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We welcome your ideas and opinions.

Write to: The Editor, The Family Handyman, 2915 Commers Dr., Suite 700, Eagan, MN 55121. Fax: (651) 994-2250. E-mail: editors@thefamilyhandyman.com

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STUFF we love

BY TRAVIS LARSON

editors@thefamilyhandyman.com

PRACTICALLY PERFECT PLANER

I do lots of woodworking, almost all of it starting with rough-sawn lumber. Flattening and smoothing that lumber require three tools: a jointer, a table saw and a thickness planer. I've had my DeWalt DW735 planer for about eight years now, and the only maintenance it has required is knife changes. (Use only clean, metal-free lumber since a set of knives costs upward of \$60.) All that trouble-free performance, despite sending thousands of feet of various lumber types, thicknesses and widths through its maw.

It has three two-edged knives in the cutter head, so you can flip them around when one side gets dull. There are two speed settings: The slower one is for smoother cuts (179 cuts per inch), while the second setting is for speedier work (79 cuts per inch). Frankly I only use the slow speed when I'm cutting wide or extra-tough lumber. The fast speed yields plenty smooth results using a much quicker feed rate. The thickness scale is absolutely dead on.

The dust system is the best I've ever seen on any tool. It has an internal blower to supplement any dust collection system you may have. If you don't have dust collection, it's still almost mess-free if you simply direct the chips into a trash can. It'll handle stock up to 6 in. thick and 12 in. wide. At about \$550 a copy, these rascals ain't cheap, but after eight trouble-free years, I gotta tell ya: I love mine! Check it out at dewalt.com.

Travis Larson, Senior Editor



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DIY WORK WEAR

POCKETKNIVES 2.0

Pocketknives are super handy for all sorts of tasks. I have one in my truck, one in my wife's car and another in my desk. I keep them everywhere except my pockets. I've never liked stuff weighing down my pockets, so lately I've been carrying some super-compact knives. I carry the Tool Logic Credit Card Companion, which boasts nine tiny tools. Victorinox, the makers of the Swiss Army Knife, have a couple different models to choose from, like this SwissCard Lite equipped with a miniature scissors. The Sinclair Cardsharp is an ultra-thin knife that unfolds like origami.

I recently added a SOG Key Knife to my arsenal. It fits right on my key ring and looks just like a key. I bought my knives at an online retailer. Prices range from \$10 to \$30. Warning: Leave the knives at home before heading to the airport, or you'll suffer the wrath of the folks working security and you'll lose your knife. Don't ask me how I know that.

Mark Petersen, Contributing Editor



Nifty blade height adjustment guide

I've always relied on small blocks of wood to set the cutting depth on my table saw blade. Even though I labeled each block, they would inevitably get knocked onto the floor and swept into the trash, and I'd have to make another one.

I no longer have that problem because I picked up a set of Mag Shims from FastCap. Mag Shims are 1/8-in. magnetic spacers. If you need a blade height of 7/8 in., simply stack seven spacers, and raise the blade to match. They also work great for setting the depth on router bits and drill presses. I stick them right to the backside of my fence, so they're always at hand and never get lost. A pack of eight 1/8-in. spacers and two 1/16-in. spacers costs \$25. Buy a set at fastcap.com.

Mark Petersen, Contributing Editor



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I love shellac. It's a natural product made from the dried excretions of the Lac beetle and has been used for centuries. It's a relatively nontoxic finish that dries quickly, so you can topcoat in an hour instead of waiting overnight.

Zinsser Bulls Eye SealCoat is my sealer of choice. This premixed shellac works on any wood and is universally compatible with any topcoat. I use it to seal and tone wood before applying water-based poly. The light amber color warms the wood. A foam brush works great to seal bare wood. It's available at home centers and hardware and paint stores for \$16 a quart.

David Munkittrick, Contributing Editor



Pull power, light and compressed air down from your ceiling

When auto mechanics need a trouble light, receptacle or compressed air, they just reach for the ceiling and pull down whatever hose or cord they need. Now you can too. The Chamberlain Garage Power Station mounts on your ceiling and has a 25-ft. multifunction pull-down/retractable "hose" to provide light, power and compressed air.

The base unit plugs into a nearby receptacle and houses an air compressor capable of putting out 100 psi (great for bike tires). Pop two MR16 halogen bulbs into the ceiling unit to get 100 watts of area lighting in addition to the LED work light on the retractable hose. Find the Garage Power Station at home centers and online for \$130.



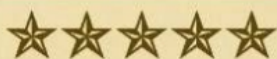
Add security with a door blocker

If you don't like the look of the metal plates that protect doors from break-ins, consider adding a Prime-Line door blocker (No. U-10826-27; \$20 at most home centers).

There's no way a burglar can kick in a door equipped with this kind of lock. However, you can only operate the blocker from inside the house, so it adds security only when you're at home.

Swing the locking assembly toward the door until it snaps into the locking channel. To open, pull the locking assembly sideways toward the hinge side, then swing it open.

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MURPHY BED & BOOKCASE

**A cozy extra bed when you need it,
a handsome showpiece when you don't**

by **Dave Munkittrick**
editors@thefamilyhandyman.com

When William Lawrence Murphy filed patents for his space-saving bed in about 1900, he couldn't have known that he was solving a 21st-century problem: the need for a home office or hobby space, plus extra sleeping space for guests. And although his invention has been improved over the last century, the basic idea is still brilliant.

Building a Murphy bed requires some precision—you have to install the hardware exactly according to the instructions. But the woodworking here is actually simpler than that required for many bookcases. There are no dadoes, mortises or tricky joinery. And all of the door frames are impostors. They look exactly like classic rail-and-stile frames, but they're just 1/4-in.-thick solid wood applied to plywood. The bookcases that flank the bed are optional.





WHAT IT TAKES

TIME: 4 weekends

COST: \$1,600 as shown

SKILL LEVEL: Advanced

TOOLS: Table saw, miter saw, jigsaw, router, pattern bit, drill, brad nailer (or micro pinner).

DESIGNED TO PAMPER YOUR GUESTS

A Murphy bed can be super simple: Some are just an upright box that contains a fold-down bed. But this is a deluxe version. Aside from the handsome design and storage spaces, I included some convenience features to make guests comfortable: On both sides of the bed, there are pullout tables mounted on drawer slides. Inside the side cabinets, there are display lights that can also act as night-lights. On the headboard, I mounted a touch knob so guests could switch on lights above the bed—no groping for a light switch in a dark, unfamiliar room.



Pullout tabletops function like nightstands—the perfect spot to set a book or a cup of bedtime tea.



Lights and switches built into the side cabinets aren't just decorative; they can act as night-lights for guests.



Just touch a knob on the headboard to operate the dimmable reading lights above the bed.

MURPHY BED HARDWARE

Hardware kits include folding legs that support the foot of the bed, pivots that allow the bed to swing down and, most important, gas pistons that operate like the pistons on a hatchback, lifting most of the weight of the bed when you close it.

There are lots of online sources for Murphy bed hardware. I ordered mine (\$375) from rockler.com and was impressed with both the quality of the hardware and the detailed instructions. Twin-, full- and queen-size kits are available. Aside from the hardware, I spent about \$115 on lighting kits designed especially for Murphy beds and bookcases. See p. 25 for details.



Before you build

Don't begin this project until you have the Murphy bed hardware on hand—you may have to alter my design slightly to suit different hardware. Also be sure the room and furniture will accommodate the bed. As built, my bed protrudes 80 in. from the wall. Most of the materials you'll need are available at home centers. The exceptions are the Murphy bed hardware (see p. 25) and 1/4-in.-thick solid oak. You can order 1/4-in. hardwood online (walllumber.com is one source) or "resaw" thicker boards (see p. 56).

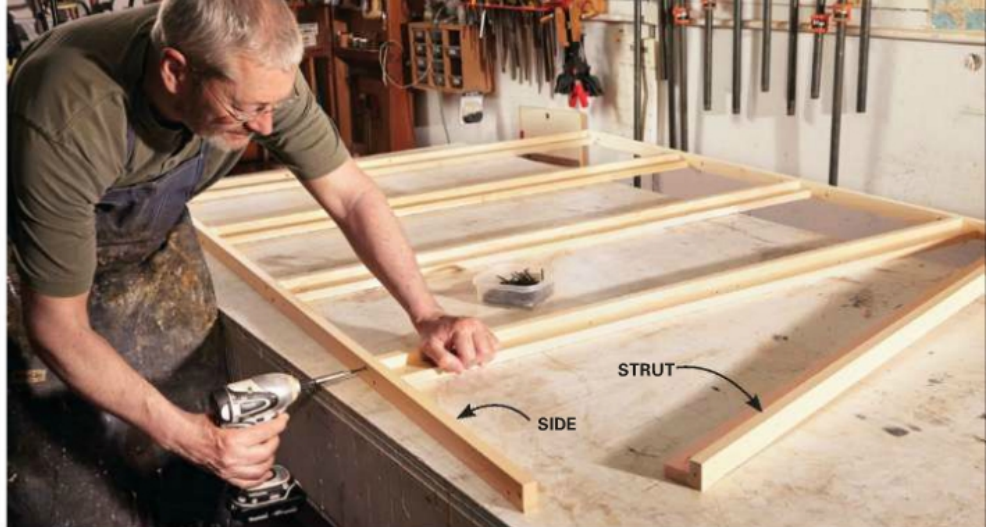
Build the bed frame

You'll want a large assembly table for this project. A full sheet of 3/4-in. plywood screwed to a pair of sturdy sawhorses does the trick. Otherwise, you'll need to work on the floor. Assemble the struts (GGG) from stock that's at least 1/4 in. too long and trim them to final length after assembly. Then join them to the frame sides (HHH) with screws (Photo 1).

The rest of the bed frame is made from oak plywood (G-J). The bed rails get 1-1/2-in. edging (KK) on the end and 3/4-in. edging on the top (LL); see Photo 2. For the curves on the rails, create a plywood template (Photo 3). Use the template to position hardware holes (Photo 4) and to mark the curves. Rough-cut the curves with a jigsaw. Smooth the curves by sanding or by running a pattern router bit along the template.

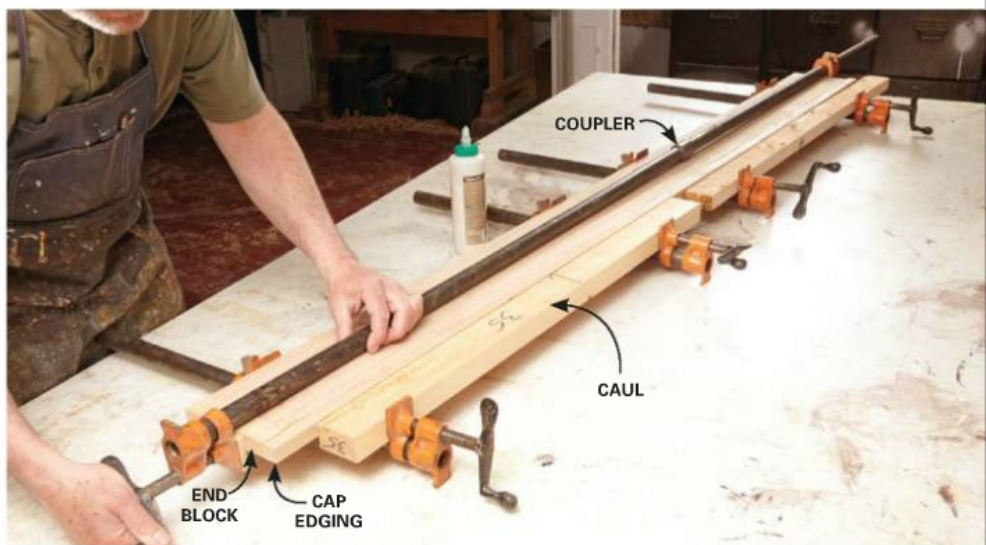
Attach the head rail, foot rail and side rails to the inner bed frame. Cut two pieces of plywood for the bed face panels (A). Trim one side and the top edge (where the foot of the bed will be) of each panel with 1/4-in. edging. Lay the two panels face down on your bench and butt the two pieces together so the hardwood edges are to the outside. Lay the assembled bed frame on top of the panels and attach with screws (Photo 5).

With a helper, carefully turn over the bed frame assembly so it's face up on your bench. Rip the stock for the faux panels and drawers (UU-BBB) to width. Use 1/8-in. spacers to create gaps between the faux doors and drawers and attach with glue and brads or pins (Photo 6). Be sparing with the glue to avoid squeeze-out, which is tough to clean up. Go ahead and mount the inner frame structure when placing your hardware. Remove all the hardware until after the cabinet is finished. Cut and fit the mattress supports (X). Don't screw these into place until final assembly.



1 BUILD THE INNER FRAME

The inner frame forms the core of the fold-down bed frame. Assemble the L-shape struts with glue and brad nails. Then fasten them to the sides with screws.



2 ASSEMBLE THE SIDE RAIL

The side rails are plywood strips edged with solid wood. Clamp the top edging in place, using cauls to distribute the pressure. You'll need a long clamp to attach the end block edging. To extend the reach of a pipe clamp, just add another length of pipe using a coupler.



3 MAKE A TEMPLATE FOR THE SIDE RAILS

Trace along the paper template and then cut a template from 1/4-in. plywood. The plywood template serves double duty as a drilling guide and a routing pattern.



4 DRILL THE HARDWARE HOLES

The template positions the holes perfectly. A stop block ensures the correct depth. Rough-cut the curve, then finish it with a router and a pattern bit guided by the template.



5 ASSEMBLE THE BED FRAME

Connect the rails to the inner frame and mount the frame on the face panels. Cut and fit the plywood that will cover the inner frame, but don't fasten it yet. Flip the entire bed frame over so you can cover the face panels with false doors and drawers.



6 ADD FALSE DOORS AND DRAWERS

To dress up the face panels, glue on thin boards that form false door frames and drawer fronts. Position the parts with spacers and tack them in place. A brad nailer will work, but a micro pinner is best because the nail heads are tiny and barely distinguishable.



7 BUILD THE SHELF UNITS

Join the fixed shelves to the side panels with screws and cleats. The other shelves rest on adjustable supports.



8 BUILD THE FASCIA BOXES

Build simple plywood boxes and cover them with 1/4-in.-thick solid wood. Tack the fascia into place and use clamps and cauls to hold them flat.

Build the cabinets

Cut the bed cabinet plywood parts (B, C, E). Glue and clamp 3/4-in. hardwood edging (MM) on the bed cabinet verticals. Add 1/4-in. edging to the top and bottom edge of the headboard. Lay out and drill for the hardware. If you plan to add the light fixtures, now is the time to cut the 2-7/8-in.-diameter holes in the bed header panel. Follow the instructions in the kit. Screw and glue the mounting cleats (JJJ) to the ends of the header board. Add the header front and back (BB) according to the instructions. Wait to assemble the bed cabinet.

The bookcases on either side of the bed cabinet are assembled with the same screw and cleat system used for the bed cabinet. Cut the plywood parts (F, N-R, U) and cleat stock (KKK-NNN). Cut 1/4-in.-deep by 3/8-in.-wide rabbets along the back edge of the middle and bottom shelves and on the cabinet sides between the two shelves. Assemble the side cabinets with screws (Photo 7).

Cut the face frame and pullout parts for the side cabinet (DD-HH). Build the face frames with pocket screws or dowels. Clamp and glue the face frames to the cabinets. Cut and glue the hardwood edge on the middle shelf. Build and mount the pullout. Add the faux panel frames (CCC-EEE) to the doors. Mount the doors. If you're using Euro-style cup hinges, be sure to order the ones made for thick doors (see the list on p. 25). Cut and fit the backs (Y).

Build the cabinet tops

Cut the parts for the three cabinet top and fascia assemblies (D, K-M, S, T, V, W, PP-TT). Assemble the fascia boxes with screws and glue. Cut and fit the 1/4-in. oak fascia with mitered corners (Photo 8). Trim the 1/2-in. plywood in the same manner. Attach the fascia trim board to the bottom of the fascia boxes, then screw the box down onto the top of each cabinet. If you're using lights, use a jigsaw to make a 4-in.-diameter hole in the bottom of each fascia trim board. Cut the top parts (D, M, CC). Cut a 15-degree bevel on the top trim on the table saw. Cut and miter the top trim to fit. Wait to attach the tops until installation. Drill ventilation holes in the cabinet tops for the lights.

Installation

You'll need at least one helper for this phase of the project. The Murphy bed can be disassembled as far as you need to get the bed into the room. The only thing remaining that's large and cumbersome is



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the bed frame. If the bed has to wind its way through a narrow staircase or other obstacle, consider leaving off the middle drawer and the two horizontal dividers on the faux front. These are the elements that bridge the two face panels and once installed cannot be easily dismantled for moving. You can reassemble the bed frame in the room and add the drawer and horizontal dividers at that point.

Before installation, reattach all the bed hardware but leave the bed stops, pulls and handles off for now. Place a pad on the floor about 2 ft. in front of the wall where the bed will be mounted. Lay the bed frame face down on the pad with the head of the bed frame toward the wall. Mount the bed cabinet sides to the bed frame on the metal pivots. At this point, the cabinet verticals should also be face down alongside the bed frame. Attach the headboard with screws.

With a helper on the other side, lift the bed cabinet up to the vertical position. Be sure the leg support is folded up before you lift the cabinet (**Photo 9**). Then attach the bed header assembly to the top. Next, lift the bed frame into the vertical position while your helper holds the cabinet. Be careful: Until the cabinet is attached to the wall, you need someone holding the bed in place and keeping the cabinet steady.

With the bed cabinet and frame vertical, it's time to attach the gas springs. Snap the ends of the springs onto the ball stud plates on the bed frame and the cabinet verticals. The springs are marked with a "This End Up" sign; follow the directions carefully. Attach the bed stops from inside the cabinet. With the bed held in place by the gas springs, go ahead and move the cabinet up against the wall. Mark the stud locations just above the bed header and attach with screws (**Photo 10**).

Slide the bookcases in position and attach to the bed cabinet. All that's left is to remount the crowns and add the tops (**Photo 11**). Go ahead and pull the bed frame down and swing the leg supports to the floor. Without the mattress, the bed will want to close back up. Add a little weight to it to hold it down while you attach the two 1/4-in. plywood mattress supports to the inner frame. Add the elastic retaining straps and you're ready to set the mattress into place.



9 ASSEMBLE THE BED CABINET

Assemble the cabinet and bed frame face down on the floor. Protect the floor with cardboard or padding. Then stand up the cabinet and add the header.



10 SCREW THE CABINET TO THE WALL.

Make sure the cabinet is square—you may need to nudge the top slightly left or right to square it. Then drive at least three 3-in. screws into studs.



11 ADD THE SIDE CABINETS

Screw the side cabinets to the bed cabinet, hiding the screws behind the face frames and under shelves. Finally, fasten the cabinet tops and your Murphy bed is ready for guests.

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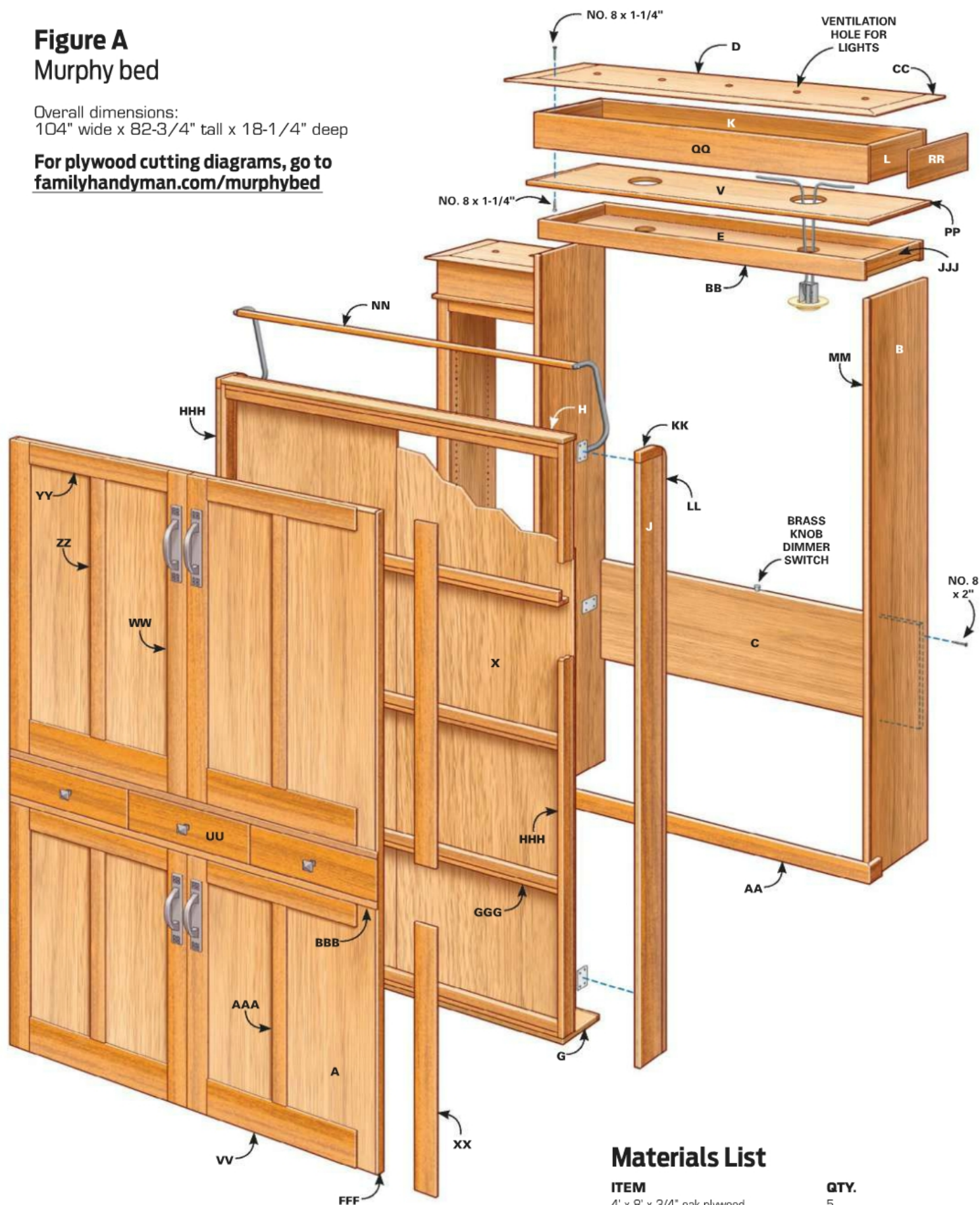


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Figure A Murphy bed

Overall dimensions:
104" wide x 82-3/4" tall x 18-1/4" deep

For plywood cutting diagrams, go to
familyhandyman.com/murphybed

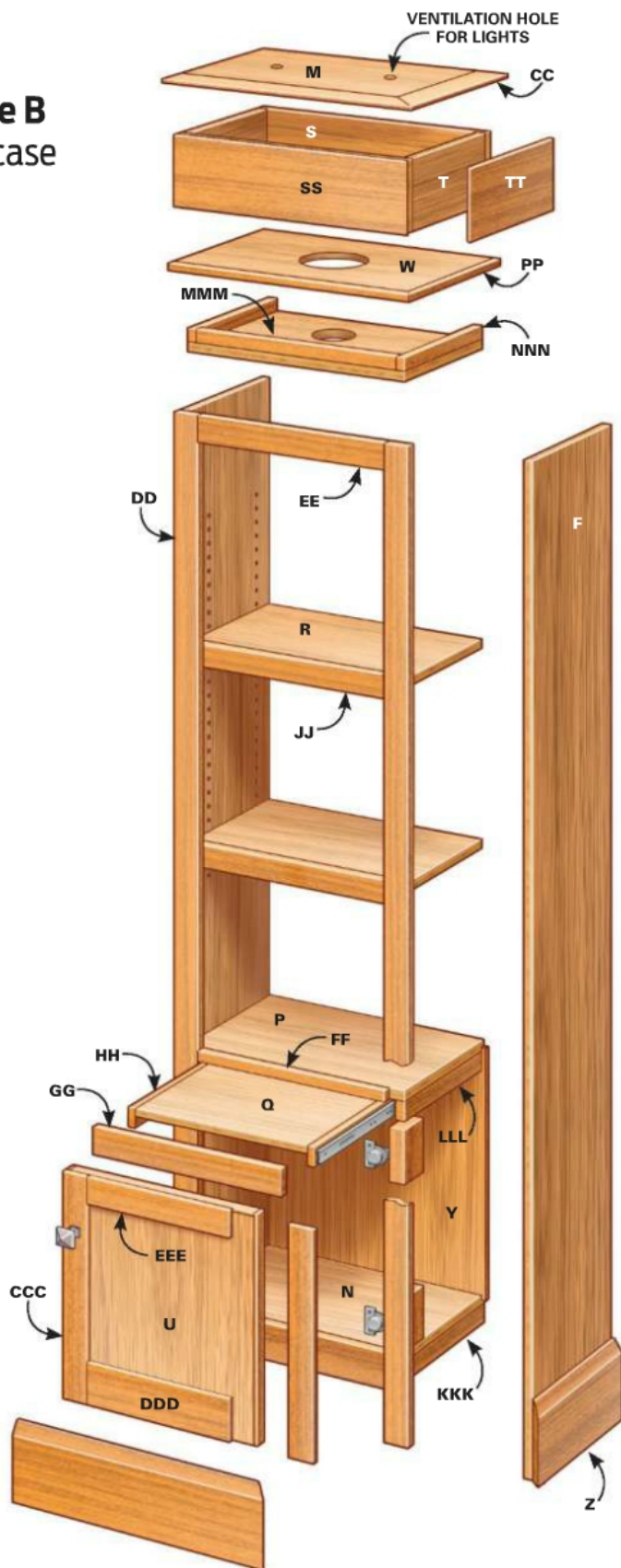


Materials List

ITEM	QTY.
4' x 8' x 3/4" oak plywood	5
4' x 8' x 1/2" MDF	1
4' x 8' x 1/4" oak plywood	2
3/4" solid oak*	60 bd. ft.

*Includes material for resawing into 1/4"-thick stock.

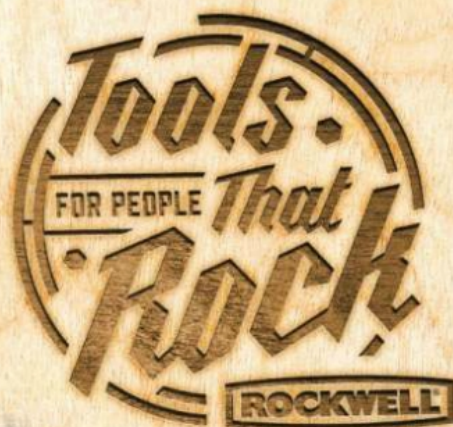
Figure B
Bookcase



We ordered the following supplies from rockler.com:

- Deluxe Murphy Bed Hardware Kit, Item No. 46025
- Murphy Bed Box Light Kit, Item No. 31965
- Single Bookcase Light Kit, Item No. 31953
- 96mm Arts & Crafts Pulls (2), Item No. 10988
- 96mm Arts & Crafts Backplates (2), Item No. 11014
- 3" Arts & Crafts Pulls (2), Item No. 10962
- 3" Arts & Crafts Backplates (2), Item No. 11001
- 1-1/4" Square Arts & Crafts Knobs (5), Item No. 10910
- 10" Series 757 100-lb. Slides (two pairs), Item No. 48386
- 95° Thick Door Frameless Inset Hinges (two pairs), Item No. 55879

Continued on p. 86



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MACKINTOSH TABLE

You can build this Arts & Crafts
classic with inexpensive wood
and two basic power tools



ART DIRECTION MARCIA ROEPKE • PHOTOGRAPHY TOM FENENCA • ILLUSTRATIONS FRANK ROHRBACH III

For a while now, I've been on the lookout for a simple piece of furniture for my brother to make. He has a modest shop and some experience building, but he's ready to tackle a "real" project. This table is perfect. It's also a great design for a more experienced builder who appreciates a project that's quick and easy.

You can build the table from paint-grade yellow poplar. It's widely available at home centers in 1x3s, 1x4s and other standard sizes. You'll also need 1/2-in.-thick and 1/4-in.-thick material for the drawer. The total cost for the wood will be well under \$100. Aside from a drill, all you'll need to build the table are two power tools: a table saw and a plate joiner. A drill press is helpful but not necessary.

This table was originally designed in 1904 by the Scottish architect Charles Rennie Mackintosh for a home in Glasgow. Like so many other things Scottish, it's economical in terms of time, materials and tools.

TWO POWER TOOLS

A table saw and a plate joiner are all the muscle you'll need.



READY-TO-GO MATERIALS

Make the whole project from paint-grade yellow poplar.



A WELL-CRAFTED DRAWER

The joints are just 1/4-in. oak pegs.



First make the sides

When you buy your lumber (see Materials List, p. 28), select pieces that are straight and flat. To make finishing easier, stay away from pieces that are green or have black streaks. Most stores have large piles to pick through—and you won't need much wood—so be choosy.

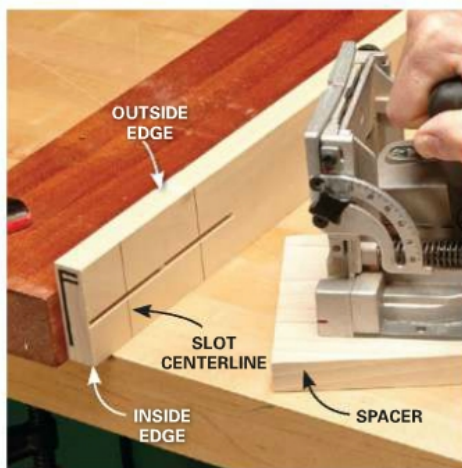
Start by cutting the legs (A) from your 1x3 material. You won't have to rip the wood; just cut the pieces to final length. Mark the top end of each leg to indicate which sides face out (**Photo 1**). I always mark each piece of a project like this. If you make your marks anywhere else, sanding will erase them. Ends usually don't get sanded.

Draw centerlines for the biscuits that will join the legs to the sides (B) and drawer guides (C)—see **Figure A**. Draw these lines across the inside faces of the legs. Position each leg so that its outside edge faces up, then place a poplar offcut under the plate joiner and cut the slots (**Photo 2**).

Use 1x6s to make the sides and 1x4s to make the drawer guides. Again, you won't have to rip the wood, but this time cut each piece 1 in. extra long. Glue the pieces together, making sure their top edges



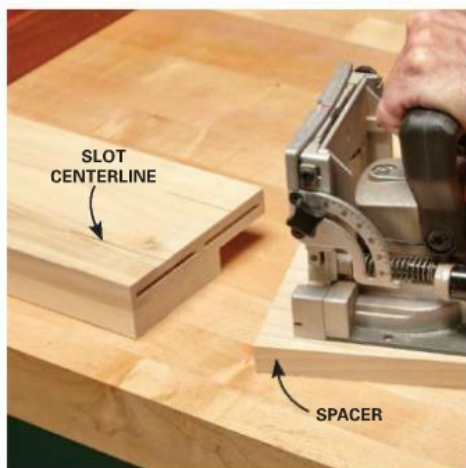
1 CUT THE TABLE LEGS
Begin by cutting the table legs from poplar 1x4s. Mark the ends of all the parts to identify the sides that face out.



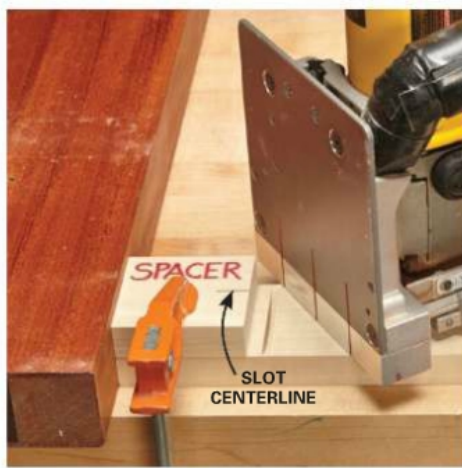
2 MAKE THE BISCUIT SLOTS
Cut a pair of No. 20 biscuit slots in the top end of each leg. Place a 3/4-in. scrap under the plate joiner to space the slots.



3 GLUE SIDES AND GUIDES
Glue together the table's sides and drawer guides, cut 1 in. extra long. After the glue dries, trim them to final length.



4 MAKE SLOTS IN THE GUIDES
Cut biscuit slots in the side/guides, using the spacer again. This puts the drawer guides flush with the inside edge of the legs.



5 CUT SLOTS IN STRETCHERS
Make vertical slots in the stretchers that go between the legs. Butt the plate joiner against a spacer to locate each slot.



6 GLUE TABLE SIDES
Glue the sides of the table. Use a combination square to make sure the stretcher is in the correct position.

are flush (**Photo 3**). Cut some more 1x3 material to make the long stretchers (D). Also make these pieces 1 in. extra long.

After the glue dries, cut the side/guides and long stretchers to the same final length. Draw biscuit-slot centerlines on the outside faces of the side/guides, then place the pieces face up on your bench and cut slots in them (**Photo 4**). Use the same offcut as a spacer under the plate joiner. This method ensures that the drawer guides will be flush with the inside edge of the legs. That's essential for the drawer to work right.

Next, adjust your plate joiner to make No. 10 slots. Mark and cut slots in the legs to receive the long stretchers. Place the spacer under the plate joiner this time too. Cut corresponding slots in the

ends of the long stretchers (without using the spacer, of course).

Cut vertical slots on the inside faces of the long stretchers (**Photo 5**). Make a 2-5/8-in. spacer from a 1x3 for positioning the outside slots (**Figure D**). Make a 5-7/8-in. spacer for the middle slots.

Smooth the inside faces of the legs with 150-grit sandpaper. In addition, sand the outside faces of the side/guides and both faces of the long stretchers. Glue all these pieces together (**Photo 6**).

Join the sides

The curves on the table's front apron (E) are a beautiful detail—and easy to make. Start by cutting the apron 1 in. extra long from a piece of 1x4. Rip it 3-1/4 in. wide. Discard the waste, then rip it again to

Materials List

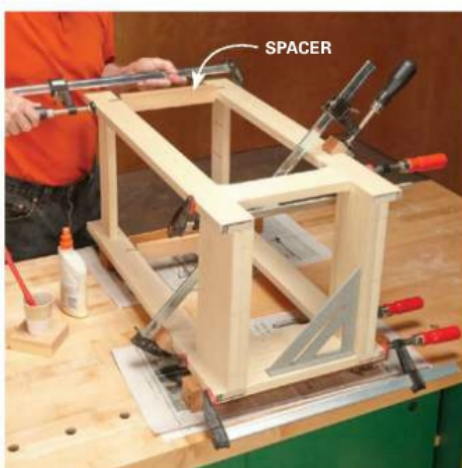
ITEM	QTY.
1x3 yellow poplar	16 lin. ft.
1x4 yellow poplar	6 lin. ft.
1x6 yellow poplar	4 lin. ft.
1x8 yellow poplar	5 lin. ft.
1/2x4 yellow poplar	3 lin. ft.
1/4x6 yellow poplar	3 lin. ft.
1/4" oak dowel	1 ft.
No. 20 biscuits	14
No. 10 biscuits	10
Desktop fasteners	6
5/8" No. 6 screws	14
Knob and glue	

2-3/4 in. wide. Cut 1-3/4-in.-long pieces from both ends of the narrow offcut and glue them back to the main piece. Once the glue dries, trim 1/2 in. from one end of this piece, then trim the piece to final



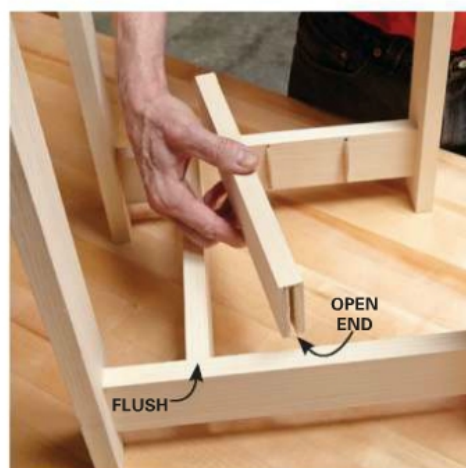
7 CREATE ARCHES

Shape arches from small pieces glued to the table's apron. With so little wood to remove, just use a rasp and sandpaper.



8 GLUE THE BASE

Glue the table's base. Clamp spacers between the legs to make sure they're parallel. Be sure the table is square.



9 CUT SLOTS IN STRETCHERS

Cut open-ended slots in the short stretchers. Slide them in place, making sure their top edges are flush.

length. Cut the table's back (F) from a piece of 1x6 and trim it to the same length. In addition, cut two 1x3 spacers to this length.

Using a 1-gallon paint can as a guide, draw the apron's arches on the small pieces you cut and glued to the apron (Figure F, p. 86). Form the arches with a

rasp and sandpaper (Photo 7). Adjust your plate joiner to make No. 20 slots, then mark and cut biscuit slots in the ends of the apron and back pieces. Mark and cut corresponding slots in the base (Figure D).

Glue the base together, clamping the spacers between the legs (Photo 8). After

the glue dries, cut short stretchers (G) to fit between the long stretchers. Cut biscuit slots in the short stretchers. The lower end of these slots must be open so you can slip the parts in place (Photo 9). That's easy to do—just make three overlapping cuts with the plate joiner to form each slot. Glue biscuits into the long stretchers, then apply

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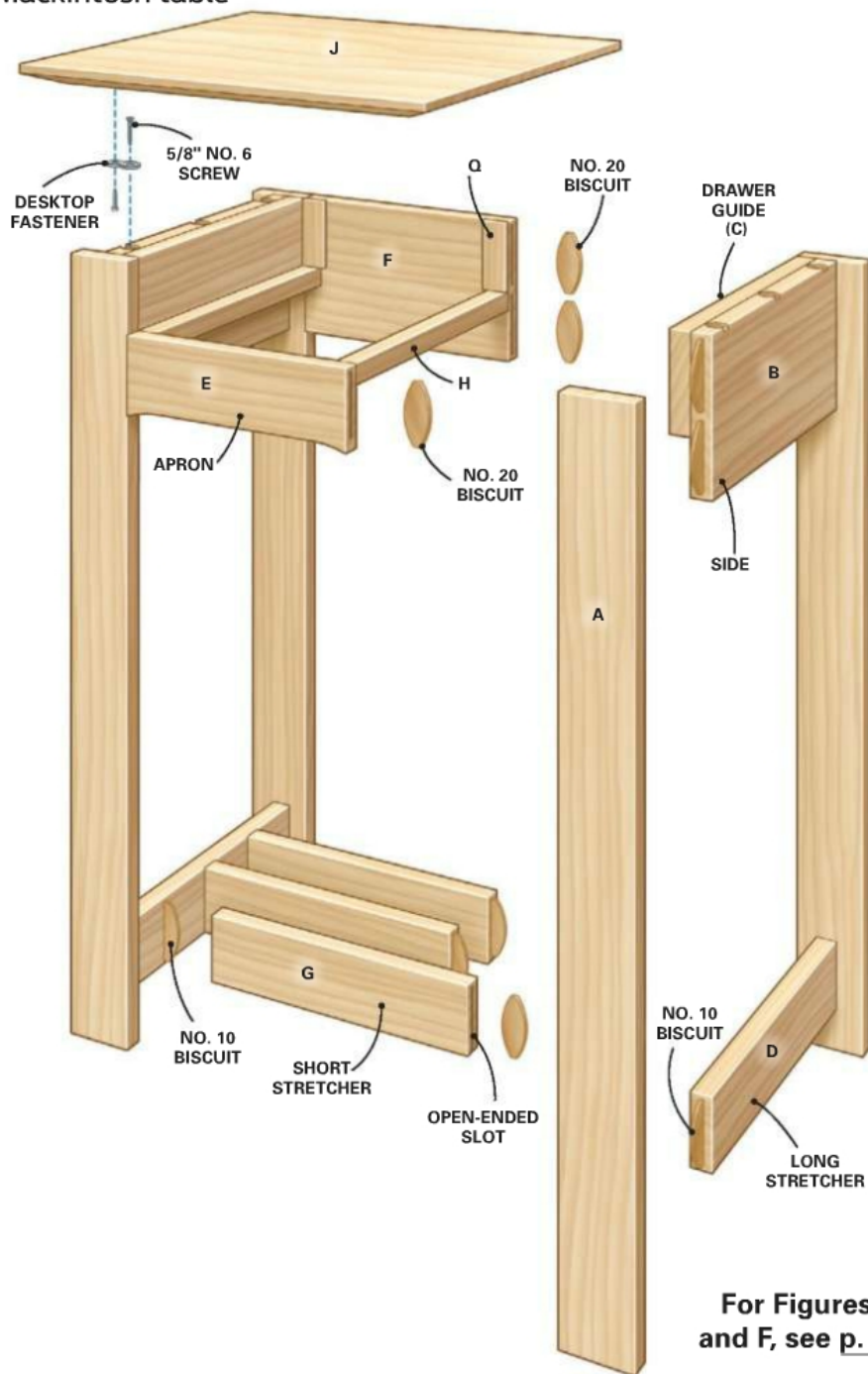


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Figure A
Mackintosh table



For Figures E and F, see p. 86.

Figure B
Drawer

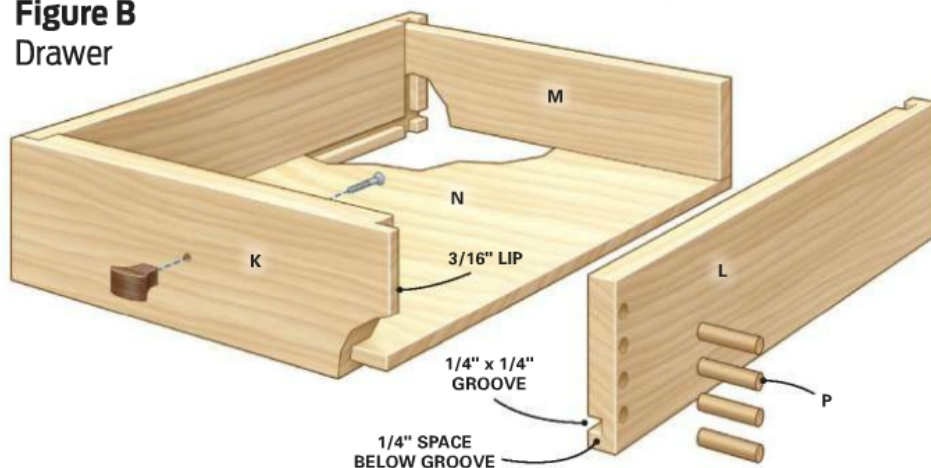


Figure C
Front view



Figure D
Side view



glue to the short stretchers and slide them over the biscuits.

Cut the drawer runners (H) to size and glue them in place. Their front edges must be level with the top of the apron. Use a combination square to make sure the runners are parallel to the top edges of the drawer guides.

Make the top

Assemble the top (J) from three pieces

of 1x8. Trim each piece to final length, then glue them together, making sure their ends are even. Rip the top to width after the glue dries. Sand the top to even the joints, starting with 60-grit paper. Continue with 100 grit, then finish with 150 grit. Cut bevels around the top by tilting your saw blade to 20 degrees (**Photo 10** and **Figure E**, p. 86).

Using a Forstner bit, drill holes for desktop fasteners in the top edges of

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10 SAW BEVEL EDGES Saw bevels around the table's top. Use a tall sliding fence to support the top.



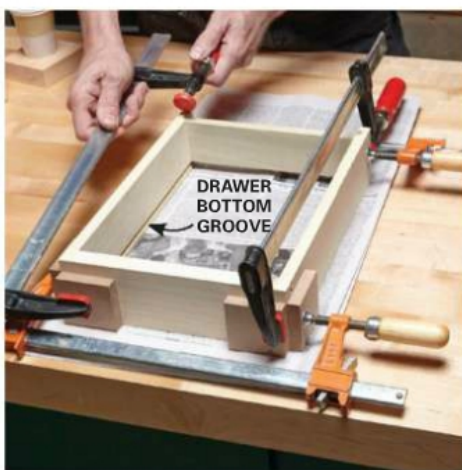
11 FASTEN TOP TO BASE Screw the top to the base using desktop fasteners. Positioned on the outside, they won't interfere with the drawer.



12 CUT RABBETS Begin making the drawer by using a dado set to cut rabbets in the drawer's front.



13 DRILL HOLES IN SIDES Drill 1/4-in. holes through the drawer's sides, then cut grooves in the front and sides to receive the drawer's bottom.



14 GLUE THE DRAWER Glue the drawer together. Position the back of the drawer so it sits just above the groove for the drawer's bottom.



15 GLUE IN PEGS Drill through the 1/4-in. holes to make them deeper, then glue in short pegs. This makes a very strong joint.

the table's sides (**Figure A**). Screw the fasteners in place, then turn over the table's base and center it on the top. Fasten the base to the top (**Photo 11**).

Build a well-crafted drawer

Now build the drawer. Cut the drawer front (K) slightly undersize—it should be 1/32 in. narrower than the space above the table's apron and 1/32 in. shorter than the distance between the table's legs. Using 1/2-in. poplar, cut the drawer sides (L) the same width as the front. Trim them to final length. Using a 1/2-in.-wide dado set, cut rabbets in the ends of the drawer front to receive the sides (**Figure B** and **Photo 12**). (You could also make multiple cuts with a regular blade.)

Drill 1/4-in. holes in the sides (**Photo 13**). A drill press is best, but you can do this by hand—just make sure the holes are perpendicular. Using a 1/4-in. dado set (or by making two passes with a regular blade), cut grooves for the drawer bottom in the front and side pieces. In addition, cut 1/4-in.-wide dadoes in the side pieces to receive the drawer's back (M). Cut the back to width and length.

Glue the drawer together using clamps in both directions to make sure the front joints are tight (**Photo 14**). After the glue dries, drill through the holes in the drawer's sides, making them 1 in. deep. Note: Don't drill the holes directly opposite the drawer bottom grooves.

Cut 1-in. pegs from 1/4-in. oak rods, then glue them in the holes you drilled (**Photo 15**). Glue 1/4-in.-long pegs in the

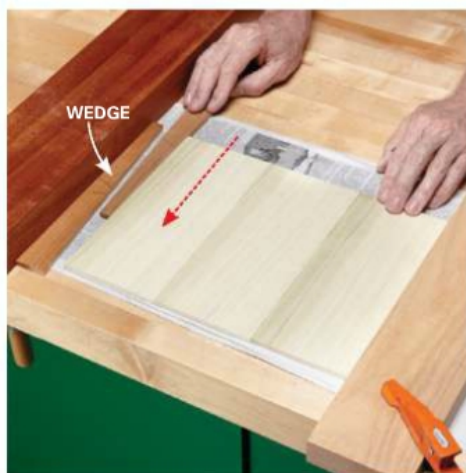
other two holes (they're just for show).

Cut pieces for the drawer's bottom (N) from 1/4-in. poplar. Trim them to final length and glue them together (**Photo 16**). Clamping boards this thin is very difficult—I use wedges instead. Cut the bottom to final width.

Using 60-grit paper, sand the edges of the bottom until the bottom slides easily in the drawer's grooves (**Photo 17**). Fasten the bottom to the drawer's back with screws. Remove the table's top, then slide the drawer into the table. Position the drawer's front flush with the legs, then make stops (Q) to fill the small gap behind the drawer's sides. Glue the stops to the base.

Finally, finish your table

Finish the top of the table separately. It



16 GLUE UP BOTTOM Glue up the drawer's bottom from 1/4-in. poplar. Use opposing wedges to squeeze the pieces between two clamped boards.

should have equal coats of finish on both sides, so it doesn't warp.

The original Mackintosh table was painted white, and if you'd like to paint your table, we recommend aerosol paint. You can also let the wood darken naturally. I chose to stain my table instead. To avoid a blotchy look, I first sealed the table with two coats of water-base poly. Then I applied a coat of amber shellac, thinned 50 percent with denatured alcohol, to give the wood a golden color. I applied two coats of gel stain (General Finishes' "Candlelite") followed by two more coats of poly (**Photo 18**). Whatever stain approach you choose, be sure to test it thoroughly on pieces of scrap.

See Figures E and F on p. 86.



17 FIT DRAWER BOTTOM Slide the bottom into the drawer. Don't use glue, because the bottom must be free to expand and contract.



18 STAIN AND SEAL Seal the wood with two coats of poly, then use thin coats of gel stain. Plain poplar can look quite pretty!

Cutting List

KEY	QTY.	DIMENSIONS	NAME
A	4	3/4" x 2-1/2" x 29-1/4"	Legs
B	2	3/4" x 5-1/2" x 12-1/2"	Sides
C	2	3/4" x 3-1/2" x 12-1/2"	Drawer guides
D	2	3/4" x 2-1/2" x 12-1/2"	Long stretchers
E	1	3/4" x 3" x 9-1/4"	Apron
F	1	3/4" x 5-1/2" x 9-1/4"	Back
G	3	3/4" x 2-1/2" x 10-3/4"	Short stretchers
H	2	3/4" x 3/4" x 12-1/2"	Drawer runners
J	1	3/4" x 16-3/4" x 17"	Top
K	1	3/4" x 2-3/4" x 9-1/4"	Drawer front
L	2	1/2" x 2-3/4" x 12-3/4"	Drawer sides
M	1	1/2" x 2-1/8" x 8-3/4"	Drawer back
N	1	1/4" x 12-1/4" x 8-11/16"	Drawer bottom
P	8	1/4"-dia. x 1"	Drawer pegs
Q	2	1/4" x 1" x 2-3/4"	Drawer stops

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SHOWCA WALL

Turn a bland wall into a showstopper for \$300!

by Jeff Gorton

editors@thefamilyhandyman.com

There aren't many DIY projects that will give you as much bang for the buck as this dramatic drywall showcase. Granted, you'll have a chunk of time invested before you're done, but the materials are readily available and inexpensive. As you'll see, it's just 2x6 framing covered with drywall. And the beauty of this type of construction is that the design is limited only by your imagination. You can build shelves just like ours, or you can design any other size and shape you like. In this article we'll show you how to build the frame, hang the drywall, and finish the project with corner bead and drywall tape. We'll also show you how to add an outlet for the TV and wire the switch and lights. For more information on how to hang and tape drywall and install outlets, switches and rough-in wiring, go to familyhandyman.com.

Our wall is 12 ft. wide with a 9-ft. ceiling. We designed the 18-in.-deep shelves to accommodate home theater gear and the center rectangle to fit around a 60-in. TV screen. This arrangement also looks great even if your ceilings are only 8 ft. high. And keep in mind that you don't have to build your shelves wall to wall. You can leave one or both ends exposed and simply finish them with drywall.

DRAMATIC RESULTS WITH CHEAP MATERIALS

Stunning projects usually carry a stunning price tag. Not this one. It requires only common 2x6 framing lumber, drywall, corner beads and joint compound. All of the materials for this project (not including the lights and wiring) cost us only \$300. And you can get everything off-the-shelf at your local home center or hardware store.

WHAT IT TAKES

COST: \$300 for the shelves, \$275 for the dimmer, lights, LED bulbs and AFCI outlet

TIME: About 40 hours

TOOLS: Circular saw, drywall square, drywall screw gun, tin snips, 6- and 8-in. taping knives and mud pan, voltage sniffer, wire cutter and stripper, painting tools

ASE





1 MARK IT OUT ON THE WALL

Mark the location of the framing and snap chalk lines on the wall. Make sure there's at least 1/2 in. between the outside lines and the walls, floor and ceiling, and that the lines are level and plumb.



3 BUILD THE FRAMES

Pick the straightest lumber for the long lengths and cut the parts. Mark the front and the back of the base and top for the column locations. Mark the column sides for the shelves. Then build the U-shape and box-shape backers and nail the parts together.



4 LEVEL THE BASE

Shim the base up with 1/2-in. scraps of plywood on all four corners. Then use a level and add shims as needed to level the frame across the front and from front to back. Add shims under each column. Screw the frame to the wall studs.



2 ADD A SWITCH AND OUTLET

If your project includes a TV and lights, you'll need another outlet and a switch. Start by turning off the power to the existing outlet. Cut a hole for the new TV outlet and another hole directly below, near the floor. Extend NM (nonmetallic) electrical cable from the existing outlet to the new TV outlet. Run another cable from the new outlet through the hole near the floor. Leave enough cable to reach your switch location plus at least 12 in. of extra cable (Figure B).

We used a computer drawing program called Sketchup to design these shelves. But you can use graph paper or just map it out on the wall. We first added about 5 in. to the width and height of the TV, and then centered this rectangle on the wall. When we were satisfied with the design, we marked the wall at the vertical and horizontal framing locations and chalked lines to get a better sense of how it would look (Photo 1). We left a 1/2-in. space between the 2x6 framing and the floor, walls and ceiling. The 1/2-in. space serves two purposes. First, it allows you to prebuild the framing and slip it in without trying to fit it exactly to the room. And second, the 1/2-in. space creates a perimeter that's the same width (6-1/2 in.) as the rest of the vertical and horizontal dividers after they're covered with drywall.

Getting started

If your room is carpeted, you can either build right over the carpet, or peel it back and hire a carpet layer to reattach it after you're done. You can cut the baseboard molding in place, or remove it like we did and reinstall it when the shelves are done. Make sure the framing isn't going

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to cover an electrical outlet. If it is, you'll have to relocate the outlet or change your design. We've included a Shelf Materials List on p. 39, but you'll have to adjust the quantities for your design.

Measure the distance from the floor to the ceiling at both ends of your proposed shelves. Then measure the distance between the walls at both the top and the bottom. Subtract 1 in. from the smallest measurement of both the width and the height. Use these dimensions to build the frames.

Build the frames

The 2x6 framing consists of a full-length base and top, four vertical columns and shelves. You can build all of the parts in your garage or backyard (**Photo 3**) and move them into your room to assemble. Cut the 2x6s for the top and bottom to length and mark the column locations. If you have a miter saw, set up a stop and cut all the short crosspieces you'll need.

You can see from **Figure A** that you'll need three crosspieces, assembled into a U-shape at each column location. Use L-shape crosspieces at the ends. Nail the top and bottom frames together. Then build the columns. The center columns have 2x6 boxes at each shelf location to provide backing for the dry-wall on both sides. We added flatwise 2x6s to provide backing for our glass-shelf supports. Finally, build the shelves.

Prepare for wiring

If you're going to add lights and another outlet, add the new outlet box and the cable that runs to the switch before you install the framing (**Photo 2**). The first step is to turn off the power to the outlet, and double-check that the power is off by testing the wires with a noncontact voltage detector. Then remove the outlet and twist wire connectors onto the black wires as an extra precaution. Determine whether the wires are 12 or 14 gauge. Then count the wires in the box and calculate the box size required, including the extra hot, neutral and ground wire you'll be adding. Go to familyhandyman.com and search for "dimmer switch" for information on calculating box sizes. If the box is too small, cut it out and add a larger one.

Remove a knockout from the top of the box for the new cable. If the box is metal and doesn't include built-in cable connectors, add a cable connector to the new cable. Next, cut the hole for the TV outlet. To make running new cable much easier, try to



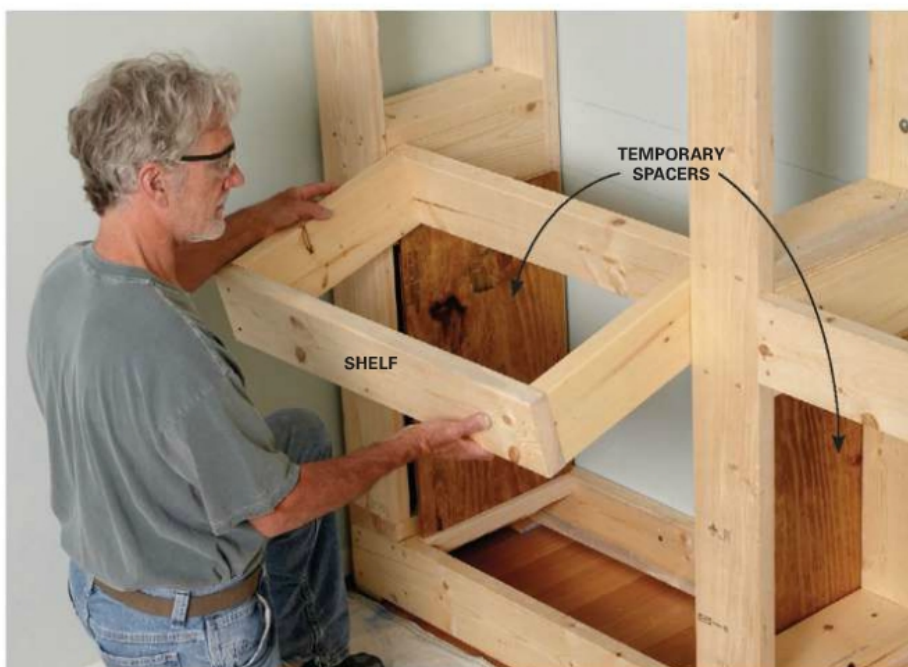
5 SET THE COLUMNS

Screw the outside columns to the base. Plumb them and attach them to the wall with screws or drywall anchors. Position the center columns, plumb them and attach them the same way.



6 MOUNT THE TOP FRAME

Slide the top into place over the columns. Line up the columns so the shelves fit and screw them to the top frame. Then screw the top frame to the wall.

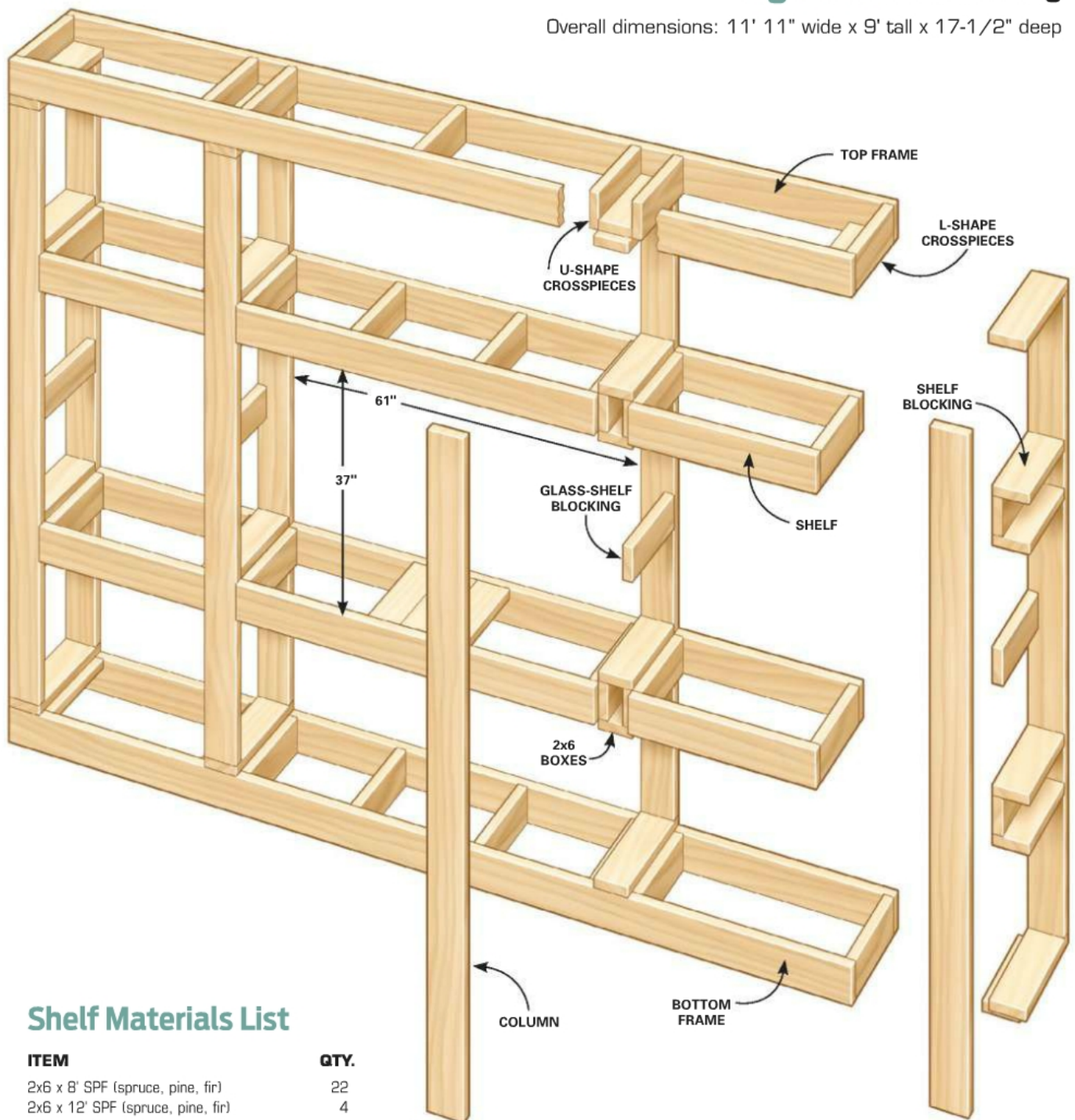


7 POSITION THE SHELVES WITH SPACERS

Cut scraps of plywood as spacers. Rest each shelf on the spacers and screw them to the columns. This will ensure that the shelves are lined up precisely. You'll need another set of spacers for the top shelves.

Figure A Shelf framing

Overall dimensions: 11' 11" wide x 9' tall x 17-1/2" deep



Shelf Materials List

ITEM	QTY.
2x6 x 8' SPF (spruce, pine, fir)	22
2x6 x 12' SPF (spruce, pine, fir)	4
4' x 8' x 1/2" drywall	8
8' drywall corner beads	14
Scraps of 1/2" plywood	
Shims	2 pkgs.
16d nails	2 lbs.
3" construction screws	2 lbs.
1-1/4" drywall screws	2 lbs.
1-1/4" ring-shank drywall nails	2 lbs.
1"-long, 1/4"-crown staples (optional)	1 box
45-minute setting-type joint compound	2 bags
Premixed joint compound	1 bucket
Paper tape	1 roll
Mesh tape	1 roll

Optional (not included in materials cost)

1/4" glass shelves	2
Glass-shelf supports	8

Electrical Supplies

ITEM	QTY.
3" recessed lights*	6
Dimmable LED flood bulbs	6
14-2 or 12-2 NM cable with ground	80'
Single-gang remodel box	1
Single-gang new-work box	1
Cable connectors (optional)	
Wire connectors	30
1/2" staples	30

*We ordered 3" Recessed Lighting Kits, No. 90305 (\$19 each), from lumesty.com.



8 ROUGH-IN THE ELECTRICAL WIRING

Drill holes and run the cable to the switch box and then to the recessed light fixture locations. Leave at least 2 ft. of extra cable at each light. Secure the cables with 1/2-in. plastic staples.

choose a location that's in the same stud space as the existing outlet. If this isn't possible, you'll have to cut out some drywall to drill through studs. Mark around the remodel box and cut the hole. Also cut a hole near the floor, directly under the TV outlet hole.

Match the gauge of the new cable—12 or 14 gauge—to the gauge of the wire in the existing box. Run the NM (nonmetallic) cable with ground from the existing outlet to the new outlet, and from the new outlet to the hole near the floor. Leave 12 in. of extra cable at the new outlet. Then run enough cable from the new outlet through the hole near the floor to reach your new switch location. Be generous with the cable to the switch to be certain you'll have at least an extra foot at the switch location. That's all the wiring you need to do for now.

Install the framing

Tack small squares of 1/2-in. plywood to the four corners of the bottom frame. Drill a 3/4-in. hole in the back 2x6 to feed the cable through. Set the frame in place and level it by adding shims if necessary (Photo 4). When the frame is level, add scraps of 1/2-in. plywood and shims under the two column locations. Make sure the frame is centered, with a 1/2-in. space on each end, and screw it to the wall. Next, install the columns (Photo 5). Use a level to make sure the end column is plumb and screw it to the bottom frame and to the wall. If there is no stud to drive screws into, use toggle-type drywall anchors to hold the column against the wall. Then use the shelves as spacers to make sure the columns are in the correct locations before you screw them to the base. There should be a 1/2-in. space between the wall and the end columns.



9 INSTALL THE DRYWALL

Attach the drywall with screws. If you plan to caulk the back edges, get a tight fit between the drywall and wall. Shave off overhanging edges at the front so they don't interfere with corner bead installation.



10 NAIL ON THE TOP AND BOTTOM CORNER BEADS

Notch one of the corner beads as shown here. Push it into the corner and mark the opposite end. Notch the other end the same way. Fit the corner bead into the opening and staple or nail it. Repeat on the opposite side of the opening.

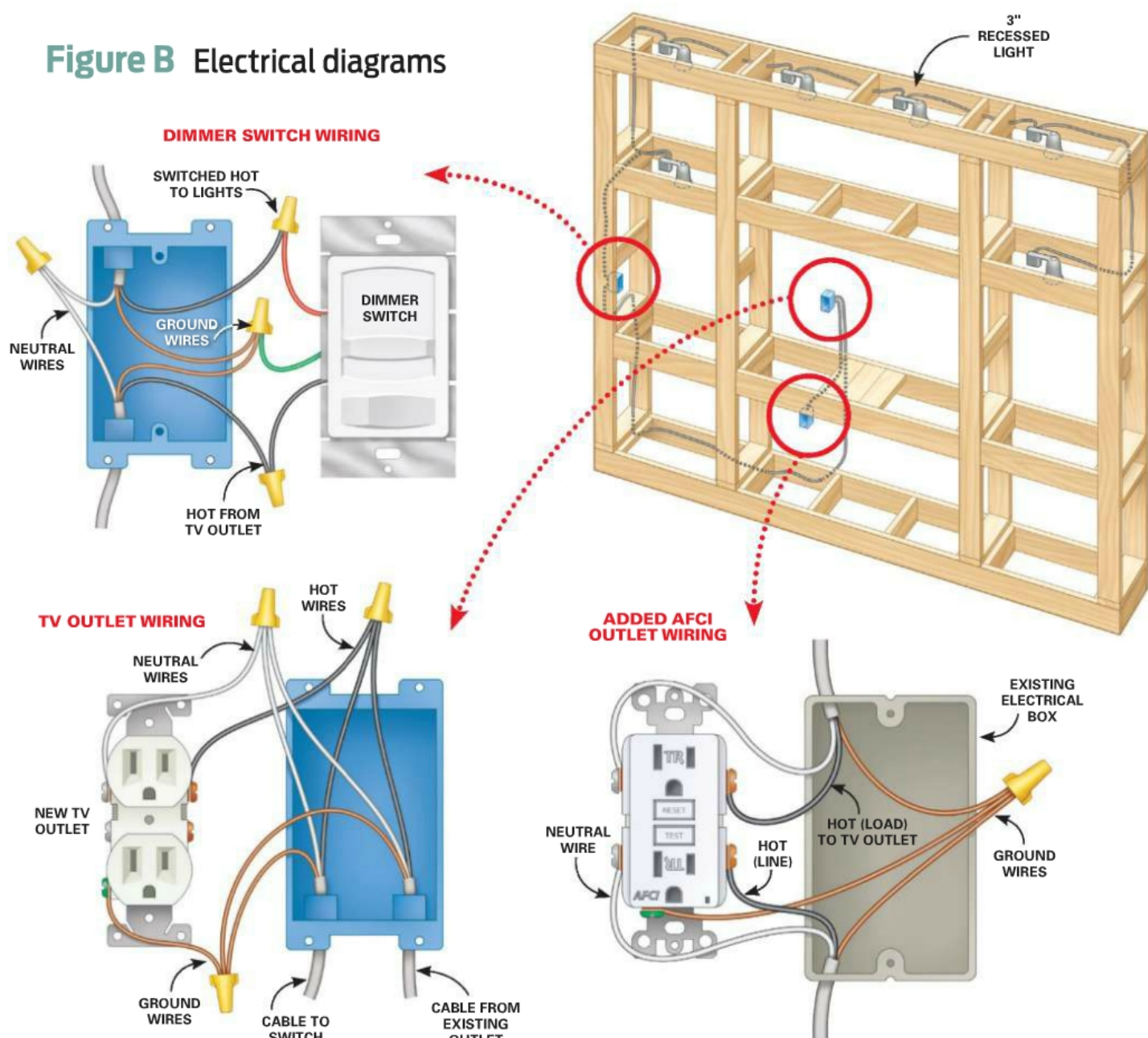
Next, set the top frame in place on the columns. Screw the top frame to the wall, and screw the top of the columns to the top frame (Photo 6). Finish the framing by installing the shelves (Photo 7).

Rough-in the wiring

Before you start your project, contact your local inspections department to find out if an electrical permit is required. In most cases the wiring will need to be inspected before you cover it with drywall. The new electrical code requires an AFCI (arc-fault circuit interrupter) in many areas when new wiring is added. Ask your inspector if an AFCI is required in your situation. If so, simply replace the existing outlet with an AFCI receptacle, and run power from the "load" side of the AFCI outlet to the new TV outlet and then on to the switch and lights. Any new receptacle outlets must also be tamper resistant.

Start wiring by nailing a switch box to the frame in a convenient location, and then drilling 3/4-in. holes through the

Figure B Electrical diagrams



framing to make a path for the new cables (**Photo 8** and **Figure B**). Run lengths of cable from the TV outlet to the switch, from the switch to the first light fixture, and between the light fixtures. Leave a 2-ft. loop of extra cable at each light fixture location. For details on rough-in wiring, go to familyhandyman.com and search for "wiring."

We ordered our 3-in. recessed light fixtures online because the fixtures we found at a home center were too tall to fit in the drywall space and still meet the electrical code requirement of 1/2-in. space between the fixture and the combustible surfaces. We chose remodel-type fixtures, which are installed after the drywall is finished. You can choose any non-IC (insulation contact) fixture you like, as long as there's at least



11 ADD CORNER BEADS TO THE SIDES

Cut the side pieces to fit between the top and the bottom notched corner beads so they overlap the metal tabs. Line up the corners and attach the beads with nails or staples.



12 ATTACH CORNER BEAD WITH A STAPLER

Using a 1/4-in.-crown, pneumatic stapler and 1-in.-long staples, drive staples every 6 in. and wherever the corner bead is buckled out. Then cover the edge of the bead with mesh tape.

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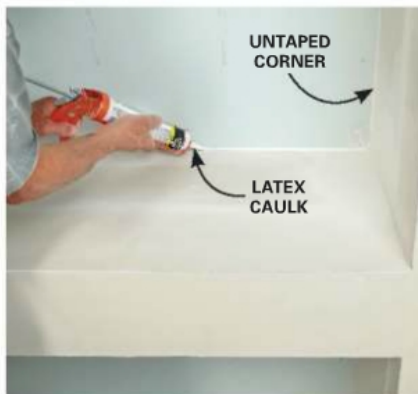
13 TAPE THE INSIDE CORNERS

Spread a layer of joint compound on both sides of the corner. Cut a piece of paper tape and fold it to fit in the corner. Press the tape in with your fingers. Then embed it with your taping knife. Spread a thin layer of compound over the top of the tape.



14 FILL THE BEAD

Mix about a half bag of setting compound with water. Spread a thick layer of compound between the corner beads and smooth with an 8-in. taping knife. Fill both sides of all beads. Recoat after the compound firms up.



15 CAULK THE BACK CORNERS

Avoid a lot of tricky corner taping by caulking the back inside corners. Cut the tip of the latex caulk tube carefully to create a very small hole. Then apply a neat bead of caulk and smooth it out with your finger.

1/2 in. between the fixture, and any combustible material and insulation are kept more than 3 in. away. You can use any IC-rated fixture that will fit in the space.

When the wiring is in place, call for a rough-in wiring inspection. After the wiring is approved, move on to the dry-wall and corner bead.

Cover the frame with drywall

You can cut the drywall the usual way by scoring one side with a utility knife, bending it to break at the scored line, and then cutting the paper backing. But for fast, super-clean cuts, we used a table saw to cut the drywall. We have a table saw with a good dust collection system, so it wasn't too dusty. But you could also cut the drywall outdoors with a circular saw and a straightedge (you can see a short video of this dusty operation on our iPad edition). Stack four pieces of drywall and cut all of them in one pass. We started by cutting a 2-1/2-in.-wide strip from the edge of each sheet to remove the tapered section. We did this to avoid having a tapered edge under the corner bead or at the back where we wanted to caulk the back edges rather than tape them (Photo 15). If you're using the score-and-break method, clean up the cut edges with a rasp.

Once the pieces are cut to width, it's easy to cut them to length and screw them to the framing. Mark the length and use a drywall square to score them. All drywall cuts should be 1/8 in. to 1/4 in. less than the actual measurements. You can easily fill gaps, but drywall will break along the edge if you try to force it in. Attach the drywall with 1-1/4-in. drywall screws. Use a special drywall screw gun, or buy a special bit for your cordless drill that sets the screws just under the surface without driving them too deep.

Nail on the corner bead

There are several types of corner bead. You can buy perforated plastic corner bead that attaches with spray adhesive, or paper-faced corner bead that you embed in a layer of joint compound. But we decided to use conventional metal corner bead. To speed up the process, we used a 1/4-in.-crown, air-powered stapler to fasten the beads (Photo 12). You can buy a stapler for as little as \$30. Or simply fasten the corner bead with 1-1/4-in. ring-shank drywall nails.

You'll need a tin snips to cut the corner bead. **Photos 10 and 11** show an easy method for cutting the metal beads to length and creating a strong corner. The key to installing corner beads is to press them in until the outside corner is just slightly proud of the dry-wall before driving the fasteners. Also, adjust the position of the bead so the corners of adjoining beads line up. For extra insurance against cracking, cover all the corner bead edges with adhesive-backed mesh tape.

Tape the corners and fill the bead

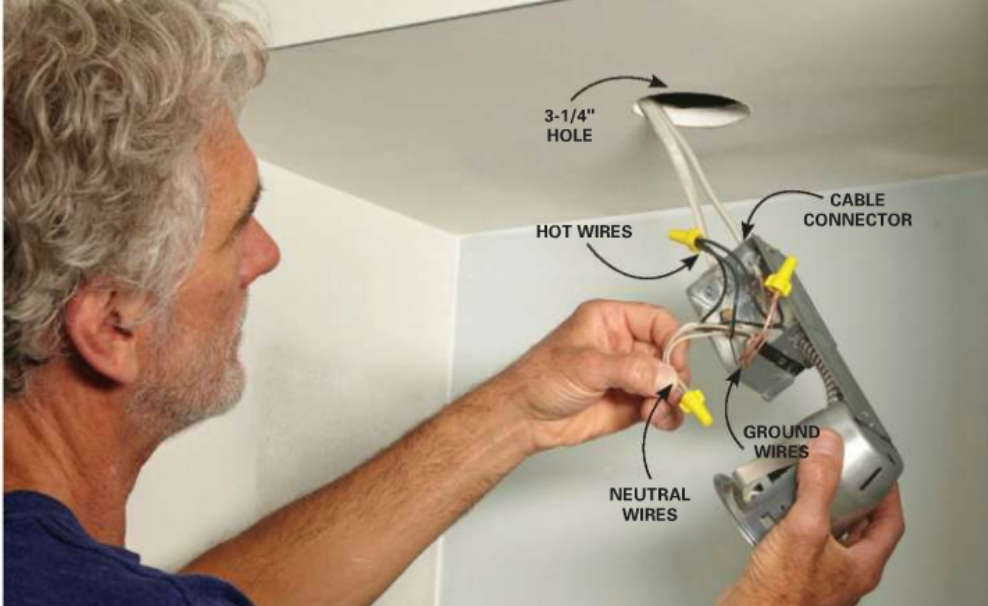
To save time, we decided to confine our taping to the intersection of the sides and tops of the drywall recesses (**Photo 13**). We caulked the back edges later (**Photo 15**). Start by taping the inside corners. Then fill the corner beads with joint compound. Use 45-minute setting-type compound for this. Mix the powder with water according to the instructions on the bag. Then use an 8-in. taping knife to fill the corner beads (**Photo 14**). We used almost two full bags of setting compound for this project. When the joint compound has firmed up to the consistency of soap, carve off any lumps and high spots with your taping knife. You can add another coat as soon as the compound hardens. You don't have to wait for it to dry completely.

Don't rush this part of the job. Plan on spending a few hours a day for several days. Use premixed joint compound for the final coats, letting it dry between each coat. Trowel on thin coats until you've got a smooth, flat surface. Let the final coat dry. Then sand carefully with 120-grit dry-wall sandpaper mounted on a drywall sander. Use a fine sanding sponge with an angled edge to sand the inside corners. Vacuum all the dust from the surfaces and check your work with a strong raking light. Fill any imperfections, resand, and you're ready to prime and paint.

Finish the wiring

When you're done sanding the drywall, you can install the recessed lights. Then when the painting is complete, finish the wiring by adding the outlets and connecting the switch or dimmer switch. For more help with installing switches and outlets, go to familyhandyman.com and search for "switch" or "outlet." **Figure B** shows how to wire the outlets and dimmer switch. **Photo 16** shows how to install the recessed lights.

We used 6-watt dimmable LED flood



16 INSTALL THE RECESSED LIGHTS

Cut holes for the lights using the template provided, or a large hole saw mounted in a drill (we used a 3-1/4-in. hole saw). Remove the cover and knockouts and add cable connectors if they're not built into the fixture. Push the cable(s) through the connectors and connect hot, neutral and ground wires with the appropriate wire connectors.



17 ADD GLASS SHELVES

Screw shelf supports into the 2x6 backer, making sure they're level with each other. Set the 1/4-in. polished-edge glass shelves on the supports.

bulbs (\$12 each) in our fixtures. If you're using LED bulbs and want to install a dimmer, check the manufacturer's instructions to make sure the switch is compatible with the brand of LED bulb you're using. When the wiring is complete, turn on the circuit breaker to check your work. Then call the electrical inspector for a final inspection.

Finishing touches

Since we wanted to use the shelves as an entertainment center, we cut holes for low-voltage old-work brackets in the back wall of the TV compartment and the compartment below it. That

way we could run HDMI and other audio/video cables through the wall from the components to the TV. Make sure the cables are rated for in-wall use—look for CL2- or CL3-rated cables.

We also installed 1/4-in. polished-edge plate-glass shelves in two compartments (**Photo 17**). To protect the drywall from wear and moisture (such as from potted plants), consider having more glass pieces cut that you can use to cover the bottoms of the other compartments. Reinstall the baseboard molding and you're ready to move in and enjoy your dramatic new display wall.

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SHINE ON....

Recently I needed to polish brass parts for a project. I didn't have a buffing disc, so I looked around the shop for an alternative. I saw several paint roller covers that I thought might work—but how to drive them? I found that they fit tightly on a 1-1/2-in. hole saw. I cut a 3-in. length of roller cover, inserted the hole saw and chucked it into my drill press. It worked great, and I've used this method often to buff and polish jewelry and all sorts of other items. You can buy buffing compound at a hobby store.

Bill Wells



Closing the gap

Keep mulch from clogging the tailgate opening of your truck. Use a PVC pipe to fill the gap. When I'm not using the pipe, I store it behind the front seat.



Francis Itaya

Get \$100 for your Handy Hint! See p. 4 for details.



Homemade nut loosener

Rusted bolts and nuts can be stubborn as all get out to loosen. I make my own rust penetrant by mixing half automatic transmission fluid and half acetone in a metal oilcan. The solution really penetrates—after a few minutes, even the toughest bolts and nuts spin loose (with a little elbow grease, that is). Best yet, it's stuff I already have on the garage shelf.

Calvin Stevens



STIR IT UP

I buy a lot of quart cans of paint, and eventually the pigments settle to the bottom of the can. To speed up the mixing, I use a paint can opener chucked into my drill. I cut and straightened the bent prying end and ground it flush with the shaft. Now whenever I have paint that needs mixing, I tighten the modified opener in the drill chuck and stir away!

Ron Nitchie



Stool leg protector

The legs on my stool have sharp ends that slice through the plastic caps. To solve this problem, I place a washer the same diameter as the pipe into the plastic cap and then fit it onto the leg. Now the stool is no longer marring the floor.



Peter Trivilino



Diverter lube

Over time, the hard water in our area leaves deposits in the moving parts of the plumbing. When our tub spout diverter clogs, I use WD-40 with its spray nozzle curved up the spout to the diverter valve. A couple of sprays gets things loosened up and working again.



Jackson Tutt



CORD CLIP

A paper binder clip works great to manage small electrical cords. I use one to keep my long headphone cords neatly wound and tangle-free.

Michael Johnson



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Just because you're stuck at work doesn't mean you can't shut the garage door your teenager left open or unlock the front door for the house cleaners and relock it when they leave. And on your way home, you can warm up your house and preheat the oven with just a few taps on your smartphone.

There's a large, and rapidly growing, selection of devices that can be controlled remotely. The beauty of most of these options is that they can be installed without running new wires. At most, you'll have to replace a switch or a receptacle. Best of all, you don't have to be a computer programmer to get them working. You can spend thousands of dollars on a whole-house automation system or just spend \$15 on one wireless switch to operate your favorite lamp.

by Mark Petersen

editors@thefamilyhandyman.com

GETTY

GETTY

HOME MANAGEMENT SYSTEM

If you like the idea of being able to control every switch, outlet, electronic device and appliance in your house, you'll want to buy a home management system like the Iris shown here. Most home management systems consist of a central hub that connects to your home wireless network and allows you to control security systems and any number of devices from anywhere in the world using a smartphone, tablet or computer.

How it works: The central hub communicates with compatible devices in the home via an RF (radio frequency) wireless protocol. The devices and the hub need to share the same protocol in order to communicate with each other. Z-Wave, ZigBee and INSTEON are some of the more common RF protocols on the market. Some home management systems operate on more than one protocol, which means they can manage a wider variety of devices.

There are several advantages to a home management system. Because the hub communicates by way of RF rather than Wi-Fi, it won't bog down your home Wi-Fi system. You only have to download (and learn) one interface instead of a bunch. And it's easier and cheaper to add devices at a later date.

The Iris system by Lowe's, shown at right, starts at \$100, with packages including thermostats, outlets and security for \$180 to \$300. Another popular system is Lutron's Caséta, which controls lights, shades, dimmers and thermostats (starting at \$120).

A central hub operates the devices in your home, and you control the hub with your smartphone, tablet or computer...from anywhere.

IRIS APP ON SMARTPHONE



IRIS SMART HUB: Can remotely control hundreds of devices and appliances using your computer or the Iris app. \$100.

IRIS SMART HUB



IRIS THERMOSTAT



IRIS THERMOSTAT: Change temperature settings or program weekly schedules. \$99.

HARDWIRED SWITCH



GE SINGLE-POLE LIGHT SWITCH (works with Iris): Hardwired switch controls existing lights. \$35.

ELECTRONIC DOOR LEVER



SCHLAGE ELECTRONIC DOOR LEVER: Operates with key, by push-button code, or remotely. \$200.

HARDWIRED RECEPTACLE



GE 15-AMP ELECTRICAL OUTLET (with Iris): Hardwired receptacle. \$35.

SMART PLUG



IRIS SMART PLUG: Plug-in (no wiring necessary) receptacle remotely monitors power consumption of individual appliances. \$30.



INDIVIDUAL DEVICE SYSTEMS

There are devices that can be operated remotely by your mobile device and that don't require a whole-house system. Belkin is one company that makes a line of products under the WeMo brand that work individually, using the Wi-Fi signal in your house. It offers outlets, a light switch and a camera. WeMo even teamed up with the folks at Crock-Pot, so now you can remotely power up and adjust the temperature so your pot roast will be finished to perfection exactly when you want it to be.

There are other stand-alone products that don't require a whole-house system. Several thermostats can work independently with your smartphone, tablet or computer. Lawn irrigation systems are also joining the remote bandwagon. And this MyQ Garage overhead door controller turns your old garage door opener into a modern-day smart device. It requires no wiring and works on most garage doors manufactured after 1993. But remember, most of these stand-alone products use a home's Wi-Fi, and too many individually controlled devices could result in sluggish Internet speeds.

Use your smart phone to communicate with individual devices using an app provided by the manufacturer.

BELKIN NETCAM



BELKIN NETCAM WITH NIGHT VISION: Watch your home on your smartphone or tablet from anywhere. \$100.

HARDWIRED WeMo LIGHT SWITCH



WeMo LIGHT SWITCH: Hardwired light switch. \$50.

SMARTPHONE WITH WeMo APP



WeMo SWITCH



WeMo SWITCH: Plug-in receptacle. \$50.

CROCK-POT SMART SLOW: Slow cooker operated by WeMo app. \$130.



SMARTPHONE WITH MyQ APP



CHAMBERLAIN MyQ GARAGE DOOR CONTROLLER: Operates existing garage door opener with free MyQ app. \$130.

DOOR SENSOR



HUB



SIMPLE REMOTE CONTROL

Control lights and outlets with remote controls, some disguised as wall switches. There's no reason to spend tons of money if you just want to switch devices when you're at home. There are many simple remote control gadgets that control lights and outlets.

Install an inexpensive plug-in outlet that's controlled by a battery-operated remote that looks like a light switch. Stick the new switch on the wall where you want it and plug the lamp into the remote-controlled outlet—problem solved. A similar setup made for exterior use is perfect for your Christmas lights. This one is controlled by a key chain remote.

WESTEK WALL-MOUNTED SWITCH AND PLUG-IN RECEIVER: Control this plug-in outlet with a battery-operated wall switch. \$15.



WESTEK
WALL-MOUNTED
SWITCH



WESTEK PLUG-IN
RECEIVER



Want some cool convenience? Swap out the light switch in the TV room (or anywhere else!) with a remote dimmer switch. That way you can turn off or dim the lights without leaving the comfort of your cushy sofa. There's even a memory button that remembers your favorite light level. Take note, however, that devices like these communicate with an IR (infrared) signal that requires a clear line of sight—meaning, they'll only work together as long as they're in the same room.

LUTRON MAESTRO IR REMOTE DIMMER SWITCH: Dim the lights without leaving the couch. \$40.



LUTRON
MAESTRO
IR REMOTE



LUTRON
MAESTRO
IR DIMMER



GETTY

Are you notorious for forgetting to turn off the lights in the garage, shop or barn? Tired of trudging down the stairs or across the yard to shut them off? Here's a neat product: Convert any single-pole light switch in your house or on your property into a three-way switch with a product like this Skylink SK-8. Replace the switch you want to control with the Skylink receiver switch. Then attach the battery-operated remote wherever you want. The new switch will work like a three-way that can be operated with the remote or at the source. Each switch has a specific distance limitation; some can only travel 50 ft. This one reaches 500 ft. in open areas.

SKYLINK SK-8 WIRELESS REMOTE 3-WAY: Replace an existing switch and control it locally or with the battery-operated wall switch. \$35.



SKYLINK
WIRELESS
WALL SWITCH



SKYLINK
RECEIVER
SWITCH



PRO tips

BY TIM JOHNSON

editors@thefamilyhandyman.com



ART DIRECTION ELLEN THOMSON • PHOTOGRAPHY TOM FENENGA

Resawing on a band saw

Cutting a board into thinner pieces of the same length and width is my favorite band-sawing operation because it opens a world of woodworking opportunities. Called “resawing,” this process allows creating wide panels from narrow boards, cutting a board into thin pliable pieces for bent laminations, slicing thin sheets of veneer, and even turning logs into lumber. Like any woodworking skill, resawing takes time and practice to master. Here are a few of my best tips to help make resawing your favorite band-sawing operation too.



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Three must-dos for resawing success

1. Use a resaw blade. Specifically designed to make straight cuts in thick stock, resaw blades are wide and have only three to four teeth per inch (TPI). Don't scrimp on the price: Buy a high-quality blade such as the Timber Wolf 1/2-in. 3PC blade I'm using here (about \$36 online). Resawing with a dull blade wastes both time and materials, so replace the blade at the first signs of dullness—when the feed rate slows or the cut starts to wander.
2. Install a tall resaw fence like the one shown at the bottom of this page. Just glue the face to the base at 90 degrees, using a pair of gussets for stability. For the best results, make the fence tall enough to completely support the board.
3. Match the feed rate to the cutting action. Simply feed the stock at a steady pace that efficiently advances the cut without significantly slowing the blade or bogging down the motor.



SQUARE THE BLADE AND THE BOARD

Making sure the blade is perpendicular to the table is especially important when you're resawing a wide board. For the best results, raise the guidepost all the way and use a square with an arm that matches the saw's resaw capacity (**photo above left**). Adjust the table so no gaps appear between the blade and the arm. Next, make sure the board has a square corner (**photo above right**). That way it will ride flush against both the tall fence and the table during the cut.



MEET THE PRO

Tim Johnson has worked with wood for more than 40 years as an antiques dealer, a professional furniture maker, and most recently as senior editor of *American Woodworker* and *Woodwork* magazines.

SET THE FENCE AT THE CORRECT ANGLE

It sounds crazy, but on most band saws, you have to angle the stock to make a straight cut. Finding this "drift angle" and setting the fence to match it is crucial to successful resawing.

Start by marking a straight line on a scrap board, parallel to its edge. Then follow the line to make a straight cut, angling the board as necessary. When you've cut far enough to establish the drift angle, hold the board in position and transfer the angle to the saw's table (**top photo below**).

Use the line you've marked to position the fence at the same angle (**bottom photo**). Then make test cuts and adjust the fence as necessary to fine-tune the setup until the stock stays flush against the fence, without binding against it or wandering away.



Continued on p. 58

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New technology usually starts out at astronomical prices and then comes down years later. We skipped that step to allow everyone the chance to experience this watch's brilliant fusion of technology and style. We originally priced the Stauer *Compendium Hybrid* at \$395 based on the market for advanced sports watches... but then stopped ourselves. Since this is no ordinary economy, we decided to offer the *Compendium Hybrid* at **92% off**. That means this new technological marvel can be yours for only \$29⁹⁵!

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With the release of the dynamic new *Compendium*, those boxy, plastic wrist calculators of the past have been replaced by this luxurious LCD chronograph that is sophisticated enough for a formal evening out, but rugged and tough

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The Compendium: The spectacular face of the latest watch technology.

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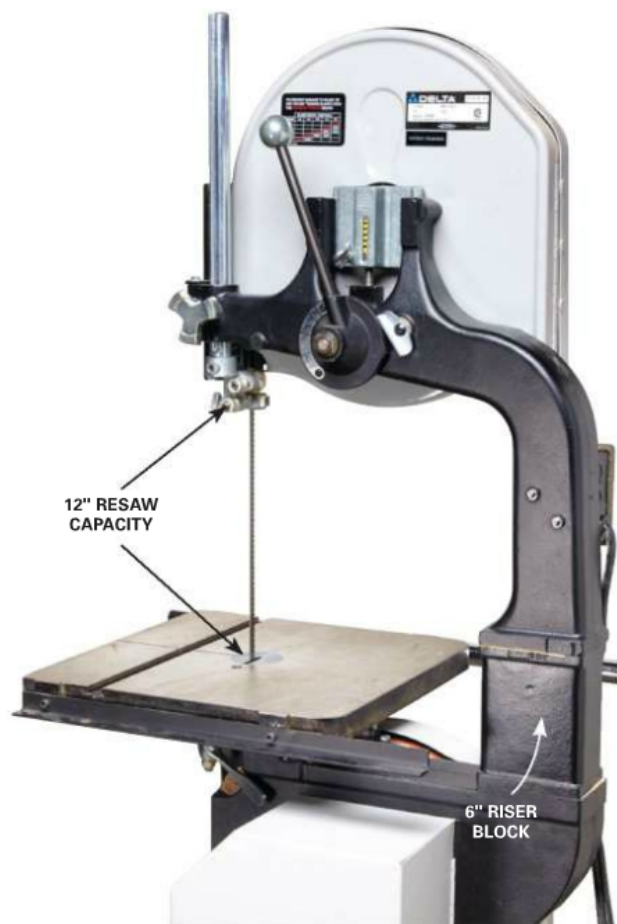
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Box in long boards

Resawing long boards is a breeze with this setup, because it automatically holds the board against the fence so your hands are free to feed the board. Make the box about as tall as the board is wide, about as wide as the distance between the blade and the front of the table, and about as long as the distance between the blade and the table's right edge. Position the box in front of the blade and clamp it so the board fits snugly but slides between the box and the fence without binding or wobbling.



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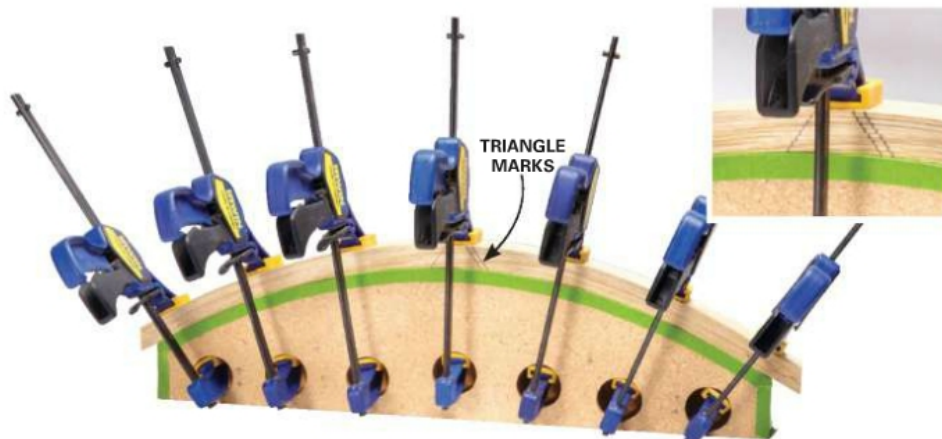
Imagine creating a 24-in.-wide book-matched tabletop or turning a 12-in.-diameter log into lumber. Installing a riser block on a typical 14-in. band saw increases its resaw capacity from 6 to 12 in. Check with the manufacturer to see if a riser block kit is available for your saw.

The kit includes the block and all the other parts you need to stretch your saw, such as a longer guidepost and blade guard. Of course, you'll also have to buy new, longer blades, and if your saw bogs down easily when resawing those super-wide boards, you may have to install a larger motor to handle the increased workload.

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DIY TIP GENIUS



Make it easy to stack resawn pieces

Resawing a board into thin, pliable pieces allows you to create curved shapes by bending and gluing the pieces around a form—a process called “bent lamination.” Marking the board with the cabinetmaker’s triangle (photo at left) allows you to reassemble the thin pieces as they came from the board, so the lamination closely resembles a single piece of bent wood (photo above).



Create stunning grain patterns

Opening a pair of resawn pieces for the first time is my favorite part of resawing. That’s because resawing transforms an ordinary—or even homely—board into something extraordinary. It also turns a narrow board into a panel that’s twice as wide. Opening the pieces like a book—called book-matching—creates a mirror image. And that’s just the start: By simply rearranging the two pieces, you can create other patterns that are completely different but just as spectacular (see below).



EASY RESAWING

Partially resawing a board on your table saw makes resawing with your band saw easier, because the blade has less to cut and the saw kerfs keep it from wandering. It’s a great method to use if your band saw bogs down during full-width resawing, and in many cases, it can save time by allowing you to resaw without installing a resaw blade. Even if you can completely resaw the board by raising the table saw’s blade, I prefer this method, because it’s safer to finish the cut on the band saw.

Start with a board that’s thick enough

Resawing consumes some of a board’s thickness, so don’t expect to get three 1/4-in.-thick boards from a 3/4-in. board. In addition to the material lost during the initial cut, you have to plane the resawn pieces to flatten them and remove the saw marks. When I resaw a 3/4-in.-thick board, I only expect to get two 1/4-in.-thick boards.

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Top Ten TIPS

BY ELISA BERNICK

editors@thefamilyhandyman.com

How to choose paint colors

Selecting paint colors can be a very subjective (and difficult!) process. But aside from what's fashionable at the moment, there are some practical considerations that can make the decision easier. Here are our top suggestions to help you pick paint colors and sheens that you'll be happy with for years to come.

1 Use actual paint samples, not chips

It's difficult to tell what a color is going to look like on your wall from a small paint chip, so many manufacturers offer sample containers of their colors. Depending on the manufacturer, you can buy sample containers in quarts, pints or even smaller sizes, and they range in price from \$3 to \$8. They're a wise investment that will prevent you from wasting money on a color that isn't right. And because colors can change dramatically under different lighting conditions, instead of rolling the sample onto the wall, roll it onto white tag-board. You'll be able to move the sample around (as in the photo above) and view it under all the different lighting conditions in your home.



ART DIRECTION ELLEN THOMSON • PHOTOGRAPHY TOM FENENGA UNLESS NOTED

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1" x 25 FT.
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Item 69080 shown

PITTSBURGH ITEM 69080 69030/69031

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14866668

SUPER COUPON



CENTRAL PNEUMATIC
3 GALLON, 100 PSI OILLESS PANCAKE AIR COMPRESSOR

LOT NO. 95275 60637/69486/61615

Item 95275 shown

\$39.99 REG. PRICE \$79.99

SAVE 50%

14940159

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SUPER COUPON

"The Undisputed King of the Garage"
- Four Wheeler Magazine

PITTSBURGH

RAPID PUMP® 1.5 TON ALUMINUM RACING JACK

Item 68053 shown

LOT NO. 68053 69252 60569/62160

\$59.99 ~~\$89.99~~ REG. PRICE \$119.99

SAVE \$60

- 3-1/2 Pumps Lifts Most Vehicles
- Weighs 27 lbs.

14906790

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SUPER COUPON

US* GENERAL

26" 16 DRAWER ROLLER CABINET

• 1060 lb. Capacity
• 14,600 cu. in. of storage

Item 67831 shown

LOT NO. 67831/61609

\$319.99 REG. PRICE \$499.99

SAVE \$180

14933500

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SUPER COUPON

WINNER
The Family Handyman

12" SLIDING COMPOUND DOUBLE-BEVEL MITER SAW WITH LASER GUIDE

LOT NO. 69684/61776/61969/61970

Item 69684 shown

\$139.99 ~~\$199.99~~ REG. PRICE \$299.99

SAVE \$160

14856484

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2500 LB. ELECTRIC WINCH WITH WIRELESS REMOTE CONTROL

Item 61258 shown

LOT NO. 68146 61258/61297/61840

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PREDATOR GENERATORS

4000 PEAK/3200 RUNNING WATTS 6.5 HP (212 CC) GAS GENERATORS

• 70 dB Noise Level

LOT NO. 69676/69729

Item 69729 shown

\$299.99 ~~\$499.99~~ REG. PRICE \$499.99

SAVE \$200

14896814

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SUPER COUPON

16 OZ. HAMMERS WITH FIBERGLASS HANDLE

PITTSBURGH

CLAW LOT NO. 47872 69006/60715/60714

RIP LOT NO. 47873 69005/61262

Item 47872 shown

\$2.99 REG. PRICE \$7.99

YOUR CHOICE!

14909454

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SUPER COUPON

17 FT. TYPE 1A MULTI-TASK LADDER

LOT NO. 67646

• 300 lb. Capacity
• 23 Configurations

\$119.99 REG. PRICE \$199.99

SAVE \$80

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SUPER COUPON

SAVE \$100

10", 12 SPEED BENCH MOUNT DRILL PRESS

LOT NO. 60237/44836/62408

Item 60237 shown

\$99.99 ~~\$139.99~~ REG. PRICE \$199.99

SAVE \$100

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SUPER COUPON

90 AMP FLUX WIRE WELDER

• No Gas Required

LOT NO. 68887 61849

Item 68887 shown

\$99.99 REG. PRICE \$149.99

SAVE \$50

14823573

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SUPER COUPON

18 GAUGE 2-IN-1 NAILER/STAPLER

CENTRAL PNEUMATIC

LOT NO. 68019/61661

Item 68019 shown

\$15.99 REG. PRICE \$35.99

SAVE 55%

14835005

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SUPER COUPON!

HEAVY DUTY RETRACTABLE AIR HOSE REEL WITH 3/8" x 25 FT. HOSE
 LOT NO. 69234/46104/69266
 Item 69234 shown
CENTRAL PNEUMATIC

SAVE 51%

\$43.99 REG. PRICE \$89.99

15037555

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SUPER COUPON!

MECHANIC'S GLOVES
 MEDIUM LOT NO. 61235/62434/62426
 LARGE LOT NO. 93640/60447/62433/62428
 X-LARGE LOT NO. 93641/60448/62432/62429

Item 93640 shown

YOUR CHOICE!

SAVE 61%

\$3.89 REG. PRICE \$9.99

14948175

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SUPER COUPON!

CHICAGO ELECTRIC POWER TOOLS
10 AMP, 3-IN-1, 1-1/8" VARIABLE SPEED SDS ROTARY HAMMER
 Item 69274 shown
 LOT NO. 69274/61882

SAVE \$125

\$74.99 REG. PRICE \$199.99

14995378

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SUPER COUPON!

60" WORKBENCH WITH FOUR DRAWERS
 LOT NO. 93454/69054

Item 93454 shown

SAVE \$110

\$139.99 REG. PRICE \$249.99

14982019

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SUPER COUPON!

RECIPROCATING SAW WITH ROTATING HANDLE
 Item 65570 shown
 LOT NO. 65570/61884/62370

SAVE 60%

\$21.99 REG. PRICE \$54.99

14950948

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SUPER COUPON!

10" PNEUMATIC TIRE
 Not for highway use.
 LOT NO. 30900/69385/62388/62409

Item 30900 shown

SAVE 60%

\$3.99 REG. PRICE \$9.99

14994030

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SUPER COUPON!

80 PIECE ROTARY TOOL KIT
 LOT NO. 68986/97626/69451
 Item 97626 shown

drillmaster

SAVE 70%

\$74.99 REG. PRICE \$24.99

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SUPER COUPON!

2.5 HP 10" INDUSTRIAL TILE/BRICK SAW
 PROFESSIONAL SERIES
 CHICAGO ELECTRIC POWER TOOLS

Item 69275 shown
 LOT NO. 69275/62391

SAVE \$185

\$214.99 REG. PRICE \$399.99

14970927

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SUPER COUPON!

32 PIECE SCREWDRIVER SET PITTSBURGH
 LOT NO. 61259/90764

Item 90764 shown

SAVE 60%

\$5.99 REG. PRICE \$14.99

14947945

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SUPER COUPON!

HEAVY DUTY HAND TRUCK
 HaulMaster
 LOT NO. 95061

• 600 lb. Capacity

SAVE 50%

\$29.99 REG. PRICE \$59.99

14992870

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SUPER COUPON!

350 LB. CAPACITY FOLDING SAW HORSE
 CENTRAL MACHINERY
 LOT NO. 69446/61979/60710

Item 69446 shown

SAVE 37%

\$9.99 REG. PRICE \$15.99

14973553

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SUPER COUPON!

4-IN-1 JUMP STARTER WITH AIR COMPRESSOR
 CENTECH
 LOT NO. 60666/69401/62374/62453

Item 69401 shown

SAVE 25%

\$59.99 REG. PRICE \$79.99

15014581

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SUPER COUPON!

ADJUSTABLE SHADE AUTO-DARKENING WELDING HELMET
 LOT NO. 46092/61611

Item 46092 shown

SAVE 55%

\$35.99 REG. PRICE \$79.99

15030219

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SUPER COUPON!

500 LB. CAPACITY ALUMINUM CARGO CARRIER
 LOT NO. 92655/69688/60771

Item 92655 shown

SAVE \$70

\$79.99 REG. PRICE \$149.99

14982316

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SUPER COUPON!

HEAVY DUTY PORTABLE SCAFFOLD
 HaulMaster
 LOT NO. 69055/98979/62208

• 900 lb. Capacity

Item 98979 shown

SAVE \$70

\$179.99 REG. PRICE \$249.99

14967873

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SUPER COUPON!

4 PIECE 1" x 15 FT. RATCHETING TIE DOWNS
 LOT NO. 90984/60405/61524/62322

Item 90984 shown

SAVE 60%

\$7.99 REG. PRICE \$19.99

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SUPER COUPON!

2 HP INDUSTRIAL 5 MICRON DUST COLLECTOR
 CENTRAL MACHINERY
 LOT NO. 97869/61790

Item 97869 shown

SAVE \$90

\$159.99 REG. PRICE \$249.99

14981009

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SUPER COUPON!

3 TON HEAVY DUTY STEEL JACK STANDS
 PITTSBURGH
 LOT NO. 38846/69597/61196/62392

Item 38846 shown

SAVE 55%

\$19.99 REG. PRICE \$44.99

14966676

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2 Paint family color collections are invaluable

Paint companies have gone to a lot of trouble (and spent a lot of money) grouping colors into “families” and “collections” and “concepts” and “schemes.” Basically, these are combinations of complementary colors that may not occur to you until you see how well they work together. There are specific room-by-room collections, white-only collections, color combinations for kids’ rooms, exterior paint collections designed for specific areas of the country, and so much more.

Take advantage of all the research already done for you by color experts. Find brochures at paint stores and go online to paint manufacturer websites, houzz.com and Pinterest, where you’ll find hundreds of examples of interior and exterior paint color combinations.



PHOTOGRAPHY HSP

3 Start with the permanent colors

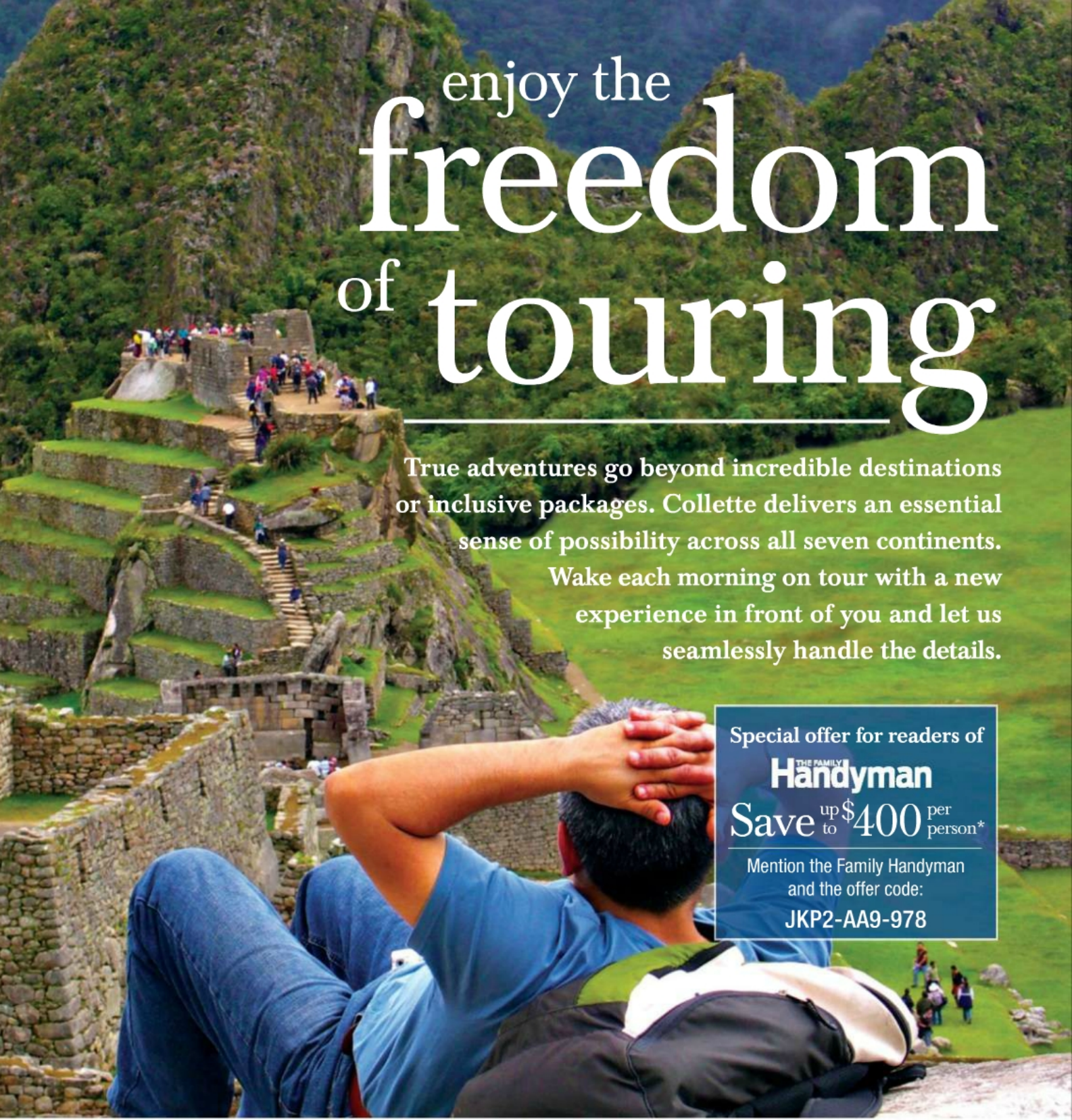
Base your color choice on the permanent furnishings in the room or the features on the exterior of your home. Inside, the flooring, rugs, artwork, blinds and upholstery will suggest a color direction. Outside, factory-finished materials like the roof, gutters, fascia, soffits and brickwork are existing elements whose colors rarely change but should play a role in determining your paint colors. The landscaping is another important factor. Select colors that fit in with the surrounding palette. If you have brilliant-colored spring-blooming trees or a sea of green foundation plantings, choose colors that will complement them.



PHOTOGRAPHY GETTY IMAGES

4 Consider the neighbors!

A clashing color choice is a lose-lose situation. You may think a purple house with red trim would be really groovy, but your neighbors will hate you. You’ll not only drag down your resale value but affect theirs as well. Inside you only have to please yourself and your family. But remember this: If you plan on selling, bizarre colors or schemes will likely turn off potential buyers.



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5 Lighten the ceiling color

Because ceilings are seen in shadow, the color often appears darker than the same paint on walls. If you want the ceiling to match the wall color, buy ceiling paint one or two shades lighter than the wall color. Or instead of buying another gallon of a lighter shade, save money by diluting the wall color you have with 50 percent white paint.



6 Choose the right sheen

When you choose a color, you have to choose its sheen, too. Most paint companies offer flat, eggshell, satin, semigloss and gloss as options. Glossier finishes offer greater durability and are easier to clean, but they emphasize any wall imperfections.

Flat paint will do a much better job of hiding imperfections, but it's easier to damage than high-gloss. Flat finishes are generally best for ceilings and low-traffic areas like living and dining rooms where all you'll need to do is wipe them down with a damp sponge. If they do get scuffed, they're easy to touch up.

Glossier finishes—including satin and semigloss—can withstand moisture and grease so they're good for trim and cabinets and high-traffic rooms like kitchens and bathrooms. If you love the way flat wall paint looks but you wish it were more durable, try mixing it 50/50 with eggshell paint. The paint will still offer a nonreflective look, but the eggshell will add some durability to the finish.

FLAT

EGGSHELL

SATIN

SEMIGLOSS

GLOSS

7 Skim-coat bad walls—especially for darker colors

Lighter colors are more forgiving in terms of showing wall imperfections; darker colors show more detail. If you're set on using a darker color (or a glossy sheen) and your walls are in rough shape, you should really "skim-coat" your walls with a thin layer of drywall compound before painting (search for "skim coat walls" at familyhandyman.com). And even skim-coating the walls won't make dark colors look good in every room.

Extremely dark colors don't handle the moisture in a bathroom very well; they can look blotchy and chalky. You might want to stick with lighter colors in that particular room. If you're planning to use a dark color, reduce the number of coats necessary by using a high-hide gray-tinted primer. Talk to a paint store clerk to find out which tinted primer is best for the wall color you've chosen.



PHOTOGRAPHY HSP



8 Don't just paint the walls

Just as paint accentuates features, you can use it to hide unappealing elements too. Paint conduit, radiators, gutters and other utilitarian components the same color as the walls to make them blend in. You can also do that with light fixtures, switches, outlets and just about anything else. There are spray paints for all different types of material now.

DON'T BUY CHEAP PAINT

For the best results, spend at least \$40 to \$50 per gallon of paint. Paint is made of solvents, pigments and resins. Better-quality paint will be more concentrated with finer pigments and higher-grade resins, so the final product will have a more even color and durable finish. It's tempting to try to save money up front, but remember, better coverage means less paint to buy—you could easily wind up spending just as much for two coats of a less expensive formula. Even reputable brands have a range of paint qualities within their product lines, so do your homework and buy the best you can afford.



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9 Virtually paint your house

Many manufacturers offer opportunities to "paint" your home virtually—you upload a photo of your home or a room and try out different colors and painting schemes. You can also search for homes similar to your own and try "painting" with various combinations and products. There are also apps that allow you to take a photo of a color you like and have it matched with a manufacturer's color or suggested palette (Paint My Place on

iTunes is one example).

Just be aware that your computer monitor, cell phone or iPad screen will affect the color of the paint you see, so don't skip Tip 1!



PHOTOGRAPHY HSP



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10 Vivid exterior colors fade faster

The more intense or dark a color is, the more likely it is to fade and show dirt. After a few years, vivid blues and deep reds will become subdued, and you may see streaks and splotches of dirt more readily. Dark colors can also absorb heat and sustain more moisture problems than lighter shades. And because dark paint fades, it can be difficult to match exactly when you do small touch-ups.

On the plus side, dark colors can give your house an air of dignity or drama. Generally, colors like red, blue, green and yellow tend to fade more quickly than earth tones like beiges, tans and browns, which are considered more stable.

Recaulk a tub or shower

Anybody can recaulk a tub or shower. All you need is a tube of caulk and a caulking gun. But if you don't prep the surfaces properly, the caulk won't last long. And if you're sloppy, the messy caulk job will ruin the look of even the most beautiful tile job. We talked to a few experts to learn how they get such smooth, clean-looking caulk lines, and we'll show you their technique. And we'll show you the best way to remove the old caulk and prep the surface to get a long-lasting caulk job. Finally, we'll give you a heads-up on how to avoid the most common caulking mistakes.

You can remove the old caulk, prep the surface, and recaulk a tub or shower in about four hours (including drying time). You'll need a razor scraper and single-edge razor blades, caulk remover, mineral spirits, paper towels, a utility knife, a caulk gun, and kitchen and bath caulk. An oscillating tool with a flexible scraper blade really speeds up the job of removing old caulk, but you can do the job without it. Here's how to start.

Buy the right caulk and a quality caulk gun

Tubs and showers require a special caulk that contains mold and mildew prevention additives. The tubes are usually labeled "for kitchen and bath use." Most are 100 percent silicone, but you can also find some latex versions. Latex caulk is easier to tool and cleans up with soap and water. If this is your first time applying caulk, latex may be your best option. Silicone is more challenging to tool and requires mineral spirits for cleanup.



However, silicone lasts longer than latex and stays flexible over its life. But it's harder to remove when it's time to recaulk. Both types can develop mold and mildew once the additives wear out.

Most home centers and hardware stores stock only three kitchen and bath caulk colors: white, almond and clear. However, ask a salesclerk whether you can special-order a custom color. And check out a paint or hardware store. Some can custom-mix colors right in the store.

A high-quality caulk gun can make a difference in your caulk job. It has a sturdier plunger mechanism to provide a smooth, even flow and a pressure release

to stop the flow quickly. High-quality caulk guns cost a bit more (about \$15), but they're worth it. Economy guns usually have a ratchet action or a sloppy friction mechanism that pushes the caulk out in bursts, so you apply too much in some areas and too little in others.

Remove the old caulk

You can't apply new caulk on top of the old and expect it to last. So the old caulk has to go. If the old caulk was silicone, you have to devote extra effort to remove all traces of it before applying new caulk. Start by slicing through the old caulk with a utility knife or an oscillating tool

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1 CUT AND PEEL THE OLD CAULK

Slice through the caulk along the walls with a utility knife or with an oscillating tool equipped with a flexible scraper blade. Then use your knife or tool to scrape along the tub or shower floor.



2 LOOSEN AND REMOVE THE REMAINING CAULK

Squirt caulk remover on all the remaining caulk and let it do the hard work. Then scrape off all the old caulk with a razor scraper. Wipe with a rag.

(Photo 1). Then scrape off as much old caulk as possible. Next, apply caulk remover (3M, Goof Off, Goo Gone, DAP and Motsenbocker all make caulk remover products) to break the adhesive bond and make it easier to scrape off (Photo 2).

Once the old caulk is gone, remove any loose grout between the walls and the tub or shower floor. Treat any mold in the grout along the wall/tub gap with a mold-killing product (one choice is ZEP Mold Stain & Mildew Stain Remover; less than \$10 a bottle at home centers). Scrub the grout and then rinse off the mold killer with water and let it dry (use a hair dryer to

speed the drying). Clean the surfaces one last time with mineral spirits. Let dry.

Mask the gap

Some pros scoff at the idea of using masking tape. But they caulk every day and can lay down a caulk bead with their eyes closed. For DIYers, we recommend masking the gap. It takes a bit more time, but you'll get much better results than caulking freehand. Start by finding the largest gap between the tub/shower and the walls. That gap dictates how far apart you must space the two rows of tape. Then apply the masking tape (Photo 3). If you have a fiberglass or composite tub, you should fill it before you caulk.



3 MASK THE GAP

Mask the wall corner gaps first. Then apply tape to the walls above the tub or shower floor. Finish by applying tape to the tub or shower floor.

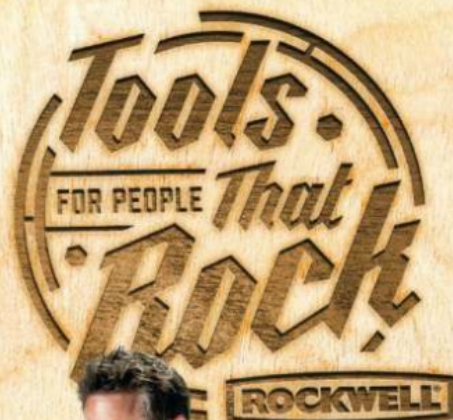


4 CUT, PUSH AND APPLY

Cut the nozzle tip to match the gap width. Hold the gun at a 90-degree angle to the gap and push a bead of caulk slightly ahead of the nozzle as you push the gun forward and continue applying pressure. Apply only enough caulk to fill the gap.

AVOID THESE CAULKING MISTAKES

- **Buying the wrong caulk.** Always use kitchen and bath caulk in a tub or shower. It contains mold and mildew inhibitors that are not present in other types of caulk.
- **Caulking on top of old caulk.** New caulk doesn't bond well to old caulk, especially if the old caulk contains silicone. Just like with painting, better surface prep provides better results.
- **Not removing mold on grout near the caulk areas.** Grout is porous, and any mold present in the grout above the caulk line will eventually spread down into the new caulk area and destroy the bond.
- **Cutting the nozzle larger than the gap you're filling.** A larger opening applies too much product, making it harder to tool and clean up.



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5 TOOL WITH YOUR FINGER

Wet your finger with water and start at an outer corner. Wipe your finger across the caulk to create a rounded bead and remove excess caulk from the gap.



6 PEEL OFF THE TAPE

Lift a corner of the tape along the tub and pull it off at a steep angle while the caulk is still wet. Then remove the tape along the wall. Remove the tape from the wall corners last.

Apply the caulk bead

There are two schools of thought when it comes to tip angle and whether to pull or push the caulk. Our experts prefer cutting the caulk tube nozzle at a

blunt 20-degree angle, instead of 45 degrees. And they hold the gun at a 90-degree angle to the gap while pushing a small bead ahead of the tip (**Photo 4**).

That way, they can complete the entire bead in one pass. Plus, the gun pressure forces the caulk deeper into the gap for better holding power and sealing.

If you cut the tip at a 45-degree angle and pull the gun away from the starting corner, your gun will always run into the opposite corner, forcing you to flip it 180 degrees and start the bead again. That creates a blob where the two beads meet, making tooling more difficult. Plus, pulling the gun tends to apply a surface bead that doesn't penetrate as far into the gap.

Whichever tip angle you choose, always cut the tip with a sharp utility knife rather than the cheesy guillotine mechanism built into some caulk guns. Remove any burrs with a utility knife or sandpaper before caulking—the burrs will create grooves in the caulk lines.

Shape the bead and remove the tape

You can find all kinds of caulk-shaping tools at home centers. But if you take our advice and tape off the wall, you won't need any shaping tools. Just use your index finger to tool the caulk (**Photo 5**). After tooling, remove the masking tape while the caulk is still wet (**Photo 6**). Let the caulk cure for the recommended time before using the tub or shower.

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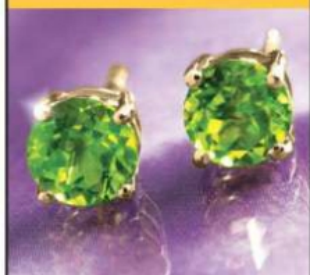
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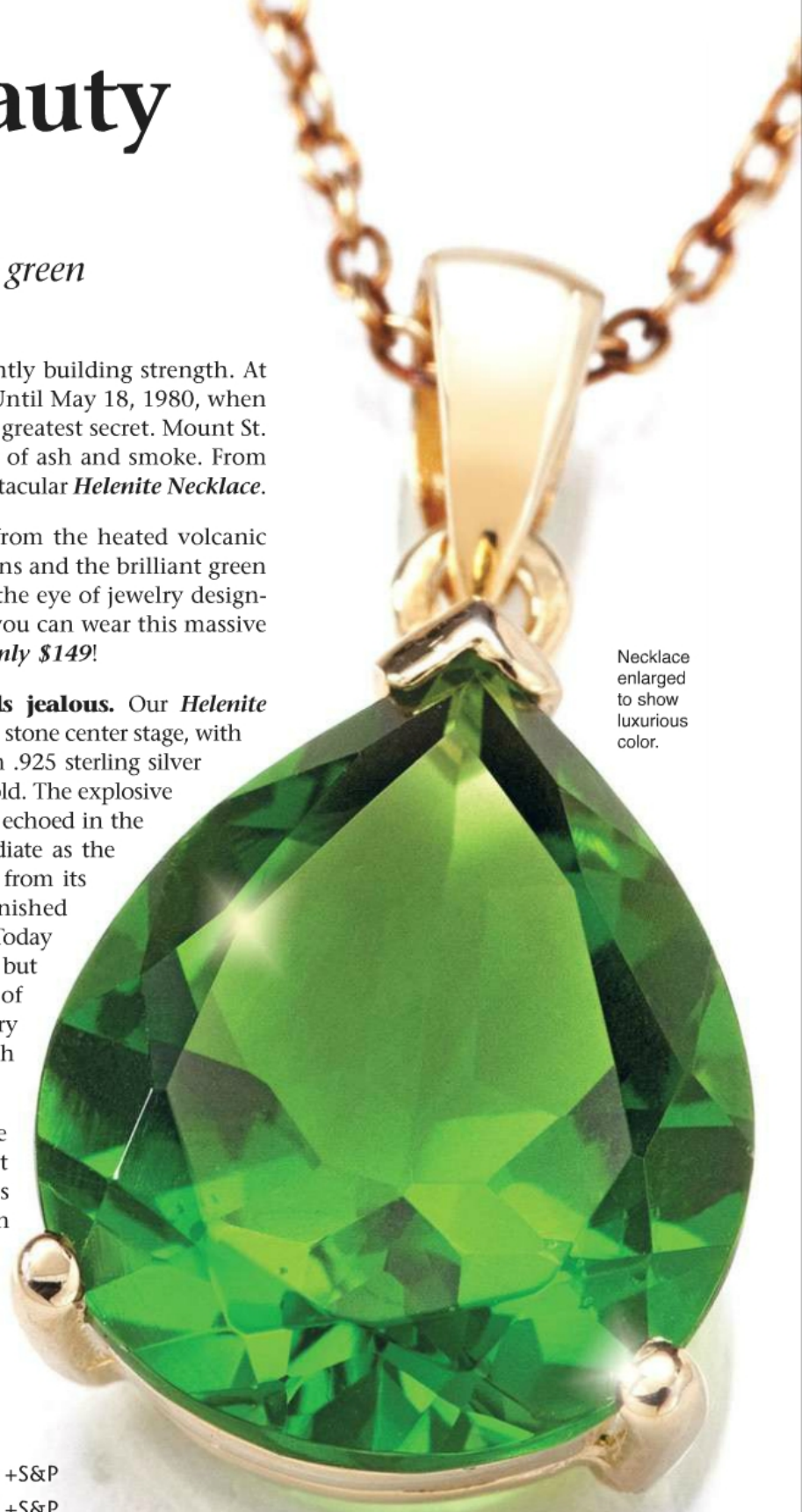
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Dealing with dead batteries

You probably keep jumper cables in your vehicle so you can solicit a jump if your battery dies or offer a jump to a fellow driver. But jumping batteries on cars built after 2000 might not be so smart. That's because newer vehicles contain as many as a dozen computers and even more digital devices. Jump-starting with cables connected to a running vehicle can create a voltage

surge large enough to fry expensive computers in either vehicle. And, since most of these components communicate on a shared data bus, surge damage to just one computer or digital device (even a radio) can disable the entire data bus, preventing the vehicle from starting and costing hundreds to diagnose and repair. Think about that: You can cause expensive damage to

your own car simply by providing a jump to someone else.

Here's the bottom line: Dealing with a dead battery in a modern vehicle requires new equipment and techniques. We'll get you up to speed on the latest jump-starting methods and show you what new equipment you need to safely jump-start and replace an automotive battery.

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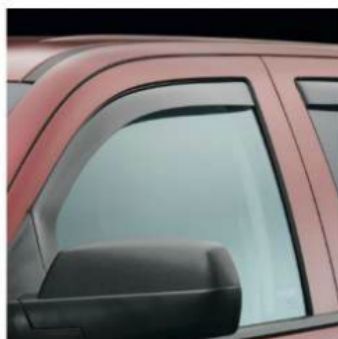
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Avoiding voltage spikes

When you connect jumper cables from a running vehicle to a dead battery, the alternator in the running vehicle instantly puts out maximum charging voltage. That can create a voltage spike of up to 15.5 volts in both vehicles. And it's that voltage spike that can fry computers and digital devices.

One way to eliminate the voltage spike is to leave the engine off in the donor car. That will prevent frying computers in the donor car. But if the car won't start right up, don't grind away to the point that you end up with dead batteries in both cars!

Jump-starting with a jumper pack (also called a booster pack or a juice pack) is a better alternative. The battery inside the jumper pack provides the boost to the dead battery at a safe voltage. When used properly, it's the safest way to protect the electronics in the dead vehicle while providing enough boost to get the engine running.

To use a jumper pack, first turn off all lights and electrical accessories in the dead vehicle. Next, connect the cables the same as you would ordinary jumper cables—positive clamp to the positive battery post and negative clamp to a metallic engine component or chassis grounding point. Then try starting the vehicle. Follow the jumper pack's instructions for maximum cranking times. If the jump works, you're all set. If not, you tried your best and didn't damage any electronics.

Choosing a jumper pack

Big-box retailers and auto parts stores sell jumper packs and emergency and recreational portable power packs. Even though both have battery cables and clamps, they're two different animals. Emergency and recreational portable power packs are designed to provide low power for long periods to get you through a power failure or provide portable power for picnics, camping or tailgating. They may start a vehicle with a slightly discharged battery, but they may not pack enough punch to jump-start a seriously discharged battery or start a vehicle that's flooded. Packs meant for jumping, on the other hand, have batteries that'll deliver a lot of power for short periods and are the ones to buy if emergency battery jumps are your intended purpose.

Here's how to choose a jumper pack. First, ignore the pack's peak amp rating. Peak amps doesn't indicate the pack's ability to

POWER PACK VS. JUMPER PACK

Emergency portable power packs and jumper packs look alike, but they're built with different batteries. A power pack battery is designed to provide low power for long periods, while a jumper pack battery is designed to provide maximum power for short periods to start a deeply discharged vehicle battery. A power pack can usually provide enough power to jump a slightly discharged vehicle battery, but that can shorten the life of the unit.



USES FOR AN EMERGENCY PORTABLE POWER PACK

- Power port sockets for recharging phones and tablets during a power failure.
- Inflate a spare tire.
- Light up a work area.
- Jump a slightly discharged vehicle battery.



USES FOR A JUMPER PACK

- Jump-start a dead battery.

PEAK AMPS VS. CRANKING AMPS

Many manufacturers list a peak amp rating on their pack. But it's not a reliable indicator of battery power. Instead, check for the pack's cranking amps (CA) rating. To arrive at the CA rating, the battery is discharged for 30 seconds. The number of amps the battery delivers during that period while still maintaining at least 1.2 volts per cell is its CA rating. The higher the CA, the better the battery.

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KEEPING IT CHARGED

If your jumper pack is equipped with an internal charging mechanism, plug an AC extension cord into it and connect to any receptacle. The internal charger is the easiest to use but the most costly to repair if it fails. If an external transformer ever fails or you misplace it, simply order a new one from the manufacturer. Some units come with a power port adapter used for emergency charging.

How a Chicago Doctor ***Shook Up*** the Hearing Aid Industry with his ***Newest*** Invention

New nearly invisible digital hearing aid breaks price barrier in affordability

Reported by J. Page

Chicago: Board-certified physician Dr. S. Cherukuri has done it once again with his newest invention of a medical grade **ALL DIGITAL affordable hearing aid**.

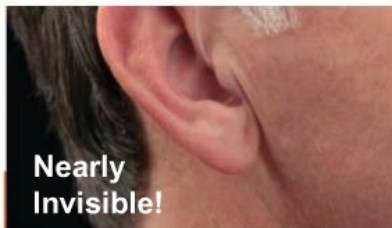
This new digital hearing aid is packed with all the features of \$3,000 competitors at a mere fraction of the cost. **Now, most people with hearing loss are able to enjoy crystal clear, natural sound—in a crowd, on the phone, in the wind —without suffering through “whistling” and annoying background noise.**

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Dr. Cherukuri knew that many of his patients would benefit but couldn't afford the expense of these new digital hearing aids. Generally they are *not* covered by Medicare and most private health insurance.

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FDA Guidance and Consumer Education

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start a vehicle. Instead, look for the unit's cranking amps (CA) rating. You need a minimum of 225 CAs to start a four- or six-cylinder engine. (One jumper pack that meets these specs is the Clore JNC300XL with 225 CA; \$85 at sears.com). If you have a larger engine or want more power, find a pack with 400 or more CAs. (Two choices at amazon.com are the Clore ES5000 with 400 CA, \$130; and the Schumacher PSJ-3612 with 470 CA, \$270.)

Keep the pack charged

Jumper packs require regular recharging. You can't charge a pack, throw it in your truck for six months and expect it to work when you need it. Recommendations vary, but count on recharging a jumper pack at least once every 30, 60 or 90 days. If you don't keep the pack charged, its battery will degrade to the point that it won't accept or hold a charge. Then you'll have to buy a new battery, which costs almost as much as a pack. However, if you maintain it properly, it'll last for several years.

Jumper packs must be recharged at a very low rate (usually less than 1 amp)

for long periods (usually 24 hours). The units come with a wall transformer or an AC extension cord (as shown on p. 78) that plugs into an internal transformer. Some packs also come with a power port adapter cable for emergency charging. Since a port outputs almost 12 amps (12 times the recommended charging rate), always follow the manufacturer's instructions to avoid overheating the internal battery. Finally, never connect a jumper pack to the battery on a running vehicle or to an automotive battery charger. The high charging rate will destroy the jumper pack battery.

Maintaining a jumper pack is a hassle. They're not the perfect alternative to jumper cables, just the safest. So it really comes down to this: You can drag the pack inside and charge it periodically, or you can take your chances with jumper cables. If you forget to recharge your jumper pack, you're out about \$125. If you fry an electronic component while using jumper cables, you're looking at a minimum of \$500 for a tow, diagnostic fee, labor and parts. The choice is yours.

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MAINTAIN COMPUTER MEMORY WHEN CHANGING A BATTERY

Replacing a battery in an older vehicle is simple; remove the cables and hold down and swap in the new battery. But if you're changing a battery in a vehicle built after 2000, a jumper pack and power adapter cables are good tools to have on hand. That's because newer vehicles require backup power (a minimum of 12 volts) to maintain the "learned" calibrations for the electronic throttle body, anti-pinch windows, power sliding door, HVAC actuators, theft-deterrent radio and security system. If you don't provide backup power, the vehicle will "forget" the calibrations when you disconnect the old battery. Then, when you connect the new battery, the vehicle may not start or may run so poorly that it has to be towed to a shop. Some vehicles require costly (\$150 and up) dealership-only recalibration with a factory scan tool. Others will run poorly until they eventually relearn.

You can avoid all those recalibration issues by providing backup power to the vehicle while you change the battery. Use your jumper pack with a special cable (SOLAR ESA30 OBD II Memory Saver Connector; \$13 at tooltopia.com). Find the OBD II diagnostic port on your vehicle (usually under the dash on the driver's side) and push the D-shape connector onto the port. Plug the other cable end into a jumper pack or emergency and recreational portable power pack. Then remove the battery cables (negative cable first) and insulate each one with electrical tape or shove them into a nonconductive cover to prevent shorting.



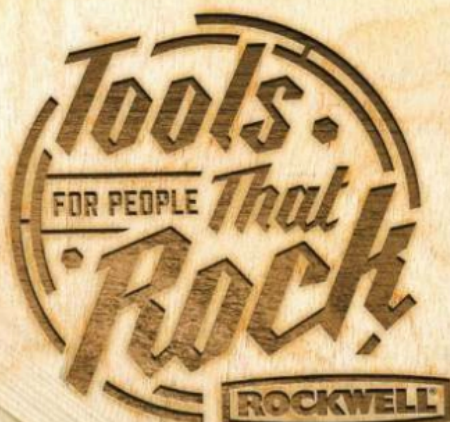
CONNECT THE BACKUP POWER

Let the engine sit for at least 15 minutes to allow the computer modules to power down. Then find the OBD II diagnostic port on your vehicle (usually under the dash on the driver's side) and push the D-shape connector onto the port. Then plug the other cable end into a jumper pack or emergency and recreational portable power pack.



INSULATE THE BATTERY TERMINAL

Remove the negative cable first and insert it in a nonconductive cover, like a leather glove. Repeat on the positive terminal. Then replace the battery and install the negative cable last.



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DIY Quiz

BY TRAVIS LARSON

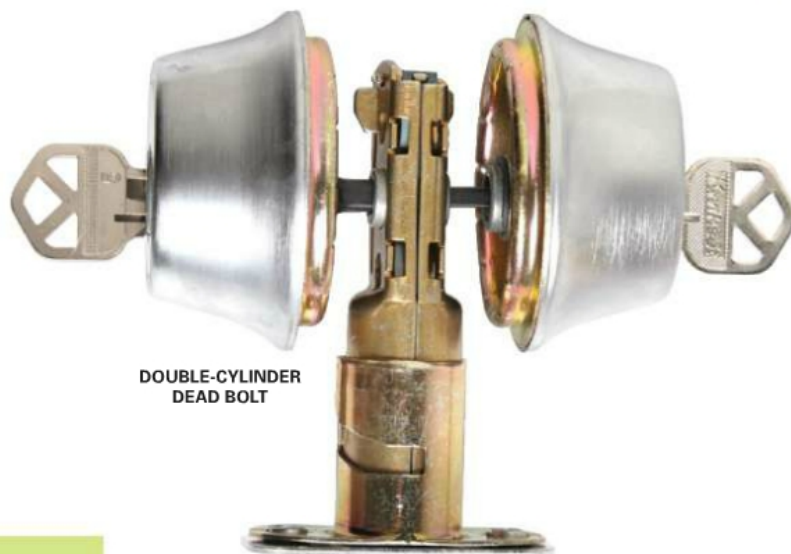
editors@thefamilyhandyman.com

Put on your thinking cap and take this month's quiz to see just how smart you are when it comes to DIY. Here's how it works:

- There are easy, intermediate and really tough questions all mixed together.
 - There may be more than one correct answer!
 - Find the answers and get your DIY rating on pp. 84 and 85.
- Good luck!

1. Double-cylinder dead bolts can be dangerous because:

- A. The internal tumblers are more easily picked.
- B. They pose a safety hazard during home fires.
- C. Users often forget to engage the second cylinder.
- D. This is a bogus question. They're not risky at all.



DOUBLE-CYLINDER DEAD BOLT

2. What's the difference between Type M and Type L copper?

- A. Type L copper has thicker walls.
- B. Type M copper has thicker walls.
- C. Type L copper is really a copper alloy combined with two other metals to give it more strength and corrosion resistance.
- D. Type M copper is used strictly for high-pressure commercial applications.



3. What could cause your brakes to squeak?

- A. Warning rivets that indicate your pads need replacing.
- B. Failure to apply copper grease to the back of the pads during installation.
- C. A warped rotor, which sets off a harmonic hum that sounds like a squeak.
- D. A pebble lodged between the caliper and the rotor.



SINGLE-CYLINDER DEAD BOLT

4. Which would cause a gas water heater to gurgle?

- A. Sediment collecting at the bottom.
- B. A missing or broken dip tube.
- C. An airlock above the water level.
- D. Defective burners producing inadequate heat.

6. True or False?

Sandpaper grit numbers refer to the number of abrasive particles per square centimeter on the sandpaper.

5. True or False?

Even if your car doesn't require premium gas (90+/- octane), it's a good idea to use it during cold winter months for easier starting.



7. Car manufacturers are switching over to ceramic brake pad materials because:

A. They last longer and enable you to stop faster than other pads.

B. They're the quietest pad available.

C. They're easier on your rotors.

D. They don't generate as much brake dust, which wrecks the appearance of alloy wheels.

8. The No. 1 cause of furnace trouble is:

A. Igniter failure

B. Blocked exhaust

C. Unpaid energy bill

D. Dirty air filter

9. Plastic dryer duct is a good choice because:

A. It's flexible and easy to run.

B. It's translucent, so you can see lint deposits.

C. It conducts less heat than metal does, so it saves on energy costs.

D. It's actually a poor choice because in the event of a lint fire, it won't contain the fire.

10. What does "UF" stand for in reference to cable?

A. Universal fixture

B. Underground feeder

C. Ultra Field

D. Universal feed

11. What is this tool used for?

A. Attaching ends on Ethernet cable

B. Crimping F-type connectors onto coaxial cable

C. Stripping communication cable

D. Stripping coaxial cable



12. Wood is designated as either hardwood or softwood depending on:

A. Its rating on the Janka wood hardness scale. Above 1,000 it's a hardwood; below 1,000 it's a softwood.

B. Whether the tree bears cones.

C. The density of the wood pulp.

D. The terms are arbitrary; neither has a definitive meaning.

13. True or False? When you're drywalling a ceiling with 24-in. spacing on framing, you should always use 5/8-in. drywall to prevent sagging.

14. "Cross taping" is a way to:

A. Check to make sure something is square.

B. Secure a pickup load.

C. Tape drywall to ensure a crack-free wall.

D. Mask off a pattern on a wall for decorative painting.

15. True or False? When determining desired swing directions on casement windows, pretend your back is against the hinge-side jamb. If the window swings left, it's a left swing; right, it's a right swing.

Find the DIY Quiz answers on pp. 84 and 85.

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DIY Quiz Answers

1. (B) Because double-cylinder dead bolts require a key to unlock them from the inside as well as the outside, they can keep you from getting out of the house during a fire. When you're at home, you should leave the key in the lock set or hang it on a nail near the lock.



2. (A) Type L copper has thicker walls for handling higher pressures. Type M is typically used for residential plumbing. Type L is sometimes used for acidic water, but PEX is now the best choice in that situation.

3. (A, B and D) All three of these scenarios can cause your brakes to squeal or squeak. A warped rotor will feel like a vibration or chatter when you apply the brake pedal.



4. (A) Minerals from water form a thick layer of sediment at the bottom of the tank. When the sediment is heated from below, steam "burps" up through the debris the same way it rises through oatmeal cooking on the stove.

5. False. Your car won't start any easier, get any better mileage, get any more power or anything else if you buy premium gasoline. However, if your particular car requires it, you can damage the engine by not using it.

6. False. The grit number refers to the size of each granule. The bigger the grit number, the smaller the granules. A manufacturers' association standardizes the numbering system. If you'll pardon the pun, the grit number gives consumers a "rough" idea of how aggressive the sandpaper is.

7. (B, C and D) Contrary to popular wisdom, brakes with ceramic pads don't stop your car any faster or last any longer.

8. (D) Dirty air filters can greatly restrict the airflow in your furnace. Poor airflow can cause the heat exchanger to overheat and shut down the burners. It will automatically reset a few times, but if the problem continues, your furnace will shut down completely.



9. (D) Plastic dryer duct is a dangerous substitute for solid, smooth-walled metal pipes. Did you know that about 3,000 home fires occur in the United States each year because of clothes dryers? These fires are almost always caused by lint buildup at the bottom of the dryer near the heat source. The fire starts there and finds its way into dirty vent lines as well. The plastic has no hope of containing fire, and the corrugated surfaces actually encourage lint buildup. That said, cleaning lint from the bottom of the dryer and the vent pipes is even more important than avoiding plastic vent lines.



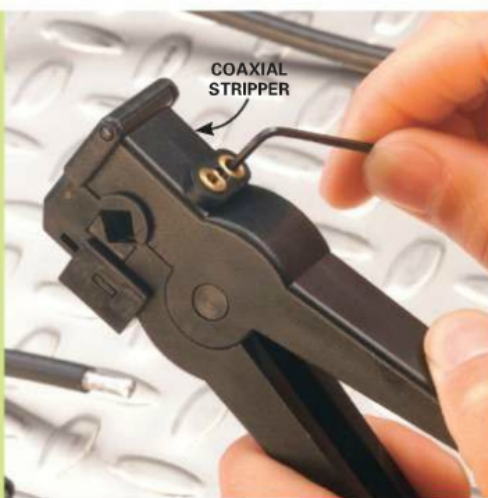
10. (B) Underground feeder wire has extra plastic insulation molded around the individual wires to provide greater protection for buried cables.



WHAT'S YOUR LEVEL OF EXPERTISE?

Beginner: 0 – 5 correct
Intermediate: 6 – 12 correct
DIY Guru: 13 – 15 correct

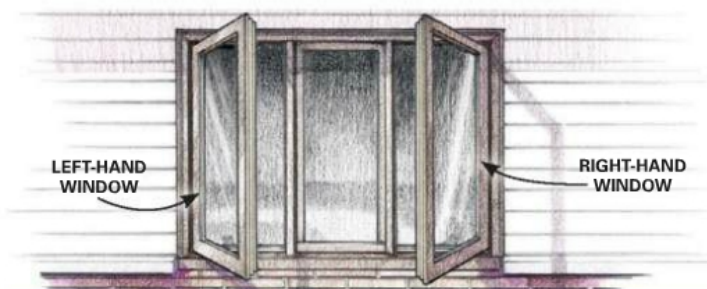
11. (D) The coaxial stripper peels back various layers of coaxial cable to prepare it for F-type connectors. Fine adjustments are sometimes necessary depending on the brand of the coaxial cable.



14. (A) Cross-taping involves measuring opposing corners of a square or rectangle. Identical measurements ensure a square structure.

12. (B) Softwoods are part of the coniferous, or cone-bearing, group of trees, which include pine, fir and cedar. Hardwoods, such as oak, maple and walnut, produce seeds with a covering such as a fruit or nut. The terms "hardwood" and "softwood" don't always describe a wood's hardness. For example, Southern yellow pine is a hard softwood, and balsa is a soft hardwood.

13. False (although it used to be true). New drywall products like ToughRock, a 1/2-in.-thick drywall from Georgia-Pacific, are rated to span 24-in. spaces without sagging. Why should you care? It's a heckuvalot lighter, that's why!



15. False. While that's what you do for ordering doors, it's just the opposite with casement windows.



Less Pees, More Zzz's...

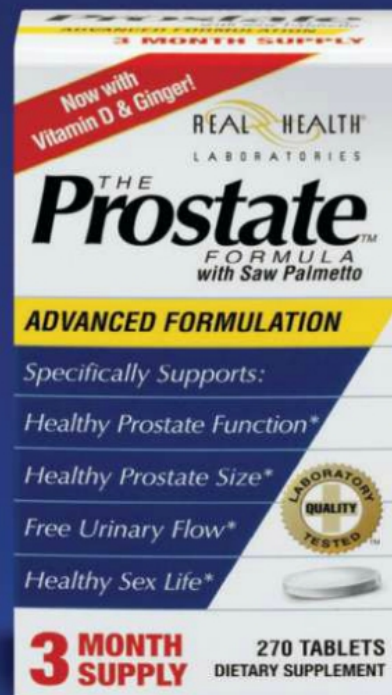
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Figure E
Top detail

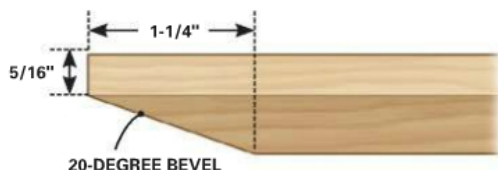
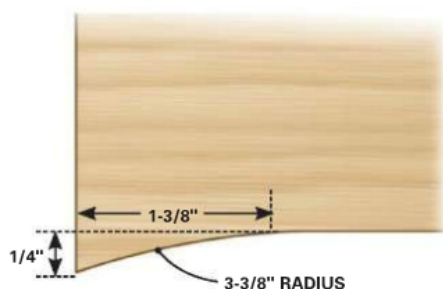


Figure F
Apron detail



Statement of ownership, management, and circulation

Statement required by the Act of August 12, 1970, Section 3685, Title 39, United States Code, showing the ownership, management and circulation of THE FAMILY HANDYMAN (USPS 515-930) published monthly (except bimonthly in December/January and July/August) 10 times a year, at 1610 N. 2nd St., Suite 102, Milwaukee, WI 53212-3906, as filed on Sept. 30, 2014. Annual subscription price: \$24.

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The Family Handyman

Issue date for circulation data: October 2014

Average number of copies of each issue during preceding 12 months, and of the single issue published nearest to filing date, respectively, is as follows:

	Average	Single Issue
Total number of copies printed (net press run)	1,183,113	1,185,178
Mail subscriptions	1,004,596	998,219
Paid distribution—sales through dealers and carriers, street vendors and counter sales	58,522	63,737
Total paid distribution	1,063,118	1,061,956
Free or nominal-rate distribution	24,068	24,136
Total distribution	1,087,186	1,086,092
Copies not distributed	95,927	99,086
Total	1,183,113	1,185,178
Percent paid and/or requested circulation	98%	98%
I certify that the statements made by me above are correct and complete.		
Jim Woods, Vice President, Planning, Consumer Marketing		

Cutting List

KEY QTY. DIMENSIONS NAME

3/4" OAK PLYWOOD

A	2	28-3/4" x 76-1/2"	Bed face panels
B	2	15-1/2" x 82-1/8"	Bed cabinet verticals
C	1	15-3/8" x 58-3/8"	Bed headboard
D	1	15-9/16" x 58-1/2"	Bed cabinet top
E	1	14-3/4" x 58-3/8"	Bed header panel
F	4	11-1/2" x 72-3/8"	Bookcase verticals
G	1	7-5/8" x 56"	Head rail
H	1	2-3/4" x 56"	Foot rail
J	2	5-1/8" x 75-1/4"	Side rails
K	2	5-3/4" x 59-3/8"	Bed fascia box front/back
L	2	5-3/4" x 14-1/2"	Bed fascia box sides
M	2	11-9/16" x 19-5/16"	Bookcase top
N	4	11-1/2" x 18-1/2"	Bookcase top/bottom shelves
P	2	11-1/4" x 18-1/2"	Bookcase middle shelves
Q	2	11-1/4" x 13-1/2"	Pullouts
R	4	10-1/2" x 18-1/4"	Adjustable shelves
S	4	4-3/4" x 19-3/4"	Bookcase fascia box front/back
T	4	4-3/4" x 10-1/2"	Bookcase fascia box sides
U	2	15-3/8" x 16-1/4"	Doors

1/2" BIRCH PLYWOOD OR MDF

V	1	16" x 59-3/8"	Bed fascia trim boards
W	2	12" x 19-3/4"	Bookcase fascia trim boards

1/4" OAK PLYWOOD

X	2	28" x 75"	Mattress supports
Y	2	19-1/4" x 19-3/8"	Bookcase back

3/4" OAK

Z	1	5-3/4" x 60"	Bookcase base
AA	1	2-3/8" x 80"	Bed base
BB	2	2-3/4" x 58-3/8"	Bed header front/back
CC	1	2-3/4" x 182"	Top trim
DD	4	2" x 72-3/8"	Face frame stiles
EE	4	2" x 16"	Face frame rails
FF	2	3/4" x 16"	Middle shelf edges
GG	2	1-3/4" x 15-7/8"	Pullout fronts
HH	4	1-1/2" x 11"	Pullout sides
JJ	4	1-1/4" x 18-3/8"	Adjustable shelf trim
KK	2	1-1/2" x 5-1/8"	Side rail end trim
LL	2	3/4" x 76-1/2"	Side rail edges
MM	2	3/4" x 82-1/8"	Bed cabinet edges
NN	1	3/4" x 54-1/4"	Leg support rail
PP	1	1/2" x 168"	Fascia trim

1/4" OAK

QQ	1	5-3/4" x 59-7/8"	Bed fascia front
RR	2	5-3/4" x 16-1/4"	Bed fascia sides
SS	2	4-3/4" x 20"	Bookcase fascia fronts
TT	2	4-3/4" x 12-1/4"	Bookcase fascia sides
UU	3	4-3/4" x 19-1/4"	Bed panel drawer fronts
VV	4	4" x 22-15/16"	Bed panel bottom rails
WW	4	3" x 40"	Bed panel upper stiles
XX	4	3" x 30"	Bed panel lower stiles
YY	4	2-1/2" x 22-15/16"	Bed panel upper rails
ZZ	2	2" x 33-1/4"	Bed panel upper mullions
AAA	2	2" x 23-1/2"	Bed panel lower mullions
BBB	2	3/4" x 58"	Bed panel horizontal dividers
CCC	4	2" x 16-1/2"	Door panel stiles
DDD	2	2-1/2" x 12"	Door panel bottom rails
EEE	2	2" x 12"	Door panel top rails
FFF	1	3/4" x 600"	Edging

3/4" POPLAR

GGG	10	1-1/2" x 54-1/2"	Bed frame struts
HHH	2	1-1/2" x 75"	Bed frame sides
JJJ	2	1-1/2" x 14-3/4"	Bed header mounting cleats
KKK	4	1-1/2" x 11-1/2"	Bottom shelf cleats
LLL	4	1-1/4" x 11-1/4"	Middle shelf cleats
MMM	2	1" x 17"	Top shelf front cleats
NNN	4	1" x 11-1/2"	Top shelf side cleats



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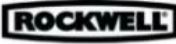
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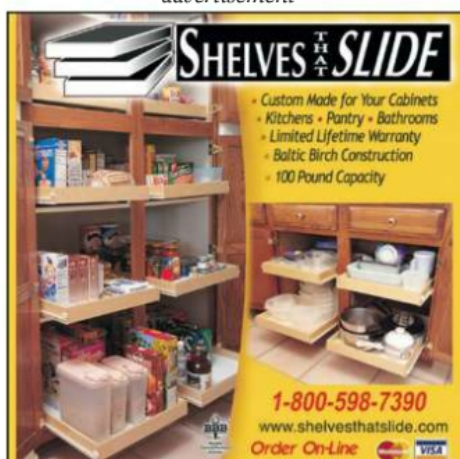
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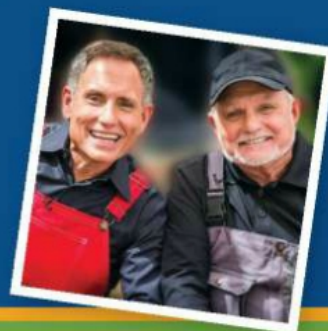
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On the House

With the Carey Brothers
Tips of the Month



SLASH YOUR HEATING COSTS WITH INFRARED ZONE HEATING!

Are you seeking ways to lower your winter heating bill? If you've insulated, caulked, sealed and performed other energy-efficient upgrades and your heating costs are still more than you can bare and, worse, you're still chilly, you may want to consider investing in a portable heater. A portable heater is not a replacement for a whole-home heating system. It is designed to heat certain areas (zones) of your home without the need to fire up your whole house heating system. When it comes to heating costs and comfort, remember the 80/20 rule. Most people spend 80% of their time in only 20% of their home. Why pay to heat your entire home if you're only occupying part of it?

Keep in mind that not all portable heaters are created equal. The old standby has been a cheap, inefficient and potentially dangerous electric-resistance coil heater. Thanks to advances in portable heating systems, today you can get the best bang for your portable heating buck with a heater that utilizes infrared technology. Many traditional space heaters run constantly, get very hot and can be a fire hazard. In contrast, infrared heating can maintain an even, comfortable heat setting by running as little as 15 or 20 minutes per hour. The difference is the transfer of heat. The infrared warmth is absorbed by your body – similar to infrared waves from the sun. Everything in the heating zone absorbs the heat – carpeting, furnishings, clothing, blankets AND people. The zone is heated with less energy because of the process of transferring infrared heat.

A leading infrared portable zone heater manufacturer, SUNHEAT International, uses 24 ounces of copper and six commercial-grade quartz tubes to compose the heat chamber of it's newest, fully American-made model, the new Original SUNHEAT USA 1500. These core elements, combined with a high velocity fan and washable filter, produce a heat output equaling your room temperature plus 120°F. This highly efficient output allows the infrared heat to be absorbed by the moisture in the air as it's pulled through the heat chamber. The heated air then flows out of the heater and transfers soft infrared warmth to the people and objects in the room, heating up to 1,000 square feet. Consequently, you will be able to turn down the furnace that's working unnecessarily to heat the rest of your home, which will slash heating costs. The U.S. Energy Information Administration (EIA) estimates that for every degree you lower the temperature setting on the furnace you will save 3% to 5% off your heating costs.

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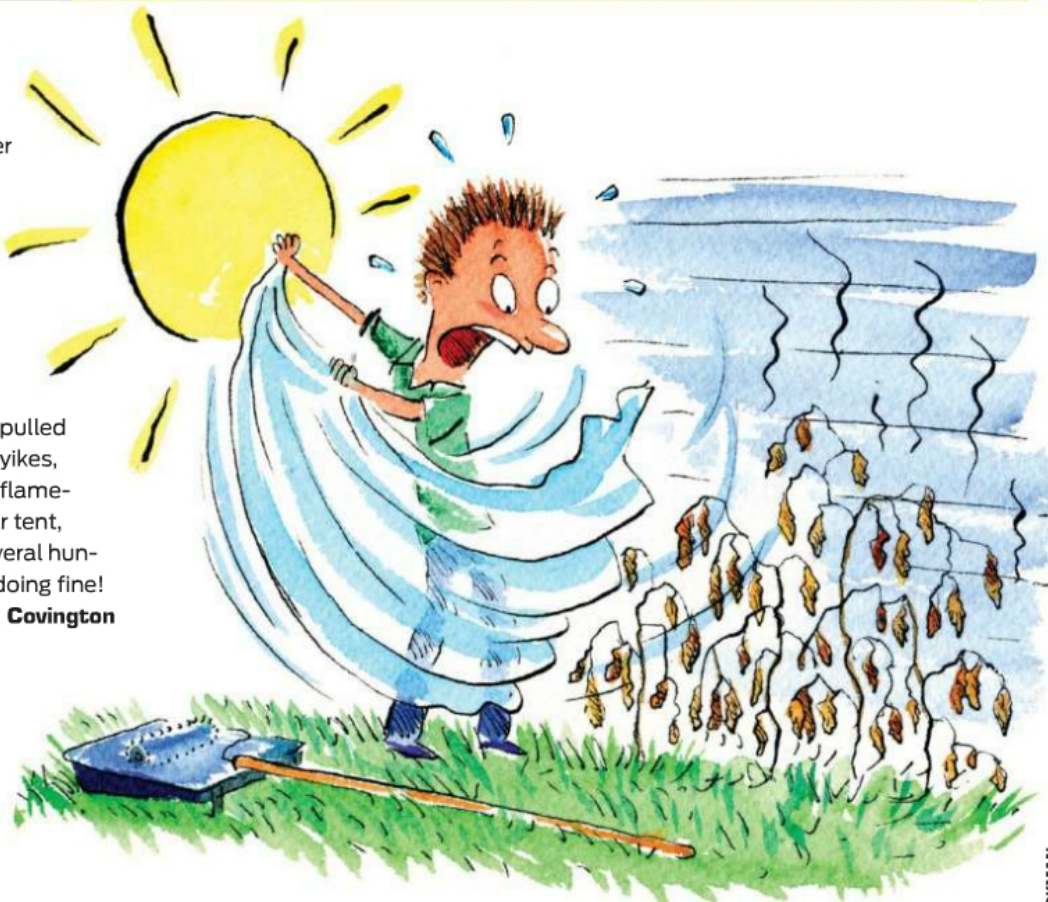
PAINT ME BLUE

I got up early one Saturday last summer to paint the large gable end of the house before the afternoon heat. Below the gable were a group of variegated aucuba bushes (my wife's favorites), so to protect the leaves from paint drips, I draped them with a plastic drop cloth. I climbed the ladder and started painting. After five hours I was finished, and so were the plants! I pulled the plastic away from the bushes, and yikes, they looked like they had been hit by a flame-thrower. The plastic had created a solar tent, overheating and killing the bushes. Several hundred dollars later, the new bushes are doing fine!

Dwight H. Covington



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Screen repair again....

Recently I was working in my garage making some molding for my screen windows. The garage just happens to be where I store my screens in the winter—right behind my table saw. As I was ripping some strips of wood, a small piece jammed and the saw kicked it back fast and furious. Luckily I was out of harm's way, but my stack of screen windows wasn't so lucky. The chunk of wood made it through six screens before coming to a stop. Now I really have a repair project!

Joe Magee



A horse of a different color....

Last summer, after much debate about color selection, we were finally ready to paint our kitchen cabinets. I removed all the doors and hardware, and since it was a nice day, I decided to paint the doors and drawer fronts out by the driveway while my wife worked on the cabinet frames inside. After a couple of hours, my wife came to check the progress. "That's not the right color!" she shrieked. I had mistakenly grabbed one of the quarts we had rejected from our testing and was nearly halfway through painting the doors. "Well, it's only paint," I told her as she handed me the right color. Sheepishly I finished up the next day—after double-checking with her first!



Dan Doshan

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