Small Entertainment Center

Before tackling this project, understand that it is for a more advanced woodworker. The need for non-standard thickness of hardwood joined in intricate ways demands advanced skill and surgically-sharp tools. But if you're up to the challenge, this project will be a stunning centerpiece for your home.

A Strong Foundation

Start construction with the main case. It's the largest part of the project, and the foundation to which all other parts are added. Begin by cutting the rails and stiles to size, taking time to orient the wood grain for best overall appearance.

Once all stiles and rails are cut, mark their relative locations on end grain surfaces. Mark panel grooves, mortises and tenons, then cut mortises in the ends of the stiles. I use a hollow-chisel mortising machine for this operation.

To cut the 1/4"-wide x 3/8"-deep panel grooves in the rails and stiles, use a tablesaw and make three passes across an ordinary ripping blade. Reference all cuts with the same faces of the frame parts against the fence so the grooves line up during assembly.

I must admit, I don't take any shortcuts when it comes to tenon design. They are step-shaped (called "haunched" in the trade) and some interlock with their neighbors inside the beefy 2" x 2" back corner stiles. Go ahead and simplify the design of the tenons if it suits you better. Regardless of design, the total tenon length must be 1/16" shorter than the mortises to allow the tenon shoulders to fit tightly against the surrounding wood.

A shop-built tablesaw sled is required to cut accurate tenon shoulders. A sled turns your tablesaw into a precision crosscutting tool, with lots of room to hold large parts securely. To build one like mine, use a 3/4"-thick plywood base, with a fence attached along the back edge and hardwood runners that slide in the grooves of your tablesaw top.

By clamping a stop block on the crosscutting sled's fence, you'll find it easy to get absolutely consistent cuts across the tenon shoulders. As usual, I make the shoulder cuts 1/32" deeper than the kerfing cuts that will define the tenons themselves. This makes it easy to pare the tenons down to final size later with a chisel or plane. The slightly deeper cuts prevent shavings from hanging onto the shoulder areas as they'd normally do if kerfing cuts were the same depth.

A precise tenon fit is especially important when joining hardwood. The difference between a too-tight joint and a too-loose one is small, just one or two thicknesses of the paper you're reading now.

Saw the tenons slightly wider than they need to be for a good fit in their mortises, then pare away the excess carefully until parts slide together just right. Check the fit after each shaving is removed. With all tenons cut, assemble the stile and rail framework without glue and panels. If you did everything right, it should stand firm, by friction alone. Keep the stiles and rails assembled for now as you work on installing the other main cabinet parts.

The dovetail-joined top and bottom stretchers square the case by supporting and strengthening it at the front. The stretchers also provide a surface against which the doors

can close. Cut and install these now, without glue, before making the mitred top and bottom frames.

YOU WILL NEED

Material	Size	Qty.	
For the Base			
Legs		2 1/2" x 2 1/2" x 15"	4
Front/back skirt		7/8" x 4 3/4" x 35 1/8"	2
End skirts		7/8" x 4 3/4" x 23 3/8"	2
Cross braces		3/4" x 3" x 20 3/4"	2
For the Main Case			
Back stiles		2" x 2" x 46"	2
Front stiles		1 1/4" x 2" x 46"	2
Side rails		2" x 2" x 22 1/2"	4
Back rails		2" x 2" x 45 1/2"	2
Short side stiles		3/4" x 2" x 45 1/2"	2
Top and bottom stretchers		3/4" x 2 1/8" x 32 3/4"	2
Back panels	maple-veneer ply	3/4" x 5 1/2" x 42 3/4"	2
Side panels	walnut	3/4" x 9 1/2" x 42 9/16"	4
For the Doors			
Door rails		3/4" x 2" x 16"	4
Outer door stiles		3/4" x 2" x 46"	2
Inner door stiles*		3/4" x 5" x 46"	2
Door panels		5/8" x 12 15/16" x 42 9/16"	2
For the Top and Bottom Frames			

Frame front and back		7/8" x 4" x 39 1/4"	4
Frame sides		7/8" x 4" x 27 1/2"	4
Frame braces		7/8" x 3" x 21 7/8"	2
For the TV Shelf and Drawer Case			
TV shelf	maple-veneered ply	3/4" x 20 1/4"** x 34 1/4"	1
Drawer case faces***		3/4" x 5 1/4" x 5 1/2"	2
Drawer case sides	maple-veneered ply	3/4" x 6" x 19 3/8"	2
Drawer case back	maple-veneered ply	3/4" x 6" x 22 3/4"	1
Drawer runner	maple	3/4" x 1" x 17 7/8"	2
Drawer front		3/4" x 5 1/4" x 22"	1
Drawer back		5/8" x 5 1/4" x 22"	1
Drawer sides		5/8" x 5 1/4" x 18 3/4"	2
Drawer handle	walnut	5/8" x 5/8" x 3"	1
For the Equipment Shelf****			
Equipment shelf top	maple-veneered ply	3/4" x 19 1/2" x 32 3/4"	1
Equipment shelf sides		3/4" x 13 1/2" x 18 3/4"	2
Equipment shelf bottom		3/4" x 18 3/4" x 26 3/4"	1

*See plans for important details
**Width includes 1/4" solid maple strip along front edge
***Cut from same plank as drawer front
**** All part sizes include 1/4" thick solid maple strips on visible edges

The Doors

It is even more important than normal to preserve grain direction and pattern. I started by labeling parts in the order they came off the boards while cutting. The only tricky parts were the 3" decorative wings on the inside door stiles. I ripped a 3"-wide strip, crosscut it to length, then reattached it to the stiles using #20 biscuits to create the necessary step. The advantage of having crisp, inside corners far exceeds the extra work of cutting and gluing. Prepare all these details now, but don't glue the decorative wings on until later.

Make the panel grooves in the door stiles and rails next. Use a tablesaw to prepare these, as with the main case stiles and rails. By getting these grooves done first, they act as a guide for preparing the haunched mortises that need to be cut in the ends of the door stiles. Once again, I used a mortising machine fitted with a 1/4"-wide bit. Tenons in the door rails are made following the door stile mortises, cut in the same was as before on the tablesaw, then pared down by hand to fit.

Crisp details and contrasting wood colors help give this project its good looks. Solid brass hinges and traditional inward-oriented panels are revealed every time doors are opened

Hand-cut, half-blind dovetails testify to the uncompromising quality that runs through this cabinet. Varying the spacing of pins and tails adds to the visual effect of this classic feature

The Panels

Prepare the panels for both the doors and the main cabinet by following measurements taken from the frame openings. Raising panels means reducing the thickness of their edges so they fit into the grooves of the frames that surround them. The usual way to do this is with a large table-mounted router and bit, but I did the job differently, using a tablesaw.
The design of my raised panels allows for a tablesaw to be used to remove the bulky waste, but the resulting surface isn't very smooth. It's necessary to clean things up by hand with a shoulder plane. As you do, test fit the panels into their grooves, using the plane to adjust for a precise fit.

Now you should be able to dry fit the main case and doors with their panels in place. Fasten the decorative wings now to the inner door stiles, using glue and biscuits.

Plywood projects parts include the equipment shelf components, the TV shelf, and the drawer case sides and back, and the two back panels. These are actually 51/2"-wide strips that create the illusion of a solid back when the cabinet is stocked with gear, yet leave the back wide open for wiring. Cut all ply parts to size now.

FINISHING

The Drawer, Equipment Shelf and Base

I used solid maple for the visible drawer parts, with 7/16" Baltic birch ply for the bottom. The layout of the hand-cut, half-blind dovetails is offset, as shown in the plans, to add visual interest for those who assess the quality of furniture by pulling out a drawer and looking at the joinery. The drawer pull is shop made and secured with a wedged through.

The equipment shelf is suspended from rabbets and dados cut into the top parts of the main cabinet. The plans show how the sides, bottom and top are joined with glued dados and screws to support the electronics that will be stored there. The visible front edges are capped with strips of varying thickness, to create a stepped look.

I built the base last because I needed as much time as possible to figure out how to do it. I started by preparing the leg stock to thickness and width, then trimmed the 7* compound angles on both top and bottom ends. Be careful here. If one of the angles is off, even by half a degree, it will throw off the whole assembly. Stand all four trimmed legs up in a group, leaning together to check for accuracy.

The base legs are reverse-tapered, starting at 2" x 2" at the top (same as the stiles that sit on them), expanding to 21/2" x 21/2" at the bottom. I used a shop-built tablesaw jig to prepare the tapers, though with parts this small, rough-cutting to size and planing down to final dimensions works fine.

Final Assembly

Now's the time to fine-tune, prepare hinge pockets and get all your clamps and glue stuff ready for a final assault on the summit. Start by assembling the main case, and then fit the inner parts when its glue has had a chance to dry. The upper and lower frames attach to the cabinet with screws driven into the end-grain parts of the main case. I used some shop-cut maple notch blocks to secure the TV shelf.

Finishing

My goal for the final finish of this project was to bring out the figure of the curly maple, without darkening the color of the walnut significantly. After lots of experimentation on scrap pieces of both woods, I settled on an aniline dye mixture. To duplicate my finish, mix half the recommended concentration of Lee Valley's Light Yellow Maple in water and apply one coat with a gauze pad. After the dye had dried overnight, I flattened the raised grain with a Scotch-Brite pad, then applied three coats of tung oil, rubbed down with a pair of old track pants after each. A coat of Briwax provided a final, smooth-as-silk seal.