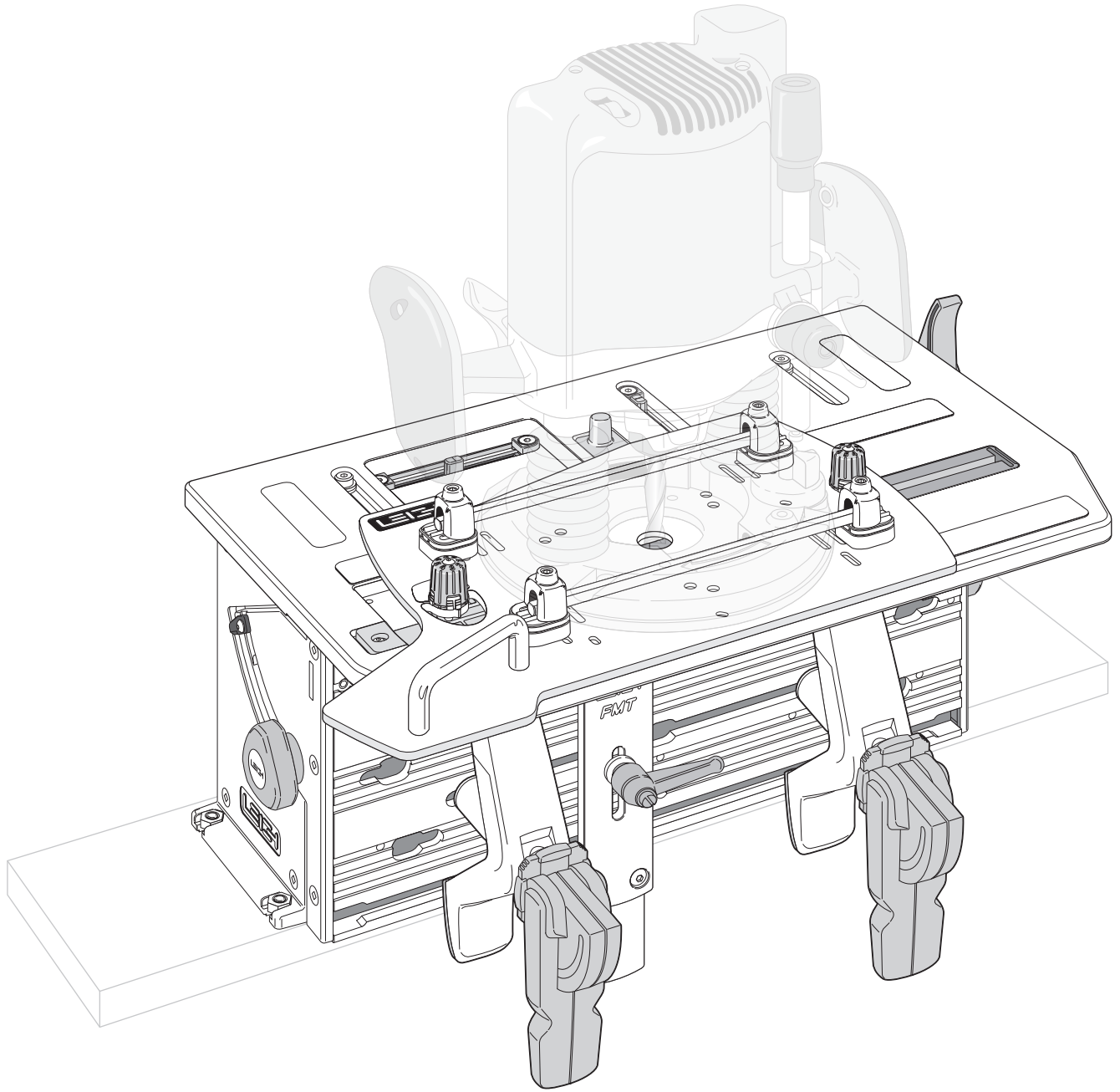


**LEIGH FMT PRO**  
*Frame Mortise & Tenon Jig*  
**User Guide**



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

**LEIGH**<sup>®</sup>  
Joining Tradition with Today

## Your New Leigh Frame Mortise & Tenon Jig (FMT Pro)

Congratulations for selecting the unique Leigh FMT Pro, the best mortising and tenoning jig available. The FMT Pro will allow you to rout a large range of sizes of mortise and 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 set-up directions, and thoroughly familiarize yourself with the basic functions and principles of operation. Use scrap wood before attempting any actual projects with valuable hardwood.

If you have any questions that are not answered in this manual, please call the Leigh Customer Support line\*.

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

\*See Appendix IV - Customer Support.

Important! Inches and Millimeters.

The Leigh FMT Pro is available in two models; Inch or Metric. The only difference is in 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"x2"[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.

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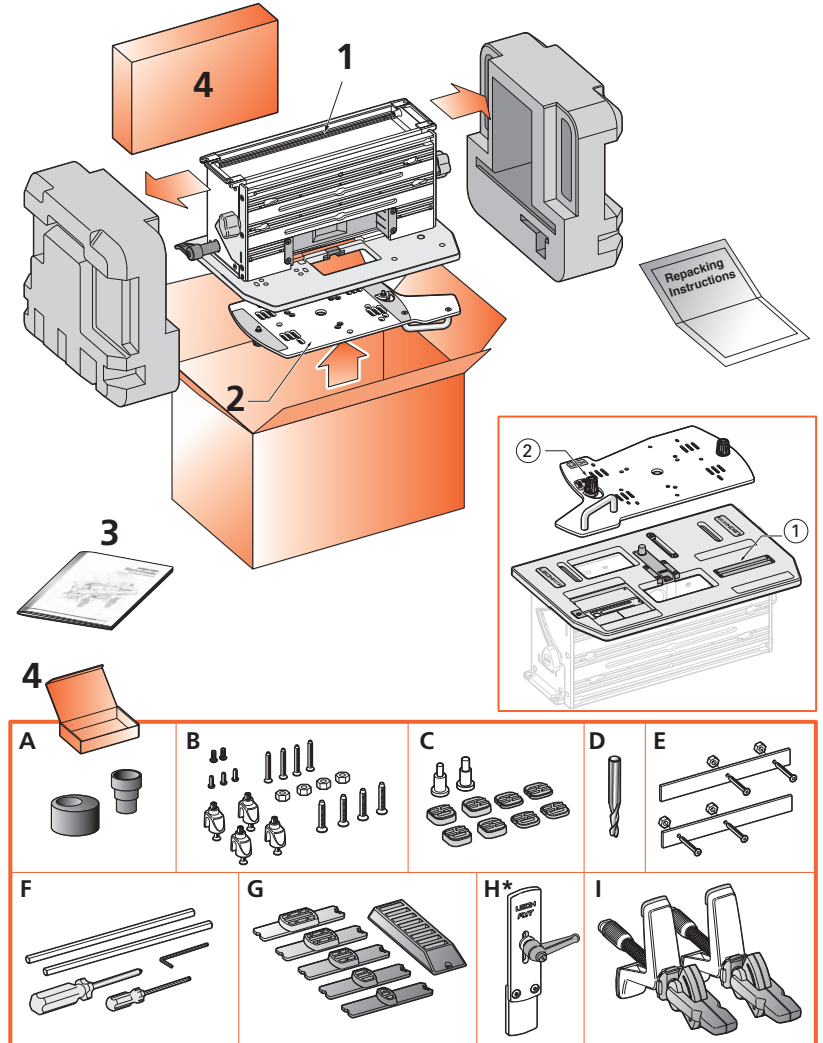


# Mounting the FMT Pro

## Jig Assembly and Mounting

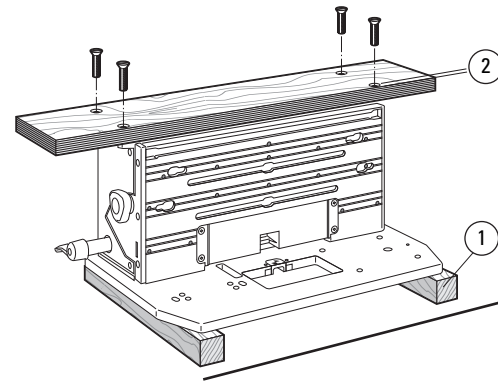
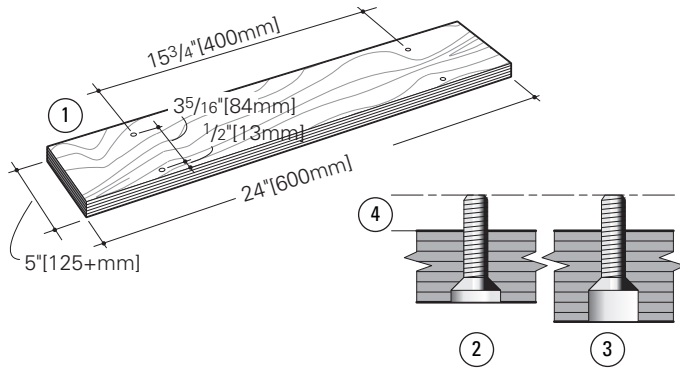
The Leigh FMT Pro comes almost fully assembled with all adjustments factory set, but... Before you start to set up your Leigh FMT Pro Jig, make sure you have received all the required parts.

- 1. The main **Jig Body**, complete with:
  - 1 Guide Track ①
- 2. **Router Sub-Plate** complete with:
  - 2 Guide Pins ②
- 3. 1 User Guide
- 4. 1 Box Containing:
  - A 2 Vacuum Hose Adaptors
  - B 4 Jig Hold-down Nuts and Bolts 1/4"-20
  - B 4 U-Posts with 4 set-screws and four 3/4" c/sink Screws
  - B 4 1" c/sink Screws
  - B 6 Hex Socket Button Head Screws 10x24 x 3/8"
  - B 2 Hex Socket Button Head Screws M6
  - C 4 High Shim Spacers
  - C 4 Low Shim Spacers
  - C 1 1/4" - 1/2" Centering Mandrel
  - C 1 8-12mm Centering Mandrel
  - D 1 5/16" HSS Spiral Upcut 1/2" shank
  - E 2 Outrigger Bars with 4 screws and nuts
  - F 1 Leigh Square Drive Screwdriver
  - F 1 Leigh 1/8" Hex Ball Screwdriver
  - F 1 5/64" Hex Key
  - F 2 Router Hold-down Rods
  - G 5 5/16" guides (or 6x8mm with FMT Pro-M) & 1 Guide stand
  - H\* 1 Sidestop Fence with lever\*
  - I 2 Clamp assemblies



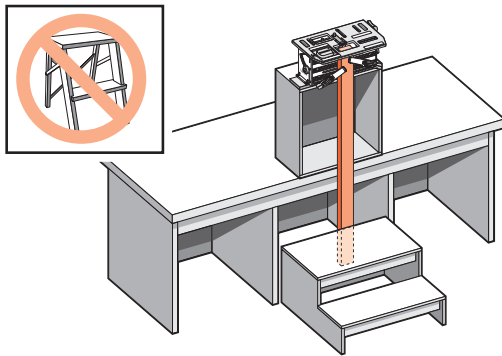
**\*IMPORTANT:** Some illustrations show the side stop fence with a “knob”. All FMT Pro jigs are shipped with a sidestop fence with a “lever”, (see H, above right).

**Note:** Any optional accessories that you ordered may also be inside the parts box, or packaged inside the main carton. *If any of these items are missing from your order, please notify your supplier or Leigh Industries immediately.*



**1-1 Mounting the FMT Pro:** Prepare a flat board at least  $\frac{3}{4}$ " [20mm] thick, a **minimum** of 24"x5" [600x125mm]. Drill four  $\frac{1}{32}$ " [7mm] holes on 15 $\frac{3}{4}$ "x3 $\frac{5}{16}$ " [400x84mm] centers,  $\frac{1}{2}$ " [13mm] in **from the front edge of the board** ①. Countersink ②, or counter-bore ③ if board is thicker, the underside so that the four  $\frac{1}{4}$ -20 x 1" long machine screws will project above the top surface by  $\frac{3}{8}$ " [9,5mm] ④.

**1-2** Turn the jig upside-down on two padded blocks ① (to protect the table and sight-knob). Using the four nuts and four countersunk machine screws, bolt the base board to the jig using the two nut recesses in each end housings. **The  $\frac{1}{2}$ " [13mm] front edge ② to the front of the jig (of course).** Now you can clamp your FMT Pro 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, these are unstable and unsafe.** ■

# FMT PRO CHAPTER 2

## Mounting the Router

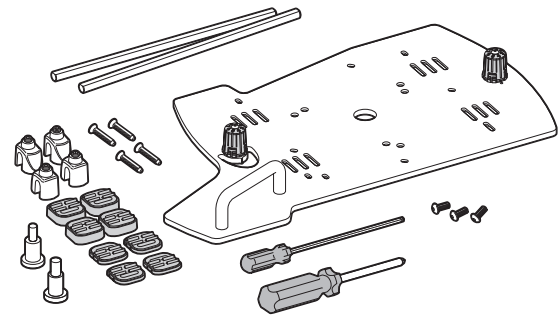
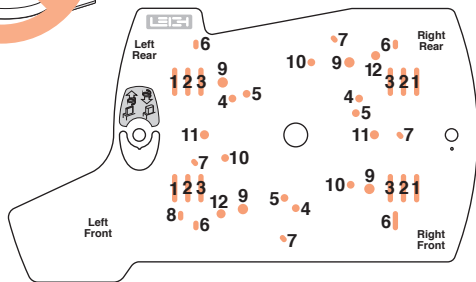
### Fence Rod Mounting Screw Mounting

**Foreword** The threaded sub-base mounting holes on many routers are not strong enough for the stresses produced when routing joints with the FMT Pro, so Leigh developed the Universal Fence Rod Mounting System. The Leigh FMT Pro Sub-Base provides great attachment strength and lateral anchoring. Depending on your router model, fitting the Sub-Base to your router may take up to an hour...**the first time only**. Once fitted, the router can be removed and re-attached in about a minute. Mounting the Sub-Base correctly is critical to the accuracy of the jig, so take your time and get it right the first time. Here's how...

#### Fence Rod Mounting

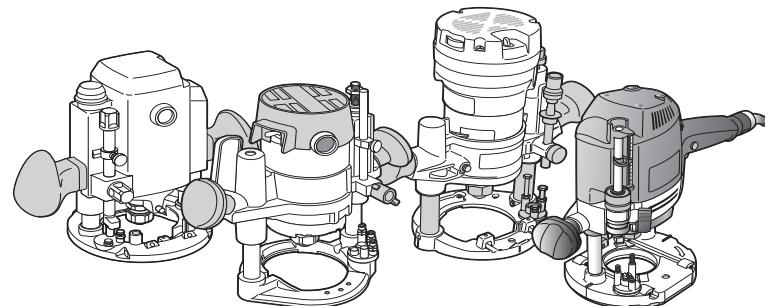


**⚠ The FMT Pro must only be used with a plunge router. Never, ever use a fixed base router!**



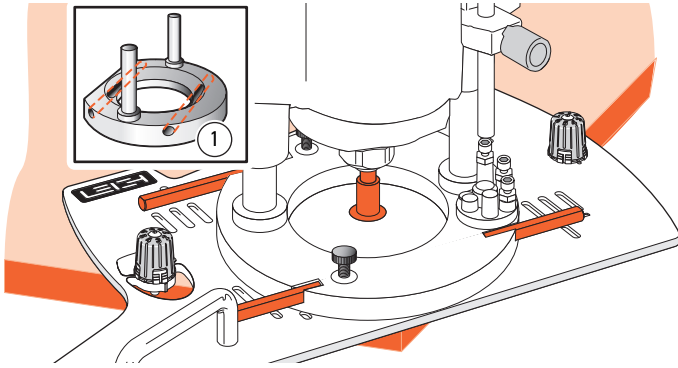
**2-1 The Leigh FMT Pro Sub-Base** Place your router, the FMT Pro Sub-Base and all the mounting parts on a clear bench. From the Sub-Base diagram and chart on this page, find the make and model of your router.

ROUTER MAKE	HOLES				NOTES
	LR	RR	LF	RF	
AEG OFS 50					2
BOSCH 1450, 1611EVS, 1613EVS, 1617EVS					2
BOSCH 1619 EVS	1	*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					Requires 1/16" packing shim. See 2-9
ELU 97	1	3	1	3	
ELU MOF 131					2
ELU MOF 177/02					2
ELU 3304					3
ELU 3338					2
FESTOOL 900E, 1010					7
FESTOOL OF1400					11
FESTOOL OF2000					2
FESTOOL OF2200					Use 2 #5130 screws provided. See 2-30
FLEX OFT2926VV					12
FREUD FT2000E					Use 2 #5130 screws provided. See 2-30
HITACHI M12V					5
HITACHI M12VC					Use 3 #6410 screws provided. See 2-30
HITACHI TR12	2	**8	2	2	**To avoid Turret
MAKITA 3600B					1
MAKITA 3612BR					3
MAKITA 3612C					**To avoid Turret
MAKITA RP 0910					3
MAKITA RP 1100 Series					4
METABO OFE728					Use 3 screws from router base. See 2-30
METABO OFE1028					3
METABO OFE1229					3
MILWAUKEE 5616					4
RIDGID					Use 3 screws from router base. See 2-30
RYOBI R-150					10
RYOBI RE180PL					3
RYOBI R-500					2
RYOBI R-E600					2
PORTER CABLE 693					4
PORTER CABLE 890, 893					Use 3 #6410 screws provided. See 2-30
PORTER CABLE 893 Type 2					10
PORTER CABLE 7529, 8529					4
PORTER CABLE 7539					5
TRITON, TRC001 3 1/4hp					*2
TRITON, MOF 001 2 1/4hp					Use 3 #6410 screws provided. See 2-30
					9
					*Reverse U-Post to put screws outside rods
					Use 4 No.6677 1/4-20 x 3/8" button head socket screws
					9

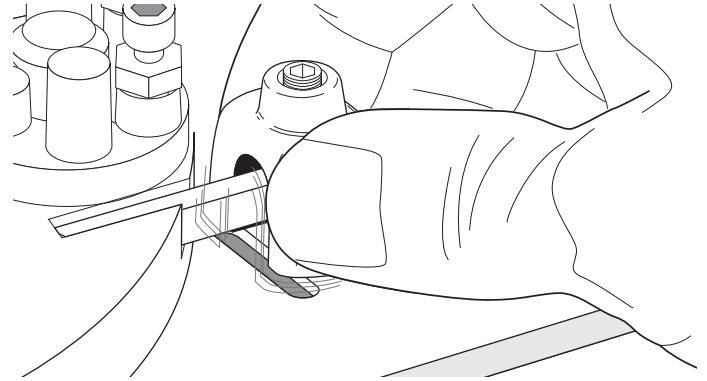


**2-2** Mark the appropriate mounting holes on the Sub-Base. Use a non permanent medium e.g. chalk, sticky tape (ink will permanently stain the anodized surface).

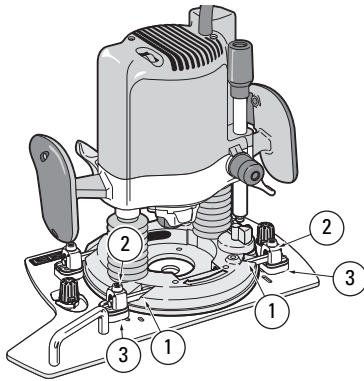
**Note:** If the chart at left indicates your router is a "Screw mount" (routers in shaded rows) go directly to 2-30. If your router is not listed here, proceed to 2-3. For the most up-to-date list of routers, go to [www.leighjigs.com](http://www.leighjigs.com).



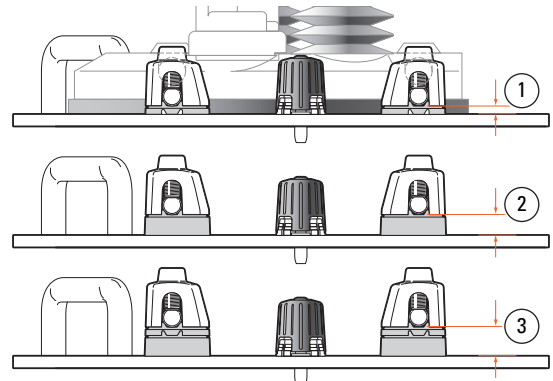
**2-3** If you have a plunge router that is not listed in the Sub-Base list, it is essential that your router have two parallel fence rod holes through the router base. These must be at least  $\frac{5}{16}$  [8mm] in diameter ①. Fit the correct shank sized centering mandrel to your router, place it 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.



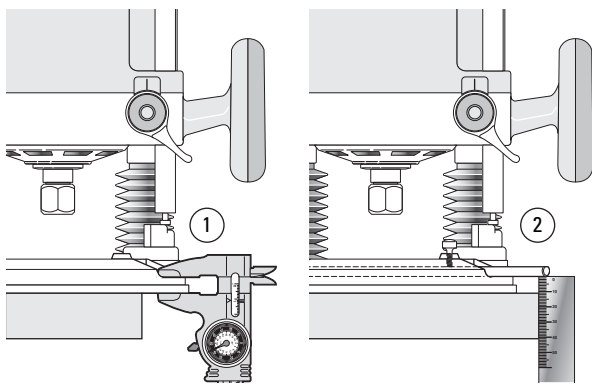
**2-4** Take the four U-Posts and by trial, establish which four Sub-Base slots or holes will serve to attach the U-Posts. Mark these with chalk or sticky tape and follow instructions 2-5 through 2-29.



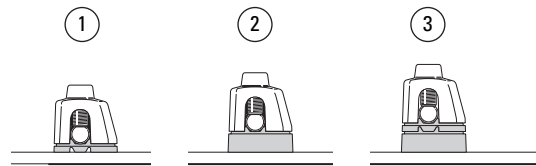
**2-5** Most plunge routers will be mounted to the Sub-Base like this, with rods through the fence rod holes ① and clamped down with the U-Posts ②, but it is essential that the correct shim spacers ③ are selected.



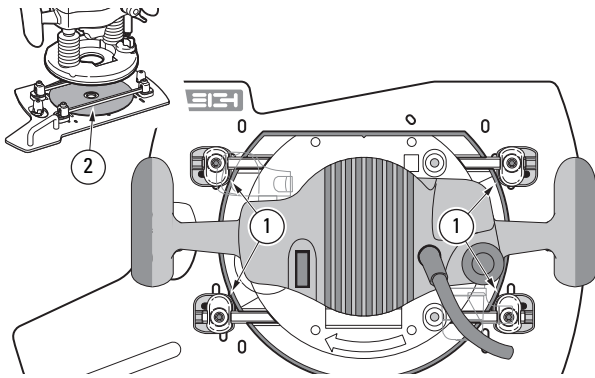
**2-6** Depending on the make and model of your router, the height between the underside of your router and the bottom of the rod hole ① will vary. This dimension will determine if you need to use low ① or high ② shim spacers, or possibly both together ③.



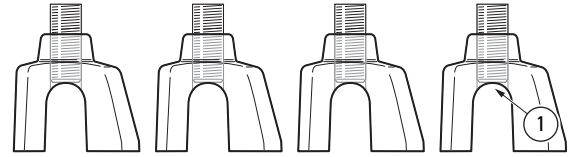
**2-7** To measure the “rod height”, place the router on a bench. Either use a calliper ①, or insert a rod (flat side up) and use a good rule to measure between the bench top and the bottom of the rod ②.



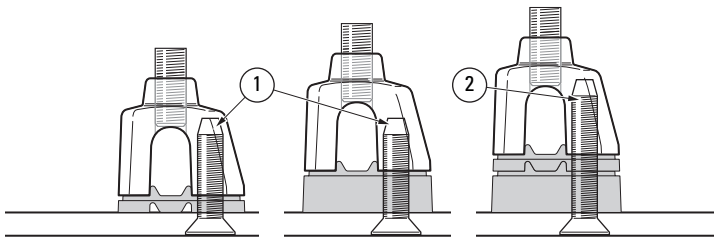
**2-8** If rod height is between  $\frac{3}{16}$  [4,5mm] and  $\frac{3}{8}$  [9,5mm], use low shim spacers ①. If rod height is between  $\frac{3}{8}$  [9,5mm] and  $\frac{17}{32}$  [13,5mm], use high shim spacers ②. If rod height is between  $\frac{17}{32}$  [13,5mm] and  $\frac{3}{4}$  [19,5mm], use both shim spacers ③, with the high one on the bottom. Note: If the rod height is less than  $\frac{3}{16}$  [4,5mm], see 2-9.



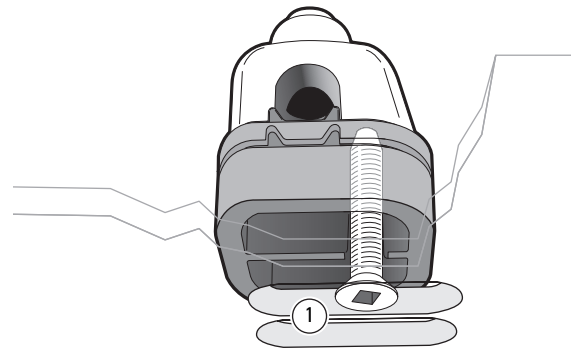
**2-9** Note: Use of the shim stops is essential, not only to provide the correct rod height but to also act as side-to-side stops for the router ①. If the rod height of your router is less than  $\frac{3}{16}$ " [4,5mm] you must provide a shop-made packing shim between the router and Sub-Base. We suggest one or more sheets of sandpaper ②, rough side up. Don't forget the center hole.



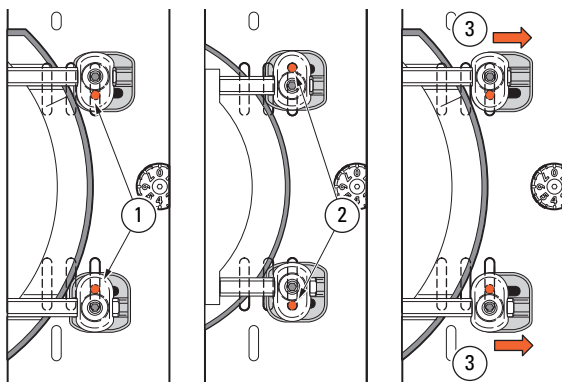
**2-10** Adjust the four U-Post set-screws with the set-screw end flush inside the arch of the posts ①.



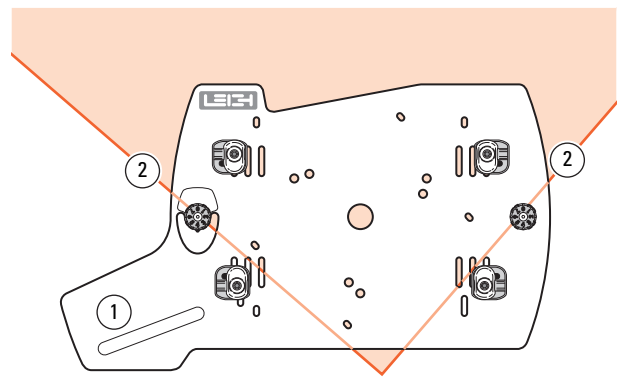
**2-11** There are two lengths of U-Post screws;  $\frac{3}{4}$ " [19mm] and 1" [25mm]. The  $\frac{3}{4}$ " [19mm] are factory fitted as a quality control measure. Use these for either the low or high shim spacers ①. Change them for the 1" [25mm] screws if both shim spacers are used ②.



**2-12** Using the four selected screws, lightly attach the four U-Posts and correct shim-stop combination through the previously marked slots or holes in the Sub-Base. The screws must enter from below ①. **Only very lightly tighten; you will need to move the U-Posts and the shim-stops during setup.**

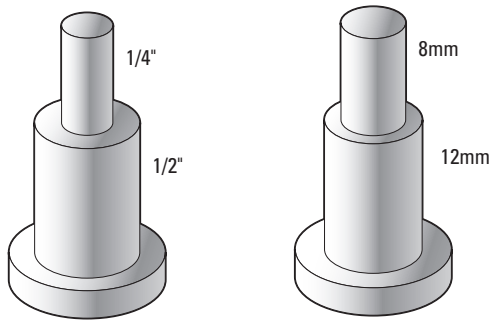


**2-13** In most cases, position the U-Post screw leg to the inside of the rod ① or depending on the size and shape of the router base, to the outside ②. Slide the shim-stops away from the router position ③. These will be repositioned against the router later.

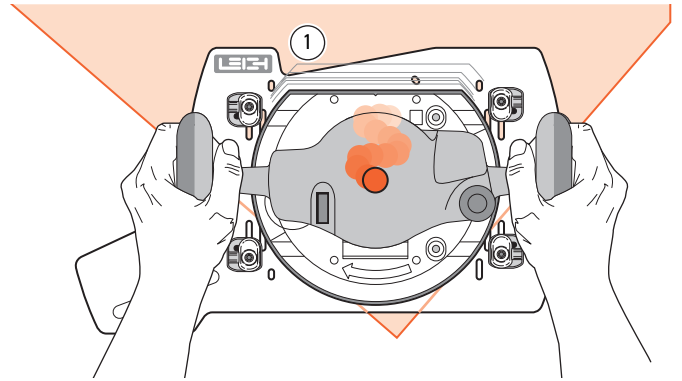


**2-14** Place the Sub-Base flat down on the corner of a smooth bench, **the handle to your near left** ① and the guide pins touching the adjacent edges of the bench ②.

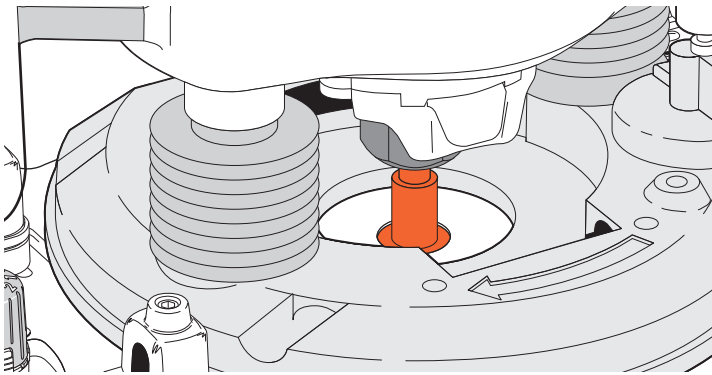




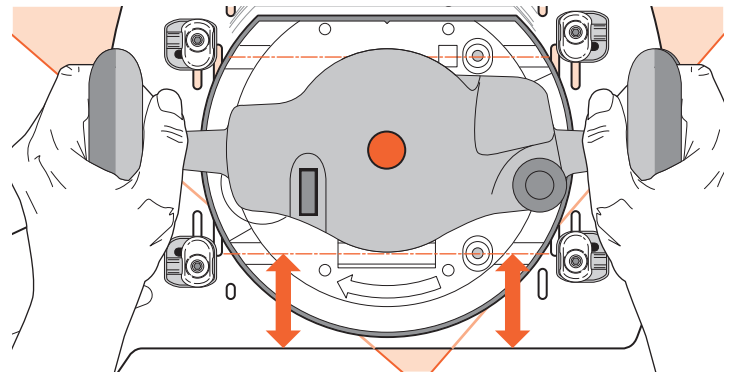
**2-15** Unplug the router. Note the collet size of the router. Choose the matching size centering mandrel and fit it into the router collet.



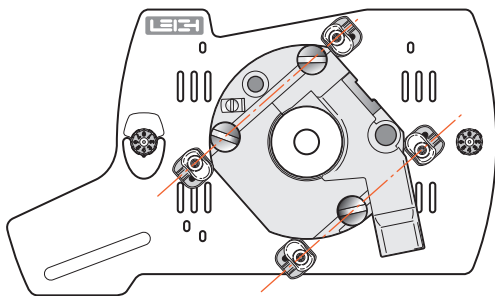
**2-16** Holding the router as you would in normal use, place it base down onto the Sub-Base; the rear of the router toward the rear of the Sub-Base and large notch ①. Plunge and move the router so that the large diameter of the centering mandrel fits through the Sub-Base center hole...



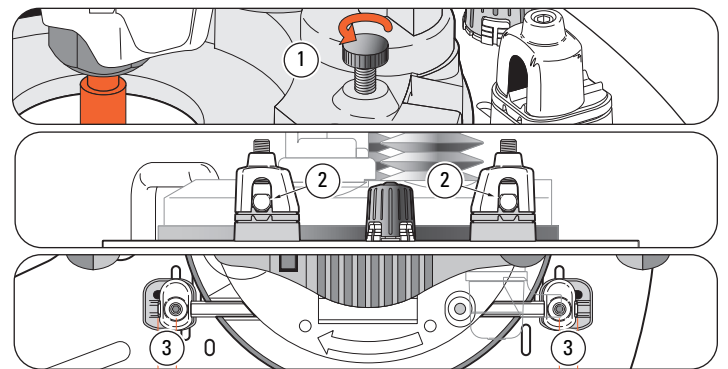
**2-17** ...and touches flush to the bench. Lock the plunge.   
 ⚠ Concentricity of bit to Sub-Base bit hole is essential to FMT Pro accuracy, so never mount the router without using the centering mandrel.



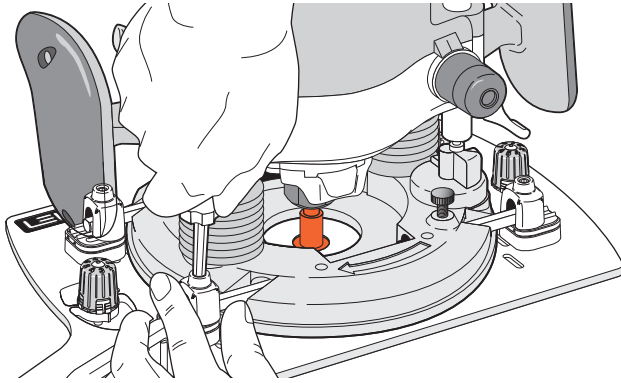
**2-18** Align the router so that the fence rod holes are parallel to the front edge of the Sub-Base (except Festool 900 and 1000 Series, see 2-19).



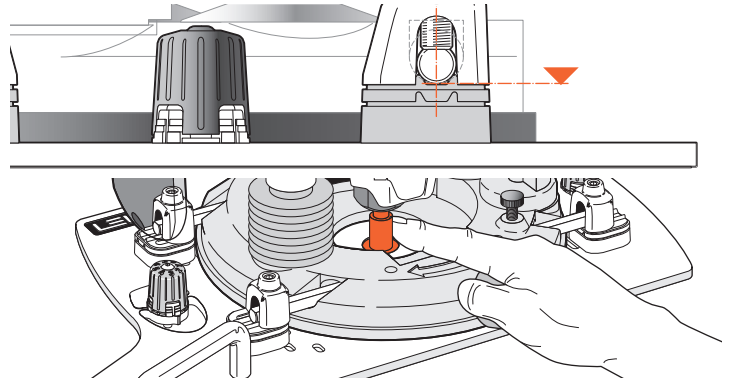
**2-19** Festool 900 and 1000 Series: Align the fence rod holes to the previously positioned U-Posts.



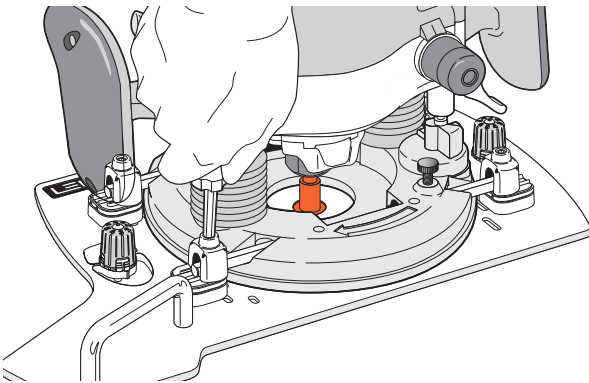
**2-20** Loosen and raise any router fence rod knobs ①. Move the U-Posts and adjust as necessary to slide the two hold-down rods through the U-Posts and router fence rod holes, flat side of rods on top ②. Leave an equal amount of rod projecting through each U-Post ③.   
 ⚠ Never use the router's fence rod knobs ① to "help" secure the router. This places uneven pressure and could damage the router base.



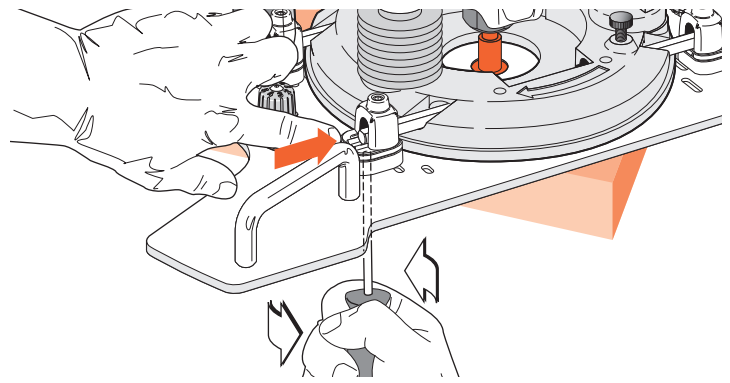
**2-21** Using the hex screwdriver, turn down the four U-Post set-screws **until there is only very slight and even pressure** on each end of both rods. Leave the shim stops in the outer position.



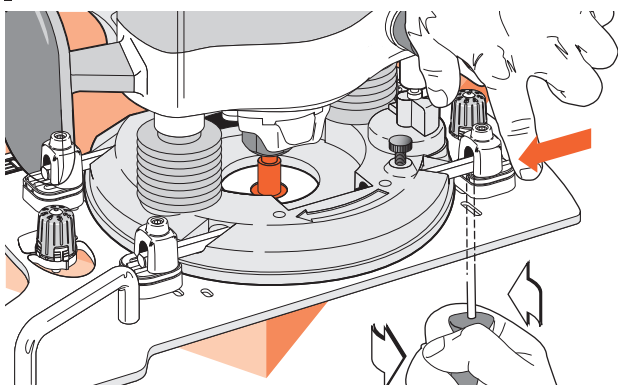
**2-22** Check that the rods are still centered in the rod holes ① and check that the router collet can rotate without excessive binding in the Sub-Base hole. Mandrel touching side of hole is OK; mandrel binding tight is not! Move the router if required to allow mandrel to rotate.



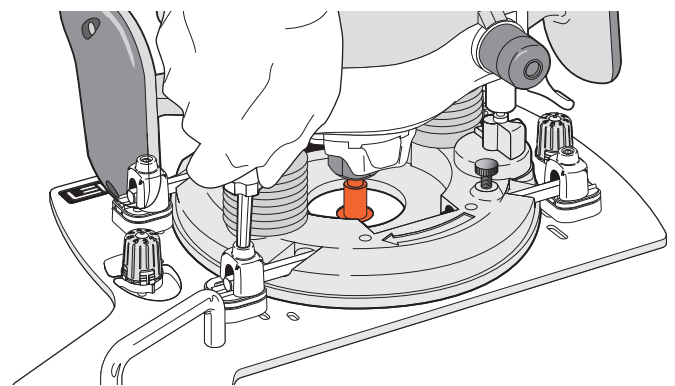
**2-23** Tighten the top U-Post set-screws a little more securely to hold the bars and router.



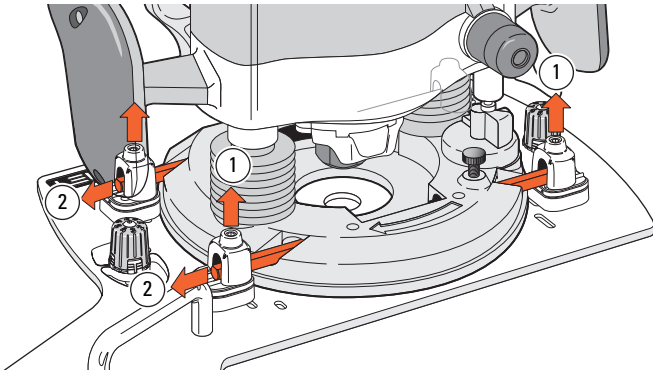
**2-24** Slide the router/Sub-Base assembly on the corner of the bench so that one U-Post bottom screw is overhanging the edge. **Loosen** this screw just slightly (if necessary) to take any pressure off the shim spacer above. Push the Shim spacer in to touch the router base and, holding it in position against the router base, **firmly tighten** this bottom screw.



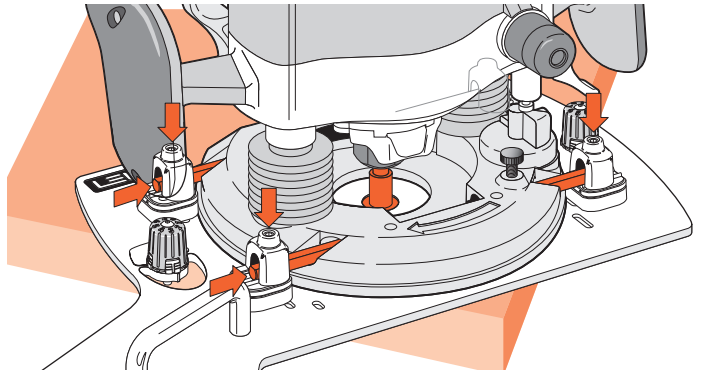
**2-25** Repeat this procedure at the other end of the same rod to position the shim stop against the router base. Re-check the collet/mandrel for relatively free rotation. Turn the router around on the corner of the bench and repeat this procedure on the two U-Post assemblies on the second rod.



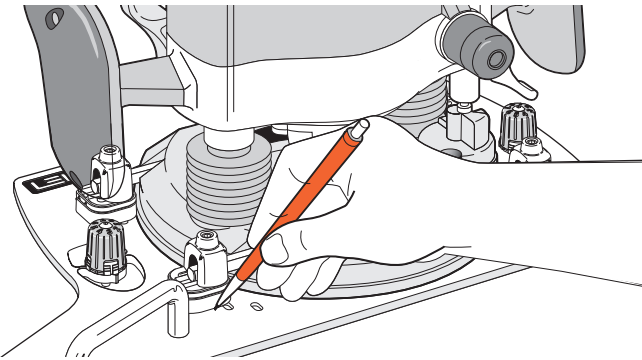
**2-26** Tighten the four U-Post set-screws to the rods. **The hex driver has high leverage so use common sense when tightening.** The rods will bow slightly. Objective: have the collet concentric to the bit hole; the four shim stops providing secure side thrust security, and the U-Posts clamping the rods which hold the router against the Leigh Sub-Base. Router /Sub-Base are now a unit. Release the plunge; remove and store the mandrel. You're set to go.



**2-27** Here's how to remove the router for use elsewhere: Loosen the four top U-Post set-screws ① Slide out the two rods ②. **Do not remove the U-Posts.** In about a minute, the router is free to be used for other tasks.

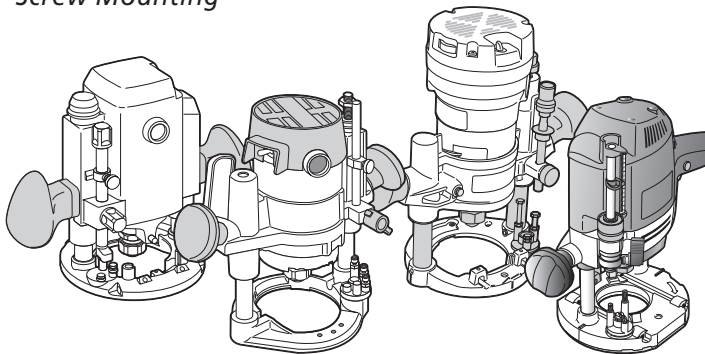


**2-28** To re-mount the router: place the Sub-Base over the corner of the bench. Make sure surfaces are clean. Place the router on the Sub-Base with the centering mandrel in the center hole. Insert the fence rods. Evenly tighten the four U-Post set-screws. Check that the mandrel rotates freely. In about two minutes the router/Sub-Base assembly is ready for making mortises and tenons.

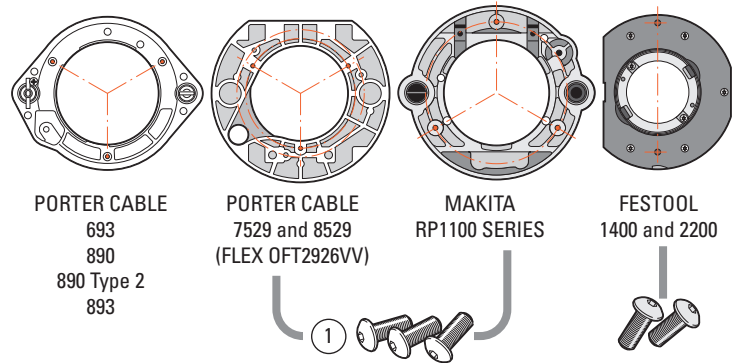


**2-29** Hint: If you plan to fit a different make/model router and later use the current one again, you can greatly speed up the re-installation of the first router by marking around the original four U-Post/shim-stop positions. ■

**Screw Mounting**

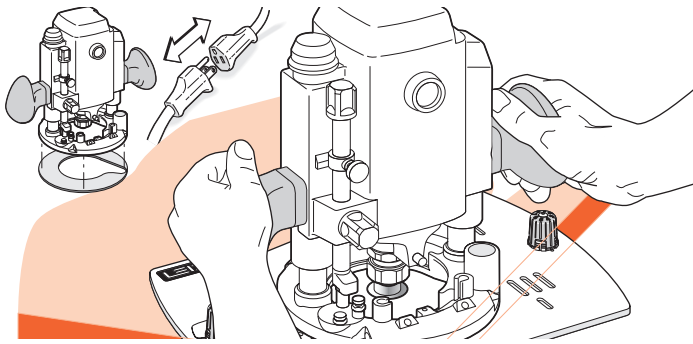


**2-30** These routers do not have suitable through fence rod holes: Porter Cable 693, 890, 890 Type 2, 893, 7529, 8529; Flex OFT 2926VV; Festool 1400, 2200; Makita RP0910, Makita RP1100 series; Triton TRC001, MOF001. We've provided Sub-Base holes and screws to mount these directly to the Sub-Base. Using Porter Cable 7529 and 8529 as examples, here's how.

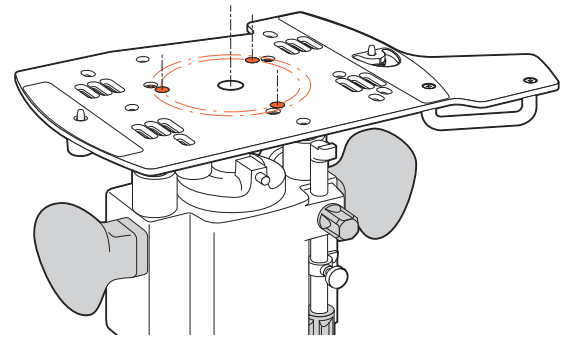


**2-31** Note: Porter Cable 7529 & 8529 (Flex OFT2926VV) have two sets of 3 threaded holes. Use the inner circle of FMT Pro Sub-Base holes. The outer circle holes align with threaded holes, but are not deep enough for the screws. For Porter Cable (Flex) 693 & Makita RP1100 series routers use the outer 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. See 2-32.

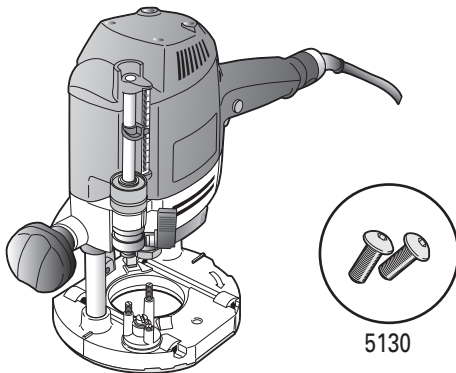




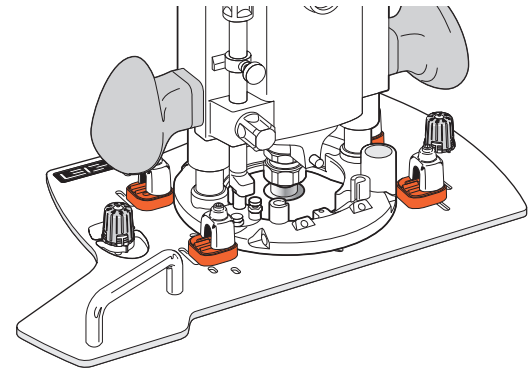
**2-32** Unplug the router. Remove the router's plastic Sub-Base (except Festool 1400) and template guidebush adaptor from 7529 or 8529. Remove the clear plastic dust cover from 8529 router base top (screw holes are used to attach Leigh FMT Pro Sub Base). Store removed parts for future use. Fit the correct shank sized centering mandrel to collet. With the Leigh Sub-Base on a flat bench corner, place router on top and plunge mandrel through to bench and **lock the plunge**.



**2-33** Remove the router and stand it upside down on the bench. Depending on the router design, you may need to support it in a soft-padded vise. Place the Sub-Base upside down onto the router's metal base with the mandrel centering the router to the base through the bit hole. Rotate the Sub-Base until the correct threaded screw holes in the router base align with the counter-bored holes in the Sub-Base.



**2-34** Festool 1400 series routers attach using the two No. 5130 screws provided, through base holes No. 11. Festool 2200 series routers attach using the two No. 5130 screws in the No. 12 holes.



**2-35** ⚠ In addition to the base screws it is vital to attach the four U-Posts and four of the shim stops (either size) and position and tighten these against the edge of the router base to prevent lateral router movement. For correct positioning, see 2-16 through 2-18, 2-24 and 2-25. Note: Porter Cable 7529 and 8529 handles will be slightly angled (not parallel) to the FMT Pro Sub-Base. ■

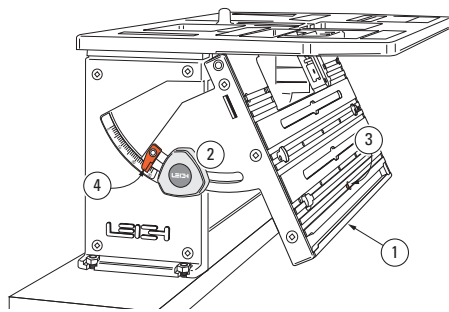


## FMT PRO CHAPTER 3

# The FMT Pro Jig

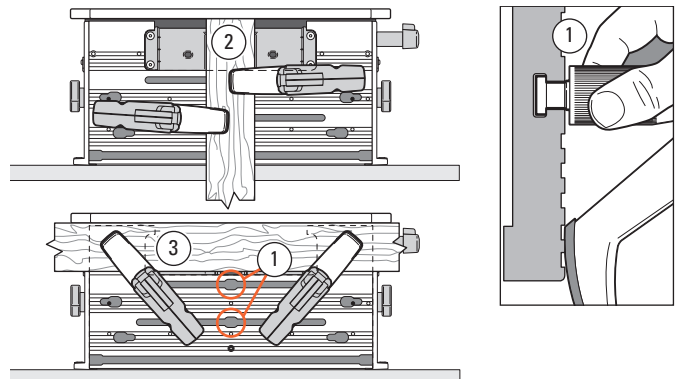
*The Clamp Plate and Clamping  
The Table  
Jig Operation Concept  
Safety and Router Operation  
Wood Preparation*

### The Clamp Plate and Clamping

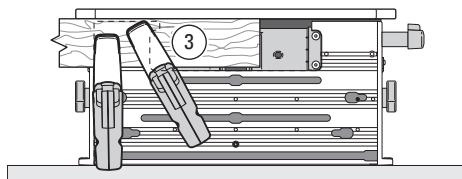


**3-1** The clamp plate ① is adjustable up to 30° from vertical and is held securely by two quadrant knobs ②. A set-screw ③ allows for positive return to 90°. To ensure flush and in-plane joints, it may be necessary to adjust the clamp-plate angle. See Appendix II, Jig Adjustments. An angle scale is provided, with an indicator adjustable to zero ④.

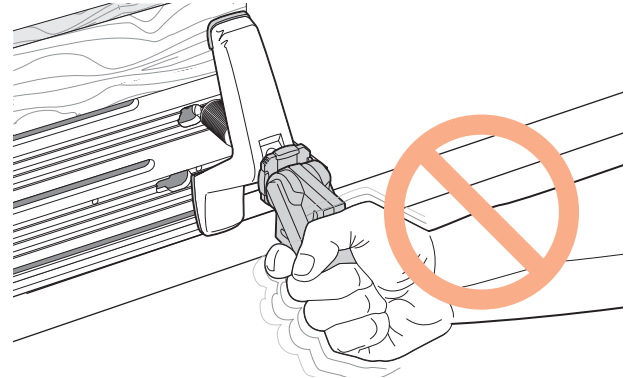
⚠ The clamp plate and cam-clamps are a self contained clamping area. Under no circumstances should any other jig component be used for clamping and no auxiliary clamping method used, other than as illustrated in this guide.



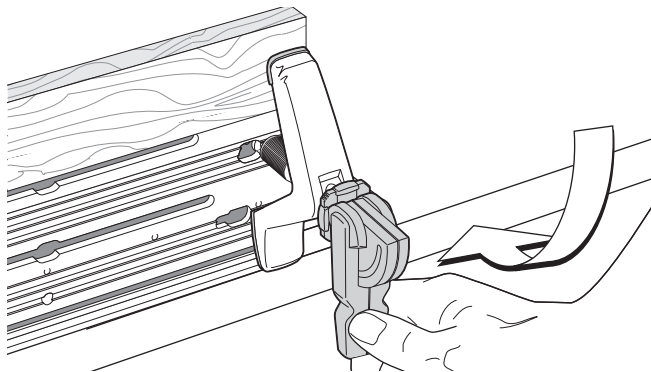
**3-2** The two clamps are powerful cam-action rocking-arm clamps with capacity from zero to 3" [76mm]. The T-bolt is inserted directly into the T-slot opening ①, moved to desired position and brass thumb nut lightly tightened. Normally tenon workpieces will be clamped vertically ②, and mortise workpieces horizontally like this ③, or...



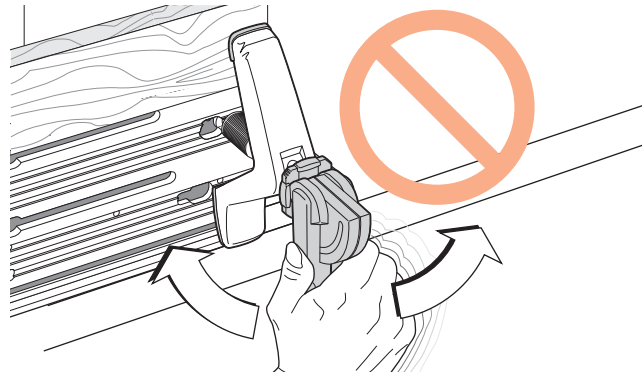
**3-3** ...like this ③. For clamping very small workpieces see Chapter 4, Small Joints.



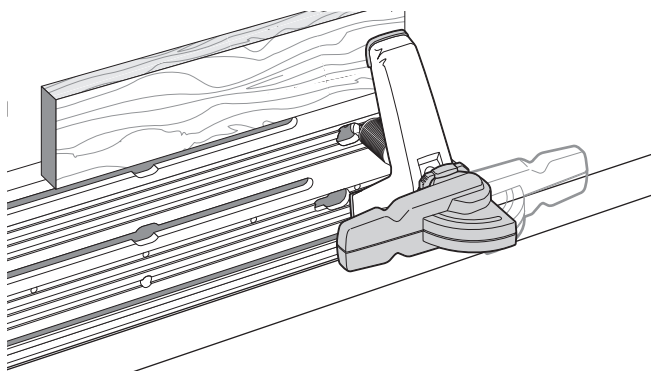
**3-4** Never force a cam-action clamp. It has great leverage, and using excessive force may damage the workpiece. The powerful clamp, combined with a non-slip clamping surface, requires only moderate clamping pressure to hold the workpiece securely in place.



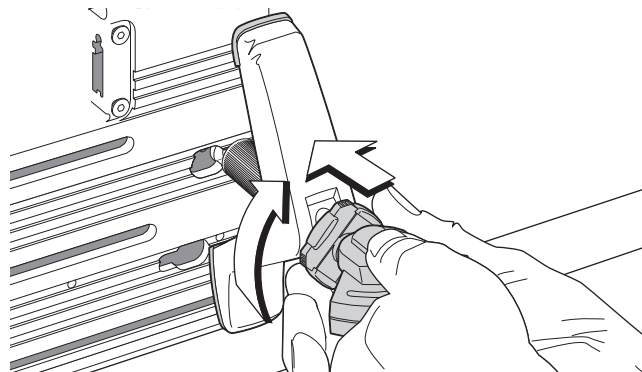
**3-5** A smooth, firm action is enough to engage the clamp. Rule of thumb: if you can't throw the lever comfortably by strong thumb pressure, reduce the tension. A few minutes of trial and error testing will soon give you the feel for the correct clamp tension.



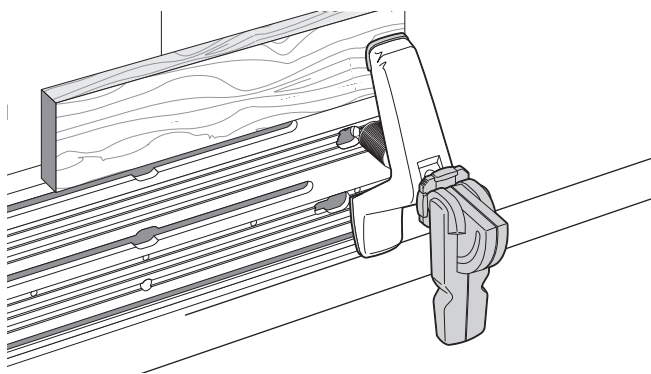
**3-6** Do not use the lever as a torque arm! Adjust the clamp pressure only with the clamp disengaged.



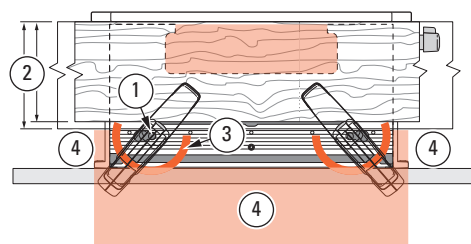
**3-7** The clamping pressure is the same whichever of the two directions the lever is thrown. But if the lever is uncomfortably positioned at the correct clamping pressure...



**3-8** ...release the clamp, remove the workpiece and turn the step-washer a quarter turn. The step height in the step-washer is one quarter of the thread pitch.

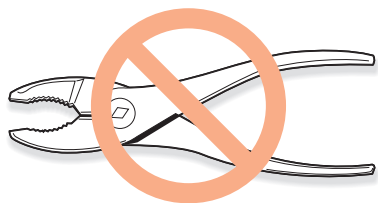


**3-9** Then adjust the clamp until the lever is in the correct position at the required pressure.

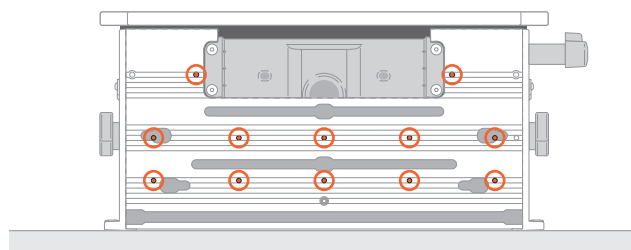


**3-10** The clamp T-Bolt Slots and “keyholes” allow for full clamping coverage. The two lower keyholes ① are for the rare requirement to clamp mortise boards between 4¾" [120mm] and 5½" [140mm] wide ②. Always clamp with the heel and toe of the clamp over the surface area of the clamp plate ③.

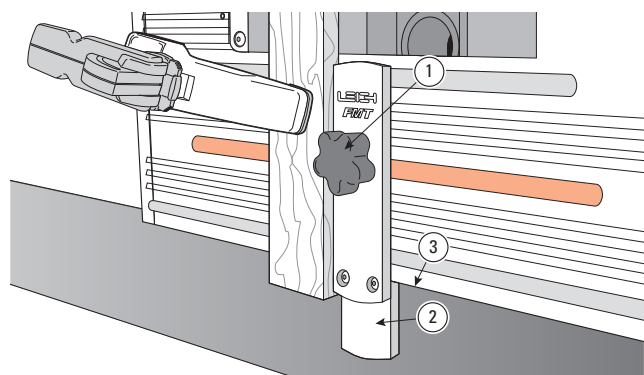
⚠ Never allow the clamp arm heel pad in these red shaded areas ④, even if (particularly if) the mounting board or bench is there.



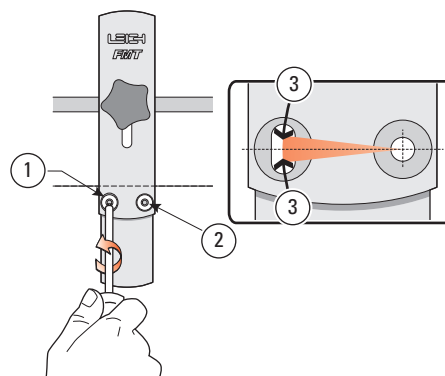
**3-11** The clamp T-bolts nuts need only be lightly finger tightened to prevent accidental clamp movement. The nuts are knurled to provide a good finger grip. **Never use a tool to tighten these nuts!**



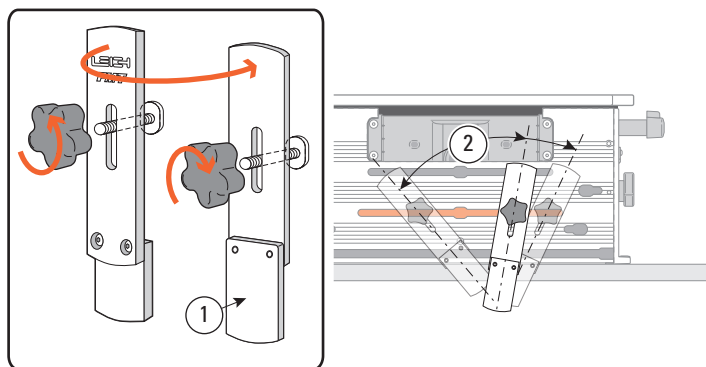
**3-12** The clamp plate is provided with twelve through-holes. If for any reason a facing board is required to be attached to the clamp plate, No.8 or M4 wood screws (not supplied) may be used from the rear. See chapter 4, Small Joints.



**3-13** The FMT Pro's sidestop fence is attached in all modes by a single knob and T-bolt inserted to the **center clamp plate slot** ①. Most tenon pieces are routed vertically, and for that purpose the short part of the fence ② acts as a T-square against the edge of the clamp plate ③. In this mode the Leigh logo faces toward you.

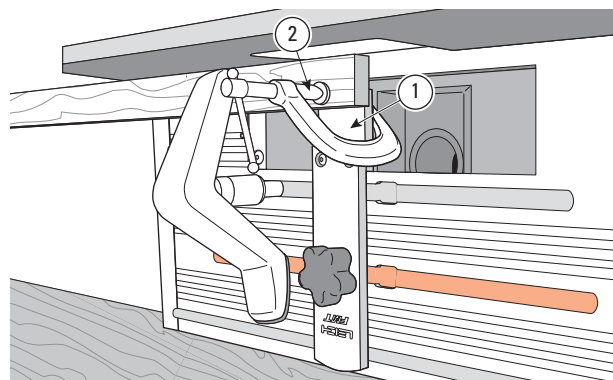


**3-14** The sidestop fence is squared at the factory, but check your first test joints. If your router/bit is not perfectly perpendicular to the table adjust the sidestop fence: slightly loosen the 'pivot' screw ① and the 'lock' screw ②. Adjust the angle ③ to match the bit and retighten. Rout test joints to confirm correct setting. Once locked in this position it should never need adjusting when used with that same router.

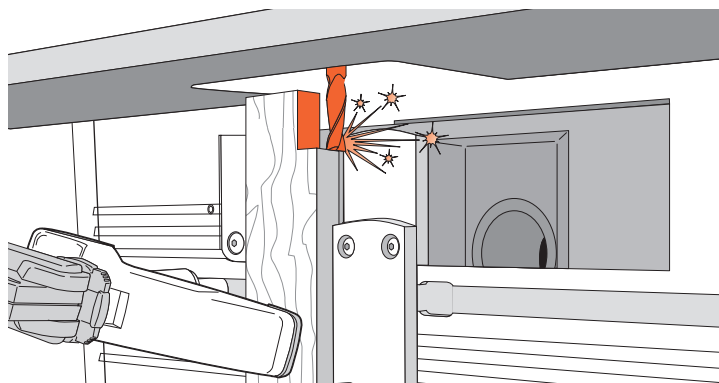


**3-15 Angled Joints:** Remove the knob and T-bolt. Reverse the fence so the short end faces toward you ①. The fence may now be set at any angle along the center clamp plate slot ② by tightening the knob.

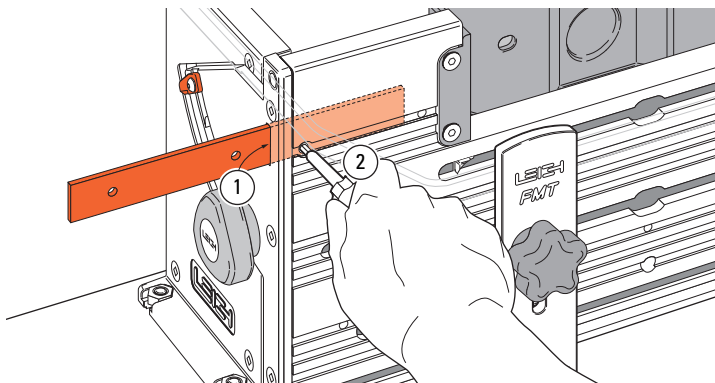
**⚠ NOTE:** *Never rout tenons with the short part of the fence to the top, in the bit opening.*



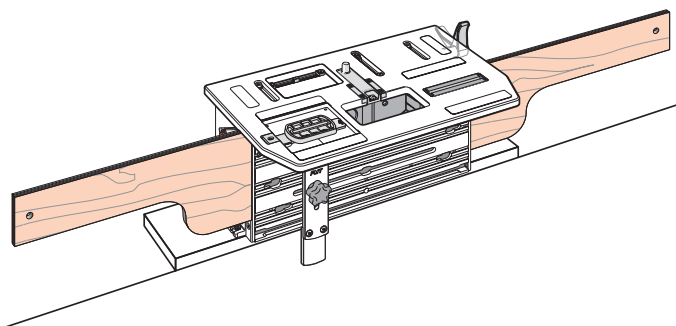
**3-16 'Mortise steady':** When routing mortises in small stock the piece may 'flutter' causing poor joint fit. Invert the fence with the short end up in the bit opening ①. Clamp the mortise piece against the face of the short fence ② which is perfectly flush with the clamp plate face ①. When routing mortises at the end of a board, always move the table as far as possible left or right to minimize the length of unsupported workpiece.



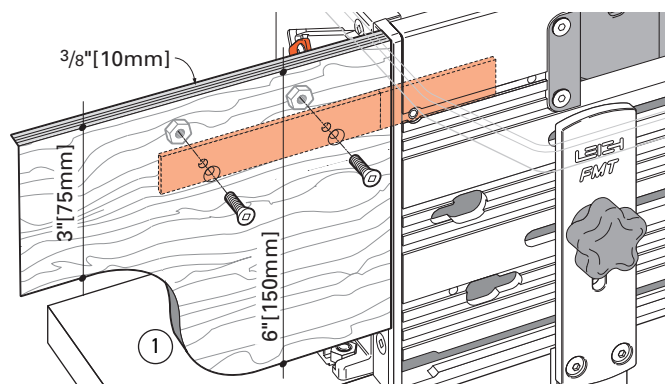
**3-17** ⚠ **WARNING:** Never rout tenons with the sidestop fence in the inverted position (with the short end up in the bit opening). The inverted fence mode is only used to support small mortise stock.



**3-18** The jig clamp plate has an opening on each outer edge in which to fit the included “outrigger bars” ①. The bars are retained by set-screws ② tightened with the hex driver.

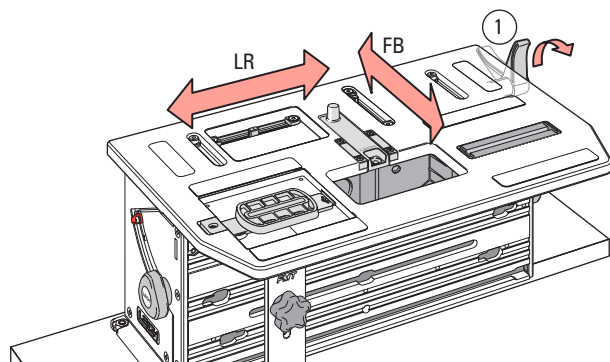


**3-19** The outrigger bars allow for attachment of shop-made outrigger beams on which to mount sidestops or add pencil marks. This makes for efficient routing of multiple mortises. See Chapter 4, Production Procedures.

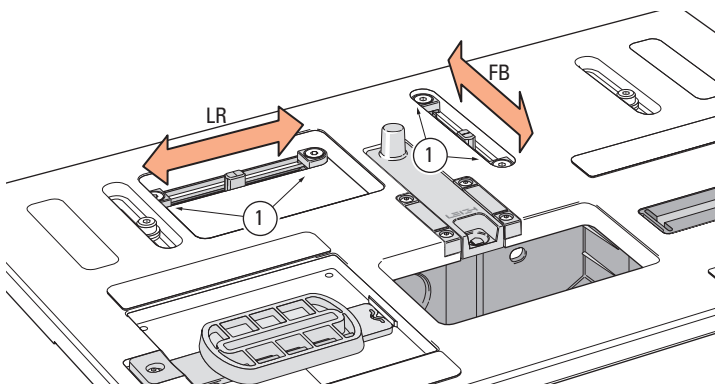


**3-20** The outrigger beams should be  $\frac{3}{8}$ " [10mm] plywood, shaped as suggested to minimize weight. Drill as shown and attach with the small nuts and bolts provided. The top edge should just clear the underside of the locked table. Store the outriggers on a wall hanger when not in use. The deep shoulder ① provides cantilever support against the end of the clamp plate assembly. ■

### The Table



**3-21** The table is clamped in any desired position by the Table Clamp ①. Turning the clamp lever up 90° releases the table, which can then be moved in any direction to any position within its range. Clamp tension is factory preset. See Appendix II, Jig Adjustments.

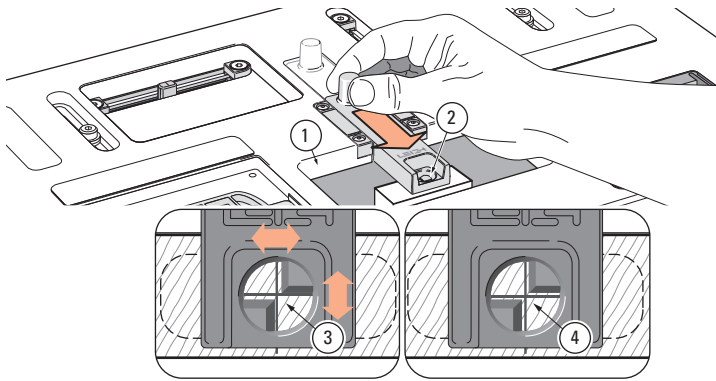


**3-22** Adjustable Limit Stops ① are used to limit or prevent table movement left to right (X-axis) and front to back (Y-axis), and to precisely align double and quadruple mortises and tenons (see Chapter 4). Use Limit stops when you see these icons:

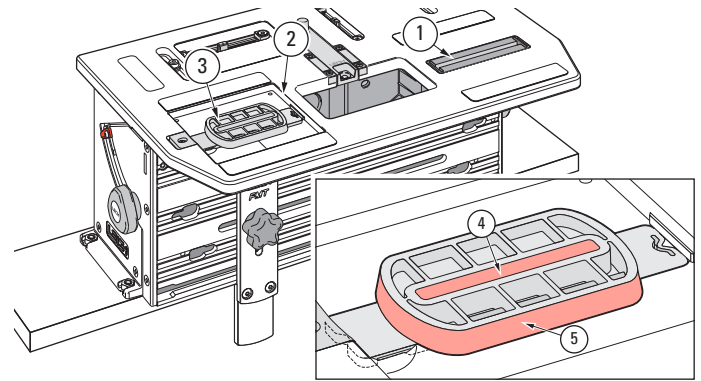
◀▶ **LR** for left-to-right table movement

⏪⏩ **FB** for front-to-back table movement.

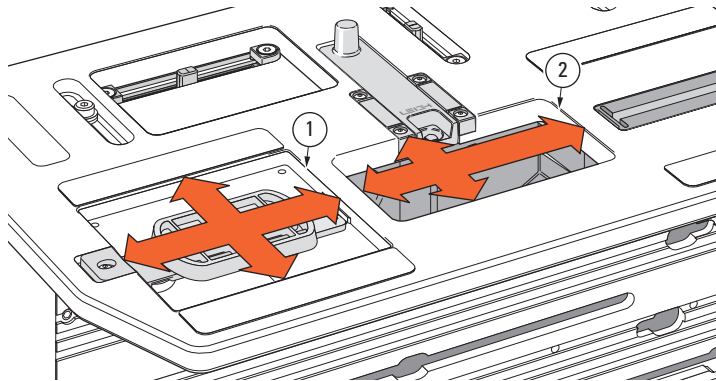




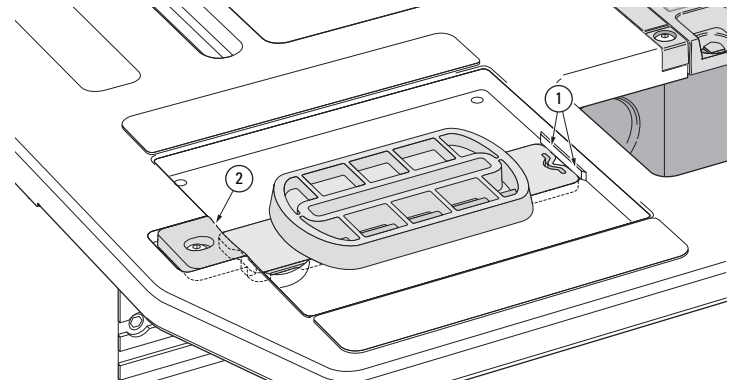
**3-23** The table has a bit opening ① and Joint Aligning Sight ②. Pulling the sight fully forward to its detent provides precise table positioning over joint cross-marks ③. Because the human eye excels at comparisons, we can perceive differences as small as .004 in the space between the edges of the line and the triangles ③. That's .002 off center! You can readily center the sight using slight table movements until the spaces appear the same ④.



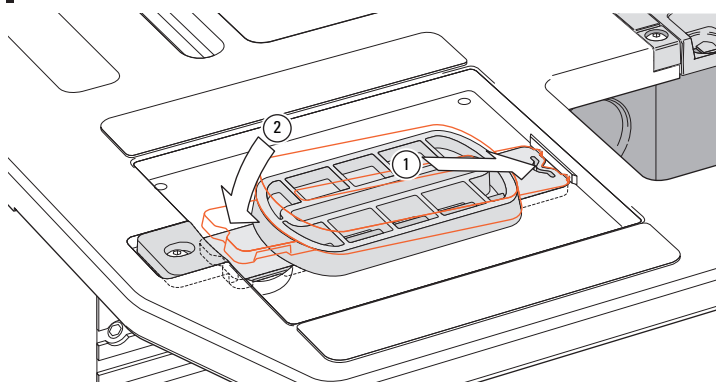
**3-24** To the right front is the right-hand "Pin Track" ①. The right-hand router sub-base Guide Pin runs in this track in **all** routing operations. To the left front is the Guide Recess ②, in which all Joint Guides ③ are placed. The left hand router sub-base Guide Pin runs in the guide slot ④ for cutting mortises or around the outside of the Guides ⑤, for cutting tenons.



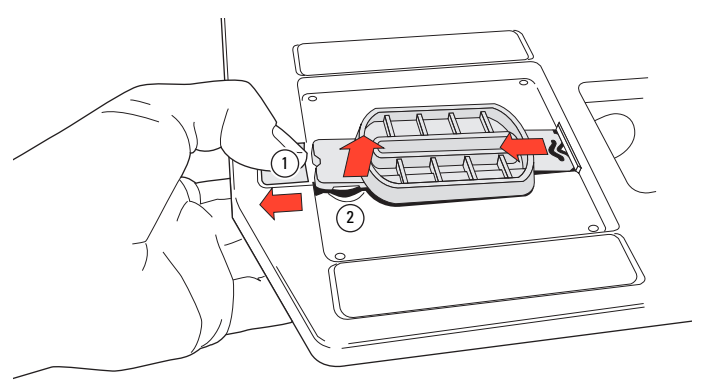
**3-25** The Guide Pin cannot move horizontally outside the recess ①, and prevents the bit from touching the sides of the bit opening ②.



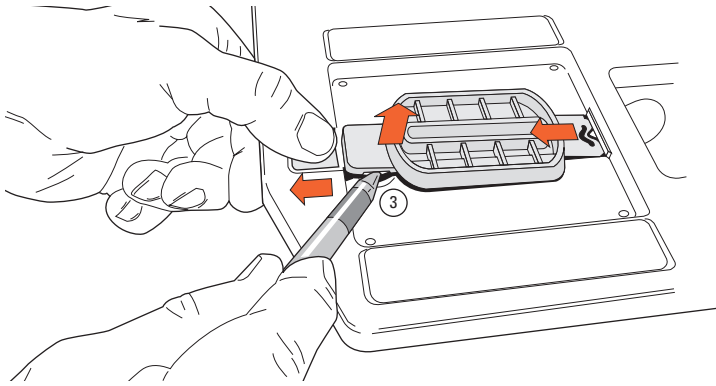
**3-26** Two small projections on the Guide fit into undercuts on the right side of the guide recess ①. The left end of the Guide is pushed down and retained by the spring-loaded Guide Latch ②. **⚠ Note: the guide end shapes are not identical. Guides can only be installed one way as shown here.**



**3-27** Snap the Guides in like this. Use firm pressure just next to the guide latch. Note: The guides are injection molded acetal 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.

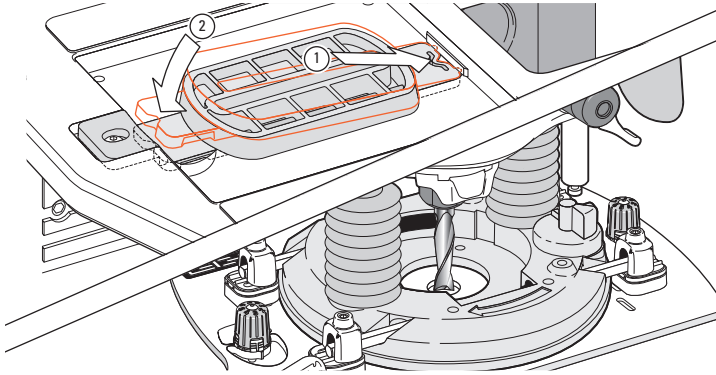


**3-28** To remove a Guide, pull back the latch ① and push through the finger-hole from below with your fingertip ②.

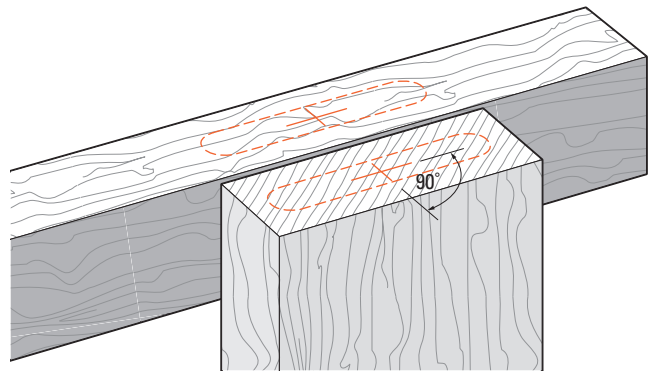


**3-29** If the finger-hole is not accessible from below, use your fingernail or a small **non-metallic** pry to lift the Guide up ③. ■

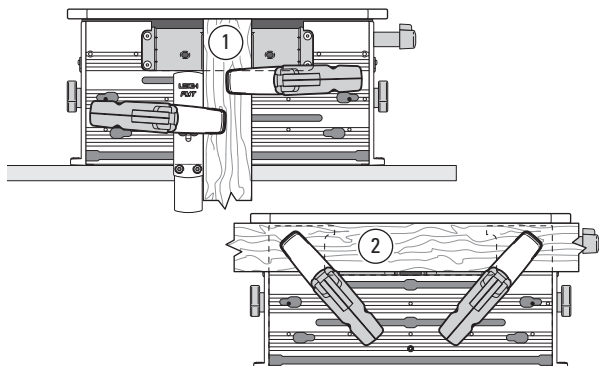
### Jig Operation Concept



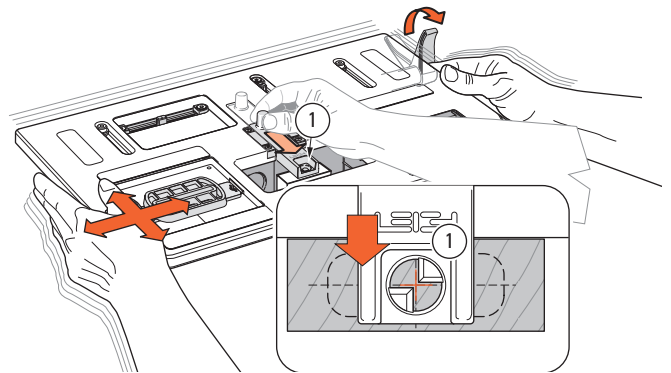
**3-30** The selected guide is placed into the guide recess and the matching bit fitted to the router.



**3-31** The centers of a mortise and tenon are marked with a cross.

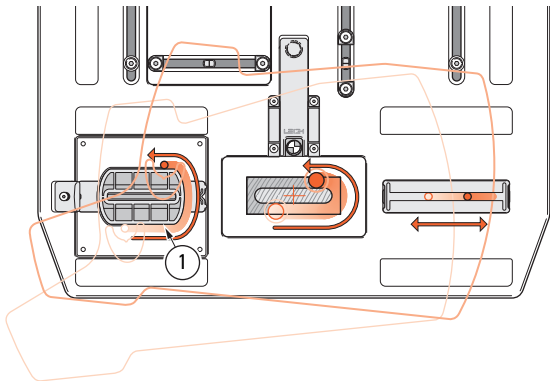


**3-32** Tenon workpieces are usually clamped vertically ①. Mortise workpieces are always clamped horizontally ②.

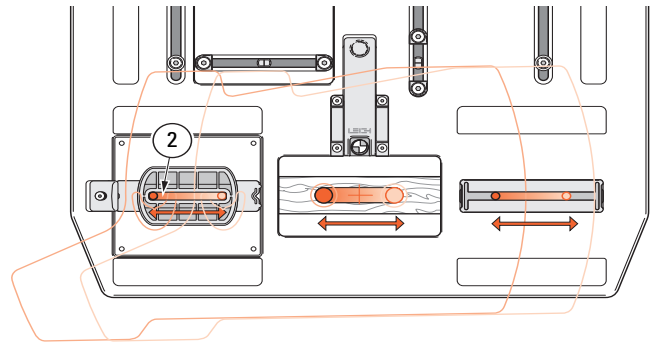


**3-33** The jig table is centered over the marked workpiece with the extended sight ①.





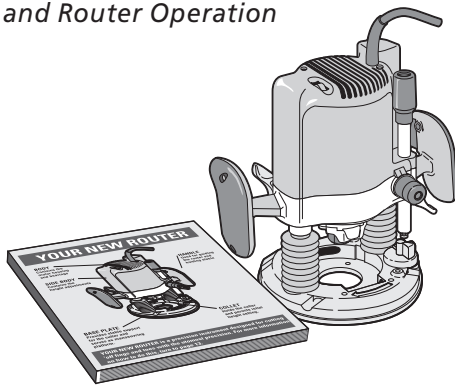
**3-34** Tenons are routed with the guide pin running around the outside (tenon) part of the guide ①. See Chapter 4 for routing techniques.



**3-35** Mortises are routed with the guide pin running in the inside mortise part 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 require to be cross marked and sighted. Please read all of the procedural chapters to gain the utmost efficiency from your FMT Pro. ■

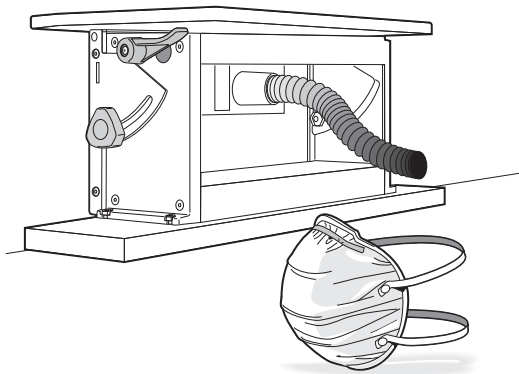
### Safety and Router Operation



**3-36** Read the owner's manual that came with your router. It is essential to understand the router manufacturer's instructions completely.



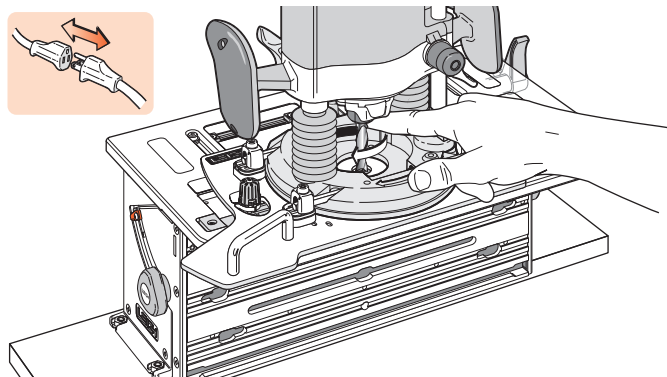
**3-37** Always wear approved safety glasses. Always wear hearing protection.



**3-38** Protect yourself from harmful dust by wearing a face mask. Connect your shop vacuum or dust collection system to the FMT Pro whenever possible.

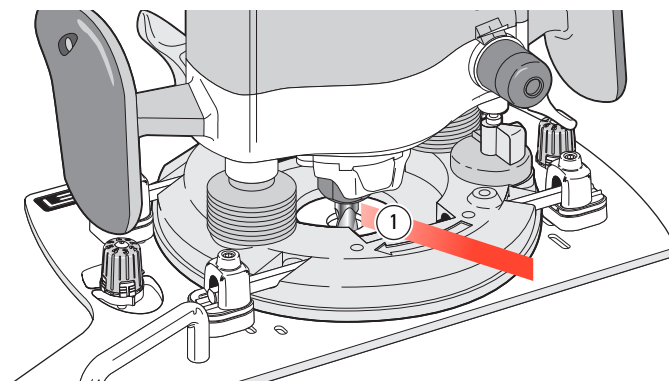


**3-39** ⚠️ Never drink alcohol or take medications that may cause drowsiness when you will be operating a router.

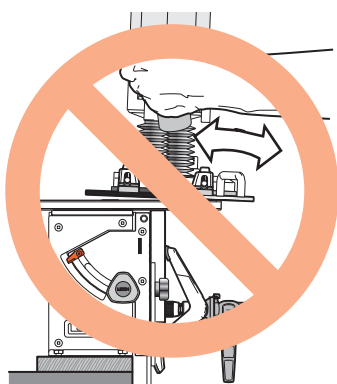


**3-40** Always disconnect the power source from the router when fitting bits, or making adjustments.

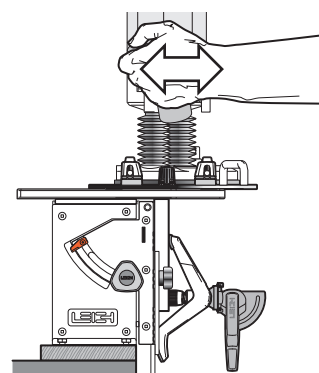
Before connecting the router to the power source, make sure the bit revolves freely through the Sub-Base bit hole, and table and clamp plate bit openings in all extreme guide pin positions and preset bit depths.



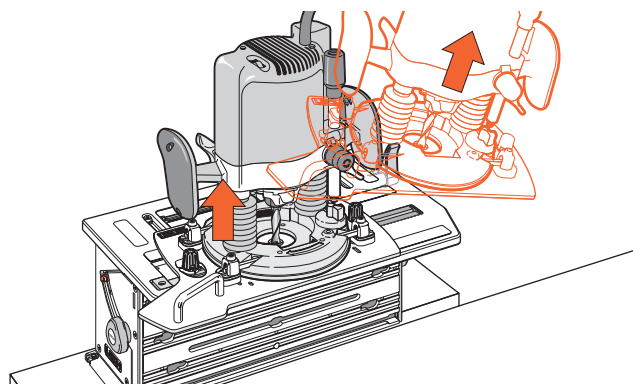
**3-41** Make sure the router collet does not contact the FMT Pro Sub-Base at full plunge cuts. Set the router plunge stop rod as necessary to prevent this ①.



**3-42** Do not tilt the router on the jig.



**3-43** Keep the router flat on the jig assembly.



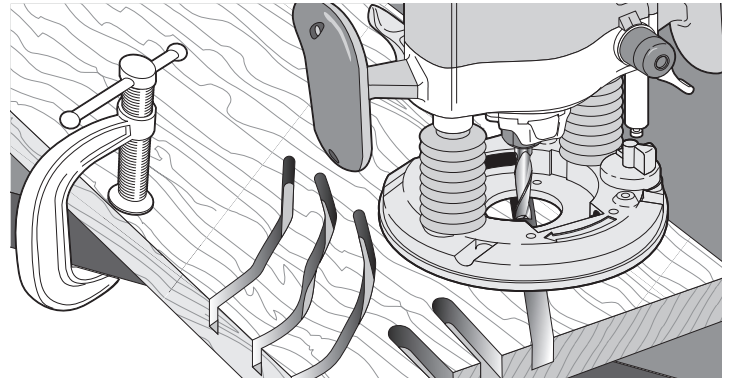
**3-44** Always raise the plunge router mechanism before removing the router assembly from the jig.



**3-45** Never, never, use a non-plunge fixed base router on the FMT Pro.

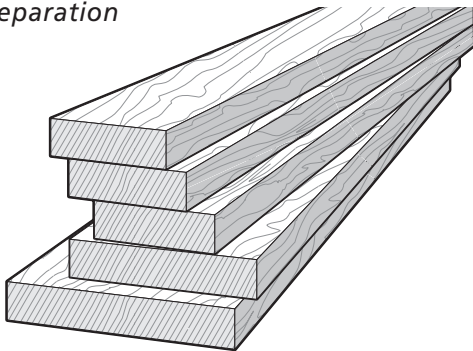


**3-46** Do not rout at face level.



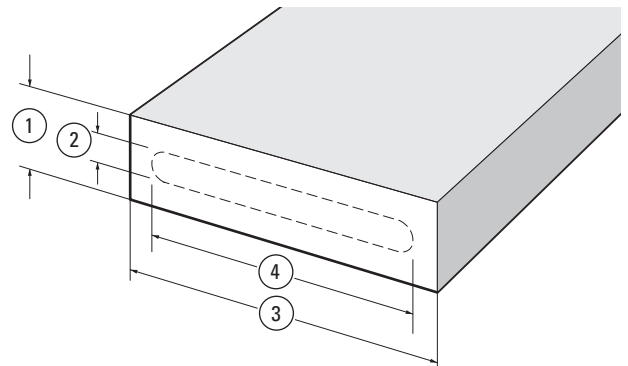
**3-47** If you have never used your router before, be sure to follow the router manufacturer's instructions for its use. Make plenty of simple open-face practice cuts before you try to use the router on the Leigh FMT Pro. ■

### Wood Preparation



**3-48** Stock for use on the Leigh FMT Pro should generally be straight, flat, of even thickness and width with square ends and edges, except where design issues dictate otherwise.

Please note that even small ridges (caused by damaged planer blades) can cause noticeable misalignment of "flush" joint faces.



**3-49** You will want to test the jig, so prepare some stock with a thickness ① of about 2½ to 3 times the bit diameter ②,

For example:

¼" [6mm] bit ⅝" to ¾" [15-19mm]

⅝" [8mm] bit ¾" to 1⅝" [20-24mm]

⅜" [10mm] bit 1⅝" to 1⅞" [25-30mm]

½" [12mm] bit 1¼" to 1½" [30-36mm]

and a stock width ③ of say, 1½ bit diameters greater than the selected guide length ④. ■



## FMT PRO CHAPTER 4

# Mortise & Tenon Routing Procedures

*Single Mortise & Tenon, Test  
Production Procedures  
Small Joints*

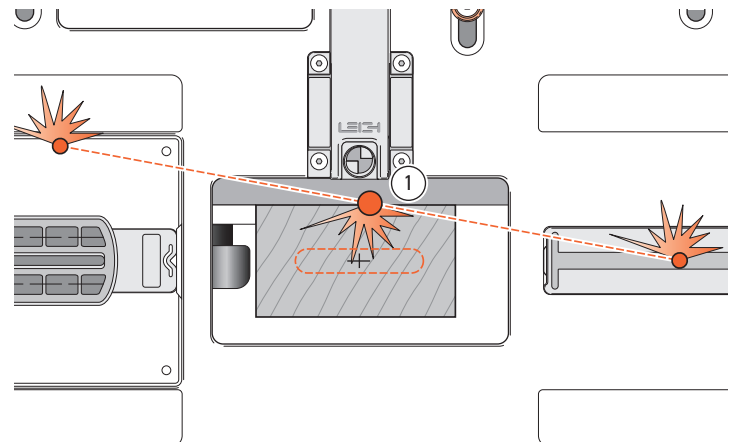
**See Appendix I for complete joint specifications and guide and bit selection**

*Before using your Leigh FMT Pro 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.*

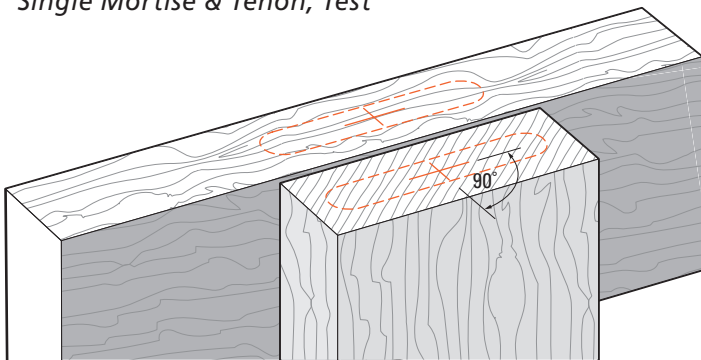
### ⚠ IMPORTANT SAFETY NOTE

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  $1\frac{5}{16}$ " [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.**

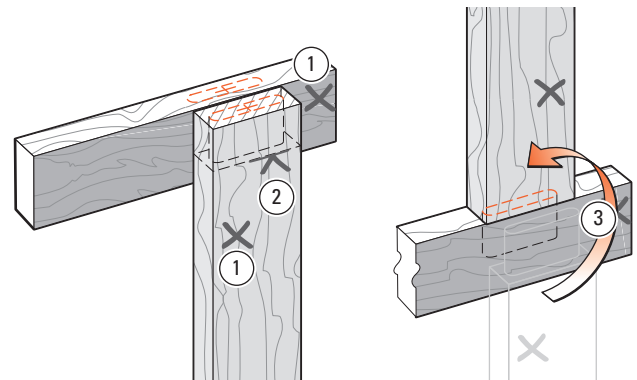


#### Single Mortise & Tenon, Test

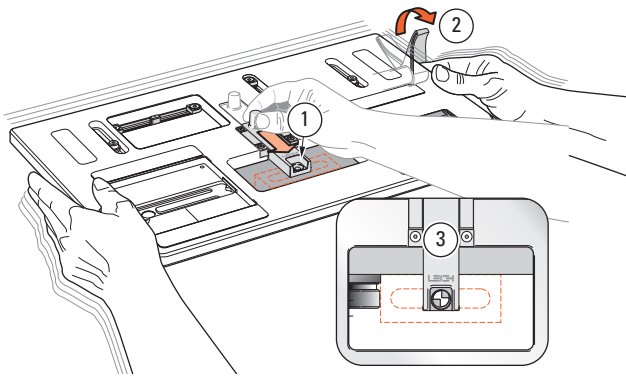


**4-1** Let's make a plain single mortise and tenon. Using a fine pencil, mark a cross at the center of the required tenon and mortise positions, the cross lines along and across the axis lines of the joint, at 90° to each other.

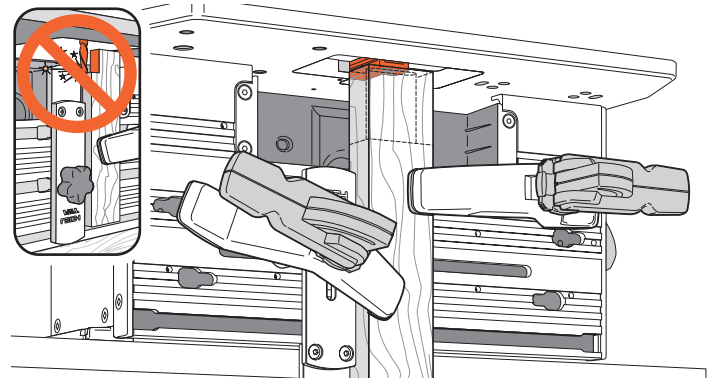
Mark the mortise several inches [10cm] or so away from the end.



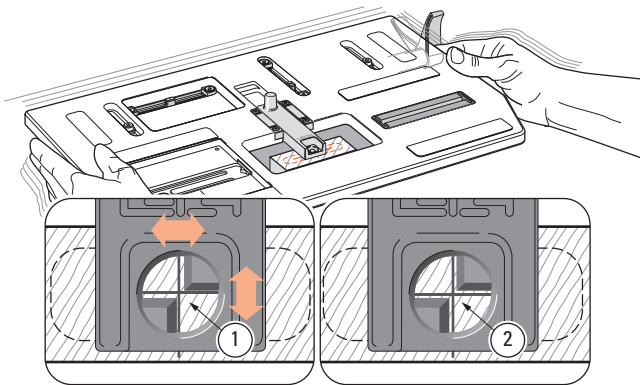
**4-2** In almost all cases, it is critical to have the same side of workpieces reference against the clamp plate for each tenon and mortise. So mark one side of each workpiece to reference “this side toward the clamp plate” ①, or “away from” if you prefer. Make a pencil mark ② to the required shoulder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



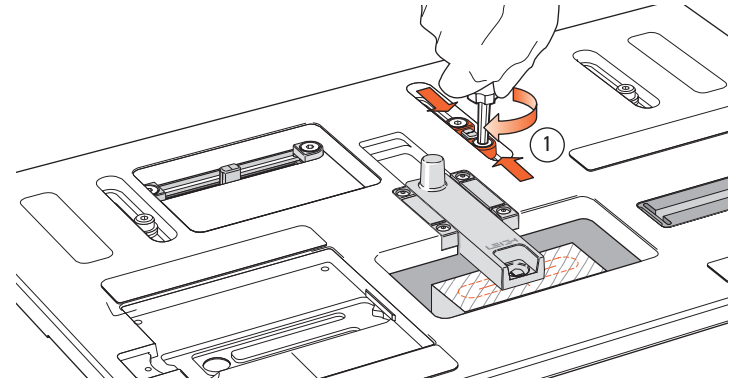
**4-3** If you have not yet mounted the sidestop fence, do so now (see 3-13 to 3-15). Place it off center by about half the width of the tenon piece; either side, it doesn't matter. Pull the table sight forward to its stop ①. Release the table clamp ② and move the table to position the sight over the approximate tenon piece position ③. Lock the table. Always lock the table before positioning work pieces.



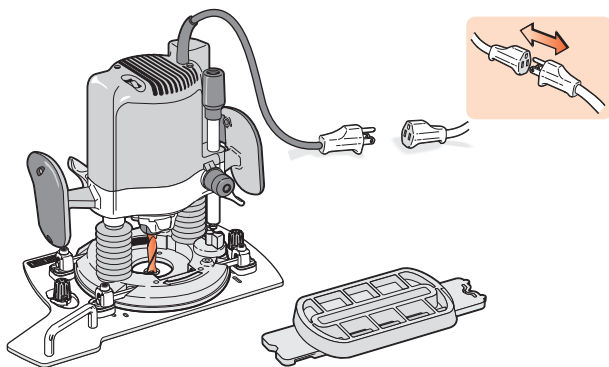
**4-4** Clamp the tenon piece with the end edge **lightly touching the underside of the sight**. Its side edge should touch the previously set side-stop fence, with the marked side toward the clamp plate.



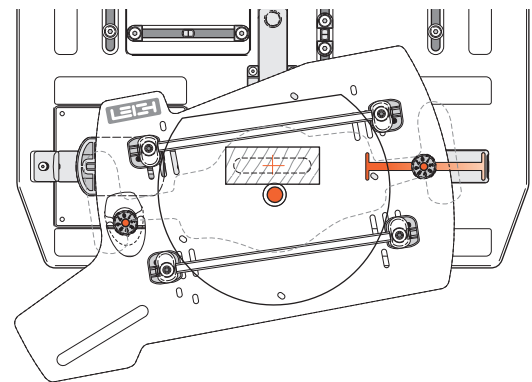
**4-5** Release the table clamp and move the table until the sight opening is positioned equally about the cross lines on the workpiece. Lock the table. Because the human eye excels at comparisons, differences as small as .004 can be perceived in the space between the edges of the line and the triangles 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. Retract the sight.



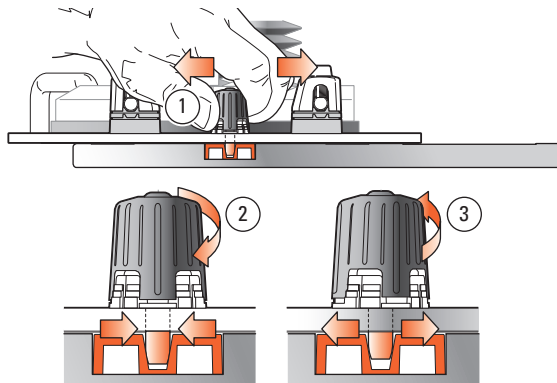
**4-7** Unplug the router. Insert the selected guide to the guide recess and matching diameter bit to the router.



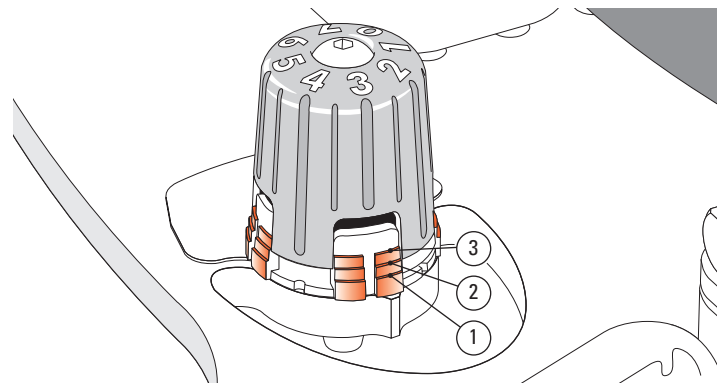
**4-8** Make sure the two guide pins are turned up two full turns from the lowest position!

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.

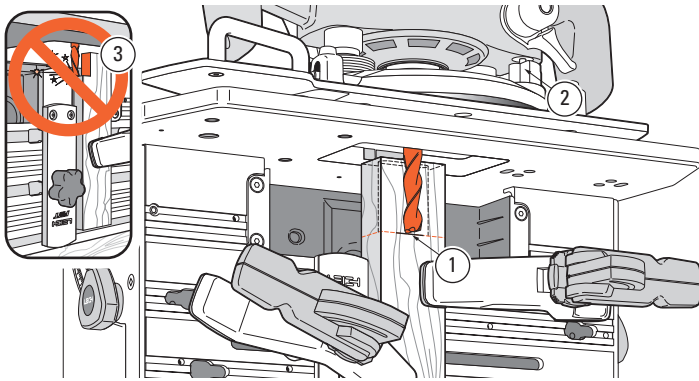




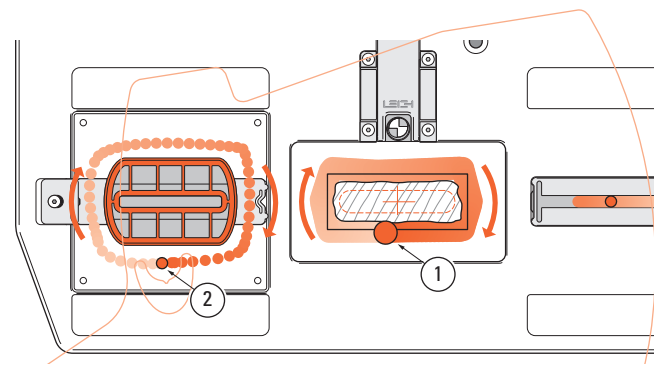
**4-9** Adjust the right hand guide pin. Grip the right hand pin knob and move the Sub-Base back and forth to feel the “free play” of the pin across the slot width ①. Turn the knob down  $\frac{1}{8}$  of a turn at a time, to feel the “play” diminish ②. When the “play” stops, turn the knob up  $\frac{1}{8}$  of a turn until the slightest play can be felt ③. The router/Sub-Base should slide freely left to right. If the right pin is a little “sticky”, turn it up a bit more.



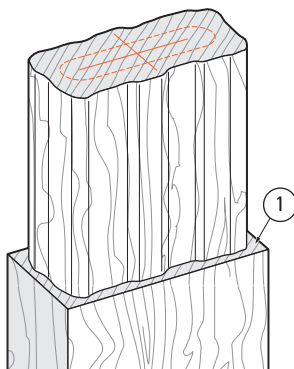
**4-10** Check that the left hand knob is two turns up. From this setting the actual fit setting will be established by trial and error and the result recorded for each guide/bit combination. Note: The “steps” in the height “washer” indicate numbers of “turns up”; one turn ① two turns ② three turns ③. **Never turn the knobs up more than  $3\frac{1}{2}$  turns in use.**



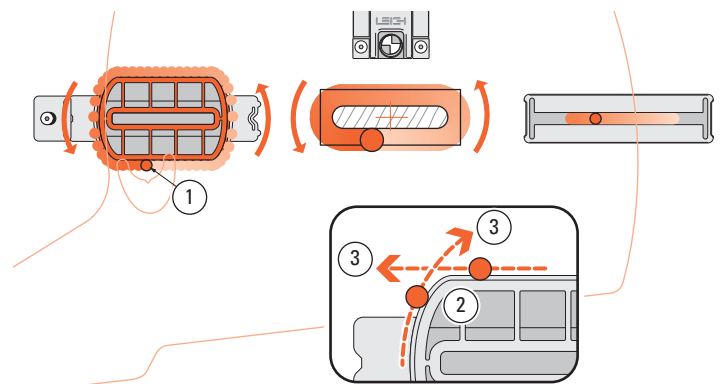
**4-11** Plunge the router so the tip of the bit is level with the pencil mark of the tenon shoulder and lock the plunge ①. Set the plunge depth stop rod to its stop ②. *Generally, tenons are routed in one depth setting, it is not necessary to make multiple passes at different depths of cut.* ⚠ **WARNING:** Never rout tenons with the sidestop fence in the inverted position ③.



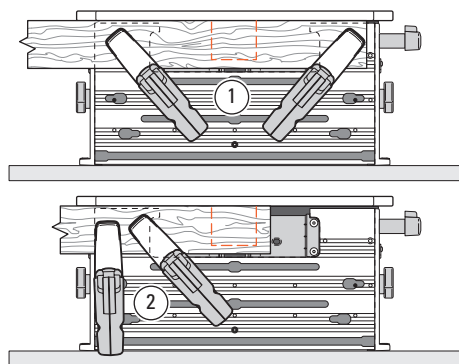
**4-12** Read all of the next three instructions before routing. With the guide pin in the near side of the guide recess, switch on the router power and with firm control, move it in until the bit lightly touches the tenon workpiece. Very carefully, with the bit very lightly engaging the wood surface,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



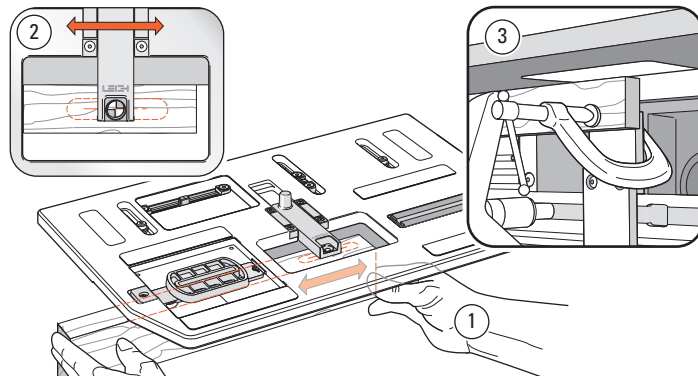
**4-13** Control the router firmly, the router is driven clockwise by the bit rotation. This first shallow climb cut will leave a small but clean shoulder ①.



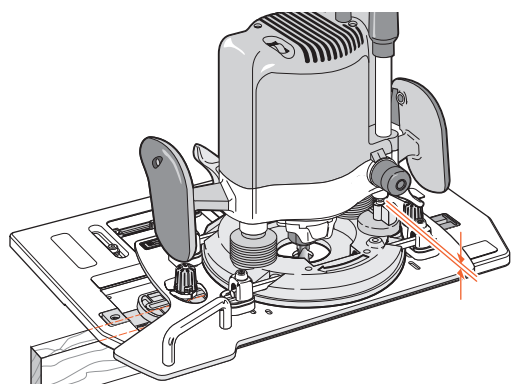
**4-14** Routing counter-clockwise, run the guide pin around the tenon guide surface. Make sure the pin contacts the entire outer surface ①. In these first test cuts, check the tenon for a completely smooth cut before removing the piece from the jig. Until you are confident with this procedure, we recommend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



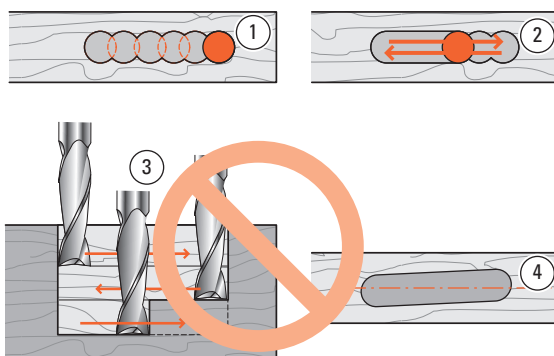
**4-15** Remove the router and tenon workpiece from the jig. Position the two clamps so the mortise piece can be positioned for secure holding. Clamp to either both sides of the vacuum box ① or to one side ②. Note: Leaving a “horn” on the ends of mortise pieces as in ① not only makes for easy clamping, it’s good woodworking practice as the horns will be an aid in assembly gluing and clamping later.



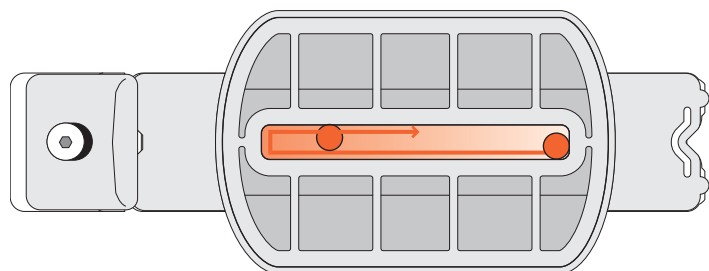
**4-16** Extend the sight. With the marked side of the mortise piece toward the clamp plate, either move the board left and right ① to align the cross with the sight and clamp in place; or clamp in place first and move the table to align the sight ②. Remember, you previously set the  $\frac{3}{8}$ FB limit stops to allow only left/right movement. For routing very small pieces ③, see 3-16.



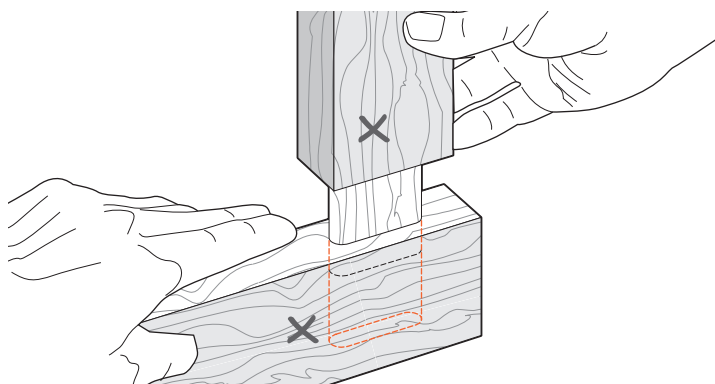
**4-17** Place the router/Sub-Base assembly on the jig, the left hand guide pin in the mortise slot part of the guide. Now raise the plunge stop rod slightly, say  $\frac{1}{32}$ - $\frac{1}{16}$ " [1-1,5mm] to allow the mortise to be routed slightly deeper than the tenon to ensure perfect tenon shoulder flushness on the finished joint.



**4-18** The best way to rout mortises (parallel to workpiece) is plunge full depth, slightly overlapping holes ①, then clean out left-right-left at full depth of cut ②. Do not route 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.

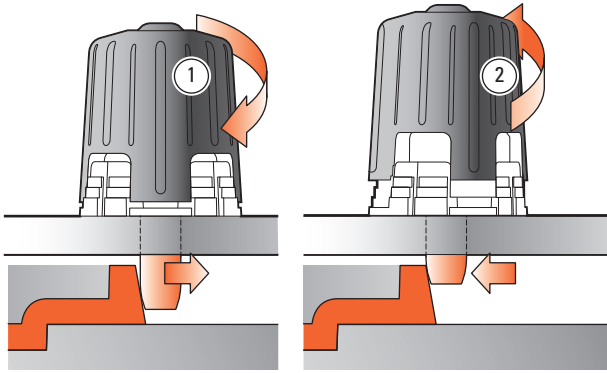


**4-19** Make sure the guide pin is run clockwise against both the front and rear of the mortise guide slot on the final passes. The gap between pin and mortise guide slot is greatly exaggerated in this illustration.

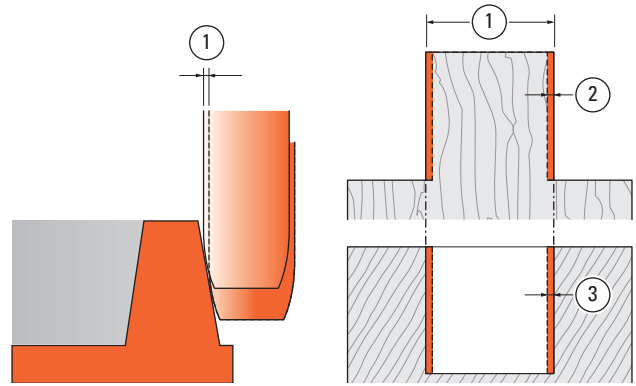


**4-20** Remove the mortise piece and test the tenon for fit and (keeping the marked faces adjacent) for flushness. If the face sides are not flush, check the straightness of the two parts. If they are straight, the clamp plate may not be vertically parallel to the bit. See Appendix II, Jig Adjustments,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

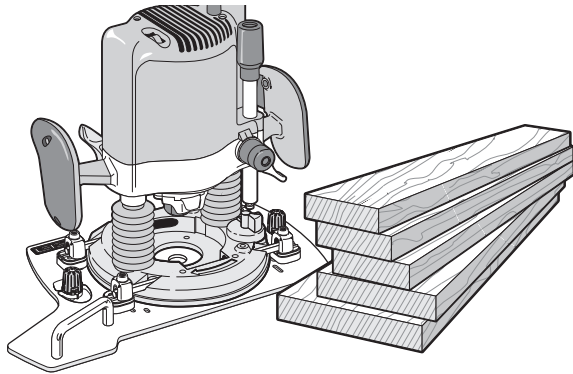




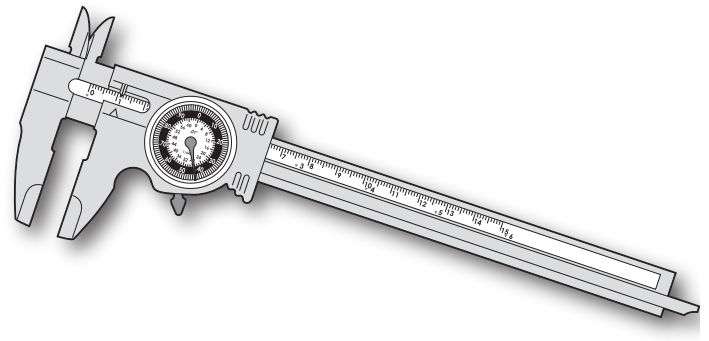
**4-21** If the joint is too loose, turn the guide pin down ①. If the joint is too tight, turn the guide pin up ②. For how much, see 4-22. Rout a complete new joint. *Note: It's possible to adjust the guide pin and rout only one new mortise or tenon part and get a good fit, but on a project this would mean routing each part at different settings. Establish ideal pin height for both mortise and tenon at one pin setting.*



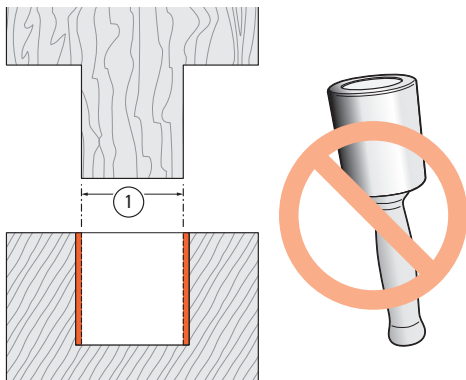
**4-22** How much adjustment is required? One eighth of a turn of the guidepin knob will change the joint glue-line fit by 0.001" [0,025mm] ①, i.e. turn one-eighth up; the bit will reduce the tenon thickness by 0.001" [0,025mm] (half of that per side ②) and increase the mortise width by the same amount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



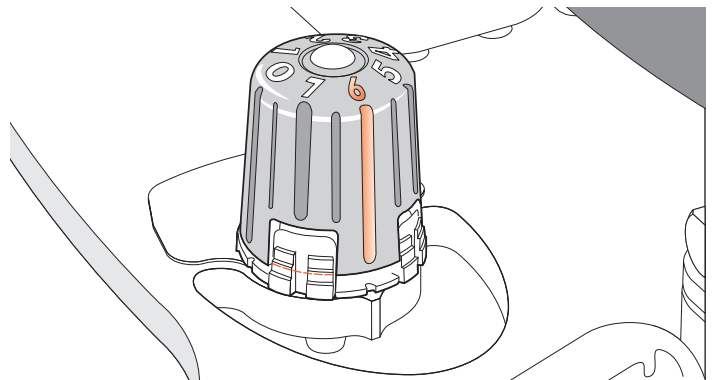
**4-23** The FMT Pro can provide this accuracy for settings but remember, you're working with wood and a hand-held router, with lots of movement tolerances; it's not a computer-controlled milling machine. Nevertheless, the FMT Pro will allow you to do very precise and consistent work.



**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 (that's .001" [0,025mm] on the glue line) should require one eighth of a turn; down to tighten, up to loosen.


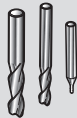

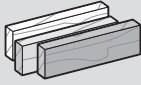



**4-25** Generally we have found the best fit differential to be 0.005" [0,13mm] "loose". Basically, the dry joint should "push" together fairly easily, but not fall apart under its own weight. If a mallet is needed, it's too tight.



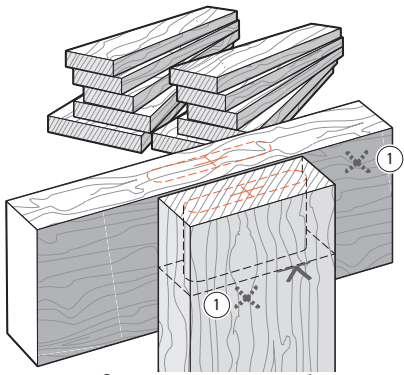
**4-26** Once you have established the guide pin setting for a specific bit/guide combination, record the setting. For example:  $\frac{5}{16}$ "x $1\frac{1}{2}$ " [8x35mm] "up  $1\frac{3}{4}$  turns". Using the same bit and guide next time, use the recorded setting for a good fit first time. *Note: As with all joinery, different wood species do not necessarily rout precisely to the same fit.* ■

Settings Record

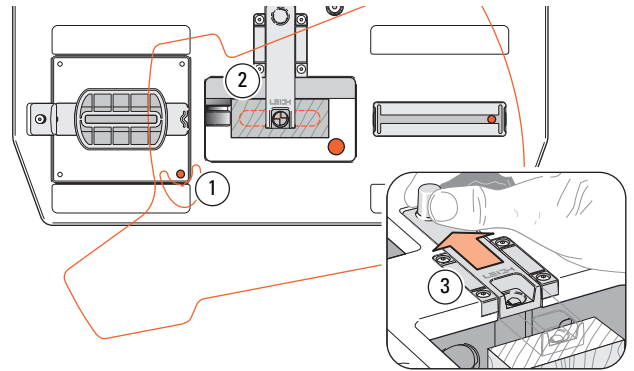
		 TURNS UP	 SPECIES	 DATE
e.g. 1/2x2	1/2	1-7/8	cherry	01/01/2014
e.g. 10x40mm	10mm	1-3/8	mahogany	jan 1, 2014

Hint: Photocopy or scan this page for future records.

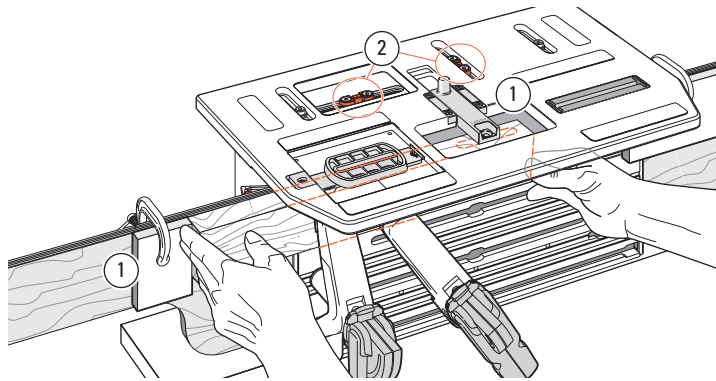
Production Procedures



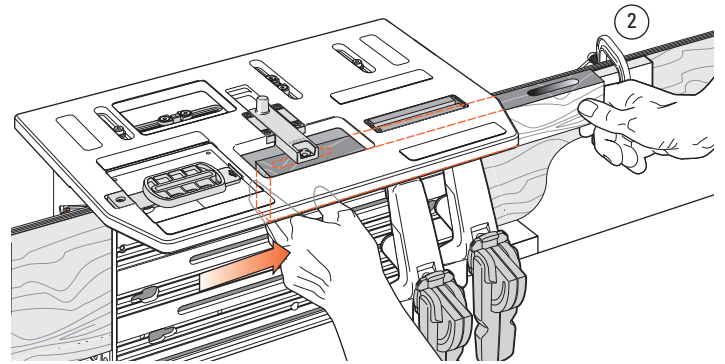
**4-27** When routing frame joints it is only necessary to mark and sight a single tenon and perhaps two mortises. Once the sidestop fence or outriggers are set and the table sighted for one joint, any number of similar joints may be routed without marking and without removing the router from the jig.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



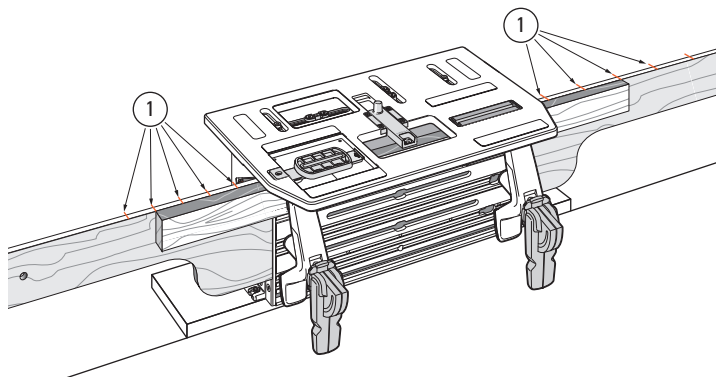
**4-28 Tenons** The router is “parked” with the guide pin in the near front corner of the recess ①. Extend the sight and use only as a tenon stop ② when clamping successive (unmarked) tenon pieces against the sidestop. Retract the sight ③ and rout any number of tenons without removing the router. **Note: If you forget to retract the sight, the Sub-Base will push it out of the way as you move it rearward, but we do not recommend this.**



**4-29 Mortises:** Sight one mortise and set a stop block ①. Set both sets of axis stops to prevent unintentional table movement ②.

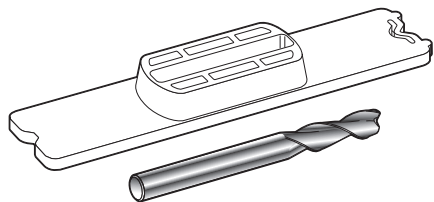


**4-30** Sight the second mortise by moving the mortise piece (not the table) and set the second stop block ②. Rout any number of successive (unmarked) mortises without removing the router from the table.

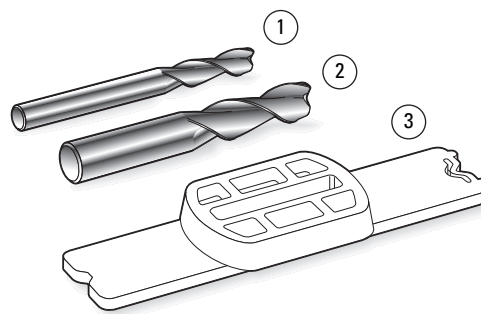


**4-31** Multiple mortises in “ladder” type construction are rapidly routed. Mark all mortises on only one piece (only one of the marks needs a front-to-back mark!). Sight the first mortise (cross) to set the table and mark the top of one outrigger in line with the workpiece end. Table locked, move the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

## Small Joints



**4-32** The FMT Pro 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 say, a single frame with a  $\frac{1}{4}$ " [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.

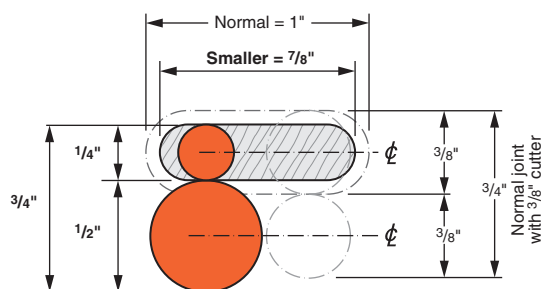


**4-33** For example, if you want to rout many  $\frac{1}{4}$ " [6mm] mortises and tenons, the tenons can be much more speedily routed with a  $\frac{1}{2}$ " [10mm] bit. Here's how.

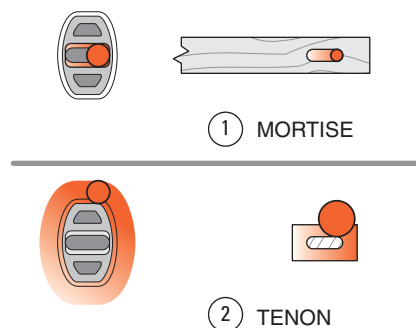
Select  $\frac{1}{4}$ " [6mm] bit for mortises ①.

Select  $\frac{1}{2}$ " [10mm] bit for tenons ②.

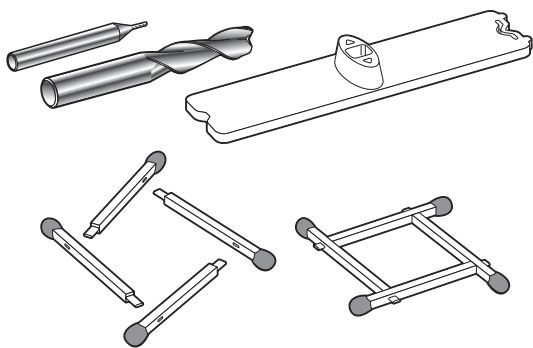
Select  $\frac{3}{8}$ " [8mm] guide ③ for length from the guide/bit selection chart in Appendix I.



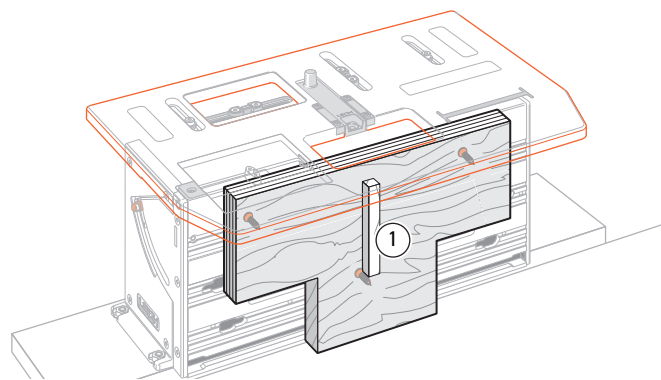
**4-34** The diagram illustrates routing the  $\frac{1}{4}$ " joint described above (guide not shown). The result is a perfect  $\frac{1}{4}$ " mortise and tenon,  $\frac{1}{8}$ " smaller both ways than the guide size. Any two bit diameters which add up to two times the nominal guide size will produce a joint the size of the smaller bit. Bear in mind, the maximum usable bit diameter with the FMT Pro is  $\frac{1}{2}$ " [12mm].



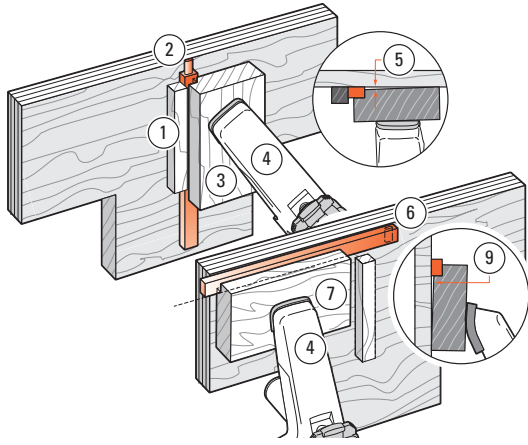
**4-35** Using a small guide, combined with an even smaller mortise bit and a larger tenon bit gives the FMT Pro an additional unique ability to rout joints smaller than the smallest ( $\frac{1}{4}$ " [6mm]) guide. For example, if you take a  $\frac{1}{4}$ " [6mm] guide and **step up**  $\frac{1}{8}$ " [4mm] to  $\frac{3}{8}$ " [10mm] diameter on the tenon bit ...and **step down** the same amount for the mortise bit, you have  $\frac{1}{8}$ " [2mm] mortise and tenons...all with adjustable joint tightness.



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



**4-37** For very small joints we recommend attaching a rigid piece of ply or MDF minimum  $\frac{3}{4}$ " [20mm] to the clamp plate, using the through screw holes in the plate. This should have its own mini sidestop fence attached for tenons ①.



**4-38** To hold very small work pieces ②, make up a rabbeted holder ③ with the rabbet slightly shallower than the work piece thickness, leaving a gap at ⑤ and ⑨. **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 ⑨. ■



## FMT PRO CHAPTER 5

## Multiple Joints

Double Joints

Twin Joints

Quadruple Joints

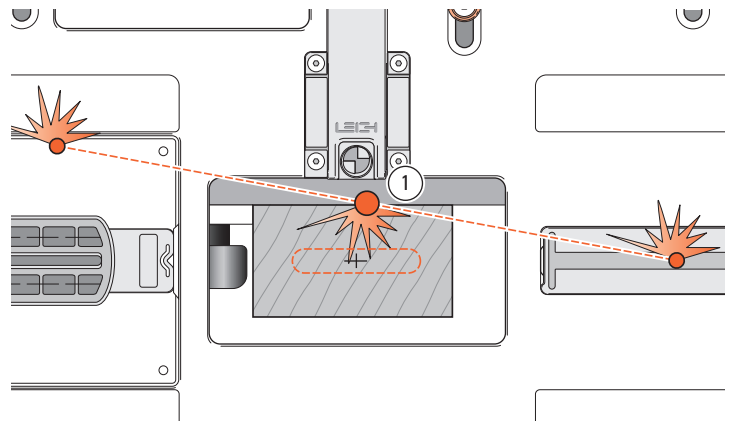
Triple Joints

*Before using your Leigh FMT Pro 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.*

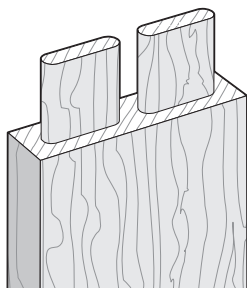
### ⚠ IMPORTANT SAFETY NOTE

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  $1\frac{5}{16}$ " [34mm] before referring to 5-39 through 5-44.

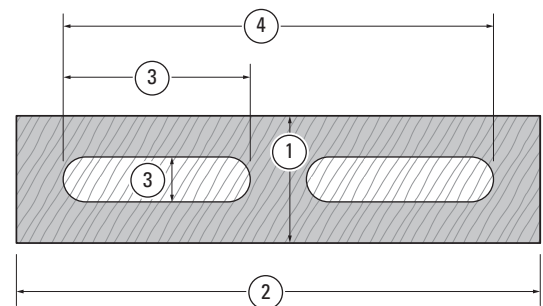
Without using the table movement as prescribed, the bit would have to be plunged into the side of the tenon rail causing the bit to powerfully “drive” the router across the jig. **This could be dangerous and can damage the jig.**



#### 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.



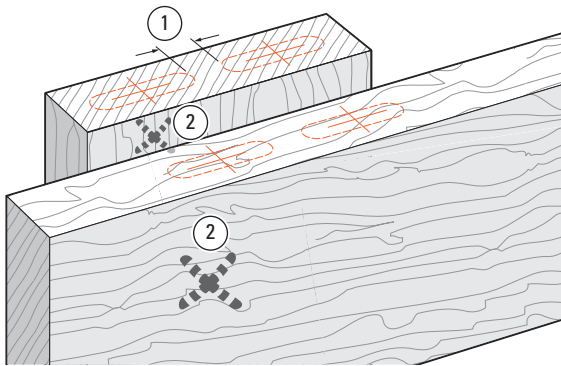
**5-2** Note: The **maximum** dimensions for doubles are:

①② Tenon Workpiece:  $1\frac{5}{16}$  x  $5\frac{1}{2}$ " [34x140mm]

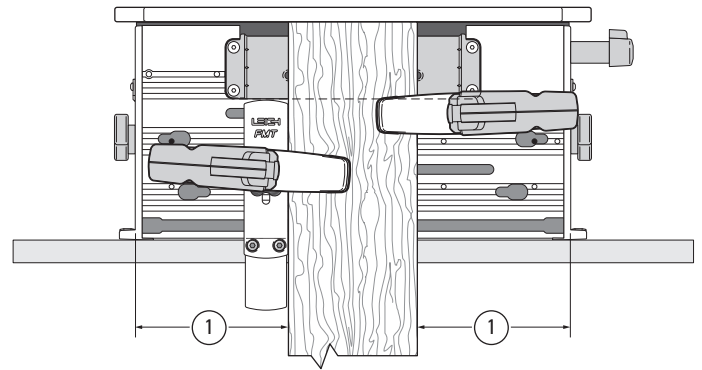
③ Tenon:  $\frac{1}{2}$  x 2" [12x50mm]

④ Tenons, both Overall:  $\frac{1}{2}$  x  $4\frac{1}{2}$ " [12x115mm]

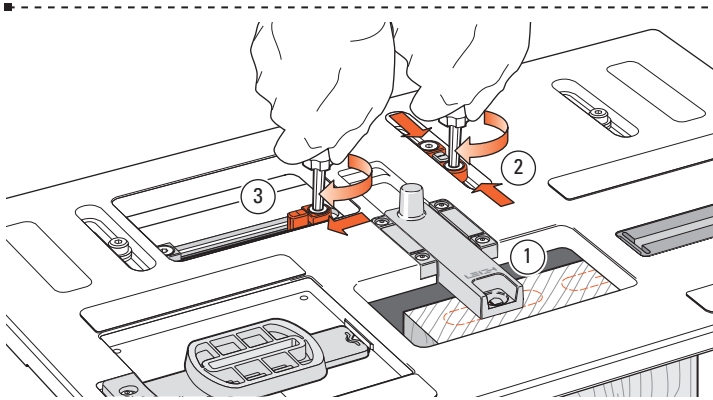




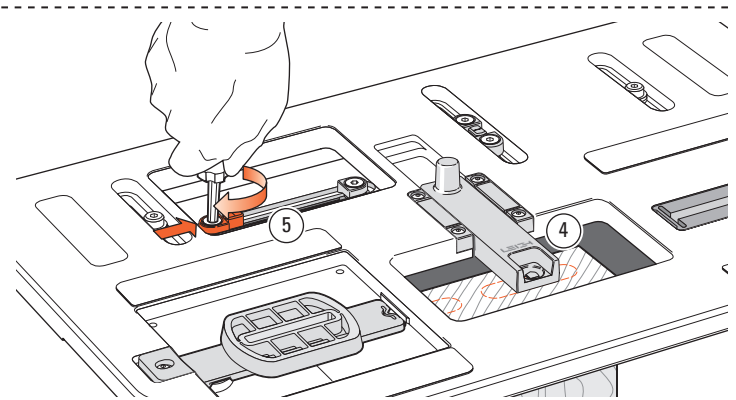
**5-3** Mark the two mortise and tenon centers, taking care to allow space between the joints ① at least equal to the tenon bit diameter. Mark the faces that go against the clamp plate ②.



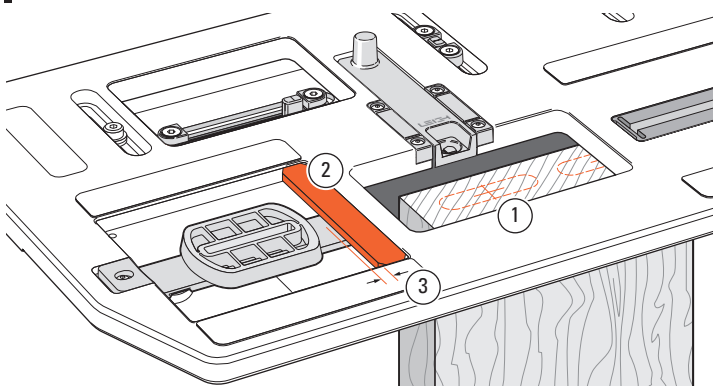
**5-4** Set the sidestop fence so that the tenon piece is clamped approximately centrally on the clamp plate ①.



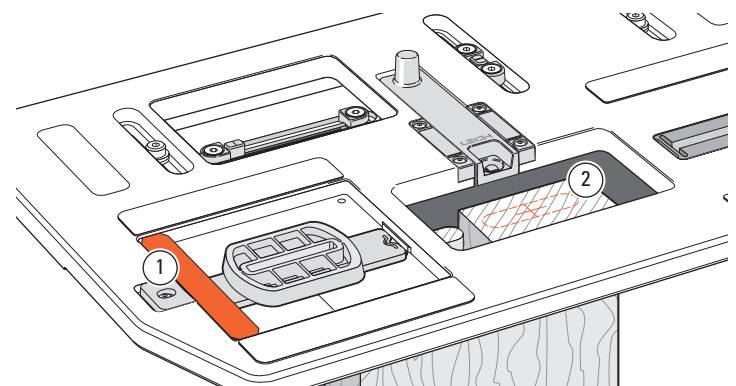
**5-5** Sight the left hand tenon and lock the table ①. Set and lock both **FB** limit stops against their stop post ②. Set and lock only the right hand **LR** limit stop against its post ③.



**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. Retract the sight.

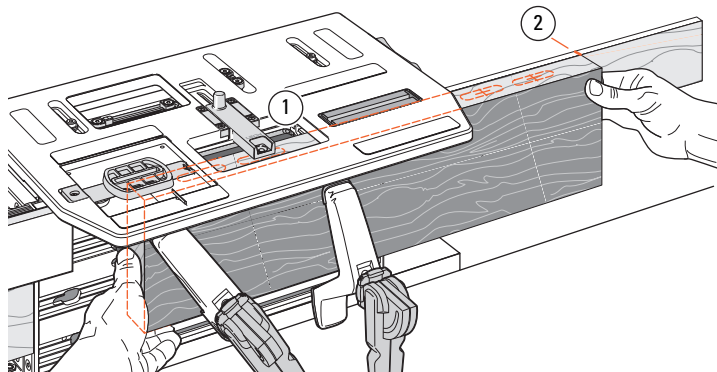


**5-7** Move the table left and lock. **Do not rout yet.** While with practise it is fairly easy to avoid routing “into” the right tenon while routing the left ①, we recommend that beginners use a small shop-made “guard” to prevent this ②. Use 1/4" [6mm] thick MDF or plywood. Allow a 3/16" [5mm] gap between the end of the guide and guard ③. Rout the left tenon.

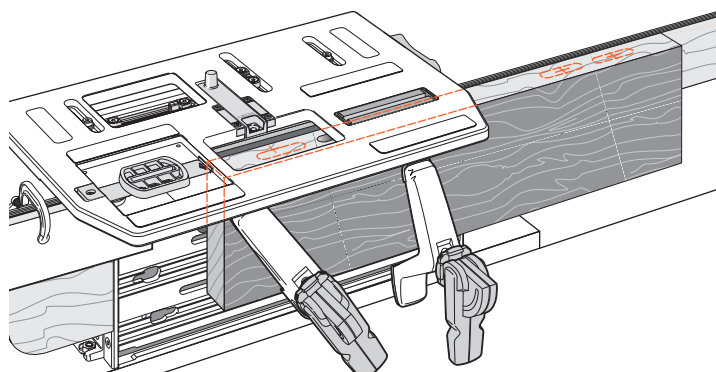


**5-8** Move the table right and lock. Lift the left end of the (stationary) router and move the “tenon guard” left ①. Rout the right hand tenon ②. Repeat as required for all tenon ends, moving the table “guard” piece only once for each pair. Leave the table to the right. Remove and save the guard.

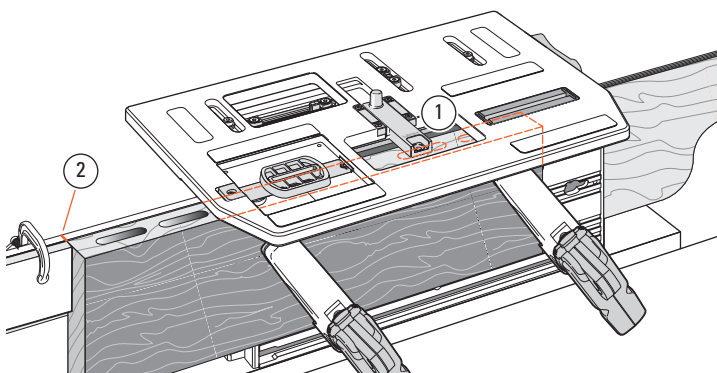




**5-9** Extend the sight. Position and clamp the mortise piece so the right hand mortise of the first pair is centered under the sight ①. Either mark an outrigger or set a stop block for successive mortise pieces ②. Rout the right hand mortise.

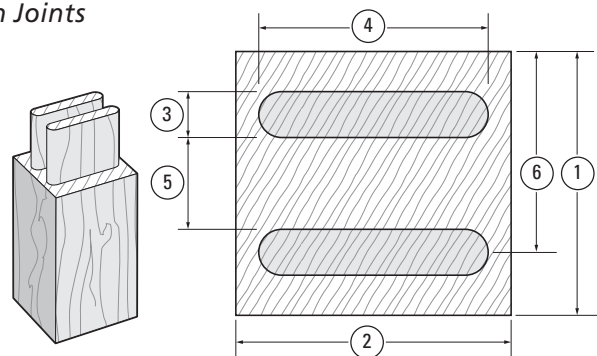


**5-10** Move the table left and lock. Rout the left hand mortise. Leave the table to left.



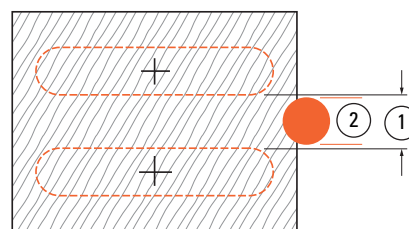
**5-11** Extend the sight and unclamp. Sight the left of the other pair of mortise positions ① and re-clamp. To avoid re-sighting each board, mark the left hand outrigger or set a stop at the workpiece end ②. Rout the mortise, then move the table and rout the right hand mortise. The table limit stops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

**Twin Joints**

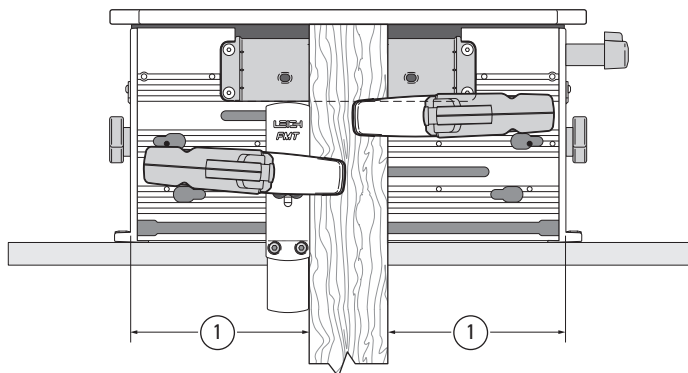


**5-12** Note: The **maximum** dimensions for “side-by-side” double joints are:

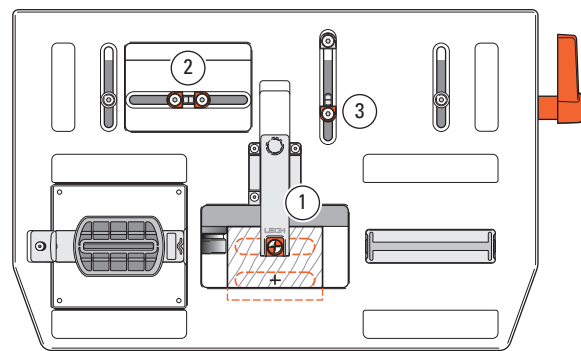
- ① ② Tenon workpiece: 3" x 3 1/8" + [76x79+mm]
- ③ ④ Tenon size: 1/2" x 2 1/2" + [12x65+mm]
- ⑤ Min. spacing: 1/16" [13mm]
- ⑥ Max. distance from board edge to center of tenon: 2 3/8" [60,3mm]



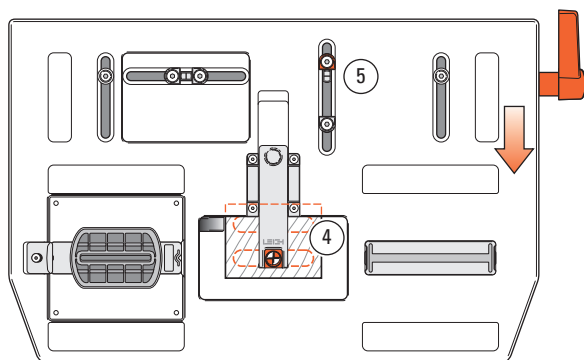
**5-13** Mark the two tenon centers taking care to allow space between the two joints ① **at least slightly greater** than the tenon bit diameter ②.



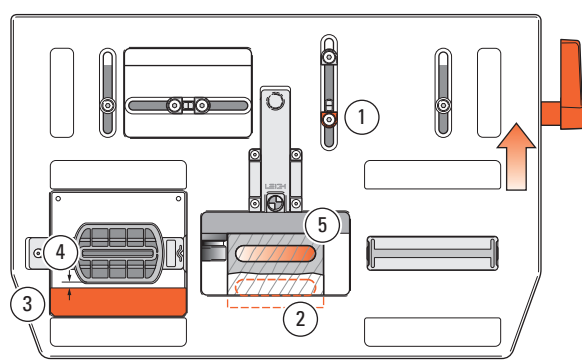
**5-14** Approximately center the table left to right and lock ①. Extend the sight. Clamp the tenon piece against the sidestop fence, the tenon piece lightly touching the underside of the sight.



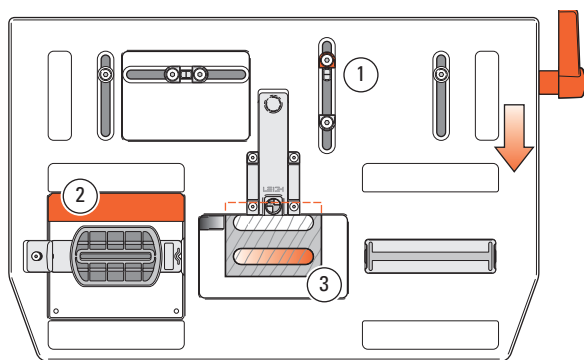
**5-15** Unlock the table, sight the rear tenon center and lock the table ①. Set and lock both <sup>LR</sup> limit stops against their stop post ②. Set and lock the front <sup>FB</sup> limit stop against its stop post ③.



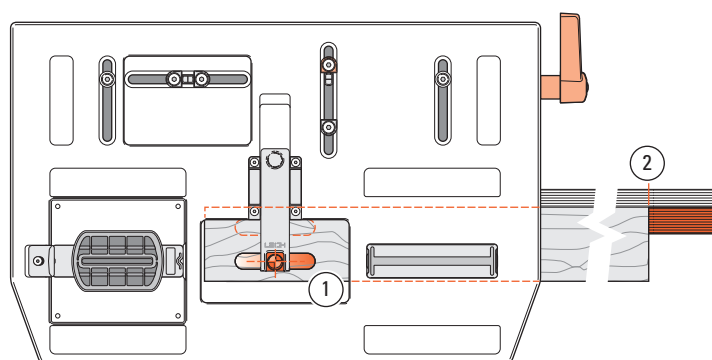
**5-16** Unlock the table and sight the front tenon ④ and lock the table. Set and lock the rear <sup>FB</sup> stop against its post ⑤. Unlock the table and move the table front to back against the stops to double-check the tenon sighting.



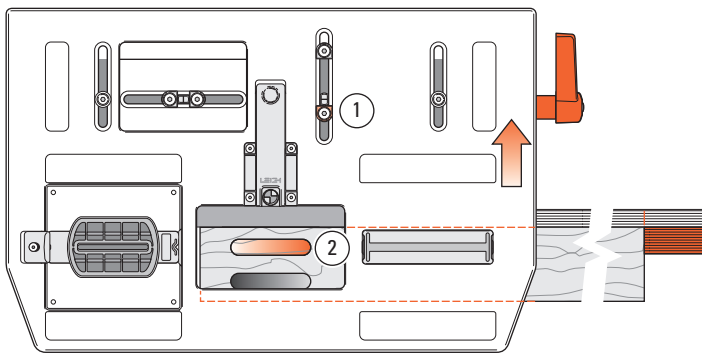
**5-17** Move the table to the rear against the stop and lock ①. Do not rout yet. While with practise it is fairly easy to avoid routing into the front tenon ② while routing the rear, we recommend that beginners use a simple shop-made “guard” ③ to prevent this. Use 1/4" [6mm] thick MDF or plywood. Allow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



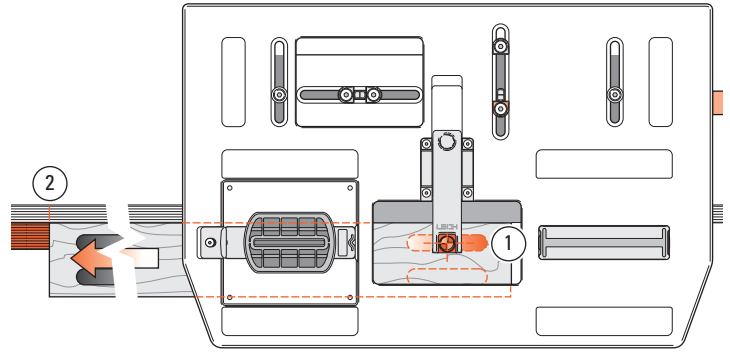
**5-18** Move the table forward and lock ①. Lift the left end of the router and move the “tenon guard” to the rear ②. Rout the front tenon ③. Repeat as required for all tenon ends, moving the table and guard piece only once for each pair. Leave the table forward. Note: By using two or three left-right table positions, (in addition to the front-back positions), the workpiece width and tenon width may be increased to the maximum (see Chapter 6, Longer and Shorter Joints).



**5-19 Mortises** Extend 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 or set a stop block for successive mortise pieces ②. Rout the front mortise.

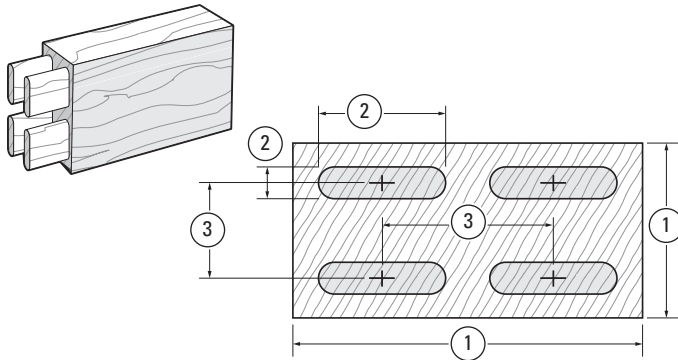


**5-20** Move the table back against its stop ① and lock. Rout the rear mortise ②. Leave the table back.

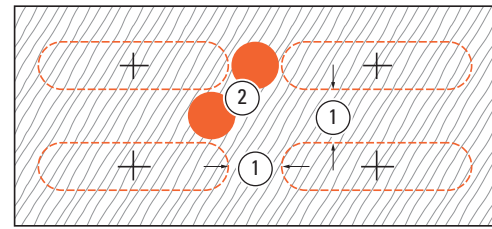


**5-21** Extend the sight, unclamp and move the mortise board left so that the rear mortise of the pair at the right end of the piece is centered under the sight ① and re-clamp. Mark the left hand outrigger or set a stop ② adjacent to that end of the workpiece. Rout first the rear mortise at this (right-hand)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

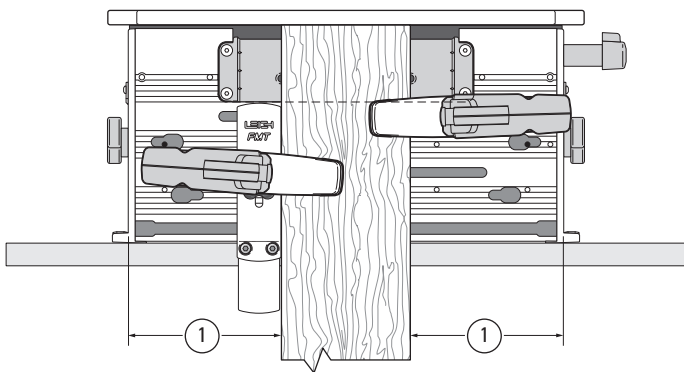
**Quadruple Joints**



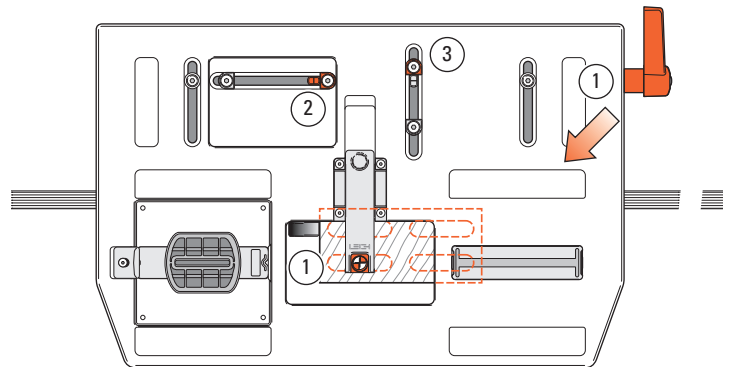
**5-22** The maximum dimensions for quadruple joints are:  
 Tenon Workpiece ①: 3" x 5½" [70 x 140mm]  
 Tenon Size ②: ½ x 2" [12 x 50mm]  
 Center Spacing ③: 1½ x 2½" [38 x 63mm].



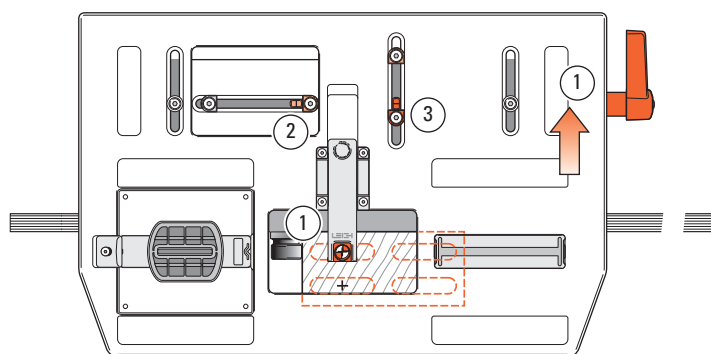
**5-23 Tenons** Mark the four tenon and mortise centers to suit your layout. Take care to leave a space between tenons ① at least slightly greater than the tenon bit diameter ②.



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



**5-25** Extend 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.

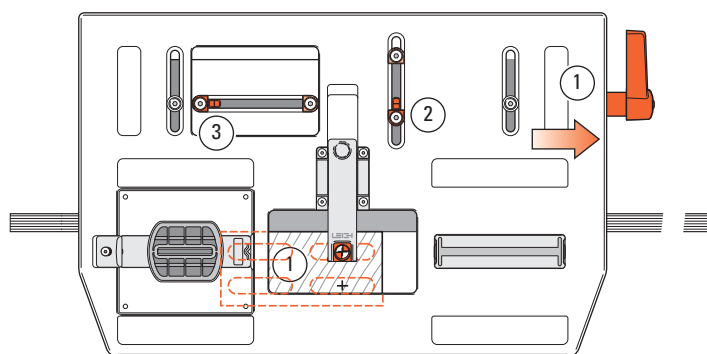


**5-26** Release and move the table to sight the rear left-hand tenon ①.

*Note: Ensure the  $\text{LR}$  post is still touching the right-hand limit stop ②.*

Lock the table.

Move the front  $\text{FB}$  stop to its post and lock ③.

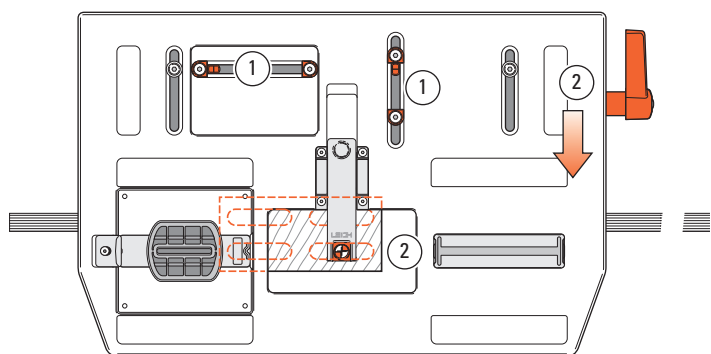


**5-27** Unlock the table and move to the rear right-hand tenon and sight ①.

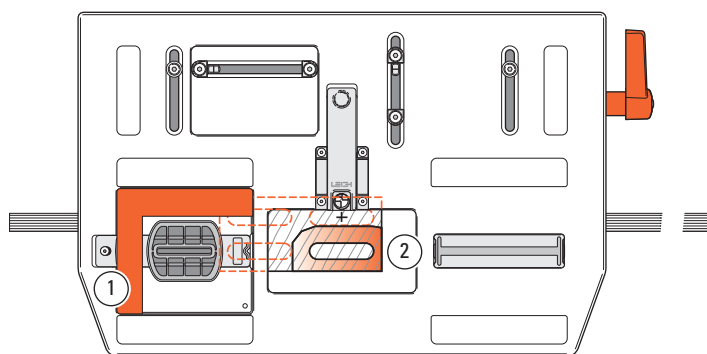
*Note: ensure the  $\text{FB}$  post is still touching the front limit stop ②.*

Lock the table.

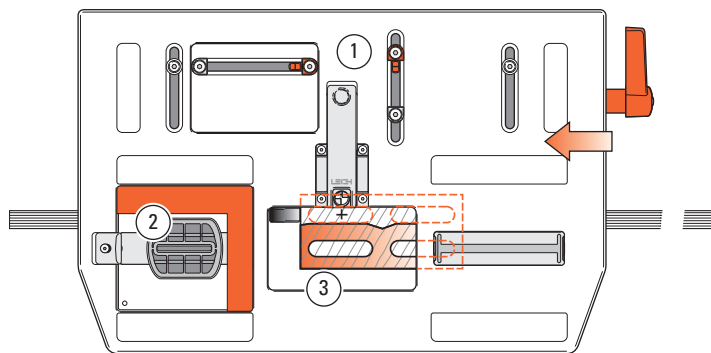
Move the left-hand  $\text{LR}$  stop to its post and lock ③.a



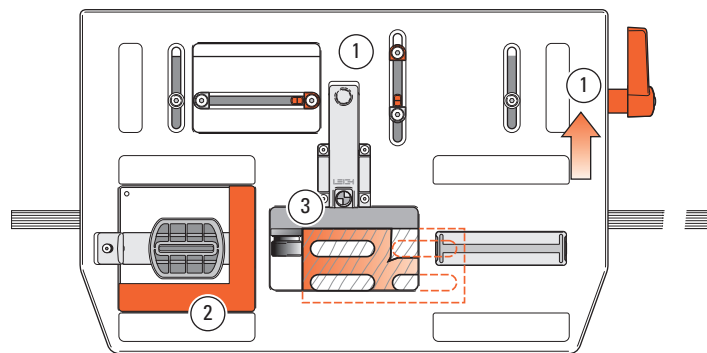
**5-28** All four stops are now set ① and provided you have symmetrically marked out the joint, moving the table to the front right-hand tenon, the sight should automatically align with that mark ②. If it does not, do not change anything. Just check the other three positions; the actual joint will be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



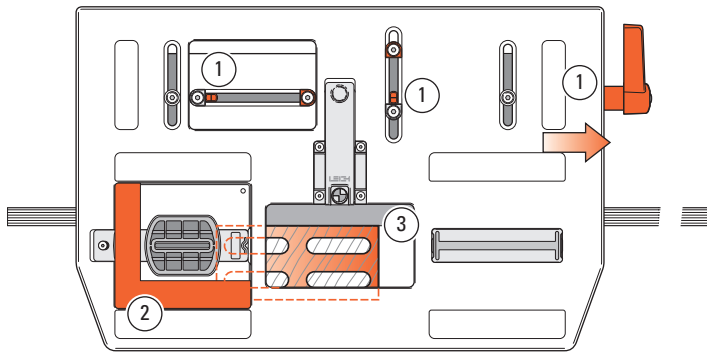
**5-29** With practice, it is fairly easy to avoid routing into an adjoining tenon; however, we do recommend that beginners use a simple “L”-shaped shop made guard to prevent this ①. Use  $\frac{1}{4}$ ” [6mm] MDF or plywood and allow a  $\frac{3}{16}$ ” [5mm] gap between the guide and guard. Rout the front right tenon ②.



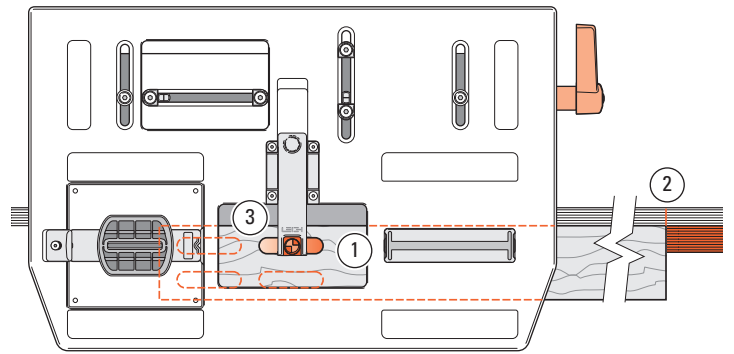
**5-30** Move the table to the front left against the stops and lock ①. With the “guard” at the rear-right ②, rout the front-left tenon ③.



**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.

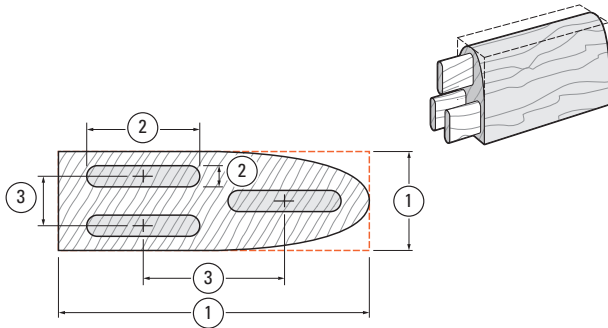


**5-32** Move the table to the rear right against the stops and lock ①. Move the “guard” to the front-left ②. Rout the rear-right tenon ③. Rout all other tenon ends required. Leave the table to the rear-right.

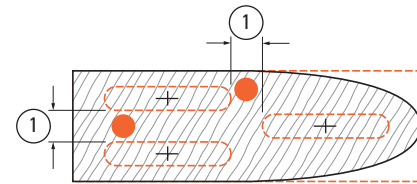


**5-33 Mortises** Extend the sight, position and clamp the mortise board so that the rear right mortise is centered under the sight ①. Either mark an outrigger or set a stop-block for successive mortise boards ②. Rout all four mortises in their respective positions ③. **Note:** The FMT Pro vacuum port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

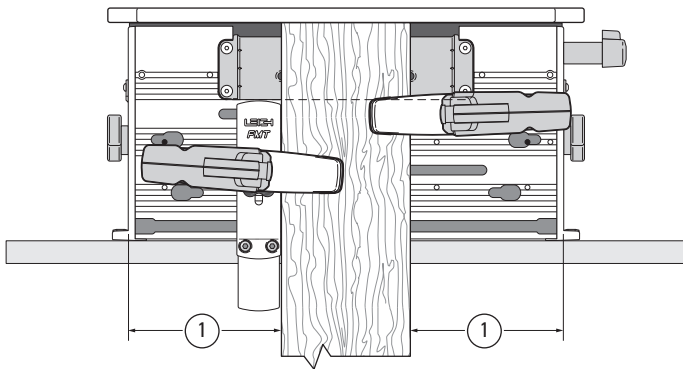
Triple Joints



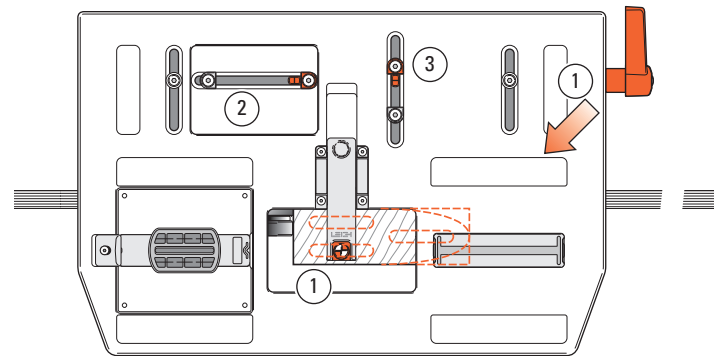
**5-34** Because of safety considerations it is only practical to rout triple joints with  $\frac{3}{8}$  bits and guides or smaller. Maximum dimensions for triple joints are:  
 Tenon Workpiece ①:  $1\frac{3}{4} \times 5\frac{1}{2}$ " [44 x 140mm]  
 Tenon Size ②:  $\frac{3}{8} \times 2$ " [10 x 50mm]  
 Center Spacing ③:  $\frac{7}{8} \times 2\frac{1}{2}$ " [22 x 63mm].



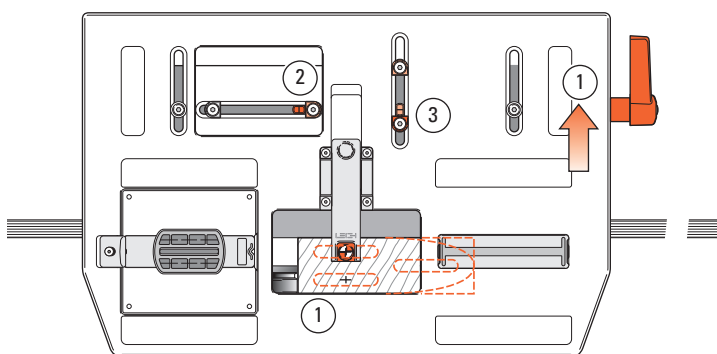
**5-35** Mark the three tenon and mortise centers, taking care to leave a space between tenons at least slightly greater than the tenon bit diameter ①.



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



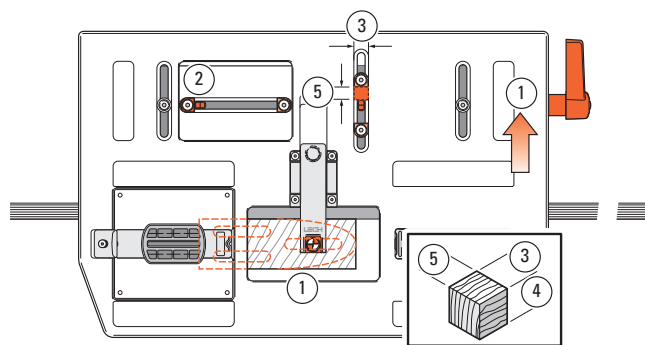
**5-37** Extend the sight, release the table clamp and sight the front tenon of the pair ①. Lock the table, move the right hand LR limit stop to the post and lock ②. Move the back FB limit stop to the post and lock ③.



**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.

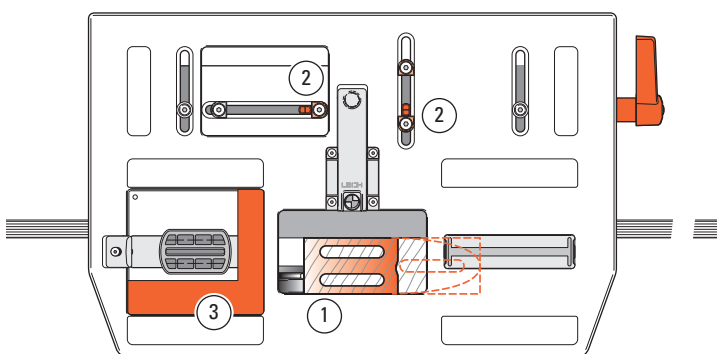
Move the front FB limit stop to its post and lock ③.



**5-39** Release the table clamp and move the table to sight the third (single) tenon ①. Lock the table.

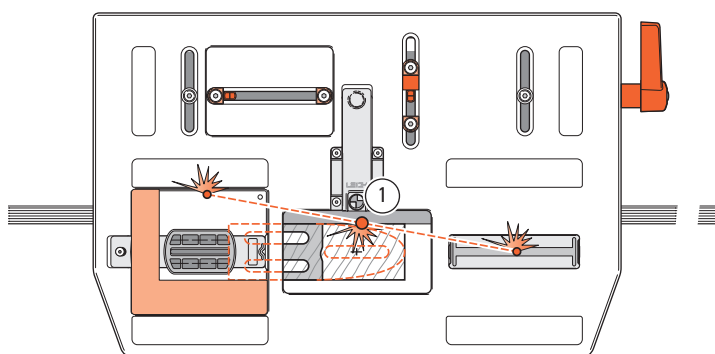
Set and lock the left-hand LR limit stop to its post ②. Cut a small hardwood block to the following size:

Width ③  $\frac{1}{2}$ " [13mm], Depth ④  $\frac{5}{16}$ " [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.



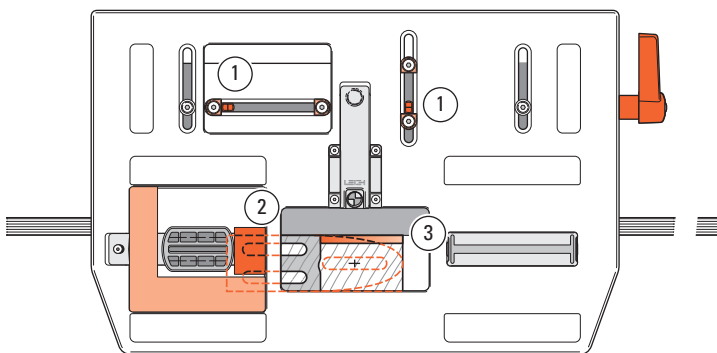
**5-40** Rout the left pair of tenons in the same way as for the quadruple tenons ① (see 5-30 and 5-31), using the Limit Stops ② and an L-shaped guard ③ in the guard recess to prevent accidental routing of adjacent tenons.

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

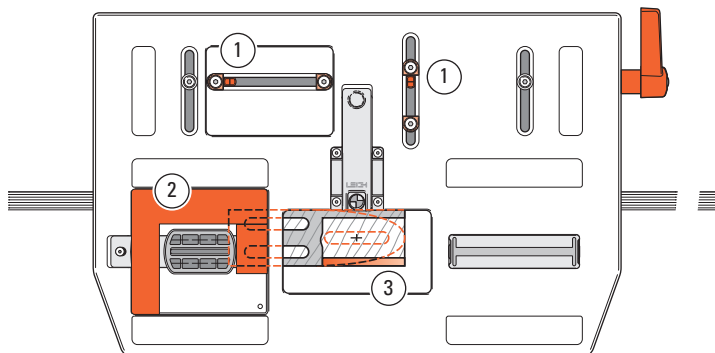


**5-41** **⚠** If the tenon rail is thicker than  $1\frac{5}{16}$ " [34mm] (as is most likely with this type), then great care must be exercised not to "trap" the bit ① when routing the third tenon.

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.

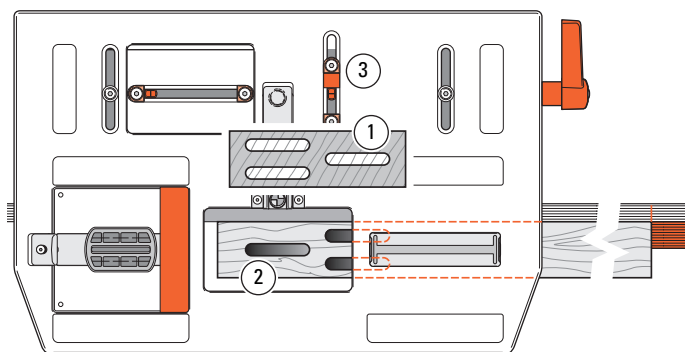
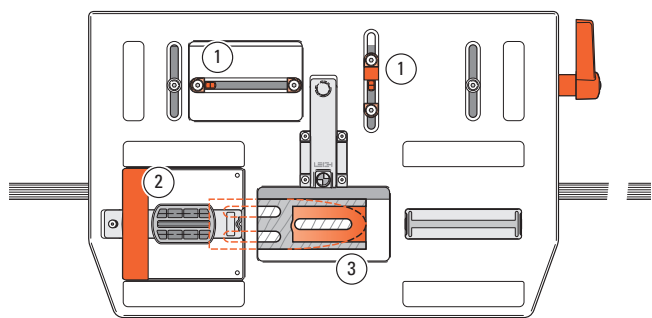


**5-42** So to reduce the thickness, move the table right and rearward against the stops ① as if to rout a quadruple tenon. Then add a small "guard" piece ② to the L-shaped guard in the guide recess. Now rout away part of the workpiece ③.



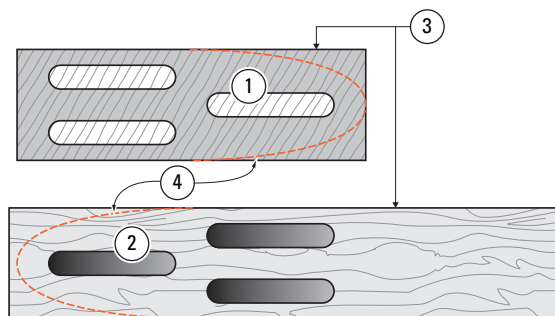
**5-43** Move the table forward, keeping it to the right ①. Flip the guards to the back ②. Now rout away the front-right part of the workpiece ③.





**5-44** Release 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 that the mortises and tenons will align ③. It's much easier to clamp square section workpieces so do not do any shaping of workpieces until after the joints are routed ④. ■



## FMT PRO CHAPTER 6

# Workpiece and Joint Options

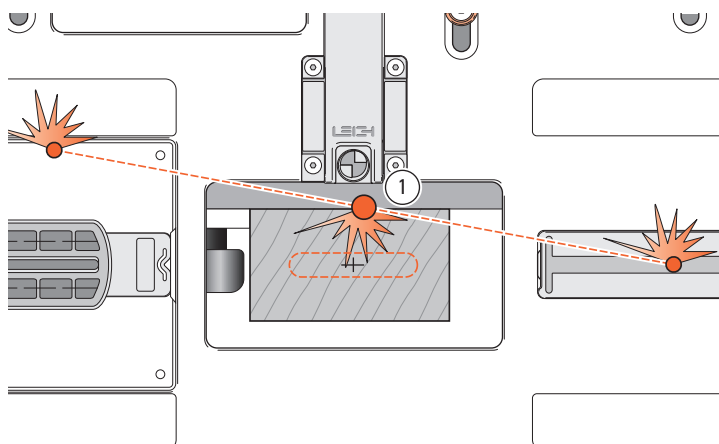
*Different Workpiece Thicknesses  
Longer and Shorter Joints  
Thicker and Wider Boards*

*Before using your Leigh FMT Pro 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.*

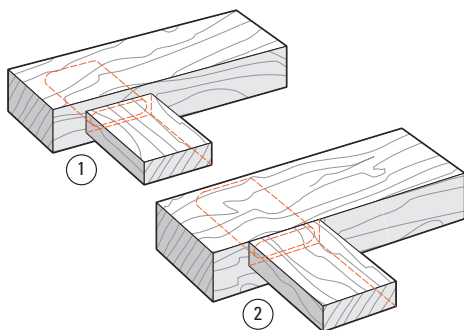
### ⚠ IMPORTANT SAFETY NOTE

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<sup>5</sup>/<sub>16</sub>" [34mm] before referring to 5-39 through 5-44.

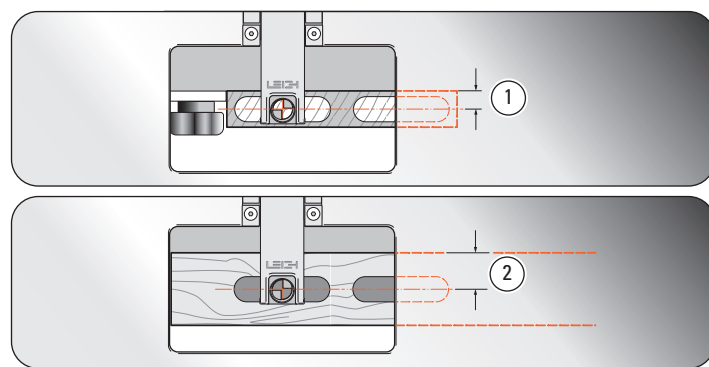
Without using the table movement as prescribed, the bit would have to be plunged into the side of the tenon rail causing the bit to powerfully “drive” the router across the jig. **This could be dangerous and can damage the jig.**



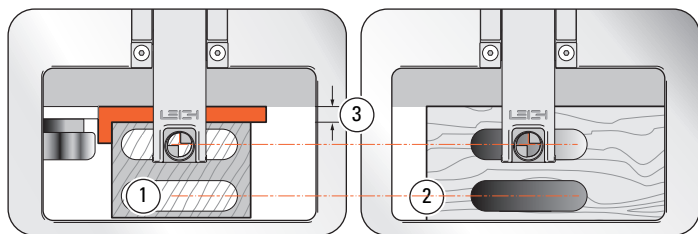
### Different Workpiece Thicknesses



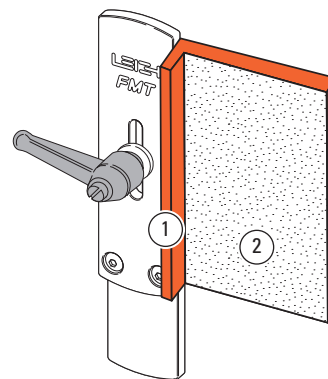
**6-1** So far we have only illustrated joints where the mortise and tenon workpieces are the same thickness. There will be numerous times when this is not the case, as in where the tenon piece is thinner and centered on the mortise board ①, and where the tenon piece is deliberately off-center on the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



**6-2** Single or double (in-line) mortise and tenons are straight forward. Simply mount and 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.

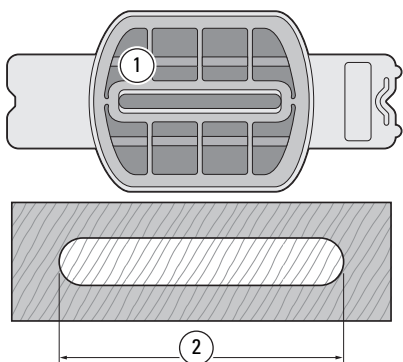


**6-3** Side-by-side double and quadruple joints of different stock thicknesses require a packing piece (see 6-4) between the clamp plate and tenon piece, the thickness equal to the offset of the two pieces. For example, a 2" [50mm] tenon piece ① centered on a 3" [75mm] mortise piece ② will require a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

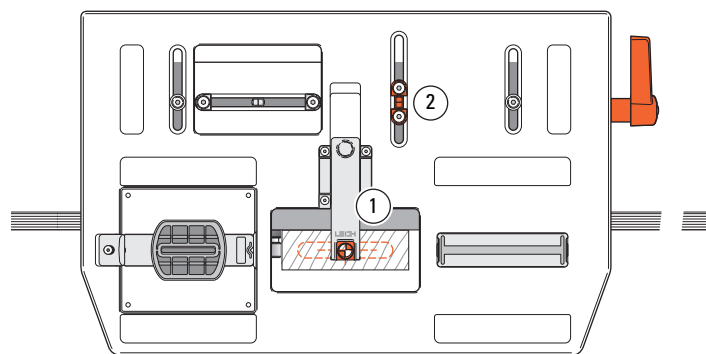


**6-4** This packing piece should include its own side-stop fence ① and if required frequently, should have sandpaper glued onto its outer surface for secure workpiece clamping ②. Sight and rout the tenons in the usual way with the packing piece in place. Then, remove the packing piece before sighting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

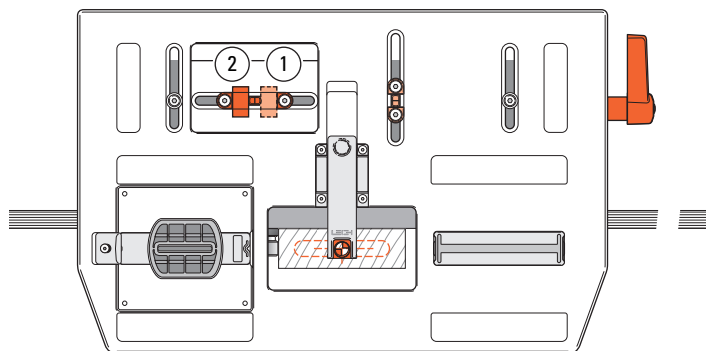
### Longer and Shorter Joints



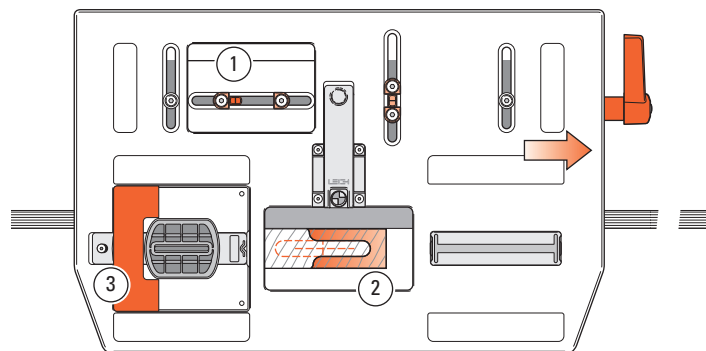
**6-5** The FMT Pro table movement allows for easy routing of odd-sized joints. For example, you may want to rout a 3" [75mm] joint and you only have a 2" [50mm] guide ①. Use this simple formula:  
**Joint, minus Guide, divided by 2.**  
 Example:  $3" - 2" \div 2 = \frac{1}{2}"$  [75 - 50  $\div$  2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



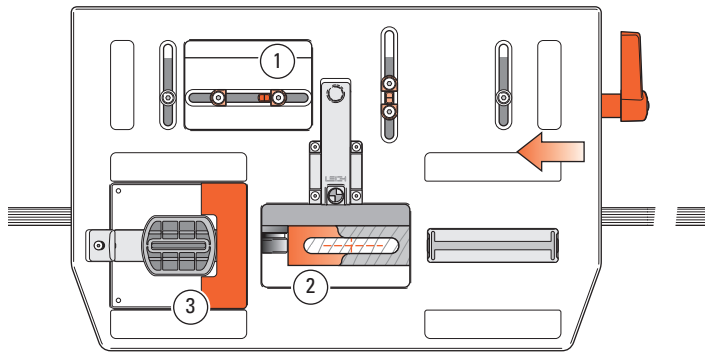
**6-6 Tenons** Mark the center as before. Position and sight the tenon ①, and lock the table. Set the  $\frac{\circ}{\text{FB}}$  stops against the post ②.



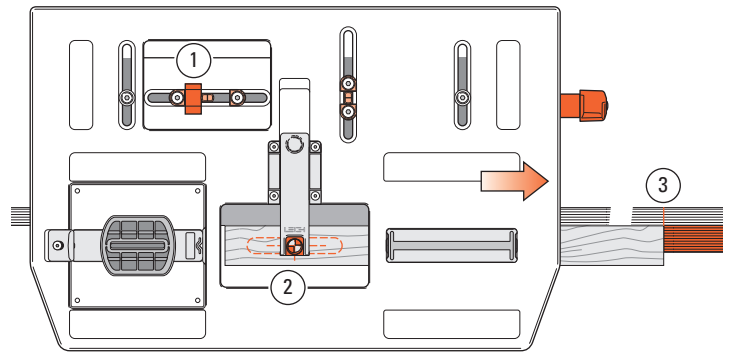
**6-7** Set the  $\frac{\circ}{\text{LR}}$  stops one at a time with the small block between the stops and post ①②. This ensures that the table movement is centered about the joint center-mark on the stock. Remove the block, but save it.



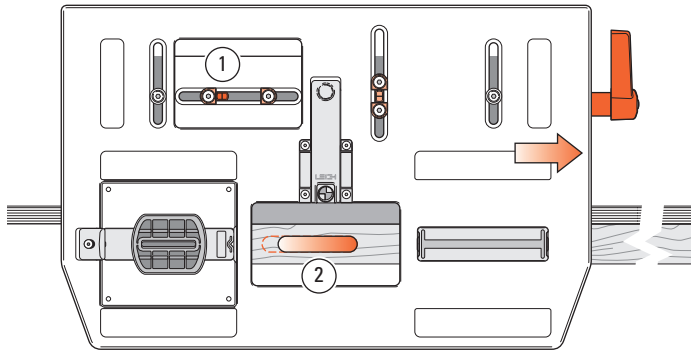
**6-8** To rout the wider tenon:  
 - Move the table **right**, to the stop ①.  
 - Rout the **right-hand** end of the tenon ②.  
 Use a guard in the left end of the guide recess ③.



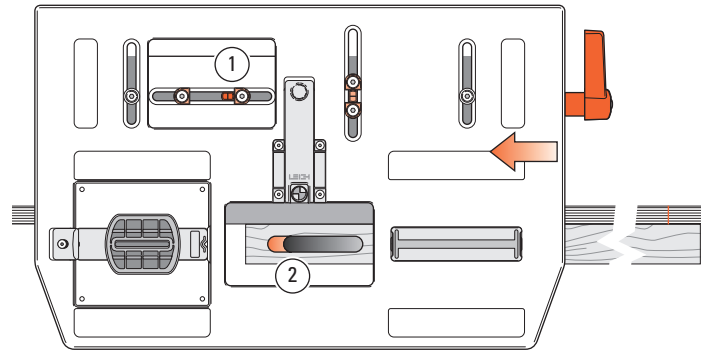
**6-9** - Move the table **left** to the stop ①.  
 - Rout the **left-hand** end of the tenon ②.  
 If you're using a "guard", flip it to the right end of the recess ③.  
 - Repeat for all required tenons.



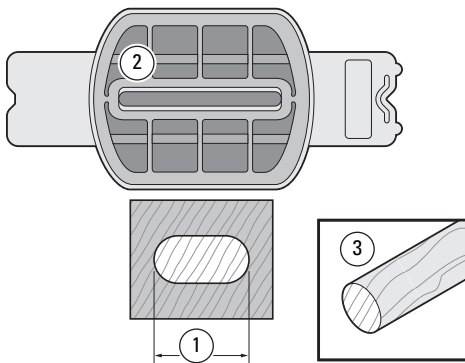
**6-10 Mortises** Release the table clamp. Use the small block between one stop and the stop post ① and lock the table clamp. Center a mortise piece under the sight and clamp ②. Set side-stop blocks or marks on the outriggers ③.



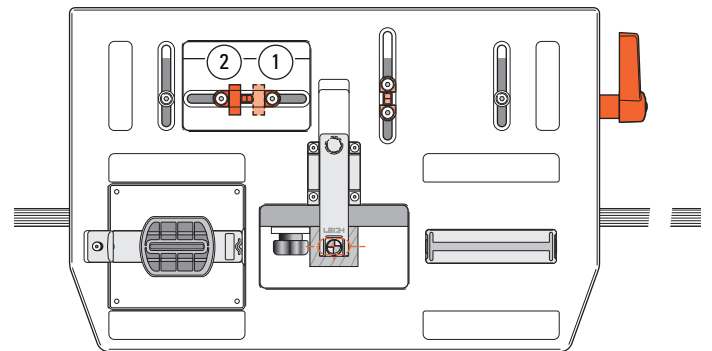
**6-11** Move the table **right** to the stop ①. Rout the **right-hand** end of the mortise ②, using the full length of the mortise guide.



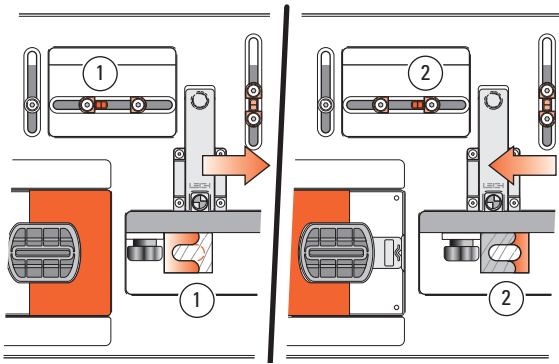
**6-12** Move the table **left** to its stop ①. Rout the **left-hand** end of the mortise ②. Repeat for all required mortises.  
 So to recap; for joints **longer** than the guides:  
 -move the table **right** and rout **right**,  
 -move the table **left** and rout **left**.



**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 2" [50mm] guide ②.  
 So,  $2'' - 1'' \div 2 = \frac{1}{2}$  [50mm - 25mm  $\div$  2 = 12,5mm].  
 Make a block  $\frac{1}{2}$ " [12,5mm]. **You will also need a short length of  $\frac{3}{16}$ " [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 ①② is exactly the same as for longer tenons set-up, **except when you come to rout.**

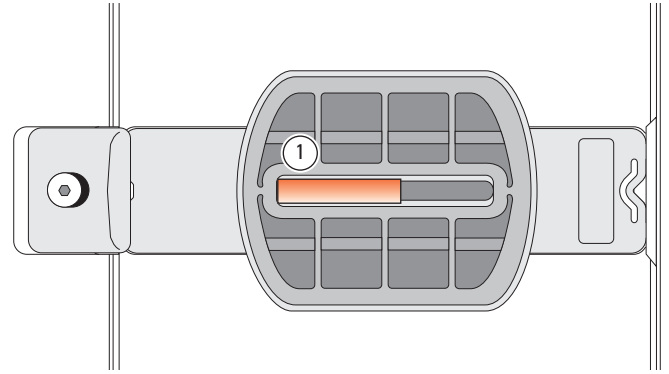


**6-15** Then it is:

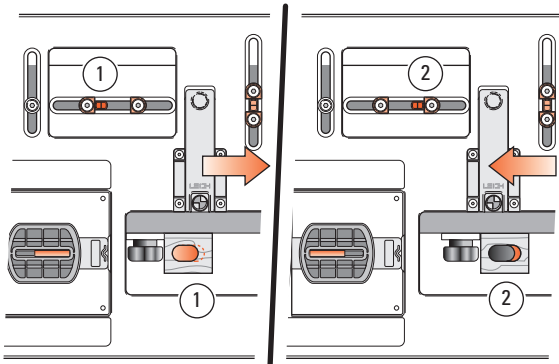
-Move table **right**; rout to the **left** ①.

-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  $\frac{3}{16}$ " [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". So you need a guard dowel to prevent cutting a mortise longer than required.

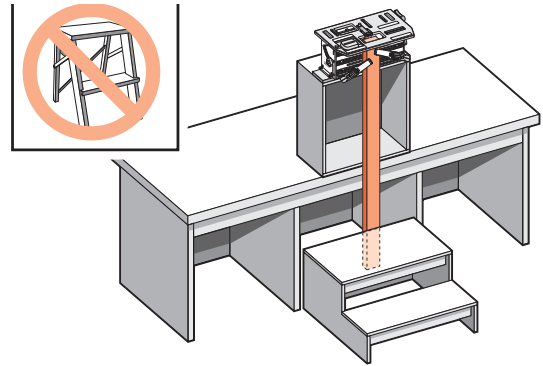


**6-17** So, for the shorter mortises:

Table **right**; dowel **right**; rout **left** side ①.

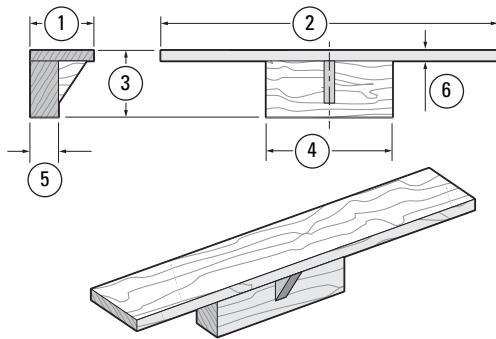
Table **left**; dowel **left**; rout **right** side ②.

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.



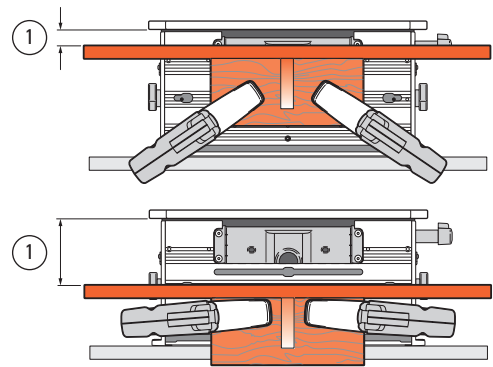
**6-18** To rout long vertical boards you could build a jig stand to mount on your bench. Make the stand/bench combination high enough to accept the desired board length. *Bolt securely to the bench.* Make a stable platform as shown here to stand on. **Don't use a folding step, these are unstable.**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

### Thicker and Wider Boards



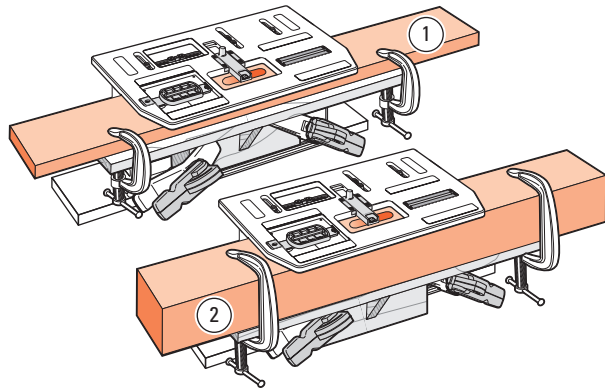
**6-19** Make this bracket to mount and mortise a wide board face, clamp pieces greater than Leigh Clamp 3" capacity, and center mortises on boards up to  $4\frac{5}{8}$ " [115mm] wide or even  $6\frac{3}{8}$ " [162mm].

- |                            |                            |                          |
|----------------------------|----------------------------|--------------------------|
| ① $4\frac{1}{2}$ " [115mm] | ③ $4\frac{3}{4}$ " [120mm] | ⑤ 2" [50mm]              |
| ② 24" [600mm]              | ④ 9" [230mm]               | ⑥ $\frac{3}{4}$ " [20mm] |

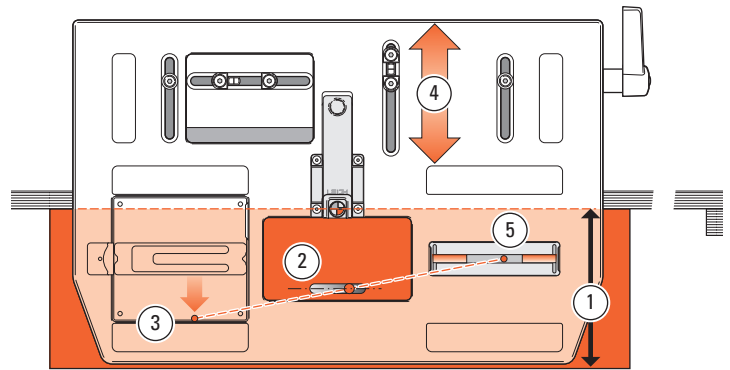


**6-20** Use the Leigh clamps to secure the bracket to the FMT Pro clamp face and adjust the distance below the table to slightly greater than the mortise piece thickness ①.





**6-21** Use C-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. Re-secure with the Leigh Clamps. The widest board in which a mortise may be centered is  $4\frac{5}{8}$ " [115mm] ①. The thickest depth capacity is 4" [100mm] ②.



**6-22 Mortises in center of boards  $4\frac{5}{8}$ " to  $6\frac{1}{2}$ " [115 to 165mm]** ①: Mark 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  $\frac{3}{16}$ " [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.* ■



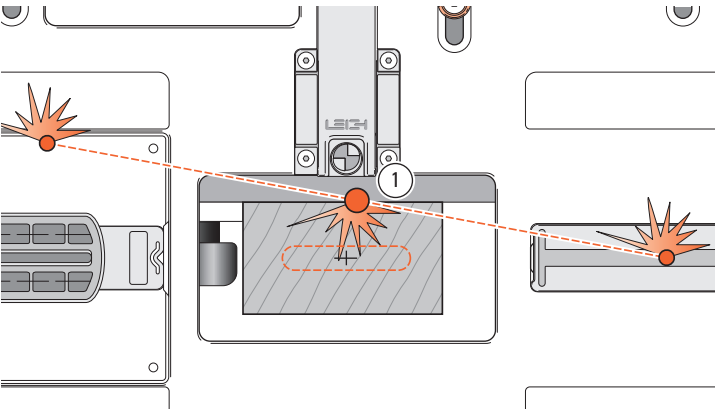
# Special Joints

- Angled Joints*
- Through Tenons*
- Bridle Joints*
- Asymmetric Tenons*
- Haunched Joints*
- Doweling*

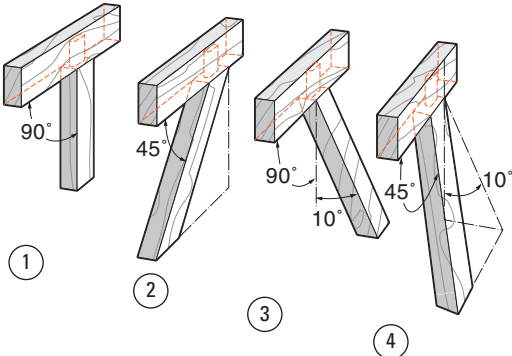
*Before using your Leigh FMT Pro you must have completed all of the preparatory steps including reading the router safety recommendations on the previous pages. If you haven't done so, it is essential that you do it now.*

**⚠ IMPORTANT SAFETY NOTE**

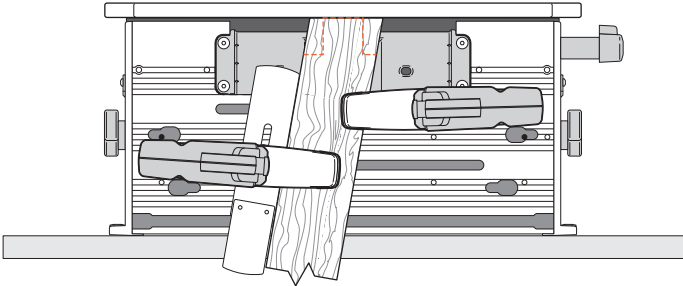
Take great care to not “trap” the bit against the side of tenon rails ①. Do not attempt to rout center tenons in rails thicker than 1<sup>5</sup>/<sub>16</sub>" [34mm] before referring to 5-39 through 5-44. Without using the table movement as prescribed, the bit would have to be plunged into the side of the tenon rail causing the bit to powerfully “drive” the router across the jig. **This could be dangerous and can damage the jig.**



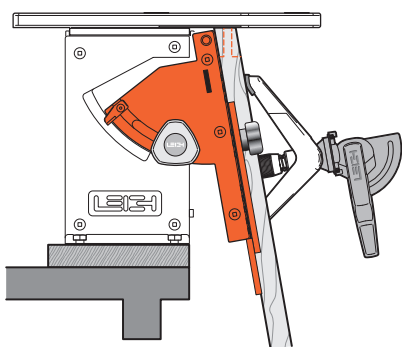
**Angled Joints**



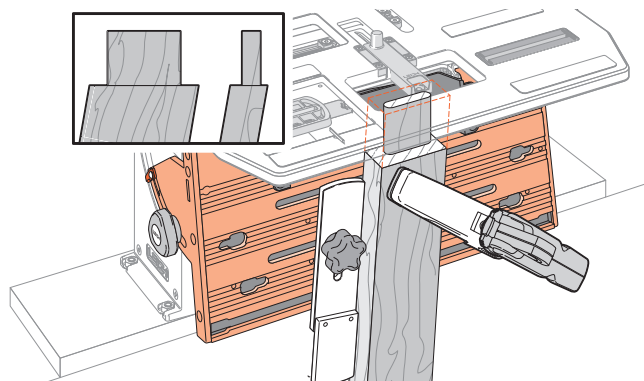
**7-1** The majority of frame joints are at 90° ① but the ability to angle joints is essential in, for example, chair construction. Whether these joints are single angles ② and ③ or a compound angle ④ they are easily achieved on the FMT Pro.



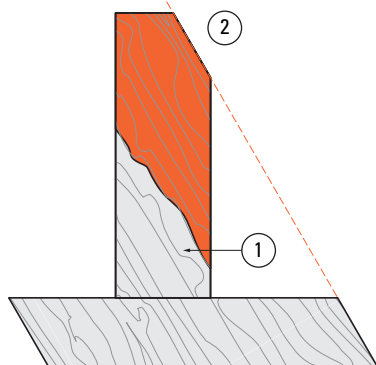
**7-2** Angling the sidestop fence gives a single angled joint in the left-right direction.



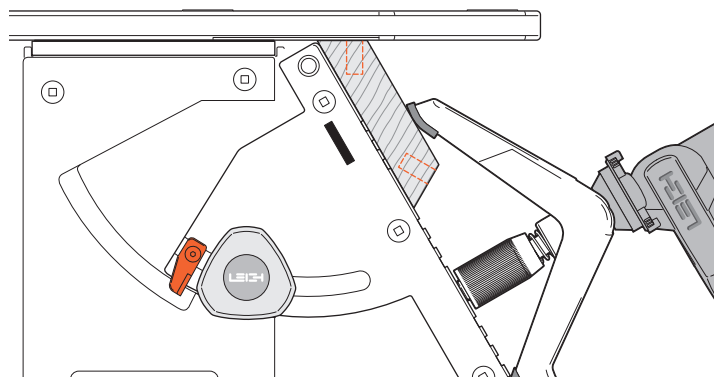
**7-3** Angling the clamp plate with vertical sidestops also gives a single angled joint in the front-back direction.



**7-4** Angling both fence and clamp plate give a double, or compound angled joint.

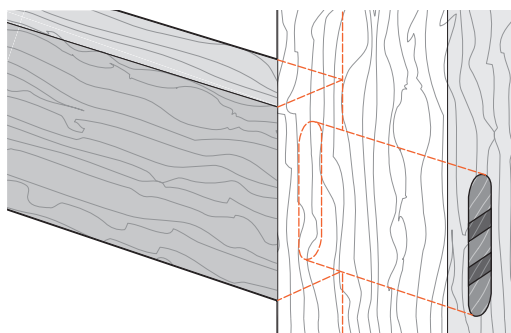


**7-5** The FMT Pro clamp plate can be angled up to 30° but it is doubtful you will ever need to approach even 10° on a mortise and tenon joint. The strength of a tenon across its grain lessens considerably as the angle increases ①. In addition, the length and position of the tenon is limited in slope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

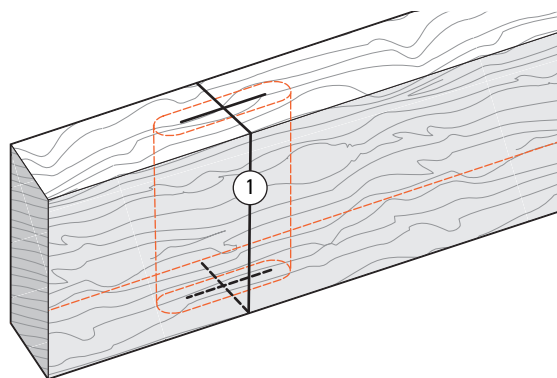


**7-6** However, you may for example, want to machine spline mortises or dowel holes in a stave type construction in, say, octagons at 22½°, or hexagons at 30°, so the 30° capacity may prove to be useful. You can then machine precisely fitting splines on the FMT Pro and trim them to length. ■

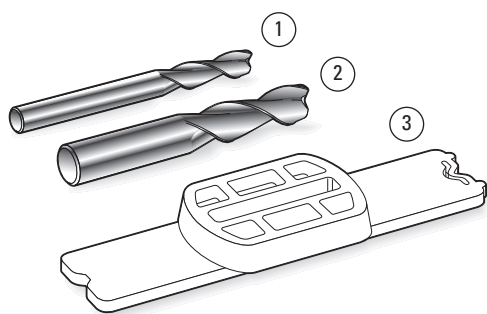
### Through Tenons



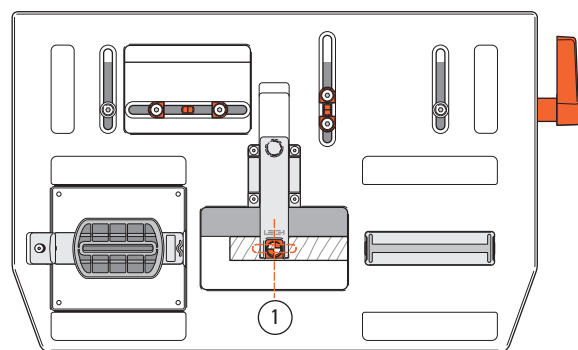
**7-7 Through Tenons** Occasionally, a design feature will call for through, exposed tenons, possibly “wedged” for decorative effect. The limited depth of cut of router bits can make this difficult, but the two-sized bit technique described previously, combined with the precision of the FMT Pro, makes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



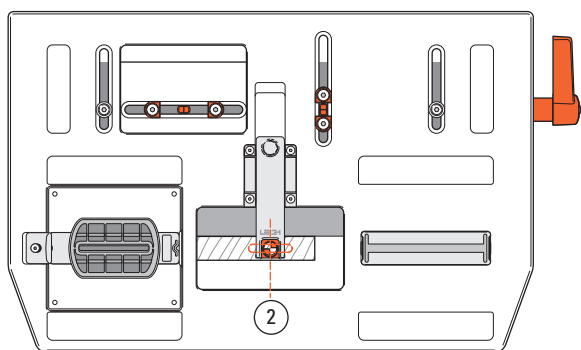
**7-8** The problem with through mortises is their great depth relative to the cutting depth and diameter of the bit. However, if the left-right part of the joint center mark ① is carefully squared around the mortise workpiece, it is possible to accurately plunge from **both sides**.



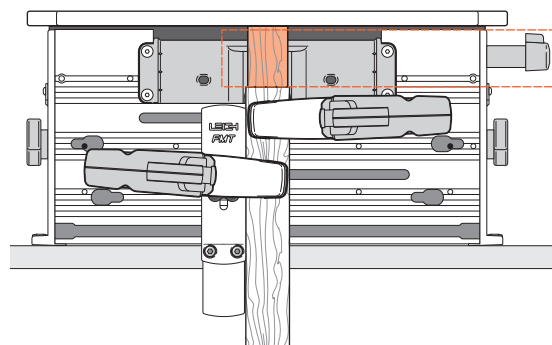
**7-9** Here's an example.  
 $\frac{1}{4}$ " [6mm] joint through  $1\frac{1}{2}$ " [35mm] deep mortise.  
 Select  $\frac{1}{4}$ " [6mm] bit for mortises ①.  
 Select  $\frac{1}{2}$ " [10mm] bit to rout the  $1\frac{1}{2}$ " [35mm] long tenon ②.  
 Select  $\frac{3}{8}$ " [8mm] guide ③ for length from the guide/bit selection chart in Appendix I.



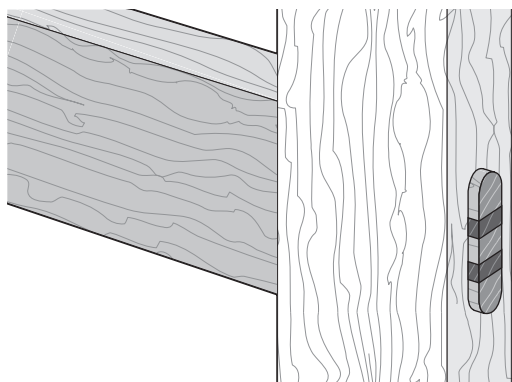
**7-10** Carefully sight the mortise taking particular care to center the "vertical" line ① in the sight. Plunge and rout down deeper than half the mortise board depth.



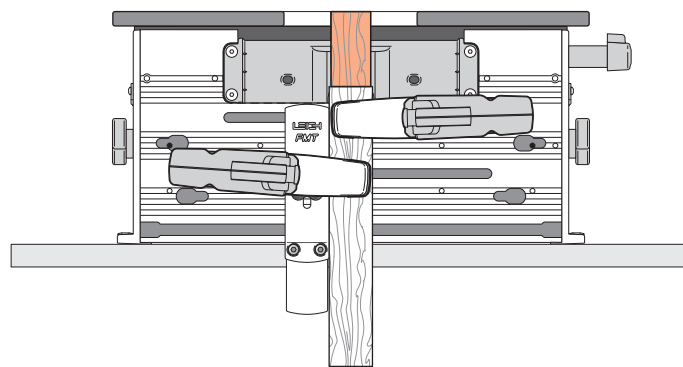
**7-11** Turn the mortise piece end for end and, keeping the same reference side of the mortise board to the clamp face, carefully sight the "vertical" mortise center mark ② and lock the table. Plunge and rout to clear the through mortise.



**7-12** Rout the tenons with the larger (longer) bit slightly deeper than the mortise depth.

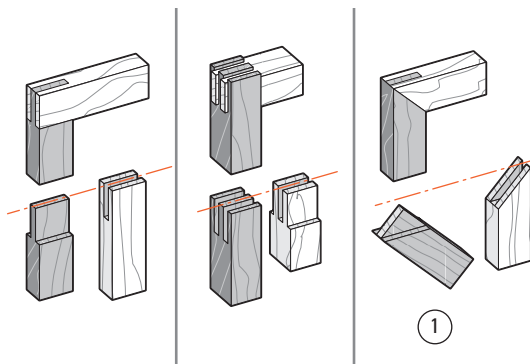


**7-13** It may even be possible to make tenons long enough to be raised if this decorative effect is desired. "Wedging" the tenons is a simple hand procedure and a nice decorative touch.

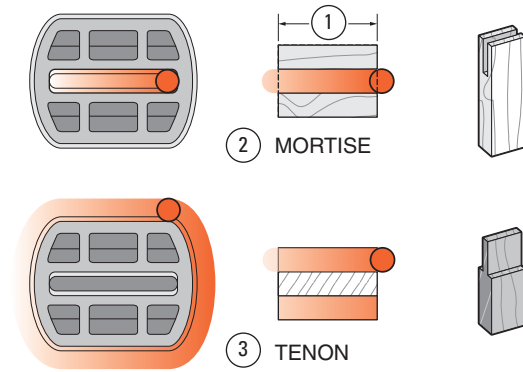


**7-14** If the tenon stock is smaller than the table opening it may be possible (after sighting) to slide the tenon workpiece up to almost touch the router base and thereby gain an extra  $\frac{1}{2}$ " [10mm] of tenon length. Assuming of course that the bit has sufficient cutting depth. ■

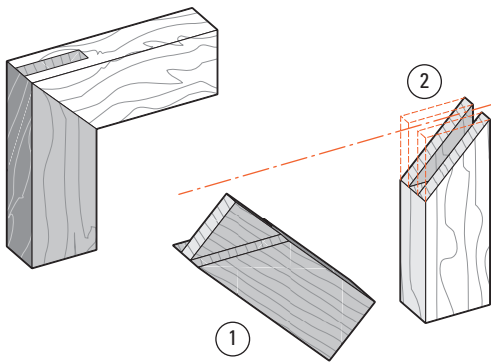
## Bridle Joints



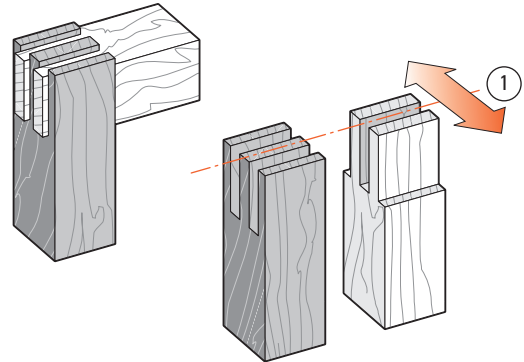
**7-15** Routing bridle joints on the FMT Pro is simple. All the workpieces (with the exception of the mitred tenon) ① are mounted vertically on the jig.



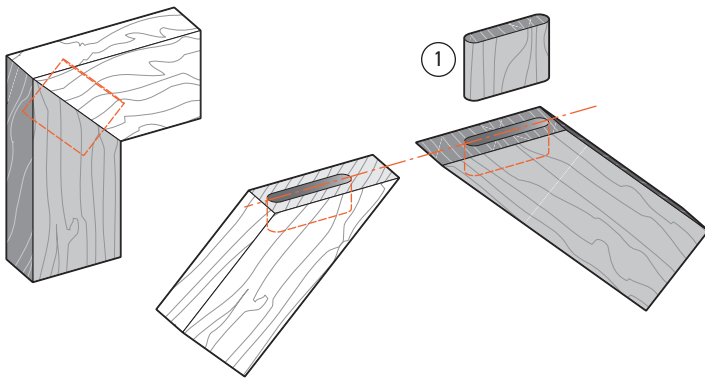
**7-16** Select a guide that is greater in length than the workpiece width ① by at least two bit diameters. Rout right through the “vertical mortise” ② and across the tenon sides ③. The bit will clear the edge of the workpiece before the guide pin reaches the rounded part of the guide.



**7-17** The mitred “tenon” is mounted at 45° on the clamp plate ①. The “mortise” end mitre ② is cut on the table saw after routing the mortise.



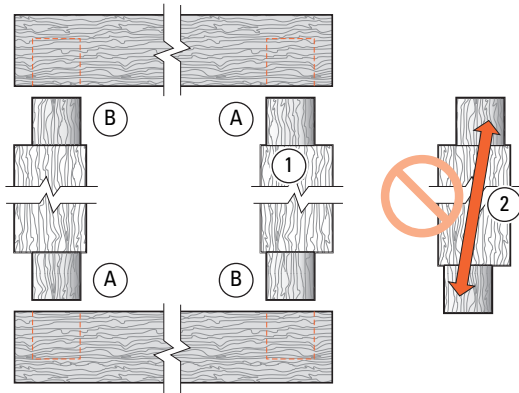
**7-18** Twin bridle joints use the technique described above combined with the table movement ① (see 5-12, Twin Joints).



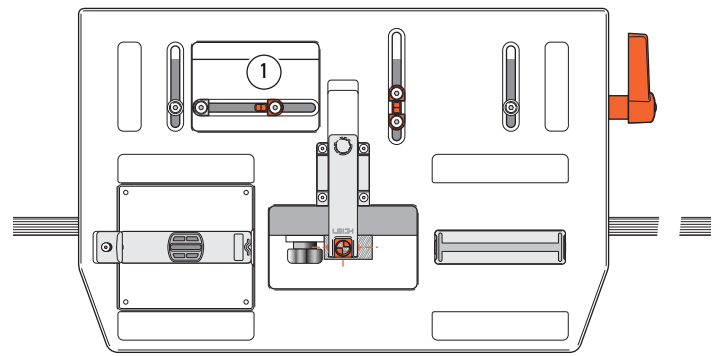
**7-19 Floating Tenons** A “floating” tenon in a mitred corner allows for a greater joint glue area at the inside of the corner. On this mitred corner, the workpieces are mounted in the jig at 45° and the mortises routed. The floating tenon ① is routed on the end of a vertically mounted scrap piece using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



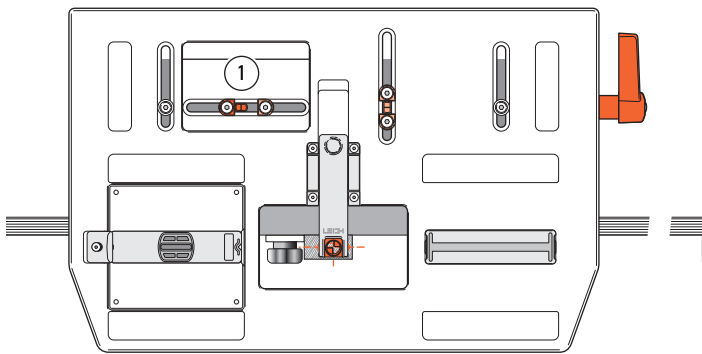
Asymmetric Tenons



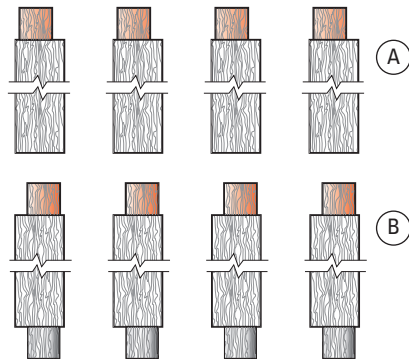
**7-20 Asymmetric Tenons** Not all tenons are centered on the long axis of the workpiece end ①. This means that tenons “A” are routed at one table sighting and tenons “B” at a second table sighting. If you don’t, the two tenons will be diagonally opposed to each other ②.



**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...

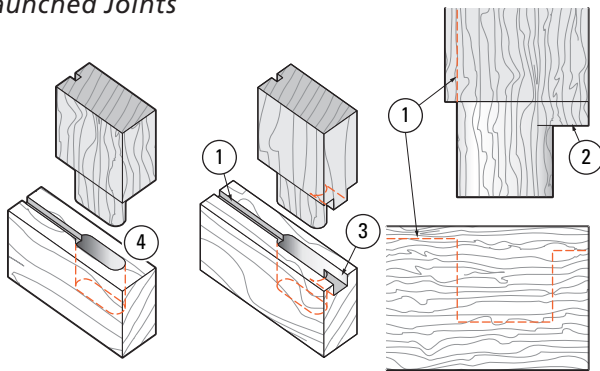


**7-22** ...sight tenon “B” and set the left-hand limit stop to the left of the post ①. Now alternately rout tenons “A” and “B”, moving the table left and right each time.

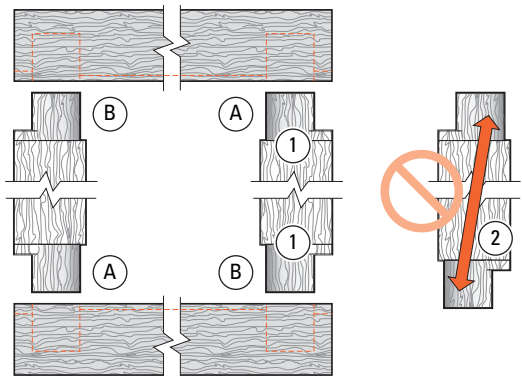


**7-23** Of course, if you don’t trust yourself to get the sequence correct, you could rout all the “A” tenons first, then change the table one time to rout all the “B” tenons. This latter procedure would be the simplest way to rout haunched tenons (see next section). ■

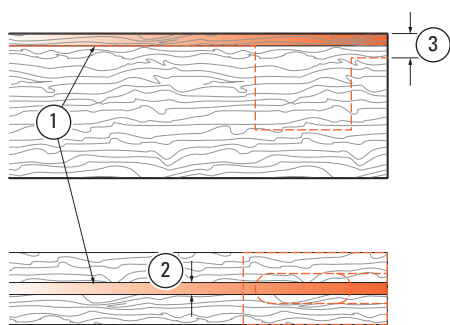
Haunched Joints



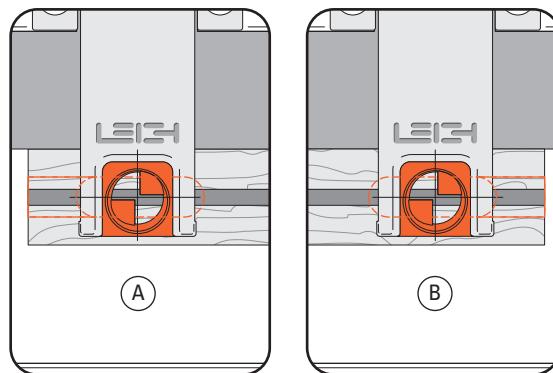
**7-24 Haunched Joints** Frame and panel door construction can call for rails and stiles to be grooved for the panel ①, and the tenons haunched ②, both for joint stability and to fill the end of the stile groove which is sometimes run right through ③. This is not as common as it once was. Routers and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



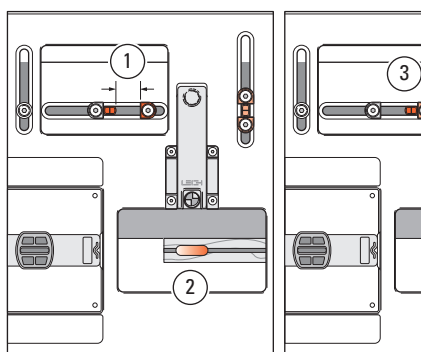
**7-25** Haunched mortises and tenons are “handed”, and require separate setups for each. e.g. if these two tenons ① were routed with the same jig setup, the result would be offset tenons ②. So mark out the two types of corners as “A” and “B” mortises and tenons.



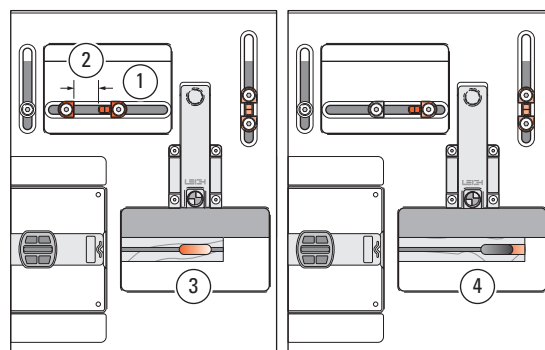
**7-26** First, groove all the workpieces ①. The groove should be less than the mortise width ② and shallower than the haunch recess ③.



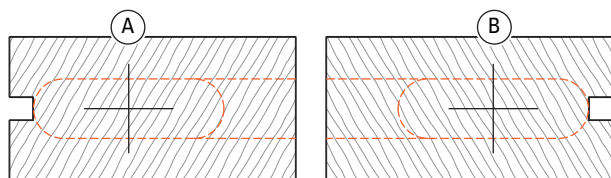
**7-27** Sight both the “A” and “B” mortises. Set stops or mark the outrigger for repeatable successive workpieces. Position and lock the  $\square$ FB Limit Stops against the post.



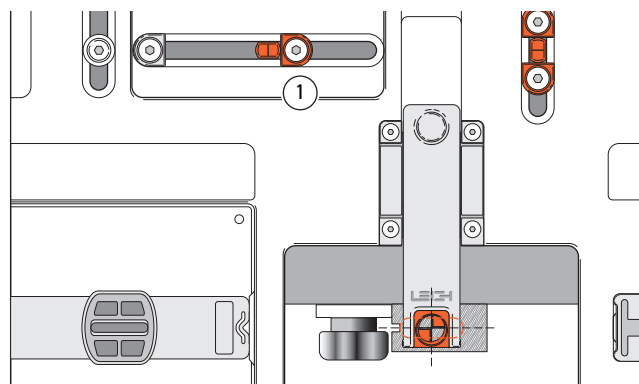
**7-28 “A” Mortises and Haunch Recesses** Set right-hand  $\square$ LR Limit Stop from the post, say, 3 quarters guide length ①: e.g. 1” guide, move  $\frac{3}{4}$ ”. Table still in “mortise center” position, rout mortise full depth ②. Raise the plunge. Move table left to the stop ③. Lower the bit to 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.



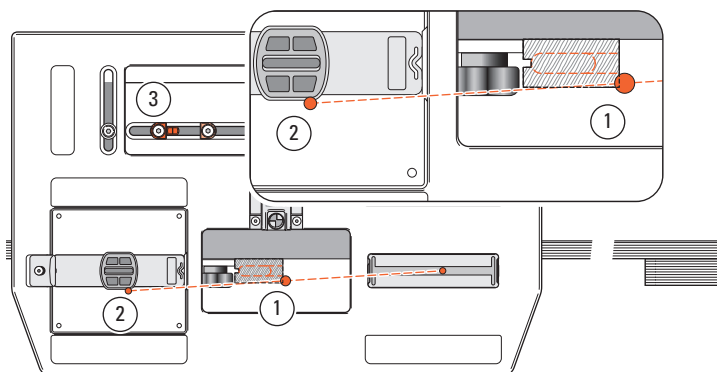
**7-29 “B” Mortises and Haunch Recesses** Move the table left to touch the right-hand  $\square$ LR Limit Stop against the post ① and lock the table. Move the left-hand  $\square$ LR Limit Stop (by three quarters of the guide length) to the left ②. Rout the “B” mortises ③ and haunch recesses ④ using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



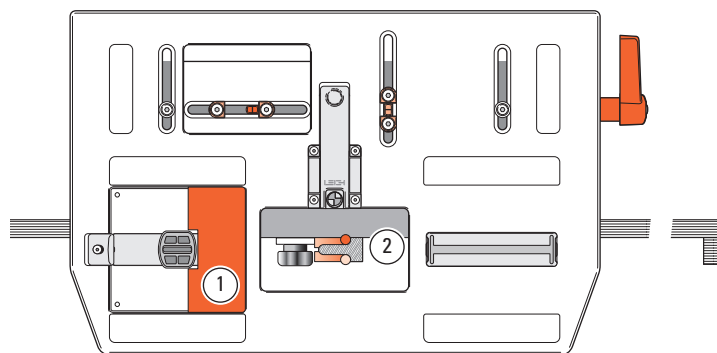
**7-30 Routing the Tenons** Mark the tenon centers “A” and “B”. Remember, the tenons are “off center” and each end of the tenon pieces are marked off center in opposite directions. Prepare and make a couple of extra (scrap) tenon pieces to use in setting haunch bit depth later.



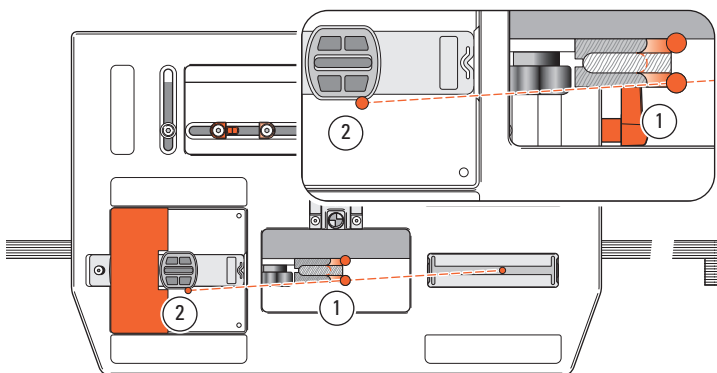
**7-31 “A” tenons.** With the workpiece centered on the jig, sight the tenon center and set the right hand  $\square$ LR limit stop to the post ①.



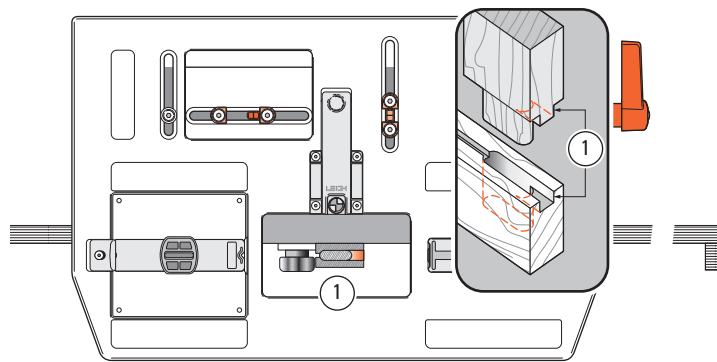
**7-32** Move the table right to a position where the bit will clear the end of the haunch ① while the guide pin is still on the straight part of the guide ②. Set the left hand **LR** limit stop to its post ③.



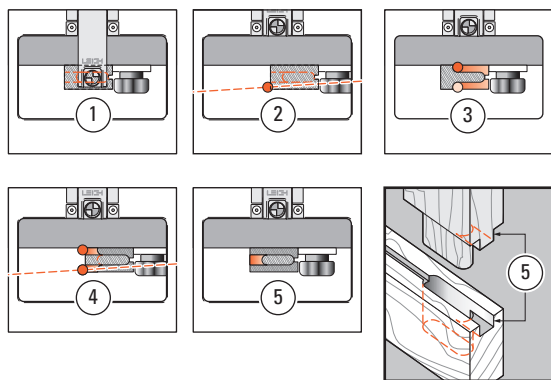
**7-33** Move the table to the left again and if necessary, set a “guard” piece in the guide recess ① to prevent routing around the right end of the tenon ②. Rout the left end of the tenon (shaded area) at full shoulder depth.



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

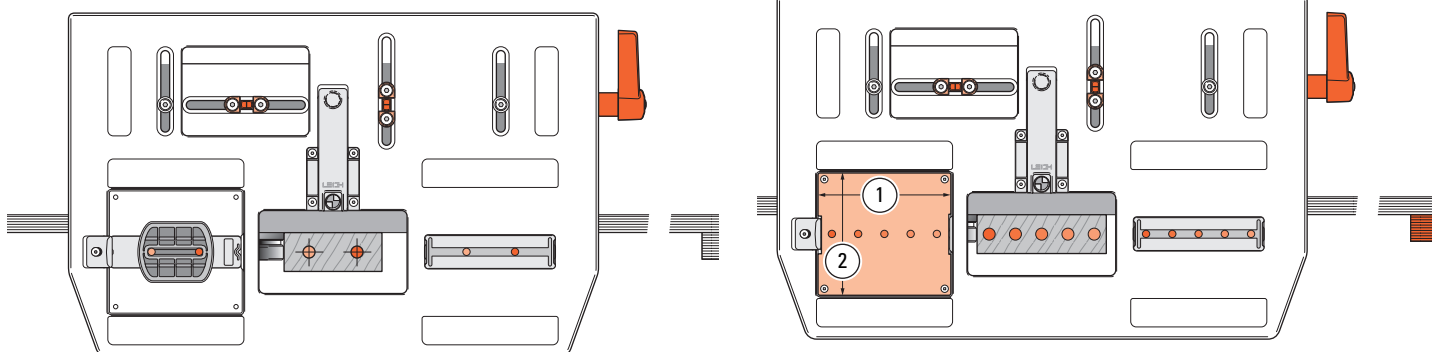


**7-35** Move the table left, remove the guard from the bit recess. a **Depth:** You will have to preset the plunge router depth-of-cut rod and turret so that the routed haunch exactly equals the depth of the haunch recess ①. Use the scrap test tenons to achieve this setting by measurement and a little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



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

## Doweling



**7-37 Doweling** Sometimes where the strength of a mortise and tenon is not required, doweling may be a suitable alternative. A bonus use of the FMT Pro 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, or...

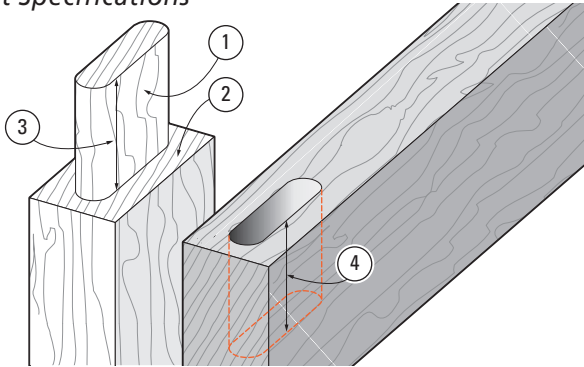
**7-38** ...make up your own row of dowel hole guide holes in a piece of plywood or MDF which can be retained in the guide recess with small flat head screws, using the four countersunk holes through the table. Make this auxiliary “guide” dimensions:  $4\frac{5}{32}$ ① x  $3\frac{3}{4}$ ② [105 x 95mm]. Don't forget, you can use the table movement and limit stops to double or quadruple the number of hole positions in the ends or side edges of boards; all precisely indexed to each other. ■

## FMT PRO Appendix I

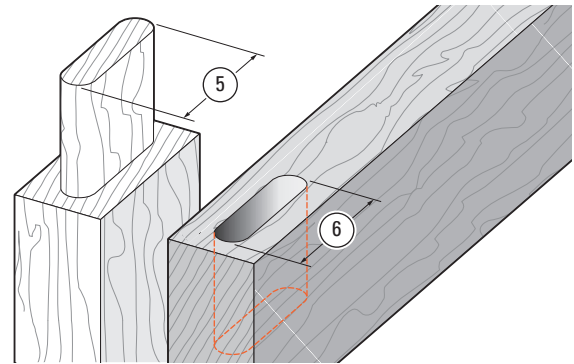
# Joint Specifications, Guide & Bit Selection

**Foreword** The illustrations and specifications in this Appendix show the largest tenon rail and tenon sizes possible on the FMT Pro, 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

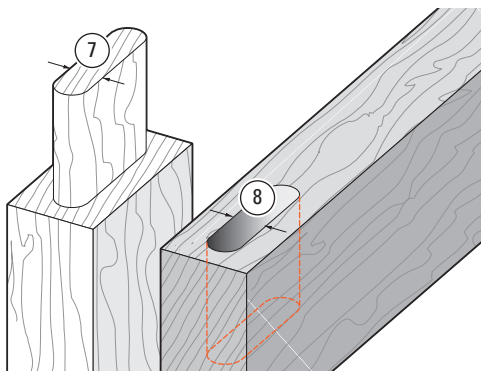


**A1-1 Joint Terminology** The tenon sides are the “Cheeks” ①. The tenon shoulders are called (luckily) the “Shoulders” ②. Unfortunately, references to dimensions of mortises and tenons do not share matching terminology, so... Long or short tenons ③ fit into deep or shallow mortises ④.  
**Tenon Length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



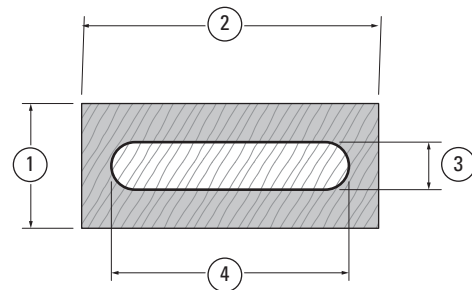
**A1-2** Wide or narrow tenons ⑤ fit into long or short mortises ⑥.

**Tenon Width = Mortise Length.**



**A1-3** Thick tenons or thin tenons ⑦ fit into wide or narrow mortises ⑧.

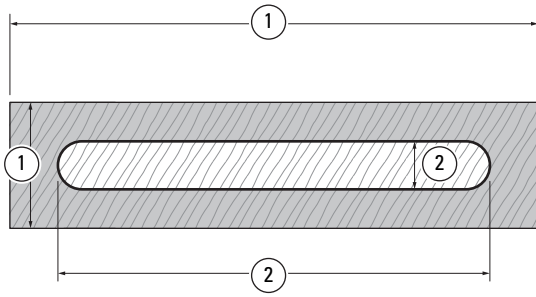
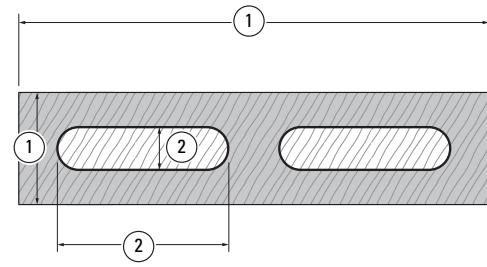
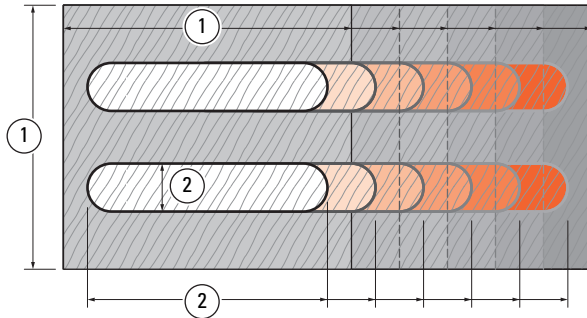
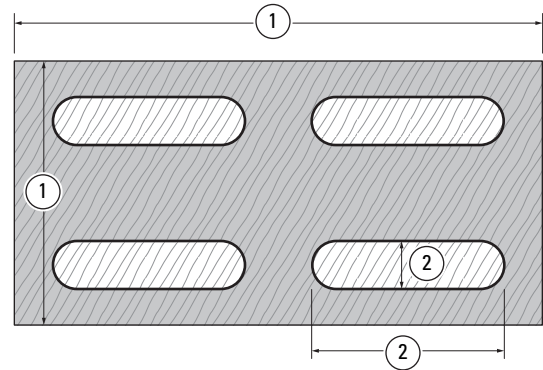
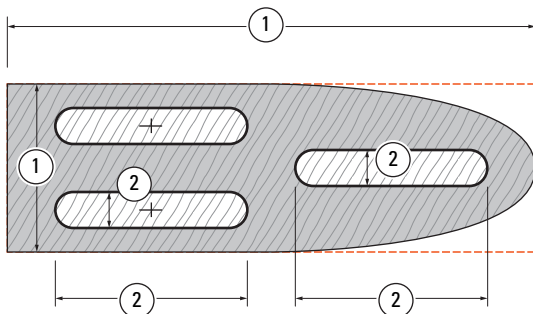
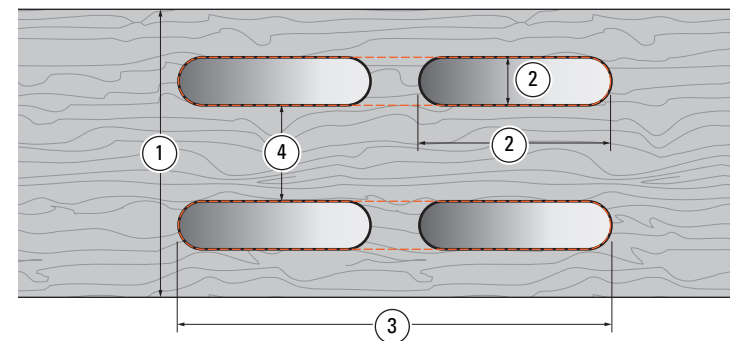
**Tenon Thickness = Mortise Width.**



### A1-4 Largest Single Rail and Tenon Using One Table Position with 1/4" Bit

- ① Workpiece width 1 5/16" [34mm]
- ② Workpiece length 3 1/8" [80mm]
- ③ Tenon width 1/2" [12mm]
- ④ Tenon length 2 1/2" [65mm]

*Note: To rout single tenons in stock thicker than 1 5/16" [34mm] would require the bit to be plunged into the edge of the workpiece and so “trapping” the bit. That could be dangerous, so follow the “Third Tenon” procedure (see 5-39 through 5-44).*

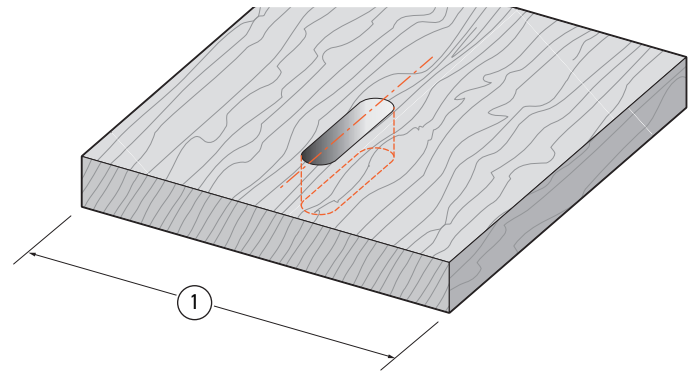
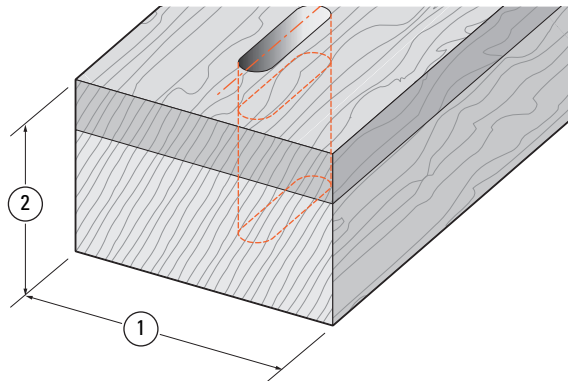
**A1-5 Largest Single Rail and Tenon -Two Table Positions.**Workpiece  $1\frac{5}{16}$ " x  $5\frac{1}{2}$ " [34 x 140mm] ①.Tenon  $\frac{1}{2}$ " x  $4\frac{1}{2}$ " [12 x 115mm] ②.Guide  $\frac{1}{2}$ " x  $2\frac{1}{2}$ " [12 x 65mm].*Note: Using three table positions tenon length ② may be up to 5" [125mm]***A1-6 Largest Tandem Double Tenon -Two Table Positions.**Workpiece  $1\frac{5}{16}$ " x  $5\frac{1}{2}$ " [34 x 140mm] ①.Tenons  $\frac{1}{2}$ " x 2" [12 x 50mm] ②.Guide  $\frac{1}{2}$ " x 2" [12 x 50mm].**A1-7 Largest Side-by-Side Twin Tenon -Two\* Table Positions.**Workpiece 3" x  $5\frac{1}{2}$ " [76 x 140mm] ①.Tenons  $\frac{1}{2}$ " x  $2\frac{1}{2}$ " [12 x 65+mm] ②.Guide  $\frac{1}{2}$ " x  $2\frac{1}{2}$ " [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  
Using Four table positions.**Workpiece 3" x  $5\frac{1}{2}$ " [76 x 140mm] ①.Tenons  $\frac{1}{2}$ " x 2" [12 x 50mm] ②.Guide  $\frac{1}{2}$ " x 2" [12 x 50mm].**A1-9 Largest Triple Tenon -Five\* Table Positions.**Workpiece  $1\frac{3}{4}$ " x  $5\frac{1}{2}$ " [44 x 140mm] ①.Tenons  $\frac{3}{8}$ " x 2" [10 x 50mm] ②.Guide  $\frac{3}{8}$ " x 2" [10 x 50mm].*\*Note: To avoid "trapping" the bit on larger workpieces it is necessary to rout the third tenon in three different  $\frac{3}{8}$ FB table positions. See Chapter 5, Triple Joints.***A1-10 Thickest Mortise Board and Mortise Centers.  
-Four Table Positions**

Thickness 3" [75mm] ①.

4 Mortises  $\frac{1}{2}$ " x 2" [12 x 50mm] ②.2 Mortises  $\frac{1}{2}$ " x  $4\frac{1}{2}$ " [12 x 115mm] ③.Spacing  $\frac{9}{16}$ " to 1" [13 x 26mm] ④.

Board Width Clamping Capacity: 5" [128mm].



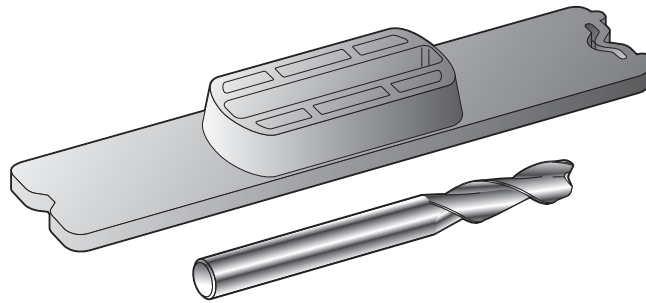
**A1-11 Widest, Deepest Workpieces for Mortising to Center**Width up to 4 $\frac{5}{8}$ " [115mm] ①.

Depth up to 4" [100mm] ②.

Note: See 6-21 mounting instructions for these pieces.

**A1-12 Maximum Width Board for Mortising to Center**Width from 4 $\frac{5}{8}$ " [115mm]up to 6 $\frac{1}{2}$ " [165mm] ①

See 6-22 for special instructions. ■

**Guide and Bit Selection****Guide and Bit Selection**

Use the following charts 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 as described in 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.

INCH BIT SPECIFICATIONS					
LEIGH BIT ITEM NO.		Mortise Size Cutting Diameter	HSS Cutting Depth	Solid Carbide Cutting Depth	Shank Diameter
HSS Spiral Upcut	Solid Carbide Spiral Upcut				
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"

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

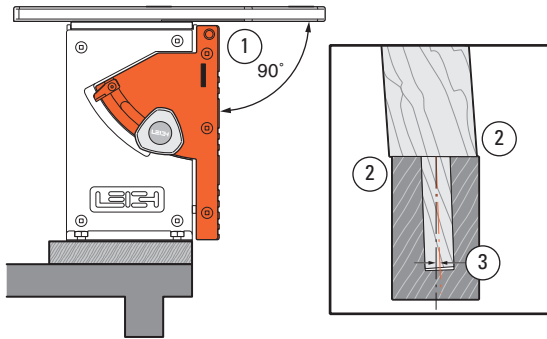
**METRIC BIT SPECIFICATIONS**

**Important Note:** Due to limited availability of metric bits in North America, Leigh does not stock or sell metric bits. Contact the national Leigh distributor or local supplier in your region.

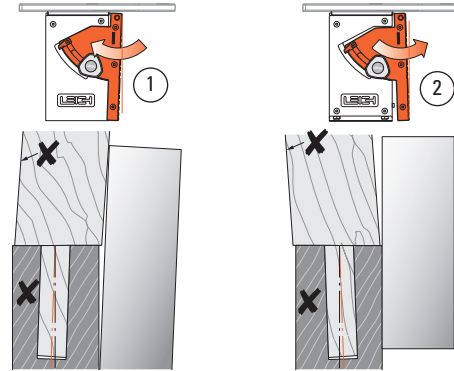


## FMT PRO Appendix II

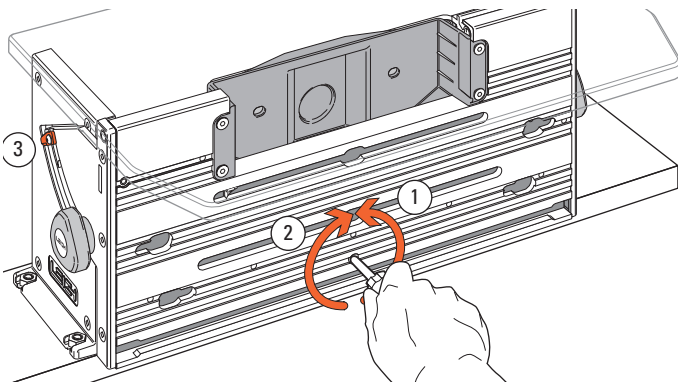
# Jig Adjustments



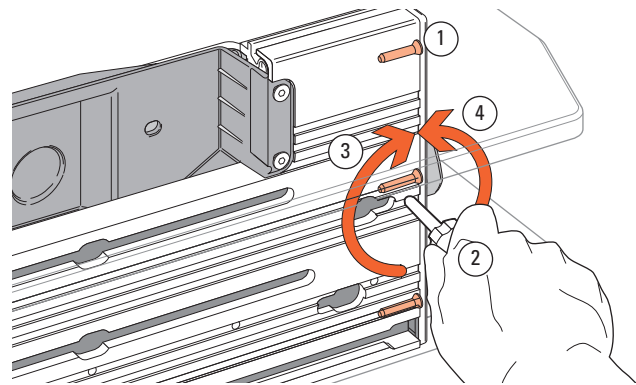
**A2-1 Clamp Plate** The Clamp Plate is factory set square to the table ①. However, this does not guarantee perfectly in-line joints. If your router shaft and bit are not perpendicular to the router sub-base and the Leigh Sub-Base, then the bit will not be square to the Jig Table (nor parallel to the 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.



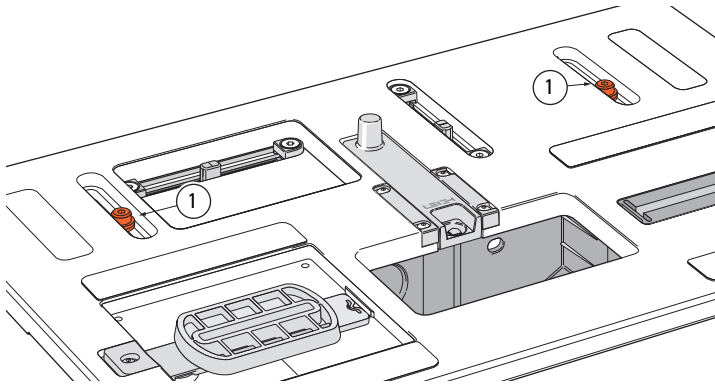
**A2-2** Check your test joints for alignment with a straightedge. The cross represents the inside face toward the clamp face. The left example shows the clamp plate should be adjusted in toward the jig body ①. The right example shows the clamp plate should be adjusted away from the jig body ②. Test and adjust the Clamp Plate angle (see A2-3) until the workpieces are in the same plane, with no joint misalignment.



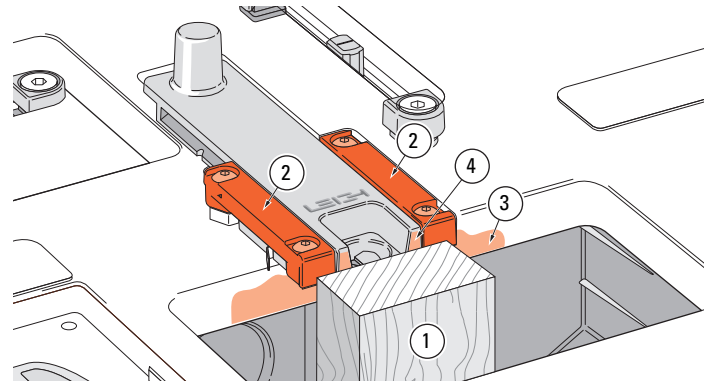
**A2-3** The adjusting screw for setting the clamp plate is in the lower center of the plate. Loosen the quadrant knobs. Use the hex screwdriver to turn the screw counterclockwise to move the plate in ①. Turn the screw clockwise to move the plate out ②. The screw is treated with Loctite™ to prevent accidental rotation. When the clamp plate is square, re-zero the angle indicator if necessary ③.



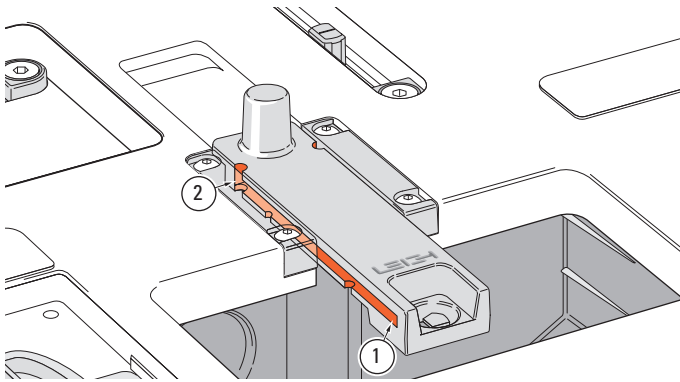
**A2-4 Joint Alignment** The Clamp Plate is precision-set parallel to the table at the factory and should never need attention. However, if it should need adjustment, here's how. First, loosen the two quadrant knobs and tilt the Clamp Plate up approximately 1/4" and re-tighten the knobs. Then **slightly loosen** the three screws holding the right end quadrant using the square drive screwdriver ①. Use the hex driver to turn the setscrew in this hole ② clockwise to move the right end of the Clamp Plate in toward the jig ③; counterclockwise to move it out ④, then tighten the quadrant screws ①. The adjusting screw is 28 pitch; one turn is 0.036" [0.9mm]. That's a lot. If adjustment is ever necessary it will likely be a small fraction of a turn.



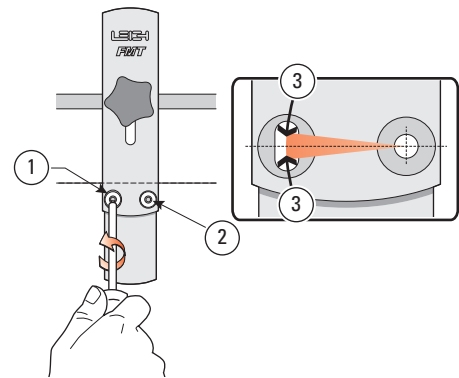
**A2-5 Table Clamp Setting** The setting for this is factory pre-set using a torque tool. Should you need to adjust the pressure, lock the table and lightly tighten the two clamp screws **equally** ①. Do not adjust these screws with the table unlocked. You should be able to work the table lock lever with quite light pressure. When locked, it should not be possible to move the table with firm side to side hand and arm pressure. When unlocked, it should be easy to position the table without sticking. The screws are treated with Loctite™ to prevent accidental rotation.



**A2-6 Sight Position** The sight position is factory set. If you ever need to reset it here's how. Clamp a straight vertical rail that projects through the table bit opening ①. Slightly loosen the four small hex cap screws that hold the two sight rails ② using the provided hex key. Move the table forward until the rear edge of the bit opening ③ firmly touches the vertical rail ①, and lock the table. Pull the sight and rails against the wood piece ④; at the same time centring the rear end of the sight in the recess. Tighten the four screws.



**A2-7 Jig Maintenance** Very little maintenance is required. Fine dust build-up in the front and rear sight stops should be removed from time to time. The end of the small hex key or a piece of wire will do the trick. At the front ① and with the sight to the rear position at ②. Dusting off with compressed air (if available) will keep the jig clean.

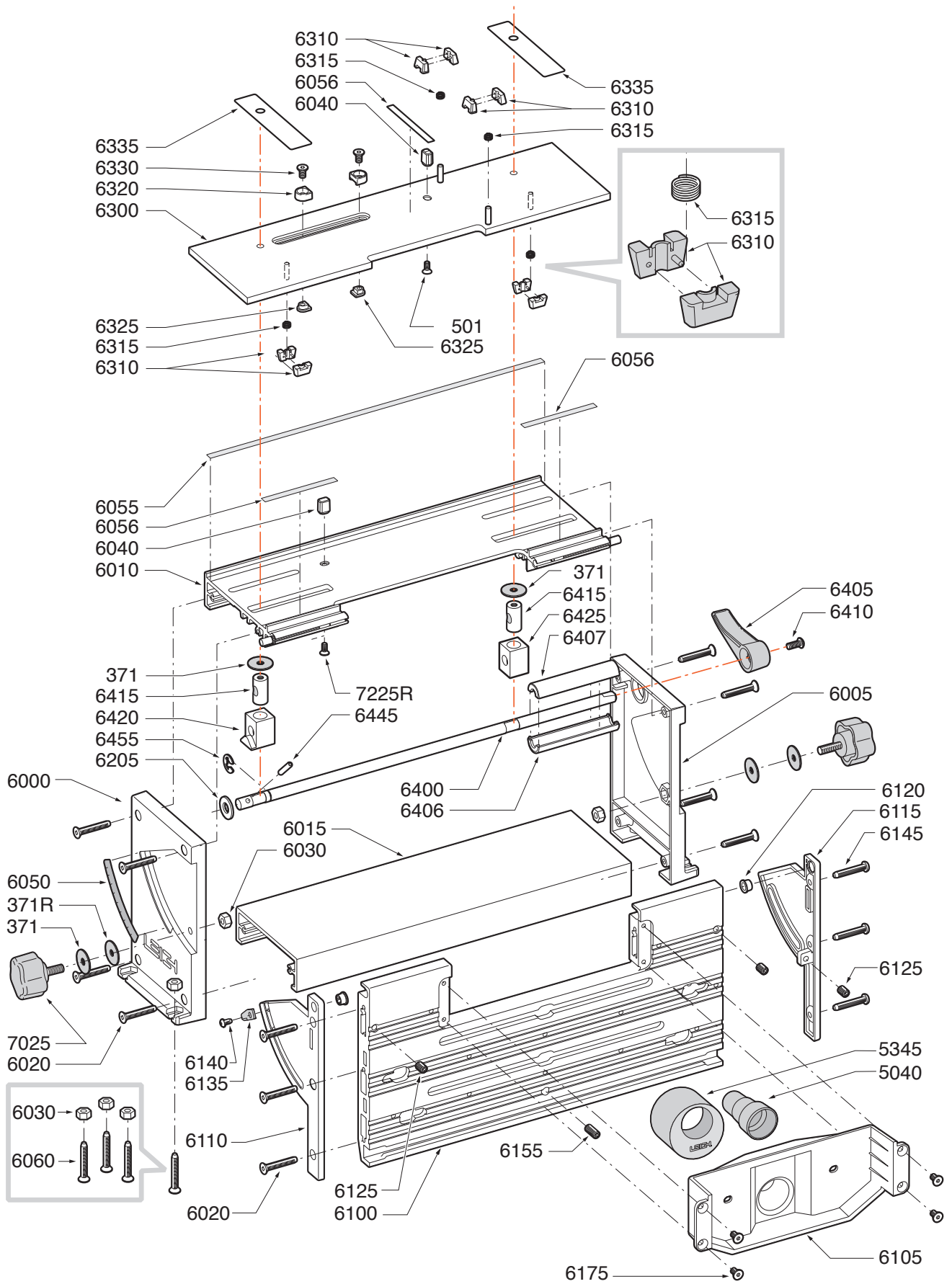


**A2-8** The sidestop fence is squared at the factory, but check your first test joints. If your router/bit is not perfectly perpendicular to the table adjust the sidestop fence: slightly loosen the 'pivot' screw ① and the 'lock' screw ②. Adjust the angle ③ to match the bit and retighten. Rout test joints to confirm correct setting. Once locked in this position it should never need adjusting when used with that same router. ■

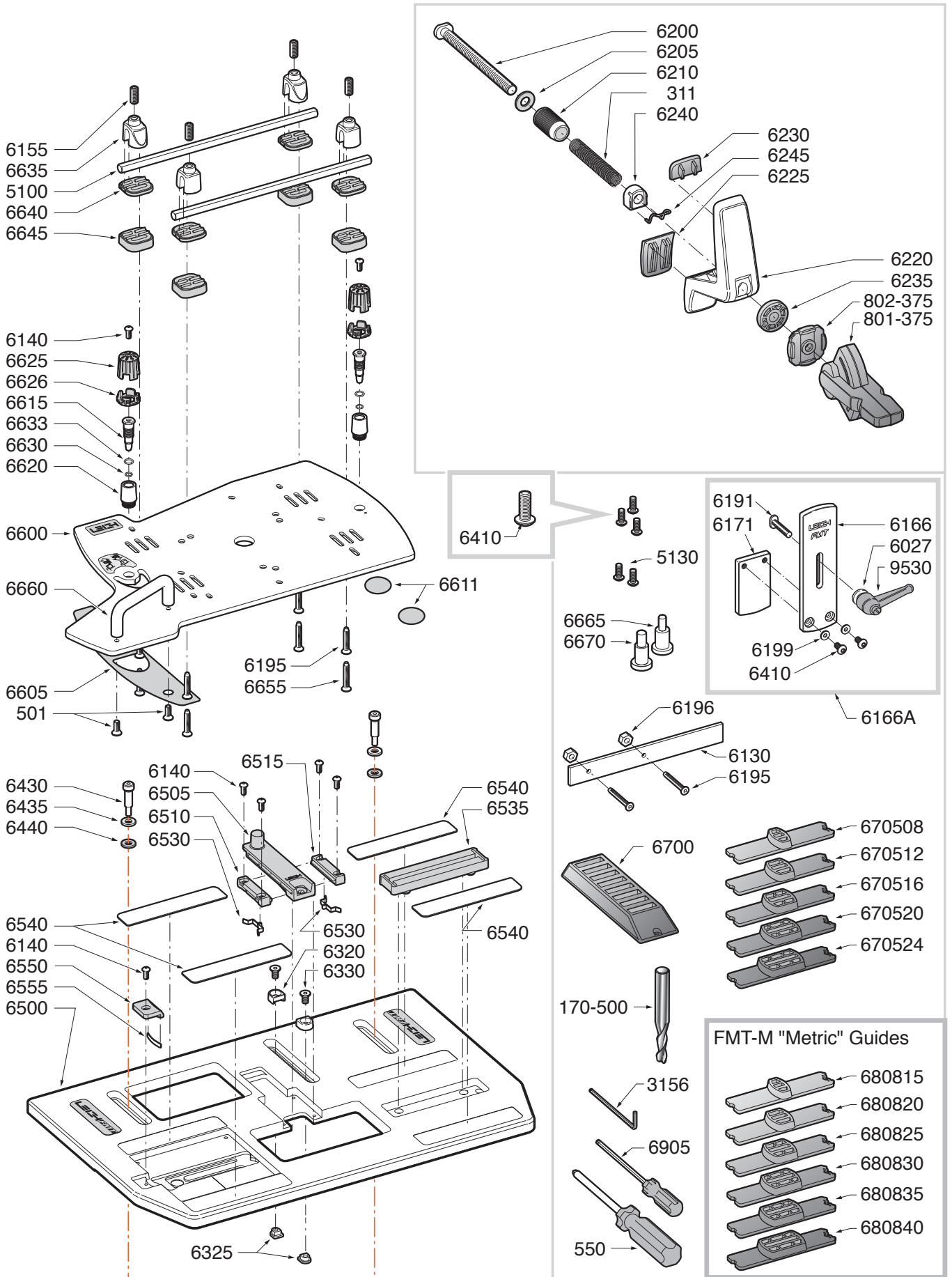


*FMT PRO Appendix III*  
**FMT Pro Parts List**

PART NO.	QUANTITY PER JIG	PART DESCRIPTION
311	2	1/2" x 3" Compression Springs
371	4	1/4" x 7/8" x .031" Nylon Washers
371R	2	9/32" x 7/8" x .016" Nylon Washers
501	3	8-32 x 3/8" Square Socket No.2 Robertson
5040	1	Vacuum Hose Adaptor – Small
5100	2	Sub-Base Fence Rods
5130	2	M6x14mm Hex Socket Button HD Cap Screws (for Festool)
5345	1	Vacuum Hose Adaptor – Large
6000	1	LH. End-Housing
6005	1	RH. End-Housing
6010	1	Top Extrusion
6015	1	Bottom Extrusion
6020	11	10-1 1/4" Self tapping # 2 Robertson Oval HD Screws
6030	6	1/4 - 20 Hex Nuts (for Quadrant Knobs & Jig Hold-down)
6040	2	Limit Stop Posts
6050	1	Angle Indicator Decal
6055	1	UHMW Strip Long
6056	3	UHMW Strip Short
6060	4	1/4-20 x 1" Flat HD Machine Screws ( Jig Hold-down)
6100	1	Clamp Plate
6105	1	Vacuum Box
6110	1	LH Quadrant
6115	1	RH Quadrant
6120	2	Quadrant Bushings
6125	3	Hex Socket Flat Point Set Screws 1/4-28 x 3/8"
6130	2	Outrigger Bars
6135	1	Quadrant Angle Indicator
6140	8	6-32 X 3/8" Hex Socket Button HD Screws
6145	3	10 x 1 1/4" Self Tapping #2 Robertson SQ Drive Pan Hd Screws
6155	5	Hex Socket Flat Point Set Screw 1/4-28 X 5/8"
6166A		Sidestop Fence Assembly complete
6027	1	Washer - 3mm
6166	1	Sidestop Fence Body
6171	1	Sidestop Squaring Block
6191	1	T Bolt
6199	2	Washers
6410	2	10-24 x 3/8" Hex Socket Button HD Cap Screw
9530	1	Lever
6175	4	10-24 x 1/2" Flat HD Hex Socket Machine Screws
6195	8	8-32 x 3/4" Flat HD Machine Screws ( for Outrigger & Low Shim Spacers)
6196	4	8-32 Hex Nuts (for Outriggers)
6200	2	Clamp T-Bolts 3/8"-16
6205	3	3/8" x 3/4" x .062" Nylon Flat Washers
6210	2	3/8"-16 Clamp T-Bolt Brass nuts
6220	2	Clamp Arm
6225	2	Clamp Arm Heel Pads
6230	2	Clamp Arm Toe Pads
6235	2	Clamp Swivel Pads
6240	2	Clamp Lifters
6245	2	Clamp Lifter Springs
7025	2	Quadrant Knobs
7225R	1	Top Extrusion Stop Post Screw
801-375	2	Cam-Action Speed-Clamps
802-375	2	Speed-Clamp Step Washers



PART NO.	QUANTITY PER JIG	PART DESCRIPTION
6300	1	Intermediate Plate Assembly c/w pressed-in Pins
6310	4 pairs	Wedge Blocks
6315	4	Wedge Block Compression Springs
6320	4	Limit Stops
6325	4	Limit Stop Nuts
6330	4	10-24 x 3/8" Hex Socket Nyloc Flat HD Machine Screws
6335	2	UHMW Glides
6400	1	Table Clamp Rod
6405	1	Table Clamp Handle
6406	1	Clamp Handle Sleeve- Lower
6407	1	Clamp Handle Sleeve- Upper
6410	6	10-24 x 3/8" Hex Socket Button HD Cap Screw
6415	2	"Pull Down" Clamp Block
6420	1	LH "Push-Up" Clamp Sleeve
6425	1	RH "Push-Up" Clamp Sleeve
6430	2	Hex Socket HD Shoulder Screws 1/4" x 3/4" (10-24)
6435	2	1/4" Flat Washers SS
6440	2	1/4" Fibre Washers
6445	1	5/32" x 1" Spring Pin
6455	1	SnapRing 3/8" x .035" thick
6500	1	Table Plate Assembly c/w Decals & Teflon Pads
6505	1	Sight
6510	1	LH Sight Rail
6515	1	RH Sight Rail
6530	2	Sight Rail Spring Detents
6535	1	R.H. Guide Pin "Track"
6540	4	Teflon Decal Pads
6550	1	Guide Latch
6555	1	Guide Latch Spring
6600	1	Sub-Base Plate Assembly c/w Decals & Teflon Pads
6605	1	LH Teflon Pad
6611	2	Teflon Discs
6615	2	Guide Pins
6620	2	Guide Pin Bushes
6625	2	Guide Pin Knobs
6626	2	Guide Pin Height Washers
6630	2	O-rings 4.5mm I.D. x 1mm
6633	2	O-rings 7.0mm I.D. x 1mm
6635	4	Sub-Base U-posts ( includes 2 screws in each)
6640	4	"Low" Shim-Spacers
6645	4	"High" Shim-Spacers
6655	4	8-32 x 1" No. 2 SQ DR Flat HD Machine Screws ( for High-Shims)
6660	1	Sub-Base Handle
6665	1	"INCH" Mandrel
6670	1	"METRIC" Mandrel

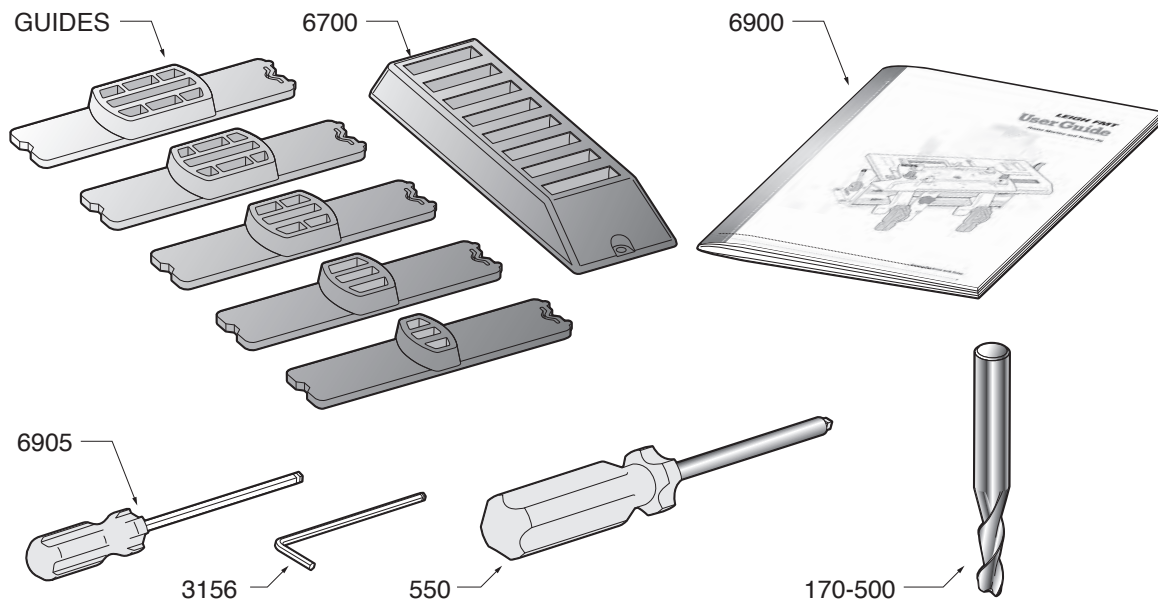


PART NO.	QUANTITY PER JIG	PART DESCRIPTION
670508	1	5/16" x 1/2" Template Guide
670512	1	5/16" x 3/4" Template Guide
670516	1	5/16" x 1" Template Guide
670520	1	5/16" x 1 1/4" Template Guide
670524	1	5/16" x 1 1/2" Template Guide

#### FMT Pro-M Metric Guides

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

6700	1	Template Guide Stand
6900	1	FMT Pro User Guide
6905	1	LEIGH 1/8" Ball End Hex Screw Driver
3156	1	5/64" Hex Key (for No.6 Button HD)
550	1	LEIGH No.2 Robertson Screw Driver
170-500	1	5/16" dia x 1/2" Shank HSS Spiral Upcut Bit





## FMT PRO Appendix IV

# Customer Support

### Our Commitment to You

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

#### Manufacturer: Canada/USA

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

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

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

#### Distributors

##### AUSTRALIA & NEW ZEALAND

Carba-Tec Pty. Ltd.  
P.O. Box 4310, Gumdale QLD 4154  
128 Ingleston Rd., Wakerley QLD 4154  
Australia  
Tel: 07 3390 5888  
Fax: 07 3890 5280  
Orders: 1800 658 111  
Email: orders@carbatec.com.au  
Web: www.carbatec.com.au

##### CHINA

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

##### FRANCE

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

##### GERMANY, AUSTRIA & SWITZERLAND

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

##### ITALY

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

##### JAPAN

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

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Fax: +82 - (0)31-765-5602  
Mobile: +82 - (0)10-9122-0629  
Email: sjc@leigh.co.kr  
Web: www.leigh.co.kr

##### NORWAY

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Stoelsmyrvn. 103  
5542 Karmsund, Norway  
Tel: +47 99271932  
Fax: +47 52910011  
Email: info@aurus.no  
Web: www.aurus.no

##### RUSSIA

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Nikitskij Boulevard 12  
Moscow, 119019, Russia  
Tel: +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  
Post: PO Box 4059, 2125  
Randburg, South Africa  
Tel: (011) 791-0844/46  
Fax: (011) 791-0850  
Email: info@hardwarecentre.co.za  
Web: www.hardwarecentre.co.za

##### SWEDEN

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

##### UNITED KINGDOM & IRELAND

BriMarc Tools & Machinery  
Unit 10 Weycroft Avenue  
Axminster, Devon EX13 5PH England  
Tel: 0333 240 69 67  
Fax: 0333 240 69 76  
Email: email@brimarc.com  
Web: www.brimarc.com



## Specialty Guides For Your FMT

All specialty guides for the FMT are engraved with the Leigh logo and dimensional information. When installing the new guides, the Leigh logo **MUST** be readable (right side up) from the operator's position. Guides can only be installed one way. Please read, understand and be familiar with FMT operations before using the specialty guides.

### Square Tenon Guides

All square tenon guides for the Leigh FMT are installed and used in the same manner as regular tenon guides.

1. Install the square tenon guide with the Leigh logo facing the operator.
2. ALL square tenons are routed with a  $\frac{1}{2}$ " spiral upcut router bit - Leigh # 180 (HSS) or #180CL (Solid Carbide).
3. The left guide pin on the FMT router sub base should be set at  $1 \frac{1}{2}$  turns up for the first test cut and then adjusted for fit as necessary.
4. Left guide pin adjustments affect only the thickness of the tenon.
5. Left guide pin adjustments DO NOT affect the width of the tenon.
6. Table limit stops and table movement may be used to increase or decrease the width of the tenon (see 4-89 in your user guide).
7. As with regular tenons, a light climb cut (clockwise) at full depth will ensure a clean shoulder. Complete the tenon routing in the normal direction (counter clockwise).
8. Although primarily intended to fit tenons to mortises formed by square chisel mortisers, a bit, with a cutting diameter matching the guide size, may be used to rout the mortise, and the corners squared with a hand chisel. Please note the guides are designed so routed mortises will be slightly shorter than the tenon width. This ensures that there is adequate wood for a perfect fit on through tenons.

### Louver Guides

1. Install the louver guides with the Leigh logo facing the operator.
2. Louver guides must be used in pairs; a left hand guide and a right hand guide.
3. Louver mortises are routed with a  $\frac{1}{4}$ " diameter bit and produce a mortise  $\frac{1}{4}$ " x  $1 \frac{1}{4}$ " at a  $45^\circ$  angle. Use the standard  $\frac{1}{4}$ " x  $1 \frac{1}{4}$ " tenon guide to produce matching tenons - Leigh # 670420.
4. Left guide pin adjustment does not affect the size of the mortise, however, the left guide pin should be turned down as far as possible without fouling the bottom of the guide. Adjustments for fit are made when routing the tenon.
5. Louvers will normally be routed at approximately  $45^\circ$  to the grain direction therefore, the direction of bit travel is important. Each louver guide is engraved with a directional arrow.
6. Always favour the left side of the mortise slot when routing.

7. **Procedure:** Centre the table sight over the **second** louver mortise position on your work piece and set the front to back and left to right limit stops to prevent table movement.
8. Using the left or right outer edge of the FMT table, mark a pencil line across the stile. This becomes the first reference mark.
9. Mark successive lines at 3" [76.2mm] centres along the stile.
10. Rout the first three mortises; unclamp and move the stile to bring the next pencil mark precisely under the table edge. Re-clamp and rout the next three mortise slots. Repeat as required.
11. Note: Long or heavy stiles should be supported either side of the jig.

### Y Axis Mortise Guide

1. Install the Y Axis Mortise Guide with the Leigh logo facing the operator.
2. Select a router bit with a cutting diameter that matches the chosen mortise slot.
3. The length of the mortise may be increased or decreased using the front to back table limit stops and table movement. (see 4-89 in your user guide).
4. The centre slot of the guide ( $\frac{1}{4}$ " x  $\frac{3}{4}$ ") corresponds to the centre of the sight and bit. All other guide slots are indexed at  $\frac{1}{2}$ " increments left or right of the centre slot. The numbers across the top of the guide indicate the offset for the slot directly beneath the mark. For example, the  $\frac{1}{4}$ " x  $\frac{3}{8}$ " slot (far left) is offset exactly one inch to the left of the centre slot. If you are using a slot to the left of the centre slot, place your layout mark on your work piece to the right of the desired location equal to the offset indicated on the guide. Conversely, using a slot to the right of centre requires an index mark to the left of the desired mortise location.
5. The outside guide surface on the right of the guide can be used to make mortises of any length or mortises (dado) completely through the mortise board from front to back. The offset for this guide surface is  $1 \frac{3}{4}$ ".
6. Use successive full depth plunges along the length of the mortise, then rout a full length clean up cut.
7. Left guide pin adjustments have no effect on the length or width of the mortise slot, however, the left guide pin should be turned down as far as possible without fouling the bottom of the guide. Adjustments for fit are made with the corresponding tenon guide.