For woodworkers today, hand-cut dovetails seem to be a holy grail of sorts, the status symbol of the truly accomplished woodworker. But some people think that one must perform a Jedi mind trick on wood to coerce those perfect little shapes out of its stubborn grain. The truth is that cutting dovetails by hand is not that hard. I learned in an afternoon and have been working to perfect it since. The key to my success has been practice and consistency.

I recently had the privilege of taking a few lessons in dovetailing from Chris Kuehn of Sterling Tool Works. I was impressed by how simple and straightforward he made the process seem, so I wanted to share it with others. There’s stuff here that will help both the beginner and the expert.

Whenever I’m learning a new skill, I try to remove as many variables as possible. This way, it’s easier to identify and correct errors in method before they become habit. Start with square stock, which is crucial for making flawless joints. If you do, all necessary surfaces will mate together perfectly within the joint, and the drawer or box you’re making will also end up being square. Along those same lines, for your first few sets of dovetails, you’ll want to use stock that is exactly the same thickness to eliminate confusion.

It’s worth mentioning that this is taught from a “tails first” perspective. You can cut your pins first if you want, and I won’t argue with you. Whichever part of the joint you cut first acts as a pattern for the second part, so choose the order that makes the most sense to you.
Set your marking gauge to the thickness of your stock and use it to scribe your base lines. Instead of using one heavy stroke to deeply mark your piece, use three lighter strokes to gradually deepen the cut. Trying to take too heavy a stroke with the marking gauge could nudge your setting off mark and result in crooked, careless lines.

Placing the stock in the vise at the correct working height
Hold your stock square inside the vise. You want the workpiece high enough to work on, but not so high that the wood will chatter as you saw. Again, you want to minimize any chance for error. If your stock is square, you don’t have to correct for any crazy angles when you are sawing.

When marking your dovetails, there are three things to consider: function, looks and efficiency. For function, you want to achieve the greatest amount of strength possible without sacrificing appearance. The same argument goes for efficiency. Small drawers don’t need more than three dovetails; large drawers and carcasses will obviously need more. I like to look at the piece and divide it out by eye, taking into consideration the fact that every extra dovetail I make adds a few minutes to the project. To that end, less is often more. When I’m deciding the width of my half pins, I think about their function. While I love the look of thin, fine dovetails, I like to leave my half pins pretty beefy because they hold the holding power of the joint. If they’re too fragile, even the smallest piece of superfluous waste within the joint could force them to split during assembly. Another thing to consider with regard to efficiency is that you want the bottom of your pins (the part that gets seated in the joint) to be the same size as the dovetail chisel you’ll use to chop out the waste. That way, you’ll make fewer chops, which also means fewer opportunities for error.
Now you get to play with your dividers. I like to use two pairs – one set to the width of my half pins, which will hold the outside of the joint together, and one set to the width of one tail plus one pin. Setting the dividers correctly takes a lot of fussing, especially when you add in the fact that you want to have the bottom of your pins end up a specific dimension. Start by marking the half pins using your first divider. Next, set your second divider to roughly what you think it should be. Step it across the end of the board and adjust until it goes past your half-pin mark by the width of the chisel you intend to use. Reposition your divider onto the line marking the opposite half pin and step back across the other way. Use a pencil to make your indentations more visible. Now you have indentations that represent the locations of both your half pins as well as each tail and pin across your board. Time to mark them in.

*Make three light strokes (rather than one deep one) to mark the lines using a knife.*
Using your marking tool of preference, mark your lines. I like to use a marking knife with a perfectly flat back so I can register the back of the knife on the whole bearing surface of my dovetail marker as I work. A dovetail marker is not essential, but I like to use one because it speeds up the process. Place your marking knife in the indentation for your first half pin. Slide your dovetail marker up to your knife and hold the knife perfectly flush to the marker.

Mark the square line across and the angled line down using three strokes: one light stroke to establish the line and two subsequent strokes to deepen the cut. This will help you see the lines better and give your saw a helping hand when you start sawing. Be careful not to mark past your base lines and don’t let the dovetail marker shift as you are marking. If you struggle to see the lines, a pencil can be used to fill them in.

Mark your waste. This will help you avoid accidentally cutting out the wrong part of the joint. Even the pros mark their waste and unless you love wasting time (sorry I couldn’t help myself), you are no exception.

You’re now ready to make some sawdust. Using the radius of your thumb as a guide for your saw, place it in the line you are about to cut. Take as much weight as possible off the back of the saw and use a gentle back stroke to start your cut. Start in the corner closest to you, then saw across your line and down the slope. The most important thing here is keep your cut square to the side. Your slope can be off, but you must cut perfectly square across your piece. Otherwise, your joint will have gaps. Some people cut all the slopes going in one direction first, then all the slopes going in the other direction. Some people just cut the lines they marked right across the piece, from left to right. Either way you want to do it is fine, but pay attention to where your saw is in relation to the waste. Saw all the way down to your base line, but not past it.

Remove your waste. You can either use a coping saw or a chisel to chop it all out in a few minutes. I prefer the coping saw because it seems faster and requires less chopping, which is not my favorite activity.
Gently paring away a shelf for the saw to ride in

Rotate the workpiece in the vise so you can make a cut to remove the half pins on the sides. Square up your piece in the vise. Using a wide chisel, deepen your base line. Place the chisel tip into the base line with the bevel facing the waste. Hold the chisel perfectly perpendicular and give it a few taps with your hammer to deepen the cut. Gently pare away a shelf for the saw to ride in. Since this part of the joint is visible, you want it to look as clean as possible and this way, you are getting more of a chisel cut than a saw cut. Place your saw in the shelf and saw that piece away.

Remove your workpiece from the vise and place it on a chopping block. You can also set it on your bench, but I don’t like the thought of a chisel leaving its signature in my beautiful curly benchtop. Be careful to set your workpiece on a surface clean of any wood chips or debris since as you’re chopping, these could dent or otherwise damage your workpiece.
If you skipped the coping saw portion, you'll have more to chop here. Divide your waste in half and chop. Divide what's left in half and chop again. Creep slowly to your base line and as you do, chop only halfway through your piece. I like to start chopping on the side of the piece that will show when the joint is assembled. That way, the cleanest lines will show. I then flip the piece over and chop down to the base line on the other side. When there is about a 1/16” of waste left, I use hand pressure to pare away the last of it. If you need a little extra oomph, you can position yourself over the chisel and use your weight to finish the cut.
Place the workpiece back into the vise. Square it up using a small set square and examine the joint. A trained eye will be able to see where the joint needs to be adjusted, but at this point, I like to get out my little double square to check that every surface I’ve cut or chopped is square. I use a chisel and hand pressure to pare away any excess material that remains. Be absolutely certain there are no high spots at the bottom of your joint or you’ll never be able to get it to close fully. For this reason, some people undercut a V across the wood between the base lines as they chop the waste. I don’t like to do that because if you plane away too much material after the joint is assembled (i.e. when you’re flushing up the pins and tails), you may be left with a gap.

Now on to marking your pins. Lay a piece of scrap material from your project on the vise and set the pin piece in the vise exactly level with it. Move the scrap piece back and use it to support one end of the tails board. This way, you can place the tails board on top of the pins board balanced resting on the surface of your pins board and your scrap. Using hand pressure in the middle of the board, you can keep the two boards perfectly straight as you mark out your pins. Place the tails board on top of the pins board. Use the dovetail marker again to square the two pieces. Getting this step right is crucial because during the marking process, if your board isn’t placed perfectly square to its mate or if it moves or slips, your joint will not be square.
Marking the lines

Marking the lines inside the tails

Marking the waste to be removed on the pin board and double checking it against the tail board.

With your marking knife perfectly flush against the side of the tail, mark each line carefully. Use three strokes, one to establish, two to deepen your cut. Remove the tail board and mark out your waste. I find it helpful to hold the tail board up to the pin board after I've marked my waste to double check that I have indeed marked the correct waste.
Now use your dovetail marker or a small square to mark your square lines down from the slope you just marked from the tails. As you did with the indent from the dividers when you were first marking out your tails, place your knife point in the cut and slide the dovetail marker or square up to the knife using the entire bearing surface of the dovetail marker or square to guide your knife as you mark.
Hand-Cut Dovetails

The same as you did with the tails, place your saw on your lines and saw down to the base line. Use the coping saw to remove the majority of the waste. Chop out the rest with your chisel, dividing the waste in halves and creeping up to the base line. Chop only halfway into the cut, then flip the board over and finish from the other side. Replace the piece in the vise, check for square, and pare away any residual waste with your chisel.

After you have finely honed your skills, test fitting the joint may become an unnecessary step.

You are finally ready to test fit your joint. As your skill progresses, you will eventually be able to eliminate the test fit and trust the precision of your sawing and paring, but this takes a lot of practice.

If you’ve cut the joint perfectly, stiff hand pressure should drive it most of the way home. If you’re a little off, a few taps with your mallet using a scrap should get you there. If your joint won’t go together as easily as that, there’s a problem. If you weren’t so hasty in your assembly process that you split the tails apart, you can gently remove the two pieces and look for shiny spots within the joint. These are a sign of compressed wood fibers where too much waste is still present. You can pare this away and try again. In this step, a little paring goes a long way, so don’t overdo it.
After your joint is seated, you’ve successfully cut dovetails. Congratulations! These steps may seem daunting and time and labor intensive when you are first starting out. But take heart – after a few attempts, all of this will become second nature. Before long, you’ll surprise yourself with the speed and precision with which you are able to cut them, and the furniture you build will be strong enough to last many generations.

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