

# Designing and Building an Entertainment Center

Housing electronic equipment, routing wires, storing CDs and dealing with that big TV are all part of the challenge

BY BRIAN WORMINGTON

**T**he first extendable TV turntable I installed in an entertainment center was a surprise. This slick hardware, rated to hold 200 lb., seemed to be an engineering coup. I smiled as I helped my customer set his new 32-in. TV in place. But as he extended the turntable, I started to worry: The TV bobbed up and down alarmingly. The bobbing worried my customer, too. He never again pulled the TV out from the cabinet—the image of his \$900 TV on the end of a diving board was too disturbing.

I run a one-man shop where custom entertainment centers are my main business. Years of handling the whole process—designing, building and installing—have taught me to avoid such gaffes as flexible turntables.

## Most entertainment centers revolve around the TV

Designing an entertainment center begins with a visit to the client's home. I measure the space, see where the TV will be most easily viewed and verify the presence of electrical and cable outlets. Sometimes there is a radiator or heat vent in the way, and the client needs to be reminded to call the appropriate contractor to move it.

I build freestanding and built-in units. My techniques apply equally to both types. Because I work alone, I build entertainment centers in modules (drawing facing page). One large cabinet would be difficult to handle, but I can move smaller modules by myself and join them together on the job.

The design of most entertainment centers revolves around housing a 27-in. or 32-in. TV (drawing facing page). Such large TVs are 2 ft. or more deep. Although the dimensions don't vary much among TV manufacturers, I always measure the set before designing the cabinet.



### Good looking and well organized.

Video gear above the TV, audio equipment to the side and drawers for tapes and CDs help to manage the clutter of entertainment.

Depending on the final height of the TV shelf, I fill the space below it with two or three full-extension drawers to store CDs, audiotapes, videocassettes and accessories.

CDs are  $4\frac{7}{8}$  in. wide, and audio tapes are  $4\frac{1}{4}$  in. wide. I divide my standard  $20\frac{1}{4}$ -in. deep drawers into 5-in. rows that accommodate either. Videotapes take up  $7\frac{1}{2}$  in., so I divide drawers for them into three rows. The front two rows are the full width of the tapes, while the back row holds several rows of four tapes lengthwise. Reversible blocks inside

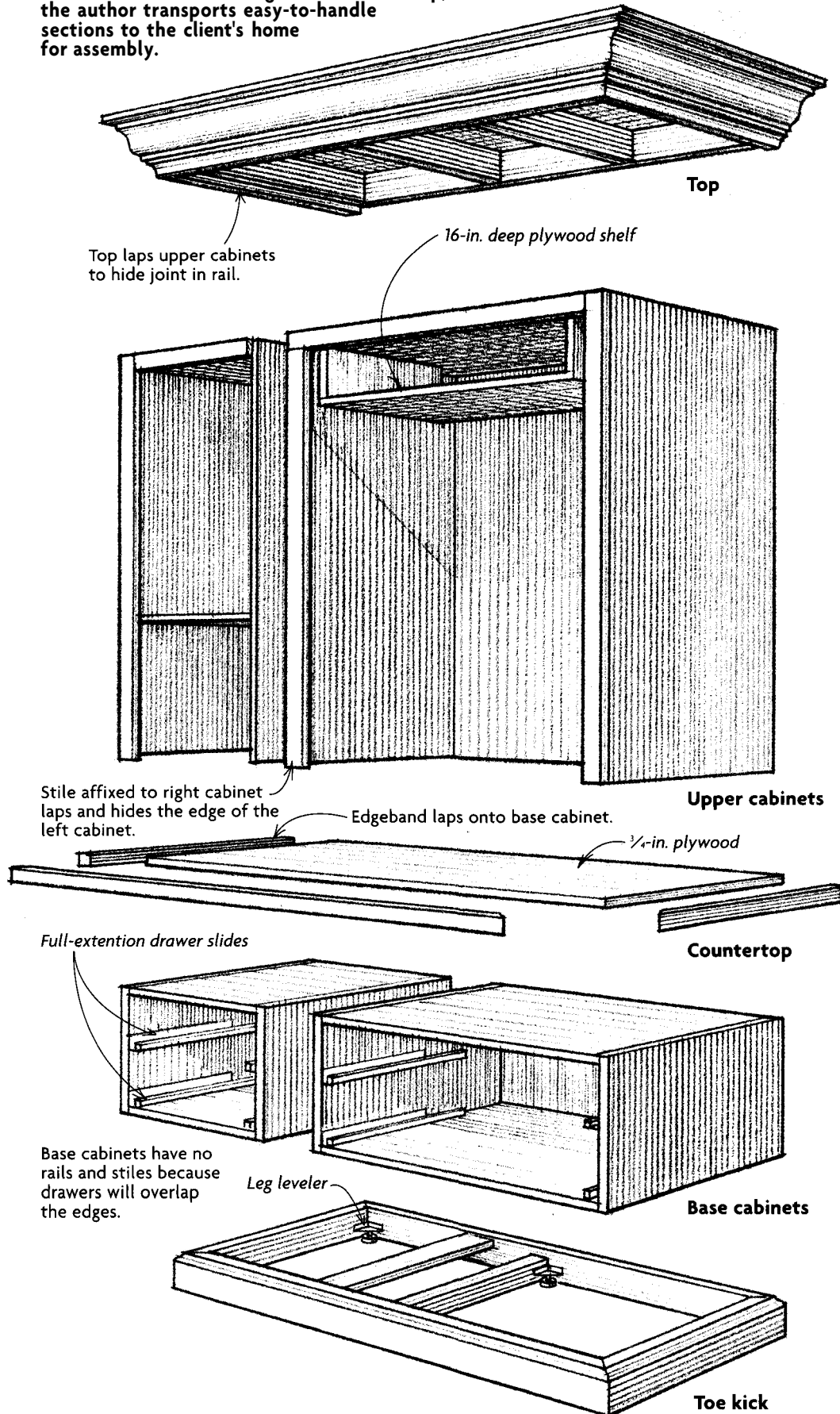
the drawers hold aluminum bars that divide tapes and CDs when set one way, and videocassettes when set the other way (bottom photo, p. 74).

### Biscuits and pocket screws hold the cabinet together

I build these units from  $\frac{3}{4}$ -in. hardwood-veneer plywood. I butt-join the tops, bottoms and sides, using #20 biscuits to align the parts and pocket screws to hold them together. To keep the case square, I rabbet the

## MODULES FOR EASY INSTALLATION

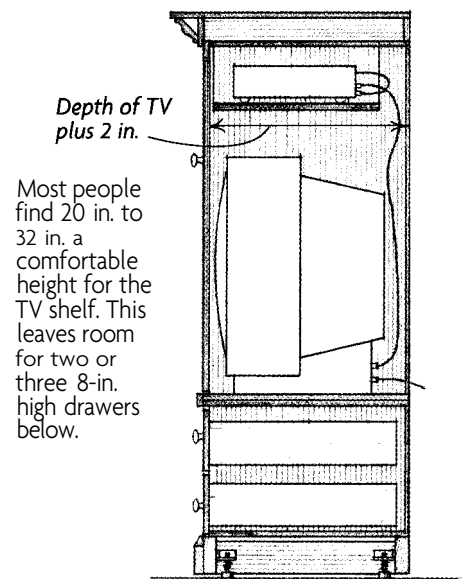
Rather than assemble large units in the shop, the author transports easy-to-handle sections to the client's home for assembly.



**Shelf hangs from cabinet top.** Angle iron on the shelf's side fits into rabbeted blocks above the pocket-door slides.

### Component shelves don't go the full depth of the cabinet

This leaves room for air circulation and wiring. However, deep drawers on full-extension slides make tapes and the like easily accessible.



**Hidden levelers ease installation.** After assembling the entertainment center in the house, the author adjusts the levelers through holes that will be concealed by drawers.

## DETAILS



**Pocket doors hide that embarrassing TV when guests visit.** Then they slide unobtrusively to the sides of the TV as the set returns to regular use.



**Shelf doubles as a doorstop.** Stops on the countertop might interfere with sliding in the TV.



**Aluminum bars divide drawers.** These drawer dividers are set up for videotapes, but the wood blocks where the bars rest can be flipped over. Their other side has slots to arrange the bars to organize CDs and audio cassettes.

sides, top and bottom to receive a 1/2-in. plywood back. I screw the back to the case with 1 5/8-in. cabinet screws. The back is strong enough for the 2 1/2-in. screws I use to attach the cabinet to the wall. I don't need an extra cleat. If necessary, the back can be removed easily to route electrical wires.

### Put the VCR and the TV in the same module

Once the location of the TV is decided, the arrangement of the other equipment more or less falls into place. I find that the best place for the VCR and the cable or satellite box is on a shelf above the TV. This placement simplifies wiring, and the TV and its peripherals can hide behind the same doors. That way, if the TV is on, the doors in front of the VCR are open. This is important because remote controls communicate with their components by line-of-sight signals. There are devices that sidestep this problem by relaying the signal. But they cost about \$100, and the need for them is avoided by keeping the VCR with the TV.

If there are only a few components, it may be possible to stack the audio and the video gear together on a shelf above the TV. Most equipment is the same width, 17 1/4 in., and about 1 ft. deep, so it stacks well.

But few people trouble with an entertainment center to house only a few components. They either own or intend to buy a serious system. I often build three-door cabinets to house such systems. Two doors enclose a TV cabinet, and the remaining door closes on an audio-component cabinet about half the width of the TV cabinet.

### Books are entertainment, too

Often, clients want bookshelves as part of their entertainment centers. Bookshelves generally aren't as deep as shelves for audio or video components; a 12-in. shelf accommodates most books. I build plywood bookshelves in modular units no more than 32 in. wide, a dimension that minimizes plywood waste. It's also a maximum width that I'm comfortable with for a 3/4-in. plywood shelf. Wider shelves sag more under the weight of books. Of course, it's possible to build wider shelves that don't sag by laminating several layers of plywood together. Another way to beef up a shelf is to replace the regular 1/2-in. by 3/4-in. hardwood edge with 1x2 or 1x3 stock. (For more on bookshelves, see *FHB* #103, pp. 98-103.)

### Keeping the music cool

A frequent concern my clients have is cooling their electronic equipment and TV. This

concern is a holdover from the days of tube-based equipment, which generated considerable heat. Modern solid-state components don't generate much heat. Some manufacturers recommend about 7 in. of airspace above the components and a few inches to the sides and back.

Sometimes, however, I encounter tube-based equipment and large power amplifiers. They need air movement; the manufacturer can tell you how much. In these cases, I drill ventilation holes in the top or in the back of the cabinet and ventilate with whisper fans. These small fans are commonly used to cool computers. I buy them for about \$12 each from JDR Microdevices ([www.jdr.com](http://www.jdr.com); 800-538-5000).

## "Concerns about cooling electronic equipment are a holdover from the days of vacuum tubes."

TVs don't need much ventilation. The picture tube is taller than the vents in the TV's back, so there is always airspace above. And the cabinet doors are open when the TV is in use, so airflow is constant.

### Provide access to equipment backs

I encourage my clients to stack their components—except for heat-generating tube equipment—atop each other. I provide a pull-out shelf on a full-extension drawer slide to stack the components on. With the shelf extended, there is easy access to rear-panel cable connections.

An exception is when the client has a record turntable or carousel-type CD player that loads from the top. I provide individual pull-out shelves for these items.

### Hiding the TV

Many of my clients want to be able to close the TV behind doors. I think it's to hide the fact that they actually watch TV. Sometimes, regular hinged doors won't work. There may not be room to open them all the way, or the client simply may not like the look of open

doors. This is why pocket doors that open 90° and slide into the cabinet alongside the TV are a popular option (top photo, facing page). The cabinet width must be increased by 2 in. on a side, or 4 in. total, to accommodate the pocket-door hardware.

Because pocket doors slide into the cabinet, they are necessarily smaller than their opening. Therefore, they can't overlay the cabinet face and must be inset. For symmetry, I often inset the other doors on the unit as well, using Blum (Julius Blum Co.; 704-827-1345) European-style hinges made for inset doors.

There are several types of pocket-door hardware on the market. The most common and least expensive resembles paired drawer slides. I use them only for doors up to about 30 in. high. Larger doors sag when extended and rub on the cabinet bottoms. Accuride (562-903-0200; [www.accuride.com](http://www.accuride.com)) and Blum both make versions of this slide.

For larger doors, I use Accuride model 1332 hardware. The 1332 uses a set of cables like those on a draftsman's parallel rule to keep the hinges perfectly aligned.

Accuride suggests a 1/8-in. margin between the doors and the cabinet, but I think 1/16 in. looks better. In entertainment centers with pocket doors, I hang a shelf unit from the top of the cabinet (top photo, facing page). This provides a pull-out shelf above the TV for the VCR while leaving space for the pocket doors to slide.

### Making the best of extendable turntables

The story at the beginning of this article doesn't always discourage my clients from turntables. If they insist, I buy the heaviest-duty turntable I can find, usually the KV 1385 (Knapp & Vogt; 616-459-3311). The cost difference between this 200-lb. rated turntable and a 150-lb. rated turntable is less than \$5. I fasten turntables to the cabinet with 1/4-in. #20 bolts and washers. Wood screws will eventually strip out, dropping that \$900 TV to the floor.

A more stable platform for extending the TV from the cabinet is a lazy Susan affixed to a shelf. The shelf is mounted on 200-lb. rated full-extension drawer slides. This setup is much steadier, but it can't be used on entertainment centers that have pocket doors. The drawer slides must be screwed to the sides of the cabinet and would leave no room for the pocket doors. □

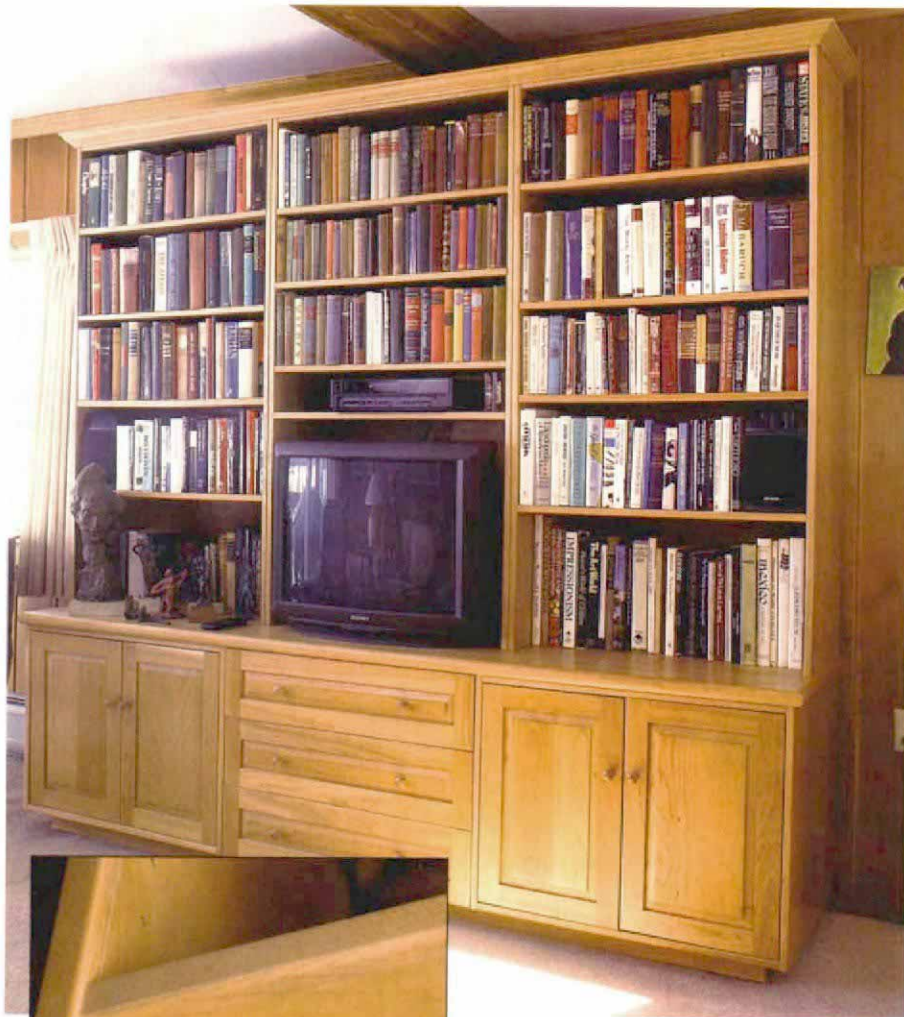
Brian Wormington owns Acorn Woodworks in Otis, Massachusetts. Photos by Andy Engel, except where noted.

## ADJUSTABLE SHELVES THAT STABILIZE A TALL BOOKCASE

To accommodate clients who are interested in showing off extensive libraries, I build bookcases. To stiffen wide or tall bookcases, it's sometimes necessary to fix a centrally located shelf in place. Rather than permanently install such shelves, I preserve some adjustability by affixing the shelf with Titus knock-down connectors (800-762-1616;

[www.titusint.com](http://www.titusint.com)). These connectors have studs that thread into shelf-peg holes. Connectors that are set into holes bored in the shelf bottom capture the studs. A reverse turn of the screwdriver draws the parts tightly together, bracing the cabinet and making it stable for plenty of books.

—B. W.



Case sides are bored for shelf pegs on 32mm centers. The studs for these connectors screw into the peg holes. They can be moved to different holes to improve the shelf layout, something that's impossible with fixed shelves.

