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August 2000 #116

Popular Woodworking

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Dayton, O.

As I watched my daughter grow, I waited patiently for more than a decade to build this secretary. This year both she and I were ready for this ultimate heirloom.

Traditional Secretary

Back in 1989 a local sawmill owner passed away in these parts and his family went about auctioning off all his personal possessions, including a large quantity of lumber. Before the auction I went through the wood and found some 20"-wide curly maple that apparently had been milled in 1954. I wanted that wood, and so I went to the auction with $1,000 in my pocket ready to to bid, but also ready to be disappointed.

When the curly maple lot came up, the auctioneer put one leg up on that pile of wood, spit out a huge wad of tobacco and said the words that would lead to the lumber purchase of a lifetime.

"Who wants to bid on this pile of oak?" he says.

Well, a few minutes and $200 later that pile of the most amazing and wide curly maple was mine. For more than 10 years that lumber has sat in my shop. I've used a couple small pieces for important projects, but mostly I've been saving it for something very special: a drop-lid secretary for my daughter.

Now I've been a professional cabinetmaker for a long time, and have built just about every piece of reproduction furniture imaginable. But I've got to tell you that some aspects of this project were a real challenge. The beaded mullioned doors require a lot of tricky cuts that are dangerous if not executed carefully. If you're squeamish, I'd recommend you make the mullions flat instead of beaded. Most of all, don't get into a hurry with this project. It's going to take you a lot longer than you expect.

Lower Case

Some cabinetmakers build a separate base that the case rests on. After years of building Shaker and 18th century American furniture, I've found it's better to build the lower case and base as one. Instead of a separate base, I make my side pieces extend to the floor and attach the ogee feet to the sides and a build-up block on the front. We'll get to the feet later, but don't look for parts for a separate base.

The lower case is held together by mortise-and-tenoned framed panels that are attached to the two sides using sliding dovetails. The writing surface is also attached to the sides using sliding dovetails. And the top of the lower case is attached using half-blind dovetails. The lid is supported by two pieces that slide out beside the top drawer. The back is shiplapped and nailed into rabbets on the side pieces.

by Troy Sexton

Troy Sexton designs and builds custom furniture and is a private woodworking instructor in Sunbury, Ohio, for his company, Sexton Classic American Furniture. Troy is a contributing editor for Popular Woodworking.

Here you can see the jig that cuts the female part of the sliding dovetails. What you can't see is the board attached to the back of the jig (next to my stomach) that keeps the jig square to the side ***(left).*** *Unless you taper the male part of the sliding dovetail, it's going to bind up as you knock it into the case. I made a little sanding block for just this purpose. One edge has the same angle cut on it as the dovetail (14 degrees). Wrap sandpaper around the block and sand both edges of the dovetail. Don't sand up near the front where the dovetail will show. You want that part of the joint to be tight* ***(right).***

Begin by roughing out your parts and gluing up any panels you might need. First cut the sliding dovetails in the side pieces. These cross the entire width of the cabinet side. Build a jig from two pieces of plywood to do this. The jig, as shown in the photos, has a long slot in the top that is exactly the same width as the template guide on my router. The second piece of plywood keeps the jig square to the side. Chuck a 3/4" dovetail bit with a 14-degree slope into your router and set the router to cut 7/16" into the sides. Lay out the locations of all the sliding dovetails on the sides and make your cuts. Now cut the slant on the sides and top as shown in the diagrams and cut a 1/2" x 1/2" rabbet on the sides to hold the back pieces. Do not cut a rabbet on the top piece.

Now turn your attention to the stuff that goes between the sides. Start by cutting the material for the mortise-and-tenon panels that run between the sides. These panels (sometimes called dust panels or dividers) are much like a door, with rails, stiles and a flat panel that floats inside. The tenons are 1" long, and the groove to hold the panel is 3/8" x 3/8". When you assemble the frames, glue the front mortises but not the rear ones. When you attach the assembled frames to the case, the divider fronts should be flush to the front of the case and the divider backs flush to the inside of the rabbet. This allows the case to expand with the seasons.

Fit your panels, then cut the male part of the sliding dovetail on the ends of the writing surface, the rails and the ends of the stiles. You'll need to use a router in a router table for this operation. Go ahead and cut the sliding dovetails for the vertical dividers that house the lid supports.

Now sand the back section of the male part of the dovetail as shown above.

To attach the top to the sides, I used half-blind dovetails. I cut the pins using a homemade jig that was featured in the September 1999 issue. The pins should be 7/16" deep. Cut your pins and then dry-fit the case together. Now cut the tails on the top and knock that into place. When everything fits, disassemble the case and sand the inside of the desk. Glue up the case and clamp it.

Top Case

The top case is built similarly to the lower case. The top is attached to the sides using half-blind dovetails. The two shelves and bottom are attached to the sides using sliding dovetails. Then you build and nail a face frame to the case.

Cut your sliding dovetails in the sides in the locations shown in the diagram using the same dimensions and jig from the lower case. Then cut the pins for the half-blind dovetails in the sides and cut the 1/2" x 1/2" rabbet on the sides to hold the back.

Fit the top case together and then cut the top piece to size and cut the tails on the end to fit into the pins on the sides. Sand the interior, glue up the top case and build the face frame.

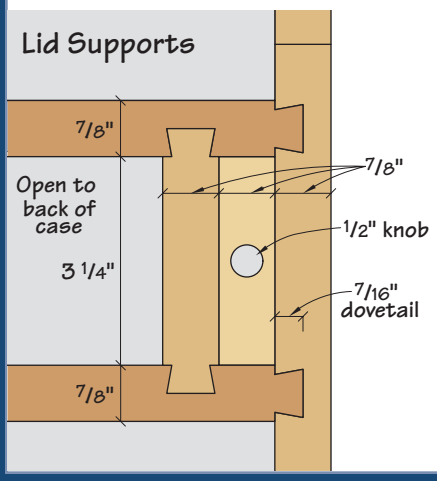
The face frame is built using mortise-and-tenon construction. Cut 1"-long tenons on the rails and 1 1/16"-deep mortises on the stiles. Glue up the face frame and attach it to the top case with nails.

Finish sand the exterior of both cabinets because the next step is the moulding.

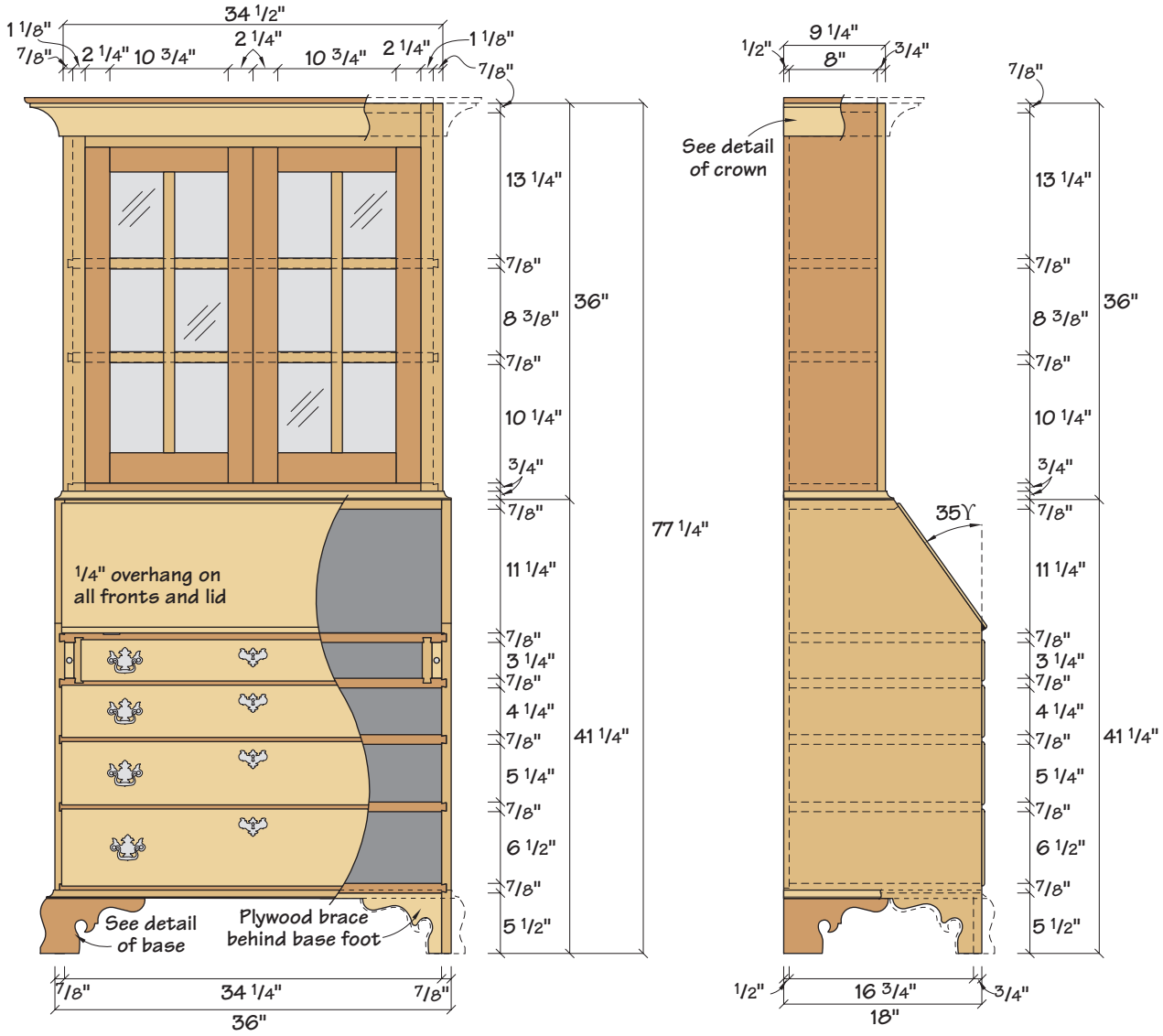
Moulding

There are custom mouldings on this project that require skill to cut, especially the ogee feet. Begin working on the feet by gluing a long block to the front of the lower case (below the lowest divider). You're going to nail your feet to this.

To make the ogee feet moulding, first make a cove cut down the middle of your



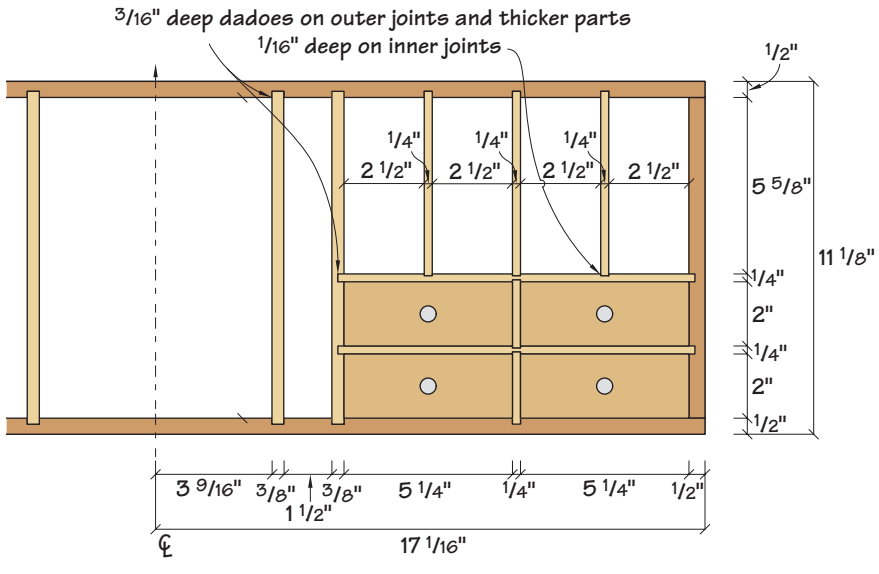
Cut the pins in the case sides using a custom-made jig and a template guide in your router. The jig is explained in the September 1999 issue ***(left).*** *After the pins are cut, dry-fit the case and mark the tails for the top piece* ***(right).***



stock using your table saw in the same way you would cut cove moulding. It helps to draw the profile on the end of one of the boards to help guide your cuts.

After the cove cut is complete, round over the top of the moulding by running the moulding on edge against your rip fence, changing the blade's bevel as you nibble away at the edge until you can smooth the cuts with a sander.

Sand the feet and then miter the pieces. Trace the profile of the scrollwork from the diagram onto the glued-in block. Cut the scrollwork profile on the block using a jigsaw (it doesn't have to be pretty). Cut the scrollwork on the ogee feet on your band saw or scrollsaw and sand your cut (these have to be pretty). Nail the feet to your case sides and front. Then miter and nail ¾" cove moulding on top of the ogee



Insert

feet moulding.

You're done with the feet. Now put the top case on top of the lower case. Center it and attach ¾" cove moulding to the lower case around the base of the top case.

Attach cove moulding to the top case (I bought mine off the rack) and then add a ½"-thick cap as shown in the diagrams.

Doors

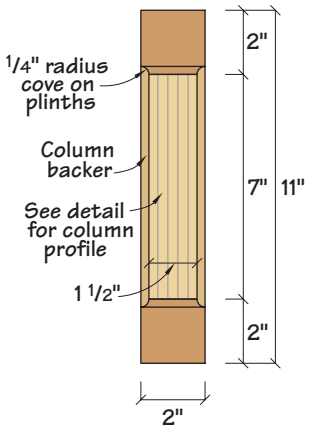
The doors are real tricky. In fact, you shouldn't feel bad about modifying the doors to suit your taste or skill level. The joints for the door are formed using a custom cope-and-stick shaper profile. The rails and stiles are attached using loose tenons. The mullions are coped on the ends and glued between the rails and stiles. Coping these tiny pieces is the tricky part.

Begin by cutting the cope-and-stick profile on the rails and stiles. Now cut the cope on the mullions. Here's how: Take a block of wood that's about 4" wide and cope the ends, then rip your mullions from this wider board. Use a really wide pushstick to protect your fingers during this dangerous cut. Cut the beaded profile on the edges of the mullions and cut the ¼"-deep x 5/16" wide rabbet on both back edges to hold the glass. Because this cut is so tricky, I recommend you use a special pushstick that you can see in action in the photo at right.

Fit the rails and mullions between the stiles and get ready to cut the loose tenons that hold the doors together. I cut the mortises in the rails and stiles using a straight bit in a router. Each mortise measures ⅜" wide x 1" deep x 1½" long. Cut your tenon material from shop scraps. Glue and clamp your doors.

Here you can see how I build my bases. I add a block at the front and attach the moulding to that. It's much like a kick on a traditional cabinet, except it's flush to the front of the case. Cut out the scroll pattern using a jigsaw ***(top).*** *After you've cut out the scroll pattern on the ogee feet, nail them in place to the sides and the block at front* ***(right).***

Cut the tails on your band saw and clean them up with a chisel if necessary.



Drawers

The drawers are built entirely using solid lumber. The drawer fronts lip over the case and are rounded over on the front. The sides attach to the front with rabbeted half-blind dovetails and through-dovetails at the back. The bottom, which is a panel with beveled edges, slides into a groove in the sides and front.

Begin by cutting your parts to size and cutting a 5/16"-wide x 7/16"-deep rabbet all the way around the back of the drawer fronts. Then cut a roundover on the drawer fronts.

Cut your half-blind dovetails using the same type of jig you used for building the case. Now cut the ⅜"-wide x ¼"-deep groove in the drawer front and sides for the bottom panel. Cut your bottom panel to size and bevel the edges so the panel will fit between the side pieces. Glue up your drawers and slide the bottom panel into place.

Drop Lid

The drop lid is built using traditional mortise-and-tenon breadboard ends. Begin by cutting three 2"-wide x 1"-long tenons on each end of the panel. Use these to lay out the mortises on the breadboards. Cut the mortises a little wide, glue the center tenon in the mortise and peg your tenons through elongated holes in the tenons.

Now cut a rabbet on the sides and top of the lid and roundover the front edge like you did the drawers. Attach the lid to the lower case using the hinges listed in the supplies box.

Build the slide-out supports for the lid. They are simply a piece of maple with a second piece of maple tenoned on the end to hide the end grain. Slide these into their holes and move onto the back pieces.

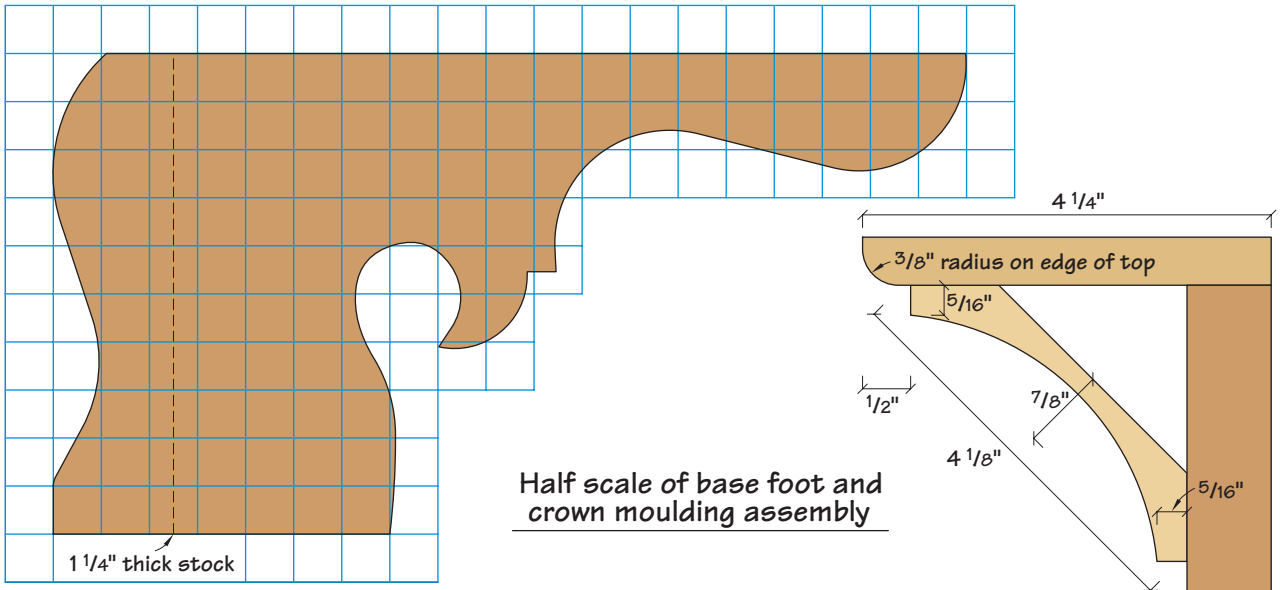
Back Pieces

I made a traditional shiplapped back for this piece using ½"-thick material. Cut ¼" x ½" rabbets on the edges and then cut a bead on the edges using a ¼" beading bit in a router table. You'll nail these boards in place after finishing.

Insert

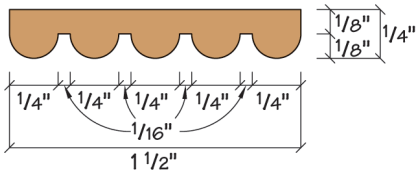
The pigeonholes add a lot to this piece. You might want to customize yours with more secret spaces than I did. First build the dovetailed box that slides into the desk. I used through-dovetails because the material is thin. Now use the diagram to lay out and cut the dadoes for all the dividers. I used a dado stack in my table saw for this.

Glue the dividers in place. Cut the pigeonhole scrollwork on a scrollsaw and

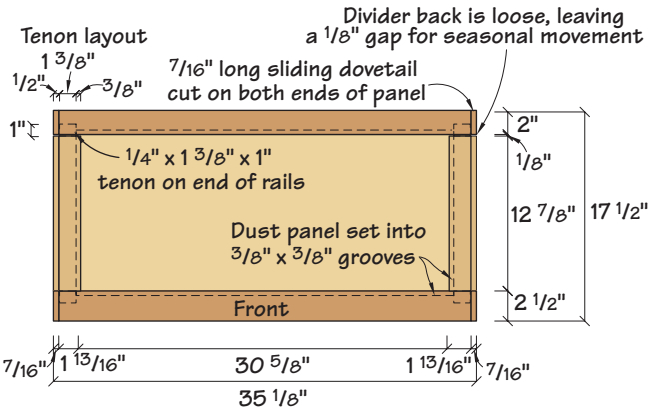


Half scale of base foot and crown moulding assembly

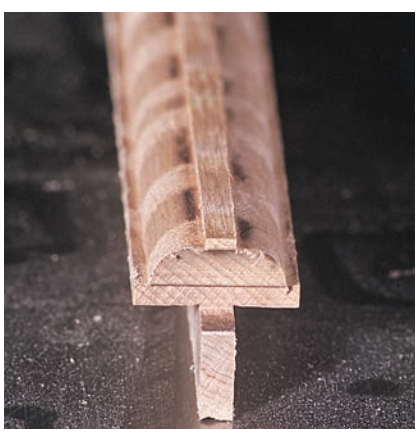
The mullions are tricky. Here you can see the special jig I rigged up to cut the rabbet on the mullions. One edge is shaped to hold the beaded side ***(far top).*** *Then you simply put the mullion in the jig, set your table saw to make your cut and be careful* ***(top).***



Column Detail



Case Dividers



When it's all said and done, this is what your mullion should look like. The cope for my set of knives is 5/16" deep.

Before you cut your loose tenon joints, make sure all your mullions fit between the door rails and stiles.

Here's a close-up look at the loose-tenon construction. Cut the mortises in the rails and stiles using a spiral bit in a router.

Schedule of Materials: Traditional Secretary

Lower Case

No.	Item	Dimensions T W L	Material
2	Sides	7/8" x 18" x 41 1/4"	P
1	Case top	7/8" x 10 1/8" x 35 1/8"	P
1	Desktop	7/8" x 17 1/2" x 35 1/8"	P
4	Divider fronts	7/8" x 2 1/2" x 35 1/8"	P
4	Divider backs	7/8" x 2" x 35 1/8"	P
6	Divider rails	7/8" x 2 1/4" x 14 7/8"	P
2	Divider rails (top)	7/8" x 3 1/2" x 14 7/8"	P
2	Vertical rails	7/8" x 3/4" x 4 1/8"	P
4	Lid suppt guides	7/8" x 3/4" x 12"	S
3	Lower panels	3/8" x 13 5/8" x 31 3/8"	S
1	Top panel	3/8" x 13 5/8" x 28 7/8"	S
1	Drop lid panel	7/8" x 13 7/8" x 32 3/4"	P
2	Breadbords	7/8" x 2" x 13 7/8"	P
2	Lid supports	7/8" x 3 1/4" x 17"	P
2	Support ends	7/8" x 2" x 3 1/4"	P
1	Feet support strip	3/4" x 5 1/2" x 34 1/4"	Ply
	Back	1/2" x 35" x 41 1/4"	S
	Ogee feet	1 1/4" x 5" x 7'	P
	Cove mould	3/4" x 3/4" x 14'	P

Upper Case

2	Sides	7/8" x 8 1/2" x 36"	P
4	Shelves and top	7/8" x 8" x 33 5/8"	P
2	Face frame stiles	3/4" x 2" x 36"	P
1	Face frame top rail	3/4" x 4" x 32 1/2"	P
1	Face frame bot rail	3/4" x 1 1/2" x 32 1/2"	P
	Back	1/2" x 33 1/2" x 36"	S
	Cove mould	7/8" x 4 1/2" x 6 1/2'	P
	Moulding cap	1/2" x 4 1/4" x 6 1/2'	P

Upper Case Doors

4	Stiles	3/4" x 2 1/4" x 30 1/2"	P
2	Top rails	3/4" x 2 1/4" x 11 3/8"	P
2	Bott rails	3/4" x 2 3/4" x 11 3/8"	P
2	Vert mullions	3/4" x 3/4" x 26 1/8"	P
8	Horiz mullions	3/4" x 3/4" x 5 5/8"	P

Lower Case Drawers

1	Front A	7/8" x 7" x 34 3/4"	P
1	Front B	7/8" x 5 3/4" x 34 3/4"	P
1	Front C	7/8" x 4 3/4" x 34 3/4"	P
1	Front D	7/8" x 3 3/4" x 31 1/4"	P
2	Sides A	1/2" x 6 3/8" x 17 1/4"	S
2	Sides B	1/2" x 5 1/8" x 17 1/4"	S
2	Sides C	1/2" x 4 1/8" x 17 1/4"	S
2	Sides D	1/2" x 3 1/8" x 17 1/4"	S
1	Back A	1/2" x 5 3/8" x 34 1/8"	S
1	Back B	1/2" x 4 1/8" x 34 1/8"	S
1	Back C	1/2" x 3 1/8" x 34 1/8"	S
1	Back D	1/2" x 2 1/8" x 30 5/8"	S
1	Bottom	1/2" x 17 1/2" x 30 1/8"	S
3	Bottoms	1/2" x 17 1/2" x 33 5/8"	S

Insert

2	Sides	1/2" x 8 1/2" x 11 1/8"	P
2	Top & bott	1/2" x 8 1/2" x 34 1/8"	P
4	Large vert dividers	3/8" x 8 1/2" x 10 1/2"	P
4	Shelves	1/4" x 8 1/2" x 11 1/8"	P
6	Dividers	1/4" x 8 1/2" x 5 7/8"	P
4	Dividers	1/4" x 2 1/8" x 8 1/2"	P
8	Pigeonhole arches	1/4" x 2" x 2 1/2"	P

Column drawers

4	Front & back	1/2" x 1 7/16" x 10"	S
4	Tops & botts	1/2" x 1 7/16" x 8 1/4"	S
2	Sides	1/2" x 7 3/4" x 9 3/4"	S
2	Column backer	1/4" x 2" x 11 1/16"	P
2	Beaded boards	1/4" x 1 1/2" x 7"	P
4	Plinths	5/8" x 2" x 2"	P

Insert drawers and door

8	Fronts	1/2" x 1 15/16" x 5 3/16"	P
8	Backs	3/8" x 1 5/8" x 5 3/16"	S
16	Sides	3/8" x 1 15/16" x 8 1/8"	S
8	Bottoms	1/4" x 4 13/16" x 8"	S
2	Door stiles	11/16" x 1 1/2" x 10 1/16"	P
1	Bott rail	11/16" x 1 1/2" x 5 1/4"	P
1	Top rail	11/16" x 3" x 5 1/4"	P
1	Panel	1/4" x 5 1/8" x 7 3/4"	P

P=Maple • S=Poplar

The support end on the lid support, (attached with a haunched mortise), is a nice way to conceal the end grain.

The insert is merely slid into the desk after finishing. You don't need to attach it to the lower case if you don't want to. Here I'm fitting the pigeonhole scrollwork into the cubbyholes using spring clamps.

Supplies

Horton Brasses Inc. 800-754-9127

H-42 1/2" interior knobs (10)
H-34 exterior pulls (8)
H-34SE escutcheons for drawers, slant top (5)
H-38 interior escutcheon (1)
H-551 top door escutcheon (2)
LK2 lock (2)

Rockler 800-279-4441

#29157 hinges for slant top lid $2.99/pair (1 pair)
#25700 hinges for interior door $1.99/pair (1 pair)
#31495 hinges for top doors $5.79/pair (2 pair)
#15190 lock, interior door $18.99 (1)

glue it in place using spring clamps.

Build the eight horizontal and two vertical drawers using half-blind dovetails. The vertical "drawers" open to the inside for hanging jewelry. Cut the column profiles and attach them and the plinths to the backer, then glue the whole assembly to the drawers.

To build the little door in the center I used a cope-and-stick set in my router table. Then I band sawed out the curve in the top rail and cut the profile using the same router setup. The 1/4" panel is flat (not raised) and slides neatly into the groove created by the router cutters.

Details

Attach all the hardware and hang your doors. I used an aniline dye to color the piece followed by three coats of spray lacquer. After finishing, attach the back boards and add the glass using either silicone or traditional water putty.

The good news was that my daughter loved the new secretary. I'm sure she'll treasure it for years to come. The bad news is that now my wife wants one. **PW**