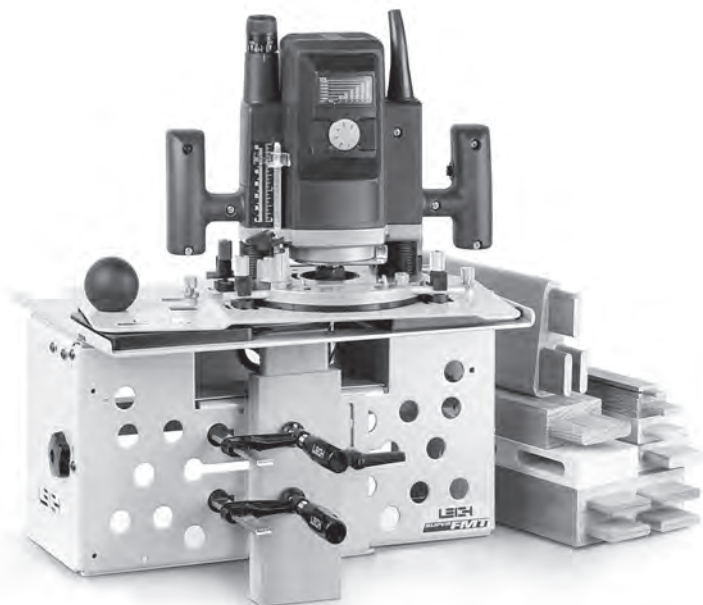
Item SHDC1 Surface mount



Visit [www.leighjigs.com](http://www.leighjigs.com) for more details



## Mortise & Tenon Joints **have never** been easier!



**Leigh Super FMT**  
Mortise & Tenon Jig  
Item SFMT



**Leigh FMT Pro**  
Mortise & Tenon Jig  
Item FMT Pro

**Rout mortises and tenons in 60 seconds!** Leigh Jigs make it easy: One bit, one guide, one setup for perfect joints every time. Make tables, chairs, beds, chests, cabinets and so much more!



### JIG FEATURES

- 21 standard joint sizes
- Hundreds of optional sizes
- 68 mortise & tenon sizes
- 6 specialty guides: Four square tenon guides, louver guide set, Y-axis mortise guide
- Maximum 1/2" x 5" joint size
- Single, double (tandem and side-by-side), triple, quadruple joints
- Recordable, repeatable fit adjustment
- Angled and compound angled joints
- Works with virtually any plunge router
- Heavy gauge steel frame (Super FMT)
- CNC machined alumin. frame (FMT Pro)
- Multi-position clamping
- Clamp boards up to 3" x 5"
- Easy and precise joint sighting

### STANDARD EQUIPMENT

- Universal sub-base that attaches to virtually any plunge router
- Two F-Clamps (Super FMT); Cam-action speed clamps (FMT Pro)
- Joint guide stand
- 5/16" HSS spiral upcut bit, 1/2" shank
- Two outrigger bars (FMT Pro only)
- Adjustable sidestop fence for tenoning
- Screwdrivers and mounting hardware
- Illustrated user guide

Visit [www.leighjigs.com](http://www.leighjigs.com) for more details

## D4R Pro - CHAPTER 1

# Jig Assembly, Mounting, and Using the Clamps

## Make Sure You Have All the Parts.

Before you start to assemble your Leigh D4R Pro, check to make sure you have received all the required parts.

The small carton you removed from the end of the main carton contains:

1. 1 Leigh e7 Elliptical Guidebush & Pin Wrench  
2 Spacers
2. 2 Dovetail bits, 1 straight bit, 1 Collet Reducer,
3. 2 scale assemblies
4. 2 support brackets
5. 2 support bracket knobs
6. Square-head guide finger screwdriver
7. 4 clamp springs  
4 clamp T-bolts  
4 flat washers  
4 T-bolt nuts  
2 square nuts  
1  $\frac{5}{64}$ " hex key  
1 flat head machine screw  
1 Leigh wrench/gauge  
4 Jig Hold-down Nuts & Machine Screws  $\frac{1}{4}$ "-20
8. 4 cam-action speed clamps  
4 cam clamp step washers

...and any other small optional items you may have ordered with your new jig. Check the packing slip for this information.

The main carton contains:

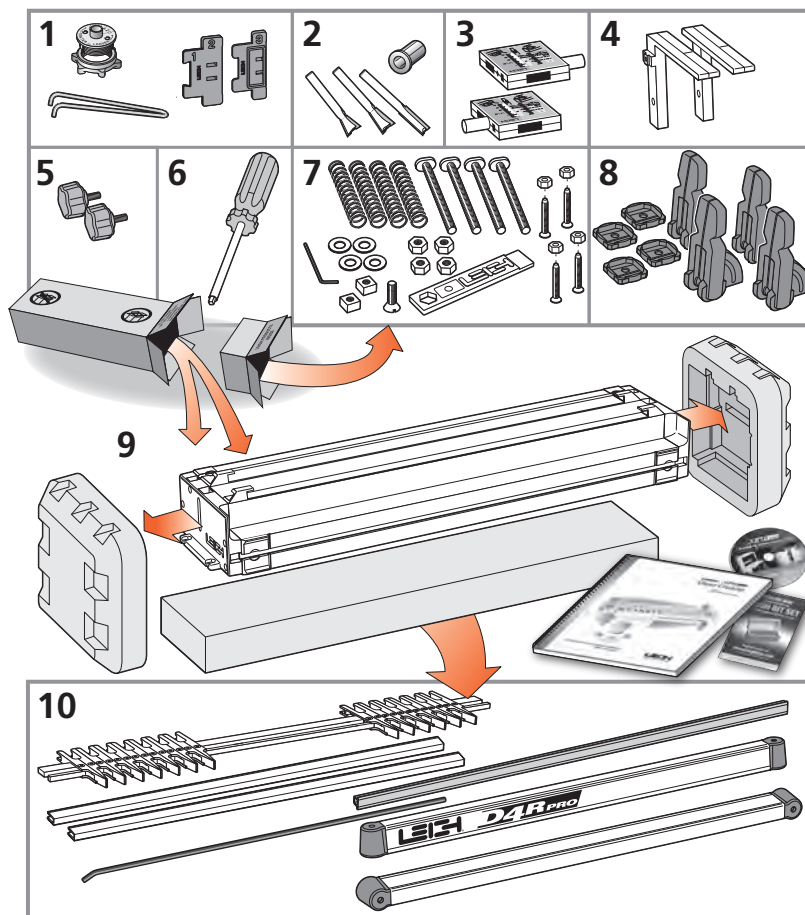
9. 1 main jig body  
1 Leigh jig User Guide  
Warranty/Registration Card  
DVD instructional video (English only)

The large inner box contains:

10. 1 finger assembly on 2 bars  
*D4R Pro has 26 guidefingers (13 pairs)*  
2 lengths bridge extrusion  
1 cross cut fence  
1 nylon Stop Rod  
2 clamp bars

If any items are missing from your jig, contact your supplier or Leigh Industries immediately.

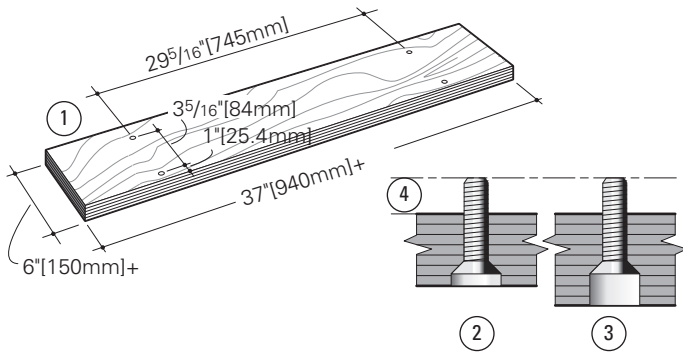
See Appendix IV - Customer Support.



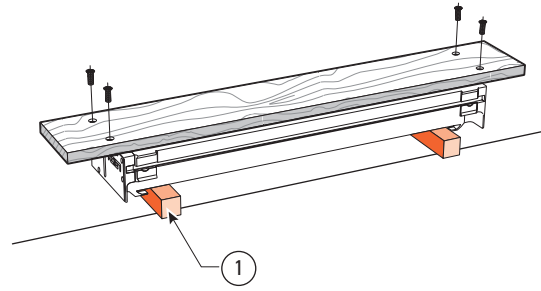
## Important Note

Mount your jig securely and assemble it completely before you try to use it.

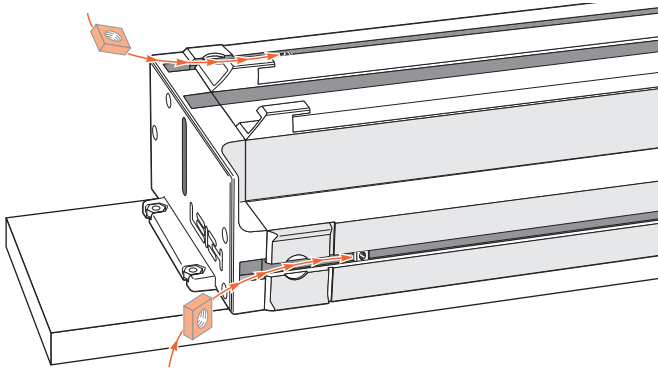
Make sure you have read and understood all the material in the Safety section of this user guide before using the jig.



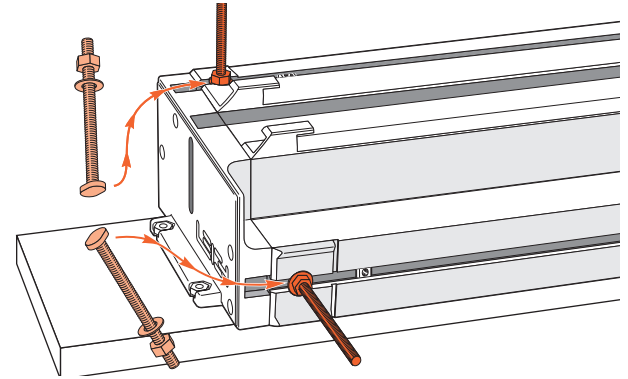
**1-1** Prepare a flat board at least  $\frac{3}{4}$ " [20mm] thick, and a minimum of 37"x6" [940x150mm]. Drill four  $\frac{5}{32}$ " [7mm] holes on 29  $\frac{5}{16}$ " x 3  $\frac{5}{16}$ " [745x84,2mm] centers, 1" [25.4mm] in from the front edge of the board ①. Countersink ② or counterbore the underside ③ if the board is thicker, so that the four  $\frac{1}{4}$ "-20x1" long machine screws will project above the top surface by  $\frac{3}{8}$ " [9,5mm] ④.



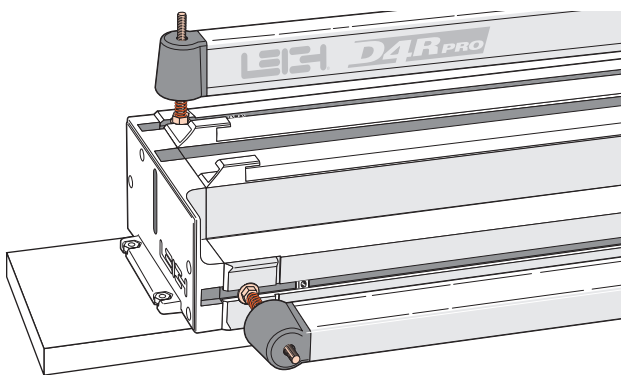
**1-2** Turn the jig body upside-down on two blocks ① (to protect the side stops). Using the four nuts and four countersunk machine screws, bolt the base board to the jig using the two nut recesses in each end housing. Holes drilled 1" [24mm] from the front edge of the board go to the front of the jig. Now you can clamp your D4R to any bench.



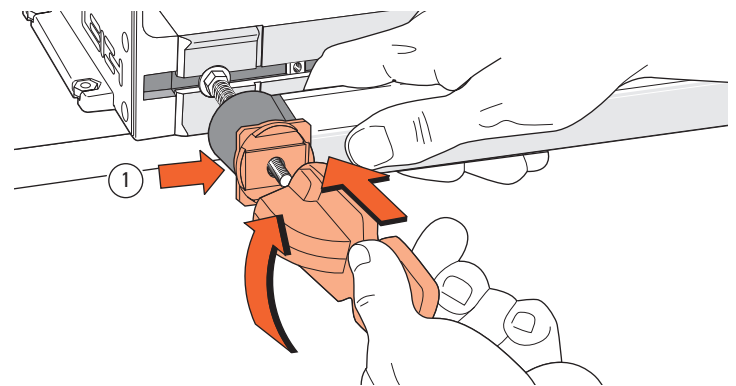
**1-3** With the jig right side up, insert one square nut (part #284) into each of the channels in the main extrusion. These nuts are for possible future attachment of accessories. See Chapter 9.



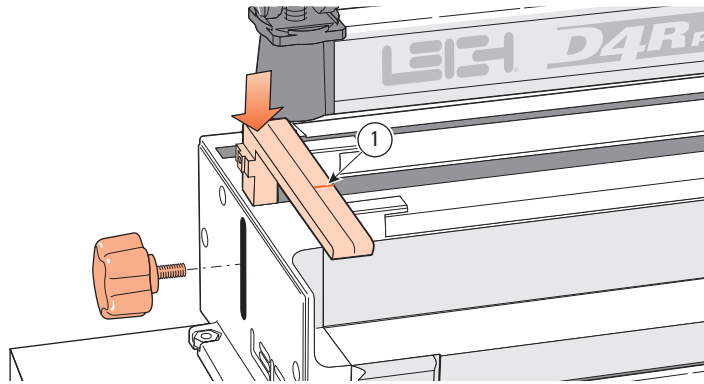
**1-4** Insert the four clamp T-bolts into the T-slots (two at each end of the jig). Position so that the washers seat into the round milled recesses. Tighten the four clamp bolt nuts with the Leigh wrench.



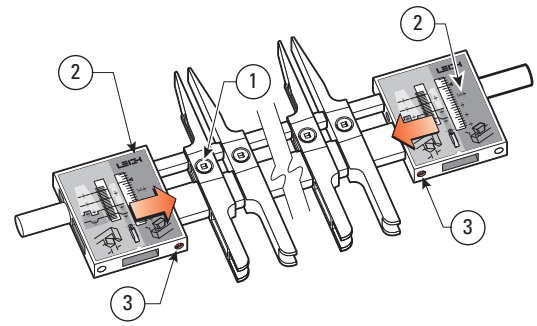
**1-5** Place four springs and two clamp bars on the T-bolts. Make sure the clamp bars move freely on the T-bolts.



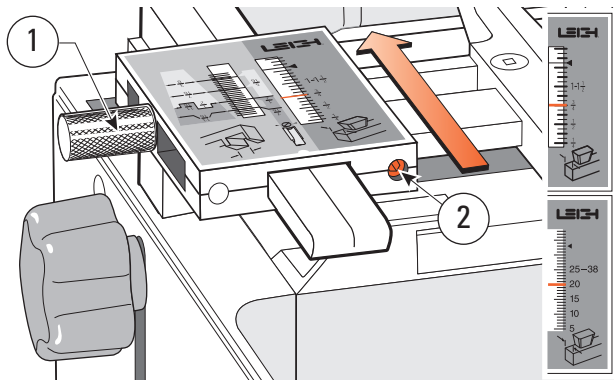
**1-6** Place one black step washer ① on each T-bolt with the flat side against the clamp bar. Screw a clamp lever assembly onto each T-bolt, making sure the cam lobes are between the step washer sidewalls.



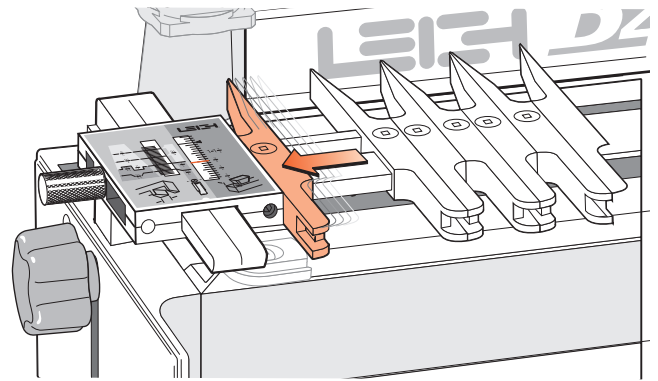
**1-7** Insert the right and left support brackets. Attach the knobs, raise to full height and tighten. **Note:** For clarity, the set line ① is drawn in red. The actual lines are black.



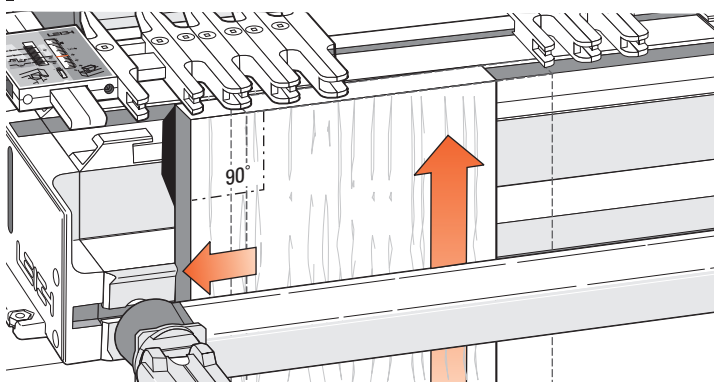
**1-8** Place the finger assembly on your bench with the guidefinger screws ① on top and the pointed ends of the guidefingers away from you. Fit the scales onto the finger assembly, placing the HB TAILS scale ② to the right at both ends. **Do not tighten the scale set screws ③ yet.** **Note:** The 1/4" square half-blind pin bar is supposed to be shorter than the finger bar. It is not intended to fit in the scales at both ends.



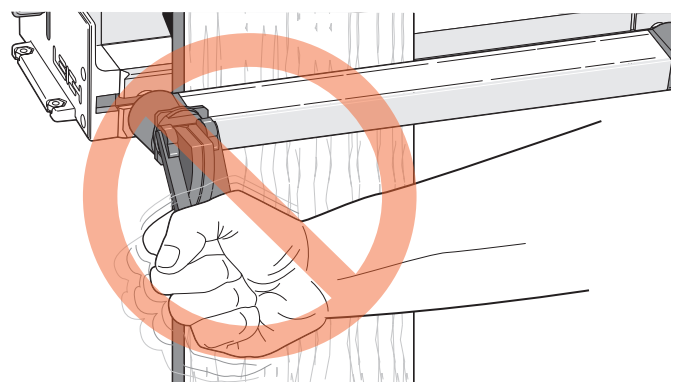
**1-9** Slide the complete finger assembly with loose scales onto the support brackets. Set the bracket index line at 3/4" [20mm] on the HB TAILS scale and tighten the thumb screws ①. Tighten the scale screws ② firmly with the hex key provided. **If the scales are removed from the finger bar for any reason, follow this procedure to re-attach them.**



**1-10** Loosen the thumbscrews and make sure the finger assembly slides on and off the support brackets smoothly, in both the tail and pin modes. Move the outermost guidefinger at each end of the finger assembly outward to touch the scales, and tighten. **If fingers do not slide easily, see note on page 7.** This finger acts as an end support for the router and is not generally used as a guide.

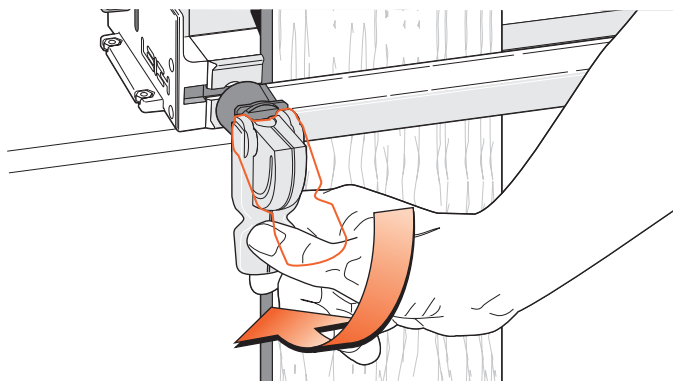


**1-11** You will operate the cam-action speed-clamps every time you use the jig, so get used to the feel of the clamps first. Use some square ended boards for practice. Make sure the end of the board is touching the underside of the guidefingers. Then slide the board over against the side stop.

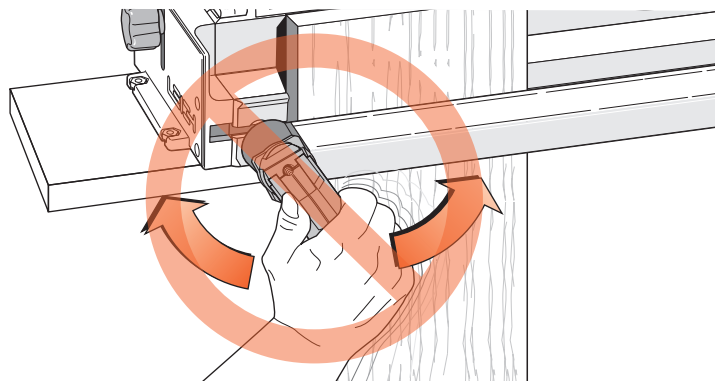


**1-12** **Do Not force the cam-action speed-clamp.** It has great leverage, and excessive force may damage the workpiece or the jig.

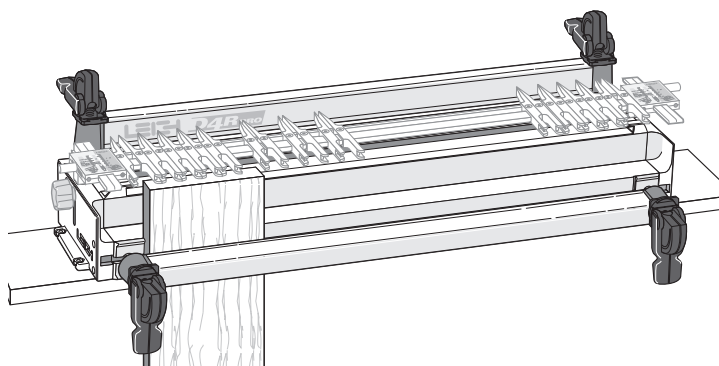




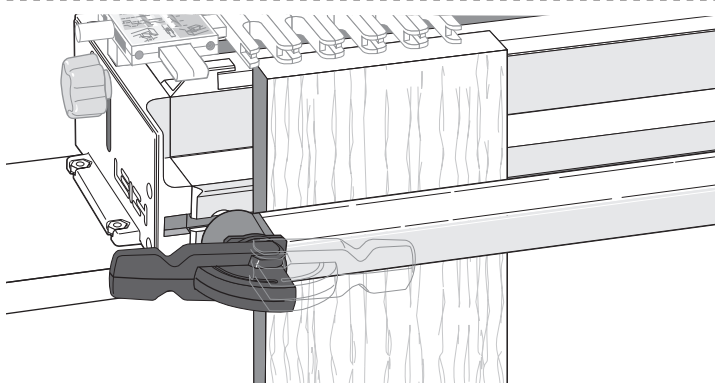
**1-13** A smooth, firm action is enough to engage the clamp.  
*Rule of thumb:* If you can't throw the lever comfortably by pressing the end of it with your thumb, reduce the tension. A few minutes of trial and error will help you feel the right clamp tension. **Firm thumb pressure is about right.**



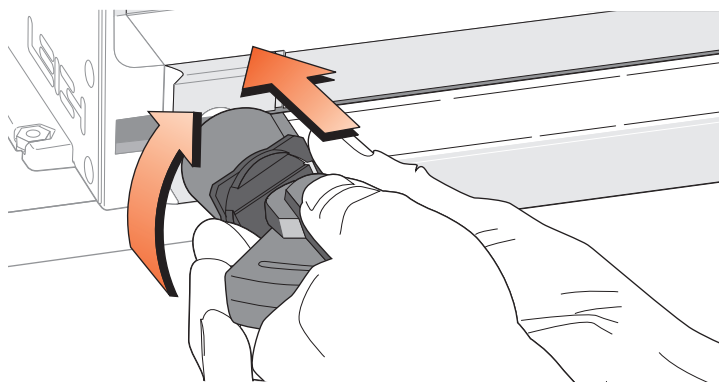
**1-14** Do Not use the lever as a torque arm. Adjust the clamp tension only with the clamp disengaged.



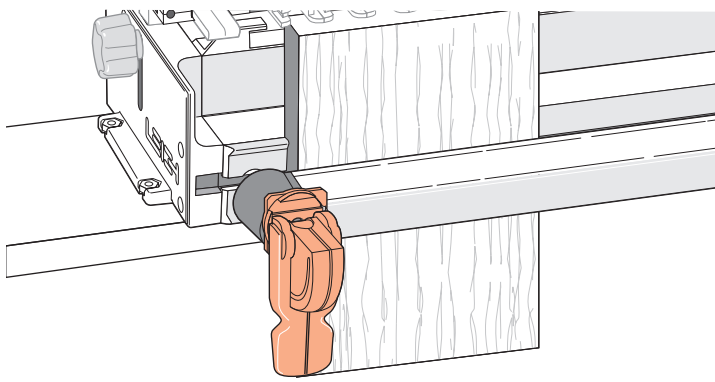
**1-15** When engaged, the front clamp levers should point down and the rear clamp levers should point away from the operator.



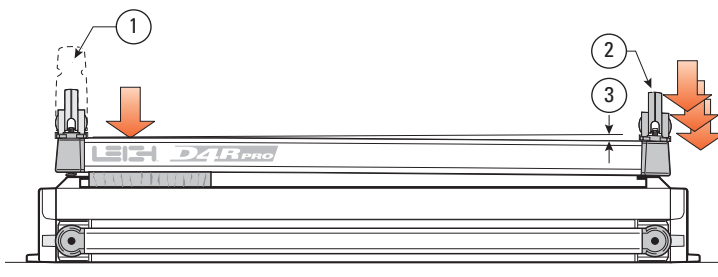
**1-16** If the lever is badly positioned at the correct clamping pressure...



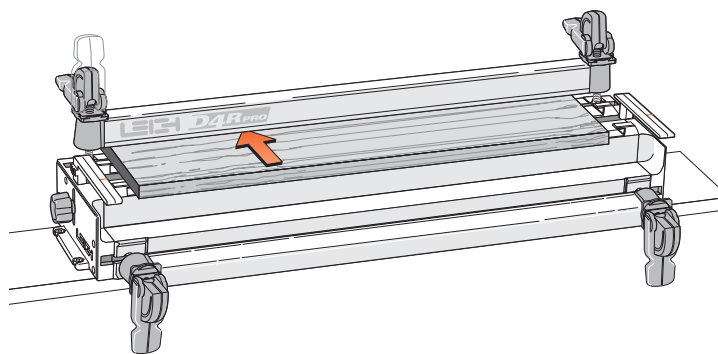
**1-17** Release the clamp, remove the board and turn the step washer a quarter turn (the step height inside the step washer is one quarter of the thread pitch).



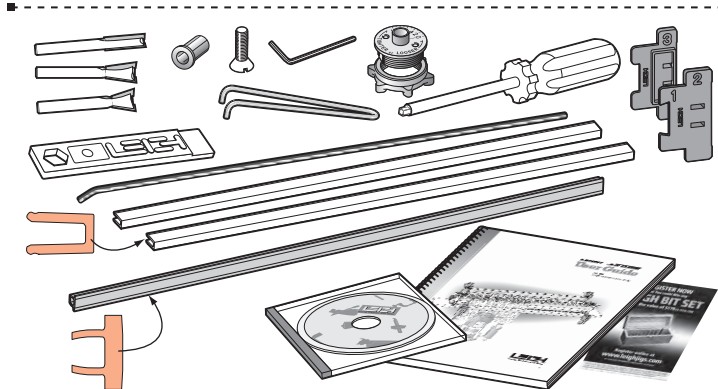
**1-18** Then adjust the clamp until the clamp lever is in the right position at the right pressure.



**1-19** For all but the wider workpieces, you need only operate the clamp on the workpiece end ① of the jig to release the board. For narrower boards, the clamp at the free end ② should be just tight enough to bow the clamp bar about  $\frac{1}{8}$ " [3mm] ③ *greatly exaggerated in this view.*



**1-20** Make up a spacer board. This board will be used to support the finger assembly in **all front-clamping vertical board modes**. The spacer board should be flat, straight and of even thickness. We suggest  $\frac{3}{4}$ " x 6" [20x150mm] by approximately 23" [580mm] long. **Note:** the thickness of the spacer board has no relationship to the thickness of the vertical board being routed.

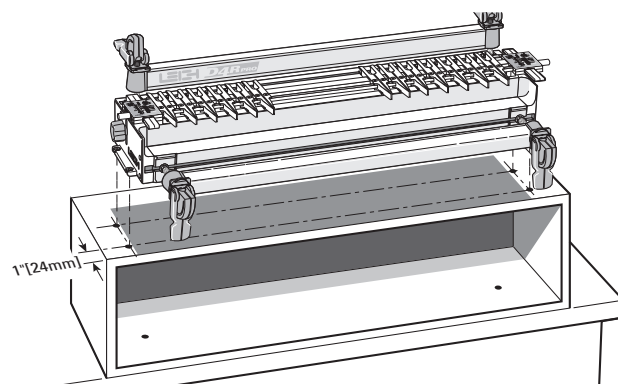


**1-21** After you have assembled and mounted the jig, you will have some items left over:

- 1 straight router bit Leigh No.140-8
- 1 dovetail router bit Leigh No.80-8
- 1 dovetail router bit Leigh No.120-8
- 1 collet reducer
- 1 Leigh wrench/gauge (*gauge: Ch.9*)
- 1 accessory attachment screw (*Ch.9*)
- 1 hex key, allen wrench
- 1 Leigh e7 elliptical guidebush
- 1 pin wrench (eBush adjustment wrench)
- 1 Leigh guide finger adjustment screwdriver
- 2 spacers, one for single pass half-blind dovetails (*Ch.11*), and one for box joints (*Ch.15*)
- 2 lengths of bridge piece extrusion (*Ch.10*)
- 1 cross cut fence (*Ch.16*)
- 1 nylon stop rod (*Ch.11*)
- 1 instructional DVD, and this user guide.

*Please keep all these items ready for use.*

1 warranty card. **Please register your warranty.** You will automatically be entered in Leigh's Warranty Registration Contest.



**1-22** To gain height for a more comfortable working position or for routing longer boards, mount the jig to a box that can be bolted securely to a bench.

*See also fig. 17-15.* ■

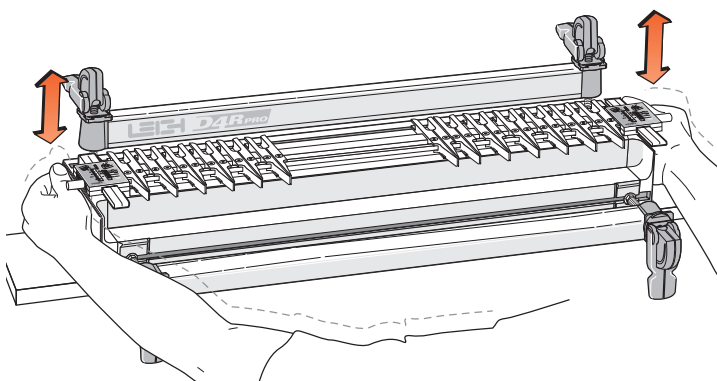


## Adjusting the Finger Assembly

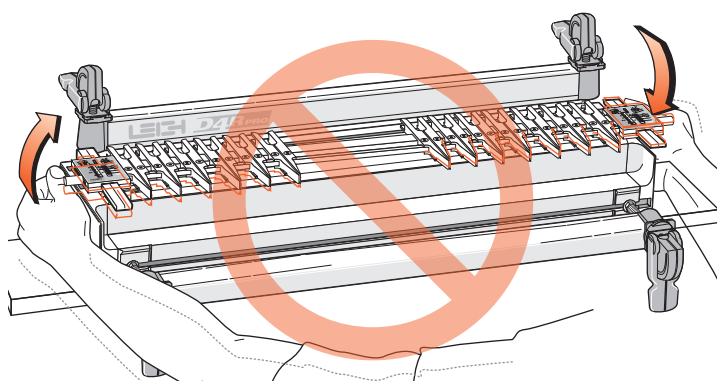
**THE FINGER ASSEMBLY IS THE HEART OF THE LEIGH JIG.**

Spend a few minutes now to familiarize yourself with these simple adjustments.

**NOTE:** The first few times you use your jig, some fingers may "stick". This is normal. To "unstick", loosen the finger screw approximately 3/4 of a turn, and with the screwdriver still in the screw, press down firmly (on the screwdriver). This will loosen the finger locking wedge (you should feel a click). The finger will now move freely.



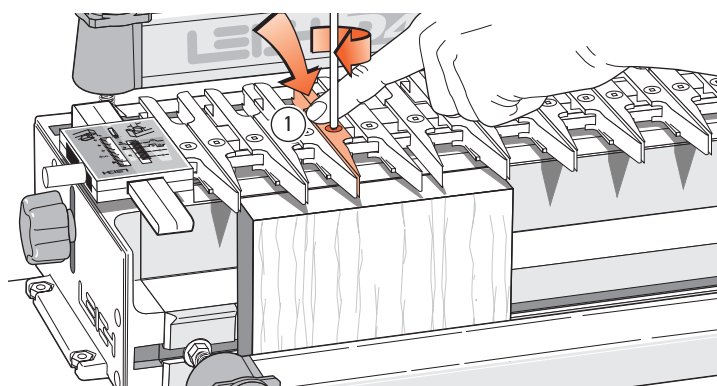
**2-1** Practice adjusting the finger assembly height. Loosen the support bracket knobs and hold them firmly. Raise and lower the assembly evenly, keeping it level, and tighten the knobs to lock it at various heights.



**2-2** Do Not raise or lower one end of the finger assembly at a time.

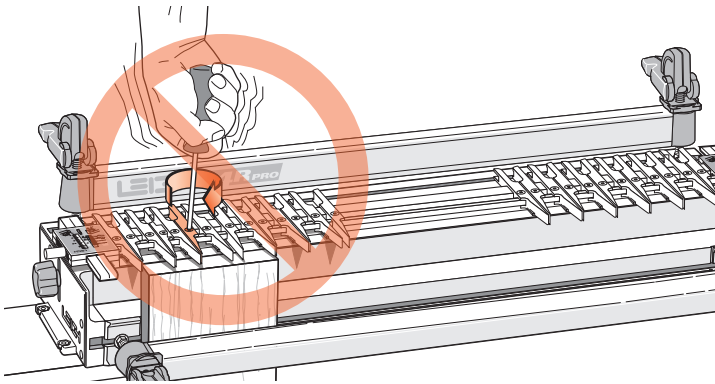


**2-3** To practice adjusting the guide fingers, put a board in the front clamp. Always raise the finger assembly slightly, approximately 1/8" [2mm] above the spacer board and/or workpiece ①. This is essential to allow the guide fingers to move freely on the guide finger bar and ensures that the fingers will be level and flush when locked up. Move the guide fingers by pushing on the middle to slide them along the guide finger bar.

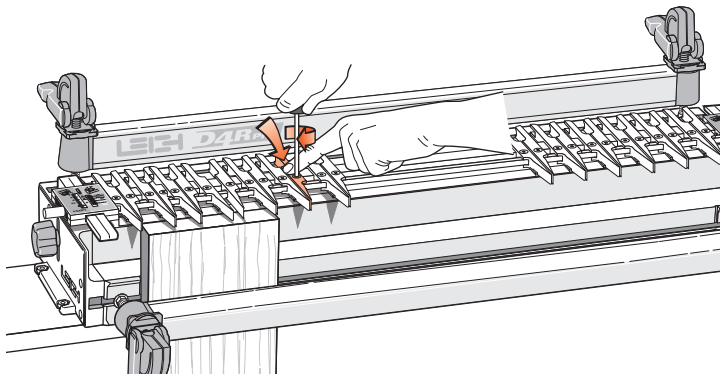


**2-4** Loosen about half the guide fingers and practice unlocking, moving, positioning and re-locking them. Always press down lightly on the center of each guide finger ① when tightening the screws.

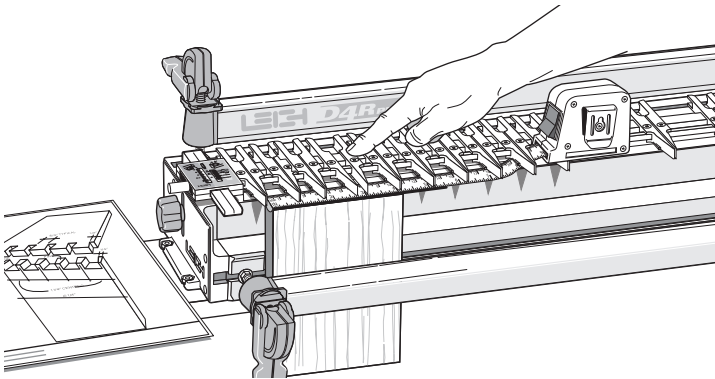
*If after loosening a finger it "sticks" and doesn't slide, see header note above.*



**2-5** Do not over-tighten the guide finger locking screws. The Leigh screwdriver provided will give ample torque for easy lock-up without strain.



**2-6** *Always tighten unused guide fingers before routing, as router vibration will cause loose screws and wedge nuts to fall out and be lost.*



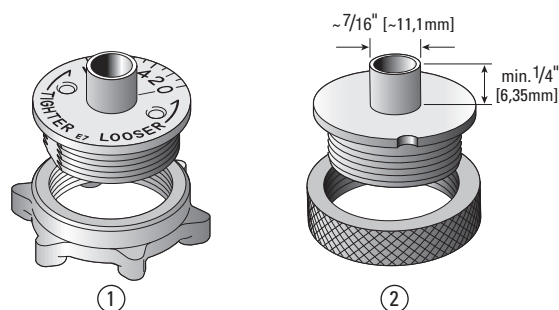
**2-7** You can adjust the guide fingers by eye, or by measurement to suit a set of plans.

*Note: Always lower the finger assembly down onto the workpiece before routing. ■*

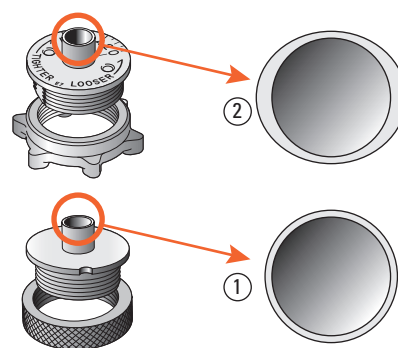
## The Leigh e-Bush and Optional Guidebushes

*The guidebush is the vital link between router and jig. All joints created on the D4R Pro are routed with the unique e7\* elliptical guidebush, a Leigh innovation that provides precise joint fit adjustment for box joints and sliding dovetails. If your router doesn't accept the e7-Bush, you can use an alternative guidebush with some limitations.*

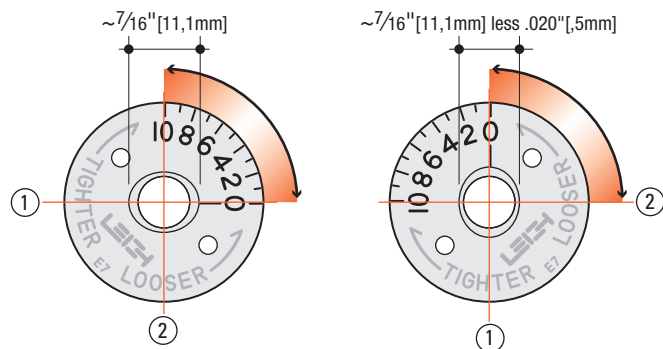
\*Supplied with the D4R Pro. U.S. Patent No. 8,256,475. UK Patent No. GB2443974. Patent Pending in Canada.



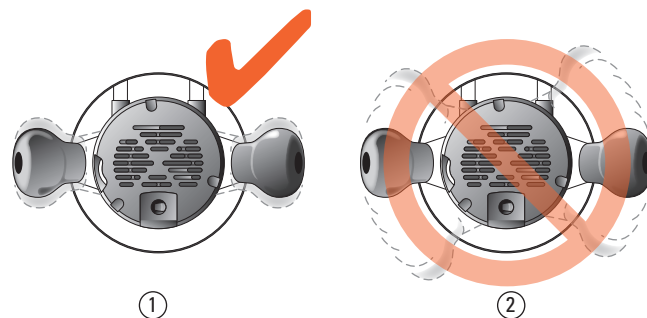
**3-1** The Leigh e7-Bush ① is used to rout through, half-blind, single pass half-blind and sliding dovetails on the D4R Pro. The elliptical design provides precise joint fit adjustment for box joints and sliding dovetails. A round  $\sim 7/16"$  [11,1mm] guidebush (min. barrel length  $1/4"$  [6,35mm]) ② can be used to rout through, half-blind, and sliding dovetails on the D4R Pro, but the e7-Bush is superior.



**3-2** The Leigh e7-Bush that comes with your D4R Pro is a unique template guidebush that is adjustable in size. Unlike regular circular template guidebushes ①, the e7-Bush is slightly elliptical in cross section ②. This simple innovation effectively changes the guidebush "active diameter size" when it's rotated, and provides benefits not possible with a standard round guidebush.

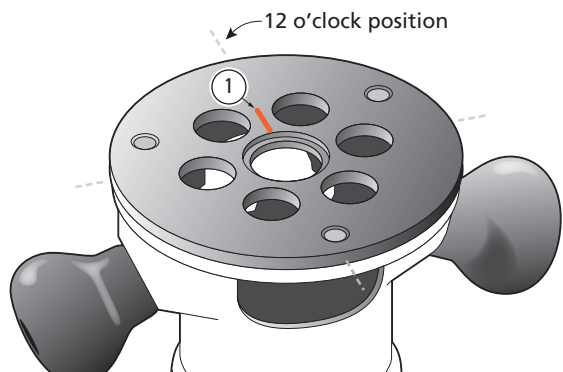


**3-3** The e7-Bush ( $\sim 7/16"$ ) fits the router base or a guide bush adaptor in the base (see Appendix I). The ellipse/oval shape has a major axis ①  $\sim 7/16"$  [11,1mm], and minor axis ②  $\sim 7/16"$  [11,1mm] less .020" [5mm]. Turning the e-Bush 90 degrees in the router base changes the active diameter by .020" [5mm] providing minute adjustment and recordable settings for perfectly fitting box joints.

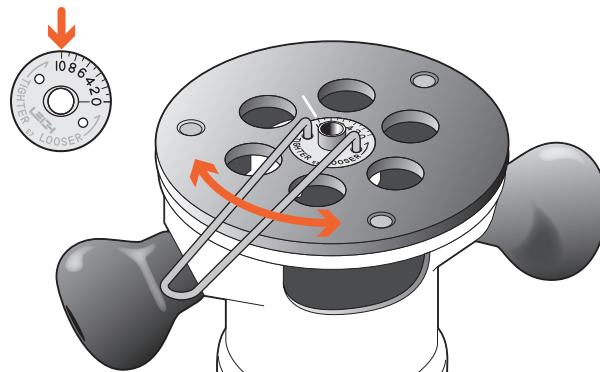


**3-4** Here's how it works. In normal use on a dovetail jig, the operator does not rotate the router more than a few degrees either way ①. In fact, because of potential bit-to-bush eccentricity problems it is advisable to minimize router rotation on jigs ②.

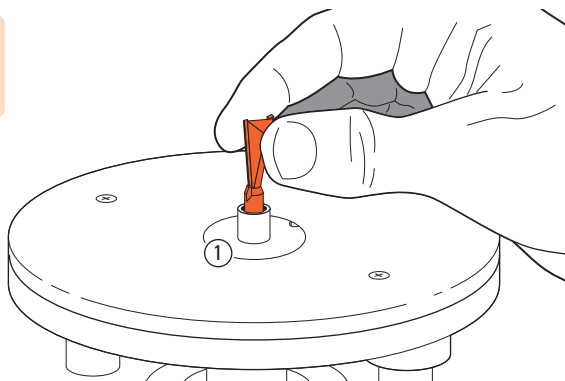
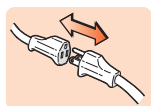




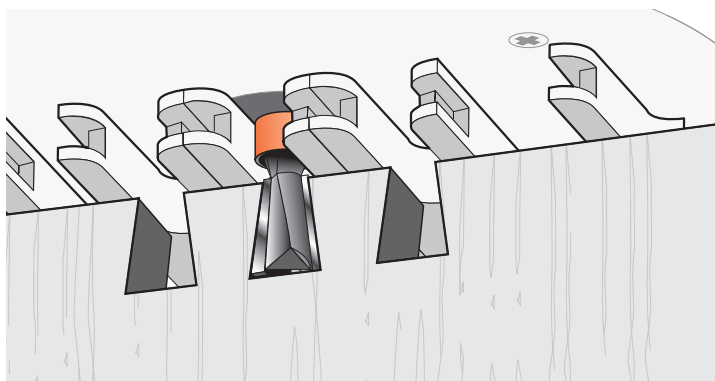
**3-5** Establish the orientation in which you normally hold and operate the router on the jig. Now, up-end the router in the same orientation. Make a small scratch line or permanent ink mark ① on the router base or e-Bush adaptor at the 12 o'clock position. Learn about e-Bush adaptors on page 69.



**3-6** Fit the e7-Bush to the router and align No.10 to the scratch mark. This setting is used for all through and variably spaced half-blind dovetails on the D4R Pro. Settings for single pass half-blinds, box joints and sliding dovetails are described in applicable chapters. Be sure to retighten the e-Bush nut after each adjustment is made with the included pin wrench.



**3-7** The bit goes through the e7-Bush ① and fits in the router collet or chuck.



**3-8** The projecting part of the guidebush runs along the side edge of the guide finger. The rotating bit cuts the wood only, and touches neither the guidebush nor the guide surface. ■



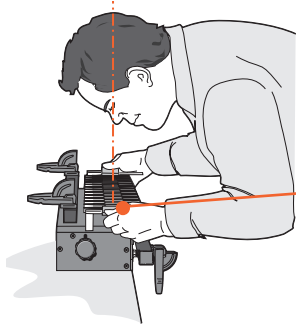
# Basic Jig Functions and Scale Modes

Here are the very basics for understanding the different D4R Pro dovetail modes and settings.

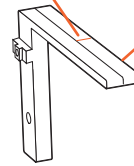
## THE FOUR SCALE MODES

The Finger Assembly attaches to the support brackets in four different modes to match the type of joint you are cutting.

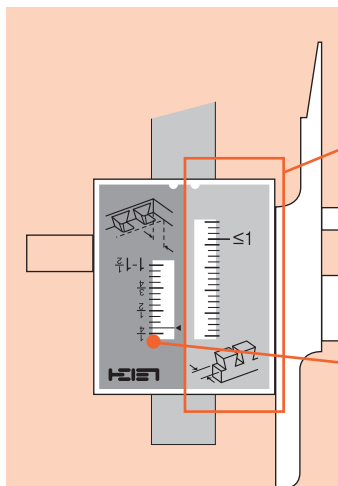
This index line is used when setting the finger assembly scales. The line is illustrated in red for clarity, but is black on the jig.



Always read scales from directly overhead to avoid parallax problems.



All D4R Pro jigs are shipped with “short” support brackets.

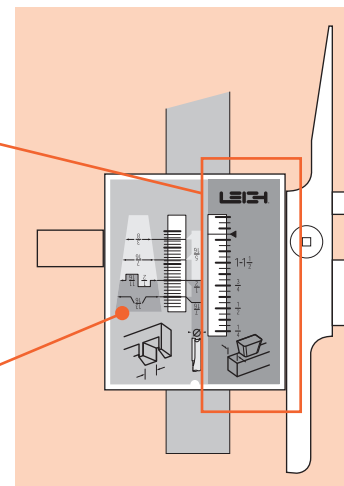


1. TD TAILS

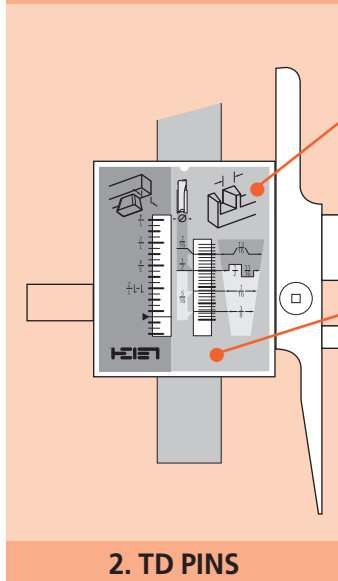
*Note: Inch scales are shown here. Millimeter scales have identical layout.*

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

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



3. HB TAILS

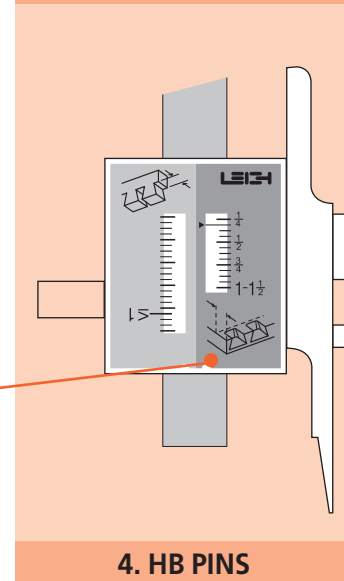


2. TD PINS

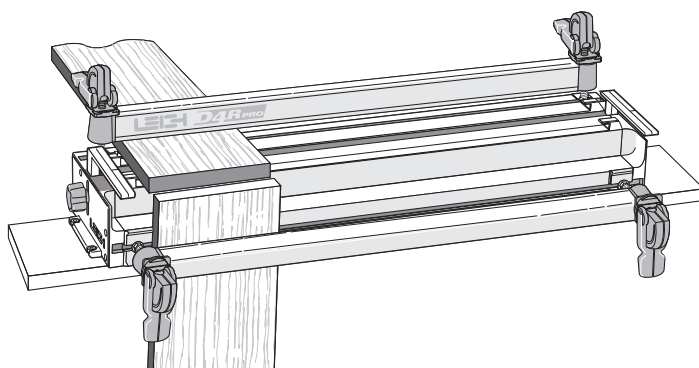
Each scale has its own mode icon (a drawing of the joint part made in that mode).

Scales are color coded.  
Silver background for Through Dovetails.  
Green background for Half-Blind Dovetails.

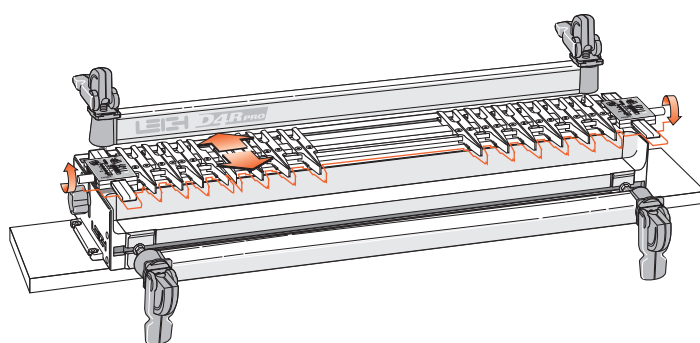
The specific settings for each scale are fully described in the appropriate chapters.



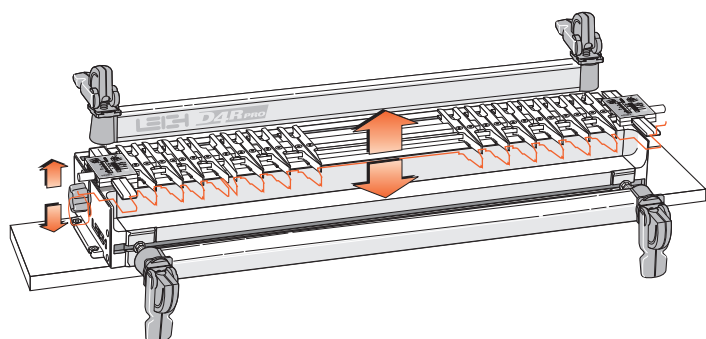
4. HB PINS



**4-1** The two clamp bars hold workpieces horizontally or vertically. The side stops align the boards in the correct position each time.



**4-2** The guidefinger assembly slides on to the support brackets above the workpiece. The finger assembly is adjusted in or out using calibrated scales on each end to suit different thicknesses of vertical boards.



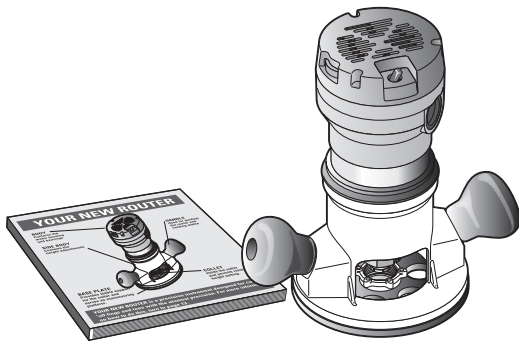
**4-3** The finger assembly is raised or lowered using the support brackets to suit different thicknesses of horizontal boards. ■

## D4R Pro - CHAPTER 5

# Using Your Jig Safely

**Safety is not optional.**

*Read and follow the recommendations in this chapter.*




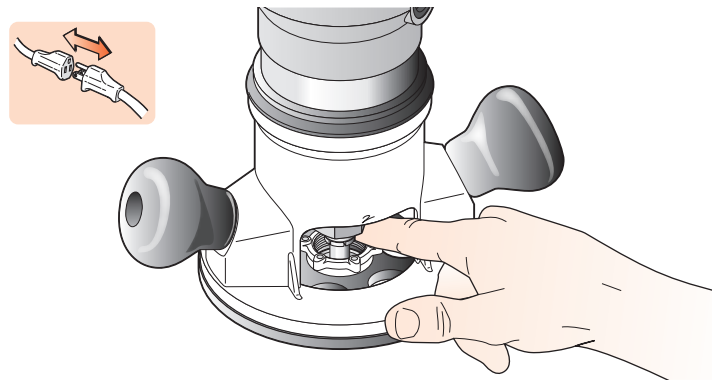
**5-1** Read the owner's manual that came with your router. It is essential to understand the router manufacturer's instructions **completely**. Always operate variable speed routers at the fastest possible speed.



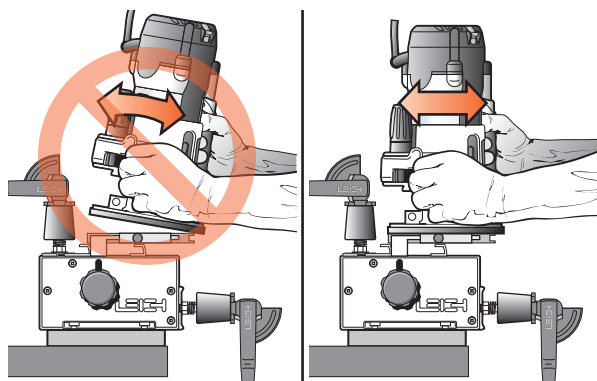
**5-2** Always wear approved safety glasses. Always wear hearing protection. Protect yourself from harmful dust with a face mask. For complete dust and waste collection, add a Leigh VRS (Vacuum & Router Support) to your jig. See page vi.



**5-3**  Never drink alcohol or take medications that may cause drowsiness when you will be operating a router.

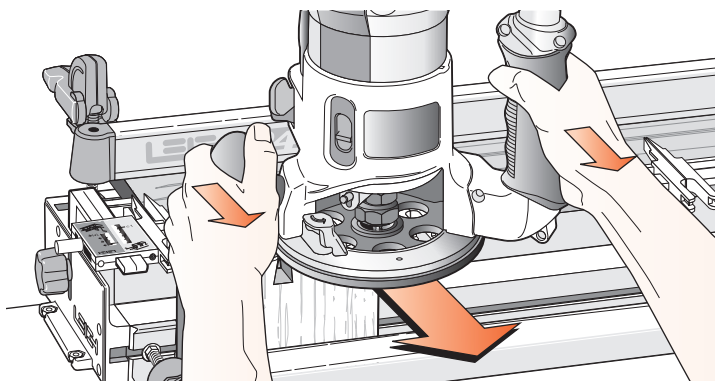


**5-4** Always disconnect the power source from the router when fitting bits or guidebushes, or making adjustments. Before connecting the router to the power source, make sure the bit and collet revolve freely in all the areas you plan to rout, and the bit does not touch the guidebush or jig.

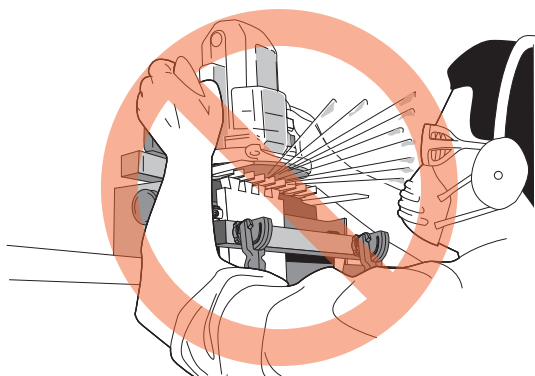


**5-5** Do not tilt the router on the jig. Keep the router flat on the jig assembly.

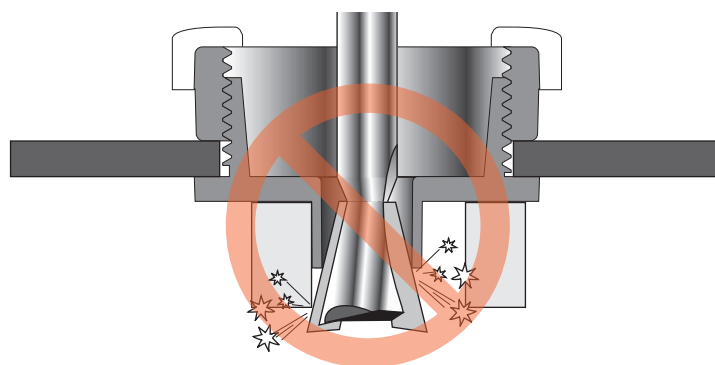
*Note: The optional Leigh VRS attachment prevents router tilting. See page vi.*



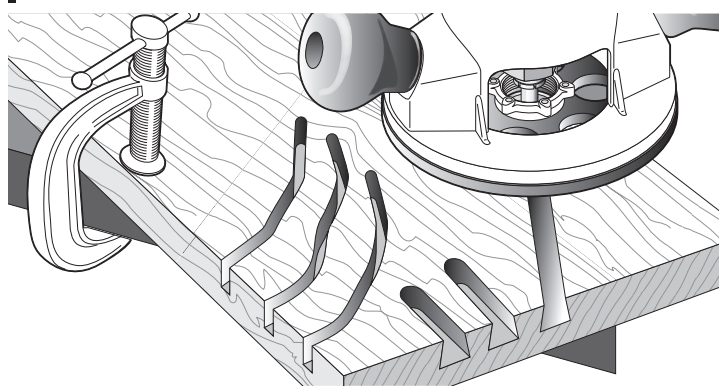
**5-6** If you insist on removing the router from the jig while it is still revolving, always pull it straight off the jig horizontally, and do not raise or lower the router until it is completely clear of the jig. With the Leigh VRS fitted to your jig you can simply park your router to one side.



**5-7** Do not rout at face level.



**5-8** Never release the router plunge mechanism when using dovetail bits. Check if your plunge router has a stop nut to prevent this from happening accidentally.



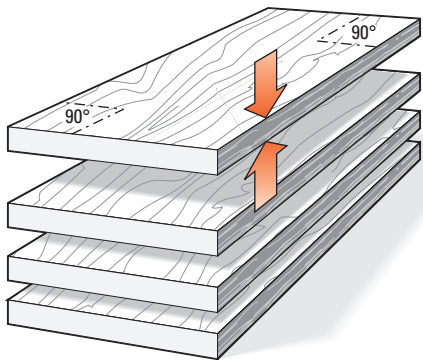
**5-9** If you have never used your router before, be sure to follow the router manufacturer's instructions for its use. Make plenty of simple open-face practice cuts *without a guidebush* before you try to use the router on the Leigh jig. You must, of course, always use a guidebush when routing on the Leigh Jig. ■

## D4R Pro - CHAPTER 6

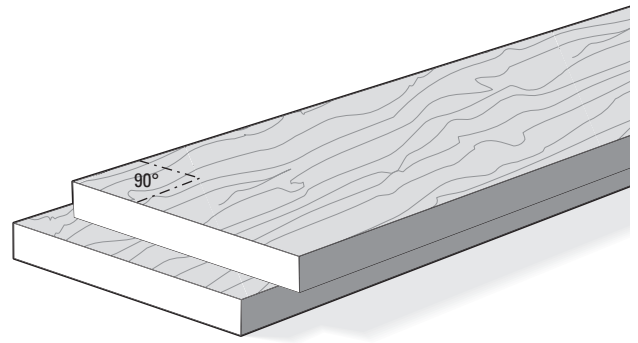
# Wood Preparation

"Garbage In - Garbage Out"...

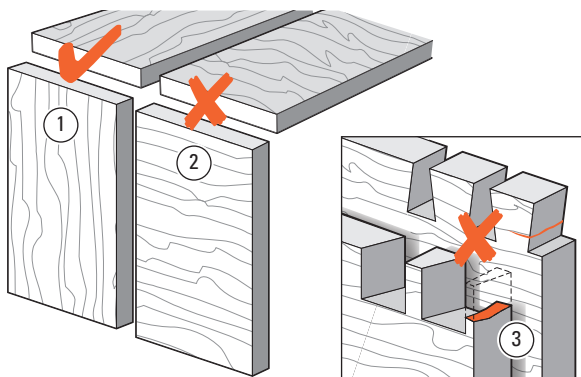
This adage of the computer age stands equally true for dovetail jigs.




**6-1** It is vital for accurately aligned joints that stock used on the Leigh jig must be prepared straight, flat, of even thickness and equal widths, with square ends and edges. *Note that plywood is generally unsuitable for routing because of tearout problems.*



**6-2** You will want to test the jig, so prepare some  $\frac{3}{4}$ " x  $5\frac{1}{2}$ " [20x140mm] boards. Cut them to length as you need them for the jig tests you want to perform. Use them for practice with the jig's various joint modes so you can see how the different modes work. Remember, though, that two boards of different thicknesses can be joined just as easily.

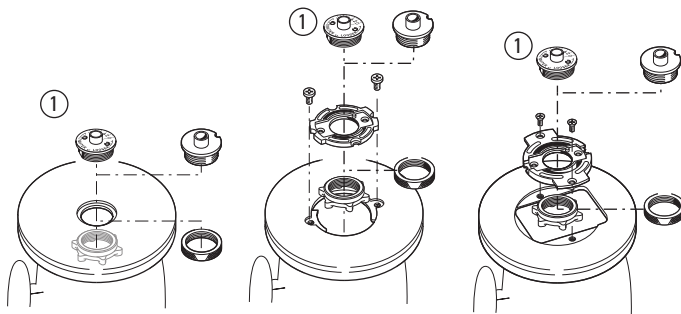


**6-3**  Dovetail joints are intended for joining end-grain ① to end-grain ①. Attempting to cut dovetails in side-grain ② does not work because:

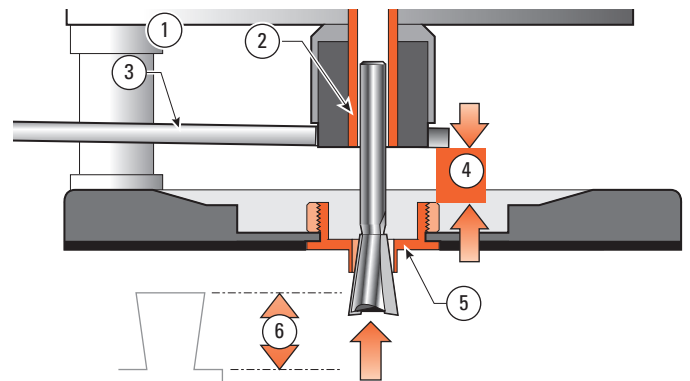
- A. The wood will tear out badly when routing.
- B. Even if you could rout them, the pins and tails would easily break off across the short grain ③, either during or soon after the assembly when the boards start expanding or contracting at different rates. ■



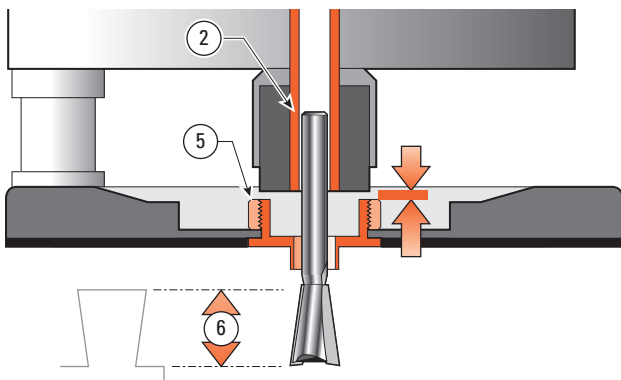
## Router Preparation



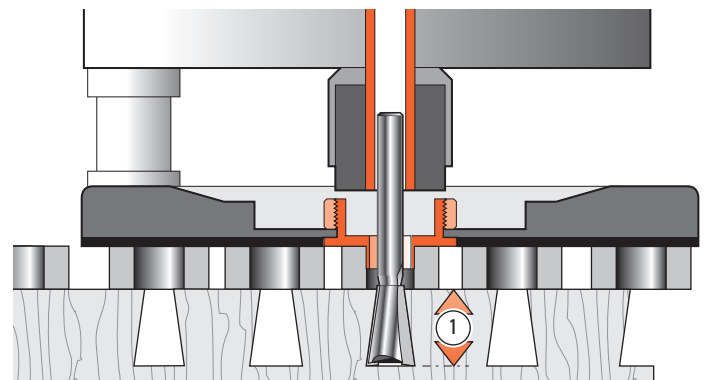
**7-1** Fit the **e7-Bush** ①. One is included with your D4R Pro. If the e-Bush is incompatible with your router, any  $\sim 7/16"$  [11,1mm] guidebush (min. barrel length  $1/4"$  See page 70) will work for all but box joints on the D4R Pro.



**7-2** When fitting a bit to the router ①, **fit the shank as far into the collet ② as possible**. Always rout with the collet as close to the guidebush as possible. Usually you can't securely grip the collet nut with a wrench ③ if the collet is at its optimum low position. Fit the bit so that the remaining travel ④ between collet and guidebush ⑤ will let the bit reach the required depth of cut ⑥.

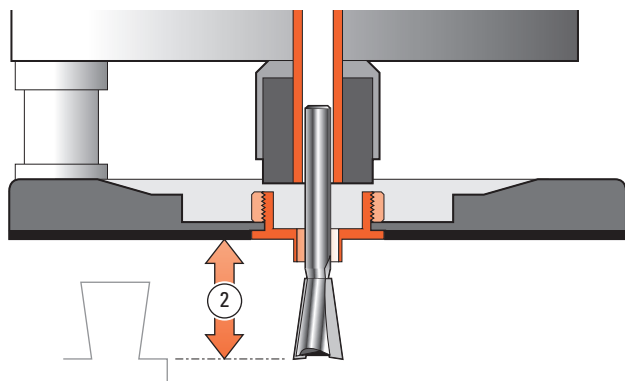


**7-3** Tighten the collet ② securely and lower the collet to adjust the depth of cut ⑥, but make sure the collet does not contact the guidebush ⑤. Some smaller collets can go down into the inside of the guide bush. Take advantage of this.

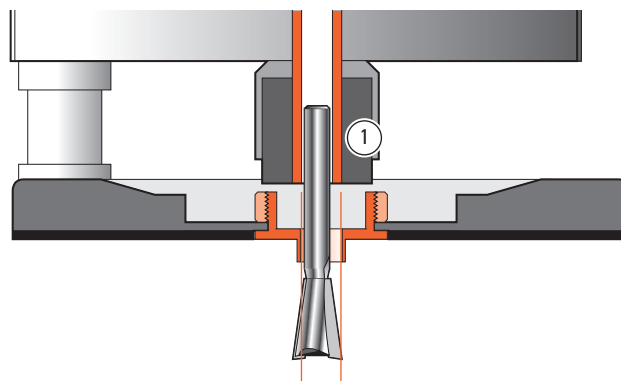


**7-4 Depth of Cut:** The depth of cut always refers to the actual depth of the cut into the wood beneath the guidefingers ①.

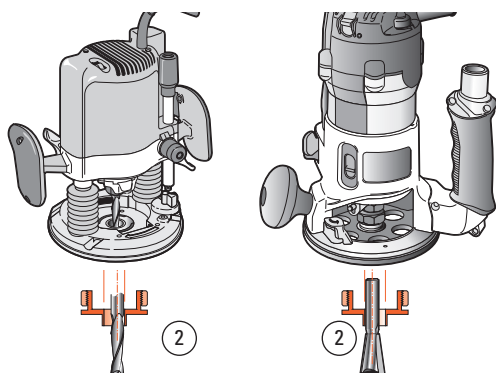




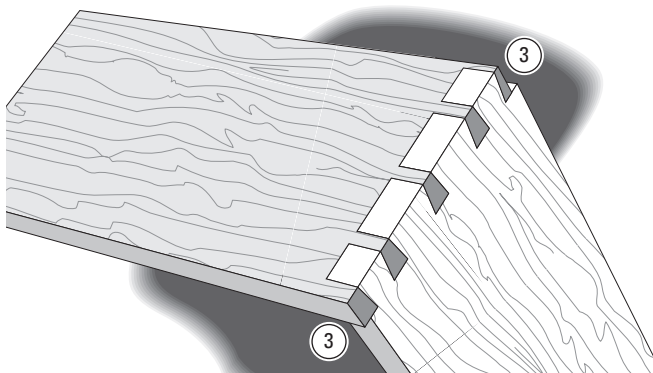
**7-5** Depth of cut is **not** the distance the bit projects from the router base. This is **bit projection** ②. This guide generally refers to depth of cut. Bit projection ② is always .450" [11,5mm] more than depth of cut.



**7-6** Ideally, the router collet (and bit) should be concentric (centered) to the guidebush as in figure 7-5. Regrettably, this is often not the case; the bit can be off center (eccentric to) the guidebush ①. The illustration shows the problem highly exaggerated. The good news: bit to bush alignment doesn't affect joint fit or flushness; both are "adjusted out" in normal jig setup.

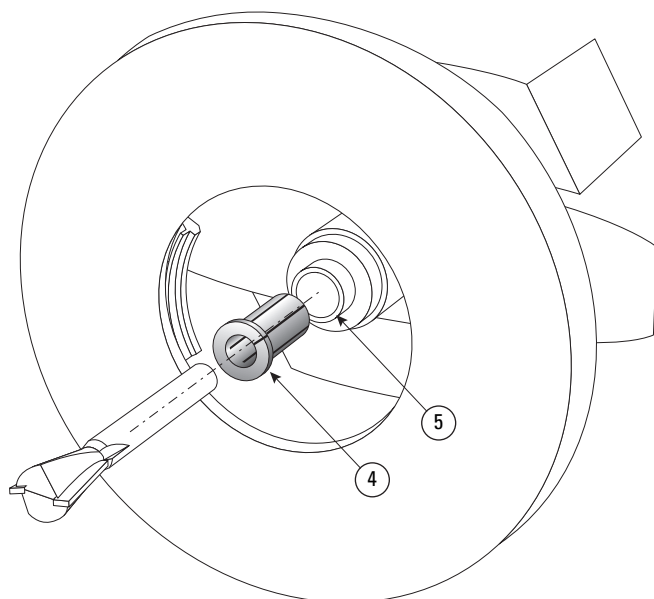


**7-7** Concentricity problems can only arise if two routers are used for through dovetails, (one for pins; one for tails). Routers with different bit to guidebush offsets ② (misalignment shown highly exaggerated)...



**7-8** ...will cause pin to tailboard ③ misalignment (again, shown highly exaggerated).

Fortunately, some newer routers have sub-bases that can adjust for concentricity. If you don't have this type, it might pay to stick to a single router for through dovetails.



### 7-9 Shank Selection/Collet Reducer


All Leigh Dovetail jigs are shipped with superior strength 8mm shank dovetail bits and a 1/2" to 8mm collet reducer. The reducer ④ simply slides into the 1/2" collet of your router ⑤ (do not remove the collet nut) and the 8mm shank bit is inserted into the collet reducer. The collet is tightened as normal. The collet reducer is not required with 1/2" shank bits. ■

## D4R Pro - CHAPTER 8

# Through Dovetails

In these instructions for the Leigh D4R Pro Dovetail Jig, we have recommended certain bits and board sizes because they are easy to work with. When you have routed some practice joints and gained confidence in your ability to get the results you want, free to use the guidebush and adaptor selection charts in Appendix I, pages 69-70, and bit options in Appendix II, pages 71-77, to plan whatever dovetail routing you need for your projects.

### Concept of Jig Operation – THROUGH DOVETAILS

Start with the Finger Assembly in the  TD TAIL mode and follow these steps on your jig. Grasping the simple basic concept of operation will now greatly assist you in understanding the instructions. *Note that the active guide surface (against which the guidebush runs) is indicated in red in these illustrations.*

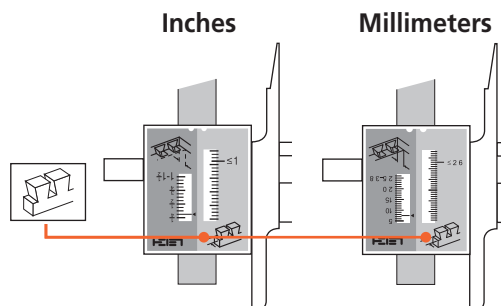
1

Start in

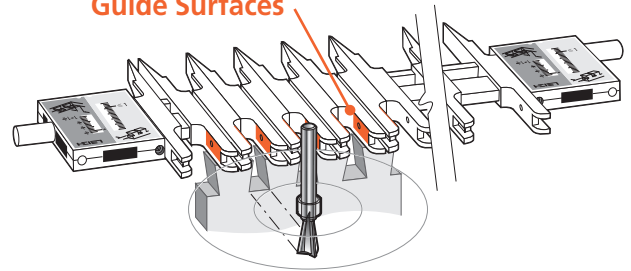
### Through Dovetail Tails (TD TAILS) mode

#### 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.

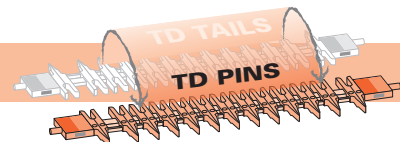


Active Guide Surfaces



2

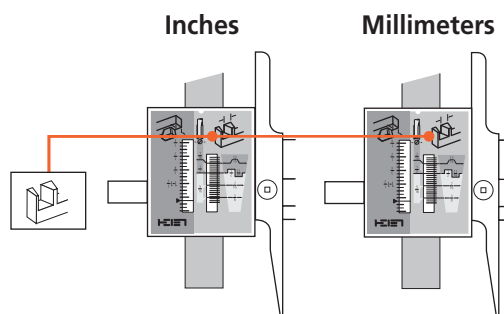
ROTATE the finger assembly toward you 180°



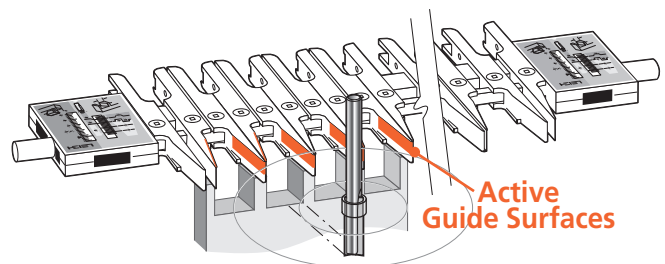
3

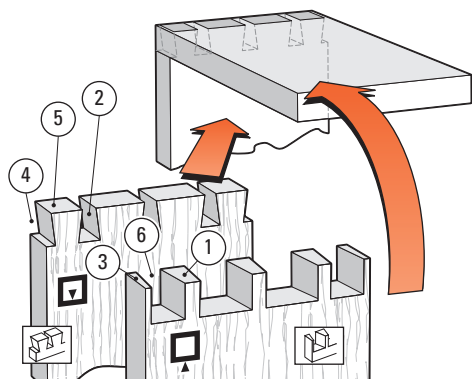
Now the Finger Assembly is in

### Through Dovetail Pins (TD PINS) mode



Active Guide Surfaces

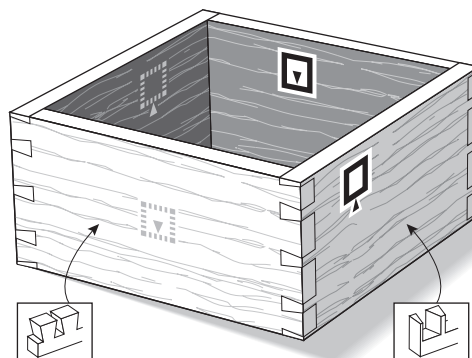




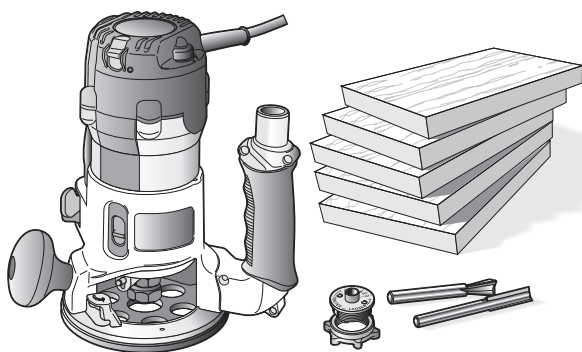
### 8-1 Through Dovetail Terminology:

- 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.

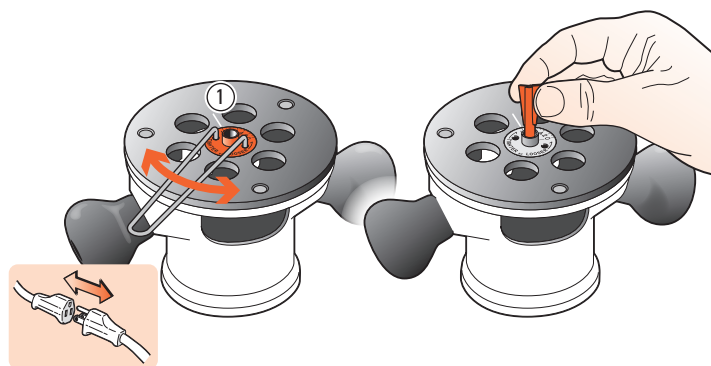


**8-2** Let's look at how to make a simple square box. When you assemble the finished pieces with the faces properly oriented, any one of the pin ends will fit any one of the tail ends. In fact, the box can be put together in six different ways ...each of the four corners will fit two ways!

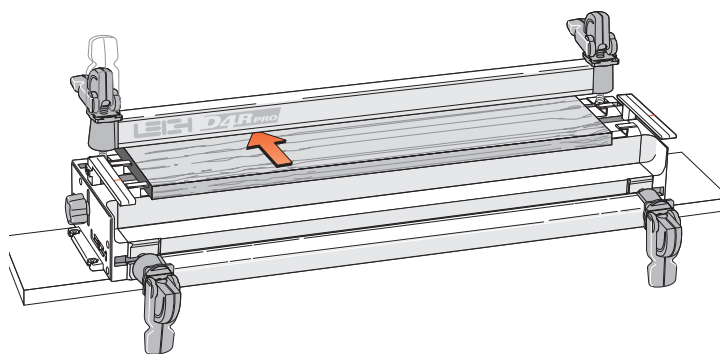


**8-3** Make five identical boards  $\frac{3}{4}$ " x  $5\frac{1}{2}$ " [20x140mm] about 8" [200mm] long. Mark the inside faces of the two tailboards and outside faces of the three pinboards (you may not need one of the pinboards). Use: Leigh e7 or  $\frac{7}{16}$ " [11,1mm] O.D. guidebush with:

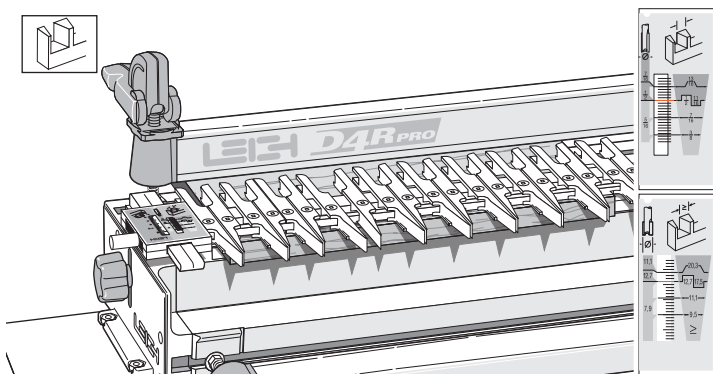
- No. 80-8  $\frac{1}{2}$ " [12,7mm] x  $8^\circ$  dovetail bit and
- No. 140-8  $\frac{5}{16}$ " [7,9mm] straight bit.



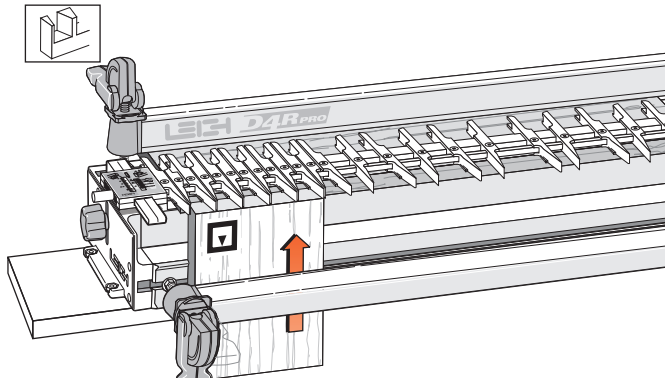
**8-4** Fit the e7-Bush or  $\frac{7}{16}$ " securely to the router and set it to the No. 10 index mark ①. Then fit the supplied 80-8 dovetail bit to the router. **Note:** The e7 guidebush is not used to adjust joint tightness with through dovetails.





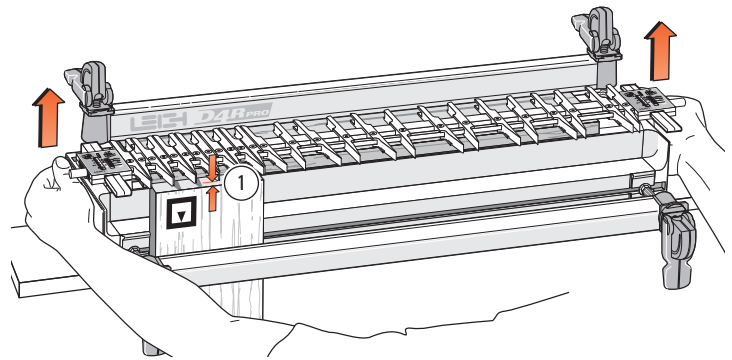
**8-5** Clamp the spacer board in the rear clamp.



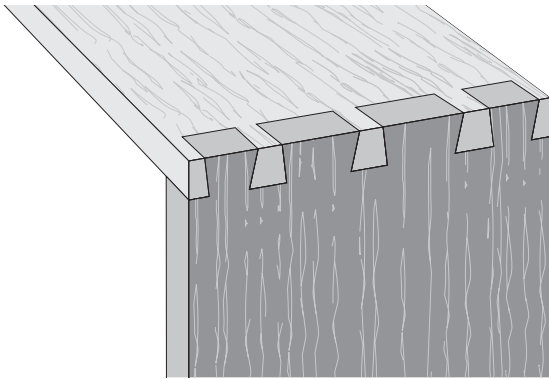
**8-6** Place the finger assembly on the support brackets in the TD PINS mode, flat on the spacer board, and with the scale set on the  $\frac{1}{2}$ " [12,7mm] setting for now. Don't worry about the scale's specific meaning now. Each scale's use will be fully explained in the appropriate section.



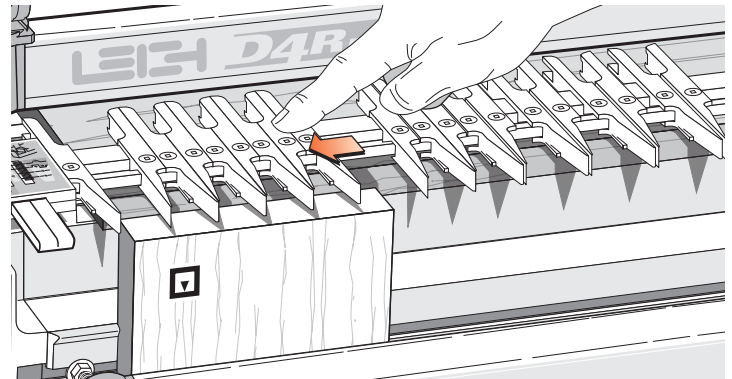
**8-7** Clamp a tail board against the left front side stop, top edge touching flush under the guidefingers, inside face  away from the jig body. Although you will cut tails first, adjust the guidefinger layout in  TD PINS mode. The adjustment screws are on top in this mode, and it's easier to visualize the final joint pattern.



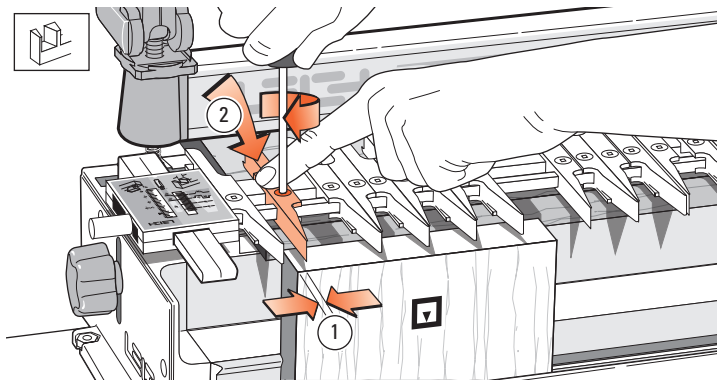
**8-8** Loosen the support bracket knobs and raise the finger assembly about  $\frac{1}{8}$ " [3mm] ① above the boards and retighten the knobs. This will allow easy and accurate guidefinger adjustment.



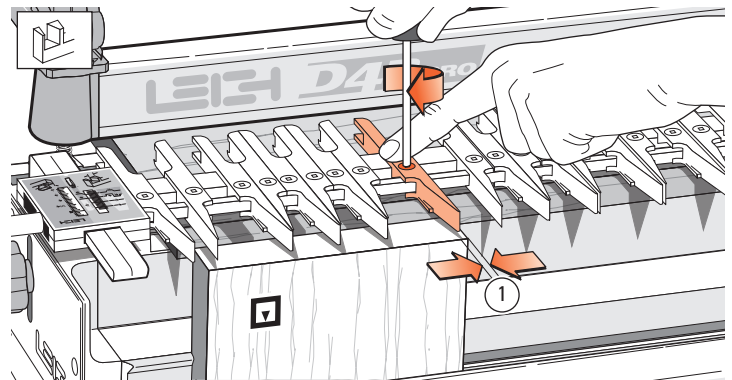
**8-9** This joint layout is only a suggestion for this trial. It has a typical, traditional **symmetrical** layout of pins, with half-pins at each edge. The Leigh jig, however, allows for an infinite variety of joint designs, and boards of different thicknesses can also be joined to each other as shown in this illustration. Before attempting joints of **asymmetrical** layout, please see chapter 14.



**8-10** Ignoring the extreme outer guidefinger next to the scale (it just supports the router), loosen the next eight guidefingers and slide them over the workpiece. *NOTE: The first few times you use your jig, some fingers may "stick". This is normal. To "unstick", loosen the finger screw about 3/4 turn. Press down firmly on the screwdriver (in the screw) to loosen the finger locking wedge (you should feel a click).*

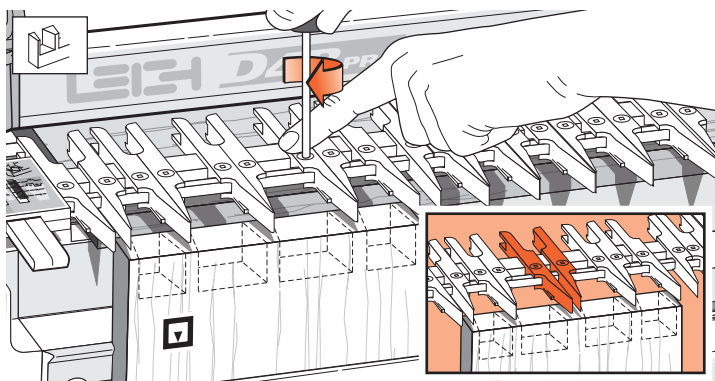


**8-11** Lock the left-most half-pin guidefinger about  $\frac{1}{8}$ " [3mm] ① in from the left edge of the board. Always apply light downward pressure to each guidefinger as the finger screws are tightened ②. This will ensure the fingers are flat and level on the bar.

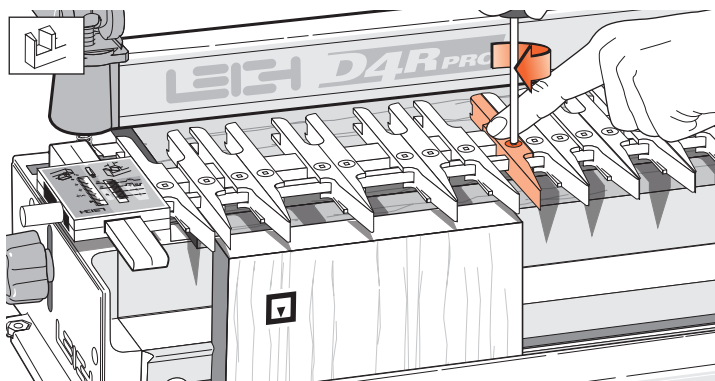


**8-12** Leave three pairs of guidefingers over the board and lock the right-most half-pin guidefinger about  $\frac{1}{8}$ " [3mm] ① in from the right edge of the board. Judge this distance by eye: it need not be exact. The sockets and pins will align automatically.

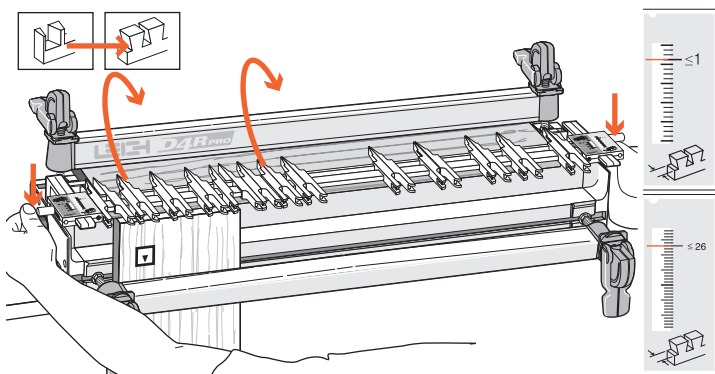





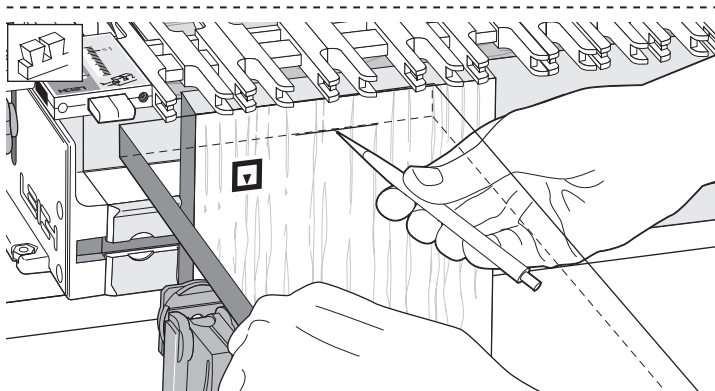
**8-13** Space and lock the three remaining pairs as shown. Again, judge it by eye. If it looks right on the jig, the finished joint will look right. Note: Here we have shown pins of equal width, but with tails of increasing width. However, by opening up a pair of guides, the pin (and pin socket) can be widened for decorative or structural reasons as shown in the drawing inset.



**8-14** Tighten any other loose guidefingers.



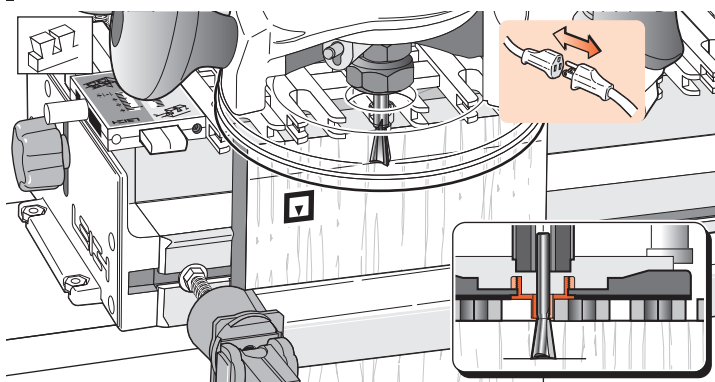
**8-15** Rotate the finger assembly to the  TD TAILS mode, and set it to the  $\leq 1"$  [ $\leq 26\text{mm}$ ] position on the scale. Lower the finger assembly onto the spacer board. All TD tails are routed at this  $\leq 1"$  [ $\leq 26\text{mm}$ ] setting. (The  $\leq 1"$  setting allows the dovetail bit to pass completely through all tail boards.)



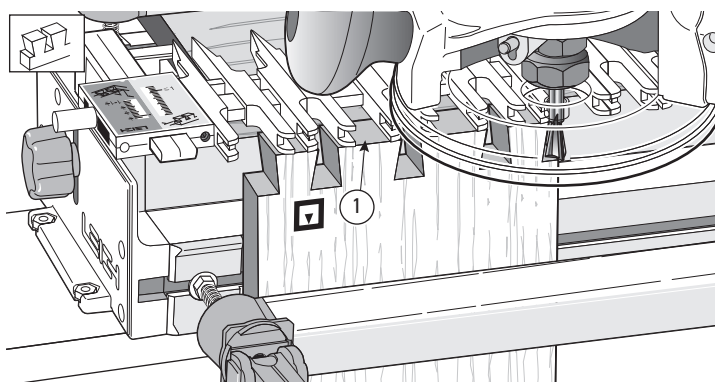
**8-16** Place the end of a *pin board* horizontally flush under the guidefingers and mark a thin pencil line partly across the tail board.



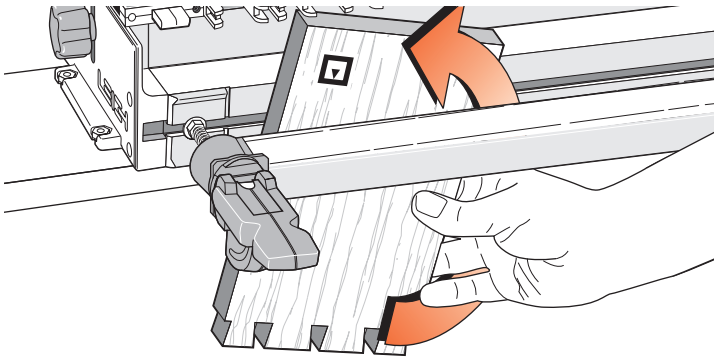
**REMEMBER SAFETY!**




**8-17** Place the router on the finger assembly and adjust the router until the dovetail bit tip is level with the center of the pencil line. *Note: This means the pin socket will be half a thin pencil line deeper than the thickness of the pin board, leaving minimal cleanup after assembly.* Check to make sure the bit rotates freely.

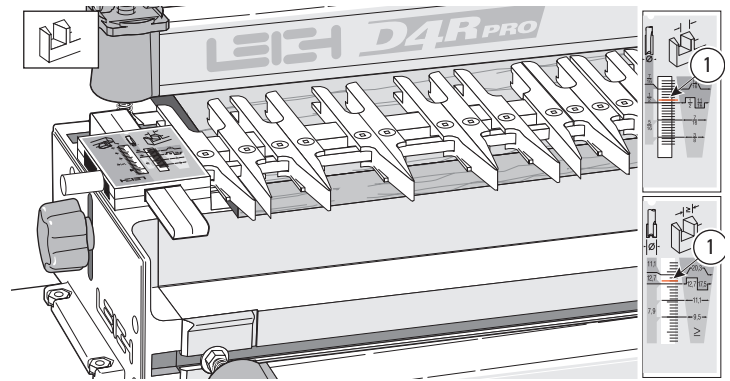




**8-18** Before routing the tails, read "Hints and Tips 17-10". Plug in the router and rout out the half-pin and pin sockets. Use **only light side pressure on the guide fingers**. Take care not to rout unwanted sockets where there are gaps between the pairs of fingers ①. Rout only between the rounded guidefinger tips. See *Hints and Tips 17-20*.

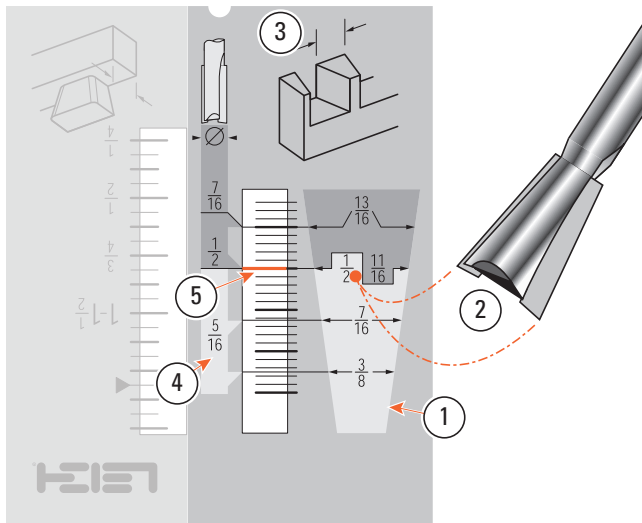


**8-19** Before removing the routed board from the jig, check by eye and touch to make sure no parts have been missed. Release the clamp and reverse the tail board in the jig, keeping the same inside face  away from the jig body.




Rout the other end of this tail board and both ends of the second tail board in the same fashion, then unclamp and put them aside.





**8-20** Rotate the finger assembly to the  TD PINS mode and set it one scale increment more than the  $\frac{1}{2}$ " [12,7mm] mark . **Do not change the guidefinger layout.**

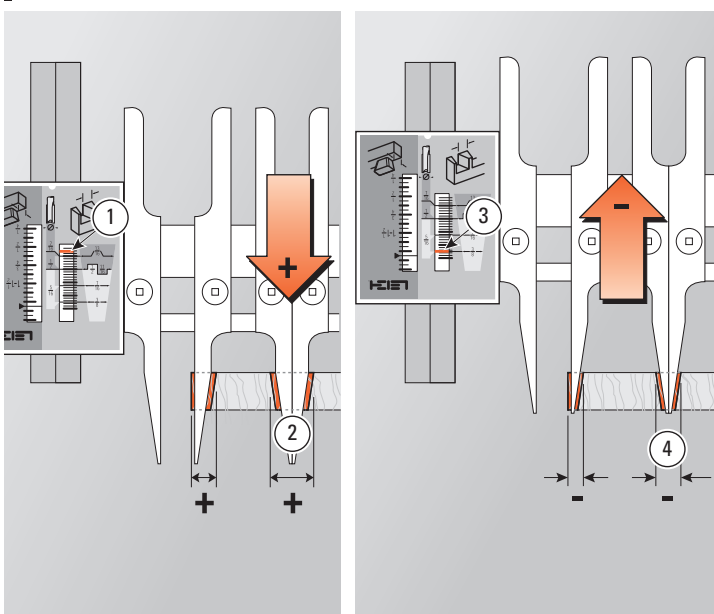


### 8-21 How the TD PIN Scales Work






Dimensions inside the pin shaped panel  correspond with the diameter of the dovetail bit chosen to rout the tails . In this example the  $\frac{1}{2}$ " [12,7mm] diameter of the #80-8 dovetail bit matches the  $\frac{1}{2}$ " [12,7mm] setting on the scale. This also becomes the width of the pin .

Dimensions in the central panel  indicate which straight bit diameter is required with the selected dovetail bit, i.e.  $\frac{5}{16}$ " [7,9mm] straight bit with the  $\frac{1}{2}$ " [12,7mm],  $\frac{7}{16}$ " [11,1mm] and  $\frac{3}{8}$ " [9,5mm] diameter dovetail bits.

The increment lines in the scale window  are referenced to the index lines on the support brackets when making fit adjustments. Once the desired fit is achieved, settings can be recorded for precise setup next time.

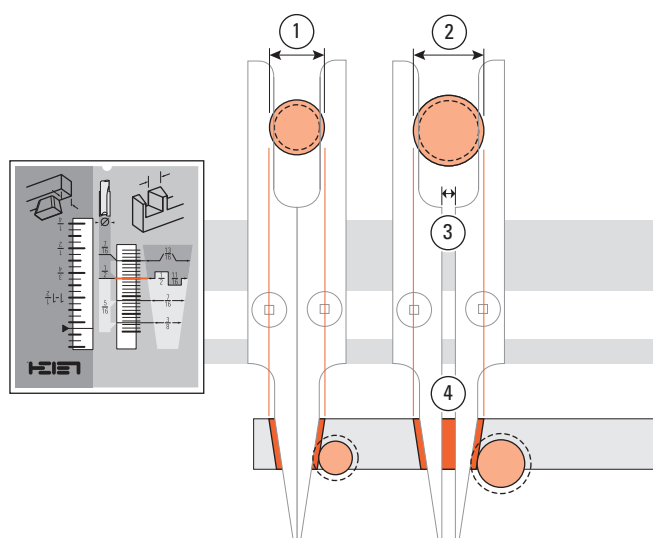


### 8-22 Finished Joint Tightness

The fit of the finished joint is determined in the  TD PINS mode. Moving the finger assembly outward  increases the width of the pins , giving a tighter fit. Moving the finger assembly backwards  allows more wood to be routed, making the pins smaller , and the joint looser. A one increment movement changes joint fit by 0.005" [0,125mm]. A one quarter increment movement changes fit by a tiny 0.00125" [0,03mm]. Most importantly, when that fine fit is achieved, it allows recordable and repeatable settings for future joints using the same router and bits (*see page 28*).

**Why can't there be specific, preset scale settings for each bit combination?**

Cumulative tolerances in routers, bits, guidebushes and the dovetail jig, make it impossible to give exact jig settings for a precision glue joint. A fine fitting joint can only be attained by trial and error test cuts, and takes only minutes for each bit combination. Dimension lines on the TD PIN scale provides the starting point for testing.



### 8-23 Why are the 1/2" and 11/16"[12,7&17,5mm] pin widths on the same scale line?

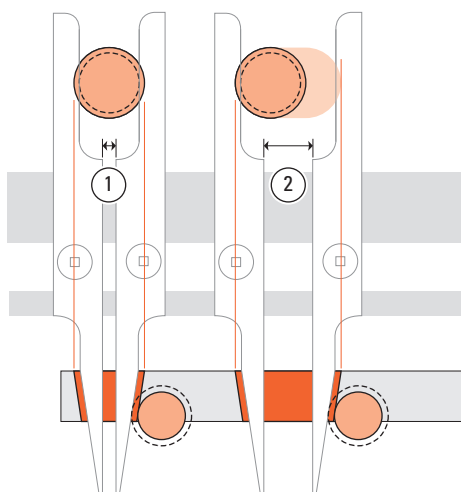
1/2" through dovetails are routed using a 7/16" guidebush ①

11/16" through dovetails are routed with a 5/8" guidebush ②.

That's a 3/16" difference in size between the two bits ...and between the two guidebushes.

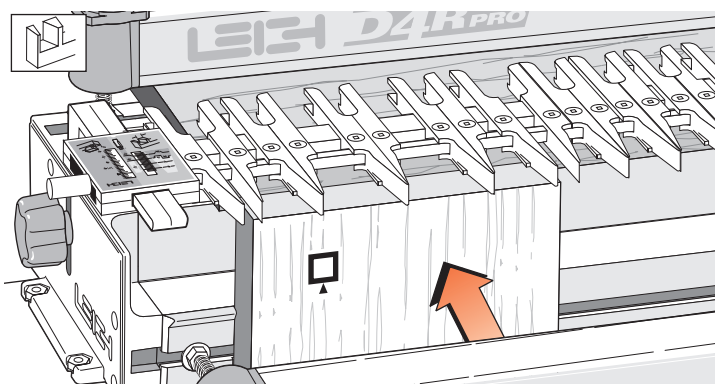
The 5/8" diameter guidebush for 11/16" joints requires that the guide fingers be opened up by 3/16" ③.


This automatically makes the pins 3/16" wider ④ but on the same scale setting.

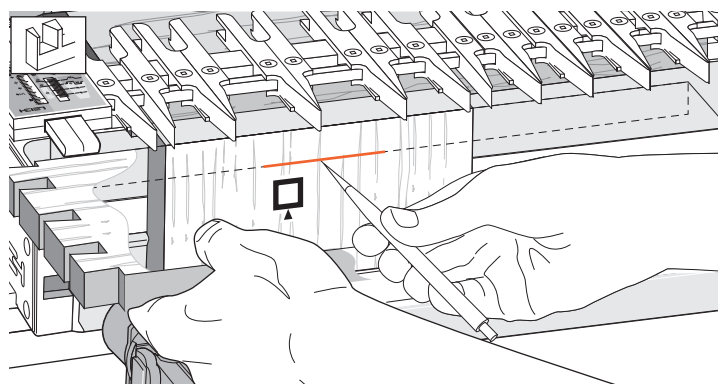


### 8-24 Do the guide fingers have to be opened up precisely 3/16"[4,75mm] for larger combinations?

No, just so long as they are opened up by at least 3/16" (4,75mm) ① to allow the larger guidebush to enter the tail guides. Anything more than this minimum is fine ②; both the pin and matching pin socket widths will be automatically increased by exactly the same amount, whatever the spacing. Varying the pin width does not affect the joint fit or the scale setting. In fact, the pin width can be varied with all bit combinations, not just the larger bits

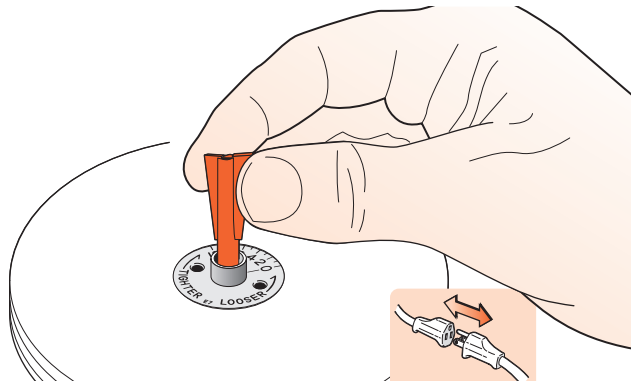


**8-25** Clamp a test pin board against the left hand side stop, outside face  away from the jig, with the top end flush under the guides.



**8-26** Place the side edge of one of the finished *tail boards* horizontally flush under the guidefingers and mark a thin pencil line part way across the pin board.

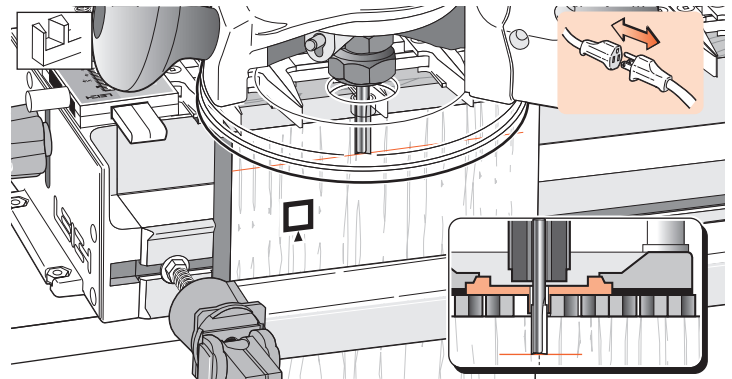




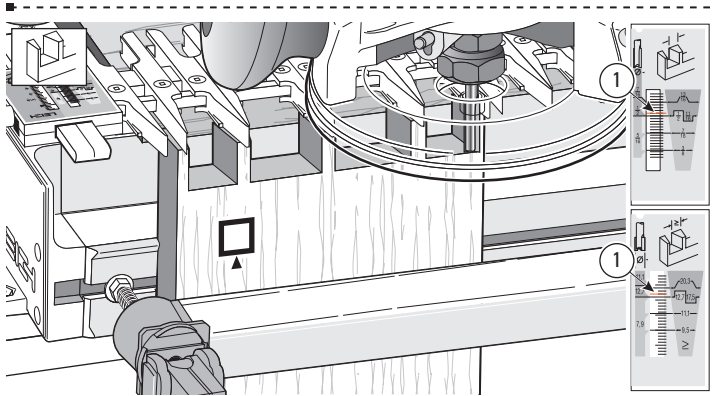
**8-27** Unplug the router and remove the dovetail bit. Mount the No. 140-8 straight bit to the router. *If you are using two routers, see concentricity concerns, Figures 7-6 thru 7-8.*



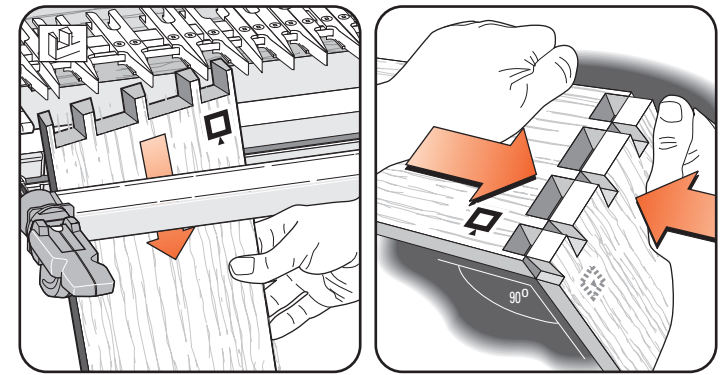
**REMEMBER SAFETY!**



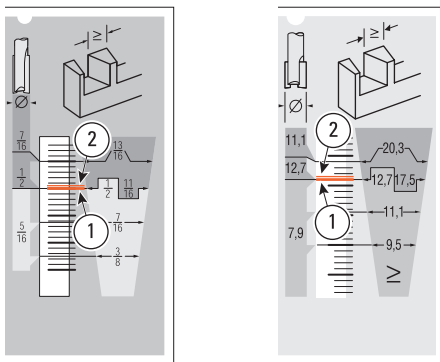
**8-28** Place the router on the finger assembly and adjust the router until the tip of the bit is level with the center of the pencil line. Check to make sure the bit rotates freely.



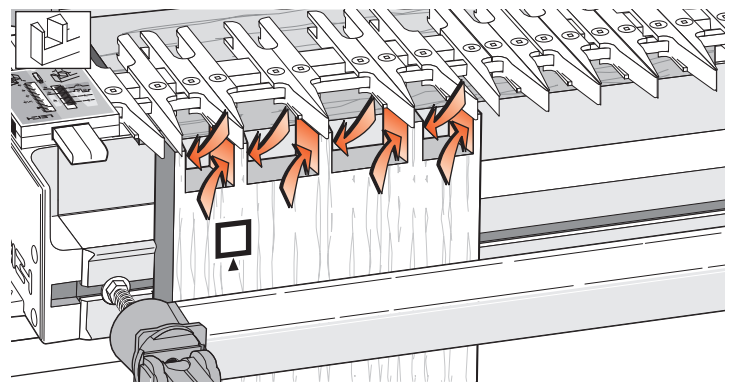
**8-29** Check that the scales are set one increment above the  $\frac{1}{2}$ " [12,7mm] mark ①. Rout out the waste between the pins. Check to make sure no parts have been missed. See 17-1 to 17-5, "Hints and Tips" on how to minimize tearout. Use only light side pressure on the guide fingers.



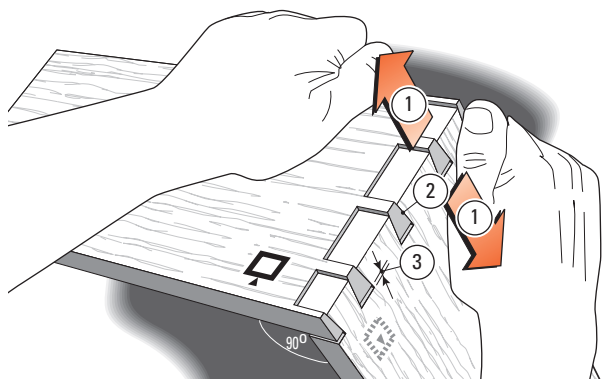
**8-30** Remove the test pin board from the jig and test it for fit in one of the tail boards. *Make sure the outside faces □ face outward on both pieces.* The joint will probably be too tight. A firm push fit is perfect, perhaps a tap with the heel of your hand. But having to use a mallet means the joint is too tight to take glue.



**8-31** If it is much too tight, move the finger assembly in (away from you) by one division on the scale. If it is only a little tight, adjust the scale by only half a division. If it is too loose, go to 8-33.

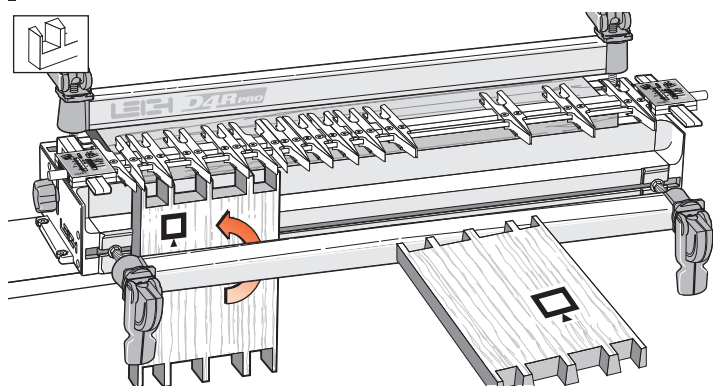



**8-32** Replace the same pin board back in the jig, carefully aligned against the same side stop. Rout off the sides of the pins and test it again for fit.

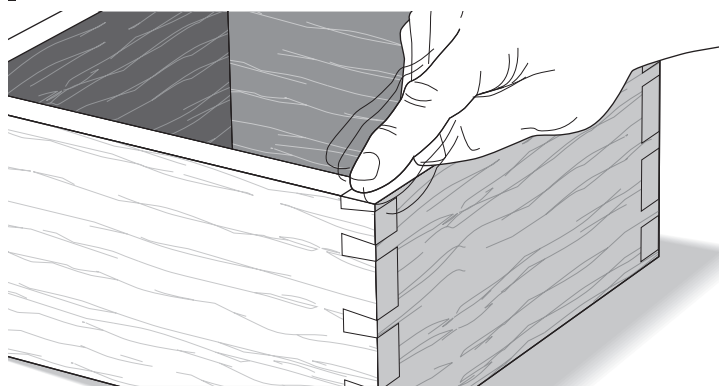


**8-33** Test and repeat as required to achieve the desired fit.

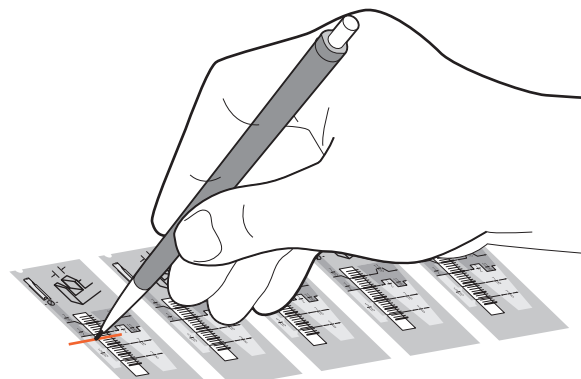
*Note: If you overdo it and make a loose joint, do this test. Pull the tail board “away” from the pins ① so that the angled sides of the pins and tails jam together ②. The gap between the bottom of the pins and the pin sockets ③, is the amount to move the finger assembly out, (toward you). Reset the finger assembly and test again on the other end of this (fifth) board.*




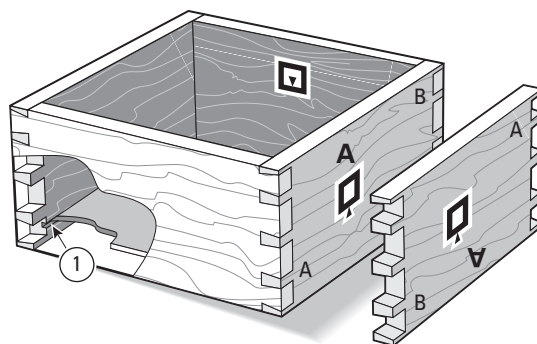
**8-35** Rout all four ends of the pin boards, keeping the outside face  outwards. (With luck you may not have used the fifth board.)





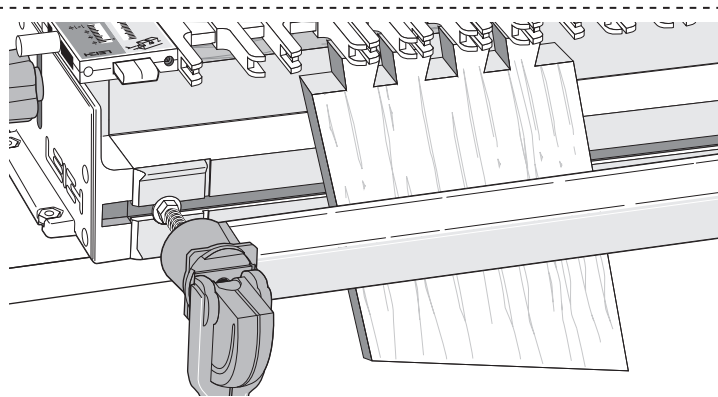
**8-37** The box should be square and in plane. If it is not in plane (i.e., the side edges of each board are not in line), then either the ends of the boards are not square, the board widths are not exactly equal, or there is a concentricity problem (see 7-6 to 7-8).



**8-34** Once the correct fit is achieved, mark the final  TD PINS scale setting on one of the scale prints (see page 28) for future reference. Very slight variations to the scale setting may be necessary with different wood species or hardness.

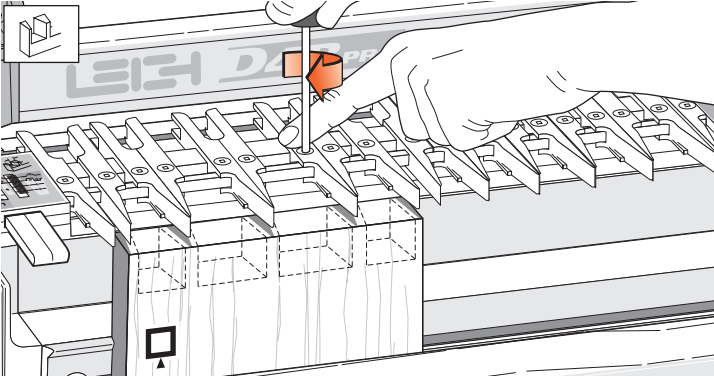


**8-36** Assemble the box, making sure the tail boards face the proper way, i.e. tail boards inside face in ; pin boards outside face out . Provided you haven't already routed out the drawer bottom grooves ①, it doesn't matter which edge of any of the boards are at the top or bottom, the box will still fit together i.e. pin board “A” can be up either way.

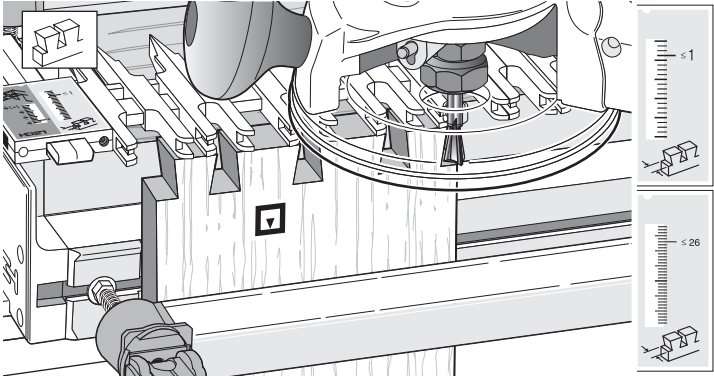


**8-38** To form angled dovetails, refer to the Technical Bulletin “How to Rout Angled Through Dovetails on your Leigh Jig”. You can download this bulletin from the support page of our website: <http://www.leighjigs.com/support.php>. ■

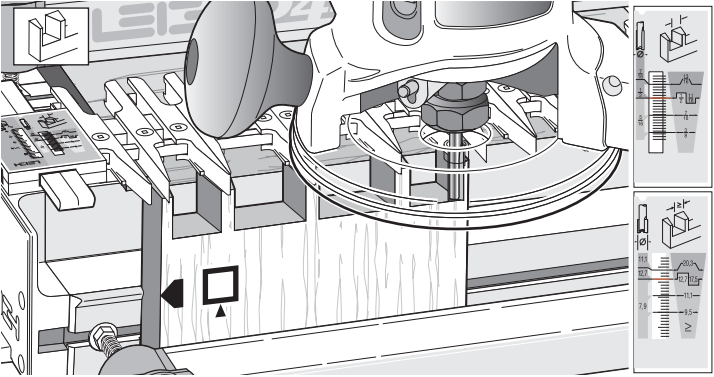
QUICK REFERENCE REMINDERS



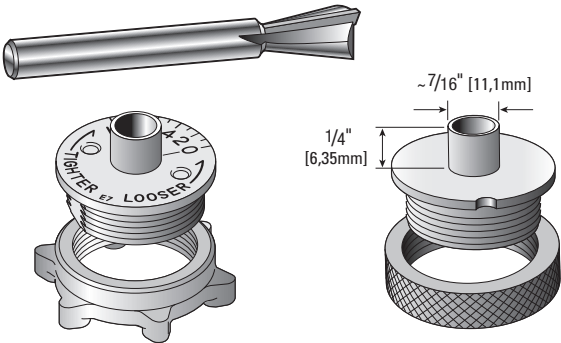
**8-39** Through dovetails are laid out in the TD PINS mode with the finger assembly slightly raised above the spacer board. The outside face of the TD pins is away from the jig body.



**8-40** TD tail boards are clamped vertically in the jig. The inside face of the TD tails is away from the jig body. The finger assembly is in the TD TAILS mode, set on the single  $\leq 1"$  [ $\leq 26\text{mm}$ ] setting. There is only one setting in this mode.



**8-41** Clamp TD pin boards vertically in the jig. This is the only one of the four main modes that puts the outside face of the board away from the jig body. The finger assembly is in TD PINS mode, with the scale set to a recorded setting (see detailed fit instructions 8-21 to 8-34). TD pins are cut with a straight bit; the only time a straight bit is used in dovetailing.



**8-42** Through dovetail tails are always routed with an 8° dovetail bit to match the 8° guide finger. All through dovetail routing on the D4R Pro is done with the Leigh e7-Bush, or any  $\frac{7}{16}"$  [11,1mm] diameter bush (min. barrel length  $\frac{1}{4}"$  [6,35mm]). See page 70 for more on routers and guidebushings. The e10-Bush or a  $\frac{5}{8}"$  [15,9] O.D. guidebush is used for  $\frac{1}{2}"$  shank TD bits.

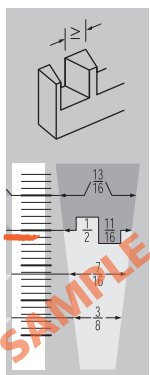
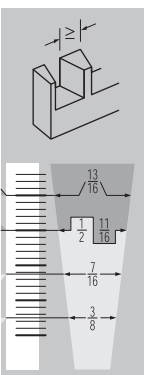
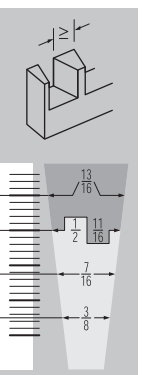
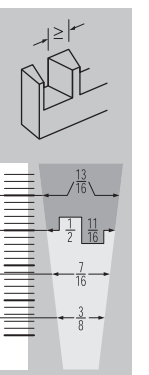
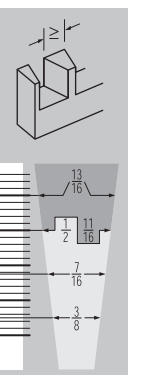
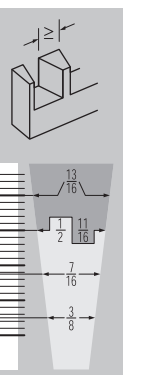
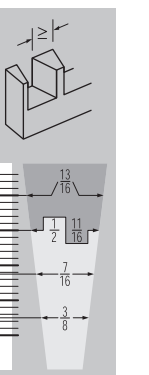
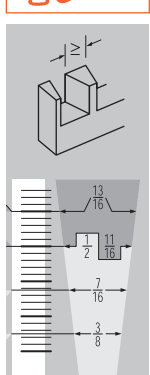
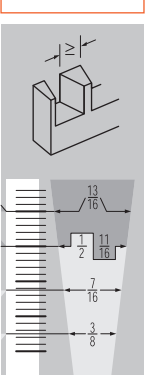
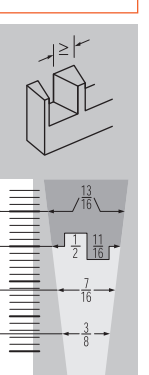
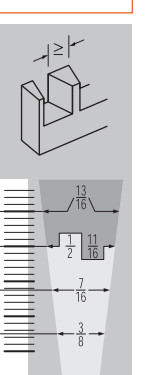
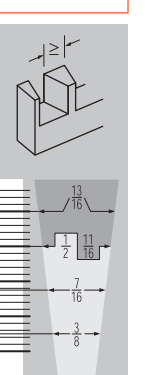
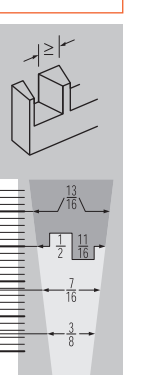
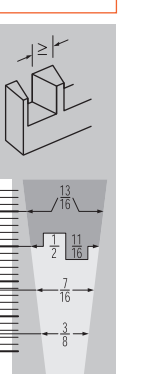
Thickness of Tail Board	Thickness of Pin Board	Dovetail Bit	Straight Bit	Guidebush Diameter
up to 1" [26]	1" - 1 1/4" [26-32]	No.100	No.150	Leigh e10 or 5/8" [15,9]
	5/8" - 1" [16-26]	No.90	No.160	
	1/2" - 13/16" [12-20]	No.80-8	No.140-8	Leigh e7 or ~7/16" [11,1]
	3/8" - 5/8" [10-16]	No.75-8		
	1/4" - 1/2" [6-13]	No.70-8		
	up to 3/8" [10]	No.60-8		
	up to 1/4" [6]	No.50-8		

Numbers in brackets are millimeters

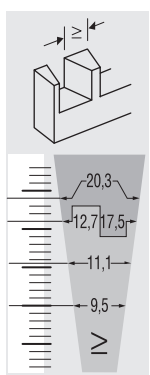
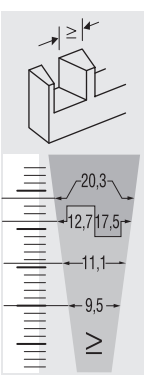
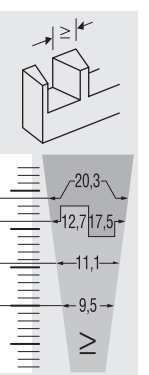
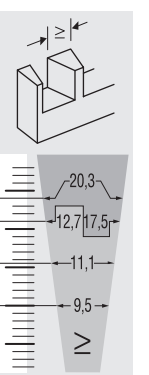
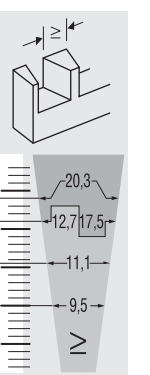
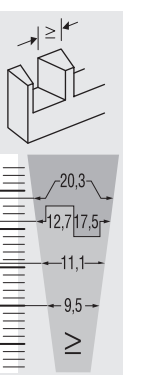
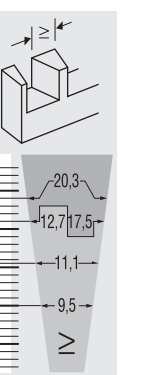
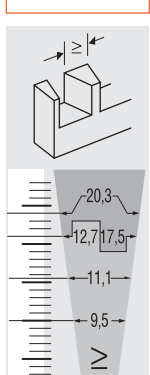
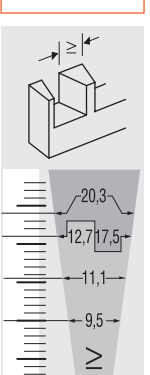
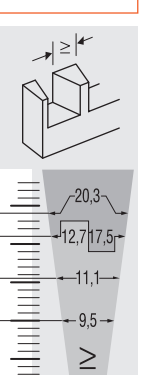
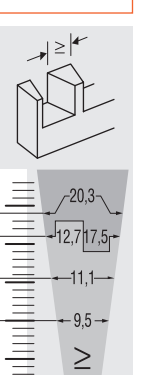
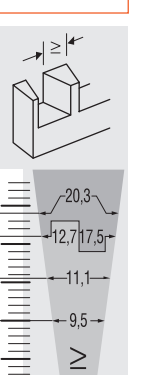
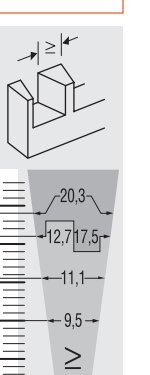
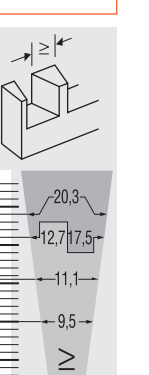
**8-43** Here is a quick reference selection chart for through dovetail bits and guidebushes. Please study the bit and guidebush selection appendixes for a full explanation.

## PROJECT SETTINGS

INCHES

 <b>80-8</b>						
						

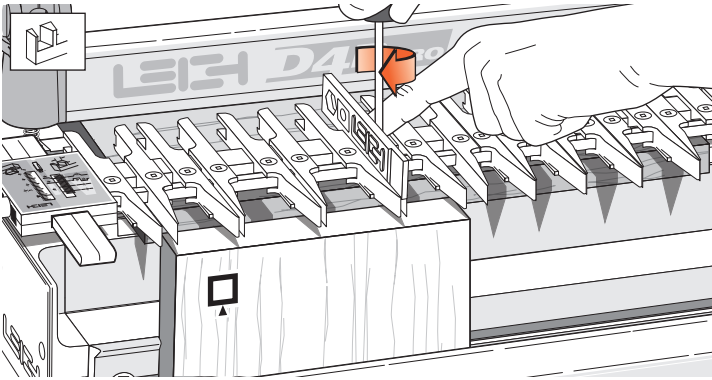
METRIC



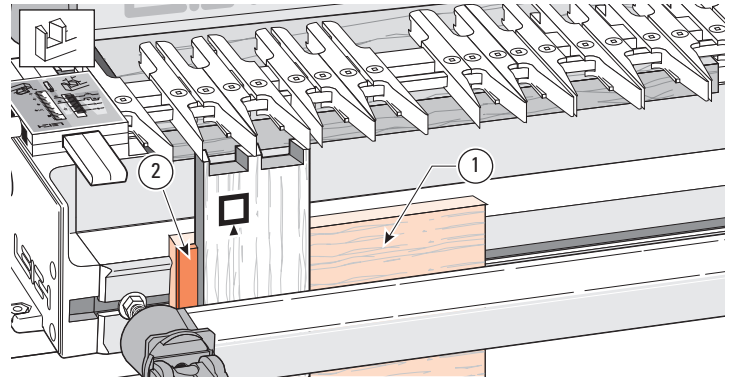
## Large and Small Through Dovetails

The following procedures considerably expand the D4R Pro jig's versatility. However, before attempting them, thoroughly master the techniques of Through Dovetails in Chapter 8.



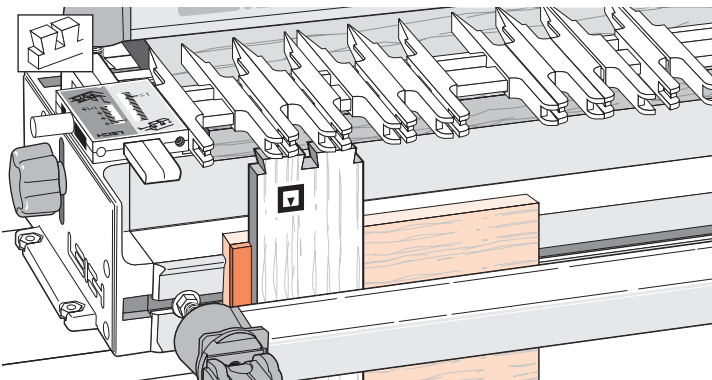
### 9-1 LARGE THROUGH DOVETAILS

The procedures for using bits 90 and 160 or 100 and 150 are identical to the previous figures, except that a  $\frac{5}{8}$ " [15,9mm] OD guidebush, or Leigh e10 e-Bush is used, and *each guidefinger must be at least  $\frac{3}{16}$ " [5mm] apart*. Use the Leigh wrench gauge ( $\frac{3}{16}$ " [5mm] thick) to make sure there is enough separation. Note: Because the  $\frac{5}{8}$ " [15,9mm] guidebush is used, the closest possible pin centers using these bit combinations is  $1\frac{3}{8}$ " [35mm], instead of 1" [25,4mm].

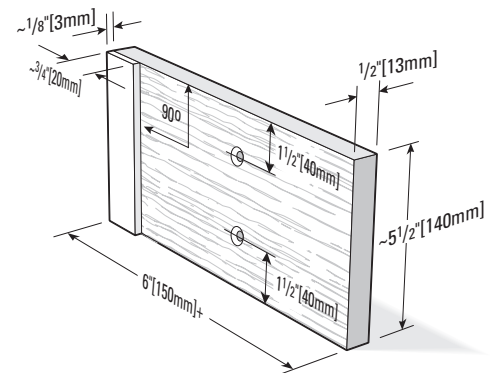


### 9-2 SMALL THROUGH DOVETAILS

Bits 50-8 and 60-8 allow you to create tiny through dovetails in material  $\frac{3}{8}$ " [10mm] or less in thickness. This procedure is an extra bonus: the Leigh jig was not originally designed for it. The TD PINS scale does not go down far enough, so you have to space the boards away from the jig face with a shop-made block ① fitted with its own side stop ② (see 9-4). Use the e7 or a  $\frac{7}{16}$ " [11,1mm] O.D. guidebush for these small joints.

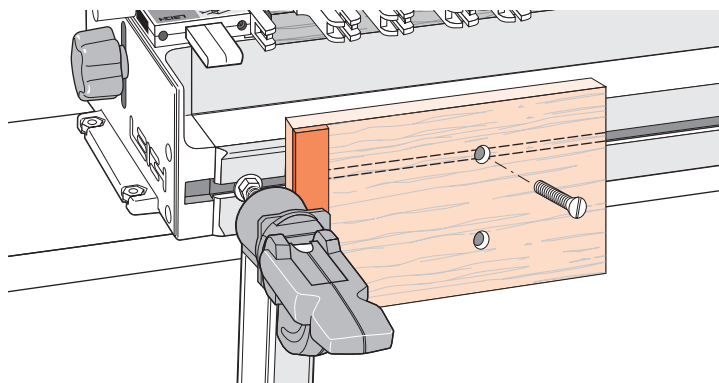


**9-3** Use the same block with side stop when cutting the tails to ensure correct alignment of the pin and tail boards.

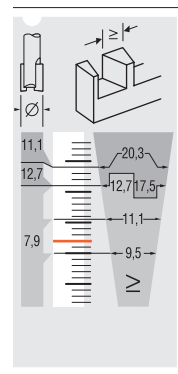
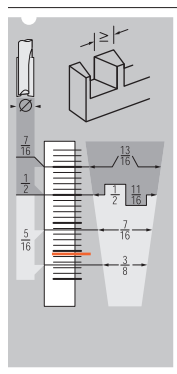


**9-4** Make the block with its side stop out of  $\frac{1}{2}$ " [13mm] stock as shown. Bore two  $\frac{1}{4}$ " [6mm] holes, countersunk for a flat head screw (part no. 287) to allow the blocks to be used at either end of the jig.

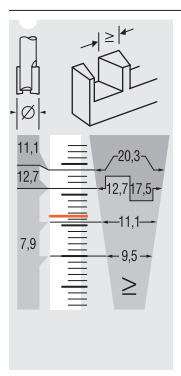
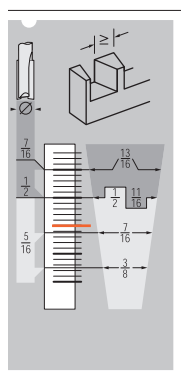




**9-5** Remove one front cam clamp, lower the clamp bar and attach the block to the jig face using the screw (No. 287) into the entrapped square nut. Replace the clamp bar and cam clamp.



**9-6** For boards up to  $\frac{1}{4}$ " [6mm] thick use dovetail bit 50-8 and pin bit 140-8 with the e7 or a  $\frac{7}{16}$ " [11,1mm] guidebush. To cut pins matching the sockets made with bit 50-8, begin with the setting shown here. Cut test pins in scrap stock and test for fit. Adjust as necessary.

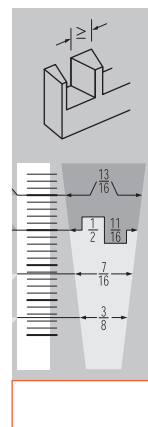
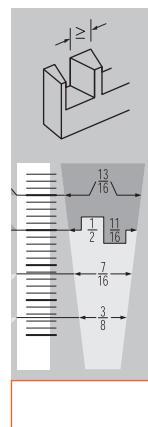
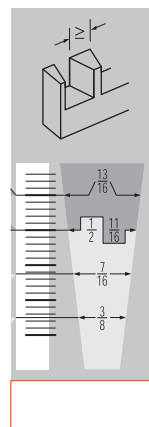
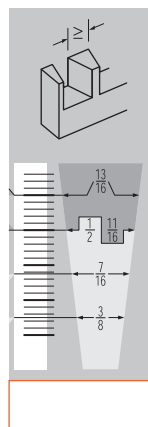
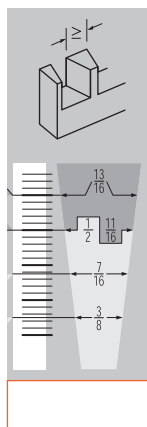
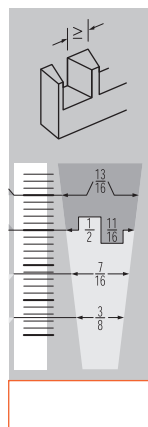
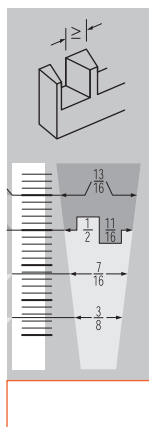


**9-7** For boards up to  $\frac{3}{8}$ " [9,5mm] thick use dovetail bit 60-8 and pin bit 140-8 with the e7 or a  $\frac{7}{16}$ " [11,1mm] guidebush. To cut pins matching the sockets made with bit 60-8, begin with the setting shown here. Cut test pieces in some scrap stock and test for fit, then adjust as necessary. Record the actual settings for bits 50-8 and 60-8 on these scale reproductions below.

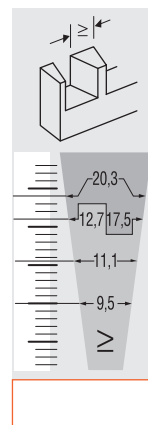
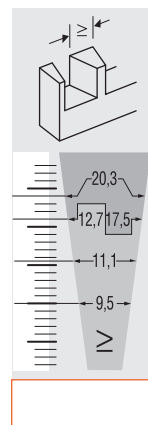
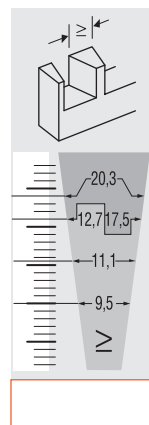
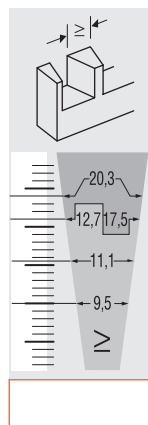
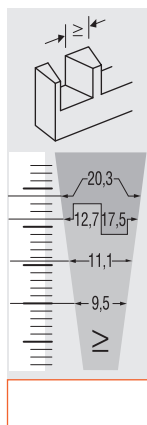
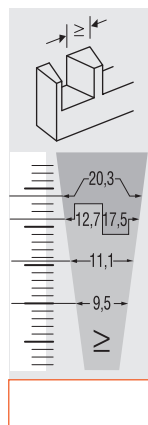
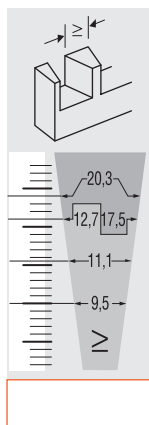
*Note: You may also rout joints in boards  $\frac{5}{16}$ " to  $\frac{3}{8}$ " [8,0 to 9,5mm] with bits No. 70-8 and 140-8 without the use of the shop-made block.*

### PROJECT SETTINGS

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## Variably Spaced Half-Blind Dovetails

**IMPORTANT!** The most commonly misunderstood aspect of routing half-blind dovetails is how the dovetail bit's depth of cut is used to adjust the joint fit, and how the angle of the bit affects that depth of cut. Review this chapter for a clear understanding of this concept.

**Note:** The Leigh e7-Bush or any  $\sim 7/16"$  [11,1mm] guidebush with a min. barrel length of  $1/4"$  (see page 70), and any one of the bits listed on the next page may be used for half-blind dovetails. See Appendix II, Half-Blind Bit Selection, Page 75, for a full description on how to select an appropriate bit.

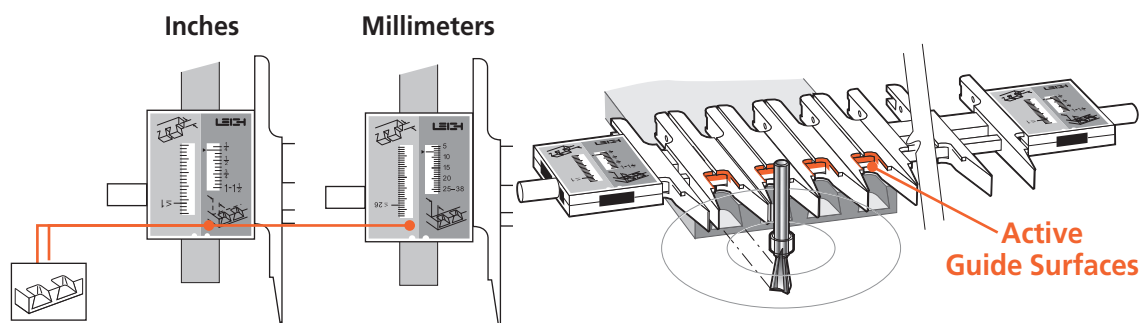
1

Start in

### Half-Blind Dovetail Pins (HB PINS) mode

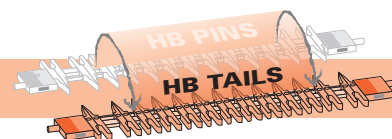
#### MODE ICONS

Illustrations in this manual include the correct *mode* icon for the current instruction. The icons are also used in the instruction text.



2

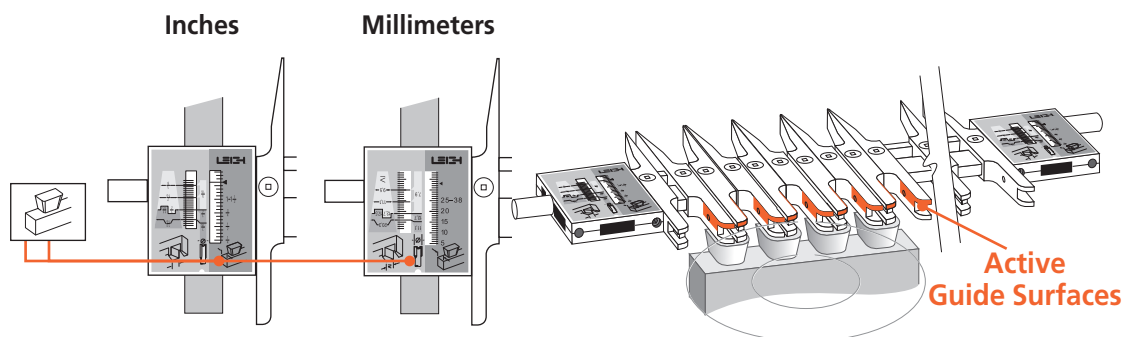
ROTATE the finger assembly toward you 180°

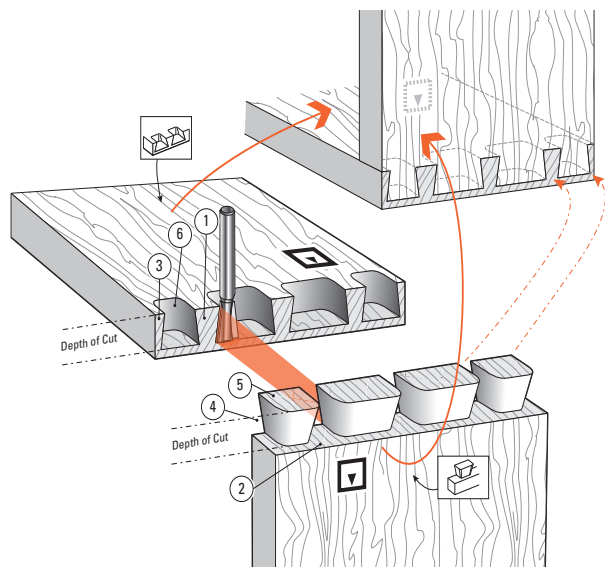


3

Now the Finger Assembly is in

### Half-Blind Dovetail Tails (HB TAILS) mode





### 10-1 Half-Blind Dovetail Terminology:

① Pins

② Pin sockets

③ Half-pins

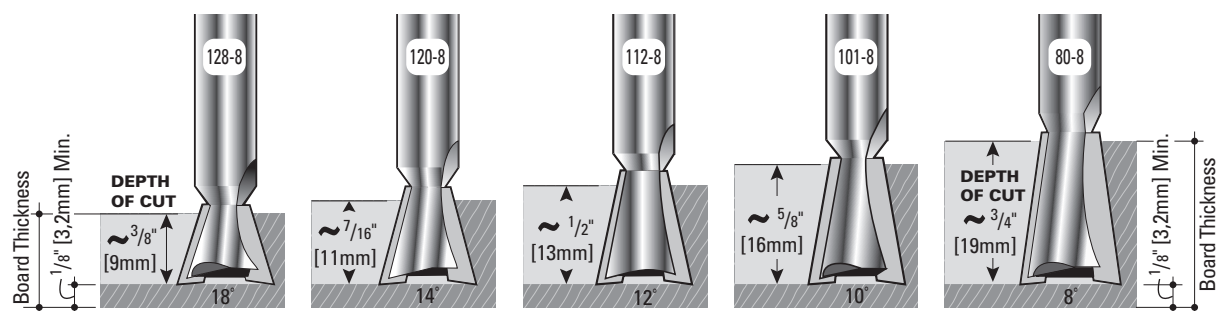
④ Half-pin sockets

⑤ Tails

⑥ Tail Sockets

The pins fit in the pin sockets. Joints should almost always end each side with half-pins.

### 10-2 Cutting Depth for Variably Spaced Half-Blind Dovetails



**Note:** Add at least  $\frac{1}{8}$ " [3,2mm] to the depth of cut for board thickness. ~ Symbol for "approximately"

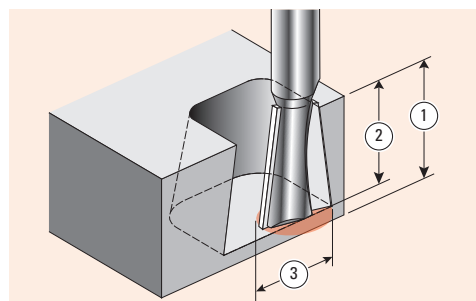
## Important! Read This About HB Depth of Cut

Bit selection is critical. You need to select a specific dovetail bit for your half-blind dovetail project, depending on the pinboard (drawer front) thickness you are using.

- Choose one of the five  $\frac{1}{2}$ " [12,7mm] diameter dovetail bits shown above. Check bit selection in Appendix II.
- Depth of cut must be as specified for each of the five bits illustrated above. *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.

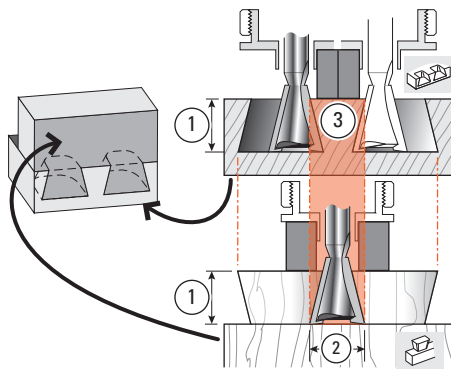
- Small Depth of Cut adjustments will change joint fit tightness. See 10-3 to 10-5 for why.
- Half-blind PINS and TAILS are routed with the same dovetail bit and must be at the same Depth of Cut.
- All half-blind dovetail bits work with the Leigh e7-Bush supplied with your Leigh jig or standard  $\frac{7}{16}$ " [11,1mm] outside diameter guidebush.



**PINBOARD THICKNESS** ① determines the **maximum depth of cut** ② you can use. Select a bit with a specified cutting depth that is at least  $\frac{1}{8}$ " **less** than the pinboard thickness.

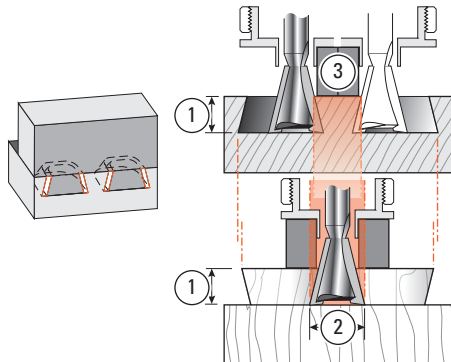
A dovetail bit will produce **only one specific cutting depth**.

**Only**  $\frac{1}{2}$ " [12,7mm] ③ cutting diameter bits can be used for half-blind dovetails.



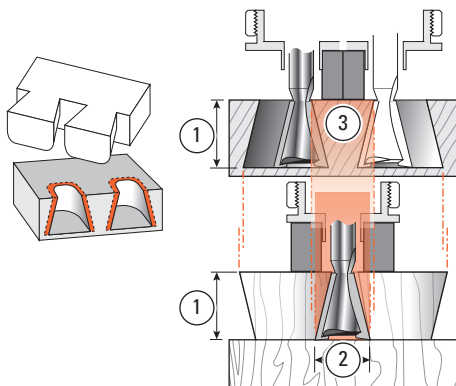
### 10-3 Joint Fit and Depth of Cut

Here's why the depth of cut ① changes the fit in half-blind dovetails. Increasing or decreasing the depth of cut does not affect the pin socket width ②, but does affect the width of the pin ③ that goes into the socket ②.

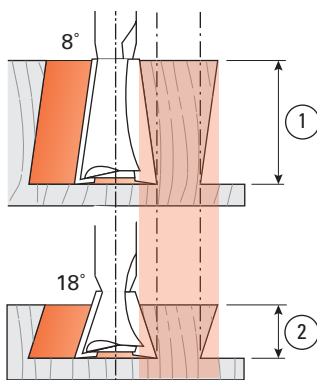


**10-4** Note that decreasing the bit depth ① makes the pin ③ narrower while the pin socket ② stays the same width, producing a loose fit.

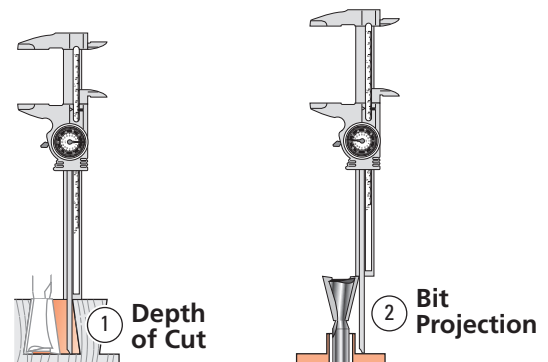
Decreasing the bit depth (i.e. raise the bit into the router) produces a looser fit.



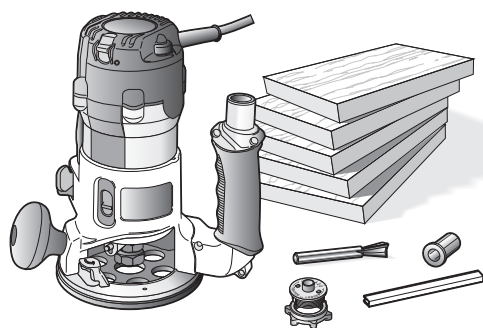
**10-5** Increasing the bit depth ① makes the pin ③ larger while the pin socket ② stays the same width, producing too tight a fit. Increasing the bit depth (i.e. lower the bit) produces a tighter fit.



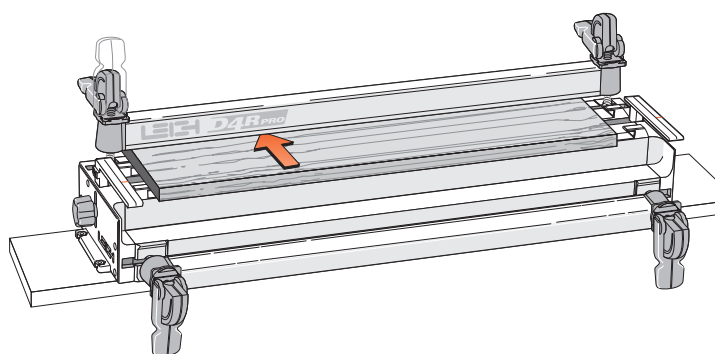
**10-6 Bit Angle and Depth of Cut.** Half-blind pins and tails are routed with the **same** dovetail bit, the **same** guidebush, and the **same** depth of cut. A different depth of cut requires a different angled bit. Leigh offers five different angled dovetail bits for a range of cut depths. A lesser angle, say 8°, for a deeper cut ①; a greater angle, say 18°, for a shallower cut ②.



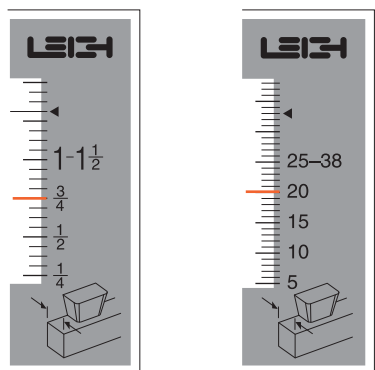
**10-7** Cumulative plus/minus tolerances in routers, bits and guidebushes, make it impossible to state exact bit depth for first-time precision fit. All dovetail jigs require trial and error tests to attain fine fitting joints. The good news; we give a starting depth for each bit. Test and measure the successful 'Best fit' depth of cut ① or bit projection ②. Record for future first-time fits.



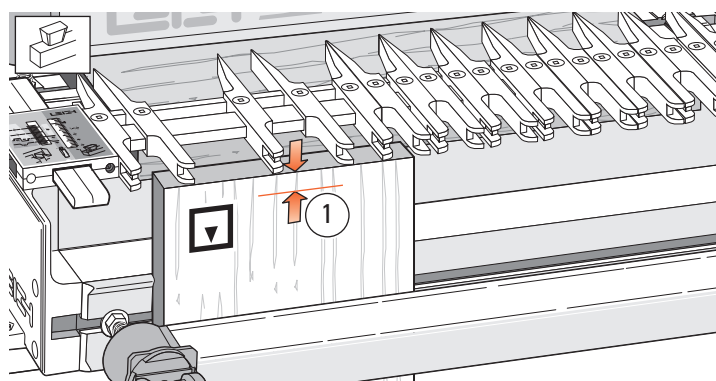
**10-8 Routing a Test Joint** Use the Leigh e7-Bush, and No. 120-8,  $\frac{1}{2}$ " [12,7mm]  $14^\circ$  dovetail bit. Select several pieces of  $\frac{3}{4}$ " x  $5\frac{1}{2}$ " [20 x 140mm] x about 8" [200mm], and the plastic bridge extrusion. *Note: Half-blind pin boards must be minimum  $\frac{1}{2}$ " (13mm) thick to clamp. For thinner boards see fig. 10-21.*



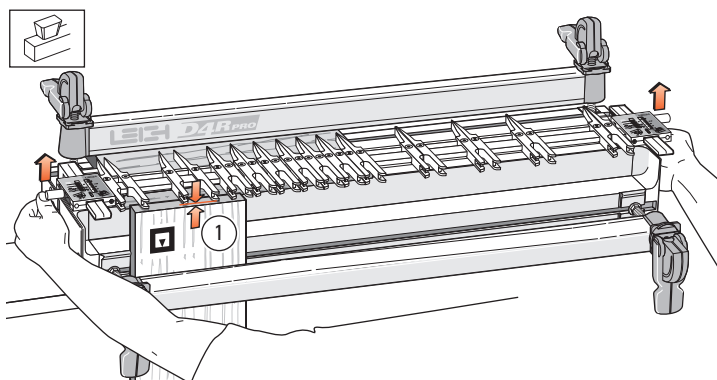
**10-9** Clamp the spacer board in the rear clamp.



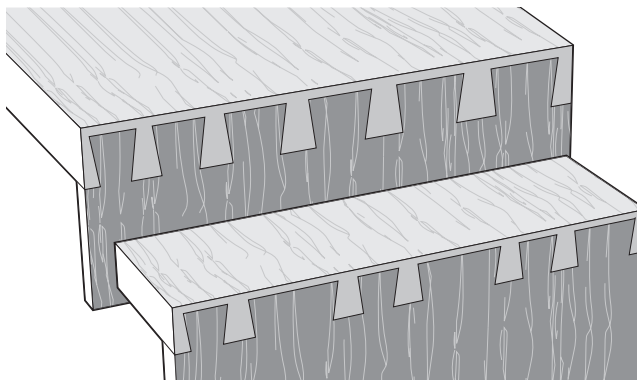
**10-10** Mount the finger assembly on the support brackets in the HB TAILS mode, flat on the spacer board, *scales set on the thickness of the tail board* ( $\frac{3}{4}$ " [20mm] in this instance). The HB TAILS scale is always set at the tail board thickness. The scale increments above 1-1  $\frac{1}{2}$ " [25-38mm] are for use on sliding dovetails (see Chapter 16).



**10-11** Measure and mark a line on the inside face of the tail board ① to the working depth of the bit to be used as per 10-2 of this chapter. Clamp this test tail board in the left front clamp, against the side stop with the top edge flush under the guidefingers, and the inside face □ of the drawer side away from the jig.

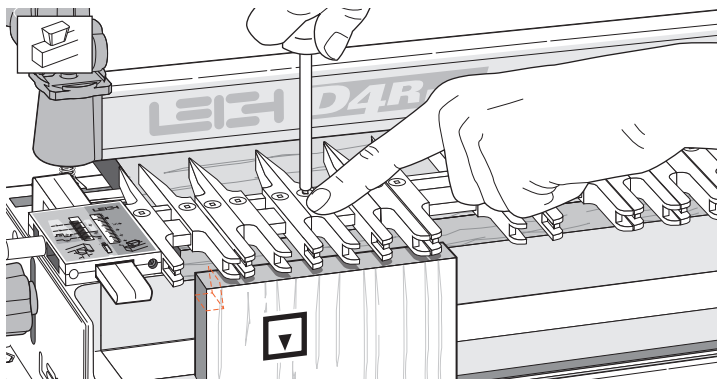


**10-12** Unlock and raise the finger assembly support brackets slightly so that the finger assembly is about  $\frac{1}{8}$ " [2mm] ① above the boards. This will allow easy movement of the guidefingers.

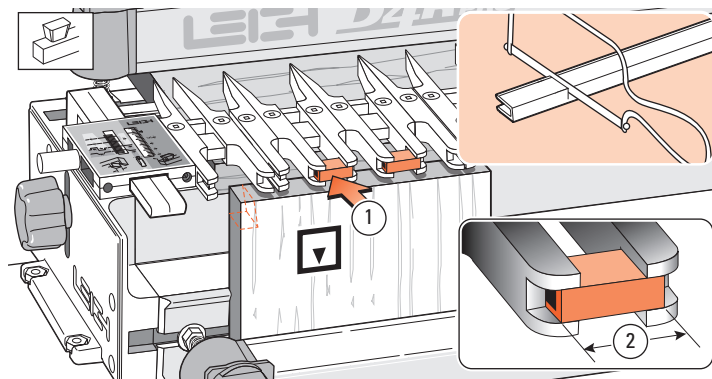


**10-13** While typical traditional layouts have symmetrical pins and spacing with half-pins at each edge, the Leigh jig allows infinitely variable joint designs. Different thickness boards can be easily joined together. Pins can be various sizes and randomly spaced to suit just about any design you create. *Before attempting joints of asymmetrical design, see Chapter 14.*

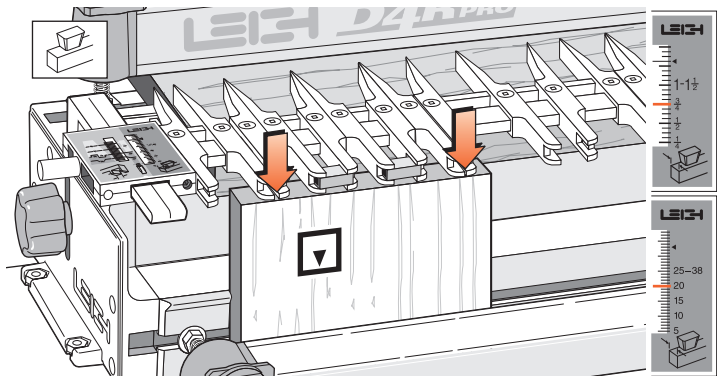




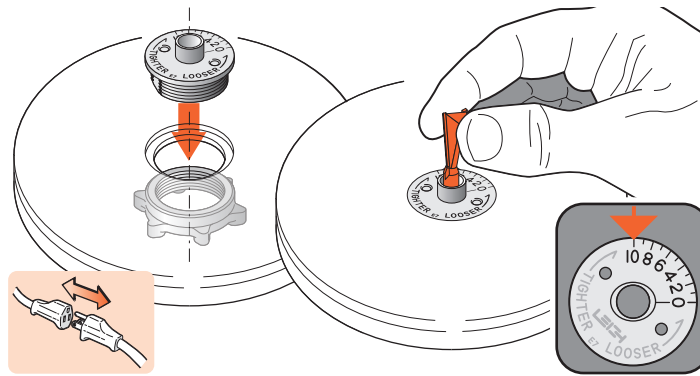
**10-14** Ignoring the outer guidefinger (router support) at the scale, loosen enough guides for the desired tail layout. The illustrated half-pin guidefinger position gives a half-pin socket profile as shown (dotted lines). *NOTE: The first few uses, some fingers may “stick”. This is normal. To “unstick”, loosen the finger screw  $\frac{3}{4}$  turn. Press down firmly on the screwdriver (in the screw) to loosen the finger locking wedge.*



**10-15** If gaps between the guidefinger tails are wider than about  $\frac{1}{8}$ " [3mm], mark and cut pieces of bridge extrusion ① to fit the guidefinger tail slots. Cut slightly shorter than the space between the guidefinger shoulders ②, so guidefingers won't force apart with the bridge pieces. Squeeze the open side of the pieces and push into place for a friction fit.



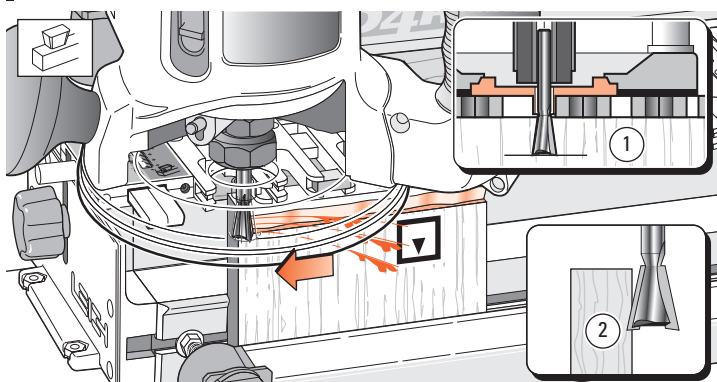
**10-16** Remember to tighten any loose guidefingers. Lower the finger assembly back onto the spacer board and workpiece. It must touch the workpiece or the depth of cut will vary and the joint won't fit. The scale should be set on the tailboard thickness, in this case  $\frac{3}{4}$ " [20mm].




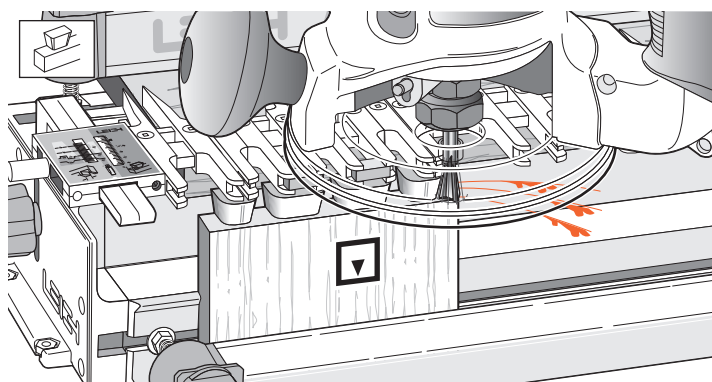
**10-17** Attach the e7-Bush securely to the router and mount the supplied No. 120-8 bit to the router. Set the e7-Bush to No. 10.



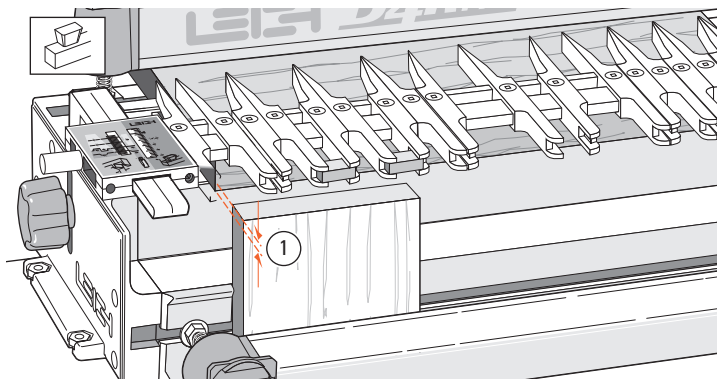
**REMEMBER SAFETY!**



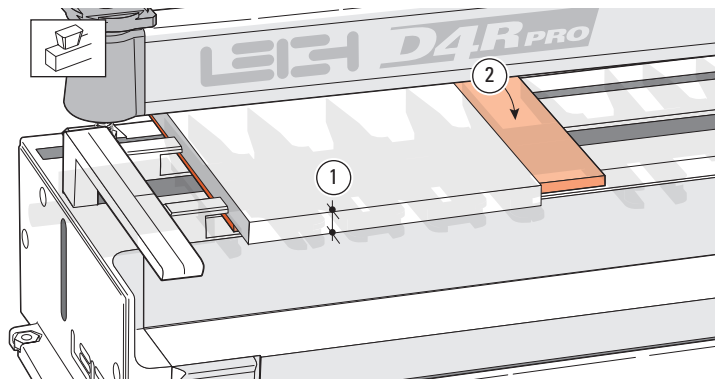
**10-18**  Adjust the bit height until the bit tip is level with the marked line ①. For the first light cut move the router from right to left. Make sure you control it firmly, because it is driven in this direction by the bit. Only the tip of the bit should be cutting on the first cut ②. This *back* or *climb* routing leaves a very clean shoulder in face grain.



**10-19** Now rout in and out from left to right following the guides and bridge pieces to rout out the pin sockets, leaving the tails. See fig. 17-10 “Hints and Tips”.

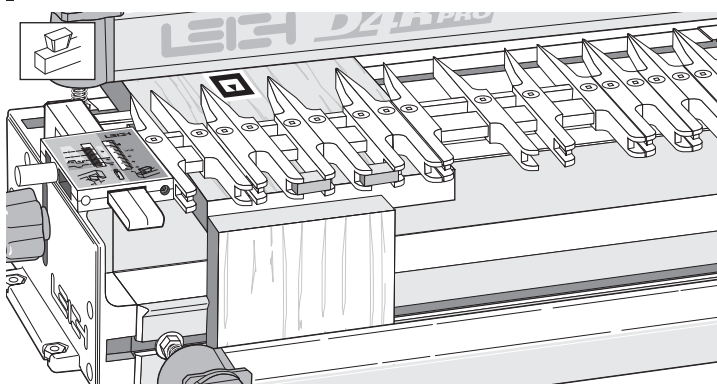


**10-20** Remove the test tail board, then clamp a scrap board in the front of the jig so that the top edge projects above the top face of the jig by about  $\frac{1}{8}$ " [3mm] ①. This will keep the scrap piece below the path of the bit when routing the pin board. Remove the spacer board from the rear clamp.

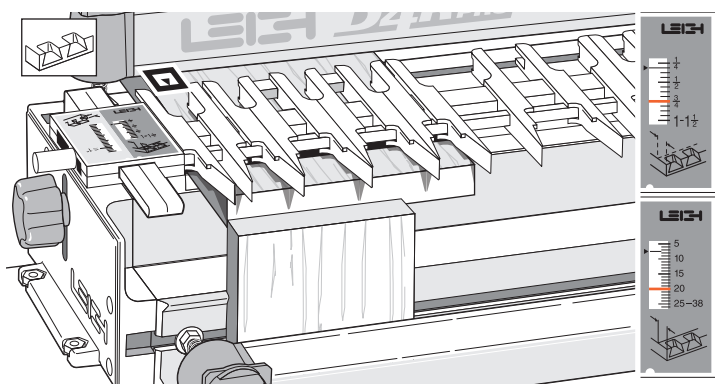


### 10-21 If you're mounting Thin Pin Boards:

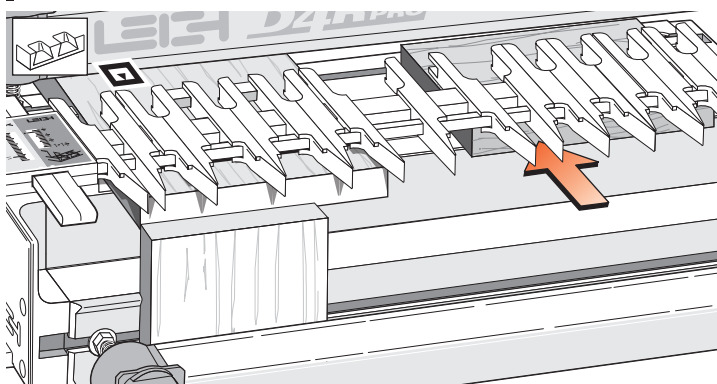
The minimum recommended pin board thickness is  $\frac{1}{2}$ " [13mm]. If you wish to rout a pin board less than the minimum thickness ①, it will be necessary to pack the board up from the jig body. We suggest using a piece of  $\frac{1}{4}$ " to  $\frac{3}{8}$ " [6 to 9mm] plywood for this purpose ②.



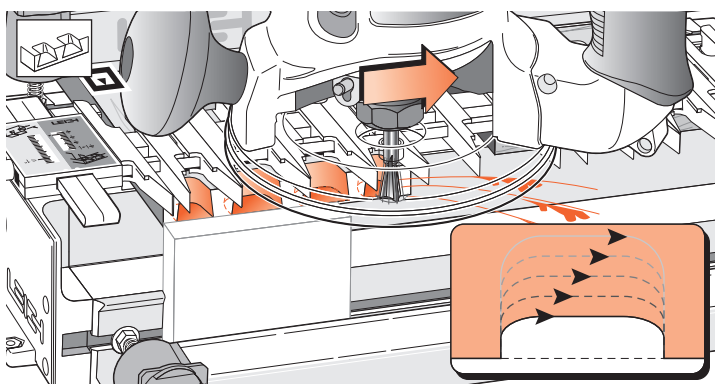
**10-22 Flush Drawers** Place a test pin board in the left rear clamp against the side stop, fitting its front end edge flush against the vertical scrap piece, inside face ① of the drawer front away from the jig body. The pin board is now positioned with the edge to be routed flush with the jig's front face, correctly registered for the scale readings. For drawers with rabbeted fronts, see Chapter 12.



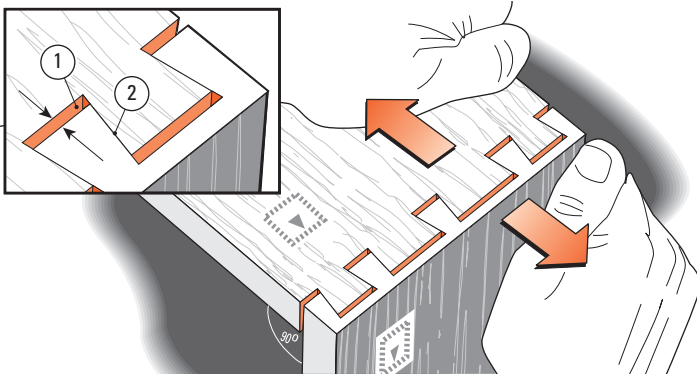
**10-23** Rotate the finger assembly to the HB PINS mode. Set the HB PINS scale equal to tail board thickness (i.e., same setting as tails: this example,  $\frac{3}{4}$ " [20mm]). HB pins and HB tail scales are always set to tail board thickness. Make sure the finger assembly is flush and level on the pin board. The guidefingers must touch the pin board or depth of cut will vary, causing poor joint fit.



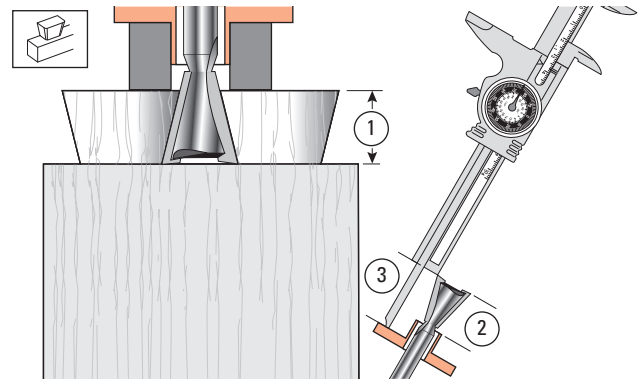
**10-24** If you have difficulty leveling the finger assembly on a narrow workpiece, place a board the same thickness as the pin board under the other end of the finger assembly, *but not under the rear clamp*.



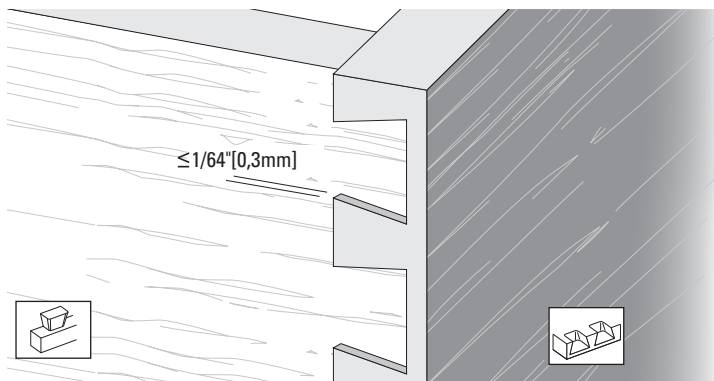
**10-25** ⚠️ Rout out the waste between the pins. Rout each space from left to right. Do not back rout on end grain. If the bit enters on the right side of the opening there will be a very strong pull to the left, so... Rout each opening in at least three or four passes, left to right.



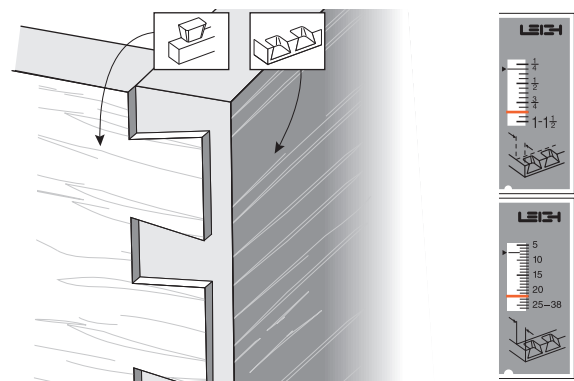
**10-26** Remove the pin board and test the joint for fit. If the joint is loose, as shown here, you need to lower the bit by the same amount as the gap at the bottom of the pins ① (when the pins are pulled against the socket sides ②). If the joint is too tight, raise the bit slightly. Test again. You cannot rout the same board twice with a dovetail bit, so use two fresh board ends for each test.



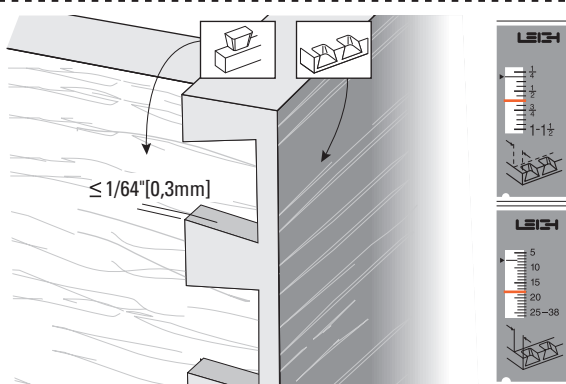
**10-27** Keep the test tail board that fits well, and mark it with the number of the bit you used to rout it. For quick set-up next time, clamp this tail board in the jig as a *depth-of-cut gauge* ① to show how far to lower the bit. Better yet, measure the bit projection from the end of the guidebush ② or guidebush flange ③ and record this for fast set-ups in future.



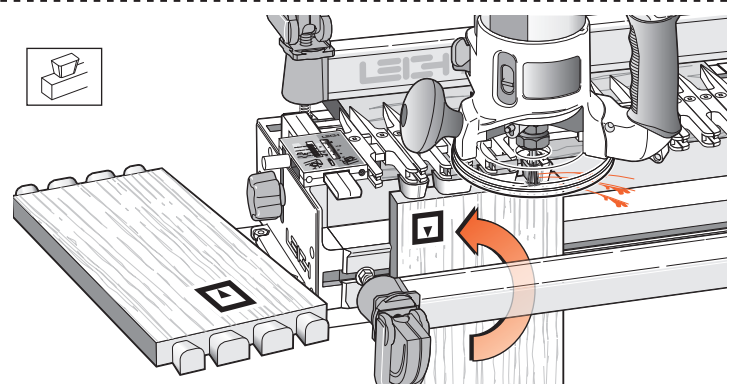
**10-28** When you have the proper tightness of fit, check the flushness. The tails should be under flush to the pins by *no more than 1/64" [0,3mm] to allow for cleanup (exaggerated here)*. The concentricity of the collet and guidebush on different routers will affect this tolerance.



**10-29** If the tails stand out from the pins, set the HB PINS scale **away from the operator** by the amount required.

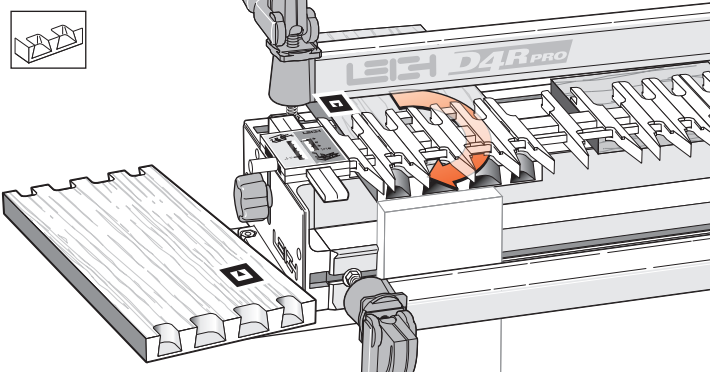



**10-30** If the tails fit in too far past the pins ends, set the HB PINS scale **toward the operator** by the amount required. These adjustments for “flushness” are made only in the HB PINS mode.



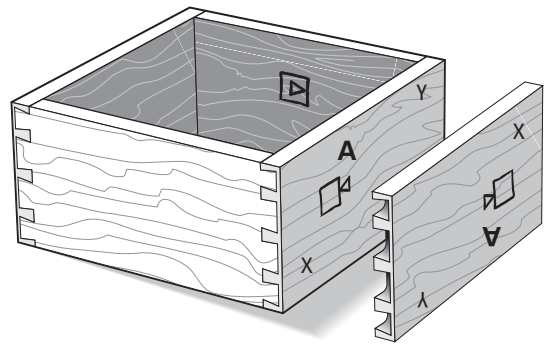
**10-31** To make a box, rout all four ends of the tail boards, keeping the inside face of the tail boards away from the jig.





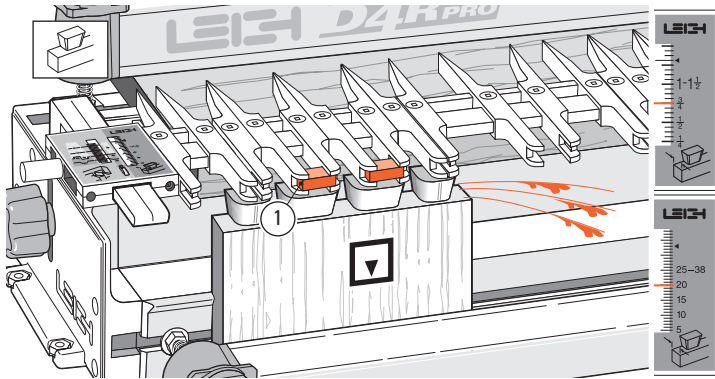
**10-32** Rout all four ends of the pin boards keeping the inside face  of the boards away from the jig.



*Note: When making drawers you may prefer to use through dovetails on the rear corners.*

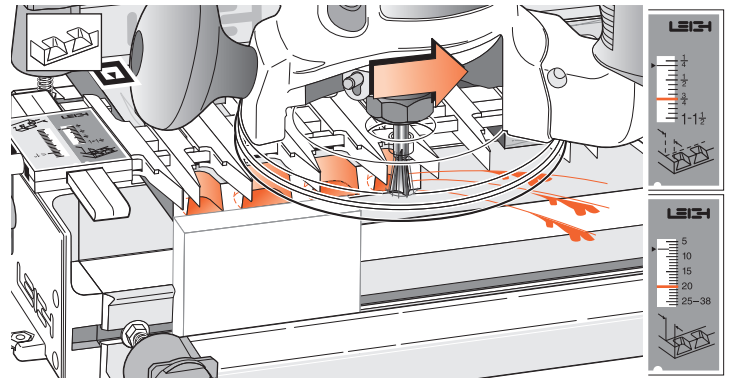




**10-33** Assemble the box. As with through dovetails, it doesn't matter which edge of any of the boards are at the top or bottom, the box will still fit together e.g. pin board "A" can be up either way.


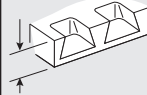



## QUICK REFERENCE REMINDERS

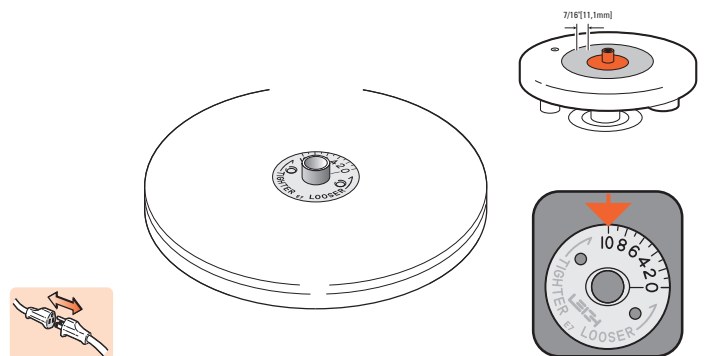


**10-34** Half-blind (HB) tails: Drawer sides (tailboards) are clamped vertically in the jig. The inside face  of the drawer side goes away from the jig body. The finger assembly is in the  HB TAILS mode, set to the thickness of the drawer side. Use bridge pieces where required ①.



**10-35** Half-blind (HB) pins: Drawer fronts (pinboards) are cut with the board clamped horizontally in the jig. The inside face  of the drawer front faces away from the jig body. The finger assembly is in the  HB PINS mode, and again set on the thickness of the drawer side (but adjusted for a flush fit, see 10-28 to 10-30).

				
Thickness of Tail Board	Thickness of Pin Board	Depth of Cut	Dovetail Bit	Guidebush Diameter
up to 1"[26]	7/8" -up [22]	~ 3/4" [19]	No.80-8	Leigh e7 or ~ 7/16" [11,1]
up to 1"[26]	3/4" -up [20]	~ 5/8" [16]	No.101-8	
up to 1"[26]	5/8" -up [16]	~ 1/2" [13]	No. 112-8	
up to 1"[26]	9/16" -up [14]	~ 7/16" [11]	No.120-8	
up to 1"[26]	1/2" -up[12]	~ 3/8" [9]	No.128-8	



**10-36** On the Leigh D4R Pro, all half-blind dovetails are routed using the Leigh e7-Bush set at No. 10 or standard ~ 7/16"[11,1mm] diameter bush (min. depth 1/4" see Appendix I). For instructions to rout end-on-end dovetails see Chapter 13. ■

## 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.*

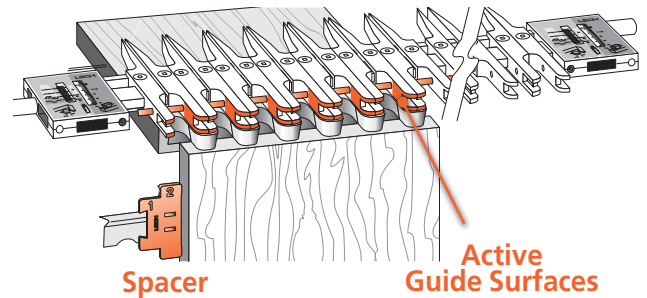
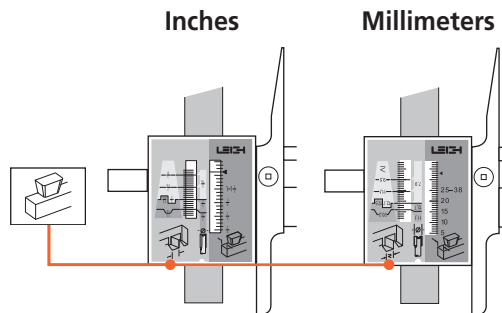
1

Only one mode is required:

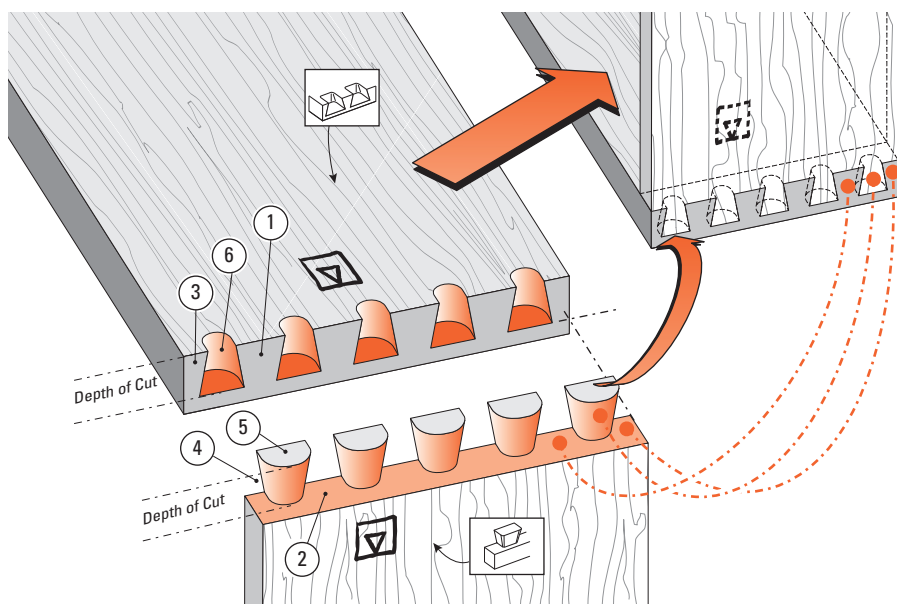
### Half-Blind Dovetail Tails (HB TAILS) mode

#### MODE ICONS

Illustrations in this manual include the correct *mode* icon for the current instruction. The icons are also used in the instruction text.





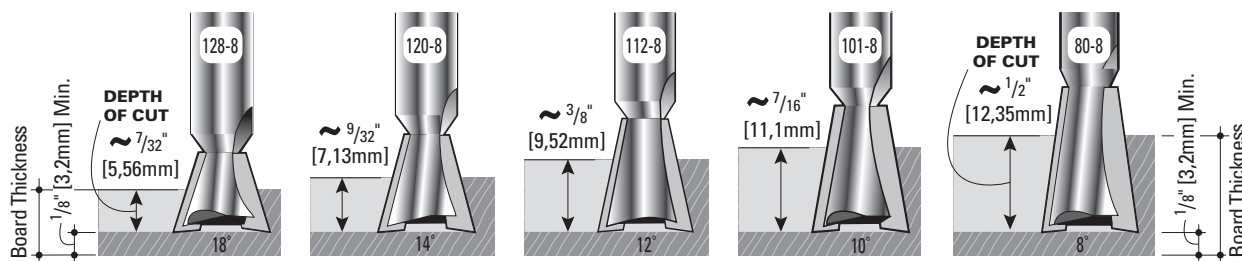


### 11-1 Single Pass Half-Blind Dovetails:

- 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.

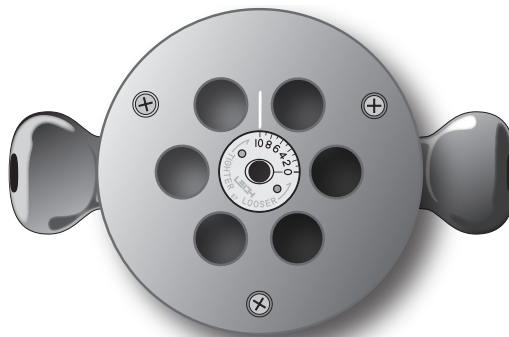
### 11-2 Cutting Depth for Single Pass Half-Blind Dovetails

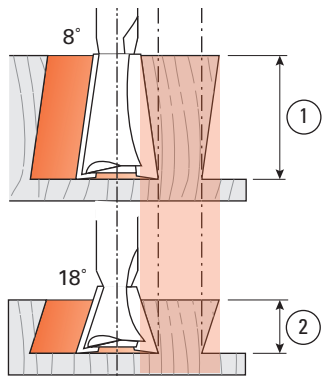


**Note:** Add at least  $1/8"$  [3,2mm] to the depth of cut for board thickness.  $\sim$  Symbol for "approximately"

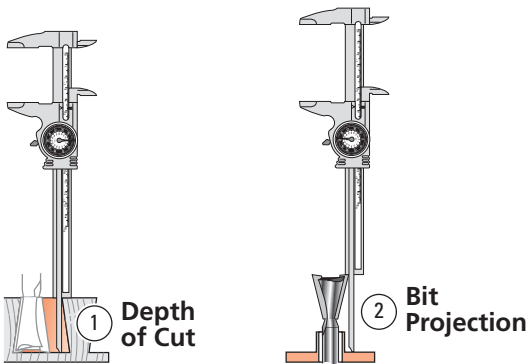
**! IMPORTANT! Bit depths of cut for "single pass" dovetails are not the same as for variably spaced joints.**

- 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,  $1/2"$  [12,7 mm] diameter dovetail bits shown above.
- Fit the provided Leigh e7-Bush to the router as shown below and set at No. 10, or use a standard  $7/16"$  [11,1mm] guidebush (min. barrel depth  $1/4"$  see page 69).

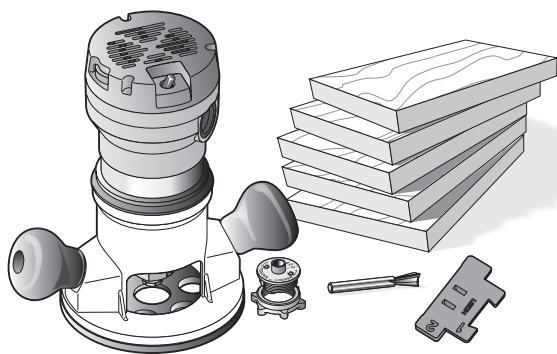




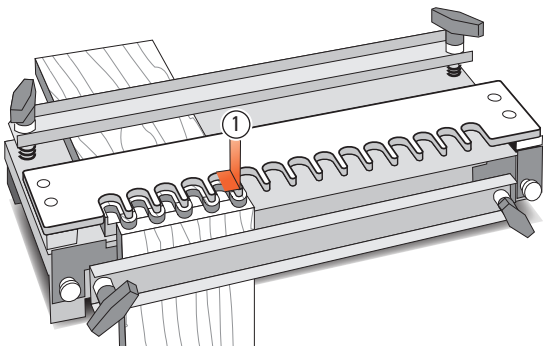
**11-3 Bit Angle and Depth of Cut** Half-blind pins and tails are routed with the **same** dovetail bit, the **same** guidebush, and the **same** depth of cut. A different depth of cut requires a different angled bit. Leigh offers five different angled dovetail bits for a range of cut depths. A lesser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



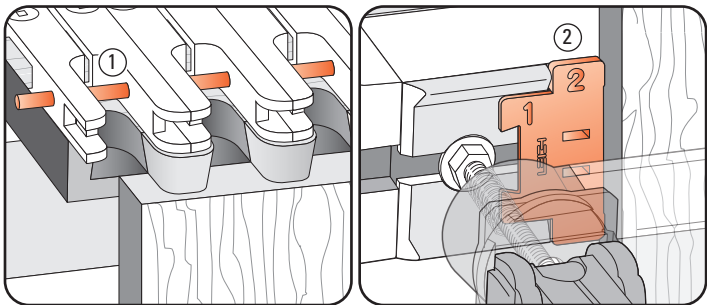
**11-4** Cumulative plus/minus tolerances in routers, bits and guidebushes, make it impossible to state exact bit depth for first-time precision fit. All dovetail jigs require trial and error tests to attain a fine fitting joint. The good news; we give a starting depth for each bit. Test and measure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



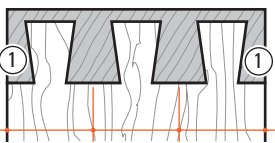
**11-5 Routing a Test Joint** You need a router, the **e7-Bush** set at No.10 (see chapter 3 for **e-Bush** instructions) and the 80-8 ½" [12,7mm] 8° dovetail bit. *Note:* The No 80-8 bit routs at a shallower ~½" [13mm] depth on single pass dovetails than on regular variably spaced joints. For this test, start with the No 80-8 bit projecting 1⅝" [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].

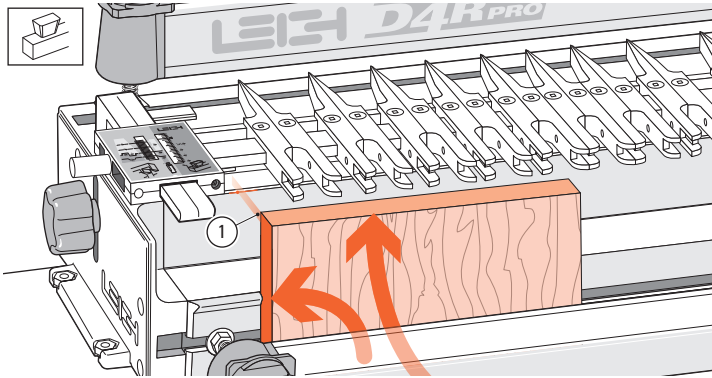


**11-7 Stop Rod and Dovetail Spacer** The stop rod is inserted in the fingers ① to convert them from deep tail sockets to a shallow fixed comb. The flexible stop rod is fed through the holes in the fingers from the “far” end of the jig. The **Dovetail Spacer** (note the dovetail shaped notch) snaps into 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.



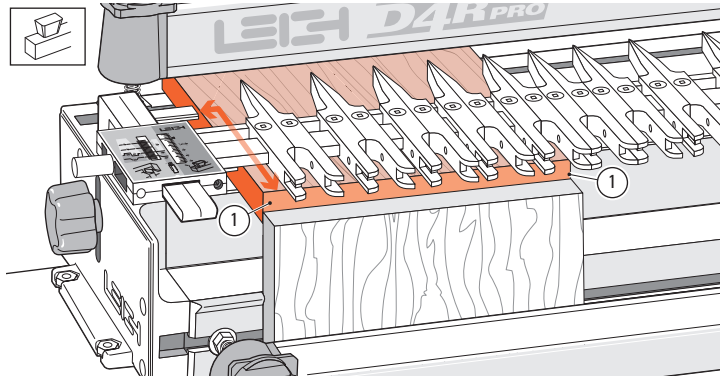
Single Pass Board Width Chart	
Add up to ¼" [6mm] or subtract up to 1/8" [3mm]	
2 3/16 [55]	8 11/16 [221]
3 1/4 [83]	9 3/4 [248]
4 3/8 [110]	10 7/8 [276]
5 7/16 [138]	12 [305]
6 1/2 [166]	13 1/16 [331]
7 5/8 [193]	-

**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 ⅛" [331mm]. Example: the 12" [305mm] can be up to 12¼" [311mm] or as small as 11⅞" [302mm].

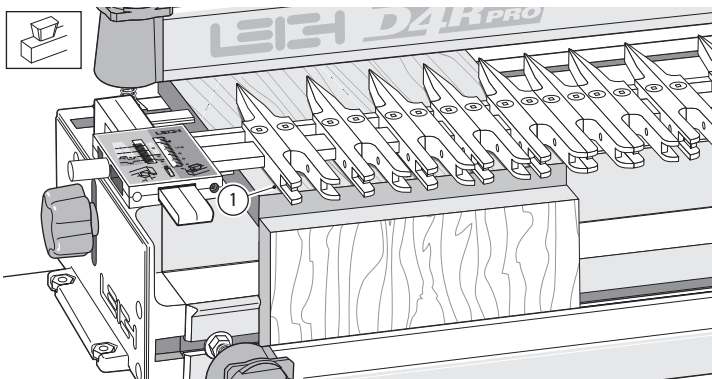


**11-9** With the finger assembly raised in the HB Tails mode, clamp a drawer side in the front left side, against the side stop and the top end edge slightly above the jig body top ①.

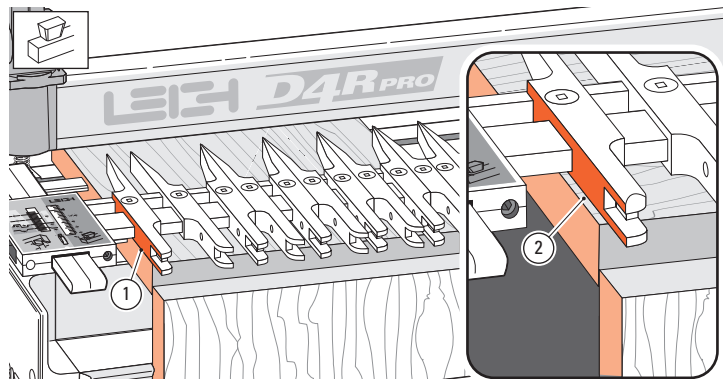
**Note:** Drawer side thickness can be from  $\frac{7}{16}$ " to  $\frac{9}{16}$ " [11mm to 14mm]. See 11-25 re drawer side thickness greater than  $\frac{9}{16}$ ".



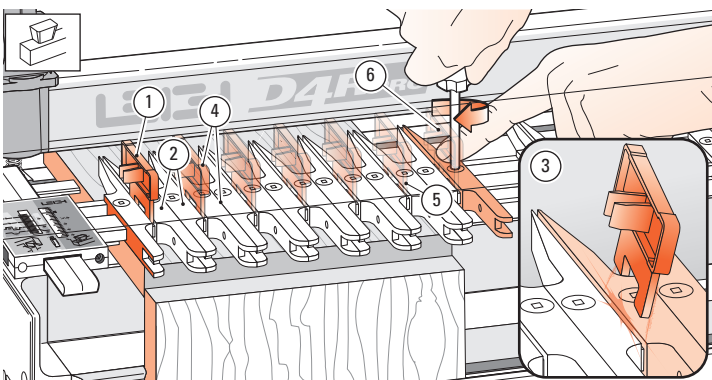
**11-10** Place a sample drawer front from  $\frac{5}{8}$ " to  $1\frac{1}{2}$ " thickness [16 to 38mm] in the rear clamp. Clamp with the side edge against the left rear side stop, front end edge touching flush across the rear of the front board ①. Note: the  $\frac{5}{8}$ " minimum thickness can be reduced if using other shallower bit depths. **! Board edges must be square.**



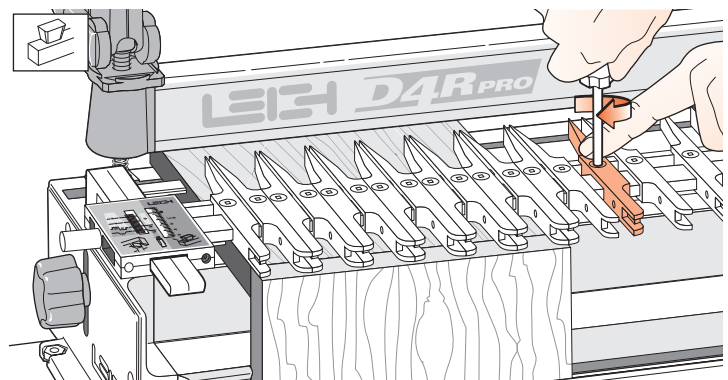
**11-11** With the scale set on  $\frac{1}{2}$ " [12,7mm], lower the finger assembly to about  $\frac{1}{8}$ " [3mm] above the drawer front to ease adjusting the guide fingers ①. **The scale is always set on the  $\frac{1}{2}$ " mark for single pass dovetails.**



**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 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.

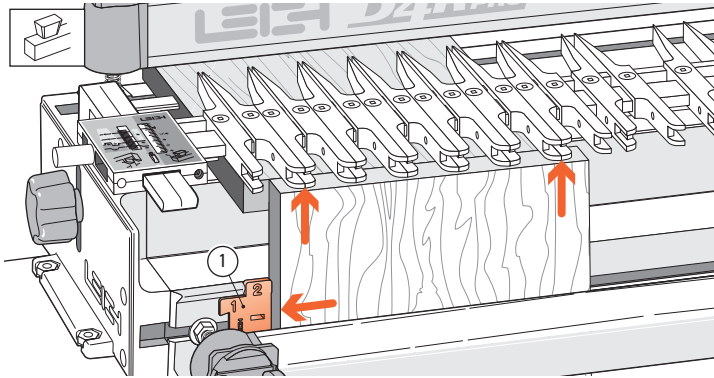


**11-14** Move any spare fingers so that they will support the router and **tighten all loose fingers**. Lower the assembly **flat onto the drawer front**.



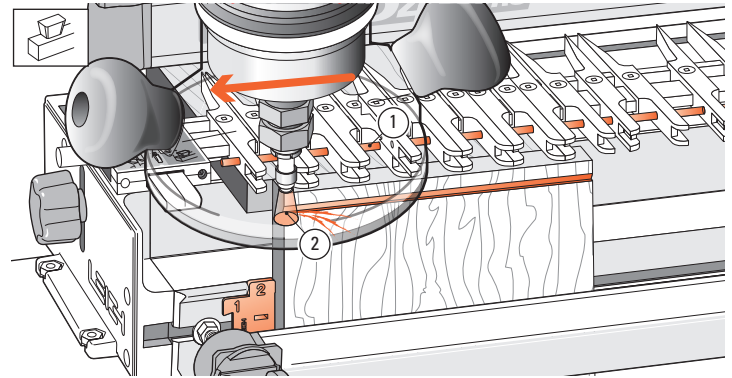
**REMEMBER SAFETY!**



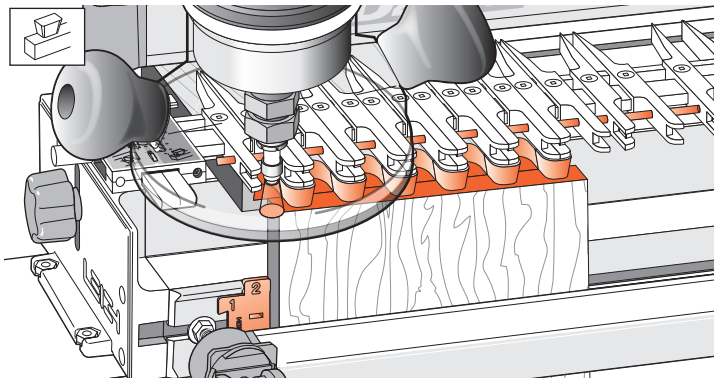


**11-15** Unclamp the tail board from the front clamp and insert the dovetail spacer as shown against the side stop ①. Re-set the drawer side in the front clamp so that its top edge touches the guide fingers and is perfectly flush with the top face of the drawer front and the left edge is against the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

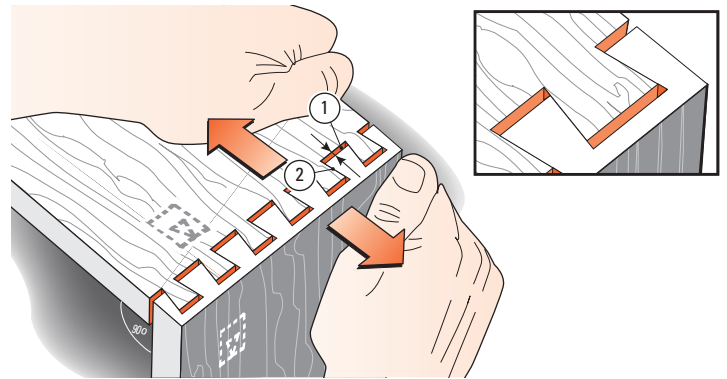
! Board edges must be square.



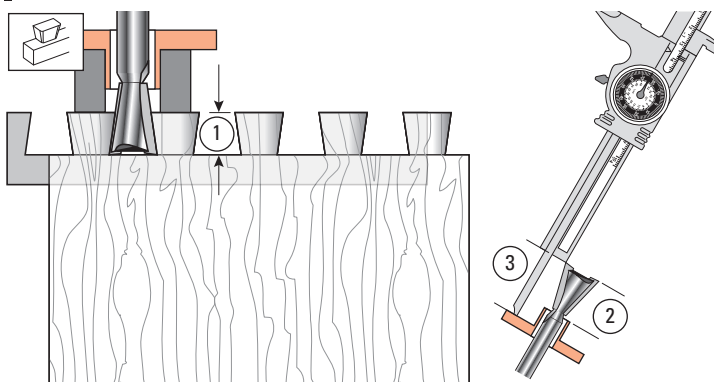
**11-16** Insert the Stop Rod through the holes in the fingers ①. For the first light cut move the router from right to left. **Make sure you control it firmly, because it is driven in this direction by the bit.** Only the tip of the bit should be cutting on the first cut ②. This back, or climb routing,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



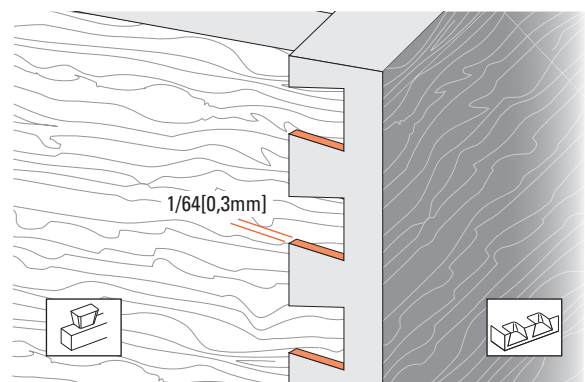
**11-17** Now rout in and out from left to right. Follow the guides in on the left of each finger opening to touch the stop rod and come out on the right. The pins, tails and sockets are formed simultaneously.



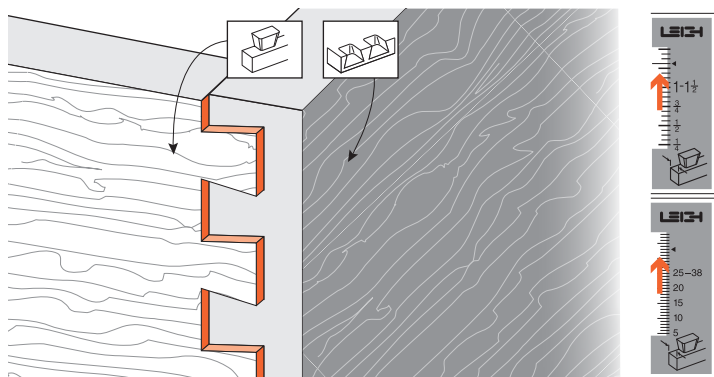
**11-18** Remove the boards and test the joint for fit. If the joint is loose, as shown here, lower the bit by the same amount as the gap at the bottom of the pins ① when the pins are pulled against the socket sides ②. If the joint is too tight, raise the bit slightly. Test again. You cannot rout the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



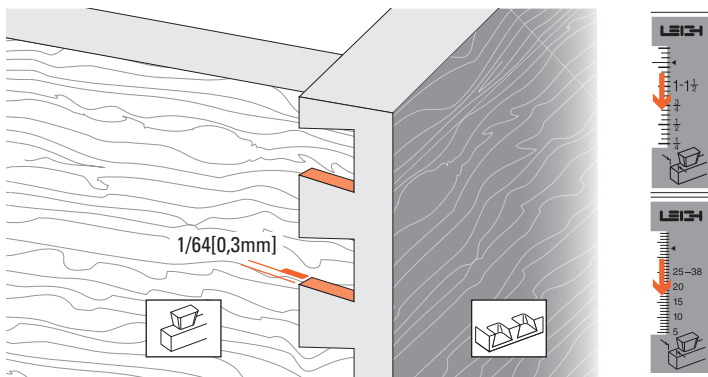
**11-19** Keep the test tail board that fits well, and mark it with the number of the bit you used to rout it. For quick set-up next time, clamp this tail board in the jig as a *depth-of-cut gauge* ① to show how far to lower the bit. Better yet, measure the bit projection from the end of the guidebush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



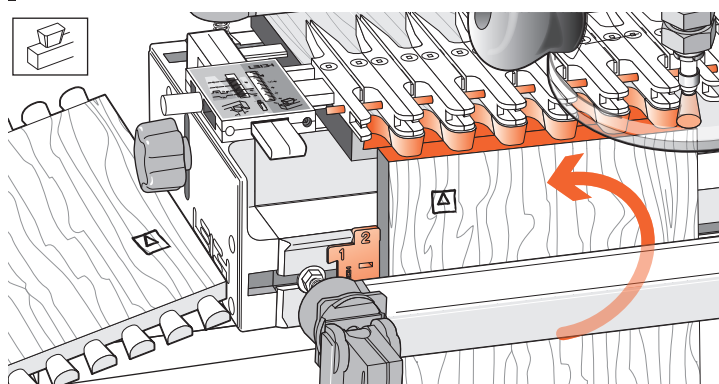
**11-20** When you have the proper tightness of fit, check the flushness. The tails should be under flush to the pins by *no more than 1/64" [0,3mm] to allow for cleanup (exaggerated here)*. Any concentricity errors in the collet and guidebush on different routers will affect this tolerance.



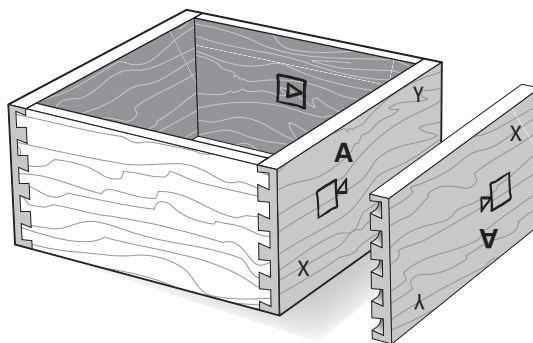
**11-21** If the tails stand out from the pins, set the HB TAILS scale **away from the operator** by half the amount required.



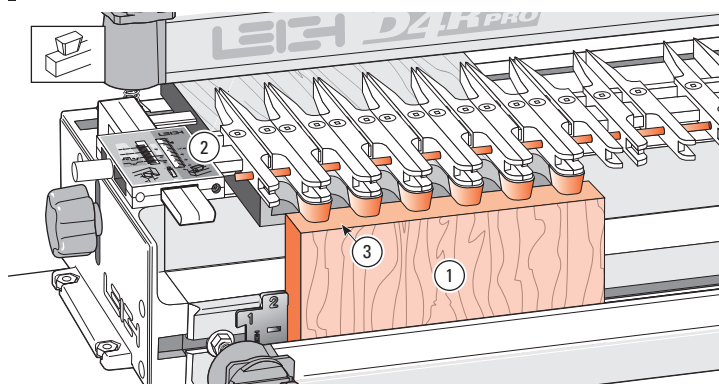
**11-22** If the tails fit in too far past the pins ends, set the HB TAILS scale **toward the operator** by half the amount required.



**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.



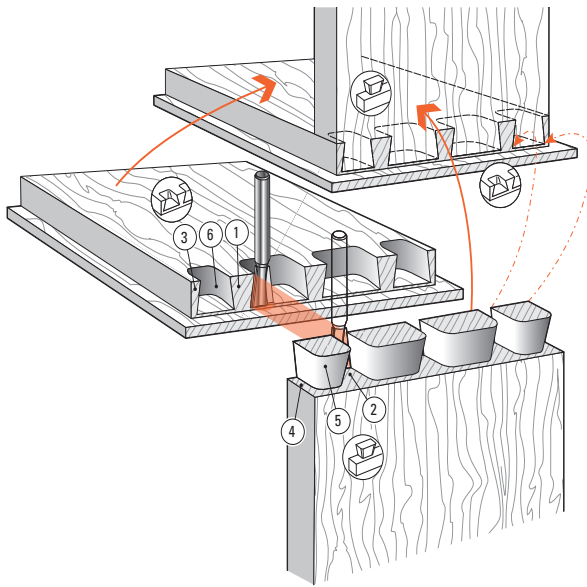
**11-25** For tail (drawer side) boards thicker than  $\frac{9}{16}$ " ①, **set the scale to  $\frac{1}{2}$ " ②** and leave the stop rod in place. **Do not** set the scale to the actual tail board thickness. With thicker boards, more of the inside portion of the tail board ③ will be routed away. Slight 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 e-Bush on 10. The depth of cut for each bit can be increased slightly by turning the e-Bush to a lower number. For example, if you turn the e-Bush from 10 to 9 you will have to increase the depth of cut by 0.014" for the 80-8 bit. If you turn the e-Bush two increments to number 8 you will have to increase the depth of cut by 0.028" 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

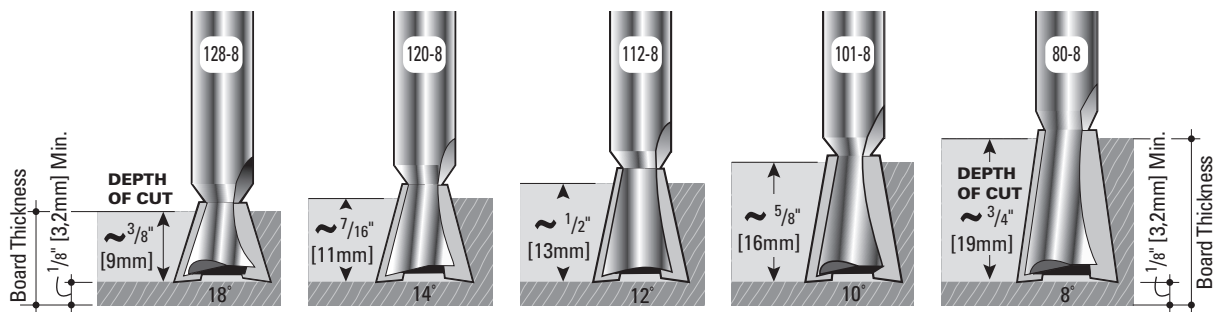
The pins fit in the pin sockets. Joints should almost always end each side with half-pins.

④ Half-pin sockets

⑤ Tails

⑥ Tail Sockets

### 12-2 Cutting Depth for Rabbeted Half-Blind Dovetails



**Note:** Add at least 1/8" [3,2mm] to the depth of cut for board thickness. ~ Symbol for "approximately"

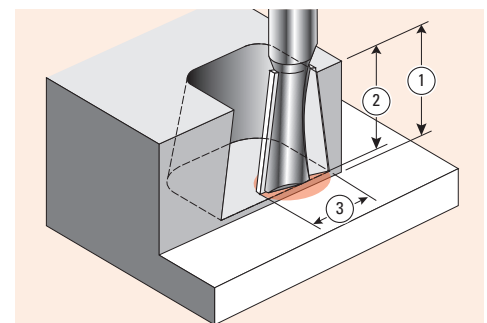
## ⚠ Important! Read This About Rabbeted HB Depth of Cut

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.

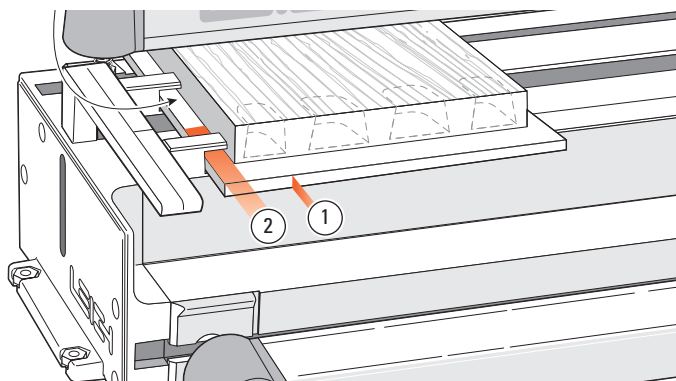
- Small Depth of Cut adjustments will change joint fit tightness. See 10-3 to 10-5 for why.
- Rabbeted Half-blind PINS and TAILS are routed with the same dovetail bit and must be at the same Depth of Cut.
- All half-blind dovetail bits work with the Leigh e7-Bush supplied with your Leigh jig or a standard 7/16" [11,1mm] outside diameter guidebush.



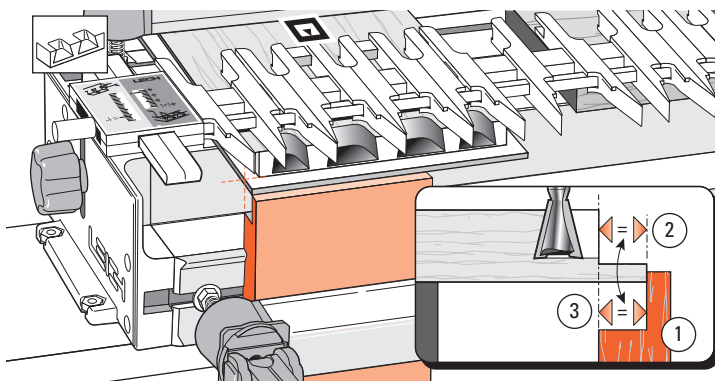
**RABBIT DEPTH** ① determines the **maximum depth of cut** ② you can use. Select a bit with a specified cutting depth that is at least 1/16" [1,6mm] **less** than the rabbet depth.

A dovetail bit will produce **only one specific cutting depth**.

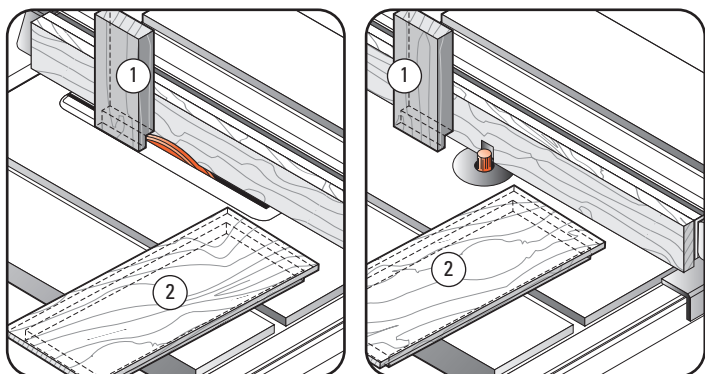
**Only** 1/2" [12,7mm] ③ cutting diameter bits can be used for half-blind dovetails.



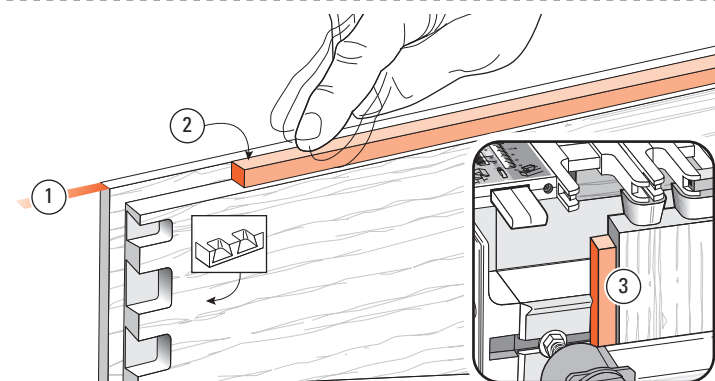
**12-3** Provided the drawer front lip is  $\frac{3}{8}$ " [9,5mm] or less in thickness ①, you can mount and rout rabbeted drawer fronts **and** sides exactly the same way as flush drawer fronts. If the lip is thicker or wider than  $\frac{3}{8}$ " [9,5mm] ② see 12-6 thru 12-8.



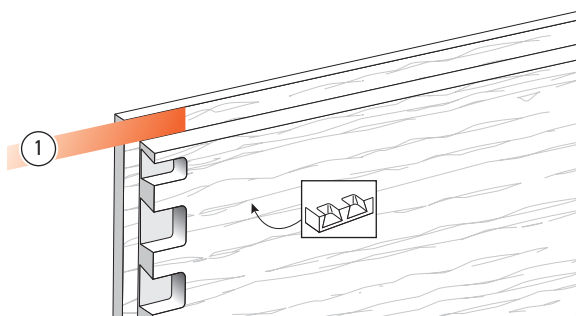
**12-4 Rabbeted Pins** You will need to clamp a scrap stop block ① in the front of the jig out from the jig's front face by exactly the depth of the rabbet ②. This brings the pin ends exactly in line with the front jig face ③, ensuring that the scale reading is accurate.



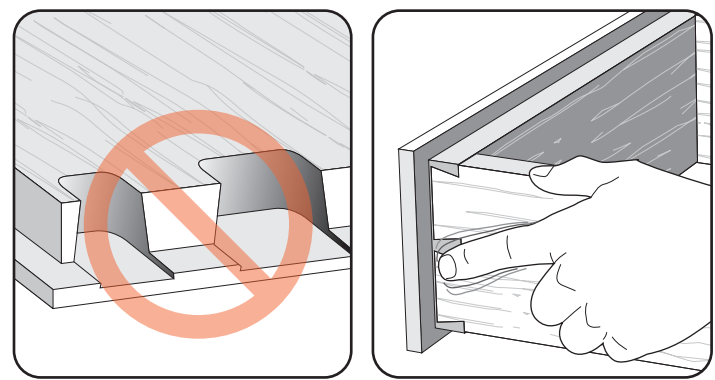
**12-5** An easy accurate way to do this is to rabbet the end of a scrap piece ① vertically over a dado blade or router bit at the same time as you rabbet the drawer front (horizontally) ②.



**12-6** If the lip thickness ① is greater than  $\frac{3}{8}$ " [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  $\frac{3}{8}$ " [9,5mm], the drawer side must be offset from the front side stop by the depth of the rabbet **minus**  $\frac{3}{8}$ " [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.

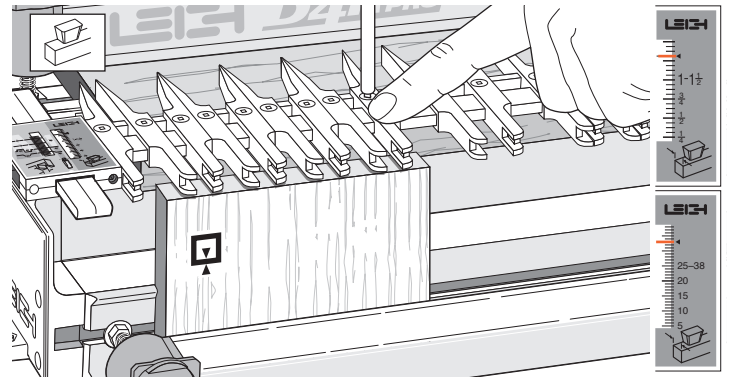
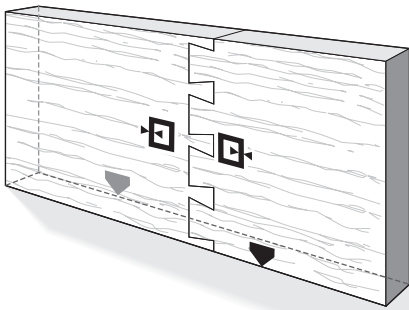
It is difficult to clean up the drawer sides and front corner after assembling a rabbeted drawer, so make sure the fit is flush before you complete the drawers (see 10-28 to 10-30). ■


## 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.




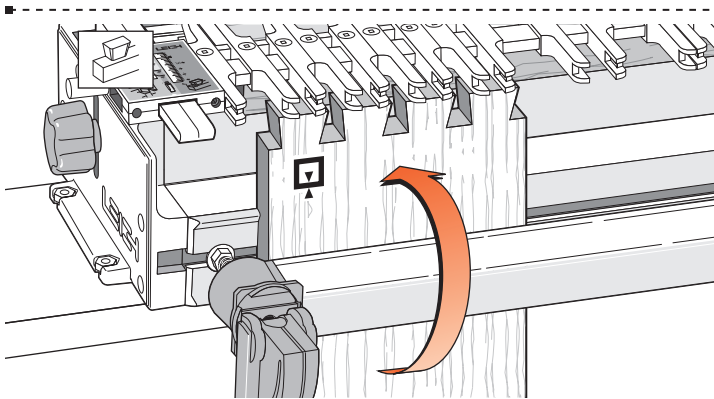
**If you have not yet routed half-blind dovetails or read through chapter 11, please do so now before attempting end-on-end dovetails.**



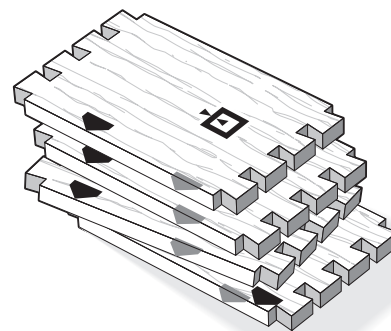
**13-1** End-on-end dovetails are made in the same modes as half-blind joints, *but both boards are routed vertically in the front clamp*, alternately face side in and then face side out . Boards for end-on-end joints may be up to  $\frac{3}{4}$ " [20mm] thick.

 Use only the guidebush, dovetail bits and depths of cut as specified in 10-32.

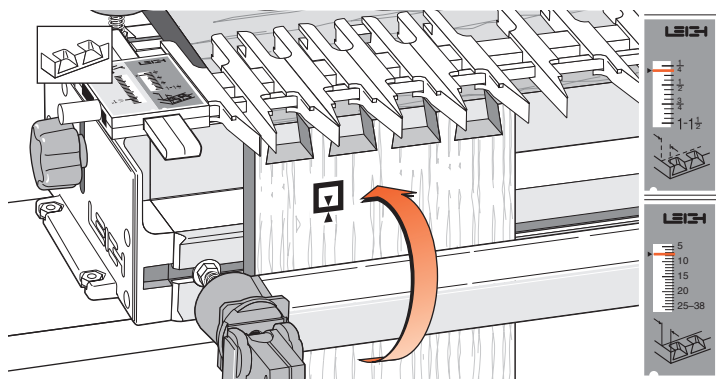
**13-2** The end-on-end dovetail is laid out in the  HB TAILS mode. There is a special mark on the scale for end-on-end dovetails. *Align the support bracket line with the small arrow as shown.* Adjust the guidefingers as required.




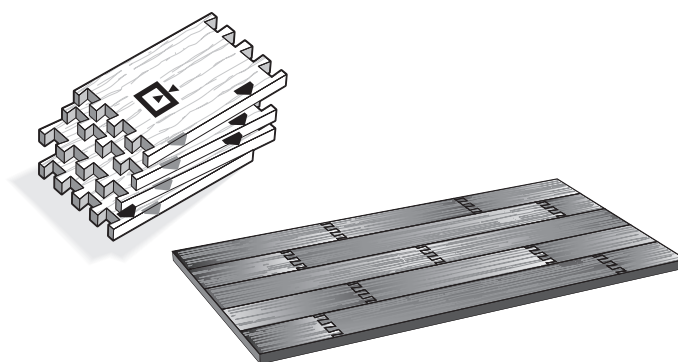
**13-3** Rout the tails. Clamp end-on-end dovetail boards in the jig for routing one end face side in and one end face side out. *Keep the same edge against the side stop for both ends.*



**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 ( $\frac{3}{4}$ " [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.



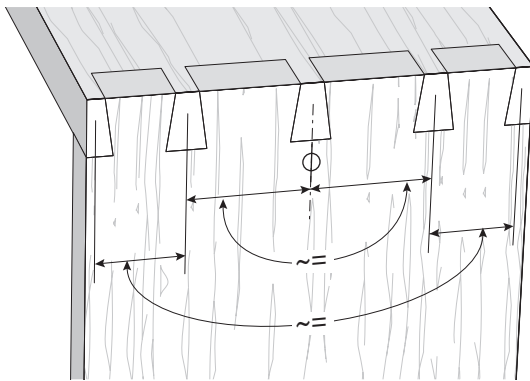
**13-6** Always assemble end-on-end joints keeping the edges of the boards that were against the side stop all in line.

### Applications for End-on-End Dovetails

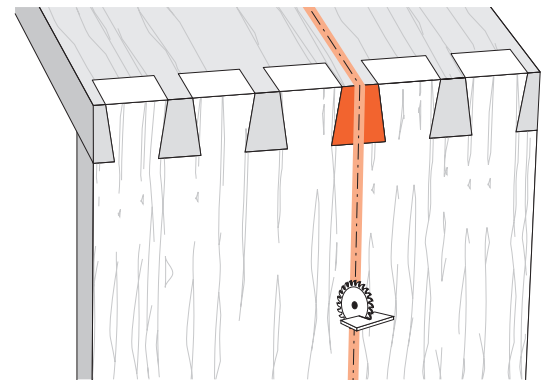
As one example, you can make a flat, stable, and attractive chest lid by edge-jointing and glueing end-on-end dovetailed boards. ■

## Asymmetric Dovetails

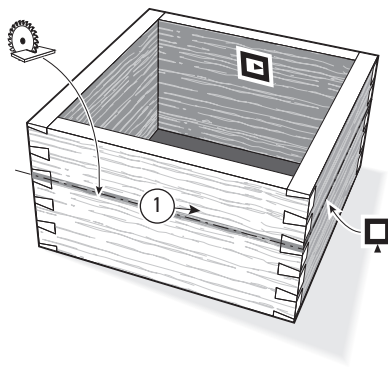
For certain procedures, you will need to use both ends of the Leigh D4R Pro jig. Asymmetrical joint layouts are one example. On the Leigh Jig, no joints will be truly symmetrical, but they can **look** symmetrical. Apparent symmetry is only required for aesthetic reasons, and not for strength. **Be sure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



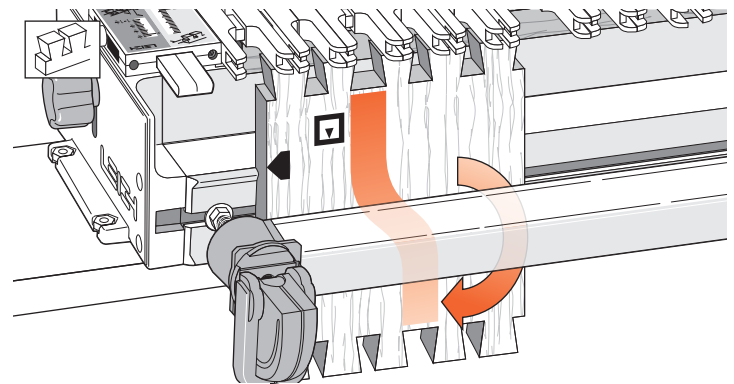
**14-1** By *symmetrical* we mean a joint that looks or is approximately symmetrical about its center line but is probably not, and need not be precisely symmetrical. Using the Leigh jig, it is easy to cut a joint that looks symmetrical; the pins will always align perfectly with the tails cut at the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

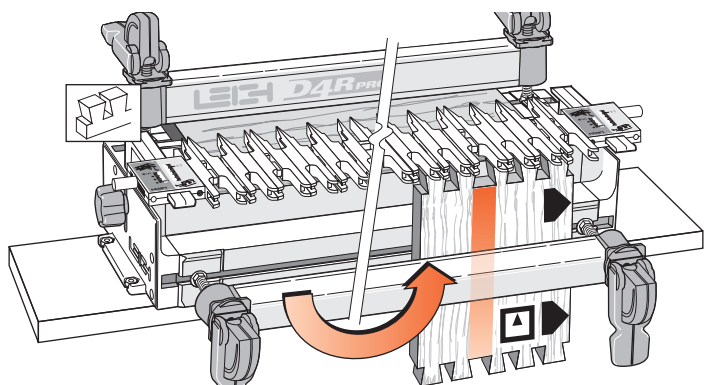


**14-3** So the chest and lid half-pins all look the same width after the lid portion ① is cut off.

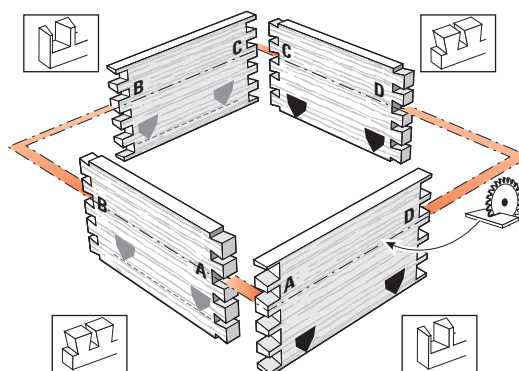


**14-4** In the chest example you can see that if both ends of the board are cut under the same guidefingers, the wide sockets and pins at opposite ends will not line up. Remember, the same inside face □ of the through dovetail tail board has to face away from the jig for each cut.

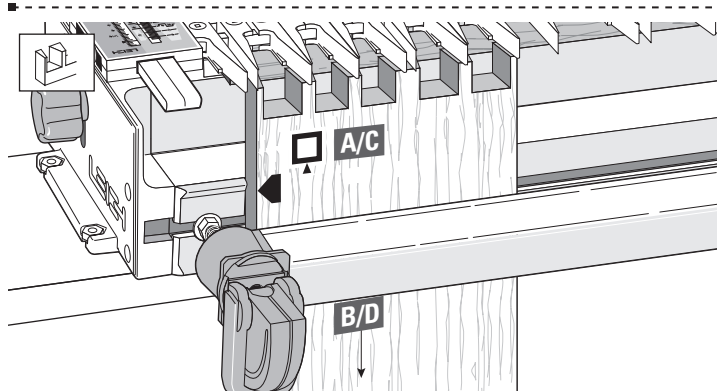




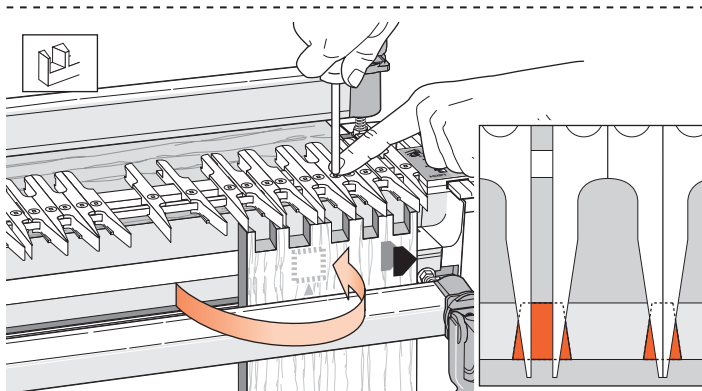
**14-5** Deliberately asymmetrical joints must therefore be routed on both ends of the jig using two separate, **almost** mirror-image layouts.



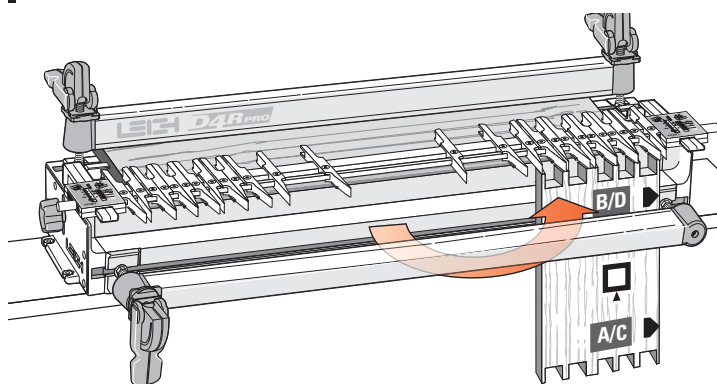
**14-6** The layouts need not be exact mirror images because the parts that fit together will be made on the same end of the jig. For a typical blanket chest you would rout corners **A** and **C** on one end of the jig and corners **B** and **D** on the other end. As long as the side stop marks all face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




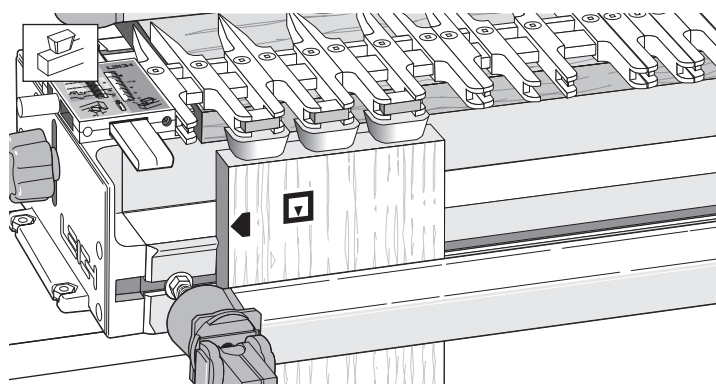
**14-7** Here is an easy way to cut these near-mirror-image joints. Lay out the **A** and **C** corner joints in the usual way (i.e., in the TD PINS mode). Rout the **A** and **C** corners' tails and pins. Leave the guidefingers set and in the TD PINS mode.



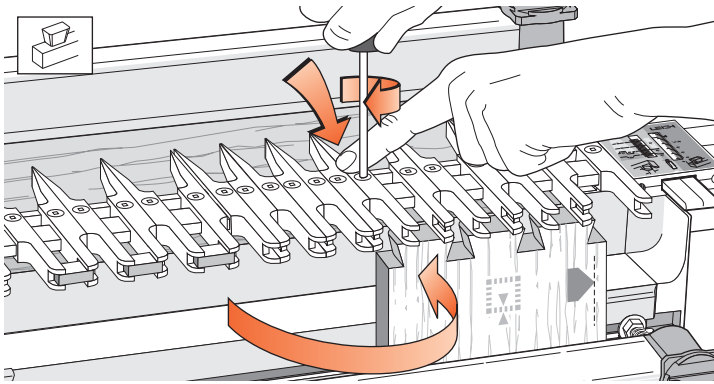
**14-8** Simply flip a completed **A** or **C** pin board from one end of the jig (like turning a page) to the other end, and center each pair of guidefingers over a pin.



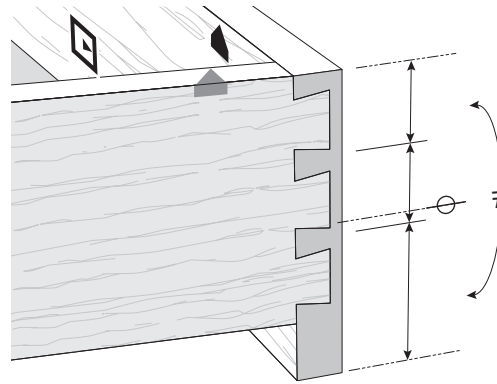
**14-9** Now rout the **B** and **D** corners' tails and pins using this guidefinger pattern. When you assemble the case, the **A** and/or **C** ends will fit each other, and the **B** and/or **D** ends will also fit each other. Keep the boards inside face  inwards on the case and the side stop edges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



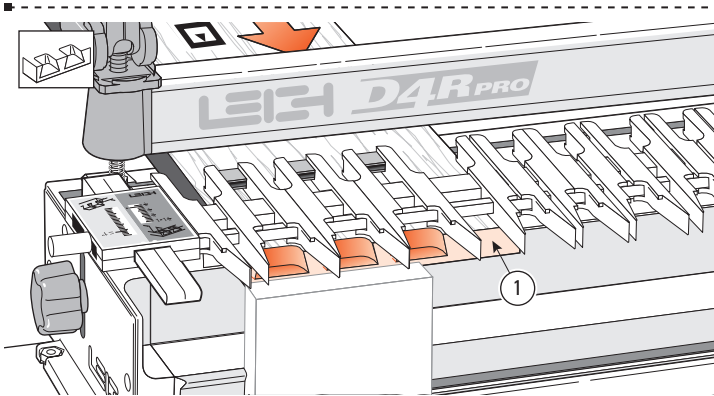
**14-10** To transfer a **mirror image** asymmetrical half-blind joint...



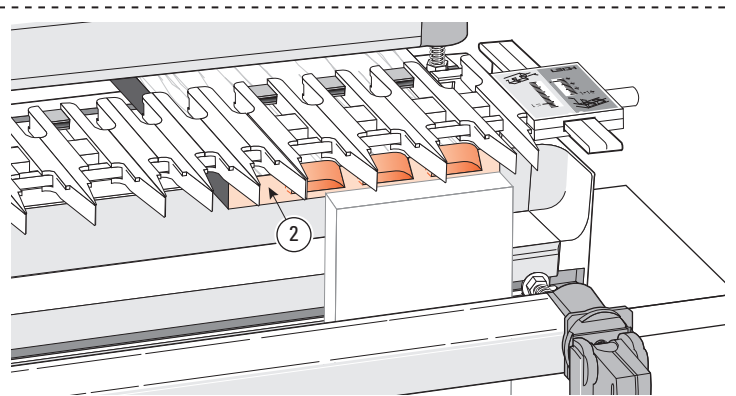
**14-11** Turn the tail board (like turning a page of a book) to the other end of the jig. Position the guidefingers over the tails, then rout the tails for the other drawers. This tail board layout may look symmetrical, but as the next illustration shows, it forms part of an asymmetrical joint.



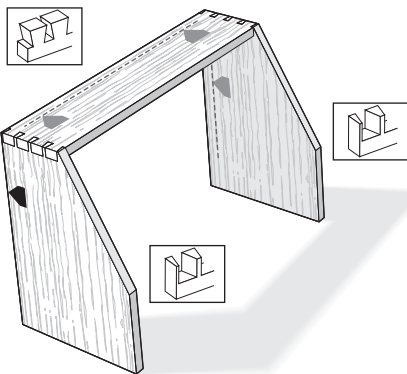
**14-12** This common example of asymmetry is where boards are of a different width. In this case, a drop-front drawer, the drawer front bottom half-pin is much wider than the top half-pin. The top edges of the drawer front and sides are flush, so it makes sense to use these edges against the side stops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



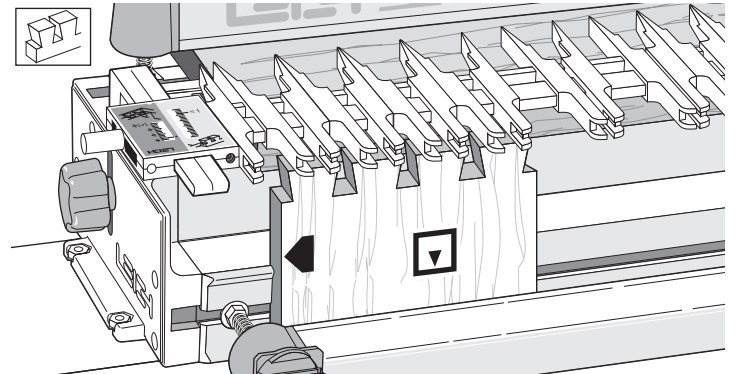
**14-13** Mount the right end of the drawer front on the left end, but do not rout this opening ①.



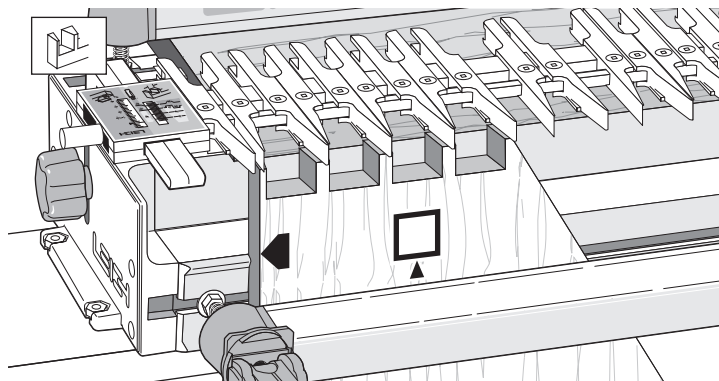
**14-14** Mount the left end of the drawer front on the right end, using the **mirror-image** layouts on both ends, but do not rout this opening ②.



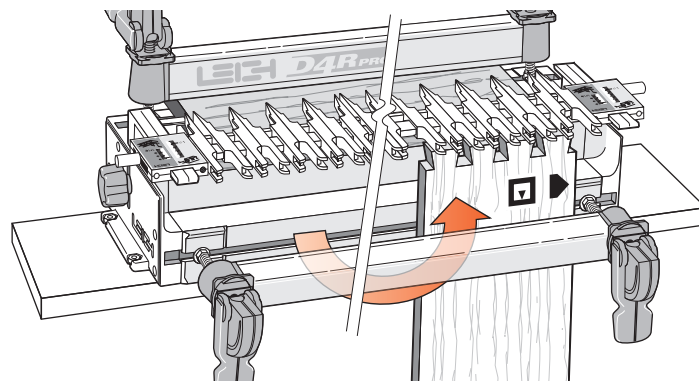
**14-15** Both ends of the jig are also used for the top corners of a slant-front desk. The joints themselves may be symmetrical, but they must be routed on opposite ends of the jig because the sloped front will not register accurately against the fixed side stops.



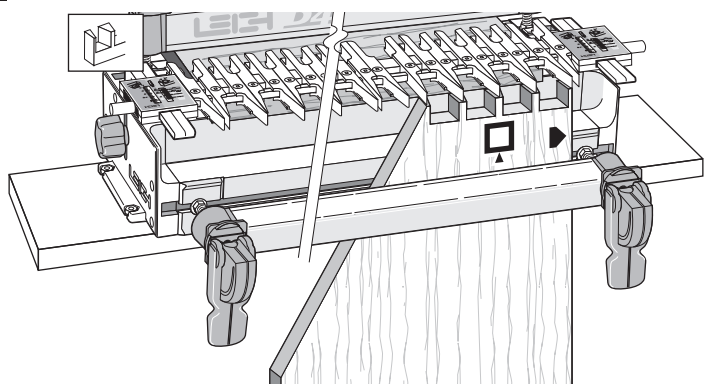
**14-16** At the back of the desk both sides and top are flush, so the rear edges are set against the side stops. Place the left end of the top tail board against the left side stop ◀. Rout the tails.



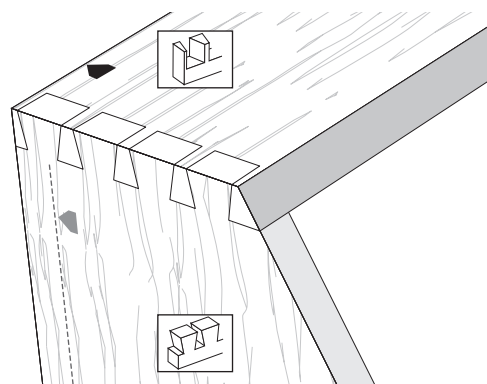
**14-17** The left side of the desk goes against the left side stop ◀. Rout the pins.



**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. ■*

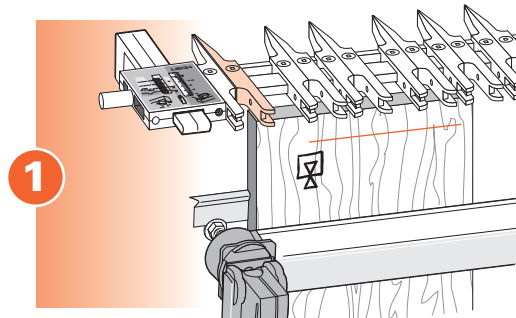
## Box Joints

### IMPORTANT: "Actual" Joint Sizes

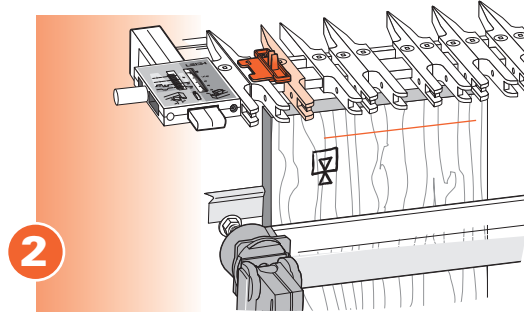
The D4R Pro finger assembly was originally designed solely for dovetailing. Adapting the assembly for box jointing was a serendipitous combination of luck (existing guides approximately the correct dimension) and clever design; the e7-Bush and Spacer. As a result, the nominal  $\frac{3}{8}$ " and  $\frac{3}{4}$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

### Concept of Operation

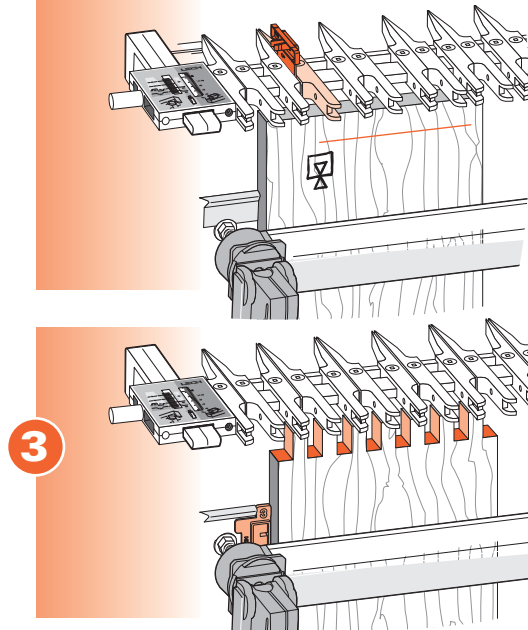
The first board is set against the side stop ①.



The Spacer is used to space the guide fingers ②.



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







**Choose your Board Width:**

Symmetrical joints: Use the red column





Asymmetrical joints: Use the grey column

Count the total sockets and pins in the first column

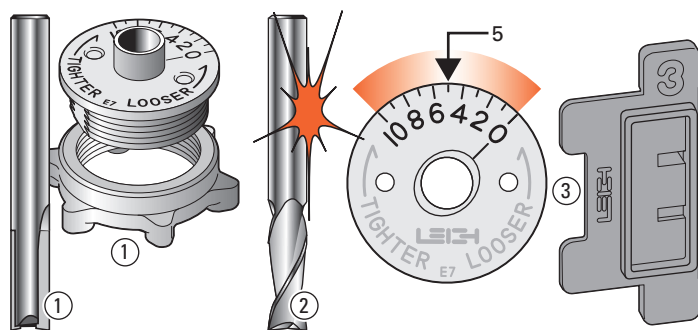
**Board Width - INCHES**

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

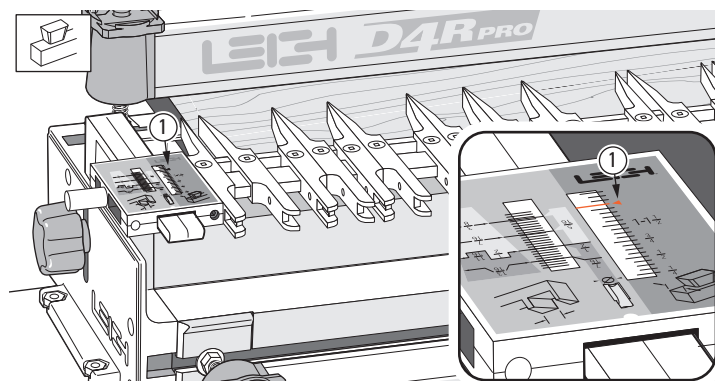
**Board Width - MILLIMETERS**

<b>9,5mm</b>		<b>19mm</b>	
Symmetrical	Asymmetrical	Symmetrical	Asymmetrical
			
1		1	
2		2	
3	29	3	
4		4	
5	49	5	59
6		6	
7	68	7	78
8		8	
9	88	9	98
10		10	
11	107	11	117
12		12	
13	127	13	137
14		14	
15	137	15	157
16		16	
17	167	17	176
18		18	
19	186	19	196
20		20	
21	206	21	216
22		22	
23	225	23	235
24		24	
25	245	25	255
26		26	
27	265	27	275
28		28	
29	284	29	294
30		30	
31	304	31	314
32		32	
33	324	33	334
34		34	
35	343	35	353
36		36	
37	363	37	373
38		38	
39	383	39	393
40		40	
41	402	41	412



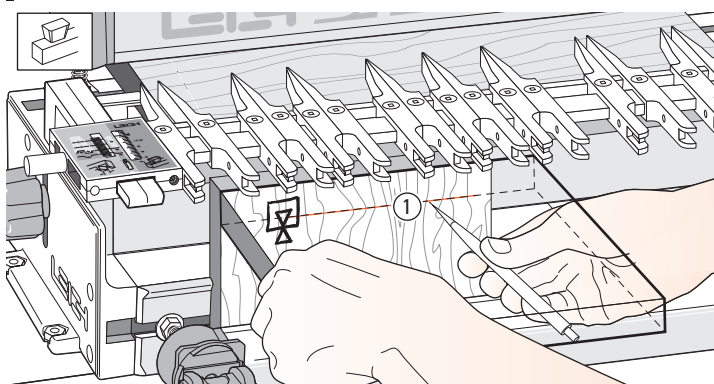


**15-1 Bit and Guidebush selection** Only the e7-Bush and the  $\frac{5}{16}$ " bit ① that came with the D4R Pro are required for box joints. Spiral upcut router bits ② will cut cleaner than straight flute. Where metric size bits are available an 8mm straight or spiral bit may be substituted for the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

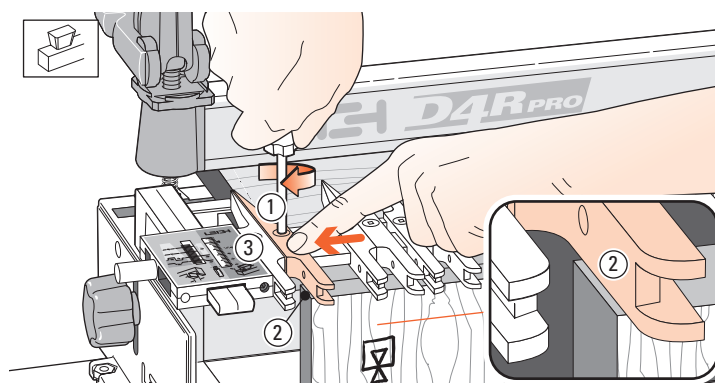


### 15-2 $\frac{3}{8}$ " [9,5mm] Box Joints.

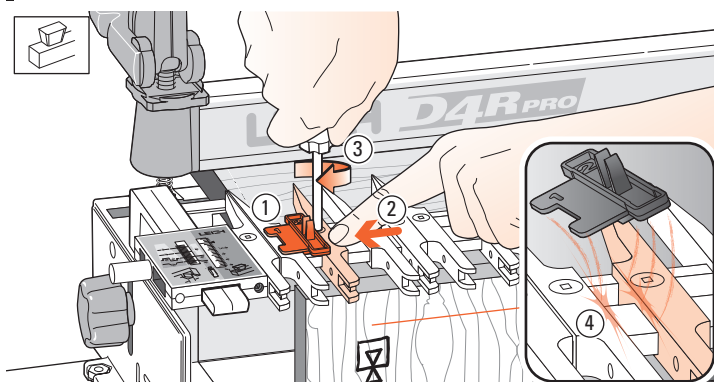
Place the finger assembly on the support brackets in the HB TAILS mode, set the scales on the **small triangular arrow** ① and lower the assembly onto the spacer board. All box joints are routed in this position. Note: maximum board thickness is 1" [25mm]



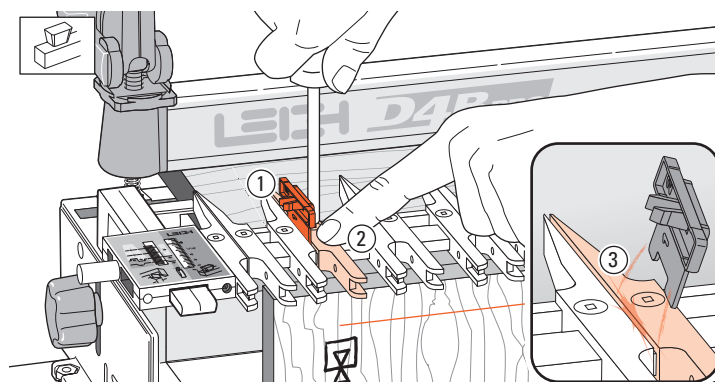
**15-3** Clamp a test board in the front left clamp, against the side stop with the top edge flush under the guidefingers. The board may be clamped face side in or out. Mark and adjust the depth of cut to suit the thickness of the mating boards ①.



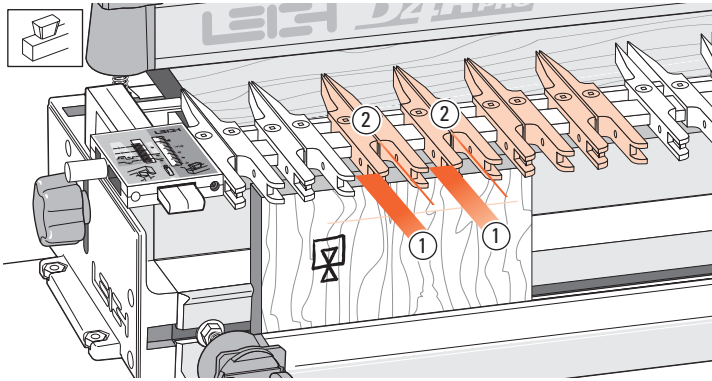
**15-4** Raise the finger assembly about  $\frac{1}{8}$ " [3mm] to allow ease of guide finger adjustment ①. Position the second guidefinger  $\frac{1}{32}$ " [1,0mm] in from the board edge ② and tighten the finger. The first finger stays against the scale block as a router support ③. *Note: Square ended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



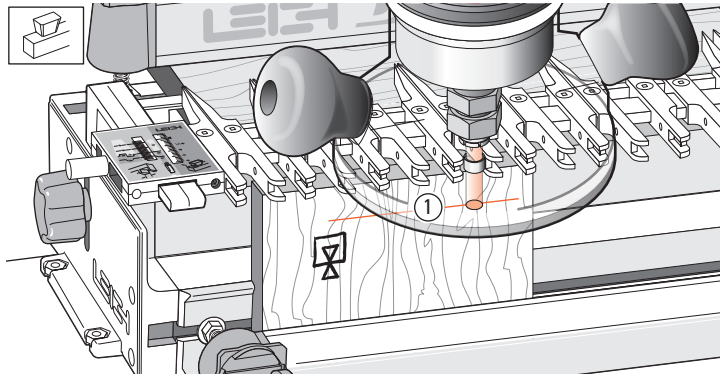
**15-5** Place the Spacer on the finger bar to the right of the second finger, numeral 1 on top overlapping the locked finger ①. Move the next finger in to touch the Spacer ②. Hold the guidefinger firmly against the Spacer and tighten the second finger screw ③. As you remove the Spacer you should feel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



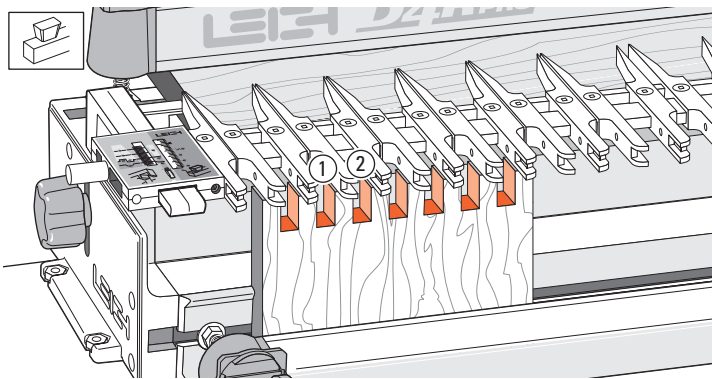
**15-6** Now place the spacer vertically on the right hand side of the third finger; the prongs to the left ①. Hold the guidefinger firmly against the Spacer and tighten the second finger screw ②. As you remove the Spacer you should feel some friction ③; this indicates that the guidefinger is correctly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



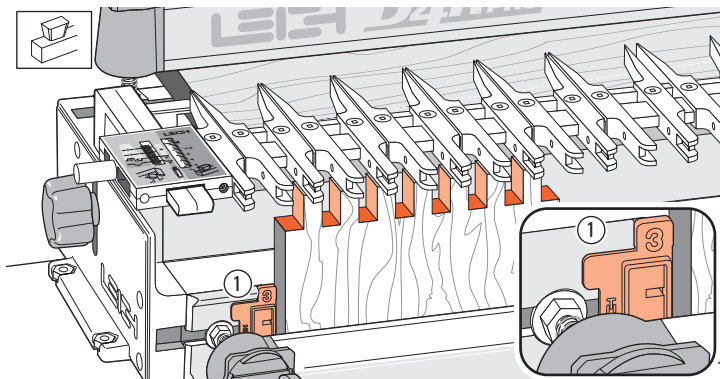
**15-7** Repeat this procedure across the jig until there is at least one guidefinger spaced past the right hand side of the work piece. Finger pairs should have a uniform  $\frac{1}{2}$ " [12,7mm] space between them ①, and .054" [1,37mm] gap ② between fingers of the same pair. Tighten the unused guides.



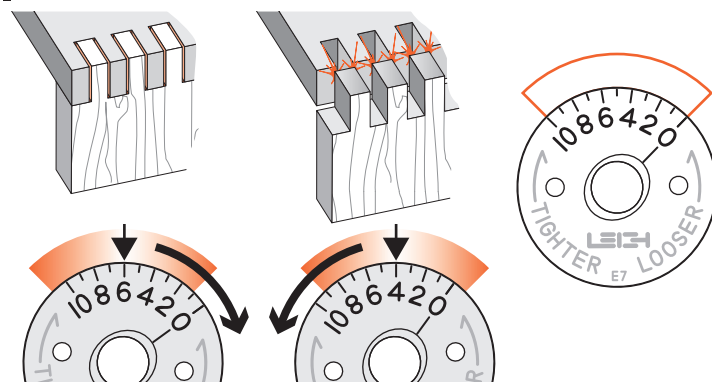
**15-8** Lower the finger assembly onto the spacer board and double-check that the bit depth is down to the center of the pencil line ①. Make sure the collet does not rub on the guidebush.



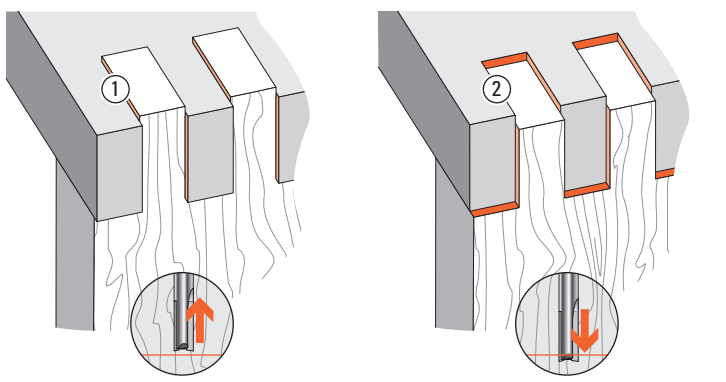
**15-9** Rout one end of the scrap board. Rout into each finger opening ① and between each finger ②. Make sure to run the guidebush on both sides of each opening.



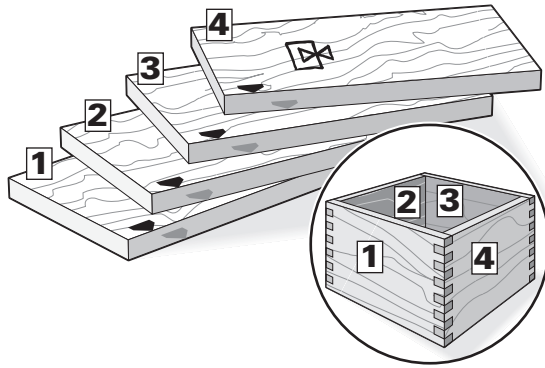
**15-10** Remove the board and fit the box joint Spacer against the front side stop with the **number 3** showing ①. Make sure it is fully home. Clamp the second test board with its side edge against the Spacer and its top edge touching the guidefingers. Rout this board. *Note: Square ended boards are 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 e-Bush nut after each adjustment.*

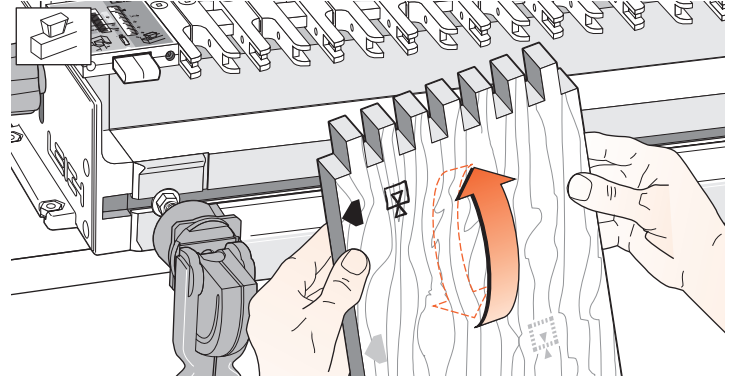




**15-12** If the joint is over-flush ①, raise the bit slightly. If it is under-flush ②, lower the bit.

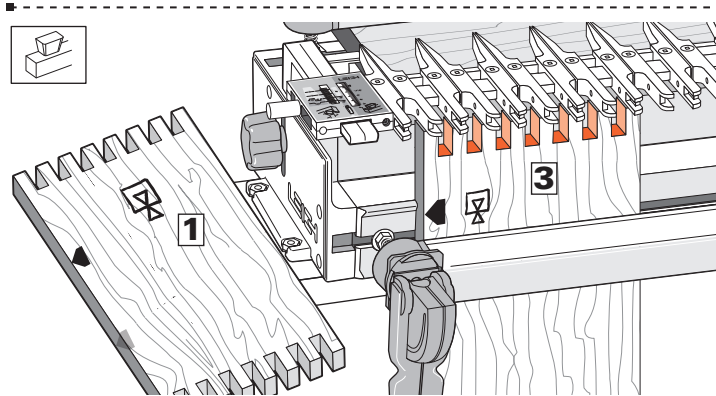


### 15-13 Lets make a box with $\frac{3}{8}$ " box joints..

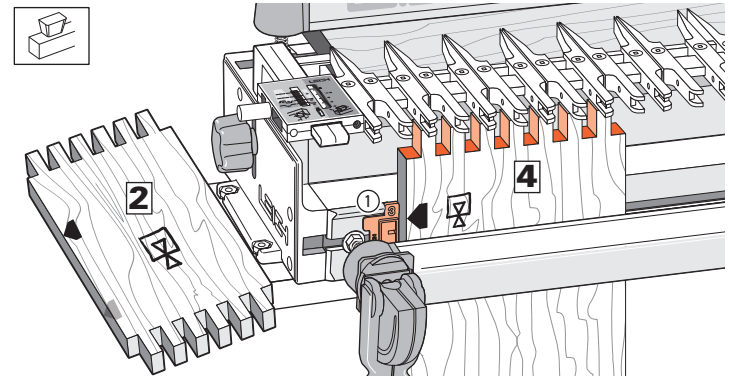
Prepare four boards and number them **1** to **4**. Then select the grain alignment and mark the common top (or bottom) edge **▶**. Don't worry about face side selection; this can be done after routing.



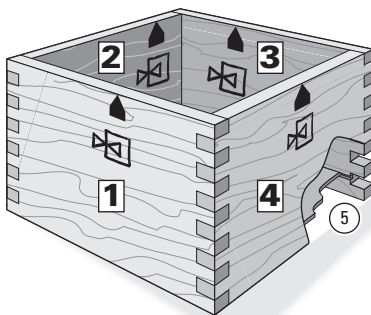
**15-14** All box joint boards are clamped alternating face side in  and face side out  always with the same side edge against the side stop (or Spacer).



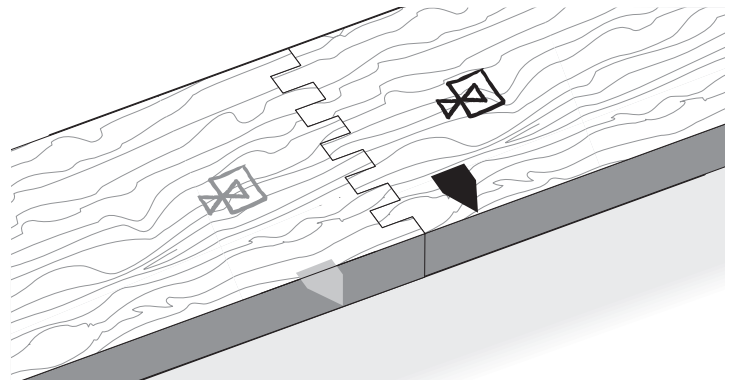
**15-15** Rout both ends of boards **1** and **3** with their edges against the side stop. Be sure to keep the same edge to the stop.



**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.

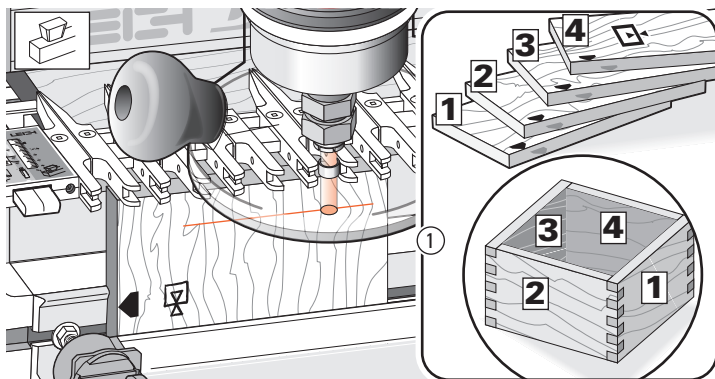


**15-17** Keeping the marked side stop edges of all boards toward the top (or all to the bottom) of the box, select the preferred outside faces before routing the grooves **⑤** for the bottom.



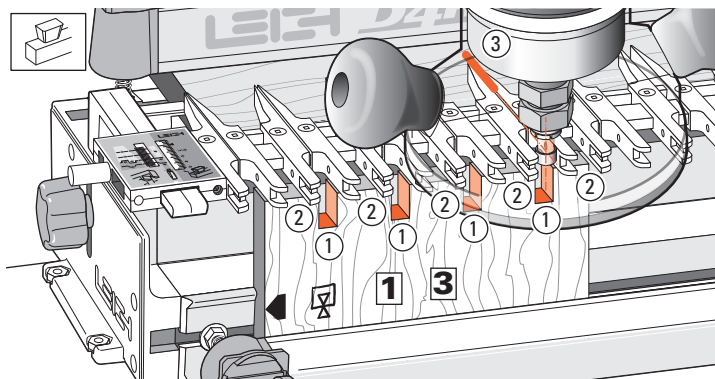
**15-18** The same method will produce end-on-end joints.





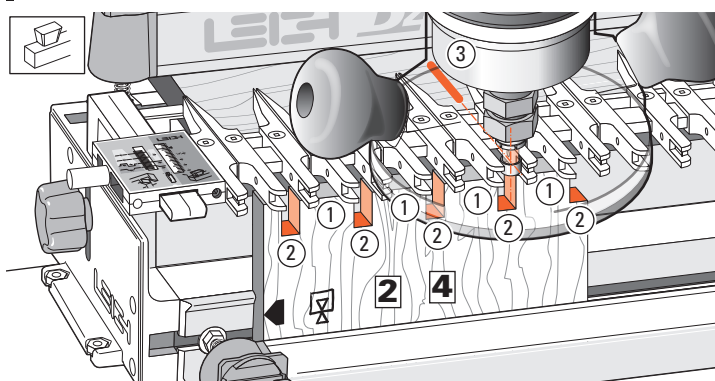
**15-19 3/4"[19mm] Box Joints** Set-up and space the guide fingers exactly as for 3/8"[9mm] joints. Start with the same e7-Bush setting. See 15-2 thru 15-9.

Prepare four boards using the board width chart for 3/4"[19mm] joints and number them **1** to **4** around the box **1** with the common edges marked.



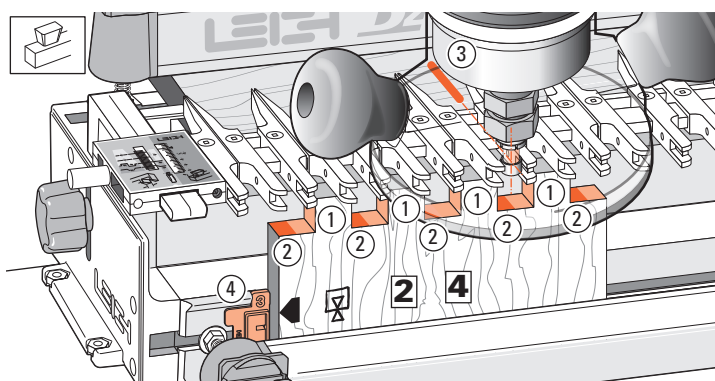
**15-20** Rout both ends of boards **1** and **3** but only rout between the guide finger openings **1** not between the finger sides **2**. Keep the common edge against the side stop.

*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.

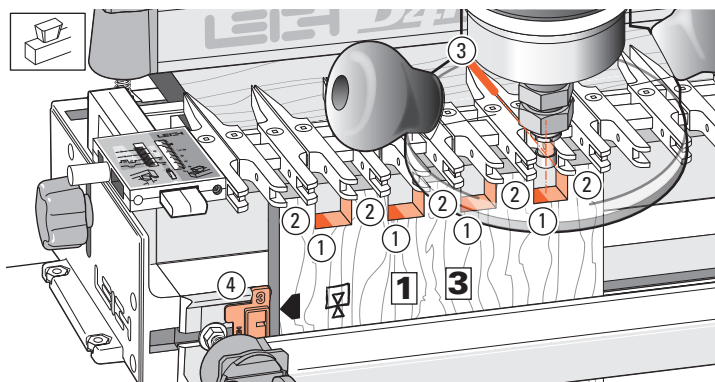


**15-21** Now rout both ends of boards **2** and **4**, with the common edge against the side stop but only rout between the finger sides **2** not between the finger openings **1**.

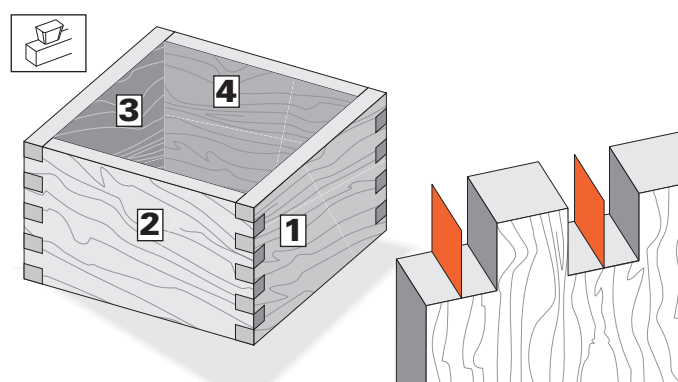
*Hint:* Now steer the base 12 o'clock mark between the pairs of finger points **3**.



**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 3/4"[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. ■



## D4R Pro - CHAPTER 16

# Sliding Dovetails



Routing sliding dovetail "slots" across the face grain of horizontal boards is very tough on dovetail bits. **Always use the largest shank size available to you;** we recommend at least 8mm shanks, but 1/2" would be even better, with of course the appropriate guidebush.

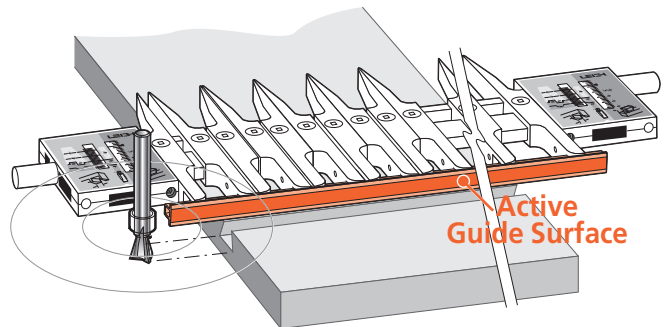
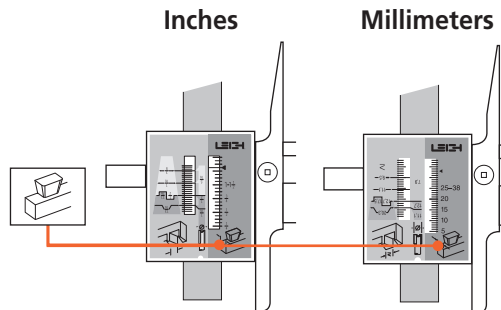
If you have to use 1/4" shanks in hardwood, use a second router to rough out the slot centre with a straight bit.

While we recommend 5/8" [15,9mm] as the ideal size guidebush for sliding dovetails, we appreciate that many users will have only a 7/16" bush. These instructions cover both those guidebushes.

**1**

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

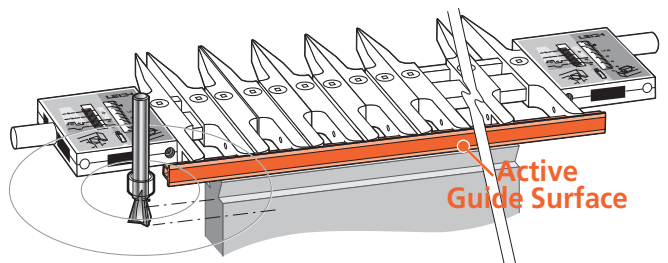
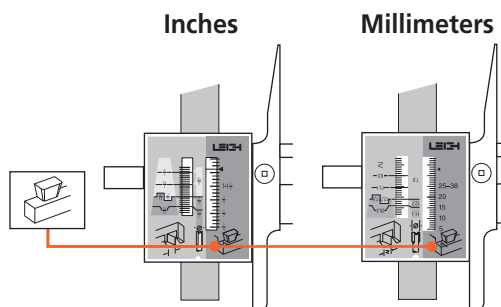
Sliding Dovetail slots are cut across the board face.

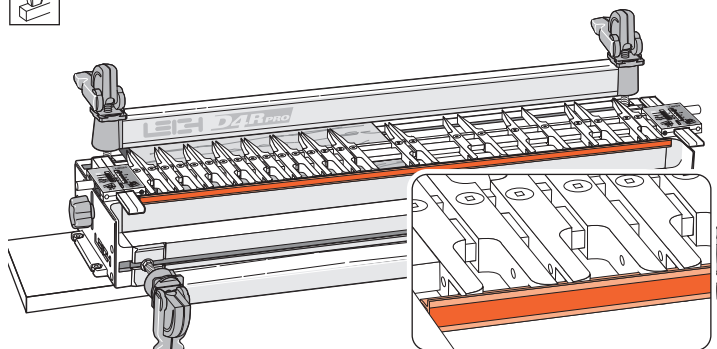

**2**

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

**3**

Sliding Dovetail tails are cut across the board end edge

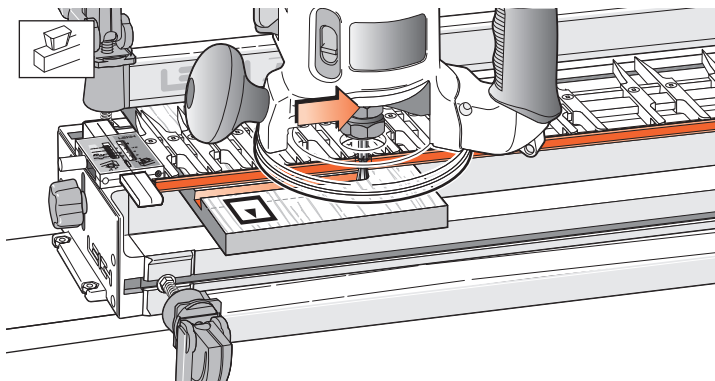




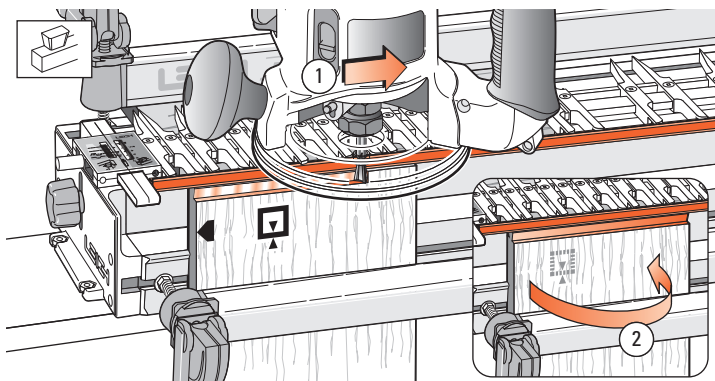
**16-1** With the finger assembly in HB TAILS mode, the cross cut fence fits into the recesses in the ends of the tail guides for routing sliding dovetails.



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

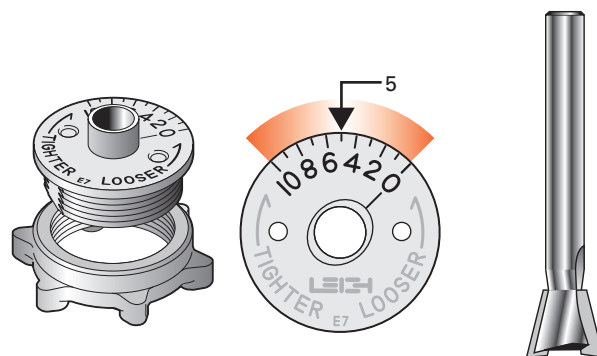


**16-2** Using the cross cut fence as a guide surface for the guidebush, you can make lateral router cuts across the faces of horizontal boards (we call these dovetail *slots*), and...



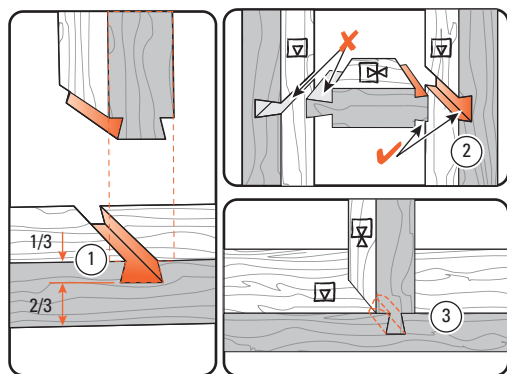
**16-3** Across the top ends of vertical boards to cut the tail. First rout one side ①...

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

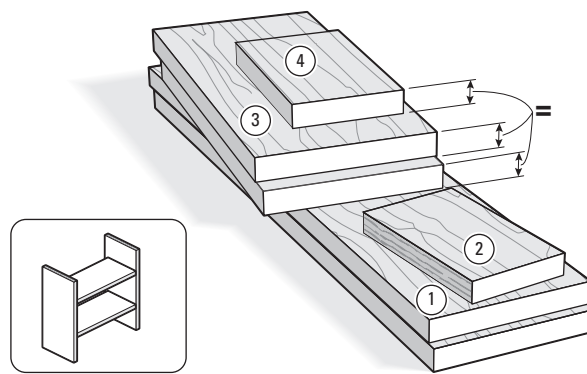


**16-4** Turn the e7-Bush to “5” and use the No. 120-8, 1/2" x 14° bit for sliding dovetails. This e7-Bush setting will allow for fine fit adjustment of the tail later.

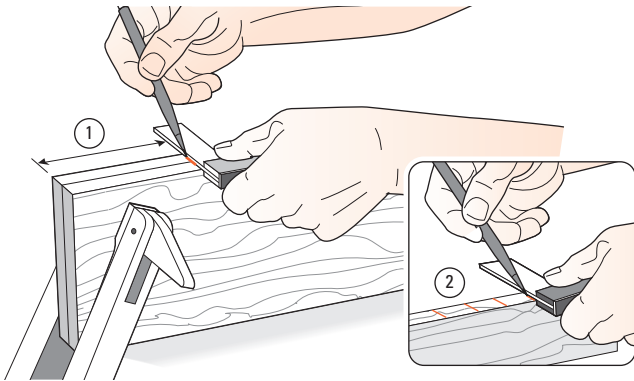
A standard 7/16" [11,1mm] guidebush (min. depth 1/4" see page 69) can be used but without the fine adjustment provided by the e7-Bush.



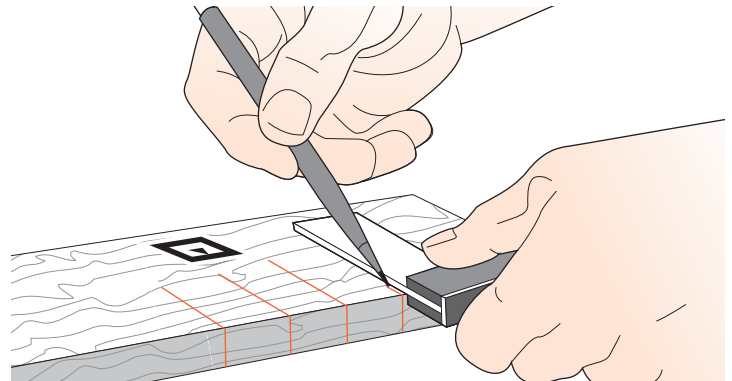
**16-5** On a full width joint, the slot depth-of-cut should be no more than 1/3 the board thickness ①. If the tail board is a load-bearing horizontal member (e.g., bookshelf or step), make the tail fairly thick for good tail neck strength ②. Shorter sliding dovetails for less structural demand may be slightly deeper, with narrower profiles, especially if appearance is important ③ (e.g., where narrow rails join wider boards).



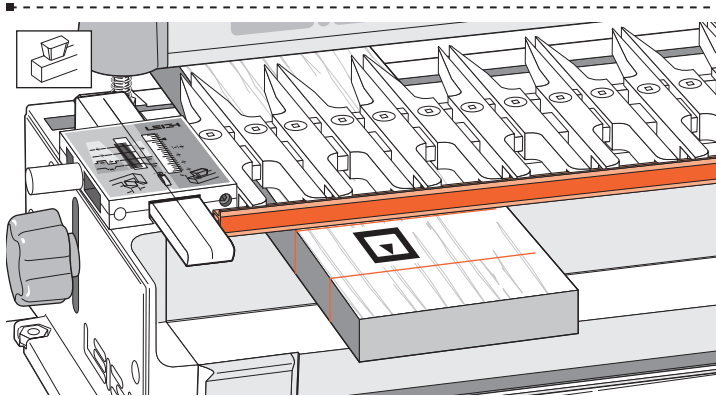
**16-6** Use 3/4" x 5 1/2" [20x140mm] softwood to make two slot boards ①, plus one narrow test slot board ②, two tail boards ③ and one narrow test tail board ④. The tail boards ③ and test tail board ④ must be exactly the same thickness. This will make two uprights and two shelves.



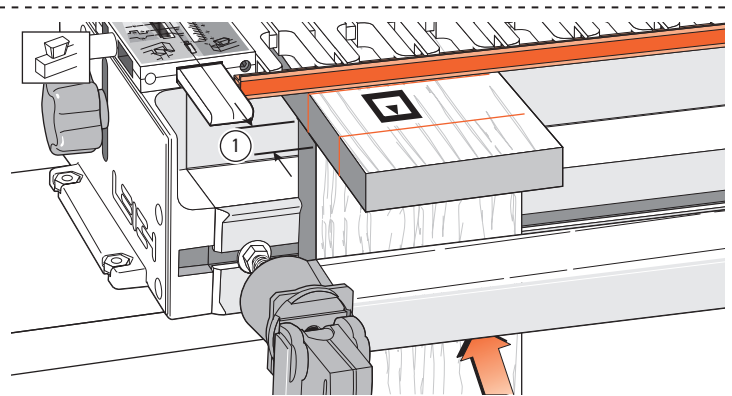
**16-7** Marking Out: *Do not mark slot positions on board faces; mark the edges ① of both slot boards together for perfectly level shelves. Mark the narrow test slot board in the same way at several closely spaced random spots ②. This board is used only for setup.*



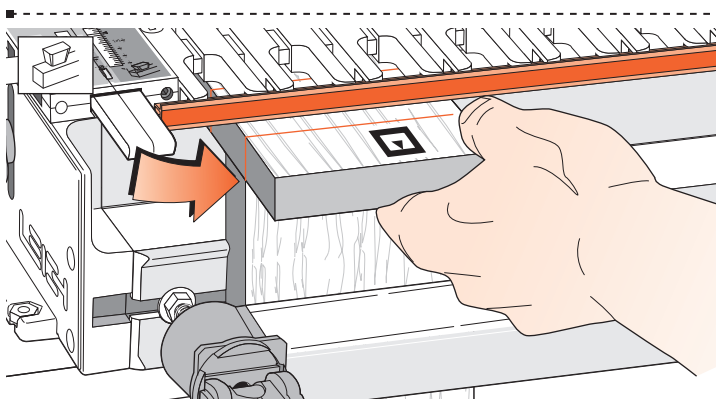
**16-8** *On the test slot board only, square the marks across the face.*



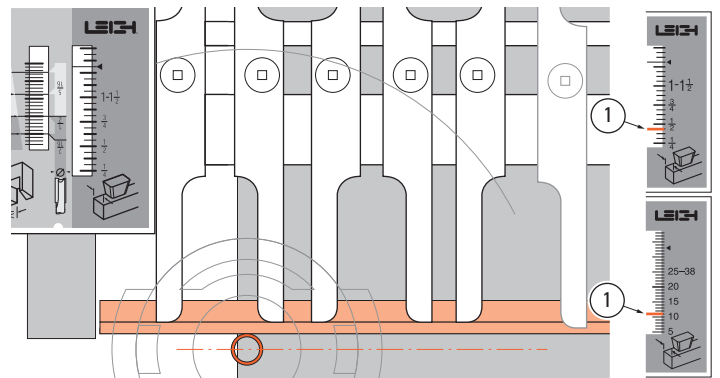
**16-9** Mount the test slot board in the rear clamp, markings up. ▲ Dovetail slots are best routed from left to right because the bit's clockwise rotation pulls the guidebush against the fence. But when routing close to both ends of a board, you may need to rout slots from right to left. *See 16-30.*





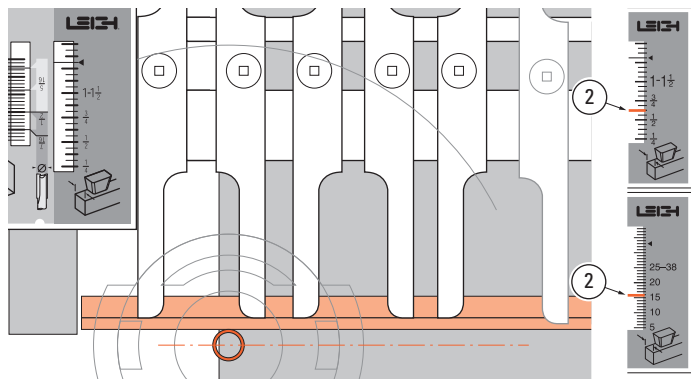
**16-10** Mount a  $\frac{3}{4}$ " [20mm] thick ① (*yes, the  $\frac{3}{4}$ " [20mm] thickness is important*) square-ended board vertically in the front clamp against the side stop, with the top edge butting the underside of the test board.



**16-11** Position and clamp the test board so that one of the edge marks is in line with the *outside edge* of the vertical board.

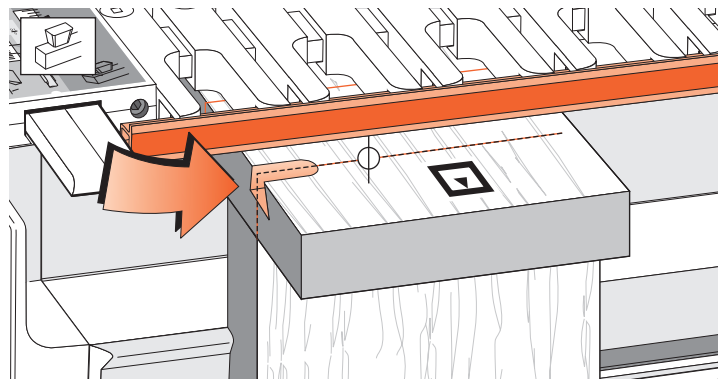


**16-12** With the finger assembly (including the cross cut fence) on the support brackets in the  HB TAILS mode, set the scale to  $\frac{7}{16}$ " [11mm] ①. *Make sure the finger assembly is level and sitting flush on top of the board.* The  HB TAILS scale was not designed for this operation, but with this setting the routed slot will be close to centered on the slot line.



**16-13** If you use a larger guidebush, for example  $\frac{5}{8}$ " [15,9mm] rather than  $\frac{7}{16}$ " [11,1mm], move the scale in by the difference of the two guidebush radii.

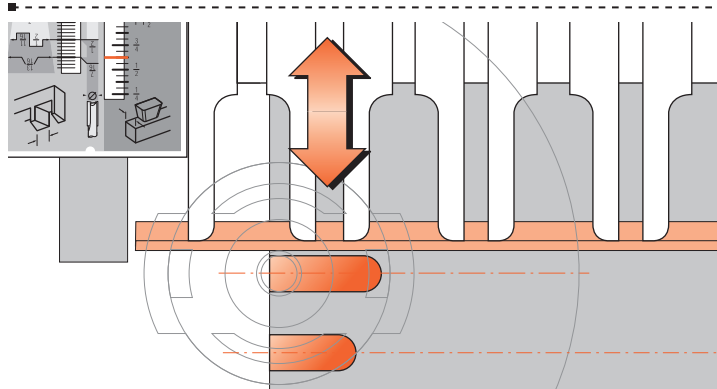
E.g., suggested scale reading for a  $\frac{5}{8}$ " [15,9mm] guidebush would be  $1\frac{1}{32}$ " [9mm] ②.



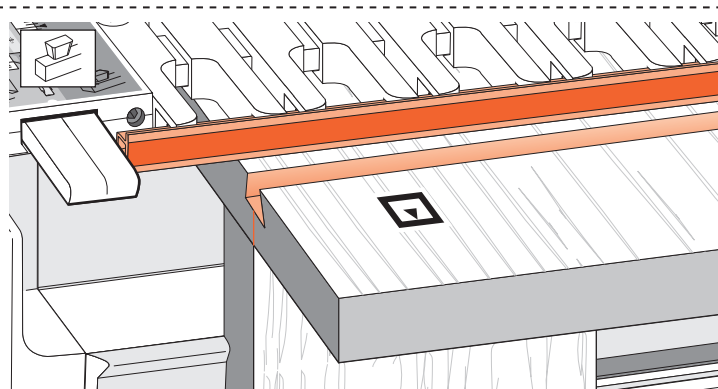
**16-14** Adjust the bit so the cut depth is about  $\frac{5}{16}$ " [8mm]. Rout from left to right maintaining light inward pressure of the guidebush on the fence. Rout in only about 1" [25mm] and back out again.




**Do not lift the router.**

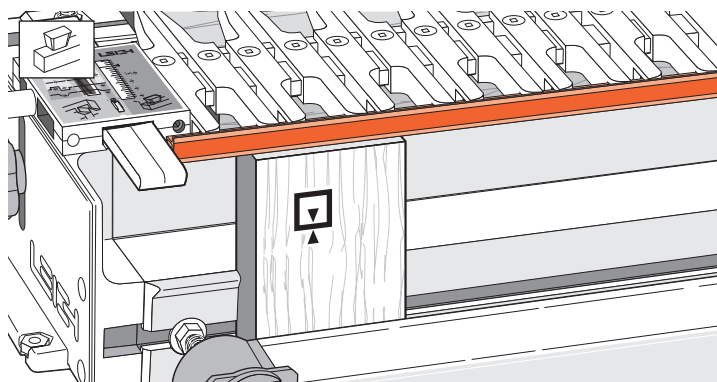



**16-15** Check to see if this short slot is centered on the pencil line. If not, adjust the finger assembly in or out and retest on the other lines as necessary until the slot is centered. Lock the finger assembly in this position and record the setting for future reference.

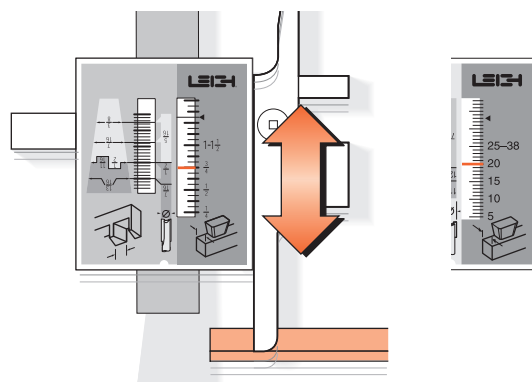



**16-16** Now rout sliding dovetail slots in the two main slot boards with the boards in the horizontal position in the rear clamp, slot side, that is inside face  up.

The guidefingers must be flush on the board.

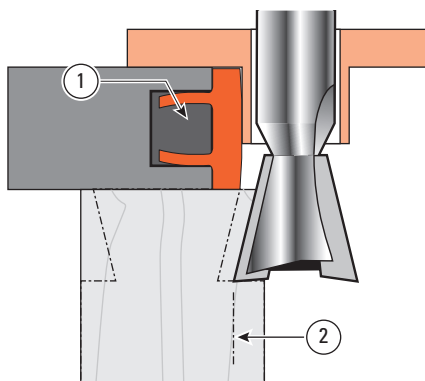


**16-17** Replace the spacer board in the rear clamp, and with the finger assembly on the spacer board, mount a test tail board vertically in the front clamp, **flush under the guidefingers**. Either side can face out .

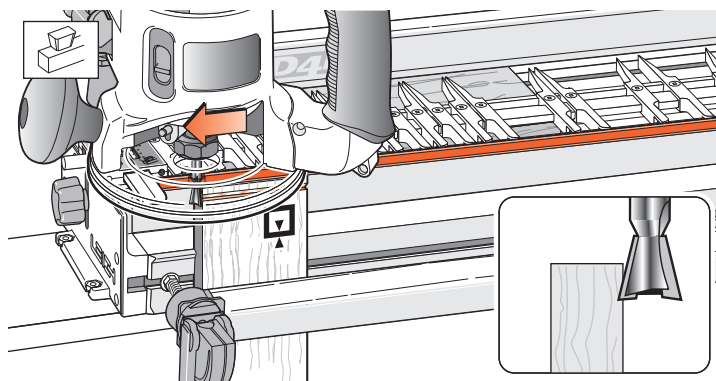


**16-18** The  HB TAILS scale is not designed specifically for this mode, but it does allow you to make precise adjustments for tail size and tightness of fit on sliding dovetails.

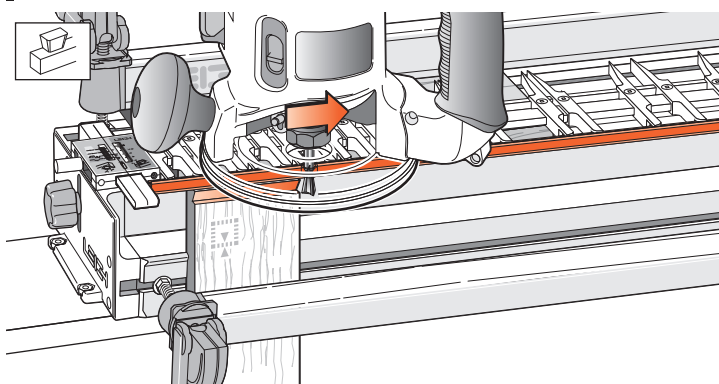




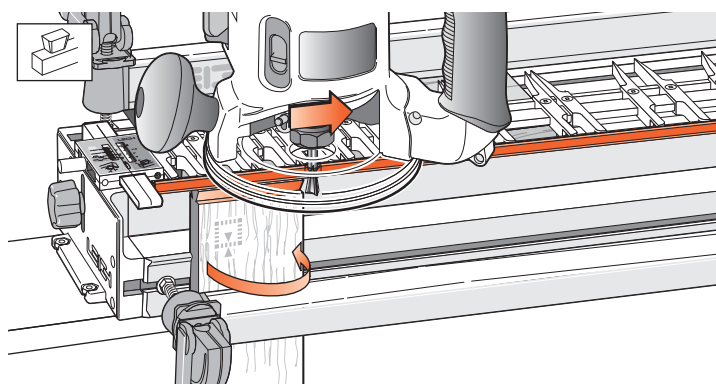
**16-19** Adjust and set the finger assembly ① so it is clear that the routed tail ② will be too large for the slot.



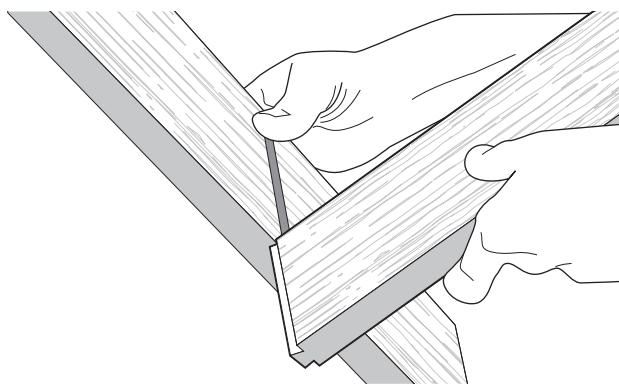
**16-20** ⚠️ Rout one side of the test tail board. Make one light pass from right to left (climb routing). Make sure you control it firmly, because it is driven in this direction by the bit. Only the tip of the bit should be cutting on the first cut (see inset). This *back* or *climb* routing leaves a very clean shoulder in side grain.



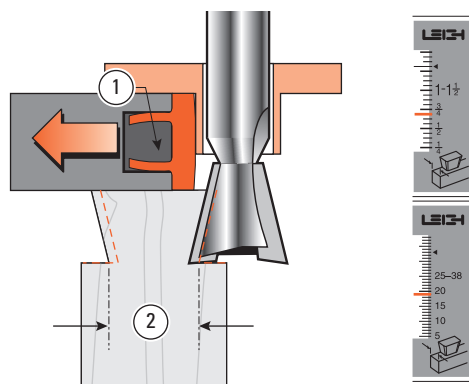
**16-21** Finish left to right, with the guidebush touching the fence.



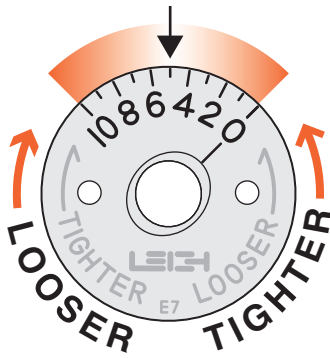
**16-22** Turn the test tail board around in the jig and rout the other side as above.



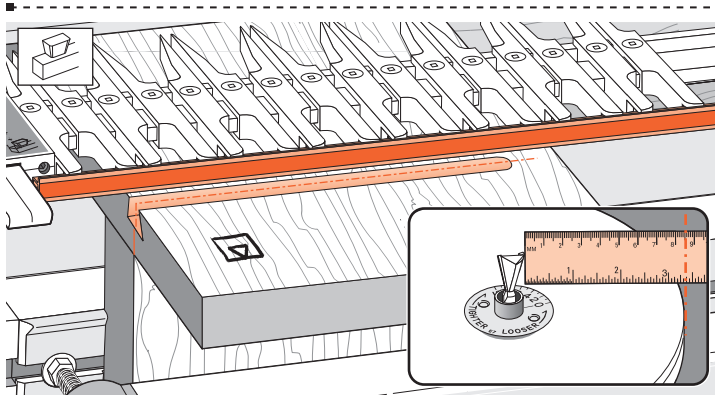
**16-23** Test the joint for fit. The tail should be too big. If it is too small, adjust the finger assembly outward by at least half the difference and rout another test tail on the other end of this test board.



**16-24** If the tail ② is too big, move the finger assembly ① toward the jig by half the amount the tail is too big. Rout the same test board again; keep adjusting and testing until a good fit. *Use trial and error each time. It doesn't take long, and you get a good fit. For fine fit adjustment with the e-Bush see 16-25.*



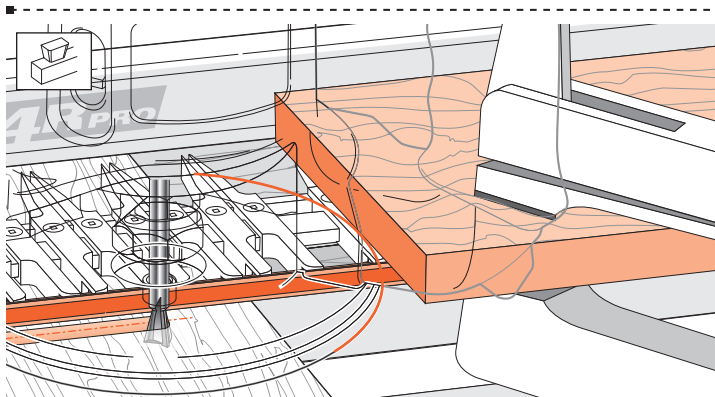
**16-25** For fine fit adjustment we use the unique e-Bush. *Note: joint tightness is only adjusted with tail size, not the socket.* To increase the tail size (tighter joint) rotate the e-Bush to a lower number. Each increment will adjust the joint fit by .001" on the glue line. To decrease the tail size (looser joint) rotate the e-Bush to a higher number. Remember to rout both sides of the tail board as in 16-21 & 22.



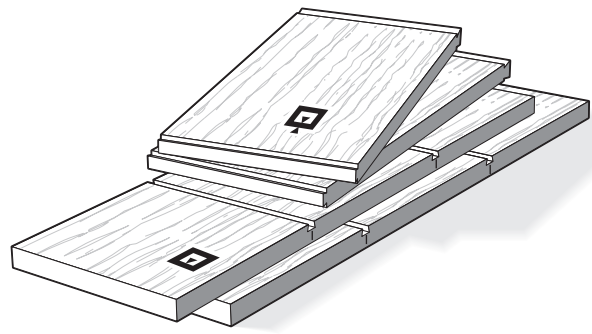
### 16-27 Stopped Sliding Dovetails

If a stopped sliding dovetail is called for...

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

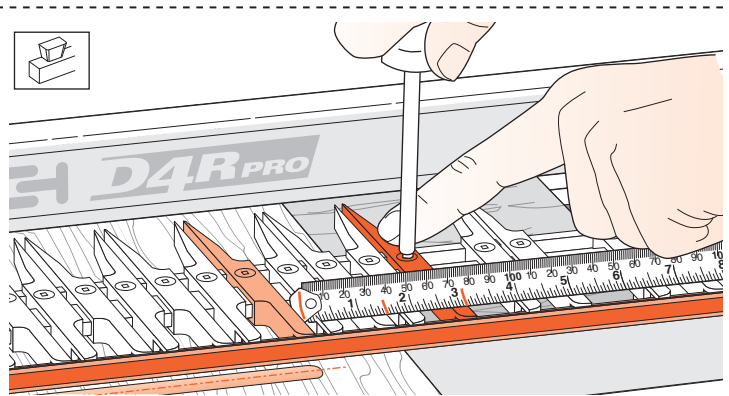


**16-29** Or lightly clamp (with a soft-jawed clamp) a short board to the finger assembly to act as a router stop.

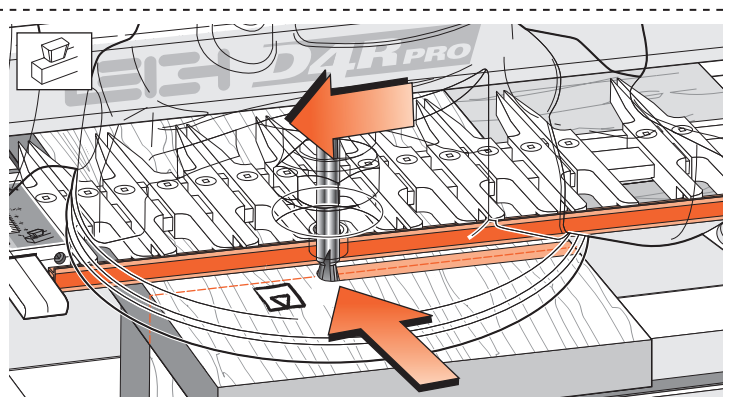


**16-26** When the fit is satisfactory, rout one end of a project tail board and test again. If the fit is good, rout all the other ends.

*Note: Variations in board thickness, guidebush diameter, bit depth, angle, diameter and concentricity, make it impractical to record sliding tail size settings.*



**16-28** Measure the same distance from where you want the slot stopped to a position on the finger assembly. Move a guidefinger to that point and mark the guidefinger with a felt pen as a visual router stop mark...



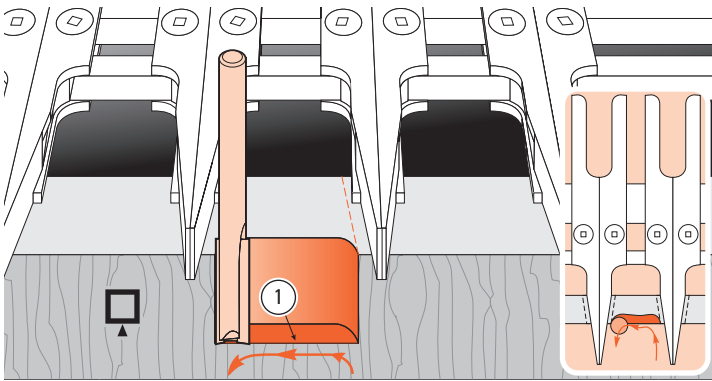
**16-30** ⚠ Dovetail slots preferably are routed from left to right because the bit's clockwise rotation pulls the guidebush against the fence. However; as when routing close to both ends of a board, it may be necessary to rout slots from right to left. **Bit rotation** will tend to pull the router away from the fence. Feed slower and maintain constant guidebush pressure against the fence. ■

## D4R Pro - CHAPTER 17

## Hints and Tips

The following pages contain valuable information that will help you get the most from your new Leigh D4R Pro dovetail jig. Our website contains additional information and technical bulletins that further expand your jig's capabilities.

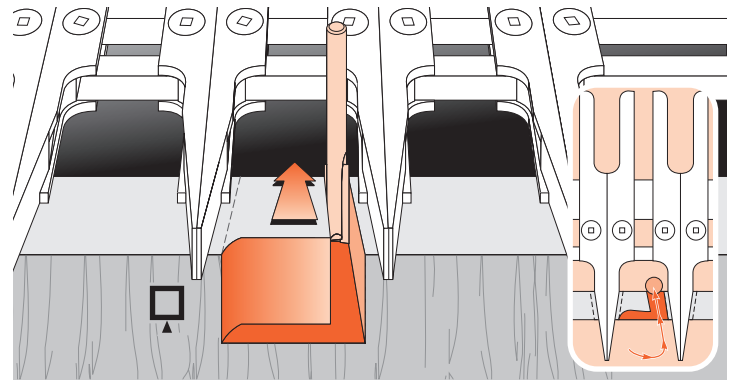
Go to: [www.leighjigs.com](http://www.leighjigs.com) and click on the "Support" tab.



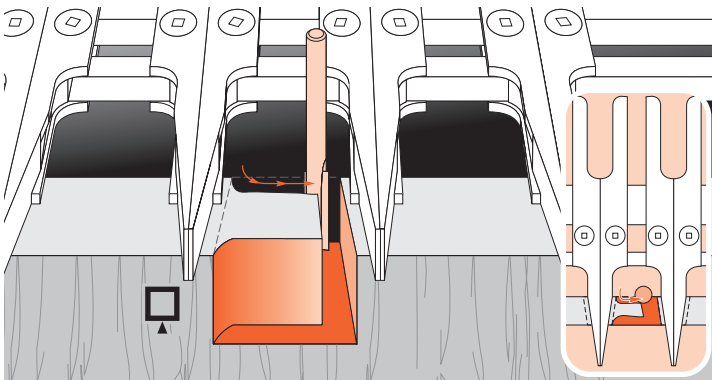
**17-1 Through Dovetail Pins** With the straight bit, carefully climb-rout from right to left. Make sure you control the router firmly when climb routing.

Climb routing produces a nice clean shoulder at ①.

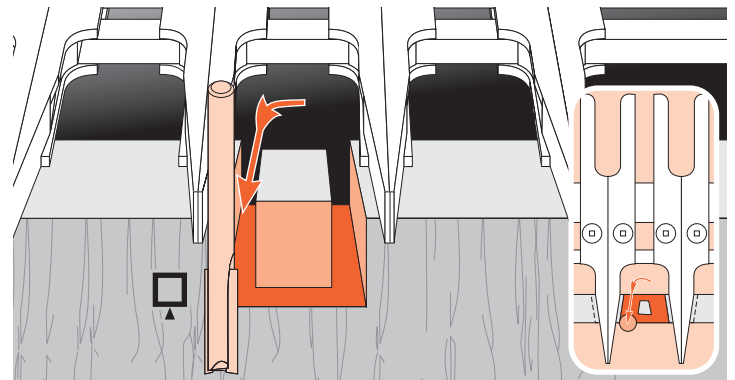
*Note: For clarity, the guidebush is not shown in this sequence.*




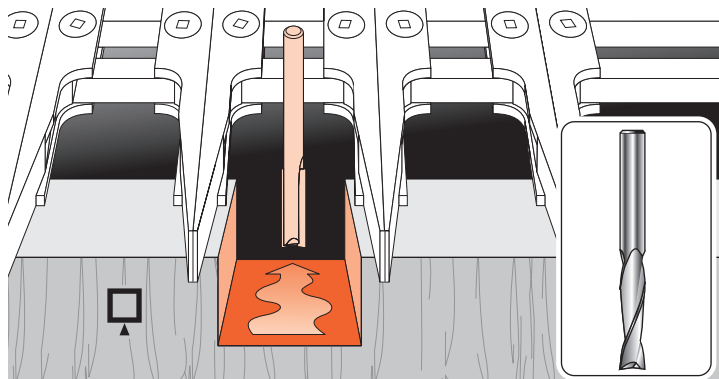
**17-2**  Rout through on the right side.



**17-3** Climb rout from left to right from the rear of the cut. Take care to control router.

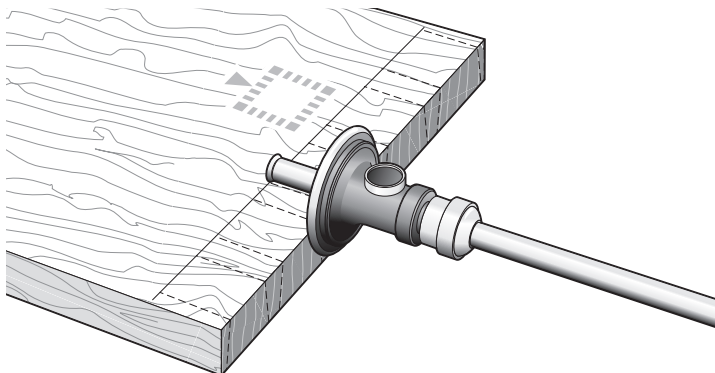


**17-4**  Rout back through towards you on the left side.



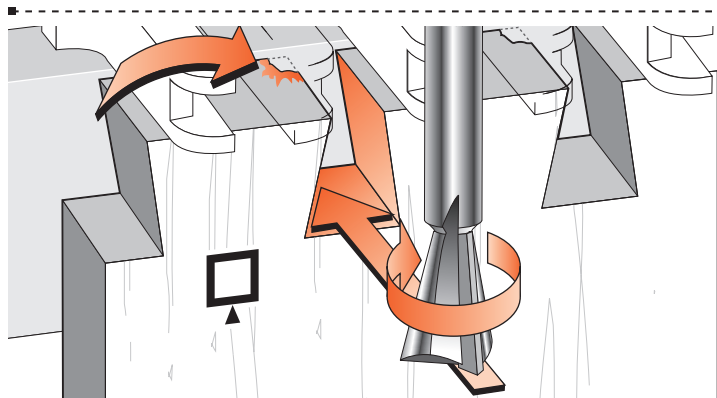
**17-5** Rout away the rest of the waste.

**Note:** Spiral up-cut straight bits (inset) generally rout more smoothly than the two-flute carbide-tipped bits. Leigh recommends solid carbide bits.

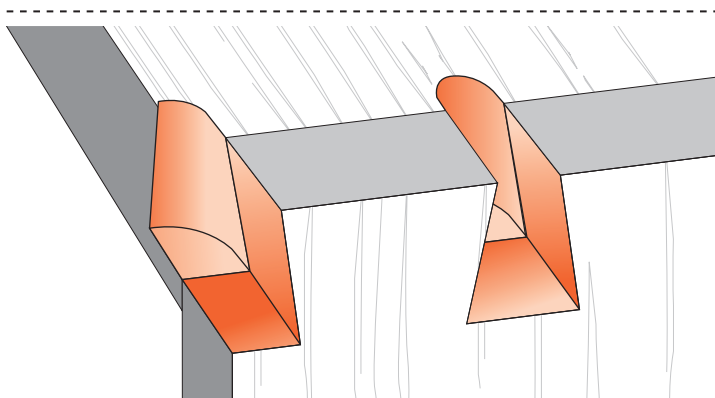


### 17-6 Through Dovetail Pins Tearout

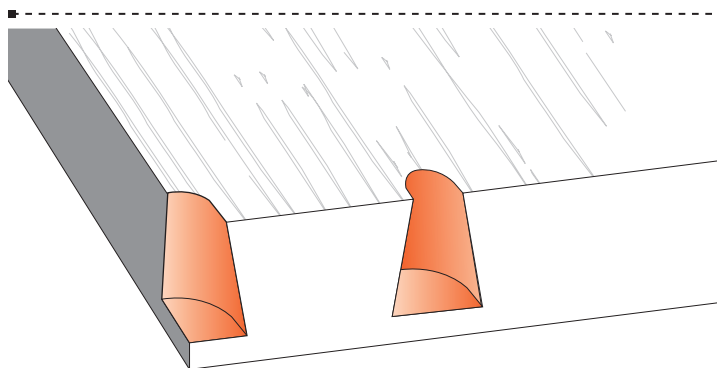
To prevent tearout at the back bottom part of a straight cut, scribe a line with your marking gauge across the back of the pin board at exactly the depth of cut.



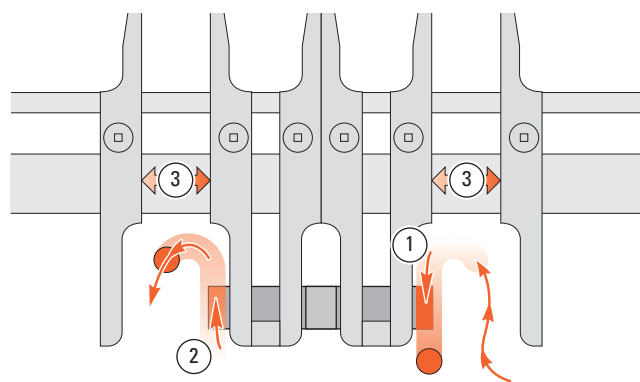
**17-7 Dovetail Tails Tearout** With the dovetail bit, most tearout occurs at the top left exit of the cut.



**17-8** To help prevent this, back up the cut with the end-grain of a horizontal board pushed against the back of the workpiece and held in the rear clamp. This board replaces the spacer board.

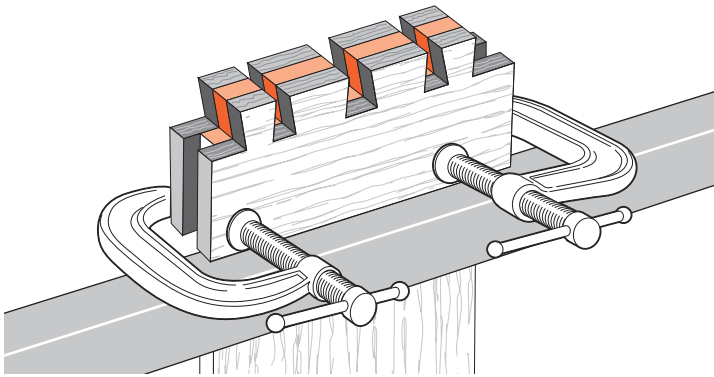


**17-9** This same scrap piece can remain in place for successive cuts.

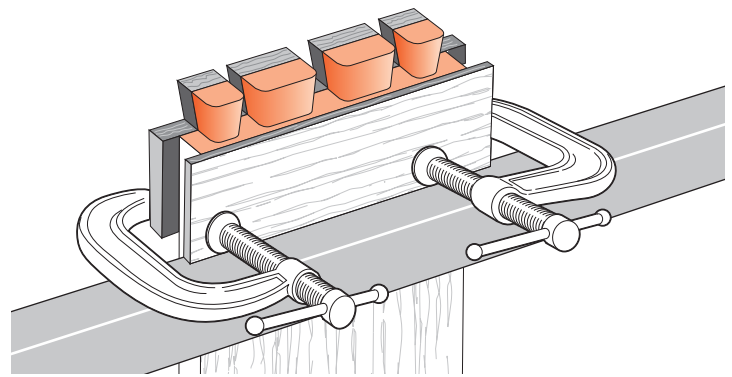


**17-10** Always rout the right hand half pin socket starting from behind the board and moving the router outwards ①, and rout the left hand half pin socket from the outer face, moving the router inwards ②. Position the non-active guide fingers both sides so that they do not impede this process ③.

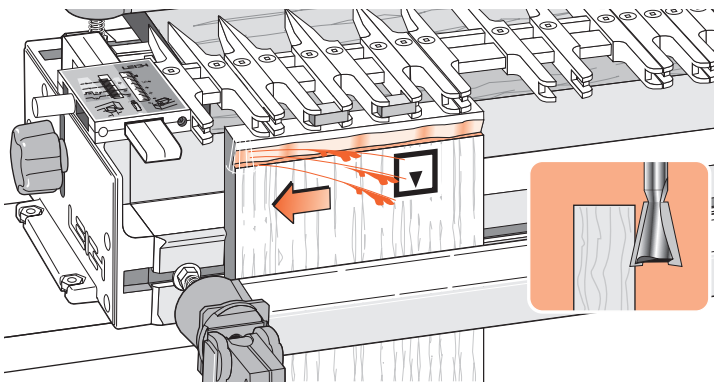





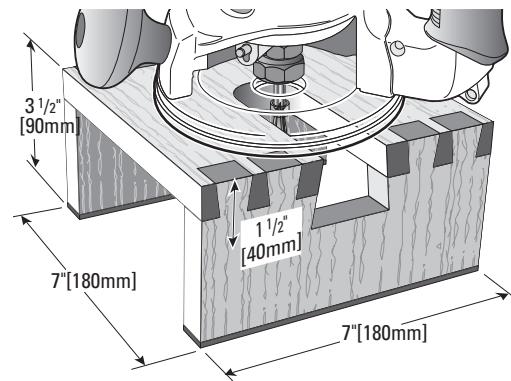
**17-11** For particularly vulnerable pieces or that last piece of exotic wood, the best solution is to clamp horizontal scrap pieces to front and back of the work piece. **Make sure the clamps are below the bit depth.** **PLYWOOD** material is **not** suitable for routing; laminates are very prone to tearout. Figures 17-10 or 17-11 are essential for plywood but do not guarantee success.



**17-12** A single scrap piece can be C-clamped on the back of half-blind tails, *but make sure you protect the workpiece from the clamp pads.* Note: There is no 100% solution to tearout. It's not the jig's fault, just something that happens when machining, sawing and even chiseling wood. Important pieces fall off from where you least want them to.

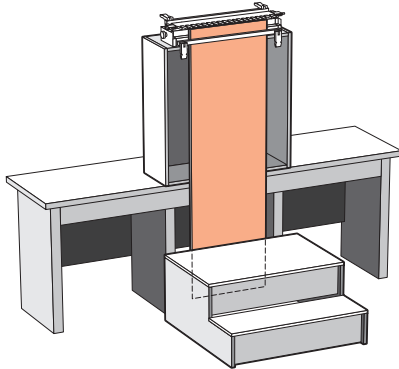
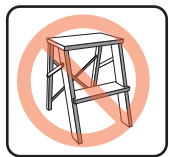


**17-13**  On face cuts, whether using a straight bit or a dove-tail bit, climb routing or back routing will leave a clean edge; **but great caution must be exercised in controlling the router's movement from right to left, as the bit rotation pulls the router in that direction anyway**

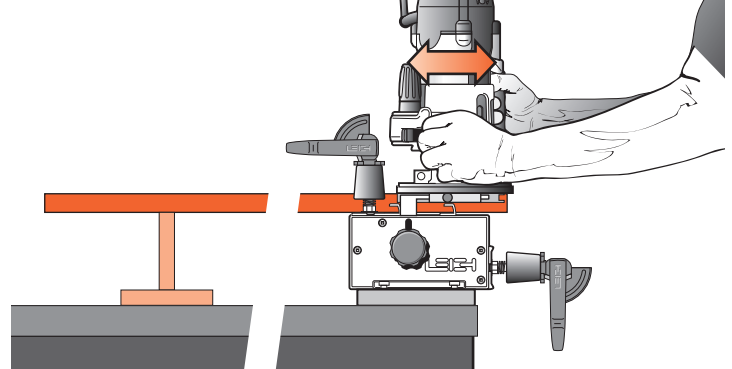


#### 17-14 General Hints

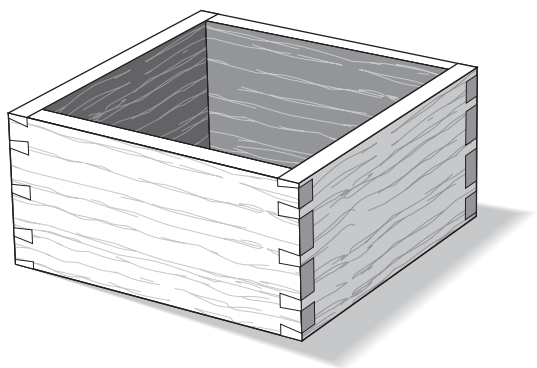
Router Stand: Make up a small router stand as illustrated, to mount the router securely on the bench when not in use.



**17-15** For routing long vertical boards it may be necessary to build a jig stand to mount securely on your bench. Make the stand and bench height combination sufficient to accept the board length you have in mind. *The jig stand should be bolted securely to the bench.* Make up a stable platform to stand on as in the illustration. **Do not use a set of steps. Steps are not stable enough.**

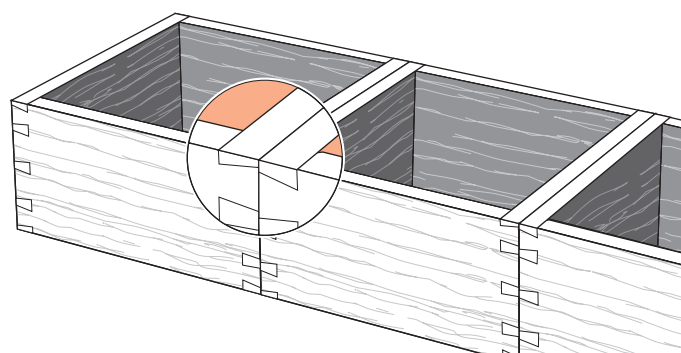


**17-16** When placing long horizontal boards in the rear clamp, make sure the rear end of the board is supported to prevent unnecessary racking of the jig.

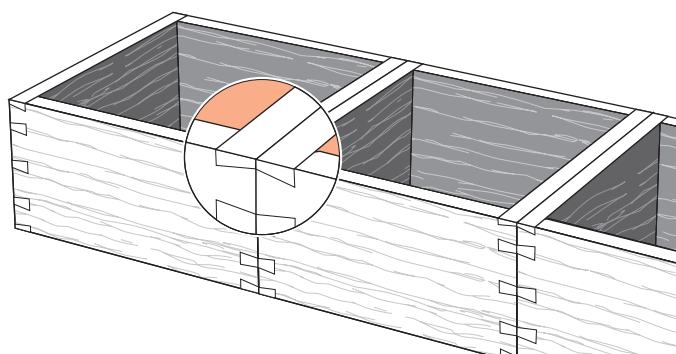


### 17-17 More On Symmetry

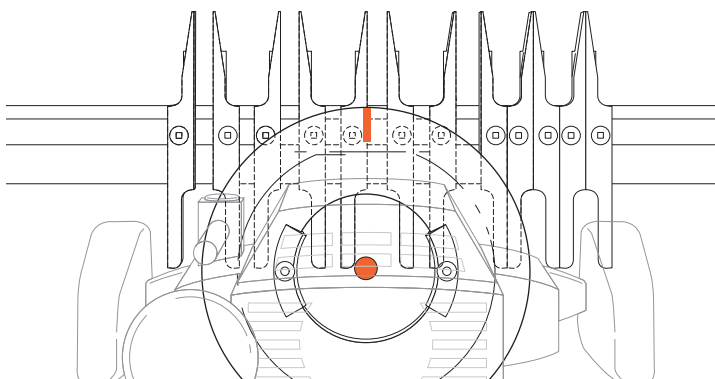
It doesn't matter if symmetrical-looking joints on a single box do not precisely mirror the adjacent corners. No one will ever know the difference. These joints look perfectly symmetrical on their own, but...



**17-18** If a number of these boxes end up side-by-side, e.g. spice caddys on a kitchen shelf, the slight misalignments of the joints could be unattractive. So when making boxes or through dovetail drawers that will be lined up beside each other with the joints showing...

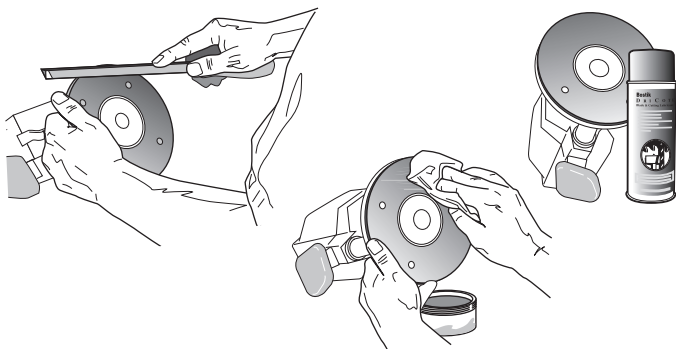


**17-19** Use the asymmetrical *mirror image* aligning techniques 14-4 to 14-11 for perfectly aligned *neighbour* joints.



**17-20 Using The Router** Mark the router base top edge at the 12 o'clock position with a felt marker pen. Without wood or bits, try some **dry runs** in each jig mode. This will soon get you used to positioning the guidebush against the correct guide surface without looking under the router.

⚠ **Do not rout at face level.**



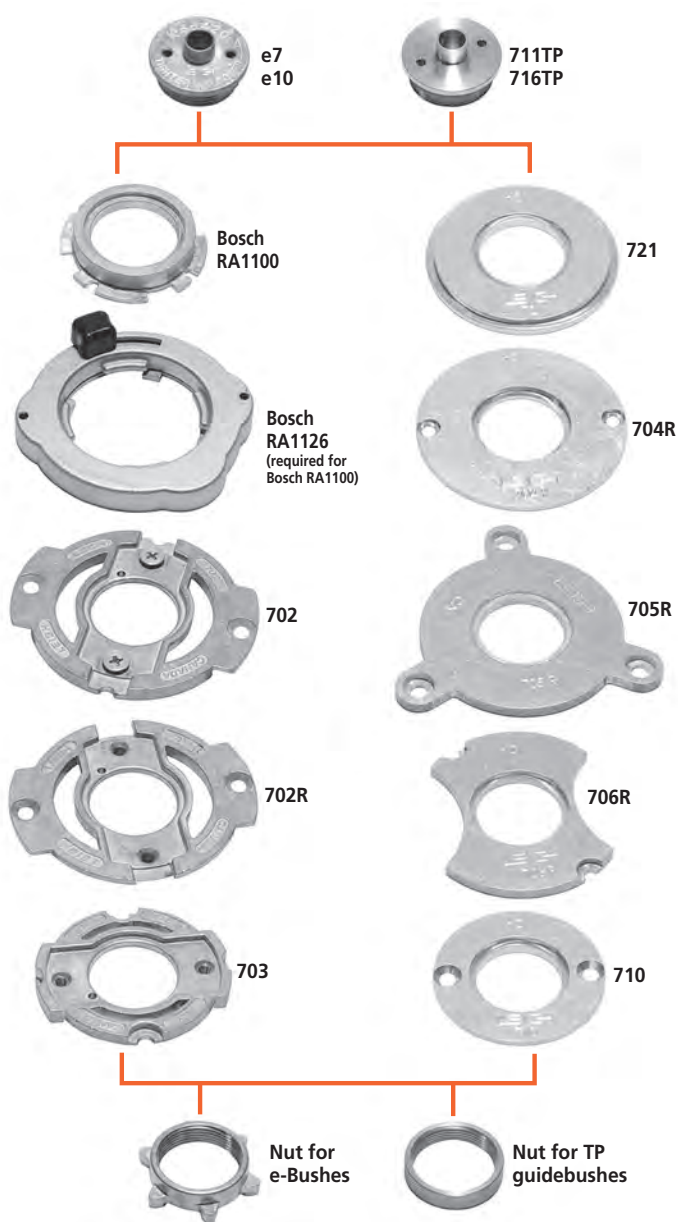
**17-21** Some router bases have sharp edges on the outside and inside corners. A slight chamfer of the edges with a fine file or sandpaper block will ease router movement on the jig. An occasional light spray of "Top Cote®" application of soft wax to the router base makes for smooth, easy router movement on the jig. ■

## Attaching the Leigh e-Bush to the Router

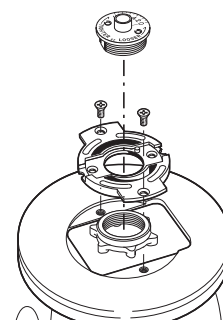
The correct guidebush is the vital link between the router and your Leigh Jig. It precisely steers the router. Where possible, always use the Leigh system to **ensure correct bush length and precise diameter for accurate results.**

Leigh offers the adaptors below to fit guidebushes to over one hundred router models new and old, including Porter Cable, Black & Decker, and DeWalt. Many other makes e.g. Bosch, Fein, Festool, Milwaukee etc., either offer or include base adaptors. See list of routers in the Template Guide Bushing and Adaptor Selection chart on the next page.

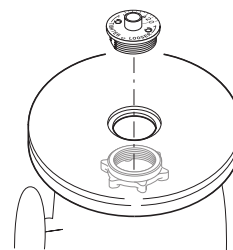
### Leigh Template Guide Bushing and Adaptor System



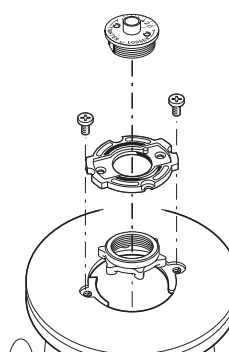
### e-Bush Mounting Variations



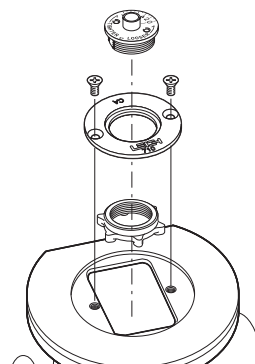
e-Bush with Adaptors 702 & 702R



e-Bushes fit many routers directly



e-Bush with Adaptor 703



e-Bush with Adaptor 710

## Template Guide Bushing and Adaptor Selection

Your router may need an adaptor to mount the guide bushing. Find out with this chart.

See [www.leighjigs.com](http://www.leighjigs.com) for the latest list of routers.

### DIRECTIONS

- A.** Locate name of router maker in Column 1.
- B.** Locate router model in Column 2.  
If your router is not listed visit [leighjigs.com](http://leighjigs.com) for a complete, up-to-date list of routers.
- C.** Locate adaptor required for your router in Column 3.
  - Order Leigh adaptors (part no's in red) in Column 3 from Leigh.
  - Order Bosch adaptors RA1100 and RA1126 in Column 3 from Leigh or your Bosch dealer.
  - Order all other adaptors in Column 3 from the router manufacturer's dealer.
- D.** Guide bushings in Columns 4 and 5 fit all adaptors listed and may be ordered if required. Note the following:
  - ◆ 7/16" (e7, 711TP) guide bushings are supplied with all Leigh dovetail jigs. Order only if you require a replacement.
  - ▲ 5/8" (e10, 716TP) guide bushings are used with 1/2" shank router bits on D4R Pro, D4R, D4, D3 & D1258(R) jigs. Order only if using 1/2" shank router bits.
  - MAFELL – Rework adaptor slightly.

### Adaptor Mounting Screws

Screws are included with router.

### Guide Bushings

All 8mm shank bits work with the e7-Bush supplied with your Leigh jig, or with any 7/16" OD guide bushing that has a min. barrel length of 1/4". The optional Leigh e10-Bush or standard 5/8" OD guidebush is used with 1/2" shank bits. No other guide bushing sizes can be used.

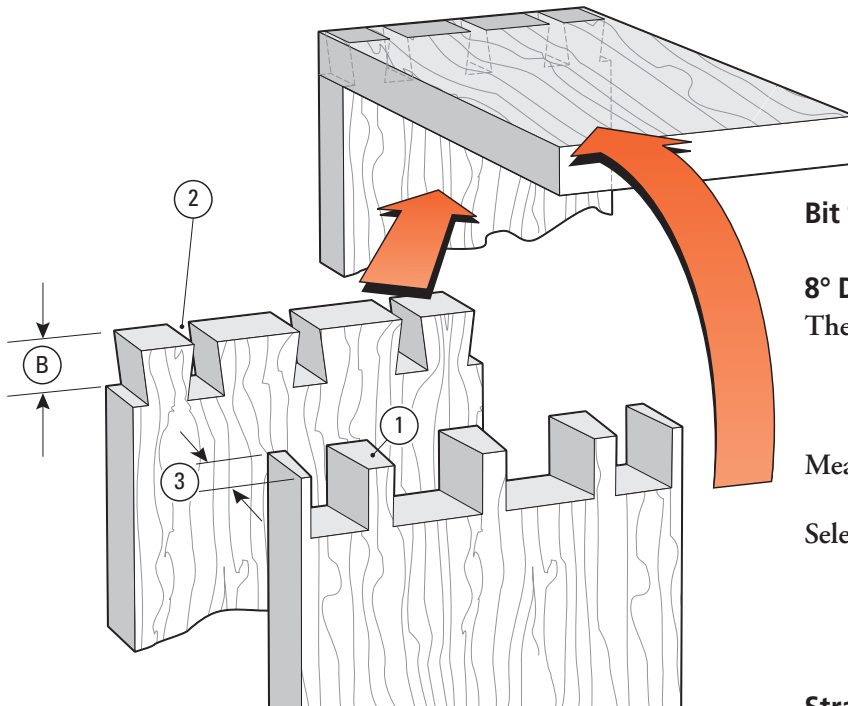
1 ROUTER MAKER	2 ROUTER MODEL	3 ROUTER ADAPTOR	4 7/16"OD BUSHING ◆	5 5/8" OD BUSHING ▲
BLACK & DECKER	All Professional, HD1250, RP400K,7614	Not Required	e7 or 711TP	e10 or 716TP
	6200	720673-00	e7 or 711TP	e10 or 716TP
	SR100, 7AEE, KW780 series, KW 800, KW850	710	e7 or 711TP	e10 or 716TP
BOSCH	90140, 90088, 90098, 90085, 90150, 90300, 90303, 90305, 91264	Aftermarket base plate required	82855	82854
	1600, 1601, 1602, 1603, 1604, 1606, B1350	2 610 906 290	82859	82864
	ROUTERS PRODUCED AFTER mid 2010: 1613AEVS, 1617EVS, 1618EVS, and MR23EVS series, in N.America require Bosch adaptors RA1100 & RA1126. GOF1600CE in Europe requires RA1100 only.	RA1100 Adaptor and RA1126 Quick Change Adaptor required	e7 or 711TP	e10 or 716TP
	ROUTERS PRODUCED BEFORE mid 2010: 1613AEVS, 1614EVS, 1617EVS, 1618EVS, 1619EVS POF800ACE, POF1400ACE, POF1100AE, POF1200AE, GOF1200, GOF900ACE, GOF1300ACE, GOF900CE, GOF2000CE, GMF1400, B1450	RA1100	e7 or 711TP	e10 or 716TP
	1611, 1611EVS, 1615, 1615EVS, B1550, GOF1600, GOF1700ACE	702	e7 or 711TP	e10 or 716TP
CMT	1E	702R	e7 or 711TP	e10 or 716TP
CRAFTSMAN (SEARS)	All non-plunge models	Aftermarket base plate required	Order 5-piece set from Sears USA 0925973, or 3-piece set from Sears Canada 0900970704	
	135275070 Plunge	See Skil 1823 or 1835		
	Other plunge models	702	e7 or 711TP	e10 or 716TP
	MD11 Plunge & Fixed Base. MD9.5 Fixed Base	Not Required	e7 or 711TP	e10 or 716TP
DEWALT	DW610, DW616, DW618	Not Required	e7 or 711TP	e10 or 716TP
	DW613, DW615(UK)	710	e7 or 711TP	e10 or 716TP
	DW614, DW615, DW621, DW624, DW625, DW626	N. America Only, Supplied w/router	e7 or 711TP	e10 or 716TP
	DW621K & DW626 outside N. America	706R	e7 or 711TP	e10 or 716TP
	DW625 Type 1,2,3,5 outside N. America	702	e7 or 711TP	e10 or 716TP
	DW624 & DW625 Type 4 outside N.America, DW625EK	702R	e7 or 711TP	e10 or 716TP
	ELU	OF15, OF15E, OF97, OF97E	706R	e7 or 711TP
MOF68, MOF69, MOF96, MOF96E		710	e7 or 711TP	e10 or 716TP
MOF131, MOF177 Type 1,2, & 3		702	e7 or 711TP	e10 or 716TP
MOF177 Type 4, MOF177EK		702R	e7 or 711TP	e10 or 716TP
2720, 2721, 3328		Not Required	e7 or 711TP	e10 or 716TP
3303, 3304		E09600 or 761 270-00	e7 or 711TP	e10 or 716TP
3337, 3338, 3339		702	e7 or 711TP	e10 or 716TP
FEIN	RT1800	Supplied w/router	e7 or 711TP	e10 or 716TP
FESTOOL	OF1E , OF2E, OF650, OF900E ,OF1000, OF1010E	704R	e7 or 711TP	e10 or 716TP
	OF2000, OF2000E	705R	e7 or 711TP	e10 or 716TP
	OF1400 and OF2200 North America Only	Supplied w/router	e7 or 711TP	e10 or 716TP
	OF1400 Outside North America	493566	e7 or 711TP	e10 or 716TP
	OF2200 Outside North America	494627 O-Ring may be required to keep bushing centered	e7 or 711TP	e10 or 716TP
FREUD	FT700(2), FT2000, FT2200, FT3000	721	e7 or 711TP	e10 or 716TP
HITACHI	TR8, TR12, FM8, M8, M12 Series	325211 OR 703	e7 or 711TP	e10 or 716TP
	M12VC, KM12SC, KM12VC	Not Required	e7 or 711TP	e10 or 716TP
	M12SA2, M12V2	325224	e7 or 711TP	e10 or 716TP
MAFELL	L065E	702 ■	e7 or 711TP	e10 or 716TP
MAKITA	M363, MRP090, RP1800, RP1801, RP2301, RP2301FC, 3612C Europe Qk Fit Base	721	e7 or 711TP	e10 or 716TP
	3600, 3606, 3608, 3612, 3612B, 3612BR, 3612C N. America, 3620, 3621, RP0900, RP900K	703	e7 or 711TP	e10 or 716TP
	3601B	321 493-1	e7 or 711TP	e10 or 716TP
	RP0910, RP1110C	706R	e7 or 711TP	e10 or 716TP
	RF1100, RF1101, RD1100, RD1101, RP1101	Not Required	e7 or 711TP	e10 or 716TP
METABO	OF1612, OFE1812	704R	e7 or 711TP	e10 or 716TP
MILWAUKEE	5615, 5616, 5619	49-54-1040	e7 or 711TP	e10 or 716TP
	5625	49-54-1026	e7 or 711TP	e10 or 716TP
	5670	Not Required	e7 or 711TP	e10 or 716TP
PERLES	OF808 Series, OFE6990	710	e7 or 711TP	e10 or 716TP
PORTER CABLE (ROCKWELL)	All	Not Required or Supplied w/router	e7 or 711TP	e10 or 716TP
RIDGID	R2930	704R	e7 or 711TP	e10 or 716TP
RYOBI	R30, R50, R150, R151, RE155, R500, R501, R502	703	e7 or 711TP	e10 or 716TP
	R600, R601, RE600, RE601	702	e7 or 711TP	e10 or 716TP
	R160, R161, R162, R163K, R165, R170, R175, RE175, R180, R180PL, R181, R185, ERT1150	706R	e7 or 711TP	e10 or 716TP
SKIL	1823 or 1835	91803	e7 or 711TP	e10 or 716TP
	SK1810, 1815, 1820, 1825	RAS140	e7 or 711TP	e10 or 716TP
	All others	Aftermarket base plate required	11592	71021
TREND	T3, T4, T5, T9, T10, T11—UniBase required	710	e7 or 711TP	e10 or 716TP
TRITON	TRC001	TGA006 or 704R	e7 or 711TP	e10 or 716TP
	JOF001, MOF001, TRA001	Accessory Kit (includes adaptor) TGA001 or TGA150	e7 or 711TP	e10 or 716TP
WEGOMA	OF850 Series	710	e7 or 711TP	e10 or 716TP



## Bit Selection

Optional router bits for variably spaced through and half-blind dovetails.

### Through Dovetails



#### Bit Selection for Through Dovetails

##### 8° Dovetail Bit for Tails

The pins ①

must fit into the sockets ②. So the dovetail bit's depth of cut B must be equal to or a little greater than the pinboard thickness ③.

**Measure**

the pinboard thickness ③

**Select**

the dovetail bit with the correct depth of cut B from the following pages (bits must be 8° for through dovetails).

##### Straight Bit for Pins

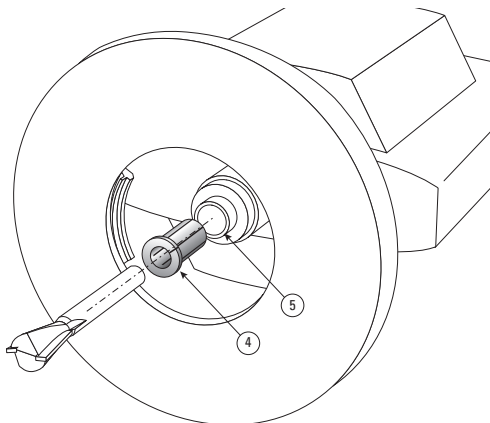
The matching straight bit is listed on the charts with the dovetail bit.

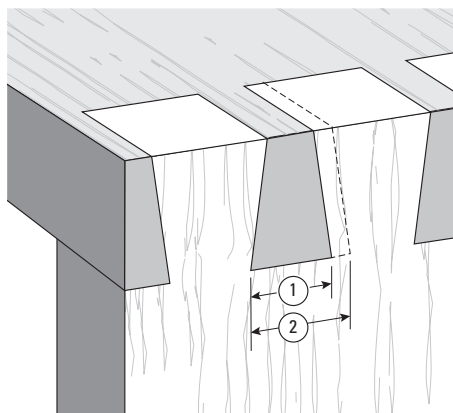
##### Guidebush

All 8mm shank through dovetail bits listed in this appendix work with the e7-Bush (~7/16" OD) supplied with your Leigh jig, or any ~7/16" OD guidebush. The optional Leigh e10-Bush or standard 5/8" OD guidebush is used with 1/2" shank bits. No other guidebush sizes can be used for through dovetails. See page 70.

##### Shank Selection

All Leigh Dovetail jigs ship with one through dovetail bit and one straight bit, with 8mm shanks, plus a 1/2" to 8mm collet reducer. The reducer ④ simply slides into the 1/2" collet ⑤ of your router and the 8mm shank bit is inserted into the collet reducer. The collet is tightened as normal. The collet reducer is not required with 1/2" shank bits. **Note: If your router has an 8mm or larger collet, we highly recommend you use our 8mm shank bits instead of 1/4" [6,35mm] shanks.**





Note that some of the dovetail bits' depths of cut overlap. For example:

No.80-8 bit Ⓑ :  $\frac{1}{2}$ " –  $\frac{13}{16}$ " [12 - 20mm]

No.90 bit Ⓑ :  $\frac{5}{8}$ " – 1" [16 - 26mm]

This means that boards between  $\frac{5}{8}$ " and  $\frac{13}{16}$ " [16 - 20mm] thick can be joined using either the:

No.80-8 and 140-8 combination, or the

No.90 and 160-8 combination.

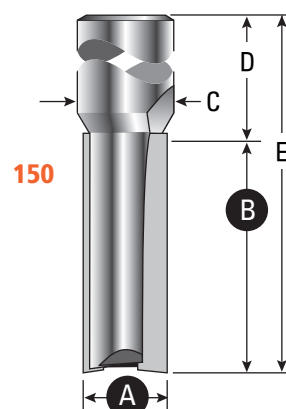
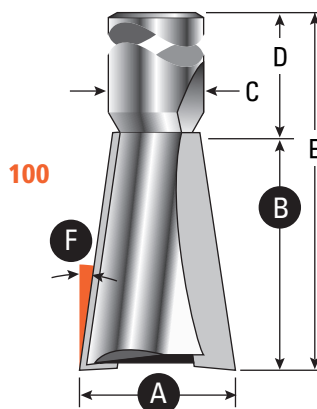
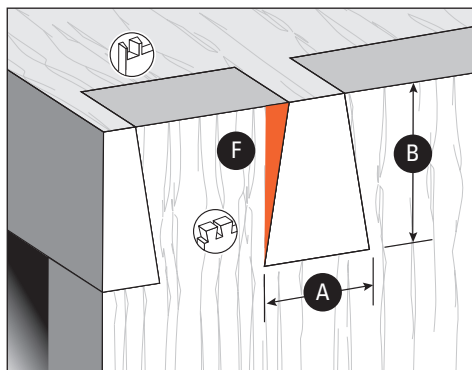
The two bit combinations will produce slightly different-looking joints because the No.80-8 bit can cut a narrower pin socket ① than the No.90 bit ②.



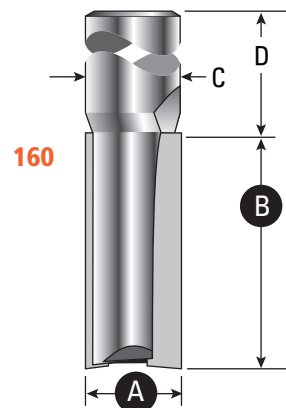
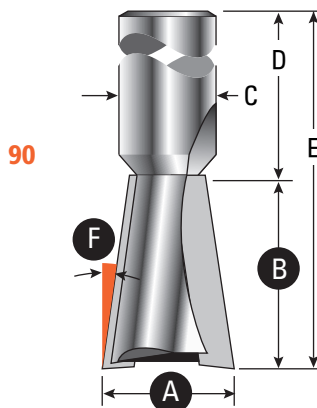
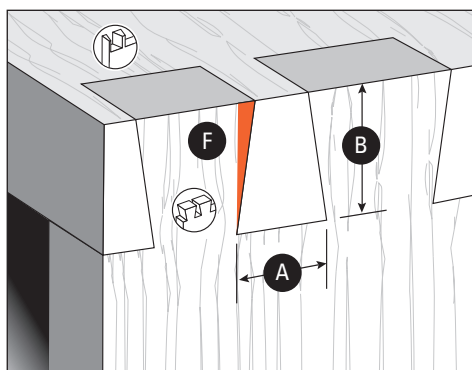
**Do not attempt to rout dovetails at less than the minimum depth of cut specified.**

### Leigh Through Dovetail Bits

**Note: Bit and joint drawings are about actual size.**

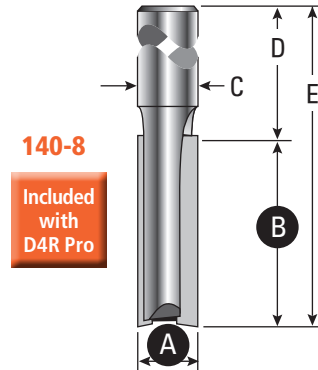
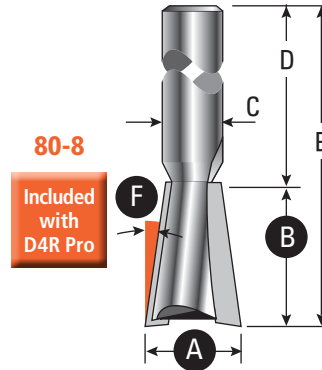
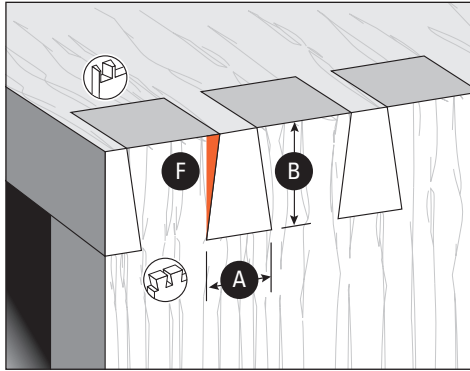


BITS	A Overall Diameter	B Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 100	13/16" [20,6]	1" to 1-1/4" [26,0 - 32,0]	1/2" [12,7]	1-3/4" [45,0]	3" [76,0]	8°	e10 or 5/8" [15,9]
No. 150	7/16" [11,1]	up to 1-1/4" [32,0]	1/2" [12,7]	1-3/4" [45,0]	3" [76,0]	–	e10 or 5/8" [15,9]

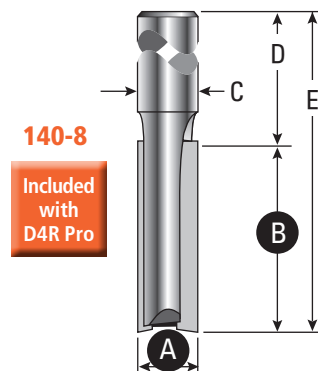
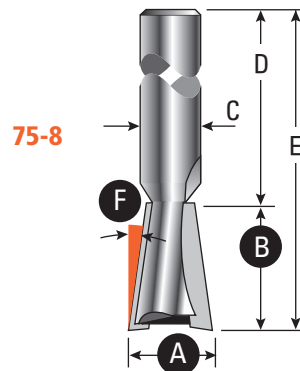
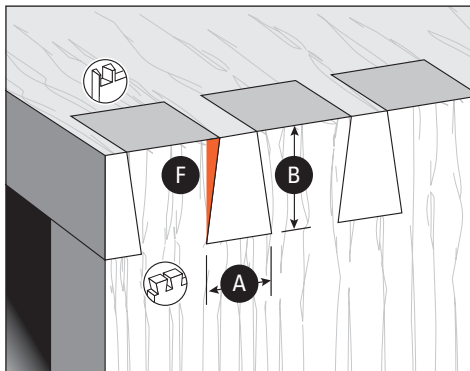


Bits	A Overall Diameter	B Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 90	11/16" [17,5]	5/8" to 1" [16,0-26,0]	1/2" [12,7]	1-3/4" [45,0]	2-3/4" [70,0]	8°	e10 or 5/8" [15,9]
No. 160	1/2" [12,7]	up to 1-1/4" [32,0]	1/2" [12,7]	1-3/4" [45,0]	3" [76,0]	–	e10 or 5/8" [15,9]

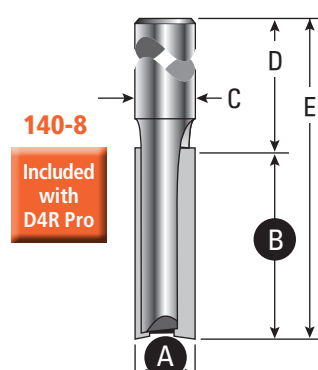
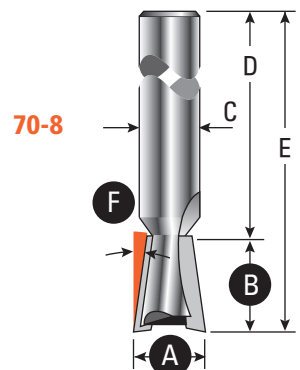
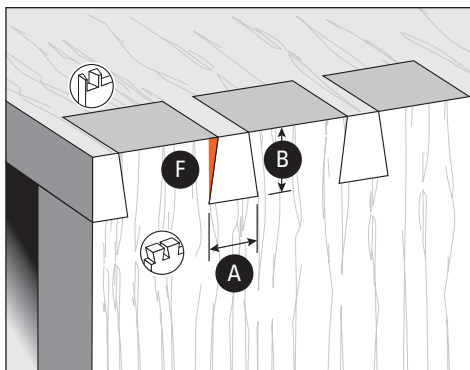
**Note:** Bit and joint drawings are about actual size.



BITS	A Overall Diameter	B Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 80-8 *	1/2" [12,7]	1/2" to 13/16" [13,0-20,6]	8mm (or 1/4")	1-3/4" [45,0]	2-9/16" [65,0]	8°	e7 or 7/16" [11,1]
No. 140-8 *	5/16" [7,9]	up to 1" [26,0]	8mm (or 1/4")	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16" [11,1]



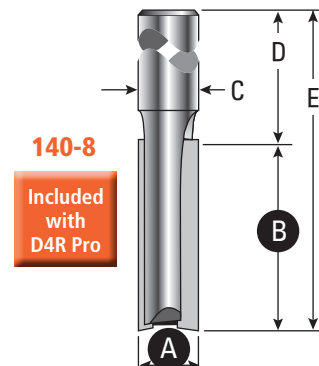
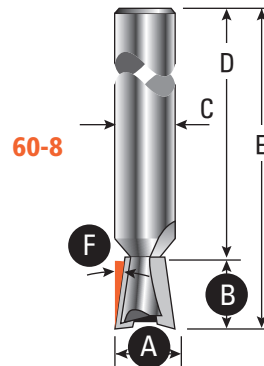
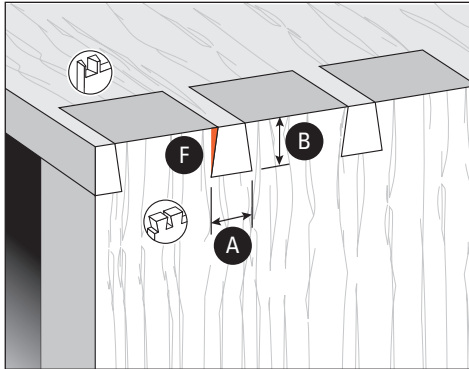
BITS	A Overall Diameter	B Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 75-8	7/16" [11,1]	3/8" to 5/8" [9,5-16,0]	8mm (or 1/4")	1-3/4" [45,0]	2-3/8" [60,0]	8°	e7 or 7/16" [11,1]
No. 140-8*	5/16" [7,9]	up to 1" [26,0]	8mm (or 1/4")	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16" [11,1]



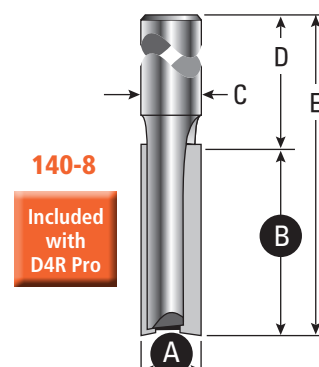
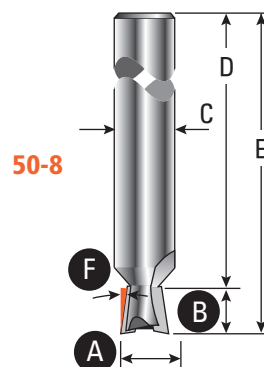
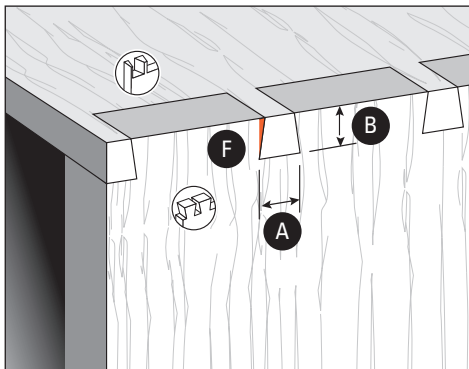
BITS	A Overall Diameter	B Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 70-8	3/8" [9,5]	1/4" to 1/2" [6,0-13,0]	8mm (or 1/4")	1-3/4" [45,0]	2-1/4" [57,0]	8°	e7 or 7/16" [11,1]
No. 140-8*	5/16" [7,9]	up to 1" [26,0]	8mm (or 1/4")	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16" [11,1]

Numbers in brackets are millimeters

\* Bits 80-8, 120-8, and 140-8 come standard with the Leigh D4R Pro



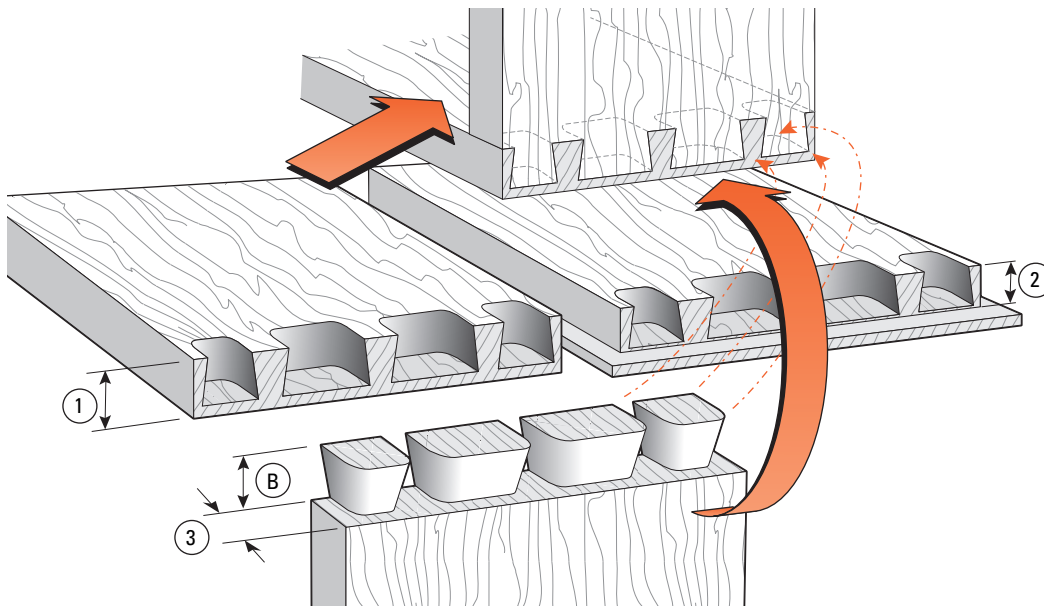
Bits	A Overall Diameter	B Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 60-8	5/16" [7,9]	up to 3/8" [9,5]	8mm (or 1/4")	1-3/4" [45,0]	2-1/8" [54,0]	8°	e7 or 7/16"[11,1]
No. 140-8*	5/16" [7,9]	up to 1" [26,0]	8mm (or 1/4")	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16"[11,1]



Bits	A Overall Diameter	B Cutting Depth Range	C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
No. 50-8	1/4" [6,35]	up to 1/4" [6,35]	8mm (or 1/4")	1-3/4" [45,0]	2" [50,0]	8°	e7 or 7/16"[11,1]
No. 140-8*	5/16" [7,9]	up to 1" [26,0]	8mm (or 1/4")	1-3/4" [45,0]	2-3/4" [70,0]	—	e7 or 7/16"[11,1]



## Half-Blind Dovetails



### About Bit Selection for Half-Blind Dovetails

#### Bits:

Both parts of a half-blind dovetail are cut with the same dovetail bit.

#### Flush Drawers:

The dovetail bit's working depth of cut (B) must be less than the pinboard thickness ① for flush drawers by at least  $\frac{1}{8}$ " [2mm].

#### Rabbeted Drawers:

The dovetail bit's working depth of cut (B) must be slightly (about  $\frac{1}{16}$ " [1mm]) less than the rabbet depth ② for rabbeted drawer fronts.

#### Drawer Sides (Tailboard):

Minimum thickness is  $\frac{1}{4}$ " [6mm].

Drawer side thickness ③ does not affect bit selection.

*Note:* (B) is the nominal working depth for half-blind dovetails, not the maximum depth. (B) must not be varied, except for minor adjustments for joint fit. See page 37.

### Selecting the Bit

#### Measure

Drawer front thickness (minimum  $\frac{1}{2}$ " [12mm]) ①  
or rabbet depth (minimum  $\sim \frac{7}{16}$ " [11,1mm]) ②

#### Select

A bit with the appropriate depth of cut (B) from the following pages.

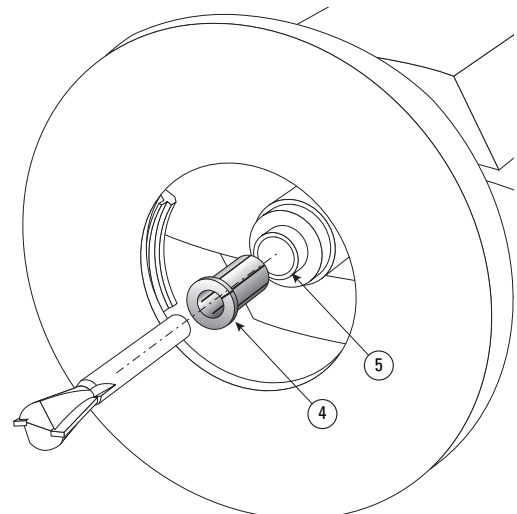
### Guidebush

All 8mm shank half-blind dovetail bits listed in this appendix work with the e7-Bush ( $\sim \frac{7}{16}$ " OD) supplied with your Leigh jig, or any  $\sim \frac{7}{16}$ " OD guidebush. No other guidebush sizes can be used for half-blind dovetails. See page 70.

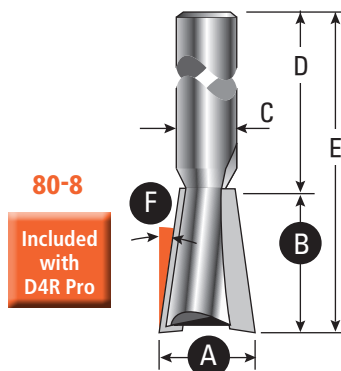
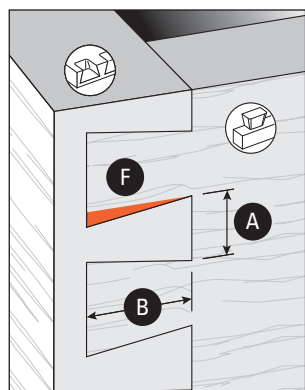
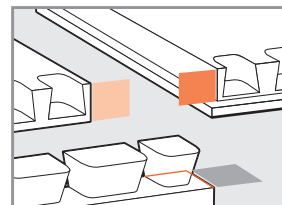
### Shank Selection

*Note:* If your router has an 8mm or larger collet, we highly recommend you use our 8mm shank bits instead of  $\frac{1}{4}$ " [6,35mm] shanks. For a  $\frac{1}{2}$ " [12,7mm] collet you will require our  $\frac{1}{2}$ " [12,7mm] to 8mm collet reducer No. 172-8.

*Note:* This is a collet reducer ④, not a collet ⑤. The reducer does not replace the collet, it slides directly into your  $\frac{1}{2}$ " collet.



## Leigh Half-Blind Dovetail Bits

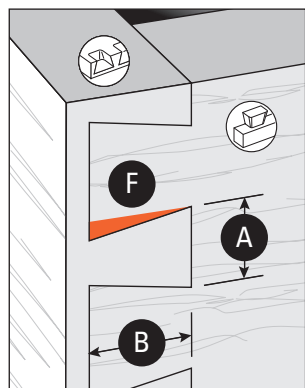
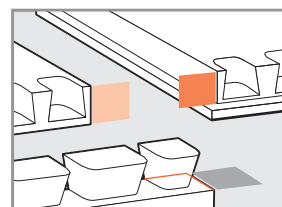
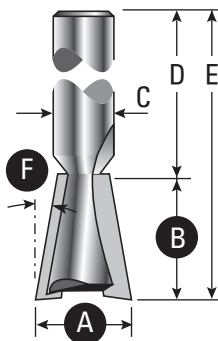
**80-8**Included  
with  
D4R Pro

**Pinboard**  
Flush Drawer Front  
**Min Thickness**  
7/8" [22mm]

**Pinboard**  
Rabbeted Drawer Front  
**Min Rabbet Depth**  
13/16" [20,5mm]

**Tailboard**  
Drawer Side  
**Min Thickness**  
1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 80-8*	1/2" [12,7]	~3/4" [19]	~1/2" [12,7]	8mm (or 1/4")	1-3/4" [44,0]	2-9/16" [65,0]	8°	e7 or 7/16" [11,1]

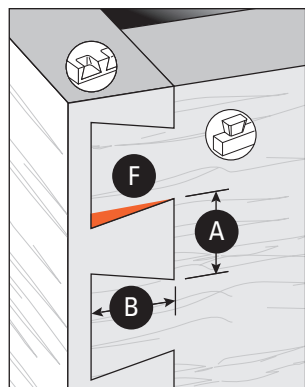
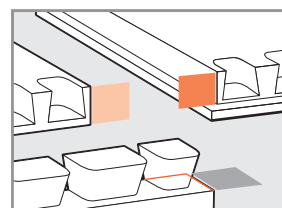
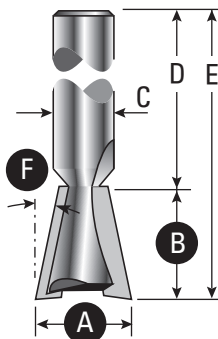
**101-8**

**Pinboard**  
Flush Drawer Front  
**Min Thickness**  
3/4" [19mm]

**Pinboard**  
Rabbeted Drawer Front  
**Min Rabbet Depth**  
11/16" [17,5mm]

**Tailboard**  
Drawer Side  
**Min Thickness**  
1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 101-8	1/2" [12,7]	~5/8" [15,9]	~7/16" [11,1]	8mm (or 1/4")	1-3/4" [44,0]	2-3/8" [60,0]	10°	e7 or 7/16" [11,1]

**112-8**

**Pinboard**  
Flush Drawer Front  
**Min Thickness**  
5/8" [16mm]

**Pinboard**  
Rabbeted Drawer Front  
**Min Rabbet Depth**  
9/16" [14,5mm]

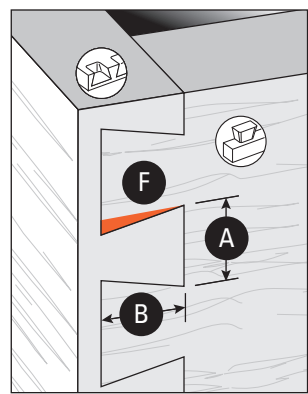
**Tailboard**  
Drawer Side  
**Min Thickness**  
1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 112-8	1/2" [12,7]	~1/2" [12,7]	~3/8" [9,5]	8mm (or 1/4")	1-3/4" [44,0]	2-21/64" [59,0]	12°	e7 or 7/16" [11,1]

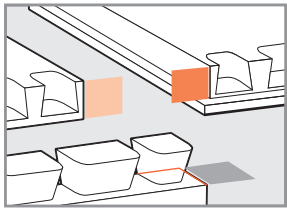
Numbers in brackets are millimeters

\* Bits 80-8, 120-8, and 140-8 come standard with the Leigh D4R Pro

Note: Bit and joint drawings are about actual size.



**120-8**  
Included with  
D4R Pro

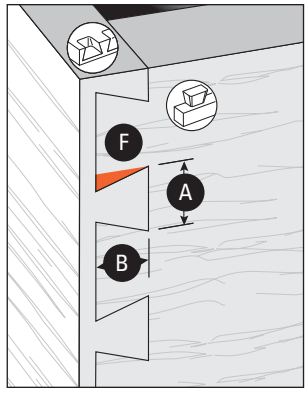


**Pinboard**  
Flush Drawer Front  
**Min Thickness**  
9/16" [14,5mm]

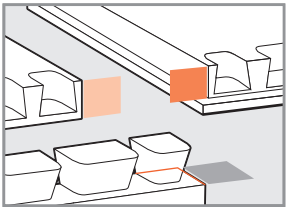
**Pinboard**  
Rabbeted Drawer Front  
**Min Rabbet Depth**  
1/2" [12,7mm]

**Tailboard**  
Drawer Side  
**Min Thickness**  
1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 120-8*	1/2" [12,7]	~7/16" [11,0]	~9/32" [7,1]	8mm (or 1/4")	1-3/4" [44,0]	2-1/4" [57,0]	14°	e7 or 7/16" [11,1]



**128-8**



**Pinboard**  
Flush Drawer Front  
**Min Thickness**  
1/2" [12,7mm]

**Pinboard**  
Rabbeted Drawer Front  
**Min Rabbet Depth**  
7/16" [11mm]

**Tailboard**  
Drawer Side  
**Min Thickness**  
1/4" [6,5mm]

Bits	A Overall Diameter	B Working Depth		C Shank Diameters	D Shank Length	E Overall Length	F Angle	Guidebush Diameter
		HB Variable	HB Single Pass					
No. 128-8	1/2" [12,7]	~3/8" [9,5]	~7/32" [5,5]	8mm (or 1/4")	1-3/4" [44,0]	2-1/8" [54,0]	18°	e7 or 7/16" [11,1]

Numbers in brackets are millimeters

\* Bits 80-8, 120-8, and 140-8 come standard with the Leigh D4R Pro





## ***D4R Pro - Appendix III***

### **Jig Parts**

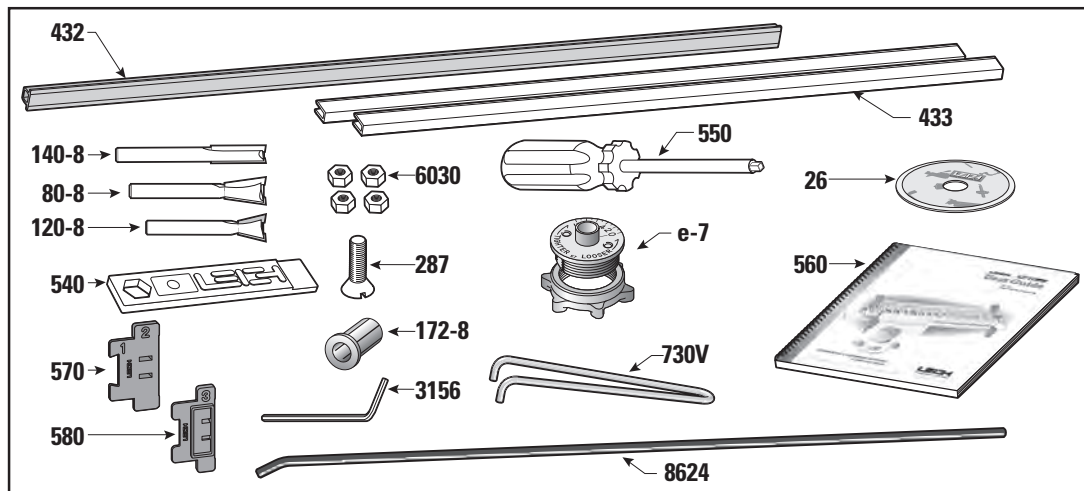
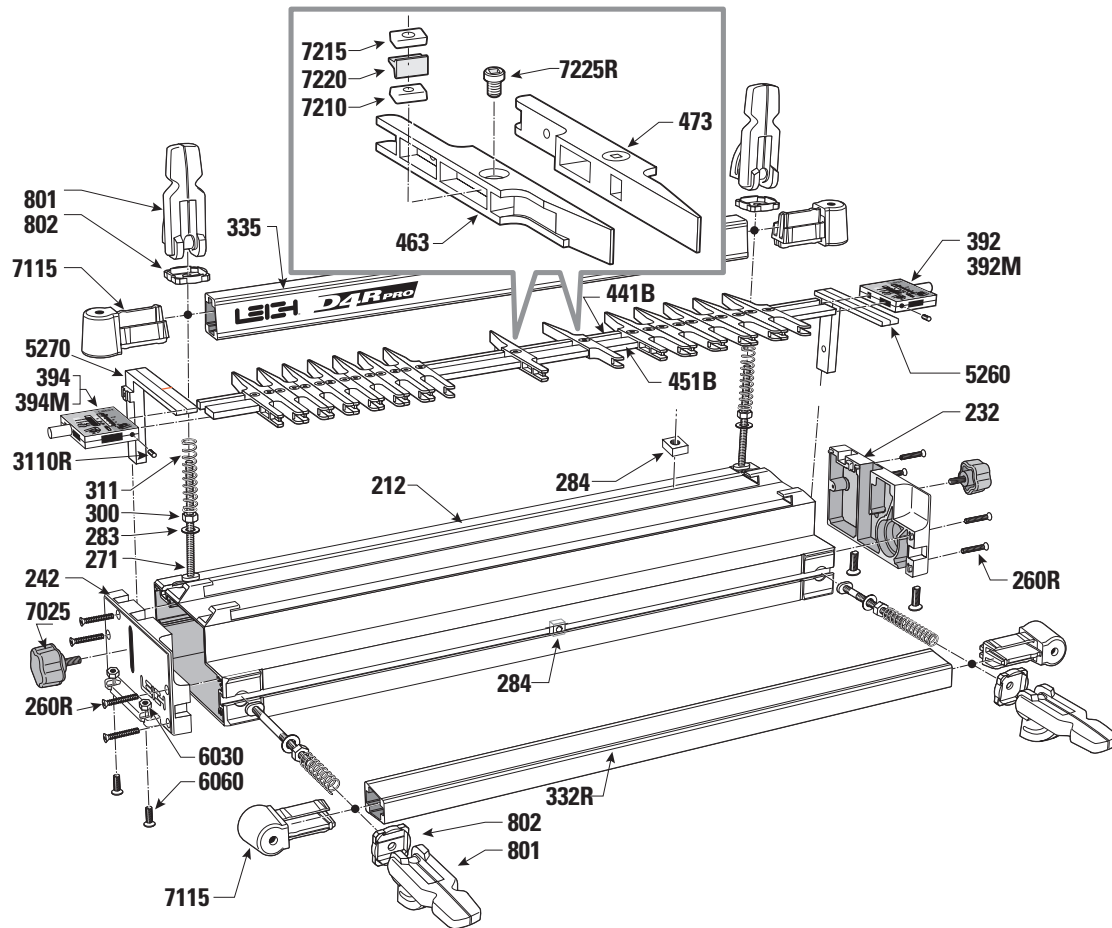
***See parts list and drawing on the following pages.***

*Order parts directly from Leigh by calling toll-free 800-663-8932 — but first have your jig information ready. Please quote the jig model, serial number, part number, part description and quantity required.*

## How to Order Parts

Order directly from Leigh by calling toll free 800-663-8932—but first have your jig information ready. You'll need the jig model, serial number, part number, part description and quantity required. **Note:** Place the finger assembly in half-blind mode to determine left hand and right hand scales.

PART DESCRIPTION	PART No.	QUANTITY
User Guide D4R Pro (English–Inch/Metric)	560	1
Instructional DVD (English - inch only)	26	1
Dovetail Bit, 8mm shank	80-8	1
Dovetail Bit, 8mm shank	120-8	1
Straight Bit, 8mm shank	140-8	1
1/2" to 8mm collet reducer	172-8	1
Body Extrusion	212	1
R.H. End-Housing	232	1
L.H. End-Housing	242	1
End-Housing Screws	260R	8
Clamp Bar T-Bolts	271	4
Flat Washers for Clamp Bolts	283	4
Accessory Attachment Square Nuts	284	2
Accessory attachment screw	287	1
Clamp Bar Bolt Nuts	300	4
Clamp Bar Springs	311	4
Front Clamp Bar (complete with End Plugs 7115)	332R	1
Rear Clamp Bar (complete with End Plugs 7115) and Leigh decal	335	1
R.H. <b>Inch</b> Scale Assembly, complete (R.H. in H.B. Tail Mode)	392	1
or R.H. Metric Scale Assembly, complete (R.H. in H.B. Tail Mode)	392M	1
L.H. <b>Inch</b> Scale Assembly, complete (L.H. in H.B. Tail Mode)	394	1
or L.H. <b>Metric</b> Scale Assembly, complete (L.H. in H.B. Tail Mode)	394M	1
Cross Cut Fence	432	1
Bridge Piece extrusion	433	2
H.B. Pin Guide Rail, 1/4" x 1/4"	441B	1
Finger Guide Rail, 1/4" x 3/4"	451B	1
R.H. Finger complete with Wedge, Washer, Nut and Screw	463	13
L.H. Finger complete with Wedge, Washer, Nut and Screw	473	13
Finger Wedge	7220	26
Finger Nut (Threaded)	7210	26
Finger Washer	7215	26
Finger Lock Screw	7225R	26
Leigh Assembly Wrench/Gauge	540	1
Finger Adjusting Screwdriver	550	1
R.H. Support Bracket	5260	1
L.H. Support Bracket	5270	1
Cam-Action Speed-Clamps complete with Step Washers 802	801	4
Speed-Clamp Step Washers	802	4
Scale Lock Set Screws	3110R	2
5/64" Hex Key (2mm may also work)	3156	1
1/4"-20 Hex nuts, jig hold-down	6030	4
1/4"-20x1 Flat head machine screws, jig hold-down	6060	4
Support Bracket Knobs	7025	2
Clamp Bar End Plug	7115	4
E7-Bush Oval Guide Bush & Nut	E7-Bush	1
Pin Wrench	730V	1
Nylon Stop Rod	8624	1
D4R Pro Dovetail Spacer	570	1
D4R Pro Box Joint Spacer	580	1







## D4R Pro - Appendix IV

# Customer Support

**Our Commitment to You** Leigh Industries takes pride in its commitment to providing excellence in customer service and support. This user guide is designed to provide you with the answers to any questions you have. However, if you require assistance, please feel free to contact our technical support staff or a distributor listed below.

### Manufacturer: Canada/USA

LEIGH INDUSTRIES LTD. (est. 1981)  
P.O. Box 357  
1615 Industrial Ave.  
Port Coquitlam, B.C.  
Canada, V3C 4K6

Toll Free: 800-663-8932  
Phone: 604-464-2700  
Fax: 604 464-7404  
Customer Service: leigh@leighjigs.com  
Tech Support: help@leighjigs.com  
Web Site: www.leighjigs.com

**NOTE:** Email can be useful, but technical queries usually raise queries from us. A phone call is the quickest and most convenient way to get queries answered; either directly to Leigh (toll-free in North America) or to your national distributor. –Thanks!

### Distributors

#### AUSTRALIA & NEW ZEALAND

Carba-Tec Pty. Ltd.  
128 Ingleston Rd., Wakerley, Qld., 4154  
Australia  
Tel: (07) 3390 5888  
Fax: (07) 3890 5280  
Order: 180 658 111  
Email: orders@carbatec.com.au  
Web: www.carbatec.com.au

#### CHINA

Harvey Industries Co., Ltd.  
68-10 Suyuan Avenue  
Jiangning District Nanjing 211100, China  
Tel: (0)86 5792 8869 / 5792 8021  
Fax: (0)86 5792 8826  
Email: caozhi@harvey.cn  
Website: www.harveyworks.cn

#### FRANCE

Ets Bordet  
23 Rue Traversiere  
93556 Montreuil Cedex, France  
Tel: 01 48 58 28 39  
Fax: 01 48 58 48 58  
Email: info@bordet.fr  
Web: www.bordet.fr/pages/

#### GERMANY, AUSTRIA & SWITZERLAND

Hacker GMBH  
Holzbearbeitungsmaschinen  
Traberhofstraße 103 D-83026 Rosenheim,  
Deutschland  
Tel: 08031 269650  
Fax: 08031 68221  
Email: hacker.rosenheim@t-online.de  
Web: www.leigh.de

#### ITALY

Ferrari Macchine Legno SRL  
Via Gallarate 74/76/78  
20019 Settimo M.se (MI) Italy  
Tel: 39 02 335 010 95  
Fax: 39 02 335 005 27  
Email: info@ferrarimacchine.com  
Web: www.ferrarimacchine.com

#### JAPAN

Off Corporation Inc.  
323-1 Yanbara, Shimizu-ku, Shizuoka-shi  
Shizuoka-ken, Japan 424-0002  
Tel: 81-054-367-6511  
Fax: 81-054-367-6515  
Email: info@off.co.jp  
Web: www.off.co.jp

#### KOREA

Leigh Korea  
1st Floor, Yongyu Building, 25-3,  
Neung Pyung-Ri, Opo-Eup, Kwangju-Si,  
Kyunggi-do, Korea  
Tel: 82 (0) 70-8252-0988  
Fax: 82 (0) 31-765-5602  
Email: smgi@paran.com  
Web: www.htools.co.kr

#### RUSSIA

Unicom Ltd.  
Nikitskij Boulevard 12  
Moscow, 119019, Russia  
Tel: 7 (495) 690 0454  
Email: info@leighjigs.ru (Russia)  
Email: info@leighjigs.ru.ua (Ukraine)  
Web: www.leighjigs.ru (Russia)  
Web: www.leighjigs.ua (Ukraine)

#### SOUTH AFRICA

Hardware Centre Group  
Post: PO Box 4059, 2125  
Randburg, South Africa  
Tel: (011) 791-0844/46  
Fax: (011) 791-0850  
Email: info@hardwarecentre.co.za  
Web: www.hardwarecentre.co.za

#### SWEDEN

Toolbox Sweden AB  
Bruksgatan 3, S-597 30  
Atvidaberg, Sweden  
Tel: 46 120 854 50  
Fax: 46 120 854 69  
Email: info@toolbox.se  
Web: www.toolbox.se

#### UNITED KINGDOM & IRELAND

BriMarc Tools & Machinery  
Unit 10, Weycroft Avenue  
Axminster, Devon  
EX13 5PH England  
Tel: 0333 240 6967  
Fax: 0333 240 6976  
Email: email@brimarc.com  
Web: www.brimarc.com

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