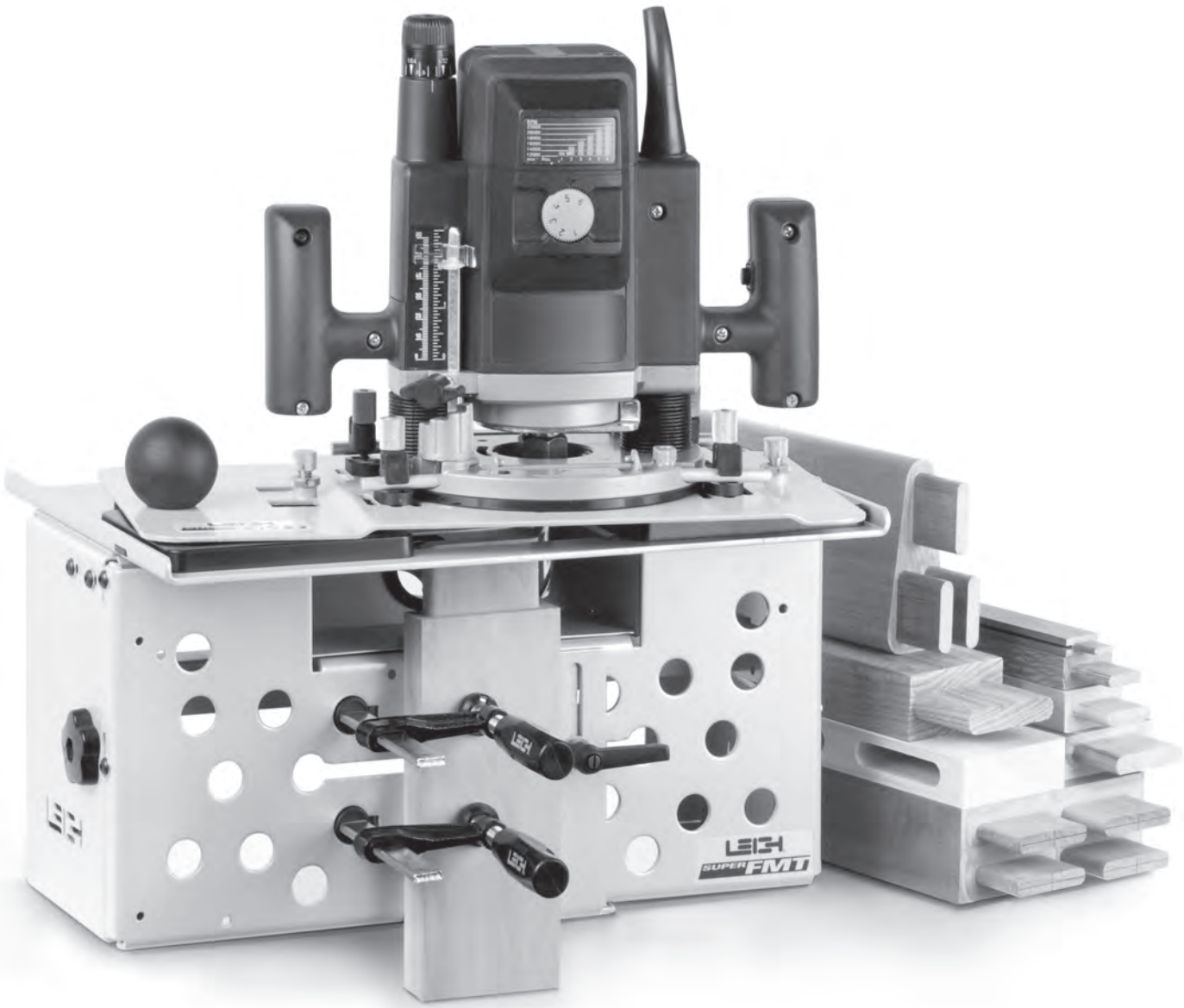
LEIGH SUPER FMT
User Guide

For the Leigh Super FMT Mortise & Tenon Jig



Dedicated Customer Support
1-800-663-8932

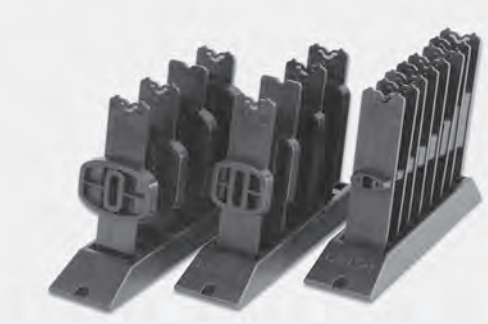
Joining Tradition with Today

Get the Most From Your Super FMT with These Great Accessories

Our Best Value Accessory Kit

Buy the optional 16-piece guide set with matching HSS or Solid Carbide bits and the Vacuum Box to explore the full potential of your new Super FMT. Use the standard guide set with matching bits or bit combinations for 68 joint sizes. Use table limit stops for limitless mortise & tenon sizes. The vacuum box hooks up to a shop vac or built-in dust control system to keep you and your shop clean. Items ACSMTV, ACSMTVC

16-Piece "Completer" Set



This 16-piece set combined with the five guides included with your jig gives you every standard guide available for the Super FMT. With the 8-piece bit set, the standard guide set will produce 68 joint sizes and literally hundreds of additional sizes when using table limit stops. With standard guides and bits you can customize a joint size to fit any project.

Item 6720

Stay Clean and Avoid Breathing Harmful Fine Dust

Routers are among the most challenging tools when it comes to dust and chip collection. That's why the Vacuum Box Attachment is a must-have for all Super FMT users. The box attaches easily to the jig table with just two hex nuts, included in the kit. The large and small adaptors and built-in nozzle allow you to connect to several hose sizes, and shop vac adaptors allow even more connectivity. Item VBSMT

Save Time With an Extra Set of Clamps

Whether you're routing a production run or just a few mortise & tenon joints, an extra set of Leigh F-Clamps will always come in handy. A second set of clamps can hold mortise boards firmly in place without rearranging the clamps used for your tenon boards. Switching from mortise to tenon is fast and easy with these economical Leigh F-Clamps. Each clamp comes complete with clamp pad and powerful rare earth magnet to hold it in place while you position your workpiece. Item 9500PR

Visit www.leighjigs.com for complete details and dealer information.

More Leigh Jigs and Accessories

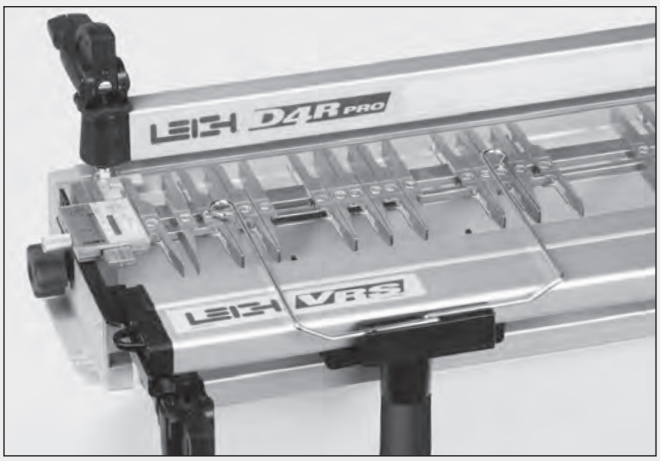
Make Single Pass Dovetails and More with Leigh Super Jigs

Leigh Super Jigs offer extraordinary joint making capability at exceptional price points. Super Jigs are available in three sizes, 12", 18" and 24" widths, to satisfy the needs of every woodworker and every budget. Items Super12, Super18 and Super24

D4R is now D4R Pro! Same Jig – New Name

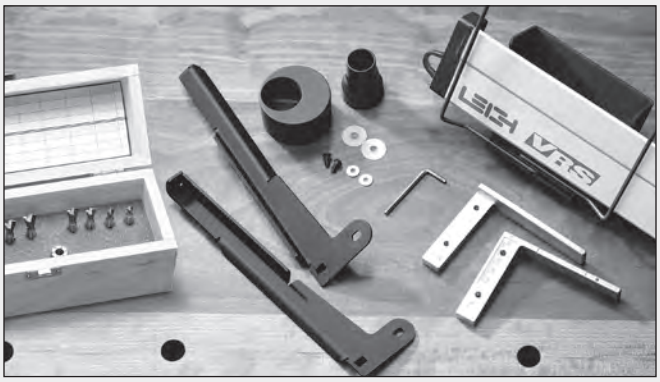
The D4R Pro is undoubtedly the most versatile dovetail jig on the market today. No other jig offers the incredible range of joinery options, right out of the box, and no other jig offers the amazing range of optional templates and attachment.

Dust-free routing and exceptional router support are here with the revolutionary patented Leigh **VRS Vacuum & Router Support**. Fits all Leigh dovetail jigs.



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 handy bit chart to list the bit specs. Leigh bit sets are available for all Leigh jigs and templates. See **www.leighjigs.com/cutters.php** for set details.



Combine the VRS with a Bit Set for Exceptional Savings!

A Leigh Accessory Kit is the best deal going! Enjoy great savings on 7-piece and 12-piece bit sets and even greater savings when you combine a bit set with the VRS Vacuum & Router Support. Accessory Kits are available for all models of Leigh dovetail jigs. See **www.leighjigs.com/kits.php** for details.

Visit www.leighjigs.com for complete details and dealer information.

Your Leigh Super FMT Mortise & Tenon Jig

Congratulations on selecting the unique Leigh Super FMT. This jig will allow you to rout a large range of sizes of mortise & tenon joints with total control over joint fit.

To gain the most advantage from this unique tool, please read all of this user guide, carefully set up the jig following the simple setup directions, and thoroughly familiarize yourself with the basic functions and principles of operation. Use scrap wood before attempting any actual projects with valuable hardwood.

Customer Support

If you have questions not answered in this user guide, please call the Leigh Customer Support line, **1-800-663-8932** or email Leigh at **help@leighjigs.com**

Reminder: If at first you don't succeed, read the instructions!

Important! Inches and Millimeters

The Super FMT is available in two models: inch or metric. The only difference is the guides and bits used—otherwise the jig itself is identical. Text and illustrations in this English language user guide indicate dimensions in both inches and millimeters, with "inches" first, followed by "millimeters" in square brackets, i.e. ½"x 2"[12x50mm].

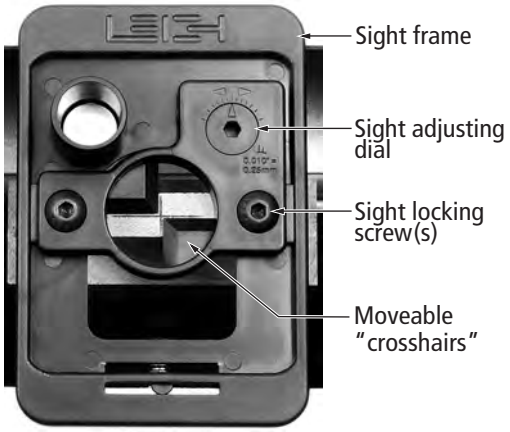
Do not be concerned that the inch/millimeter equivalents are not mathematically "correct." Just use the dimensions that apply to your guides and bits.

IMPORTANT UPDATE

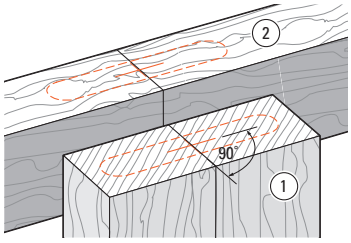
Sight Improvement

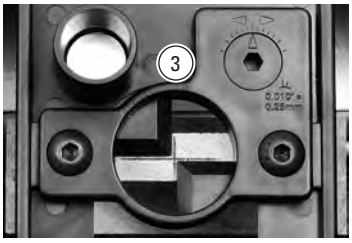
All Super FMT steel parts are CNC punched and formed. Although this process is remarkably accurate, it is possible that an accumulation of industry standard dimensional tolerances may result in a slight left/right joint misalignment. To ensure proper joint alignment, we have made the sight adjustable.

The new sight, included with your jig, is pictured to the right. Although cosmetically different than the sight pictured throughout this guide, the sighting principles are the same. Please use the following procedure for sight adjustment, if required.

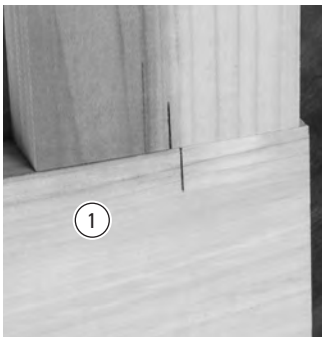


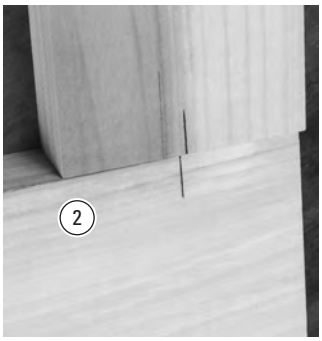
Sight Adjustment Procedure



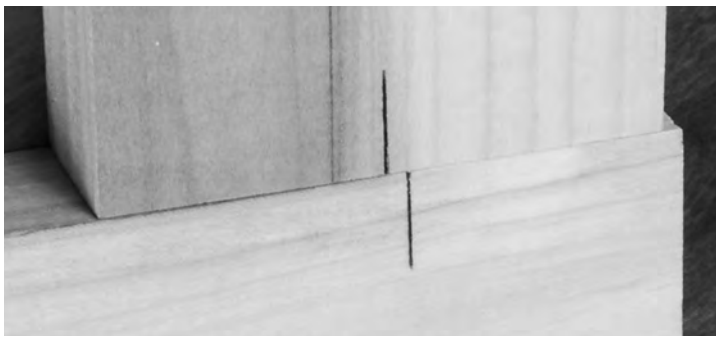


A Mark layout lines on the tenon piece ① and mortise piece ②. Carefully sight the tenon piece in the jig ③. Be sure the layout marks are not touching either side of the cross hairs. Rout the mortise and tenon, assemble the joint and check the layout marks.

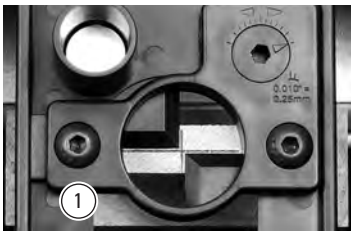


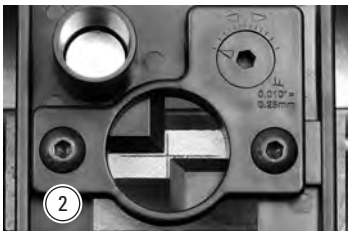


B If your joints are misaligned like this ① or this ② (exaggerated) first **double check** that the router collet is perfectly centered on the sub-base as in figures 2-11 to 2-31. When the router is perfectly centered, proceed to C.



C In this example, the mortise board was clamped on the left side of the jig and the tenon piece is offset to the left. The sight needs to be adjusted by ***half*** the amount of the offset **because changes to the sight position affect the mortise and the tenon**.





D Here's How *Note: Each division on the dial equals an adjustment of 0.010".* If the tenon piece is off **left of center** (B①), loosen the sight locking screws and using the hex driver in the sight adjusting dial, move the sight **left, by half of the joint offset** ①. If the tenon piece is off **right of center** (B②), using the hex driver in the sight adjusting dial, move the sight **right by half of the joint offset** ②. ■

Mounting the Super FMT

Jig Assembly and Mounting

The Leigh Super FMT comes almost fully assembled with all adjustments factory set, however, before you start to set up your jig, make sure you have received all the required parts.

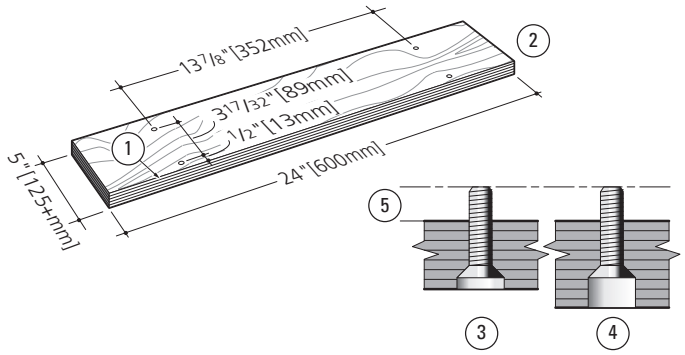
SUPER FMT CARTON CONTENTS

1. **Jig Body**
2. **Router Sub-base**
3. **Parts Carton including:**

A	1	User Guide
B	4	Jig Hold-down Nuts and Bolts ¼"-20
B	4	Rod Clamps
B	4	Brass Rod Clamp Knobs
B	4	1¾" Button Head Hex Socket Screws
B	4	Square Nuts
B	4	Hex Drive Button Head Screws
B	4	Sliding Washers
B	3	Hex Socket Button Head Screws 10x24 x ⅜"
B	2	Hex Socket Button Head Screws M6
B	2	Router Hold-down Rods
C	1	¼" - ½" Centering Mandrel
C	1	8 -12mm Centering Mandrel
D	1	5⁄16" HSS Spiral Upcut ½" Shank (not included with FMT-M)
E	1	Sub-base Knob
F	1	⅛" Hex Driver
G	1	Sight
H	5	5⁄16" Guides (or 6x8mm with FMT-M) and 1 Guide Stand
I	1	Sidestop Fence
J	2	F-Clamps

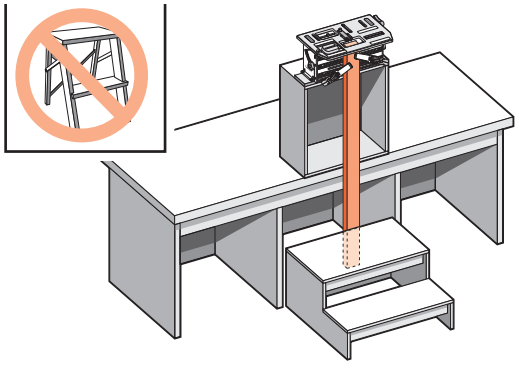
Note: Any optional accessories you ordered may be included in the main carton or parts carton.

If any of these items are missing from your order, please notify your supplier or Leigh Industries immediately.



1-1 Mounting: Prepare a flat board at least ¾"[20mm] thick, a **minimum** of 24"x5"[600x125mm]. Center the jig on the board **with the front edge of the base frame flush with the edge** ①. Mark and drill four 9/32"[7mm] holes ②. Countersink ③, or counterbore ④ if board is thicker, the underside so that the four ¼-20 x 1" long machine screws will project above the top surface by ⅜"[9,5mm]⑤.

1-2 Turn the jig upside down on a smooth surface and place the mounting board on the base of the jig. Using the four screws and hex nuts, secure the mounting board to the jig. ①. Now you can clamp your jig to any bench.



1-3 For routing long vertical rails 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 as shown here to stand on. **Do not use a collapsible step stool, it is unstable and unsafe.** ■

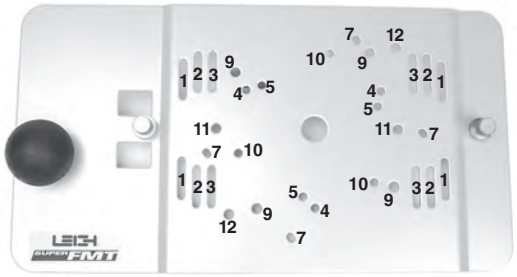
Mounting the Router

Foreword

*The Super FMT universal sub-base mounting system provides great attachment strength and stability for almost any plunge router. Fitting the sub-base to your router may take up to a half hour…**the first time only**. The router can be removed in seconds for use elsewhere, and re-attached in about a minute for Super FMT use. Mounting the sub-base correctly this first time is critical to the accuracy of the jig, so take your time and get it right. Here's how...*

***NOTE** If your router is not listed in the chart below, please check www.leighjigs.com for the latest updates or call us at 1-800-663-8932.*

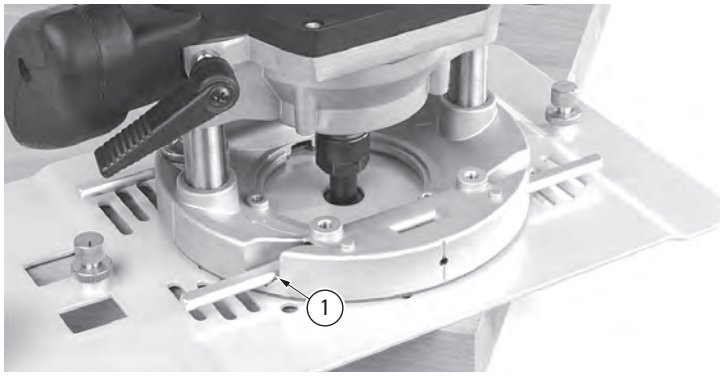
⚠ The Super FMT must only be used with a plunge router. Never, ever use a fixed base router!



ROUTER MAKE	HOLES LR	RR	LF	RF	NOTES
AEG OFS 50	2				
BOSCH 1450, 1611EVS, 1613EVS,1617EVS	2				
BOSCH 1619 EVS	1		*1	1	*File notch in U-Post if req'd to avoid Turret.
CRAFTSMAN	2				
DEWALT 616/618	3				
DEWALT 621	1	3	1	3	
DEWALT 625	2				Requires 1/16" packing shim. See 2-7
ELU 97	1	3	1	3	
ELU MOF 131	2				
ELU MOF 177/02	2				
ELU 3304	3				
ELU 3338	2				
FESTOOL OF900E	7				
FESTOOL OF1400	11				Use 2 #5130 screws provided. See 2-26
FESTOOL OF2000	2				
FESTOOL OF2200	12				Use 2 #5130 screws provided. See 2-26
FLEX OFT2926VV	5				Use 3 #6410 screws provided. See 2-26
FREUD FT2000E	2				
HITACHI M12V	2				
HITACHI M12VC	4				
HITACHI TR12	2		**8	2	**To avoid Turret
MAKITA 3600B	1				
MAKITA 3612BR	3			**6	**To avoid Turret
MAKITA 3612C	3				
MAKITA RP 0910	4				
MAKITA RP 1100 Series	4				
METABO OFE728	3				
METABO OFE1028	3				
METABO OFE1229	3				
MILWAUKEE 5616	4				
RYOBI R-150	3				
RYOBI RE180PL	2				
RYOBI R-500	2				
RYOBI R-E600	2				
PORTER CABLE 693	4				Use 3 #6410 screws provided. See 2-26
PORTER CABLE 890	10				
PORTER CABLE 890 Type 2	4				Use screws from router base. See 2-26
PORTER CABLE 7529, 8529	5				Use 3 #6410 screws provided. See 2-26
PORTER CABLE 7539	*2				*Reverse U-Post to put screws outside rods
TRITON, TRC001 3¼hp	9				Call Leigh or your national distributor for Attachment Screws
TRITON, MOF 001 2¼hp	9				

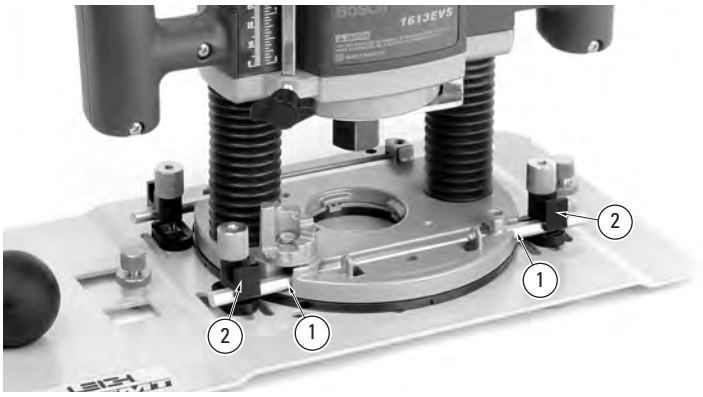
2-1 The Leigh Super FMT Sub-base First, install the black knob ① and guide pins ②. Then, place your router, the sub-base and all mounting parts on a clear bench. From the sub-base diagram and chart opposite, find the make and model of your router and mark the appropriate mounting holes in the sub-base, then see 2-4. If the chart at left indicates your router is a "Direct Screw" mount (shaded routers), then see 2-26.

If your router is not listed but has two fence rod holes going through the base, see 2-2 and 2-3.

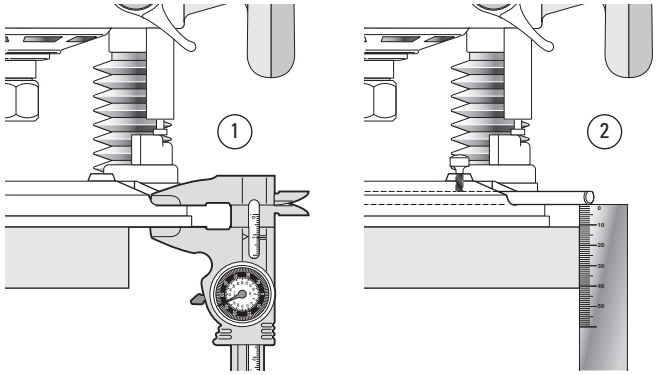


2-2 If you have a plunge router not listed in the sub-base diagrams, it is essential that your router have two parallel fence rod holes through the router base. These must be at least 5⁄16"[8mm] in diameter ①. Fit the centering mandrel to your router, place it on the sub-base and plunge the mandrel into the base hole. Place the fence rods through the rod holes with an equal amount protruding at each end.

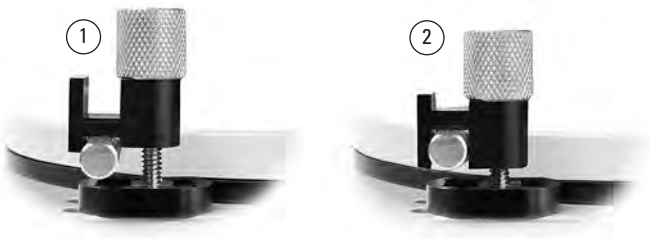
2-3 Take the rod clamps and by trial, establish which four sub-base slots or holes will serve to attach the rod clamps.



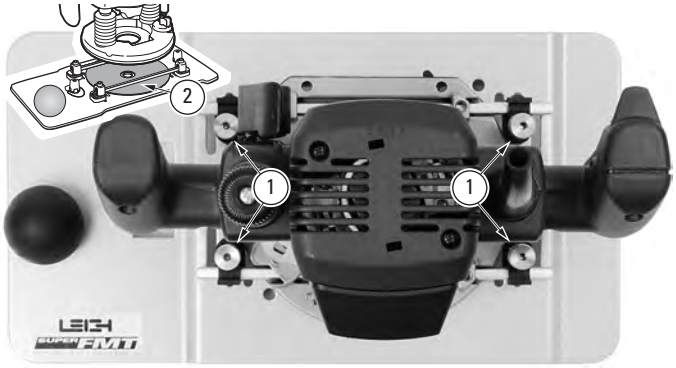
2-4 Most plunge routers will be mounted to the sub-base like this, with rods through the fence rod holes ① and clamped down with the rod-clamps ②.



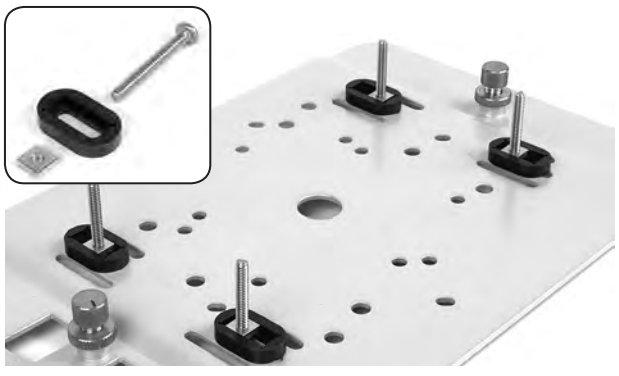
2-5 Depending on the make or model of your router, the height between the underside of your router and bottom of rod hole will vary. This dimension will determine which way up the rod-clamps are applied. To measure the "rod height", place router on a bench. Use a calliper ①, or insert a rod (flat side up) and use a good rule to measure between bench top and bottom of rod ②.



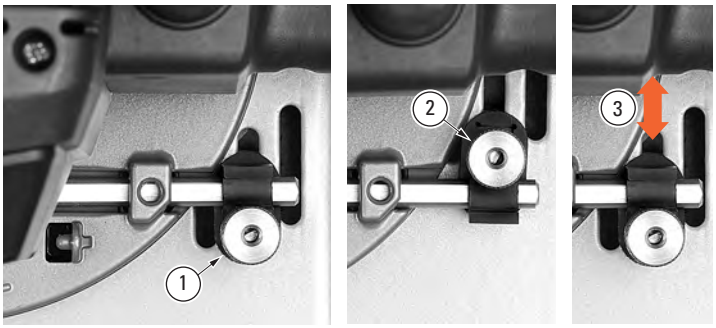
2-6 If rod height is between ¼"[4,5mm] and ⅜"[9,5mm], use the rod clamp this way up ①. If rod height is between ⅜"[9,5mm] and 17⁄32"[13,5mm], use rod clamp this way up ②. Note: If the rod height is less than ¼"[4,5mm]. See 2-7.



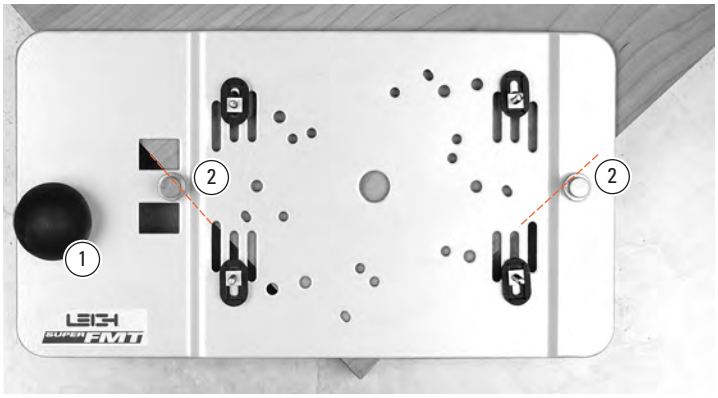
2-7 **Note:** Use of the sliding washers is essential to act as side-to-side stops for the router ①. If the rod height of your router is less than ¼"[4,5mm] you must provide a shop-made packing shim between the router and sub-base. We suggest one or more sheets of sandpaper ②, rough side up.



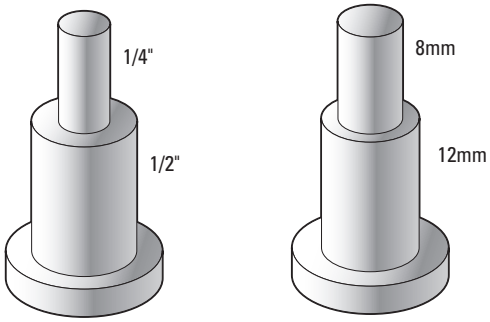
2-8 Using the four #10-24 1¾" screws, insert each through the previously marked slots or holes in the sub-base. Fit a square nut in each sliding washer. The screws must enter from below. Fit the plastic sliding washers and four nuts and tighten ***very lightly*—you will need to move the sliding stops during setup**.



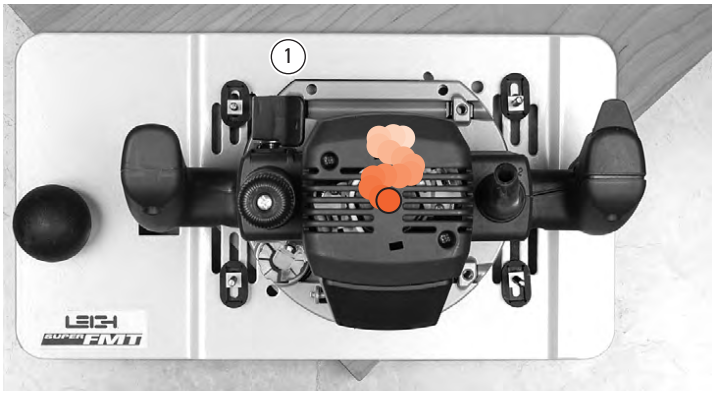
2-9 In most cases, position the clamp screws to the outside of the rod ① or depending on the size and shape of the router base, to the inside ②. Slide the sliding stops away from the router ③. These will be repositioned against the router later.



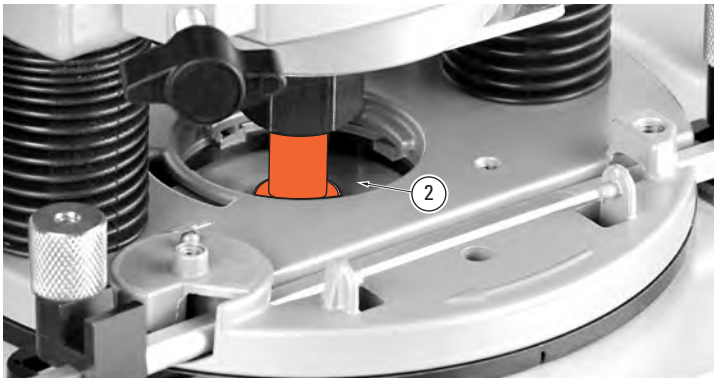
2-10 Place the sub-base flat down on the corner of a smooth bench, **the knob to your near left** ① and the guide pins touching the adjacent edges of the bench ②.



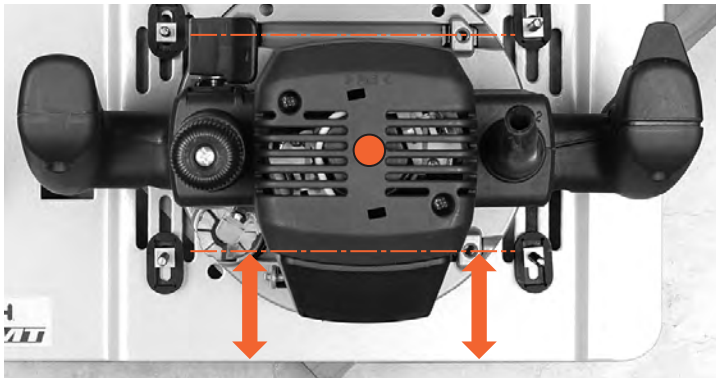
2-11 Unplug the router. Note the collet size of the router. Choose the matching size centering mandrel and fit it into the router collet.



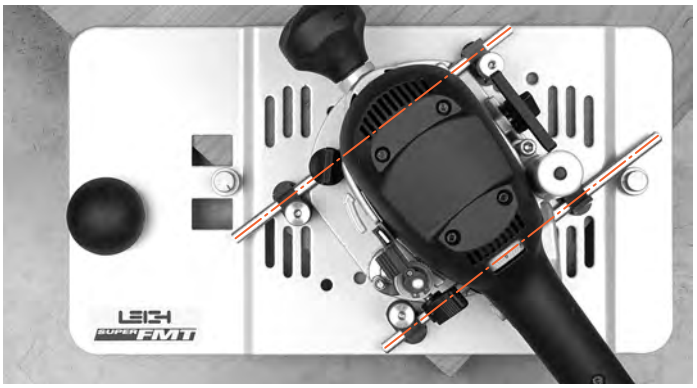
2-12 Holding the router as you would in normal use, place it base down onto the sub-base; the rear of the router toward the rear of the sub-base ①. Plunge and move the router so that the centering mandrel fits through the sub-base center hole…



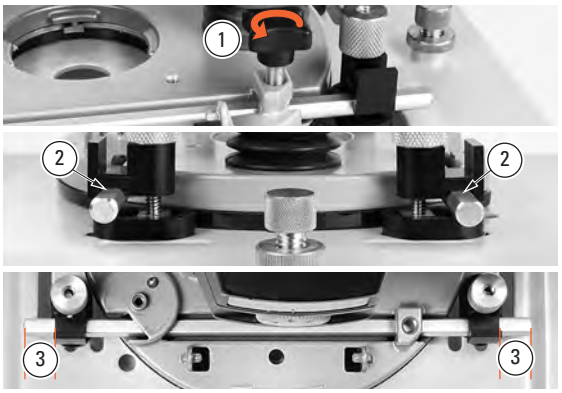
2-13 …and touches flush to the top of the sub-base ②. Lock the plunge. ⚠ Concentricity of bit to sub-base bit hole is essential to Super FMT accuracy, so never mount the router without using the centering mandrel.



2-14 Align the router so that the fence rod holes are parallel to the front edge of the sub-base **except Festool 900, 1000 and 1010 Series** (see 2-15).

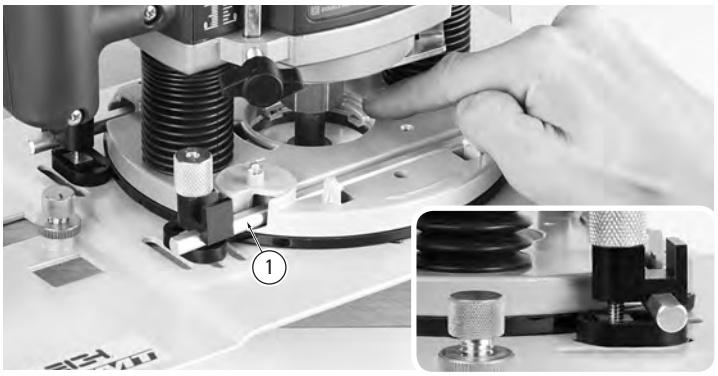


2-15 Festool 900, 1000 and 1010 Series: Align the fence rod holes to the previously positioned screws.

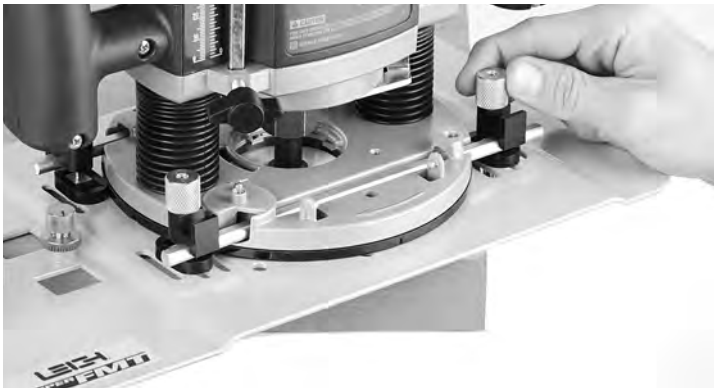


2-16 Loosen and raise any router fence rod knobs ①. Loosen the clamp screws and adjust as necessary to slide the two hold-down rods through the router fence rod holes, **flat side of rods on top** ②. Leave an equal amount of rod projecting through each rod clamp ③.
⚠ Never use the router's fence rod knob ① to "help" secure the router. This places uneven pressure and could damage the router base.

2-17 Turn down the four brass knobs **until there is only very slight and even pressure** on each end of both rods. Leave the sliding stops in the outer position.



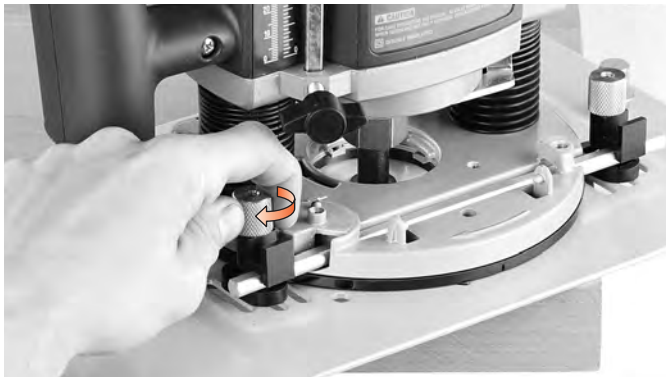
2-18 Check that the rods are still centered in the rod holes ① and that the router collet can rotate without binding in the sub-base hole. The mandrel touching the side of the hole is OK; mandrel binding is not! Move the router if required to allow mandrel to rotate.



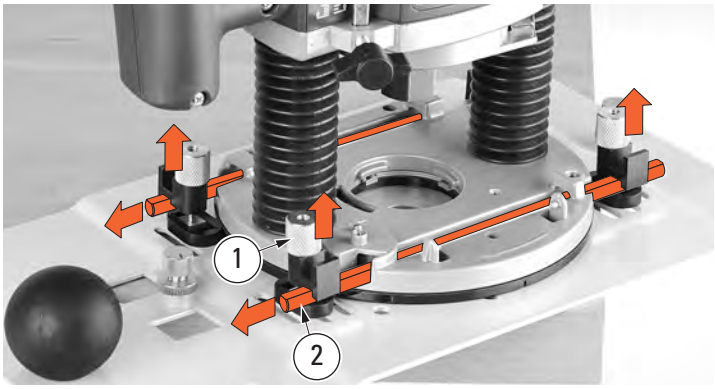
2-19 Tighten the brass knobs a little more securely to hold the rods and router.

2-20 Slide the router/sub-base assembly on the corner of the bench so that one clamp screw is overhanging the edge. Loosen this screw just slightly. Push the sliding washer in to touch the router base, and holding it in position against the router base, tighten the screw firmly.

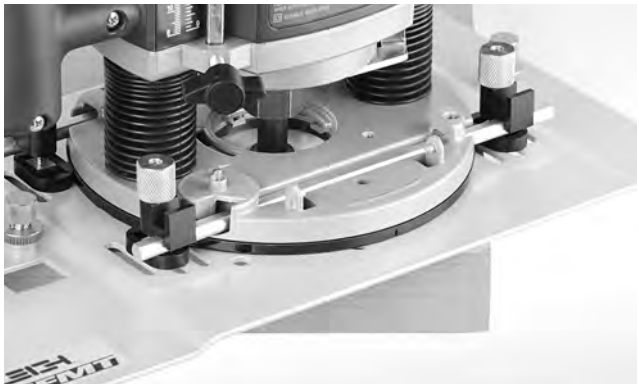
2-21 Repeat this procedure at the other end of the same rod. Recheck the collet/mandrel for relatively free rotation. Turn the router around on the corner of the bench and repeat this procedure on the two assemblies on the second rod.



2-22 Tighten the four brass knobs to the rod clamps. Use common sense when tightening. The rods will bow slightly. Objective: have the collet concentric to the bit hole; four sliding stops provide secure side thrust security, and clamps securing the rods hold the router against the Leigh sub-base. Router and sub-base is now a unit. Release the plunge; remove and store the mandrel. You're set to go.

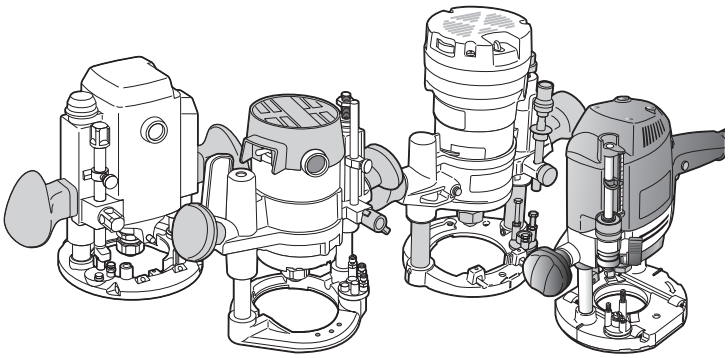


2-23 Here's how to remove the router for use elsewhere: Loosen the four top brass knobs ①, slide out the two rods ② and lift the router up. Do not remove the knobs and clamps. In about a minute, the router is free to be used for other tasks.

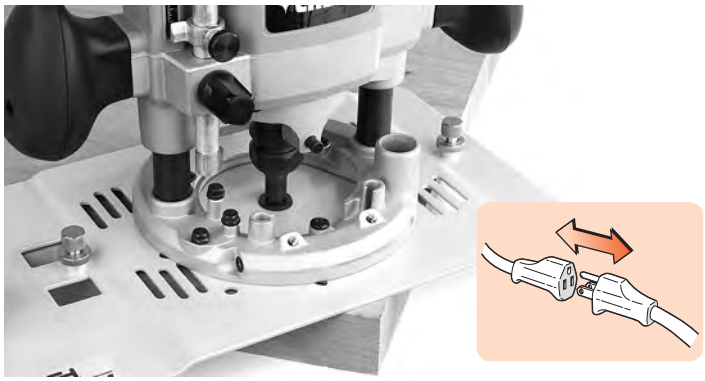


2-24 To remount the router: Place the sub-base over the corner of the bench. Make sure surfaces are clean. Place the router on the sub-base, insert the two rods and tighten the four brass knobs. Check that the mandrel rotates freely. In about two minutes the router/sub-base assembly is ready for making mortises and tenons.

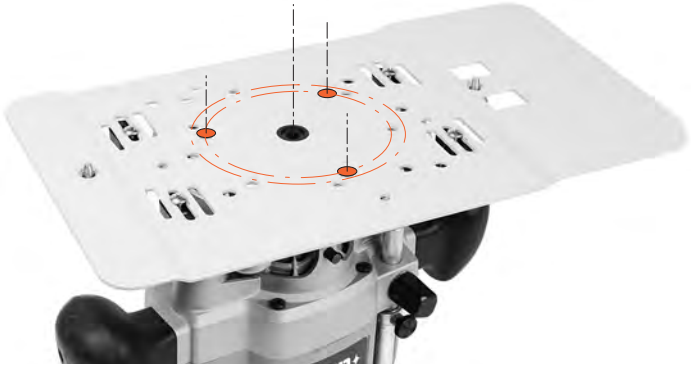
2-25 Hint: If you plan to fit a different make/model router and later use the current one again, you can greatly speed up the re-installation of the first router by marking around the original four clamp screw positions.



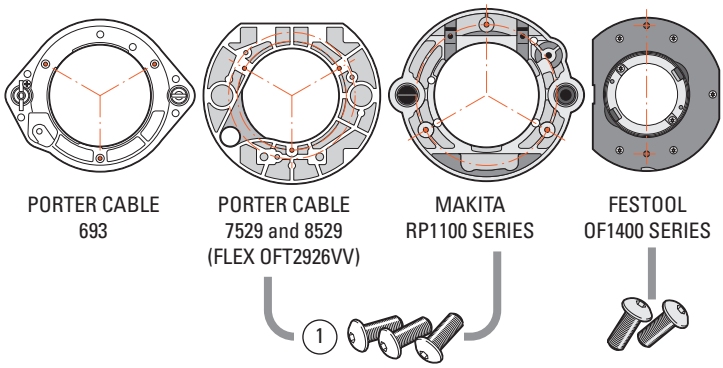
2-26 These routers have unsuitable through fence rod holes: Porter Cable 693, 890, 7529, 8529; Flex OFT 2926VV; Festool OF1400, OF2200; Makita RP1100, RP1101, RP0910, RP1110C; Triton TRC001, MOF001. We've provided sub-base holes and screws* to mount these directly to the sub-base. Using Porter Cable 7529 and 8529 as examples, here's how. **Note: Triton owners use ¼ x 20 flat bottom pan head screws.*



2-27 Unplug the router. Remove router's plastic sub-base base (except Festool 1400 and 2200) and template guidebush adapter from the 7529 or 8529. Remove clear plastic dust cover from the top of 8529 router base (screw holes are used to attach the Super FMT sub-base). Fit mandrel to the collet. With sub-base on a flat bench corner, place router on top, plunge mandrel through to the bench and lock the plunge.

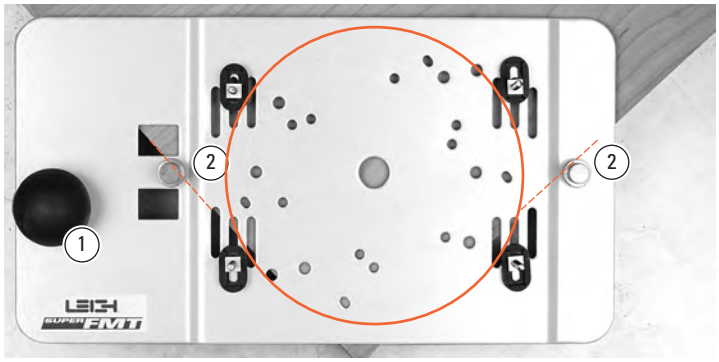


2-28 Remove router and stand it upside down on bench. Depending on the router design, you may need to support it in a soft-padded vise. Place sub-base upside down onto router's metal base with the mandrel centering the router to the base through the bit hole. Rotate sub-base until the correct threaded screw holes in the router base align with the counterbored holes in sub-base. See 2-29 before fitting screws.



2-29 Notes: Porter Cable 7529 & 8529 (Flex OFT2926VV) have two sets of 3 threaded holes. Use the inner circle of the Leigh sub-base holes. The outer circle holes align with threaded holes, but are not deep enough for the screws. For Porter Cable (Flex) 693 & Makita RP1100 series routers use the outer circle of sub-base holes. Firmly attach the sub-base using the three 6410 hex socket button head screws provided ①.
Do not use the router's sub-base screws. **Important: See 2-31!**

2-30 Festool 1400 and 2200 routers attach using the two 5130 (M6) screws provided, through base holes No.11 and 12 respectively.



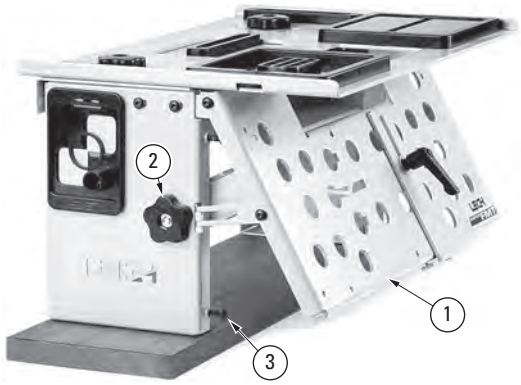
2-31 ⚠ **In addition to the base screws it is vital to attach the four clamp screws and the four sliding stops.** Position and tighten these against the edge of the router base to prevent lateral router movement. For correct positioning, see 2-8 through 2-10 and 2-20 through 2-21. Note: Porter Cable 7529 and 8529 handles will be slightly angled (not parallel) to the Super FMT sub-base. ■

SUPER FMT CHAPTER 3

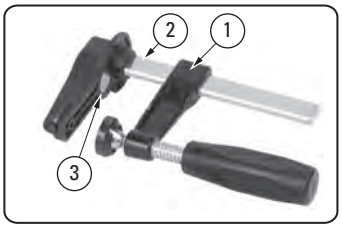
The Super FMT Jig

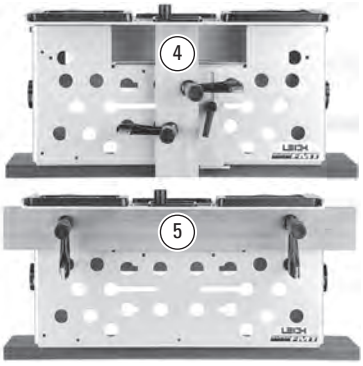
The Clamp Plate and Clamping
The Table
Jig Operation Concept
Safety and Router Operation
Wood Preparation

The Clamp Plate and Clamping



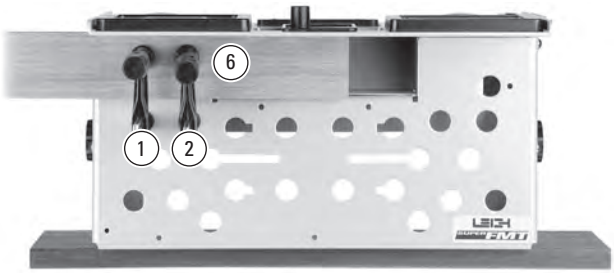
3-1 The clamp plate ① is adjustable up to 30° from vertical and is held securely by two quadrant knobs ②. A set-screw ③ allows for positive return to 90°. **To ensure flush and in-plane joints, it may be necessary to adjust the clamp plate angle. See Appendix II, Jig Adjustments.**





3-2 The two F-Clamps have a capacity from zero to 3"[76mm]. The threaded clamp arm ①, is removable and the clamp bar ② is inserted through the clamp plate hole from the rear. Each clamp 'foot' has a powerful rare earth magnet embedded in its plastic 'pad' ③ which maintains clamp position. Normally tenon workpieces will be clamped vertically ④ and mortise workpieces horizontally like this ⑤, or...

Using Two Clamps

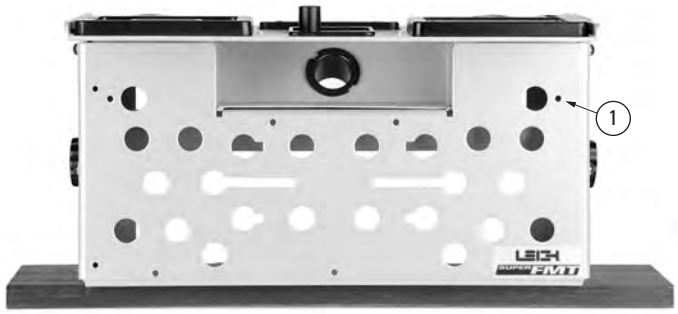


Using Two Clamps on Top Left or Top Right Corner

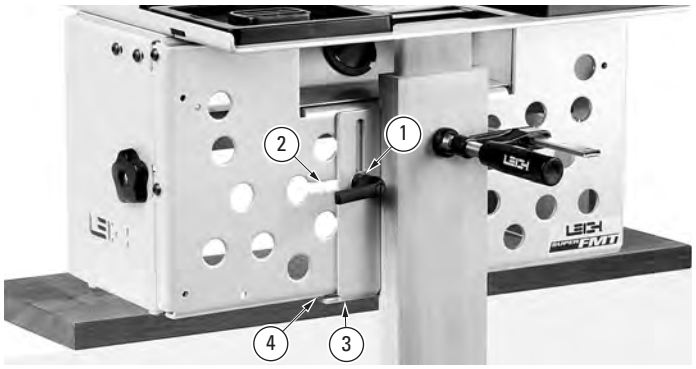
3-3 ...like this ⑥. For clamping very small workpieces see Chapter 4, Small Joints. **Attention: When using two clamps as pictured, tilt the clamp plate fully upwards before inserting clamps. Insert the outermost clamp ① from below the horizontal bar on the inside of the clamp plate. Insert the inner clamp ② from above the horizontal bar on the inside of the clamp plate.**

3-4 ⚠ **Do not over tighten the clamps;** excessive force may damage the workpiece. A few minutes of trial and error testing will soon give you the feel for the correct clamp tension.

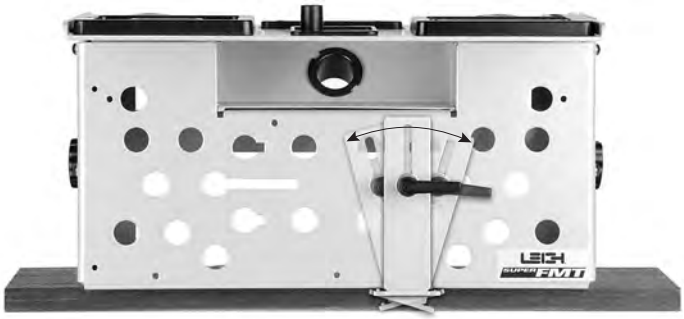
3-5 The clamp plate holes allow for full clamping coverage. The two long keyholes ① are for the sidestop fence, but these holes (not the slots) may be used for clamping if required.



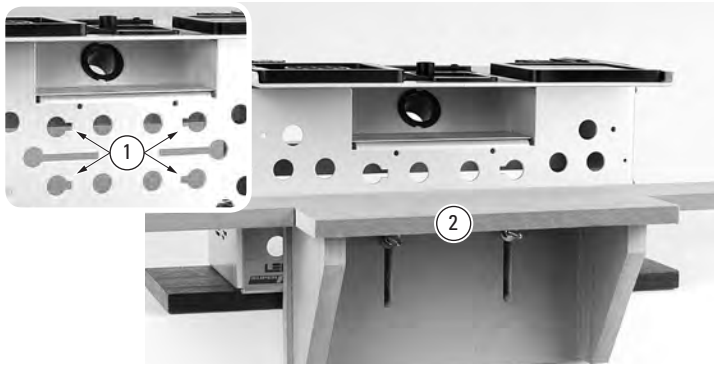
3-6 The clamp plate is provided with seven small through-holes ①. If a facing board is required use No.8 or M4 wood screws (not supplied) from the rear. Alternatively the clamp plate holes could be marked onto a ply or MDF panel, bored through with a ¾" [20mm] Forstner bit and attached with a pair of optional Leigh F-Clamps.



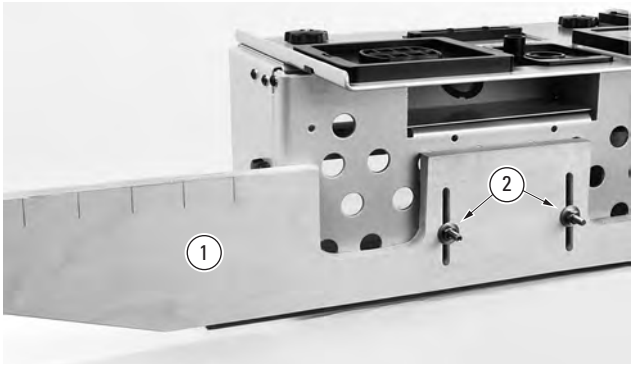
3-7 The sidestop fence is attached by a single index lever ① and carriage bolt inserted through one of the two 'keyhole' slots ②. Most tenon pieces are routed vertically, and for that purpose the bottom of the fence ③ acts as a T-square against the bottom edge of the clamp plate ④. See Appendix II (A2-5), for sidestop squareness adjustment.



3-8 **Angled Joints:** Simply loosen the index lever, adjust the fence to the desired angle and re-tighten the lever.

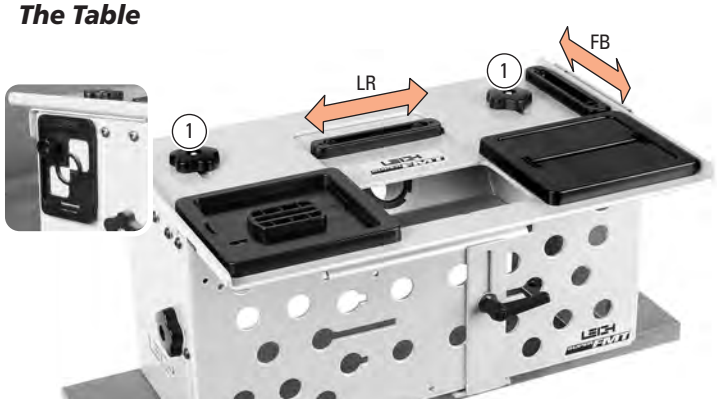


3-9 The jig clamp plate has four clamp holes with notches ① to allow the mounting of a shop-made mortise beam ② or outrigger beam for handling large mortise pieces for efficient routing of multiple mortises. See Chapter 4, Production Procedures.

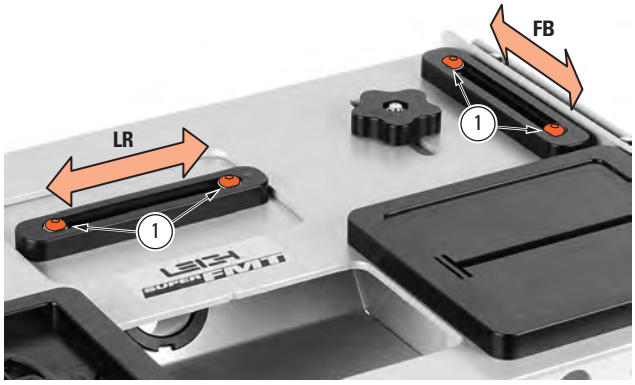


3-10 The outrigger beam should be ⅜" to ½" [10-12mm] plywood, shaped as suggested to minimize weight. Drill and cut out as shown ① and attach using either ¼-20 [M6] carriage bolts and wing nuts (not supplied) ② or alternatively a pair of optional Leigh F-Clamps ■. See leighjigs.com/support.php#r22

The Table



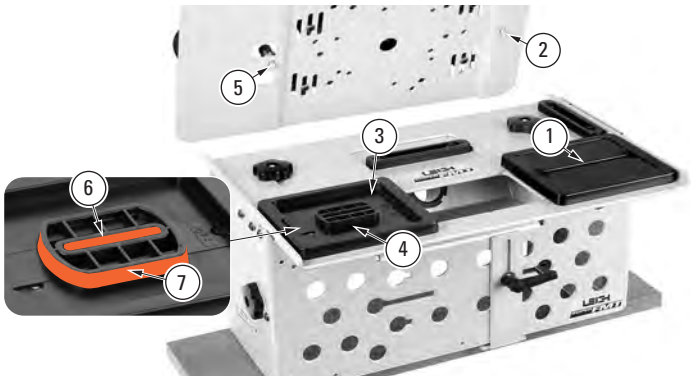
3-11 The table is clamped in any desired position by the Table Clamp Knobs ①. Loosening the knobs slightly releases the table, which can then be moved in any direction to any position within its range.



3-12 Adjustable Limit Stops ① are used to limit or prevent table movement left to right (X-axis) and front to back (Y-axis), and to precisely align double and quadruple mortises and tenons (see Chapter 5). Use Limit stops when you see these icons:

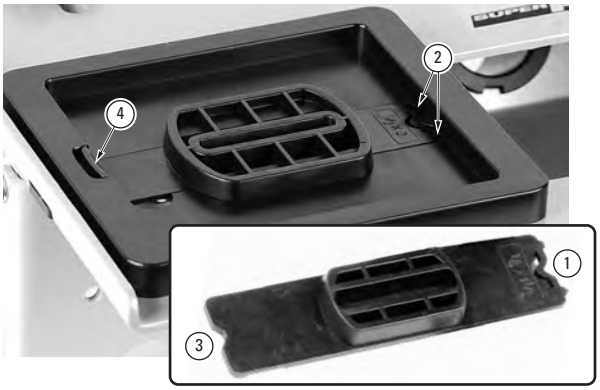
LR for left-to-right table movement
FB for front-to-back table movement.

3-13 The table has a bit opening ① and a Joint Aligning Sight ②. The sight and opening have matching locating notches and allow precise table positioning over joint cross marks ③. Because the human eye excels at comparisons, we can perceive differences as small as .004 in the space between the edges of the line and the triangles ④. That's .002 off center! You can readily center the sight using slight table movements until the spaces appear the same. The sight magnet allows for convenient storage on the end of the jig body.

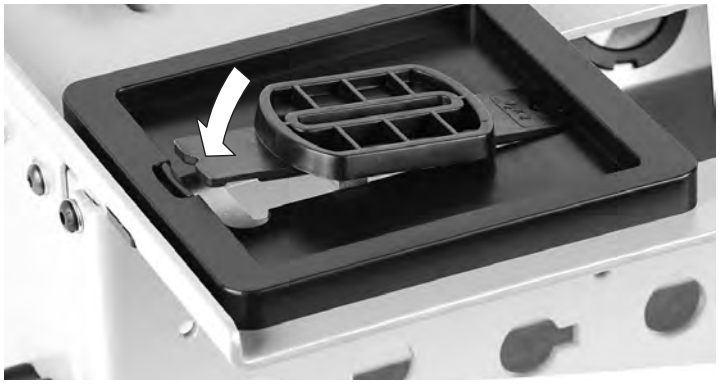


3-14 To the right front is the right hand "Guide Pin Track" ①. The right hand router sub-base Guide Pin ② runs in this track in all routing operations. To the left front is the Guide Recess ③, in which all Joint Guides ④ are placed. The left hand router sub-base Guide Pin ⑤ runs in the guide slot ⑥ for routing mortises, or around the outside of the Guide ⑦, for routing tenons.

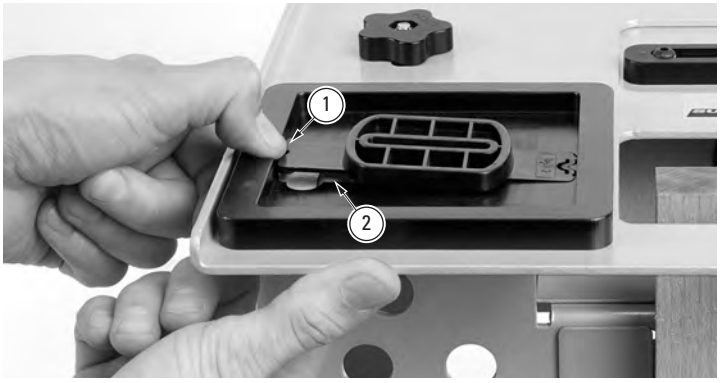
3-15 The Guide Pin cannot move horizontally outside the recess ①, and prevents the bit from touching the sides of the bit opening ②.



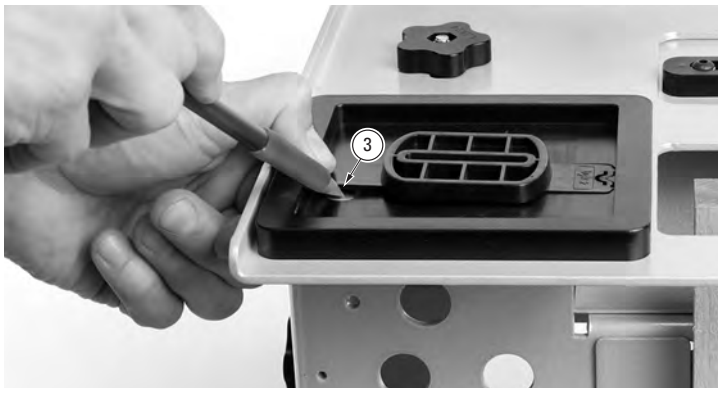
3-16 Two small projections on the Guide ① fit into undercuts on the right side of the guide recess ②. The left end of the Guide ③ is pushed down and retained by the spring-loaded Guide Latch ④. ⚠ Note: the guide end shapes are not identical. Guides can only be installed one way as shown here.



3-17 Snap the Guides in like this. Use firm pressure just next to the guide latch. Note: The guides are injection molded acetyl and the guide bases may vary slightly in tolerance. **Some may require more pressure to insert.** The tighter guides will become easier after a few insertions.

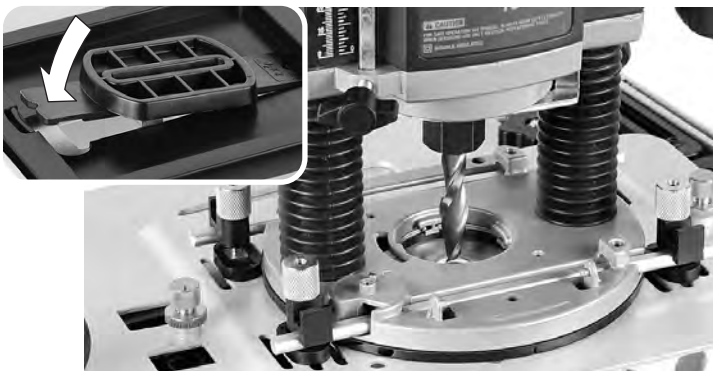


3-18 To remove a Guide, pull back the latch ① and push through the hole from below with your fingertip ②.

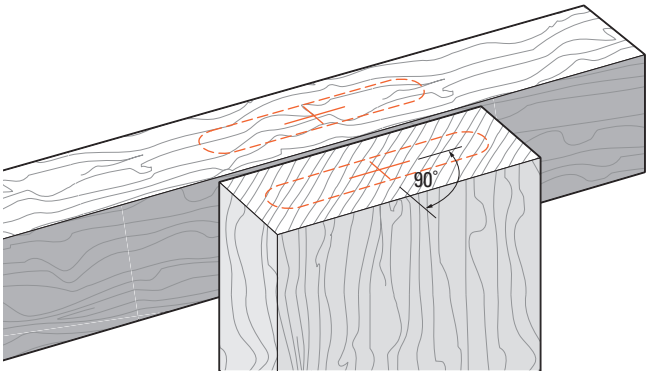


3-19 If the finger hole is not accessible from below, use your fingernail or a small **non-metallic pry** to lift the Guide up ③. ■

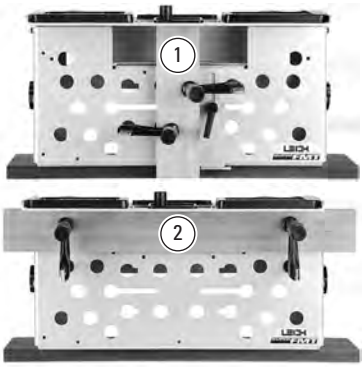
Jig Operation Concept



3-20 Select a guide and bit. Snap the guide into the guide recess and install the bit in the router.

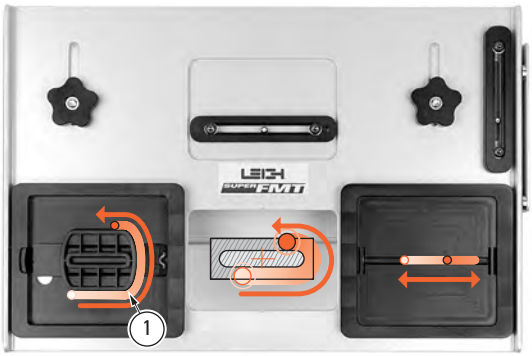


3-21 The centers of a mortise and a tenon are marked with a cross.

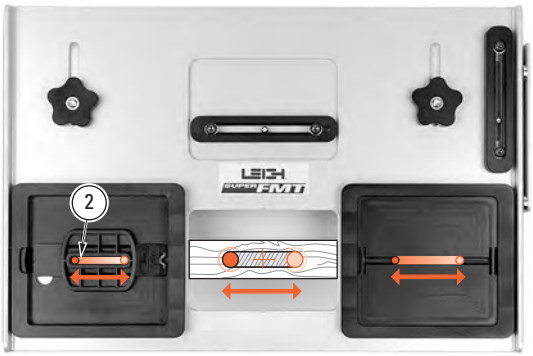


3-22 Tenon workpieces are usually clamped vertically ①. Mortise workpieces are always clamped horizontally ②.

3-23 The jig table is centered over the marked workpiece with the sight ①.

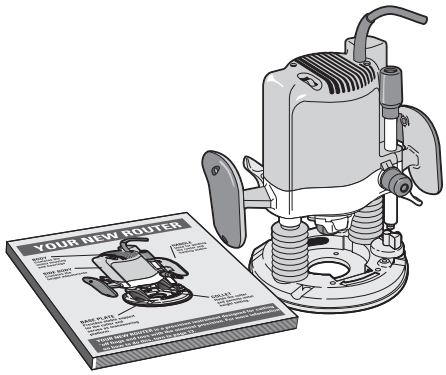


3-24 Tenons are routed with the guide pin running around the outside (tenon) part of the guide ①. See Chapter 4 for routing techniques.



3-25 Mortises are routed with the guide pin running in the inside mortise slot of the guide ②. Always rout the mortise slightly deeper than the tenon length. **Note: In most constructions, only one tenon and perhaps two mortises need to be cross marked and sighted. Please read all of the procedural chapters to gain the utmost efficiency from your Super FMT.** ■

Safety and Router Operation

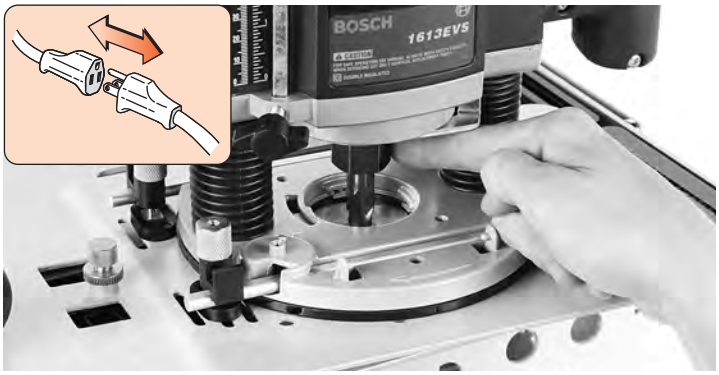


3-26 ⚠ **Read the owner's user guide that came with your router. It is essential to understand the router manufacturer's instructions completely.**

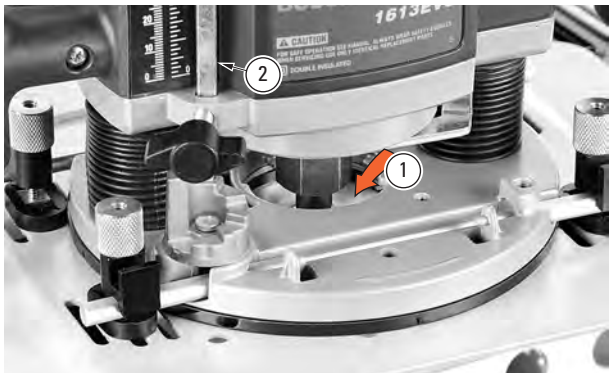
3-27 Always wear approved safety glasses and hearing protection. Protect yourself from harmful dust by wearing a face mask. We highly recommend you acquire and use the optional Leigh Super FMT Vacuum Attachment. Connect your shop vacuum or dust collection system directly to the vacuum box.

3-28 The optional Vacuum Attachment consists of the metal box with adaptor, two additional adaptors to suit multiple hose sizes and two hex nuts used to attach the box.

3-29 ⚠ **Never drink alcohol or take medications that may cause drowsiness when you will be operating a router.**



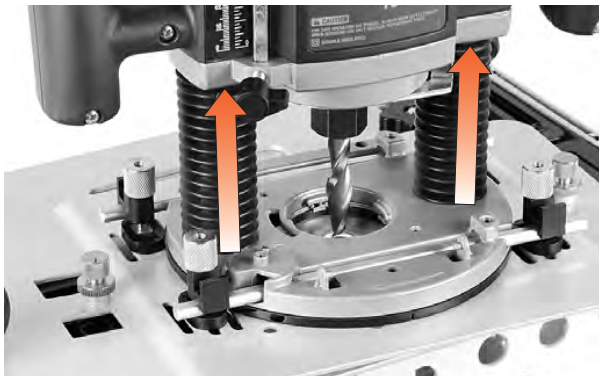
3-30 Always disconnect the power source from the router when fitting bits, or making adjustments. Before connecting the router to the power source, make sure the bit revolves freely through the sub-base bit hole, and table and clamp plate bit openings in all extreme guide pin positions and preset bit depths.



3-31 Make sure the router collet does not contact the Super FMT sub-base at full plunge cuts ①. Set the router plunge stop rod as necessary to prevent this ②.

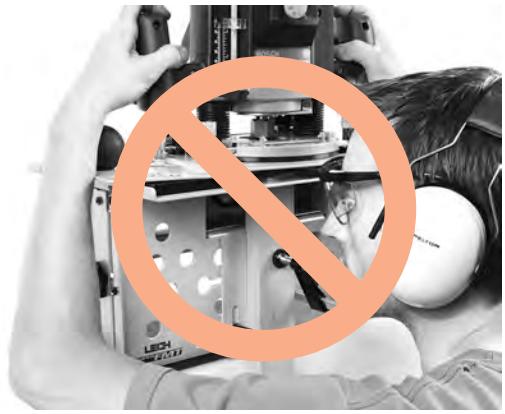
3-32 Do not tilt the router on the jig.

3-33 Keep the router flat on the jig table.

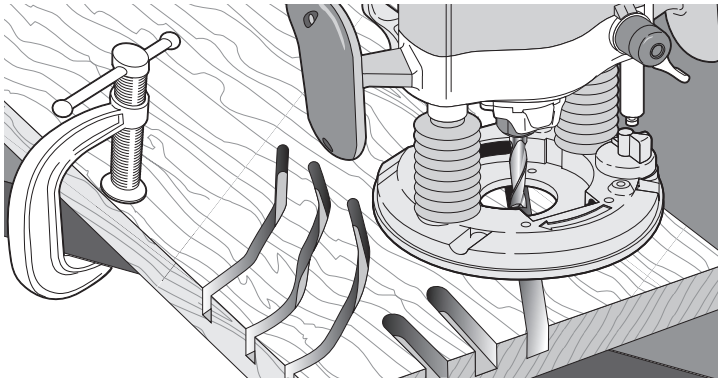


3-34 Always raise the plunge router mechanism before removing the router assembly from the jig.

3-35 The Super FMT must only be used with a plunge router. Never, ever use a fixed base router!

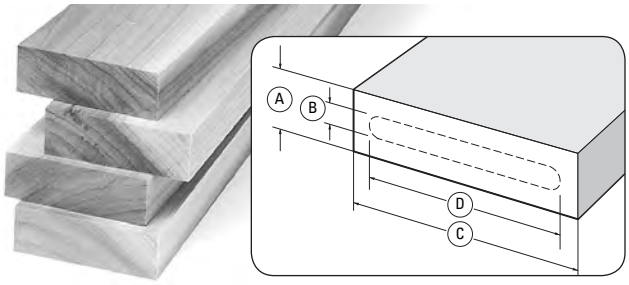


3-36 Do not rout at face level.



3-37 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 before you try to use the router on the Super FMT. ■

Wood Preparation



3-38 You will want to test the jig, so prepare some stock with a thickness **A** about 2.5 to 3 times the bit diameter **B**.
For example: ¼" [6mm] bit ⅝" to ¾"[15-19mm]
5⁄16"[8mm] bit ¾" to 15⁄16"[20-24mm]
⅜"[10mm] bit 15⁄16" to 1⅛"[25-30mm]
½"[12mm] bit 1¼" to 1½"[30-36mm]
and a stock width **C** of say, one and a half bit diameters greater than the selected guide length **D**. ■

SUPER FMT CHAPTER 4

Mortise & Tenon Routing Procedures

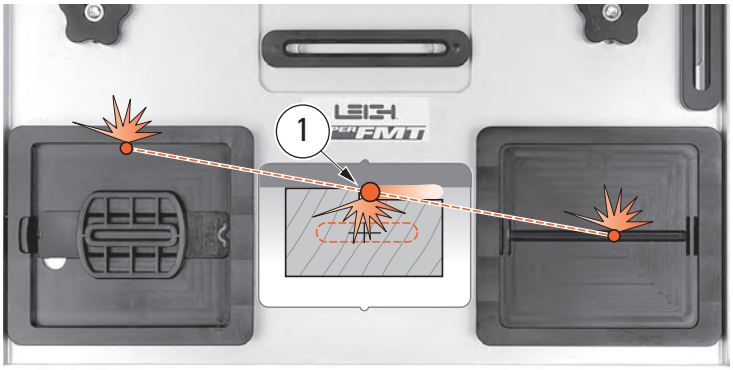
Single Mortise & Tenon, Test
Production Procedures
Small Joints

Before using your Leigh Super FMT you must have completed all of the preparatory steps including reading the router safety recommendations on the previous pages. If you haven't done so, it is essential that you do it now.

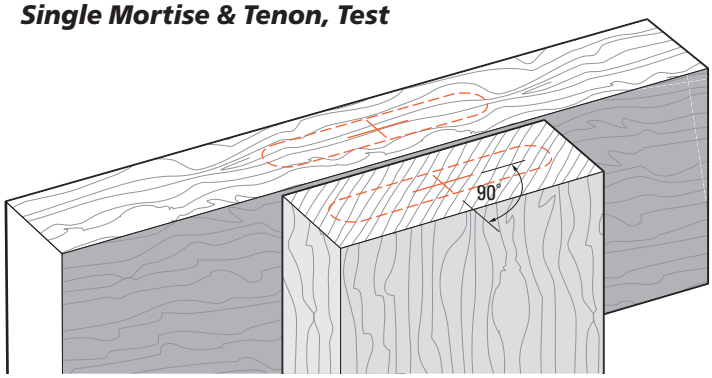
⚠ IMPORTANT SAFETY NOTE

Take great care to not "trap" the bit against the side of tenon rails ①. **Do not attempt to rout center tenons in rails thicker than 1 5/16"[34mm] before referring to 5-39 through 5-44.**

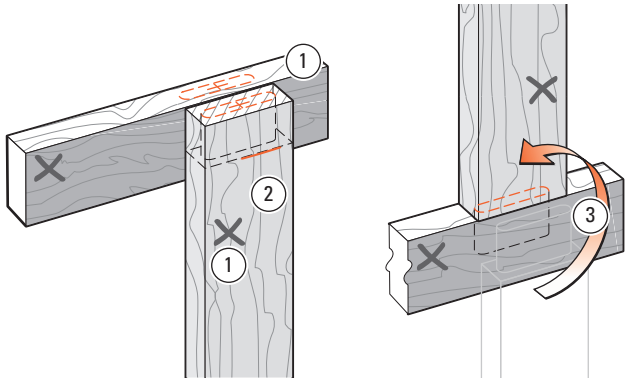
Without using the table movement as prescribed, the bit would have to be plunged into the side of the tenon rail causing the bit to powerfully "drive" the router across the jig. **This could be dangerous and can damage the jig.**



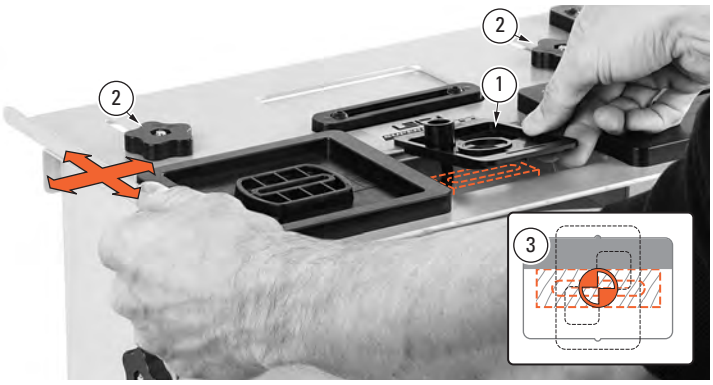
Single Mortise & Tenon, Test



4-1 Let's make a plain single mortise and tenon. Using a fine pencil, mark a cross at the center of the required tenon and mortise positions, the cross lines along and across the axis lines of the joint, at 90° to each other. Mark the mortise several inches[10cm] or so away from the end.

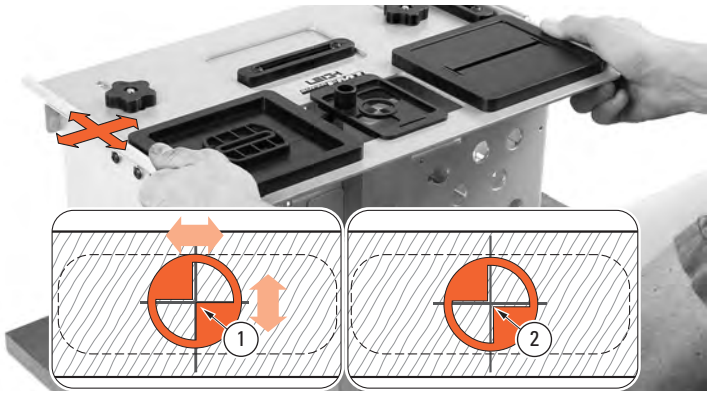


4-2 In almost all cases, it is critical to have the same side of workpieces reference against the clamp plate for each tenon and mortise. So mark one side of each workpiece to reference "this side toward the clamp plate" ①, or "away from" if you prefer. Make a pencil mark ② to the required shoulder depth on the tenon workpiece. When the joint is cut, the tenon piece is rotated 180° to assemble ③.



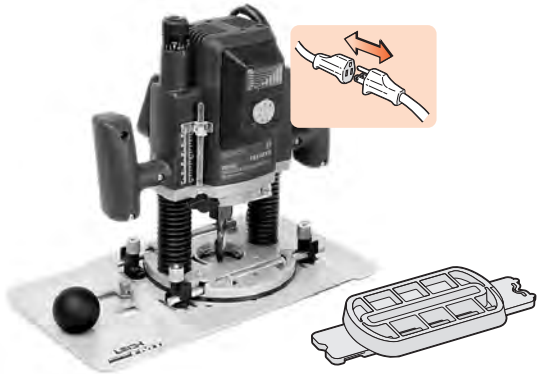
4-3 If you have not yet mounted the sidestop fence, do so now (see 3-7). Place it off center either side, it doesn't matter which. Fit the table sight in the bit opening ①. Loosen the table knobs ② and move the table to position the sight over the approximate tenon piece position ③. Lock the table knobs. **Always lock the table before positioning workpieces.**

4-4 Clamp the tenon piece with the end **lightly touching the underside of the sight** ①. Its side edge should touch the previously set sidestop fence ②, **with the marked side toward the clamp plate.**

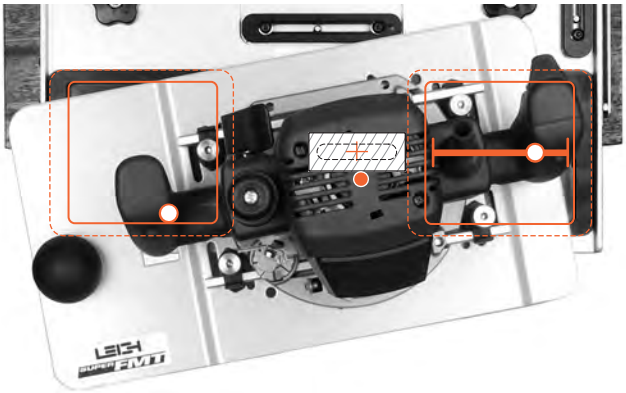


4-5 Loosen the table knobs and move the table until the sight opening is positioned equally around the layout marks on the workpiece. Lock the table. Because the human eye excels at comparisons, differences as small as .004 can be perceived in the space between the edges of the line and the triangles as shown here ①. You can readily center the sight using slight table movements until the spaces appear the same ②.

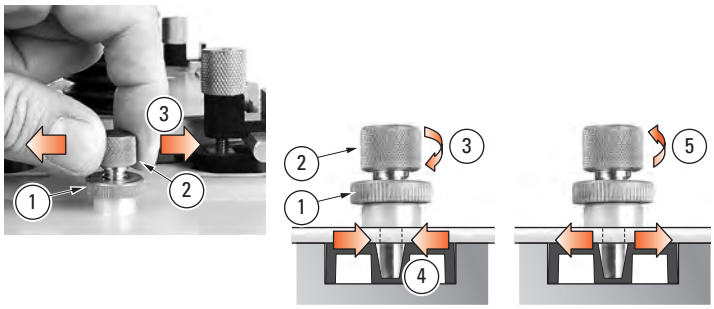
4-6 Unlock the two **FB** front/back limit stops. Move both so they touch the Stop Post, and tighten both stops ①. This prevents front-to-back movement of the table when later sighting the mortise. Remove the sight and store it at the end of the jig.



4-7 Unplug the router. Insert the selected guide into the guide recess and matching diameter bit into to the router.

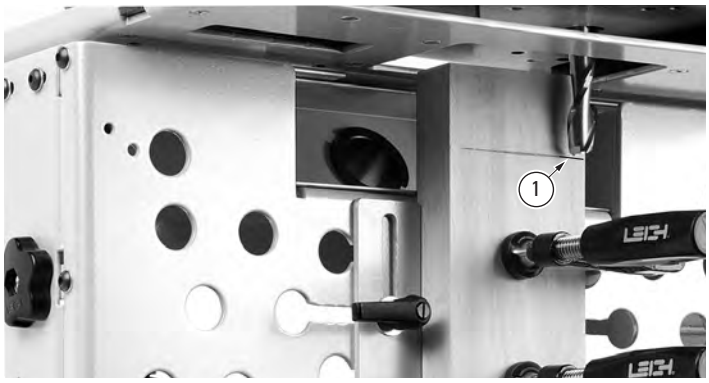


4-8 **Make sure the two guide pins are turned up approximately two-and-a-half turns from the lowest position to avoid the end of the guide pin contacting the bottom of the guide pin track and guide recess!** Place the router on the jig table, the right-hand guide pin in the right side track, the left-hand guide pin in the **near side of the guide recess.**

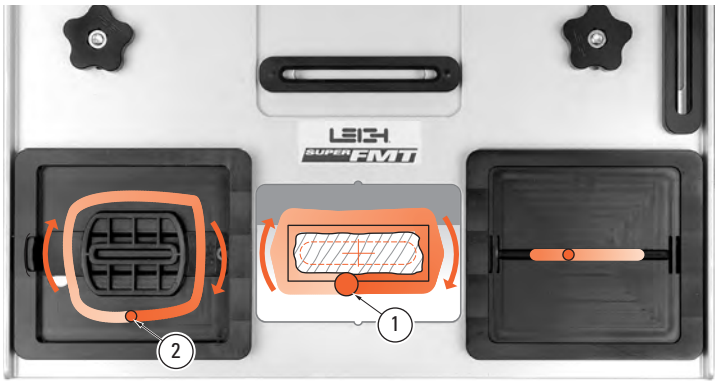


4-9 Adjust the right hand guide pin. Turn guide pin lock nut ① up under the guide pin ②. Turn the guide pin down ③ until all front-to-back "play" is eliminated ④, then turn it back up ⅛ of a turn ⑤. To prevent the guide pin from turning, turn guide pin lock nut down firmly against the threaded boss. The router/sub-base should slide freely left to right. Once set, RH guide pin should require no more adjustment.

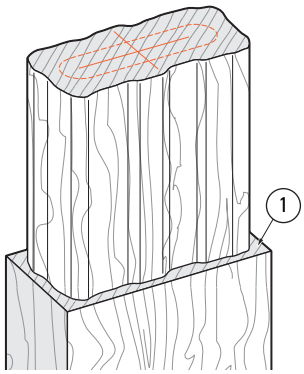
4-10 Repeat this procedure with the left guide pin set in a guide mortise slot. When you have minimal "free play", use a permanent ink pen to mark a small "dash" at the 12 o'clock position on the guide pin ②. This indexes the guide pin. Before routing your first joint, turn the guide pin up 2 full turns. This is your starting point. Record "number of turns up" or "down" when joint fit is good. Each ⅛ turn of the LH pin changes the joint glue line fit by approximately 0.0011" [0.03mm].



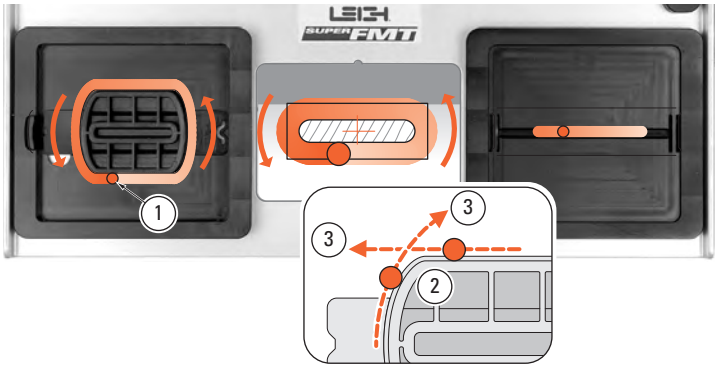
4-11 Plunge the router so the tip of the bit is level with the pencil mark of the tenon shoulder ①, and lock the plunge. Set the plunge depth stop rod to its stop. Tenons are routed in one depth setting; it is not necessary to make multiple passes at different depths of cut.



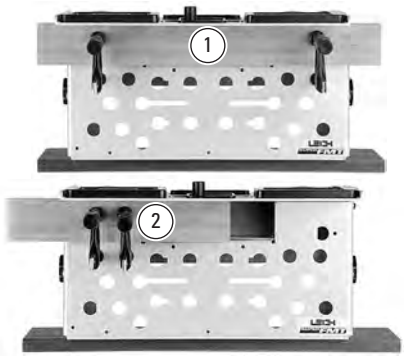
4-12 Read 4-12 through 4-14 before routing. With **guide pin in near side of guide recess,** switch on router power and with firm control, move it in until the bit lightly touches the tenon workpiece. **Very carefully, with the bit very lightly engaging the wood surface, "climb rout" clockwise around the tenon piece** ①. Maintain very light bit contact. **Do not run guide pin on guide yet** ②.



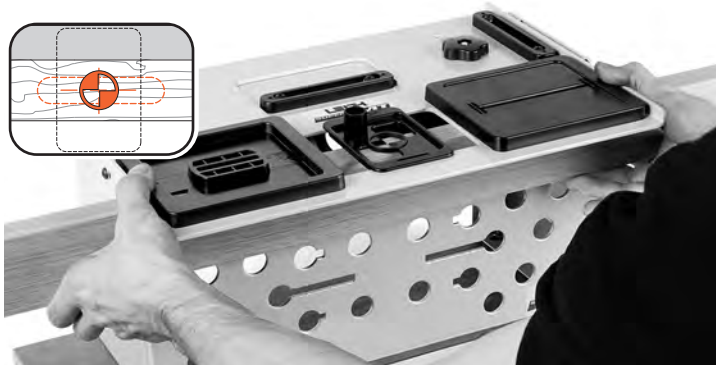
4-13 Control the router firmly, the router is driven clockwise by the bit rotation. This first shallow climb cut will leave a small but clean shoulder ①.



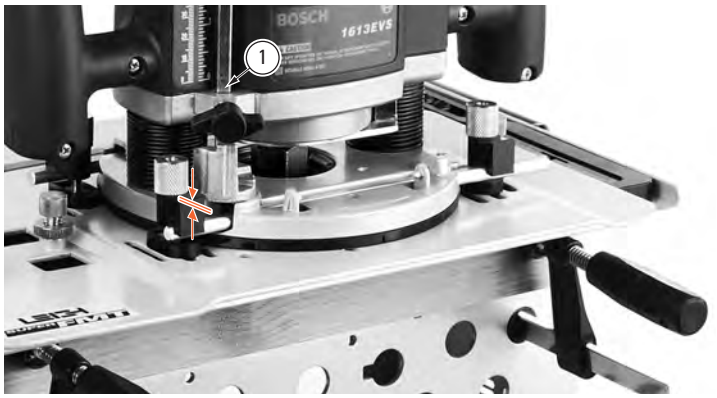
4-14 Routing counterclockwise, run the guide pin around the tenon guide surface. Make sure the pin contacts the entire outer surface ①. In these first test cuts, check the tenon for a completely smooth cut before removing the piece from the jig. Until you are confident with this procedure, as a final cleanup we recommend you run the guide pin "off" of each guide "corner" ② in both directions ③.



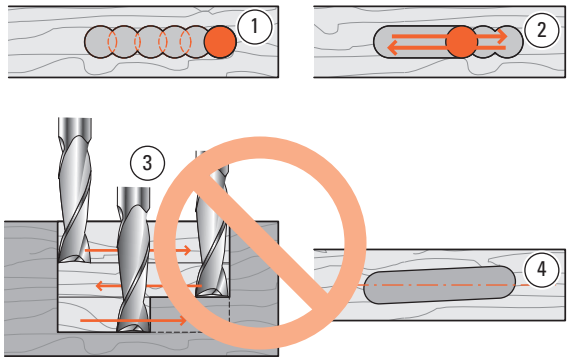
4-15 Remove the router and tenon workpiece from the jig. Position the two clamps so the mortise piece can be positioned for secure holding. Clamp to either both sides of the bit opening ① or to one side ②. Note: Leaving a "horn" on the ends of mortise pieces as in ① not only makes for easy clamping, the horns will be an aid in assembly gluing and clamping later. **Refer to 3-3.**



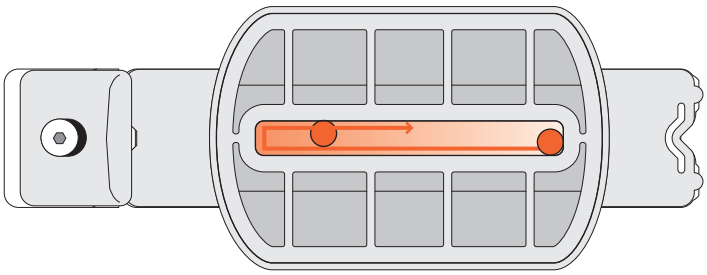
4-16 Fit the sight and remove the sidestop fence if it is in the way. With the marked side of the mortise piece toward the clamp plate, either move the board left and right to align the cross with the sight and clamp in place, or clamp in place first and move the table to align the sight. Remember, you previously set the **FB** limit stops to allow only left/right movement.



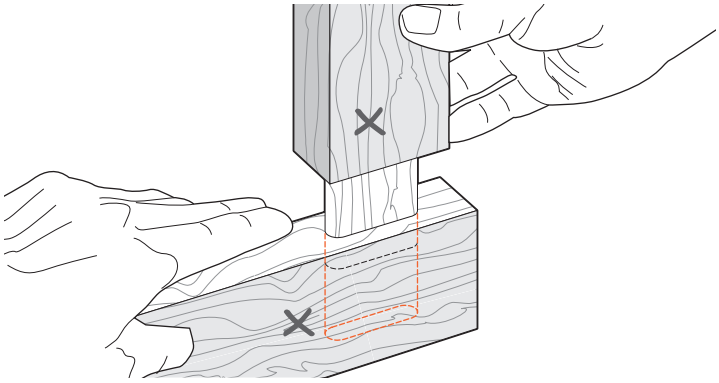
4-17 Remove the sight and place the router/sub-base assembly on the jig, the left hand guide pin in the mortise slot part of the guide. **Now raise the plunge stop rod ① slightly, say 1/32-1/16"[1-1,5mm] to allow the mortise to be routed slightly deeper than the tenon to ensure perfect tenon shoulder flushness on the finished joint.**



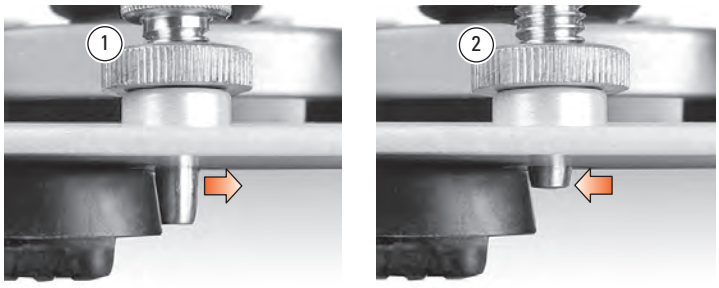
4-18 The best way to rout mortises (parallel to workpiece) is to plunge slightly overlapping holes to full depth ①, and then clean out left-right-left at full depth of cut ②. **Do not rout left-right-left at progressively greater depths without plunging holes** ③…the bit's rotation will pull the bit off the intended mortise line with each pass ④ and the mortise may not be parallel to the workpiece.



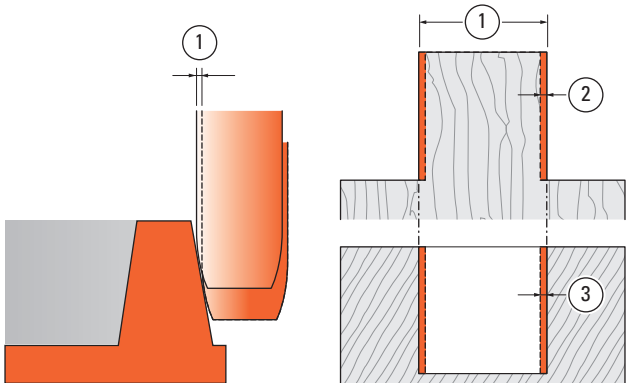
4-19 Make sure the guide pin is run clockwise against both the front and rear of the mortise guide slot on the final passes. The gap between pin and mortise guide slot is greatly exaggerated in this illustration.



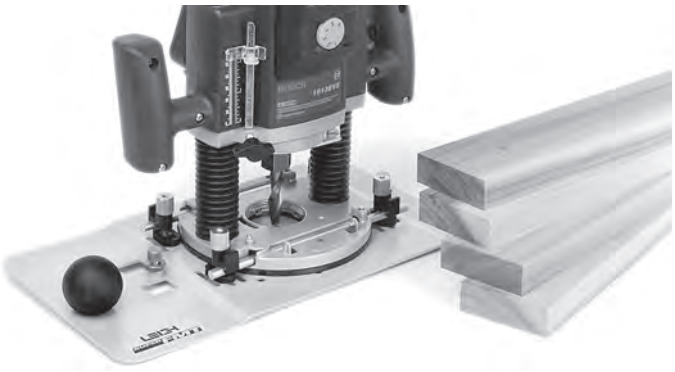
4-20 Remove the mortise piece and keeping the marked faces adjacent, test the tenon for fit and flushness. If the face sides are not flush, check the straightness of the two parts. If they are straight, the clamp plate may not be vertically parallel to the bit. See Appendix II, Jig Adjustments, A2-1 through A2-3.



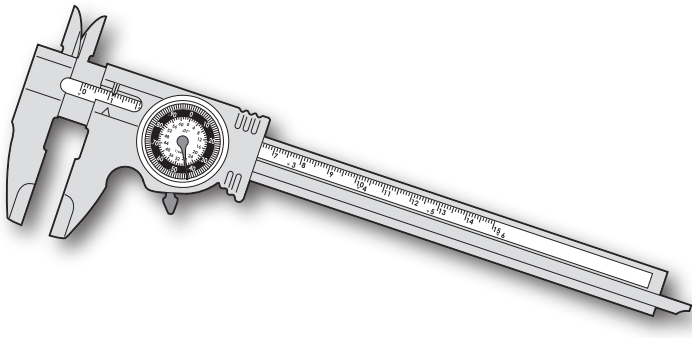
4-21 Joint fit is adjusted with the left hand guide pin only. If the joint is too loose, turn the guide pin down ①. If the joint is too tight, turn the guide pin up ②. For how much, see 4-22. Guide pin changes affect the mortise and tenon, so rout a complete new joint. **Establish ideal pin height for both mortise and tenon at one pin setting.**



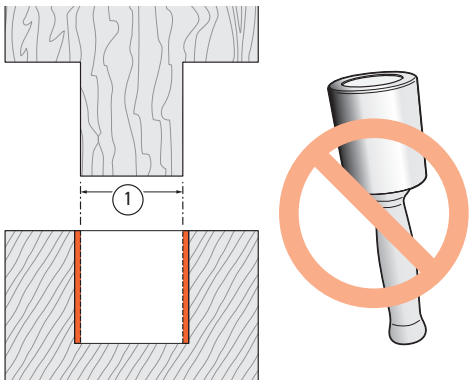
4-22 How much adjustment is required? ⅛ of a turn of the guide pin knob will change the joint glue-line fit by 0.001"[0,025mm] ①, i.e. turn ⅛ up; the bit will reduce the tenon thickness by ~0.001"[0,025mm] (half of that per side ②) and increase the mortise width by the same amount ③. Dimensions and angles shown here are exaggerated.



4-23 The Super FMT can provide this accuracy for settings but remember, you're working with wood and a hand-held router, with a lot of movement tolerances; it's not a computer-controlled milling machine. Nevertheless, the Super FMT will allow you to do very precise and consistent work.



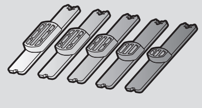
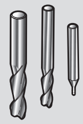
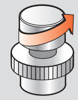
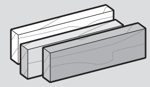
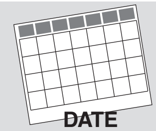
4-24 If you have a dial or digital calliper (every shop should have one) you can literally measure the tenon and mortise and adjust accordingly. Every ~0.002"[0,05mm] of difference in mortise to tenon size (say ~.001"[.025mm] on the glue line) should require ⅛ of a turn; down to tighten, up to loosen.



4-25 Generally we have found the best fit differential to be 0.005"[0,13mm] "loose". Basically, the dry joint should "push" together fairly easily, but not fall apart under its own weight. If a mallet is needed, it's too tight.

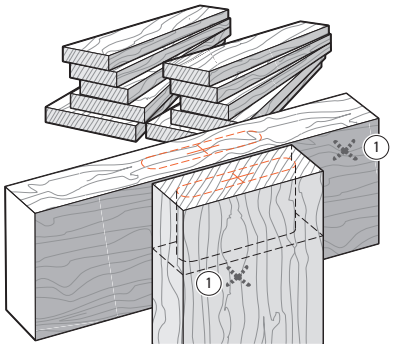
4-26 Once you've established the guide pin setting for a specific bit/guide combination, record the setting on the following page. For example: 5/16"x1½"[8x35mm] "up 1¾ turns". Using the same bit and guide next time, use the recorded setting for a good fit first time. Note: Different wood species may require slightly different settings. ■

Settings Record

		 TURNS UP	 SPECIES	 DATE
e.g. 1/2 x 2	1/2	1-7/8	cherry	6/15/10
e.g. 10x40mm	10mm	1-3/8	mahogany	June 20/10

Hint: Photocopy or scan this page for future records.

Production Procedures



4-27 When routing frame joints it is only necessary to mark and sight a single tenon and perhaps two mortises. Once the sidestop fence or outriggers are set and the table sighted for one joint, any number of similar joints may be routed without marking. We recommend marking the finished face which goes against the clamp plate (shown here from operator view) ①.

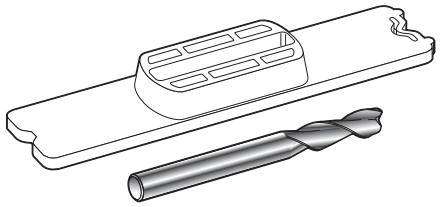
4-28 Mortises Sight ① one mortise and set a stop block ②.

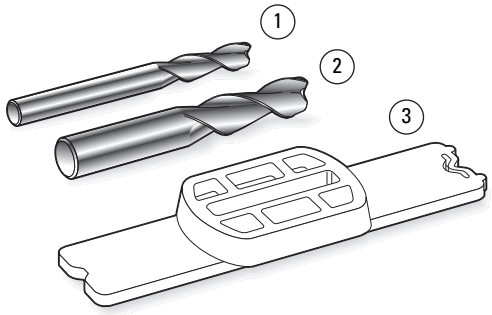
4-29 Set both sets of axis stops to prevent unintentional table movement ①.

4-30 Sight the second mortise by moving the mortise piece (not the table), and set the second stop block ①. Rout any number of successive (unmarked) mortises without removing the router from the table.

4-31 Multiple mortises in "ladder" type construction are rapidly routed. Mark all mortises on only one piece (only one of the marks needs a front-to-back mark!). Sight the first mortise (cross) to set the table and mark the top of one outrigger in line with workpiece end ①. Table locked, move workpiece, sighting each successive mortise line, marking the outrigger(s) ②. To rout, align unmarked board ends with outrigger marks ②. ■

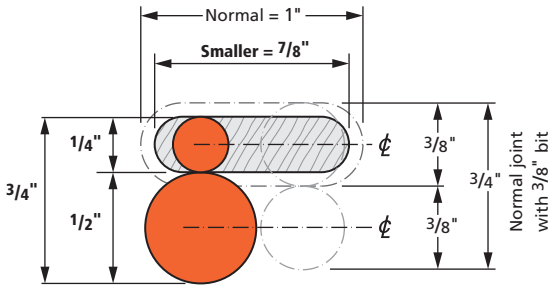
Small Joints

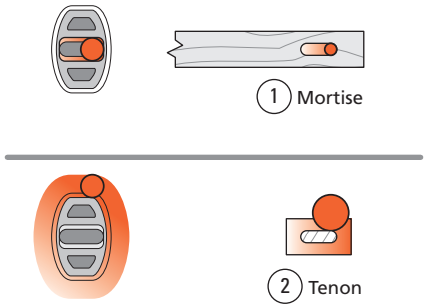




4-32 The Super FMT is designed so that both mortise and tenon of a particular sized joint may be routed with the same sized bit. So if you are making a single frame with a ¼"[6mm] guide and bit, this works very effectively. However, if you are in production, it is much more efficient to rout small tenons with a larger bit.

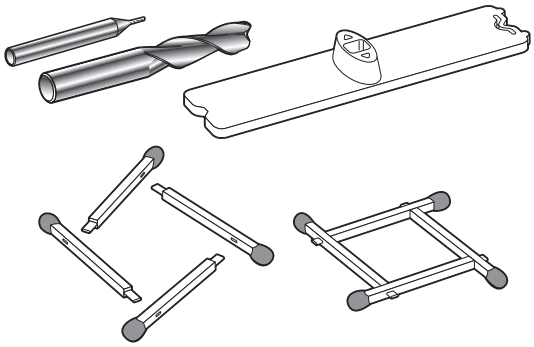
4-33 For example, if you want to rout many ¼"[6mm] mortises and tenons, the tenons can be much more speedily routed with a ½"[10mm] bit. Here's how.
Select ¼"[6mm] bit for mortises ①.
Select ½"[10mm] bit for tenons ②.
Select ⅜"[8mm] guide ③ for length from the guide/bit selection chart in Appendix I.

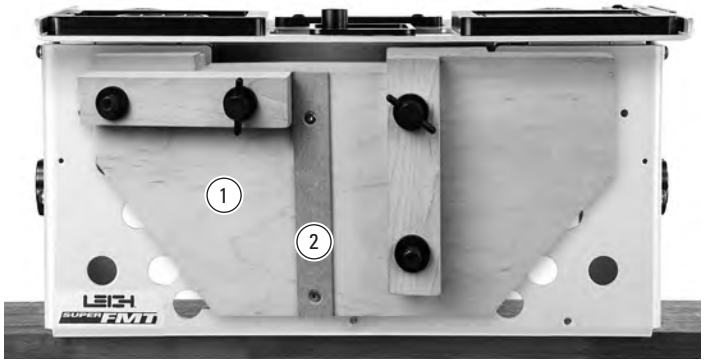




4-34 The diagram illustrates routing the ¼" joint described above (guide not shown). The result is a perfect ¼" mortise and tenon, ⅛" smaller both ways than the guide size. Any two bit diameters which add up to two times the nominal guide size will produce a joint the size of the smaller bit. Bear in mind, the maximum usable bit diameter with the Super FMT is ½"[12mm].

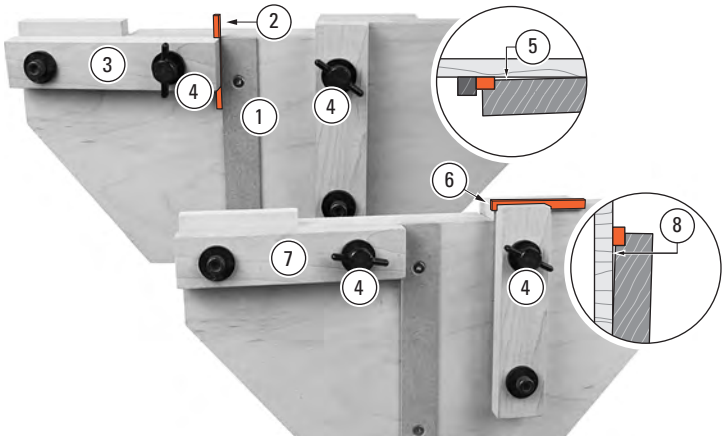
4-35 Using a small guide, combined with an even smaller mortise bit and larger tenon bit gives the Super FMT an additional unique ability to rout joints smaller than the smallest (¼"[6mm]) guide. For example, take a ¼"[6mm] guide and **step up** by ⅛"[3mm] to ⅜"[10mm] diameter on the tenon bit...and **step down** the same amount for mortise bit to get ⅛"[3mm] mortise and tenons...**all with adjustable joint tightness.**





4-36 1/32 x 3/32"[0,8 x 2,4mm] mortises and tenons on this "match frame" were formed (with machine tool bits) on a ¼"x 5/16" guide. The 15/32" tenon bit is 7/32" larger than ¼". The 1/32" bit is 7/32" smaller than ¼". A similar metric set: 6mm guide, 1mm mortise bit, and 11mm tenon bit produce 1mm joints. Machine tool bits as small as .010" with ¼" shanks and similar metric bits are available from machine tool suppliers.

4-37 For very small joints we recommend attaching a rigid piece of ply or MDF ① minimum ¾"[20mm] to the clamp plate, using the through screw holes in the plate. This should have its own mini sidestop fence attached for tenons ②.



4-38 To hold very small workpieces ②, make up a rabbeted holder ③ with the rabbet slightly shallower than the workpiece thickness, leaving a gap at ⑤ and ⑧. **i.e. For Tenons:** Sidestop ① Tenon Piece ② Holder ③ Clamp ④ Gap ⑤. **For Mortises:** Mortise Piece ⑥, Holder ⑦, Clamp ④, Gap ⑧. ■

Multiple Joints

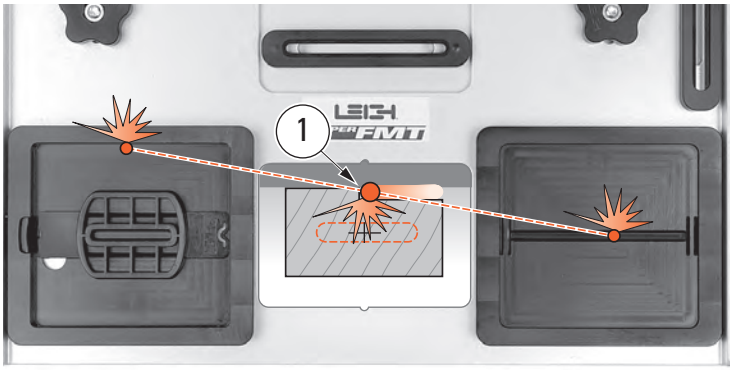
Double Joints
Twin Joints
Quadruple Joints
Triple Joints

Before using your Leigh Super FMT you must have completed all of the preparatory steps including reading the router safety recommendations on the previous pages. If you haven't done so, it is essential that you do it now.

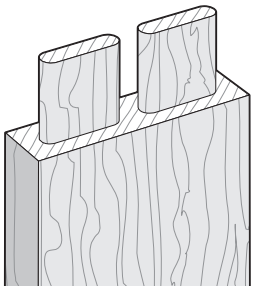
⚠ IMPORTANT SAFETY NOTE

Take great care to not "trap" the bit against the side of tenon rails ①. **Do not attempt to rout center tenons in rails thicker than 1 5/16"[34mm] before referring to 5-39 through 5-44.**

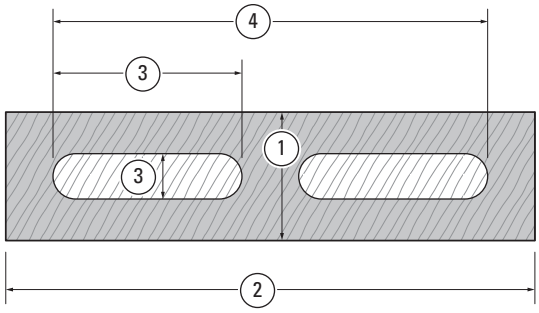
Without using the table movement as prescribed, the bit would have to be plunged into the side of the tenon rail causing the bit to powerfully "drive" the router across the jig. **This could be dangerous and can damage the jig.**



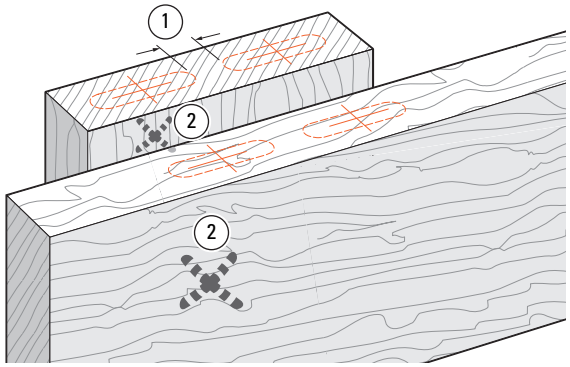
Double Joints



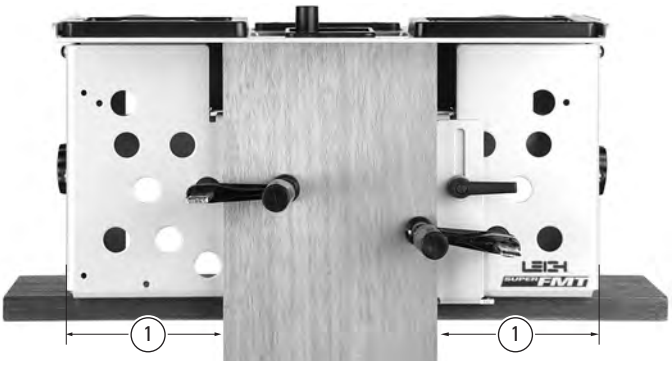
5-1 These instructions are based on the assumption that the correct joint tightness and guide pin setting has been established and that you are thoroughly familiar with the Jig's use for single joints.



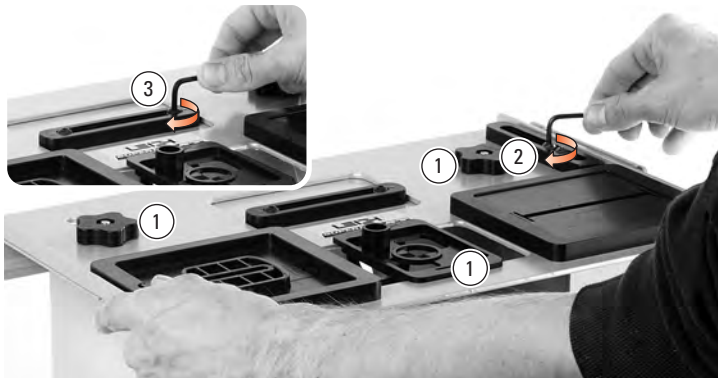
5-2 Note: The **maximum** dimensions for doubles are:
Tenon Workpiece ①②: 1 5/16 x 5½"[34x140mm]
Tenon ③: ½ x 2"[12x50mm]
Tenons, both Overall ④: ½ x 4½"[12x115mm]



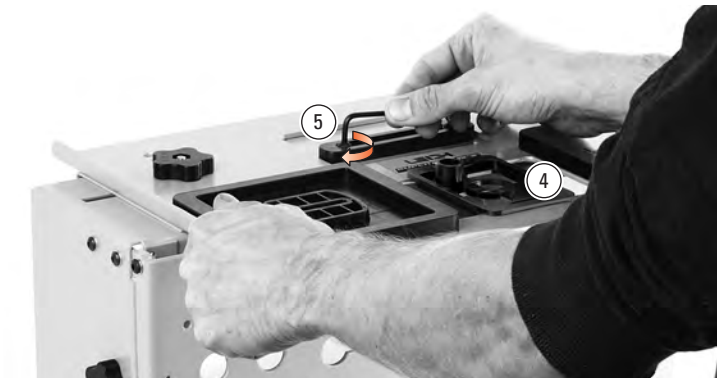
5-3 Mark the two mortise and tenon centers, taking care to allow space between the joints ① at least equal to the tenon bit diameter. Mark the faces that go against the clamp plate ②.



5-4 Set the sidestop fence so that the tenon piece is clamped approximately at the center of the clamp plate ①.



5-5 Sight the left hand tenon and lock the table ①. Set and lock both **FB** limit stops against their stop post ②. Set and lock only the right hand **LR** limit stop against its post ③.

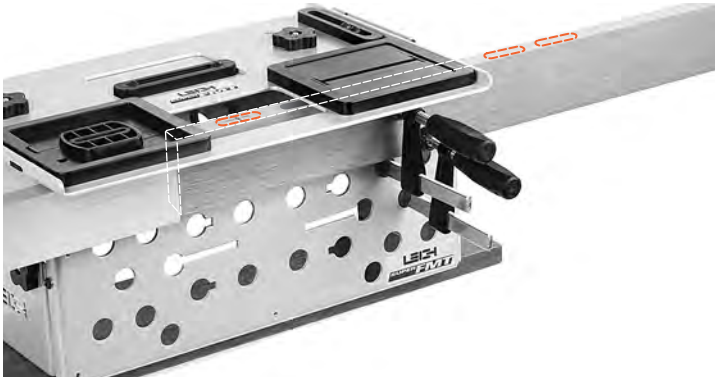


5-6 Unlock the table and sight the right hand tenon ④ and lock the table. Set and lock the left hand **LR** limit stop against the post ⑤. Release the table clamp and move the table left and right against the **LR** stops to double-check sight alignment to the two tenons. Remove the sight.

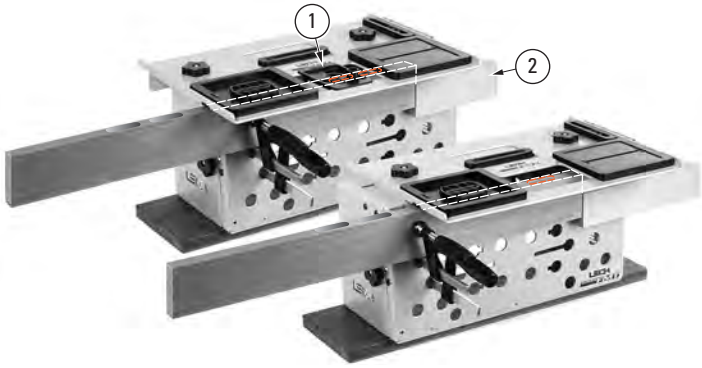
5-7 Move the table left and lock. **Do not rout yet.** While with practise it is fairly easy to avoid routing "into" the right tenon when routing the left ①, we recommend that beginners use a small shop-made "guard" to prevent this ②. Use ¼"[6mm] thick MDF or plywood. Allow a 3⁄16"[5mm] gap between the end of the guide and guard ③. Rout the left tenon.

5-8 Move the table right and lock. Lift the left end of the router and move the "tenon guard" left ①. Rout the right hand tenon ②. Repeat as required for all tenon ends, moving the table "guard" piece only once for each pair. Leave the table to the right. Remove and save the guard.

5-9 Replace the sight. Position and clamp the mortise piece so the right hand mortise of the first pair is centered under the sight ①. Either mark an outrigger or set a stop block for successive mortise pieces ②. Remove the sight and rout the right hand mortise.

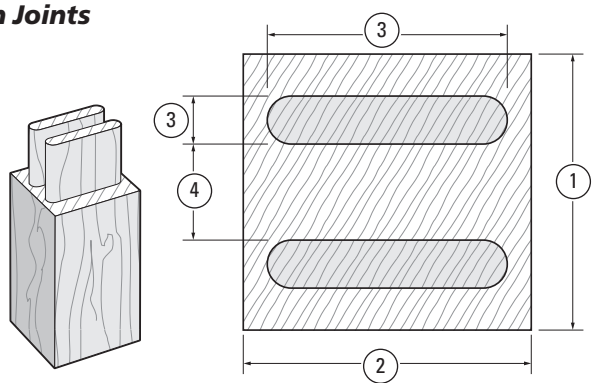


5-10 Move the table left and lock. Rout the left hand mortise. Leave the table to left.

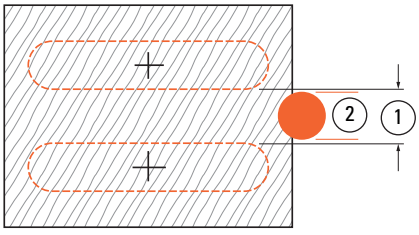


5-11 Now, sight the left mortise of the pair of mortises ① on the right end of the board and re-clamp. To avoid re-sighting each board, mark the left hand outrigger or set a stop at the workpiece end ②. Remove the sight and rout the mortise, then move the table and rout the right hand mortise. The table limit stops and outrigger marks (or stops) are now set for successive workpiece mortising. ■

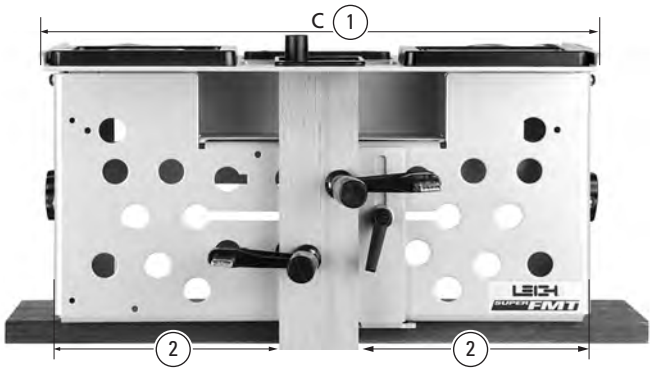
Twin Joints



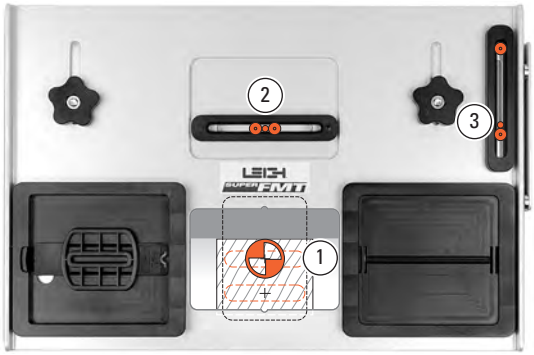
5-12 Note: The maximum dimensions for "side-by-side" double joints are:
Tenon Workpiece ①②: 3 x 3⅛+[76 x 79+mm]
Tenon size ③: ½ x 2½+[12 x 65+mm]
Spacing ④: 9⁄16 or greater [>13 mm]



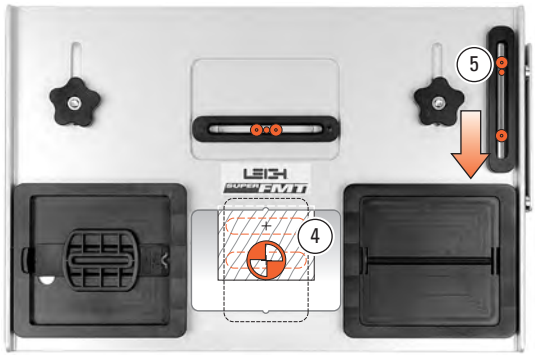
5-13 Mark the two tenon centers taking care to allow space between the two joints ① **at least slightly greater** than the tenon bit diameter ②.



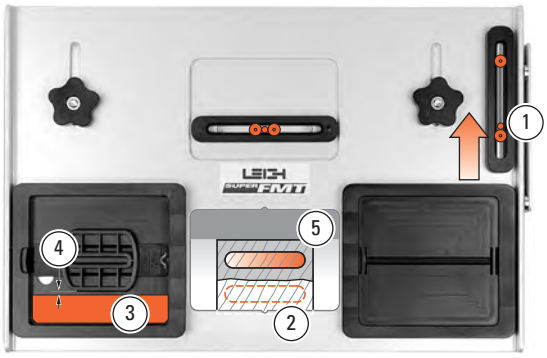
5-14 Roughly center the table left to right and lock ①. Position the sight. Clamp the tenon piece against the sidestop fence, in approximately the center of the clamp plate ② with the tenon piece lightly touching the underside of the sight.



5-15 Unlock the table, sight the rear tenon center ① and lock the table.
Set and lock both **LR** limit stops against their stop post ②.
Set and lock the front **FB** limit stop against its stop post ③.

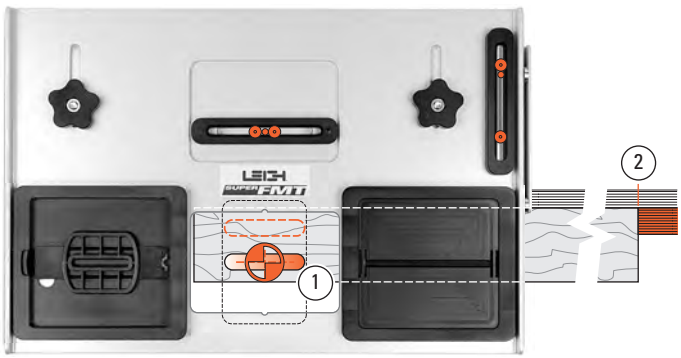


5-16 Unlock the table and sight the front tenon ④ and lock the table. Set and lock the rear **FB** stop against its post ⑤. Unlock the table and move the table front to back against the stops to double-check the tenon sighting.

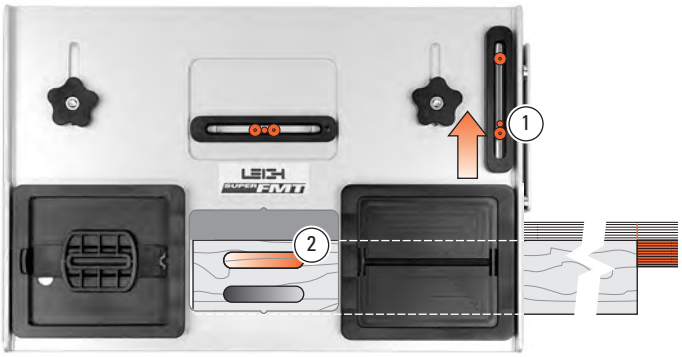


5-17 Move the table to the rear against the stop ①, and lock. Do not rout yet. While with practise it is fairly easy to avoid routing into the front tenon ② when routing the rear, we recommend that beginners use a simple shop-made "guard" ③ to prevent this. Use ¼"[6mm] thick MDF or plywood. Allow a 3⁄16"[5mm] gap ④ between the side of the guide and guard. Rout the rear tenon ⑤.

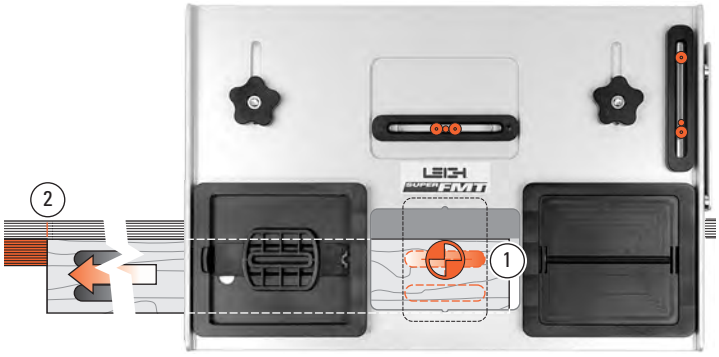
5-18 Move the table forward against the rear limit stop and lock ①. Lift the left end of the router and move the "tenon guard" to the rear ②. Rout the front tenon ③. **Leave the table forward.** Note: By using two or three left-right table positions, (in addition to the front-back positions), the workpiece width and tenon width may be increased to the maximum (see 6-5, Longer and Shorter Joints).



5-19 Mortises Position the sight. Position and clamp the mortise piece so the left end front mortise is centered under the sight ①. Either mark the right hand outrigger beam or set a stop block for successive mortise pieces ②. Rout the front mortise.

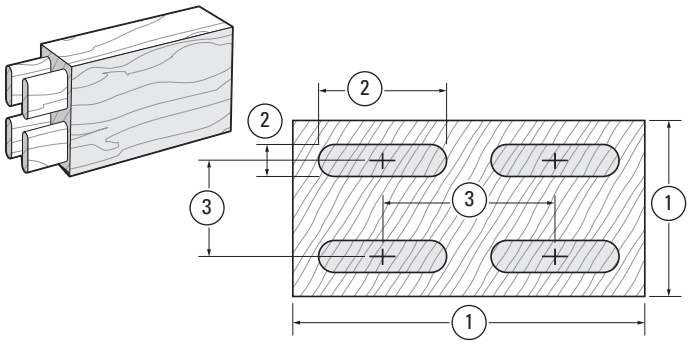


5-20 Move the table back against its stop ① and lock. Rout the rear mortise ②. Leave the table back.

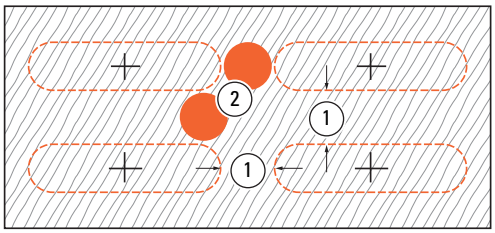


5-21 Replace the sight, unclamp and move the mortise board left so that the rear mortise of the pair at the right end of the piece is centered under the sight ①, and re-clamp. Mark the left hand outrigger or set a stop ② adjacent to that end of the workpiece. Rout first the rear mortise at this (right hand) end, then move the table and rout the front mortise. The outrigger marks or stops are now set up for successive workpiece mortising. ■

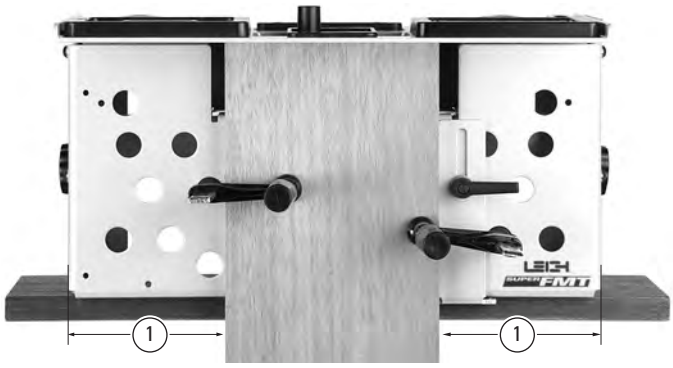
Quadruple Joints



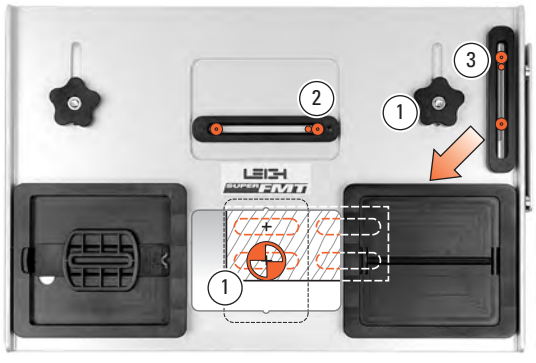
5-22 The maximum dimensions for quadruple joints are:
Tenon Workpiece ①: 3" x 5½"[70 x 140mm]
Tenon Size ②: ½ x 2"[12 x 50mm]
Center Spacing ③: 1½ x 2½"[38 x 63mm].



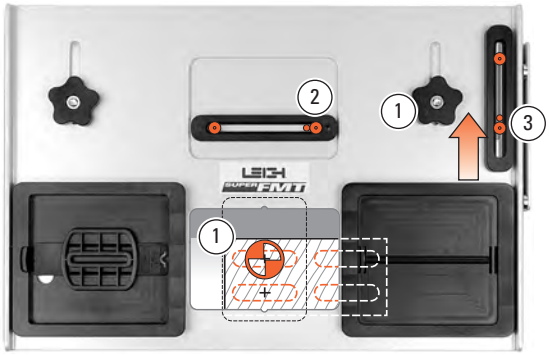
5-23 Tenons Mark the four tenon and mortise centers to suit your layout. Take care to leave a space between tenons ① **at least slightly greater** than the tenon bit diameter ②.



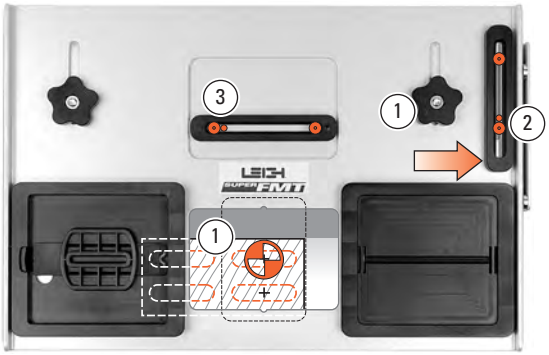
5-24 Center (approximately) ① and clamp the tenon board on the clamp plate and set the sidestop fence.



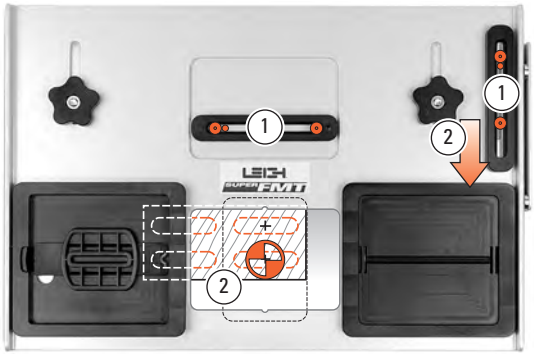
5-25 Position the sight, release the table clamp and move the table to sight the left hand front tenon ①. Lock the table. Move the right hand **LR** stop to its post and lock ②. Move the back **FB** stop to its post and lock ③.



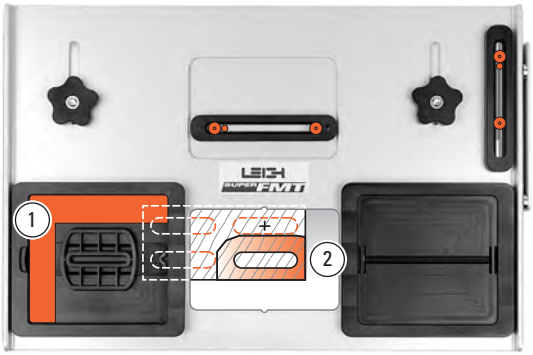
5-26 Release and move the table to sight the rear left hand tenon ①. *Note: Ensure the* **LR** *post is still touching the right hand limit stop* ②. Lock the table. Move the front **FB** stop to its post and lock ③.



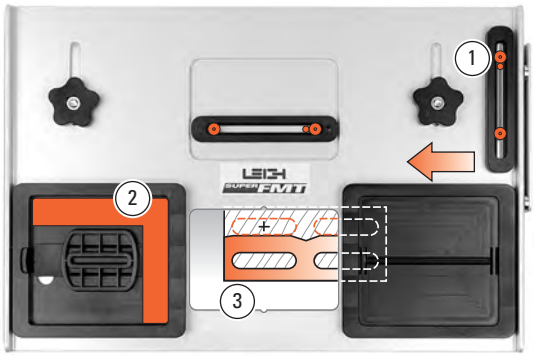
5-27 Unlock the table and move to the rear right-hand tenon and sight ①. *Note: ensure the* **FB** *post is still touching the front limit stop* ②. Lock the table. Move the left hand **LR** stop to its post and lock ③.



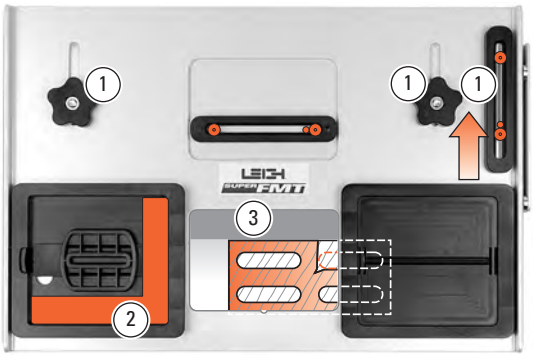
5-28 All four stops are now set ① and provided you have symmetrically marked out the joint, moving the table to the front right hand tenon, the sight should automatically align with that mark ②. If it does not, do not change anything. Just check the other three positions—the actual joint will be symmetrical.



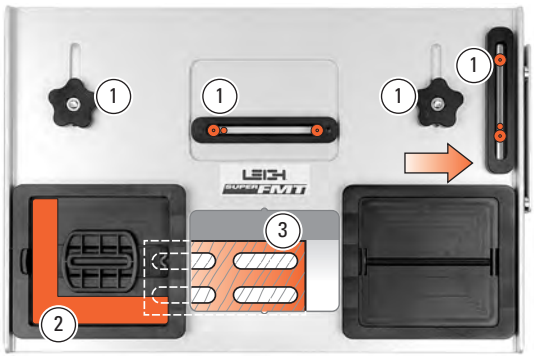
5-29 With practice, it is fairly easy to avoid routing into an adjoining tenon, however, we do recommend that beginners use a simple "L"-shaped shop-made guard to prevent this ①. Use ¼"[6mm] MDF or plywood and allow a 3⁄16"[5mm] gap between the guide and guard. Rout the front right tenon ②.



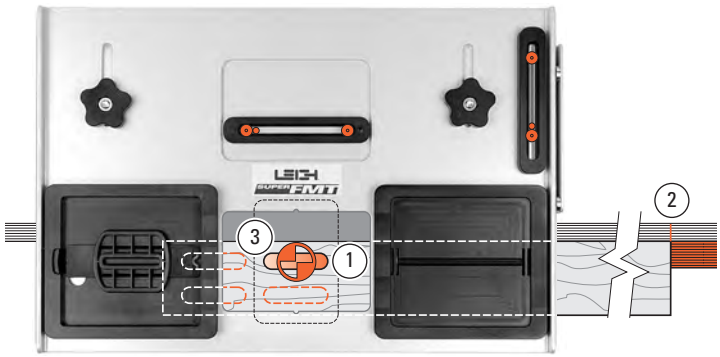
5-30 Move the table to the front left against the stops and lock ①. With the "guard" at the rear right ②, rout the front left tenon ③.



5-31 Move the table to the rear left, and lock ①. Move the "guard" to the front right ②. Rout the rear left tenon ③.

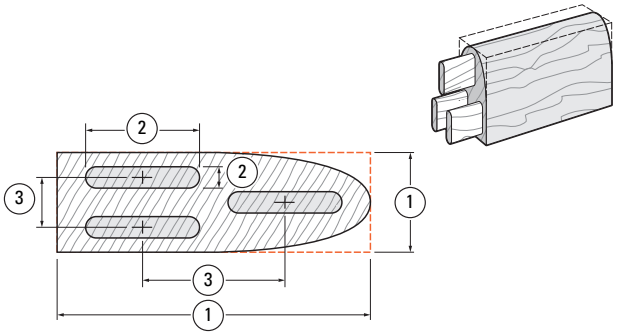


5-32 Move the table to the rear right against the stops and lock ①. Move the "guard" to the front left ②. Rout the rear right tenon ③. Rout all other tenon ends required. leave the table to the rear right.

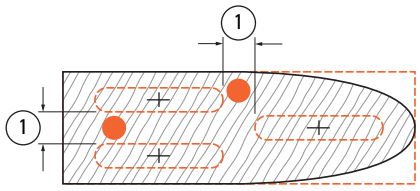


5-33 Mortises Extend the sight, position and clamp the mortise board so that the rear right mortise is centered under the sight ①. Either mark an outrigger or set a stop-block for successive mortise boards ②. Rout all four mortises in their respective positions ③. **Note: The Super FMT vacuum port may prove ineffective on wide mortise pieces, particularly on the front mortises.** ■

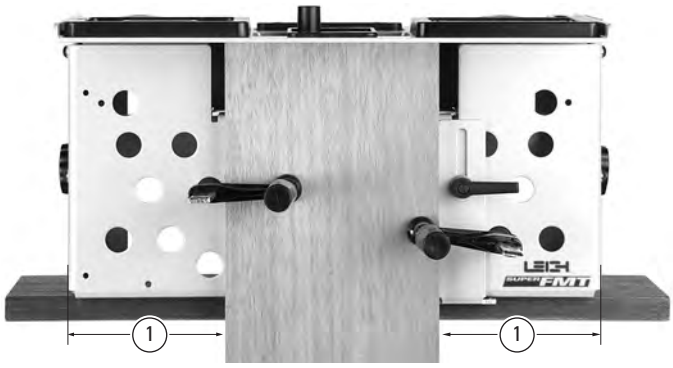
Triple Joints



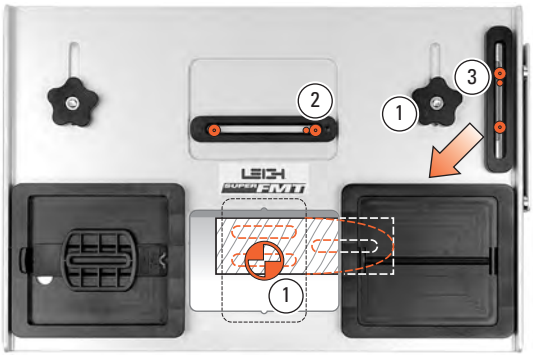
5-34 Because of safety considerations it is only practical to rout triple joints with ⅜" bits and guides or smaller.
Maximum dimensions for triple joints are:
Tenon Workpiece ①: 1¾ x 5½"[44 x 140mm]
Tenon Size ②: ⅜ x 2"[10 x 50mm]
Center Spacing ③: ⅞ x 2½"[22 x 63mm].



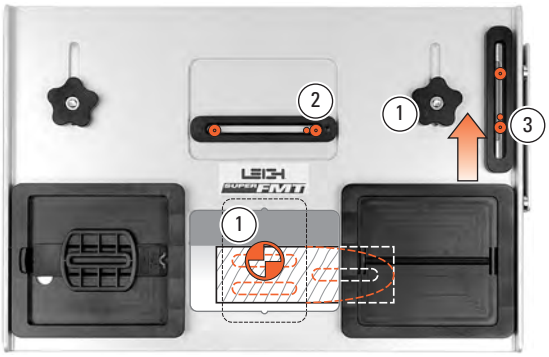
5-35 Mark the three tenon and mortise centers, taking care to leave a space between tenons at least slightly greater than the tenon bit diameter ①.



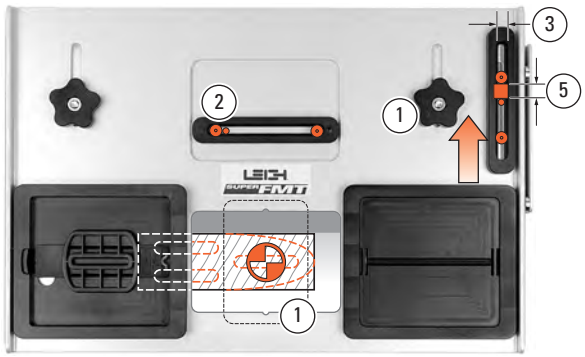
5-36 Tenons Center (approximately) and clamp the tenon workpiece on the clamp plate ① and set the sidestop fence.



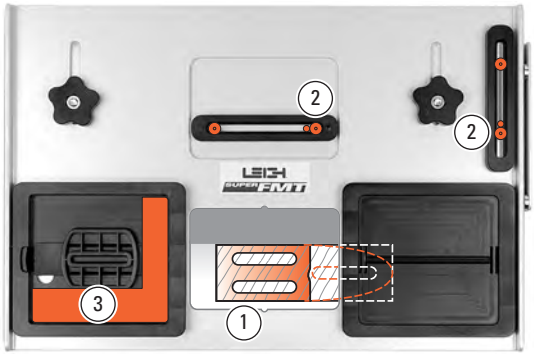
5-37 Fit the sight, release the table clamp and sight the front tenon of the pair ①. Lock the table, move the right hand **LR** limit stop to the post and lock ②. Move the back **FB** limit stop to the post and lock ③.



5-38 Release the table clamp and sight the rear tenon of the pair ①, making sure that the right-hand **LR** stop is against its post ②. Lock the table. Move the front **FB** limit stop to its post and lock ③.

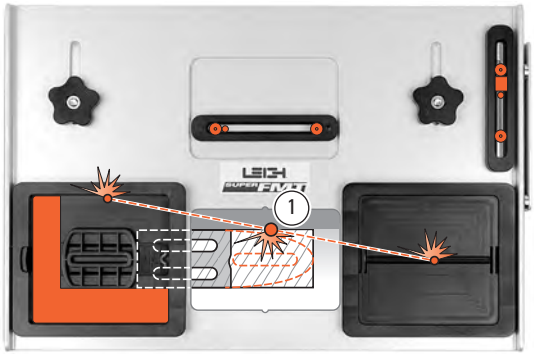


5-39 Loosen the table clamp and move the table to sight the third (single) tenon ①. Lock the table. Set and lock the left hand **LR** limit stop to its post ②. Cut a small hardwood block to the following size: Width ③ ⅜"[13mm], Depth 5/16"[8mm], Length ⑤: Cut to length to a snug fit between the rear **FB** limit stop and its stop post. This block will be used for the "third" tenon position.

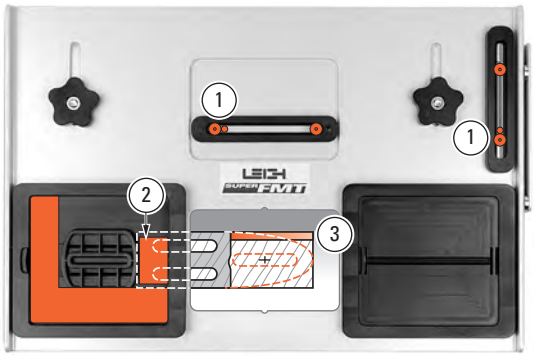


5-40 Rout the left pair of tenons in the same way as for the quadruple tenons ① (5-30 and 5-31), using the Limit Stops ② and an L-shaped guard ③ in the guard recess, to prevent accidental routing of adjacent tenons.

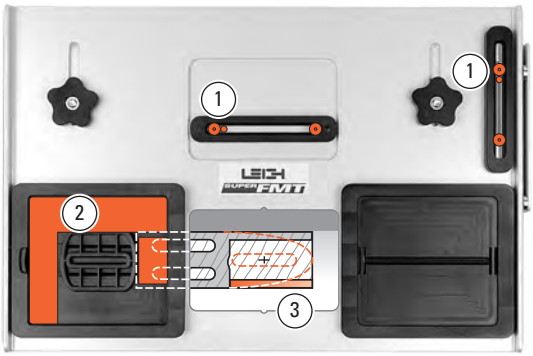
⚠ **Do not attempt routing the third tenon before reading on.**



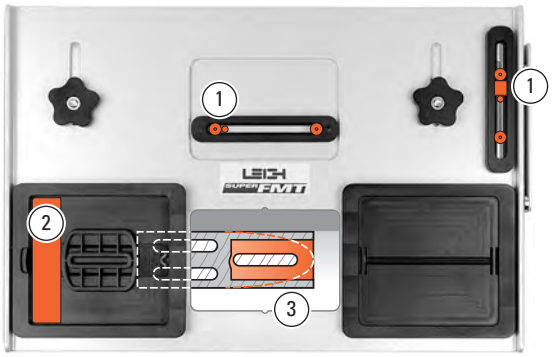
5-41 ⚠ If the tenon rail is thicker than 1 5/16"[34mm] (most likely with this joint type), then great care must be exercised not to "trap" the bit ① when routing the third tenon, i.e. the bit would have to be plunged into the side of the tenon board. This could result in the bit "driving" itself across the board which could be dangerous.



5-42 So to reduce the thickness, move the table right and rearward against the stops ① as if to rout a quadruple tenon. Then add a small "guard" piece ② to the L-shaped guard in the guide recess. Now rout away part of the workpiece ③.

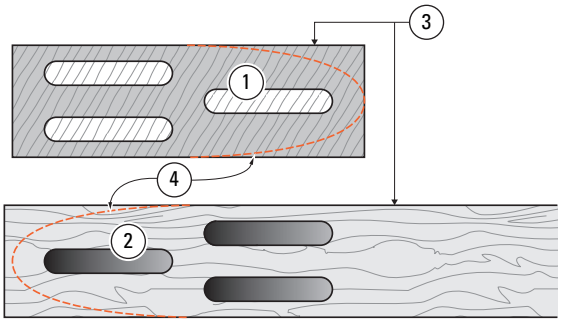


5-43 Move the table forward, keeping it to the right ①. Flip the guards to the back ②. Now rout away the front right part of the workpiece ③.



5-44 Loosen the table clamp. With the table to the right, against the **LR** stop, put the small block between the rear **FB** stop and its post ①. You must always use the same limit stop for all other third tenons and mortises. Using a guard to avoid routing into the other two tenons ②, rout the rest of the third tenon ③.

5-45 ⚠ **Mortises** **Triple mortises are routed the opposite way around.** If the single **tenon** is to the right ①, the single **mortise** must be to the left ②, and vice versa, **using the same block on the same side of the stop post** ③.



5-46 Remember, mortises are routed the opposite way around to their matching tenon, e.g. in this illustration the single tenon is to the right ①, single mortise to the left ②. Keeping the reference faces together on the finished joint will ensure mortises and tenons align ③. It's much easier to clamp square section workpieces, so don't do any shaping of workpieces until after joints are routed ④. ■

Workpiece and Joint Options

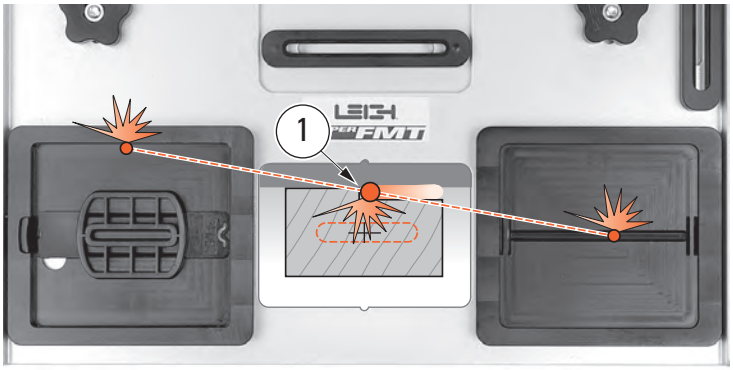
Different Workpiece Thicknesses
Longer and Shorter Joints
Thicker and Wider Boards

Before using your Leigh Super FMT you must have completed all of the preparatory steps including reading the router safety recommendations on the previous pages. If you haven't done so, it is essential that you do it now.

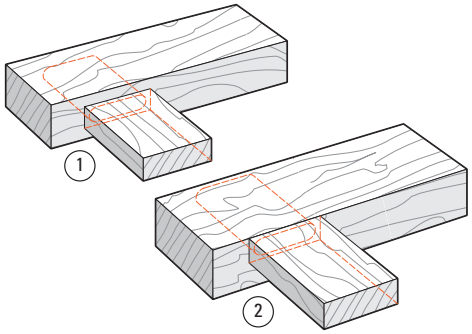
⚠ IMPORTANT SAFETY NOTE

Take great care to not "trap" the bit against the side of tenon rails ①. **Do not attempt to rout center tenons in rails thicker than 1 5/16" [34mm] before referring to 5-39 through 5-44.**

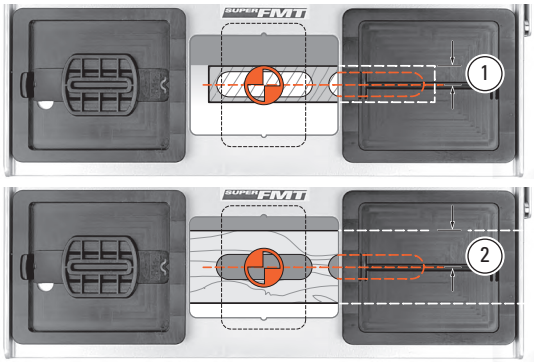
Without using the table movement as prescribed, the bit would have to be plunged into the side of the tenon rail causing the bit to powerfully "drive" the router across the jig. **This could be dangerous and can damage the jig.**



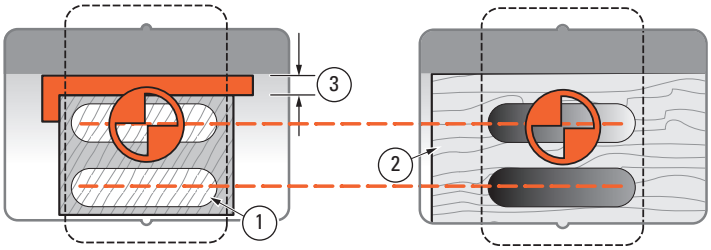
Different Workpiece Thicknesses



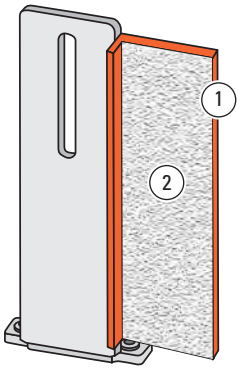
6-1 So far we have only illustrated joints where the mortise and tenon workpieces are the same thickness. There will be numerous times when this is not the case, as in where the tenon piece is thinner and centered on the mortise board ①, and where the tenon piece is deliberately off center on the mortise piece ②.



6-2 Single or double (inline) mortises and tenons are straight forward. Simply mount, sight and rout all the tenons as shown before ①, then mount and re-sight the mortises at the desired front-back position before routing ②.

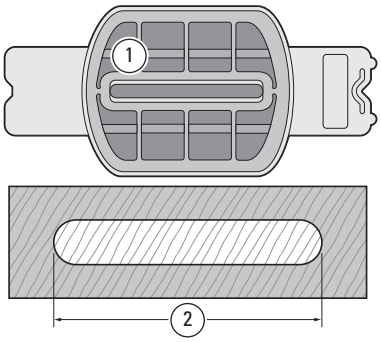


6-3 Side-by-side double and quadruple joints of different stock thicknesses require a packing piece (see 6-4) between the clamp plate and tenon piece, the thickness equal to the offset of the two pieces. For example, a 2"[50mm] tenon piece ① centered on a 3"[75mm] mortise piece ② will require a ½"[12,5mm] packing piece ③. ⚠ **Never attempt to achieve this alignment by re-sighting the joint and resetting the FB limit stops. That would make it impossible to guarantee twin-tenon to mortise alignment.**

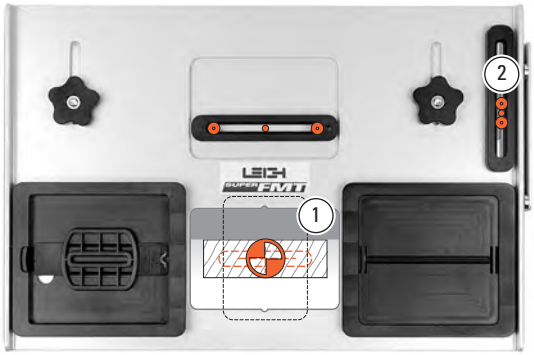


6-4 This packing piece should include its own sidestop fence ① and if required frequently, should have sandpaper glued onto its outer surface for secure workpiece clamping ②. Sight and rout the tenons in the usual way with packing piece in place. Then, remove packing piece before sighting and routing the mortises. ■

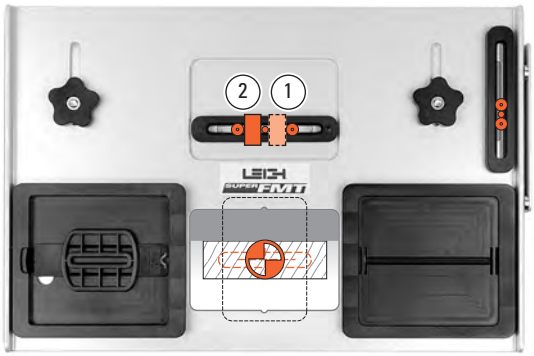
Longer and Shorter Joints



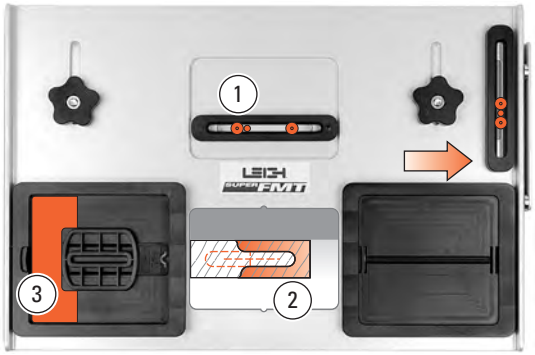
6-5 The Super FMT table movement allows for easy routing of odd-sized joints. For example, you may want to rout a 3"[75mm] joint ② and you only have a 2"[50mm] guide ①. Use this simple formula: **Joint, minus Guide, divided by 2.**
Example: 3" - 2" ÷ 2 = ½"[75 - 50 ÷ 2 = 12,5mm]
Cut a small block equal to the result; in this example, ½"[12,5mm].



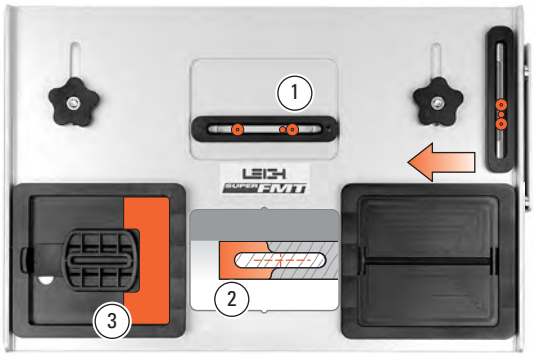
6-6 Tenons Mark the center Position and sight the tenon ①, and lock the table. Set the FB stops against the post ②.



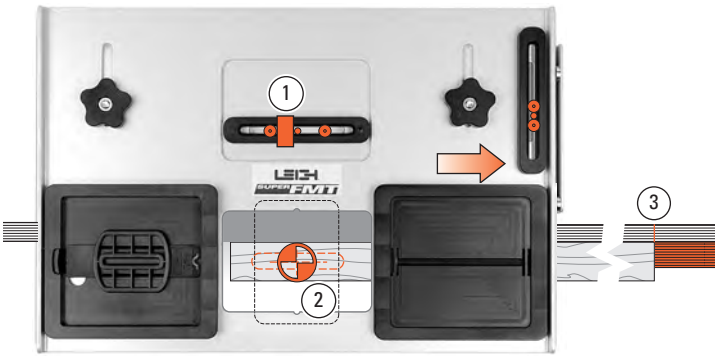
6-7 Set the LR stops one at a time with the small block between the stops and post ① ②. This ensures that the table movement is centered about the joint center mark on the stock. Remove the block, **but save it.**



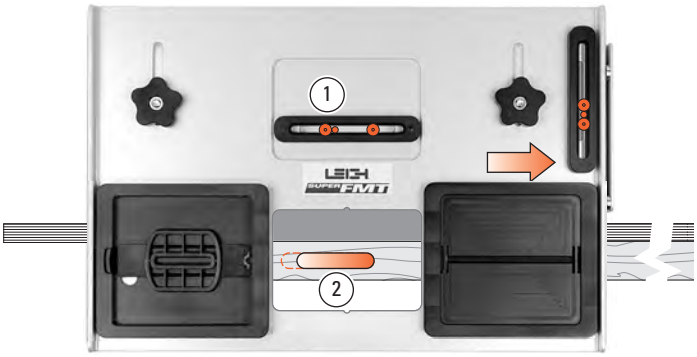
6-8 To rout the wider tenon: Move the table **right**, to the stop ①. Rout the **right hand end** of the tenon ②. Use a guard in the left end of the guide recess if necessary ③.



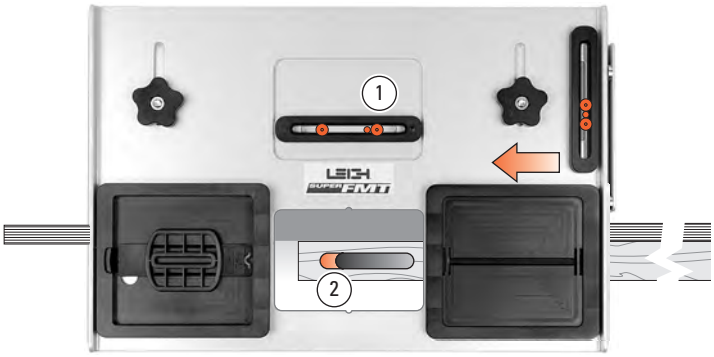
6-9 Move the table **left** to the stop ①. Rout the **left hand end** of the tenon ②. If you're using a "guard", flip it to the right end of the recess ③. Repeat for all required tenons.



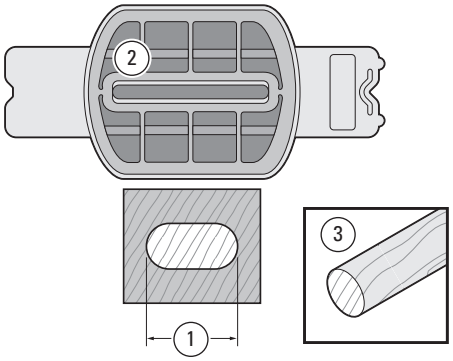
6-10 Mortises Loosen the table clamp. Use the small block between one stop and the stop post ① and lock the table. Center a mortise piece under the sight, and clamp ②. Set sidestop blocks or marks on the outriggers ③.



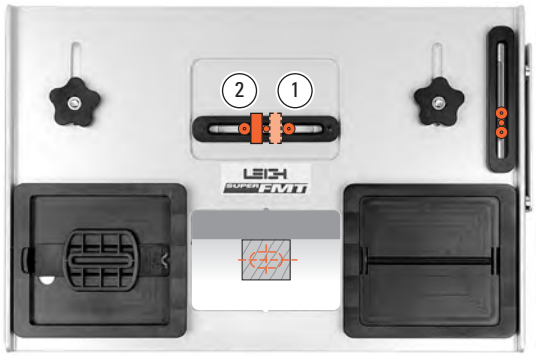
6-11 Move the table **right** to the stop ①. Rout the **right-hand end** of the mortise ②, using the full length of the mortise guide.



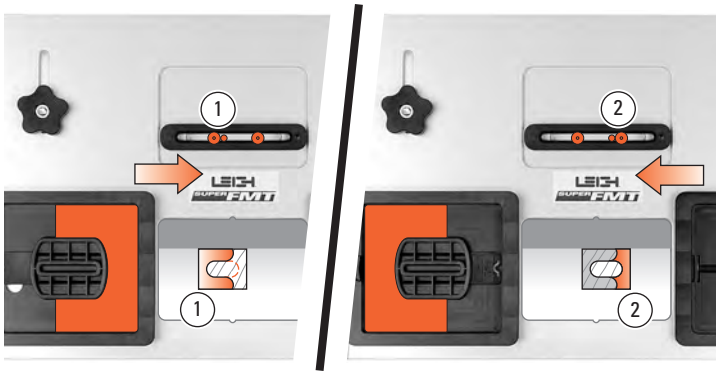
6-12 Move the table **left** to its stop ①. Rout the **left-hand end** of the mortise ②. Repeat for all required mortises. To recap: for joints longer than the guides, **move the table right and rout right, move the table left and rout left.**



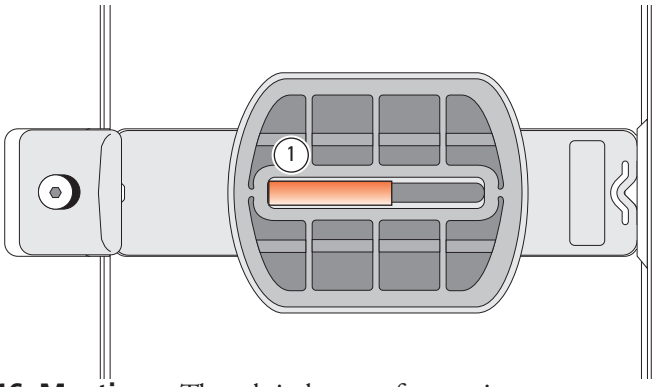
6-13 For mortises and tenons shorter than the guide, reverse the calculation: **Guide, minus Joint, divided by 2**. Example: you may want a 1"[25mm] joint ① using a 2"[50mm] guide ②. 2" - 1" ÷ 2 = ½" [50mm - 25mm ÷ 2 = 12,5mm]. Make a block ½"[12,5mm]. You will also need a short length of 3⁄16"[5mm] dowel ③ to act as a guard when routing the mortises.



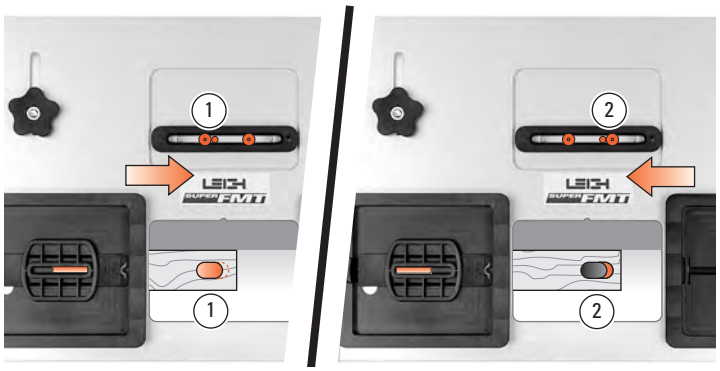
6-14 Tenons Setting the block and limit stops for the shorter tenons procedure ① ② is exactly the same as for longer tenons setup, **except when you come to rout…**



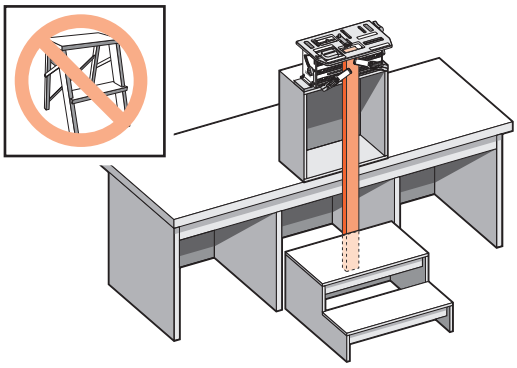
6-15 …Then it is:
Move table **right**; rout to the **left** ①. Move table **left**; rout to the **right** ②. Again, use a guard in the guide recess if necessary.



6-16 Mortises The rule is the same for mortises except you will need to use a small piece of that 3⁄16"[5mm] dowel as a guard in the guide's mortise slot ①. The dowel should be slightly longer than the difference between the guide length and joint length; in this example, slightly longer than 1"[25mm]. In this example, the joint is only 1" long and the guide mortise slot is 2". Therefore you need a guard dowel to prevent routing a mortise longer than required.

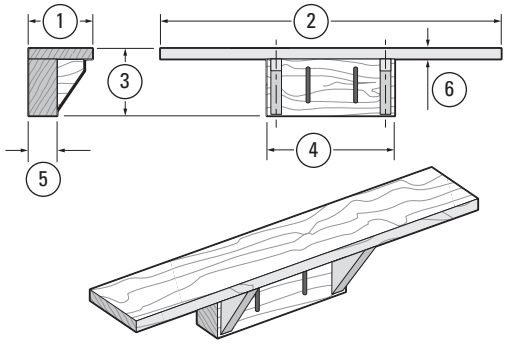


6-17 For the shorter mortises: Table **right**; dowel right; rout **left** side ①. Table **left**; dowel left; rout **right** side ②. The length of the dowel guard allows you to rout a mortise slightly shorter than required in the first cut and to clean out in the second cut.



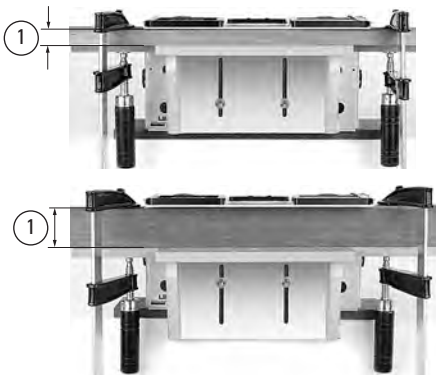
6-18 To rout long vertical boards you could build a jig stand to mount on your bench. Make the stand/bench combination high enough to accept the desired board length, bolted securely to the bench. Make a stable platform as shown here to stand on. **Don't use a folding step, it is unstable.** Other novel solutions: holes in (suspended) floor; jig bolted to deck or mezzanine railing; wall brackets.

Thicker and Wider Boards



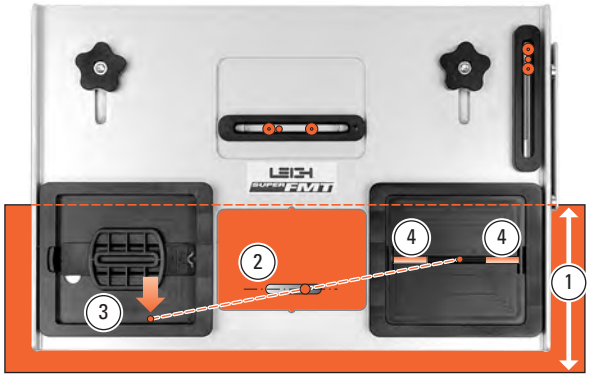
6-19 Make this bracket to mount and mortise a wide board face, clamp pieces greater than Leigh Clamp 3" capacity, and center mortises on boards up to 4⅜"[115mm] wide or even 6⅜"[162mm].

① 4½"[115mm] ③ 4¾"[120mm] ⑤ 2"[50mm]
② 24"[600mm] ④ 9"[230mm] ⑥ ¾"[20mm]



6-20 Use carriage bolts and nuts to secure the bracket to the Super FMT clamp face and adjust the distance below the table to slightly greater than the mortise piece thickness ①.

6-21 Use C-clamps or F-Clamps to hold the workpiece onto the bracket, with the workpiece rear edge touching the clamp plate. **Now raise the bracket so the workpiece touches the underside of the table.** Tighten the clamp plate nuts. The widest board in which a mortise may be centered is 4⅝"[115mm] ①. The thickest depth capacity is 5"[100mm] ②.



6-22 Mortises in center of boards 4⅝" to 6½"[115-165mm] ①: Mark the mortise center on a test board ②. Using the guide recess front edge as mortise guide ③, adjust the table to center the mortise. Control mortise length with 3/16"[5mm] dowel pieces in the pin track ④ (see 6-16). *Note: This is not a standard Leigh solution, but we thought it would solve this rare challenge.* ■

Special Joints

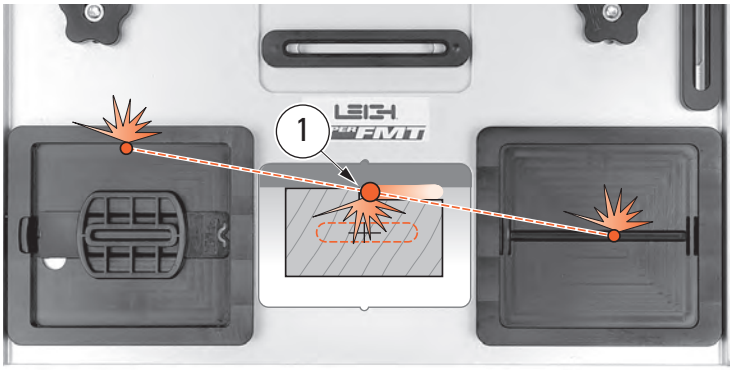
Angled Joints
Through Tenons
Bridle Joints
Asymmetric Tenons
Haunched Joints
Doweling

Before using your Leigh Super FMT you must have completed all of the preparatory steps including reading the router safety recommendations on the previous pages. If you haven't done so, it is essential that you do it now.

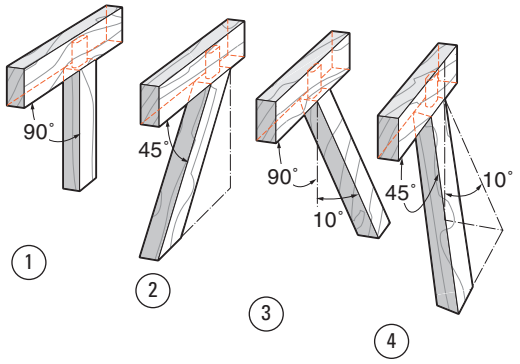
⚠ IMPORTANT SAFETY NOTE

Take great care to not "trap" the bit against the side of tenon rails ①. **Do not attempt to rout center tenons in rails thicker than 1 5/16" [34mm] before referring to 5-39 through 5-44.**

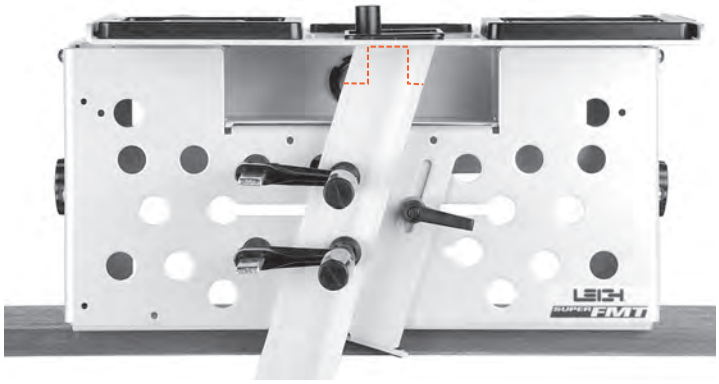
Without using the table movement as prescribed, the bit would have to be plunged into the side of the tenon rail causing the bit to powerfully "drive" the router across the jig. **This could be dangerous and can damage the jig.**



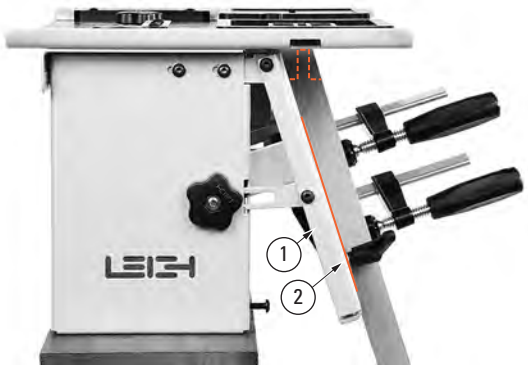
Angled Joints



7-1 The majority of frame joints are at 90° ① but the ability to angle joints is essential in chair construction, for example. Whether these joints are single angles ② and ③ or a compound angle ④ they are easily achieved on the Super FMT.

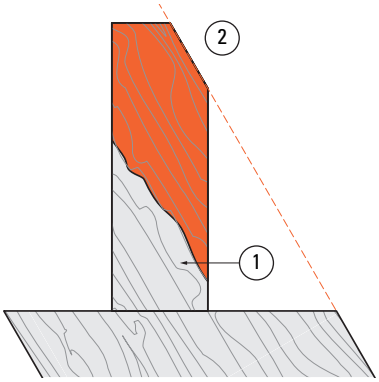


7-2 Angling the sidestop fence gives a single angled joint in the left-right direction.



7-3 Angling the clamp plate ① with the sidestop in a vertical position ② gives a single angled joint in the front-back direction.

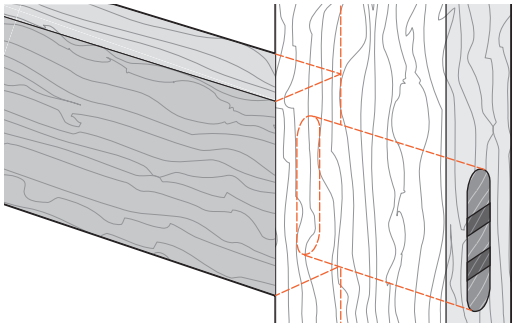
7-4 Angling both the sidestop fence and clamp plate gives a double or compound angled joint.



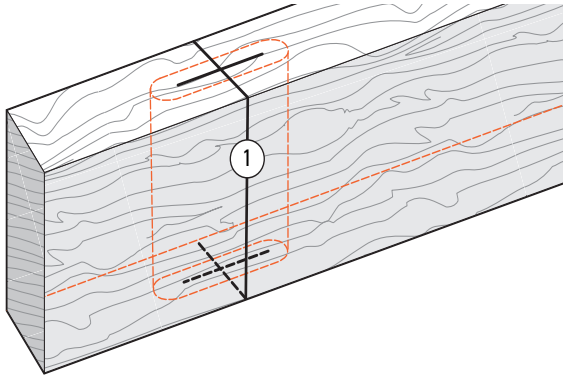
7-5 The Super FMT clamp plate can be angled up to 30° but it is doubtful you will ever need to approach even 10° on a mortise & tenon joint. The strength of a tenon across its grain lessens considerably as the angle increases ①. In addition, the length and position of the tenon is limited in slope by the angled workpiece relative to the vertical bit ② (angle shown in illustration is exaggerated).

7-6 However, you may for example, want to machine spline mortises or dowel holes in a stave type construction in, say, octagons at 22½°, or hexagons at 30°, so the 30° capacity may prove to be useful. You can then machine precisely fitting splines on the Super FMT and trim them to length. ■

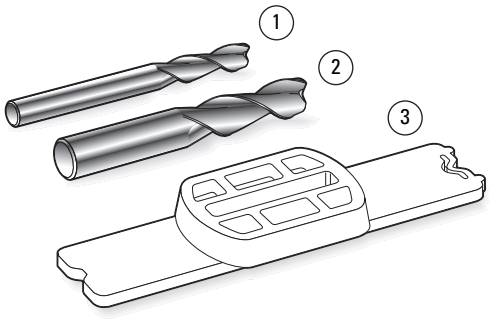
Through Tenons



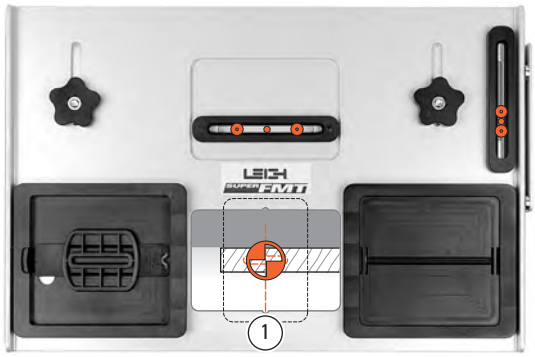
7-7 Through Tenons Occasionally, a design feature will call for through, exposed tenons, possibly "wedged" for decorative effect. The limited depth of cut of router bits can make this difficult, but the two-sized bit technique described previously, combined with the precision of the Super FMT, makes this procedure perfectly feasible in many instances.



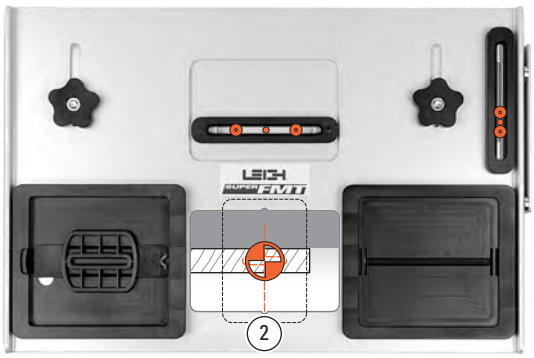
7-8 The problem with through mortises is their great depth relative to the cutting depth and diameter of the bit. However, if the left-right part of the joint center mark ① is carefully squared around the mortise workpiece, it is possible to accurately plunge from **both sides.**



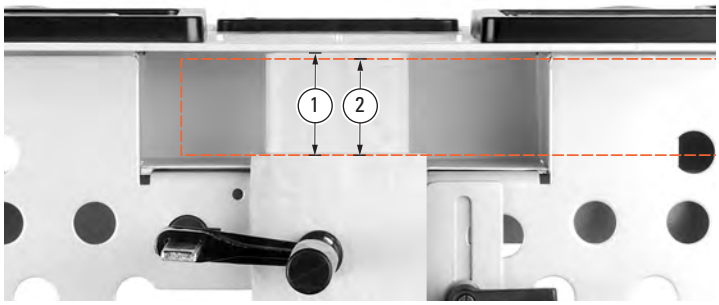
7-9 Here's an example:
¼"[6mm] joint through 1½"[35mm] deep mortise.
Select ¼"[6mm] bit for mortises ①.
Select ½"[12mm] bit to rout the 1½"[35mm] long tenon ②.
Select ⅜"[8mm] guide ③ for length from the guide/bit selection chart in Appendix I.



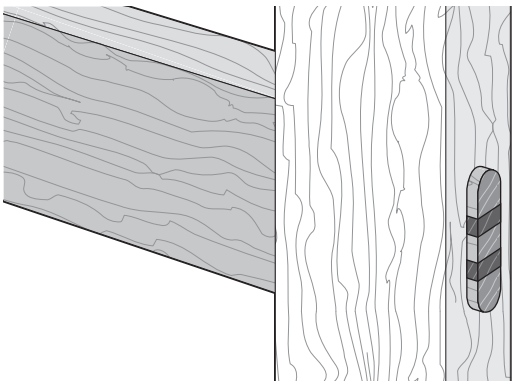
7-10 Carefully sight the mortise taking particular care to center the "vertical" line ① in the sight. Plunge and rout down deeper than half the mortise board depth but no more than the cutting length of the bit.



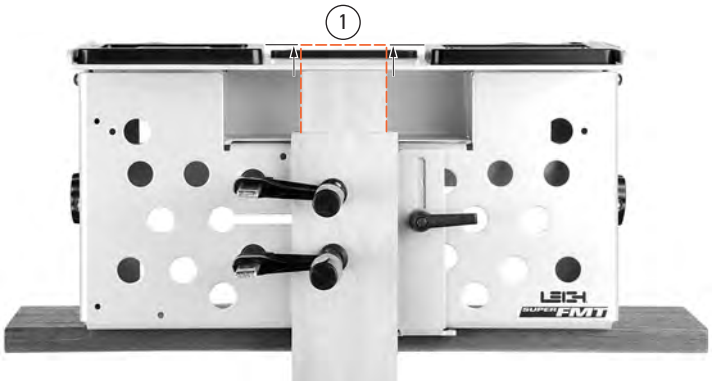
7-11 Turn the mortise piece end for end and, **keeping the same reference side of the mortise board to the clamp face,** carefully sight the "vertical" mortise center mark ② and lock the table. Plunge and rout to clear the through mortise.



7-12 Rout the tenons with the larger (longer) bit for slightly more tenon depth ① than mortise depth ②.

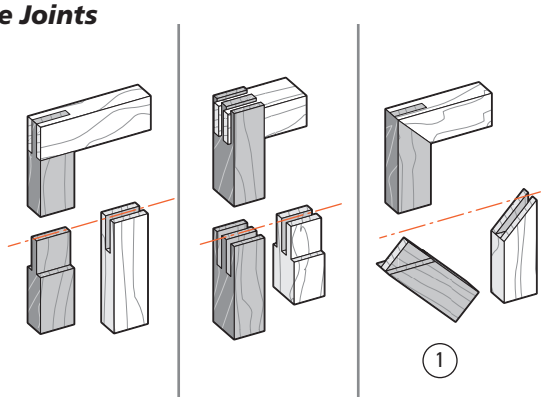


7-13 It may even be possible to make tenons long enough to be raised if this decorative effect is desired. "Wedging" the tenons is a simple hand procedure and adds a nice decorative touch. By design, mortise length is slightly greater than tenon width. Wedging expands the tenon to eliminate the gap.

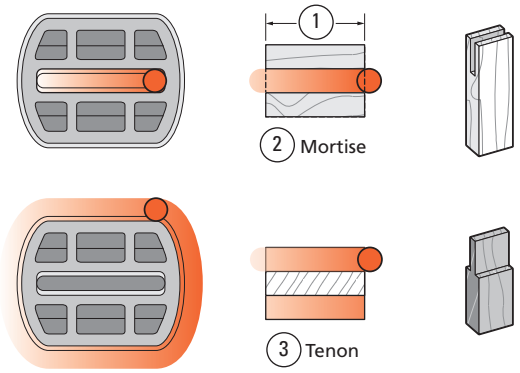


7-14 If the tenon stock is smaller than the table opening it may be possible (after sighting) to slide the tenon workpiece up to gain an extra ½"[12mm]① (exaggerated for clarity) of tenon length (assuming of course that the bit has sufficient routing depth) but no higher than the top of the guide moldings ①. ■

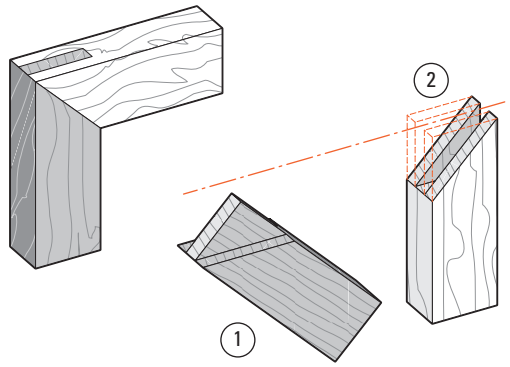
Bridle Joints



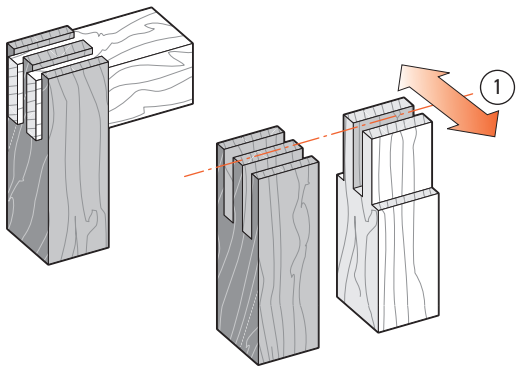
7-15 Routing bridle joints on the Super FMT is simple. All the workpieces (with the exception of the mitered tenon) ① are mounted vertically on the jig. Fit for bridle joints is adjusted with the left guide pin.



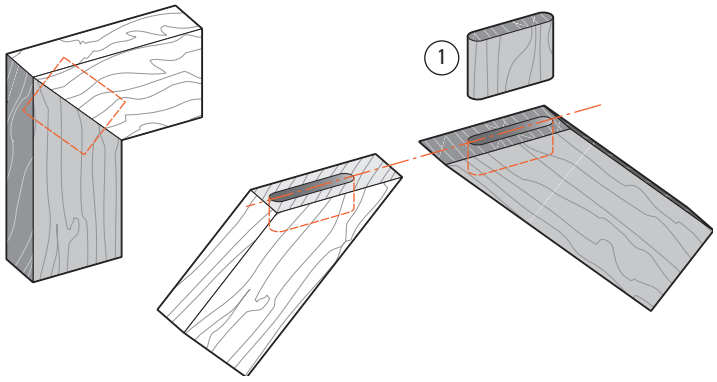
7-16 Select a guide that is greater in length than the workpiece width ① by at least two bit diameters. Rout right through the "vertical mortise" ② and across the tenon sides ③. The bit will clear the edge of the workpiece before the guide pin reaches the rounded part of the guide. Adjustment for fit is made with the left hand guide pin.



7-17 The mitered "tenon" is mounted at 45° on the clamp plate ①. The "mortise" end miter ② is cut on the table saw after routing the mortise.

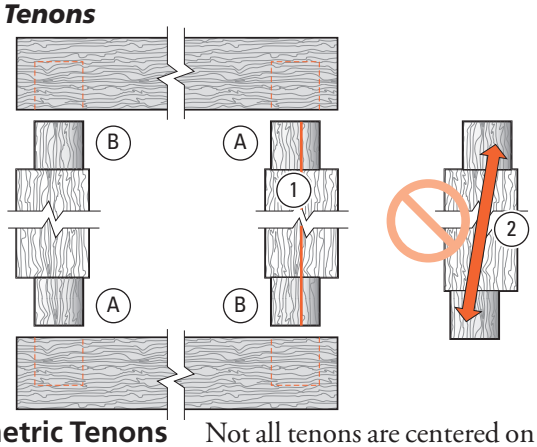


7-18 Twin bridle joints use the technique shown above combined with the table movement ①. See Twin Joints, 5-12.

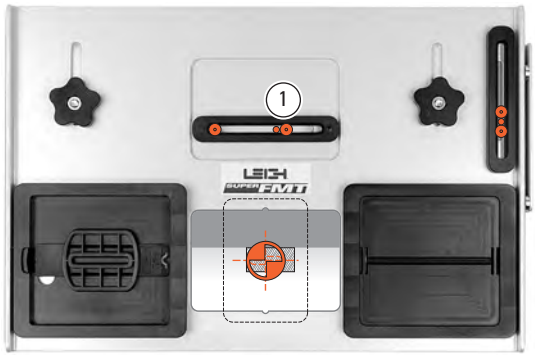


7-19 Floating Tenons A "floating" tenon in a mitered corner allows for a greater joint glue area at the inside of the corner. On this mitered corner, the workpieces are mounted in the jig at 45° and the mortises routed. The floating tenon ① is routed on the end of a vertically mounted scrap piece using the same guide and then sawn off. ■

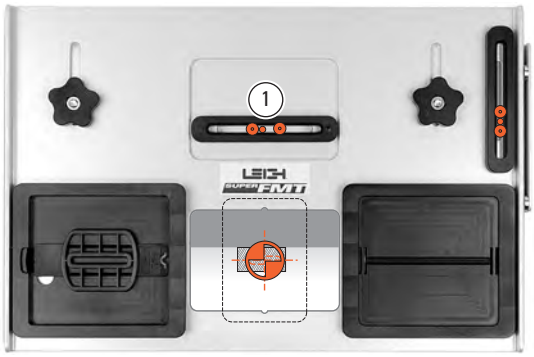
Asymmetric Tenons



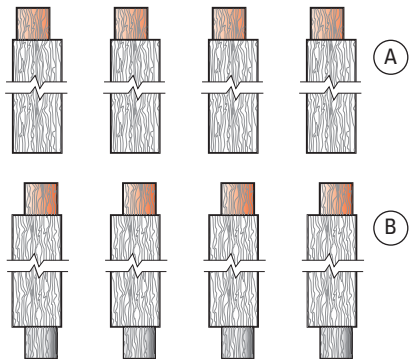
7-20 Asymmetric Tenons Not all tenons are centered on the long axis of the workpiece end ①. This means that tenons "A" are routed at one table sighting and tenons "B" at a second table sighting. If they aren't routed in this manner, the two tenons will be diagonally opposed to each other ②.



7-21 Use the **LR** limit stops for rapid changeover from tenons "A" to tenons "B".
For example, with the workpiece centered on the jig, sight tenon "A" and set the right hand limit stop to the right of the post ①, then…

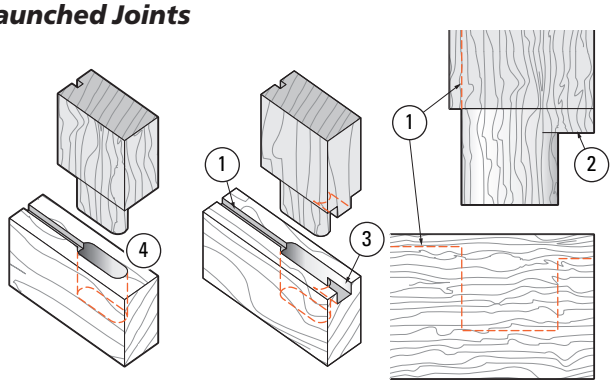


7-22 …sight tenon "B" and set the left hand limit stop to the left of the post ①. Now alternately rout tenons "A" and "B", moving the table left and right each time, or…

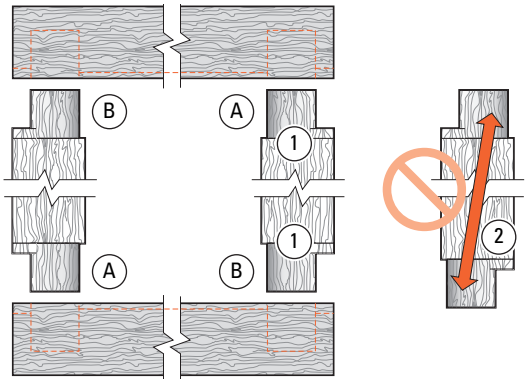


7-23 …if you don't trust yourself to get the sequence correct, you could rout all the "A" tenons first, then change the table one time to rout all the "B" tenons. This latter procedure would be the simplest way to rout haunched tenons (covered in the next section). ■

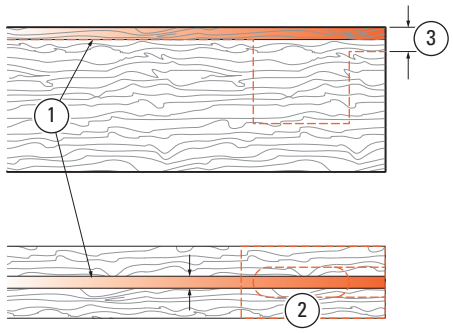
Haunched Joints



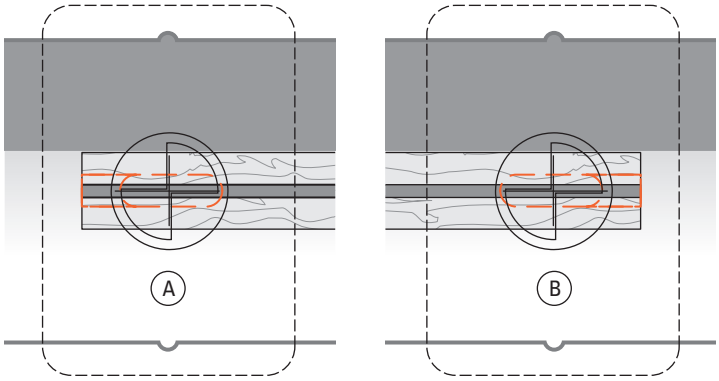
7-24 Frame and panel door construction can call for rails and stiles to be grooved for the panel ①, and the tenons haunched ②, both for joint stability and to fill the end of the stile groove which is sometimes run right through ③. This is not as common as it once was. Routers and router tables now make it simple to have a stopped groove ④, avoiding the need for the haunch.



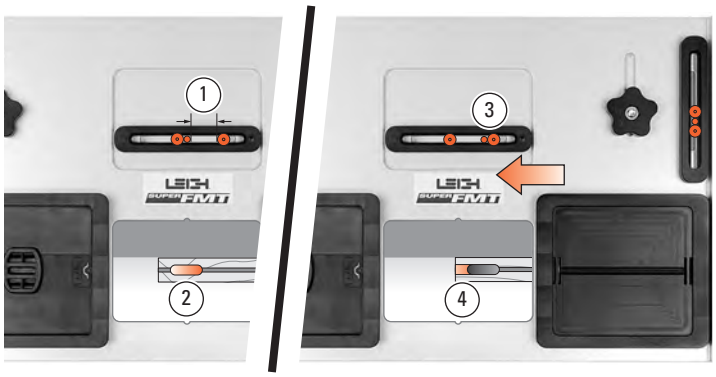
7-25 Haunched mortises and tenons are "handed", and require separate setups for each. e.g. if these two tenons ① were routed with the same jig setup, the result would be offset tenons ②. So mark out the two types of corners as "A" and "B" mortises and tenons.



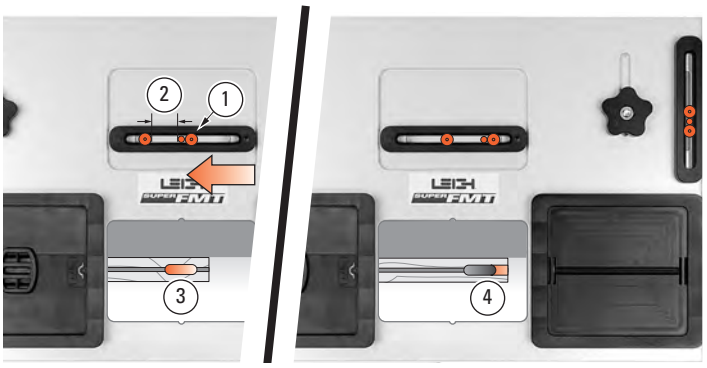
7-26 First, groove all the workpieces ①. The groove should be less than the mortise width ② and shallower than the haunch recess ③.



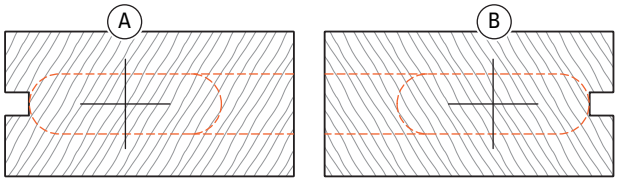
7-27 Sight both the "A" and "B" mortises. Set stops or mark the outrigger for repeatable successive workpieces. Position and lock the FB Limit Stops against the post.



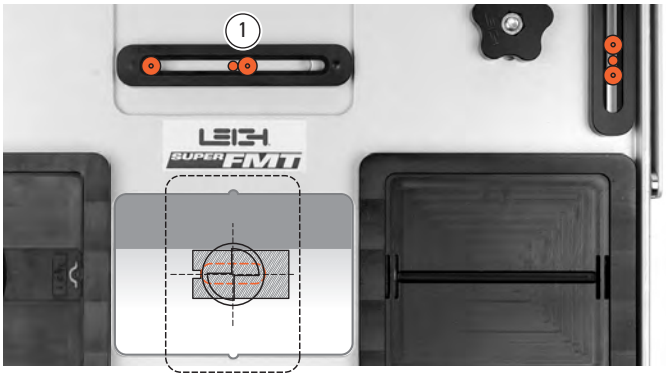
7-28 "A" Mortises and Haunch Recesses Set right hand LR Limit Stop away from the post, ¾ of the guide length ①. e.g. 1" guide, move ¾". Table still in "mortise center" position, rout mortise full depth ②. Raise the plunge. Move table left to the stop ③. Lower the bit to haunch depth; set router depth turret. The router is now set for both depths of cut. Rout haunch recess ④. Repeat for all "A" mortises.



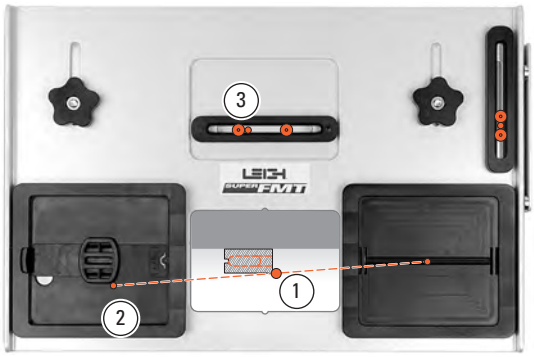
7-29 "B" Mortises and Haunch Recesses Move the table left to touch the right hand LR Limit Stop against the post ① and lock the table. Move the left hand LR Limit Stop (by ¾ of the guide length) to the left ②. Rout the "B" mortises ③ and haunch recesses ④ using the table movement and the same router depth settings.



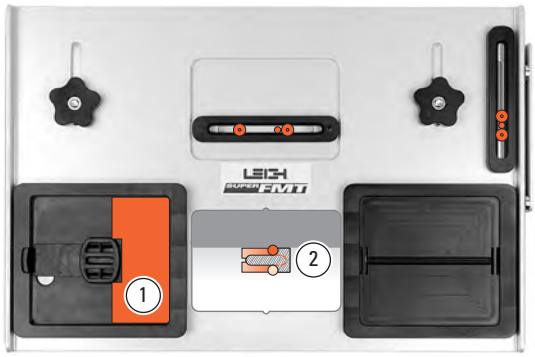
7-30 Routing the Tenons Mark the tenon centers "A" and "B". Remember, the tenons are "off center" and each end of the tenon pieces are marked off center in opposite directions. **Prepare and make a couple of extra (scrap) tenon pieces to use in setting haunch bit depth later (see 7-35).**



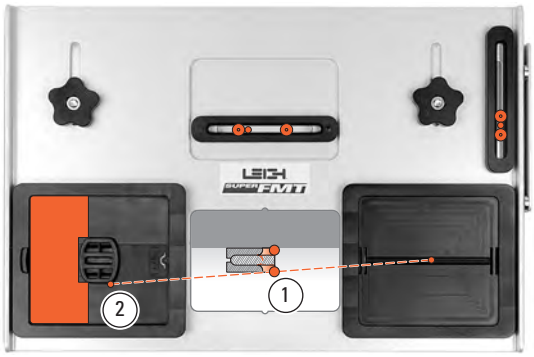
7-31 "A" Tenons With the workpiece centered on the jig, sight the tenon center and set the right hand LR limit stop to the post ①.



7-32 Move the table right to a position where the bit will clear the end of the haunch ① while the guide pin is still on the straight part of the guide ②. Set the left hand **LR** limit stop to its post ③.

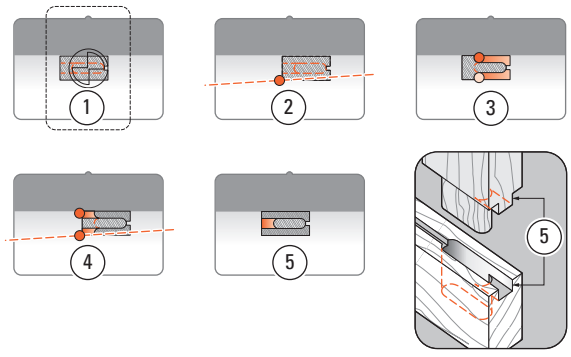


7-33 Move the table to the left again and if necessary, set a "guard" piece in the guide recess ① to prevent routing around the right end of the tenon ②. Rout the left end of the tenon (shaded area) at full shoulder depth.



7-34 Move the guard to the left end of the recess. Move the table right and rout the rest of the "A" tenon at full depth; the bit prevented from rounding the haunch off at ① by the guide pin against the guide side at ②.

7-35 Move the table left, remove the guard from the bit recess. **Depth: You will have to preset the plunge router depth-of-cut rod and turret so that the routed haunch exactly equals the depth of the haunch recess** ①. Use the scrap test tenons to achieve this setting by measurement and a little trial and error. Now rout completely around the actual tenon.



7-36 "B" Tenons on the other end are routed with the procedure reversed. ■

Doweling

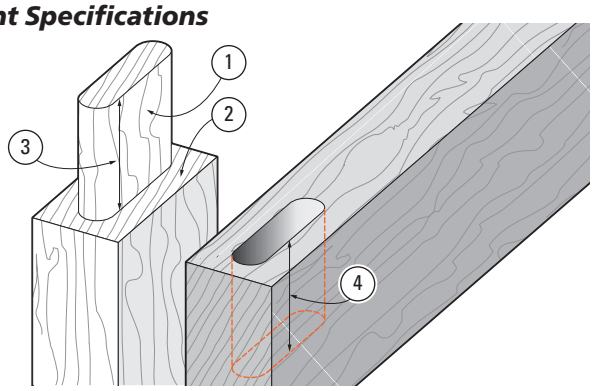
7-37 Sometimes where the strength of a mortise and tenon is not required, doweling may be a suitable alternative. A bonus use of the Super FMT is its ability to provide very precise dowel hole boring. Turn the left hand guide pin down to "zero free play" in the mortise guide slot. Simply use one or both ends of a mortise guide slot for positioning while plunging the dowel holes. ■

Joint Specifications, Guide and Bit Selection

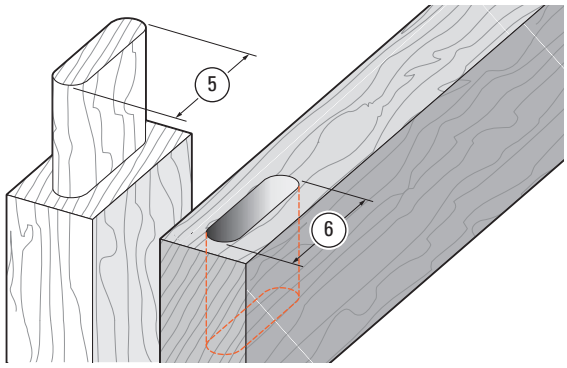
Foreword

The illustrations and specifications in this Appendix show the largest tenon rail and tenon sizes possible on the Super FMT, either in one table position or multiple table positions as noted. For all smaller sizes, refer to the guide and bit selection chart.

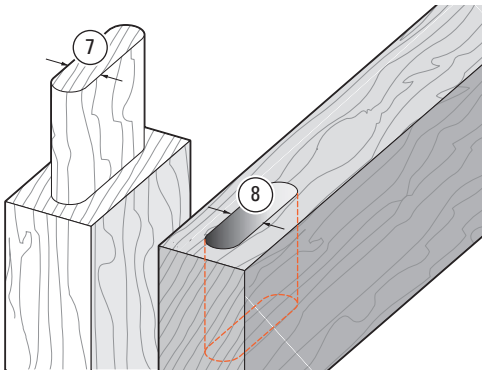
Joint Specifications



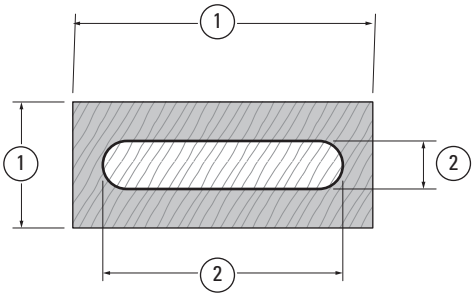
A1-1 Joint Terminology The tenon sides are the "Cheeks" ①. The tenon shoulders are called (luckily) the "Shoulders" ②. Unfortunately, references to dimensions of mortises and tenons do not share matching terminology, so...
Long or short tenons ③ fit into deep or shallow mortises ④.
Tenon Length = Mortise Depth.



A1-2 Wide or narrow tenons ⑤ fit into long or short mortises ⑥.
Tenon Width = Mortise Length.



A1-3 Thick or thin tenons ⑦ fit into wide or narrow mortises ⑧.
Tenon Thickness = Mortise Width.

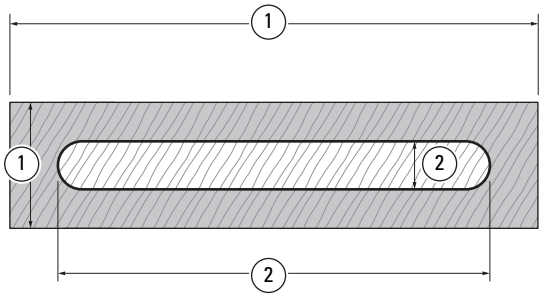


A1-4 Largest Single Rail and Tenon

(using one table position with ¼" bit)

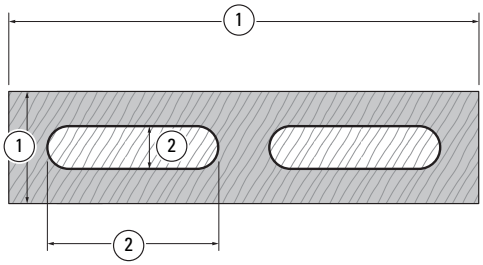
Workpiece 1 5/16" x 3⅛"[34 x 80mm] ①.
Tenon ½" x 2½"[12 x 65mm] ②.
Guide ½" x 2½"[12 x 65mm].

Note: Routing single tenons in stock thicker than 1 5/16"[34mm] would require the bit to be plunged into the edge of the workpiece, dangerously "trapping" the bit. See 5-39 through 5-44 and follow the "Third Tenon" procedure.



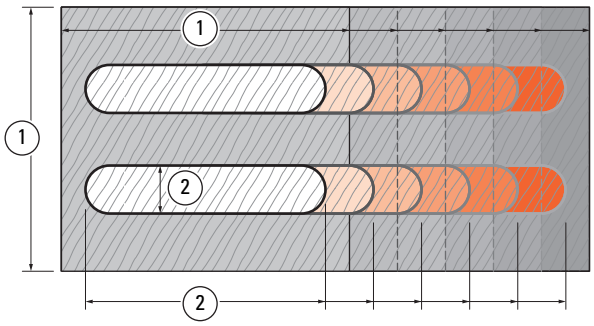
A1-5 Largest Single Rail and Tenon
(using two table positions)

Workpiece 1 5/16" x 5½"[34 x 140mm] ①.
Tenon ½" x 4½"[12 x 115mm] ②.
Guide ½" x 2½"[12 x 65mm].
Note: Using 3 table positions tenon length ② may be up to 5"[125mm]



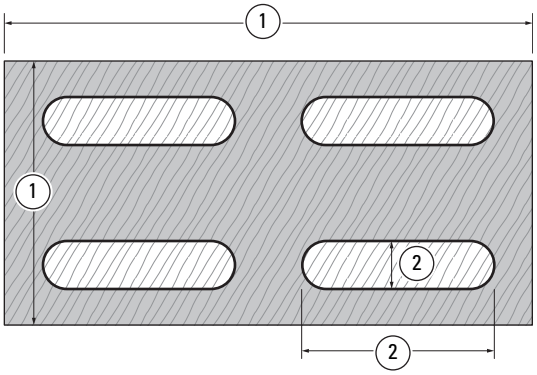
A1-6 Largest Tandem Double Tenon
(using two table positions)

Workpiece 1 5/16" x 5½"[34 x 140mm] ①.
Tenons ½" x 2"[12 x 50mm] ②.
Guide ½" x 2"[12 x 50mm].



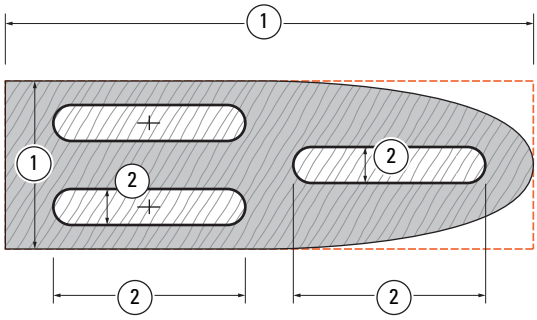
A1-7 Largest Side-by-Side Twin Tenon *(two* table positions)*

Workpiece 3" x 5½" [76 x 140mm] ①.
Tenons ½" x 2½+" [12 x 65+mm] ②.
Guide ½" x 2½" [12 x 65mm].
**Note: Add left-right table positions to the two front-back settings, for maximum workpiece and tenons extension. See A1-5.*



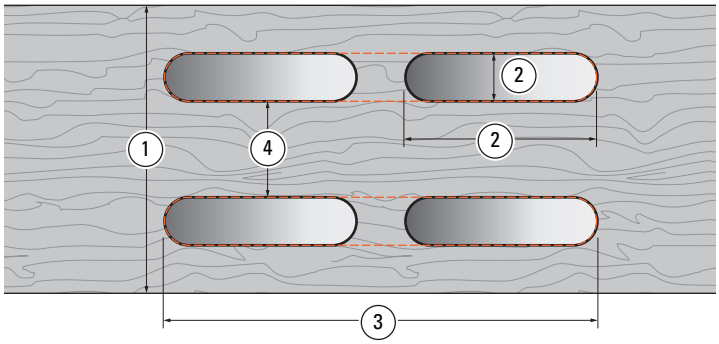
A1-8 Largest Quadruple Tenon *(four table positions)*

Workpiece 3" x 5½" [76 x 140mm] ①.
Tenons ½" x 2" [12 x 50mm] ②.
Guide ½" x 2" [12 x 50mm].



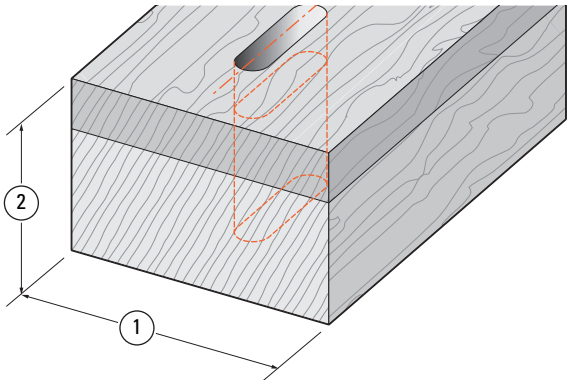
A1-9 Largest Triple Tenon *(five* table positions)*

Workpiece 1¾" x 5½"[44 x 140mm] ①.
Tenons ⅜" x 2"[10 x 50mm] ②.
Guide ⅜" x 2"[10 x 50mm].
**Note: To avoid "trapping" the bit on larger workpieces, rout the third tenon in three different ⊓ ⊏⊐ table positions. See Chapter 5, "Triple Joints".*



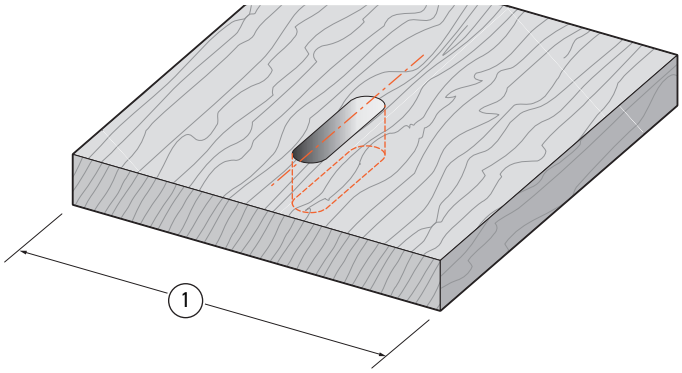
A1-10 Thickest Mortise Board and Mortise Centers
(four table positions)

Thickness 3" [75mm] ①.
4 Mortises ½" x 2" [12 x 50mm] ②.
2 Mortises ½" x 4½" [12 x 115mm] ③.
Spacing 9/16" to 1" [13 x 26mm] ④.
Board Width Clamping Capacity: 5"[128mm].



A1-11 Widest, Deepest Workpieces for Mortising to Center

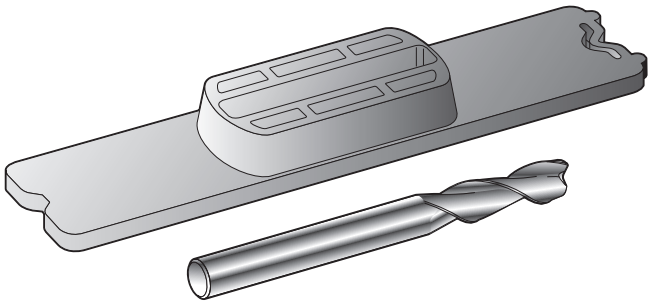
Width up to 4⅝"[115mm] ①.
Depth up to 4" [100mm] ②.
Note: See 6-21 for mounting instructions for these pieces.



A1-12 Maximum-width Board for Mortising to Center

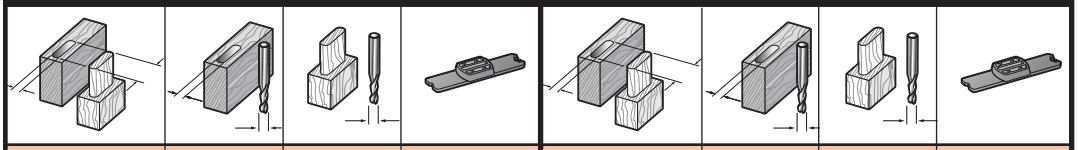
Width from 4⅝" [115mm]
up to 6½"[165mm] ①
Note: See 6-22 for special instructions. ■

Guide and Bit Selection



Use the charts on the next few pages to select appropriate guide and bit combinations. ➔

INCH GUIDE AND BIT SELECTION CHART



JOINT SIZE	MORTISE BIT	TENON BIT	GUIDE SIZE	JOINT SIZE	MORTISE BIT	TENON BIT	GUIDE SIZE
1/16" x 1/8"	1/16	7/16	1/4" x 5/16"	1/4" x 5/16"	1/4	1/4	1/4" x 5/16"
1/16" x 3/16"	1/16	7/16	1/4" x 3/8"	1/4" x 3/8"	1/4	1/4	1/4" x 3/8"
1/16" x 5/16"	1/16	7/16	1/4" x 1/2"	1/4" x 7/16"	1/4	3/8	5/16" x 1/2"
1/16" x 7/16"	1/16	7/16	1/4" x 5/8"	1/4" x 1/2"	1/4	1/4	1/4" x 1/2"
1/16" x 9/16"	1/16	7/16	1/4" x 3/4"	1/4" x 5/8"	1/4	1/4	1/4" x 5/8"
1/16" x 13/16"	1/16	7/16	1/4" x 1"	1/4" x 11/16"	1/4	3/8	5/16" x 3/4"
1/16" x 1-1/16"	1/16	7/16	1/4" x 1-1/4"	1/4" x 3/4"	1/4	1/4	1/4" x 3/4"
1/16" x 1-5/16"	1/16	7/16	1/4" x 1-1/2"	1/4" x 15/16"	1/4	3/8	5/16" x 1"
1/8" x 3/16"	1/8	3/8	1/4" x 5/16"	1/4" x 1"	1/4	1/4	1/4" x 1"
1/8" x 1/4"	1/8	3/8	1/4" x 3/8"	1/4" x 1-3/16"	1/4	3/8	5/16" x 1-1/4"
1/8" x 5/16"	1/8	1/2	5/16" x 1/2"	1/4" x 1-1/4"	1/4	1/4	1/4" x 1-1/4"
1/8" x 3/8"	1/8	3/8	1/4" x 1/2"	1/4" x 1-3/8"	1/4	1/2	3/8" x 1-1/2"
1/8" x 1/2"	1/8	3/8	1/4" x 5/8"	1/4" x 1-7/16"	1/4	3/8	5/16" x 1-1/2"
1/8" x 9/16"	1/8	1/2	5/16" x 3/4"	1/4" x 1-1/2"	1/4	1/4	1/4" x 1-1/2"
1/8" x 5/8"	1/8	3/8	1/4" x 3/4"	1/4" x 1-7/8"	1/4	1/2	3/8" x 2"
1/8" x 13/16"	1/8	1/2	5/16" x 1"	1/4" x 2-3/8"	1/4	1/2	3/8" x 2-1/2"
1/8" x 7/8"	1/8	3/8	1/4" x 1"	5/16" x 1/2"	5/16	5/16	5/16" x 1/2"
1/8" x 1-1/16"	1/8	1/2	5/16" x 1-1/4"	5/16" x 3/4"	5/16	5/16	5/16" x 3/4"
1/8" x 1-1/8"	1/8	3/8	1/4" x 1-1/4"	5/16" x 15/16"	5/16	7/16	3/8" x 1"
1/8" x 1-5/16"	1/8	1/2	5/16" x 1-1/2"	5/16" x 1"	5/16	5/16	5/16" x 1"
1/8" x 1-3/8"	1/8	3/8	1/4" x 1-1/2"	5/16" x 1-1/4"	5/16	5/16	5/16" x 1-1/4"
3/16" x 1/4"	3/16	5/16	1/4" x 5/16"	5/16" x 1-7/16"	5/16	7/16	3/8" x 1-1/2"
3/16" x 5/16"	3/16	5/16	1/4" x 3/8"	5/16" x 1-1/2"	5/16	5/16	5/16" x 1-1/2"
3/16" x 3/8"	3/16	7/16	5/16" x 1/2"	5/16" x 1-15/16"	5/16	7/16	3/8" x 2"
3/16" x 7/16"	3/16	5/16	1/4" x 1/2"	5/16" x 2-7/16"	5/16	7/16	3/8" x 2-1/2"
3/16" x 9/16"	3/16	5/16	1/4" x 5/8"	3/8" x 1"	3/8	3/8	3/8" x 1"
3/16" x 5/8"	3/16	7/16	5/16" x 3/4"	3/8" x 1-1/2"	3/8	3/8	3/8" x 1/2"
3/16" x 11/16"	3/16	5/16	1/4" x 3/4"	3/8" x 2"	3/8	3/8	3/8" x 2"
3/16" x 7/8"	3/16	7/16	5/16" x 1"	3/8" x 2-1/2"	3/8	3/8	3/8" x 2-1/2"
3/16" x 15/16"	3/16	5/16	1/4" x 1"	1/2" x 1"	1/2	1/2	1/2" x 1"
3/16" x 1-1/8"	3/16	7/16	5/16" x 1-1/4"	1/2" x 1-1/2"	1/2	1/2	1/2" x 1-1/2"
3/16" x 1-3/16"	3/16	5/16	1/4" x 1-1/4"	1/2" x 2"	1/2	1/2	1/2" x 2"
3/16" x 1-3/8"	3/16	7/16	5/16" x 1-1/2"	1/2" x 2-1/2"	1/2	1/2	1/2" x 2-1/2"
3/16" x 1-7/16"	3/16	5/16	1/4" x 1-1/2"				

Note: Joints routed with a single bit are shown shaded.

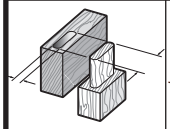
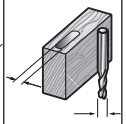
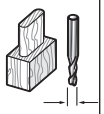
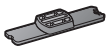
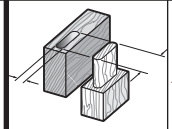
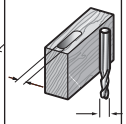
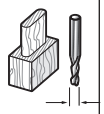
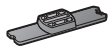
In addition to the joint sizes listed in the charts, any tenon width (mortise length) can easily be achieved by using the jig's quick-acting table movement and limit stops (see Chapter 6, Longer and Shorter Joints). By using combinations of machine tool bits, even more sizes of small and miniature joints may be routed (see Chapter 4, Small Joints).

BIT SPECIFICATIONS

LEIGH BIT ITEM NO.		A	B	B	C
HSS Spiral Upcut	**Solid Carbide Spiral Upcut**	**Mortise Size Cutting Diameter**	**HSS Cutting Depth**	**Solid Carbide Cutting Depth**	**Shank Diameter**
162	N/A	1/16"	3/16"	-	1/4"
164	164C	1/8"	3/8"	1/2"	1/4"
166	166C	3/16"	5/8"	3/4"	1/4"
168	168C	1/4"	1"	1-1/8"	1/4"
170-500	170-500C	5/16"	1"	1-1/8"	1/2"
173-500	173-500C	3/8"	1-1/4"	1-1/4"	1/2"
177	177C	7/16"	1-3/4"	1-3/4"	1/2"
180	180CL	1/2"	1-1/2"	2-1/8"	1/2"

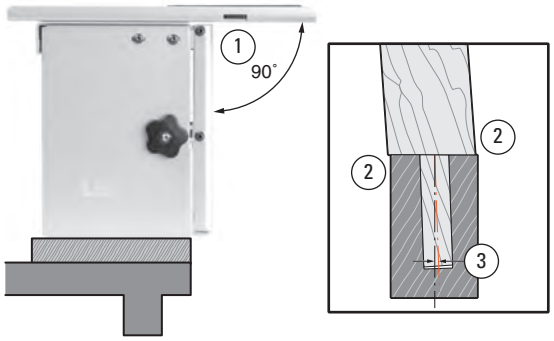
Note: For metric bit specifications, please see your national Leigh distributor.

METRIC GUIDE AND BIT SELECTION CHART

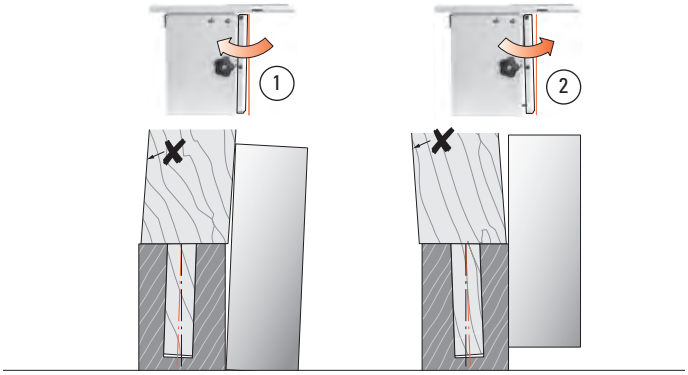









JOINT SIZE	MORTISE BIT	TENON BIT	GUIDE SIZE	JOINT SIZE	MORTISE BIT	TENON BIT	GUIDE SIZE
2 x 4	2	10	6 x 8	6 x 8	6	6	6 x 8
2 x 6	2	10	6 x 10	6 x 10	6	6	6 x 10
2 x 11	2	10	6 x 15	6 x 13	6	10	8 x 15
2 x 16	2	10	6 x 20	6 x 15	6	6	6 x 15
2 x 21	2	10	6 x 25	6 x 18	6	10	8 x 20
2 x 26	2	10	6 x 30	6 x 20	6	6	6 x 20
2 x 31	2	10	6 x 35	6 x 23	6	10	8 x 25
2 x 36	2	10	6 x 40	6 x 25	6	6	6 x 25
3 x 5	3	9	6 x 8	6 x 28	6	10	8 x 30
3 x 7	3	9	6 x 10	6 x 30	6	6	6 x 30
3 x 12	3	9	6 x 15	6 x 33	6	10	8 x 35
3 x 17	3	9	6 x 20	6 x 35	6	6	6 x 35
3 x 22	3	9	6 x 25	6 x 38	6	10	8 x 40
3 x 27	3	9	6 x 30	6 x 40	6	6	6 x 40
3 x 32	3	9	6 x 35	7 x 14	7	9	8 x 15
3 x 37	3	9	6 x 40	7 x 19	7	9	8 x 20
4 x 6	4	8	6 x 8	7 x 24	7	9	8 x 25
4 x 8	4	8	6 x 10	7 x 29	7	9	8 x 30
4 x 11	4	12	8 x 15	7 x 34	7	9	8 x 35
4 x 13	4	8	6 x 15	7 x 39	7	9	8 x 40
4 x 16	4	12	8 x 20	8 x 15	8	8	8 x 15
4 x 18	4	8	6 x 20	8 x 20	8	8	8 x 20
4 x 21	4	12	8 x 25	8 x 23	8	12	10 x 25
4 x 23	4	8	6 x 25	8 x 25	8	8	8 x 25
4 x 26	4	12	8 x 30	8 x 30	8	8	8 x 30
4 x 28	4	8	6 x 30	8 x 33	8	12	10 x 35
4 x 31	4	12	8 x 35	8 x 35	8	8	8 x 35
4 x 33	4	8	6 x 35	8 x 40	8	8	8 x 40
4 x 36	4	12	8 x 40	8 x 43	8	12	10 x 45
4 x 38	4	8	6 x 40	8 x 53	8	12	10 x 55
5 x 7	5	7	6 x 8	8 x 63	8	12	10 x 65
5 x 9	5	7	6 x 10	10 x 25	10	10	10 x 25
5 x 14	5	7	6 x 15	10 x 35	10	10	10 x 35
5 x 19	5	7	6 x 20	10 x 45	10	10	10 x 45
5 x 24	5	7	6 x 25	10 x 55	10	10	10 x 55
5 x 29	5	7	6 x 30	10 x 65	10	10	10 x 65
5 x 34	5	7	6 x 35	12 x 25	12	12	12 x 25
5 x 39	5	7	6 x 40	12 x 35	12	12	12 x 35
				12 x 45	12	12	12 x 45
				12 x 55	12	12	12 x 55
				12 x 65	12	12	12 x 65

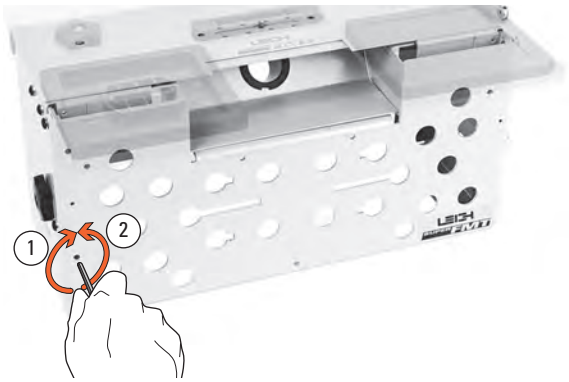
Jig Adjustments



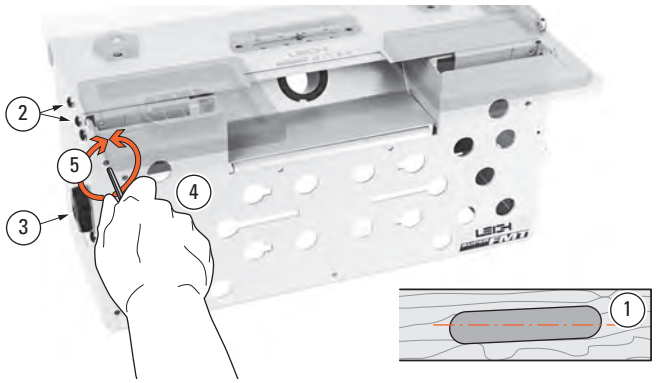
A2-1 Clamp Plate The clamp plate is factory set square to the table ①. However, this does not guarantee perfectly in-line joints. If your router shaft and bit are not perpendicular to the router sub-base and the Leigh sub-base, then the bit will not be square to the jig table (nor parallel to the clamp plate). This will cause a tiny "step" in the joint alignment ②. This is because the tenon center mark is now offset from the mortise center mark in the assembled joint ③. For clarity, the angle and step in this example is highly exaggerated.



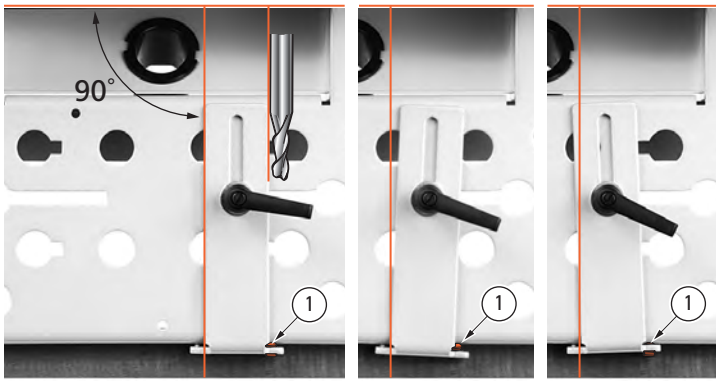
A2-2 Check your test joints for alignment with a straightedge. The cross represents the inside face toward the clamp face. The left example shows the clamp plate should be adjusted in toward the jig body ①. The right example shows the clamp plate should be adjusted away from the jig body ②. Test and adjust the clamp plate angle (see below) until the workpieces are in the same plane, with no joint misalignment.



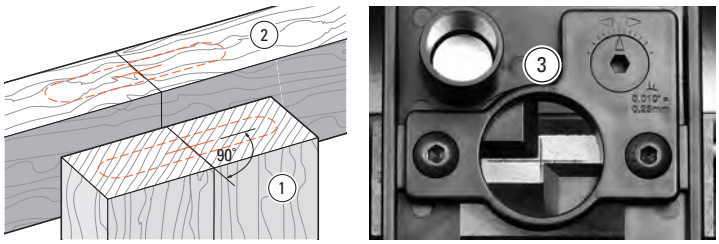
A2-3 The adjusting screw for setting the clamp plate is in the lower left front of the jig base. Loosen the quadrant knobs. Use the hex screwdriver to turn the screw clockwise to move the plate in ①. Turn the screw counterclockwise to move the plate out ②. The screw is treated with Loctite™ to prevent accidental rotation and will require firm pressure to adjust.



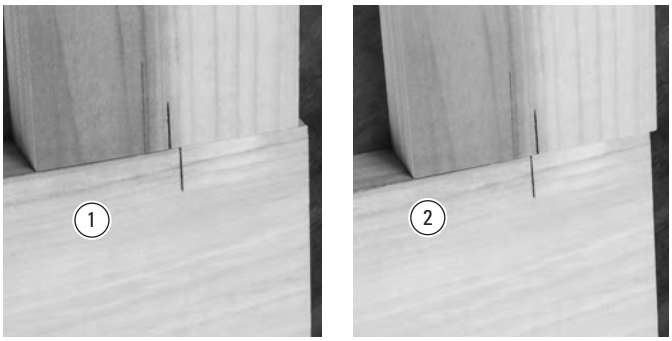
A2-4 Joint Alignment The clamp plate is factory set parallel to the guide track centerline and should not need attention. If the mortise or tenon is angled ① an adjustment may be required. Here's how: Slightly loosen the two screws ② holding the left end quadrant using the hex driver. Also loosen the LH Quadrant Knob ③. While pushing against the left hand end of the clamp plate ④ turn the screw in or out ⑤ to adjust the angle of the clamp plate relative to the guide track centerline. Firmly tighten the screws and then tighten the quadrant knob. After tightening the two screws, turn the adjusting screw in towards the jig body at least two full turns. Rout test joints to check the joint alignment.



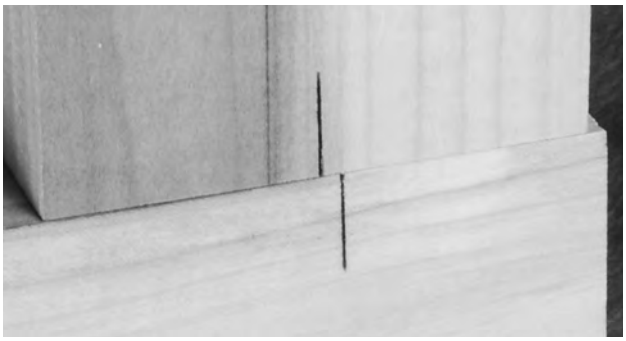
A2-5 Sidestop Squareness The travel of the router bit must be perfectly parallel to the sidestop fence. The fence is factory set square to the bottom of the jig table, however, tolerances in plunge routers may necessitate a small sidestop adjustment. If adjustment is required, the set screw on the bottom right side of the sidestop fence ① is turned in or out to change the angle of the fence.



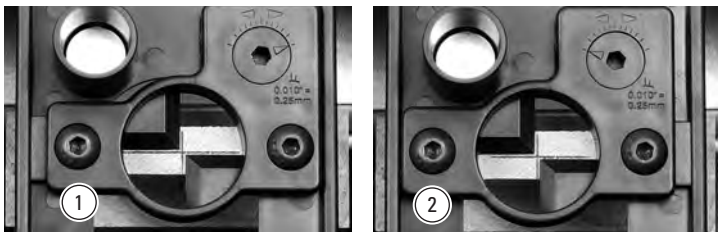
A2-6 Sight Adjustment Procedure Mark layout lines on the tenon piece ① and the mortise piece ② . Carefully sight the tenon piece in the jig ③. Be sure the layout marks are not touching either side of the sight. Rout the mortise and tenon, assemble the joint and check the layout marks.



A2-7 If your joints are misaligned like this ① or this ② (exaggerated) first **double check** that the router collet is perfectly centered on the sub-base as in figures 2-11 to 2-31. When the router is perfectly centered, proceed to A2-8.



A2-8 In this example, the mortise board is clamped on the left side of the jig and the tenon piece is offset to the left. The sight needs to be adjusted by ***half*** the amount of the offset **because changes to the site position affect the mortise and tenon**.



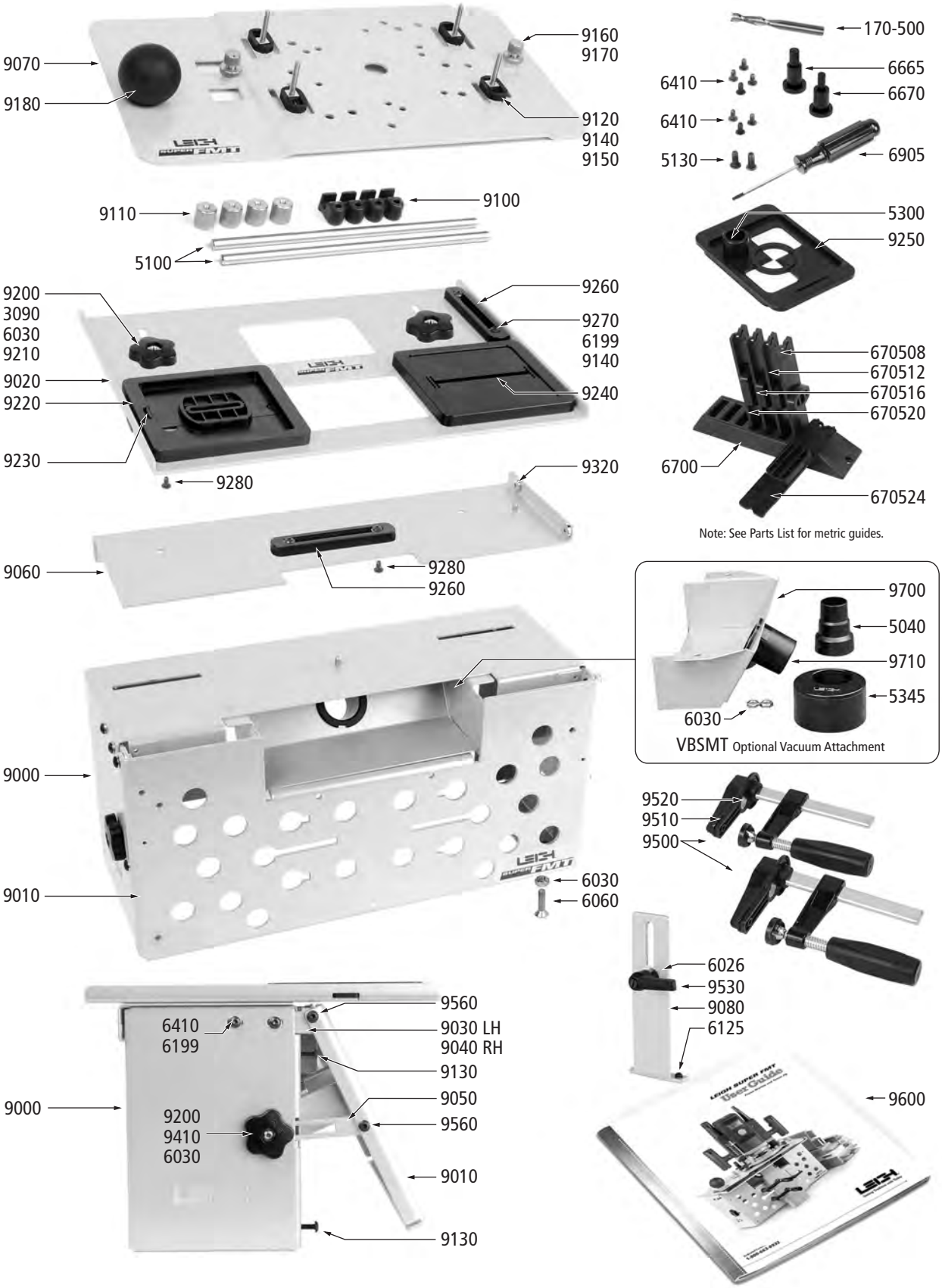
A2-9 Here's How *Note: Each division on the dial equals an adjustment of 0.010".* If the tenon piece is off **left of center** (A2-7①), loosen the sight locking screws and using the hex driver in the sight adjusting dial, move the sight **left, by half of the joint offset** ①. If the tenon piece is off **right of center** (A2-7②), using the hex driver in the sight adjusting dial, move the sight **right by half of the joint offset** ②. ■

SUPER FMT Appendix III

Super FMT Parts List

PART NO.	QUANTITY PER JIG	PART DESCRIPTION
		MAIN COMPONENTS
9000	1	Jig Frame
9010	1	Clamp Plate
9020	1	Table Plate
9030	1	LH Clamp Plate Pivot
9040	1	RH Clamp Plate Pivot
9050	2	Clamp Plate Struts
9060	1	Intermediate Plate
9070	1	Sub-base
		SUB-BASE COMPONENTS
5100	2	Router Hold-down Rods
9100	4	Router Rod Clamps
9110	4	Router Rod Clamp Knobs, Brass
9120	4	Router Rod Clamp Screws 10-24 x 1-3/4"
6410	4	Router Rod Clamp Screws 10-24 x 3/8"
9140	4	Sliding Washer/Limit Stop Nuts
9150	4	Router Clamp Sliding Washers
9160	2	Brass Guide Pins
9170	2	Brass Guide Pin Lock Nuts
9180	1	Sub-base Knob
		TABLE AND INTERMEDIATE PLATE COMPONENTS
3090	2	Carriage Bolts 1/4-20 x 3/4"
5300	1	Sight Magnet
6030	2	Table/Pivot Knob, Vac Box Nuts
6199	4	Limit Stop Washers
9140	4	Sliding Washer/Limit Stop Nuts
9200	2	Table/Pivot Lock Knobs
9210	2	Nylon Washers (not shown)
9220	1	Guide Base
9230	1	Guide Base Latch
9240	1	Guide Pin Track
9250	1	Sight
9260	2	Limit Stop Tracks
9270	4	Limit Stop Screws
9280	4	Limit Stop Track Hold-down Screws
9280	12	Guide Base, Guide Pin Track Hold-down Screws (n/s)
9300	1	UHMW Table Plate Strip 6-3/4" x 1/4" (not shown)
9310	2	UHMW Intermediate Plate Strips (not shown)
9320	2	Ring Magnets
		MAIN FRAME COMPONENTS
6030	2	Table/Pivot Knob, Vac Box Nuts
6199	4	Flat Washers
6410	4	Button Head Cap Screws 10-24 x 3/8"
9130	2	Clamp Plate Angle Adjustment Screws
9200	2	Table/Pivot Lock Knobs
9320	2	Ring Magnets (not shown)
9410	2	Carriage Bolts 1/4-20 x 1/2" (not shown)

PART NO.	QUANTITY PER JIG	PART DESCRIPTION
		CLAMP PLATE COMPONENTS
6026	1	Sidestop Fender Washer
6199	4	Flat Washers
9080	1	Sidestop Fence
9500	2	F-Clamps, complete with Magnets and Pads
9510	2	F-Clamp Back Pads (not shown)
9520	2	F-Clamp Back Pad Magnets (not shown)
9530	1	Sidestop Lever
6125	1	Sidestop Set Screw 1/4-28
9550	1	Sidestop Carriage Bolt 1/4-20 x 5/8" (not shown)
9560	4	Button Head Cap Screws 10-24 x 1/2"
		OTHER COMPONENTS
170-500	1	5/16" HSS Spiral Upcut Bit
5130	2	M6 Screws for Festool OF1400 and OF2200
6905	1	1/8" Hex Driver
6030	4	Jig Hold-down Nuts
6060	4	Jig Hold-down Screws
6410	3	Screws for Porter Cable Router 10-24 x 3/8"
6665	1	Imperial Router Centering Mandrel 1/4" x 1/2"
6670	1	Metric Router Centering Mandrel 8mm x 12mm
6700	1	Template Guide Stand
6705	1	5/16" Template Guide Set **(Inch Jig only)**
670508	1	5/16" x 1/2" Template Guide
670512	1	5/16" x 3/4" Template Guide
670516	1	5/16" x 1" Template Guide
670520	1	5/16" x 1-1/4" Template Guide
670524	1	5/16" x 1-1/2" Template Guide
6808	1	8mm Template Guide Set **(Metric Jig only)**
680815	1	8 mm x 15 mm Template Guide
680820	1	8 mm x 20 mm Template Guide
680825	1	8 mm x 25 mm Template Guide
680830	1	8 mm x 30 mm Template Guide
680835	1	8 mm x 35 mm Template Guide
680840	1	8 mm x 40 mm Template Guide
9600	1	User Guide
	1	Serial Number Decal (not shown)
		OPTIONAL COMPONENTS
VBSMT	1	Vacuum Box Attachment
5040	1	Small Hose Adaptor
5345	1	Large Hose Adaptor
6030	2	Table/Pivot Knob, Vac Box Nuts
9700	1	Vac Box
9710	1	Vac Box Nozzle


9070
9180
9160
9170
9120
9140
9150
9110
9100
5100
9200
3090
6030
9210
9020
9220
9230
9260
9270
6199
9140
9240
9280
9320
9060
9280
9260
9000
9010
6030
6060
9560
6410
6199
9030 LH
9040 RH
9130
9000
9200
9410
6030
9050
9560
9010
9130
170-500
6665
6410
6670
6410
5130
6905
5300
9250
670508
670512
670516
670520
6700
670524
Note: See Parts List for metric guides.
9700
5040
9710
5345
6030
VBSMT Optional Vacuum Attachment
9520
9510
9500
6026
9530
9080
6125
9600

Customer Support

Our Commitment to You

At Leigh Industries we take pride in our commitment to provide excellence in customer service and support. We hope your use of the Leigh Super FMT is enjoyable, rewarding and most of all, trouble free. This user guide should provide you with the answers to any questions you may have. If this is not the case, please feel free to contact our technical support staff or our distributor in your country by any of the means 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
Tel: (604) 464-2700
Fax: (604) 464-7404
*Email: leigh@leighjigs.com
Web: www.leighjigs.com

*Email can be useful, but technical queries usually raise queries from us. The telephone (if possible) is a much quicker and more convenient way to get those 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: +61 7 3390 5888
Fax: +61 7 3890 5280
Order: 1 800 658 111
Email: orders@carbatec.com.au
Web: www.carbatec.com.au

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/

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

Japan

Off Corporation Inc.
323-1 Shimizu-Yanbara Shimizu-Ku
Shizuoka-Shi, Shizuoka-Ken,
Japan 424-0002
Tel: 81-54-367-6511
Fax: 81-54-367-6515
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.woodworking-academy.com

Norway

Aurus
Stoelsmyrvn. 103
5542 Karmsund
Norway
Tel: +47 992 71 932
Fax: +47 529 10 011
Email: info@aurus.no
Web: www.aurus.no

Russia

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

South Africa

Hardware Centre Group
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
Facetten Faj 9
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 10a Weycroft Avenue
Axminster
Devon
EX13 5PH
England
Tel: 0300 100 1008
Fax: 0300 100 1009
Email: email@brimarc.com
Web: www.brimarc.com

Joining Tradition with Today

LEIGH INDUSTRIES LTD.
Manufacturers of Precision
Woodworking Tools
PO Box 357
(1615 Industrial Ave.)
Port Coquitlam, BC
Canada V3C 4K6

Printed in Canada