

Project - Stickley Style Writing Desk - Making the Sliding Dovetail Legs



This is a sample of the leg/apron joint I will use. The oak leg measures 1 3/4" square, and I have cut sample apron pieces of 3/4" oak stock in a 3" width.

I am positioning the sides so that I have a 1/8" setback, or reveal. At this point, I am just butting them together to get an idea of how the reveal would look.

I want to choose a dovetail bit that will be appropriate for the corner. In my CMT Inca Set of bits, there are several dovetails to choose from. The small ones (1/2" and under) have a higher dovetail angle. This makes for great drawers where the stock is usually thin, but I want a longer tail cut. The two larger bits have 7° cuts. The smaller angle makes possible, a longer tail. I am holding the 5/8" - 7° cutter on the stock to see what it looks like.



I roughly outline the bit to see where the two cuts will be.

This is a sample leg but from the actual stock. Actually, I cut this piece long by 5" so that I can run this test. Once I get it right, I will cut the leg to length and re-do the corner when I do the other legs. There will be no chance for minor variations this way.

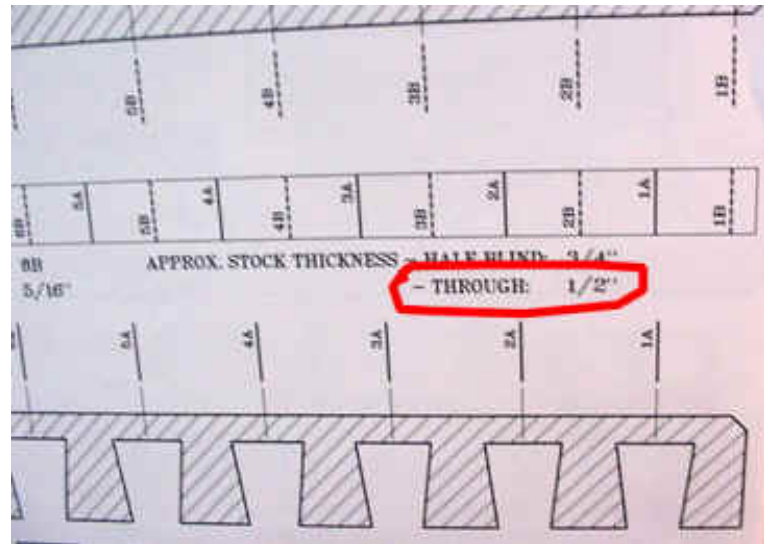




Now the "through dovetails." I must say that I had real trepidation about making these on this jig. For one, I didn't know how a single dovetail bit could cut both tails and pins. After all, the jigs I have experience with used a dovetail bit and a straight bit. Reading the instructions, at first, didn't help. "Whittling" as the last step seemed to defeat the purpose of such a precision jig. Maybe this jig really isn't meant for this joint.

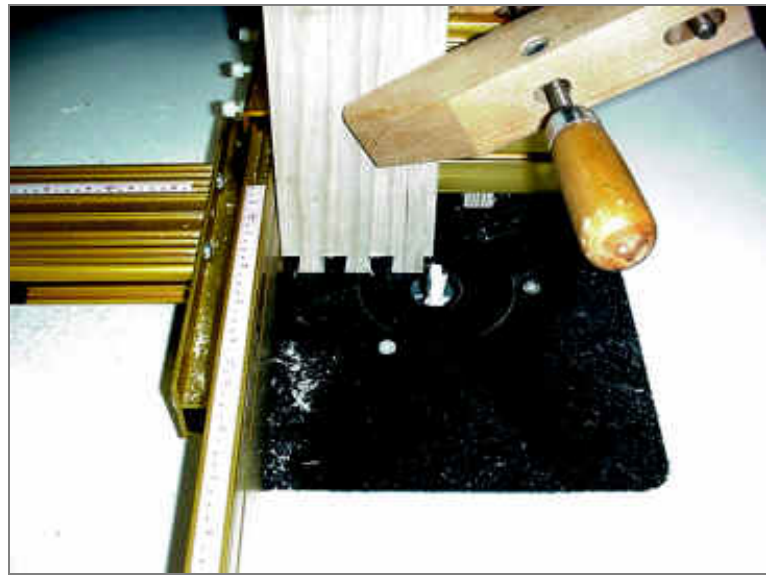
I was very wrong. It is as easy to make through dovetails as it is any of the other joints...and as accurate. And the "whittling" required is to remove a very small protrusion...no skill required. Happily I stand corrected.

Again, I start by looking through the template pages. This time I note the stock thickness for the "through" dovetails. Here I find a template for the 1/2-inch stock I am using and one that uses a dovetail bit I have.



Setting the router depth is the same as for blind dovetails. You set first by the "approx. depth of cut" listed in the template. Then cut the tests and put them together and adjust accordingly. This adjustment is unique to this method but will quickly be easy to repeat. It does make for very exact joints.

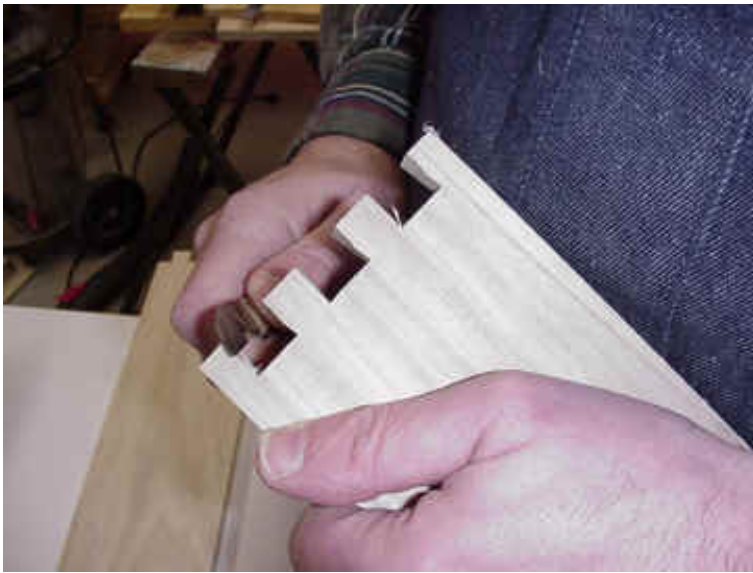
The sides get tails cut exactly the same way as for half-blind dovetails.



The end board pins are cut in three steps: the first step is to cut the pins exactly like the sides (tails) were cut but using the "B" settings.

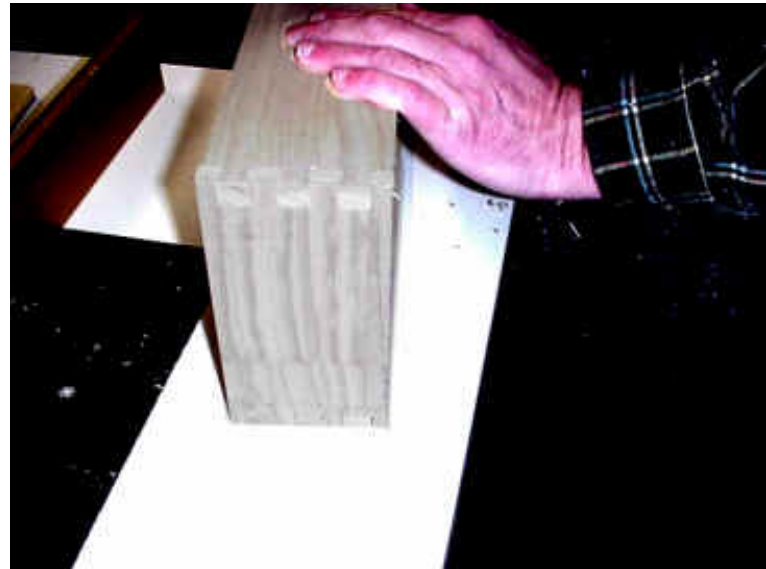
Now to the second cut. You set the Inkra Stop so that the dovetail cutter just cuts to the baseline of the earlier cuts. Then you use the holddown pad and make the "B" cuts with the end piece flat on the table, as shown.





The third cut is simply to remove a tiny nib that is left from the first two cuts. I used a chip carving knife to remove it in one simple stroke. Absolutely no carving skill is required. A chisel or utility knife could be as easily used.

The final box with four very tight through dovetails. As I said at the outset, I was very skeptical about doing this joint with only the one bit...and the carving step caused me to wonder *but not now*. I frankly don't quite understand how it does it using only the dovetail bit, but it does and that is good enough for me.



So here is that first picture again. Three strong, accurate and beautiful joints. For anyone about to use the Inca Jig, I strongly recommend taking on the task in the exact same order I did them. There are a lot of steps. No one step is difficult. Leave any one step out and you will have trouble. The instructions are well written and clearly illustrated. Follow them and you will have success.

That is the end of this section. There are two things I have to do with the Incra Jig:

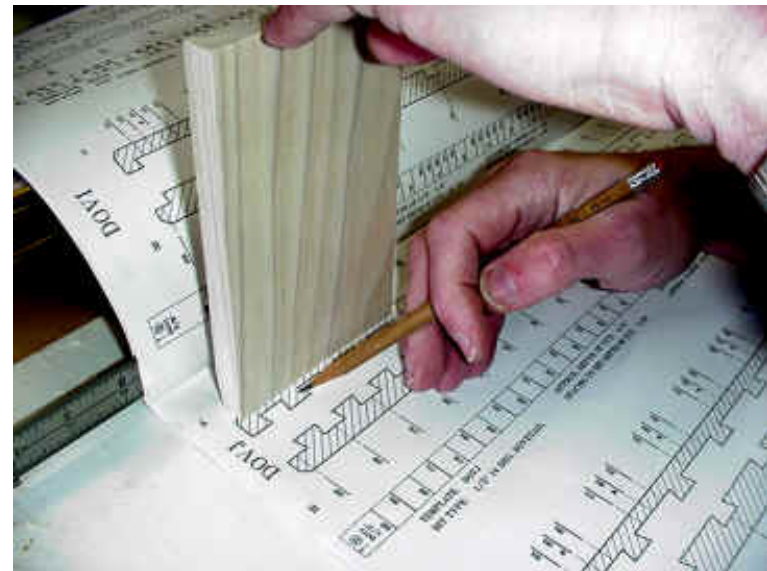
1) Get to work and make the drawers for the 18 drawer mini-chest. Bethany has promised to help and she wants to learn the Incra Jig methods so I will photograph her learning; and

2) Use this great jig to make wide joints, such as a blanket chest. There are several things for me to work out but I plan to make it work and to use an even different joint variation stay tuned.



With the box joint accomplished, I am ready to try dovetails. The Incra Jig can do both half-blind and through dovetails and while I am wanting to do the latter for my chest project (I am adding special drawer fronts to the drawer boxes), I decided to learn to do half-blind dovetails first.

You start in much the same way...looking through the pages of full-scale template guides until you find one that will handle the board thickness and give you the look you want. Here I like the looks of "DOVJ." I also can see that the "A" cuts will be the 1/2 blind in the end pieces.



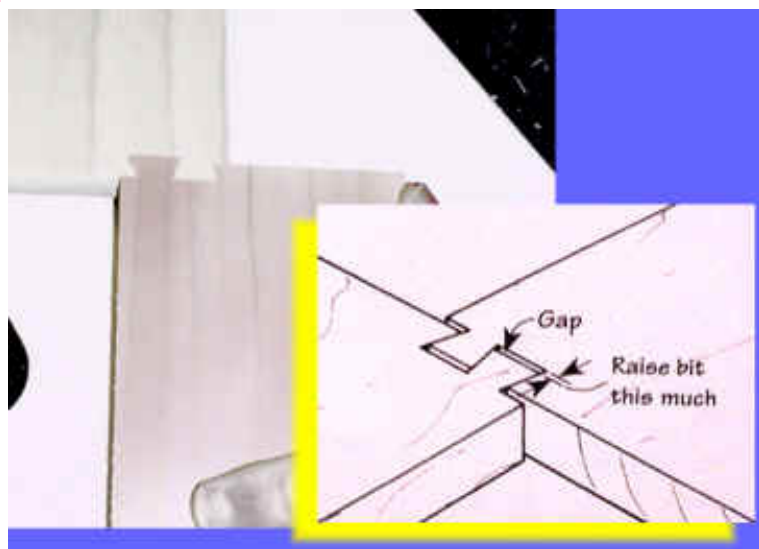
I install the dovetail bit specified for that template and set the router depth of cut to what the template calls "the approximate depth of cut." This is a rough starting point. We will determine the exact depth next. I am using the Incra Gauge a clever devise that uses the Incra molded scale to give repeatable measurements to within 0.004-inch.

This next step is kind of tricky. Its purpose is to set the absolute correct depth of cut. You start by aligning the fence over the bit so that 1/2 the bit is exposed. At that point you slide the correct template so that an "A" mark is under the line. You make the cut at this "0" position. Then you move the fence to the next "A" point at make another cut. You make this cut on two boards clamped together.



Then you flip one board over and put the two together. If they fit perfectly, your router depth is set exactly right.

My boards fit so exactly that the photograph makes them look like one board. The inset shows the illustration from the instructions. You adjust the router depth the amount of space in the test dovetail.





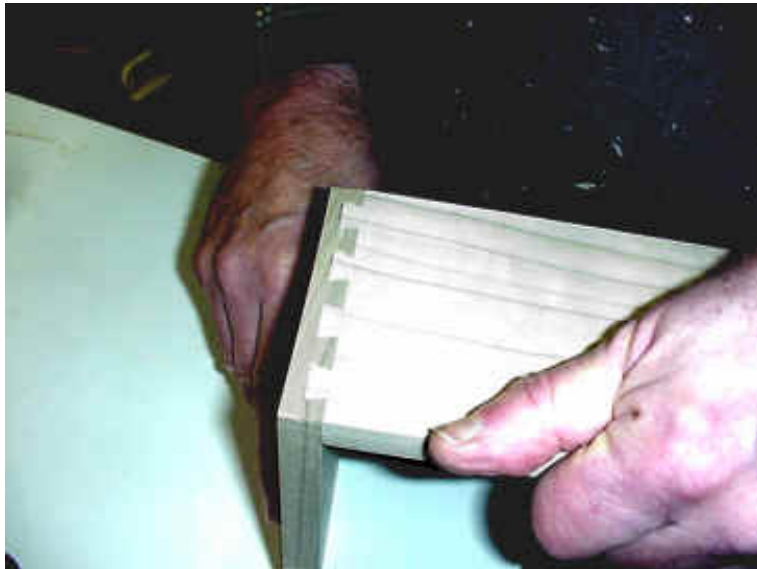
The instructions say to cut "a dovetail shaped rabbet" in both ends of the pin (end) boards. The template tells you how deep this rabbet should be and the guide helps you set it. You make this cut on one side and on both ends of the front and back pieces.

Next, I place the rabbeted side pieces back to back and make the "B" cuts.



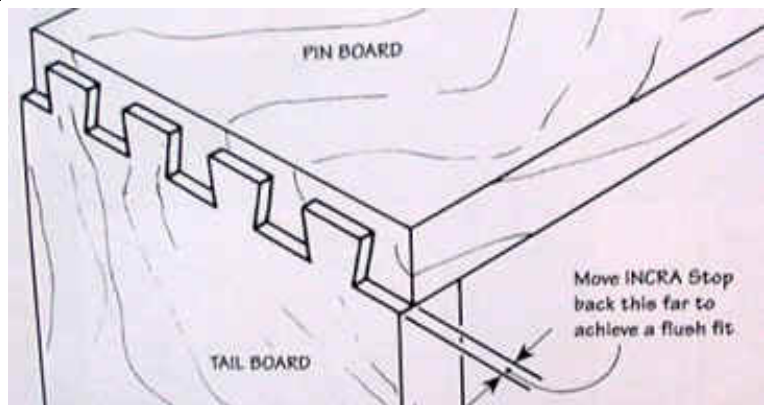
When done on one end, I flip the boards end-for-end and make the cuts on the other end. The inset shows you the already completed ends with the rabbets.

The end pieces get the "A" cuts. The Incra Stop (red part) is placed on the fence and adjusted so that the stop is as close to the bit as is possible. The cuts are made with the piece laying flat on the table and against the fence using a push block. The stop limits the depth of cut.



The final step: fit the pieces together. I was lucky that my first cut fit exactly. Usually you make a test end piece to test the depth of cut.

The instruction booklet clearly shows how to adjust the Incra Stop to correct a joint that doesn't fit exactly.





While I stained the end so that the joint would photograph better, I didn't have to sand either piece. The joint was absolutely tight fitting...a very nice half-blind dovetail.

My next challenge was the "through dovetail."

With the router unplugged, I lock the shaft and install the 5/8" 7° bit.



I install as small an insert plate that the bit will allow. The Rout-R-Lift insert plates are nicely machined and fasten in place easily and positively.

I use the Rout-R-Lift's handcrank to adjust the bit to the height I want. I use my pencil marks to guide the positioning. I do not want to use the full height of the dovetail bit. The board isn't thick enough, and the two dovetails would leave very little wood in between. This is why sketching the joint helps to position the dovetails to the best depth.





To set the fence properly, I first move it until the router bit is centered at the edge of the fence. This is what it looks like:



With the fence centered over the dovetail bit, I move the template to read "0" under the cursor. In this photo, I am using the middle scale. The upper scale is set for measuring distance to the saw blade when the unit is shifted to the table saw position. The lower scale is a centering scale used in drawer dovetailing and other operations.



I now use a formula for moving the fence so that the dovetail bit will cut the slot at the right place.

First, I take one half the thickness of the side stock ($1/2$ of $3/4'' = 3/8''$) and to that, I add the $1/8''$ reveal that I want ($1/8'' + 3/8'' = 1/2''$). Having "zeroed" the fence over the dovetail bit's center point, I can now move the fence to the $1/2''$ point on the scale. And remember, this formula only works when the fence is centered on the bit.



I next set the Inkra Stop using a side piece to judge the depth. I want to set the stop so that the dovetail bit makes a groove about 3/8" short of the edge. This doesn't have to be accurate since we will be cutting a haunch in the side pieces to match the groove.

It is time to make some cuts.



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The leg is white oak and very dense. There is no way that I can make a cut with a dovetail bit without first removing as much of the groove as possible.

I will use a straight bit to remove material in the groove, but first, I "mark" the ends. I do this by turning the router on and starting the cut. I want to cut just enough so that I can get an outline of the bit. There is a lot of burning, so I take this very slow, in order to not overheat the bit.

I want to mark the location of the other side's dovetail so I go to the opposite side of the router. *NOTE: do not make cuts from this direction. I only want to mark the end in the same way as before, so I carefully ease the leg until it is marked.*



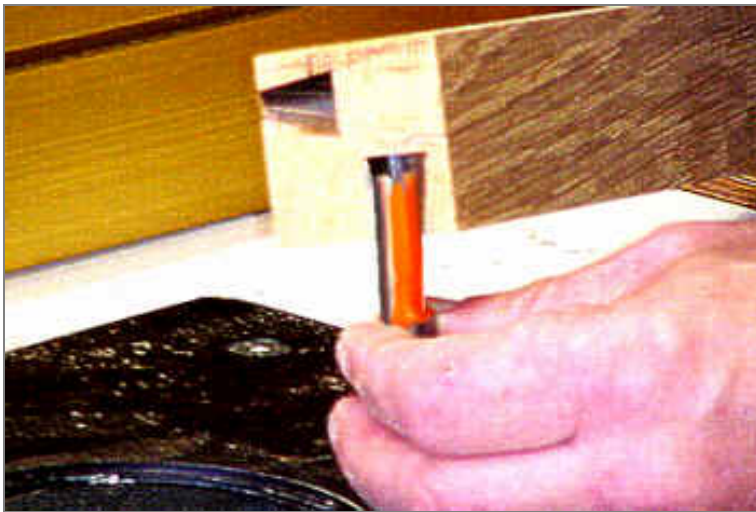
Now you can see that the dovetail marking is a good way to show where the actual dovetails will be. I position the side piece, with the centerline marked, to see if the reveal is correct. It looks good. It is time to cut the legs.



I set the Inca Stop to cut the groove the width of the side, less about 3/8". This can be approximate since we will trim the tails to fit. Once set, I move the Inca Stop's scale to 0°, so that I can remove the Inca Stop and later return it to the exact position.



I want to use a straight bit to rout out as much of the groove as possible. The right straight bit diameter will depend on the dovetail. I went through one bit at a time and tried it against the dovetail impression I had made on the leg. The 3/8" seems to fit.



I have installed the straight bit and am lowering it to be level with the router plate. I use a scrap piece of wood to help me judge when the router bit is just level.

Once level, I crank the height adjustment 3 to 4 turns clockwise and make my cuts. I make cuts only on the first dovetail slot.





Here is my leg now. The pencil is fitting in the 3/8" straight bit groove and the groove depth exactly matches the dovetail depth

If you recall, I "burned" the dovetail shape in the other groove by coming from the other direction. You do NOT want to do any cutting from this direction. What I did was use the "burn" mark to move the fence so that the straight bit was centered on the "burn."

There is a way to compute this location, but it is complicated. This method works much better for me. I lowered the straight bit and made a series of cuts, raising the bit 3 to 4 turns for each pass.



Once the straight bit has done its job, I install the dovetail bit again and make a pass. Even in this very dense quarter-sawn oak, the dovetail bit makes an easy cut, now that the straight bit removed the bulk of the slot. Now it is time to cut the sides.

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I have two sample side pieces. The first step is to rabbet the ends using the very same dovetail bit at the very same height. I have started by placing the fence 1/16" in. I will cut one side and then the other, and then check the fit. You can use a simple push block like this.

I prefer to use the jig that I developed for the locking miter cuts. It clamps the work piece and gives me a much smoother rabbet.

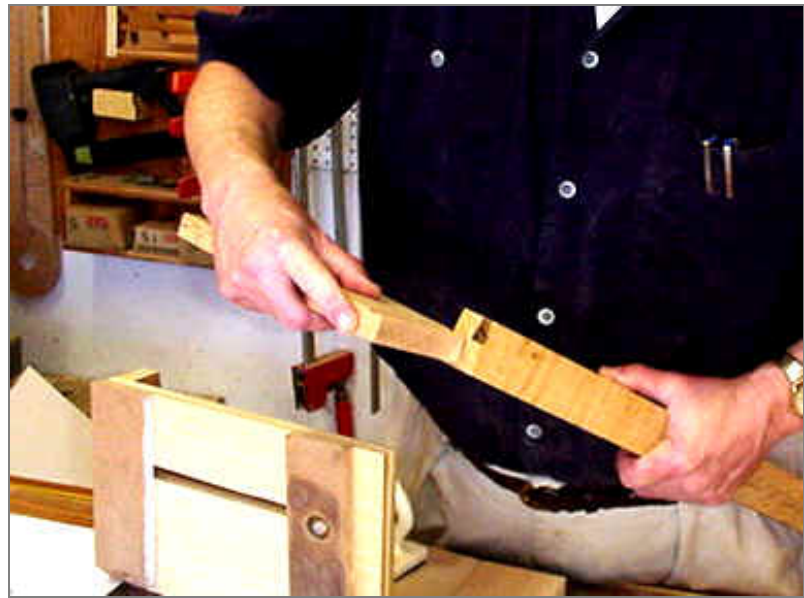


I think this is proof that the jig controls the cutting much better and it can handle two boards at a time.



After rabbeting both sides at 1/16", I test fit the tail. It is too big. I visually check to see how much there is to remove. I do not want to go over and have too small a tail.

I continue to take off 1/16" at a time on both sides. In fact, to make the perfect tail for my leg, it took one more 1/16" pass, and then I used the micro adjust control to "nudge" a little more off. When exactly right, I record the scale and micro-adjust setting.



With the side fitting smoothly, I can now measure how much of the "haunch" I have to remove.

I use the Incra right angle fixture to hold the pieces for cutting the haunch. Just like in making the rabbets for the sides, I cut 1/16" at a time and make successive passes until the piece fits correctly. I then record that setting.





The sides fit well not too loose and not too tight. This sample leg took about 30 minutes to set up. I expect that the actual cutting of the four, final legs and sides will take about the same time. If I follow my "recipe" (the notes), the final desk should have a solid foundation.

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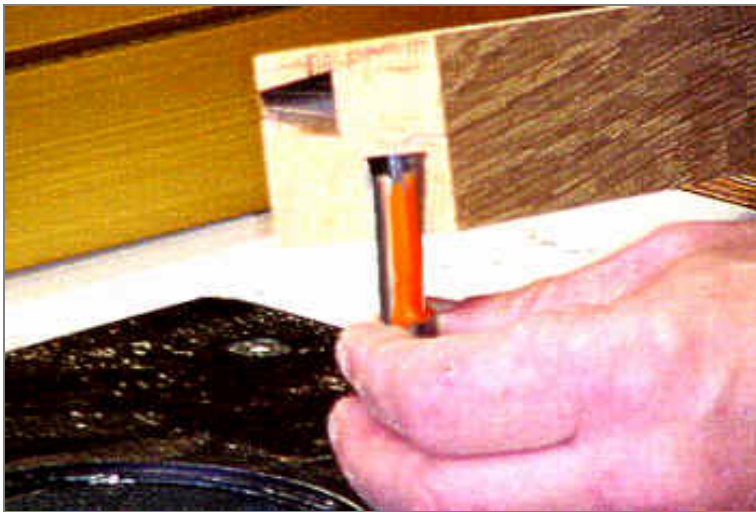


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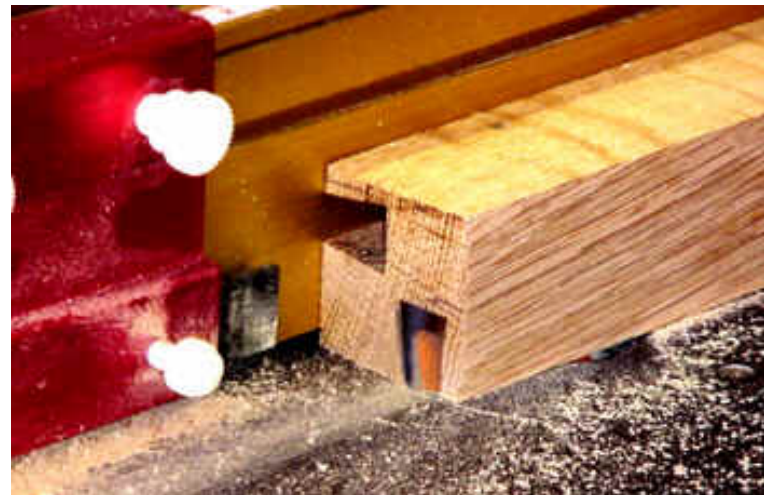




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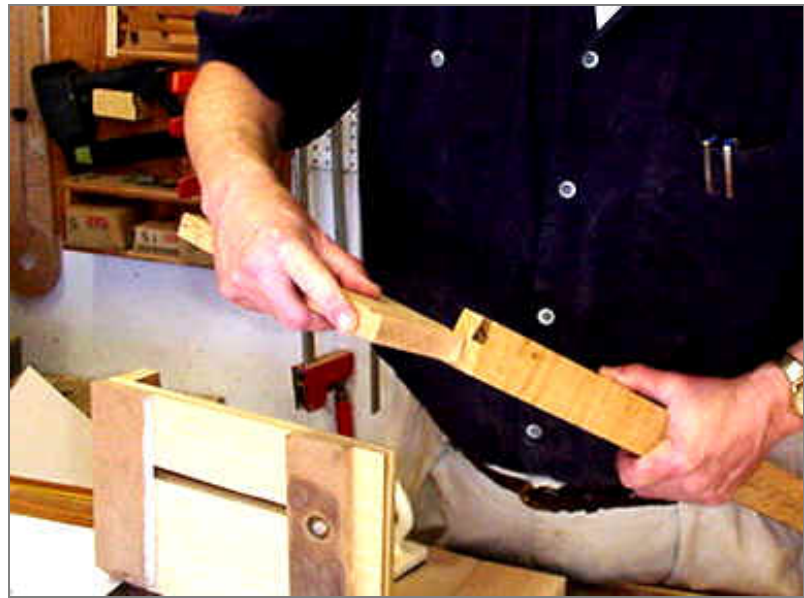


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It is always amazing how many fine joints the Incra Jig can make. Anyone who has attended a woodworking show can easily be mesmerized by the demonstration of this product. I know, I have been.

The real question is: "Can I make good tight joints with this product?"

I just recently learned how to use it and now know the answer is "yes," but there are things I have learned that I will gladly pass on to you. By the way, the items pictured at the left are the first attempts for each joint, except for the box the clamp loosened during the making of the first ends my fault.

The key to success is to take your time and read each instruction carefully. I decided to master the box joint first, then the blind dovetail and lastly, the through dovetail. I strongly suggest you do the same. So here are the steps:

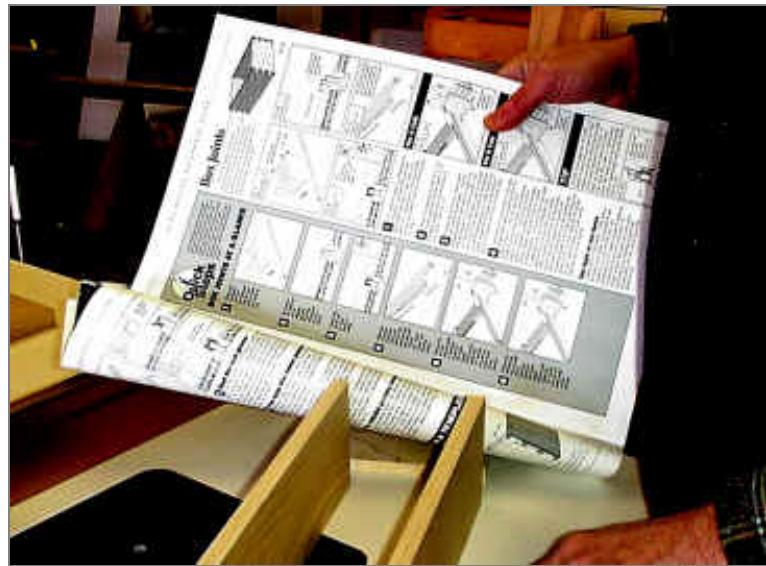
The first step is to mount the unit on the router table. The unit I have is the Ultra which has quite a long travel range (16" or 24" depending on the model.) The Ultra Lite has a range of 12 1/2" and that may be plenty for you and your needs. Here I am mounting the unit on my double router table it is large and perfect for holding this unit. Two C-clamps hold it securely in place. But you do not need such a large table; I also have mounted it on a small table and it works fine.



As with all their instructions, Incra has done a superb job in condensing and illustrating the instructions. Each joint has its own section and each section has both detailed step-by-step instructions as well as "Quick Steps" which are abbreviated. I found that once I did each joint once using the full explanation, the Quick Steps were easy to follow from that point on.

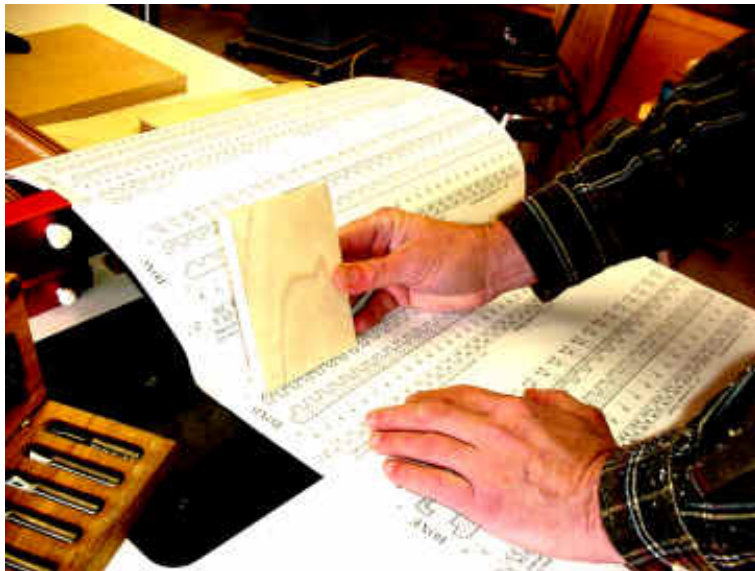
You can see that I have the parts cut for the practice box I am going to be doing.

This closer view will give you a better idea of how each section is set up. The gray box is the "Quick Step" section.

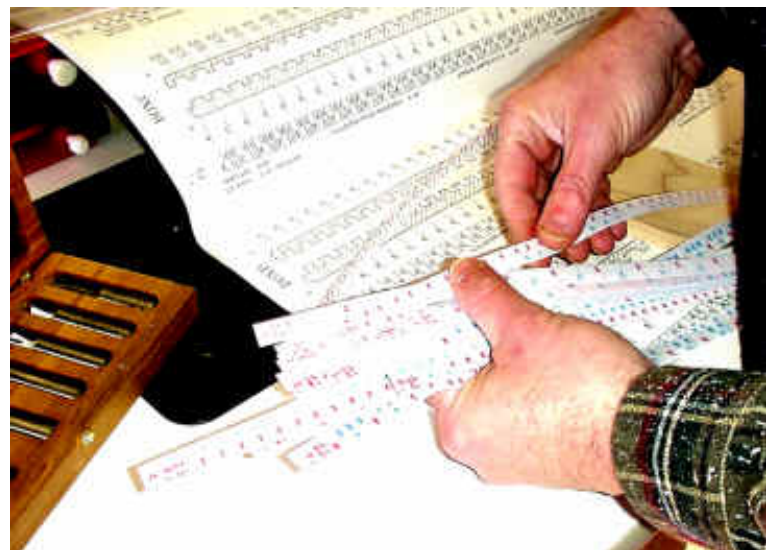


In the second half of the instruction book is a full size layout of each and every joint template. Here I am using one of the end pieces to determine which template will work best for this trial box.

At the left, I have a Jesada kit of router bits especially selected for the Inkra jig. It consists of two straight bits and six dovetail bits which gives me quite a few joint possibilities.



Having selected the joint I want I locate the corresponding template. Each template is of durable acetate and has exact printings of each stop location.





And slide the template into one of the jig's tracks. There are several tracks on the Ultra. It doesn't matter which one you use. At this point, I slide it all the way in; I will position it exactly in one of the next steps.

And I install the bit. Each template page tells you which bit to use for a given joint, along with recommended stock thickness and starting or approximate depth to set.

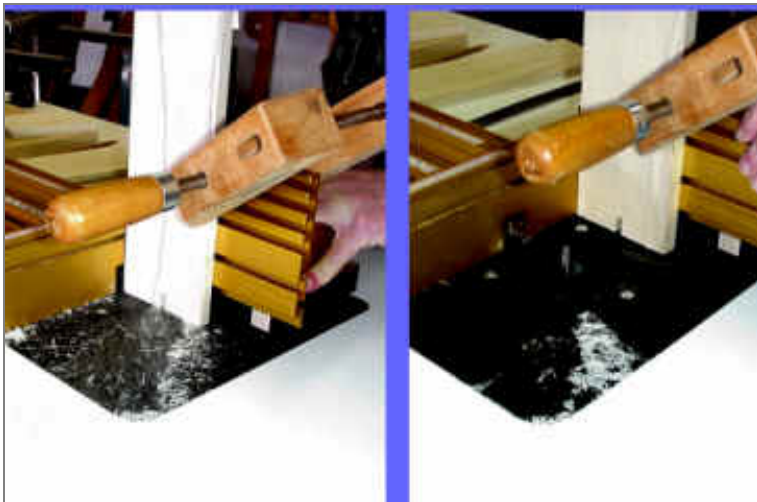
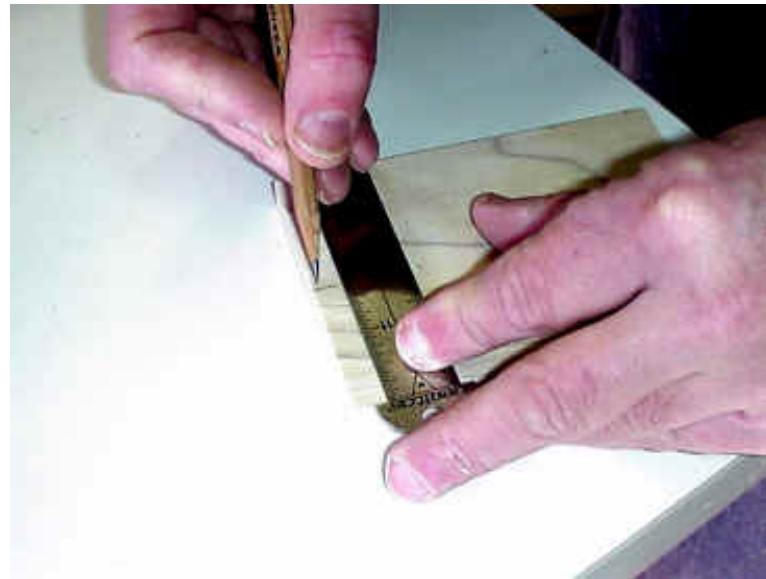


Before I go further, I use a block of wood to be sure that the router plate insert is absolutely level with the table. I do not want even the smallest bit of unevenness when sliding the right angle fixture and wood pieces back and forth. The Woodhaven router table has an excellent leveling adjustment system that makes this very possible.



Since this is a box joint, I adjust the router depth to a slightly greater depth than the thickness of my stock.

The next step is to find the center of the stock. You start by measuring and locating the center *approximately*. If you don't measure this exactly or make a mistake in your division, don't worry. In the next step we will make it exact.



Now with the piece clamped in the right angle fixture, I move the fence until the piece is approximately at the center mark and cut one side. I then turn the piece around and without changing the fence position I cut the piece from the other side.

Now with the piece against the fence, I can visually line up the router bit so that it is accurately centered in the slot I just cut. I use the micrometer adjustment to make this fine shift. I now lock the fence carriage.

This test piece is discarded now. It should either be from a scrap piece cut to the same width, or as Incra suggests, cut one board long; make the centering adjustment and then trim this off to the final exact measurement. That is what I did.



With the fence carriage locked, I move the template so that the "center mark" is directly under the alignment line. The long strip can be difficult to move so I used an awl to budge it. Be careful not to mar the template or carriage.

The "center mark" can be any of the marks but there is a recommended center given for each of the templates.

The device is so precision that you must look at this window and alignment line from directly above the indicator. If you are off to one side or the other, the joint may be similarly off.





Here I am making my first cut. I have clamped the two end pieces together with a backer board. I used a wood clamp to secure these pieces to the right angle fixture. The backer board is a scrap piece that will minimize tearout.

Here, I am continuing the cuts using the "A" lines on the template.



The two end pieces are done with the "A" cuts. You can see the backer board still in place on the right angle fixture.

I have flipped the backer board and am placing the sides in position to receive the "B" cuts.

For accurate joints, you must:

- 1) clamp the material securely so it will not move; and
- 2) be sure the stock is firmly positioned on the table and against the fence.



For the outside cuts, the instructions suggest "sneaking up" on this cut by making several light passes before the actual first full "B" cut. This minimizes splintering of the ends.

Several minutes have gone by and I have flipped the sides and am finishing the "B" cuts. Assembly is just ahead.





My first Incra Jig box joint. Not perfect but pretty good for the first time around. I will sand the pieces flush but next time setting the router depth more accurately will lessen the need for sanding.

I did learn by this two important things:

- 1) clamp the pieces securely on the fixture, and**
- 2) slide the fixture smoothly on the fence.**

Sanded and stained and the box joint looks real good.

This is a good joint to do first if only to get use to your Incra Jig and how it works. The hour it took to do this first box made the making of the next joints so much easier. I strongly recommend that all "newbies" do the same.

