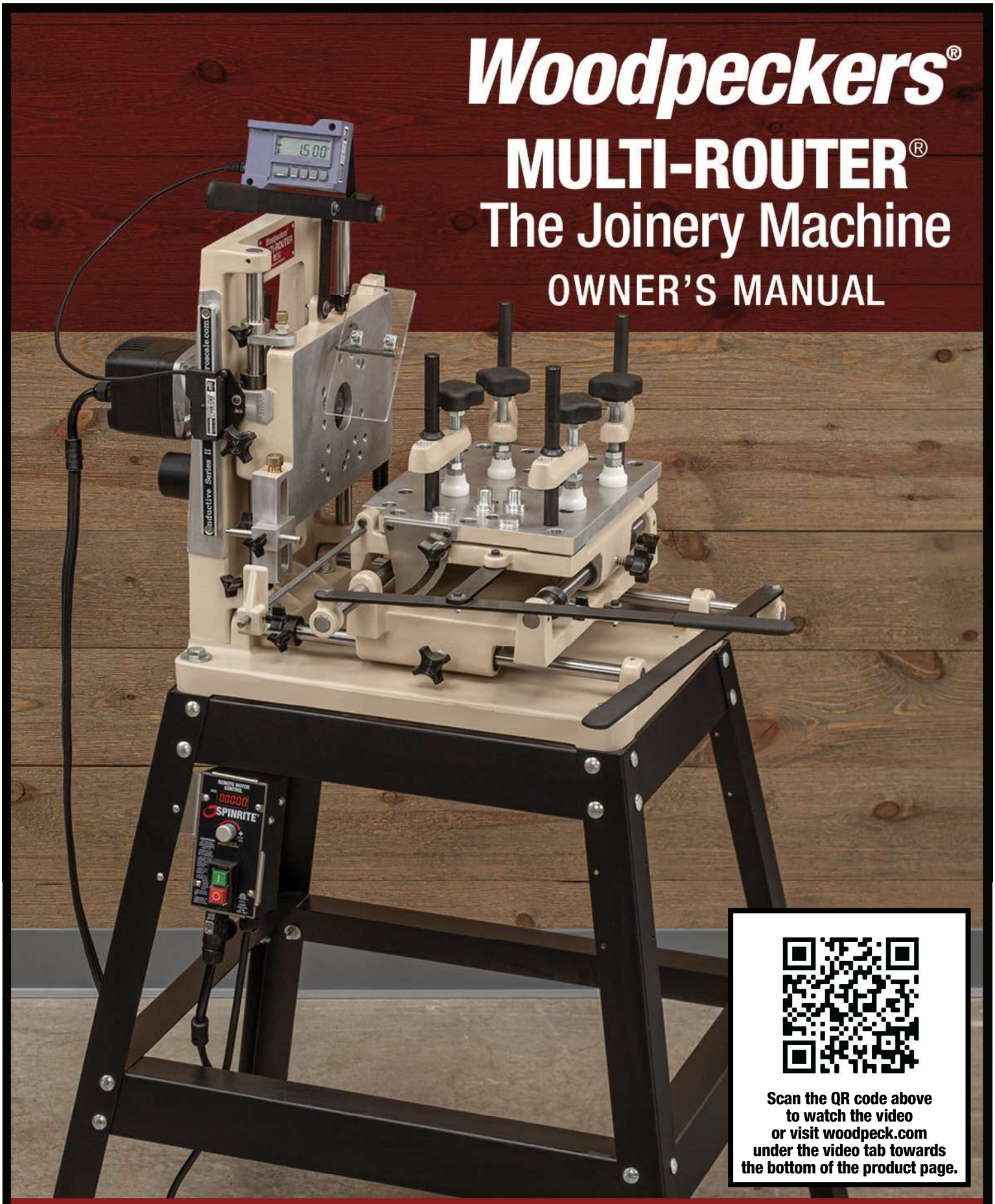
Woodpeckers®

MULTI-ROUTER®

The Joinery Machine

OWNER'S MANUAL



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You can also call us at 800-752-0725 from 9:00 a.m. to 4:00 p.m. EST Monday - Friday.

I. UNPACKING & ASSEMBLY OF LINKAGE ARMS

You'll find your Multi-Router nearly fully assembled when you open it. There are just a few things you need to do before you're ready to start cutting.

1. If you purchased the Machine Stand (sold separately), assemble it first, following the instructions included with the stand. If you did not purchase the stand, you'll need a stable workbench or table for your Multi-Router to mount to. If you're about 5'-10", you will likely want your stand about 31" tall. Adjust up or down as needed to provide a comfortable working height.

2. Remove the corrugated blocking and bracing from the carton. Please note that parts, hardware and accessories may be packed within the blocking. Check each piece carefully.

3. The Multi-Router is bolted to a piece of plywood in the bottom of the carton. Cut the carton down around the machine, remove the nuts holding the machine to the plywood and set the machine on its stand or table. Use 1/2" hex-head bolts to attach the Multi-Router to the Machine Stand or your owner-supplied stand. Use a flat washer on top of the machine base and a flat washer, lock washer and nut on the bottom as shown. ***FIGURE 1.***

4. In shipping, the stop collars are set to prevent table movement and the Table Locks are secured. You'll find it easier to install the Control Arms ① if you leave the tables locked in position. All three Control Arms are identical. Each one mounts to its table with a Pivot Bolt and to the Pivot Linkage.

- The Pivot Bolt ② into the table requires no washers for the X and the Y-Control Arms. Tighten with a 5/8" wrench. ***FIGURES 2 & 3. ALSO SEE PAGE 3.***
- The Z-Control Arm Pivot Bolt ② into the table requires the Pivot Bolt Spacer ⑦ between the Control Arm and the Table. Tighten with a 5/8" wrench. ***FIGURE 4. ALSO SEE PAGE 3.***
- The Pivot Linkage gets a SAE Stainless Steel Washer ④ between the head of the Shoulder Bolt ③ and the Pivot Linkage. A SAE Stainless Steel 1/4" Washer ④ between the Pivot Linkage and the Control Arm. And a SAE #10 Washer ⑤ between the Control Arm and the Nylock Nut ⑥ as shown. ***FIGURES 2, 3 & 4. ALSO SEE PAGE 3.***

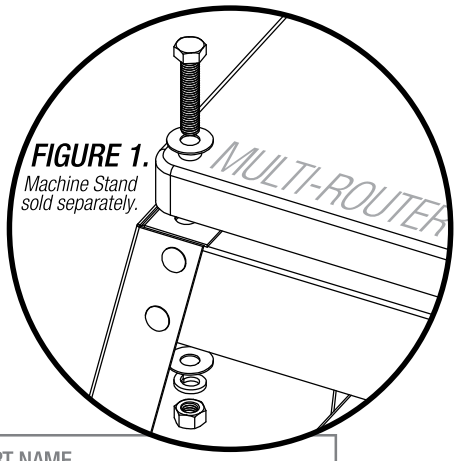


FIGURE 1.
Machine Stand sold separately.

DIAGRAM NUMBER	(QTY)	PART NAME
①	(3)	Control Arm
HARDWARE BAG A		
②	(3)	Pivot Bolt
③	(3)	Shoulder Bolt, 1/4" x 3/8"
④	(6)	SAE Stainless Steel Washer, 1/4"
⑤	(3)	SAE Washer, #10
⑥	(3)	Nylock Nut, 10-24
⑦	(1)	Pivot Bolt Spacer

FIGURE 2.
X-Control Arm

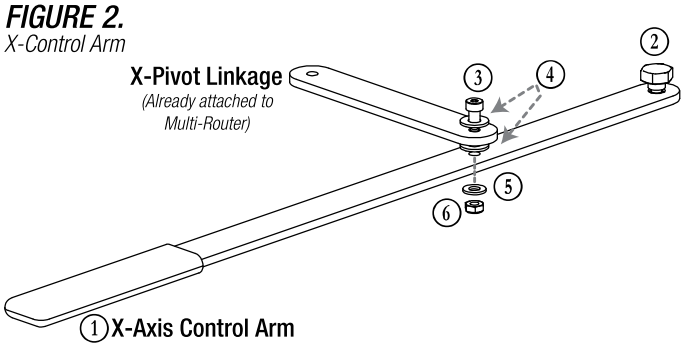


FIGURE 3.
Y-Control Arm

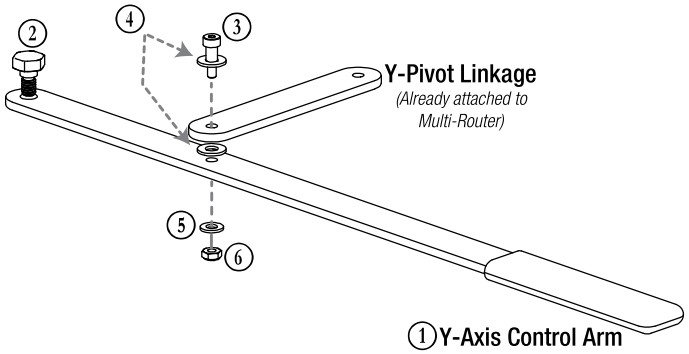
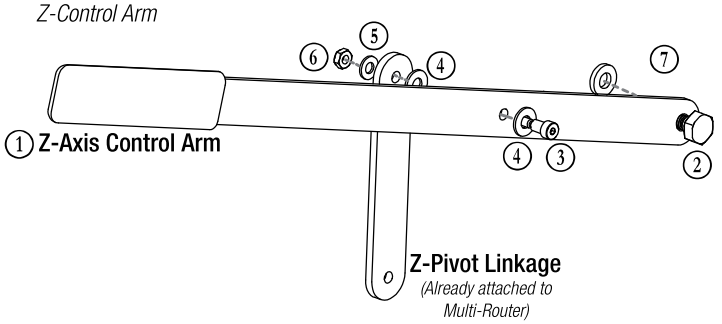


FIGURE 4.
Z-Control Arm



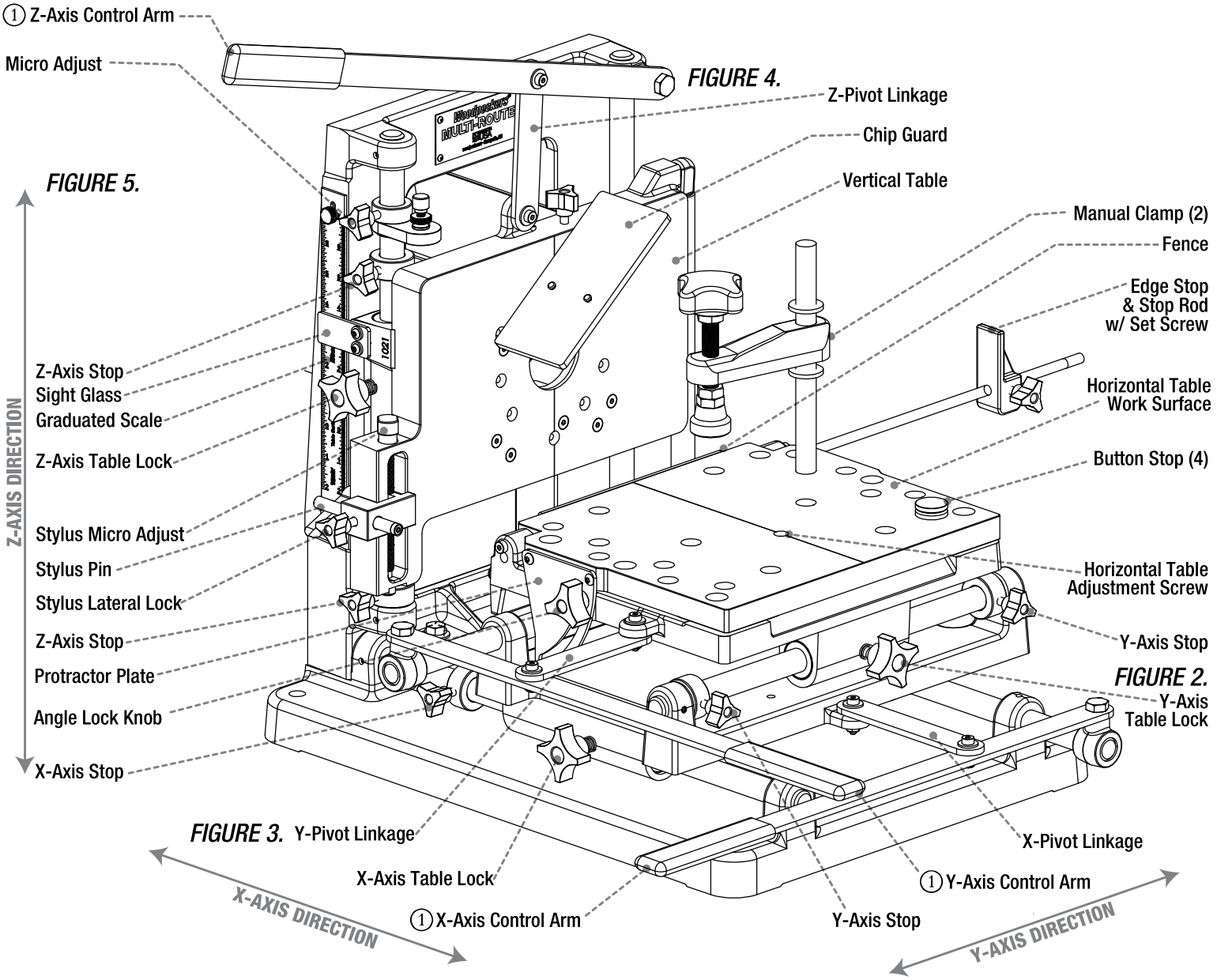


FIGURE 2.

FIGURE 3.

FIGURE 4.

FIGURE 5.

II. MOUNTING YOUR ROUTER

If you're installing your SpinRite Router Motor and Multi-Router Motor Mount, follow the instructions included with the motor mount and motor.

If installing your own router, mount the router base *(not included)* that came with your router onto the Multi-Router Vertical Table. Refer to the router mounting diagram to determine which holes to use. ***FIGURES 1 & 1-A.***

Once you determine which of the holes correspond to your specific router motor, use (3) Flat Head Screws ⑰ to mount it to the machine. ***FIGURE 2.***

To change your router bit, remove the router from the base and follow the manufacturer's instructions.

FIGURE 1.

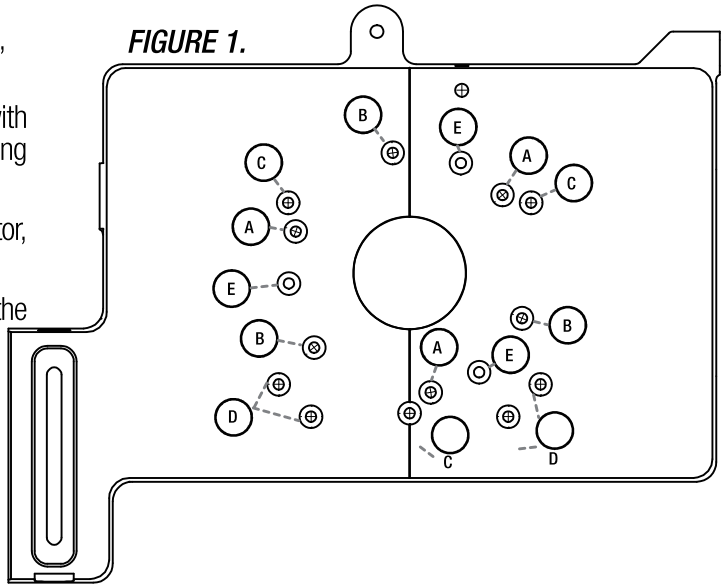


FIGURE 2.

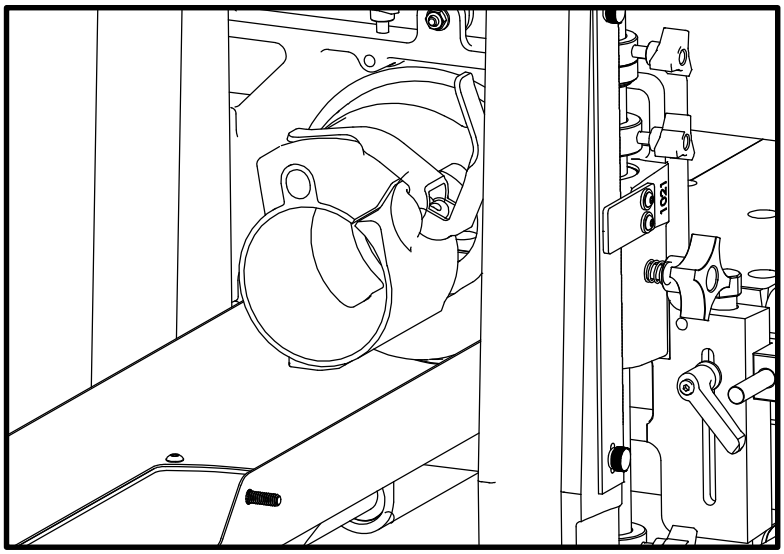


FIGURE 1-A.

Compatible Router	Hole Pattern	Screw Size	Qty of Screws
Milwaukee 5615-20	A	#10-24	3
Milwaukee 5616-20	A	#10-24	3
Bosch 1617	B	#10-24	3
Bosh 1617 EVS	B	#10-24	3
Porter Cable 890	E	#10-24	3
Dust Cabinet Enclosure	D	#10-24	4

III. CALIBRATE THE SCALE

Once the router is mounted the next step is to calibrate the Scale to the top of the Vertical Table. The Scale is most useful when the zero point of the Scale aligns the center of the router bit with the top of the Horizontal Table. ***FIGURE 3.***

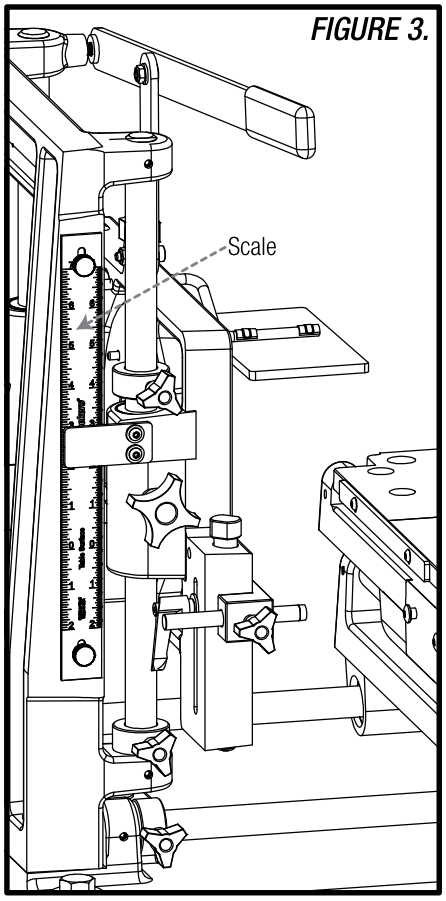
- **Here's the quickest and simplest way to align the Scale.**

1. Mount a 1/2" spiral router bit in your router and extend it out from the Vertical Table.
2. Bring the Horizontal Table in close to the Vertical Table.
3. Lower the Vertical Table until the router bit just touches the Horizontal Table.
4. Adjust the Scale to 1/4" above zero.

Now the center of the router exactly matches the top of the Horizontal Table when the Scale reads "0".

NOTE: *Assembly instructions for the ProScale Digital Rule (sold separately) is included with that accessory.*

FIGURE 3.



WARNING! To Reduce the Risk of Injury, the user Must Read & fully understand this instruction manual before operating the product. Save this book for future instruction.

- Keep hands and clothing away from the spinning router bit and any moving parts. Do not wear gloves, neckties, jewelry or loose clothing. Keep long hair tied back.
- Wear safety goggles or glasses with side shields, ear protection & a dust mask.
- Know how to shut the router off and disconnect from the power source in case of an emergency.
- Disconnect the router from power source when not in use.
- Disconnect the router from the power source before servicing or changing the router bit.
- Do not adjust the router until it has come to a complete stop and has been disconnected from the power source.
- Securely mount the router before turning the power on. If the router cannot be securely mounted, do not use the Multi-Router.
- Before each start, check that all stops and locks are in place.
- Clamp the material to be cut securely to the work table before starting the router.
- When servicing the Multi-Router, use only factory authorized identical parts.
- Do not operate this machine while under the influence of alcohol or drugs.
- Keep this machine away from all children and uninstructed people.
- Failure to comply with these warnings may result in serious personal injury.
- Do not remove the Warning labels from the machine.

IV. BASIC FUNCTIONS

A. THREE AXIS LINEAR CONTROL

The Multi-Router approach to joinery involves three-axis linear movement. The Horizontal Table holds the workpiece and moves into and away from the router ("X" axis) and side-to-side ("Y" axis). The Vertical Table holds the router horizontally and moves up and down ("Z" axis). In general, one axis will be locked and the other two will be manipulated to make a cut. For example, when mortising, the "Z" Axis (router) remains locked and you feed the stock into the router bit with the "X" Lever while operating the "Y" Lever between two fixed stops. ***FIGURE 1.***

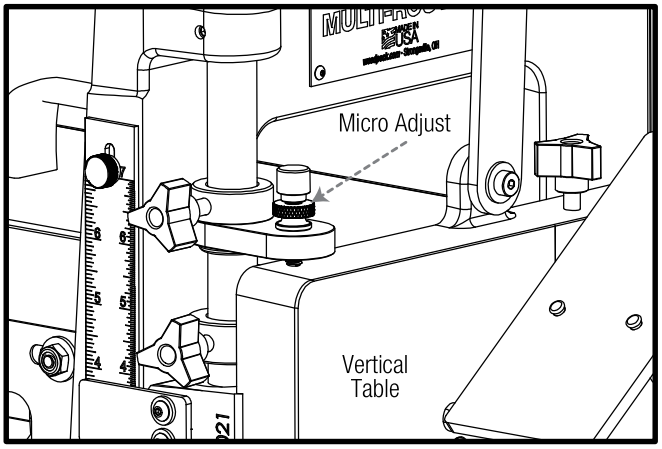


FIGURE 1. *Roughly position Vertical Table by hand then move Micro Adjust down to engage the top of the table for fine adjustment.*

B. Z-AXIS MICRO ADJUST

The Multi-Router comes equipped with a micro adjust that can rotate out of the way when not in use.

• TO USE THE MICRO ADJUST:

1. Swing the Micro Adjust forward so that the Brass Thumb Screw is over top the Vertical Table. ***FIGURE 1.***
2. Loosen the Knob on the Shaft Collar of the Micro Adjust so that the whole thing can slide up and down the Shaft. Lower it until the Brass Thumb Screw comes in contact with the Vertical Table. Tighten the Knob.
3. With the Aluminum Thumb Nut loose, make adjustments to the Brass Thumb Screw to raise or lower the Vertical Table, reading the Scale *(or optional digital readout)* to the desired location.
4. You can now locate either the top or bottom Stop Collar *(depending on what end of the feature you are dialing in)* for the vertical slide. The Stop Collars work best as repeatable stops, though the Micro Adjust can be used as a stop for the "up" direction.

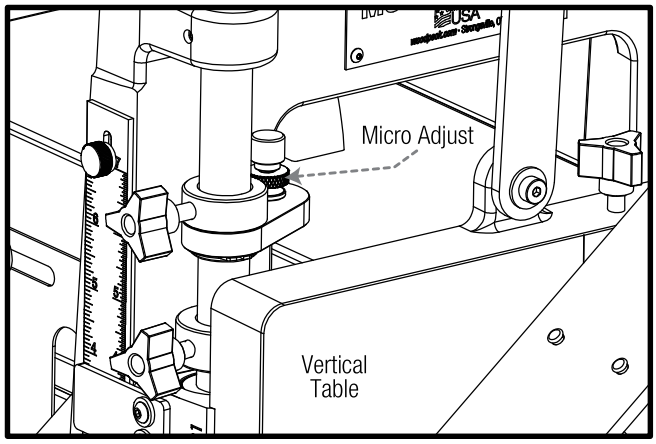


FIGURE 2. *Swing the Micro Adjust until it contact the vertical casting to allow the lever to clear.*

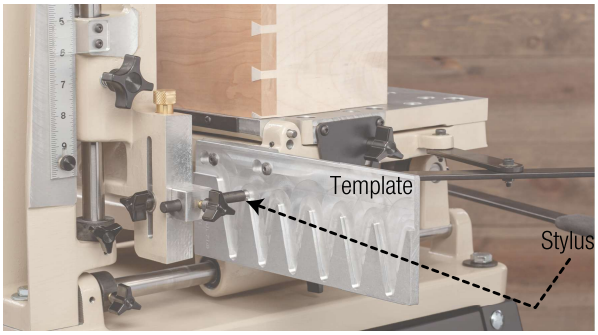
• TO STOW THE MICRO ADJUST:

1. Loosen the Knob on the Micro Adjust clamping collar, slide towards top of the shaft, then re-tighten the Knob.
2. Swing the Micro Adjust towards the center of the machine until the swing arm contacts the vertical casting. ***FIGURE 2.***

C. TEMPLATE FOLLOWING

The other key component of the Multi-Router approach is the template following Stylus and the broad assortment of optional Templates available. Typically, when using a Template, the "X" Axis will be locked and you will follow the Template by manipulating the "Y" and "Z" Levers. ***FIGURE 3.***

FIGURE 3. *While you move the "Y" and "Z" axes, the Stylus follows the Template.*



D. HORIZONTAL TABLE FIXTURING

(4) Button Stops and (2) Manual Clamps are included with your Multi-Router. The Horizontal Table has a series of holes machined into the top that receive either the Button Stops or the Clamps. By using different sets of the holes, you can position your stock at various common angles relative to the Vertical Table.

The Multi-Router comes with (4) Button Stops. These Button Stops can be arranged in the holes of the Horizontal Table to achieve parallel, perpendicular, and some common angles. ***FIGURE 4.***

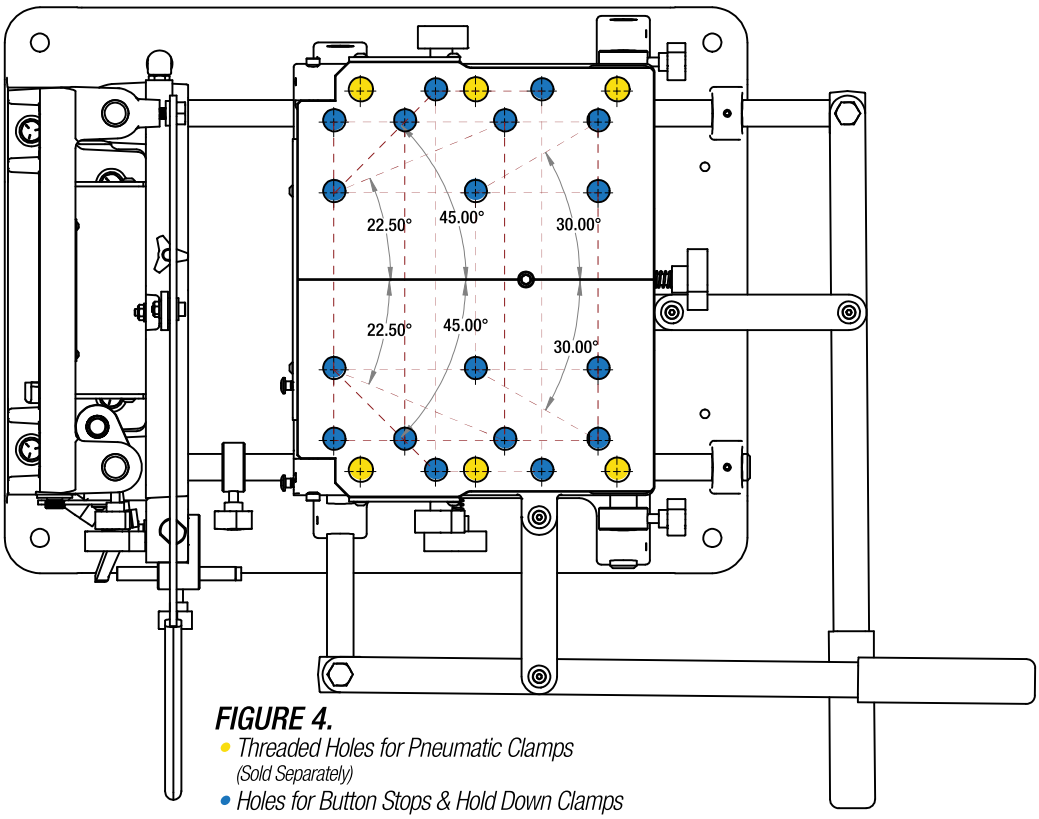


FIGURE 4.
- *Threaded Holes for Pneumatic Clamps (Sold Separately)*
- *Holes for Button Stops & Hold Down Clamps*

By adding spacers between the Button Stops and your workpiece, you can repeatably locate your work anywhere on the table. Fences and Stops can be clamped to the table with one Clamp while the second Clamp holds your workpiece.

There's also a Fence attached to the front edge of the Horizontal Table to accurately locate your stock parallel to the Vertical Table. It is a nice feature when you need it, but frequently in the way. It can be dropped below the surface of the Horizontal Table without removing it. Be cautious when you're adjusting both the Fence and the table Stops so that the travel is limited in such a way that you cannot crash the router bit into the Fence or the table edge. ***FIGURES 5 & 6.***

NOTE: *Additional Manual Camps and Button Stops can be ordered.*

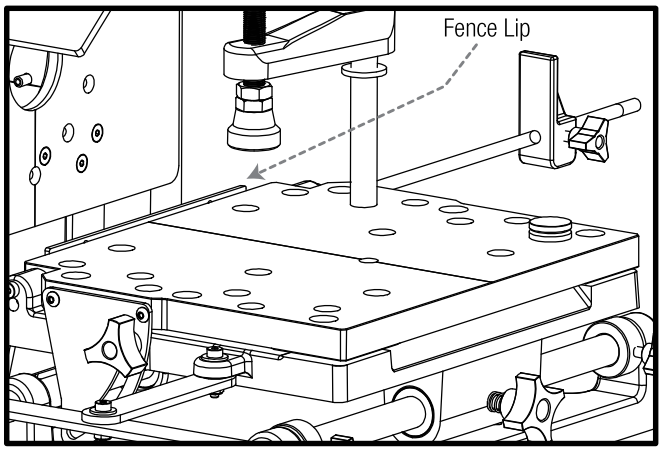


FIGURE 5. *Fence lip at the front of the Horizontal Table adjusts up or down. Use as needed.*

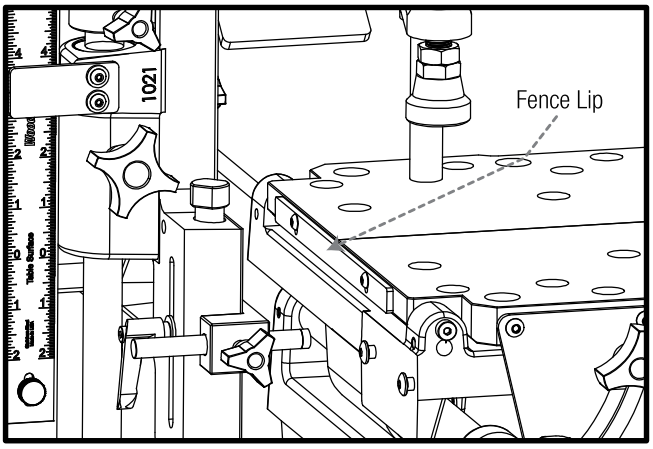


FIGURE 6. *Fence lip adjusted out of the way below table surface.*

E. STOP ROD EXTENSION

The Multi-Router comes with one positionable Edge Stop and Stop Rod, to be used as a repeatable work stop for pieces that hang over the edge of the work surface.

The Stop Rod installs in either end of the Horizontal Table in the open hole, using a Set Screw against the flat of the Stop Rod. The Set Screw uses a 1/8" hex key *(not included)*. ***FIGURE 7.***

The Edge Stop can be positioned anywhere along the Stop Rod, and clamped into place using the Knob.

When not in use, the Edge Stop can be rotated to clear or the entire Stop Rod with Edge Stop can be removed entirely.

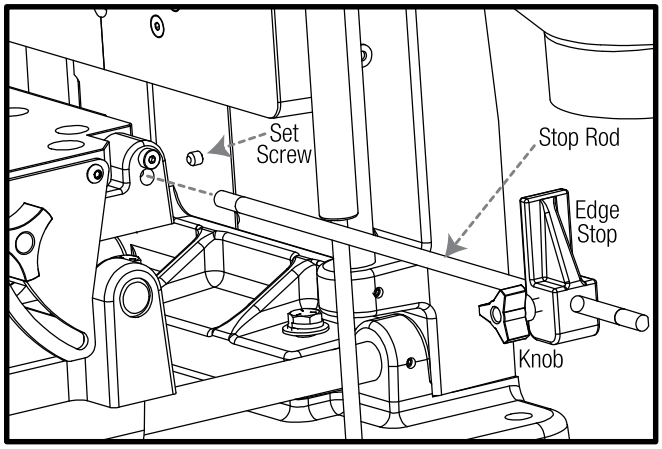


FIGURE 7. *Installing the Stop Rod extension.*

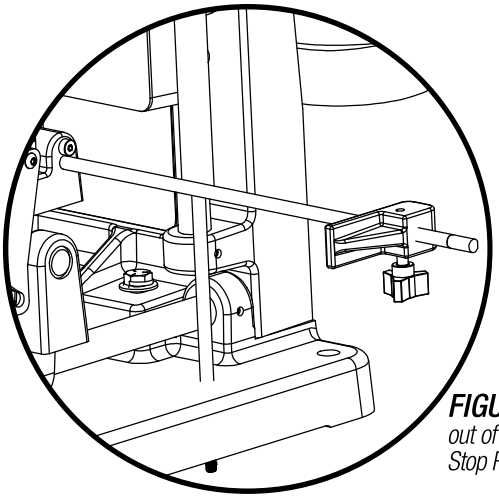


FIGURE 7. *Edge Stop can be rotated out of the way, or remove the whole Stop Rod.*

F. HORIZONTAL TABLE ADJUSTMENT & ZEROING ADJUSTMENT

The Horizontal Table on the Multi-Router can tilt up to 45° and also has a Set Screw adjustable to 0° setting.

• TO ADJUST THE ANGLE OF THE WORK SURFACE:

1. Loosen the Knobs on the Protractor Plates on the both sides of the Horizontal Table. ***FIGURE 8-A.***

2. Set the Horizontal Table to the desired angle.

3. Tighten the Angle Lock Knobs on the Protractor Plates to secure the angle. ***FIGURE 8.***

• TO ADJUST THE 0° SETTING OF THE WORK SURFACE:

1. Bring the Horizontal Table close to the Vertical Table, and align such that the centerline on both Tables line up.

2. Set the Vertical Table so that the bottom edge is just about at the Horizontal Table surface. Lock all slides.

3. Loosen the Angle Lock Knobs on the Protractor Plates on both sides of the Horizontal Table.

4. Use a reliable square reference *(such as a Woodpeckers 1281 Square, sold separately.)* to gauge squareness between the Vertical Table and the Horizontal Table.

5. Use a 1/4" hex key (Sold Separately) in the Table Adjustment Set Screw to set the Table square. The Set Screw has thread locker on it to allow for slight adjustments while remaining at its set location.

6. Tighten the Angle Lock Knobs on the Protractor Plates to secure the angle.

FIGURE 8.

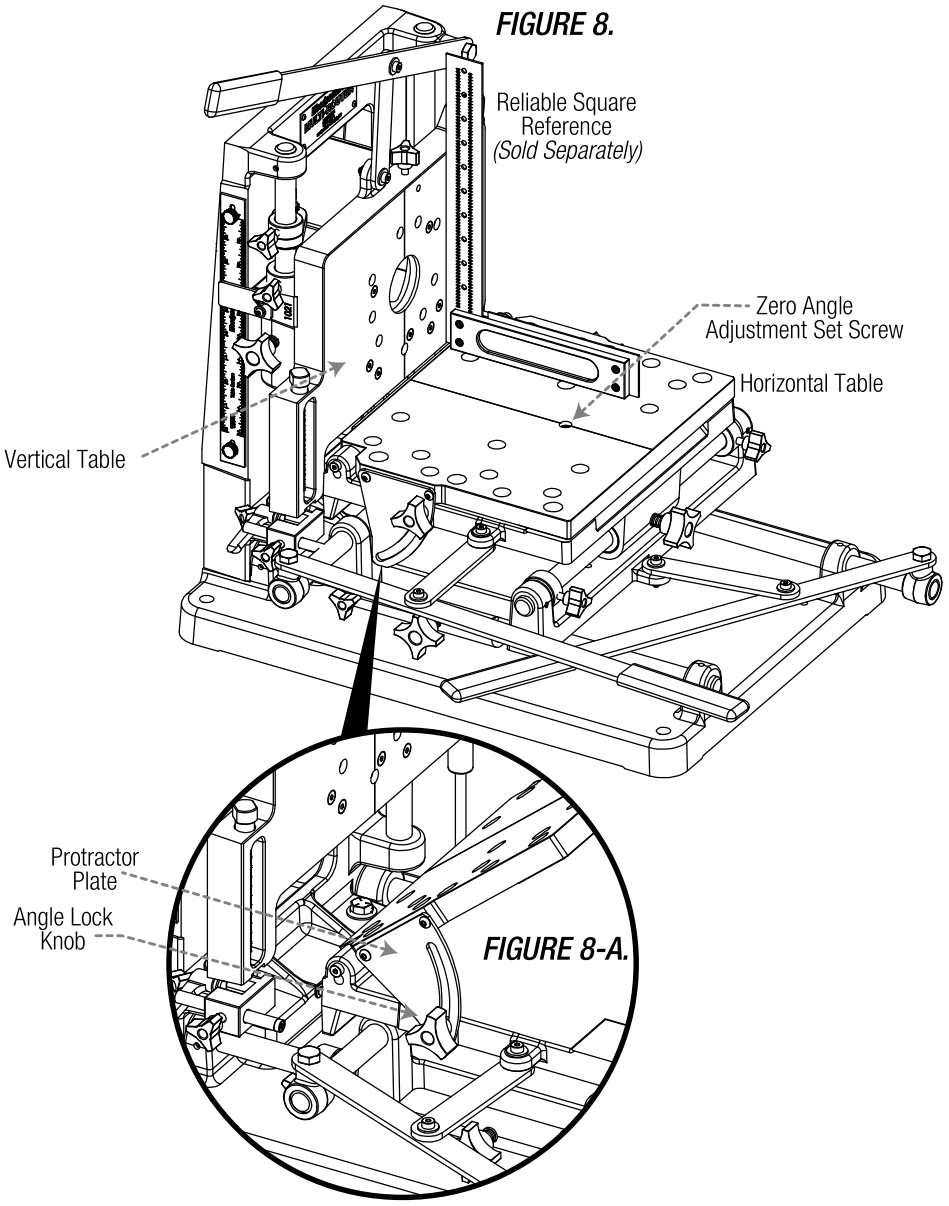


FIGURE 8-A.

V. MORTISING WITH THE MULTI-ROUTER

Mortising does not require a Template. The length of the mortise is controlled by the "Y" Axis Stops. The depth of the mortise is controlled by the protrusion of your router bit, the position of the stock on the Horizontal Table and the "X" Axis Stop. The position of the mortise in the thickness of your stock is controlled by the "Z" Axis (router position).

With the Scale calibrated to the top of the Horizontal Table all you need to know to position a mortise in your stock is where you want the center of the mortise. For example, if your stock is 3/4" thick and you want the mortise centered, position the router 3/8" above the table. By calibrating the top of the table to the center of the bit, you do not have to include the bit size in your calculation. **NOTE:** If you've worked with the Multi-Router in the past, this new Scale that references the top of the table is different (and simpler to use) than the previous scale.

Alternatively, you can lay out your mortise on the stock, install the router bit you'll be using, and align the cutting edges with the layout lines. ***FIGURE 1.***

Whether you use the Scale or adjust to layout lines, we encourage you to always start with test stock and check the fit and position carefully before cutting your actual project components.

A. MORTISING STEP-BY-STEP

1. Prepare your stock straight, flat, square and properly dimensioned. Prepare some test material along with your project stock.

2. Raise the front edge Fence on the Horizontal Table just above the table surface and lock in place.

3. Bring the Horizontal Table toward the Vertical Table, leaving a slight gap. Set the "X" Axis depth Stop and lock the "X" Axis table Lock.

4. Place your stock on the Horizontal Table and against the front Fence. Clamp in place.

5. Adjust the "Z" Axis by using the Scale or aligning the cutter as described above. ***FIGURE 1.***

6. Temporarily remove the stock.

7. Adjust the router in its base to achieve the desired depth of cut referenced to the front edge fence. ***FIGURE 2.***

8. Move the Horizontal Table away from the bit.

9. Position the stock against the Fence and adjust so the end of the mortise layout matches one of the "Y" Axis Stops.

10. Clamp a stop block to the table matching the end position of the stock if possible. This simplifies repetitive cuts. If the stock extends beyond the table on both sides, you will have to calibrate the lateral mortise position manually or use the included Stop Rod for each mortise.

11. Adjust the second "Y" Axis Stop to establish the length of the mortise. ***FIGURE 3.***

CAUTION! Before each start, check that all stops and locks are in place. Check that the router base clamp is secure.

WARNING! To reduce the risk of injury, wear safety goggles or glasses with side shields, ear protection & a dust mask.

12. Start the router and move the Horizontal Table toward the router bit until it cuts about 1/8" deep. Feed from left stop to right stop. Return to the left stop. Advance into the router bit another 1/8" and feed from left stop to right stop. Repeat until the full depth of the mortise has been reached.

FIGURE 1. *Align mortise by measurement or by adjusting to layout lines.*

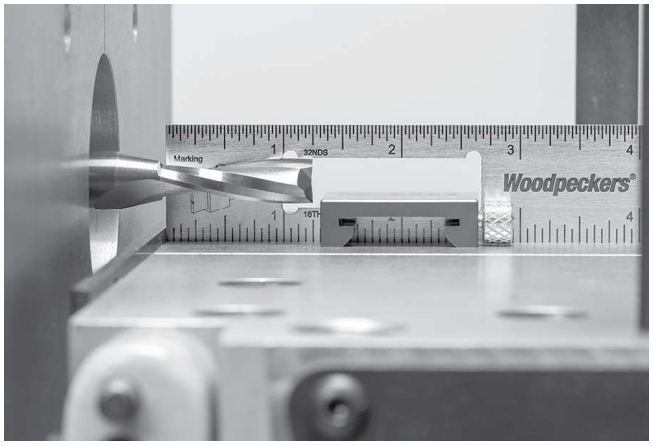


FIGURE 2. *Rule flush to front lip and depth of cut is set by adjusting router.*

FIGURE 3. *Limits of mortise controlled by "Y" Axis Stops. Set bit to layout line, then set stop.*

B. MORTISING VARIATIONS

• BRIDLE JOINT

For an open mortise with a square bottom at the end of a board, work with the stock perpendicular to the Vertical Table. Set the depth of cut with the end of the board flush against the Vertical Table. ***FIGURE 4.***

FIGURE 4. *Bridle joint mortise cut with stock perpendicular to Vertical Table.*

• MORTISE WIDER THAN ROUTER BIT

If you need to machine a mortise wider than your router bit, lay out the mortise on the edge of your stock, adjust the cutter to the lower edge and lock the "Z" Axis lower Stop. Adjust the cutter to the upper edge and lock the "Z" Axis upper Stop. When cutting the mortise, set the Vertical Table to the lower stop, lock the table in place and machine the mortise to full depth. Then move the Vertical Table to the upper stop and repeat.

• CUTTING TENONS WITH THE MULTI-ROUTER

Tenoning on the Multi-Router generally involves fixing one axis and manipulating the other two to machine material from the top and bottom of the workpiece. Using a template, you can produce a rounded-end tenon that will fit perfectly in a router-cut mortise. You can also cut square-shouldered tenons without a template. These would be used for bridle joints and for mortises that have been squared out. Let's look at the procedure for square-shouldered tenons first, then we'll explore using the Tenon Templates.

• SQUARE-SHOULDERED TENONS STEP-BY-STEP

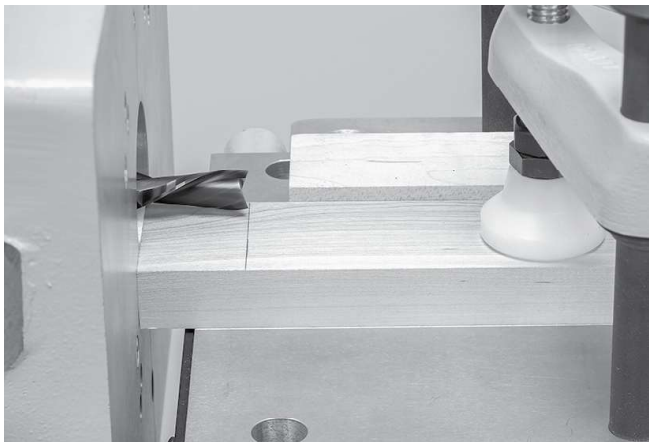


FIGURE 5. *Set depth of cut by positioning stock at travel limit and then adjusting router bit in or out.*

1. Prepare your stock straight, flat, square and properly dimensioned. Prepare some test material along with your project stock.
2. Mark the shoulder positions of the tenon on the end of the stock and mark the tenon length on the faces of the stock.
3. Lower the front edge fence.
4. Adjust the "X" Axis so that the front edge of the Horizontal Table is slightly away from the Vertical Table.
5. Align the end of the workpiece flush with the Vertical Table and outside face down on the table.
6. Clamp the stock in place.
7. Clamp a guide to the table to aid in positioning repeat cuts.
8. Adjust the "Z" Axis until the router bit is just above the stock.
9. Set the length of the tenon by adjusting the depth of cut on the router bit. ***FIGURE 5.***

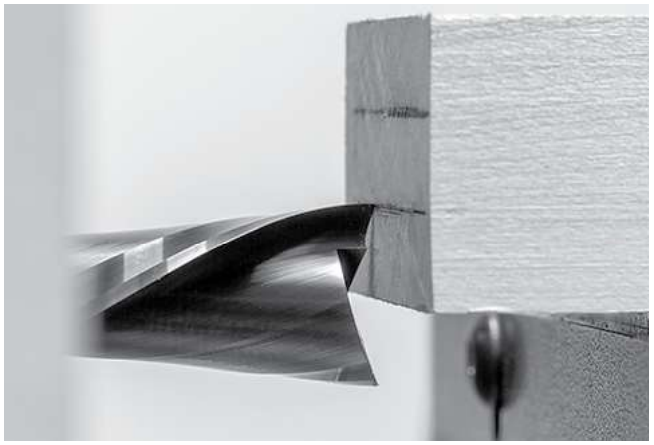


FIGURE 6. *Set tenon shoulders to layout line or using scale to set position relative to the top of the Horizontal Table.*

10. Move the Horizontal Table and the stock away from the Vertical Table, just past the end of the router bit.
11. Adjust the "Z" Axis until the router bit aligns with the bottom shoulder mark on the end of the stock. Lock the Vertical Table and set the lower stop. ***FIGURE 6***
12. Unlock the Vertical Table and adjust the "Z" Axis until the router bit aligns with the top shoulder mark on the end of your stock. Lock the Vertical Table and set the upper stop. Once the stop is secure, release the table lock, move the table down to the lower stop and re-lock the table.

CAUTION! Before each start, check that all stops and locks are in place. Check that the router base clamp is secure.

WARNING! To reduce the risk of injury, wear safety goggles or glasses with side shields, ear protection & a dust mask.

13. Start the router and move the Horizontal Table toward the router bit until it cuts about 1/8" deep. Feed from left to right across the tenon. Return to the left. Advance into the router bit another 1/8" and feed from left to right. Repeat until the full depth has been reached.
14. Unlock the table, raise it to the upper stop and re-lock it. Repeat the step and cut procedure for the upper tenon shoulder.
15. Check the fit of the tenon in its mating mortise. Adjust the "Z" Axis as needed to fit.

NOTE: When making adjustments, change the lower cut to align the face of the stock. Change the upper cut to correct the fit of the tenon in the mortise. This procedure should result it perfectly mating faces and a uniform tenon thickness, even if there is slight variance in the stock.

VI. CUTTING TENONS USING THE TENON TEMPLATES

Multi-Router Tenon Templates are available in 1/2", 3/8" and 1/4" thicknesses. All three thicknesses are available in 5 widths…from 1" to 3" in half-inch increments for a total of 15 template sets. Each set has 3 templates, one that is exactly to specified thickness, one that is .010" thinner than specified and one that is .020" thinner than specified. The under-sized templates allow you to make tenons that are slightly under-sized to compensate for mortises made with re-sharpened or out of specification router bits.

The Tenon Templates are fixed to the Tenon Template Holder, which is mounted to the front face of the Horizontal Table.

Regardless of tenon size, use a 1/2" straight bit. Solid carbide up-cut spiral bits are recommended.

A. TEMPLATE-GUIDED TENONS STEP-BY-STEP

1. Prepare your stock straight, flat, square and properly dimensioned. Prepare some test material along with your project stock.

2. Lay out the tenon shoulders and length on a test piece. Locate and mark the centerline of the test piece, as well. ***FIGURE 1.***

3. Select the correct size template and install it in the Template Holder. ***FIGURE 2.***

4. Install the Template Holder with the socket-head cap screws on the front edge of the Horizontal Table.

5. Lower the front edge Fence and tighten in place.

6. Bring the Horizontal Table toward the Vertical Table and position so that the router bit cannot reach the Horizontal Table when set to full cutting depth. Lock the "X" Axis of the Horizontal Table at this point, ensuring that the router bit cannot touch the table.

7. Raise the Stylus Pin block to approximately the middle of its range.

8. Extend the Stylus so it is over the template.

9. Lower the Vertical Table and adjust the "Y" Axis until the Stylus drops into the notch in the top of the Template Holder.

10. Place the stock flush to the Vertical Table, face down on the Horizontal Table and align the center of your stock with the centerline on the Vertical Table. Clamp the stock in place and position a stop block for repeat cuts. ***FIGURE 3.***

11. Retract the Stylus temporarily.

12. Lower the router bit until it just kisses the top surface of your workpiece.

13. Adjust the router depth of cut to set the correct tenon length. ***FIGURE 4.***

14. Move the Horizontal Table back until it is just clear of the router bit.

15. Lower the Vertical Table until the router bit is aligned to the top tenon shoulder. Lock the Vertical Table.

16. Loosen the two locks on the Stylus.

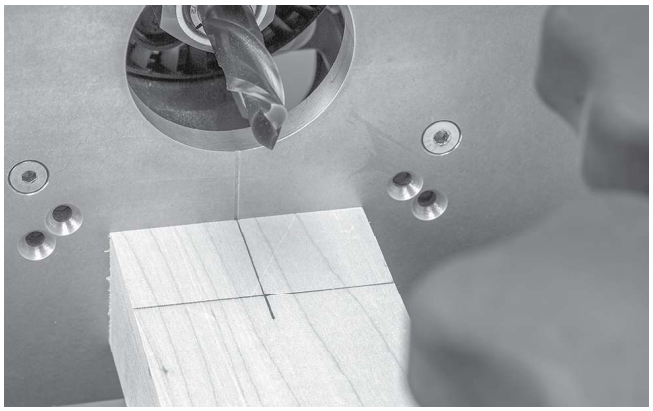


FIGURE 1. *Carefully lay out the centerline of your stock and the depth of the tenon cut.*

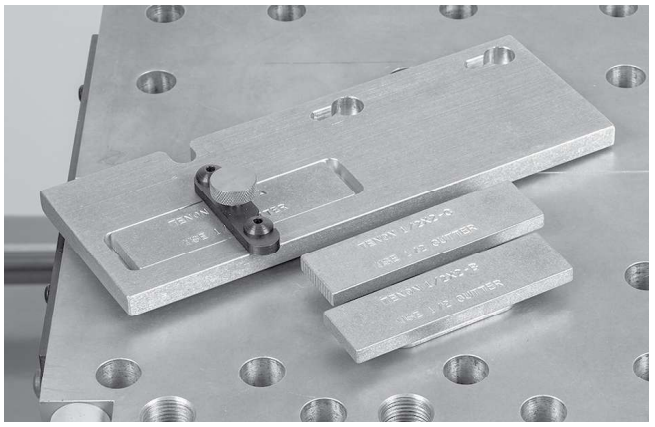


FIGURE 2. *Each tenon template has three versions. Start with "A", which is exact measurement. B = -0.010". C= -0.020"*

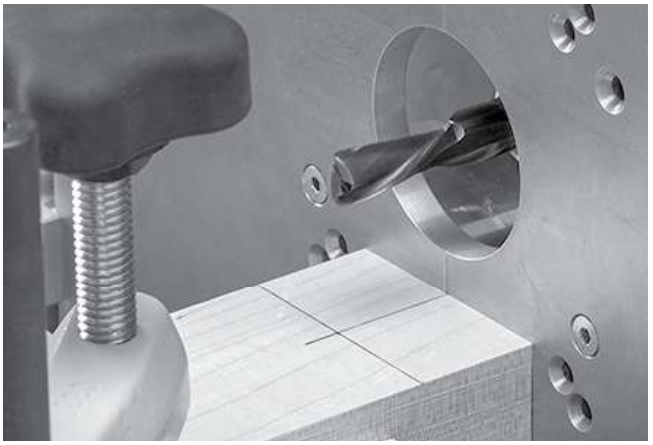


FIGURE 3. *Calibrate stock to template by aligning centerline of stock to centerline of the vertical table.*

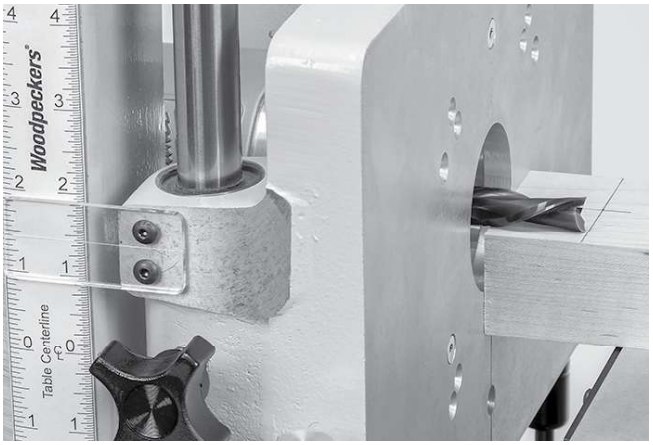


FIGURE 4. *Adjust the depth of cut by adjusting the router.*

17. Move the Stylus forward until it is just short of the template face and tighten the Lateral Lock. ***FIGURE 5.***

18. Adjust the Stylus vertical travel until the bearing is resting on top of the protruding portion of the template and tighten the Vertical Lock. Now the Stylus is calibrated to the top shoulder of the tenon.

19. Unlock the Lateral Lock on the Stylus and retract it temporarily.

20. Unlock the Vertical Table, raise it until the router bit is above the stock and lock it.

21. Bring the Horizontal Table toward the Vertical Table until the stock is flush with the Vertical Table. It's a good idea at this point to bring the bit down to the stock and confirm that the router is properly set for the correct tenon length. Also confirm that the stock is square to the Vertical Table in both planes. Lock the "X" Axis travel of the Horizontal Table. The stock should be touching the Vertical Table, but not binding its movement.

22. When the Horizontal Table is correctly positioned and locked, move the Stylus forward until the end is just short of the template face and the bearing is correctly positioned on the template protrusion. Lock the Stylus.

23. Unlock the Vertical Table and the "Y" Axis of the Horizontal Table (if locked).

CAUTION! Before each start, check that all stops and locks are in place. Check that the router base clamp is secure.

WARNING! To reduce the risk of injury, wear safety goggles or glasses with side shields, ear protection & a dust mask.

24. Start the router. Bring the router down onto the stock until it starts cutting. Move the router across the tenon with the "Y" Axis Lever. Make shallow cut across the top of the tenon until the Stylus engages the template. Move to the end of the tenon and make shallow cuts up and down across the shoulder of the tenon until the Stylus engages the template. Repeat at the other shoulder.

25. Move the bit under the tenon and make shallow cuts across the bottom of the tenon until the Stylus engages the template.

26. Holding consistent pressure against the template with the "Y" and "Z" Axis Handles, go completely around the tenon once or twice. ***FIGURE 6.***

27. Check the fit of the tenon in the mortise. If it is too tight, use one of the under-sized templates. If the faces don't align properly, adjust the Stylus up or down as needed to change the position of the tenon on the stock.

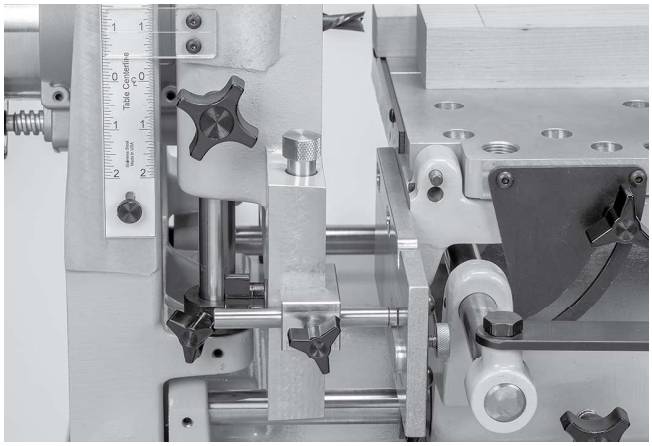


FIGURE 5. *Stylus is adjusted to top of template once cutter is adjusted to tenon shoulder. Bring Stylus forward to Template, then* ***back off slightly.***

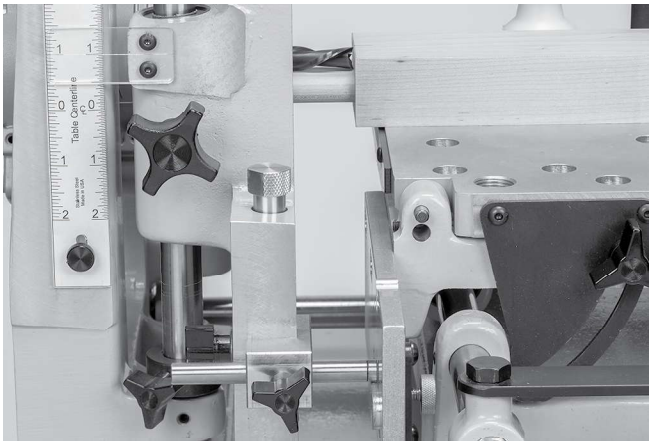


FIGURE 6. *After most of the material is machined away, hold Stylus tight to Template and work all the way around the Template a* ***few times.***

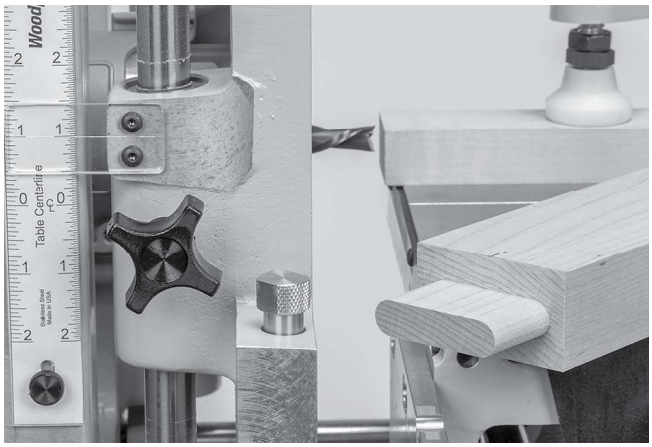


FIGURE 7. **Finished tenon.**

VII. MORTISE & TENON VARIATIONS

A. ANGLED TENONS

Angled and compound angle mortise and tenon joints can be made by manipulating the Button Stop positions, custom made fences and the angle adjustment of the Horizontal Table. There are far too many variations to cover in this manual, but the fundamentals are the same. Match the end cut to the Vertical Table and cut the tenon to the template. Your individual project will dictate the angles needed in both directions.

B. FLOATING TENONS

You can make a wide variety of floating tenon joints by cutting mortises in the joining parts with your Multi-Router and making tenons with a template and cutting them off. Alternatively, you can make tenon stock by using a thickness planer and round-over bits in a router table.

VIII. BOX JOINT TEMPLATE

There are two box joint templates available, one for 1/4" fingers and one for 3/8" fingers. You will need a matching solid carbide spiral router bit for whichever finger size you're cutting.

A. BOX JOINTS STEP-BY-STEP

1. Prepare your stock straight, flat and square. Prepare some test material to the same dimensions. Prepare a spacer block that precisely matches the width of the cut made by the router bit you will use. ***FIGURE 1.***

2. Use the joining pieces to mark the length of the fingers to be cut on each other.

3. Install the template on the front of the Horizontal Table.

4. Install a matching router bit in the router.

5. Lower and lock the front edge Fence (it will not be used).

6. Move the Horizontal Table toward the Vertical Table until there's a gap of approximately 1" and lock the "X" Axis movement.

7. Insert the Stylus Pin in the first vertical slot of the template and lock it. Adjust the Vertical Table up or down until the router bit is just above the surface of the Horizontal Table.

8. Place your test stock on the Horizontal Table flush against the Vertical Table and butted sideways to the router bit.

9. Clamp the stock in place and clamp a fence next to the stock to speed up consecutive cuts.

10. Bring the router bit up and over the test stock. Adjust the router in or out to align to the depth of cut mark on the stock. ***FIGURE 2.***

CAUTION! Before each start, check that all stops and locks are in place. Check that the router base clamp is secure.

WARNING! To reduce the risk of injury, wear safety goggles or glasses with side shields, ear protection & a dust mask.

11. Raise the bit above the stock, start the router and move the tables so that the Stylus enters the second vertical slot. Cut through the board, return the cutter above the stock, move over to the third slot and repeat across the width of the board.

12. To cut the joining board, place the spacer that you made in Step VI-1-A against your fence. Place the joining board against the spacer. Cut the joint exactly as you did on the first board, but because of the spacer the pattern will be offset and will start with a cut, instead of a finger. ***FIGURE 3.***

13. Boards wider than 8" can be cut by moving the board down and indexing the last cut to the router bit.

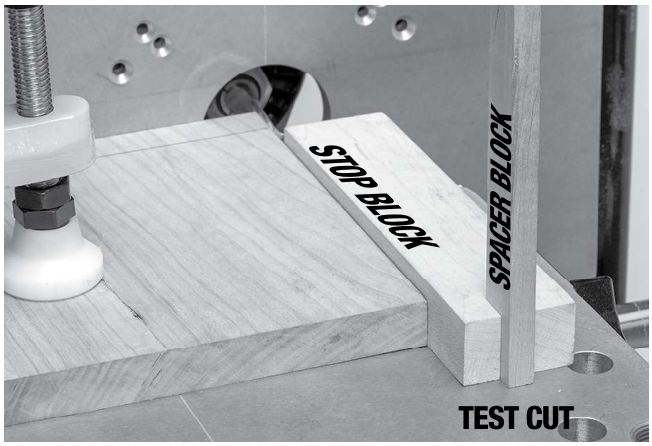


FIGURE 1. *Use your stop block to make a test cut of the router bit. Make your spacer block a perfect fit. Keep them together for convenience.*

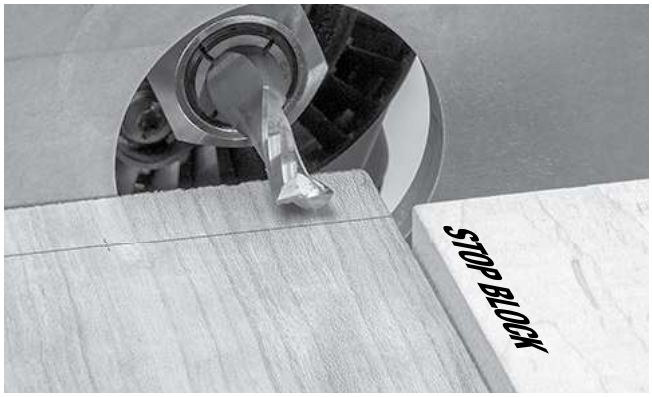


FIGURE 2. *First cut in first board leaves a finger.*

FIGURE 3. *With spacer block in place, first cut on second board begins at edge to mate with first board.*

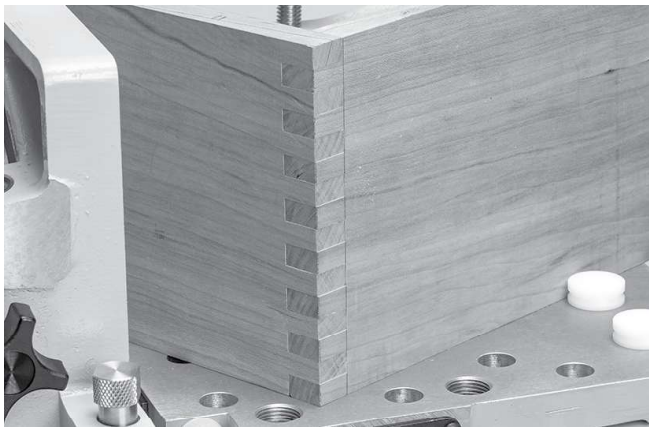


FIGURE 4. *Finished box joint.*

IX. THROUGH DOVETAILS

There are two different template sets for through dovetails. The 3/4" Template Set (10603) and the 1/2" Template Set (12919). Both sets have two templates and require a dovetail bit and a straight bit. The 10603 set is the more versatile of the two. It can use two different sized pairs of bits to create two completely differently appearing joints. You can use a 3/4" - 14° dovetail bit with a 3/8" straight bit or a 1/2" - 14° dovetail bit with a 1/2" straight bit.

For the 1/2" Template Set (12919), you must use a 1/2" - 14° dovetail bit and a 3/8" straight bit.

For either Template Set, the tails are cut with a dovetail bit using the template with parallel grooves. The pins are cut with a straight bit and the template with triangular grooves. The Multi-Router dovetail method works from the center of the stock, leaving equal partial pins or partial tails on both edges of the joint. Set up is quite easy, with the final fit adjusted by raising or lowering the Stylus Pin when setting up for the pins.

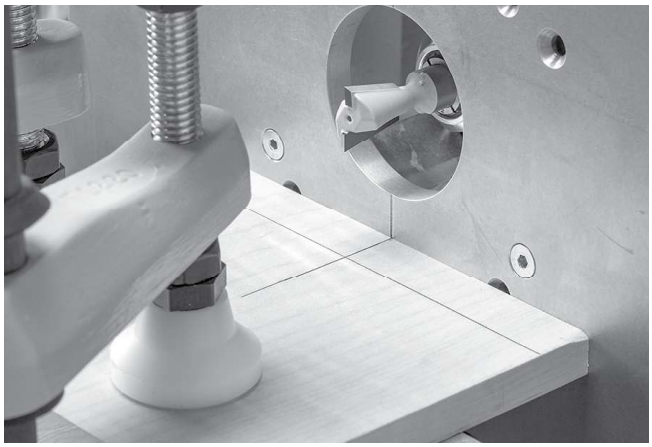


FIGURE 1. *Carefully aligning the center of your stock with the center of the Vertical Table ensures even spacing at the ends of the board.*

A. THROUGH DOVETAILS STEP-BY-STEP

1. Prepare your stock straight, flat, square and properly dimensioned. Prepare some test stock to the same dimensions as your workpieces.

2. Mark your test stock for depth of cut…tail board thickness marked on the pin board and pin board thickness marked on the tail board.

3. Mark the center line on the top surface of the test stock.

4. Install the appropriate Dovetail Cutter into the unplugged router.

5. Install the Tail Template on the Multi-Router.

6. Position the Horizontal Table so that the template is 1" away from the Vertical Table. Secure it at this location by tightening the Horizontal Lock Knob on the operator's side of the Multi-Router.

7. Move the Horizontal Table left/right until the Stylus Pin is aligned in the vertical slot near the template's center.

8. Tighten the Vertical Lock Knob, securing the Stylus Pin in the template center slot.

9. Position the work piece on the Horizontal Table, flush and square against the Vertical Table and with the stock's centerline aligned to the centerline on the Vertical Table. Clamp the stock in place. ***FIGURE 1.***

10. Install a stop against the stock and clamp in place, if possible. All subsequent workpieces can be aligned to the Stop.

11. Adjust the router depth of cut to match the mark on your test stock. ***FIGURE 2.***

12. Unlock the Vertical Table and raise it until the Stylus Pin is 1/2" above the template slot.

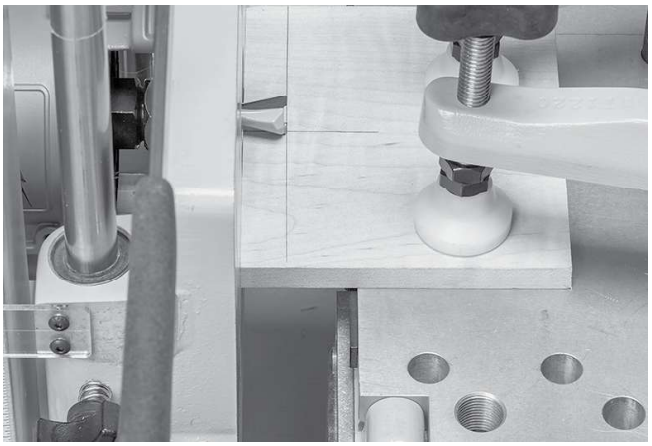


FIGURE 2. *Set depth of cut to match the thickness of the joining material.*

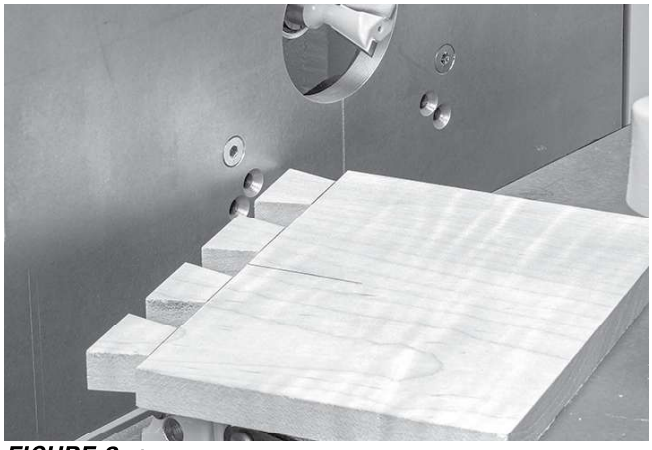


FIGURE 3. *Completed tail board.*

CAUTION! Before each start, check that all stops and locks are in place. Check that the router base clamp is secure.

WARNING! To reduce the risk of injury, wear safety goggles or glasses with side shields, ear protection & a dust mask.

13. Move the Horizontal Table away from the operator until the Stylus Pin is above the first slot that will engage the cutter with the stock. Slowly and smoothly bring the Vertical Table down and cut through the tail board.

14. Raise the Vertical Table and move the Stylus Pin to the next template slot for the second cut.

15. Repeat until all cuts are made.

16. If the test tail board came out as expected, cut all tail boards.

17. Leave the Stop in place.

18. Pin boards.

19. Mark off a center line on the top surface of the test stock.

20. Attach the pin template to the Multi-Router.

21. Install the appropriate-sized bit in the unplugged router. ***FIGURE 4.***

22. Position and clamp the pin test stock against the stop and flush and square to the Vertical Table. ***FIGURE 5.***

23. At this point, the centerline of the test stock and the centerlines of both tables should all coincide. Check the pin template and ensure that the Stylus aligns to the apex of the center rib. If it doesn't, loosen the bolts that hold the template in place, adjust and re-tighten.

24. Adjust the router depth of cut to match the mark on your test stock.

25. Adjust the Stylus Pin vertically until it is roughly at the bottom third of its travel.

26. Raise the Vertical Table until the Stylus Pin is 1 /2" above the template slot.

27. Plug the router to power and turn it on.

28. Move the Stylus Pin into the first template slot and make a cut, allowing the stylus to follow the angled shape of the slot.

29. There may be stock in the center of the cut not removed when the template edges are followed.

30. For the cleanest cuts, first cut down and through the work piece on the socket wall opposite the operator's side. Next, make a shallow cut across the top and then make a plunge cut down on the operator's side of the socket. Finally, remove any material in the middle.

31. Repeat this procedure until all remaining cuts are made.

32. More than likely, the joint will be too tight at this point. Positioning the Stylus Pin lower means that you can "sneak up" on the fit. If your joint is too sloppy, you have to cut the pins off and start the test procedure over. If the pins are too tight, you can adjust the Stylus up in small increments until you get the fit you want. Notice in the photo that the tail board is short enough to test the fit to the pin board without un-clamping the pin board from the table. Once the fit is dialed in, your actual workpieces can be any length, but it is best to work with short stock for the test cuts. ***FIGURE 6.***

- If the fit is loose, lower the Stylus Pin assembly.
- If the fit is tight, raise the Stylus Pin assembly.

FIGURE 4.

Size Bit	Mates With	Dovetail Template
3/4" - 14°	3/8" Straight Bit	10603
1/2" - 14°	1/2" Straight Bit	10603
1/2" - 14°	3/8" Straight Bit	12919 1/2"

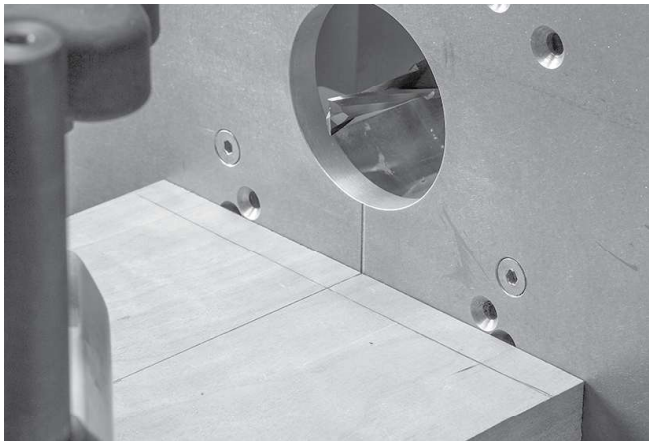


FIGURE 5. *Pin board aligns to center. Adjust Template so Stylus also aligns at apex of center rib of the Template.*

FIGURE 6. *Make sure your dovetail test piece will fit over the rails so you can test in place. Sneak up on a perfect fit with small adjustments.*

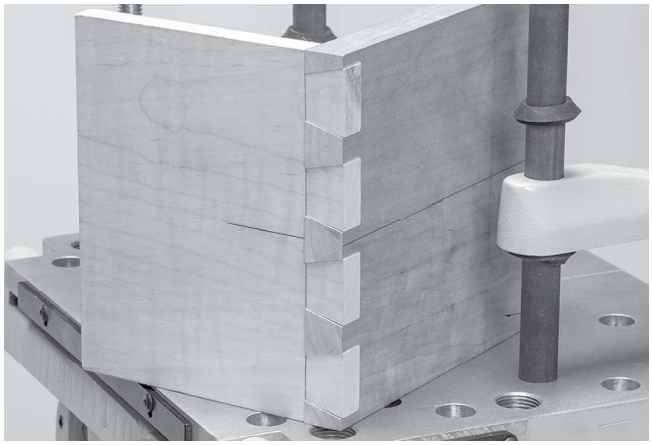
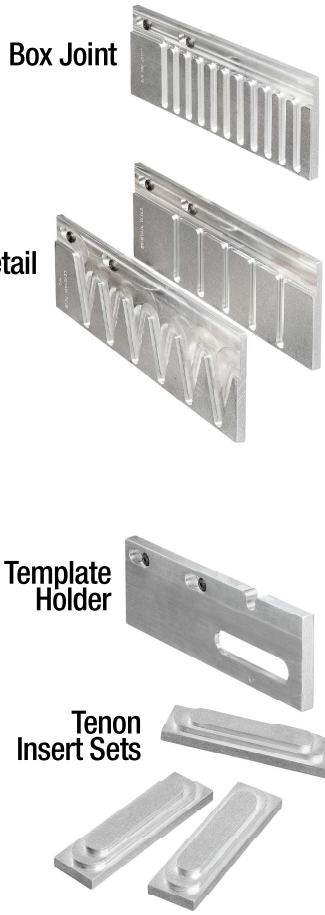


FIGURE 7. *Finished dovetail.*



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☐MR10552	**Box Joint Template 1/4"**
☐MR11908	**Box Joint Template 3/8"**
☐MR10603	**Dovetail Template Set 3/4"**
☐MR12919	**Dovetail Template Set 1/2"**
☐MR10702	**Tenon Template Holder**

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☐MR90009 **1/2" x 1"**

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☐MR12252 **3/8" x 2"** / ☐MR12104 **3/8" x 1-1/2"** /
☐MR11957 **3/8" x 1"**

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☐MR12203 **1/4" x 2"** / ☐MR12054 **1/4" x 1-1/2"** /
☐MR10751 **1/4" x 1"**

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