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- Walnut Bookshelf
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#100 May 2003

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A READER'S DIGEST PUBLICATION

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Benchtop Planers 77

We chose the best of today's advanced machines.



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Cover photo by Bill Zuerke

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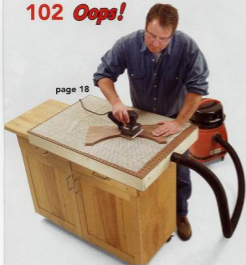
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Question & Answer

How Do I Get Rust Off My Saw?

Q. By accident, I left a pressure-treated 2x4 on my spotless tablesaw for a couple of days. Big mistake! What can I do to remove the rust it left behind?

A. Here is a fast and simple technique for removing light rust. Pull out your random-orbit sander and cut a square about the size of your disc from a non-woven abrasive pad. A green or dark-red 1/4-in.-thick Scotch-Brite pad is the right coarseness. The dark-red pads will last longer than the green ones.

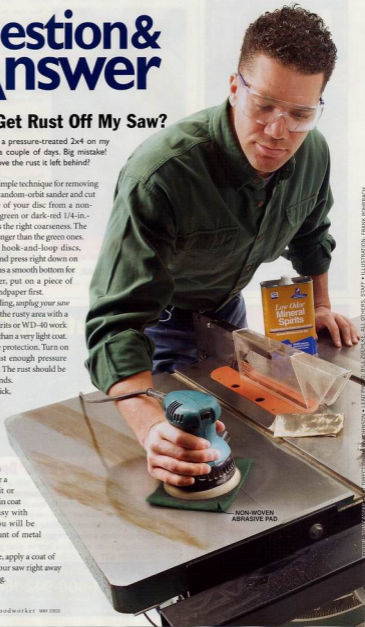
If your sander uses hook-and-loop discs, remove the sandpaper and press right down on the pad. If your sander has a smooth bottom for pressure-sensitive paper, put on a piece of coarse (60 to 80 grit) sandpaper first.

Before you begin sanding, *wash your saw* and apply a lubricant to the rusty area with a paper towel. Mineral spirits or WD-40 work well, but put on no more than a very light coat.

Now, put on some eye protection. Turn on the sander and exert just enough pressure to keep the pad in place. The rust should be gone in a matter of seconds.

If this doesn't do the trick, you've got two more options. First, try a light-duty rust remover as an alternative lubricant (see Sources, page 100). If that doesn't work, switch to a more abrasive pad or a sandpaper disc (220 grit or higher). Again, apply a thin coat of lubricant. Take it easy with sandpaper, because you will be removing a small amount of metal along with the rust.

When the rust is gone, apply a coat of furniture paste wax to your saw right away to prevent it from rusting.



NON-WOVEN
ABRASIVE PAD

Question & Answer

Which is the Right Air Fitting?

Q. I bought a new coupler for my air hose, but it doesn't fit my tools. All the couplers looked the same. Aren't these things standardized?

A. No, there are actually five different styles in the 1/4-in. size. But you can easily solve your problem by buying a "universal" quick connect for your hose. At around



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STYLE



AUTOMOTIVE
STYLE



ARO
STYLE



UNIVERSAL
COUPLER

\$5.50, it is a bit more expensive than a regular coupler (see Sources, page 100), but it fits the three most popular styles of fittings: industrial, automotive and ARO. Most woodworking tools use the industrial style.

There are no functional differences among the styles. Years ago, each manufacturer devised their own special shape. Every store that carries fittings will have the industrial and automotive styles. Some stores will have all five.

If you don't buy the universal coupler, be sure to take the fitting you are trying to match with you to the store, and try the fitting in a coupler before you buy it.

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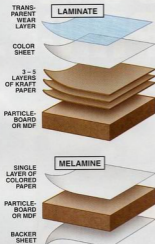
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Outfeed Table: Melamine or Laminate?



Q. I'm building an outfeed table for my table saw. Should I use melamine or plastic laminate?

A. Plastic laminate is more durable than melamine, but it will cost you more time and money to install.

Laminate provides more abrasion and impact resistance than melamine. You're less likely to wear through the top layer or dent and scar it. A top with laminate on *both* sides will sag far less than a melamine top. Thermofused melamine, the kind most commonly found at lumberyards and home centers, has a single layer of paper adhered to the front and back of a particleboard substrate, heat-fused with melamine resins. Laminate is much thicker. On top is a sim-

ilar layer of paper, but under that is a decor sheet (which carries the color or pattern) and three to five layers of kraft paper fused to the first two layers with tough phenolic resins.

Before choosing laminate, however, consider cost and labor. A 4x8 sheet of thermofused melamine costs about \$25. Cut it to the size you need, and you're ready to go. For the sake of comparison, a 4x8 sheet of laminate costs about \$55. Add to that the cost of the particleboard or medium-density fiberboard (MDF) substrate (\$20 to \$25), and the contact cement. You have to apply laminate to a substrate yourself and trim it with a router. You can wear out and replace several melamine outfeed tables for the same cost as one laminate table.



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Question & Answer

Must I Release the Tension?

Q. Do I really have to take the tension off my bandsaw, or can I leave it tightened all the time?

A. If you want the longest life out of your saw and sawblades, release the tension when your saw will sit idle for more than a few days. You don't have to take off *all* the tension. Just rotate the tensioning crank two or three complete turns.

Leaving the blade tensioned can create several problems. First, it can result in your blade breaking prematurely. The next time a blade breaks, examine it carefully. If it didn't snap at the weld, the break is likely the result of leaving the tension on.

Second, your tires will have a shorter life. Leaving the tension on will prematurely flatten their crowns and harden the rubber, eventually causing tracking problems. Two new tires for a 14-in. saw cost about \$40, and they're no fun to replace.

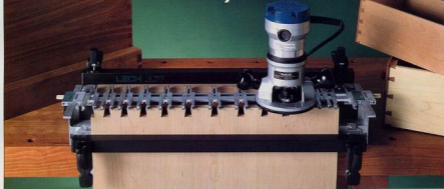
Third, you could prematurely compress the tension spring.

AW



If you have a question you'd like answered, send it to us at: Question & Answer, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121 or e-mail to qanda@readersdigest.com. Sorry, but the volume of mail prevents us from answering each question individually.

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Workshop Tips

Anti-Slip Dust-Collection Table

Here's a pair of sanding helpers that work great together. The rug pad provides a soft anti-slip surface. The Peg-Board, combined with the holes in the rug pad, allows dust to be sucked down through the table. My shop vacuum provides plenty of airflow.

I bought the wood for my sanding table at the local home center for about \$20. I found the anti-slip rug pad at the same store in the carpet department for \$6. The pad was bigger than my table, but was easily cut to size with a scissors.

Wayne Horne



ANTI-SLIP
PAD

1X4

1/8" - 24" X 48"
PEG-BOARD

3/4" PLYWOOD
BOTTOM

Workshop Tips



Rigid Routing Sled

A routing sled is a great help when coping the ends of rails and stiles. But I had a problem when I built my first sled. The pressure from the toggle clamp caused the 1/4-in.-thick sled base to deflect, which messed up the alignment of the rail-and-stile joints. I solved the problem by adding a board to the front of the sled, plus two top boards that bridge over my workpiece. This setup keeps the 1/4-in. base from bending when the toggle clamp is clamped down.

Sources See page 100 Fred Adams



Cool Tip

Changing the sanding sleeves on a spindle sander can be as tough as removing an old rusty bolt. Next time, try this trick: Put the drum in your freezer for 15 minutes. The cold will shrink the rubber drum and the sanding sleeve will almost fall off.

Alex K. Madler

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Pivoting Outfeed Support

I recently saw an outfeed stand that had a pivoting top. The pivoting action prevents a workpiece from catching the front edge of the outfeed top. Instead, the top just pivots up level as the workpiece passes over it. I figured I could make something similar that would work just as well.

For the base I used a sawhorse with a concrete block for extra stability. I screwed a couple of stop blocks to the top of the horse to keep the outfeed top from pivoting too far forward or backward. The top is a 3/4-in.-thick by 12-in.-wide by 36-in.-long melamine shelf that I bought at a home center for \$6. The 1x4 end brackets are set toward the back of the braces by 1 in. to make the outfeed top tip toward the tablesaw. The brackets are attached to the horse with a screw at each end. When the outfeed top is level, there is a 3/4-in. gap between it and the stop blocks. I trimmed the horse's legs so the outfeed top is level with my tablesaw.

David Dimick

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Dave Munkittrick



Table saw Tapering Jig



the board resting on the second screw. For the second cut, I just flip over the board and move it to the second screw (as shown in the photo), and rest the end of the board against the wood stop block. The toggle clamp holds the board in place during sawing. Once the screws are set you can cut perfect angles all day long.

Sources See page 100

Fred Adams

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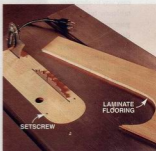
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Workshop Tips

Laminate Flooring for Zero-Clearance Inserts



Rather than mess with gluing up plastic laminate, I use a piece of laminate flooring when making zero-clearance inserts. Laminate flooring is great because it's stiff, with a nice slick surface. It's between 1/4-in. and 3/8-in. thick, which is just right for inserts. It also saws and routs nicely.

I bought a couple of sample pieces of laminate flooring for \$6 per 8-in. by 48-in. piece. You can find it at home centers and flooring stores. Each plank makes four inserts.

To make my inserts I followed the directions in "Zero-Clearance Inserts," AW #95, September 2002, page 50. The only change I made was to use #10-24 by 3/8-in.-long socket-head setscrews for the leveling screws rather than flat-head screws. I prefer setscrews because I don't have to drill a countersink. Some saws require a 1/2-in. long setscrew because the support flanges that the insert rests on are lower. To determine the screw's size, measure from the top of your saw table down to the support flange. Buy setscrews that are about 1/16-in. to 1/8-in. shorter than this measurement. You can buy socket setscrews at most hardware stores for about 25 cents each.

Jack Martin
AW

Small Shop Tips



Double-Duty Roller Tables

I like getting double duty out of my tools whenever possible. So, when I decided to build outfeed tables for my miter saw and table saw, I worked up this dual-use design. The roller tables are simple to switch between machines and take up very little space when I store them against the wall.

I made the roller frames from 2x2s, a 1x4 and eight rollers. I just clamp the rollers to a pair of sawhorses when I use them with my table saw. I adjusted the height of my sawhorses so the tops of the rollers sit about 1/8-in. below the top of my table saw. When I use them with my miter saw I add a couple of spacer boards to make the rollers level with the miter saw's table. It cost me about \$100 to build the roller frames, not including the sawhorses.

Jim Norby

ROLLER

SPACER
BOARDS

2X2

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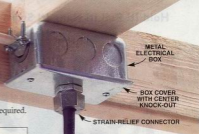
Sources See page 100

Small Shop Tips

Suspended Outlet

This is one of my favorite shop upgrades. By adding this suspended outlet over my work area I always have electricity close at hand. It sure beats running an extension cord across the floor and getting my feet tangled

in it. This suspended outlet is not difficult to install, but be sure to follow local building codes and use a ground fault circuit interrupter (GFCI), if required.



METAL ELECTRICAL BOX

BOX COVER WITH CENTER KNOCK-OUT

STRAIN-RELIEF CONNECTOR

STRANDED WIRE CORD

CORD RECEPTACLE

If you have any doubts, hire a licensed electrician.

The components include:

- a metal electrical box
- a box cover with a center knock-out
- a strain-relief cord connector
- a section of stranded-wire electrical cord
- a cord receptacle.

All of these parts can be purchased at a home center or hardware store for about \$15. If you're hooking into a 20-amp circuit, use 12-3 stranded-wire electrical cord and a 20-amp-rated plug. If you're hooking into a 15-amp circuit, use 14-3 stranded-wire electrical cord and a 15-amp-rated plug. I installed my outlet so the plug end is about 6 ft. off the floor so I don't bump my head on it.

Doug Baillie

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Small Shop Tips

Blade Caddy

Here's a handy tote for scrollsaw blades that I fashioned from a scrap of 2x6, a piece of plywood, and two Peg-Board multiple-tool holders. I cut the curved tips off the multiple-tool holders with a hacksaw so they would sit flat against the plywood.

I attached the holders to the caddy with cable staples. These small plastic tubes are perfect for holding scrollsaw blades. I wrapped some masking tape around each tube and wrote the blade size on it.

Richard Bombard



Sources See page 100



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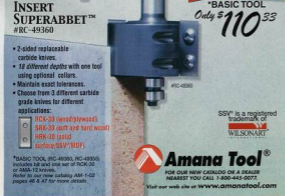
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Tackle Box Storage

This is my all-time favorite way to store screws, small hardware and router bits. Fishing tackle boxes come in a variety of sizes and shapes but I picked this one because the inner utility boxes have lids to keep stuff from spilling and the adjustable dividers allow me to use the trays for both short and long items. This tackle box, including the three big lower utility boxes, cost \$25. The five small upper utility boxes are sold separately for \$2 each. I have over 70 different items stored in my tackle box!

Randy Johnson
AW



Sources See page 100

The Well-Equi

Compact Compressor

For less than \$200, Senco is offering three nailer/compressor kits that include everything you need from fittings to a 25-ft. hose.

All three packages revolve around the PC1010 mini-compressor. It's hardly bigger than a shoebox, and weighs a mere 20 lb. Carrying it around the house is a breeze! You can haul this extremely portable and quiet tool anywhere; even set it right up on top of your workbench. Okay, it won't provide enough air for a framing nailer or spray gun, but it works great for brad nailers.

You can choose from three different 18-gauge guns; the FinishPro 15, the FinishPro 18 brad nailer, or the FinishPro 2N1 nailer/stapler combo. The FinishPro 18 shoots brads up to 2-in. long, which is great for face frames or other 3/4-in. material. The 15 and 2N1 guns shoot brads up to 1-1/4-in. long.



\$99 Plunge Router

Ryobi's new RE180PL plunge router packs variable speed, soft start, a 1/2-in. collet, and a 10-amp, 2-hp motor into a \$99 price tag. That's \$150 less than routers with similar features. Other inexpensive plunge routers are limited to a single speed, a 1/4-in. collet and lower horsepower.

You'll love the upgraded features. Soft start slowly brings the router up to speed, making it easier to hang onto the tool at start up. Variable speed makes using large-dia. bits much safer. You'll make more accurate mortises with 1/2-in.-dia. bits, which are less prone to chatter than 1/4-in.-dia. bits.

In addition, this router accepts template guide bushings. You can easily fine-tune the depth of cut with a micro-adjust dial below the stop rod.

While this router offers a lot for the money, it lacks dust collection and a multi-step turret, useful for cutting deep mortises in steps.



oped Shop

New Tools, Supplies and Materials

by George Vondriska

Pocket-Sized Plane

One of my favorite hand tools is an old block plane, long out of production. I've used it for everything from trimming miters to planing chamfers. When I'm done, it's small enough to tuck right back in my apron pocket. As much as I like my old pal, this new plane from Veritas is even better. And it has a great price (\$59).

It's a lightweight, low-angle block plane that fits your hand like a glove. Low-angle planes are superb at trimming the end grain of cabinet doors, but they can be prone to chatter. This plane fights chatter with a very thick blade and a large supporting bed. It's also fully adjustable. One knob sets both the angle of the blade to the mouth and the depth of cut, with minimal play. The only thing that's missing is an adjustable mouth.

The plane's body is ductile iron, which is far less likely to break when dropped than standard cast iron. You can upgrade the plane with a thicker and more durable A2 steel replacement blade for about \$18 or buy the plane with an upgraded A2 blade for \$67.



Faster Mortise-and-Tenon Joints

Leigh Industries has long been known for their well-engineered dovetail jig. Their new router jig, the Leigh FMT (\$800), cuts mortise-and-tenon joints with the same precision.

A price tag of \$800 is pretty steep for a joint that can be made a dozen ways with simpler tools, but once set up, this jig makes perfectly fitting tenons every time. It will handle both straight or angled joints. If you're thinking of building a set of chairs, this jig could save you lots of time.

The FMT produces both the mortise *and* the tenon in pieces as small as a matchstick or as large as 3 in. x 5 in. The jig comes with the router bit and joint guides required for a 5/16-in. mortise and tenon. Larger or smaller mortise and tenons require other bits and joint guides, at about \$42 per set. You provide the plunge router.



Sources for all products

See page 100

The Well-Equipped Shop

Dovetail Spline Jig

The Kehoe jig kit (\$60) is an easy-to-use and inexpensive tool for reinforcing corner joints. The kit contains a router jig and a table saw jig to add super-strong, cool-looking dovetail splines to your projects. Normally, dovetail splines require a lot of trial and error to fit, but the beauty of the Kehoe system is that it makes tapered splines that lock up tight as you press them into the joint.

You can add dovetail splines to virtually any project with these two Kehoe jigs. They work with wood of any thickness, any width (just re-clamp the router jig) and any angle corner.

To use the router jig, you'll need a 5/8-in.-dia. template



Clamp the Kehoe router jig to a corner joint and follow the fingers with a template guide. This makes dovetail-shaped grooves that are tapered from front to back.



Cut identical dovetail-shaped splines on the table saw with the Kehoe miter-gauge jig. The splines are also tapered from front to back. This jig is included in the \$60 kit.

Two sizes are available from Kehoe for about \$10 each.

36

American Woodworker MAY 2003

BW BRIDGEWOOD

The Woodworker's Edge...

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BW-155S
15" Bandsaw
don't let its low price fool you, this amazing bandsaw is designed and built to provide trouble free operation cut after cut.

FEATURES: Heavily ribbed cast iron frame. 3/4 hp motor is mounted directly to cast iron frame for smooth operation. Two blade speeds: 2000 or 2800 SFM. Cast aluminum wheels with rubber tires. Non-rocking steel stand. Miter gauge.

TSC-10CL

10" Table Saw
the perfect table saw for contractors or residential shops.

FEATURES: Left leaning arbor reduces chance of kickback. 1-1/2 hp motor with quick release connection plug. 10" dia. blade capacity. Miter gauge with T-slot. Large cast iron table with a solid extension wing. Beveled front table edge for smooth miter gauge operation. 4" dust collection hook-up.



Shown with standard Align-a-Flip 30" capacity rip fence.

BW-6R 6" Jointer

Acclaimed a "best buy" among 6" jointers by a professional woodworking publication.

FEATURES: 1 hp motor. 3 knife cutterhead. Jackscrew knife adjustment. Enclosed base with 4" strip collection hook-up. Precision ground 6" x 45" cast iron tables. Rubbing table and ledge. Cast iron fence fits in both directions to 45° with positive stops at 45° and 90°. Cast iron handwheels.

BW-002A Dust Collector

portable, compact unit solves your dust collector problems at a very low cost!

FEATURES: 2 hp motor. 1069 CFM. 1 Micron filter bag. 4.5-gallon collection bag. Bags attached with quick release metal straps. Metal impeller (not plastic).



BW-15P

15" Planer

economically priced yet built like larger professional planers.

FEATURES: 3 hp, 8 knife cutterhead. Jackscrew knife adjustment. Enclosed base with wheels for mobility. 15" x 6" planing capacity. Table moves up and down—cutterhead stationary for smoother cuts. Three stock support rollers front and back. 2 speed feed rate. Magnetic switch.

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Glue in the splines. They start out loose because they're tapered, making assembly very easy. As you push, they tighten up and lock solidly in place, creating a perfect joint. After the glue dries, cut the excess and sand flush.

SHUT

Do-It-Yourself Stained-Glass Doors

Wouldn't it be cool to make your own stained- or beveled-glass panels for cabinet doors? Delphi has good news for you. They've made an introductory video, and it's free to AW readers. It illustrates, step-by-step, how to make a simple panel, from cutting the glass to soldering.

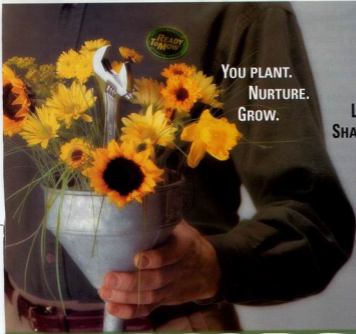
If you really get into it, you can check out their new book: *300 Stained Glass Cabinet Door Designs*, \$19. The book contains line drawings, installation and design tips, and pictures featuring prairie, Victorian, contemporary, art nouveau, southwest, and nature themes.

Making stained- or beveled-glass panels for cabinet doors requires some basic glass-specific tools. A starter kit is available from Delphi for \$190. Once you have the tools, the cost of materials for a 14-in. x 24-in. beveled-glass panel averages \$35.



Sources

See page 100



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Shop Specs come in the same correction range as standard reading glasses, from +1.0 to +3.0 diopters in .5 increments. If you don't need reading glasses, order a +1 diopter. Shop Specs will not replace standard prescription glasses.

The temples on the Shop Specs can be adjusted to fit your head, and the lenses can be inclined to a position that's comfortable for you.

Comparable safety glasses with adjustable temples and inclined lenses, but lacking magnification, cost about \$7 less. **AW**

Sources See page 100

Sand faster
than ever
and leave
a clean
shop



by George Vondriska

Shop-Made Drum Sander

If you've ever dreamed of owning an expensive drum sander, here's an economical alternative. This simple hand-fed machine costs only \$270 for parts and materials. If you scrounge a free motor, switch and plywood you can cut the cost down to as little as \$115.

How It Works

This machine is very simple. A plywood box holds a spinning drum that's wrapped with a long roll of hook-and-loop sandpaper. Unlike a self-feeding commercial drum sander, you manually push the wood against the rotation of the drum. The drum is belt-driven by a small motor mounted to a hinged board. The motor's weight tensions the belt, just like a contractor's saw. That's it.

The whole sander weighs only 37 lbs., so it's very portable. It's compact enough to slide right under a bench.

The critical parts of this machine come in a kit (Photo 1, page 42). When we first saw the ad for this build-it-yourself sander we honestly didn't think it would work. In the spirit of adventure, we ordered the hardware.

When we built the machine, we were amazed at how quickly and easily it took off saw marks and planing marks, just like a commercial drum sander. It's very quiet, too, and virtually dust-free when hooked up to any dust collector.

What It Can and Can't Do

This sander will make a smooth, flat surface faster than a random-orbit sander and is less likely to gouge than a belt sander. It works best on short, individual pieces of wood.

It's unlikely that this machine will completely replace the random-orbit or belt sanders in your shop, however. Pieces larger than 12 in. x 24 in. are hard to handle, so you're better off sanding them with a portable sander. Obviously, this machine can't thickness boards the way commercial drum sanders do. It's not a jointer either, and can't be used to straighten edges or flatten faces.

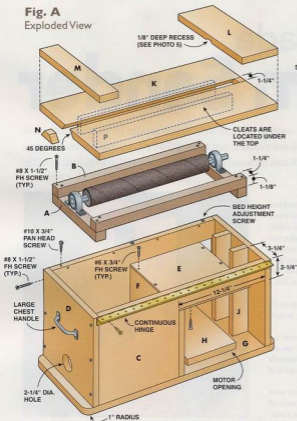


Sand surfaces flat and smooth in no time. The sanding drum is 18-in. wide, but this machine works best with boards that are less than 12-in. wide and 24-in. long. It's very effective for drawers and boxes, too.



Changing sanding grits is easy. Just open the hinged lid, peel off a roll of reusable hook-and-loop paper and wrap a new grit.

Fig. A
Exploded View



1 Order this hardware kit before you begin building (see Sources, page 100). It costs \$115 and contains all the major parts of the sander, excluding the switch, motor and handles.

What You'll Need

As with any woodworking project, order the hardware before cutting wood (Photo 1). If you use a new motor and a top-notch safety switch that's easy to wire, the entire project will cost about \$270. Additional sandpaper costs about \$6 a roll. You get four pieces from one roll. (See Sources, page 100, for the hardware kit, motor, switch and extra sandpaper.)

The easiest way to save money on this project is to substitute a used motor. (A new motor costs about \$100.) The motor must be at least 1/3 hp, rotate at 1,750 rpm and have a 1/2-in.-dia. shaft. The sander's case is designed to hold a motor that's less than 7-in. tall and 10-in. long, including the shaft. If your motor is larger, you'll have to modify the case's dimensions to hold it.

The case takes less than one-half of a sheet of 3/4-in. plywood. Almost any kind will do, as long as it's reasonably flat. We used birch plywood. You'll also need a small amount of 1-1/8-in.-thick hardwood.

Fig. B
Motor Alignment

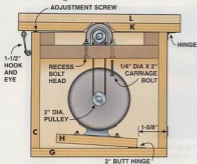


Fig. C
Location of Cleats Under the Top

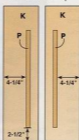
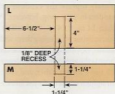


Fig. D
Underside of Top Batters



Build the Sander

The Sanding-Drum Frame

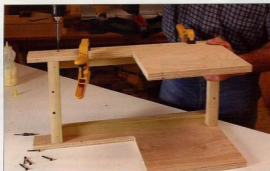
1. Assemble the sanding drum, bearings and pulley according to the kit's instructions.
2. Cut the hardwood parts of the sanding drum frame (A and B) to size. Glue and screw together the frame (Photo 2). Measure the diagonals to check it for square.
3. Center the sanding drum on the frame (Photo 3). Mark and drill holes for 1/4-in.-dia. carriage bolts.
4. Recess the heads of the carriage bolts on the pulley end of the frame by enlarging the holes with a 3/4-in. bit (Fig. B).



2 Assemble a hardwood frame to hold the sanding drum. Screw and glue together the corners. Make sure the frame is square.



3 Locate the bearings for the sanding drum on the center of the frame. Mark and drill 1/4-in.-dia. bolt holes. The holes in the bearing are elongated so you can fine-tune the drum's position later.



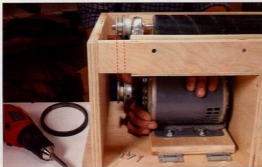
4 Screw and glue the plywood sides to the frame to begin building the case. Then add the ends. The entire box is held together with simple butt joints.

The Case

1. Cut the plywood for the case components (C through J). Cut the motor opening into the case sides (C) with a jigsaw or handsaw (Fig. A).
2. Screw and glue the case sides to the frame rails (B, Photo 4).
3. Drill or cut a 2-1/4-in. hole in one end (D) for a vacuum hose.
4. Screw and glue the case ends to the case sides and drum frame.
5. Bolt the sanding drum to its frame.
6. Screw and glue the dust ledge (E) to the case sides and the end of the frame. Screw and glue the compartment wall (F) to the case sides. Screw and glue the bottom (G) to the case.



5 Recess the undersides of the battens that span the top to make room for the sanding drum. You'll have to go about 1/8-in. deep.



6 Align the motor pulley so it's directly underneath the drum pulley. Lock the motor in place by fastening the hinges attached to the motor's plywood base plate.



7 Position the top to align with the sides. The sanding drum should be parallel to the opening in the top. If it isn't, loosen the bolts that hold the bearings and reposition the drum. Attach a continuous hinge to connect the top to the base.



8 Check the height of the table. With 80-grit paper wrapped around the drum, the table should be lower than the drum by the thickness of one playing card. Check all the way across.



The Top

1. Create a recess in the bottom of the battens (L, M) with a belt sander or a drill-press sanding drum (Photo 5 and Fig. D). Sand to a depth of 1/8 in.
2. Cut both beds (K) with a 45-degree angle on one edge of each piece (Fig. A). Slightly round over the beveled edges with sandpaper.
3. Screw and glue the battens to the beds (Fig. A). Keep the ends of the battens flush with the edges of the beds to provide the correct spacing between the 45-degree bevels.
4. Cut fillers (N) to fit in the beveled openings at the ends of the top (Fig. A). Glue the fillers.
5. Glue the lid cleats (P) to the underside of the beds (Fig. C), completing the top.

The Motor

1. Wire a 10-in. cord (with plug) onto the motor. The rotation of the motor must be counterclockwise when you're facing the shaft.
2. Bolt the motor to the plywood base (H). Screw two hinges to the bottom of the base (Fig. B).
3. Align the motor and sanding-head pulleys by eye (Photo 6). When they're aligned, screw the hinges to the case bottom (G).

Final Assembly and Alignment

1. Screw and glue the pulley guards (J) to the case end (D).
2. Align the top on the case (Photo 7). Screw the continuous hinge to the top and the case.
3. Predrill and screw in the table-height-adjustment screws. Set the table height (Photos 8 and 9).
4. Screw a hook into the bottom of the top and a screw eye into the case side (Fig. B). Use this to latch the top.
5. Mount the switch to the case (Photo 10) and plug the motor into the switch.
6. Sand and seal all the surfaces. We finished our sander with Danish oil.

9 Fine-tune the height of the table by turning adjustment screws. You only need to make this adjustment once, not every time you change grits. You'll automatically take off less wood with finer paper.

CUTTING LIST

Overall Dimensions: 12-1/2" H, 27" L, 14-1/4" D

| Part | Name | Qty. | Material | Dimensions in inches |
|------|--------------|------|----------|------------------------|
| A | Frame end | 2 | Hardwood | 1-1/8 x 1-1/4 x 10-1/4 |
| B | Frame rail | 2 | Hardwood | 1-1/8 x 1-1/4 x 21-1/4 |
| C | Case side | 2 | Plywood | 3/4 x 10-1/4 x 23-1/2 |
| D | Case end | 2 | Plywood | 3/4 x 10-1/4 x 11-3/4 |
| E | Dust ledge | 1 | Plywood | 1/4 x 11-3/4 x 10 |
| F | Wall | 1 | Plywood | 3/4 x 11-3/4 x 7-3/4 |
| G | Case bottom | 1 | Plywood | 3/4 x 11-3/4 x 27 |
| H | Motor base | 1 | Plywood | 3/4 x 7 x 7 |
| J | Pulley guard | 2 | Plywood | 3/4 x 2-1/4 x 10-1/4 |
| K | Bed | 2 | Plywood | 3/4 x 6-1/2 x 25 |
| L | Right batten | 1 | Plywood | 3/4 x 5-1/2 x 14-1/4 |
| M | Left batten | 1 | Plywood | 3/4 x 2-1/2 x 14-1/4 |
| N | Filler | 2 | Plywood | 3/4 x 3/4 x 2-1/2 |
| P | Cleat | 2 | Plywood | 3/4 x 2 x 18 |



10 Install a switch with a horsepower rating at least as big as the motor. The switch above (\$37, see Sources, page 100) doesn't need to be wired and is easy to turn off.

Oops!

My golf game is pretty good, but I still make a divot once in a while! I managed to make one with this sander by going too slow and pushing down too hard. Here's the right technique: Keep your board moving at a slow but steady pace. If you do make a "divot" like the one shown, you can remove it by sanding at an angle to the drum. *AW*



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EDITOR: RANDY JOHNSON • ART DIRECTION: PATRICK HUNTER
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Walnut Wall Shelves

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Never enough shelf space where you want it? This little shelf is a great way to add extra storage in just about any room.

It's compact—only 22-3/4-in. wide by 31-1/4-in. tall by 9-1/4-in. deep. Yet it's tall enough to accommodate three shelves of paperbacks. Hang it in your bedroom, bathroom or kitchen. This cabinet will add a touch of comfortable elegance in any room.

Details Made Easy

We've packed a ton of great details into this cabinet, and some great techniques into this story. We'll show you how to cut cove molding on your tablesaw and how a special beading bit makes quick work of the shiplapped back. Your router and router table can handle all the other moldings.

All the parts for this cabinet are made from 3/4-in.-thick lumber, which keeps the materials list simple. An intermediate-level woodworker can plan on two or three weekends to complete this cabinet. And when you're done, a hidden cleat easily and invisibly secures the case to the wall.

Small Changes

Make a Big Difference

In a small case, changing dimensions by even a fraction can make a world of difference in the final appearance. The top of this case is 11/16-in. thick and overhangs the side by 1/4-in. more at the sides than the front. The bottom is 9/16-in. thick, the shelves are 5/8-in. thick and the face frames are 1/2-in. thick. These carefully chosen dimensions give this cabinet a comfortable and balanced look.

By Jon Stumbras



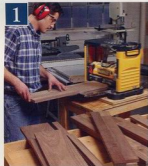
Walnut Wall Shelves

Traditional Design, Modern Tools

You'll need a surface planer, jointer, router, router table, tablesaw, dado blade and biscuit joiner for the construction. To make the moldings, seven router bits are needed, three round-over bits, a heading bit, a chamfer bit, an ogee bit and a rabbeting bit. You may have several of these already, but if you buy all the bits new, the cost will be approximately \$170 (see Sources, page 101). We used 25 bd. ft. of 4/4 rough walnut for our cabinet at a cost of \$125 (see Sources, page 101).

Build the Cabinet in Stages

1. Begin by selecting the wood for each part (the sides require the widest boards). Straight-grained wood looks best for face frames. Match the face-frame stiles to the case sides and they'll look like one piece when assembled.
2. Cut all the parts to rough size by adding 1/2 in. to the final length and width (see Cutting List, page 53) and plane the parts to their final thickness (Photo 1).
3. Next, rabbet the case sides (C1) with a dado blade in your tablesaw (Photo 2).



1 Plane your parts to final thickness after you've rough cut them to width and length. It doesn't take long because there are only about two dozen parts.



2 Cut rabbets along the inside edge of the cabinet sides with a dado blade. The cabinet back fits into this rabbet.



3 Drill shelf-pin holes before assembling the case, using a template and 5mm self-centering drill bit. The template guarantees evenly spaced holes and the self-centering bit has a built-in stop to keep you from drilling through the side.

Two passes are needed to make the 1-in.-wide by 3/8-in.-deep dado on the back inside edge of each side.

4. Now cut the case sides, the top and the bottom (C2) to final width and length.

5. Drill the shelf-pin holes next (Photo 3) using a drilling template (Fig. A) and a 5mm self-centering drill bit (see Sources, page 101). It's a lot easier to do this now because there's not a lot of room inside the finished cabinet.

A decorative top and bottom give this cabinet a clean, finished look from any angle.

6. You can now join the top and bottom to the case sides. Two #20-size biscuits will fit neatly in the panels (Fig. B). Glue up the case, carefully checking the diagonal measurements to guarantee squareness. Note that the case bottom is set 1/2-in. up from the bottom ends of the case sides (Fig. B).

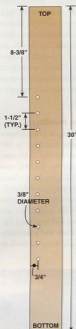
This way the case bottom and the bottom face-frame rail will be flush on the inside of the cabinet.

7. Make the face frame next. It's difficult to cut accurate biscuit joints in 1/2-in.-thick material (see Oops!, page 50), so we built a simple clamping jig with toggle clamps (see Sources, page 101) for better results (Photo 4). This jig makes it easy to cut the partial biscuit joint (Detail 1) for the bottom face-frame rail (F3), which is only 1-1/4-in. wide. To cut the biscuit slots in the stiles (F1), modify your first jig, or make a second jig to hold the stiles parallel rather than perpendicular to your biscuit joiner.

Glue up the face frame, making sure it is square. When dry, trim the protruding biscuits at the bottom and glue the face frame to the case (Photo 5). The total width for the face frames is 1/16-in. wider than the overall case dimension. This allows for some wiggle room when gluing the face frame to the case in the event the face frame or case are not perfectly square. The face frame is easily cleaned up with a hand plane, hand scraper, or a flush-trim bit in a router.

Fig. A Drilling Template for Shelf Pin Holes

Make this template out of 1/2-in. material.



**Detail 1
Offset Biscuit Joint**

Because the bottom face-frame rail is only 1-1/4-in. wide, the biscuit joint must be offset. The biscuit will protrude, but can be cut flush after glue-up.

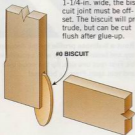
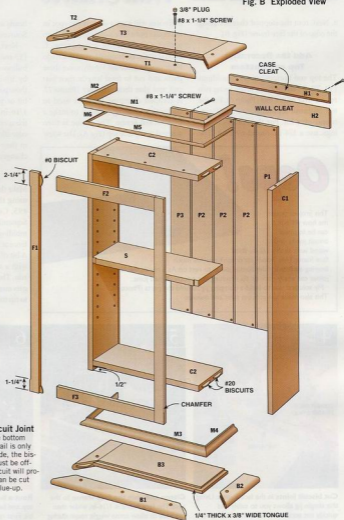


Fig. B Exploded View





Walnut Wall Shelves

8. Next, rout the stopped chamfer along the edge of the face frame (Fig. B).

Add the Decorative Top and Bottom

The top and bottom bullnose moldings (T1, T2, B1 and B2) are made using two round-over router bits (Photo 6). For the top bullnose moldings, use a 5/16-in. round-over bit. For the bottom moldings, use a 1/4-in. round-over bit. The

bullnoses will have a slightly flat spot in the center but a little sanding makes them perfect. Cut the 1/4-in. groove (Figs. C and G) in the bullnose parts with a dado blade in your tablesaw. Finally, miter these parts and glue them together (Photo 7). A stepped clamping block is used to clamp this molding together to make a three-sided frame. The frame is then screwed to the case top (Fig. A). The screw

heads are hidden with wood plugs (see Sources, page 101).

Next, make the top and bottom panels (T3 and B3) that fit into the grooves of the bullnose trim. To create the 1/4-in.-thick by 3/8-in.-wide tongue on three sides of these parts (Fig. A), use a rabbeting router bit or your dado blade. The panels are 1/16-in. undersized in length to make them easy to slide in. Gluing just the front edge allows the solid-wood panels to move in their frames with seasonal humidity changes (Photo 8).

Make the Moldings

Make the cove molding on your tablesaw using the techniques described in AW #95, *Coved Doors on the Tablesaw*, September 2002, page 34. For this cove molding (M1 and M2), set the auxiliary fence at 30 degrees to the blade (Photo 9). A bit of practice is in order here, so start with a scrap 4-in.-wide board for a test run. The wider blank will keep your fingers away from the blade and is less likely to tip toward the blade. Raise the blade in

Oops!

This project taught me how difficult it can be to make biscuit joints in thin wood such as this 1/2-in.-thick face frame. Thin wood just doesn't provide much bearing surface for the biscuit joiner to rest on. As a result, the biscuit joiner can easily rock or tip, resulting in a poorly aligned joint.

My solution was to build a clamping jig to hold the parts (Photo 4). This also made the process safer and quicker.



Cut biscuit joints in the face frames. Using this simple jig allows you to safely and quickly cut accurate slots in the thin, narrow parts. The bottom face-frame rail is too narrow to hold a whole biscuit so the slot is offset. The biscuit will protrude but can be trimmed after the gluing and will be hidden by the bullnose cabinet bottom.



Clamp and glue the face frame to the case. The face frame is 1/16-in. wider than the case to allow some wiggle room during glue up in the event that the case or face frame are a little out of square.



Rout a bullnose profile for the decorative top and bottom moldings with a round-over bit. First rout one side, flip the wood over and rout again. Presto, a bullnose!

Fig. C Bullnose Molding for Decorative Top (parts T1 and T2)



Fig. D Cove Molding (parts M1 and M2)



Fig. E Bead Molding (parts M5 and M6)



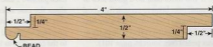
Fig. F Ogee Molding (parts M3 and M4)



Fig. G Bullnose Molding for Decorative Bottom (parts B1 and B2)



Fig. H Back Panels (parts P2) Get Routed as Shown Here
Right panel (part P1) has a rabbet and bead on one edge only. Left panel (part P3) has a rabbet on one edge only.



Glue and clamp the bullnose frames one corner at a time. The stepped clamping blocks shown here help pull the miters tight. Make the blocks the same thickness as your parts. First clamp the bullnose frames and clamping blocks to your bench. Then add clamps to the steps on the clamping blocks to pull the joint tight.



Insert the top panel into the bullnose frame. Glue only the leading edge so the panel can expand and contract with changes in humidity. Wood plugs hide the screws that attach the bullnose frame to the case.



Cut the cove molding with several passes on your table saw using an auxiliary fence set at 30 degrees. The auxiliary fence covers half of the blade, producing only the half arc needed for this cove.



Walnut Wall Shelves

small increments for each cut until you reach the desired depth. When you've mastered a practice piece you're ready for the real thing. After forming the cove, cut the molding to final width (Fig. D). Hand sand or use a curved scraper to remove the saw marks from the inside of the cove.

The ogee molding (M3 and M4) is next. Rout the profile with the ogee bit on both sides of a 2-1/2-in. board (Fig. F), then rip the board on the tablesaw to create two separate moldings (Photo 10). One 25-in.-long board will yield moldings for all three sides.

The bead molding (Fig. E, M5 and M6) is made with two passes of a 3/16-in. round-over bit in your router table. Also, just like the ogee, rout both sides of a wider board for safety and ease of routing.

Using a pneumatic pin nailer makes quick work of applying molding (Photo 11). If you hand nail, it's a good idea to drill small pilot holes to prevent the wood from splitting. These small holes are easily filled and hidden with a little putty or a wax pencil (see Sources, page 101).

Custom Fit the Shelves

Mark the shelf notches directly from the case (Photo 12). In theory, this notch should be 3/4-in. long by 1/4-in. wide, but if your face frame was glued slightly to one side, there will be minor differences in the sizes of the notches from one side of the shelves to the other. Measuring directly from the case will give a custom fit and avoid errors that can occur when making inside measurements with a tape measure or from assuming both sides are the same.

Traditional Shiplapped Back

Rout the beaded shiplapped back panels (Figs. B and H) for your cabinet with a beading bit (Photo 13). The interlocking rabbets allow for expansion and the screws at the top and bottom of each section hold the panels securely in place (Fig. B). Back panels P1 and P3 fit into the rabbets along the case sides. Gluing these case sides and just around the corners provides additional strength and stability to the case (Photo 14).

Simple and Classic Finish

To make finishing easier, remove the three center back panels (P2) that are just attached with screws. We sanded our cabinet to 220 grit and applied a walnut stain (see Sources, page 101) to even out minor color variations in the walnut. Then we applied a wiping oil finish (see Sources, page 101) to give the case a soft glow. An oil finish does not provide much protection against moisture, so if you plan to use your cabinet in the kitchen or bathroom, use a varnish instead.

Hang the Case on the Wall

Attach the case cleat (H1) to the back of the cabinet with screws (Fig. B). Make sure the screws go into the case top (C2). Mount the complementary cleat (H2) to your wall using screws and wall anchors and then hang the case (Photo 15). The beveled cleats interlock and hide neatly within the back side of the case, making them invisible from the outside.



10 Rip the cove, ogee and beaded moldings to final width on your tablesaw. The cove molding gets ripped once to remove the waste portion while the boards for the ogee and beaded moldings get ripped twice.



11 Attach the cove molding with pin nails or small brads. For additional strength, the molding is glued to the case and at the miters.



12 Mark each shelf for a notch before installing the back. Marking right off the cabinet is more accurate than taking a measurement. The notch permits the shelf to slightly overlap the face frame, creating a small, decorative detail.



13 **FRONT RABBET**
BACK RABBET
BEADING BIT

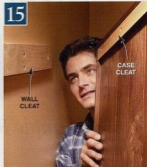
Route the beaded profile for the back. A specialty beading bit makes quick work of this traditional molding. Opposite rabbets on each piece create the overlapping shiplapped joinery for the back panels.



14

GLUE AROUND CORNER

Screw the back panels in place. Gluing the outer two panels along the case sides and 1 in. around the corner adds rigidity to the case. The center three panels, attached with screws, are free to move with seasonal changes in humidity.



15

WALL CLEAT
CASE CLEAT
WALL CLEAT

Hang the cabinet on the wall using a two-part beveled cleat. One part is screwed to the case and one part is screwed to the wall. Attach the wall cleat to at least one stud and add a couple of wall anchors for extra strength. The cabinet hangs flush against the wall with both cleats hidden from view. **M**

CUTTING LIST

Overall Dimensions: 31-1/4"H x 22-3/4"W x 9-1/4"D

| Part Name | Qty. | Dimensions |
|-------------------|------|--|
| CASE | | |
| C1 Sides | 2 | 3/4" x 7-1/2" x 30" |
| C2 Top & Bottom | 2 | 3/4" x 6-1/2" x 18" |
| FACE FRAME | | |
| F1 Sides | 2 | 1/2" x 1-1/2" x 30" |
| F2 Top rail | 1 | 1/2" x 2-1/4" x 16-9/16" |
| F3 Bottom rail | 1 | 1/2" x 1-1/4" x 16-9/16" |
| TOP | | |
| T1 Bullnose front | 1 | 11/16" x 2-3/4" x 22-3/4" |
| T2 Bullnose sides | 2 | 11/16" x 2-3/4" x 9-1/4" |
| T3 Panel | 1 | 11/16" x 6-7/8" x 17-15/16" include 3/8" wide tongue on three sides |
| BOTTOM | | |
| B1 Bullnose front | 1 | 9/16" x 2-3/4" x 21-1/2" |
| B2 Bullnose sides | 2 | 9/16" x 2-3/4" x 9" |
| B3 Panel | 1 | 9/16" x 6-5/8" x 16-11/16" include 3/8" wide tongue on three sides |
| MOLDINGS | | |
| Cove Molding | | |
| M1 Front | 1 | 3/4" x 1-1/4" x 21" |
| M2 Sides | 2 | 3/4" x 1-1/4" x 8-3/4" |
| Ogee Molding | | |
| M3 Front | 1 | 3/4" x 5/8" x 20-3/4" |
| M4 Sides | 2 | 3/4" x 5/8" x 8-5/8" |

| Part Name | Qty. | Dimensions |
|----------------------|------|--|
| Bead Molding | | |
| M5 Front | 1 | 3/8" x 3/8" x 20-1/4" |
| M6 Sides | 2 | 3/8" x 3/8" x 8-3/8" |
| SHELVES | | |
| S Shelves | 2 | 5/8" x 6-5/8" x 17-7/8" 1/4" x 3/4" notch on each front end |
| PANEL BACK | | |
| P1 Right panel | 1 | 1/2" x 4-1/4" x 30" rabbet and bead on one edge only |
| P2 Center panels | 3 | 1/2" x 4" x 30" |
| P3 Left panel | 1 | 1/2" x 4-1/4" x 30" rabbet on one edge only, no bead |
| HANGING CLEAT | | |
| H1 Case cleat | 1 | 1/2" x 1-1/2" x 18-3/4" 45-degree angle on bottom edge |
| H2 Wall cleat | 1 | 1/2" x 3" x 18-1/2" 45-degree angle on top edge |
| HARDWARE | | |
| Shelf pins | 8 | 5mm shelf pins |
| Wood screws | 23 | #8 x 1-1/4" steel wood screws |
| Biscuits | 12 | #20 biscuits |
| Biscuits | 4 | #0 biscuits |
| Wall anchors | | appropriate to wall type |
| Wall screws | | appropriate to wall type |

Sources See page 101

Central Dust Collection

Five Simple Rules for a Dust-Free Shop

Small, one-person shops don't need complicated dust-collection systems. We'll show you how to get powerful collection at the lowest possible price without ever having to use a calculator. Even if your shop is shoehorned into a corner of your basement or garage, you can still enjoy the benefits of central dust collection. We turned to the experts at Oneida Air Systems (see Sources, page 101) for both the design and materials for our fully featured, small-shop dust-collection system. Our shop fits in one stall of a two-car garage, where the machines have to be moved against the walls to accommodate a car (rats!) (photo below, right).

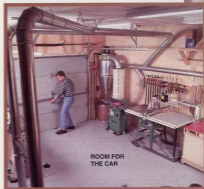
Cost

The total cost for our system (excluding the dust collector) was about \$800. Expect to spend about a day putting in the system. I know what you're thinking, "Wow, I can't afford that!" But, don't forget, we built a deluxe system with floor sweeps and ductwork running to each machine (Fig. A, page 58). You could cut the cost of our system in half simply by doing what I do in my shop at home: sharing. It takes about five seconds to pull the flex hose off one machine and hook it up to another. For example, the 4-in. flex hose to the table saw (Fig. A) could easily be shared with the bandsaw and the lathe. That would eliminate the run to the bandsaw, plus a bunch of expensive flex-hose, blast gates and fittings. In addition, we could have stopped the wall run at the chop saw instead of going all the way to the workbench.

Small Shop Systems Are Simpler Than You Think

Designing a central dust-collection system for a small shop is really straightforward. Complex calculations involving cubic feet per minute, air velocity and static pressure are important for large industrial systems with long runs to big machines all running at the same time. A small, one-person

shop is much simpler. The runs are short (our longest run was about 25 ft.) and only one machine runs at a time. The amount of air needed for good dust collection is relatively small. A system needs to pull about 500 cubic feet per minute (cfm) at the farthest machine to offer effective dust collection. A typical 1-1/2- or 2-hp dust collector with a 5- or 6-in. inlet and a 12-in. impeller is capable of delivering enough air in a small system to collect from tools like a 10-in. table saw, a 15-in. planer, a 16-in. bandsaw or an 8-in. jointer.



You can have a central dust-collection system! Just because your shop is small it doesn't mean a central system isn't practical. We built our system in a single stall of a double garage. The ductwork goes along the wall and ceiling and all the tools are on mobile bases.

By Dave Munkittrick



Five Design Rules

A well-designed central dust-collection system is built like a freeway. The road has to be wide enough to handle a large volume of traffic (5-in. ductwork to all machines). Turns need to be gentle so traffic can move at a high speed without crashing (large-radius elbows). Intersections should use entrance ramps that allow traffic to gently merge (45-degree wyes for drops and branches).

Too often people build their dust-collection systems like back-country roads with narrow lanes and abrupt, 90-degree turns. They accept inferior results because they've never known what their dust collector is capable of delivering with a well-designed system.

Rule #1 Use 5-in. pipe

UNDERSIZED
DUCTWORK



PROPERLY SIZED
DUCTWORK

Using undersized ducts and fittings is the number one mistake people make. For a dust collector, it's like trying to drink a malt with a cocktail straw. Undersized ductwork restricts the cfm performance of your dust collector. Stick with 5-in. ductwork for small systems. Running 5-in. ductwork to all the machines maximizes the cfm performance of even a small central system.

Rule #2 Keep it straight



Minimize the number of bends. Each 90-degree turn creates as much resistance to airflow as 9 ft. of 5-in. straight pipe.

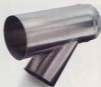
Rule #3

Use fittings designed for dust collection

Heating and air conditioning



Dust collection



Dust-collection fittings are designed to efficiently carry dust-laden air at about 40 mph. Just like a car, air moving at high speed can't take sharp turns without running into trouble. The large-radius elbow is more than three times as efficient as the sharp turn found on the HVAC elbow. Which turn would you rather make at 40 mph? HVAC fittings are designed to carry air at a slow speed. Their sharp turns and 90-degree intersections create a ton of drag in a dust-collection system.

Rule #4

Change the dust fittings on your tools



Manufacturers sometimes put a dust port where it fits best, not where it works best. More often than not, the ports are undersized as well. A few simple alterations can make a huge difference in how much dust gets left behind on hard-to-collect-from tools such as bandsaws. Use 4-in. ports wherever possible; 5 in. is even better.

Rule #5

You don't need a big dust collector

People agonize over this selection but it's really not that tough. For your basic shop under 1,000 sq. ft., where only one machine will be on at a time, a 1-1/2- to 2-hp collector with a 5-in. or 6-in. inlet and a 12-in. fanwheel will do the job. Check out our Tool Test on Dust Collectors (AW #80, June 2000, page 80). You can't go wrong with our Editors' Choice, the Oneida 1-1/2- or 2-hp cyclone collector.

Installation

A central dust-collection system is built like a freeway with wide lanes, entrance ramps and gentle turns.

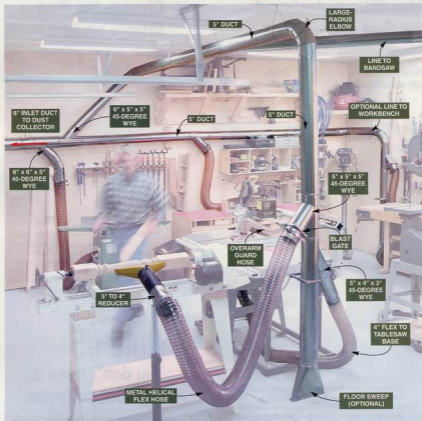


Fig. A Anatomy of a Central Dust-Collection System for a Small Shop

Because there are as many shops as there are woodworkers, each system will be unique. At the same time, all small-shop systems have certain elements in common.

Our system starts out with 6-in. duct running from the dust-collector inlet. At the second branch, the line steps down to 5 in. for the rest of the system. 45-degree wyes are used for the line branches to each tool. Large-radius elbows create direction changes. Blast gates turn the suction on and off at

each machine. Flex hose allows mobile machines to be moved without having to disconnect from the system. Reducers are used to step down the 5-in. duct to fit 4-in. ports at the machines. We included a floor sweep for all those wood shavings from the lathe, but we don't recommend using a floor sweep with single-stage collectors. Ingested metal can damage the impeller blades.

Even if you've never dealt with ductwork before, you won't have any trouble putting up your system. Be sure to wear leather gloves when handling sheet-metal parts. The metal edges can be razor sharp.

Specialty Tools and Hardware

There are a couple of specialized tools you'll want for this job (Photo 1).

The only power tools you'll need are a drill for fastening the sections and a jigsaw for cutting the pipe to length. If you don't own a jigsaw, a reciprocating saw or a pair of tin snips will do the trick.

Start at the Collector

Most 1-1/2- to 2-hp collectors have 5-in. inlets. It's best to run 5-in.-dia. pipe all the way to the tool, and use a reducer to step down to a 4-in. port, if necessary.

If your collector has a 6-in. inlet, start with a 6-in. line. After the first branch, step down to 5 in. and stick with that diameter until you get to the machines. A common mistake is to run 6 in. everywhere. Just because a 1-1/2- or 2-hp collector has a 6-in. inlet, doesn't mean it has the power to run a central system made entirely with 6-in. pipe. Also, most small shop tools have 4-in. ports. When the airflow from a 4-in. port hits the 6-in. duct, the air speed is almost cut in half. The slow air speed can result in dust settling out in your duct.

If your shop is larger than 500 sq. ft. or you have a large machine like an 18-in. planer or a 24-in. drum sander, play it safe and buy a 2-hp collector with a 6-in. or larger inlet. Big tools like an 18-in. planer or a 24-in. drum sander will max out to the dust collector as possible and run 6-in. duct right to the tool.

Assemble and Hang the Ductwork

The straight pipe we used has to be assembled, but it's no big deal. It takes a matter of seconds to snap together a section of pipe (Photo 2). Run the pipe with the crimped end pointing downstream toward the collector. We recommend mounting blocks and metal hanger strap to secure the duct to the wall (Photo 3).

1

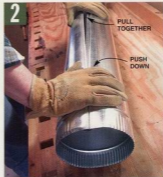


A few specialized tools and hardware are needed for installing metal ductwork. A hand crimper is a must-have. It'll set you back about \$30, but when you need one, nothing else will do.

#8-1/2-in., self-tapping hex-head sheet metal screws and a nut-driver make attaching the pipe sections a breeze.

Metal hanger strap is the least-expensive way to hang duct from your walls or ceiling. See Sources, page 101 for buying information.

2



A little downward pressure is the key to snapping together straight pipe. Start at the crimped end and slip the male edge into the female edge. Apply downward pressure on the seam as you move along the length of the pipe. Don't worry if the seam doesn't lock at first, somewhere beyond the halfway point the whole pipe will "snap" together.

Installation

Plastic or Metal?

We strongly recommend metal ductwork. It's clearly superior to PVC or plastic because:

1. Only metal pipe comes in 5-in. dia., the ideal size for small-shop systems.
2. Metal systems are much easier to disassemble and change as your shop evolves.
3. Static electric build-up in PVC and plastic ductwork can be a problem. We've all experienced the jolt a shop-vacuum hose can give. Imagine what a dust-collection system can do. Plus, all commercial codes require metal pipe for wood-dust collection.
4. The metal ductwork we used is only about 20-percent more expensive than PVC in sizes over 4 in.



This 26-gauge metal ductwork is designed specifically for dust collection.

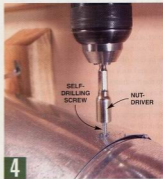


PVC plastic is designed to carry water.

Install the pipe on the wall with metal hanger strap attached to a 2x4 mounting block. Space the blocks every 4 to 5 ft. The blocks keep the pipe out from the wall a bit so it's a lot easier to fit and hang each section. Secure the pipe to the blocks by driving a #8 x 1-1/2-in. screw through a loop of metal hanger strap.



Secure joints with #8-1/2 in. self-drilling, hex-head screws. A nut-driver and a cordless drill make quick work of fastening pipe sections without predrilling.



Suspend pipe from the ceiling with metal hanger strap. Cut the strap extra long, and have a helper hold the pipe level. Adjust the length of your loop and secure with a long screw into the rafters.



To join the pipe and fittings we found self-drilling sheet metal screws to be just the ticket (Photo 4). Don't worry about the screw ends protruding into the pipe, they're too small to matter. Use metal hanger strap every 3 to 4 ft. to suspend the ductwork from the ceiling (Photo 5).

45-Degree Wyes

Use 45-degree wyes to create drops to each machine and to start branch lines (Fig. A). These are the "entrance ramps" to your dust-collection freeway. They allow the air stream to change directions without abrupt turns.

Cutting the Pipe

Cutting pipe with a jigsaw makes one heck of a racket. Don't be surprised if the noise attracts curious neighbors and family members. (It's the perfect opportunity to ask for a little help putting up that ceiling run.) We found a jigsaw with a metal-cutting blade gave the best results with the least hassle (Photo 6).

Elbows

Use adjustable, large-radius elbows to make those gentle turns. They cost less than fixed elbows (\$10 vs. \$17) and because they're adjustable, there's no need to special order 45- or 30-degree elbows. The first time I tried to change a 90-degree into a 45-degree elbow, I ended up with a mess. The key is to turn each section 90 degrees and alternate the direction each section is turned to produce a smooth 45-degree elbow (Photo 7). To get a 30-degree sweep, turn each section 120 degrees instead of 90 degrees.

Tip: Loosen the joints by gently tapping the ends of the elbow on a flat surface.

Blast Gates and Flex Hose

At the point where a line branches off to serve a single machine (usually at a 45-degree wye) we added a blast gate, blast-gate adapter and flex hose (Photo 8). Attach the flex hose with adjustable hose clamps. Flex hose is expensive (\$5 per ft. for 5-in. dia.) so keep it as short as possible. If you know your machine isn't going anywhere, run rigid pipe right to the tool.

We recommend using flex hose with an



6

Cut pipe to length with a jigsaw and a metal-cutting blade. If you're using snap-lock pipe, do the cutting before the pipe is put together. Use a felt-tip pen to mark the pipe with a series of dashes. Cutting the pipe makes a racket, so be sure to wear hearing protection.



7

A few quick twists will turn a 90-degree elbow into a 45-degree elbow. Mark each seam along the spine of the elbow. Turn the first section about 90 degrees while a helper holds the other sections still. Then, turn the first and second sections together, 90 degrees in the opposite direction. Continue until each section has been turned.



8

Blast gates act like an on/off switch to control the airflow to each machine. Install your blast gate so the thumbscrew tightens the plate toward the dust collector. Blast-gate adapters add length to the stubby flange on the blast gate for easier attachment of the flex hose. Note: you must predrill through the cast-aluminum blast gate.

Installation

Use a hand crimper for the occasional situation where the pipe needs a crimped end. For example, to make your own blast-gate adapters (see Photo 8).



Seal all the joints with silicone caulk. Adjustable elbows, blast gates and pipe joints all leak air. That many joints leaking a little air adds up to a big cfm loss in your line. Note: It is not necessary to seal the snap-lock seams along the length of the duct.



Some tools require custom-made dust ports. For our miter saw, for example, we built a simple plywood hood, with a large 5-in. port at the back. The powerful airflow from a well-designed central system makes this possible. Almost nothing escapes this dust trap.



imbedded metal coil and keeping the lengths under 5 ft. The metal coil and short length will keep electrostatic discharge to a minimum. To completely ground the system, just peel back the plastic to expose the wire at each end. Bend the exposed wire into a loop and screw it to the metal pipe on one end and the machine's dust port on the other.

Seal all the joints with silicone (Photo 10). If your pipe seems a bit oily, clean the joints with a little vinegar first.

Modifying the Dust Ports on Your Machines

You'll find most of the dust ports on your machines require some modification. For example, in our shop, we swapped out the 4-in. plastic port on our jointer with a 5-in. flange bolted to a piece of plywood. We also added a 4-in. dust port to the bandsaw and made a hood for the chop saw (Photo 11).

We split the 5-in. duct to the tablesaw with a 5-in. x 4-in. x 3-in. 45-degree wye joint and a 3- to 2-in. reducer. A 4-in. hose collects from the open area at the base of the saw while a 2-in. hose collects off of the overarm guard (Fig. A). The overarm guard makes a huge difference. It literally captures and whisks away all that stuff that gets thrown back at you from the saw blade.

Machines with a 4-in. dust port require a reducer fitting (Fig. A). Place a reducer as close to the machine as possible to ensure maximum cfm to the machine.

Once everything's attached, you'll be free at last from the tyranny of the broom and dust mask! No more dust tracked all over the house either. One last tip—get a remote control like the "Long Ranger" (\$60, see Sources, page 101) for the dust collector. With your new dust-collection system and a remote, woodworking's never been so good. **AW**

We'd like to thank Jeff Hill from Onside Air Systems for consulting on the technical aspects of the story, as well as his help in designing and installing our system.

Sources See page 101



Country-Style Grandfather Clock

For many of us, a grandfather clock is the ultimate project. Traditional high-style clocks often involve such advanced skills as spiral turning, veneering and figure carving, to say nothing of the cost of the figured wood.

This country-style tall clock is much, much easier to build, while still being a grand, stately and impressive piece of furniture. The only tricky part is the top, with those curved moldings, but we've come up with some jigs and a building process that makes it almost goof-proof.

In essence, this clock is composed of three boxes that are connected with cove moldings. The ornate "hood" rests on top of the slender "waist," which is supported by the wide, footed base. The base and waist boxes are fairly easy to build, so we won't spend much time explaining their construction. We'll concentrate on the hood. Its arched top, door and moldings are the challenging part of this project. A prototype, a shop-made compass and a couple of shop-made jigs are the keys to success.

Behind the beautiful paper dial, this clock is designed to house either a traditional mechanical or modern quartz movement (see Sources, page 101). You'll need about 55 bd. ft. of lumber; we used cherry. Including the mechanical movement and paper dial, we spent about \$800 to make our clock. Choosing a quartz movement will knock off about \$250. A hand-painted dial is an authentic, but costly upgrade (see Sources, page 101).

This project takes a well-equipped shop. You'll need a tablesaw with an accurate miter gauge, a bandsaw, a router table and router, a drill press, a spindle sander (or sanding drum for your drill press), a jointer, a planer and a good selection of router bits (see Sources, page 101).

The Base and Waist

Assemble the face frames of the base and waist sections (B1-B3 and W1-W3, Fig. A) with splines (Photo 1). The slots for the base's face frame run full length on all the inside edges, to house the panel (B4). The waist's face frame doesn't house a panel. Here, the slots stop, so the splines don't show. You have to round one end of the splines to fit these slots.

When you rout the slots, orient the face sides of the pieces the same way, so the joint surfaces will be flush.





Cut the cross-grain splines on a table saw equipped with a zero-clearance insert. The spline should slide into the slot easily, with just enough tolerance to keep it from binding.

Apply glue to both slots, slip the spline into the rail and assemble the joint. Don't put any glue on the spline. Clamp the face frames together, and check to make sure they're square. Using the patterns (Detail 1, page 75), saw out the feet on the base frame and sides.

Dadoes and Rabbits

The base and waist assemblies go together with dadoes and rabbets (Photo 2). Cut notches in the waist sides (W4) for the

backs (B8 and W11).

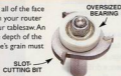
To keep the waist assembly square during glue-up, install a piece of scrap plywood as a substitute for the back.

It's important for the waist sides to extend exactly 4-5/8-in. above the top of the face-frame rail so the clock movement installs at the right height (Fig. B and Photo 6). If you use a different movement, you may have to adjust the dimensions.

Install the back (B8) and glue the three centering blocks (B7) on the base. They center the waist section and act as anchors for the screws that fasten the two assemblies together (Fig. A). Lower the waist assembly into position (Photo 3), drill pilot holes and screw the two sections together.



1 Slots and splines join all of the face frames. Cut the slots on your router table and the splines on your table saw. An oversized bearing limits the depth of the slots. For strength, the spline's grain must run across its width.



2 Rout rabbets for the sides on the edges of the face frames. Then, when you glue up the base and waist sections, the edges of the face frames virtually disappear, because they're so thin.



3 Place the waist on the base. Then fasten them together with screws into the centering blocks.

Tablesawn Cove Moldings

Make both cove moldings (W6 and W7, and Detail 2, page 75) from the same tablesaw setup (Photo 4). Use your miter gauge, set at 45 degrees, to position the fence. To create the cove, start with the blade only 1/16-in. above the table. Push the workpiece over the blade, while holding it firmly against the fence. Make successive passes, raising the blade about 1/16 in. each time, until it reaches its maximum height (1/2 in.). You'll have to sand the coves smooth after sawing.

Cut the back shoulders with the blade tilted away from the fence (Photo 5). The moldings are different sizes, so

Caution: Blade guard must be removed for this operation. *Be Careful!*

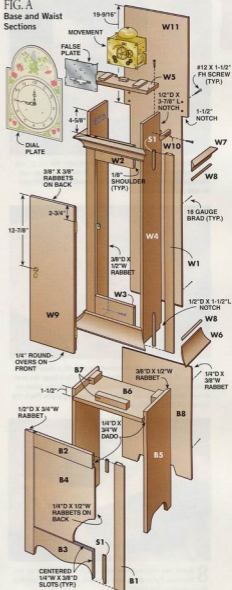


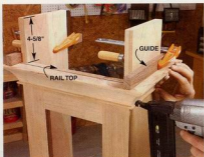
4 Cut the cove moldings using this setup. First, unplug your saw. Raise the blade 1/2-in. above the table. Then mark the throat insert where the back tooth emerges. Clamp a fence 9/16-in. behind this mark, angled at 45 degrees.



5 Rip the back sides of the cove molding at 45 degrees. To support the molding for the second 45-degree cut, reattach the offcut from the first cut with double-faced tape.

FIG. A
Base and Waist Sections





6 Attach the upper moldings flush with the top of the front rail. The hood rests on top of this molding, so use clamped-on guides to make sure the moldings are level side-to-side and front-to-back.



7 Draw arcs for all the arched pieces with a shop-made compass. Centerlines drawn on each blank keep the arcs centered. When the arc's centerpoint lies below the blank, as shown here, house it on a separate extra-long piece. Mark the centerline of this piece as well.



8 Sand the arches true after rough-cutting them on the bandsaw. If you don't have a spindle sander, use a sanding drum on your drill press.

they require different fence settings. Make sure the back shoulders are square to one another. Complete the moldings by sawing the square front edges.

Make the half-round bead (W8) with a bullnose bit (see Sources, page 101). Rout both edges of a wide board and then saw off the thin moldings. Glue the beads onto the coves.

Miter the front molding pieces and glue them in place. Fit the miters on each side piece before cutting them to length. Glue the miter joint and the first 2 or 3 in. of the side molding. At the back, fasten each side piece with a screw from inside the case, to allow seasonal movement.

The upper cove moldings have to be installed precisely (Photo 6), so the dial, (which mounts with the clock movement on top of the waist) lines up with the door opening in the hood.

Lipped Door

The waist's door (W9) has rounded-over front edges and a 3/8-in. rabbet around the back. Install the door with off-the-shelf hardware (see Sources, page 101).

The Hood

The hood features the same construction as the base and waist sections: stopped slots, rounded splines, dados, rabbets and miters (Fig. C). The arches are the new challenge.

FIG. B
Hood Cross Section

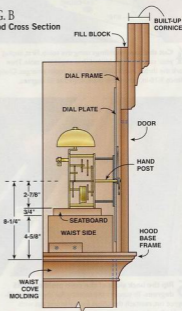
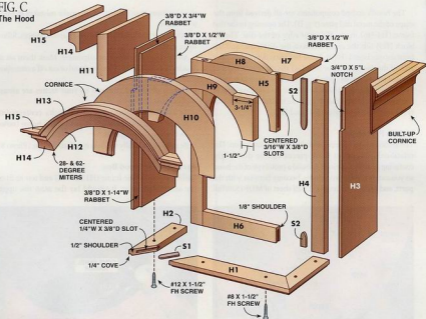


FIG. C
The Hood



9 Installing the fill block completes the recess for the door and readies the hood for its arched cornice.



The hood's arched components are all derived from the shape of the metal dial plate (Fig. D). The opening in the dial frame (H4-H6) masks the outer edge of the dial. The fill block (H9) fills the cavity between the dial frame and the front cornice board (H10). These two parts define the upper arch of the door. The door (D1-D4) sits directly in front of the dial frame and its opening for the dial is the same size. The cornice boards (H10 and H11) are the bottom pieces of the built-up cornice moldings, which also include coves (H12 and H14) and ogees (H13 and H15).

Make a Prototype

The arched pieces require careful layout and execution. The relationship between these pieces can be downright confusing. Our best advice is to build a prototype of the hood so you can test your procedures, become familiar with the parts, and verify your results. A half sheet of MDF (\$20/full

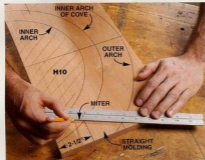
sheet) is more than enough. If you make mistakes in MDF, who cares?

When you manufacture the hood's arched pieces, follow these guidelines:

- Always use centerlines for alignment. Mark them on all sides of every blank. When you sand or cut off a centerline, re-mark it.
- Make a dedicated compass so your arches are always consistent (Photo 7).
- Be aware of the location of the arch's centerpoint. Sometimes it's on the blank, sometimes it's below (noted on Cutting List, page 74).
- Be precise: Carefully sand each arch to the line (Photo 8).

Assemble the Hood Box

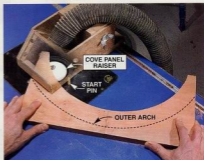
Build the hood's base frame (H1 and H2) and test its fit on the assembled waist. It should lay flat atop the upper



10 Make a pattern for the moldings right on the blank for the bottom-most of the three boards that'll make up the cornice. First, lay out the arches. Then establish the miters.



12 Build the cornice molding by gluing one routed piece on top of another. Leave a straight edge on the bottom piece to help you cut the miters later.



11 Rout the arched moldings before you cut the outer curves, so the blanks are big enough to handle safely. A start pin on your router table will give you additional control.



13 Mark the miters on the molding, using the layout lines from the pattern you created earlier (Photo 10).

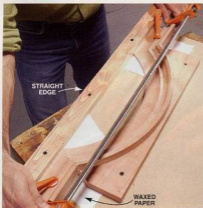
moldings, kiss the waist sides and butt up to their fronts.

Cut rabbets in the sides (H3) for the door and dial frame. Then cut additional rabbets for the top (H7) and the back (H11). Finally, bandsaw notches for the fill block (H9).

Assemble and glue the dial frame (H4-H6) after marking, cutting and smoothing the inner arch on its upper rail. You'll need a thinner slot cutter for this frame, because of its 1/2-in. thickness (see Sources, page 101). Glue the hood together; the dial frame arch should sit dead-center. Next, center the hood on the base frame and screw them together. After sawing and sanding the arches, glue the dial frame crown (H18) and the fill block in place (Photo 9).



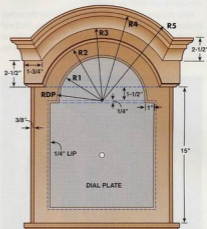
14 Miter the built-up arched molding using your miter gauge, the remaining straight edge of the blank, and the reference lines you've just drawn.



15 Glue on the straight shoulders, using a jig to keep everything in place. Waxed paper keeps the molding from sticking to the jig.

FIG. D The Arches

The metal dial plate (see Sources, page 101) determines the shape of the door, the top and all the moldings. The arches all originate from the centerpoint of the dial plate's arch.



| | |
|---------------------|---|
| RDP = 5" | Radius of dial plate (DP) arch |
| R1 = 4-3/4" | Inner radius of door rail (D2) Inner radius of dial frame rail (H5) |
| R2 = 6-1/2" | Outer radius of door rail (D2) Inner radius of front cornice board (H10) Inner radius of fill block (H9) |
| R3 = 8" | Inner radius of cove molding (H12) Outer radius of fill block (H9) Outer radius of dial frame crown (H8) |
| R4 = 9-3/4" | Inner radius of ogee molding (H13) |
| R5 = 10-1/2" | Outer radius of ogee molding (H13) Outer radius of cove molding (H12) Outer radius of front cornice board (H10) |



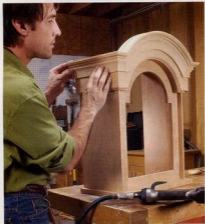
16 Miter the assembled molding, using a sled with mitered edges. Cut the sled so it's exactly the length that the molding should be cut to. Center the molding on the sled and screw it in position, making sure it lies flat. Line up the sled's mitered edge with the saw blade and make the cuts.



Make the Arched Molding

The cornice moldings are built up in three pieces (Fig. C and Detail 3, page 75). You'll need to make arched and straight versions of each built-up molding.

Keep things simple by making the blanks for the arched front cornice board (H10), cove and ogee moldings (H12 and H13) the same size. This allows you to use the same layout tools and procedures throughout. Lay everything out on the front cornice board blank (Photo 10).



17 Fit the miters and fasten the side moldings. Use a couple of pin nails to hold the moldings in place while you apply the clamps.

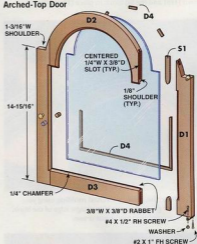


18 Cut the door's outer arch after gluing the door together. Before cutting the arch, cut the door's straight shoulders.

Draw both the inside and outside arches on the cove and ogee molding blanks, but cut and smooth only the inner arches. Check the curves of these arches on your pattern before you rout the profiles (Photo 11). Next, cut and sand the ogee molding's outer curve and glue it to the coved blank (Photo 12).

Mark and cut the 28-degree angle miter on the built-up arched molding (Photos 13 and 14). Miter the straight shoulder moldings at the same angle.

FIG. E
Arched-Top Door



19 Install the door. Special offset hinges (see Sources, page 101) allow the door to open without binding. The mounting screw acts as the pivot pin.

Glue the straight shoulders to the arched molding, using a jig made by fastening a fence to a piece of MDF (Photo 15). Simply fasten the arched molding to the MDF while holding its mitered points against the fence. Apply glue and clamp the straight shoulders in place.

Install the Cornice Molding

Cut and sand the arch on the front cornice board (H10) so it matches the arch on the fill block. Rout the ogee profile on its bottom edge, taking care to leave a 3/8-in.-wide flat surface for the door's hinge pivot screw. Center the cornice board blank on the fill block, mark the corners and cut the miters. Glue on the front cornice board, then fit and fasten the sides (H11).

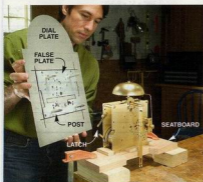
Measure the exact length of the installed front cornice so you can miter the built-up cornice molding. For the angled blade to cut all the way through the built-up moldings, your mitering sled can't be more than 1/2-in. thick (Photo 16).

With the hood on its back, glue the cornice molding in place, using the layout marks and centerline on the cornice front. Then install the side moldings (Photo 17).

Slide the hood into position on the case so you can locate and install the retainer blocks (W10). Then fit and install the waist back (W11). The adjacent edges of the waist and base back pieces are rabbeted, to keep out dust. Sand and finish the case.

Build the Door

Clamp the door's stile and rail blanks (D1-D3) together without glue, to form an oversized rectangular blank. Mark the door's shoulders and then draw both of the arches on the top rail. The outer arch runs onto the stiles before it meets the shoulder line.



20 Fasten the dial to the clock movement after fastening the movement to the seatboard (W5). Latches on the movement lock the posts on the false plate.

The Quartz Movement



Outfitting your grandfather clock with a quartz movement instead of the traditional mechanical mechanism may ruffle your feathers, but it's worth considering, for a number of reasons.

- It's a lot cheaper. You'll save about \$250—enough to buy a really good router.
- It's much easier to install. Forget all the careful measuring to line up the hood and the waist-mounted dial. Just fasten the dial to the back of the dial frame and fasten the quartz movement to the dial.
- It doesn't have to be regulated to keep accurate time.
- It never has to be wound.
- It offers different melody and chime combinations that sound surprisingly authentic.
- You can program the chimes to shut off at night.
- It never needs service. If new batteries aren't the answer, just replace the whole movement.



21 Slide the hood into position on top of the waist molding. Retaining blocks on the waist sides hold it in position. Fasten the hood to the back with brass hooks.



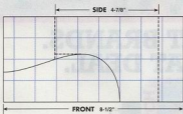
Cutting List

Overall Dimensions: 11-1/4"D x 20-1/4"W x 83-3/4"T

| PART | QTY. | NAME | BLANK SIZE | DIMENSIONS |
|--|------|-------------------------|---|--|
| BASE | | | | 9-3/4" x 17" x 23" |
| B1 | 2 | Front Stiles | | 3/4" x 3" x 23" |
| B2 | 1 | Top Rail | | 3/4" x 2-1/2" x 11" |
| B3 | 1 | Bottom Rail | | 3/4" x 5-1/4" x 11" |
| B4 | 1 | Panel | | 1/2" x 11-5/8" x 15-7/8" |
| B5 | 2 | Base Sides | | 3/4" x 9-1/2" x 23" |
| B6 | 1 | Support Shelf | | 3/4" x 8-3/4" x 16" |
| B7 | 3 | Centering Blocks | | 1-3/8" x 1-1/2" x 7" (front); x 3" (sides) |
| B8 | 1 | Base Back (plywood) | | 1/2" x 16-1/4" x 23" |
| S1 | 14* | Splines | | 1/4" x 23/32" x cut to length |
| WAIST | | | | 7-5/8" x 12-3/4" x 42-1/8" (w/out back) |
| W1 | 2 | Front Stiles | | 3/4" x 2-7/8" x 37-1/2" |
| W2 | 1 | Top Rail | | 3/4" x 4-1/2" x 7" |
| W3 | 1 | Bottom Rail | | 3/4" x 6-3/4" x 7" |
| W4 | 2 | Waist Sides | | 3/4" x 7-3/8" x 42-1/8" |
| W5 | 1 | Seatboard | | 3/4" x 4-1/2" x 13-1/4" |
| W6 | | Bottom Cove Molding | 1-1/2" x 3-3/4" x 48" | 2-1/4" x 2-1/4" x cut to length |
| W7 | | Top Cove Molding | 1-1/2" x 3-3/4" x 48" | 2" x 1-11/16" x cut to length |
| W8 | | Half-Round Beading | 1/4" x 4" x 48"; rip to width after routing | 1/4" x 3/8" x cut to length |
| W9 | 1 | Door | | 3/4" x 7-1/2" x 26-3/4" |
| W10 | 2 | Hood Retainer Blocks | | 5/8" x 1" x 3-1/2" |
| W11 | 1 | Waist Back | | 1/2" x 12"W (for waist); 15"W (for hood) x 56-3/4" |
| HOOD | | | | 11-1/4" x 20-1/4" x 24-3/4" |
| H1 | 1 | Base Front | 3/4" x 2-1/2" x 18" | 3/4" x 2-1/2" x 17-1/4" |
| H2 | 2 | Base Sides | 3/4" x 2-1/4" x 11" | 3/4" x 2-1/4" x 9-7/8" |
| H3 | 2 | Hood Sides | | 3/4" x 9" x 20" |
| H4 | 2 | Dial Frame Stiles | | 1/2" x 1-3/4" x 20" |
| H5 | 1 | Dial Frame Upper Rail** | 1/2" x 7" x 11-1/2" | 1/2" x 6-3/4" x 11-1/2" |
| H6 | 1 | Dial Frame Lower Rail | | 1/2" x 1-3/4" x 11-1/2" |
| H7 | 1 | Top | | 3/4" x 7-3/4" x 15" |
| H8 | 1 | Dial Frame Crown | 1/2" x 1-3/4" x 10" | 1/2" x 1-1/2" x 9-3/8" |
| H9 | 1 | Fill Block*** | 3/4" x 7" x 18" | 3/4" x 6-1/2" x 15-3/4" |
| H10 | 1 | Front Cornice Board*** | 3/4" x 9-1/2" x 18" | 3/4" x 9" x 17-1/4" |
| H11 | 2 | Side Cornice Boards | | 3/4" x 5" x 9-3/4" |
| H12 | | Arched Cornice Cove*** | 3/4" x 9-1/2" x 18" | 3/4" x 2-1/2" x 13-13/16" (to bottom points of miters) |
| H13 | | Arched Cornice Ogee*** | 3/4" x 9-1/2" x 18" | 3/4" x 3/4" x cut to length |
| H14 | | Straight Cornice Cove | 3/4" x 2-1/2" x 36" | 3/4" x 2-1/2" x cut to length for front shoulders**** and sides |
| H15 | | Straight Cornice Ogee | 3/4" x 2-1/2" x 36" | 3/4" x 3/4" x cut to length for front shoulders**** and sides |
| S2 | 4 | Dial Frame Splines | 3/16" x 23/32" x cut to length | |
| DOOR ***** | | | | 3/4" x 15" x 20-1/4" |
| D1 | 2 | Stiles | 3/4" x 1-3/4" x 20-1/4" | Cut blank to fit door opening in hood |
| D2 | 1 | Top Rail** | 3/4" x 7" x 11-1/2" | |
| D3 | 1 | Bottom Rail | 3/4" x 1-3/4" x 11-1/2" | |
| D4 | | Glass Retainers | 3/16" x 3/16" x cut to length | |
| <p>* Total for all 3/4" thick frames ** The arch centerpoint of this blank is 1/4" above its bottom edge *** The arch centerpoint of this blank is 1-1/2" below its bottom edge **** Blanks for front shoulders must be at least 4" long ***** Glass opening matches the opening in the dial frame</p> | | | | |

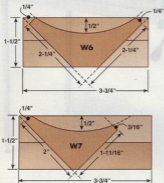
Detail 1

Pattern for Base Cutouts (1" Grid)



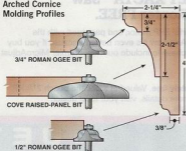
Detail 2

Pattern for Cove Moldings



Detail 3

Arched Cornice Molding Profiles



After disassembling the blank, cut and sand the upper rail's inner arch. Then glue the door blank together and cut the shoulders and the outer arch (Photo 18).

Rout the chamfer around the door's inside edge and square the corners with a chisel. Then rout a rabbet for the glass around the back inside edge (square these corners, too). Have the arched glass cut at a commercial glass company or stained glass studio (about \$20).

Trim the door to fit the opening in the hood (Photo 19). Leave 1/16-in. clearance (a dime's worth) on the sides, around the arch and at the shoulders. To keep the door's opening aligned with the opening in the dial frame, cut 3/32-in. off the bottom for the hinge and washer after you've fit all the other sides. The washer provides clearance so the hinge doesn't wear on the base frame.

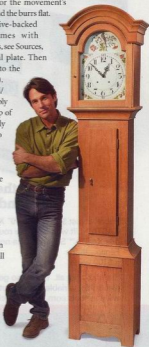
Install the Mechanism

The metal dial plate and the clock movement are connected by a universal adapter called the "false plate" (see Sources, page 101). Epoxy the dial plate and false plate together after cleaning both surfaces. They have to be perfectly aligned, or the dial will be crooked when it's attached to the mechanism. Drill out the holes for the movement's winding posts and sand the burrs flat.

Adhere the adhesive-backed paper dial (it comes with mounting instructions, see Sources, page 101) to the dial plate. Then attach the dial plate to the movement (Photo 20).

With the seatboard/movement/dial assembly resting in place on top of the waist sides, carefully slide the hood into position. The dial frame should butt up against the dial. You'll likely have to adjust the seatboard to center the dial in the opening before you fasten it to the waist sides.

Lock the hood in place (Photo 21). Install the hands, weights and pendulum. Now, what time is it? Step back, it's time to enjoy what you've accomplished! **JW**





Benchtop Planers

by Tom Caspar

There's a warm spot in my heart for a hard working planer. I'll shove in a rough board, hear the chips fly and watch a perfectly smooth surface slide out the other side. Considering all the money I've saved by using rough lumber rather than the pre-surfaced stuff, my planer has virtually paid for itself. It's an essential tool.

A lot has happened in the world of benchtop planers since we tested them three years ago. Many new machines give better results, are simpler to adjust and easier to keep sharp. However, that nasty overbite on the end of a board called snipe has yet to be vanquished. With all the new choices on the market, there hasn't been a better time to go shopping for this work-horse tool.

What a Planer Can and Cannot Do

A planer makes boards thinner. It cuts the top side of a board parallel to the bottom side. For example, you can easily reduce a 3/4-in.-thick board to 1/2-in. thick. The planer automatically feeds the board, taking off 1/32 to 1/16 in. per pass.

What a planer can't do is guarantee a flat board. If you plane a twisted or cupped board, it will come out in the same condition. Right thickness, yes, but flat, no. That's where a jointer comes in. A jointer is used to flatten one face of a board before using a planer. You'll want both machines in a well-equipped home shop, so it's a good thing benchtop planers are such great values.

Planer Options



| | | | |
|------------------|-------------|------------------|----------------|
| Type of Planer | Benchtop | Planer/Molder | Stationary |
| Price Range | \$180-500 | \$550-1,200 | \$700- up |
| Power | 120 volts | 120 or 240 volts | 240 volts |
| Motor | Universal | Induction | Induction |
| Typical Capacity | 6" x 12-13" | 5-6" x 13" | 6-12" x 15-24" |
| Weight | 63-95 lbs. | 130-275 lbs. | 300-2,000 lbs. |

PHOTOS COURTESY OF MANUFACTURERS

Before you delve into this tool test, ask this simple question: Is a benchtop planer the best fit for my shop? You've actually got three options.

Economical Benchtop Planers

Benchtop planers are perfect for the small home shop. Many have knives that are easy to set and change. They produce extremely smooth surfaces and plug into a household outlet. They don't have as much power as larger machines, so it takes more time to plane down a stack of lumber. They use universal motors with brushes, similar to the kind you'd find on a miter saw. Brushes should be regularly inspected for wear.

Benchtop planers fold up for transport or storage. They used to be called "portable" planers, but many new machines are so bulky and heavy that the term really isn't appropriate. You can lift them, but it can be a struggle.

Versatile Molder/Planers

A combination molder/planer is basically a stationary planer that can accept either straight or shaped knives. Molding knives cost from \$17 to more than \$100 per set. They range from small knives for furniture moldings to large ones for architectural moldings (such as cornice boards) which are impractical to make with a router.

The molding feature can save you a ton of money if you're doing lots of

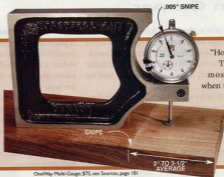
trim carpentry. Commercial moldings can be quite expensive and come in a limited variety of wood species.

Workhorse Stationary Planers

Stationary planers are built to meet the needs of production shops. They can run continuously for hours on end, remove a big bite in one pass (up to 1/8 in.) and handle very wide glued-up panels.

Both molder/planers and stationary planers run on induction motors, similar to the kind you'd find on a stationary table saw. These motors generally have a long life and don't require regular servicing. They're more powerful than benchtop planer motors.

Why We Don't Rank Planers By Snipe



OneWay Multi-Gauge: \$75, see Sources, page 161

"How much does it snipe?" That's the first question most woodworkers ask when they're going to buy a planer. Snipe is a deeper cut at the beginning and end of a board. It ranges in depth from next to nothing to about

Reducing Snipe

Snipe is an extra-deep cut on both ends of a board. It's a perennial problem with all benchtop planers. At best, it costs extra time sanding. At worst, you may have to entirely cut off the ends. No single model has the problem completely licked, but two features can make a big difference.

Headlocks

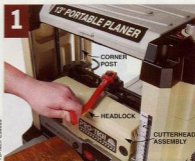
Boards are sniped when a planer's cutterhead assembly tilts ever so slightly. This tilt is minimized by a headlock, an essential feature found on many of today's planers (Photo 1). We highly recommend buying a planer with a headlock.

Here's how a headlock fights snipe. Every planer has two feed rollers: one in front of the cutterhead and one behind. When you feed a board into a planer, it's held down by the front roller. The cutterhead assembly tilts backward and temporarily cuts deeper until both rollers are engaged. The result is snipe on the leading end of the board. This snipe is consistently about 2- to 2-1/2-in. long, which is the distance from a roller to the cutterhead. As a board exits the planer, only the back roller is engaged. The cutterhead tilts forward and snipes once again on the trailing end of the board. Engaging the headlock reduces this back and forth tilt by clamping the cutterhead assembly to the corner posts.

Outfeed Tables

Long infeed and outfeed tables also help reduce snipe (see "Length of Bed" in Chart, page 87), but they're not perfect (Photo 2). When a table sags under the weight of a long or heavy board, the end of the board gets kicked up into the cutterhead and is sniped.

Most outfeed tables can't be flipped up for storage when you've got a dust-collection hose attached to the planer. You've got to leave the table down or remove the hose and unscrew the dust hood, a major pain in the neck with models that use fussy little screws. We preferred models that have large, tool-free fasteners.



A headlock mechanism minimizes snipe. When the headlock is engaged, the cutterhead assembly is clamped to four corner posts. On most machines, you must release the headlock to lower the cutterhead and then re-engage it.



All folding extension tables need additional support to minimize snipe on long and heavy boards. Long tables are best, as shown above, but no planer has tables that are rock solid.

.005 in. (about the thickness of a dollar bill).

To measure snipe, we ran dozens of boards through our machines. We tested different machines of the same brand, to see if we'd get the same amount of snipe. In addition, we talked to the engineers who design planers.

Our conclusion: there is so much

variation that a single measurement, even if it's an average, would be misleading.

First, there's too much variation within a single machine. Short and light boards snipe less than long and heavy ones.

Second, there's too much variation across machines of the same make and model. One machine can't repre-

sent all the machines that come off the assembly line. Some are better than average and some are worse.

You can't rank planers with bogus numbers. It would take an involved (and expensive) statistical test to rank planers by the amount of snipe. We believe you're better off picking a planer based on all of its features, rather than one suspect measurement.



Festool AP 7300

A depth gauge speeds up the first pass. You don't have to measure the thickness of your board before planing. Just stick it under the depth gauge and lower the cutterhead until the indicator bounces up.



Delta 22-090

Measure your cut with the crank. We prefer a crank that lowers the cutterhead by exactly 1/16 in. with one complete revolution. Turn it halfway and you know you're taking exactly 1/32 in. off. Some cranks are metric, and lower the cutterhead by 2mm per revolution, which isn't as helpful.



Ragone TP 1200 LS

Dial in a thickness with preset depth stops. You don't have to rely on a ruler or a planer's scale, which is often hard to read. This handy feature allows you to take boards down to the same exact thickness time after time.

The Next Wave: Direct-Read Planing

Three relatively new innovations in planer design have made planing boards to a precise thickness much easier, the same way direct-read rip fences revolutionized tablesaws. You don't have to constantly measure your boards with a ruler. Our top-choice machines have all three features.

A Depth Gauge Sets the First Cut

A depth gauge makes it easy to set up the first pass (Photo 3). You don't have to do any measuring or peering at a scale to get going. Simply stick your board under the gauge and lower the cutterhead until the indicator moves.

Measure the Next Cut With the Crank

Most planers have scales that are difficult to read accurately. Even worse, you have to bend way over to see them. It's far easier to measure each cut with the crank.

We prefer planers that use this easy system: one full revolution of the crank equals 1/16 in. of cut (Photo 4). You need to take a board down another 1/8 in.? No problem. That's simply two more full turns of the crank. Just follow the position of the handle as if it was a hand on a clock.

Some planers have cranks that lower the cutterhead by 2mm (about 5/64 in.) per revolution, which is less convenient when you're used to working with fractions.

A few planers have cranks that can be mounted on either side. If you're left-handed or stuck in an awkward space, this option could make your day!

Repeat a Thickness With Depth Stops

Have you ever had to plane some new boards to exactly the same thickness as an older stack? If this problem sounds familiar, look for a planer with depth stops (Photo 5).

There are two types. A preset stop allows you to dial in one of six or so standard board thicknesses. A full-range stop is adjustable to any thickness. It only remembers one thickness at a time, however. We think the full-range stop narrowly wins out because it can handle the odd sizes.

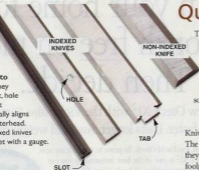
Parallel Adjustment

A planer is adjusted at the factory to cut equally deep across the width of a board. If it isn't set precisely enough, you may be able to fix the problem by rotating a gear underneath the machine. You can raise or lower one side of the cutterhead in .004-in. (or so) increments, depending on the machine.

We've noted models with these instructions in their manuals (see Chart, page 86). Other models must be adjusted by an authorized service center.

6

Indexed knives are easy to install. They have a slot, hole or tab that automatically aligns to the cutterhead. Non-indexed knives must be set with a gauge.



Quick-Change Knives

The best machines have knives that are fast and easy to install. When its knives are sharp, a benchtop planer makes an incredibly smooth surface that needs very little sanding. Almost all knives have two edges, but when both sides get dull you've got a lot more sanding to do. The easier it is to install knives, the sooner you can return to making those beautiful surfaces.

Indexed Knives Drop In Place

Knives for benchtop planers are undergoing a revolution. The best are indexed to the cutterhead (Photo 6). Essentially, they snap right in place, like safety-razor blades. It's just about foolproof.

Old-fashioned, non-indexed knives must be set with a gauge and clamped in place with an open-end wrench (Photo 7). It's not so bad once you get the procedure down, but it's tedious work.

Indexed knives are much easier to deal with. You use small magnets to hold them so you don't cut yourself. It's very easy to tighten the clamping bolts with a long wrench on most machines (Photo 8).

Resharpenable vs. Disposable Knives

Indexed knives can't be resharpened. When both sides get dull, you toss them. Resharpener would make them too narrow to project the right amount from the cutterhead.

Non-indexed knives *can* be resharpened. You can do it yourself, but it takes \$200 to \$500 worth of specialized equipment and a fair amount of time and patience to remove all the nicks and sharpen the knives absolutely straight. Most folks take or send their knives to a sharpening service.

Which type is cheaper to use? Sharpening a set of knives typically costs about \$25, including shipping. A set of disposable knives costs \$25 to \$40, about the same or a bit more than one resharpening. There is a small price to pay for the convenience of indexed knives, but we think it's worth it.

7



Non-indexed knives can be awkward to set. You must hold a height gauge on top of the knife while tightening small bolts with a short open-end wrench. Springs push the knife up against the gauge.

8



Most indexed knives are easy to tighten. On this machine, you simply slide the knives in place over two locating pins and tighten a clamping bar with a convenient long-handled Allen wrench.

Offsetting Nicked Knives

When a blade gets nicked, it leaves long ridges on your wood that are a pain in the neck to sand out. To eliminate those ridges, all you have to do is loosen one knife and shift it over 1/32 in. or so. This offsets the nicks and results in a smooth surface once again. This neat trick extends the life of your edges and is very easy to do with most indexed knives.

Unfortunately, some indexed knives cannot be offset (see Chart, page 86). This is a big drawback to two otherwise excellent machines.

To be fair, non-indexed knives can be offset, too, but it's just not as easy. You must reset them with a gauge.

9

Craftsman has introduced two planers with built-in dust collectors. There's a fan inside that blows chips and dust into a garbage can nearby. While a few chips are left behind, the fan is a reasonable substitute for a 1-1/2-hp portable dust collector.



Craftsman 21743

New Ideas

Benchtop planers just keep getting better. Here are three groundbreaking features.

Built-In Dust Collection

Planers make a heck of a mess. Thank goodness most planers have optional dust hoods for hooking up a dust collector. We highly recommend using one, but it may cost extra. Two new Craftsman planers have eliminated the need for both the dust collector and the hood (Photo 9). They have a blower fan inside the machine.

The system works well, but it does leave some chips behind, particularly when planing thick stock. You get a cloth dust hood that can be attached to a garbage bag or a 30-gallon garbage can. We lined our can with a plastic bag to make disposal easier. The only problem with the setup is that the garbage can must stand right next to the planer. It's not in the way, but it takes up valuable space in a small shop. You can still hook up the planer to a central dust collection system if you want.

Smoother Boards

The Delta 22-580 is the first benchtop planer with an option that can further cut down on your sanding time. It's equipped with a switch that slows down the speed of a board passing through the planer (Photo 10). The result is significantly more cuts per inch (cpi) and a smoother surface. It's definitely a useful option, not just a gimmick.

We tested this new feature with a pile of nasty figured wood and average straight-grained boards. The standard feed rate of 60 cpi is about the same as on other benchtop planers. We left our machine at this setting for everything but the last pass, when we flipped the switch to 90 cpi. Figured wood came out much smoother, with less tear-out. Average straight-grained boards looked better, too, but the improvement wasn't as dramatic.

Automatic Headlock

The Makita 2012NB is the only planer with a headlock you can't possibly forget to engage. You don't have to fiddle with a lever to reduce snipe on this machine. All you have to do is feed in a board. The headlock automatically engages when the board hits the first feed roller. It's just as effective as a manual headlock in reducing snipe and is far more convenient.

10

Delta 22-580

Delta's speed selector saves sanding time. It changes the speed at which a board passes through the planer. The standard speed (Dimensioning) is about the same as other benchtop planers. The super-slow speed (Finishing) produces more cuts per inch (cpi), resulting in a smoother surface.

Recommendations

Many Good Choices

Seven machines stand out from the rest with most or all of the most-important features: indexed and disposable knives, a head-lock, a crank that measures the cut in 1/16-in. increments and a dust hood. In addition to our four top choices at right, there are three honorable mentions:

Ridgid TP1300LS (\$400)

Shop-Fox W1675 (\$425)

Woodtek 115-946 (\$380)

If you want a planer with knives that can be resharpened, our top choices are:

Jet JWP12DX (\$400)

ProTech CS6005 (\$300)

Where's DeWalt?

Three years ago we gave the DeWalt DW733 (\$350) an Editors' Choice. DeWalt is currently redesigning this machine, and it will be released later this year.



Ryobi AP 1300, \$270

This new planer has far and away more great features than any machine in its price class. However, one turn of the crank equals 2mm of cut, rather than the preferable 1/16 in.

| Model/Price | Accessories Included | Dust Hood Included | FEATURES | | | | | | | | Knife Type | | |
|---|-----------------------------|--------------------|----------------|-------------------------|------------------------|-------------|-------------------------------|--------------------|-----------------|----------------------|------------|---------------|---------------|
| | | | Reducing Snipe | | Direct-Read Measuring | | | Setting the Knives | | | | | |
| | | | Headlock | Over Crank Equals 1/16" | Depth of Cut Indicator | Depth Stops | Parallel Adjustment in Manual | Indexing | Easy Tightening | Knives Can Be Offset | | | |
| Central Machinery 41921 \$180 | Spare brushes | NA | N | N | N | N | N | N | N | N | Y | Resharpenable | |
| Central Machinery 41831 \$260 | Spare brushes | NA | N | N | N | N | N | N | N | N | Y | Resharpenable | |
| Craftsman 21722 \$300 | Cloth dust hood | Y | N | Y | N | N | Y | Y | Y | Y | Y | Disposable | |
| Craftsman 21743 \$440 | Cloth dust hood | Y | Y | Y | Y | Y | Y | Y | Y | Y | Y | Disposable | |
| Delta TP300 \$270 | | \$20* | N | N | N | N | N | N | N | N | N | Y | Resharpenable |
| Delta TP400LS \$330 | Stand, second set of knives | Y | Y | N | N | N | N | N | Y | Y | Y | Y | Disposable |
| Delta 22-580 \$420 | | \$25* | Y | Y | Y | Y | Y | N | Y | Y | Y | Y | Disposable |
| Enco 240-7163 \$300 | | NA | N | N | N | N | N | Y | N | N | N | Y | Resharpenable |
| Grizzly G0505 \$195 | | NA | N | N | N | N | N | N | N | N | N | Y | Resharpenable |
| Grizzly G8794 \$300 | Stand | NA | N | N | N | N | N | N | N | N | N | Y | Resharpenable |
| Grizzly G1017 \$370 | Stand | \$20* | N | N | N | N | N | Y | N | N | N | Y | Resharpenable |
| Jet JWP12DX \$400 | | \$40* | Y | N | Y | N | N | Y | N | N | N | Y | Resharpenable |
| Makita 2012NB \$500 | | \$30* | Y | N | Y | Y | Y | N | Y | Y | Y | Y | Disposable |
| Pro-Tech CS6005 \$300 | Second set of knives | \$20* | Y | N | Y | Y | Y | N | N | N | N | Y | Resharpenable |
| Ridgid TP1300LS \$400 | Stand, second set of knives | Y | Y | Y | Y | Y | Y | N | Y | N | Y | Y | Disposable |
| Ryobi AP1300 \$270 | | Y | Y | N | Y | Y | Y | N | Y | Y | Y | Y | Disposable |
| Shop Fox W1675 \$425 | | Y | Y | Y | Y | Y | Y | N | Y | Y | N | Y | Disposable |
| Woodtek 115-946 \$380 | | Y | Y | Y | Y | Y | Y | N | Y | Y | N | Y | Disposable |

NA = Not Available * Additional cost of accessory dust hood

**Craftsman 21743, \$440**

This new planer has every single one of the features we're looking for, plus a unique built-in dust collector.

**Delta 22-580, \$420**

Delta's best model has all the latest features. It's the only planer with an optional slow feed rate to fight tear-out and deliver an ultra-smooth finish.

**Makita 2012NB, \$500**

Compact, lightweight and relatively quiet, this planer is well-suited for the small shop. It's the only planer with an automatic headlock. But one turn of the crank equals 2mm, rather than the preferable 1/16 in.

| Cost of Knives | Specifications | | | | | Details | Contact |
|----------------|----------------|-------|----------------------|----------------------|----------------------|--|---|
| | Weight in lbs. | Range | Max. Width in inches | Max. Depth in inches | Length of Bed in in. | | |
| \$20 | 86 | 7 | 10 | 5 | 22 | Single-edge knives, about 1/8" per 1 turn of crank | (800) 423-2567 www.harborfreight.com |
| \$25 | 95 | 7 | 12-1/2 | 6 | 22 | Single-edge knives, 1/8" per 1 turn of crank | see above |
| \$25 | 64 | 12 | 12 | 4-1/2 | 13 | No extension tables, built-in dust collection | (800) 377-7414 www.sears.com |
| \$27 | 87 | 15 | 13 | 6 | 35 | Built-in dust collection, 6 preset stops at 1/8" to 1-1/4", left- or right-mounted crank | see above |
| \$28 | 63 | 15 | 12 | 6 | 24 | 2mm per 1 turn of crank | (800) 438-2486 www.deltawoodworking.com |
| \$32 | 65 | 15 | 12-1/2 | 6 | 28 | 0.1" (about 3/32") per 1 turn of crank, tool-free dust hood | see above |
| \$39 | 87 | 15 | 13 | 6-1/2 | 35 | Two feed rates, full-range depth stop, tool-free dust hood | see above |
| NA | 65 | 15 | 12-1/2 | 6 | 23 | 2mm per 1 turn of crank | (800) 873-3626 www.use-enco.com |
| \$30 | 72 | 15 | 12-1/2 | 6 | 27 | 2mm per 1 turn of crank | (800) 523-4777 www.grizzly.com |
| \$35 | 70 | 15 | 12-1/2 | 6 | 25 | 2mm per 1 turn of crank | see above |
| \$40 | 75 | 16 | 12 | 6 | 21 | Single-edge knives | see above |
| \$40 | 71 | 15 | 12-1/2 | 6 | 35 | 2mm per 1 turn of crank | (800) 274-6848 www.jettools.com |
| \$38 | 64 | 15 | 12 | 6-1/2 | 30 | 2mm per 1 turn of crank, full-range depth stop, tool-free dust hood | (800) 462-5482 www.makitatools.com |
| \$30 | 76 | 15 | 13 | 6 | 33 | 2mm per 1 turn of crank, 7 preset stops at 1/4" to 1-3/4" | (800) 888-6603 www.protechpower.com |
| \$30 | 87 | 15 | 13 | 6 | 34 | 8 stops at 1/8" to 1-3/4", tool-free dust hood | (800) 474-3443 www.ridgidwoodworking.com |
| \$20 | 74 | 15 | 13 | 6 | 33 | 2mm per 1 turn of crank, 7 preset stops at 1/4" to 1-3/4" | (800) 525-2579 www.ryobi.com |
| \$35 | 88 | 15 | 13 | 6 | 39 | Full-range depth stop from 1/8" to 2" | (800) 840-8420 www.shopfox.biz |
| \$40 | 78 | 15 | 13 | 6 | 37 | 6 preset stops at 1/8" to 1-1/4", left- or right-mounted crank | (800) 645-9292 www.woodworker.com |

Great Wood!

Curly maple's striped pattern seems to move as light is reflected in different directions off the crests and troughs of each wave. Soft maple sold as "natural" will contain dark heartwood like the board shown here. All-white, or sapwood-only grades are also available, but they're more expensive.

Curly Soft Maple

Turn a piece of curly soft maple around in your hands and you'll see a tiger change its stripes. The light areas shift to dark and the dark to light. A simple oil finish brings this magical wood to life and yet it is one of the least-expensive figured woods on the market (\$4 to \$6 a bd. ft.).

Most of the curly maple sold today is soft maple. Hard curly maple is available, but expect to pay a 50-percent premium over the cost of curly soft maple. The sapwood in soft maple tends to have more of an off-white color when compared to the brighter, creamy-white sapwood of hard maple. The heartwood can be any combination of green, brown and pink. Most lumberyards offer you a choice between all white (all sapwood) and natural (sapwood with heartwood).

The word "soft" is a bit misleading. While this wood is 25-percent softer than hard maple, it's still about as hard as cherry. Unlike cherry, however, soft maple's white sapwood is the most prized part of the log.

Curly soft maple is a bit tricky to machine due to the wavy grain pattern. You can greatly reduce tear-out on the planer or jointer if you dampen the surface of the wood with water and feed it slowly and at a skewed angle.

Curly maple's wave-like grain pattern may be a curse when you're machining, but it's a blessing when it comes time to finish. The crest of each wave is end grain and absorbs the finish more readily than the trough of the wave that lies flat or parallel to the surface. This creates the light and dark areas that really accentuate the undulating patterns in the wood.

We got our curly soft maple from Steve Wall Lumber Co. (see Sources, page 101). The highly figured wood is sold as "mostly white" (\$6/ bd.ft.) or "with heartwood" (\$5 / bd.ft.). **HW**

Sources See page 101

Know of some Great Wood? We'd love to hear about it. Write to us at greatwood@readersdigest.com.



CURLY MAPLE CABINET BY DALE HILMS • PHOTO BY JESSE BRUCE HARRARD

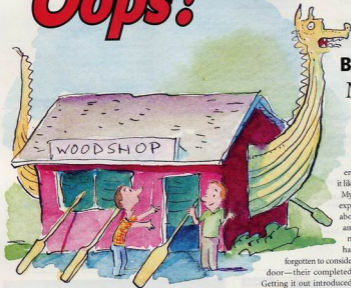
Oops!

Boat-Building 101

My father teaches a high school shop class, and they decided to build a boat as a group project. As they planned, their dream vessel grew from a six-man rowboat into a Viking warship. Full of enthusiasm, the class went at it like, well, marauding Vikings. My father says it was a great experience; they learned a lot about woodworking, history and teamwork. But their most memorable lesson was a hard one to swallow. They'd

forgotten to consider the size of the woodshop's door—their completed warship was marooned! Getting it out introduced these shipbuilders to the carpentry trade.

John P. Sellarolo



Pale-Faced Cherry Credenza

My daughter asked me to help her put a finish on the credenza she had built as a 4-H project. It was made of cherry that my dad had cut 30 years ago, so it had beautiful color. I suggested we try waterborne polyurethane, even though I'd never used it, because of its environmentally friendly chemistry and easy cleanup.

The waterborne poly darkened the cherry nicely when we first brushed it on. But as the finish dried, the wood got lighter and lighter. We tried a second coat, but the result was the same. The waterborne poly left the cherry pale and raw-looking. What a disaster! The county fair was only a week away and my daughter was in tears.

It took a lot of elbow grease, but we stripped the

credenza and refinished it with good-old oil-based poly in time for the fair. You can be sure that from now on, I'll never try a new finish on a project without testing it first.

Douglas J. Wagner

Douglas, as you discovered the hard way, waterborne polyurethanes don't make dark-colored wood come alive the way oil-based finishes do. There is an easy solution, however. Bring out the wood's color before you put on the waterborne poly by applying a coat of oil finish first. Just make sure the oil is completely dry before you put the waterborne poly on top of it. TJ JW

If you have a woodworking blunder you're willing to share, send it to us. You'll receive \$100 for each one we print. Send to: **AW Oops!, American Woodworker, 2915 Commers Drive, Suite 700, Eagan, MN 55121, or e-mail to oops@readersdigest.com.** Submissions can't be returned and become our property upon acceptance and payment. We may edit submissions, and use them in all print and electronic media.