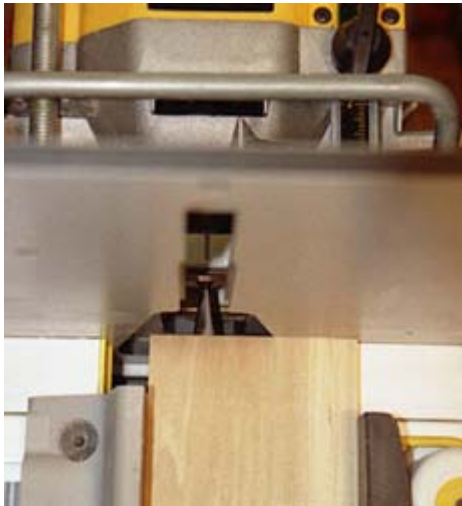


A Technique for Cutting Through Dovetails with WoodRat® Using Craftsman Gallery Button Calculator and Dovetail Angle Gauges



Draw a pattern for your dovetails

You can space your dovetails however you like. Drawing a pattern before proceeding is a good idea. With a pattern you can repeat the same cuts across multiple pieces. Draw the pattern on end of a board that is same width as the boards to be used for your tail and pin pieces. Use WoodRat parallelogram for even spacing.



Select and zero dovetail bit

Select a dovetail bit and chuck it in your router collet. Length of the bit should be slightly longer than thickness of boards to be used for the pin pieces. You will cut all tailpiece boards first using the dovetail bit.

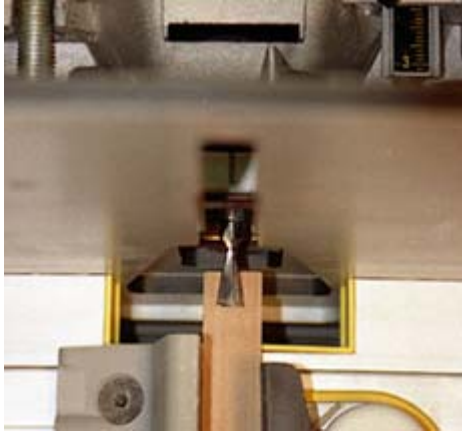
Clamp a tailpiece board flush with bottom of base plate. Slide router between guide rails then plunge the bit until it is zeroed on top of the tailpiece. Use router plunge lock to lock the bit in position.



Set router depth stop

Before cutting the tailpieces, set router plunge stop to thickness of boards that will be used for the pin pieces. Note that plunge depth is set using the actual wood. It is best if you remove any turret that is part of the router plunge stop.

Remove tailpiece board, plunge bit to depth set by the stop and lock.



Cut a profile of dovetail bit

With the dovetail bit plunged to correct depth, clamp a thin board in center cam clamp and cut a profile of the bit. Top of board should be level with bottom of base plate. Width of board or position of cut does not matter.



Draw dovetail bit profile on machine

Without moving sliding bar that supports the cam clamps, move the profile board you cut to left cam clamp with top of board level with top of machine extrusion. Trace bit profile onto machine face.

Keep bit profile board for future use.



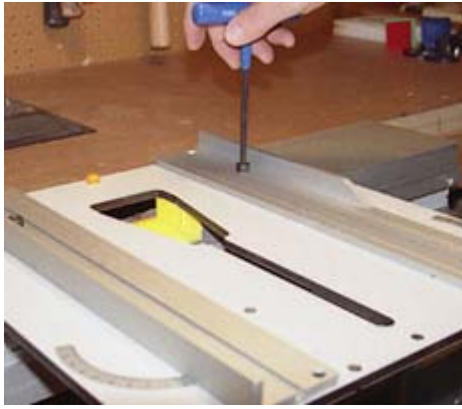
Align bit profile with dovetail pattern

To cut tailpieces that match your pattern, clamp the pattern in left cam clamp and wood to be cut in center clamp with outside face next to machine face. For each cut, align dovetail bit profile drawn on machine with a pattern mark. Exact accuracy is not needed since the pin pieces will later be cut to match the tailpieces.



Cut all tailpieces

Tailpieces are cut square to machine face with guide rails in place. After aligning on pattern, pull router and bit through the wood to make the cut. Repeat this for each pattern mark and all tailpieces.



Remove guide rails

After cutting all tailpieces, slide the router off the machine and remove the guide rails.

Button Setting Calculator

1> Select a Dovetail Bit Width measurement: millimeters inches

2> Select a Dovetail Bit Width:

3> Select a Dovetail Bit Angle:

4> Select a Straight Bit Width:

Button Setting:

Determine button setting

Pin pieces are cut at an angle with a straight bit and use a button setting.

Determine appropriate button setting from the WoodRat manual or our [Button Setting Calculator](#).



Install straight bit and button

Install straight bit then push router plate against rear stop. Place button in router plate groove. There are 3 pointers on button that relate to how base plate is mounted. Determine correct pointer then position button using millimeter marks on router plate. Tighten hex nut to lock position.



Set router plate to dovetail angle

For 6.5° (1in9), 8° (1in7) or 9.5° (1in6) dovetails (bit angle) you can use The Craftsman Gallery dovetail angle gauges.

Install left/right spirals. Position appropriate angle gauge as shown then pivot router plate on button until angle gauge is flush with both router plate and base plate.



Set spiral stops

With side of router plate flush with angle gauge, turn spiral until edge of spiral makes contact with router plate. Tighten star knob to lock spiral. Do this for both the left and right spirals. The spirals control angle of cut when cutting pins.



Set router depth stop

Before cutting pins, set router plunge depth stop to thickness of tailpieces.

Zero straight bit to top of pin piece board then, with tailpiece inserted in router depth stop mechanism, set the plunge depth.



Align bit profile with tail piece

To cut pin pieces to match tailpieces, clamp tailpiece in left cam clamp making sure it is level with top of machine extrusion. For each pin to be cut, align the bit profile drawn on machine face with a cut in the tailpiece.

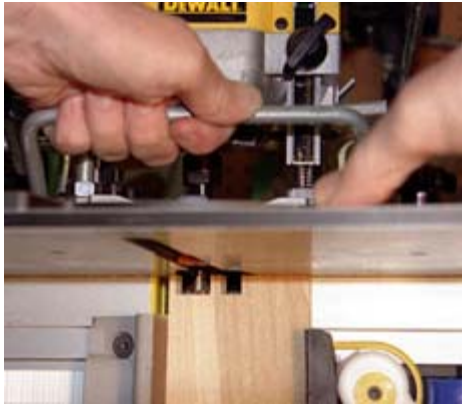
Accuracy is needed here, but you are determining only spacing. Depth, angle and width of the pin cut are determined by the machine settings already made.



Start pin cuts with left half-pin

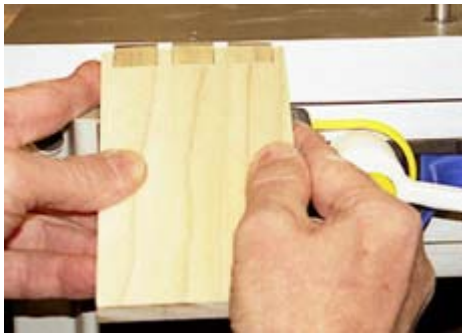
Clamp pin piece in center clamp with inside face next to machine face. Position bit behind wood, plunge and lock bit at depth stop.

Normally your pattern will require a half-pin on each side of the pin board. Cut the left half-pin by pulling the router and bit forward through the wood while keeping router plate against left spiral.



Cut rest of pins

The middle pins require both a left and right cut. Make first cut with router plate held against left spiral as you did for left half-pin. Complete the pin by pushing router and bit back through wood while keeping router plate against right spiral. Cut all middle pins this way. The right half-pin is a final single cut made with router plate against right spiral.



Test for fit

Remove the pin piece and make a test fit in the tailpiece. The pins should fit perfectly into the tailpiece. Any problem can be corrected by procedures listed below.

Correcting Problems:

A great advantage of using the WoodRat machine for dovetails is that you can use any bits and any pattern you please. Machine settings are based on geometry that you set rather than a template that you buy. You can change the machine settings to achieve the results you want. When you achieve a desired result, record your button and spiral settings and the bits you used then repeat the same settings whenever you use the same bits.



Adjust tightness of fit with button setting

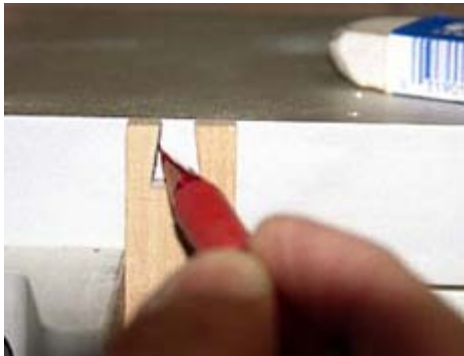
The button setting is a measurement in millimeters of the distance of button center from face of machine. It determines the width of the pin cut. For tighter fitting dovetails move the button to a higher setting. To loosen the fit move the button to a lower setting.



Correct alignment of the pieces

When put together the board edges should align. If they do not then the bit profile drawn on the machine may need to be adjusted to the left or right.

The length of pins and tails were determined by router plunge depth settings. If you want pins or tails to stand proud for your hand plane then increase the plunge depth.



Move bit profile to adjust pin alignment

If your cuts result in misalignment between board edges, clamp profile board again and align it with bit drawing, erase the current drawing then using power feed move the profile board an amount that will correct the misalignment between boards and redraw the bit profile.



Consistent positioning is important

Always clamp boards in center cam clamp with top end flush against base plate. Clamp boards in the left cam clamp with top end level with extrusion top. A good practice is to hold a flat board on the extrusion top and extend it over the edge. While clamping, push the board to be clamped flush with this board.



Expect pins and tails to fit properly

With the WoodRat you can match the accuracy and repeatability of any dovetail jig without sacrificing flexibility or individual craftsmanship.

Please email us at info@thecraftsmangallery.com with any corrections or improvements to these techniques. These techniques are similar, but not the same as in the WoodRat manual.