

TODAY'S

March/April 1990

WOODWORKERTM

PROJECTS, TIPS AND TECHNIQUES



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(Photography by
Scott Jacobson)

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TODAY'S WOOD

Black Walnut (*Juglans nigra*)

Some old, abandoned barns provide interesting surprises in the form of black walnut hiding under years of weather-beaten exposure. Although hard to comprehend today, black walnut was commonly used for barn construction generations ago because of its exceptional decay resistance and abundant supply.

Today the law of supply and demand has made black walnut one of the most expensive of all domestic species. For the finest furniture and cabinet projects, woodworkers seem willing to pay a premium price because, as the book “In Harmony with Wood” points out, “Black walnut is as close to a perfect cabinet wood as can be found in North America.”

Considering its price, black walnut is generally reserved for fine indoor applications nowadays. The

chocolatey brown color of this species instills a warm, comfortable look to any room, while its strength and durability ensure that assemblies are likely to last for generations. The hardness of black walnut falls between cherry (softer) and oak (harder).

In the workshop, black walnut works quite easily with both power and hand tools, and the species' outstanding stability prevents woodworkers from getting bent out of shape with frustration. It planes, carves and turns beautifully with very infrequent tearing and ripping. Black walnut also has excellent gluing properties.

The rich color of walnut is perfect for clear finishing, and it polishes beautifully.



Artist Unknown

March/April 1990
Volume 2, Number 2

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Today's Woodworker, (ISSN: 1041-8113) is published bimonthly (January, March, May, July, September, November) for \$13.95 per year by Rockler Press, 21801 Industrial Blvd., Rogers, MN 55374-0044. Application to mail at second class postage rates is pending at Rogers, MN 55374.

POSTMASTER: Send address changes to Today's Woodworker, PO Box 6782, Syracuse NY 13217-9916.

One year subscription price, \$13.95 (U.S. and possessions); \$20.95 (U.S. currency—other countries). Single copy price, \$3.50; (other countries, \$5.00, U.S. currency). Send new subscriptions to Circulation Dept., Today's Woodworker, PO Box 6782, Syracuse NY 13217-9916. Subscribers are welcome to submit project proposals, tips and techniques to the editor, Today's Woodworker, Box 44, Rogers, MN 55374. For purposes of clarity, illustrations and photos are sometimes shown without proper guards in place. Today's Woodworker recommends following ALL safety precautions while in the shop. Today's Woodworker is a trademark of Rockler Press.

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ON THE LEVEL

Planning Your Magazine

We're working on our next cover project already—a porch glider for two. Why a porch glider? Simply because a few readers took the time to drop us a note and request plans for just such a project. We've got some ideas for the July/August issue as well, but at Today's Woodworker, nothing is "written in stone." If, for instance, we received a flurry of letters calling for a picnic table, or a coffee table, or a dining room chair, or... Well, you get the general idea.

With no advertisers to please, that just leaves you and us; the readers and the

staff. If it's all the same to you, we'd prefer to work on the issue at hand and leave the planning of future issues to you.

Finally, don't forget to share your own expertise in "Tricks of the Trade." Take a look around your shop for a jig you made years ago, or share a technique you've learned through experience. Somewhere, a woodworking rookie will be forever grateful—and you'll be \$30.00 to the good. That's enough for a two year extension on your subscription and some spare change!

Larry N. Stoiaken

Three sharp-eyed readers have pointed out that the elevation drawing of the easel on page 10 of our Sept/Oct 1989 issue contains several errors. The depth of the rotating hole should be 9/16", not 1/16" and the diameter of the threaded insert hole should be 3/8", not 7/16". In addition, the drilling locations (from the sides) are half of what they should be. Where you see 1/2", correct it to 1" and where you see 1/4", correct it to 1/2". The drilling locations from top and bottom are correct.

Today's Woodworker has prepared a correction sheet to further clarify this drawing. Anyone who plans to build the easel can drop us a line and we'll immediately send the new drawing, at no charge.

Enclosed please find a check to cover the cost of your July/August 1989 issue. Somehow I lost my copy just as I was starting to build the futon sofa-bed and after frantically searching the house I decided I better order another one.

I enjoy receiving your magazine. It has a well balanced blend of easy and difficult projects. I like "Today's Wood"—it provides me with information on wood I do not have anywhere else.

Keep up the good work and I hope you can supply me with the back issue.

Ken Rice
Anchorage, Alaska

I received my first issue of your magazine yesterday and I'm very pleased with the articles (Vol. 1, No. 5). My only complaint is that the magazine appears to be too skimpy, however I'm quite aware that this may stem from the lack of advertisements.

At any rate I am interested enough to enclose a check for \$14.00, for back issues 1 through 4. Keep up the good work. I'm looking forward to a long and happy relationship with your magazine.

Ray Sheley, Jr.
Rochester, New York

I just received my first copy of Today's Woodworker. I can't wait to make the footrest for our cottage. I like to keep my feet up but don't have room for a bulky footstool.

I also need the back issue with the futon sofa-bed pictured on your promotional piece.

Thanks for a good magazine.

Monica Sybeldon
La Crosse, Wisconsin

I find Today's Woodworker to be just what I need for my business. The projects, tips and techniques are excellent. Is there any way I can get the first four issues? Please advise because there's bound to be something I can use in them.

Marcus E. Williams
Austin, Texas

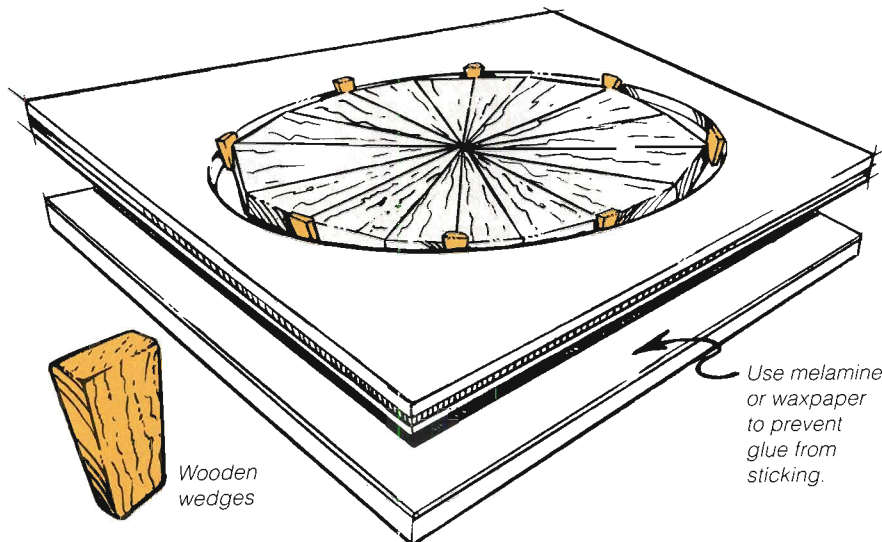
I am enclosing a check for \$25.00 for two years of Today's Woodworker. In addition, please send me your first two issues. I think Today's Woodworker is of collection value.

Thomas P. Sikora
St. Clarisville, Ohio

Today's Woodworker responds: We certainly appreciate all the words of encouragement. Back issues are still available (\$3.50 each). The Futon sofa in the July/August 1989 issue is running away with honors as most popular project of the year. Shall we have Bruce Kieffer build a matching coffee table?

Readers who are unable to locate Ken-Craft's RouterMaster™ reviewed in the January/February 1990 issue should contact the company directly for the name of a local supplier (KenCraft Co., 2851 South Ave., Toledo OH 43609). Likewise, more information on the Blade Runner featured in the July/August 1989 issue is available from Progressive Technology Inc., PO Box 98, 1003 Murphy Rd., Stafford TX 77477.

Circles, Octagons and Lathe Tricks



Gluing Circular Segments

This shop tip describes a method of gluing together pie-shaped segments into a circle. Make the jig by cutting a circular hole from 3/4" plywood—its diameter should be about 1/8" to 3/16" larger than the diameter of the segmented circle you want to create. This piece is clamped to a 3/4" plywood base with waxed paper inserted between the two pieces of plywood to prevent the segments from sticking to the plywood base. Instead of waxed paper one can also use a piece of polyester or melamine-coated particle board. Assemble the glued-up segments within the circular cut-out. Then push or drive small wooden wedges between the pie segments and the inside wall of the circular hole. This pushes each segment towards the center and into close contact with the two segments next to it. Enough pressure should be applied with the wedges to form a good glue bond. After the glue has set, the wedges are removed, freeing the segmented disc from the jig.

Not only can discs be glued-up in this manner but this jig works equally well for making circular segmented rings or frames. In this case the segments are made only as long as you want the width of the ring or frame to be. It also works when gluing-up staves.

*C. E. Rannefeld
Decatur, Alabama*

Burnishing Alternative

Wood turners often burnish their spindles with wood shavings to create a very smooth, lustrous appearance. They just pass a handful of shavings along the length of the piece while the lathe is running. But this operation is sometimes difficult to accomplish when you're turning objects on a faceplate. I have found that a good alternative to using wood shavings is to use heavy Kraft paper or a piece from a grocery bag. This material is more flexible, it's easy to maneuver on faceplate turnings and imparts the same burnished quality to the wood.

*Arthur Mendel
White Bear Lake, Minnesota*

Octagon Planer Jig

There are a variety of ways to make octagons but I find this planer jig produces the quickest and best results. Use a table saw to cut a "V" into the support block to a depth of about half the diagonal of the stock that will be used for the octagon. The depth of the "V" is not critical, you just want it deep enough to provide sufficient support for the stock. During operation the jig should not contact the feed rollers or

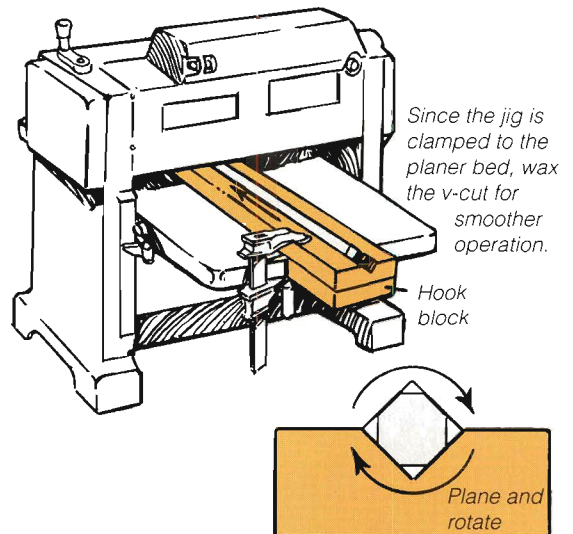
cutter knives. A hook block catches on the planer bed and prevents the jig from being pulled through during operation. Clamping the jig to the planer bed adds assurance that it will not vibrate around or catch on the knives, which could cause it to kick-back. Square stock is then simply passed through the jig and planer, rotated with each pass until the desired size is reached. Waxing the "V" eases the operation.

*Randy Johnson
Crystal, Minnesota*

Tube Clamps

Old bicycle innertubes can make great clamps for awkwardly shaped pieces or for repairing turnings. Cut an old innertube so that you have two free ends, and then slice the tube in half along its entire length. You'll now have two long, elastic "tube" clamps. Wrap these strips around the piece being glued, pull it tight and tie the ends together. If additional tension is necessary, you can always insert a short, narrow piece of scrap wood through a gap in the tube, turning it end for end until you feel the tension is adequate for the job at hand.

*Eric Smith
Tampa Bay, Florida*

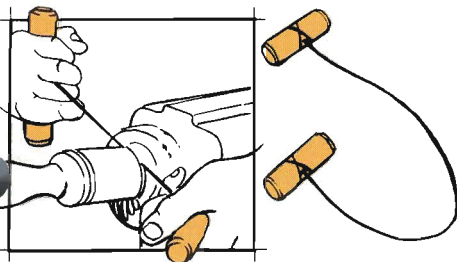


Getting Even With Plywood

While cutting some sheets of plywood, I found two pieces that were supposed to be the same size, but were actually slightly different. The pieces were too wide to rip on a table saw, and in any case I only had portable power tools available. After checking the squareness of the narrow sheet, I solved the problem by stacking the two pieces together, with the narrower piece on the bottom. I trimmed the wider one with a laminate trimming router bit with the ball bearing pilot riding against the bottom piece. Using a 1/2" shank router bit I was able to trim 3/4" material accurately.

This technique can also be used to make profile cuts of odd shapes from a template clamped to the underside of a work piece, or to joint edges square with a straight edge clamped under the workpiece.

*Allen Grantham
Minneapolis, Minnesota*



Accent Burning

Here is a very handy lathe tool that can enhance small "V" cuts in various turnings. We hung one of these on each of our five lathes at school and they were in constant use.

Cut two pieces of 3/4" dowel into 4" lengths. Drill a small hole through the dowel at its midpoint and chamfer each end. Now cut a piece of 12-16 gauge black iron wire 18" long and thread it through the hole in each dowel. Securely wrap the wire around the dowels and tie it tight.

When making a decorative turning calling for burned highlights, this simple device is just the right tool. By holding the wire tautly into a groove as the lathe is running the wire gets hot and burns the surrounding area to add nicely marked details.

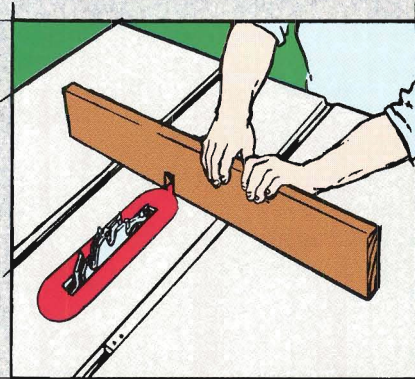
*Don Kinnaman
Phoenix, Arizona*

Today's Woodworker pays \$30.00 for all Tricks of the Trade published. Send yours to Today's Woodworker, Dept. T/T, Rogers, MN 55374-0044.

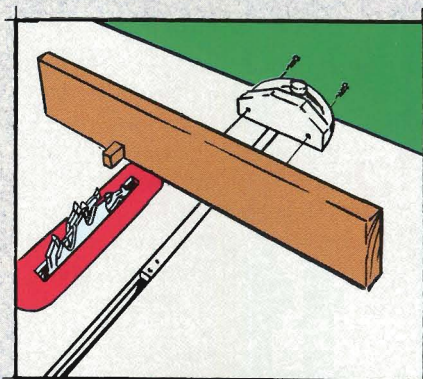
FINGER JOINTS

Finger joints add dramatic flair to an otherwise plain carcass or drawer. Not only is the finger, or box joint, attractive, but it is also extremely strong, due to the amount of side grain contact in the glue bond. An ongoing debate between woodworking enthusi-

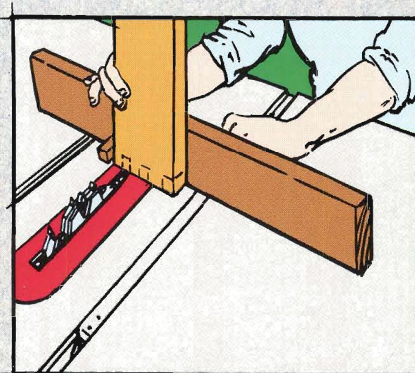
asts centers on which joint is stronger, the finger joint or the dovetail. In fact, both joints are so strong that the decision should actually be based on aesthetic considerations, not strength. The following six steps describe how to make the versatile finger joint.



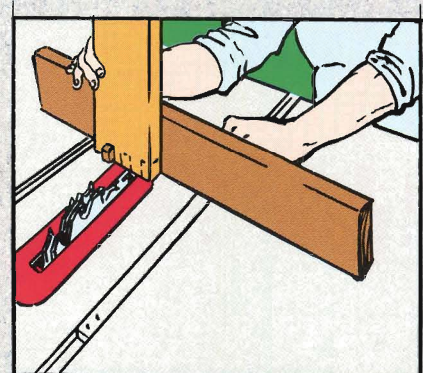
(1) Install a dado blade in the table saw and adjust it to make a 1/2" wide by 1/2" deep cut. Cradle a long wooden fence, about 3" tall, into the miter gauge and make one pass over the blade.



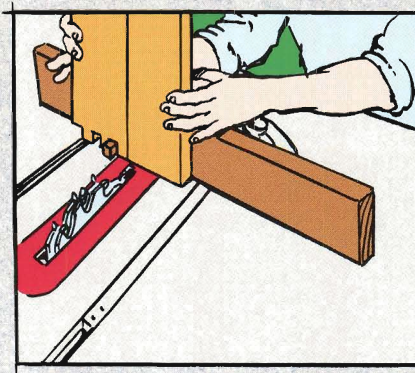
(2) Slide the fence over exactly 1/2" and secure it to the miter gauge. Mill a strip of scrap to fit the dado in the fence and glue it in place.



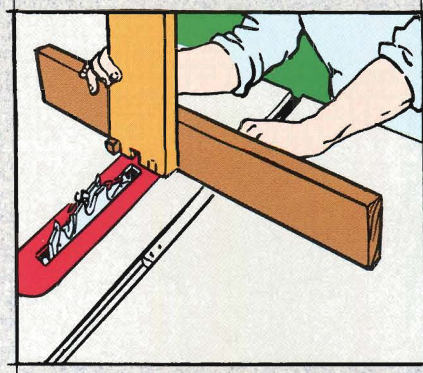
(3) Place your cabinet or drawer stock against the fence, pushing it snugly up to the spacer block. Make your first cut through the stock.



(4) Move the dado over the spacer block to make the second cut, and continue this procedure across the width of the stock.



(5) Flip the stock around and slip the first dado space over the spacer block. Set your mating stock edge up to the first piece, which correctly offsets the next cut to create the interlocking fingers.



(6) Remove the first piece and follow the original cutting sequence across the second cabinet or drawer member.

Dealing with Kitchen Corners

By Spence Cone

I believe the typical homeowner covets every spare inch of storage space they can find in their house, and this is probably more true of the kitchen than any other room. One solution to the problem of storage space is the kitchen work station shown on this issue's cover. If your kitchen is not quite big enough for a work station, never fear, hardware manufacturers have come up with an assortment of gizmos to help you get things off the

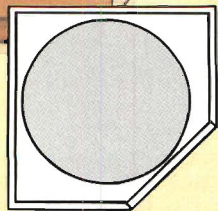
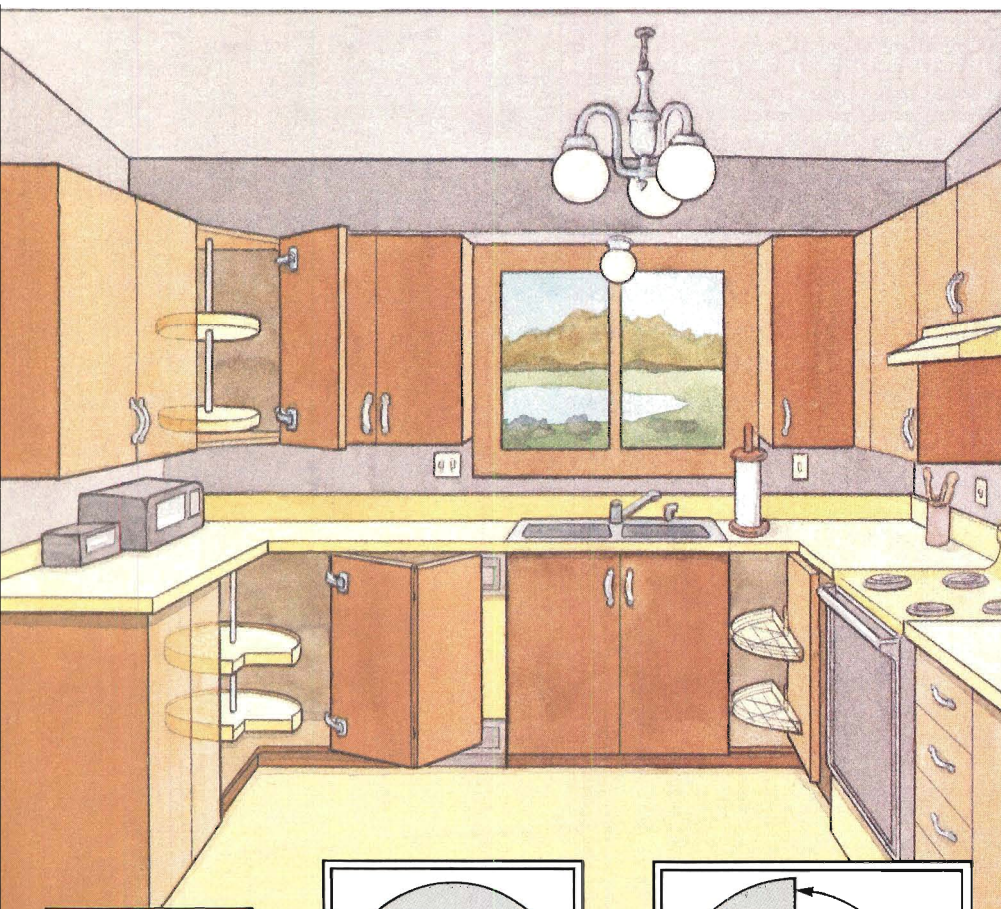
counter tops and stow them away. Perhaps it's time, after you have hung your last under-the-cabinet fold down spice rack, to see if you can squeeze more usable storage space out of your corner cabinets. In most kitchens, this space often comes to be known as the "dead zone". However, with some simple cabinet modifications or installation of corner cabinet hardware, this can be turned into very usable space.

Revolving Shelf Unit

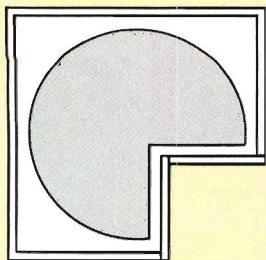
One solution to the problem of corner storage is a revolving shelf unit that enables you to rotate items from the back to the front. These shelves can be installed in either base or upper cabinets and are available in a full round shape for angled corners or pie cut for "L" shaped cabinets. Because the full round is best suited for angled cabinets, they are typically installed in upper cabinets where the design won't infringe on floor space. You can purchase a revolving hardware set that consists of a center post, top and bottom bearings, and shelves. The shelves are available in plastic, steel, or coated wire. Of these styles I prefer either the steel or plastic. They're not quite as 'high tech', but they are less expensive, easier to clean and small items don't fall through. When ordering such a unit, be sure to keep in mind the interior dimensions of your cabinet, since shelf sizes can vary from 18" to 28".

The pie shaped revolving shelf is best suited for base cabinets. This unit is similar to the full round in every way except that it has one quarter of the shelf cut out to allow for a square corner cabinet. They are available in different styles that will allow you to hinge your door independently or attach it to the revolving shelf so it turns to the inside of the cabinet when the shelf is rotated. The cabinet design is crucial to the installation. In particular, the door openings on each side of the corner must be the same size. This dimension limits the size of the revolving shelf that you're able to install. Check manufacturer's specs before designing a cabinet or ordering a unit for an existing cabinet.

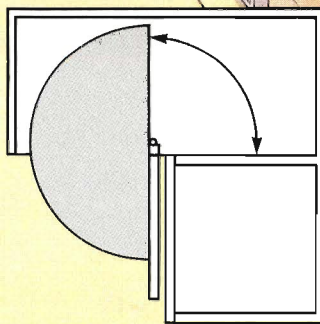
Of the many brands available in the pie shape and full round styles, the Amerock "Turn-A-Shelf" gets my vote. The manufacturer has put together a good product that is well made and easy to install, thanks in large part to the easy to follow instructions and installation templates that come with each set.



**Full Round
Corner Shelf**

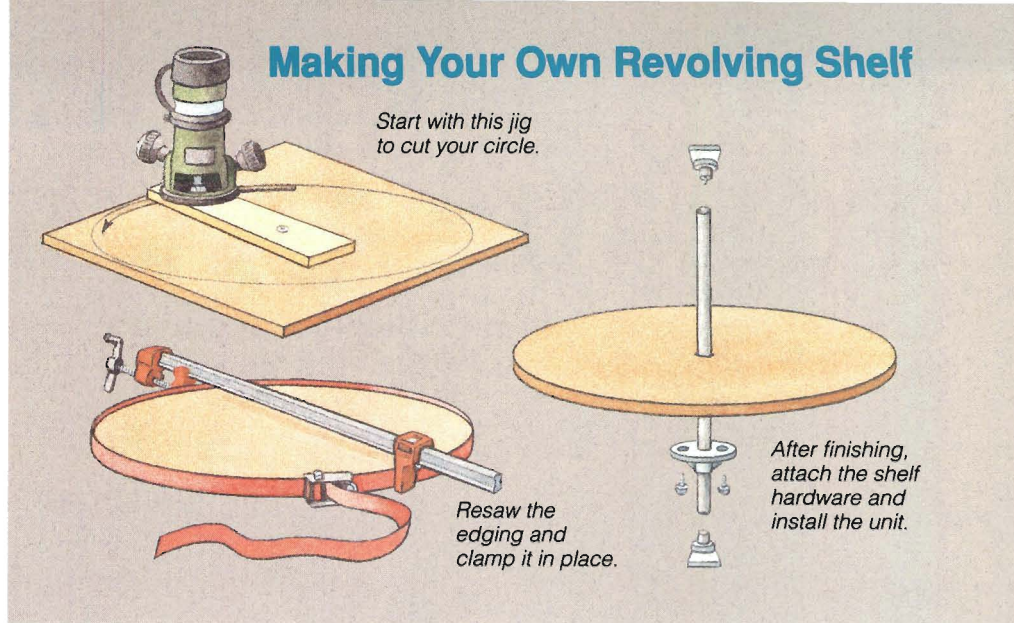


**Pie Cut
Corner Shelf**



**Half Moon
Swing Out Shelf**

Making Your Own Revolving Shelf



Half Moon Swing Out Shelf

Though the revolving shelf unit may be the best choice for base cabinets, many older kitchens were built with one cabinet running all the way to the corner and the other cabinet simply butting into it, creating a blind corner with only one door to access the space. And in new construction, space confinements often make it impossible to leave an equal size opening on either side of the corner for a revolving shelf. In both cases the hardware best suited for the application is a half moon swing out shelf. These units pivot on the inside of the door opening, allowing the shelf to swing out for easy access. They can also be purchased with a slide incorporated into the shelf which allows the unit to slide farther out, making it easier to tuck off your knees when you are looking for a jar of pickles on the bottom shelf. All of the swing out units are designed for cabinets with a 24" depth and require a door width between 14½" and 20½".

These units are only available in coat wire, and of all varieties available on the market, once again I give the nod to Amerock. The pivoting and sliding blind corner shelving units they offer require only one mounting bracket, which makes installation and height adjustment much easier. There are also simple instructions and templates included with each unit to make your job a lot smoother. Although swing out shelves are a great solution to blind corners, they do have some drawbacks, the biggest of which is that they won't fit if the cabinet is too shallow or the door too narrow. The other drawback is that the smaller size takes up a lot of space for the amount of accessible storage you gain.

Shed Some Light on the Problem

Sometimes the best solution for a blind corner involves no complicated hardware at all. Instead you can shed a little light on the interior of your cabinet by installing a small flores-

cent light above each of the shelves. This works even better if you wire a switch that turns them on automatically when the door is opened. These lights can be purchased at any local hardware store or through mail order catalogs. Another simple solution to corner storage is to purchase lazy susan bearings and make turn tables to set on top of the shelves.

Building Your Own Revolving Shelf

Building your own revolving corner shelf is not really a difficult task. By making your own, you can customize the size of the shelves and construct them from any material you choose.

You will need to purchase the necessary hardware, often sold as a set. The set will include a pivot post, mounting bracket set and shelf brackets.

Start by installing the center post to manufacturer's specifications. Now cut the shelves to the desired diameter, less 1/4". To cut the shelves attach a long base to the bottom of a router to be used as a trammel jig for cutting a circle. Chuck a 1/2" straight cutting bit in the router. From the edge of the cutter, measure back the length of the radius of your shelf, mark this point on the jig, then drill a clearance hole with a 3/16" drill bit. Using a #8 screw, secure the jig to the center of your shelf blank. Turn the router on and lower your bit into the plywood, moving in a counter clockwise direction. The depth of your cuts will depend on the power of your router. Once you've got the circle cut for the first shelf, remove the jig and move on to the next shelf.

Next you will need to resaw the

wood for your edging. This wood should be as straight grained as possible since you are going to bend it around the shelf. For each shelf, cut a strip of wood 1/8" thick by 1¼" wide by the length of the circumference of the shelf, plus 1". Make sure the 1/8" strip is on the outboard side of your tablesaw blade to avoid kickback. Then use a belt sander to remove any saw marks.

Using a band clamp, bend the strip around the outside of the shelf. When fully tightened, mark the portion of the end you must remove. Cut this end off and dry fit the strip one more time to ensure that it's cut to the right length. If the strip is correct, apply glue to the edge of the shelf and clamp the edging in place with the band clamp, and use a bar clamp directly on the joint. If more pressure is needed, add more bar clamps. Once the glue has set, sand the bottom of the shelves flush, drill the pivot post clearance holes, and finish sand. Apply your finish to the inside of the cabinet and the completed rotating shelves before you install them.

Once the finish has dried, attach the shelf brackets to the bottom of the shelves. Slide the shelves over the center pivot post and set the assembly on top of the bottom pivot. Finally, attach the top of the center post to the top pivot, slide the shelves into position and lock in place. The only thing left to do now is load it up.

Spence Cone, co-owner of Vertex Exhibits in Minneapolis, Minnesota, is a contributing editor with Today's Woodworker.

A WORK STATION FOR THE KITCHEN

Is there a cook in your life who has earned something a little better than crowded counter tops and inadequate cutting boards for preparing meals? If the answer is yes, read on.

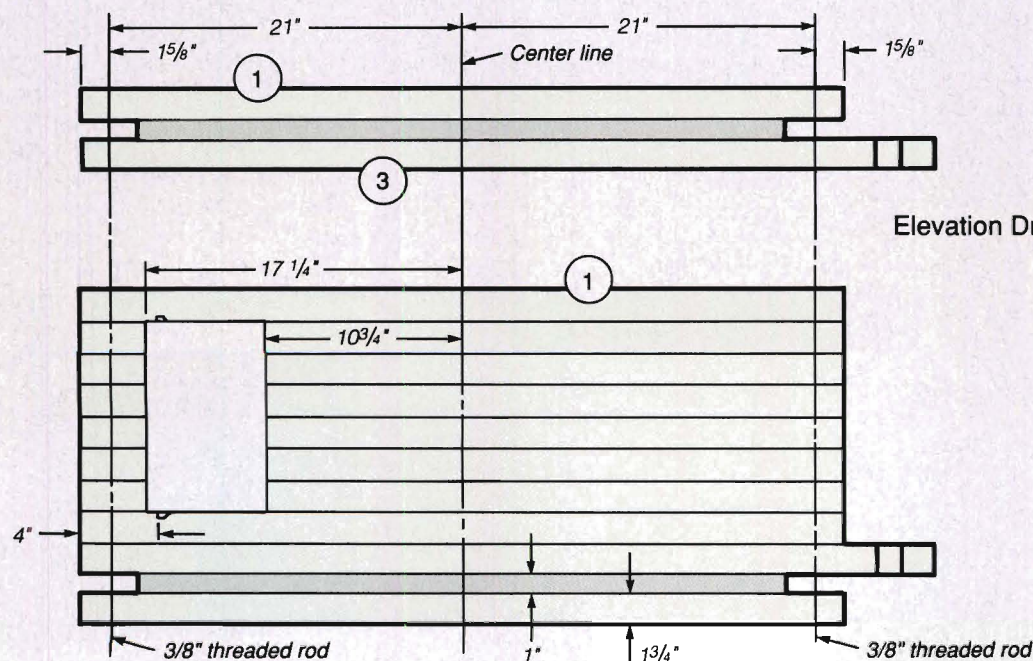
By Rick White



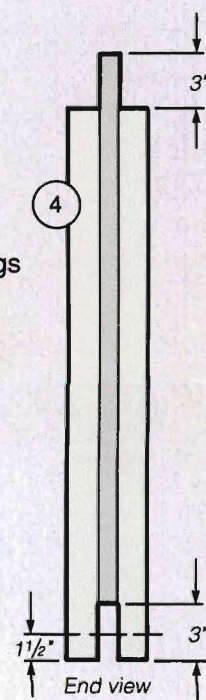
The three inch thick butcher block top of this kitchen work station is nicely off-set by airy shelves and walnut accents.

This is a serious kitchen work station —and why not. We certainly didn't cut any corners when we designed a workbench for the shop in our last issue. When you stop and consider the amount of time spent in the kitchen and some of the tasks which create breaks in the work flow, you'll appreciate the key design elements of this kitchen work station. For starters, you can eliminate those trips to the storage shelves for the blender, food processor or special mixing bowls. Adjustable shelves are provided to store your most commonly used appliances and bowls. Your best knives are close by in a finger joint drawer, safely out of harm's way. Even the rolling pin is ever ready serving double duty as a push handle and towel rack. The feature that we're really the most excited about —one that is missing on commercially available units— is the built-in disposal chute. Forget about making multiple

Top view



Leg



Elevation Drawings

trips to the waste basket in the middle of meal preparation. Instead, simply slip the disposal chute cover (which doubles as a cheese board) into the dadoes provided and push those peelings out of sight and into a Rubbermaid™ dish basin, available at any local hardware store. And don't worry about a mess dripping off the thick butcher block top—a routed groove leads any wayward juice right to the disposal chute.

Material Selection and Cost

When you're talking butcher block top, you're talking maple. Its dense grain and resistance to wear makes it the natural choice. However, this is a large piece and an accent wood is an obvious call to dress it up a bit. Just enough walnut was used to this end to break up the maple without breaking the budget.

To make this project, you'll need 7 board feet (bf) of 4/4 maple, 12 bf of 1/2" maple, 2 bf of 5/4 maple and 50 bf of 8/4 maple. To accent the piece and complete the cheese board, plan on another 12 bf of 5/4 walnut. The approximate cost of materials, including all the wood and hardware, will

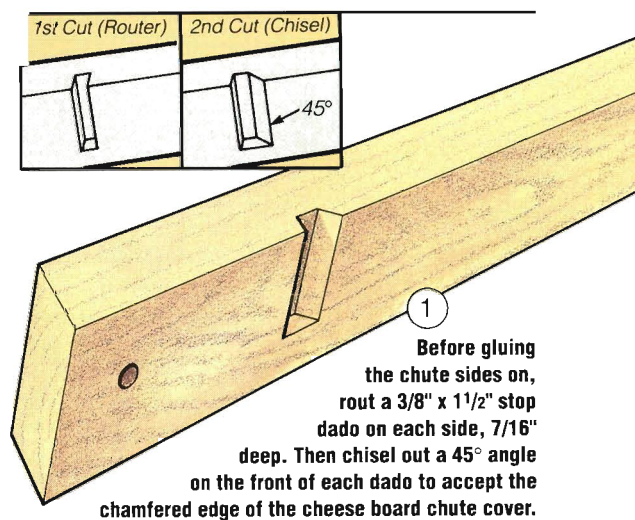
run about \$250.00, depending on local prices.

One final word before we get started. This is a large project that will not be suitable for all kitchens. You will, however, find that the techniques used for assembling this piece work equally well if you choose to scale it down to a smaller size.

Assemble the Top In Stages

Get started on this project by cutting and machining the top, top accent pieces and top handles (pieces 1-3). You can also cut the legs and leg accent pieces (pieces 4 and 5) and the stringers (pieces 6 and 7) to size, leaving an extra 1/2" in length on all pieces for final machining.

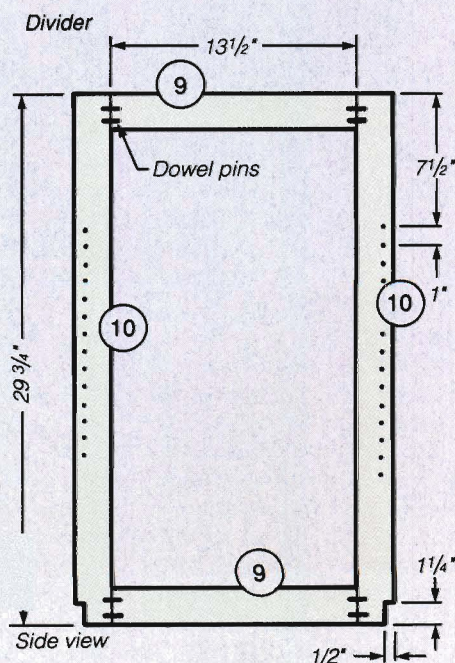
The first step is to drill the 7/16" clearance holes for the 3/8" threaded rods in the top pieces, with the exception of the walnut accent piece. To mark your drilling locations, line one end of these pieces up and dry clamp them together. Make a reference line at the center and measure out 21" each way to mark the two ends of the top. Now measure 15 5/8" in from each of these lines to mark your threaded rod drilling locations (See elevation drawings). You'll need the reference lines later on, so make sure they're dark enough. Remove the clamps and transfer the lines to one side of each piece, marking the centers (1 1/2" down from the top) at the same time. Now drill three 1" holes (1" deep) in the two outside pieces for the walnut plugs and the 7/16" clearance holes in all of the top pieces, with the exception of the walnut accent pieces. Insert the threaded rods at this point to insure that everything lines up. As long as you're on the drill press, now would be a good time to mark and drill the holes on the bottom of the legs (pieces 4) for the side stringers (See elevation drawings). Be sure to drill the holes for the walnut plugs on the outside pieces first.

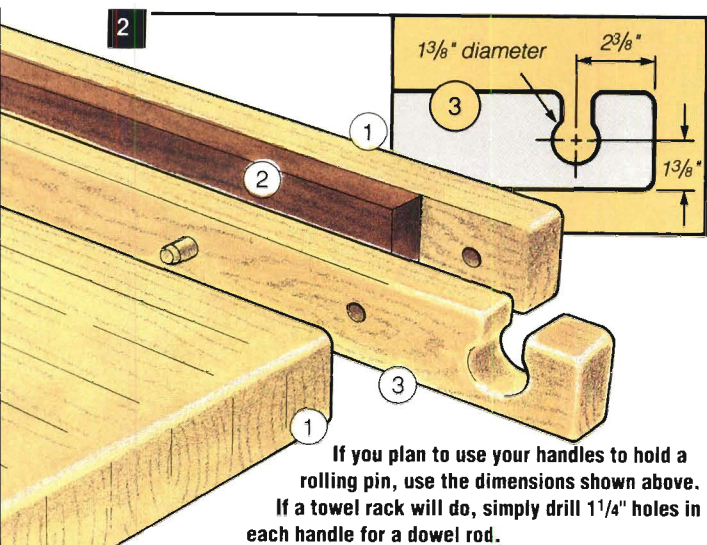


Pick six of the top pieces (pieces 1) to glue together, but first lay them on their sides and drive three brads into one side of each piece. Once the brads are secure, clip off their heads so that about 1/16" protrudes. Anyone who has tried to glue up this much material knows how slippery things can get when you try to apply clamping pressure. Using this technique, the nails will quickly bite when you start tightening your clamps and eliminate any sliding problems. (NOTE: Refer to the elevation drawings before placing these brads to avoid the cutting lines for the disposal chute.) Apply the glue, insert the rods to help keep things aligned and clamp.

Once the glue dries, it's time to move to the table saw to cut out the disposal chute. Using your center reference line, measure out 10 3/4" and 17 1/4" and make your two cuts (see elevation drawings). You'll be saving the end piece, which will contain a threaded rod hole. Before moving on, sand the two insides of the disposal chute you just created, since they'll be more difficult to reach later.

The next step is to glue two more top pieces to the middle six pieces, one on each side, to form the other two sides of the disposal chute. These pieces also require a little machining with the router and chisel to create the shaped stop dadoes that hold the cheese board, as shown in Figure 1. After routing and chiseling the dadoes, use the clipped nail technique described above, insert the threaded rods and the end piece you cut off earlier and glue and clamp.





When the glue dries, find the mark you made at the handle end of the top and square off this end on the table saw. This should be done now, before the handles (pieces 3) are glued in place. Likewise, complete the sanding at this end and roundover the top and bottom with a 1/4" roundover bit in the router.

Now we'll take a detour from the top to complete the legs. As shown in the elevation drawings, the leg accent pieces (pieces 5), are offset between the legs (pieces 4) by three inches. This creates a mortise on the bottom to accept the front and back stringers (pieces 6) and a tenon on the top. Layout the three pieces for each leg, turn them on their sides and use the clipped nail technique described above to avoid any slippage when you apply clamping pressure. Once everything lines up, glue and clamp.

When the glue dries, sand and shape the inside corner of the legs with a 1/4" roundover bit in the router, since you won't be able to reach that edge after gluing up. Make sure to keep the walnut tenons at the top flat and square.

It's time to move back to the top now, where there are only three pieces left to glue on each side. First you'll have to cut out the shape for the handle on pieces 3, as shown in **Figure 2**. If you plan to install our rolling pin (See page 17), or your own, follow the technique shown in figure 2. If a simple towel rack meets your needs, drill an 1 1/4" hole on each handle piece for a dowel rod.

When the top handle (piece 3), the top accent piece (piece 2) and the outside top (piece 1) are glued

together in the next step, the accent strip will form a mortise at each end to accept the tenons from the legs. In order to insure a good fit, measure the exact width of the leg tenons on each side and subtract that total from the overall finished length of the top. This will give you the true measurement for your two top accent pieces. This way, if you got a little carried away when sanding the legs, you'll still have a tight mortise and tenon joint.

(NOTE: This will also be the measurement for the two slat cleats (pieces 8) which will be assembled later.)

Position the top accent piece between the handle piece and outside top piece (using the clipped nail technique), make sure your reference lines are on target, and glue and clamp. Repeat this procedure for the other side.

Finally, it's time to complete the gluing of the top, which now consists of three main sub-assemblies. In this case the clipped nail technique will not offer enough stability, so I recommend using dowel pins (one at each end) instead. After drilling your holes, apply the pins, glue and clamp the three pieces together.

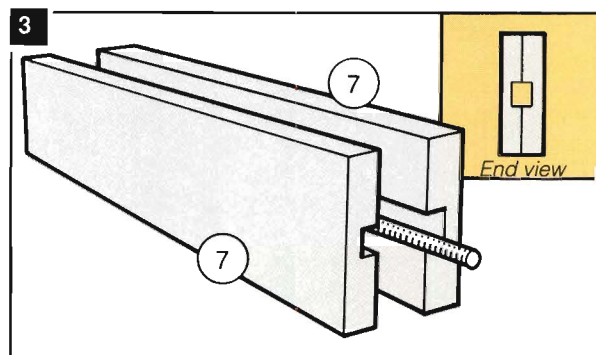
When the glue dries, square off the disposal chute end and the outside top pieces and surface the top.

Complete the Base Assembly

Now that the top is completed, most of the hard work on this project is done. You've already assembled the four legs, now it's just a matter of cutting the stringers and cleats and assembling everything. Start by cutting the front and back stringers (pieces 6), the side stringers (pieces 7) and the slat cleats (pieces 8) to size. Remember that the slat cleats should be exactly the same size as the top accent pieces, as mentioned earlier. Center and glue the two slat cleats to the inside of the front and

back stringers and cut the dadoes in the two pieces for each side stringer, as shown in **Figure 3**. Glue and clamp the side stringers together making sure the dadoes line up to provide the opening for the threaded rods. Dry assemble the top, legs and stringers together with clamps, making sure that everything is square. While it's clamped, use a 7/16" bit in a hand drill and complete the threaded rod holes in the walnut accent pieces.

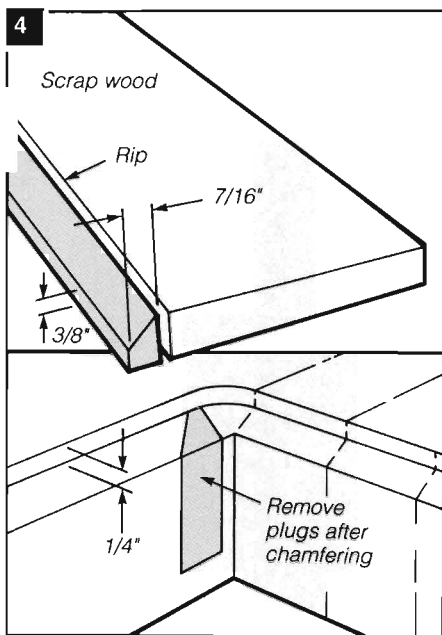
Once everything fits, disassemble and finish sand any area that will be hard to reach on final assembly. Now apply your glue, insert the threaded rods, washers and nuts and begin applying clamping pressure, making sure that you use a square throughout the process. The final step is to glue the 10 walnut plugs (pieces 14) in place, making sure to cut them a little long for final sanding.



Use a 1/2" straight bit in the router to cut a 1/4" deep dado in the center of the four side stringers (pieces 7). When the two sets are glued together the clearance hole for the threaded rod will be formed.

Center Divider, Slat and Shelves

The center divider (pieces 9 and 10) for this project goes together quickly and easily. The two front and back pieces are attached to the top and bottom with dowel pins, so a doweling jig will come in handy. Cut your pieces to size, drill your dowel pin holes and dry assemble. Once you have a good fit, disassemble and cut the notch on the bottom of the front and back pieces, as shown in the elevation drawing. To drill the shelf pin holes, I recommend putting the front piece on top of the back piece and drilling through both pieces at once, with a scrap piece on the bottom for a clean exit. Refer to the elevation drawings for the position of these holes. Once the holes are drilled, glue and clamp the center divider



Before cutting the 45° chamfer on the disposal chute make two plugs for the dadoes cut earlier. Chamfer one edge of a scrap piece, leaving 3/8" straight. Then rip the chamfer off and crosscut to make your plugs.

together. When the glue has dried, roundover the edges, complete your finish sanding and put it in place. Before screwing it in, however, save yourself some measuring and slide it over to one leg. The center divider serves as your template for marking the hole positions on the legs. Make all your marks, slide the assembly over to the other set of legs and mark that side. Now turn the whole work station upside down, center the divider and drill two 1/4" holes about 1/2" deep in the top where it will attach to the butcher block. Next drill two slightly oversized holes for the 2" x #8 screws (to allow for expansion and contraction) and screw the top of the divider in place. While the piece is

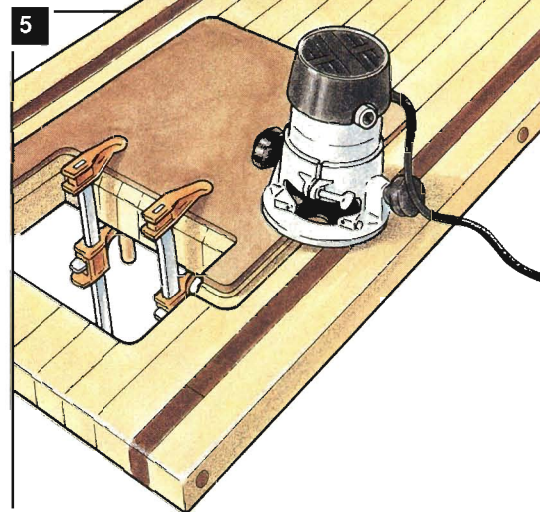
still upside down, center the bottom of the divider and repeat the procedure —only this time you'll have to drill your holes at a 45° angle, through the cleat and into the walnut stringer. Use a drill guide if you have one and mark your drill bit with masking tape to avoid going all the way through.

Turn the piece right side up and cut the 14 bottom slats (pieces 11). Chuck a 1/4" roundover bit in the router and shape the top sides of each slat (not the ends) and then cut a 1 3/4" x 1/2" notch on the outside two pieces where they'll meet the legs. Starting from the center, nail these pieces in place with 1" finishing nails, using a 1/2" piece of scrap wood as a spacer. If the final piece at either end is a little tight, file the notch until it fits just right.

The four shelves (pieces 12 and 13) are simple to assemble. After cutting the eight shelf supports and 28 shelf slats to size, cut a 3/8" dado at the end of each shelf support going in about 1/2". These dadoes will allow the shelves to lock into place on the shelf pins and hide the pins at the same time. Once the dadoes are cut, roundover the sides of the slats, finish sand all the pieces and nail them together, using your 1/2" scrap wood spacer as you did for the bottom slats.

Finish the Disposal Chute

It's time to go back to the top to complete work on your disposal chute. The top of this chute gets a 45° chamfer. You'll be using a pilot to cut this chamfer with your router, but there's a little problem. Those dadoes you cut while assembling the top will cause the pilot to go astray. The cure to this is to cut two small plugs of



A simple 15 1/2" x 16" hardboard template with rounded corners is clamped in position to make the drip groove on the top. Use a rub collar and 1/2" cove bit to rout the perimeter.

scrap wood to fit the shaped dadoes. Use the chamfer bit on the edge of the scrap wood to create a shaped plug, as shown in **Figure 4**. A small dab of white glue will hold the two plugs in place as you rout. Now chuck your chamfering bit into your router and make successive cuts until there's a 1/4" vertical drop on top of the 45° angle, as shown in **Figure 4**. Once the routing is completed, remove the plugs with a chisel. The last bit of machining for the top is to make the routed groove that leads any spills into the disposal chute. To do this, cut a 15 1/2" x 16" template from 1/4" hardboard. Now cut a 1 3/8" radius on each corner, sand smooth and clamp the piece into position in the disposal chute opening, as shown in **Figure 5**. Once you've got it clamped in place, install a rub collar and 1/2" cove bit in the router, set the depth at about 1/4" and rout around the perimeter of the template.

Finger Joint Drawer

Use the material list to cut the sides (pieces 15), front and back (pieces 16) and the bottom (piece 17) to size. Next cut 1/4" x 1/4" through dadoes in the front and back and 1/4" x 1/4" stop dadoes in the sides, to hold the bottom piece. The side dadoes should stop 1/4" from the front, and all dadoes are 1/4" up from the bottom. Use the tablesaw jig described elsewhere in this issue (See **Page 5**) to cut the finger joints on all four pieces.

Stop dadoes on the outside of the drawer sides serve as the runners for two L-shaped drawer slides.



CHEESE BOARD



To get double duty from the disposal chute cover on our kitchen work station, we decided to add a cheese board to the bottom. Walnut and marble were selected to accent the work station, and a chamfer is routed on the edge to match the one cut for the disposal chute.

Get started on the piece by gluing up strips of 4/4 walnut, alternating the end grains. Machine your piece to 3/4" x 7 3/8" x 11 3/8" and use a chamfering bit (set to cut 1/2" deep) with a pilot to rout one edge. This will leave 1/4" straight, corresponding to the opening of the disposal chute in the kitchen work station.

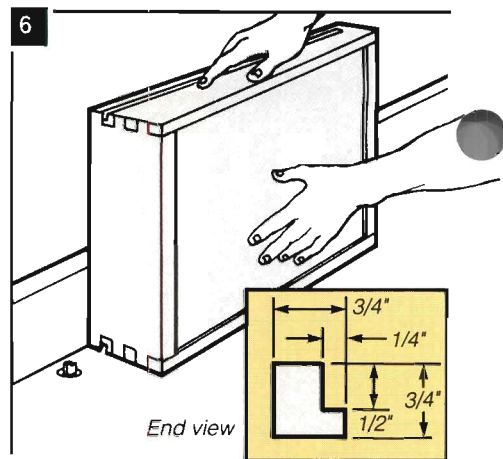
Use the measurements shown below to make a template out of 1/4" hardboard and 3/4" plywood. Everyone's template will differ slightly, depending on the exact size of your tiles and the thickness of the rub collar you use with your router.

Insert your cheeseboard in the template with the chamfered side facing up. Clamp the template to your work surface and rout both tile openings to the exact depth of your tile. Once you've got the depth right, you'll have to square up the corners with a sharp chisel. Now drill out the finger hole, sand the piece and use epoxy glue to install the tiles. Check the piece to make sure it fits perfectly in the disposal chute and finish up by chucking a 1/4" roundover bit in the router to soften the unchamfered edge. Apply a food safe finish and install the piece in your kitchen work station.

Dry fit the drawer to make sure everything fits and glue and clamp.

Next rout the stopped dadoes on the outside of each drawer side to create your drawer slide grooves, as shown in **Figure 6**. Follow the dimensions in that illustration to locate these stopped dadoes and to make the L-shaped drawer slides as well. Once the drawer and its slides are completed, turn the work station upside down and center the drawer between the divider and leg, as shown in the exploded view on the next page. Screw the two L-shaped slides in position and, before installing the drawer, drill a 3/4" deep hole for a 1 1/2" scrap piece of the 1" dowel you used for the plugs. This piece will serve as the drawer stop, but should be installed later.

To install the recessed walnut pull (piece 18), you'll use a simple template of 1/4" hardboard, about 8" x 12". First mark "crosshairs" on this piece and then do the same with the front of the drawer. Place the pull upside down on the template, right in the center of the crosshairs, and trace the outline. Cut the shape out with a



6 Rout 1/4" x 1/4" stop dadoes on the drawer sides 1/2" from the top (stop them 1/2" from the front) and machine the two 15" slides on the tablesaw.

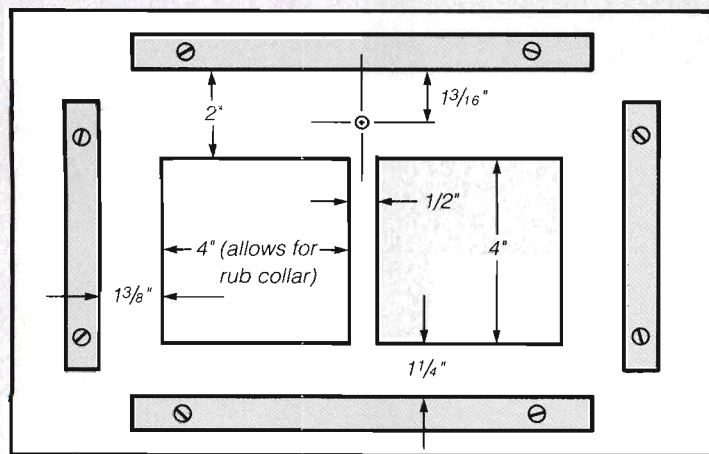
jigsaw or sabersaw and clamp the hardboard to the drawer front, making sure both of the crosshairs line up perfectly. Now simply place a rub collar on the router and use a 1/2" straight bit set to the pull's depth to remove the meat from the drawer front. Check the fit and glue in place.

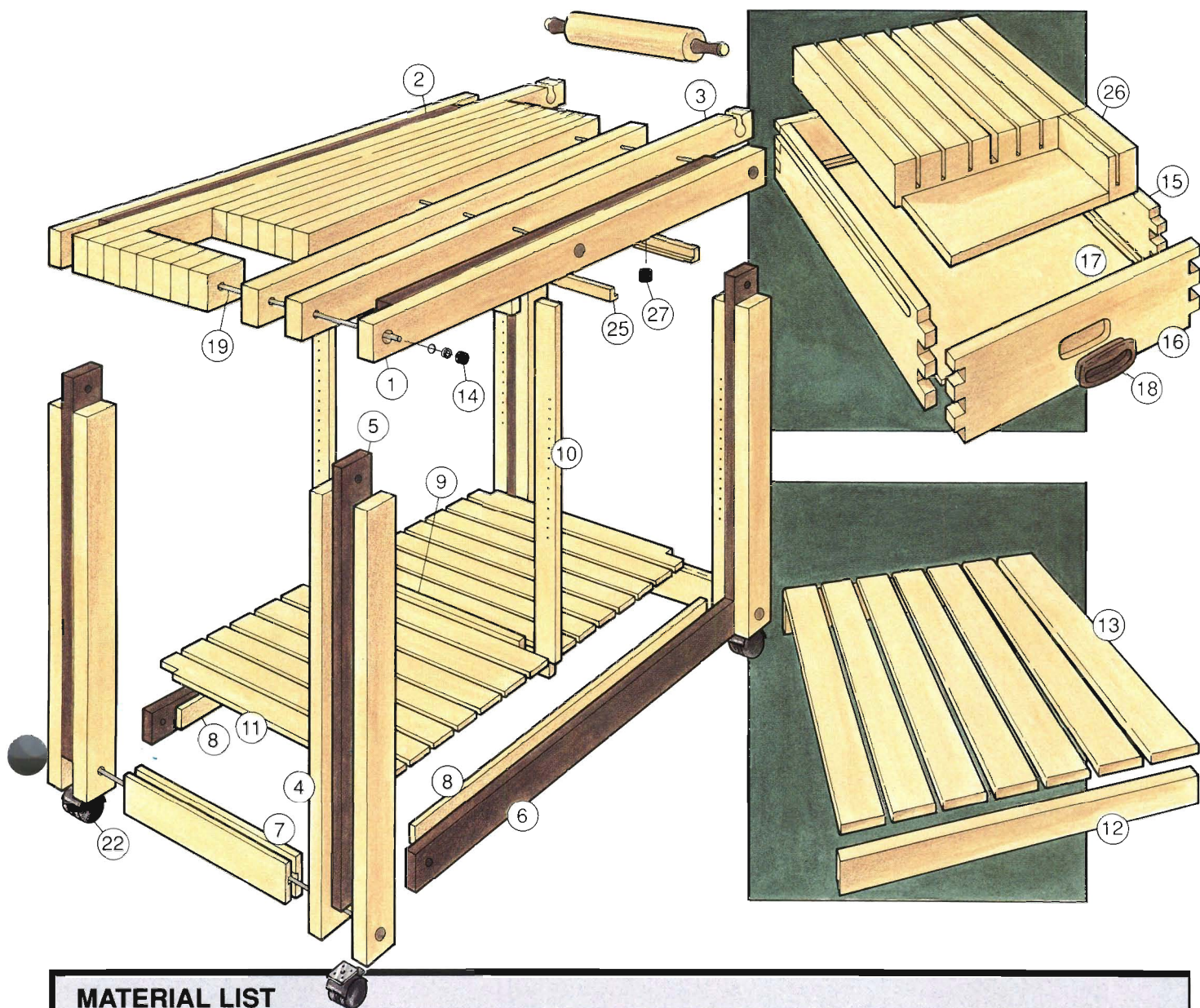
Now glue up a piece of 8/4 maple the width and length of the drawer bottom to make your knife holder. Everyone's knives are a little different, so you're somewhat on your own in terms of exact measurements. The basic technique is to measure the depth of your various knives and make corresponding kerf cuts in this piece. Crosscut the piece where the handles start. Since my largest knife needed a little something to rest the handle on, I ripped one of the end kerf section off this piece. Resaw and sand the other piece you just crosscut to make a resting place for the rest of the knife handles. Glue the three pieces back together, finish and insert in the drawer when dry. The exploded view on the next page gives a good view of how my insert came out. Finally, once the drawer is inserted, glue the drawer stop in place so the drawer won't pull all the way out.

Soften all the edges of the work station with a 1/4" roundover bit in the router, give a final sanding and apply a food safe finish on the top and a penetrating oil everywhere else. The last step on this project is to install the locking casters on the legs and roll it into the kitchen.

Rick White, a professional woodworker serves on the editorial advisory board of Today's Woodworker.

Template bottom





MATERIAL LIST

	T x W x L
1 Top (10)	1 3/4" x 3" x 42" (Hard Maple)
2 Top Accents (2)	1" x 3" x 35 1/4" (Walnut)
3 Top Handles (2)	1 3/4" x 3" x 47" (Hard Maple)
4 Legs (8)	1 3/4" x 3 3/8" x 30 1/2" (Hard Maple)
5 Leg Accents (4)	1 x 3 3/8" x 30 1/2" (Walnut)
6 Front/Back Stringers (2)	1" x 3" x 42" (Walnut)
7 Side Stringers (4)	1/2" x 3" x 14" (Hard Maple)
8 Slat Cleats (2)	1/2" x 2 1/4" x 35 1/4" (Hard Maple)
9 Divider; Top/Bottom (2)	1" x 2" x 13 1/2" (Hard Maple)
10 Divider; Front/Back (2)	1" x 2" x 29 3/4" (Hard Maple)
11 Bottom Slats (14)	3/4" x 2" x 17 1/8" (Hard Maple)
12 Shelf Supports (8)	3/4" x 1 1/2" x 17 3/8" (Hard Maple)
13 Shelf Slats (28)	1/2" x 2" x 17 3/8" (Hard Maple)
14 Plugs (10)	Cut To Fit (1" Walnut Dowel)

	T x W x L
15 Drawer Sides (2)	1/2" x 3" x 16" (Hard Maple)
16 Drawer Front & Back (2)	1/2" x 3" x 12" (Hard Maple)
17 Drawer Bottom (1)	1/4" x 11 1/2" x 15 1/2" (Plywood)
18 Drawer Pull (1)	Recessed Walnut Pull
19 Threaded Rods (5)	3/8" x 22"
20 Washers (10)	
21 Nuts (10)	
22 Locking Casters (4)	
23 Shelf Pins (16)	
24 Dowel Pins (12)	1/2" x 2"
25 Drawer Slides (2)	3/4" x 3/4" x 15" (Hard Maple)
26 Knife Block (1)	1 3/4" x 11" x 15" (Hard Maple)
27 Drawer Stop (1)	1" x 1 1/2" (Walnut Dowel)
28 Optional Towel Hanger (1)	1 1/4" x 17 3/8" (Maple Dowel)

The materials in this project are available from: Trendlines, Dept. TW, 375 Beacham St., Chelsea, MA 02150; or The Woodworkers' Store, Dept. TW, 21801 Industrial Blvd., Rogers, MN 55374.

A SHAKER CLASSIC

The clean lines of this candlestand table owe much to precision joinery.

By Chris Inman

Shaker craftsmen created some of the most elegantly simple furniture ever made. Their minimalist designs have a restful, understated presence that blends well with virtually any room decor, making Shaker pieces very popular and among the most sought after styles by collectors and antique dealers.

The Shaker candlestand table described here is a wonderful example of streamlined construction, involving just a few individual parts and basic joinery. Traditionally, the most difficult operation in building this table was cutting the sliding dovetails, but routers and jigs have greatly simplified this step. I think you'll find turning the column is a fun diversion from typical carcass construction and helps to make this a speedy weekend project.

Constructing this table will require four board feet of 3/4" walnut, three board feet of 5/4 stock and enough material to form a turning blank measuring 3 1/2" x 3 1/2" x 20". You'll need a lathe to build this project, but all the other machine operations can be completed with hand tools if need be.

The best place to begin is to glue up any basic parts, which will cure while you go on to cut out the legs. You may find large turning stock for the column (piece 1), but if you can't, then laminate thinner stock to achieve the 3 1/2" thickness that you'll need. Set this aside to dry, and select the table top (piece 3) stock. A round table tends to distort over time as cross grain movement creates a slight oval. To minimize this tendency select straight grained or quarter sawn stock. Of course, if I had an opportunity to show off a beautiful cathedral pattern in a plain sawn board it would outweigh my concern over wood expansion and contraction. Proceed to join the table top boards together, and set aside this assembly to allow it

to cure.

The legs must curve gracefully off the pedestal, and the pattern shown in the exploded view is the result of many refinements reaching for a balance between lightness and strength. Enlarge the pattern to full size, then transfer this onto a piece of hardboard to make a template.

Mill the 5/4 stock to a thickness of 1 1/16". When laying out the legs (pieces 3) keep in mind that it is structurally important to have as much grain as possible running continuously along the length of the leg. Place the template so that the grain of the stock runs from the hip of the leg to the toe. Optimally the curve of the leg could follow a natural curve in the grain. Mark out the legs and cut them on the bandsaw.

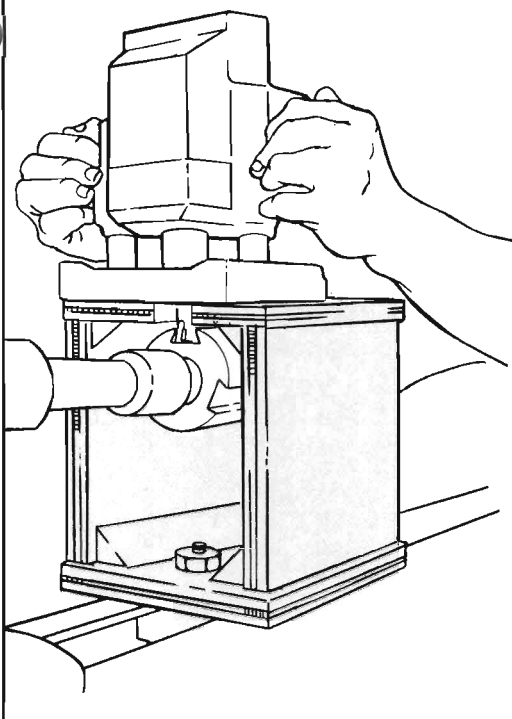
Use spokeshaves, scrapers and a drum sander to clean up the saw marks on the legs. Once you are satisfied with the shape of the legs, rout the top edges with a 3/4" roundover bit, but leave the bottom edges for now as they will require a small amount of shaping after they are assembled to the pedestal.

Mount the pedestal blank in the lathe and rough it down to 3 1/8" in diameter. Lay out the turning sections and use a parting tool to establish critical design dimensions as shown in the exploded view. Most of the column is turned using 3/4" and 1/4" spindle gouges, and finish cuts are made with a 1" skew. Be sure to test fit the tenon in a 1" hole bored with a forstner bit.

Build the jig for cutting the dovetail slots (See Figure 1).

Founded in 1774, the Shakers lead a spartan lifestyle separated from the world at large. Although isolated, they contributed a great deal to the broader social landscape. The Shakers developed many agricultural and medical advances, and invented countless industrial devices such as the circular saw and the self-feeding surface planer.





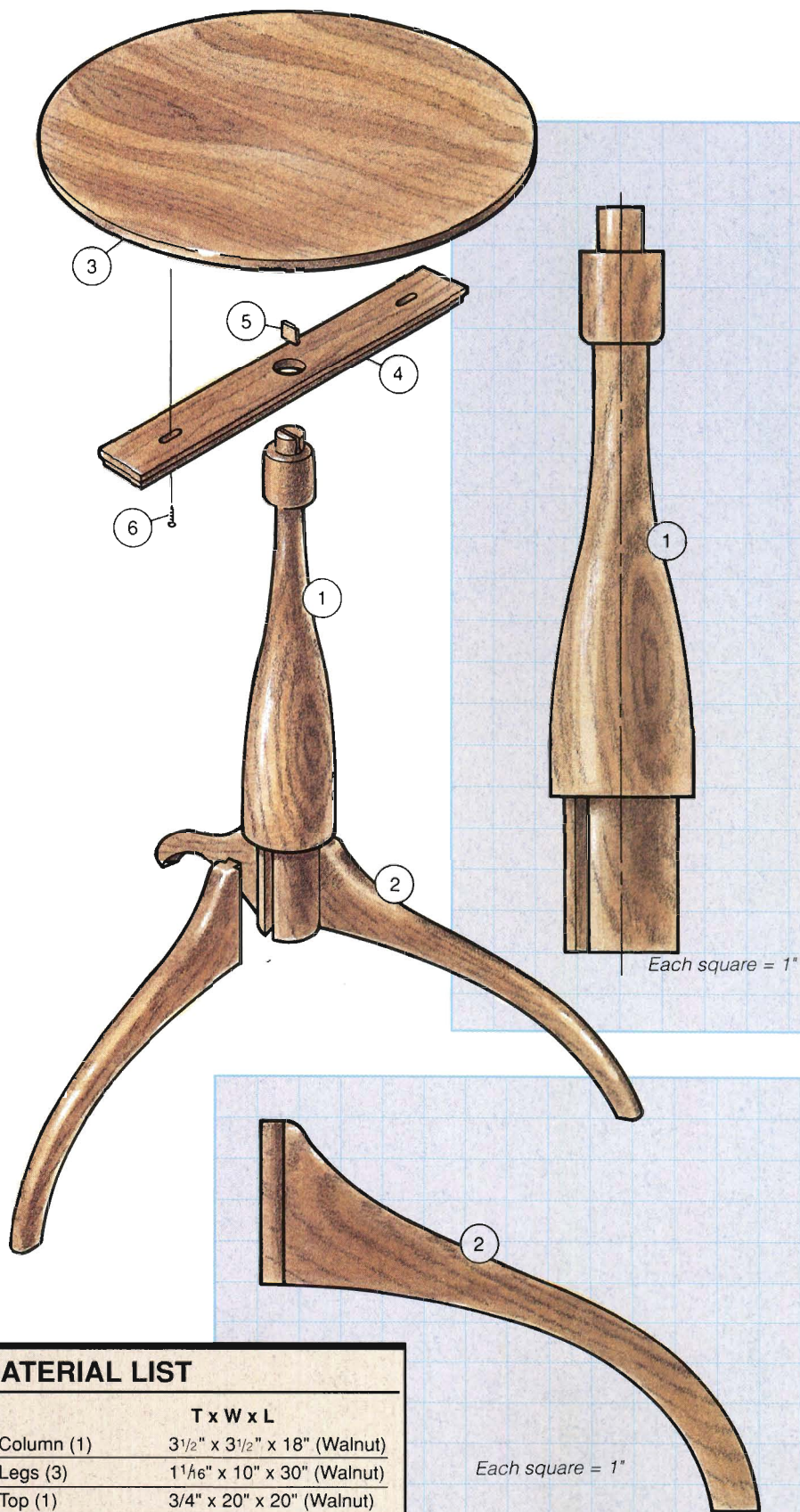
Bolt this sliding dovetail jig to the lathe frame and set your router to cut 7/16" deep dovetail slots in the pedestal column. The groove on the top of the jig should allow for two passes with the 1/2" bit for each 7/8" dovetail slot.

There's nothing complicated about this jig; it's just a box with a centered slot that holds a router above the turning. Use a 1/2" dovetail bit and a bushing to cut the dovetail slots at 120° intervals on the column cylinder.

Routing the dovetail grooves and the mating tails on each leg is a critical process. Recognize that the square cuts you will make on the legs will not readily fit the curve of the column cylinder, so several cutting operations are called for.

Cut the grooves in the cylinder 7/16" deep and 7/8" wide, using a 1/2" dovetail bit. Measuring 17/32" out from the center of the groove, put a mark at the point where this distance bisects the arc of the cylinder, as shown in **Figure 2**. By marking on either side of the groove you will have laid out the total thickness of the leg as it will join the cylinder. Connect these two points with a line, which should run parallel to the bottom of the dovetail groove. The measurement between the line and the groove bottom gives you the depth of cut for your leg tails.

Set up a router table with the 1/2"



MATERIAL LIST

	T x W x L
1 Column (1)	3 1/2" x 3 1/2" x 18" (Walnut)
2 Legs (3)	1 1/8" x 10" x 30" (Walnut)
3 Top (1)	3/4" x 20" x 20" (Walnut)
4 Cleat (1)	3/4" x 4" x 14" (Walnut)
5 Wedge (1)	cut to fit (Walnut)
6 Brass Screws (2)	1 1/4" x #10

DESIGN OPTIONS



The construction methods used to build the candlestand table can be adapted to many styles, such as the colonial version pictured above. Other possibilities include hepplewhite pedestal tables, piecrust tables or virtually any table design with a tripod pedestal base.

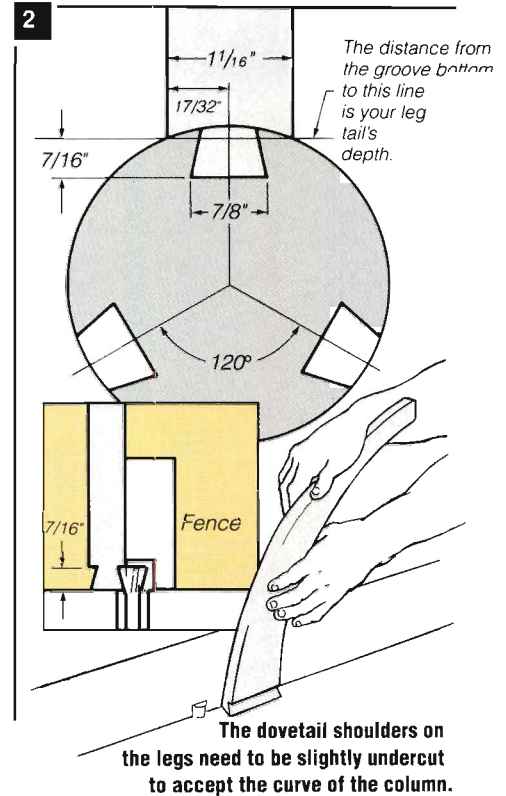
dovetail bit to cut the tails on the legs. Adjust the depth of cut, and use $1\frac{1}{16}$ " thick scrap to cut sample tails until you reach the proper fit with the portion of the dovetail groove below the bisecting line. Once you have a tail that looks like it will fit, undercut the shoulder on the sample to match the curve of the cylinder and to extend the tail to its full length. If everything fits perfectly, proceed to rout the leg

tails and fit them to the cylinder. Keep in mind that if any measurement in your set-up is different from these, nothing will correspond exactly, therefore you can expect a few changes when you build your table. Trial and error testing on this type of work will be inevitable.

Cut the wedge slot in the column tenon and drill a $\frac{1}{8}$ " relief hole at the end of the slot. Sand the column and three sides of each leg, leaving the bottoms until after assembly. Glue the legs to the column. Make the cleat (piece 4), then glue and wedge it (piece 5) onto the column tenon. Cut off the excess tenon, leaving it protrude through the cleat by $\frac{1}{8}$ ". Blend the bottom of each leg to align with the bottom of the column, and then sand the whole assembly to its final stage.

Clean up the top, planing and sanding the surfaces flat. On the underside of the top, lay out a 20" circle with a large compass, and mark the center point of the circle. Drill a 1" diameter by $\frac{3}{16}$ " deep hole at the center mark with a forstner bit. Cut out the circle on the bandsaw.

A simple set up on your workbench will help you sand the edge of the top (See Figure 3). Clamp a piece of 1" diameter dowel in a bench vise and set the table top onto the dowel. Place a couple of $\frac{1}{4}$ " thick blocks under the top to keep it from lying directly on the workbench. Use double sided tape to temporarily hold the



blocks to the bench. Clamp a belt sander on its side with the belt lightly bearing against the table top edge. Hold the top with one hand to prevent it from spinning uncontrollably when you start the sander. With the sander running, slowly rotate the top to sand the entire edge, taking light passes until all the saw marks are gone.

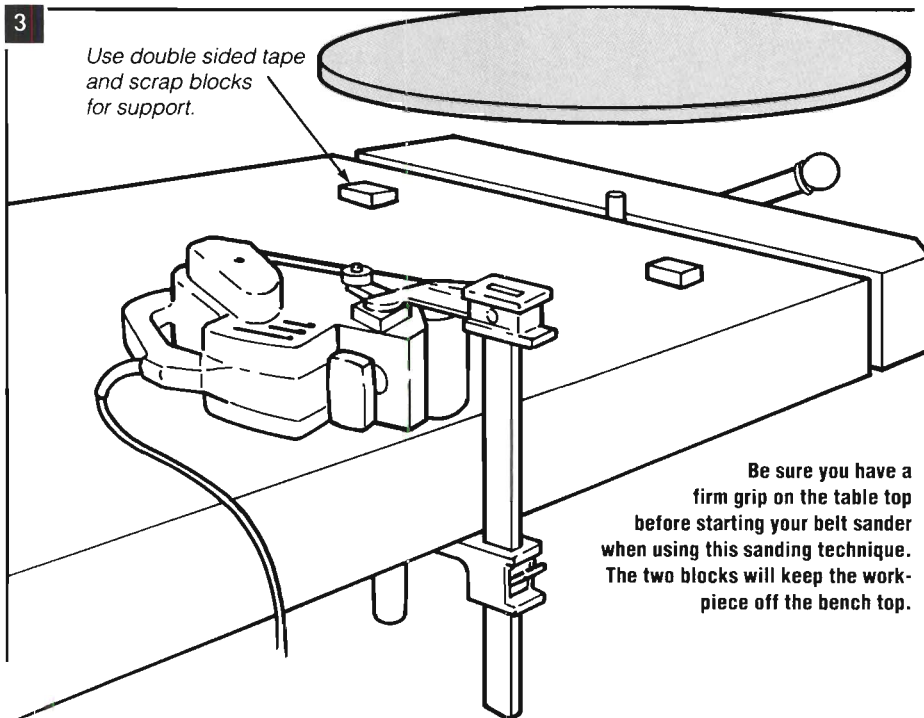
Flip the top upside down and rout a large bevel around the edge. Finish sanding the top, and then set it onto the column with the grain running perpendicularly to the cleat. Drill pilot holes in the underside of the top for $1\frac{1}{4}$ " x #10 brass oval head screws, using the center of the routed slots in the cleat to identify the hole locations. Remove the top and finish the entire piece. I prefer a hand rubbed varnish, like Bartley's paste varnish, but most any finish will do.

Shaker furniture has given us a rich legacy, creating a bridge between the ornate styles of the 18th and 19th centuries and the streamlined creations of today. This Shaker candlestand table will always find its place in a room full of furniture and will continue to draw attention for its clean lined simplicity.

Chris Inman is the associate editor of Today's Woodworker Magazine, and a professional woodworker.

3

Use double sided tape and scrap blocks for support.



Be sure you have a firm grip on the table top before starting your belt sander when using this sanding technique. The two blocks will keep the work-piece off the bench top.

ROLLING PIN

For less than ten dollars in material and four hours in the shop you can add up to years of home-baked apple pies.

By T. Martin Daughenbaugh

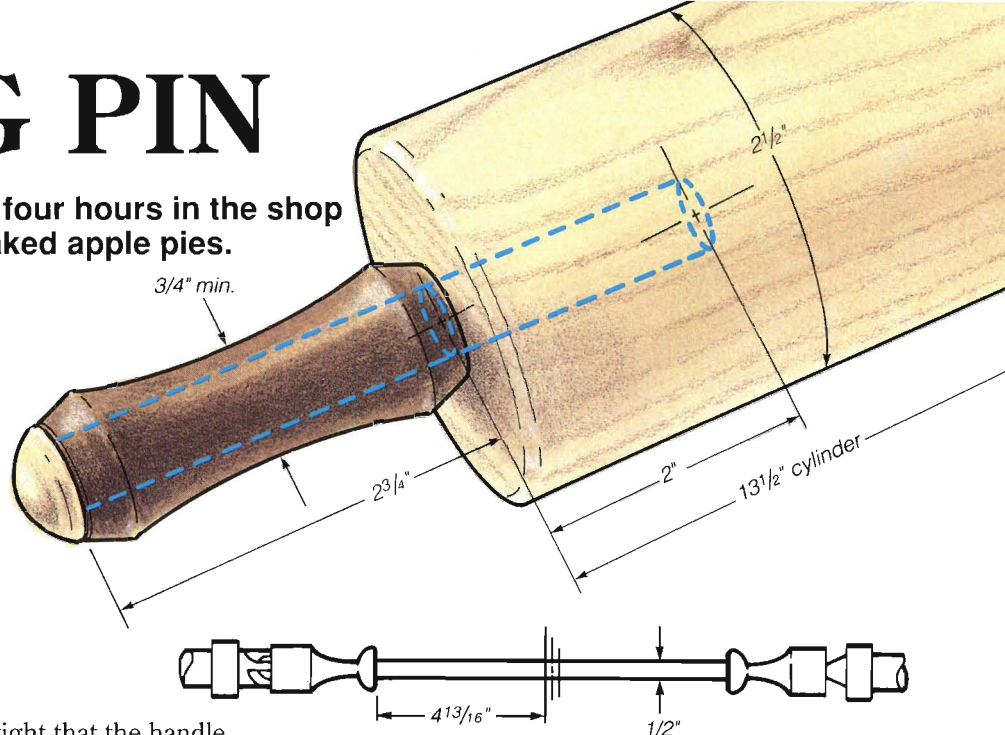
As we all know, a rolling pin is an essential item in the baker's kitchen. The one featured in this article is made up of five simple pieces—the roller, two sleeves and two handle pegs.

Start by selecting a piece of maple 3" x 3" x 14", preferably with a nice straight grain. Mount the stock between centers on the lathe, set the speed to around 490 RPM and turn the stock to a cylinder using a roughing gouge. When the stock is round switch to a 1" skew, turn the speed up to 2100 RPM and turn the roller down to its final 2½" diameter.

At this point you can start trimming the roller to its final length of 13½", using a fluted parting tool to produce a smooth cut across the grain. Leave about 3/8" of stock connecting the roller to the lathe and round off both ends to a 1/4" radius. After a good sanding, use the parting tool to remove the roller from the lathe. Before moving on to the handles, drill a 1/2" diameter hole, 2" deep, at the center of each end of the roller.

The Handle Pegs

I recommend making both handle pegs from one piece of 1" x 1" x 14" maple stock. Mount this piece between centers on the lathe and, at a speed of 1000 RPM, use a gouge to rough it down to a cylinder. Turn the center 10" of the stock down to 1/2" in diameter (being careful not to cut it undersized). Now, at each end turn a 3/4" diameter by 3/8" wide retaining button, (see drawing), making sure not to part the piece at either end. Remove the piece from the lathe, cut the waste off at the retaining button ends and lightly sand. Now cut the handles to length, measuring 4 13/16" in from the button shoulder at each end. Test fit the two handle pegs in the 1/2" hole you drilled in the roller. You want a good, snug fit—but not so



tight that the handle peg cannot fit all the way to the bottom of the hole.

Walnut Sleeves

To add a little contrast, I chose to make the handle sleeves for my rolling pin out of walnut. I started with two 4" lengths of 1¼" square stock. Mount one piece to a screw chuck, bring the tail stock up for support and turn the piece down to a cylinder using a roughing gouge. Measure 2¾" in from the tailstock end and make a 1/8" deep parting cut. This will be the final length of your sleeve. Now shape the outside of the sleeve to any desired design, just be sure not to reduce any spot to less than 3/4" in diameter. Sand through 320 grit.

Turn the two handle pegs from one piece of 14" stock. Once you have the buttons turned at each end, use the bandsaw to cut both pegs to their proper length. Carefully sand the ends of the retaining buttons round.

Pull back the tailstock, mount a Jacobs chuck holding a 1/2" brad point drill bit and bore a 3" hole in the handle sleeve. Now, using a 1/4" diameter dowel and 80 grit sandpaper, sand out the hole slightly so it will fit loosely on the handle peg. Part off the piece and repeat the procedure for the second sleeve.

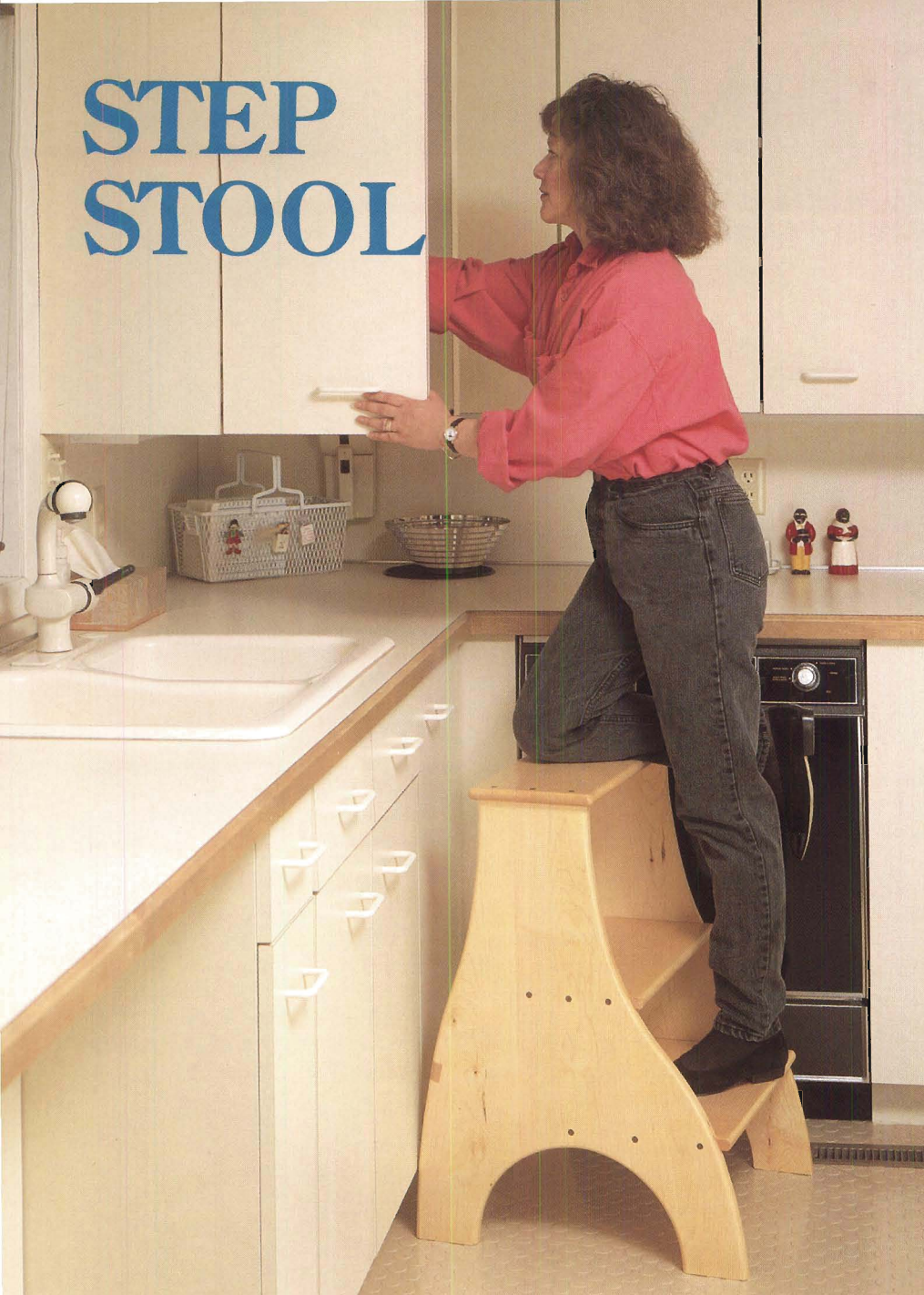
Assembly

Dry fit the handle assemblies to the roller, making sure the sleeves fit loosely over the handle pegs and spin freely between the roller and the retaining button. When you're satisfied with the fit, finish the walnut sleeves with two coats of Watco Danish oil. When the sleeves are dry, slip them over the pegs and, using a small amount of epoxy glue inside the roller holes, complete the assembly. I decided not to put a finish on my rolling pin, but if you choose to use one, be sure to stick with a food safe wood preservative.

T. Martin Daughenbaugh is a professional woodworker based in Minneapolis, Minnesota.



STEP STOOL



This multi-purpose piece of furniture will make a welcome addition to any kitchen with a little extra room. It's built from six easy to shape and assemble pieces that go together quickly.

By Bruce Kieffer

Here's a project that's easy to build, practical, and attractive. It's designed to complement our kitchen work station project (see page 8), and if your kitchen has a little extra room, this piece will prove invaluable. At 28" the seat seems a little high, but you'll find that this is the perfect

height when working at your kitchen counter tops. Additionally, having two steps is a great help for reaching things on the top shelves of your upper cabinets.

Just imagine all the possible uses of this step stool in your home, but keep in mind that the seat is for sitting only; it's not designed to safely hold a

person standing on it, so don't plan on using it for that purpose.

To build this piece you'll need to purchase 17 board feet of 4/4 hard maple and have it planed to 3/4" thick. Also purchase a small piece of walnut for cutting the screw cover plugs. You'll need a table saw, saber saw, router, drill, and 3/8" plug cutter to build this project. A drill press and band saw would speed up the construction, but they're not essential.

Cut the Pieces to Size

You'll need to join several pieces together to attain the widths needed for the sides, steps, and seat (pieces 1, 2, 3 and 4). Cut these pieces slightly oversized to allow for trimming the panels to their finished dimensions after the glue has dried.

Glue and clamp these pieces together, let the glue cure overnight, and then cut them to the dimensions given in the material list. While you're at it, cut the foot rest (piece 5) to its finished dimensions.

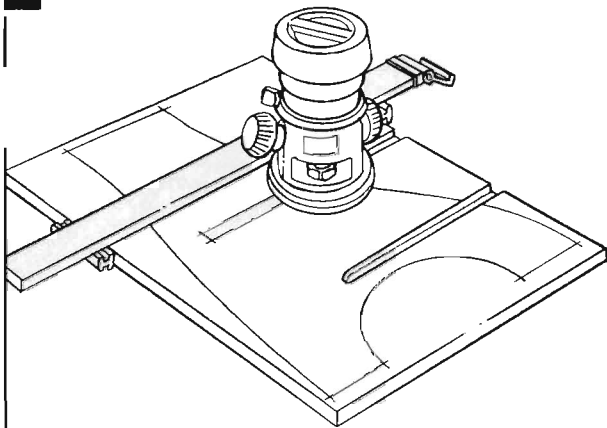
Prepare the Pieces for Assembly

Transfer the shapes of the sides from the grid on the next page to the glue up side panels, but don't start making your cuts just yet.

First lay out the four dadoes in the sides to hold the two steps, and then chuck a 3/4" diameter straight bit in your router. Measure the distance from the edge of the bit to the outside edge of the router base. Use this measurement to determine the position to clamp a straight edge to guide your router as you cut the dadoes (**See Figure 1**). Allow two or three passes to reach the finished 1/4" depth. These are blind dadoes at the back of each step, so stop about 1" short of the total step width.

Using the grid, lay out and drill the 3/16" deep by 3/8" diameter holes for the walnut screw plugs (pieces 6) and the clearance holes for the assembly screws (pieces 7) in the sides and seat. Now cut out the sides and sand the edges smooth.

Lay out and cut the dovetails on the ends of the footrest (piece 5) and set this piece in place against the back edge of the sides to transfer the dovetail shapes. Use a dovetail saw, chisel, and hand file to open the dovetails on the sides, removing the stock slowly and continually checking the fit.



Use a straight edge to guide your router as you cut the stop dados on the two side pieces.

Chuck a 3/8" radius roundover bit in your router and rout the outside edges of the sides, the front and back of the steps, and all the edges of the seat. Stop routing 1" away from both sides of the dovetail cuts on the sides. You'll complete this routing after the step stool is assembled.

Cut the haunches (1/4" x 1") at the back of the steps to complete the blind dados, and then finish sand all the pieces. Now you're ready for the final assembly.

Assemble Your Step Stool

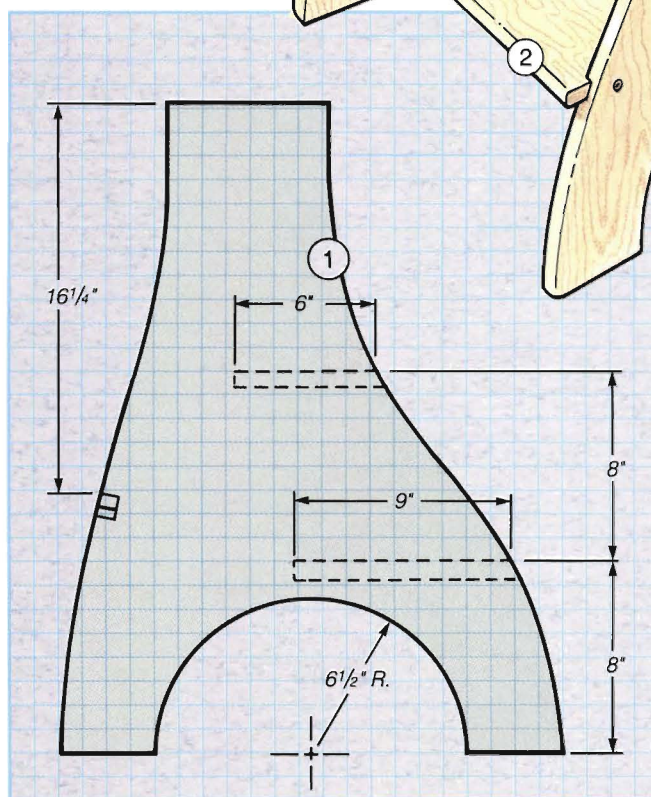
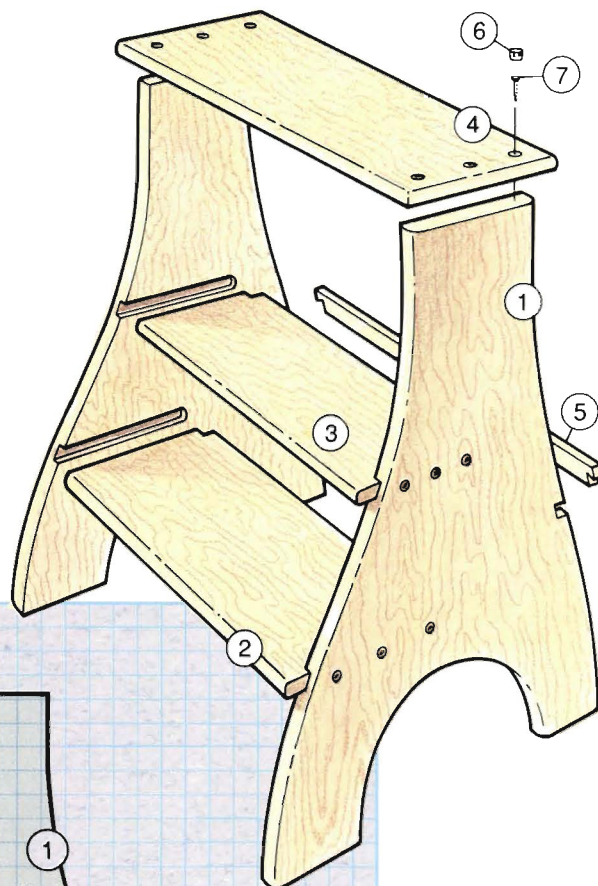
Dry assemble the sides, steps, and seat. Mark and drill pilot holes for the assembly screws to prevent them from splitting the wood when they're inserted. Now glue and screw the sides, steps, and seat together, and finish up by gluing and clamping the footrest in place. Use a chisel to clean off any squeezed out glue. Complete the rounding over on the side pieces now that the dovetailed footrest is installed.

Cut the walnut plugs (pieces 6) and glue them in their holes. When the glue has cured, trim the plugs flush using a chisel. Finish sand all the surfaces and ease any sharp edges.

Apply the Finish

I finished this step stool with Zar's wipe on finish, which is durable and easy to apply. If you think your step stool will require a really tough finish, then I suggest you use a high quality polyurethane.

Bruce Kieffer, a professional furniture builder, is a contributing editor with Today's Woodworker.



MATERIAL LIST

		T x W x L
1	Sides (2)	3/4" x 21" x 27 1/4" (Maple)
2	Bottom Step (1)	3/4" x 11" x 17" (Maple)
3	Top Step (1)	3/4" x 8" x 17" (Maple)
4	Seat (1)	3/4" x 8" x 19" (Maple)
5	Footrest (1)	3/4" x 2" x 18" (Maple)
6	Wood Plugs (18)	1/4" x 3/8" diameter (Walnut)
7	Assembly Screws (18)	1 1/2" x #6 (Drywall Screws)

The materials in this project are available from: Berea Hardwoods Co., Dept. TW, 125 Jacqueline Drive, Berea OH 44017; or The Woodworkers' Store, Dept. TW, 21801 Industrial Blvd., Rogers, MN 55374.

Buying And Using A Bandsaw

By Roger W. Cliffe

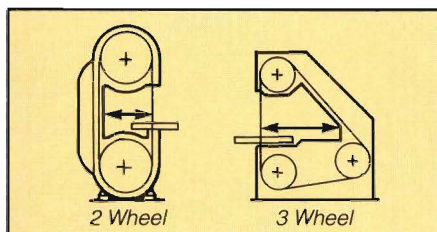
Take a welded band of metal, cut some teeth along one side, wrap it around two, three or even four large wheels, and add a motor. Obviously, it's not that easy, but that's a pretty good description of a bandsaw, one of the most versatile power tools in the shop. As the wheels are driven, the blade is thrust downward through a flat table, eliminating the kickback hazard associated with circular saws. The blade manages to stay on the wheels because they are covered with a rubber or plastic tire that is crown shaped. The tire protects the teeth of the blade and its convex shape causes the band to ride to the highest point. Tension can be applied to the blade by simply adjusting the upper wheel on a two wheel bandsaw or the rear wheel on a three or four wheel unit. In addition, blade guides are employed to control the path of the blade as it goes through the table. These guides keep the blade from twisting as work is fed into it.

Two Key Cuts

While the bandsaw can be used for such common cuts as ripping and crosscutting, it really shines when you have to cut irregular curves or resaw thick stock. Cutting inside curves requires a narrow blade, but for outside curves two approaches are typically employed to allow the use of a wider (and stronger) blade. Some woodworkers use a series of tangent cuts on these outside curves while others prefer to make relief cuts perpendicular to the outside curve, allowing the cut-off to fall free before it strains the blade.

When the bandsaw is used for intricate work, be sure to match the blade width to the curves you are cutting. This reduces strain on the blade and increases accuracy. I recommend a regular tooth blade for the smoothest cut on irregular shapes, and have provided a table to help you select the right sized blade for your job.

Finally, when you're sawing irregular curves, always keep the upper



While there are a wide variety of bandsaws available on the market, most have the same basic features, shown at right. The type of work you do will determine whether you need a two or three wheel bandsaw.

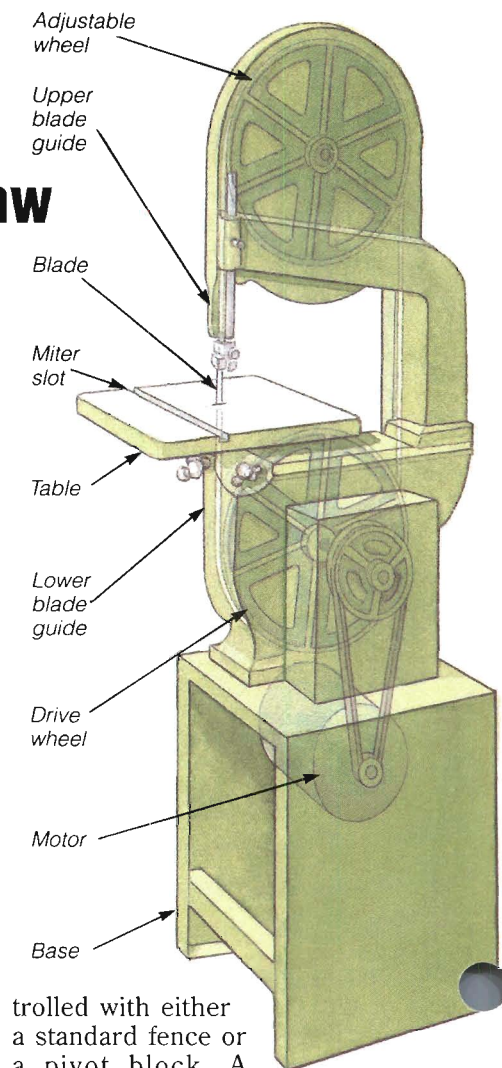
blade guide assembly close to the workpiece and never force the work, as this deflects the blade away from its intended course. When the blade deflects, it is no longer perpendicular to the blade guides and won't cut straight. You may notice that a bandsaw blade is binding in the saw kerf even though you have observed the blade size recommendations. This is generally caused by your blade set, which is the bend or offset in the teeth allowing the blade to travel through a straight cut without binding. Blade set will vary according to tooth style and blade manufacturer.

Resawing Tips

Generally, the widest blade available is selected for resawing purposes. Depending on the brand and size of the bandsaw, this will be somewhere between 1/2" and 3". Wider blades follow a straight line better because they are more rigid and less likely to deflect. Once the blade is fully engaged in the saw kerf, it tends to follow a straight line very well.

Depending on the thickness of the stock, a skip or hook tooth blade with four to eight teeth per inch is recommended for resawing. Skip tooth blades feature additional space between the teeth, which allows the chips to be cleared quickly. The hook tooth blade is similar to the skip tooth, except that the face of the teeth are inclined 10° toward the table. This allows the blade to make more aggressive and faster cuts.

The resawing operation is con-

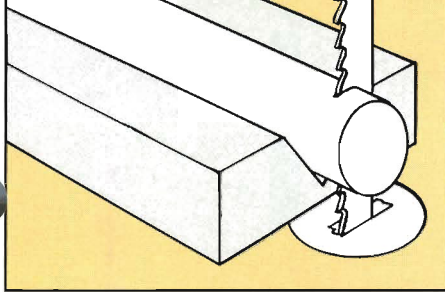


trolled with either a standard fence or a pivot block. A pivot block jig is usually no higher than the stock being cut and about one inch thick. The end closest to the saw blade is rounded over, as shown in the illustration. The chief difference between a fence and pivot block becomes evident when you're resawing some stock and the blade moves slightly away from the cutting line. The pivot block allows you to pivot the back end of the work to get the blade back on the desired path—a technique that is not possible with a standard fence.

Regardless of the operation, remember that the blade is traveling very fast and cuts more aggressively than you think. Keep your hands at least 4-6" from the blade and never allow your fingers to line up with the blade. Use a push block to complete any ripping or resawing operation.

Correcting Blade Lead

When the blade wanders from its intended path it is called blade lead. One cause of this is deflection due to excess feed pressure or improper



A V-block jig, which can also be used on the drill press table, offers a secure platform for cutting round stock.



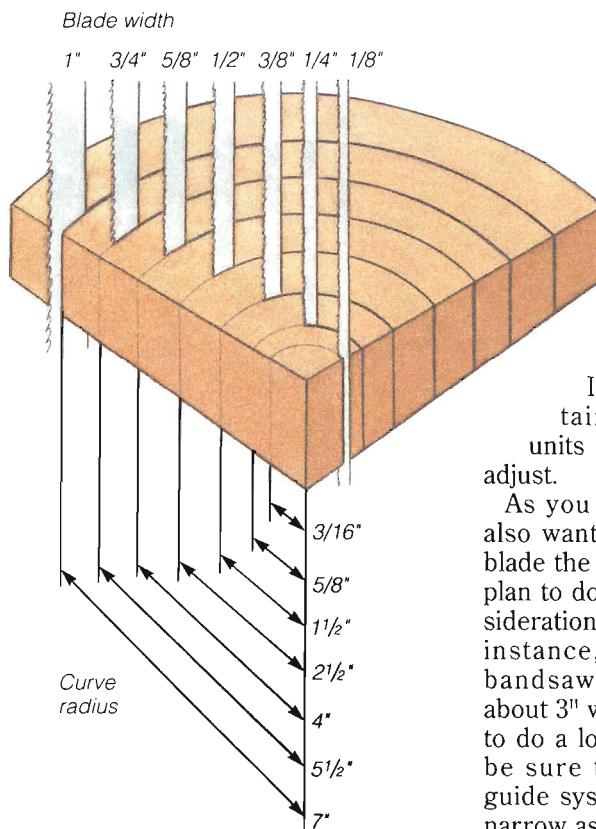
A pivot block fence allows the operator to stay on track by pivoting the back end of the workpiece. This fence is particularly useful when cutting curved stock.

blade guide adjustment. The blade may be duller on one side, causing it to pull toward the sharper side. This dullness is typically caused by cutting too tight a curve, hitting something in the wood, or incidental contact with the metal guide blocks in the blade guide assembly.

One way to cure this problem is to replace the metal guide blocks on your bandsaw with a set of "Cool Blocks". These phenolic resin guides are imbedded with graphite, so they can be adjusted very close to the blade without damaging it. I've had a set on my bandsaw for almost two years and I'm still using the same blade.

Blade tension can cause lead problems as well. The best advice here is to only tension the blade enough to keep it tracking properly. If you're doing a lot of resawing, remember that the blade tends to heat up and expand. An occasional increase in tension will solve this problem.

If you've checked your tension and replaced your guides and you're still experiencing lead problems, try cutting a kerf on both edges of your work on the tablesaw. Cut the kerfs about 1" deep then proceed to resaw the work on the bandsaw. The kerfs provide a track for the blade to follow and eliminate the lead problem.



Use the table at left to help pick the largest blade possible for the radius of the curve you plan to cut on the bandsaw.

tight radius as it turns on the wheels. In all fairness, I must add that many Inca bandsaw owners maintain that their three wheel units are very easy to track and adjust.

As you compare bandsaws you'll also want to determine how wide a blade the unit will take. In fact, if you plan to do a lot of resawing, this consideration should be number one. For instance, Ryobi or Hitachi resaw bandsaws both take blades up to about 3" wide. Conversely, if you plan to do a lot of intricate curve sawing, be sure that the machine and its guide systems will handle blades as narrow as 1/8". If the curves you are cutting are too tight for a 1/8" blade, you should be looking at scroll saws, which are designed for very tight curves.

In my opinion, the best intermediate sized bandsaw for the price is the Delta 14" machine. It has guides that are easy to adjust and changing blades and tracking present no problems. As an added bonus, it also has excellent resale and trade-in value. If you are considering an imported imitation of this machine, be aware that you will be making some trade-offs. Generally the castings are not finished as well as those on the Delta machine and sometimes they have not been aged or seasoned—which means that they are more likely to warp over time. One other problem is the motor. Motors made in the United States are superior to those imported from Taiwan.

If you're looking for a smaller bandsaw, there are many three wheel benchtop units available today. One of the best I have used in this category is made by Value Craft. However, the choice broadens if you're in the market for a larger machine. Delta, Powermatic, Inca, and Mini-Max all have units that will meet your needs.

Buy the Right Tool

Bandsaws range from benchtop models all the way up to large stationary models. One of the most important things to consider when you start shopping is the capacity of the tool, which can be determined in two different ways. First, the distance from the blade to the overarm is considered. If you are looking at a two wheel bandsaw, this dimension will be slightly less than the diameter of the wheels. On three and four wheel bandsaws, the distance will be greater. This dimension determines the longest crosscut that may be made on the bandsaw. Next, consider the distance from the table to the upper blade guide assembly at its highest setting. This dimension determines the thickest piece of stock that the bandsaw will handle.

As you study the specifications of different bandsaws, you will discover that many machines aimed at the home woodworker will have about 12 to 14" between the blade and the overarm and about 6" between the table and upper blade guard. Most of these machines have two wheels instead of three or four. Two wheel machines are more popular because they are easier to track (the upper wheel can be tilted to adjust the tracking). The stress on the blade is also reduced, since it's not bent to such a

Dr. Roger Cliffe is the author of "Table Saw Techniques" and "Radial Arm Saw Techniques", published by Sterling Publishing Co. of New York, New York.

Tips for Safe Finishing

By Jerry TerHark

The proper storage, handling and disposal of chemical finishes, solvents and strippers is an important part of any good woodworker's routine. Most of us know this, but when the chips start to fly in the workshop, sometimes we get "too busy" to follow our own shop safety procedures. When you find yourself falling prey to these bad habits, it's time to step back and review the basics!

Combustibles

For starters, if you can't immediately remove combustibles from the shop, they should be kept in fire-resistant enclosures. Used rags and filter cloths can be temporarily disposed of in metal cans filled with water to reduce the risk of spontaneous combustion. Make sure combustible materials aren't being stored near a heat source and clean up spills immediately. If you deal with hazardous materials on a regular basis, consider investing in spill proof containers with spring loaded lids.

While all states have strict guidelines covering the storage of flammable material, they're not necessarily uniform. A quick call to your state Fire Marshall will help you get your shop in compliance with your local codes. In Minnesota, a specially constructed cabinet is required if you have more than ten gallons of flammable material, such as lacquer thinner, mineral spirits, denatured alcohol or paint in your shop. Typically, this cabinet should have walls at least 1" thick and a self-closing door.

Finally, always have a fire extinguisher available, and be sure to post the telephone numbers of the local fire department and poison control center.

Safe Shop Techniques

When spraying finishes or using any type of solvent or stripper you must use a respirator with charcoal filters and provide adequate ventilation. Do not consider substituting a dust mask for a *respirator* —they are not at all

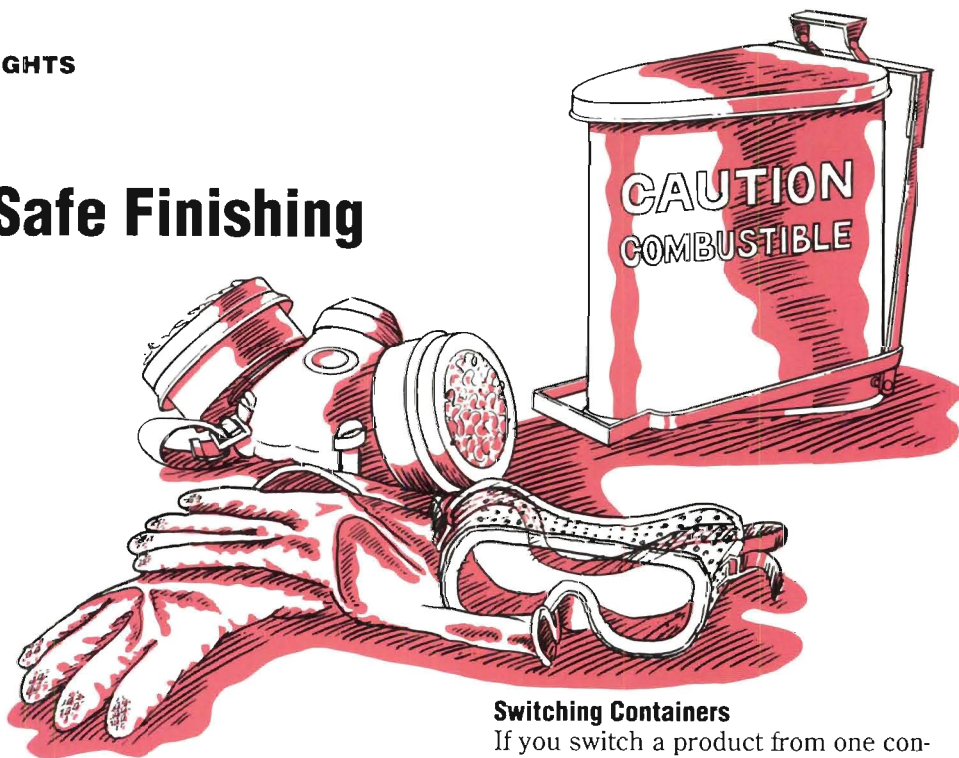
interchangeable. Respirator filters should be replaced the minute you can smell fumes from the chemicals you're using. Don't put it off— inhalation of toxic fumes is frequently the cause of lung disease.

If you do accidentally inhale the fumes or ingest a toxic chemical, call your physician or the poison control center immediately. Take the solvent or finishing container to the phone with you if possible, for there is information on the label that will help them determine the proper remedy.

Always use chemicals in well ventilated areas (no closed garages or basements) and, since many finishing chemicals are caustic, avoid all contact with eyes or skin —get in the habit of always wearing safety glasses and rubber gloves.

Paint removers should never be stored for long periods of time as they are affected by temperature and humidity changes and have a limited shelf life. Excessive pressure may build up in unopened cans, causing the fluid to burst open the cap and spray out of the can.

Never use chemicals of any kind near an open flame, pilot light, electric motors, or circuits that may cause an open spark. Not only are many chemicals flammable, but some also become highly toxic gases when burned or heated. Strippers, for instance, become phosgene gas when exposed to a flame —similar to the mustard gas used in World War I.



Switching Containers

If you switch a product from one container to another, make sure you label the new container properly. The best way to do this is to simply remove the label from the original container and tape it on the new one.

One common mistake that many finishers make is assuming that a glass jar is the best storage container for leftovers. Although glass seems like a logical choice, the obvious flaw is that it can easily break. I prefer metal cans, but they are not without shortcomings. Some chemicals can erode or rust metal cans, often at the seams, resulting in slow leaks that can go undetected for a long time. Likewise, plastic can be degraded over time by many chemicals. Unless you have a constant stream of projects underway, the best practice is to buy only what you need for the project at hand. It costs a little more to buy smaller sizes, but you won't end up with a large collection of half full containers. If you must transfer solvents, paints or finishes to another container, be sure to use the smallest size possible to extend the life of the product. Another alternative is to fill any left-over air space in the storage container with clean marbles or pebbles.

Dealing With the Leftovers

If the left-over product is still in good shape, I recommend that you simply give it to someone who can use it like a neighbor, friend, local church, or community service organization. They may have a project coming up

that could make use of your product. If there is only a little left, the first step is to dry out the product to reduce its toxicity. Find a well-ventilated work place that is well away from children, pets, rain, and any heat sources. For small quantities, remove the lid and simply let the material dry in the can. To speed up the process, mix in a little kitty litter or sawdust.

Don't forget that turpentine, mineral spirits and solvents can sometimes be reused. Let the product sit in a closed container until any particles have settled to the bottom and then slowly pour the liquid into a second container, using a cheesecloth filter.

Once your left-over material can no longer be used for its original purpose, or has become contaminated or worn out, you have a potentially hazardous waste on your hands and must proceed with care. Disposing of these products is always a problem, but there are several solutions available. Obviously, you should never consider pouring it down the drain.

An exciting new development regarding final disposal is that many communities now have hazardous waste collection days. Hold your material to take advantage of this service, or contact the local or state environmental control agency for safe disposal guidelines.

Future Changes

Many changes are taking place in the wood finishing industry to reduce the hazards to which finishers are exposed and to limit environmental problems. Water based products, for example, are becoming more prevalent as the result of legislation (or impending legislation) to reduce the number of hazardous materials in the waste stream. California and New Jersey are already severely restricting the use of oil and lacquer based finishes. Eventually, I believe that all states will follow their lead.

In the meantime, store your chemicals correctly, use the right protection when it's time to apply them and dispose of them in a safe manner. Your shop will be a safe place to work and our precious water will be safe to drink.

erry TerHark lectures nationwide on finishing and heads Dakota County Technical College's wood finishing program in Rosemount, Minnesota.

WHAT'S IN STORE

Two Random Orbit Sanders

By Hugh Foster

For years, auto body shops and professional woodworking shops have used air powered random orbit sanders with pretty good success. Now there are two excellent electric random orbit sanders available, one of which may well represent the most significant addition to your woodworking arsenal in 1990.

Random orbit sanders remove material faster than pad sanders, and they leave fewer swirl marks on the material. While 60 grit abrasive tends to mark the material badly, the next sanding with 120 grit completely removes all those swirls.

The Bosch 3273DVS (3701 Neuse Blvd., P.O. Box 2217, New Bern, NC 28560) and the Porter-Cable 7334 (Young's Crossing at Highway 45, P.O. Box 2468, Jackson, TN 38302), random orbit sanders, both new designs from solid companies, are excellent tools, but not as much alike as you might think.

The Porter-Cable uses 5" Stikit™ abrasive, though self-adhesive discs of other brands can be found, while the Bosch uses a velcro backed abrasive. This approach is about twice as expensive as the Stikit™ abrasive, but will last twice as long if you choose grits wisely. Changing grits at close interval is much easier with the velcro backed abrasive, but the pad itself is more likely to damage an inside corner if you're not careful. In either case, you'll have to try modern adhesive abrasives to believe how much superior they are to old fashioned abrasives for virtually any power sanding.

The Bosch offers a pretty effective dust bag as standard equipment, and for just a few extra dollars (if this is your only Bosch tool) the Air-Sweep™ dust removal system (which will connect your sander to your shop vac). At first, I faulted the Porter-Cable for disregarding this feature, but as I sanded some unusual shapes with both sanders, I



Not to be confused with pad sanders, these two electric random orbit sanders from Bosch and Porter-Cable are now available in a price range suitable for the home woodworker.



came to realize that the protrusion where the dust bag mounts can be a real inconvenience. The Bosch machine could run up to an interior edge through slightly less than 180° of the disc's total circumference, while the Porter-Cable will meet the edge through something over 330°, making it far more convenient to use inside assembled furniture.

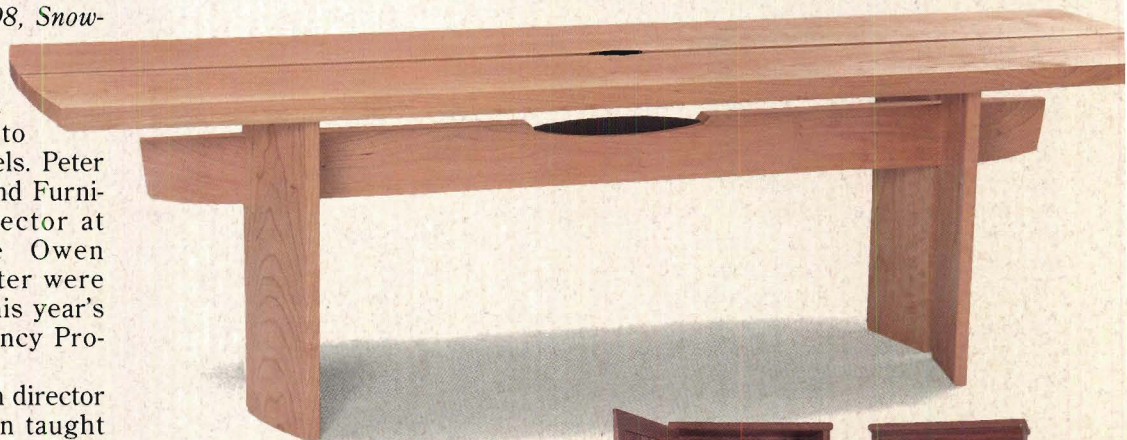
The Bosch, which is aimed at the intermediate market, can be found discounted for about \$100, and it's a lot of tool for the money. The more expensive Porter-Cable is an industrial quality machine that is often discounted to under \$150. The tool features a good, long rubber cord, and heads for flat and contour sanding. A side handle, like the one you might find on a small grinder, comes with the tool. I put it on, but the tool is so comfortable to use without it that this handle is almost superfluous. Its speed is a vibration free, virtually optimum 6,000 orbits per minute. Though the Bosch initially appears to have more features, the Porter-Cable would be my choice if I planned on sanding all day.

Hugh Foster is an English teacher, furniture builder and freelance writer based in Manitowoc, Wisconsin.

Selections from the Anderson Ranch

The Woodworking and Furniture Design Program at the Anderson Ranch Arts Center (Box 5598, Snowmass Village, Colorado 81615) offers an excellent series of workshops on design and craftsmanship to woodworkers of all skill levels. Peter Korn is the Woodworking and Furniture Design program director at Anderson Ranch, while Owen Edwards and Kim Carpenter were selected to participate in this year's eight month Studio Residency Program.

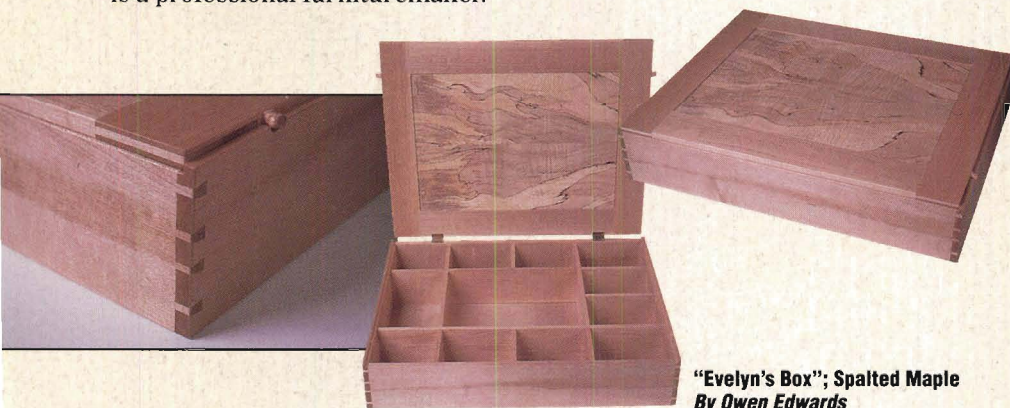
Prior to becoming program director with Anderson Ranch, Korn taught furniture design at Drexel University. Edwards is a graduate of the Fine Woodworking Program at the College of the Redwoods and Kim Carpenter is a professional furnituremaker.



Tao Bench; Figured Cherry and Ebony
By Kim Carpenter



"Seperation"; Virginian Cherry
By Owen Edwards



"Evelyn's Box"; Spalted Maple
By Owen Edwards



Chair; Ebonized ash (laminated arm and back)
Dictionary Stand; Black Walnut
Breakfast table; English brown oak and glass
By Peter Korn



NEXT ISSUE



The continuous grain bandsaw box shown above is one of three exciting new projects for our next issue. Associate editor Chris Inman is at work on a Chippendale mirror frame and we have an exciting porch slider set for the cover.

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