

# WOODWORKER'S JOURNAL

downloadable plans:  
"America's leading woodworking authority"™

## Fluted-Door Wall Cabinet

### In this plan you will be getting:

- Step by Step construction instruction.
- A complete bill of materials.
- Exploded view and elevation drawings.
- How-to photos with instructive captions.
- Tips to help you complete the project and become a better woodworker.



To download these plans, you will need **Adobe Reader** installed on your computer. If you want to get a free copy, you can get it at: **Adobe Reader**.

### Having trouble downloading the plans?

- If you're using Microsoft Internet Explorer, right click on the download link and select "Save Target As" to download to your local drive.
- If you're using Netscape, right click on the download link and select "Save Link As" to download to your local drive.

WOODWORKER'S JOURNAL  
©2007 ALL RIGHTS RESERVED

**\$7.95**

WJ113



Published in Woodworker's Journal "Woodworking for the Home Hobbyist: 27 Great Projects and Techniques for your Woodshop"

*Although it might have been safer to use wider strips yielding wide edges and narrow them down with the bevel cuts, our author didn't want to waste any of his precious lacewood, and he wanted to preserve as much continuity of figure as possible.*



# Fluted-Door Wall Cabinet

Some projects are born of necessity: you need a place to store china or something to sit on. Other projects start with the desire to do something neat with a striking piece of wood. This wall cabinet, with its Rorschach-blot door, framed like a painting, is one of the latter.

Our author had just spent the better part of three months designing and building an elaborate computer cabinet for his home office. The work was large-scale, precise, had many subassemblies and required lots of planning, drawing and measuring. When it was done, rather than a break from woodworking, what he wanted was another way of working: a project that would be freeform and improvisational, preferably with minimum reliance on paper, pencil and measuring tape.

About that time he came across an incredible plank of flatsawn lacewood. It had a dramatic elongated horizontal ray figure that he thought would nicely balance the strong vertical lines of a curved, fluted door he had in the back of





After many test cuts on pine, the author used his shop-made jig to form the coves in the lacewood staves. The adjustable jig accommodated both widths of door staves.

The door he had in mind needed narrow pieces coved out to almost their full width, leaving edges just wide enough to support the strips on their trip over the blade and to bevel later to establish the curve. But the edges had to be narrow enough so they could be worked to sharpness once the door was glued up.

It might have been safer to use wider strips yielding wide edges and narrow them down with the bevel cuts, but he didn't want to waste any of this precious wood, and he wanted to preserve as much continuity of figure as possible. In addition, the coves had to be deep enough to create the shadow lines that comprise the other half of the fluted rhythm, but shallow enough to leave

his mind. This project was starting to take shape, but it was time to figure a few things out.

The basic technique was clear enough: he decided he would cut a plank into strips, cove each one, and bevel the edges so when they were edge-glued back together they would form a curve (this process is called "coopering," named for the barrelmakers who invented it).

The challenges were, one: getting a tight joint between each strip without the strips slipping against each other and, two: smoothing the coves (rough from the saw blade) while keeping the arrises (the "spines") between them sharp and clear, which is half of the visual rhythm that flutes establish. He knew the door had to be perfect before making the rest of the cabinet, because the sizes and proportions of the other pieces would be determined by the door. With the width of the door absolutely fixed by the high points of the outer arrises, there would be no adjusting once it was made.

### Solving a Cove Conundrum or Two

The first order of business was to figure out how to cut the coves. The usual trick is to clamp an angled fence across the table saw and run a board over the blade, raising the blade slightly with each pass so that the skewed angle of presentation forms a radius. He had made a few pieces of crown molding that way, but this was a bit different.



After plowing the coves on each door stave, the author formed a 5° angle on both long edges (with the exception of the outside staves). To align the staves during glue-up, biscuit joints were put to good use.



## RAISING A SHARP POINT

enough thickness for the biscuits he'd use to join the strips as well as the screws for the hinges he planned to use to hang the door.

The solution was a jig with two long pieces forming a "chute" to guide the strips over the blade without exposing his fingers to it. Because he wasn't yet sure how wide the strips should be to get the intended effect, he made the width adjustable. And because the strips were to be at least 18" long, and therefore had to travel at least 36" from front to back, he built up the ends so the strips could pass underneath them. The jig "legs" were made from 1/2" stock so the 3/4" strips would project above the jig, allowing them to be pushed from the side rather than the top and in order to keep the push stick above the blade so it was not in danger of contacting it at the end of the cut.

Now he had the means, but there were other questions. How wide should the coves be? How deep? How many? And how would it be possible to get the arrises sharp after glue-up? (See the *tint box* at right for that answer.)

There are tables that give angles and equivalent radii for cove cutting. His solution was to cut 20 or so strips of scrap pine into various widths and begin experimenting. He clamped the jig to the table front and back at an arbitrary angle and began cutting. The

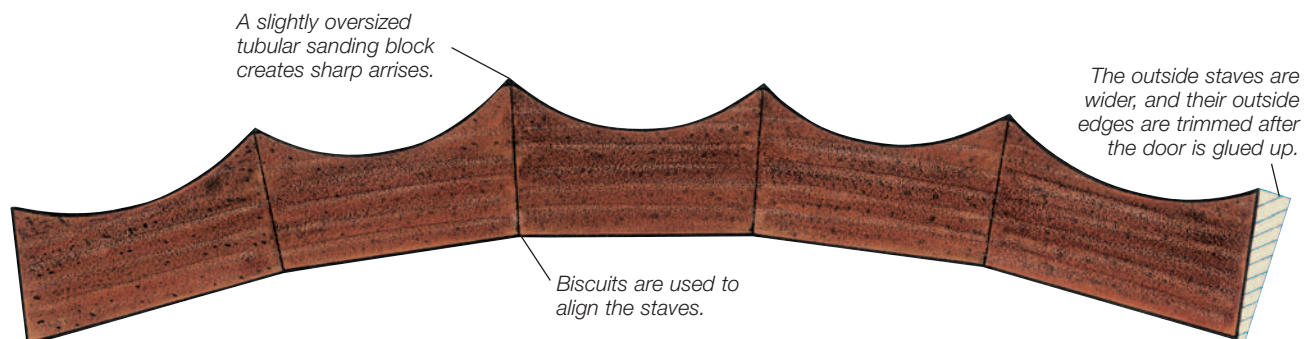
The challenge was how to get the coves' arrises sharp after glue-up. You'll need a cylindrical sanding block because the coves coming off the saw will be rough and need lots of smoothing. What our author figured out was that a sanding block with a radius just slightly larger than the coves bore against the edges first, before bottoming out in the coves.

By cutting the coves to the proper radius and keeping the edges narrow enough, the sanding process would essentially abrade from the top down, sharpening the arrises and then smoothing the coves.

The theory proved correct. Our author found a stout cardboard mailing tube with removable plastic flush cap ends that did the trick. The walls were almost 3/16" thick, and he simply cut it down to a suitable length and attached the sandpaper with thumbtacks. The end caps kept it quite stiff. A perfect and simple solution to a challenging sanding problem.

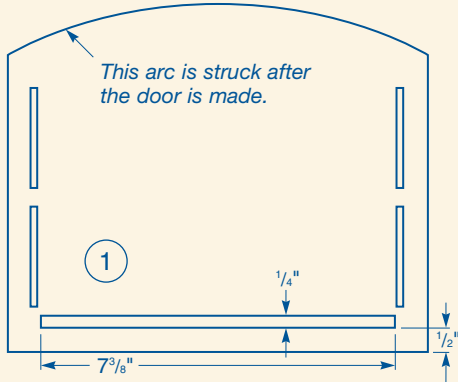


*The radius of a mailing tube was key to the author's success in creating his dramatic door with knife-edge arrises.*

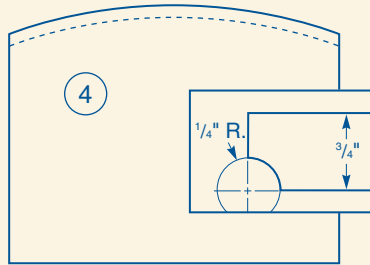


# Cabinet Exploded View

**Top and Bottom**  
(Inside View)

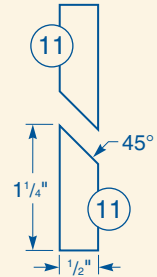


**Shelf and Door Stop**  
(Top View)

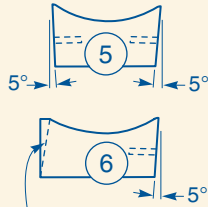


**NOTE:** The cove is only found on the forward edge of the shelf; omit it for the door stop.

**French Cleats**  
(End Views)



**Door Staves**  
(End Views)



**NOTE:** There are right and left pieces 6.

## MATERIAL LIST

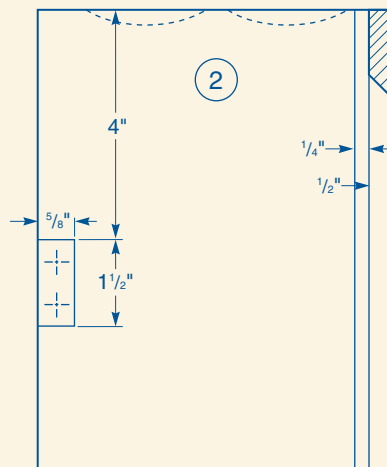
	T x W x L
1 Top and Bottom* (2)	3/4" x 7 1/4" x 8 3/4"
2 Sides (2)	3/4" x 6 1/4" x 20"
3 Back (1)	1/4" x 7 3/8" x 20 1/2"
4 Shelf and Door Stop* (2)	3/4" x 5 3/8" x 6 7/8"
5 Inner Door Staves (3)	3/4" x 1 3/4" x 20"
6 Outer Door Staves (2)	3/4" x 2" x 20"
7 Handle (1)	9/16" x 1/2" x 1 3/4"
8 Hinges (2)	1 1/2" Extruded Brass
9 Magnetic Door Catch (1)	Round, 5/16" Dia.
10 Shelf Pins (4)	Brass
11 French Cleats (2)	1/2" x 1 1/4" x 6 7/8"

\*Trim front edge to accommodate arc.

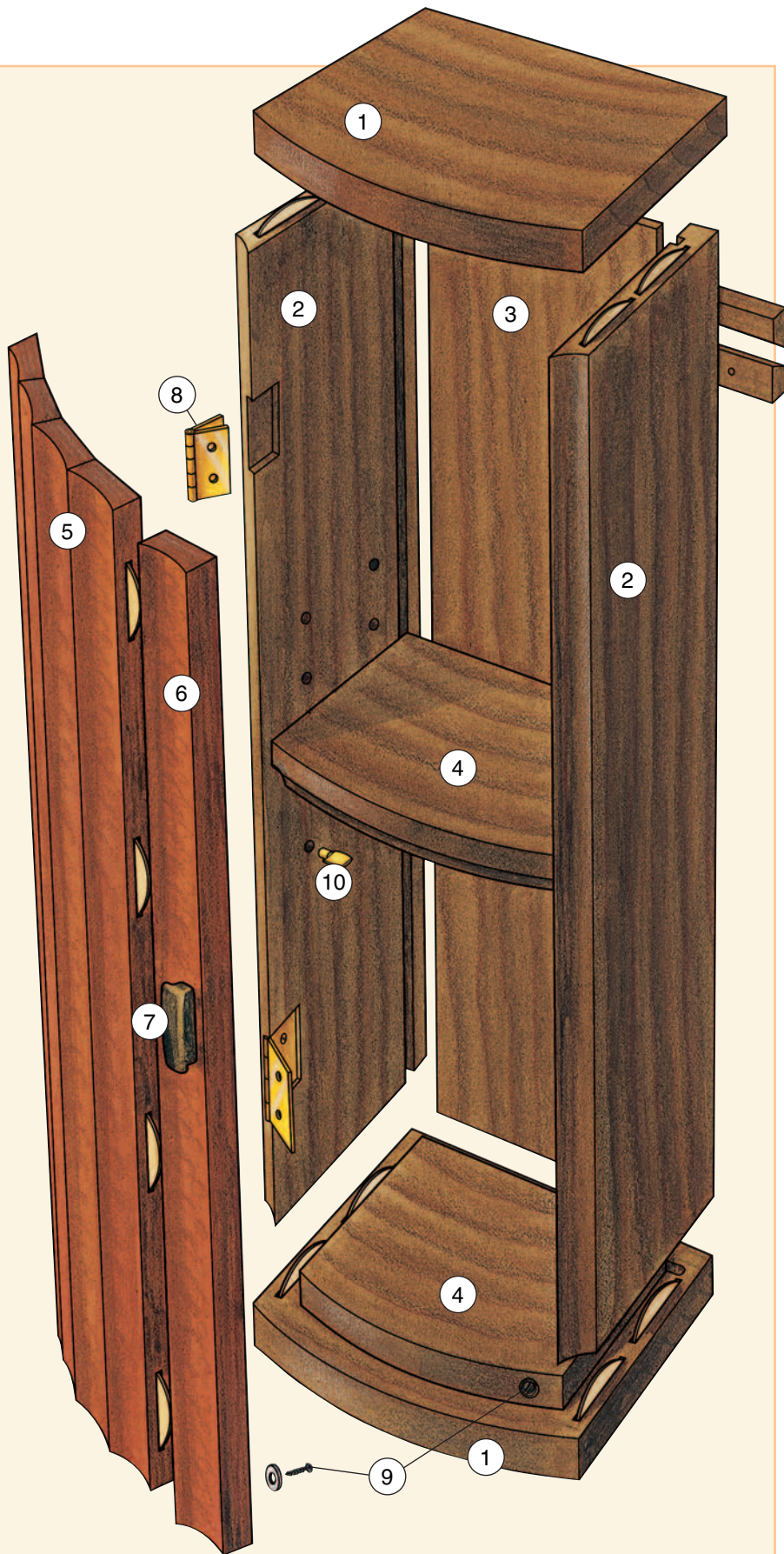
## Fluted Door Wall Cabinet

(Front View)

(Side View)



**NOTE:** The author mortised the hinges into the door first, then marked their corresponding placement on the cabinet.



first thing he learned was that the larger the angle of the jig relative to the blade, the wider (and larger radius) the cove is in relation to its depth. Some trial and error here yielded the conclusion that 1/4"-wide strips would be right for this door. He adjusted the jig to that width, raised the blade to a little less than half the thickness of the strips and clamped the jig to the table so that the blade emerged from the throat plate about 1/16" from the inside edges of the jig front and back, reasoning that this would result in a cove of the proper depth with 1/16" edges. Then he lowered the blade to just above the table for the first cuts. Another sacrificial strip showed that he was pretty close, but the radius of the cove was a little too large. He fiddled with the angle until his sanding block (with coarse paper attached) bore against the edges of the cove with about 1/16" clearance to the bottom (see *tint box*, page 153).

### Ripping and Coving Lacewood Strips

Now he was ready to cove the real thing. But first, he marked the jig angle right on the saw table and took the setup apart to cut the lacewood into 1/4" strips. (It would have been easier to have the strips ready, but he didn't know they should be that width until he had experimented.) Some further experimentation with the pine scrap strips had shown that a 5° bevel on the edges resulted in a nice, mild curve. Luckily, he remembered that the outside strips (i.e., the edges of the door), once glued up, would need to be trimmed after the door was assembled. This necessitated extra width on the ends, so he cut two lacewood strips to 2" and four to 1/4". He arranged and rearranged the strips into a pleasing pattern (always with the wider strips to the outsides) and

marked them in sequence with the cabinetmaker's pyramid on the backs.

Returning the jig setup to the angle marked on the saw table, he ran one more pine strip through it for a final check with the sanding block. It came out right, so he lowered the blade, ran all four 1 3/4" lacewood strips through, raised the blade a bit, and repeated the process until the cove was the right depth and the edges were about 1/16" wide. Then he readjusted the outer leg of the jig so the "chute" was 2" wide (keeping the inner leg fixed relative to the blade), again lowered the blade and ran the 2" strips through it, taking care to run them in the same orientation with each successive raising of the blade, until the coves matched the other

pieces and one edge was the same 1/16" width as the narrower strips, but the other edge was about 1/4" wide.

### Beveling and Joining a Coopered Door

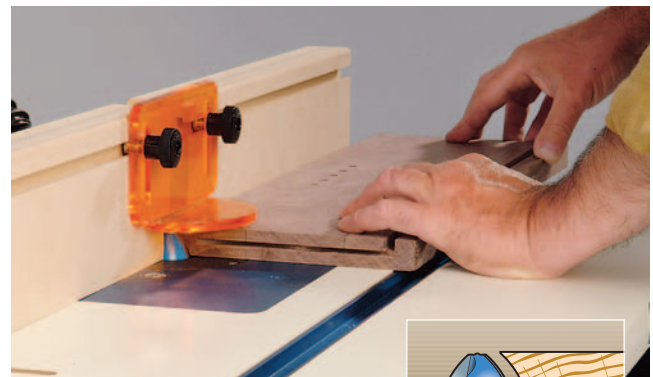
If you're following the same protocol for building your cabinet, take the setup apart at this point, set the blade to 5° and set the fence to cut one edge of each 1 3/4" strip, eyeballing the line of cut so it just skims the outer point of the edge of the cove. This is a chance to narrow the edges if they've come out a bit fat. Then reset the fence to cut the opposite edges, and reset yet again to cut the bevel on the thin-edged side of the 2"-wide strips, leaving the wide edge alone. These won't be cut until the door is almost finished.

Experimenting with the finished strips, and keeping in mind the final composition will be 1 1/2" wider with the side

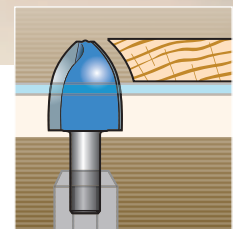
pieces, you'll discover as our author did that five flutes looks best here.

The biscuit joiner will make easy work of joining the strips into a curve. Simply strike four lines across the backs of the strips, set the joiner's fence to the 5° angle, register it to the back faces, and cut the slots on all the strips (except for the wide-edged sides of the 2" strips, which will be the outer edges of the door). Glue up the outer and next inner strips in pairs and clamp them with handscrews. When they dry, glue the middle strip onto one of the outer pairs and clamp up again. Finally, glue the two-strip and three-strip halves together along the last joint, drawing the halves together with pipe clamps set on a plywood panel to just beyond flush and clamping down with handscrews at the ends between the door and the underside of the plywood to tighten the joint.

The sanding block will sharpen the arrises nicely. Use 60-grit paper to smooth out the saw marks, then polish with finer grits through 220. Lacewood has a coarse texture that doesn't really



The author scalloped the front edge of the sides on his router table (above). A 1/8" strip of hardwood, flexed on his workbench or between a pair of nails, will provide a perfect offset for the top and bottom and make it easy to transfer the curved shape.

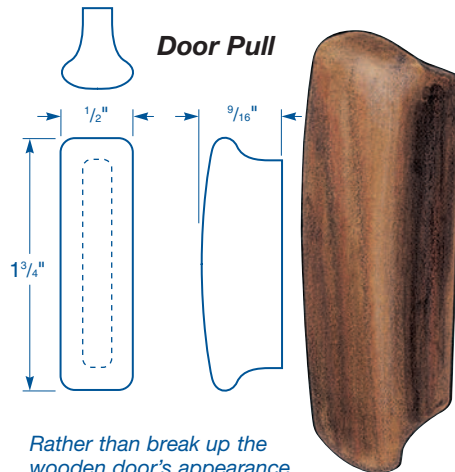




require anything beyond that. Then trim the edges of the finished door. It's important to have the extra width here for this operation, so the blade can skim the high point of the outer arrises while cutting a clean edge all the way to the bottom.

### Building a Carcass for a Door

The rest of the cabinet is straightforward. While the height of the sides and the width of the top and bottom pieces are determined by the door, a few points deserve mentioning. The project is designed so the edges of the side pieces have shallow angled coves to complete the visual rhythm of the door. A vertical cove panel-raising bit will cut the perfect gentle cove with the sides run across it horizontally in the router table. To leave nothing to chance, mortise the extruded butt hinges into the cabinet and door. Hang the door before determining the final width of the cabinet by clamping two plywood spacers between the sides and adjusting the width of the spacers until the door fits perfectly, with a mini-



*Rather than break up the wooden door's appearance with a metal pull, the author carved an organically shaped version instead.*

mal gap. Then use the spacers to register the biscuit joiner to cut the slots in the top and bottom pieces.

Our author used a piece of walnut for the top with a natural curve to the grain that closely followed the curve of the door. Mark the curve on the front of the top and bottom pieces by springing a 1/8" strip of wood between two nails tacked into your walnut blank until it matches the curve of the door. Set the

cabinet upside down on the top piece, butt the door against the strip and trace the curve onto the top piece. This will simultaneously fair the curve described by the high points of the arrises and space it 1/8" away from them for a nice overhang. You'll find that the angle of the coves on the side pieces of the cabinet will tighten the radius at the ends of the top and bottom curves. Use the top as a template to mark the bottom. Then cut the back panel to size from walnut veneer plywood and let it into grooves in the sides, top and bottom. Recess the back 1/2" to leave a little room to mount the cabinet half of a 1/2"-thick French cleat. With the other half mounted on the wall, this cabinet is simple to install.

### Finishing Up

With the cleats in place, take the cabinet down and remove the door from the carcass. Complete this challenging but elegant project by finishing it with oil and wax to create a soft, satin finish that's a joy to look at and touch.

## QuickTip

### Instant Edging Clamps

Edging clamps are useful items, but you may need them so seldom that they aren't worth the extra investment. Here's a simple solution: improvise with small C-clamps and wooden wedges as shown. For small jobs where only a little pressure is required, 1" strapping tape can come to the rescue as well.

