Shopmade Dovetail Templates

Half-blind joints may be variably spaced or fixed and any size you like

BY JAMIE BUXTON

The variable-spaced, half-blind dovetail joint is complete. *Templates can be custom-made for any project of any width.*

Hand-cut dovetails are versatile and suitable for projects of any size. The problem, however, is that they're time-consuming to make and require a fair amount of skill. Router jigs solve some of the problems, but the most adaptable jigs cost a lot of money. It turns out that there's another solution: custom-sized shopmade router templates.

I worked on the problem in my spare time, and after a few weeks of number crunching, I was ready to put my theory to the test. In a few hours I succeeded in making my first dovetailed drawer using a pair of shopmade templates.

My method is limited to making variably spaced, half-blind dovetails. Both halves of the joint are cut using a bearing-guided dovetail bit. Then I ease the corners of the square-cornered tails with a chisel so that they fit the round-cornered sockets. With this method I can cut joints faster than I

Photos: Anatole Burkin

could by hand, yet it allows me to custom-make templates for individual projects.

Half-blind dovetails are most commonly used to join drawer sides and fronts, but you can also use them to join solid casework. My templates take only an hour or so to build, and I make a new set for each project so that the dovetail pattern is perfectly suited to the width and scale of the piece.

Accurate by construction

My system uses two templates—one for cutting tails and another for cutting pins. Because the initial and critical machining for the templates is done with them sandwiched together, they are mirror images of each other, which makes the joint accurate.

As with all machine-cut dovetail joints, tails cannot be any narrower than the dovetail bit itself. But the maximum width of the tails and the maximum spacing between them are infinitely variable, features that make this technique so versatile.

These jigs have their idiosyncrasies. For example, the height of the tails depends on the thickness of the sawblade used to make the first cuts in the template (see the chart on p. 89).

To join ¾-in.-thick stock and end up with ½-in.-high tails, which look about right, I use a 11⁄16-in.-dia., 8° dovetail bit fitted with a ¾-in.-dia. bearing. Next, lay out the tails on the stock, keeping in mind the diameter of the dovetail bit at its widest point. Then transfer those marks to the tails template. Clamp both templates together so that they are flush on all sides.

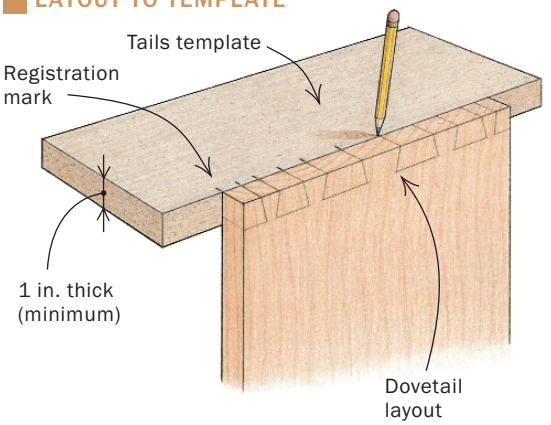
Before making a first template, make some test cuts in scrap using whatever sawblades are available. Measure the kerf with a dial caliper, then refer to the chart. You may find that the measurements (kerf widths) don't exactly match my chart. Don't worry. Find the closest match and make a template that suits your needs. It can be fine-tuned later. I use a blade that's a hair thicker than ⅛ in., but it produces a kerf of 0.135 in. due to runout.

Template stock should be about 6 in. wide so that it can support a router and slightly longer than the workpiece to allow for clamps. I use plywood or medium-density fiberboard (MDF) for the templates and laminate the material to get stock that is at least 1 in. thick. Both templates must be the same thickness.

Clamp the tails and pins templates together and lay out the dovetails. The space

MAKING THE TEMPLATES

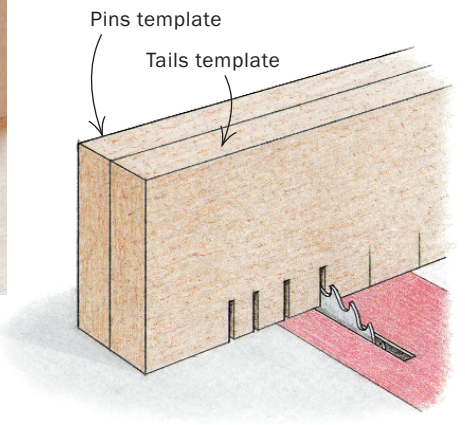
1 TRANSFER DOVETAIL LAYOUT TO TEMPLATE



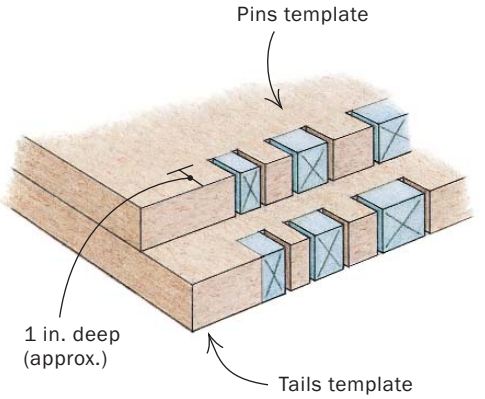
Choose an appropriately sized bearing-guided dovetail bit. *The diameter of the bit determines how close the tails may be spaced.*

Make the first cuts in the dovetail templates using a tablesaw blade. *Clamp the pins and tails templates together and cut notches that define the templates' fingers.*

2 SANDWICH TEMPLATES TOGETHER AND CUT NOTCHES ALONG LAYOUT MARKS



3 DADO TEMPLATES SEPARATELY



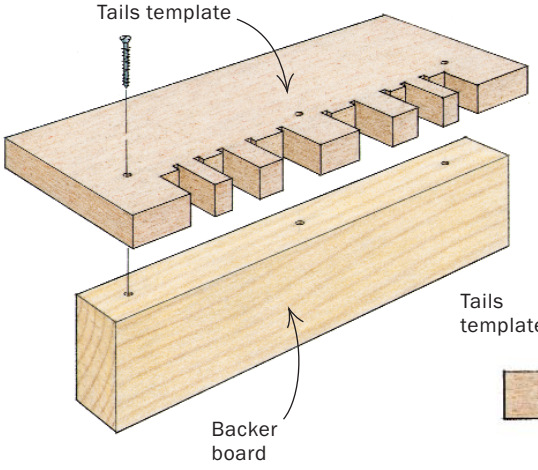
Note: The template fingers are made deeper than necessary. The extra depth allows you to adjust the offsets, if necessary, to get snug-fitting dovetail joints.

Remove the remaining waste with a dado blade. *Be sure the space between fingers is wide enough to allow the dovetail bit and bearing to fit inside.*

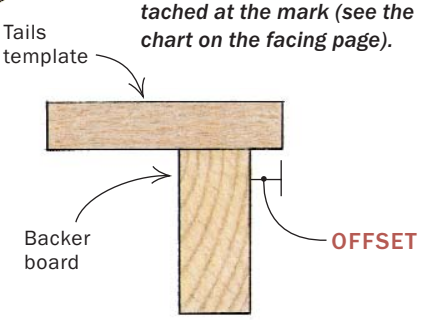
Drawings: Vince Babak

ROUTING THE TAILS

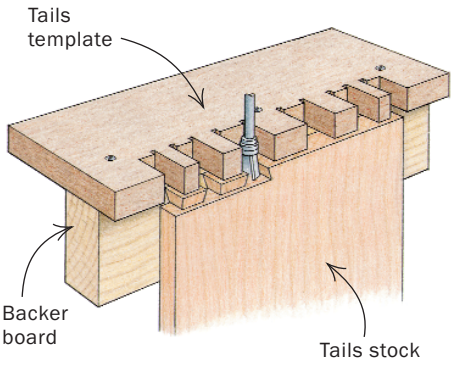
1 ATTACH BACKER BOARD



Mark the offset on the tails template. *A backer board is attached at the mark (see the chart on the facing page).*

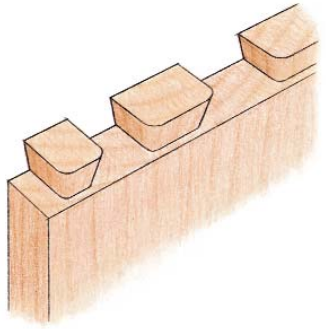


2 CLAMP WORKPIECE TO THE JIG AND ROUT TAILS



The tails are routed with the stock clamped vertically. *The backer board positions the stock and prevents tearout.*

3 ROUND THE TAILS WITH A CHISEL



Chop off the corners of the tails using a chisel. *The corners must be removed for the tails to fit inside the rounded sockets produced by the pins template.*

between the fingers on the tails template must, obviously, be larger than the diameter of the bit's pilot bearing. Next, using the tablesaw, cut out notches along the layout lines. Make these notches deeper than the depth of the tails by about ½ in. (The exact amount isn't important; you'll see why soon.) Separate the halves and mark out the waste sections, which will be opposite for each half. Finally, remove the waste with a dado blade set for a slightly shallower cut than the notches. The exact depth of cut isn't important as long as it's greater than the height of the tails (refer to the chart). For the 11⁄16-in.-dia. dovetail bit, I cut a dado that's about 1 in. deep.

Mark out the offsets on both the pins and tails templates. The offsets are used to register stock. Because the dadoes on the templates are cut deep, the offsets can be repositioned, if necessary, to tweak the fit of the joint. One could make the templates without offsets for an exact fit, but it's not worth the extra effort.

I mark the offsets using a finely sharpened mechanical pencil. For the pins template, measure the offset from the bottom of the dado out toward the edge of the template. For the tails template, do the opposite: Measure the offset from the outside edge of the template in toward the base of the dado. Offsets will vary, depending on the thickness of the stock and the kerf width (see the chart).

Finally, screw a backer board onto the tails template. I use a piece of 2x4 that has been jointed square. The block does two things: It registers the stock to the offset and prevents tearout as the bit exits the tails stock. The pins template requires no additional preparation.

Using the templates

Chuck the bit in the router and set the depth. Refer to the chart and be sure to add the thickness of the template to the depth setting. Some routers with limited travel may not work with my templates. I use a 3¼-hp plunge router that has lots of travel. Use the same depth setting for cutting both pins and tails.

Now for the fine-tuning. If your saw's kerf is a few thousandths of an inch wider than indicated in the chart, set the router bit slightly deeper. Conversely, if your saw leaves a kerf thinner than indicated in the chart, set the bit shallower by a few thousandths of an inch. Make trial cuts in scrap

and check the fit. If the joint is loose, adjust the router for a deeper cut.

To make the cuts, secure the tails stock—with the inside face out—to the tails template using a pair of clamps. Place the stock in a vise to hold it upright. Take a light pass along the edge of the board to establish the shoulder cut. Then rout out the remaining waste, taking care that the router-bit bearing rides firmly along the fingers of the template. It doesn't hurt to take a second pass to ensure a clean cut. If you are using a ¼-in.-dia. shank bit, remove most of the waste using a straight bit first to avoid stressing the dovetail bit. I prefer to use ½-in.-dia. shank bits whenever possible.

The pins template is clamped to the inside face of the stock, which is aligned to the offset. I clamp the template and stock directly to my workbench with a second pair of clamps. Make the cuts, moving the router from left to right. If your router seems to be straining, especially when cutting thick stock, take several light passes.

After removing all of the waste, only one step remains. Because the tails have square corners and the pins have rounded corners, they won't seat properly. I solve that by chopping off the corners of the tails using a chisel. The corners need not be rounded to match the pins perfectly because most of the joint's strength will be in the long-grained areas. But if you prefer, the pins can be chiseled out and made square to mate cleanly with the tails. This will take longer and, to my mind, defeats the timesaving nature of the jig. □

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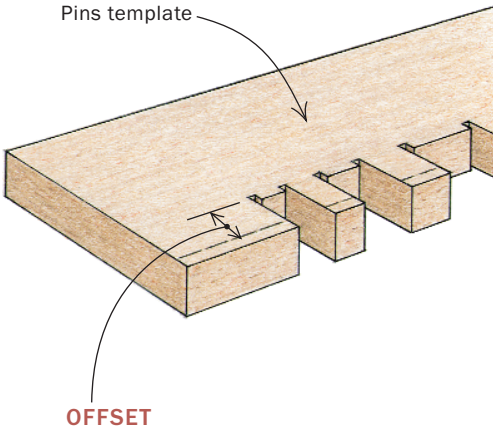
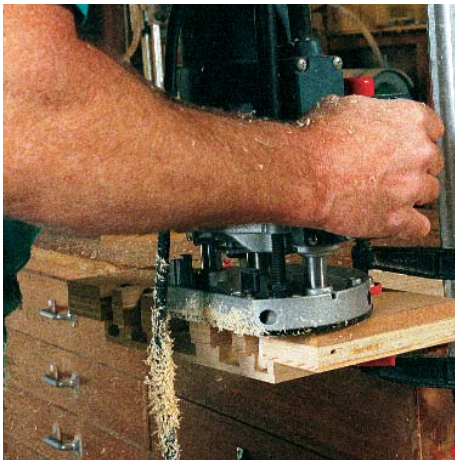
ROUTING THE PINS

1 MARK OFFSET ON PINS TEMPLATE



Use a ruler to mark the offset. *The pins offset will depend on the thickness of the stock used (see the chart below).*

2 CLAMP WORKPIECE AT OFFSET LINE AND ROUT PINS



The pins stock is clamped facedown to the template. *Rout the pins from above using a router bit with a bearing and stop collar.*

DOVETAIL TEMPLATE SETTINGS

Cutter diameter	Cutter angle	Bearing diameter	Kerf width	Depth setting*	Offsets ½-in. stock		Offsets ⅝-in. stock		Offsets ¾-in. stock	
					Tails	Pins	Tails	Pins	Tails	Pins
11/16 in.	8°	¾ in.	0.125	0.445	0.344	0.469	0.469	0.594	0.656	0.781
11/16 in.	8°	¾ in.	0.135	0.516	0.334	0.469	0.459	0.594	0.646	0.781
11/16 in.	8°	¾ in.	0.160	0.694	0.309	0.469	0.434	0.594	0.621	0.781
11/16 in.	8°	¾ in.	0.200	0.978	0.269	0.469	0.394	0.594	0.581	0.781

*Add this number to the thickness of the template for the actual router-bit depth setting.
For an expanded chart, see our web site at www.finewoodworking.com.

SOURCE OF SUPPLY

Eagle America (800-872-2511; www.eagleamerica.com) offers a good selection of dovetail bits, including 8° bits, which I use frequently. Eagle also sells bearings and stop collars, which are needed with my templates. The collar and bearing fit directly over the bit's shank.