

Multiple Joints

Double Joints

Twin Joints

Quadruple Joints

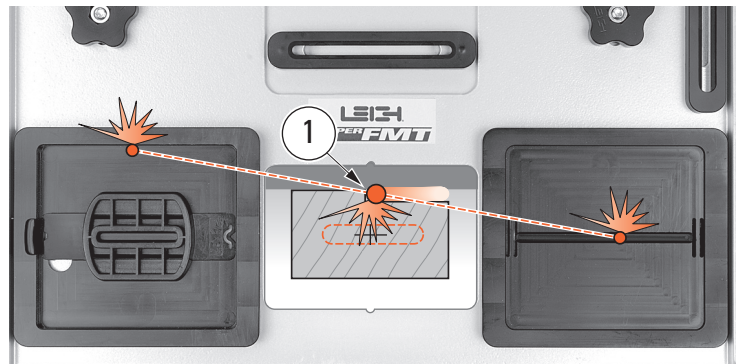
Triple Joints

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

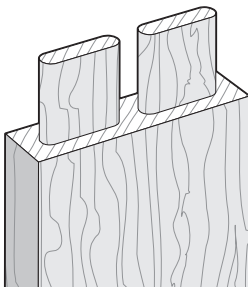
⚠ IMPORTANT SAFETY NOTE

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

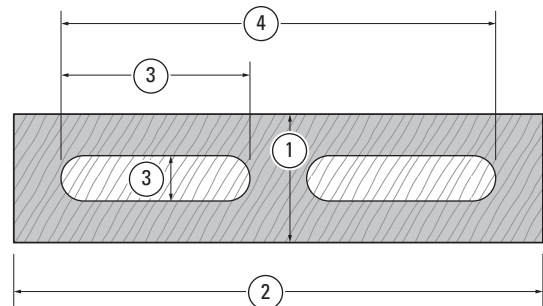
Without using the table movement as prescribed, the bit would have to be plunged into the side of the tenon rail causing the bit to powerfully “drive” the router across the jig. **This could be dangerous and can damage the jig.**



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.

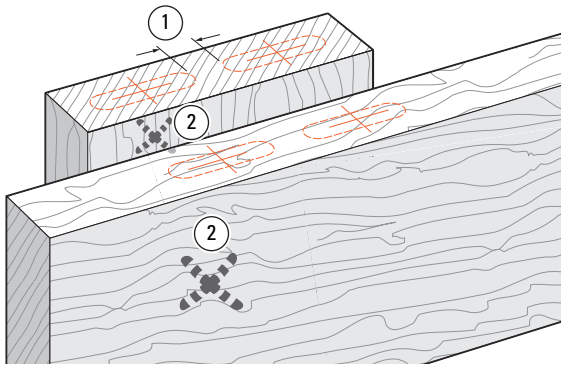


5-2 Note: The **maximum** dimensions for doubles are:

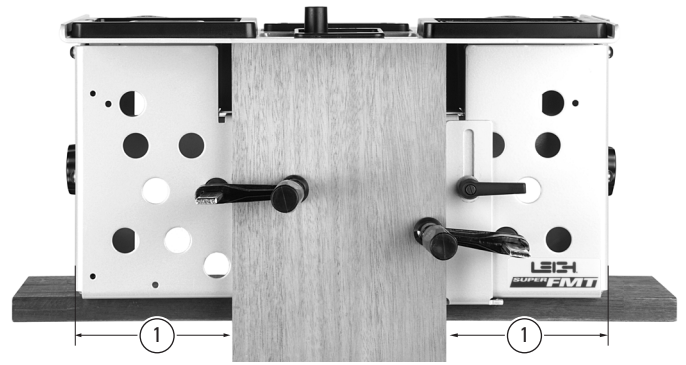
Tenon Workpiece ①②: $1\frac{5}{16}$ x $5\frac{1}{2}$ " [34x140mm]

Tenon ③: $\frac{1}{2}$ x 2" [12x50mm]

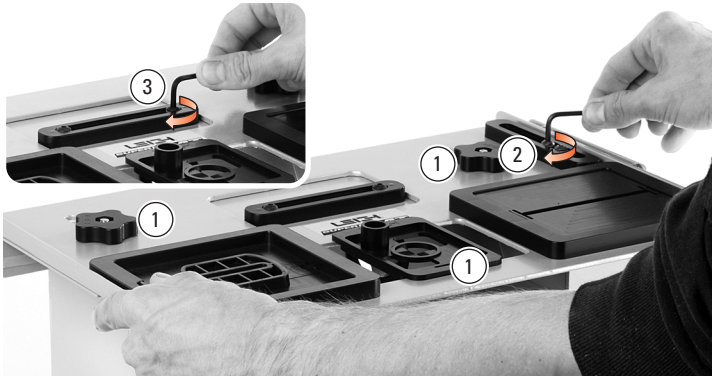
Tenons, both Overall ④: $\frac{1}{2}$ x $4\frac{1}{2}$ " [12x115mm]



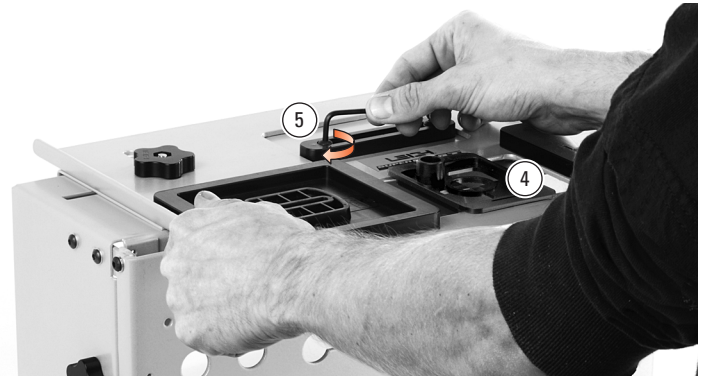
5-3 Mark the two mortise and tenon centers, taking care to allow space between the joints ① at least equal to the tenon bit diameter. Mark the faces that go against the clamp plate ②.



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



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



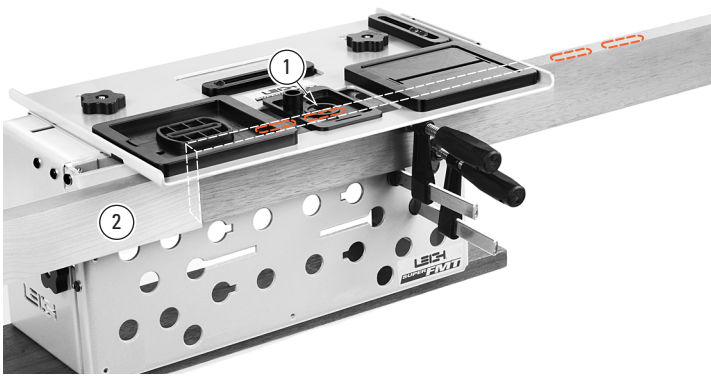
5-6 Unlock the table and sight the right hand tenon ④ and lock the table. Set and lock the left hand **LR** limit stop against the post ⑤. Release the table clamp and move the table left and right against the **LR** stops to double-check sight alignment to the two tenons. Remove the sight.



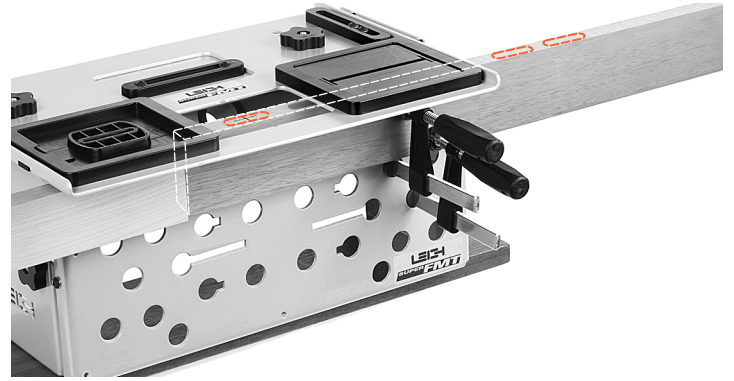
5-7 Move the table left and lock. **Do not rout yet.** While with practise it is fairly easy to avoid routing “into” the right tenon when routing the left ①, we recommend that beginners use a small shop-made “guard” to prevent this ②. Use 1/4" [6mm] thick MDF or plywood. Allow a 3/16" [5mm] gap between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



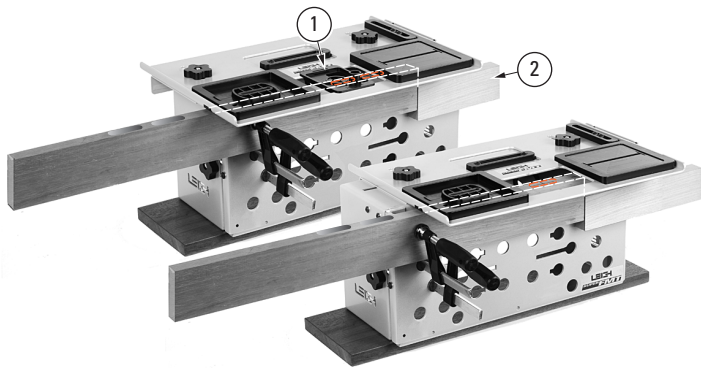
5-8 Move the table right and lock. Lift the left end of the router and move the “tenon guard” left ①. Rout the right hand tenon ②. Repeat as required for all tenon ends, moving the table “guard” piece only once for each pair. Leave the table to the right. Remove and save the guard.



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

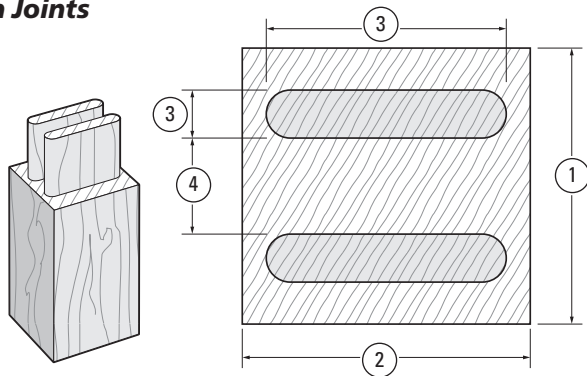


5-10 Move the table left and lock. Rout the left hand mortise. Leave the table to left.

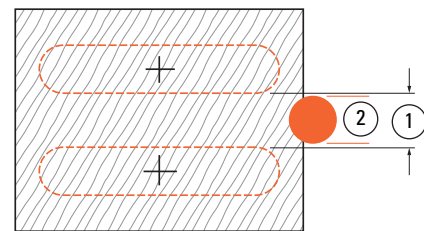


5-11 Now, sight the left mortise of the pair of mortises ① on the right end of the board and re-clamp. To avoid re-sighting each board, mark the left hand outrigger or set a stop at the workpiece end ②. Remove the sight and rout the mortise, then move the table and rout the right hand mortise. The table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

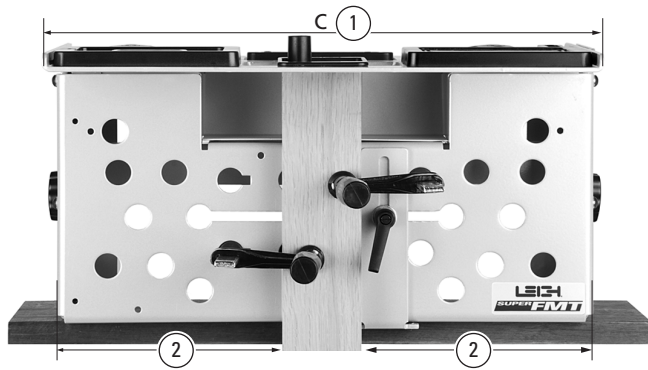
Twin Joints



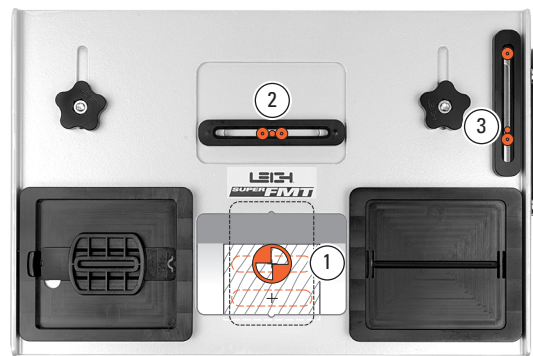
5-12 Note: The maximum dimensions for “side-by-side” double joints are:
 Tenon Workpiece ①②: 3 x 3 1/8+ [76 x 79+mm]
 Tenon size ③: 1/2 x 2 1/2+ [12 x 65+mm]
 Spacing ④: 1/16 or greater [>13 mm]



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

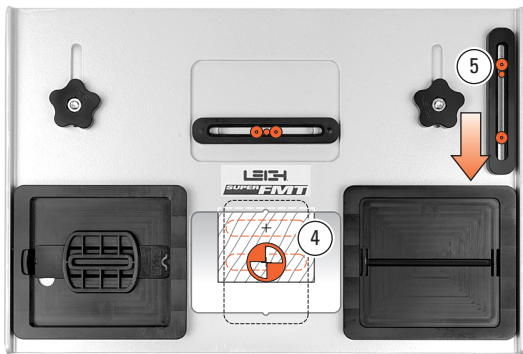


5-14 Roughly center the table left to right and lock ①. Position the sight. Clamp the tenon piece against the sidestop fence, in approximately the center of the clamp plate ② with the tenon piece lightly touching the underside of the sight.

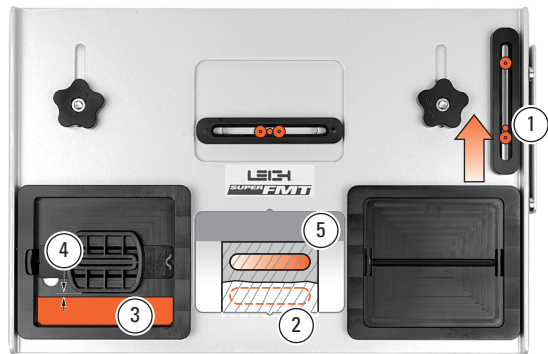


5-15 Unlock the table, sight the rear tenon center ① and lock the table.

Set and lock both ^{LR} limit stops against their stop post ②. Set and lock the front ^{FB} limit stop against its stop post ③.



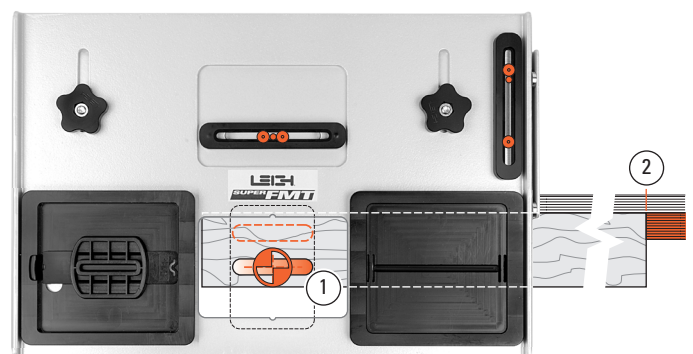
5-16 Unlock the table and sight the front tenon ④ and lock the table. Set and lock the rear ^{FB} stop against its post ⑤. Unlock the table and move the table front to back against the stops to double-check the tenon sighting.



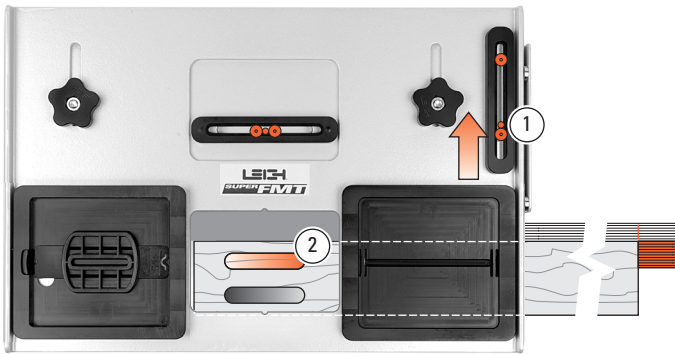
5-17 Move the table to the rear against the stop ①, and lock. Do not rout yet. While with practise it is fairly easy to avoid routing into the front tenon ② when routing the rear, we recommend that beginners use a simple shop-made “guard” ③ to prevent this. Use 1/4" [6mm] thick MDF or plywood. Allow 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 against the rear limit stop and lock ①. Lift the left end of the router and move the “tenon guard” to the rear ②. Rout the front tenon ③. Leave the table forward. Note: By using two or three left-right table positions, (in addition to the front-back positions), the workpiece width and tenon width may be increased to the maximum (see 6-5, Longer and Shorter Joints).



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

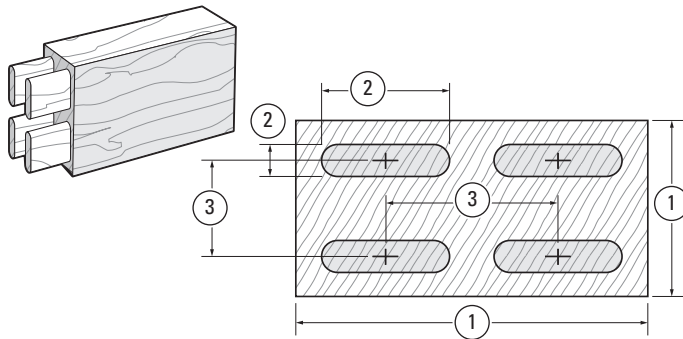


5-20 Move the table back against its stop ① and lock. Rout the rear mortise ②. Leave the table back.

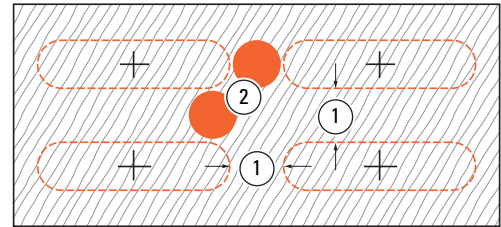


5-21 Replace the sight, unclamp and move the mortise board left so that the rear mortise of the pair at the right end of the piece is centered under the sight ①, and re-clamp. Mark the left hand outrigger or set a stop ② adjacent to that end of the workpiece. Rout first the rear mortise at this (right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

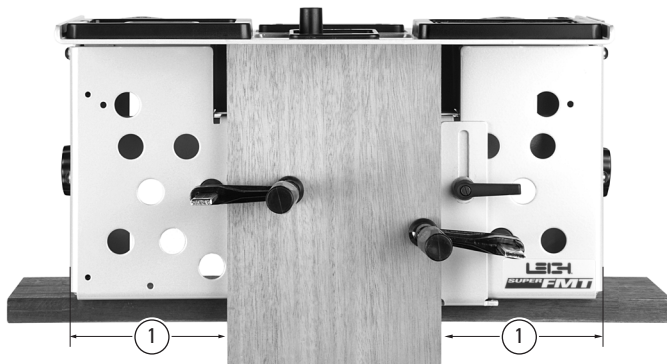
Quadruple Joints



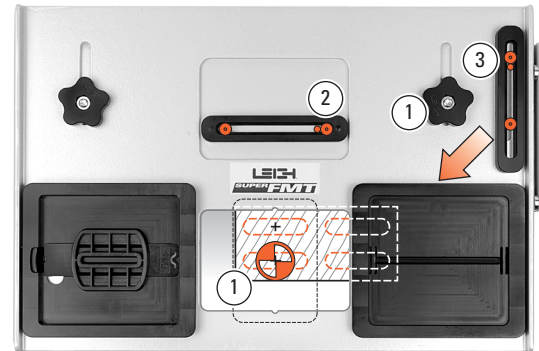
5-22 The maximum dimensions for quadruple joints are:
 Tenon Workpiece ①: 3" x 5½" [70 x 140mm]
 Tenon Size ②: ½ x 2" [12 x 50mm]
 Center Spacing ③: 1½ x 2½" [38 x 63mm].



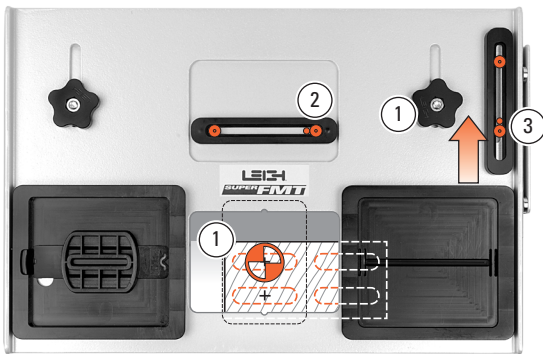
5-23 Tenons Mark the four tenon and mortise centers to suit your layout. Take care to leave a space between tenons ① at least slightly greater than the tenon bit diameter ②.



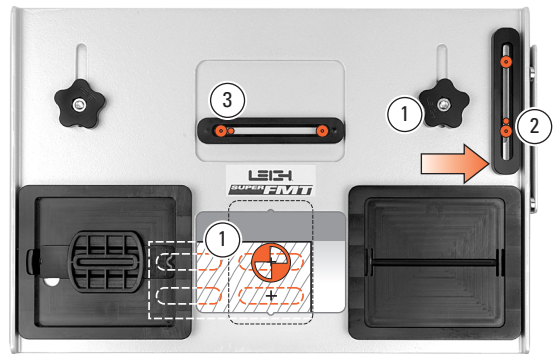
5-24 Center (approximately) ① and clamp the tenon board on the clamp plate and set the sidestop fence.



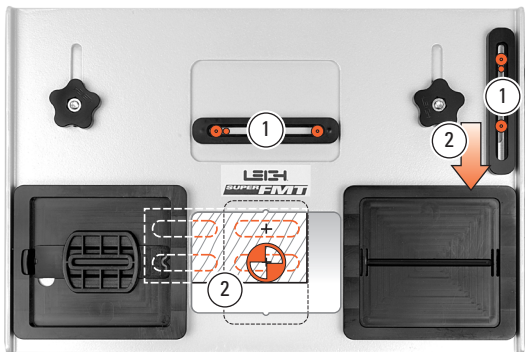
5-25 Position the sight, release the table clamp and move the table to sight the left hand front tenon ①. Lock the table. Move the right hand ^{LR} stop to its post and lock ②. Move the back ^{FB} stop to its post and lock ③.



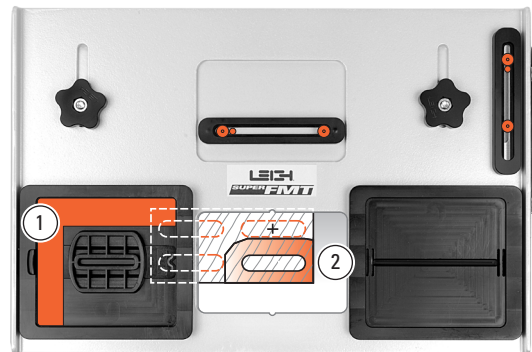
5-26 Release and move the table to sight the rear left hand tenon ①. *Note: Ensure the \square LR post is still touching the right hand limit stop ②.* Lock the table. Move the front \square FB stop to its post and lock ③.



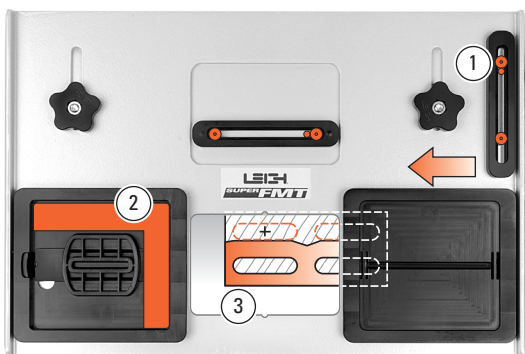
5-27 Unlock the table and move to the rear right-hand tenon and sight ①. *Note: ensure the \square FB post is still touching the front limit stop ②.* Lock the table. Move the left hand \square LR stop to its post and lock ③.



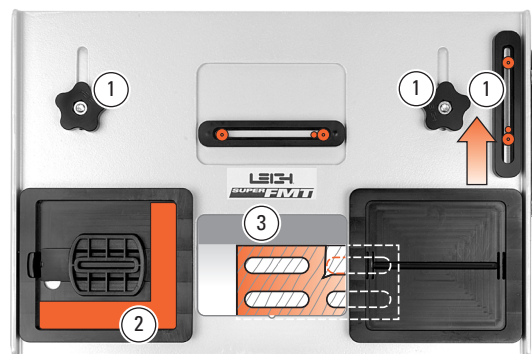
5-28 All four stops are now set ① and provided you have symmetrically marked out the joint, moving the table to the front right hand tenon, the sight should automatically align with that mark ②. If it does not, do not change anything. Just check the other three positions—the actual joint will be symmetrical.



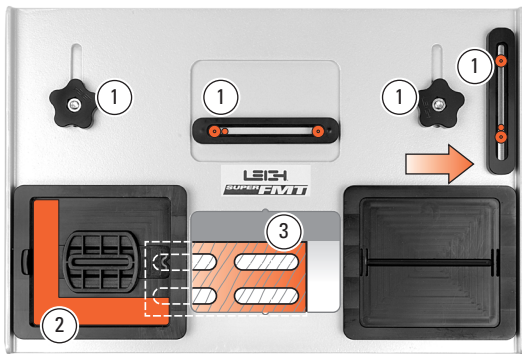
5-29 With practice, it is fairly easy to avoid routing into an adjoining tenon, however, we do recommend that beginners use a simple “L”-shaped shop-made guard to prevent this ①. Use 1/4" [6mm] MDF or plywood and allow a 3/16" [5mm] gap between the guide and guard. Rout the front right tenon ②.



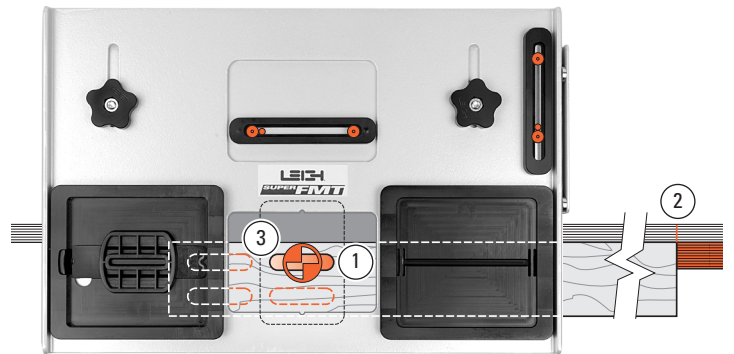
5-30 Move the table to the front left against the stops and lock ①. With the “guard” at the rear right ②, rout the front left tenon ③.



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

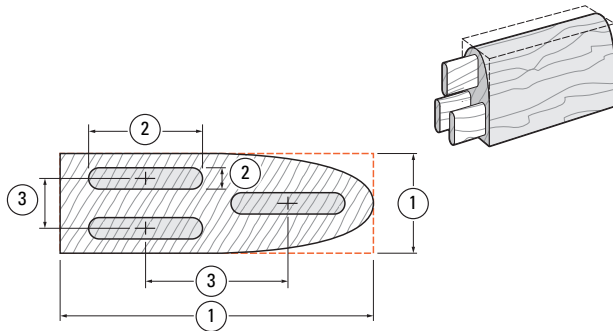


5-32 Move the table to the rear right against the stops and lock ①. Move the “guard” to the front left ②. Rout the rear right tenon ③. Rout all other tenon ends required. Leave the table to the rear right.

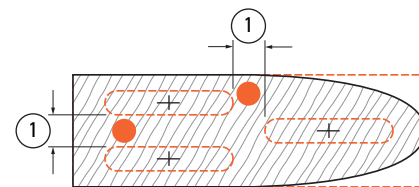


5-33 Mortises Extend the sight, position and clamp the mortise board so that the rear right mortise is centered under the sight ①. Either mark an outrigger or set a stop-block for successive mortise boards ②. Rout all four mortises in their respective positions ③. **Note: The Super FMT vacuum port may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

Triple Joints



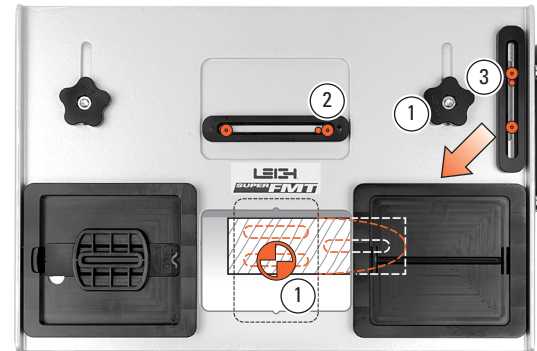
5-34 Because of safety considerations it is only practical to rout triple joints with $\frac{3}{8}$ " bits and guides or smaller. Maximum dimensions for triple joints are:
 Tenon Workpiece ①: $1\frac{3}{4}$ x $5\frac{1}{2}$ " [44 x 140mm]
 Tenon Size ②: $\frac{3}{8}$ x 2" [10 x 50mm]
 Center Spacing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



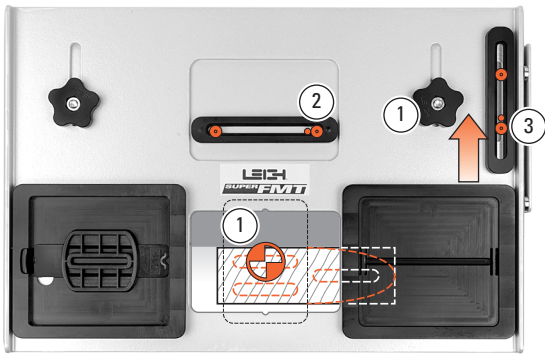
5-35 Mark the three tenon and mortise centers, taking care to leave a space between tenons at least slightly greater than the tenon bit diameter ①.



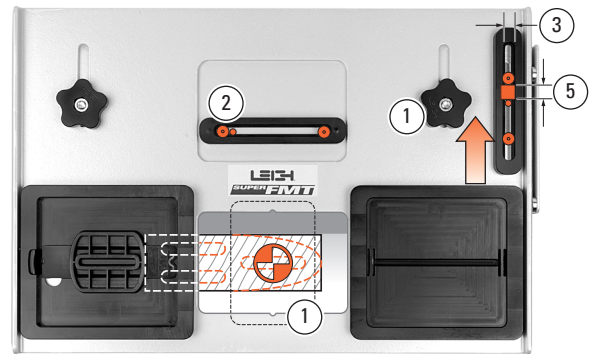
5-36 Tenons Center (approximately) and clamp the tenon workpiece on the clamp plate ① and set the sidestop fence.



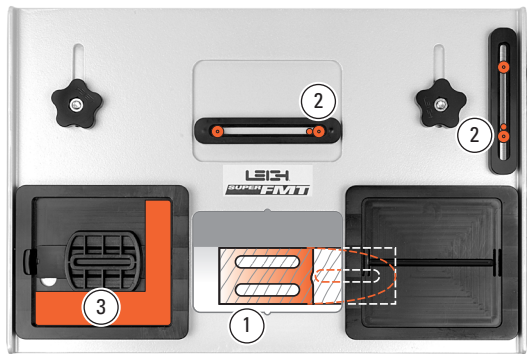
5-37 Fit the sight, release the table clamp and sight the front tenon of the pair ①. Lock the table, move the right hand **LR** limit stop to the post and lock ②. Move the back **FB** limit stop to the post and lock ③.



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

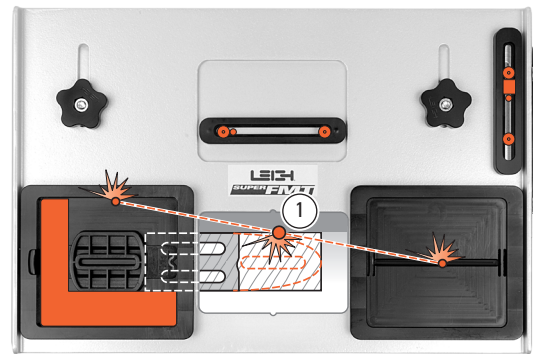


5-39 Loosen the table clamp and move the table to sight the third (single) tenon ①. Lock the table. Set and lock the left hand \square LR limit stop to its post ②. Cut a small hardwood block to the following size: Width ③ $\frac{3}{8}$ " [13mm], Depth $\frac{5}{16}$ " [8mm], Length ⑤: Cut to length to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

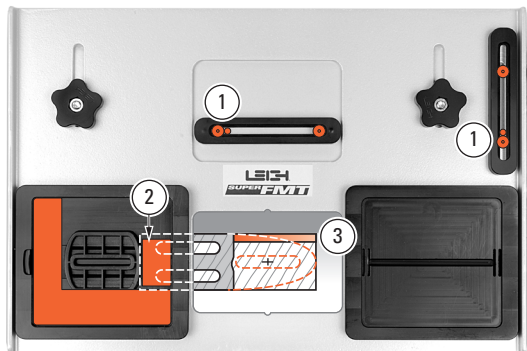


5-40 Rout the left pair of tenons in the same way as for the quadruple tenons ① (5-30 and 5-31), using the Limit Stops ② and an L-shaped guard ③ in the guard recess, to prevent accidental routing of adjacent tenons.

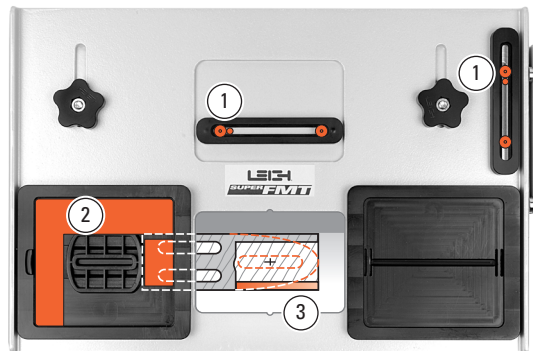
⚠ Do not attempt routing the third tenon before reading on.



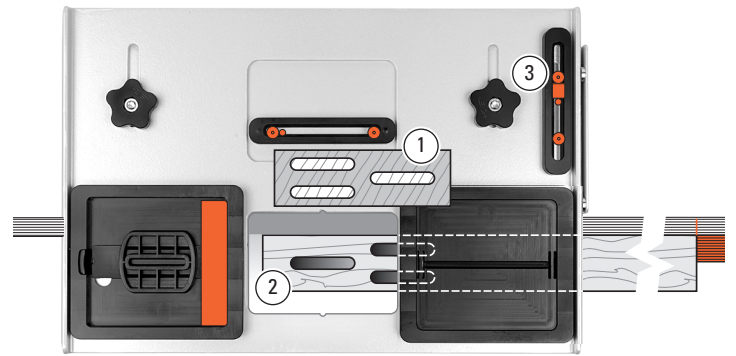
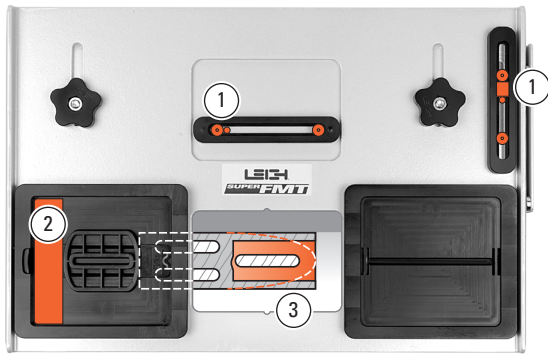
5-41 **⚠** If the tenon rail is thicker than $1\frac{5}{16}$ " [34mm] (most likely with this joint type), then great care must be exercised not to "trap" the bit ① when routing the third tenon, i.e. the bit would have to be plunged into the side of the tenon board. This could result in the bit "driving"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




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

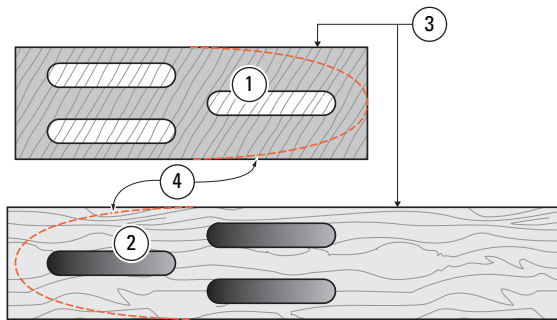


5-43 Move the table forward, keeping it to the right ①. Flip the guards to the back ②. Now rout away the front right part of the workpiece ③.



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

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



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

SUPER FMT CHAPTER 6

Workpiece and Joint Options

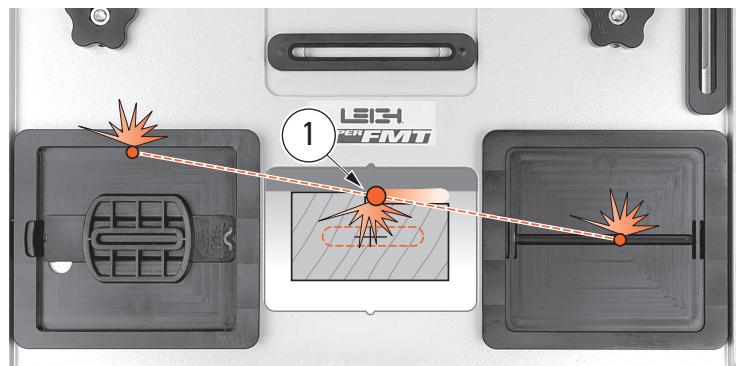
*Different Workpiece Thicknesses
Longer and Shorter Joints
Thicker and Wider Boards*

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

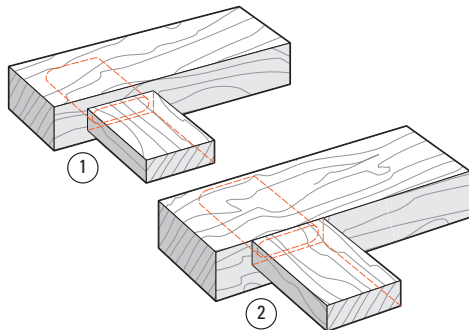
⚠ IMPORTANT SAFETY NOTE

Take great care to not “trap” the bit against the side of tenon rails ①. Do not attempt to rout center tenons in rails thicker than 1⁵/₁₆" [34mm] before referring to 5-39 through 5-44.

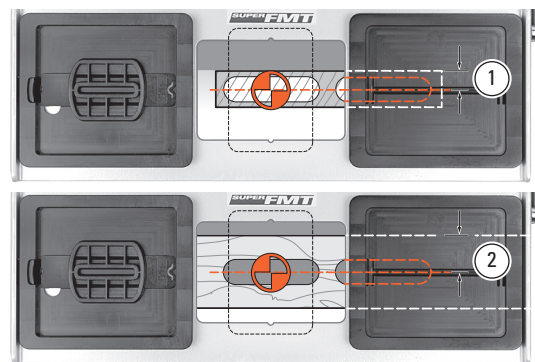
Without using the table movement as prescribed, the bit would have to be plunged into the side of the tenon rail causing the bit to powerfully “drive” the router across the jig. **This could be dangerous and can damage the jig.**



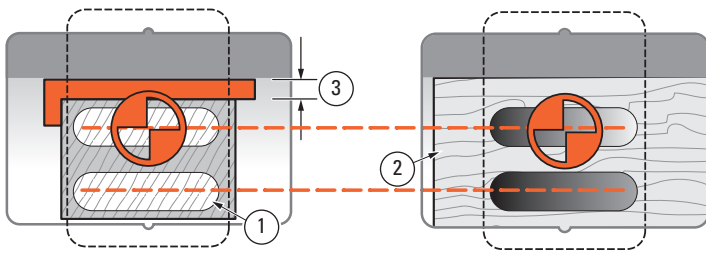
Different Workpiece Thicknesses



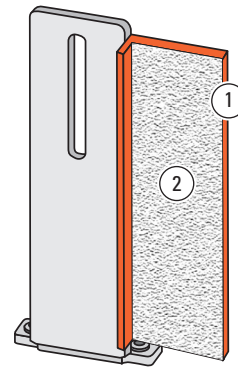
6-1 So far we have only illustrated joints where the mortise and tenon workpieces are the same thickness. There will be numerous times when this is not the case, as in where the tenon piece is thinner and centered on the mortise board ①, and where the tenon piece is deliberately off center on the mortise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



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

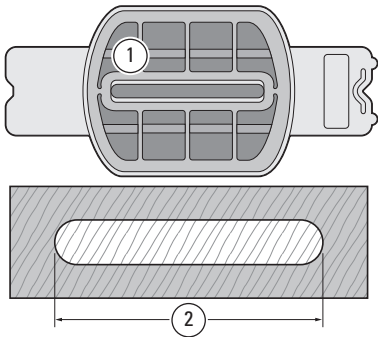


6-3 Side-by-side double and quadruple joints of different stock thicknesses require a packing piece (see 6-4) between the clamp plate and tenon piece, the thickness equal to the offset of the two pieces. For example, a 2" [50mm] tenon piece ① centered on a 3" [75mm] mortise piece ② will require a ½"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



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

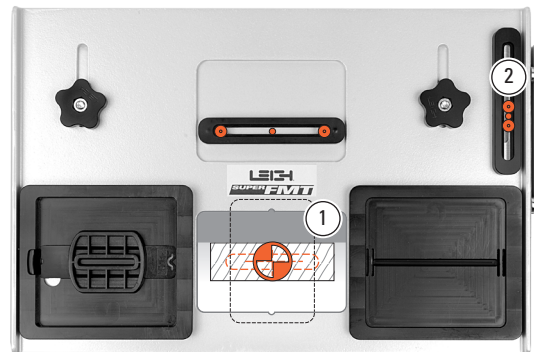
Longer and Shorter Joints



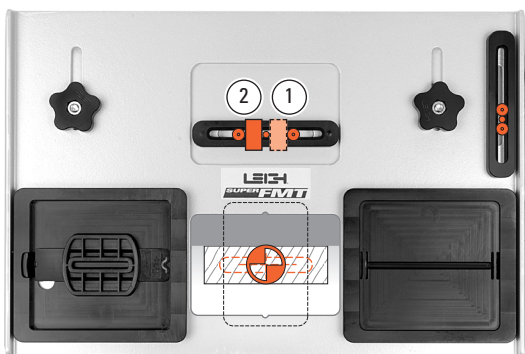
6-5 The Super FMT table movement allows for easy routing of odd-sized joints. For example, you may want to rout a 3" [75mm] joint ② and you only have a 2" [50mm] guide ①. Use this simple formula:
Joint, minus Guide, divided by 2.

Example: $3" - 2" \div 2 = \frac{1}{2}"$ [75 - 50 \div 2 = 12,5mm]

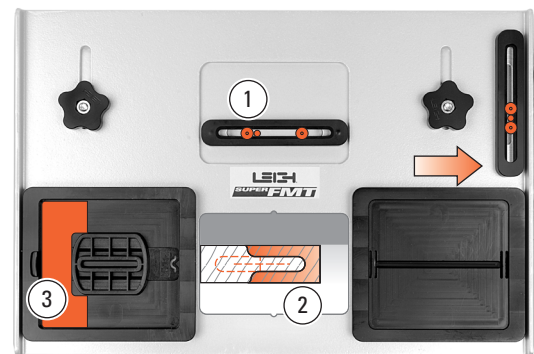
Cut a small block equal to the result; in this example, ½" [12,5mm].



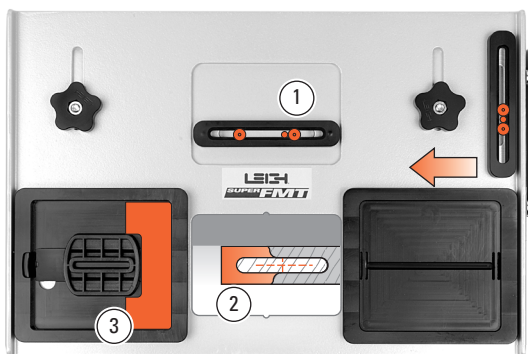
6-6 Tenons Mark the center Position and sight the tenon ①, and lock the table. Set the $\frac{\circ}{\text{FB}}$ stops against the post ②.



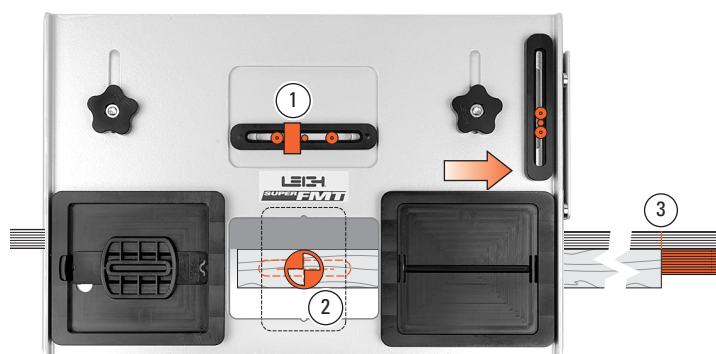
6-7 Set the $\frac{\circ}{\text{LR}}$ stops one at a time with the small block between the stops and post ① ②. This ensures that the table movement is centered about the joint center mark on the stock. Remove the block, **but save it.**



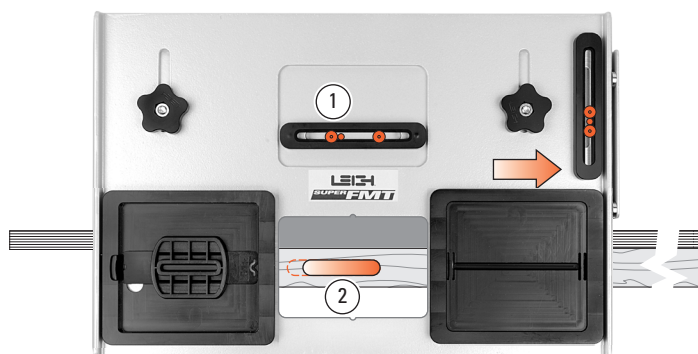
6-8 To rout the wider tenon: Move the table **right**, to the stop ①. Rout the **right hand end** of the tenon ②. Use a guard in the left end of the guide recess if necessary ③.



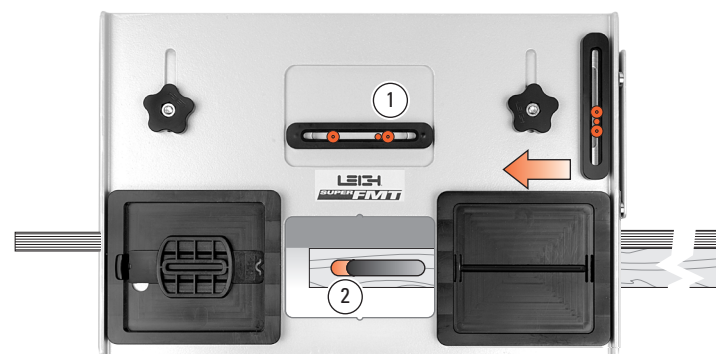
6-9 Move the table **left** to the stop ①. Rout the **left hand end** of the tenon ②. If you're using a "guard", flip it to the right end of the recess ③. Repeat for all required tenons.



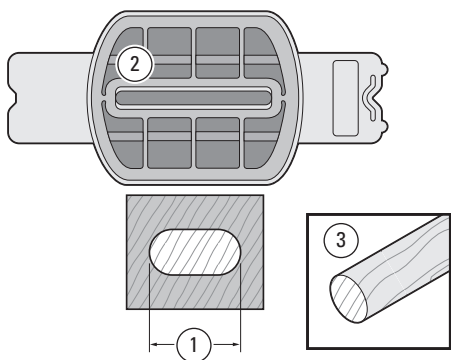
6-10 Mortises Loosen the table clamp. Use the small block between one stop and the stop post ① and lock the table. Center a mortise piece under the sight, and clamp ②. Set sidestop blocks or marks on the outriggers ③.



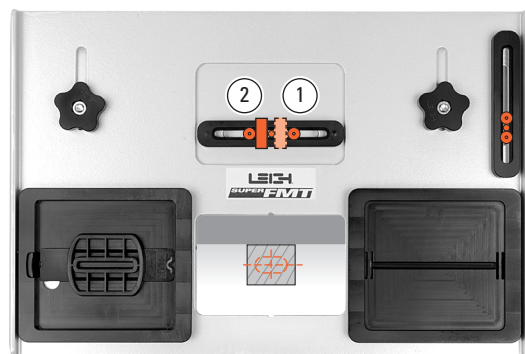
6-11 Move the table **right** to the stop ①. Rout the **right-hand end** of the mortise ②, using the full length of the mortise guide.



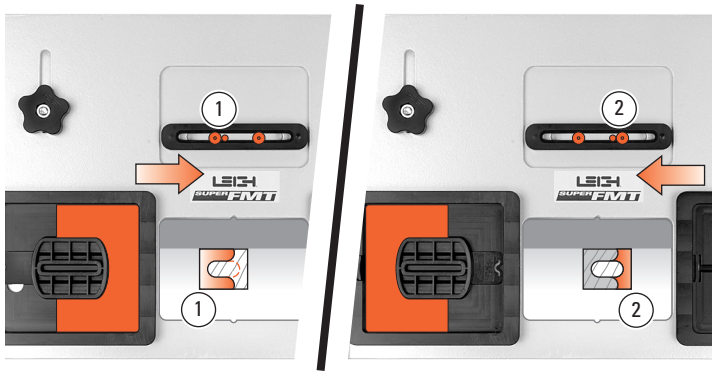
6-12 Move the table **left** to its stop ①. Rout the **left-hand end** of the mortise ②. Repeat for all required mortises. To recap: for joints longer than the guides, **move the table right and rout right, move the table left and rout left.**



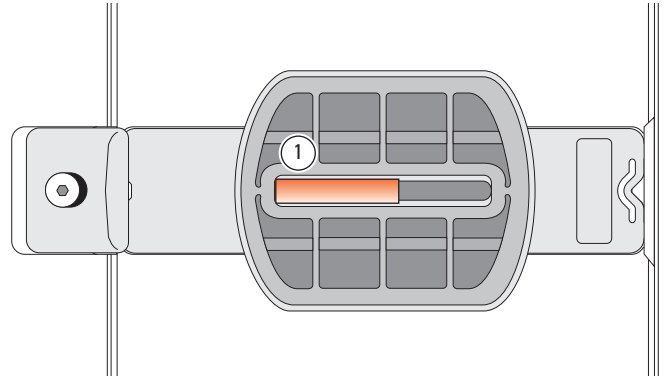
6-13 For mortises and tenons shorter than the guide, reverse the calculation: **Guide, minus Joint, divided by 2**. Example: you may want a 1" [25mm] joint ① using a 2" [50mm] guide ②. $2" - 1" \div 2 = \frac{1}{2}"$ [50mm - 25mm \div 2 = 12,5mm]. Make a block $\frac{1}{2}"$ [12,5mm]. You will also need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



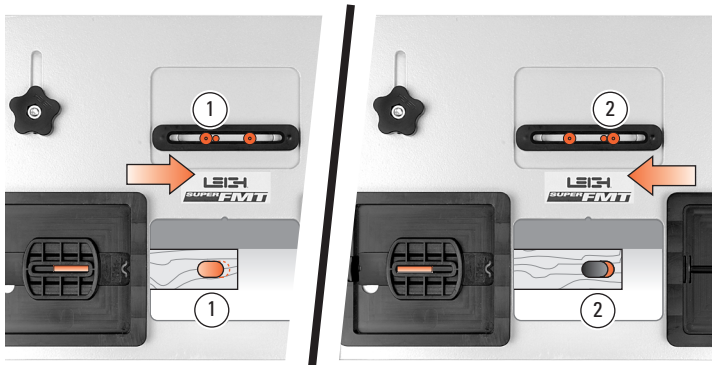
6-14 Tenons Setting the block and limit stops for the shorter tenons procedure ① ② is exactly the same as for longer tenons setup, **except when you come to rout...**

**6-15 ...Then it is:**

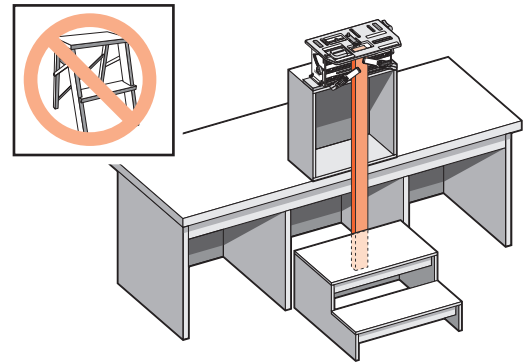
Move table **right**; rout to the **left** ①. Move table **left**; rout to the **right** ②. Again, use a guard in the guide recess if necessary.



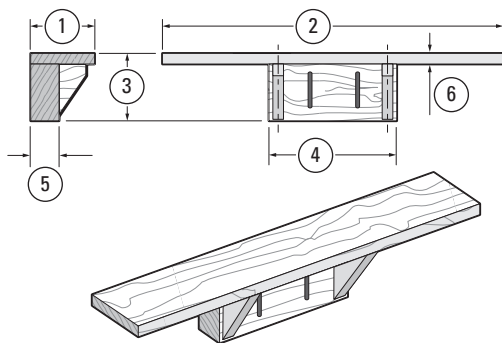
6-16 Mortises The rule is the same for mortises except you will need to use a small piece of that $\frac{3}{16}$ " [5mm] dowel as a guard in the guide's mortise slot ①. The dowel should be slightly longer than the difference between the guide length and joint length; in this example, slightly longer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



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

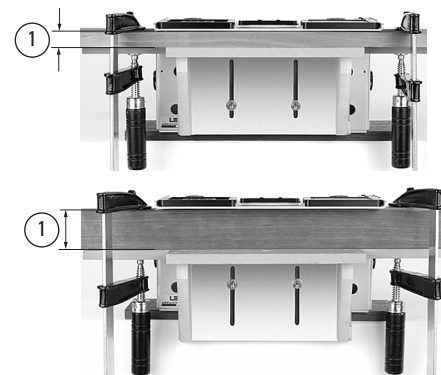


6-18 To rout long vertical boards you could build a jig stand to mount on your bench. Make the stand/bench combination high enough to accept the desired board length, bolted securely to the bench. Make a stable platform as shown here to stand on. **Don't use a folding step, it is unstable.** Other novel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

Thicker and Wider Boards

6-19 Make this bracket to mount and mortise a wide board face, clamp pieces greater than Leigh Clamp 3" capacity, and center mortises on boards up to $4\frac{5}{8}$ " [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 carriage bolts and nuts to secure the bracket to the Super FMT clamp face and adjust the distance below the table to slightly greater than the mortise piece thickness ①.



6-21 Use C-clamps or F-Clamps to hold the workpiece onto the bracket, with the workpiece rear edge touching the clamp plate. **Now raise the bracket so the workpiece touches the underside of the table.** Tighten the clamp plate nuts. The widest board in which a mortise may be centered is $4\frac{5}{8}$ " [115mm] ①. The thickest depth capacity is 5" [100mm] ②.



6-22 Mortises in center of boards $4\frac{5}{8}$ " to $6\frac{1}{2}$ " [115-165mm] ①: Mark the mortise center on a test board ②. Using the guide recess front edge as mortise guide ③, adjust the table to center the mortise. Control mortise length with $\frac{3}{16}$ " [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.* ■

