

Entertainment Center in Quartersawn Maple



Curved elements and cove moldings help keep
a big case from looking boxy

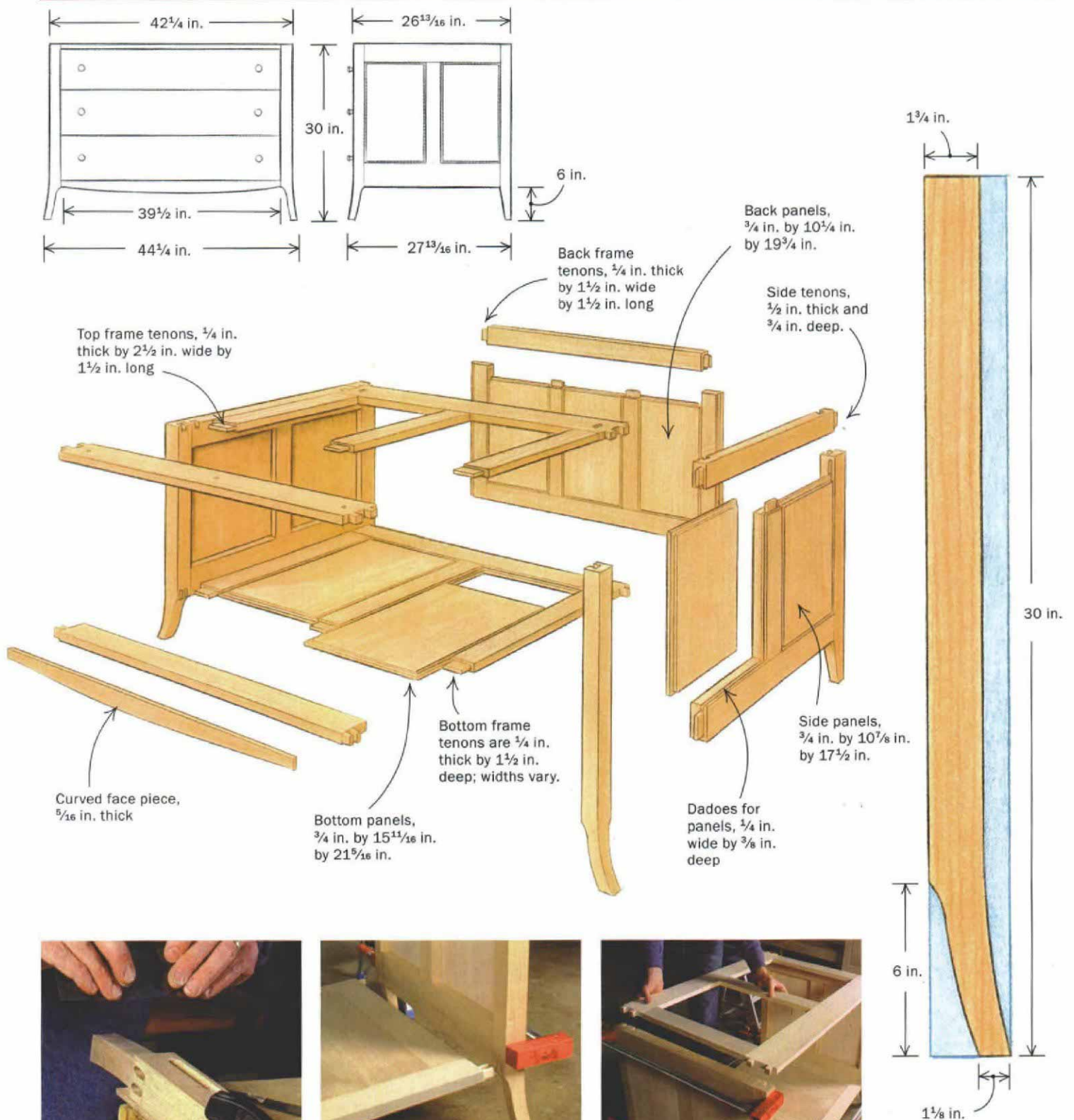
BY PETER TURNER

As my 2-year-old daughter, Morrigan, grew and became more mobile and curious, so did the urgency to design and build an entertainment center. My aim was to keep the unit looking more like a piece of furniture than a refrigerator while efficiently housing the television, VCR, and other audio components out of sight and temptation's way.

In an effort to move away from the large, heavy look of a typical entertainment center, my first design ended up as a horizontal case on a skinny, four-legged frame. I eventually scrapped this design because I realized the weight of components, especially a television, would overwhelm such a delicate piece. Instead, the cabinet evolved into a more conventional two-piece structure, with a lower section housing three drawers for storage of CDs and tapes and a slightly narrower but taller upper section enclosed by a pair of doors. I did what I could to keep the piece from getting bulky by maximizing the usable internal space and adding soft curves to the exterior, which help mask its rather hefty dimensions.

I chose cranked door hinges that allow a door to be opened a full 270° instead of pocket door hardware, which would have added several inches to the width of the piece. The curved legs lift the case off the floor and help reduce its visual weight. And to blend the lower case with the upper, I applied cove moldings at the waist and at the crown. I really like the

FRAME-AND-PANEL BASE



After cutting the mortises, shape the feet. The feet are cut out on the bandsaw, then cleaned up with a scraper.



Double tenons join the bottom to the front of the lower case. A single tenon is sufficient for the rear because the glued-in back panel will add strength.



The top of the lower case is a simple frame without panels. Double dovetail joints are used at each corner to ensure the case won't bow.



A spacing guide simplifies the installation of slides. The guide positions each pair of slides at the correct height for attachment to the inside of the case. Cut the guide down to attach the next pair of slides.

Removable dividers make the drawers versatile. Whether you need to store CDs, tapes or video-cassettes, the drawers can accommodate all.



swoop of a cove, which lends vitality to a piece.

To ensure that components such as an amplifier, tuner, CD player and a television would fit inside the upper cabinet, I took a tape measure to my electronic gear. I also checked the dimensions of stereo and TV components at an electronics store. New electronic components are

fairly standardized, being about 17 in. wide or less and just a few inches tall. Older components vary more in size. I settled on four 18-in.-wide adjustable shelves that are shallower than the interior of the case, which allows room for routing wires and for air circulation. The cabinet will easily hold half a dozen components plus a 27-in. televi-

sion. The back of the upper case has a panelless frame, which makes for easy access to wires and lets the heat produced by a television escape.

With the help of a friend, Sam Robinson, I built the cabinet within a narrow time frame—one month—because I wanted to exhibit the piece at the Philadelphia Furniture Show.

Sam was assigned the upper case, and I took on the lower box. We kept our fingers crossed and hoped that the bridge would eventually meet in the middle.

Quartersawn maple is the predominant wood used in the piece. The wood was chosen for its light color and subtle grain. Soft maple was used for the drawer sides and one internal frame. The drawer bottoms are made of plywood.

My local hardwood supplier, Dennis Day of Day Hardwoods in Scarborough, Maine, has a knack for finding high-quality wood at fair prices. He supplied me with 200 bd. ft. of quartersawn maple with several pieces close to 8 in. wide, unusually wide for quartersawn stock. The widest planks were used for visible panels and drawer fronts. The narrower stock was used for frames, internal panels and shelves.

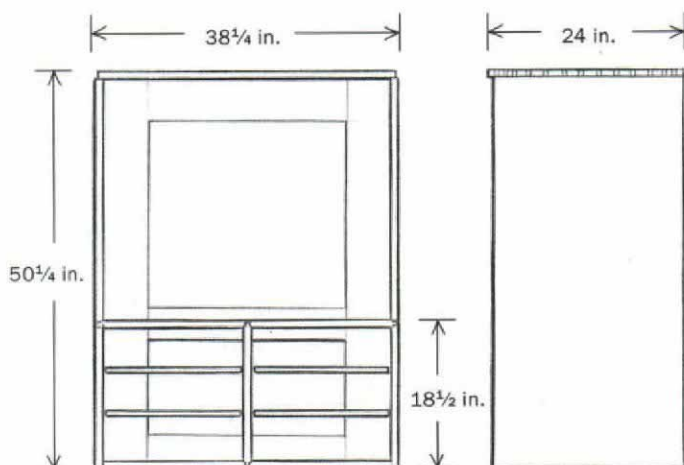
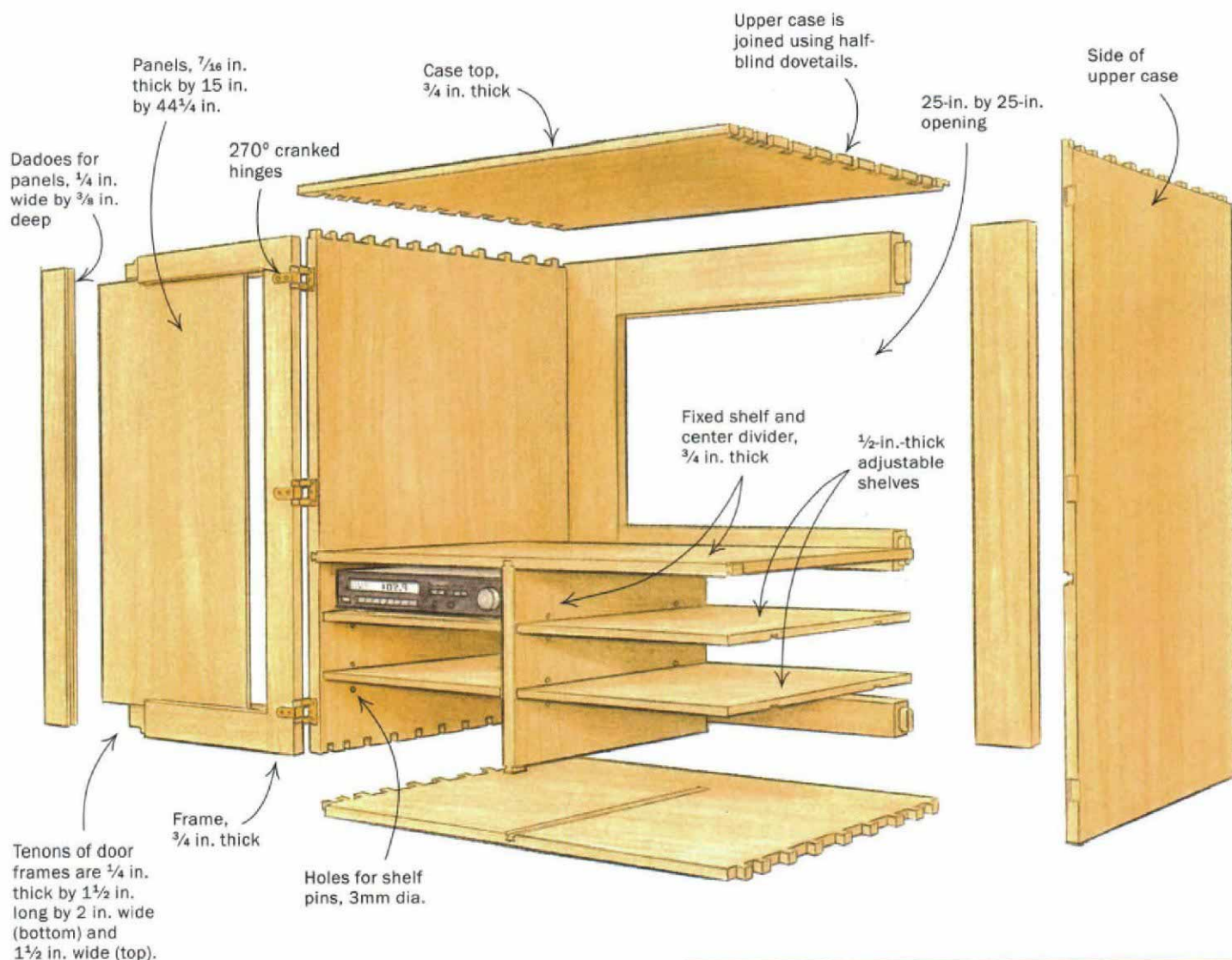
We were unable to locate thicker quartersawn stock, so we used plainsawn 16/4 material when needed, sawing it to best show off the grain.

The stoutest timbers are used in the lower case

I rough-cut the 16/4 stock and let it sit a few days to stabilize. It seemed as if this big plank was custom-made for my purposes. I was able to get quartersawn boards for the side frames and coves. The rest of the plank had diagonal end grain, which was used for the legs. Diagonal end grain is ideal for legs because you can orient the stock to show rift-sawn figure on the two exposed faces.

I rough-cut the front legs about 3 in. square; the rear legs were roughed in at 2 in. by 3 in. The flat, inside faces of the legs were mortised to receive the side rails. I used a Multirouter to cut all of my lower case joinery (see "Router milling jigs," *FWW* #130, pp. 62-63). Dadoes were

DOVETAILED UPPER CASE



SOURCES OF SUPPLY



Cranked hinges allow doors to open wide. Mortises must be cut in the doors and the front edge of the case.

DRAWER SLIDES

Julius Blum

7733 Old Plank Road
Stanley, NC 28164
(800) 438-6788

Hettich America

6225 Shiloh Road
Alpharetta, GA 30202
(800) 438-8424

HINGES

Hafele

3901 Cheyenne Drive
Archdale, NC 27263
(919) 889-2322

Sugatsune America

221 E. Selandia Lane
Carson, CA 90746
(800) 562-5267

routed into the legs for the panels. I cut the feet on the band-saw and cleaned them up with a cabinet scraper (see the left photo on p. 87).

The back, top and bottom frames are of mortise-and-tenon construction with routed stopped dados for all panels. Double dovetail joints were used to join the top frame to the rest of the lower case (see the right photo on p. 87). I used double tenons on the front corners of the bottom frame to reinforce these joints (see the middle photo on p. 87). Single tenons are adequate at the rear of the case because the back provides additional strength.

The panels were rabbeted along all four exterior edges. The reveal between the panel and frame is slight, about $\frac{1}{16}$ in. at the top and bottom and a hair more along the sides. To simplify production, I rabbeted all panels using the same setting. Next, I machined the dados in the frames, making them all $\frac{1}{4}$ in. wide and $\frac{3}{8}$ in. deep. Then I placed slivers of neoprene in the lower rails, which lift the panels to the correct height. Neoprene is available from window-repair companies.

The dry assembly of the lower case was my first opportunity to appreciate the real scale of the piece. I clamped a temporary spacer across the front between the upper corners of the sides to hold them in place. I then placed the completed top frame on top of the case and knifed the dovetail socket placement into the leg tops and upper rails.

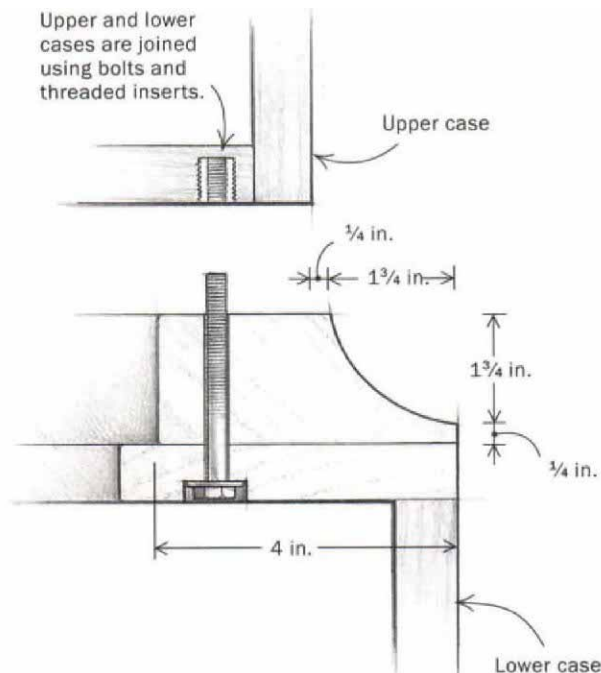
After knocking the sides apart, I finished cutting the joinery. The back is handplaned to fit. It is glued in place.

A waist molding, built as an open framework, separates the top from the bottom half of the case. Three sides are shaped; the back is square. I cut the

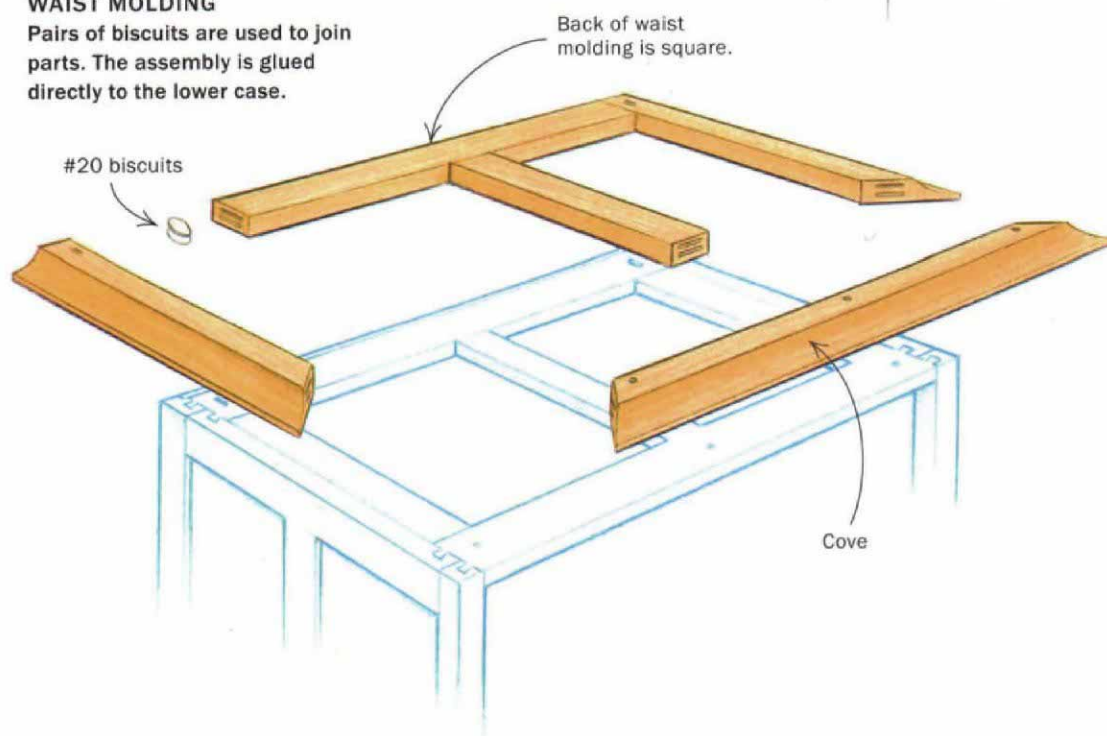
WAIST MOLDING



Upper and lower cases can be separated for ease in moving. Threaded inserts and bolts are hidden from view but make a strong connection.



WAIST MOLDING
Pairs of biscuits are used to join parts. The assembly is glued directly to the lower case.

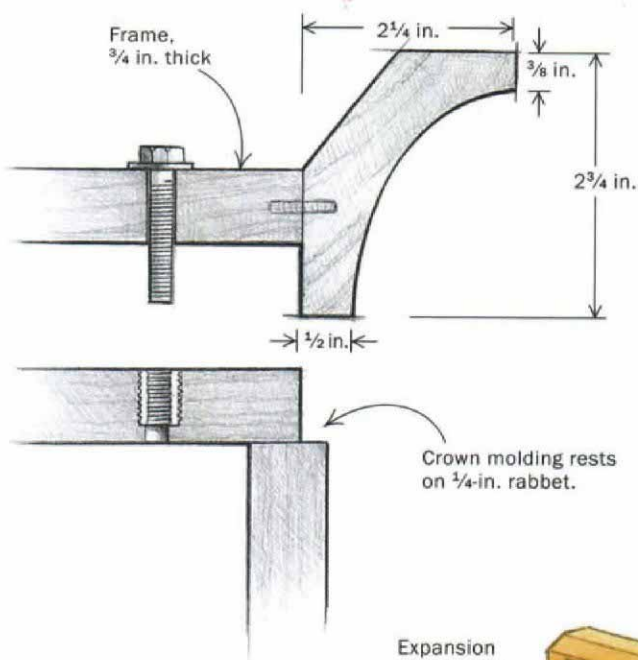


cove molding on the tablesaw with the blade at 90° , using a 25° angle of approach and ending up with a final blade height of $1\frac{1}{2}$ in. (For more on cutting coves on the tablesaw, see *FWW*#102, pp. 82-85). I ran the stock facedown to provide a

stable riding surface. Small, successive cuts with a *grazing* final pass are the keys to producing a clean cove safely. No matter how carefully you cut, there's still a bit of cleanup required. I made a custom scraper by grinding a stock scraper to the

same radius as the cove. The front corners of the cove were mitered, and the rear corners were butt-joined. I used double #20 biscuits to reinforce all of the corner joints. The completed framework was glued directly to the top of the lower case.

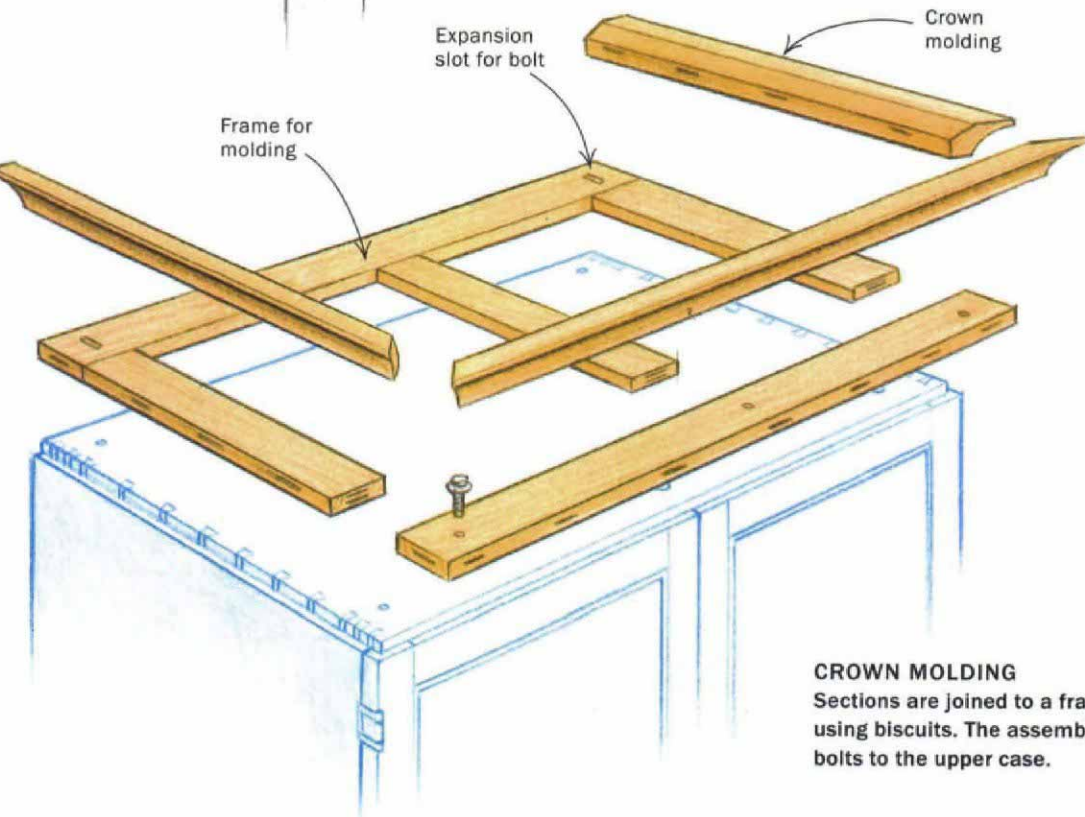
CROWN MOLDING



Crown molding rests on 3/4-in. rabbet.



Removable molding. It's much easier to protect the molding if it can be wrapped separately when transporting the case.



CROWN MOLDING
Sections are joined to a frame using biscuits. The assembly bolts to the upper case.

Biscuits are not needed here because there is plenty of face grain between parts.

Hidden, full-extension drawer slides are used

The three drawer boxes are all the same size and were built us-

ing a Leigh dovetail jig. The drawer fronts were screwed in place from the inside. For visual balance, I graduated the height of the false fronts, with the lower drawer front being the deepest. After cutting all of the dovetail joints, I machined da-

does in the fronts and sides of each drawer for the plywood bottom panel, which is rabbeted along three edges. Then I ripped the bottom inch from each drawer back to allow the bottom panels to extend past the rear edge of the drawer. The

bottoms were screwed in place to the rear drawer wall.

I also cut grooves in the front and rear of the upper drawer to hold removable partitions, good for CDs or tapes. The partitions are 1/4 in. thick by 4 in. high, and they divide the drawer into six equal channels. I cut these after cutting the dovetails and dados. I clamped matching fronts and backs flat on my bench, butting their top edges together. Then, starting in the dado, I routed rounded, 1/8-in.-deep dados across both pieces using a 1/4-in. core-box bit. After a little trial and error, I cut the partitions to length and rounded over the ends to match the round-bottomed dados. I carried the same profile along the top edge. Round dados are time-consuming, but I much prefer their softer look. Depending on the size of your CD or tape collection, other drawers could also be partitioned.

I chose Hettich Quadro 30 V6 full-extension slides for their ease of installation, smooth operation and clean look. Each drawer gets a pair of slides, which are screwed to the inside of the case. Two plastic clips, which engage the slides, are screwed to the underside of each drawer near the front. Drawers must be constructed so that their sides project 1/2 in. deeper than the drawer bottom. The slides are completely hidden by the drawer sides. With this type of hardware, I don't have to worry about whether my drawers will bind in the humid summer heat or get sloppy in the dry air of winter. I particularly like the self-closing action, which kicks in when a drawer is open an inch or less. Blum also makes a hidden drawer slide called the Tandem.

To locate each pair of drawer slides uniformly within the case, I made a spacing guide out of scrap plywood (see the top photo on p. 88). Here's how it

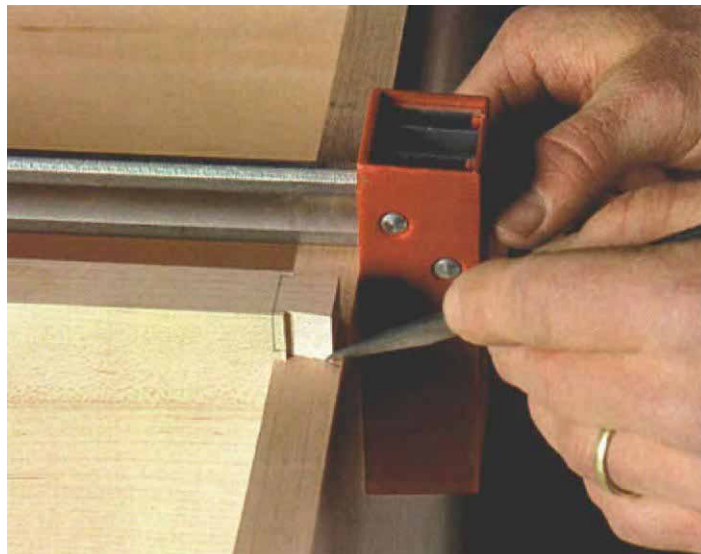


A fixed shelf and center divider strengthen the upper case.

Both the shelf and divider fit into $\frac{1}{8}$ -in.-deep stopped dadoes. The protruding ears at the front of the shelf and divider are dovetailed,

Mark the socket of the dovetailed ears during dry fitting.

Clamp the case flat and use a sharp marking knife.



works: Lay out the location of the slides. Then trim the guide so that when placed inside the case, the slide, when laid on top of the guide, is in position for attachment to the case. The guide ensures that the opposite slide will be at the same level and parallel to the first. Start with the top drawer and cut the guide down for each subsequent pair of slides.

If you use Hettich slides, order

their screws, too, which cost extra. I didn't and discovered that standard round-head screws interfered with the action of the slides. To finish off the lower case, I drilled $\frac{1}{2}$ -in.-deep mortises for the pulls, then attached the drawer fronts to the drawers with countersunk screws.

I added a curved face piece to the outside edge of the bottom of the case, below the last drawer, which helps tie the case to

the curve of the legs. This face piece is glued in place. The pulls are classic Shaker design and made of ebony. The pulls for the upper case have soft tips to prevent dinging the case (see the photos and story on the facing page).

Meanwhile, the upper case is taking shape

While I was busy cutting mortises and tenons, Sam was work-

ing away at the long rows of half-blind dovetails that join the upper case. Once he finished the dovetails, he loaded the stock into his van and came to my shop for a dry assembly and test fit. We knocked his case together and placed it on top of my lower unit. Amazingly enough, it sat nice and flat with appropriate reveals on all sides.

The upper case has a fixed shelf, which fits into a $\frac{1}{8}$ -in.-deep stopped dado. The front of the fixed shelf has two $\frac{1}{2}$ -in.-deep ears, which are dovetailed into the front edge of the cabinet. The dovetails prevent the case from bowing. A center divider was attached to the case in a similar fashion, using dadoes and dovetailed ears. To place the sockets for the dovetailed ears accurately, it's best to dry-fit the case with the shelf and divider and mark out their locations with a knife (see the bottom photo at left).

Back at his shop, Sam chopped out the sockets. He also attached threaded inserts into the case. The inserts, in conjunction with bolts, allow the upper and lower cases to be joined. The crown molding was also attached in this way.

Don't come unhinged because of hardware

Sam built the door frames using haunched mortise-and-tenon joints. Panels were constructed using the same methods employed in the lower case. The hinge mortises were marked using a knife, then most of the waste was removed by routing freehand. A chisel and gouge finished the mortises.

We used Hafele hinges (No. 307.04.806) and ran into a few bumps along the way. Because I wanted the doors to be flush to the sides of the case, we mortised the hinges into the outside edges of the doors. As designed, the hinges require that a door be inset from the side of

the case by half the thickness of the hinge. When we hung the doors, they didn't swing open all of the way.

First we thought it was because we had modified the hardware installation. But as it turned out, the problem was with the thickness of the doors. For these hinges to work properly, the doors need to be a hair under $\frac{3}{4}$ in. thick, or $\frac{7}{64}$ in. thick, to be exact. We also discovered that the hinges didn't close properly through no fault of our own. We removed them after a trial fit and found that the hinges were not manufactured perfectly square. We fixed them with a hammer and vise.

After the doors were planed to fit, Sam drilled the mortises for the knobs, which are located at the level of the interior fixed shelf. He also drilled the 3mm-dia. holes in the sides of the case and center divider for Hafele shelf pins (No. 282.06.500). I like these brass pins, which are round and stepped from 3mm dia. to 5mm. dia. Typical shelf pins require larger-diameter holes, 5mm or $\frac{1}{4}$ in., and it's surprising how discreet the 3mm holes are. Finally, Sam routed short recesses into the shelf bottoms to house the pins and keep the shelves from sliding.

The crown molding is bolted in place

We designed the crown molding as a frame and made it detachable, which comes in handy when the case has to be moved. Sam cut the molding on his tablesaw in two steps.

The lower section of the molding has a bigger radius than the upper sweep. The lower radius was done with a 33° angle of approach with a final blade height of $\frac{1}{2}$ in. The upper radius was done with a 21° angle of approach with a $\frac{9}{16}$ -in. final blade height. Then Sam blended the transition between



A door that swings on a 270° cranked hinge is great for access but can be hard on the case. That's because the pulls will smack into the side of the cabinet. To prevent dings I added nearly invisible neoprene bumpers to the upper pulls (see the photos at right).

After turning a pull, I drilled a shallow hole in the tip. Using a leather punch the same diameter as the hole, I punched out a disc of black neoprene. The disc was pressed in place. I added a drop of cyanoacrylate glue to help keep it there. The protruding neoprene was trimmed flush using a sharp chisel. Because the pulls contact the sides in a direct line, not at an angle, the neoprene won't leave scuff marks.

Pulls that won't ding the case



Drill a shallow hole in the tip of the pull. The author uses a $\frac{1}{8}$ in. brad-point drill bit fitted to a chuck in the lathe's tailstock.



Punch out a neoprene plug. Use a leather punch the same diameter as the hole in the pull.



Press the neoprene into the tip of the pull. Use cyanoacrylate glue and then trim off the excess using a sharp chisel.

the two radii by moving the fence and blade and setting it by trial and error. A scraper was used to clean up the saw marks.

The crown was mitered at the front corners, and butt joints were used elsewhere. Pairs of #20 biscuits were used at all of the joints. The entire frame slips down over the case and rests on a rabbet cut into the sides. This rabbet was cut with a router after the upper case was assembled.

Bolts and threaded inserts hold the molding in place.

To finish this cabinet, we sanded up to 220 grit, then wiped everything down with a damp cloth to raise the grain. Once the piece was dry, we finish-sanded to 320 grit.

Most of the case was finished with three coats of Hartley gel varnish. We chose this finish because it can be applied by hand, has good durability and does

not yellow maple unlike many oil finishes do. The insides of the lower case and the drawers were finished using extra blond shellac. Last, we attached the knobs, and before the epoxy had set, the entertainment center was inside my van, on its way to the Philadelphia Furniture Show. □

Peter Turner builds custom furniture in Portland, Maine.