The Family Handyman

PROJECT PLAN

Classic arch-top bookcases

This project originally appeared in *The Family Handyman* magazine.
For subscription information, visit www.familyhandyman.com

Please note that pages that appeared in the magazine as advertisements will not be included with this pdf. Page numbering may be interrupted if an advertisement ran within the original story. Addresses, phone numbers, prices, part numbers and other information may have changed since original publication

Classic arch-top bookcases

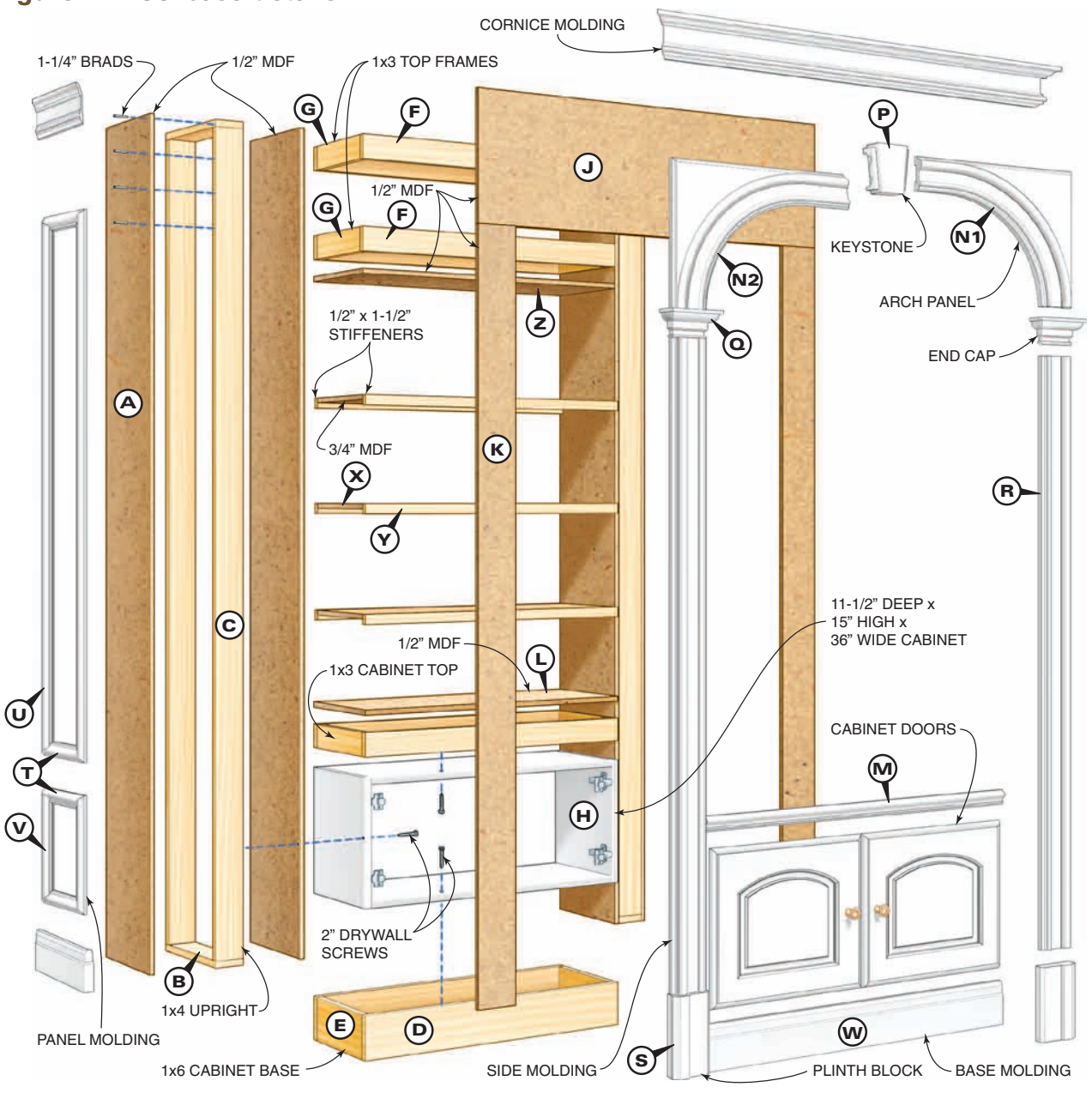
Molded millwork, off-the-shelf cabinets and inexpensive MDF make these classic-looking bookshelves a snap by Spike Carlsen

Arches can be stunning in any room—both in how they look and in how difficult they are to build. But the bookcases you see here are stunning only on the first count. Why? The curved top sections and other decorative moldings are made of high-density polyurethane and come just as you see them; all you do is cut them to length and install them.

The rest of the bookcase is designed to go together simply too. It's basically a big box with a store-bought cabinet for the bottom, a pair of upright "sandwiches" for the sides and a pair of frames for the top. The exposed surfaces and shelves of the bookcases are made of 1/2-in.-thick medium-density fiberboard (MDF), a material that's inexpensive, easy to work with and a dream to paint.

This is a project even those with moderate do-it-yourself skills can tackle successfully. And if you stick with it, you can build and install both bookcase units in a weekend. We used a power miter saw and pneumatic nailer, but you could use hand tools. If you have access to a table saw, you can save time by using it to cut the MDF panels to width instead of the circular saw method we used. All said and done, each of our bookcases cost about $400, not including the base and cornice moldings.

Figure A Bookcase details



Cutting List (per bookcase)

KEY	PCS.	SIZE & DESCRIPTION
A	4	1/2" x 11-1/4" x 94" upright side panel
B	4	3/4" x 3-1/2" x 10-3/4" upright base and top
C	4	3/4" x 3-1/2" x 92-1/2" upright front and back
D	2	3/4" x 5-1/2" x 36" cabinet base, front and back
E	2	3/4" x 5-1/2" x 10" cabinet base, sides
F	6	3/4" x 2-1/2" x 36" cabinet top and upper frames, front and back
G	6	3/4" x 2-1/2" x 10" cabinet top and upper frames and sides
H	1	11-1/2" x 15" x 36" cabinet
J	1	1/2" x 13-1/2" x 45" top face panel
K	2	1/2" x 4-1/2" x 80-1/2" MDF upright face panels
L	1	1/2" x 11-3/4" x 36" cabinet top
M	1	9/16" x 1-9/16" x 37" cabinet top front molding
N1	1	22" façade right arch
N2	1	22" façade left arch
P	1	façade keystone
Q	2	façade end caps
R	2	1-3/16" x 3-3/4" x 62-1/4" façade legs
S	2	1-9/16" x 3-3/4" x 7-1/2" façade plinth blocks
T	8	9/16" x 1-9/16" x 9-1/4" side molding horizontals
U	4	9/16" x 1-9/16" x 60-1/4" side molding verticals (upper frame)
V	4	9/16" x 1-9/16" x 13-1/4" side molding verticals (lower frame)
W	1	1" x 4-3/8" x 37" front base molding
X	6	3/4" x 10-3/4" x 35-7/8" MDF shelves
Y	12	1/2" x 1-1/2" x 35-7/8" shelf stiffeners
Z	1	1/2" x 11-1/4" x 36" bookcase ceiling

Working with polyurethane moldings

As a carpenter, I love working with real, honest-to-goodness wood. But even I grew fond of polyurethane moldings the more I worked with them. Crafting the arches from wood would have required advanced woodworking tools and skills or writing one very large check. But the premade arches we used installed quickly and were reasonably priced. Each pair of arches, along with the center keystone, cost about $90; the end blocks, plinth blocks and moldings used to finish the vertical legs cost an additional $115 per bookcase.

Polyurethane moldings cut like butter. We used a power miter saw equipped with a 60-tooth carbide "finishing" blade, but you can use a miter box and fine-tooth handsaw with equally good results.

Just as with wood, you need to fill the nail holes with putty, and lightly sand the surface to remove excess putty and small irregularities. But once properly prepared, they accept paint smoothly and evenly.

There are drawbacks. Rigid polyurethane moldings aren't as hard or as capable of taking a hit as wood moldings. If you have kids who like to play floor hockey or a spouse who likes to vacuum enthusiastically, the base moldings may eventually dent and scratch. Window and door moldings may also take it on the chin when banged by a heavy object.

But for decorative uses, where the millwork is going to be painted, they're a great alternative to wood.

Plan the project and order the pieces

The size of the bookcase is determined by the size of the cabinet it's built around. We chose "ready-to-assemble" frameless cabinets 36 in. wide, 15 in. tall and 11-1/2 in. deep (see the Buyer's Guide, p. 46) at a home center. You can modify the design to fit different-size cabinets. Since room heights vary and exact cabinet sizes differ by manufacturer, you may need to modify our dimensions. As you do, remember:

- Build your bookcases 2 in. shorter than your room height; otherwise you can't tilt them up into place.
- Make sure the back of the cabinet is slightly inset from the back of the uprights; otherwise you'll have gaps where the uprights meet the wall.
- Cabinets with protruding face frames need to be shimmed out on the back side to keep things square.
- You can create side-by-side bookcases by using "double width" end caps.

Most stock cabinet widths are based on 3-in. increments, and the uprights add another 9 in. to the overall bookcase dimension. Before you buy anything, make templates to represent the "footprint" of each bookcase and experiment with their positions (**Photo 1**). Adjust the size of your cabinets as needed.

If you cover an outlet, you'll need to either install a box extender so the face of the outlet winds up even with the back of your cabinet, or cut an oversize hole that allows you to plug in items without risk of the cord rubbing on the edges.

If you have wall-to-wall carpeting, you'll need to peel back the carpet and pad while installing the bookcases, then restretch the carpet when you're done. See "Restretch a Carpet," June '04, p. 92, for more information. To access this article online, go to www.familyhandyman.com.

Measure from floor to ceiling, then subtract 2 in. to determine the overall height of the bookcases. This will allow you to build the rough boxes in your shop or garage, then carry them inside and tilt them up into place.

A wide range of high-density polyurethane moldings can be ordered by mail or through retailers (see the Buyer's Guide, p. 46). Order well in advance so you have all the materials you need before you start.

1 Plan ahead. Lay paper templates on the floor to help you envision the best positions for the bookcases. Measure the ceiling height; you'll build the bookcases 2 in. shorter so you can tilt them into place.

2 Glue and nail the side panels to the 1x4 side uprights. Keep one edge perfectly aligned with the front edge of the frame; let the other side overhang about 1/2 in.

3 Secure the 1x6 frame to the bottom of the cabinet and the 1x3 frame to the top. When you're prebuilding the frames, use knot-free 1x3s and 1x6s for the front pieces (they'll be exposed).

Build the framework

Begin by building the 1x4 frames (**Figure A**) for the uprights. Build them 2 in. shorter than the floor-to-ceiling measurement and 3/4 in. narrower than the cabinet is deep. We built 10-3/4-in.-deep frames for our 11-1/2-in.-deep cabinet. Then cut the 1/2-in. MDF panels for the sides of the 1x4 frames, making them 1/2 in. wider than the uprights; ours were 11-1/4 in. wide. In addition to hearing protectors, wear a dust mask; MDF dust is super-fine and easily inhaled. See "Circular Saw Cutting Guide," Oct. '04, p. 18, for more information. To access this article online, go to www.familyhandyman.com.

Secure an MDF panel to each side of the 1x4 frames (**Photo 2**) using yellow glue and 1-1/4-in. brads. Set the uprights aside.

Build two boxes—one from 1x6s, the other from 1x3s—the same dimensions as the top of the cabinet. Drive drywall screws through predrilled holes to secure the 1x6 frame to the bottom of the cabinet and the 1x3 frame to the top (**Photo 3**).

Next secure the uprights to the cabinet using clamps, screws and construction adhesive (**Photo 4**). Keep the front edge of the uprights 1/2 in. back from the edge of the face frame; use a 1/2-in. piece of MDF to ensure proper spacing and shims to hold the parts in proper alignment.

Build two more 1x3 frames the same size as those you built for the top and bottom of the cabinets. Secure one between the tops of the uprights and the other one 12 to 14 in. down (or whatever height you wish the lower edge of your arches to be) as shown in **Photo 5**. Cut and nail MDF to the lower 1x3 frame to create the "ceiling," and across the width of the upper bookcase to create the front surface and "lock" everything together. Finally, install 4-1/2-in. MDF strips to finish covering the fronts of the uprights.

Install the bookcases

With a helper, carry the completed boxes into the room. Measure carefully, then cut out the backs of the cabinets to accommodate any outlets. Tip the bookcases up into place (**Photo 6**).

Use a level and shims to level the bookcases. You'll cover any gaps along the floor later with baseboard molding. Check to see how the uprights fit against the wall. If

there are gaps less than 1/8 in., fill them with caulk. If there are gaps wider than 1/8 in., either apply a small molding to conceal the gap or scribe and trim the back flanges of the uprights to fit. For more information, see "Scribing for a Perfect Fit," Nov. '02, p. 29. To access the article on-line, visit www.familyhandyman.com.

Once you're satisfied with the fit, secure the bookcases in place by driving 3-in. drywall screws through the fastening strips and into the wall studs (shown in **Photo 11**).

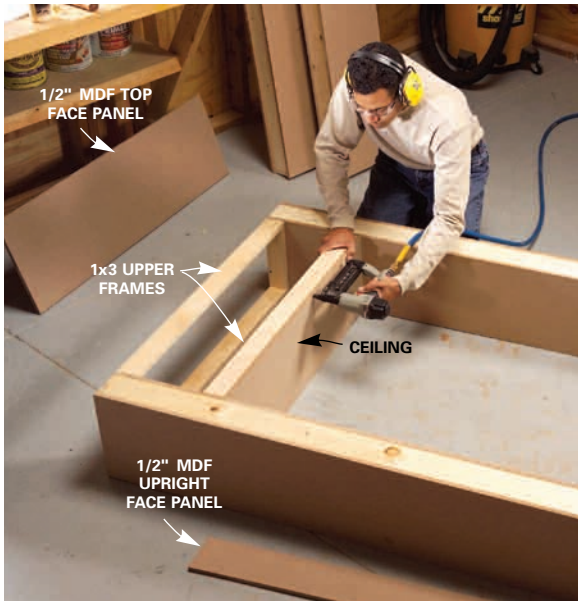
Easy drywall arches

We arched the top of the existing door opening so it would look more "at home" with the new bookcases. For ease of construction, we used prebuilt arched corners (see the Buyer's Guide, p. 46).

The corners we purchased were 4-3/4 in. thick—wide enough to accommodate the standard 4-1/2-in. wall thickness plus the thickness of the metal corner bead around the opening.

To install each arch, apply drywall compound to the back surfaces, "smoosh" it into position, then use four 2-in. drywall screws to fasten the arches into place. Once the drywall compound has set, apply self-adhesive mesh tape to the seams, Then apply two to three coats of drywall compound to the seams so they blend in with the existing wall surface.

4 **Glue and screw the uprights to the cabinet. Use a scrap piece of 1/2-in. MDF as a guide for maintaining the proper 1/2-in. setback between the front of the uprights and the face of the cabinet.**



5 **Build two more 1x3 frames. Secure one frame to the very top of the cabinet with drywall screws, and the other one at the desired "ceiling height" for the cabinet. Sheathe the face, "ceiling" and legs with MDF (Figure A).**

6 **Tilt the bookcases into position after making any cutouts to accommodate existing outlets. Extend any floor-mounted heat ducts and registers through the front of the 1x6 cabinet base, using elbows and duct extensions. Shim the base as necessary to level the bookcase. Drive screws through the fastening strip to anchor it.**

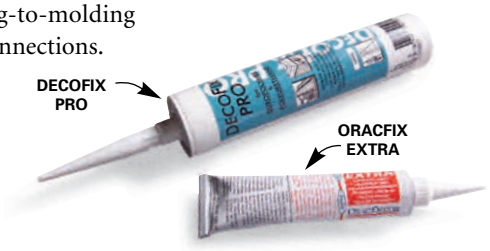
7 Draw a level line for aligning the tops of the arches. Center the vertical leg of the arch on the upright, then mark the horizontal leg 1/2 in. shy of the center point of the bookcase. Cut the arch to length, then glue and nail.

8 Glue and tack the keystone in place, then install the end caps, centered on the fronts of the uprights. Use molding-to-molding adhesive to secure the end caps to the arches (wear gloves when using this). Then use molding-to-substrate adhesive to secure them to the uprights.

9 Cut the vertical moldings to fit tightly between the lower plinth blocks and the upper end caps. Support the ends of the longer, floppier moldings while handling them. Then glue and nail them into place.

Install the arched facade

As you install the moldings, keep in mind that the adhesive does the real work; brads or nails only hold the molding in place until the adhesive sets. There are two types of adhesive: Decofix Pro is used to secure the moldings to MDF, drywall or other substrate. OracFix Extra is used for molding-to-molding connections.



You can hand-nail the moldings, but you risk damaging them with any errant hits. A pneumatic nailer allows you to hold the moldings in place with one hand while driving the fasteners with the other.

Draw a level line above the opening in your bookcase (**Photo 7**) so that when the tops of the arches are aligned with it, the lower edge protrudes into the opening about 1/4 in. Also mark the center of the bookcase. Hold the top edge of one of the arch halves on the line, center the lower leg of the arch on the front of the upright, then mark the horizontal leg of the arch 1/2 in. shy of your center mark.

Use a miter saw to cut the arch on the mark you just made; the "keystone" will eventually cover the small gap. Apply the special adhesive to the back edges of the arch, then use your brad nailer to secure it in place. Repeat the same procedure for the other arch half. When both sides of the arch are in place, install the keystone.

Center an "end cap" below the vertical legs of each arch, then use adhesive and brads to secure them in place (**Photo 8**). Cut the plinth blocks to the desired height (we made ours 3-1/2 in. taller than our baseboard molding), then use adhesive and your brad nailer to attach them to the uprights. To complete the arches, measure the distance between the end blocks and the plinth blocks, then cut the moldings that go between a hair longer to ensure a tight fit (**Photo 9**). Secure them into place.

Moldings and shelves

We used a 4-in.-tall cornice molding to conceal the 2-in. gap between the top of the bookcase and the ceiling (**Photo 10**).

10 **Install crown or cornice molding to conceal the gap between the top of the bookcase and the ceiling. Run the molding around the entire room to give your bookcases a built-in look.**

11 **Cut and install the decorative side moldings, as well as the baseboard moldings.**

12 **Fill the open pore edges of the MDF with drywall compound, let it dry, then sand it smooth. Lightly sand and round the front corner of the bookcase to create a less-likely-to-chip "paint edge."**

The cornice or crown molding, as well as the base molding around the entire room, gives the bookshelves a true built-in look. Choose the style that best fits your room.

Install "picture frames" of panel molding on the sides of the bookcases (**Photo 11**), using the same materials and techniques. Cut the MDF cabinet top (L) to fit, then glue and nail it to the 1x3 frame on the top of the cabinet (**Figure A**). Glue and nail a piece of panel molding (M) across the front of the cabinet to conceal the edge.

We used 3/4-in. MDF for the shelves, then glued and nailed 1-1/2-in. x 1/2-in. pine strips along the front and back edges for strength. Then we determined the height we wanted for our shelves and drilled holes for the shelf support pegs.

Putty, prime and paint

The exposed edges of the MDF near the front of the bookcase are more porous than the rest of the panel. Fill these pores with a light coat of drywall compound, let it dry, then hand-sand the edges smooth (**Photo 12**). Also, lightly sand the front corners to create a slightly rounded "paint edge," which is less likely to chip than a sharp corner.

Prime all MDF surfaces with an oil-based primer; a water-based primer will raise the grain and leave a slightly fuzzy surface. The moldings come already primed. Finally, paint the bookcase with a semigloss or gloss paint (either latex or oil). Then kick back and admire your work.

Buyer's Guide

We ordered our moldings through the Architectural Products division of Outwater Plastics (www.arch-pro.com, 800-631-8375) and had them shipped. (Note: As of this date, Outwater is the only company selling Orac Décor products by mail.) To locate dealers in your area who can order materials for you, contact the company at www.OracDecorNA.com or (800) 648-4217.

Other companies offering molded millwork include Fypon (www.fypon.com, 800-446-3040) and Focal Point Architectural Products (www.focalpointap.com, 800-662-5550).

"Ready-to-assemble" Mill's Pride cabinets (W3615) with raised panel doors are available at most Home Depot stores.

The premade drywall arches (model No. 712) are available through ArchCraft Products (www.creativecorners.net) for $55 per pair plus shipping.

Art Direction • BOB UNGAR
Photography • BILL ZUEHLKE
Illustrations • FRANK ROHRBACH
Photo Stylist • RENEE McDANIELS