

## SLIDING DOVETAILS

Sliding dovetails can be formed on the AKEDA jig with a little care and patience. You will need to work accurately. We strongly recommend using a clear acrylic router sub base for greater accuracy, such as the one available from The Jig Store. It has a centering cone that allows you to accurately align the guide bushing with the collet.

Don't attempt a sliding dovetail unless you are experienced with a router. Sliding dovetails require a great deal of skill, so make practice joints first, and also glue them up, so you understand the whole process.

## Nomenclature

Throughout this document, the vertical piece (e.g., a bookshelf side) is called the "Tail Socket Piece" and the shelf itself is called the "Tail Piece".

## The Principle

The front guide rail is *always* the guiding surface unless you make a shim to help form the Tail Socket piece. It's easy to allow the guide bushing to wander away from the front guide rail, but if that happens, at least the error will be hidden inside your joint.

## Tail Socket Depth And The Correct Bit

First decide how deep you want the dovetail. The dovetail socket depth should be one third, or at the very most one half of the thickness of the tail socket work piece, because the socket weakens the board all the way across. Remember, you may be using, say, 1" stock for your bookshelf sides, but if your tail socket is 3/8" deep, your bookshelf side is on 5/8" thick at that point.

## The Correct Dry Fit Is Slightly On The Loose Side

Therefore a joint that's too tight will bend the bookshelf side across the thin section, especially if the socket is too deep, or you are working with thin stock. So make the joint a slightly loose dry fit. Also, a joint that's too tight may seize from the glue when you slide it together, and you may not be able to drive it fully home.

## Pick The Right Dovetail Bit

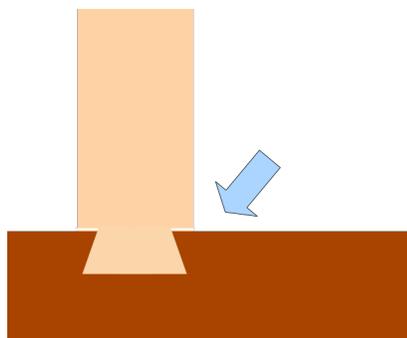
You can use any angle dovetail bit, and the tail-piece can be any thickness over 1/2". Anything less, and you will not be able to make a narrow enough socket. Always cut a test joint first to make sure the widest part of the tail is greater than the diameter of the dovetail bit (.445").

Steeper angle bits hold better in thinner stock, but they're more sensitive to fine tuning joint fit.

Never change the router bit depth of cut between forming the tail piece and forming the tail socket piece.

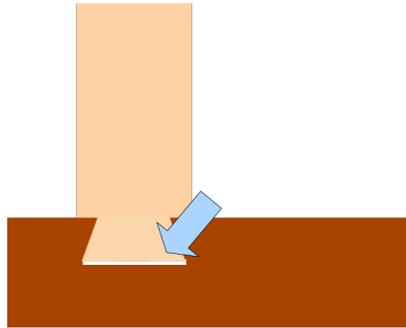
## Deliberately Create A Gap In The Right Place

You need to avoid a gap between the shoulders and the tail socket piece, as shown in the figure below:



This is one of those times in woodworking when a perfect dry fit will cause big problems when you glue up. Any adhesive that gets between the top of the tail and the bottom of the socket will have a hydraulic effect and a friction effect. As you drive the glued joint home, adhesive will pack into the tight space, lift the tail piece, cause increasing friction, prevent the shoulders from fully seating, and cause the joint to get tighter and tighter to the point where you may not be able to drive it all the way home.

A small gap as shown below will provide a place for excess glue to go and allow the shoulders to fully seat.

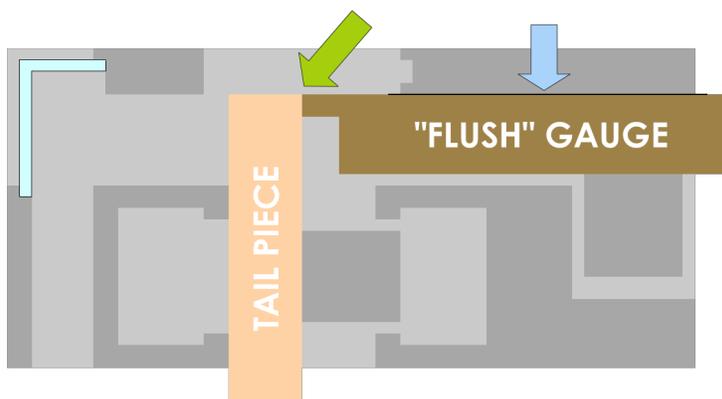


### Form The Tail Piece First

Cut a test joint first, using the following procedure, which is written as though it were the finished joint. Loosely install the vertical tail piece by eye, up against the front channel and against a side fence. IMPORTANT - form a 3" – 4" wide test tail piece at the same time you form your project tail piece. This is done so you can fit the test tail piece to the tail socket without removing the tail socket piece from the jig. Note, to test fit the test tail piece, you may need to temporarily remove the front guide rail.

Prepare and loosely install a full width "Flush Gauge" with paper shims (try .005" - .010") between the gauge and the underside of the clamp bar, shown by the thin black line in the sketch below (blue arrow). The thickness of the paper shim will equal the size of your intentional gap. It will ensure the height of the finished tail will be less than the depth of the tail socket by the thickness of the shim, thereby ensuring the shoulders will seat properly.

Note, only use the paper shim with the flush gauge, not with your final tail socket piece!

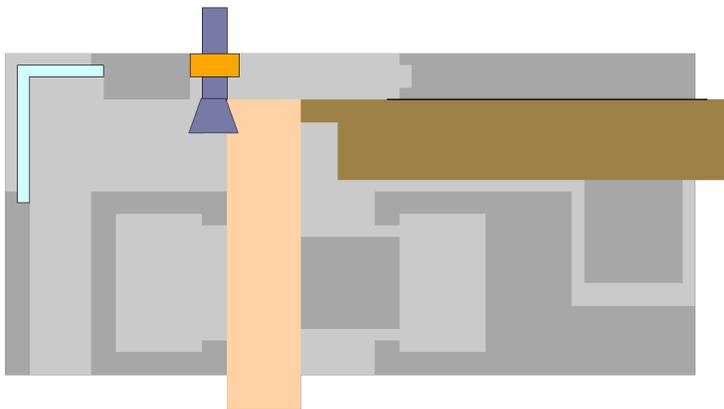


Now adjust both pieces until the edge of the flush gauge is up against the back side of your vertical tail piece. It must be flush with the top surface of the tail piece all the way across (green arrow). Use your finger tips to check.

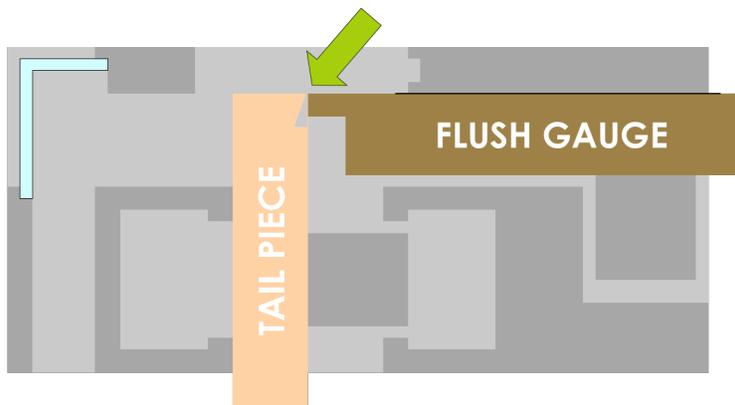
Don't remove the Flush Gauge. Set the dovetail bit to the desired depth of cut. Now you're ready to rout one side of the tail piece.

Keep the guide bushing pressed against the front guide rail at all times and rout from right to left. This is called “climb cutting” and requires special care to prevent the bit from biting into your work piece and dragging the router along with it. It’s essential to keep a solid grip on your router.

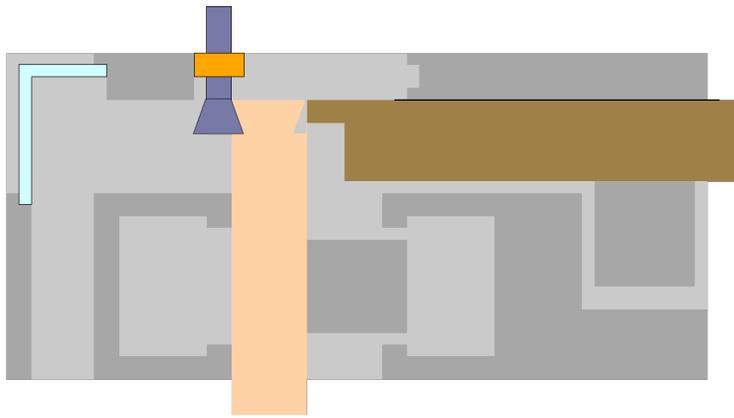
Climb cutting from right to left is essential because the router bit torque reaction helps to hold the guide bushing against the front guide rail, and because it minimizes tear-out



Now reverse the vertical tail piece. You may need to draw the flush gauge forward slightly so it contacts the already dovetailed half. Once again, use your finger tips to make sure it is exactly flush (green arrow) across the board.



Using the same routing procedure, cut the opposite side of the tail piece.



If you've already successfully gone through the test joint process, and you're working on your actual project, form a narrow test tail piece immediately after you've formed your last tail piece. Use the same thickness stock, the same settings and the same procedure. Put the test piece aside to use as a template to check the tail socket pieces.

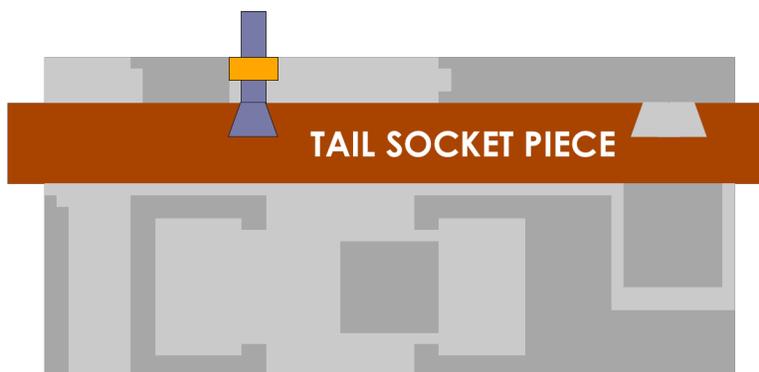
Now you can remove the "flush gauge" from the jig.

### Forming The Tail Socket Piece

Always use the front guide rail as the guide surface for your guide bushing. When forming the tail sockets it's very important to prevent the guide bushing from losing contact with the front guide rail.

Now you can form the tail socket piece (see following page). Remove the window, then mount the tail socket piece in the horizontal clamp (see below), up against a side fence. As a precaution, use a sharp pencil against the rear facing edge of the front guide rail to make a reference mark for positioning the tail socket piece just where it passes under the guide rail.

Now make the first cut. Keep the guide bush pressed against the front guide rail at all times and rout from right to left. Remember you're climb cutting again, so maintain a firm grip on the router and apply pressure to the front guide rail. Make a second pass to make sure you didn't skip any areas.



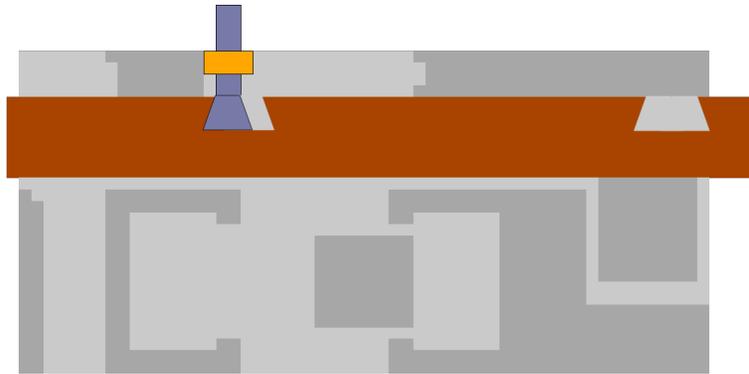
DO NOT remove the tail socket piece from the jig. Test the fit the test tail piece by removing the front guide rail if necessary. The tail socket will most likely be too narrow to fit the tail. So far, so good. Now comes the tricky part...

### Fitting The Tail Socket Piece To The Tail Piece

You will need to make a second cut to widen the socket to fit the tail. This is where you have to work very accurately, and it requires trial and error, so always form a test tail socket piece first.

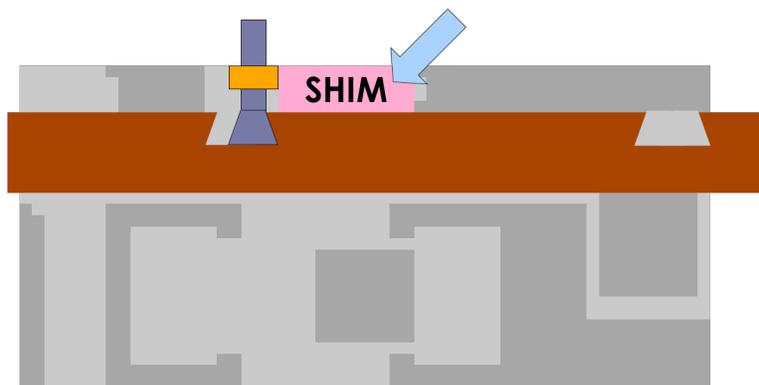
There are many ways to accomplish this. You will either have to move the tail socket piece, or move the guide bushing and bit. We recommend any method that avoids shifting the tail socket piece because it can be duplicated from joint to joint.

In principle, this is what you're aiming for:



The best way we've found to widen the tail socket is to accurately cut a length of close-grained hardwood that will just drop into the mouth of the jig lengthwise, rest on top of your tail socket piece and up against the vertical edge of the rear guide rail (see below). This wide shim acts as a second fence for the guide bushing.

This "shim" must be at least  $\frac{1}{2}$ " thick to catch the guide bushing, but less than  $\frac{9}{16}$ " thick, so it won't touch the router base. If your tail socket piece is less than half the width of the jig, it will "see-saw" downwards at the far end of the jig, so support it at the far end with a 1" block, or a vertically clamped support piece. It doesn't need to be fixed in the jig because it can't really go anywhere.



Start out with a 1-5/8" wide hardwood shim. Using the tail socket test piece, take thin cuts off the shim and re-rout your tail socket until you end up with the right fit to the tail piece. Check the fit without removing the tail socket test piece. Instead, remove the front guide rail.

Once you've dialed in to the correct width of shim, you can use the same shim on the rest of your sliding dovetails with confidence, and without having to shift your tail socket piece. But note, if you use a different cutter, a different cutter depth setting, or a different tail piece thickness on your next project, you will need to make a new shim.

### Your Method?

We've described how to form sliding dovetails by forming the tail piece first. The alternative is to form the tail socket first. Each approach has its advantages and disadvantages, and there is no one method that stands out as being the best by far. Each is a compromise, so it eventually comes down to personal preference.

Whichever method you choose, you'll have to adjust something. That's why we prefer the method that uses the shim against the rear guide rail to widen the tail socket without having to move the tail socket piece.

If you've found an alternative method for forming and repeatedly duplicating accurate sliding dovetails on the AKEDA jig and would like to share your success, please let us know and we'll incorporate it into this tech sheet.