

A Day in the Shop with Norm Abram

WOODWORKER'S JOURNAL

February 1999
Volume 23, Number 1

the magazine
for Today's
Woodworker

Staying Sharp:
Build the ultimate sharpening station

Clearing the air:
Dust collection
strategies

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WOODWORKER'S JOURNAL



50 Rolling Tea Table
By Jeff Greef

Simple curves are the story of this table with easy-to-make cabriole legs and a rounded frame.



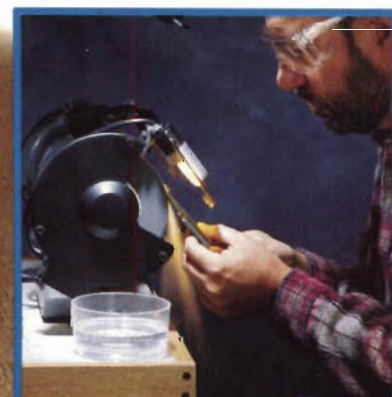
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By Larry Heinonen

Learn how to form curved moldings as you build this elegant cabinet.



28 Build the Ultimate Sharpening Station
By Rick White

Finally ... space for all your sharpening supplies and a solid pair of work surfaces for grinding, honing and lapping.



About the cover: Local woodworker Mike Stevesand uses cool water to keep his temper while sharpening chisels.

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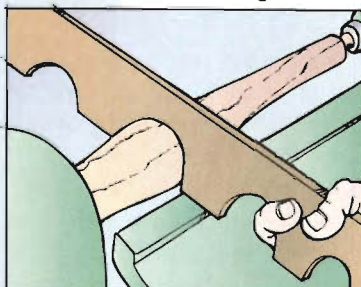
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Safety First

Learning how to properly operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary safety guards have been removed from the equipment shown in some of the photos and illustrations in Woodworker's Journal. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.



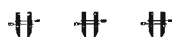
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Woodworker's Journal Visits Norm's Shop



Wouldn't you think that after ten years at the helm I'd get the choice assignments? To tell you the truth,

I'm still not real clear on how it came to pass that editor **Rob Johnstone** ended up in the New Yankee Workshop (hanging out with **Norm Abram** and our sweepstakes winner, **George Tritthardt**) ... while I found myself in Atlanta, wearing out a perfectly good pair of shoes visiting every single booth at the International Woodworking Fair. Rob assures me I approved everything in advance, but somehow I'm left with this image of Radar engaging me in conversation as I blithely sign off on a stack of form letters.



Notice anything different? Art director **John Kelliher** and our new graphic designer **Mike Birawer** have been busy freshening up the look of our department heads. It's all part of their master plan to give your favorite woodworking magazine a once-over. Not to be outdone, editor Rob Johnstone and his crew are busy preparing your editorial menu for the upcoming year. He won't be changing our emphasis on projects, tools and techniques, but Rob is ever on the watch for new and interesting ways to present useful woodworking information. Look for fresh ideas from both sides of the aisle in upcoming issues and let us know how you're liking the changes (or, for that matter, anything else about the magazine!).



Editor Rob Johnstone and our sweepstakes winner spent a day watching Norm get the new "New Yankee Workshop" season under way.

Now, if you'll allow me to be serious for a moment, I want to remind everyone about something important. There's nothing romantic about a woodworker with a bad cough — and there's nothing macho about chisel gouges in flesh. If you spend lots of time in the shop, or if you're moving in that direction, please, do two things, and do them soon. Clear the air and learn how to sharpen your tools. A razor sharp chisel edge might look deadly, but it will deliver clean cuts where you want them, not on your opposing hand. Just about every hand tool wound I hear about is the result of overworked dull blades, not effective sharp ones. And dust in the shop won't necessarily result in an annoying hack this year, but over time it will hurt you. With the low cost of today's air cleaning and sharpening devices, (both topics are in this issue), you're out of excuses!

Larry N. Storch

JANUARY/FEBRUARY 1999

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Editorial Advisors

NORTON ROCKLER

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Contributing Editors

DICK COERS, RICHARD DORN
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East/Central Publisher's Representatives

JIM VAN GILDER and MIKE HILL

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Woodworker's Journal, January/February 1998



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Arizona's Fine Woodworkers

By Joanna Werch



Doug Forsha's blanket chest has a fiddleback anegré veneer body with walnut border, skirt and legs. He vacuum veneered all the curved surfaces.



This bowl is one of Dave Batten's turnings. It's spalted myrtle burl with a walnut lip. He also incorporated engranulated turquoise.

Beginners and more accomplished woodworkers alike are welcome in the Arizona Association of Fine Woodworkers. "We decided early on that the adjective 'fine' in our name pertains to the ladies and gentlemen who make up the club," says Thormon Ellison, the club's vice president. Since the club began in 1983, the group's membership has grown to about 130 woodworkers, mostly from the greater Phoenix area.

Club members are encouraged to give tours of their shops and to present workshop sessions. Recent meetings have been held at a door manufacturer and a local art museum. This past spring the club visited the locally-based Roberto-Venn School of Luthiery/Guitar Building. Association president Ralph Gumbert said members were impressed with the artisans at the school, particularly with their knowledge of aging wood and varnish.

If you are in Phoenix and are interested in visiting the club, you can call Thormon Ellison at 602-973-6909.



Doug Forsha's side table is ebonized walnut with alder highlights painted to look like ivory.



Dave Batten turned this maple and walnut platter and the mesquite bowl with turquoise inlay. He also built the oak Windsor chair.

Club member Reid Parker specializes in toy vehicles like these. Through his church, he donates them to children.



WOODWORKER'S JOURNAL PRESENTS

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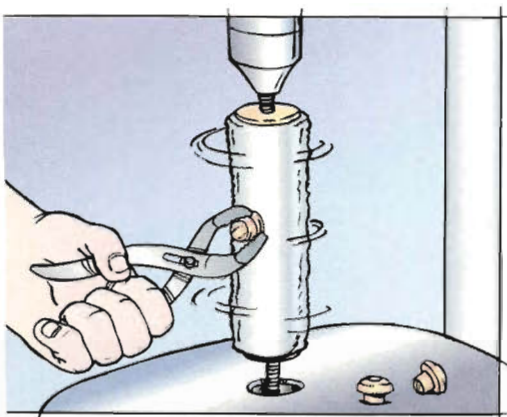
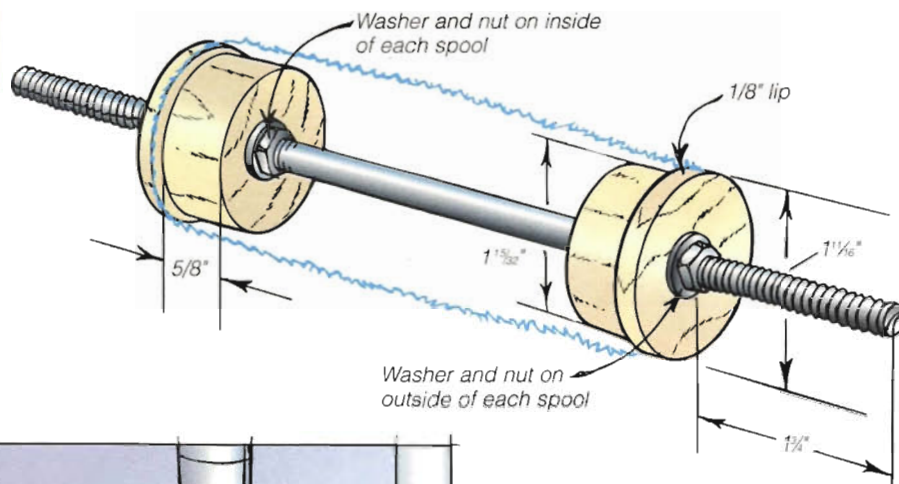


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Easy Access to Plans in the Shop



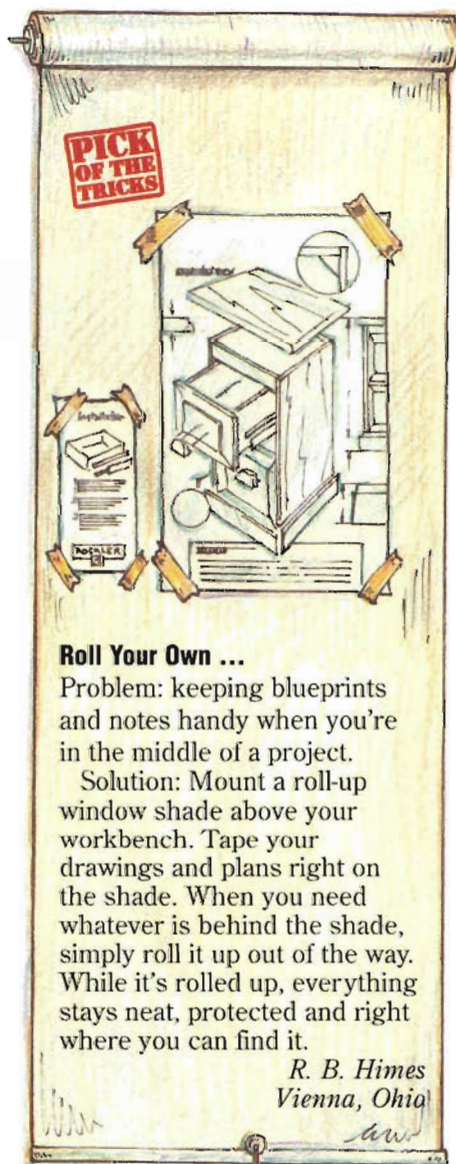
Build Your Own Small Parts Buffer

I attach an ordinary paint roller to my drill press or wood lathe to buff small wood parts, and they come out perfect every time.

To make the two spindles for your roller, glue up some 3/4" stock. Turn the inside dimension of each to 1 15/32" and the outside to 1 11/16", with a 1/8" lip. Center a 1/2" hole in each spindle for a threaded rod and secure your spindles to a roller (cut a 9" paint roller in half) using washers and nuts. Leave at least 1 3/4" for the chuck to grab.

When I make my small parts, I just stain them, let them dry and then buff. To clean the roller, wet a cloth with paint thinner and hold it against the roller while turning. It cleans up just like new — ready for the next job. When it's time to replace the roller, just remove the bottom nut.

*William Robidoux Jr.
Tiverton, Rhode Island*

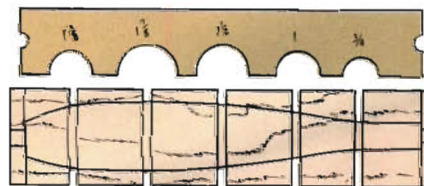
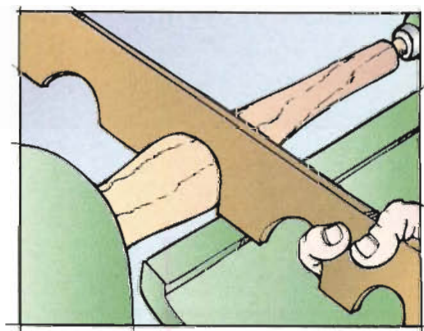


Spindle Bench Marking

I made a bench with 13 spindles that had to be cut to match. I drew a line on 1/4" hardboard and, using a center punch, drilled holes at 3/4", 1", 1 1/4" and so on, to my max of 17/8". Cutting the board along the center line gave me a gauge.

Measuring an inch from the end of the dowel, I made pencil marks at 3" intervals. At each mark, I made lines on either side to guide my 1/4" cutter, then cut into the wood until the proper gauge fit over the dowel. With my seven "bench marks" on the 13" dowel, it was simple to cut the rest of the material off and make each spindle look like it was cloned.

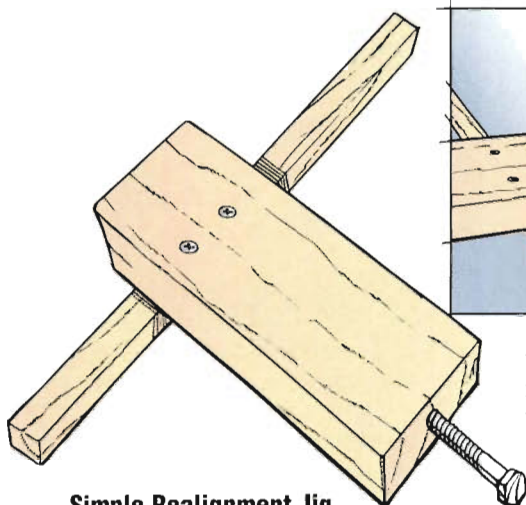
*James A. Johnson
Brunswick, Ohio*



Felt-tipped Razor Edge

We all know our turning tools must be razor sharp to do their best work, but I used to have a hard time sharpening some of mine. Now I use one of those blue felt-tipped pens to coat the entire cutting edge of the tool. It makes it a lot easier to see how I'm progressing during the sharpening process.

*Howard Moody
Upper Jay, New York*

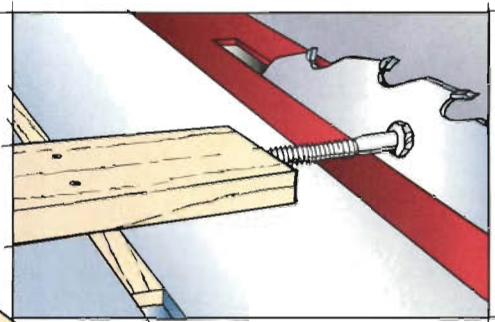


Simple Realignment Jig

Sometimes, I need to remove the table of my table saw for maintenance. Removing it is a matter of wrenching out four bolts and talking a friend with a strong back into helping me lift the cast iron top. Replacing it is simple as well, but with one big question: How do I realign the top perfectly

to the saw blade? Exact alignment is crucial for a properly working table saw. My solution was to build this little jig that slides in the miter gauge slot on my table. To use it, set the head of the bolt so it just barely grazes the saw blade as it emerges from the table. Then simply slide the jig to where the blade disappears back into the saw, making sure it barely contacts the blade as you move. Adjust the table and carefully tighten the bolts.

Sean Bree
New York, New York



Quick Dowel Fluter

When I run out of dowel pins, or need only a few of a special size, I often cut them from a 36" length of dowel stock. Before cutting, I flute the stock by dragging it over the teeth of a saw. The flutes thus created permit the passage of air and excess glue from the bore.

Michael Burton
Ogden, Utah

Sanding in Sequence

To keep track of the last grit used when sanding, stick a short length of masking tape on all your sanding tools. When you install new sandpaper, write the grit number on the tape. I use a red marking pen, so I KNOW the grit number and can carry out sanding in the correct sequence.

John A. Carso
Bellevue, Washington
continued on page 14 ...

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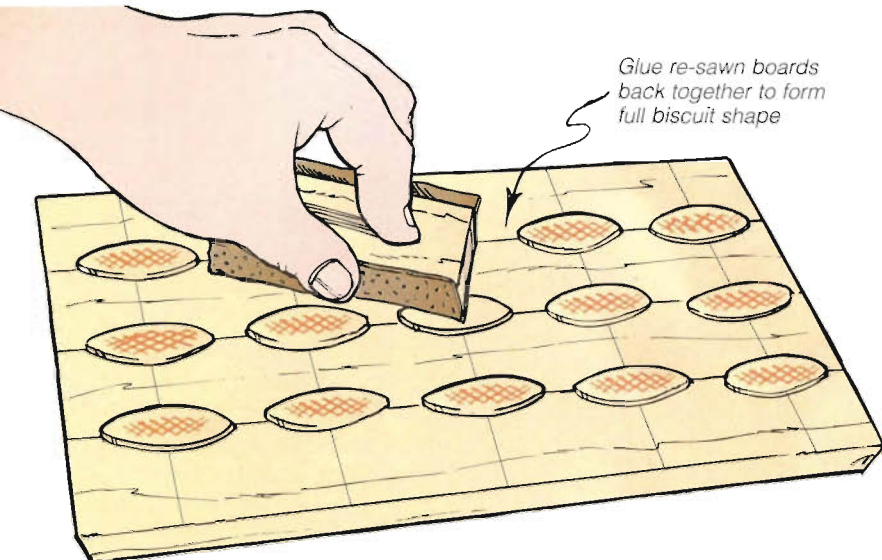
Enter a piece of furniture you've refinished or restored, and you could win the grand prize of \$3,000, plus Dremel tools. 13 winners in all. Send us before and after photos, and a written description of the project, along with a 3"x5" card with your name, address and daytime phone, to Dremel Furniture Refinishing Contest, P.O. Box 3138, Elgin, Illinois 60121-3138.

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Biscuit Lovers Jig

It can be frustrating to get halfway through a glue-up and come across a few biscuits that refuse to fit. I wasn't prepared to hand sand individual oversized biscuits, but I did come up with this easy to make jig that allows me to take care of a project's worth at a time. The job of sanding isn't a big undertaking, requiring about two strokes with a sanding block over the biscuit surfaces to complete the work.

It would be ideal if biscuit manufacturers would stamp a visible center line across biscuit surfaces so they could be inserted accurately in perfect alignment with center lines used to cut biscuit slots. But they don't. So, after sanding a group of biscuits on one side, I take advantage of the dark center lines remaining on the jig to transfer lines across the biscuits.

*Richard Dorn
Oelwein, Iowa*



Winner! R.B. Himes will receive a Makita 14.4 V cordless drill for submitting this month's Pick of the Tricks. **Woodworker's Journal** will pay from \$50 to \$150 for all Tricks of the Trade published. In addition, the reader whose trick is selected as our "Pick of the Tricks" will receive a free tool. To join in the fun, submit your original, unpublished trick to the editor. Include photos or drawings needed to explain your idea. Send all tricks to *Woodworker's Journal*, Dept. T/T, P.O. Box 261, Medina, Minnesota 55340. Or send us an e-mail at: editor@woodworkersjournal.com.

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In the Shop with Norm Abram

By Rob Johnstone

Ultimate Shop Trip

Illinois Woodworker Wins Delta Sweepstakes

George Tritthardt was on familiar ground, "I remember when Norm built that!" he exclaimed as we walked toward a gazebo nestled graciously between large broadleaf trees. George — and thousands of other folks — had watched Norm Abram build the gazebo on the New Yankee Workshop.

George and his wife, Frances, were visiting PBS's popular woodworking show as the guests of Woodworker's Journal and Delta International Machinery. As the winner of our 1997 sweepstakes, George had already flown to Delta's Tupelo, Mississippi, manufacturing facility and watched as Delta's technicians built him a new Unisaw — the first part of his grand prize winnings. To complete his winnings, George and Fran flew into Boston (courtesy of Delta Airlines) to watch the filming of the New Yankee Workshop, WGBH's long running woodworking show.

The hosts were Norm and the wonderful staff of the New Yankee Workshop, while the Tritthardts' escorts were yours truly and Delta representatives Bob Powers and Renata Mastrofrancesco.



As a new season of the New Yankee Workshop begins, George and Fran Tritthardt watch Norm Abram work his magic. Our sweepstakes winners toured the studio/workshop and the grounds of The Victory Garden — both the creations of producer Russel Morash.

As we took in the action, it was easy to see how Norm, producer Russel Morash and the Workshop staff have managed to create such an engaging and informative show.

Old-fashioned hard work, attention to detail and a collaborative, dedicated staff were evident as the project was created in front of the camera ... and our winner's eyes.

The New Yankee Workshop is located on the same grounds as The Victory Garden, WGBH's other popular show. (Don't ask me where it is, I was sworn to secrecy.) The tour of the grounds, including

The Winner! George Tritthardt Meets Norm



George Tritthardt of Mundelein, Illinois won the grand prize in the Woodworker's Journal and Delta Machinery International 1997 Sweepstakes, sponsored by Delta Machinery, Delta Airlines and Woodworker's Journal. George's winnings included a custom-built Delta Unisaw (the New Yankee Workshop version) and a trip to Boston, highlighted by a visit to Norm Abram's New Yankee Workshop. George is a serious woodworker who now wonders how he ever got along without his new Unisaw.



Delta's Renata Mastrofrancesco, George and Fran Tritthardt and your editor pause for a photo in front of Norm's gazebo.



many of Norm's outdoor projects, was stunning. Lunch included tomatoes fresh from the Victory Garden and a garnish of Norm's wonderful woodworking war stories. As George and Fran sat chatting with Norm, enjoying good food and the warm, clear New England day, the grand prize trip slowly came to a conclusion.

Woodworker's Journal again offers its congratulations to George, and a special thanks to Delta and all those associated with the New Yankee Workshop.



The assembled visitors and their host, from left to right: Fran Tritthardt, Delta's Bob Powers, Norm, Woodworker's Journal editor Rob Johnstone, George Tritthardt and Renata Mastrofrancesco, also representing Delta.

Shop Talk continues on page 18 ...

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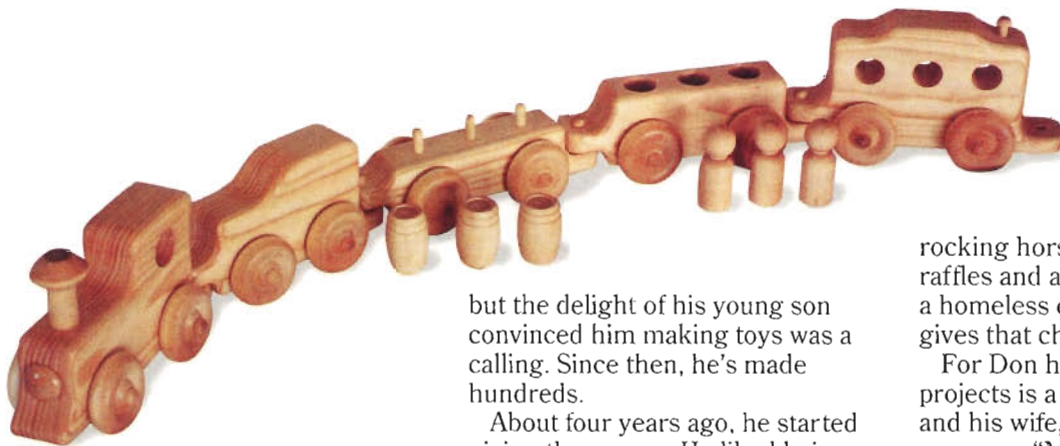
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A train set for his own son started Don Riley on the right track. Now he's well-known as "The Toy Maker."

Toy Maker Brings Joy

By Joanna Werch

At Christmas time, Donald Riley of El Cajon, California, loads the toys he's made into canvas bags on which his wife has sewn the word "toys." He throws the bags into his truck and drives off to give them away. "It's almost like being Santa Claus," he said.

Don's toy-making mission began nine years ago. On a whim, he walked into a woodworking store and bought the plans for a toy train set. Don hadn't done any woodworking since high school,

but the delight of his young son convinced him making toys was a calling. Since then, he's made hundreds.

About four years ago, he started giving them away. He liked being known for building fancy toys, but decided silhouette cut-outs from Douglas fir 2 x 4s worked best for mass production. With roundover edges and a child-safe finish, these are still quality toys, but Don can make about two dozen in a weekend. Over the course of a year, he builds about 300.

He began giving his toys to charities and soon became known as the Toy Maker. Groups now send him their "wish lists," and he makes simple cars, cameras, planes — and, of course, trains. He donates more elaborate toys, like Ferris wheels, carousels, or

rocking horses for charitable raffles and auctions. And, if he sees a homeless child on the street, he gives that child a toy.

For Don himself, every one of his projects is a nonprofit venture. He and his wife, Lois, budget for the program. "My son gets to learn the art of charity. He gets to see that not everything we do in life has a price tag on it," Don said.

Instead, Don enjoys the thank yous. Lots of those come from the animated wooden music boxes he builds and displays in public venues. One is at Children's Hospital in San Diego. "The guards say the kids just love this. It gets their minds off their problems," Don said.

The music boxes started with a carousel Don built a few years ago. One of his friends said it would be neat if he could motorize it, and he accepted the challenge. Although

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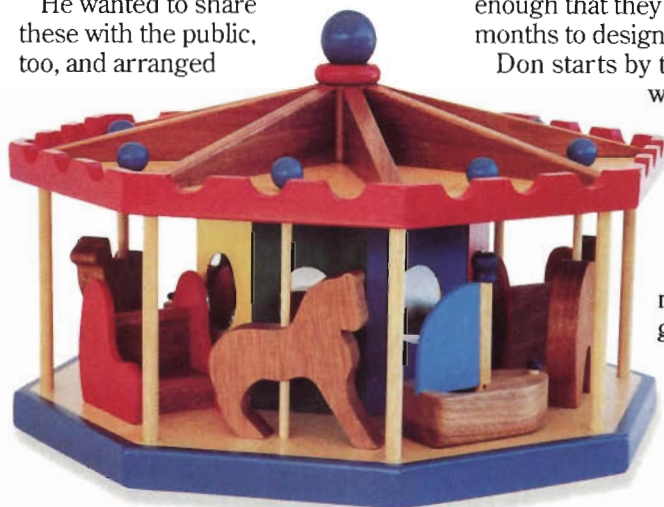
Don's day job is as a high voltage electrician, he had to teach himself enough electronics for the carousel to revolve. Since then, he's settled into a pattern of building an animated music box every other year. They're art pieces, he says, and they're often inspired by cheap wind-up toys he knows he can make better in brass and wood.

He wanted to share these with the public, too, and arranged

to display them at the hospital and at libraries near his home. Buttons on the display boxes start the movement — on some, there's hundreds of moving pieces. Every four months, he changes the displays to give everybody some variety. Lois makes the fabric parts of the music boxes — like sails for a pirate ship — but the boxes are complicated enough that they can take up to nine months to design and build.

Don starts by thinking what he wants the project to do, not how to do it. He doesn't want to limit himself, and he has a drawer full of ideas. The music boxes and giveaway toys will keep him busy in

Carousels like this serve as fundraising projects for auctions and raffles.



In the "Arcade" music box, a train and shovel rotate; a sand castle lights up, and chasing lights cascade down a mirror.

his shop (half of his two-car garage) for years to come. If they make others happy, he'll be happy. "If you look at a project, and it doesn't make you smile, it's not a successful project," he said.

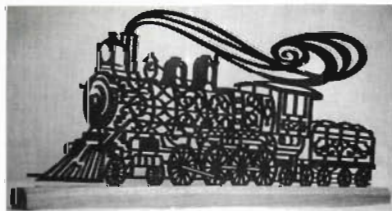
Shop Talk continues on page 20 ...

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Woodfest '98

Splintered Success Story

In German, "holz" means wood. For 17 years, Holzfest has taken place near the German-heritage Amana Colonies of Iowa. Five years ago, it got big enough to splinter off into another show — Splinterfest, appropriately enough. "Splinter," founder and organizer R.C. Eichacker says, "means splinter."

R.C. is quick to point out these aren't just shows, they're festivals: "We have people who come every year. They even establish their family reunions around the show." Music, German food and historic attractions in the area all contribute to the festival atmosphere. The Amana Colonies are a group of villages founded on communal religious principles in the 1850s. Since then, they've become known for handcrafted products — including woodwork.

These days the exhibitors for Holzfest and Splinterfest come from as far away as California and

Sam Stull of Sigourney, in southern Iowa, is a regular at Holzfest. Sam designs and builds his own clear pine wagons.

Massachusetts. A few come to sell or demonstrate tools, but most are there to sell woodworking — of all kinds. Bernie Krieger, a carver, has been coming to Holzfest since the beginning. Now it's the only show he does. "It's kind of an annual getaway," he explained.

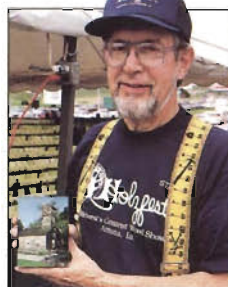
R.C.'s conservative estimate for attendance at last year's Holzfest is about 9,000. Of course, it's hard to say for sure, since he doesn't count heads or charge admission. Instead, he relies on helium balloons and lines of parked cars to draw travelers off nearby Interstate 80.

The whole thing started because R.C. was in the habit of attending craft shows, with one eye always looking for woodworking. He finally decided the world needed another show "just for woodcrafters."

People who do good business one year want to double their space the next, R.C. said. That's why he decided to start the second yearly show. Splinterfest occurs the third weekend of June, Holzfest the third weekend of August.

For more information on the show and dates, call R.C. at 319-622-3100.

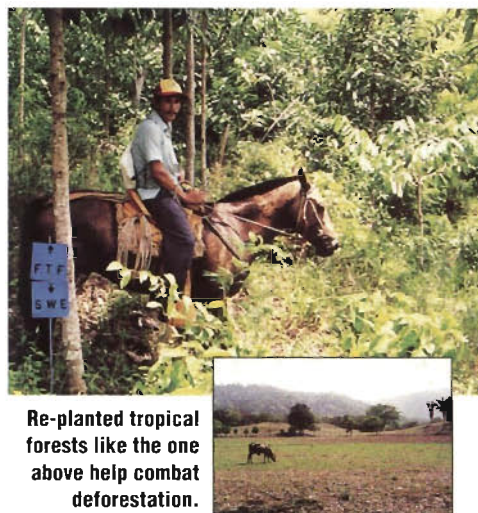
Holzfest founder R.C. Eichacker works from a shop in a historic Amana pharmacy.



Fields to Forests

Build a Project ... Plant a Tree

"If you're going to use wood, you should plant a tree" — particularly if you use tropical hardwood. That simple idea, the brainchild of Brian Lotz, helped launch the Fields to Forests program. Brian, who serves as the managing director of Timber Holdings, Ltd., is hoping more and more woodworkers will begin to calculate how many trees each of their projects use (figure about 500 board feet to a tree). His group, he says, is ready to plant that number of trees in a Costa Rican plantation.



Re-planted tropical forests like the one above help combat deforestation.

"You can say, 'Over the course of a year I've used 500 board feet.' Or, you don't have to make anything at all out of wood to participate: maybe you just think it's a good idea," Lotz said. The cost is \$30 per tree.

So far, response has been good. In the program's first six months, Fields to Forests has planted 1,000 trees. Species include teak, cocobolo, purple heart, ipe and paroba rosa.

Participants receive a personalized certificate that can include references to their project and the number of trees planted.

For more information about the Fields to Forests Reforestation Program call 414-445-8989. Or visit them on the World Wide Web at: www.fieldstoforests.org.



Jeff Nelson, of Hudson River Inlay, brought this marquetry piece from New York. The duck stamp includes 15 wood species and uses no stains.



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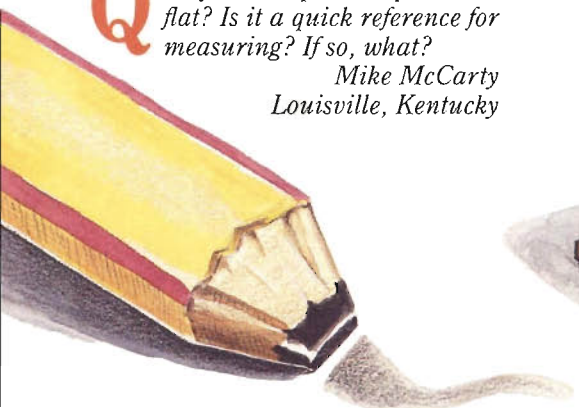
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Q Why is a carpenter's pencil flat? Is it a quick reference for measuring? If so, what?

Mike McCarty
Louisville, Kentucky



A Well, it has a thick "lead" that's extra sturdy, good for making broad lines, and easy to sharpen with a knife. The size of the lead calls for a thicker pencil. Why can't it be thick and round? Carpenters and pencil manufacturers alike say they've just always been flat.

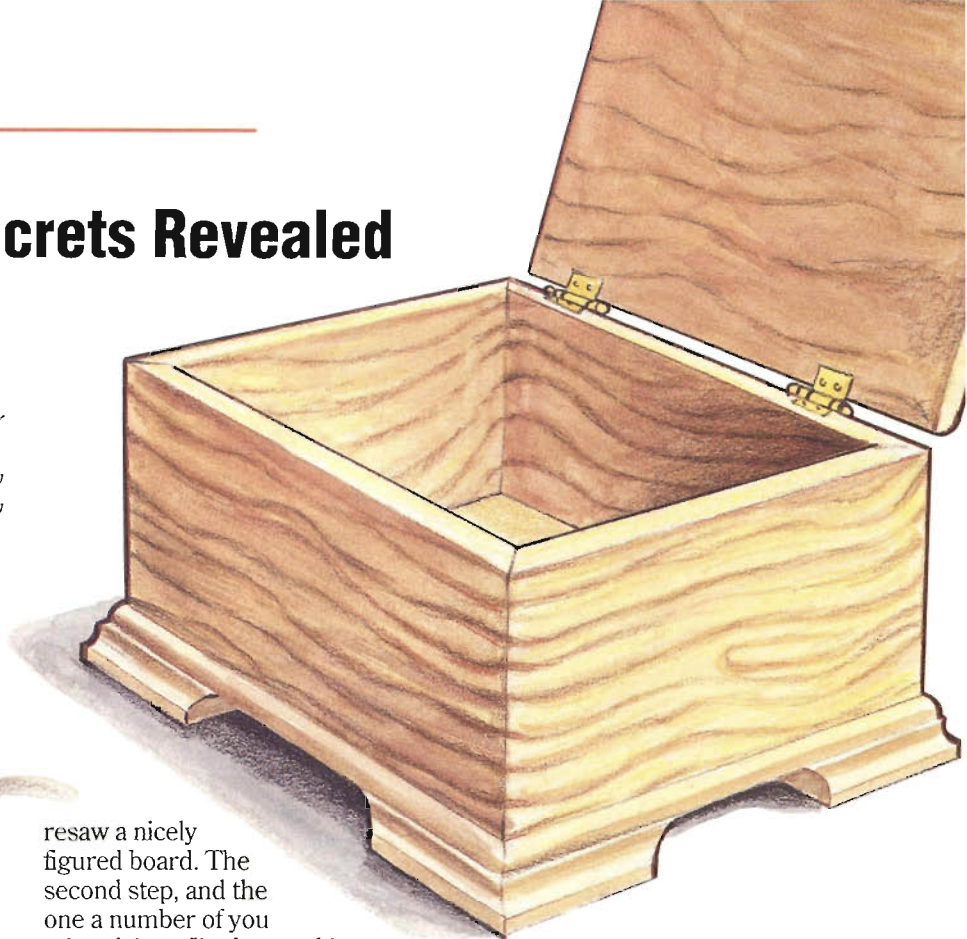
Q In our October 98 issue, Joe Szabo made a jewelry box and referred to "the inevitable mismatched joint." This led us to pose the stumper: how can you achieve continuous grain around all four corners?

The editors
Woodworker's Journal

A We got several letters suggesting the same technique we used back in 1990 (Today's Woodworker #9, page 18). It's no surprise the first step is to

resaw a nicely figured board. The second step, and the one a number of you missed, is to flip the resulting boards so the freshly resawn surfaces are facing out. This isn't important for corners B and D (see illustration below) but it's critical for corners A and C. You'll get pretty close without flipping the resawn pieces, but you'll end up with two surfaces that were $3/4$ " apart prior to your glue up. By flipping the insides out, you eliminate that offset.

To get the grain match as close as possible on corners B and D, **Russ Anderson** of Ironwood, Michigan, uses a 90° V groove bit on his router table to cut the miters on the inside faces to within $1/64$ ". He then cuts out the remaining material with a sharp utility knife, eliminating the $1/8$ " you'd normally lose to the kerf with a miter saw.



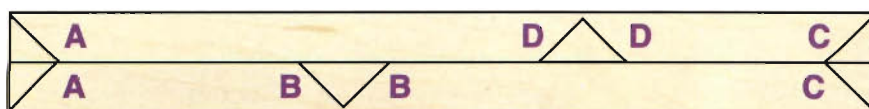
Dick Armfield of Port Townsend, Washington, points out you can cut as many sides and corners as you want: your polygon doesn't have to be a rectangle.

Many of our readers have constructed successful boxes using this method. One is **Barbara Tichenor** of Newport, Arizona, who resaws boards to make jewelry boxes for customers who say they want "everything just right."

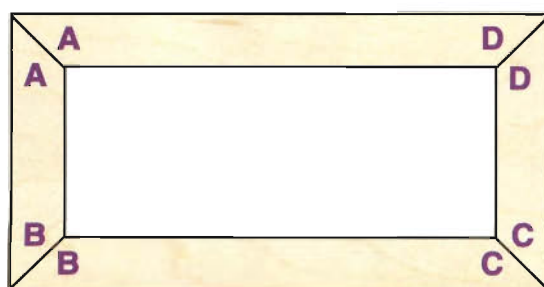


Q In our October 98 issue Greg Speros asked for some help locating the manufacturer of the crosscut saw guide shown above. It has no company name on it and Greg's friend (the owner) couldn't

continued on page 24 ...



The key to the four corner grain match lies in resawing a board, and then flipping the resulting boards inside out. One end and one side are then cut from each resulting piece, at opposite ends. Don't mark your A-B-C-D matches until you've flipped your resawn boards inside out.



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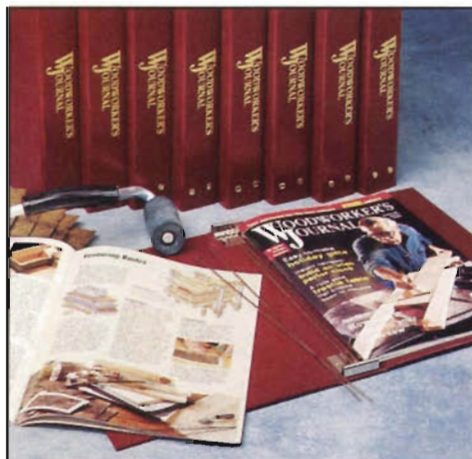


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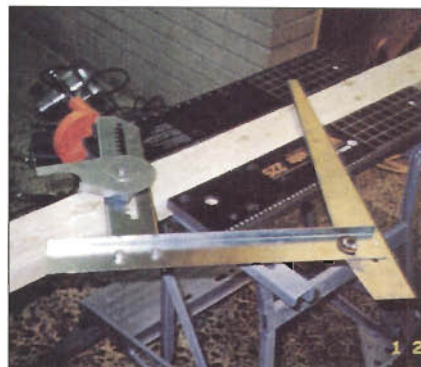
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... continued from page 22



remember where he got it. Greg liked the idea that the tool could be clamped directly to the stock being cut, leaving your left hand free to operate your circular saw.

*The editors
Woodworker's Journal*

A We didn't hear from too many of you on this elusive Stumper, but **Todd Burch** of Houston, Texas came through and traced this tool back to the Brookstone Hard-to-Find Tools catalog of 1977. When we called Brookstone, they said they no longer sell the saw guide — and, when they moved from New Hampshire to Missouri a few years back, they lost the records telling who manufactured it. This stumper remains a mystery ...

Joint A-billi-T the new matched edge jointer

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Gentlemen:

My brother and I each bought one of the smaller JOINT A-billi-T units and we also bought one larger unit to share for those rare (for us) projects that require the large model. These were purchased some years ago at the Columbus, Ohio woodworking show.

I judge any tool that I purchase by how easily it works into my normal woodworking routine and ultimately how often that I use the tool or device. I am pleased to tell you that the JOINT A-billi-T was instantly a tool that I used as regularly and as easily as my table saw. The glue joints that I was able to obtain when preparing stock were nothing short of amazing compared to my old method using the jointer. I recently completed a trestle table with a top that is 81 inches long and 31 inches wide and was constructed of full 2 inch white pine. Obviously this project required the use of the large size JOINT A-billi-T to prepare the edges of the boards for gluing. It worked perfect and by using the method described with the A and B edges in the operating instructions, I was able to obtain joints that are impossible to see except for the change in grain pattern.

I simply had to write and inform you of how pleased that I am with your product. I recommend it to any serious woodworker.

Best Regards,
Robert K. Wallace

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Joint A-billi-T the new matched edge jointer

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Winner! For taking time to respond to Stumpers, Gary Rosquist of Salt Lake City, Utah wins a collection of American Tool's Quick Grip clamps. We toss all the Stumpers letters into a hat to select a winner. If you have a question or answer, send it to the editor: Stumpers Dept., Woodworker's Journal, P.O. Box 261, Medina, Minnesota 55340. Or e-mail us: editor@woodworkersjournal.com

Here's How to Turn Your Woodworking Skills into Cash!

"My woodshop makes me \$300 a week, part time. Your's can, too!"

by Rick Gundaker

You've heard of "the woodworker who was a real butcher."

It's true, for many years I was a meat cutter in a butcher shop in Erie, Pennsylvania. But several years ago the poor economy in the Erie area forced me to look for a new job.

After four months, I found a new job, but it paid less and had fewer benefits. I desperately needed a second income.

I was sitting at the kitchen table very late one snowy night in December. I couldn't sleep. My checkbook was overdrawn, bills were piling up and the bank was threatening to foreclose on our home. Then it came to me.

For many years I had been making woodcrafts. I had made many unique items for our home. Everybody raved about them, so I started making them for gifts.

My wife, Amy, always said, "Rick, you should start selling your woodcrafts." But I would just laugh. Well, I wasn't laughing that night. Maybe Amy was right. Maybe I could sell them!

I took what little money we had, borrowed some from my Mom, and turned to my hobby with serious determination.

At first my income was small, \$60.00 to \$90.00 a week. But time and experience helped me develop many easy-to-make woodcrafts and a very successful method for selling them. My income grew beyond my greatest dreams.

Today, Amy and I live in a nice country home on ten acres of land and it's paid for! That's a great feeling, *but the best feeling of all is the self satisfaction I have of being able to make the extra money I need whenever I need it.*

You, too, can make the extra money you need while enjoying your hobby. Using your basic woodworking skills, you can create great gifts and turn your woodshop into a part-time money maker. I know it can be done because

I did it, and I've helped many other woodworkers make money, too!

The following are excerpts from letters I've received from woodcrafters I've helped.

"You sure know what sells! The items I made from your plans have been on display at the local bank in St. Joseph. In less than 30 days I have sold \$1,700 of my woodcrafts! I'm enclosing a news story our local paper did on my work!"

W.F.H. of St. Joseph, MN

"My wife is a school teacher. I made her one of your cute designs to set on her desk. Other teachers saw it and she sold eleven of them before the day was over. Keep up the good work."

C.M. of Baltimore, MD

"You're doing good. I've made several of your plans and the response to buy has been great. Every year I sell my crafts at our church fair and donate all the proceeds to the church. In 3 days I made over \$600!"

C.R. of Chalmelle, LA

"Your patterns are simple and very easy to follow. I'm fairly new to woodworking and it's great to see full-size patterns with enough information so that even a beginner with limited woodworking knowledge can complete a project on their own. I'm really having fun with woodworking. Thanks for sharing your knowledge and experience, it's invaluable to the novice."

C.L. of Houston, TX

If these woodworkers can do it, you can, too!

There's plenty of room for everyone in woodcrafting. I won't be competing with you and you won't be competing with me. That's why I would enjoy showing you how you can start your own profitable craft business using your basic woodworking skills. You can go as far as you want... *profits are virtually unlimited!*

Here is what I'll send you:

I've put all my successful methods, plus 35 of my fastest selling designs, with step-by-step instructions into one fact-filled guide.

I'll show you...

- * How to begin with a small amount of money.
- * What tools you will need. I'll give you an exact list.
- * How to buy a saw and other woodworking equipment, cheap!
- * What designs are the best sellers.
- * What type of lumber and hardware to use and where to buy it.
- * How to give your crafts that personal touch that will increase sales by 80%.
- * How to set up books and records.
- * How to avoid the mistakes that I made... and save hundreds of dollars.
- * PLUS... I'll send you THIRTY-FIVE of my show-tested, fast selling woodcrafts in easy-to-copy full size plans.
- * and much, much more...

Start turning your woodworking shop into a money maker today! I'll send you my complete guide to examine for 31 days. A full month! There is absolutely no risk to you. NONE.

I'm so sure it will help you, I'll give you my personal guarantee: I'll send you my guide, *Woodcrafting for Profit*, to read for 31 days.

There is no obligation; in fact you can postdate your check for 31 days in advance. If you're not absolutely satisfied, return the guide in 31 days. I'll promptly return your original uncashed check. No excuses. No delays. This is the fairest way I know to help you get started.

To order, send your name, address, and postdated check for \$12.95 (plus \$2.00 shipping and handling) to Rick Gundaker, 8890-WJ Hamot Road, Waterford, PA 16441.

©1999 Rick Gundaker

Thin, Smooth and Strong

By Rob Johnstone



As Larry Fry, my luthiery instructor, once explained, “The perfect cutting edge would be infinitely thin, infinitely smooth and infinitely strong — anything else is a compromise of one sort or another.” With that as gospel, every cutting edge we use must be an appropriately designed compromise. When you sharpen any tool, be it a knife, a gouge or a chisel, your goal will be to create the smoothest, thinnest edge

which will remain strong enough to perform its task. This

isn't as tricky as it may sound, since most tools will have the manufacturer's best guess for the optimum cutting edge already ground and polished.

Truth be told, most woodworkers stay out of trouble until they start changing bevels and regrinding willy-nilly. In my opinion, significant grinding should be reserved for dire situations — nicked or seriously deformed edges.

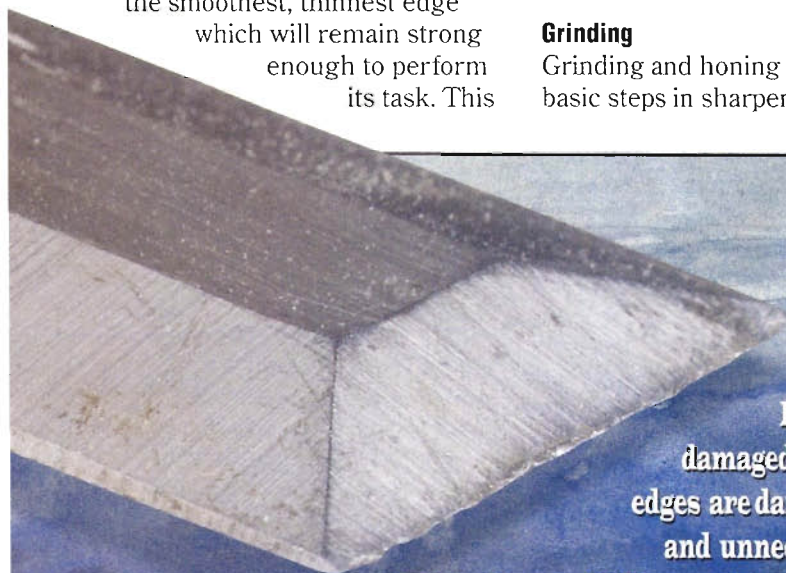
Grinding

Grinding and honing are the two basic steps in sharpening any knife

edged tool. Grinding removes a significant amount of metal and sets you up for honing success. It is also the step where danger lurks.

Improper grinding will generate excessive heat and change the metal's temper — the official term for the strength component of our perfect cutting edge. Using a lubricated grinding wheel and removing the minimum amount of material are keys to keeping your tool's temper ... and yours, too.

The first important detail in any single beveled edge is that the back of the blade must be perfectly flat. Another general principle for those of us who don't do a lot of grinding is to avoid changing the angle of the existing bevel. The bevel of an



Dull and damaged cutting edges are dangerous and unnecessary.

Follow these guidelines and step-by-step instructions to create sharp, clean cutting edges.



Step 1 Flatten the back and remove milling marks on a lapping plate. Use emery paper and a figure eight-shaped stroke.

"The perfect cutting edge would be infinitely thin, infinitely smooth and infinitely strong — anything else is a compromise of one sort or another."

edge is the compromise of a steel tool relative to our goal of infinite thinness. Most cutting bevels will be within the 25° to 35° range. Unless your expertise exceeds that of the manufacturer, make every effort to keep the existing bevel of the tool — even when you need to remove a good deal of metal (as when eliminating a large nick). This is true if it is a regular chisel, double beveled knife or a curved gouge. Also, with the aid of an appropriate guide or jig, do your best not to grind out of square or change the shape of the curved or shaped edge you are grinding.

Honing

Honing starts where grinding ends. After you have successfully ground the edge to the proper angle (thinness), while retaining the temper (strength), you must hone the edge to a mirror finish

(infinitely smooth). Compared to the grinding operation, I find honing a pleasurable, somewhat meditative experience ... which is good, as it is a process not to be hurried. Begin with a coarser stone (my favorite is the diamond "stone") and start to remove the grinding marks and establish the honing bevel. My advice is to add five to ten degrees of bevel to the tip of the ground edge. This makes it a little thinner and also smooths the actual cutting edge.

Move from coarse to ever finer grained stones, making the same number of strokes on both faces of the tool. Don't skip a grit level as you hone. Missing a degree of coarseness will not save you time, and will negatively affect your edge. The smoother you hone, the sharper your tool. You may even choose to continue past the point where you can use stones effectively. If so, you'll need a polishing wheel or a leather strop.

Tools with curved or shaped edges are sharpened in the exact same way as described above. Their shapes just present more complicated challenges. Slip stones and shaped grinding accessories provide solutions to most of these challenges.

Infinitely thin, smooth and strong cutting edges are beyond what we woodworkers are able to produce, but by following these basic guidelines, you will have tools of exceptional sharpness.

And that's the gospel truth.

Surrounded by Stones

Ceramic, oilstone, diamond and natural stone, waterstone, india, washita, Arkansas ...

stones to the left of me, stones to the right, which shall I choose? Finding the proper stone to hone your blades can be a daunting task.

Ask seven woodworkers which sharpening stones they prefer and you may

get seven different answers. And that's exactly the point. Used properly and regularly, all of the popular choices available will do the job of keeping your edges sharp.

My personal preference runs in the direction of diamond and hard Arkansas stones; I like to get done in a hurry.

The slip stones which keep my gouges keen are also from a variety of materials. Different stones do possess differing qualities, but only to a degree.

The stone itself isn't nearly as important as how you use it.

Using proper lubricants (water for waterstones and whet stones, oil for oilstones), storing your stones properly and using them regularly is far more important.

So select stones and sharpening systems to suit your shop and budget ... and see to your edges often.

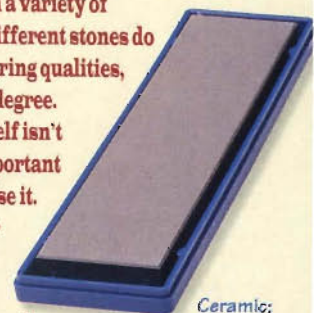
Waterstones from Asia have helped to spark renewed interest in sharpening.



Diamond Stones; fast cutting, low build-up.



Oilstones; the workhorses for honing.



Ceramic; efficient and clean.

Step 2 Next, use a bench top grinder to create a proper, hollow ground cutting bevel.

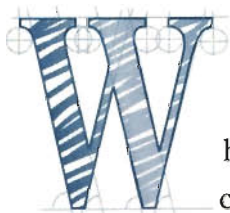
Step 3 Move through a series of ever finer grained stones to polish the bevel and back smooth.

The Ultimate Sharpening Station

By Rick White



Over the long haul, sharp tools will save you money and improve your craftsmanship. They're also a lot safer to use. Isn't it about time such an important aspect of your craft got the attention it deserves?



hen I look back over the years, I notice a strong correlation between the time woodworkers spend in the shop and the shape of their tools. Novices rarely sharpen, while the pros are almost fanatical about slurries, grits and bevel angles. During my quarter of a century as a professional woodworker, I've accumulated most of the elements of a great sharpening station. Trouble was, they were so widely scattered around the shop that an otherwise calming activity, sharpening, was becoming more and more of a headache. When it took the better part of an hour recently to find all the things I needed to tune up a plane, I knew it was time to build them a home.

Start with the Carcass

Melamine-coated medium density fiberboard (MDF) is a great choice for the carcass of this station because it's durable, inexpensive and resistant to the fluids involved in sharpening. It's heavy, too, and this extra weight doesn't hurt; the station needs to be solid to absorb the vibrations of machines and the elbow grease of a determined woodworker.

Begin construction by cutting parts to the dimensions shown in the Material List on the next page. After counterboring and predrilling for the screws (see the **Pinup Shop Drawings** for locations), glue and screw the side bottom trim (pieces 1) to the bottom edge of two of the sides (pieces 2). Use three 2" screws (pieces 3) in each piece of trim.

The remaining side serves as a center divider and is attached to the bottom (piece 4) with screws. Layout and predrill the countersunk holes in the bottom as shown in the **Pinup Shop Drawings** at the center of the magazine. Before attaching it, bore countersunk holes through two faces of the divider cleat (piece 5) and mount it to the back end of the divider, as shown on the **Exploded View** on the following page. Attach the center divider to the bottom, using care to keep the pieces square.

Next, glue and clamp trim (pieces 6 and 7) to the side and bottom edges of the back (piece 8). Now, with the T-shaped subassembly on a large flat surface, glue and clamp both sides to the bottom.



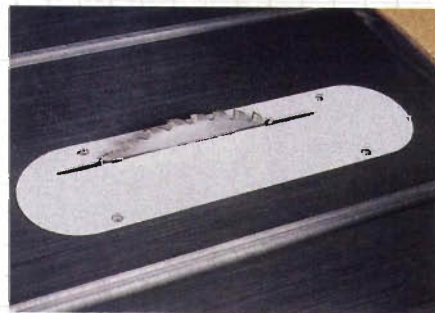
Melamine

If you happen to have a chemistry lab attached to your shop, heat up a bucket of dicyandiamide and you'll have the chief component for making melamine resin. Add formaldehyde and you're on your way to a nice laminated plastic. Now all you have to do is impregnate some Kraft paper with phenolic resin and bond it to your melamine layer.

Too much? The alternative is to walk into a building supply center and ask for melamine board. They'll show you a stack of particle board with a plastic covering that works great for projects like this sharpening center. Melamine comes in several colors and is sold oversized at 49" x 97" to allow for trimming.

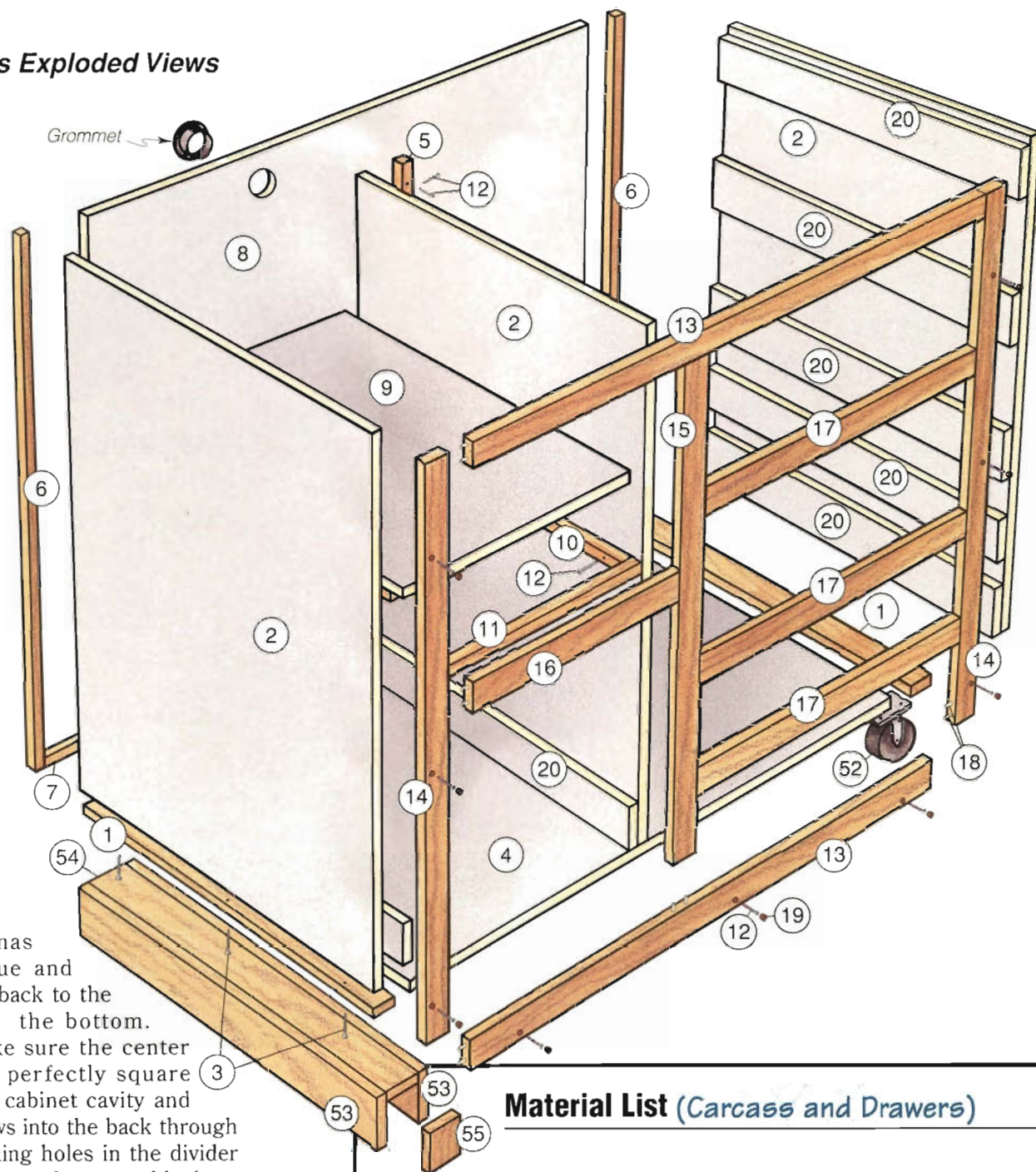
Four Steps to Chip-Free Cutting

1. Use a zero-clearance insert.
2. Cut pieces slightly oversized.
3. Use a straight-edge and a sharp knife to score the material at the exact size you need.
4. Put a carbide plywood cutting blade (very slight set on the teeth) in your table saw and cut to exact size.



A zero clearance insert is the real key to creating clean, chip-free edges when cutting melamine-coated materials.

Carcass Exploded Views



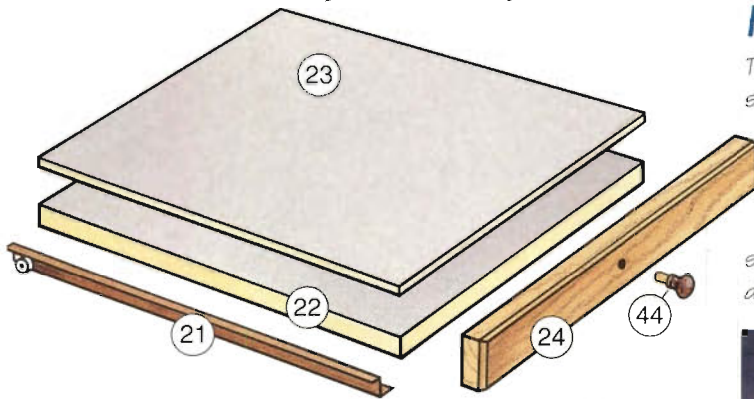
After the glue has cured, glue and clamp the back to the sides and the bottom. Next, make sure the center divider is perfectly square within the cabinet cavity and drive screws into the back through the remaining holes in the divider cleat. To keep the assembly from moving, attach a temporary cleat across the top of the three sides. You can remove it once the face frame is in place.

The left-hand bay of your newly formed carcass receives a shelf (piece 9) supported by four cleats (pieces 10 and 11). Predrill three of the cleats for $1\frac{1}{4}$ " screws (pieces 12) at the locations shown on the **Pinup Shop Drawings**, then glue and screw the cleats in place. Drive screws up through the cleats to secure the shelf. The last cleat will be attached to the face frame later.

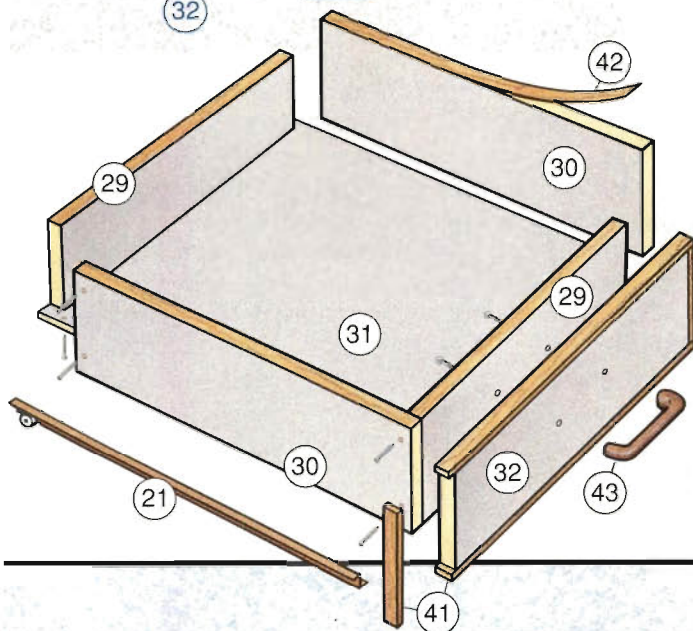
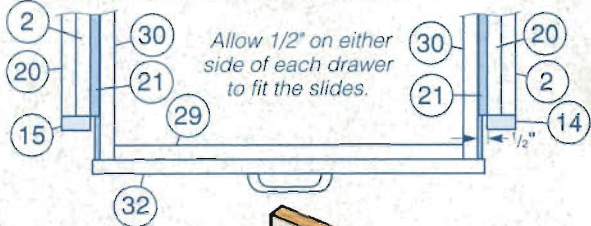
Material List (Carcass and Drawers)

	T x W x L
1 Bottom Trim, Sides (2)	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x 24"
2 Sides (3)	$\frac{3}{4}$ " x 24" x $28\frac{1}{2}$ "
3 Large Screws (50)	#8 x 2"
4 Bottom (1)	$\frac{3}{4}$ " x 24" x $35\frac{1}{2}$ "
5 Divider Cleat (1)	$\frac{3}{4}$ " x $\frac{3}{4}$ " x $28\frac{1}{2}$ "
6 Back Trim, Sides (2)	$\frac{3}{4}$ " x $\frac{3}{4}$ " x $29\frac{1}{4}$ "
7 Back Trim, Bottom (1)	$\frac{3}{4}$ " x $\frac{3}{4}$ " x 37"
8 Back (1)	$\frac{3}{4}$ " x $28\frac{1}{2}$ " x 37"
9 Shelf (1)	$\frac{3}{4}$ " x $14\frac{1}{2}$ " x 24"
10 Shelf Cleats, Sides (2)	$\frac{3}{4}$ " x $\frac{3}{4}$ " x $22\frac{1}{2}$ "
11 Shelf Cleats, Front and Back (2)	$\frac{3}{4}$ " x $\frac{3}{4}$ " x $14\frac{1}{2}$ "
12 Small Screws (50)	#6 x $1\frac{1}{4}$ "
13 Frame Top & Bottom Rails (2)	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x $35\frac{1}{2}$ "
14 Frame Side Stiles (2)	$\frac{3}{4}$ " x $1\frac{1}{2}$ " x $29\frac{1}{4}$ "

Tray/Drawer Exploded Views



Drawer Slide Detail (Top View)



How to install drawer slides

This sharpening station uses Blum's low profile 3/4 extension slides. This all purpose, bottom mounted steel slide features an epoxy coating and is self-closing, a nice feature on a project like this. Rated at up to 100 pounds per drawer, this is one of the easiest slides on the market to mount — just follow the four steps below. Remember, you'll need 1/2" on each side of the drawer to accommodate your slides.



1. In the case of this sharpening center (and many other casework projects), spacer blocks are installed to provide a mounting surface flush with the face frame.



2. Once the spacers are installed, use your drill to mount the inside slide component to the bottom edge of your drawer bottoms. Be sure to drill pilot holes first.



3. With the drawer components in place, move on to the casework components and mount them to the spacer blocks or cabinet sides, predrilling your pilot holes.



4. Locate the drawer fronts on the drawers. An old trick is to use double-sided tape to tack the drawer face in place before you secure it with screws.

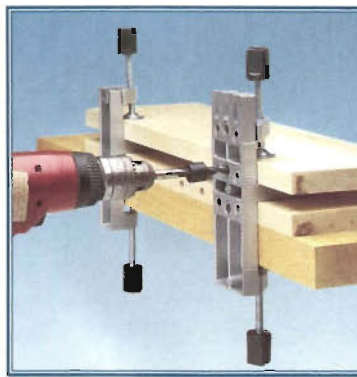
	T x W x L
15 Frame Middle Stile (1)	3/4" x 1 1/2" x 26 1/2"
16 Frame Left Rail (1)	3/4" x 1 1/2" x 13"
17 Frame Right Rails (3)	3/4" x 1 1/2" x 21"
18 Frame Dowels (26)	3/8" Fluted
19 Trim Plugs (26)	3/8" Oak Face Grain
20 Drawer Spacers (7)	3/4" x 2 1/2" x 20 3/8"
21 Drawer Slides (6 pairs)	22" Blum 3/4 Extension
22 Tray (1)	3/4" x 20" x 23 1/4"
23 Tray Liner (1)	1/4" x 20" x 23 1/4"
24 Tray Front (1)	3/4" x 1 1/2" x 20 3/8"
25 Left Drawer Front & Back (2)	3/4" x 14" x 10 1/2"
26 Left Drawer Sides (2)	3/4" x 14" x 22"
27 Left Drawer Bottom (1)	1/4" x 12" x 22"
28 Left Drawer Face (1)	3/4" x 12 1/2" x 14 1/2"
29 Upper Drawer Front & Back (2)	3/4" x 4 1/2" x 18 1/2"

	T x W x L
30 Upper Drawer Sides (2)	3/4" x 4 1/2" x 22"
31 Upper Drawer Bottom (1)	1/4" x 20" x 22"
32 Upper Drawer Face (1)	3/4" x 5 3/8" x 20 3/8"
33 Large Drawer Front & Back (2)	3/4" x 6 1/4" x 18 1/2"
34 Large Drawer Sides (2)	3/4" x 6 1/4" x 22"
35 Large Drawer Bottom (1)	1/4" x 20" x 22"
36 Large Drawer Face (1)	3/4" x 7 1/2" x 20 3/8"
37 Small Drawer Fronts, Backs (4)	3/4" x 1 3/4" x 18 1/2"
38 Small Drawer Sides (4)	3/4" x 1 3/4" x 22"
39 Small Drawer Bottoms (2)	1/4" x 20" x 22"
40 Small Drawer Faces (2)	3/4" x 2 1/4" x 20 3/8"
41 Drawer Face Trim (1)	1/4" x 3 3/4" x 26 1/2"
42 Drawer Edge Tape (1)	1/32" x 3/4" x 384"
43 Drawer Pulls (5)	Wood
44 Drawer Knob (1)	Wood

The Face Frame

With the rough treatment this sharpening station will receive over the years, it made sense to construct the face frame (pieces 13 through 17) out of a tough hardwood. I chose white oak because of its durability and good looks. All the joints are simple butts, each kept in line with a pair of 3/8" fluted dowels (pieces 18). Dry fit all the parts according to the layout shown on the **Pinup Shop Drawings**, test their fit on your assembled carcass, and, when everything looks right, glue and clamp your frame together. Note the right edge of the center stile lines up flush with the right face of the center divider. Make sure the frame is both flat and square as you tighten the clamps.

Let the glue dry overnight, then remove the clamps and belt sand both faces of the frame, working down from a 100 to 180 grit belt. Chisel out any excess glue in the inside corners. Make sure the lower edge of the face frame is



QUICK-TIP: Dowels are easier to use for joinery if you have a way to place them accurately. Fixtures like the Dowel Pro Jig are a slick and easy way to use dowels like a pro.

flush with the bottom of the carcass, then predrill for countersunk screws (pieces 3) and join the subassemblies. Glue 3/8" oak plugs (pieces 19) in all the counterbored screw holes in the carcass, then sand them flush.

Inside Details

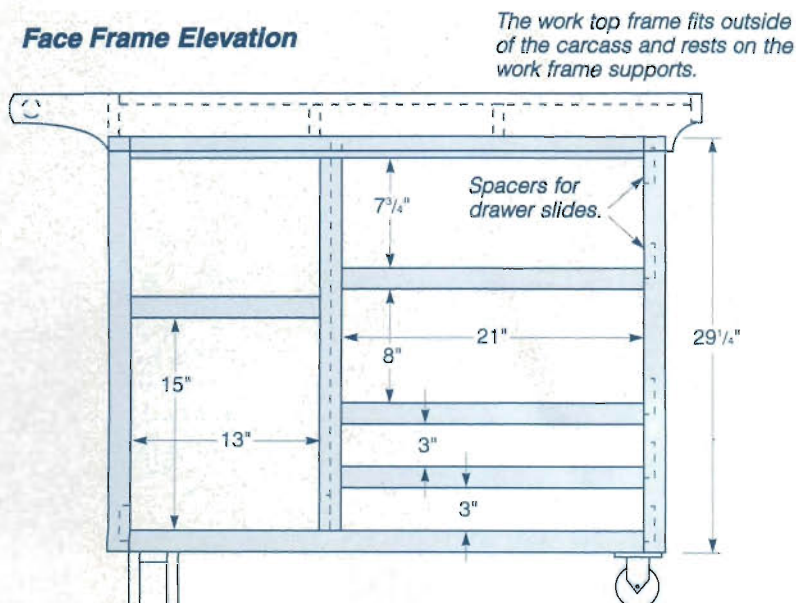
The face frame is flush with the left side of the large carcass opening, but you'll need to build out the right side before installing the drawer slides. Glue and screw these spacers (pieces 20) in place now, following the locations on the **Pinup Shop Drawings**. Attach the remaining shelf cleat to the face frame at this time.

Build the Drawers

Storage is a primary concern with sharpening supplies, so this station features five drawers and a slide-out tray. All six units are mounted on 22" drawer slides (pieces 21). The tray (piece 22) is 3/4" thick melamine with a 1/4" melamine liner (piece 23) glued to its top face. Place a heavy weight on it while the glue dries. Chamfer the front edges of the tray front (piece 24) with a chamfering bit chucked in your router, as shown on the **Pinup Shop Drawings**. Attach the front to the tray with glue and finish nails, predrilling pilot holes for the nails, then setting and filling their heads.

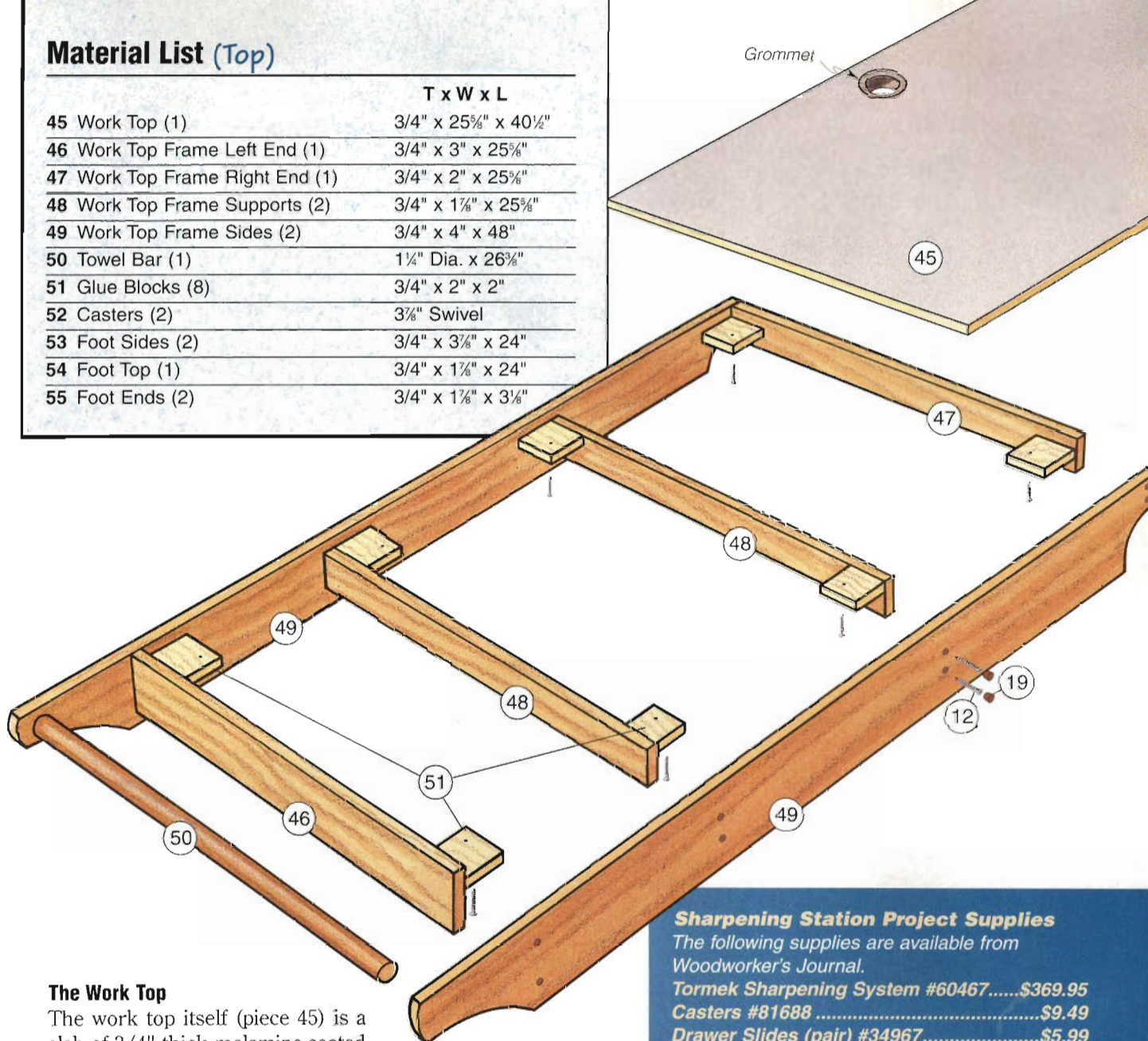
All five drawers (pieces 25 through 40) are built alike, and all are flush mounted (that is, they don't overlay the frame). This is a workshop project, so the construction process was kept simple. Butt the fronts and backs to the sides, securing them with glue and screws. Attach the bottoms with glue and screws, then trim all four edges of each face with 1/4" hardwood stock (piece 41). Attach this trim with glue and 3d finish nails driven through predrilled pilot holes, setting and filling the heads as you go. Center the drawer faces on the drawers (See sidebar on preceding page) and attach them from the inside, predrilling as you go. Wrap up the drawers by sealing the exposed top edges of the sides, fronts and backs with iron-on hardwood tape (piece 42), then drill holes in each drawer face for the pulls (pieces 43). Install the pulls and tray knob (piece 44), slide the drawers in place, and you're all set to start the work top.

Face Frame Elevation



Material List (Top)

	T x W x L
45 Work Top (1)	3/4" x 25 5/8" x 40 1/2"
46 Work Top Frame Left End (1)	3/4" x 3" x 25 5/8"
47 Work Top Frame Right End (1)	3/4" x 2" x 25 5/8"
48 Work Top Frame Supports (2)	3/4" x 1 7/8" x 25 5/8"
49 Work Top Frame Sides (2)	3/4" x 4" x 48"
50 Towel Bar (1)	1 1/4" Dia. x 26 3/8"
51 Glue Blocks (8)	3/4" x 2" x 2"
52 Casters (2)	3 3/8" Swivel
53 Foot Sides (2)	3/4" x 3 3/8" x 24"
54 Foot Top (1)	3/4" x 1 7/8" x 24"
55 Foot Ends (2)	3/4" x 1 7/8" x 3 1/8"



The Work Top

The work top itself (piece 45) is a slab of 3/4" thick melamine-coated MDF, surrounded by a hardwood frame. The frame is composed of two ends (pieces 46 and 47), a pair of supports (pieces 48), two shaped sides (pieces 49) and a handle and towel bar (piece 50).

Transfer the profile of the sides from the elevations found on the **Pinup Shop Drawings**, then band saw them to shape. Clean up the saw cuts with a drum sander and drill the stopped holes on their insides for the handle. The work top is surrounded by the hardwood frame and held securely in place by glue blocks (pieces 51) and screws, as shown in the **Exploded View** above.

Frame Assembly

The white oak frame is held together with screwed butt joints. Temporarily clamp the frame elements together, then counterbore and predrill for the large screws. You'll find all the locations on the **Pinup Shop Drawings**. While you have the frame clamped, dry fit it to the carcass. A half inch of the face frame's top rail should be peeking out below the bottom of the shaped sides. When everything fits, glue and screw the top frame together, trapping the handle as

Sharpening Station Project Supplies

The following supplies are available from Woodworker's Journal.

Tormek Sharpening System #60467.....\$369.95

Casters #81688\$9.49

Drawer Slides (pair) #34967.....\$5.99

Plugs #20875\$2.99

Pulls #18341\$3.99

Knob #23077\$1.69

Iron-on Tape (50 ft.) #91679\$18.99

Note: You'll need two casters, six pairs of drawer slides and five pulls to complete this project.

To order your supplies, call 800-610-0883.

you do. Plug the screw holes as you did earlier and make sure the handle remains free to turn.

Place the frame on top of the carcass, locating it as shown on the **Pinup Shop Drawings**. Then glue and screw it in place, driving the screws from the inside of the cabinet into the frame through predrilled and countersunk holes.



The Tormek Sharpening System

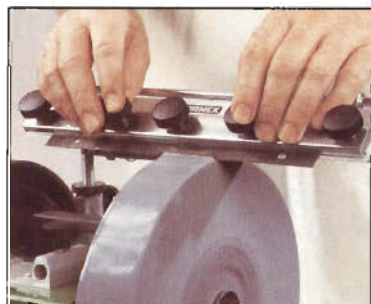
One of the premier sharpening machines on the market, the Tormek sells for about \$370. At that price it may not be for everyone, but its versatility demands a look. Replete with tons of gizmos to put an edge on everything from a curved gouge to a long planer knife, this British import is the real deal.

Pair it with a traditional grinder and

the only thing you won't be able to sharpen is your wits.



Two auxiliary sharpening aids team up to hone curved gouges, making a difficult task much easier.



Keep the knives of your bench top planer razor sharp on the water-bathed honing wheel.

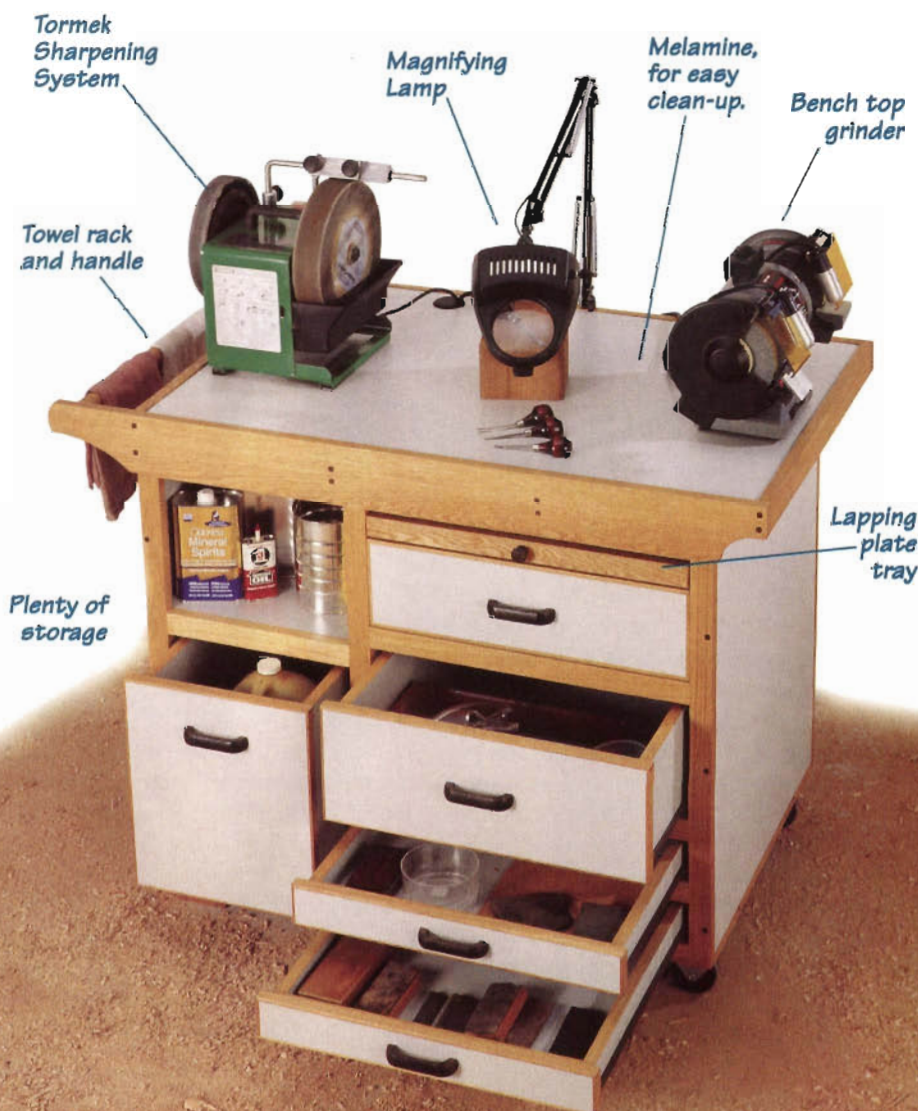
Final Details

While you won't be moving this station around too much, it's always nice to be able to rearrange the workshop to accommodate new tools or big projects. Have a friend help you lift the project onto a couple of sawhorses, then bolt a pair of swivel casters (pieces 52) to one end of the bottom, at the locations shown on the **Pinup Shop Drawings**. Bolt a matching foot on the other end: this is a simple hollow box made up of two sides, a top and two ends (pieces 53, 54 and 55). Butt joint, glue and clamp the foot together, then glue and screw it in place.

There isn't a lot of finishing to this project. Start by filling any nail holes you missed, then glue hardwood plugs over the tops of all the

counterbored screws. Mask the melamine along all the hardwood edges, then clamp a square or a metal ruler along these same edges while you lightly sand the wood. Apply three coats of clear satin varnish to the hardwood, then install the drawers, adding the pulls and knob as you go.

Now the fun begins. Start a search through your shop for all your containers of oil and mineral spirits, emery paper, stones and files. You'll probably be as amazed as I was at how much you've accumulated over the years. While you're at it, pick a couple of plane irons and chisels to give your new sharpening station a christening!



Shape the legs on a band saw, then sand and spokeshave the legs to a uniform shape.

1 Leg
(Front View)

1 Leg
(Side View)

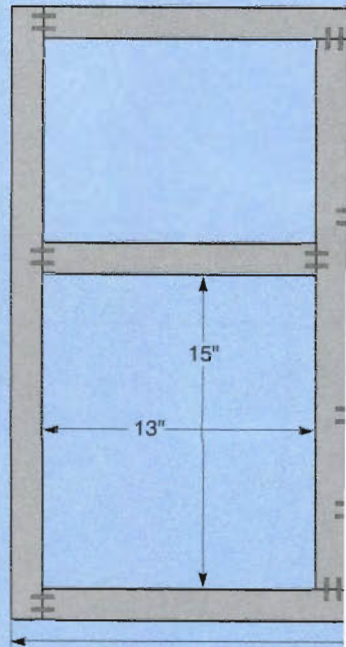
Mount Brass Wheels here.

Tea Table

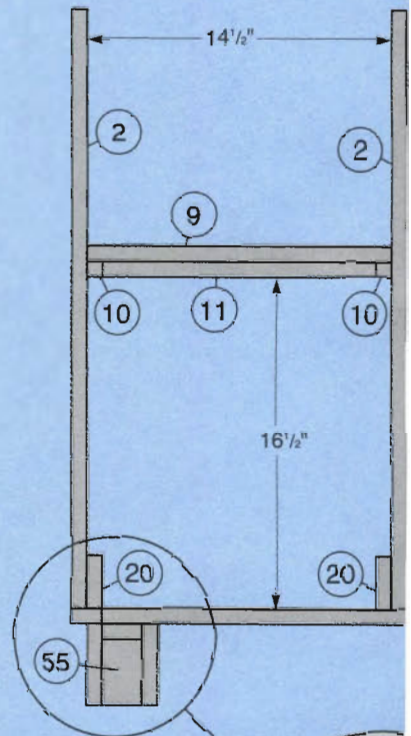
Pinup Shop Drawings

Woodworker's Journal

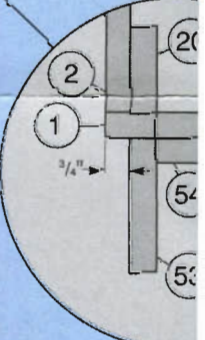
Face Frame Layout
(Front View)



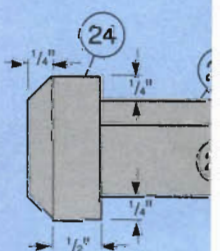
Carcass Joinery: Cleat
(Front View)



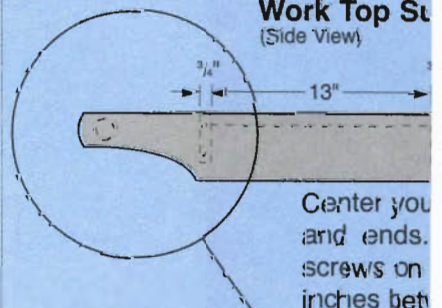
Foot Detail
(Section View)



Chamfer the front edges of the tray front.



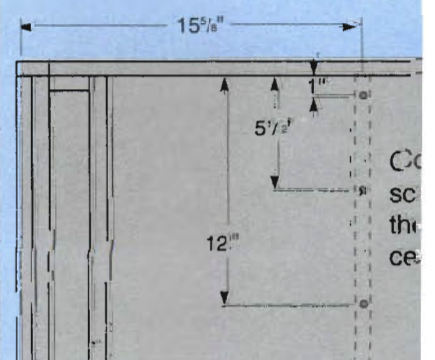
Work Top Support
(Side View)



Center your and ends. screws on inches bet

See Full for hole

Mount the tr by holding t frame end (flush to the side (piece



Full-Size Patterns

**PINUP
SHOP
DRAWINGS**

- Open staples carefully, remove pattern and fold staples back in place.
- Use graphite paper (available at art supply stores) or cut and trace full-size patterns onto your stock.
- Cut out the elevation drawings and pin them to your shop wall.



Corner Cabinet

Use the Full-Size Pattern to lay out the shape for the broken pediment crown molding.



Sharpening Station

Complete elevations and a full-size pattern of the frame side end.



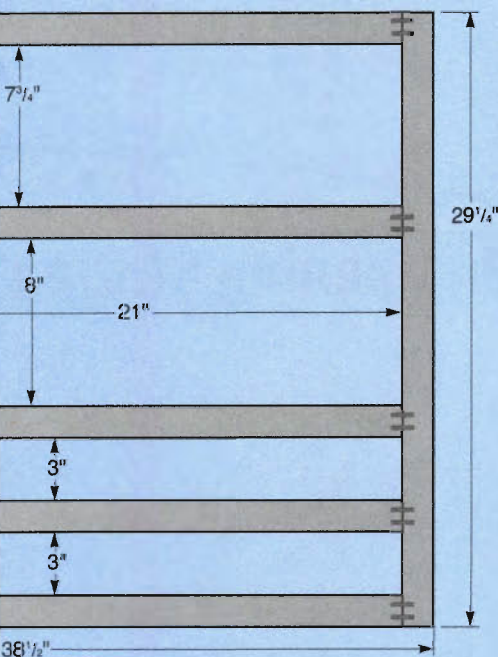
Rolling Tea Table

Patterns for all the shaped parts and key assembly details.

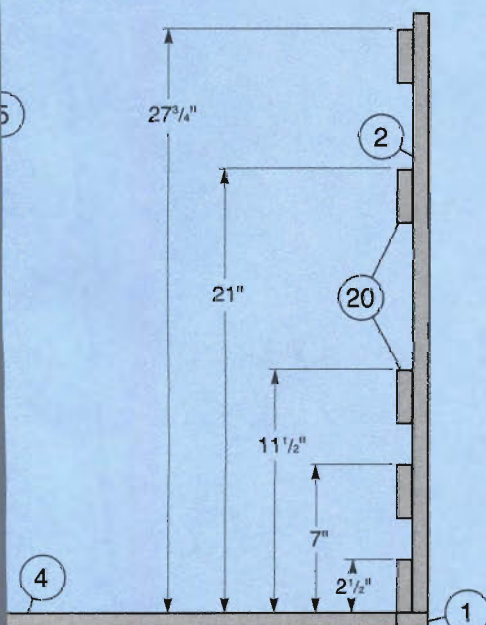
WOODWORKER'S JOURNAL

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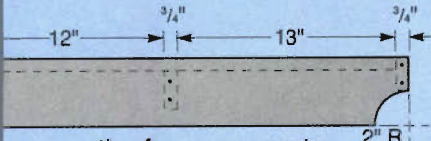


Spacer Locations

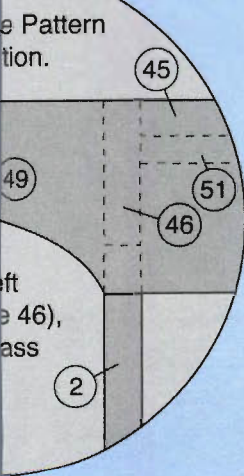


Tray Assembly (Side View)

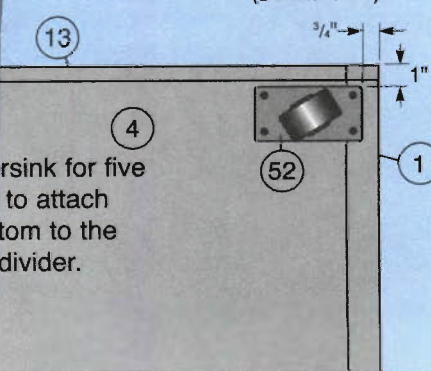
Port Locations



Screws on the frame supports
up one inch between the
pieces 47 and 48, and two
in the screws on piece 46.



Caster Location (Bottom View)



Sink for five
to attach
to the
divider.

MATERIAL LIST

	T x W x L
1 Bottom Trim, Sides (2)	3/4" x 1 1/2" x 24"
2 Sides (3)	3/4" x 24" x 28 1/2"
3 Large Screws (50)	#8 x 2"
4 Bottom (1)	3/4" x 24" x 35 1/2"
5 Divider Cleat (1)	3/4" x 3/4" x 28 1/2"
6 Back Trim, Sides (2)	3/4" x 3/4" x 29 1/4"
7 Back Trim, Bottom (1)	3/4" x 3/4" x 37"
8 Back (1)	3/4" x 28 1/2" x 37"
9 Shelf (1)	3/4" x 14 1/2" x 24"
10 Shelf Cleats, Sides (2)	3/4" x 3/4" x 22 1/2"
11 Shelf Cleats, Front and Back (2)	3/4" x 3/4" x 14 1/2"
12 Small Screws (50)	#6 x 1 1/4"
13 Frame Top & Bottom Rails (2)	3/4" x 1 1/2" x 35 1/2"
14 Frame Side Stiles (2)	3/4" x 1 1/2" x 29 1/4"
15 Frame Middle Stile (1)	3/4" x 1 1/2" x 26 1/4"
16 Frame Left Rail (1)	3/4" x 1 1/2" x 13"
17 Frame Right Rails (3)	3/4" x 1 1/2" x 21"
18 Frame Dowels (26)	3/8" Fluted
19 Trim Plugs (26)	3/8" Oak face grain
20 Drawer Spacer (7)	3/4" x 2 1/2" x 20 5/8"
21 Drawer Slides (6 pairs)	22" Blum 3/4 Extension
22 Tray (1)	3/4" x 20" x 23 1/4"
23 Tray Liner (1)	1/4" x 20" x 23 1/4"
24 Tray Front (1)	3/4" x 1 1/2" x 20 7/8"
25 Left Drawer Front & Back (2)	3/4" x 14" x 10 1/2"
26 Left Drawer Sides (2)	3/4" x 14" x 22"
27 Left Drawer Bottom (1)	1/4" x 12" x 22"
28 Left Drawer Face (1)	3/4" x 12 1/2" x 14 1/2"
29 Upper Drawer Front & Back (2)	3/4" x 4 1/2" x 18 1/2"
30 Upper Drawer Sides (2)	3/4" x 4 1/2" x 22"
31 Upper Drawer Bottom (1)	1/4" x 20" x 22"
32 Upper Drawer Face (1)	3/4" x 5 3/4" x 20 1/2"
33 Large Drawer Front & Back (2)	3/4" x 6 1/4" x 18 1/2"
34 Large Drawer Sides (2)	3/4" x 6 1/4" x 22"
35 Large Drawer Bottom (1)	1/4" x 20" x 22"
36 Large Drawer Face (1)	3/4" x 7 1/2" x 20 1/2"
37 Small Drawer Fronts, Backs (4)	3/4" x 1 3/4" x 18 1/2"
38 Small Drawer Sides (4)	3/4" x 1 3/4" x 22"
39 Small Drawer Bottoms (2)	1/4" x 20" x 22"
40 Small Drawer Faces (2)	3/4" x 2 1/2" x 20 1/2"
41 Drawer Face Trim (1)	1/4" x 3/4" x 264"
42 Drawer Edge Tape (1)	1/32" x 3/4" x 384"
43 Drawer Pulls (5)	Wood
44 Drawer Knob (1)	Wood
45 Work Top (1)	3/4" x 25 5/8" x 40 1/2"
46 Work Top Frame Left End (1)	3/4" x 3" x 25 5/8"
47 Work Top Frame Right End (1)	3/4" x 2" x 25 5/8"
48 Work Top Frame Supports (2)	3/4" x 1 1/2" x 25 5/8"
49 Work Top Frame Sides (2)	3/4" x 4" x 48"
50 Towel Bar (1)	1 1/2" Dia. x 26 3/8"
51 Glue Blocks (8)	3/4" x 2" x 2"
52 Casters (2)	3 3/8" Swivel
53 Foot Sides (2)	3/4" x 3 3/8" x 24"
54 Foot Top (1)	3/4" x 1 1/2" x 24"
55 Foot Ends (2)	3/4" x 1 1/2" x 3 3/8"

49

Work Top Frame Sides

Work top left end (piece 46) is held flush to the side (piece 2) directly below it.

Towel bar
(piece 50)
location

Sharpening Station

℄

℄

7

Long Frame

2

Long Apron

Rabbet for glass

Dovetail

Rabbet

Create the gentle curves and the shaped ends on each piece at full length and do not shape until you are done mitering and joining the entire leg and apron subassembly), as indicated on the entire frame, keeping it square and flat, then Band saw the corners and sand smooth, then frame on the leg and apron subassembly

8

Corner Cabinet

The diameter of this hole is four inches.

14

Pediment Front

Use a band saw with a 1/8" wide blade to cut the pediment front to shape. Sand the edges smooth with a drum sander chucked into your drill press.

3

Short Apron

Tea Table

7

Long Frame

8

Short Frame

The lips on the frame pieces are formed on the table saw and shaped with sandpaper.

Classic Cherry Corner Cabinet

By Larry Heinonen



Broken pediments are one area of woodworking where I've had little experience. That's why I got so excited when my good friend Patricia showed me a picture of a corner cabinet she wanted me to build for her. I hit the books and found plenty of information on various styles of pediments (crown moldings) but was surprised at how little info is available on basic corner cabinet construction. Well, that made the challenge before me even better. I ended up designing a cherry corner cabinet that matched both the old photo Patricia had been carrying around and the scale and style of her home.

Preparation

This project presents some fairly complicated carcass joinery, so I decided to use a storyboard, a tried and true cabinetmaker's technique. First, I made a full scale, top view, cross sectional drawing on a piece of 1/4" plywood. This included everything as I would build it, right down to the 1/32" undersized plywood and the exact depths of the dados. A storyboard lets you see the actual size and shape of each part, and how they interact. I figured the extra time it took to make it would be worth the frustration it would save later on.

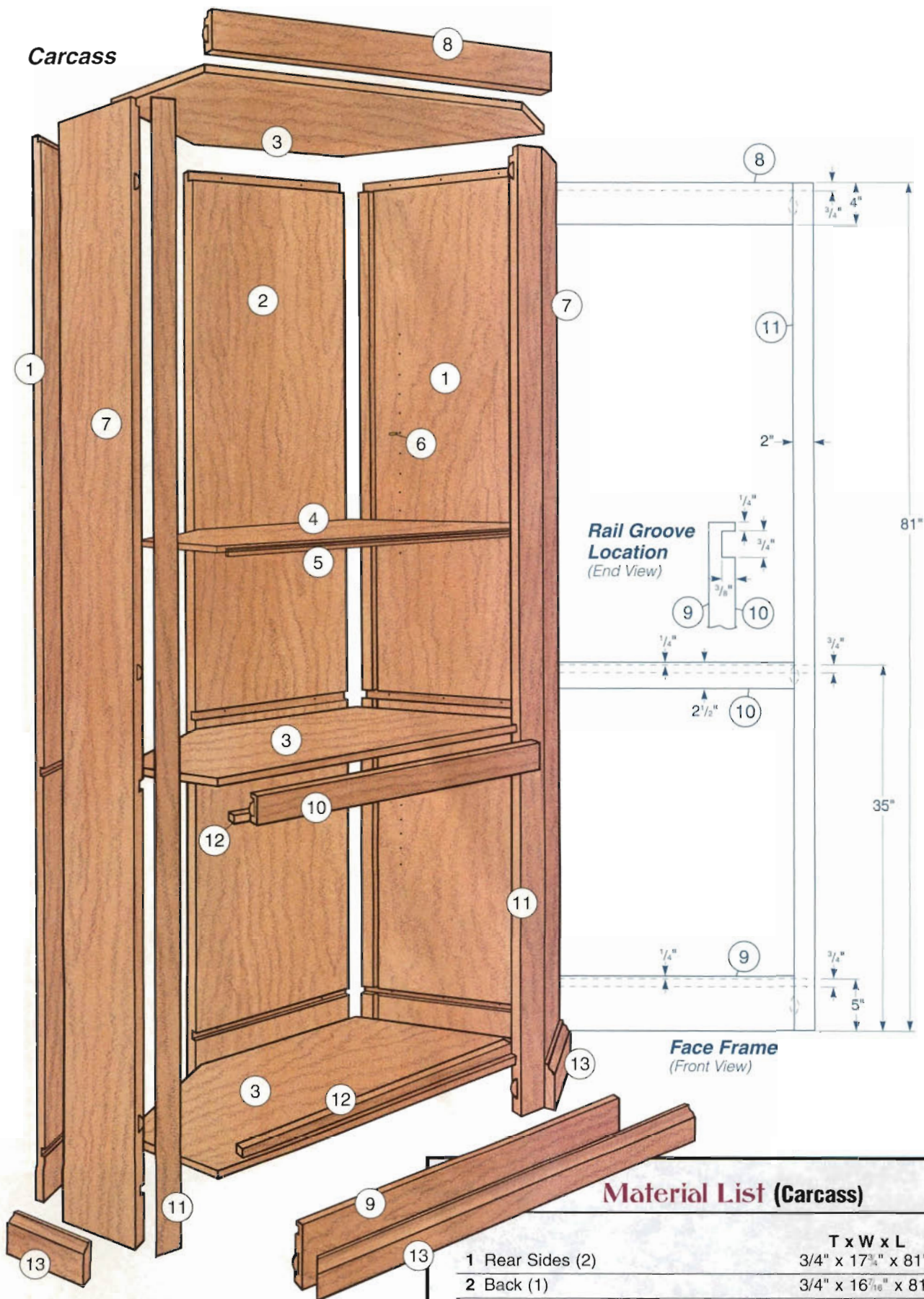
The Carcass

I divided this project into phases, the first being the case and shelf construction. In the second, I added decorative elements like the fancy pediment and moldings, and finally I built the raised panel doors.

With your storyboard as a reference, begin by laying out the rear sides and the back (pieces 1 and 2): overall dimensions are given in the Material List.



Carcass



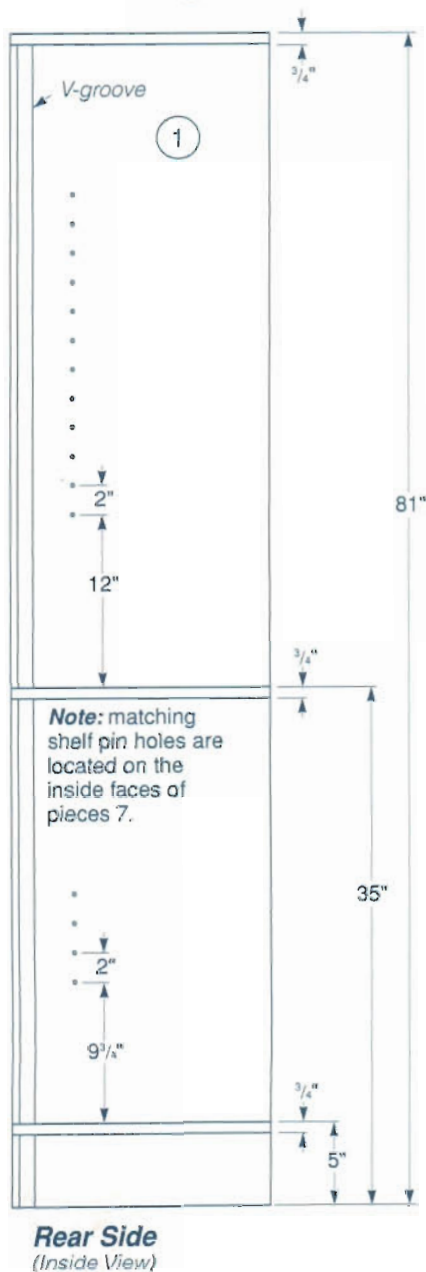
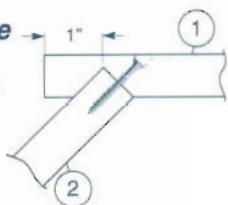
Material List (Carcass)

	T x W x L
1 Rear Sides (2)	3/4" x 17 3/4" x 81"
2 Back (1)	3/4" x 16 7/16" x 81"
3 Fixed Shelves (3)	3/4" x 16 9/16" x 39 7/8"
4 Adjustable Shelves (3)	3/4" x 15 1/2" x 38 5/8"
5 Shelf Trim (3)	1/4" x 3/4" x 30"
6 Shelf Pins (12)	1/4" Brass
7 Front Sides (2)	3/4" x 7 5/8" x 81"

Base Molding (Section View)

Roman Ogee

V-groove Joint (Top View)



Finishing Tip: Interiors of corner cabinets offer very limited room to work, so prefinishing is a real key to success for this project. (Just be sure you don't drip any of the finish into dados or onto the front or back edges where you'll be applying glue.) Prefinishing the raised panels on the cabinet doors is critical as well; otherwise you may see an unstained line (like the one at right) appear during the dry winter months.



Next, set up to cut dados for the fixed shelves in the rear sides and the back: lay all three pieces flat on your bench, then clamp them edge to edge. Refer to the illustrations at left for dado and rabbet locations and dimensions. Machine the pieces with a straight bit chucked in your router. Plowing the dados this way saves time and ensures proper alignment during assembly. Keep in mind hardwood plywood often runs about 1/32" under its nominal thickness. Undersized router bits (in this case a 23/32" bit) are now available to tackle this problem.

The back sits in two V-shaped grooves cut into the rear sides. Chuck a 45° V-groove bit in your router and set the depth to 1/2". You can make these grooves on a router table, or use a straightedge to guide your portable router. Their locations are shown above.

Cut the three fixed shelves (pieces 3) and the adjustable shelves (pieces 4) to size. Apply solid hardwood trim (piece 5) to the front edges of the adjustable shelves and set them aside.

Pre-finishing

Applying finish to the interior of a completed case can be difficult, so I decided to prefinish the inside panels on this piece. Finish sand the back, rear sides and shelves down through the grits to 220, then stain. (I used Carver Tripp wild cherry, to match Trishia's home.) Then apply a sturdy clear top-coat of your choice. I used polyurethane.

Carcass Assembly

With the machining done on the first phase and the interior finish completely dry, test fit the back, rear sides and fixed shelves. Mark and predrill for screw holes on the three back pieces: these screws will act as clamps, pulling everything tight and snug while the glue dries. Use the locations shown in the **Elevation Drawings** at left to lay out and drill holes in the rear sides for half of your shelf pins (pieces 6).

Glue and screw the back to the rear sides, then install the fixed shelves in the same manner. Don't worry too much about glue squeezing out on the finished parts. This will peel right off later.

The Face Frame and Front Sides

The most critical detail in this project is the long, mitered joints where the front sides (pieces 7) meet the face frame. The key to success here is patient preparation. Start by edge gluing enough stock for the two front sides. You could use cherry plywood here, but the grain on plain sawn solid cherry

	T x W x L
8 Face Frame Top Rail (1)	3/4" x 4" x 26 1/2"
9 Face Frame Bottom Rail (1)	3/4" x 5 1/4" x 26 1/2"
10 Face Frame Middle Rail (1)	3/4" x 2 1/2" x 26 1/2"
11 Face Frame Stiles (2)	3/4" x 2" x 81"
12 Door Stops* (2)	3/4" x 3/4" x 27"
13 Base Molding* (1)	3/4" x 4" x 50"

*Oversized, cut to fit.

lumber is much more attractive than the rotary cut on most plywood. Crosscut both pieces to final length, then rip them 1/4" oversize and set them aside while you see to the face frame.

Assemble the face frame rails (pieces 8 through 10) to the stiles (pieces 11) with biscuits and glue.

Make sure it's both flat and square as you tighten the clamps. When the glue is dry, sand the frame. Cut shelf dadoes in the backs of both front sides and the face frame (see the Elevation Drawings), using the same technique you used earlier with the back and rear sides. If you see a bit of biscuit after you rout, don't worry; it will be covered when you assemble the frame.

Now set the blade of your table saw to 22½° and rip the critical edge of both front sides to final width. Follow up by ripping the edges of the assembled face frame to match the miter: be careful to remove an equal amount of material from both edges. Use the sharpest blade you

own for this operation, and keep the stock flat to the table saw as you cut. Now drill the stopped holes for the other half of the shelf pins in the front sides, lining them up with the holes in the rear sides.

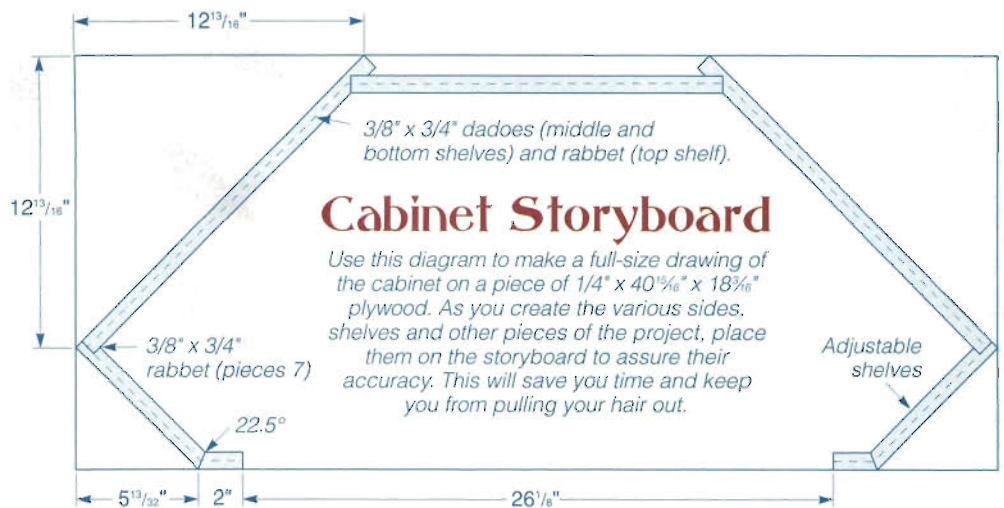
Preparing the Mitered Joint

Now comes the fun part. Dry assemble the face frame and sides to the carcass, to see if the joints are seamless. If gaps appear, clamp the face frame or side to the front of your bench and use a smooth plane to take off the high spots. Be sure the plane is sharp as a razor: it's much easier to control. Also, square the iron to the sole (test it on scrap first, checking the edge with a

square). You have to knock off the high spots, but you can't change the angle while you're at it. Remove just enough material to close the gap. When you have two good joints, mark the pieces for #0 biscuits and mill the biscuit slots. These will help the miter's alignment during glue-up.

Gluing Up the Mitered Joint

When you're satisfied with your test fit, select some straight scrap stock to make four long clamping blocks the full length of the cabinet, each with a 45° bevel on one edge. Use two-sided tape or C-clamps to attach them to either side of the joint, about 1" back from the mitered edges. These blocks will let you clamp



How to Form Curved Moldings



Making curved molding is easier than you might think. Transfer the shape from the crown pediment to the molding stock and cut the curve on the band saw.



Again, using the crown pediment as a template, draw the top edge of the molding on your stock. You'll cut this line with your band saw after you rout the profile onto the piece.



Attach a piece of scrap wood to the curved stock while you rout the profile onto the edge. This helps keep your fingers away from the router bit. Several shallow passes will give you the best results.



Figure 1: A broken pediment creates the crowning touch for this corner cabinet. Smooth its curves by using a drum sander.

across the joint to draw it together during assembly.

You can clamp the front sides to the rear sides easily enough, and you can get a clamp on the top and bottom shelves (although you may need to use deep reach clamps on the bottom shelf) as well. The middle rail presents a bit of a challenge. The easiest way to get the

middle rail glued to the middle shelf is to lay the case on its back and place a heavy weight on the rail. You could also finish nail it, but I hate to use nails in such a conspicuous place. Another good option is to wrap a band clamp around the entire case, with a block taped to the middle rail to help concentrate the clamp's pressure in the right spot.

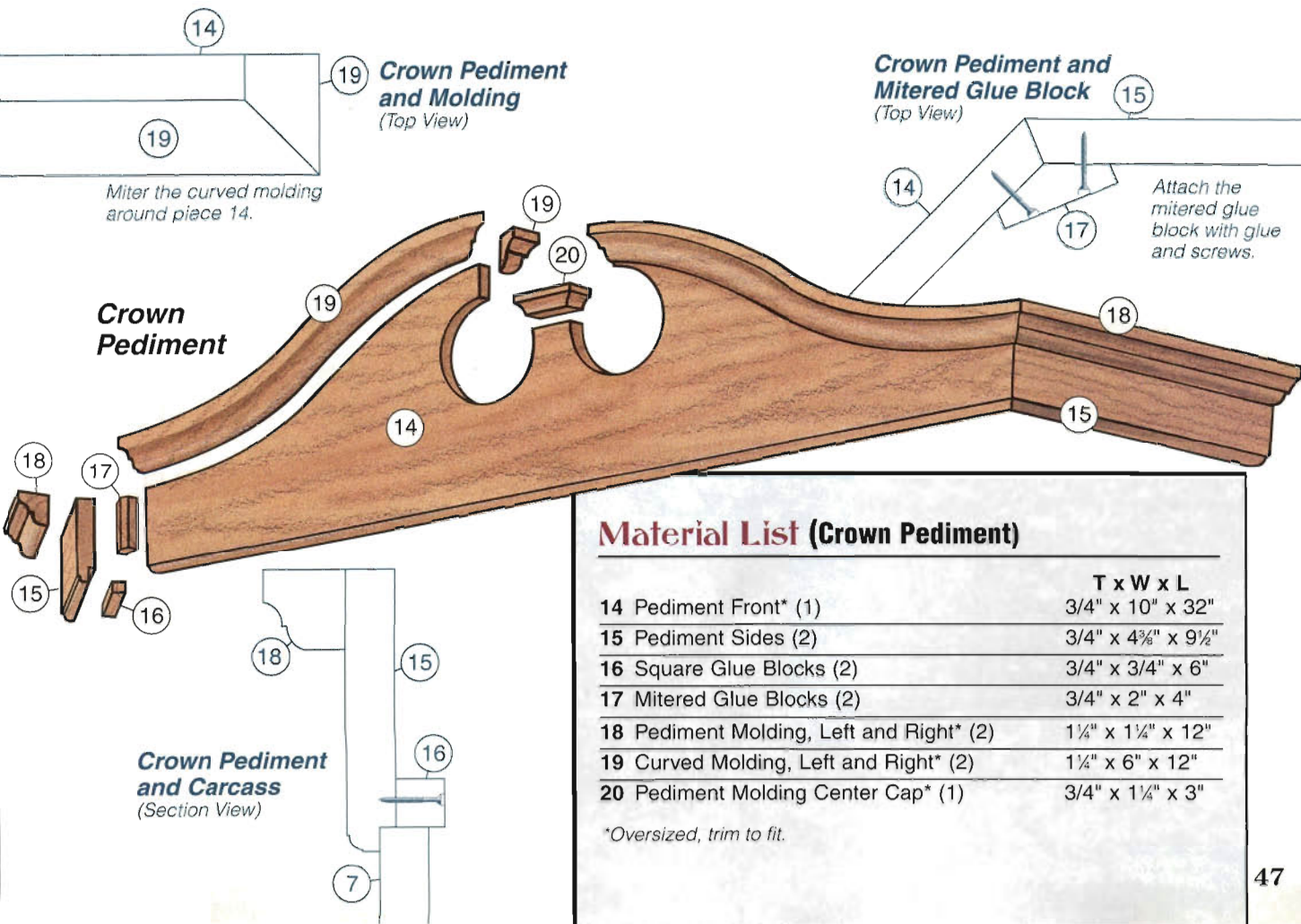
A dry run helps choreograph the assembly procedure and ensure you don't end up with half-dried or misaligned joints. Once the glue has cured, sand the frame and the front sides before adding the door stops (pieces 12). These are just 3/4" square strips that stop the door flush and provide a place to attach a magnetic catch. Glue and screw them in place flush with the back of the face frame, at the top and bottom of the door opening.

The Base Molding

With the carcass and face frame complete, it's time to add some decorative elements. These include the base trim and the crown pediment. The base molding (piece 13) is just a 4" wide board with a roman ogee profile routed on its top edge. After routing, miter it to wrap around the bottom of the carcass, then glue and clamp the pieces in place. Hold the glue 1/2" back from the top edge and squeeze-out will be minimized.

The Crown Pediment

The pediment front (piece 14) and sides (pieces 15) are edge glued and then band sawn to the profile shown on the **Full-size Pattern** on the center pull-out. Use a 1/8" scrolling blade for the inside curves. Clean up the saw cut with a drum sander, as shown in **Figure 1**,



Material List (Crown Pediment)

	T x W x L
14 Pediment Front* (1)	3/4" x 10" x 32"
15 Pediment Sides (2)	3/4" x 4 3/8" x 9 1/2"
16 Square Glue Blocks (2)	3/4" x 3/4" x 6"
17 Mitered Glue Blocks (2)	3/4" x 2" x 4"
18 Pediment Molding, Left and Right* (2)	1 1/4" x 1 1/4" x 12"
19 Curved Molding, Left and Right* (2)	1 1/4" x 6" x 12"
20 Pediment Molding Center Cap* (1)	3/4" x 1 1/4" x 3"

*Oversized, trim to fit.

Corner Cabinet Project Supplies

The following supplies are available from the *Woodworker's Journal*.

Brass Hinges (pair) #31183\$5.49

Brass Pull #36475.....\$3.99

Magnetic Catch #26559.....\$1.19

Shelf Pins (pack) #62067\$4.99

Note: you'll need two pulls, two magnetic catches, two pairs of hinges and four packs of pins for this project.

To order your supplies, call 800-610-0883.

then rout a 3/8" bead along the bottom edge of the front and side pieces. Next, switch to a rabbeting bit and cut a 3/8" wide by 1/4" deep rabbet on the inside bottom edge of each piece. Miter each piece to fit around the carcass, then spread a thin line of glue along each rabbet. Clamp the pieces in place. Apply glue blocks (pieces 16) where the top of the case meets the back of the pediment and reinforce the pediment corners with mitered blocks (pieces 17) glued and screwed in place.

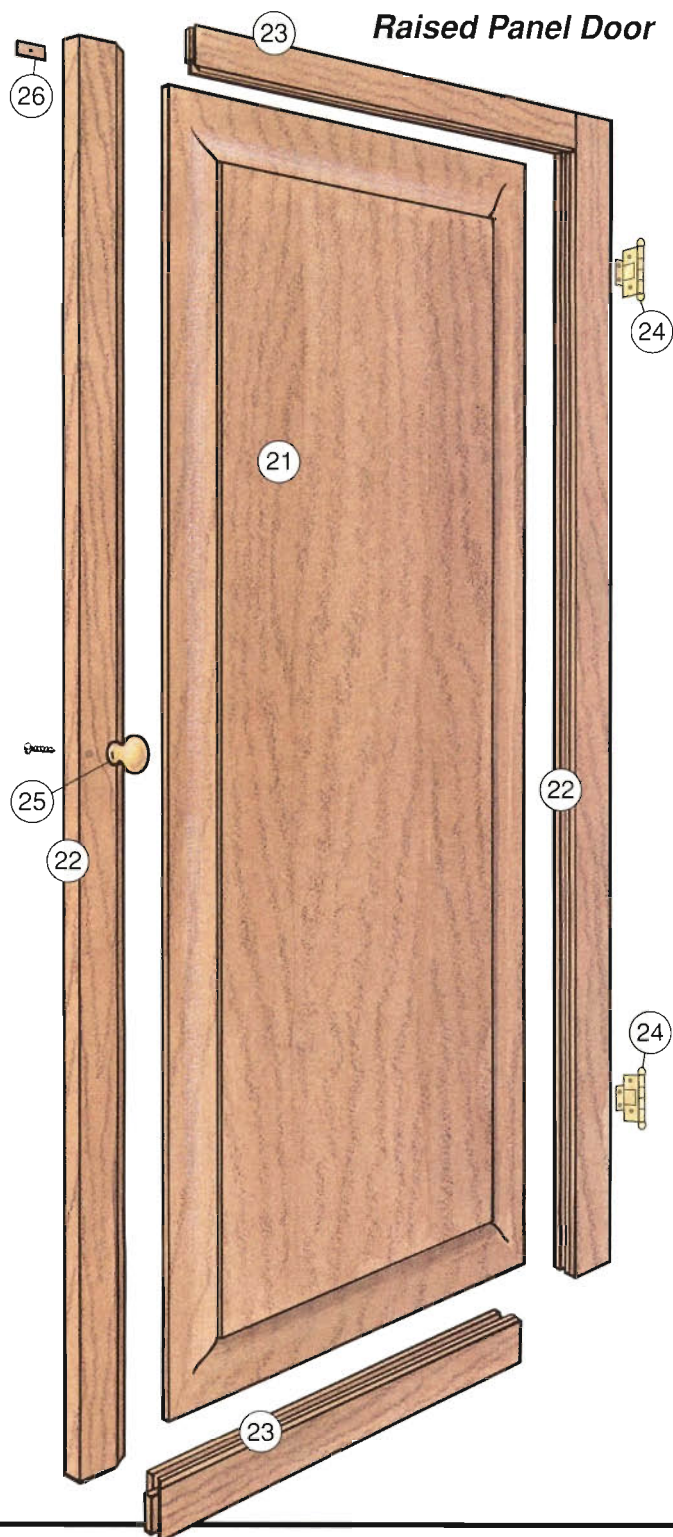
Routing the Curved Moldings

Routing the decorative profile on the moldings (pieces 18 and 19) can be a dangerous task if you don't keep a few basic safety rules in mind. I milled the curved pieces on 6" wide stock, then trimmed them to size (see *How to Form Curved Moldings*, page 46). Make each piece a little longer than needed; they can be trimmed later. For safety, cut the center cap (piece 20) off the edge of a wide board. First rout the long edge, then crosscut to width and rout the return edges. Cut the piece to size after all three edges are shaped and sanded.

Dry fit and miter the moldings to match the installed pediment front and sides, then glue the curved molding onto the case with the help of spring clamps. Again, keep the glue back from the edge to minimize squeeze-out.

Doors and Detailing

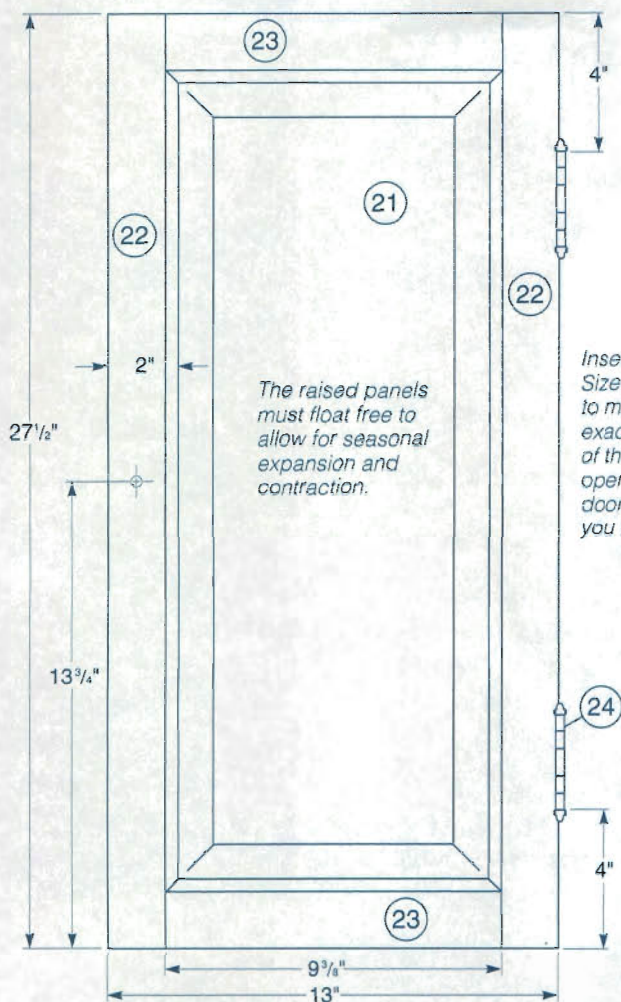
To maintain my classical theme, I used a panel raising bit in my router table to make the door panels (pieces 21). Mill the profile in several passes, then sand and stain the panels (see *Finishing Tip*, page 45).



Material List (Raised Panel Doors)

	T x W x L
21 Door Panels (2)	3/4" x 9 3/4" x 24 1/2"
22 Door Stiles (4)	3/4" x 2" x 27 1/2"
23 Door Rails (4)	3/4" x 2" x 9 3/4"
24 Door Hinges (4)	Full Wraparound Brass
25 Door Pulls (2)	1 1/2" Solid Brass
26 Door Catches (2)	Magnetic (Brown)

Raised Panel Door (Front View)



Inset Door Tip:
Size the doors to match the exact dimension of the cabinet opening. Trim the doors to fit after you build them.

A matched set of stile and rail cutters is by far the best way to mill the door stiles and rails (pieces 22 and 23). Follow the manufacturer's instructions to mill the grooves for the panels and the shaped ends of the rails (see box at right). Be sure your stock is straight and you assemble and clamp the doors on a flat surface, to prevent twisting. Don't glue the panel in place: just apply glue to the stile and rail joints. The panel must fit loosely so it can move with the seasons.

I make my inset doors exactly the size of the door opening. Later, I trim off 1/16" or so all around. This allows for the occasional occurrence of an out-of-square opening and gives me a consistent reveal around the doors. On inset doors, uneven gaps stick out like a sore thumb.

After finishing the rest of the case and the doors (following the procedure laid out earlier), hang the doors with brass wraparound hinges (pieces 24) tipped with classical ball finials. Predrill for and install the round solid brass pulls next (pieces 25), checking the **Elevation drawings** for locations. Wrap up by screwing the magnetic door catch (piece 26) in place.

This project took approximately 60 hours to complete. The smile on Trishia's face upon delivery made it worth every minute.

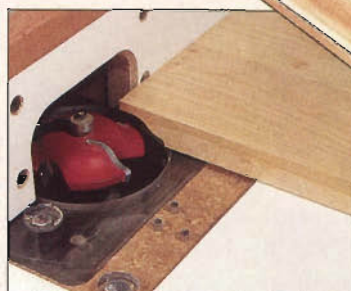
Larry Hienonen is a custom furniture builder and writer from Michigan. His last project with us was the Computer Table featured in issue 57 of Today's Woodworker.

Making Perfect Doors

If you're going to be making raised panel doors with any regularity, an investment in a panel raising bit and a stile and rail shaping bit is a sure bet to pay off quickly.



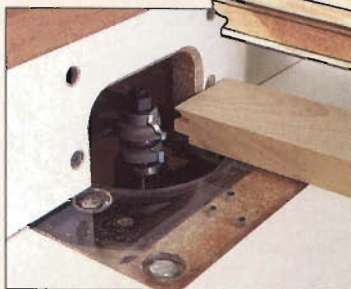
Panel raising bit



Freud's smooth cutting system bits cut raised panels so cleanly very little sanding was required.



Stile and rail bit



This two-piece, stackable Amana bit cuts both stiles and rails. Start with the rails, using your miter fence.



Invert the two cutting heads to slice the stiles for both the panels and rails. These bits are ideal for virtually any frame and panel operation.

Rolling Tea Table

Don't let the shaped pieces scare you off. A little patience and some power tool tricks will take your woodworking to the next level.

By Jeff Greef



his table is about shaping curves. At first glance it may look like a project only for woodworkers with exceptional skills, but it's approachable for anyone with a little experience and a fair amount of patience.

Sculpting the legs and curved top frames of this table is different from cutting elaborate and complex joints where every angle must be exact. To look good, a rounded shape doesn't necessarily have to follow a precise geometric pattern — it just needs to be consistent. If you shape a surface

slightly oversized you can go back and take a wee bit more off to make it look right. Try that with a hand-cut dovetail!

Using machines helps make a lot of the shaping go faster. A band saw cuts away most of the waste on the legs, and a stationary sander does the bulk of the rest of the shaping. The curved top frames get their start on the table saw — with a regular blade, no molding heads are necessary. The balance of the shaping is done with carving chisels, spokeshaves and hand sanding. This takes patience and time, but the reward for the effort is a look that beats straight table legs hands down.



Tea tables originated in 18th century America, where they were designed to display the tea service. Shapes varied regionally, with rectangular tables like this one most often found in New England.



Shapely Legs

Start by machining the leg blanks (pieces 1), then cut the bevels and dovetails on the inside corner of each, as described at right. It's a good idea to make an extra leg out of scrap wood at this point, to be used for test cuts and machine set ups. Be sure the finished bevel width matches the thickness of the aprons.

Once you complete the bevels and dovetails you're ready to glue the **Full-size Pattern** of the legs (found at the center of the magazine) to your blanks. You'll have to make copies of your pattern before using 3M's temporary adhesive to attach them.

This leg style is referred to as cabriole with a splat foot. Follow the steps shown on the next page to form the legs, using the "sand a little, look a lot" approach. Sight down the length of the legs to find bulges that need to be brought down and recesses that need to be faired in. Make all the legs at once, comparing them as you go through the steps, to ensure you shape them consistently.

Take great care when using the spokeshave, and again when you start your finish sanding. Even at these stages it is easy to form a flat spot or a depression that will stand out like a sore thumb as you apply varnish to the completed project.

Forming the Aprons

Your apron stock (pieces 2 and 3) must be uniform in thickness or the dovetails won't be consistent. Get started by planing all this stock at the same setting. Once again, machine an extra apron for test cuts and machine setups. You should also sand or scrape the stock prior to forming the joinery. It's easier to do now and you risk rounding the shoulders of the dovetails if you sand later.

Once the apron stock is sanded, mount a high vertical fence on your router table, as shown in **Figure 1** on the next page. Be sure the vertical face of the fence is 90° to the table, and give yourself at least 8" of height for stability. You will notice in the photo that I fixed a strip of plywood to the table, adjacent to the bit. This prevents the frame ends from dipping into the hole in the router table top as they pass by the bit. Complete the setup for this step by waxing the strip and vertical fence to ensure smooth movement.

If your stock is slightly bowed, it may rock against the fence, leaving you with inconsistent dovetails. Solve this problem by fixing two runners to the fence, at the top and bottom, as shown in **Figure 2** on the next page. These will allow any bows to bend inward without contacting the fence.

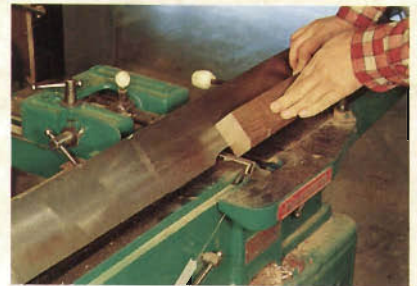
Getting Started

The legs of this project require eight quarter stock. Don't laminate the legs: glue lines would detract from the graceful elements of the cabriole style. And remember, it's important to allow thick hardwood material time to adjust to your shop's climate before you start to shape the legs.

Leg Joinery

Bevels are cut on the two inside corners of each leg at 45°. Form these bevels on a jointer (as shown below), or on a table saw. The finished bevels must match the 1/2" thick aprons exactly.

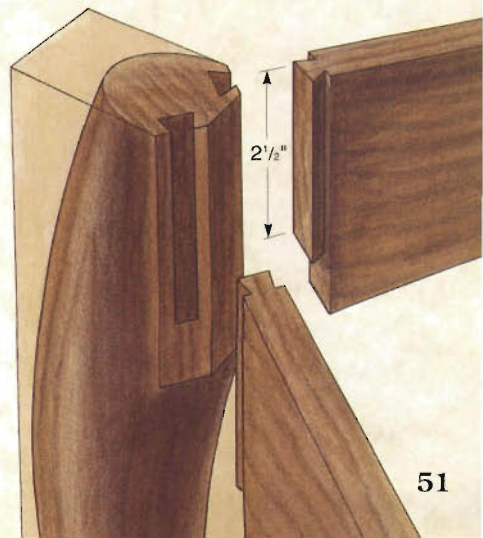
Next, step to the router table and set up a 45° fence to form the dovetail cuts. To produce a smoother cut, rout these slots in two passes. First, hog out the waste with a 1/4" straight flute bit. Then follow up with a 3/8" dovetail bit, setting the depth to 3/8". Center the slot along the width of the leg bevel, clamping a stop on the router table to limit the length of the cut to 2 1/2". Square up the slot with a chisel to complete the joint.

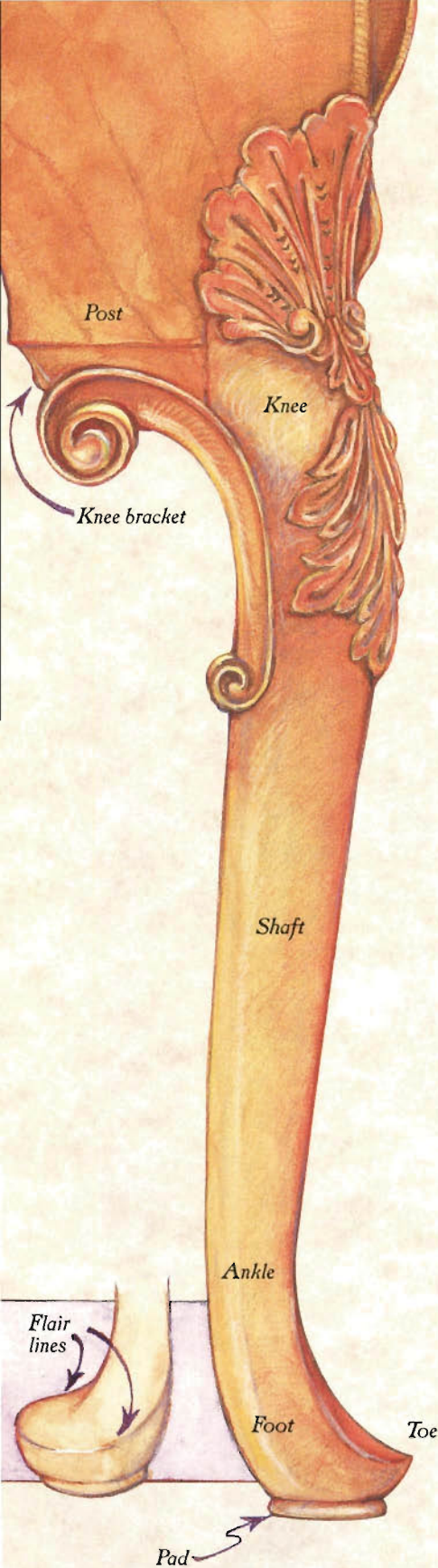


A jointer lets you sneak up to the bevel width on the legs and eliminate sanding.



The leg joinery is formed in two passes. Use a straight bit to hog out the waste and then turn to a dovetail bit to complete the joint. A stop block limits the length of the cut.





This leg style is referred to as cabriole with a splat foot. If you are a carver, you may choose to substitute a ball and claw foot, in which case you'll need to alter the profile for the leg.



Figure 1: Use an 8" high fence on the router table when forming the dovetails. Be sure the fence is set at exactly 90°. A little wax helps keep the pieces moving smoothly as you cut.



Figure 2: Slight bows could rock the aprons while the tails are being formed. I attached guide runners to my high fence to allow for any imperfection in the aprons.

Set the dovetail bit height $1/32''$ or so less than the depth of the slots on the legs and experiment with your extra apron to find a fence location that will give you tails which fit the slots well. Remember, any change in the distance of the fence from the bit will double the change in thickness of the tail, since the cut is made on both sides. The tails should slide snugly into their grooves, but you shouldn't have to use a mallet for persuasion.

Use the same basic setup to trim the bottom of the dovetails to match the $2\frac{1}{2}''$ slots in the legs, as shown in **Figure 3**. Back up these cuts with a support block to keep the aprons at 90° to the fence.

Now lay out the curved lines on the lower edges of the aprons, using the **Full-size Pattern**. Trace your curve on one long apron and one

short apron and then band saw the shapes on the matching aprons, two at a time. Smooth the curves with a spokeshave or a small drum sander mounted in a drill press. Follow up with sandpaper and a sanding block and, as with the legs, compare the curves to be sure you have the shapes you want.

Adding Strength to the Leg Assembly

To strengthen the leg-apron joints, I used screw blocks (pieces 4) made on the table saw. Cut the blocks so their grain direction is parallel with the aprons — so they'll expand and contract at the same rate. With the legs and aprons temporarily assembled, trim the blocks to a length that holds them about $1/16''$ from the rear surface of the legs, as shown in the screw block detail near the

Four steps for forming the cabriole legs



Use the fifth scrap wood leg you made earlier for testing. Trace the leg patterns from the Full-size Pattern onto adjacent sides of the leg blanks. Cut the first profile on your band saw.



Tape the cut-off pieces back in place for the second cuts. This replaces the tracings cut off on the first step and gives the bottom of the blank a flat surface to ride against the table.



Figure 3: You'll have to switch to a straight bit to knock off the bottom of the apron's tails. Be sure to use a tall support block when trimming the bottom of the apron dovetails.

Exploded Drawing. This ensures the screws will pull the block onto the aprons, rather than onto the legs, making for a considerably stronger joint.

Clamps won't be necessary for this joint because snug dovetails will hold themselves well, and the screw blocks will pull it all together. These blocks will also serve to square up the assembly, but if you're off by a little bit you can always coerce the assembly into square by pulling across the corners with twine. Assemble each joint one at a time. Before you start, seal the mitered surfaces of the screw blocks with glue so the end grain will not absorb glue faster than the face grain during assembly. Next, use tapered bits with countersinks to drill holes for the two screws (pieces 5) that hold

each block to its leg. Once the screws are installed, plug (pieces 6) the holes over the screws. Remember, this table has a glass top. These screw blocks and their plugs will be readily visible from the top, so be sure to do a neat job plugging the screw holes.

Shaping the Top Frame

The edge of each frame component (pieces 7 and 8) has a curved lip that droops downward, away from the plane of the table top. It takes several steps to make this profile, as shown in the step-by-step instructions on the next page. Once the outer edge is shaped, use your table saw to form a rabbet on the inside edge of these pieces for the glass top to fit into (see **Elevation Drawings**). Check with your glass dealer before making this cut to verify the exact thickness of the plate glass they stock — it will probably be 7/32". But don't order the glass yet; wait until you glue up the frames. It's easier to order glass to fit a top than it is to make a top to fit a pre-cut piece of glass.

Only the center of each piece will retain the curved lip, so use the band saw to cut away the lip on the

ends of each piece, using the **Full-size Pattern** as a guide. Next, begin final shaping of the curved frame on each piece with the stationary sander. The flat platen of the sander will only let you go so far before you will need to turn to a spokeshave to complete the process. Watch carefully as you shape to ensure all of the curves flow evenly. Finish shaping the underside of the frame with 60 grit sandpaper.

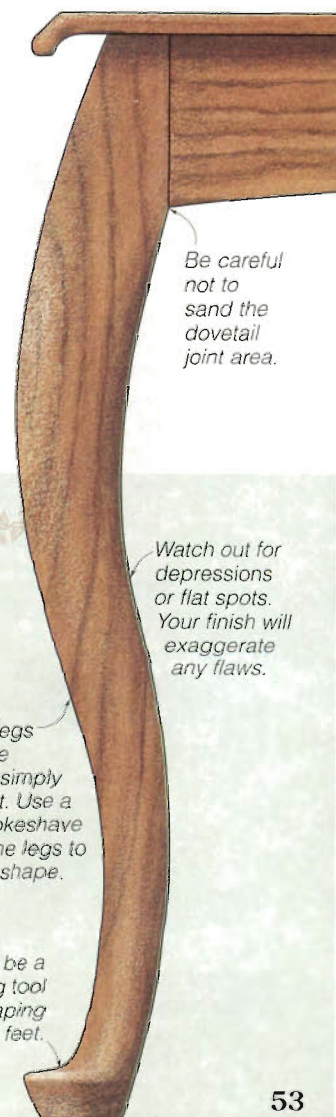
Get set up to cut your corner miters now, carefully following the instructions on the **Full-size Pattern**. These pieces are slightly



The band saw will leave a roughly shaped leg with a square cross section which must be rounded. A stationary belt sander with a 60-grit belt is excellent for this task. Compare all legs as you work on them to ensure they are shaped similarly.



After sanding and carving the curves to your satisfaction, begin smoothing the legs with a sharp spokeshave. You could do all shaping of the legs with spokeshaves if you prefer, but a sander is faster for the rough-out. Finishing with a spokeshave helps smooth the curves.



Be careful not to sand the dovetail joint area.

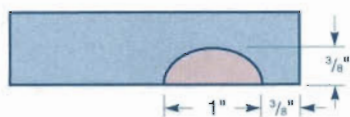
Watch out for depressions or flat spots. Your finish will exaggerate any flaws.

Cabriole legs needn't be identical, simply consistent. Use a sharp spokeshave to bring the legs to their final shape.

Sandpaper can be a handy carving tool when shaping the feet.

Shaping the Frame

The frames (pieces 7 and 8) consist of moldings created in several steps. Make an extra scrap piece to test your setups.



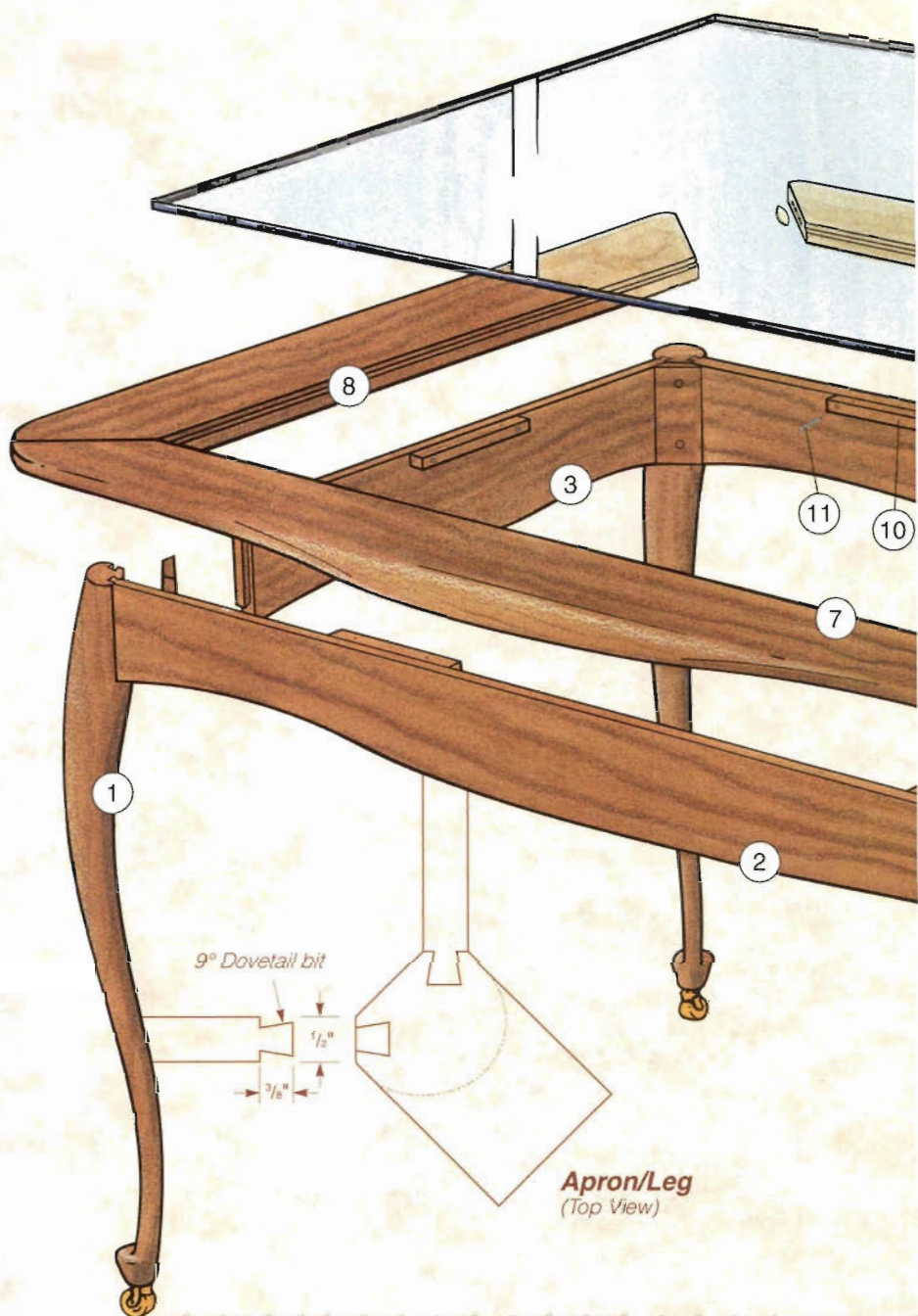
Use your table saw to form coves in the frames. Start by locating an angled fence at two points from the blade as shown above. Measure 1 3/8" from the front of the blade and 3/8" from the rear. Test your cut and adjust as needed.



Use a dado head to remove the bulk of the material from the underside of the frames. Then stand the piece on edge to remove the remaining material as shown above.



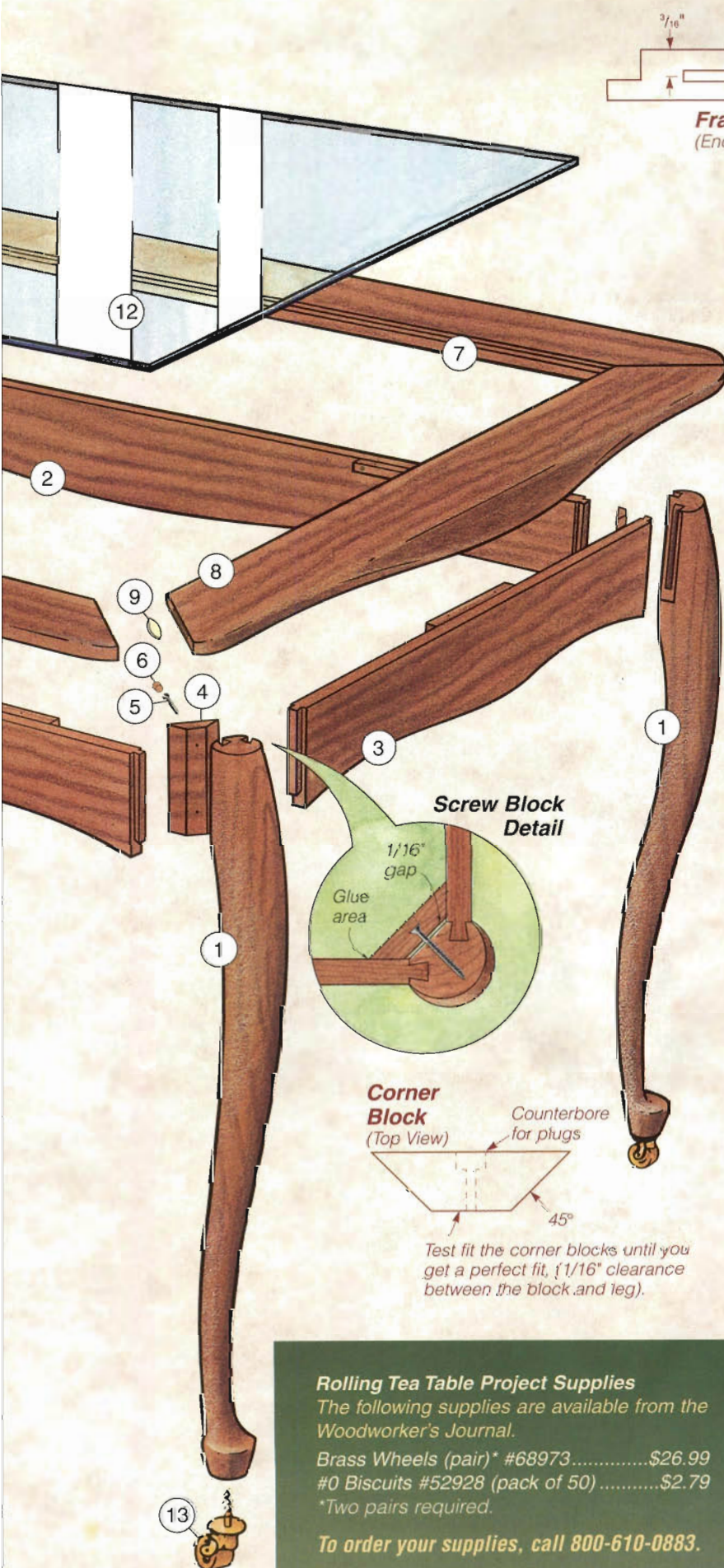
Flip the piece over and plow the rabbet in the back edge. Then insert a regular saw blade in your saw and slice the angle onto the front edge of the frame.



Material List

	T x W x L
1 Legs (4)	1 1/2" x 2 1/2" x 19"
2 Long Apron (2)	1/2" x 3" x 25 1/2"
3 Short Apron (2)	1/2" x 3" x 14 3/4"
4 Screw Blocks (4)	1/2" x 2 1/2" x 3"
5 Corner Screws (8)	#8 x 1 1/4"
6 Plugs (8)	3/8" dia.
7 Long Frame* (2)	3/4" x 3" x 31"
8 Short Frame* (2)	3/4" x 3" x 20"
9 Biscuits (4)	#0
10 Fasteners (2)	1/2" x 1/2" x 3"
11 Screws (12)	#6 x 3/4"
12 Glass Top (1)	Measure opening
13 Brass Wheels (4)	1" dia. Screw plate

*Slightly oversized, see Full-size Pattern.



oversized in the material list. For clean miters, use a sliding cut-off jig on the table saw, as shown in **Figure 4**. This jig needs to be built up to accommodate the edge lip.

Join the frame pieces with biscuits (pieces 9) as shown in the **Elevation Drawings**. Test fit the joints and when everything fits well, glue and clamp them together: measure diagonally and adjust the frame to square. When the frame is dry, use the **Full-size Pattern** to transfer the rounded shape to all four corners of the top, then use your band saw to cut the corners and round them over with 60 grit sandpaper.



Figure 4: A sliding cutoff jig forms the miters at the ends of the table's frame components. Secure the miters with biscuits located in the remaining 3/8" thick stock.

A Few Final Steps

Install the four fasteners (pieces 10) with screws (pieces 11). Measure the opening for the glass top (piece 12) and order it, asking them to knock off (swipe) the edges so they won't be sharp. Install the brass wheels (pieces 13) to the end of each leg.

That's about it. Now finish sand the entire project and apply your finish of choice. As you finish this project, be sure to remember the inside of the leg and apron assembly will be visible.

Rolling Tea Table Project Supplies

The following supplies are available from the *Woodworker's Journal*.

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*Two pairs required.

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Reproducing Woodworking's Past

By Joanna Werch

His niche is recreating the styles of the past. Contributing editor Mike McGlynn, a woodworker from Minneapolis, Minnesota, specializes in Prairie School and Arts and Crafts pieces. It's the linear

aspects of these early 20th century designs that appeal to him, along with their solidity.

Furniture design and its details are fascinating for Mike. "Chairs in particular are very satisfying," he said. "It can get quite complex ... making them aesthetically pleasing and still structurally solid. It's a real challenge."

Not that he planned to become a furniture designer. He has a degree in political science, and his previous jobs include cabinetry and building wooden boats. About 10 years ago, he opened his shop, McGlynn Woodworking, and eventually moved to a furniture concentration.

"The thing about cabinetry is that, no matter how elaborate you get, it's still mostly boxes with doors on them," he said. Mike learned woodworking from his father, a Wisconsin veterinarian who pursued it as a hobby.

Mike's adaptation of this Frank Lloyd Wright design made the chair more comfortable.



Mike kept at it because it was fun. "At the very base of it, I just like to make things," he said. "I like to take new lumber and turn it into a nice, aesthetically pleasing piece." He's interested in looking beyond the obvious, as well. While most woodworkers associated with the Prairie or Arts and Crafts schools

Mike built this Purcell and Elmslie reproduction for their most famous design: a house in Woods Hole, Massachusetts.



Architects Purcell and Elmslie varied this chair design for many projects. Mike reproduced this version because he liked the balance.

PURCELL-CUTTS: A LITTLE HOUSE IN THE PRAIRIE STYLE



The artistry of Mike McGlynn's work is on museum display. One of the feathers in the cap of this woodworker is the furniture he has designed for the Purcell-Cutts house owned by the Minneapolis Institute of Arts. The home was the personal residence of William Gray Purcell who, with partner George Elmslie, was a well-known Prairie School architect.

Built in 1913, the house was sold to railroad executive Anson Cutts in 1919 and donated to the museum in 1985 by the Cutts children. While the 3,000 square foot house itself was in good shape, most of the furniture was missing. Mike was commissioned to build reproductions — based on two photos — of Purcell's bedroom set: bed, dressing table, chairs, and a bench for the dressing table.

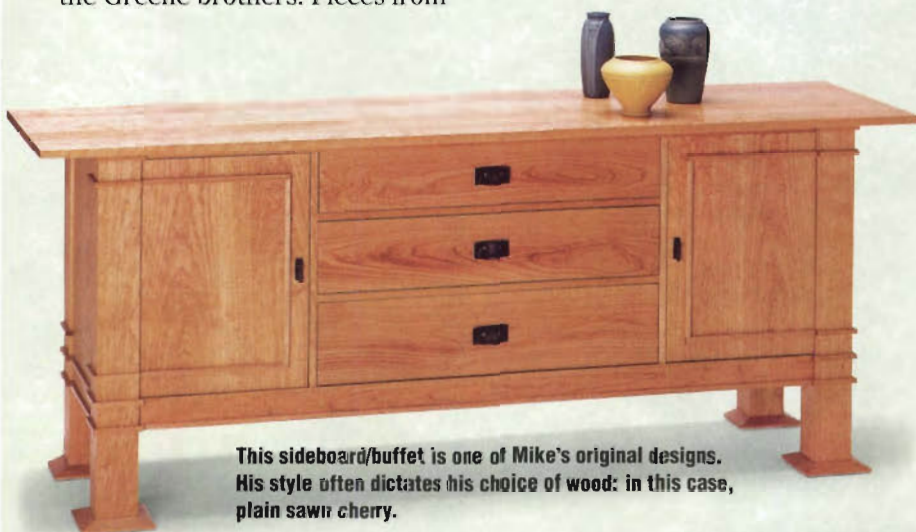


Built to go with the chair at left, this table is another Frank Lloyd Wright adaptation.

concentrate on Frank Lloyd Wright and Gustav Stickley, Mike points out there were lots of other architects and designers involved. He particularly appreciates the works of Purcell and Elmslie and the Greene brothers. Pieces from

Greene and Greene, he explained, were both beautifully made and wonderfully engineered.

Mike does find some time to take on work in other styles. For example, he recently built a 20-foot mahogany



This sideboard/buffet is one of Mike's original designs. His style often dictates his choice of wood: in this case, plain sawn cherry.



Mike calls the single board of California walnut on this desktop "possibly the nicest piece of wood I've ever used." Keyed locking tenons strengthen the base.



"IT'S FUN. IT'S A JOB
I LOVE TO DO.
I'VE NEVER BEEN
UNHAPPY GOING TO
MY SHOP AND
WORKING."

MIKE MCGLYNN



conference table with a burl veneer top. As a hobby, he still builds wooden boats, and not long ago he restored an old guitar.

Dust Collection Strategies

By John English

Although it's difficult to remove all the dust from your woodshop, minimizing harmful dust levels is something we should all address in an aggressive manner.

slip-up that results in an unbalanced system, reduces performance and actually ends up adding to the existing dust problem.

The ideally designed system should collect dust from all tools simultaneously, without using blast gates. Or, if it does use gates, they should be automatic. More on collection systems later.



Downdraft tables like the Deluxe model from Woodmark provide dust collection at the source: while you use them as a workbench, they filter the dust you create.

Getting aggressive with dust doesn't necessarily mean you have to spend a ton on new equipment. In fact, one of your first strategies for reducing dust levels is simply to vacuum the shop regularly: sweeping and blowing dust merely moves it around — vacuuming removes it. Most of us are guilty of using compressed air to blow dust from equipment, projects and even ourselves. This just returns the dust to the air, which makes matters worse, not better.

After vacuuming, dust collection systems are the most logical way to reduce dust levels. However, the system you select must be properly designed, maintained and used or it won't perform effectively. For example, how many of us forget to open and close blast gates? That's a



A typical **SINGLE-STAGE** collector consists of two bags: an upper for fine dust and a lower which collects larger debris. You can use ductwork to connect the more powerful versions to all of your machines.

Prevent New Dust

Experts all agree the most effective method of lowering and controlling dust levels is collecting it at the point of generation. If you're serious about reducing your exposure to dust, concentrate on effective controls: don't rely on dust masks or strap-on respirators.

The first trouble spots to control are the tools that generate the most dust. Hand-held power tools such as orbital sanders and routers are among the worst offenders in most shops. Dust collection bags connected to these tools are simply not effective. Dust escapes from the trajectory motion of sanders, and



Single-stage collectors like JET's DC-650 filter the dust your large, stationary tools create.

Don't expect too much from your **SHOP VACUUM**. These units are most useful for collecting large, easily visible particles of dust.



their bags often have openings which permit dust to escape. Adding to the situation, most of us keep working even after the bag is full. Often when we work, smaller bags are in our way, so we tend to remove them. For sanding and routing operations, I highly recommend investing in a downdraft table, a sanding booth, or even a vacuum-assisted power sander.



Shop vacuums like Ridgid's WD1650 model are popular, partly because they are inexpensive and mobile.

Shop Vacuums

While shop vacuums are extremely popular among woodworkers, they may not be the best solution for systematic dust control. Along with their noisy demeanor, they are excellent for collecting larger particles — the obvious dust apparent to the naked eye. But they



Portable collectors like Delta's 50-820 use a hood near the work area to gather dust from routing or sanding operations into a bag.

do have some limitations: first and foremost, their capacities are generally a lot smaller than most large, stationary machines require. Second, their filters usually don't trap very small particles that can aggravate allergies and irritate the respiratory system. For most shops, a complete dust collection system is the best choice.

Investing in a Dust Collector

Dust collection ports in themselves are useless: they have to be connected to either a shop vacuum or, preferably, an actual dust collection system. For many hobbyists, such systems seem a luxury — the last tool you buy. But more and more of us are beginning to take dust seriously, a fact that the tool industry now recognizes. At last season's professional woodworking show in Atlanta, almost every new tool featured either built-in dust collection ports or innovative in-tool collection devices.

The cost of central dust collection systems has also come down over the years. Catalogs now offer 1HP systems starting at around \$240 — basic units essentially designed to collect dust from one large tool at a time.

Dust Details

By Paul Schiermeier M.S.

In the back of every woodworker's mind is the thought that all the dust we've eaten over the years may come back to haunt us. There's reason to be concerned. Wood dust is related to many health conditions, including irritation of the eyes, nose and throat; skin rashes; asthma; allergies and some serious lung diseases. It has even been linked to a rare form of nasal cancer.

Estimates indicate up to 13% of woodworkers have asthma from dust. Breathing wood dust can also cause chronic bronchitis or emphysema.

Over 140 varieties of wood have some type of adverse effect on health. Some contain irritant chemicals, either naturally present or in treatments. White oak, walnut and mahogany may cause bronchitis, while many types of exotic wood can cause skin problems. Even pine has been linked to nasal irritation and a decrease in lung function.

According to industry studies, nasal adenocarcinoma is about 100 times more common among furniture workers than it is in the general population. It's impossible to pinpoint the concentration or number of exposures that could trigger cancer — everybody's different — but it sure makes a lot of sense to be aware of both one-time and cumulative exposures.

During their lifetimes, one third of all woodworkers experience some adverse health effects from contact with wood dust. These effects depend on the amount of dust in a shop and the types of wood. In an effort to determine some effective dust reduction methods, the Minnesota Department of Health is now studying levels of wood dust in small professional shops.

continued ...



An ambient system like the ACS-100 from Jesada uses a series of filters to trap increasingly smaller pieces of dust. This one has a rating of 460 CFM. Remember, all dust collection equipment needs regular inspection and maintenance to work at peak efficiency.

What is a CFM?

Deciding how much dust collector you need can be confusing, especially if you don't understand the terminology. Let's begin with CFMs. The 1HP model just mentioned generates 650 cubic feet per minute (CFM) of volume. That means it sucks 650 cubic feet of air through its intake port every minute it's turned on, and expels the same amount after filtering it. How big is 650 cubic feet? It's all the air in an 8' x 10' room.

Most table saws require about 300 CFM of vacuum, while a jointer or a radial arm saw will usually be rated around 350 CFM. Planers and band saws need a little more volume (about 400 CFM).

When attaching dust collection to your stationary tools, where you collect the dust is an important consideration. While most newer power tools have a dust collection port, it may not be sufficient to control all of the dust generated by that tool. Jointers and table saws may need a collection port in the body compartment of the tool because dust falls down and builds up as you use it. Both of these tools also project a significant amount of dust from their saw blade or knives. So a collection device of some sort needs to be used at the location where the

wood is being cut. A two tier collection strategy is much more effective in these situations.

Are You Under Static Pressure?

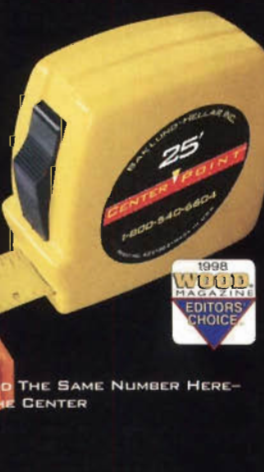
A second part of your decision involves static pressure. Most domestic dust collectors are rated on the same scale, so CFMs are the



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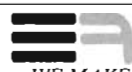
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A typical **AMBIENT** collector hangs from the ceiling. Its motor runs continuously and pulls air and fine dust through its filters.



main key to power ratings. But an understanding of static pressure may help clarify choices while sizing hoses or dealing with imports.

If you're standing at sea level, the air around you is being pressed down at 14.7 pounds per square inch (PSI) by all the air above it in the atmosphere. The higher you go, the lower this pressure becomes. But for most purposes, manufacturers use the 14.7 PSI measurement (known to engineers

as "1 atmosphere" and to the industry in general as standard cubic feet per minute, or SCFM) as their base line when rating a vacuum.

So, if a room at sea level is 650 cubic feet, and a dust collector can empty that much air in one minute, the collector can be rated at 650 CFM at 1 atmosphere. At higher altitudes, the air pressure will drop: there will actually be a little less air in the same 650 cubic foot room. So a 650 CFM vacuum will run slightly less air through its filters.

Filters

The final element in sizing your dust collector is the nature and size of its filter. A filter increases resistance, reducing the number of CFMs. The more efficient the filter is, the less air a given vacuum will move through it. This resistance is called static pressure loss. That 650 CFM rating? It's for a collector with absolutely clean filters.

Filters come in all shapes and sizes. For most shop vacuums, they are simple, accordion-shaped paper pre-filters, or cloth bags secured by

Although it's difficult to remove all dust from the shop, the Minnesota Wood Dust Study Team recommends minimizing wood dust levels. Over the next two years, they will invite about 60 shops to participate in their study. In the meantime, the team offers the following general observations.

High dust levels are observed in shops that do not practice good housekeeping, have an inadequate or poorly maintained dust collector, or use tools without proper dust controls. One simple, but effective, way to reduce dust levels is to vacuum regularly and avoid sweeping or blowing dust.

Dust collection systems are one of the most effective means of reducing dust levels, but they have to be properly designed, maintained and used.

continued ...

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(Circle No. 117 on PRODUCT INFORMATION form)

The study team recommends systems designed to collect dust from all tools simultaneously. Blast gates should be automatic.

Common sanding power tools such as orbital sanders or routers generate high amounts of dust and require specific dust controls. The team observed that dust collection bags connected to hand-held sanders are not that effective. Instead, they encourage the use of sanding booths, downdraft tables or vacuum-assisted power sanders.

The table saw is another common woodworking tool that is usually attached to the dust collector with a flex duct on the bottom portion of the table. This design often causes dust blockage in the flex duct, and the lack of a hood over the blade allows dust to escape through the top of the blade opening. In addition to connecting a duct to the bottom of the table saw, the team recommends attaching a guard equipped with a port that connects the duct to the dust collection system being used.

Ultimately, the most effective method of lowering and controlling dust levels is collecting the dust at the point of generation. That's why the study team is concentrating efforts on effective engineering controls rather than recommending the use of dust masks or respirators.

Editor's Note:
Problems with wood dust are substantially greater for professional woodworkers. Still, it's something hobbyists should keep in mind.

Collecting dust through factory installed dust ports is an effective method of dust control. This Grizzly G1029 dust collector has a CFM rating of 610. This model also comes with a 2 horsepower motor.



rubber straps. Low end dust collectors generally employ large cloth bags, while units at the top of the market have an elaborate series of cloth, paper, wire, electronically charged and/or fiber filters. Most shop air cleaners (the type that hang from the ceiling) are equipped with two or three filters of varying quality. They are rated by the size of particle they can trap, which in turn is measured in microns.

How Big is a Micron?

Almost all filters are rated by the size of dust particle they can capture and the amount of air they can treat. The smaller the particle, the better (and more expensive) the filter. The unit of measurement for dust particles is the micron, which is 1/25,400". The human eye can only see dust particles bigger than 10 microns. Most of the dust you see in a beam of sunlight is on the order of 100 microns.

Here's a discomfoting thought: 99% of all dust in the woodshop is less than one micron in size! Your dust collector's filter alone is generally not up to the job of removing these submicron particles. Instead, a separate air filtration system (most of which are designed to remove particles down to 0.3 microns or less) is the safest way to deal with these contaminants.

Air Filtration Systems

Air filtration systems (those big boxes hanging from the ceiling)

are usually nothing more than a fan and two or three filters in sequence. The first filter removes the largest particles, while the ensuing ones remove sequentially smaller contaminants.

The most recent innovation in air filtration technology is to add electrostatic fibers to the final filter in the sequence. For example, 3M's Filtrete™ series of home furnace filters employs this technology to remove micro particles of smoke, viruses, bacteria and fine dust at efficiency rates up to 25 times more effective than ordinary Fiberglas™ filters. (For more information, call 800-388-3458).

Single- and Two-Stage

Now that you're familiar with the ways to rate dust collection systems, you need to choose the type of system best suited to your needs. Two basic versions are offered to the home woodshop market. The first of these, single-stage, is essentially a big impeller that pushes dust and chips into a plastic bag, then pushes clean air out through a large filter. Most shop vacuums are essentially low-



The JET DC 1900 is a single-stage collector with hose connections for three machines. Its filter bag has a 30 micron rating.



You can transform a single-stage unit into a two-stage device with a garbage can and a plastic separator. This saves wear and tear on the dust collector's impeller.

powered single-stage collectors, so they're not a realistic choice for large stationary machines.

A two-stage collector has an additional collection device to trap the largest particles before they hit the impeller. This cuts down on wear and tear (especially on the impeller) and is generally offered in larger systems (2HP and up).

Keep in mind both systems require constant monitoring. The more waste that accumulates in either the plastic bag or the drum,

the less efficient your collector will be. This is also true of dust stuck to the inside of a filter bag: by plugging the filter holes it reduces the static pressure.

Professional shops generally employ a large cyclone type dust collector that can cope with a huge volume of dust. Some down-sized versions of the cyclone system are now beginning to appear in the home shop market. They are more efficient than a stock two-stage ... and, no surprise, more expensive.

Sparks and Grounding

No matter what type of central dust collection system you opt for, there is one final safety issue that bears mentioning. All systems require two types of grounding. Dust is a notorious fire hazard, especially fine dust. So, your system must be spark-free. Make sure your motor housings are sealed and rated spark-free. The second type of grounding applies to static electricity buildup in the ductwork. Metal ducts are most often grounded automatically when they're hooked up to a collector

A TWO-STAGE collector reduces wear and tear on impellers by employing a secondary collection device to trap large particles.



(see the documentation that comes with your machine). Plastic ductwork is a little more difficult to ground. The most common strategy is to run an exposed metal wire through the duct, then attach one end of it to a ground outside the building.

This is a serious issue. An ungrounded cyclone system at my local sawmill exploded two years ago and burned for six days. Dust is definitely a health hazard, and in more ways than one!

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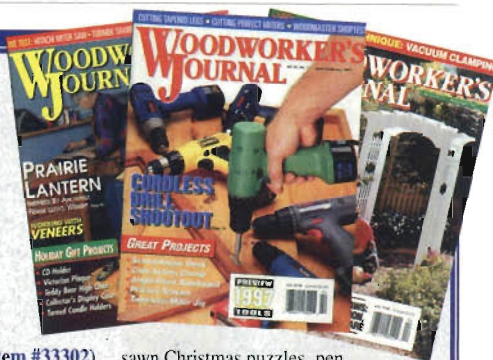
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Round Barn (May/June '98)



WOODWORKER'S JOURNAL

P.O. Box 261, Medina Minnesota 55340

New Tools Debut in Atlanta



No more flipping wood: Hitachi shows off the industry's first dual bevel compound miter saw.

Hitachi Power Tool's new 10" dual bevel compound miter saw — an industry first — was one of the innovative tools on display at the Atlanta Woodworking Show.

Their C10FCD bevels 45° to both left and right, eliminating the need to rotate materials. A scale is cast right into the table and the saw miters left and right to 45°, with positive stops at 0°, 15°, 22.5° and 31.6°. The depth of cut depends on the bevel and miter angle, but

ranges from 15/16" to 2 3/4". Width of cut ranges from 3 7/8" to 5 5/8", depending on the miter setting.

Power comes from a 13 amp belt-driven motor that runs at 3,700 rpm and boasts a soft start feature. For safety, the saw comes standard with an electric brake and safety button to prevent accidental starting. Hitachi says the C10FCD will be available this spring, with a retail price of approximately \$299.

For more info, call Hitachi's consumer line at 800-546-1666.

Carter's little clamping pad

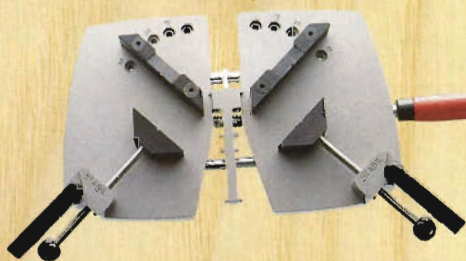
This tool was stopping a lot of woodworkers in their tracks at the 1998 International Woodworking Fair in Atlanta. The Mini Mach™ Portable Vacuum Clamping Bed from Carter Products holds a workpiece to your bench with the power of any shop vacuum rated at 1.5 HP or better.



The unit hooks to the vacuum with a hose adapter and a vacuum control valve turns the suction on and off. Put your workpiece over as many of the 12 vacuum cells as possible, push down, and powerful suction holds it tight — while also holding the Mini Mach to your workbench from the bottom. No clamps (or clamp marks) need be involved. The unit holds material while you rout, sand, hand plane or saw. Workpieces can be as small as 4" x 4" or as large as 48" x 48". At seven pounds and 24" x 13", the Mini Mach is a lightweight tool that can do some heavy-duty clamping. Suggested retail is \$149.

For more info, call Carter Products at 616-451-2928.

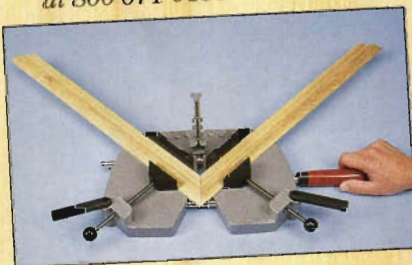
Cover all the clamping angles



Need to clamp something round or oddly shaped? The Gross Stabil Multi-angle Clamp MGS 100 is here to help. It's designed to accommodate angles of 0° to 120° in 15° increments. The cam-action wood handle draws the base plates together to assure a precise joint, and precise positioning with the alignment bar assures exact

fit of the two workpieces. It's a quick-locking system, and when you're done, the alignment bar easily lifts away so you can remove the piece from the polyamid pad. Clamping pressure is 350 pounds, for workpieces up to 4" wide. Retail prices start at about \$105.

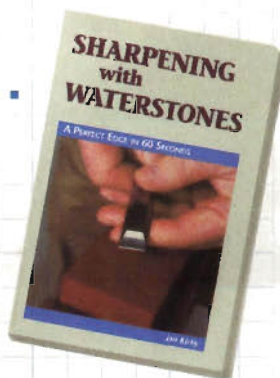
For more info, call Gross Stabil at 800-671-0838.



Getting the right edge ...

Here's the perfect book to relax with once you complete the sharpening station featured elsewhere in this issue. Master woodworker Ian Kirby's latest covers every aspect of waterstone use from establishing the correct angles on various tools to testing for sharpness. He also provides valuable advice on buying waterstones, polishing a perfect edge and choosing the right grinder. **Sharpening with Waterstones**

is a thorough guide to the care and maintenance of shop cutting tools, blades and knives.



ISBN 096439993-8: Available for \$14.95 from Cambium Press. For more info, give them a call at 203-426-6481.

Plane talk from Powermatic



Quick, what's the best part of Powermatic's new Model 412 12½" planer? If you've ever changed planer knives before, your answer is their double-sided knives with quick-change capabilities. Double-sided means longer life; quick changes mean less downtime. A cutterhead locking mechanism keeps the head from rotating when you're changing the knives. Twelve inch infeed and outfeed roller tables and stock rollers are teamed up with that head locking mechanism to effectively reduce snipe.

The powerful 2 HP, 15 amp motor delivers a feed rate of 26 feet per minute. Carrying handles, a weight of 40 pounds and adjustable rubber feet help make the Model 412 portable. A 4" dust collection shroud is standard, and so is a full two-year warranty. The Model 412 retails for around \$349.

For more info, call Powermatic at 800-248-0144.



The table saw shown here was incorrectly identified in our October 1998 issue. It is the JET Model JWTS-10CW-PF, with a street price of about \$849.

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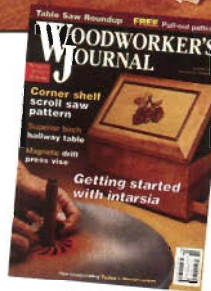
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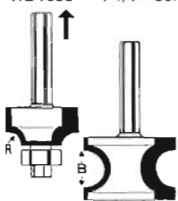
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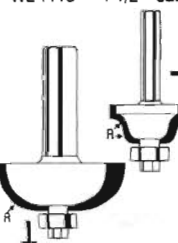
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WL-1102 1/2" \$16.
WL-1103 5/8" \$18.
WL-1104 3/4" \$19.
1/2" Shank
WL-1110 1/4" \$12.
WL-1111 3/8" \$14.
WL-1112 1/2" \$16.
WL-1113 5/8" \$18.
WL-1114 3/4" \$19.
WL-1115 1" \$22.
WL-1116 1-1/8" \$25.
WL-1117 1-1/4" \$28.
WL-1118 1-1/2" \$32.



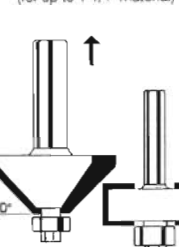
Cove Bits
1/4" Shank • Radius
WL-1159 1/8" \$10.
WL-1160 3/16" \$10.
WL-1161 1/4" \$11.
WL-1162 3/8" \$13.
WL-1163 1/2" \$14.

Cove Bits (continued)

1/2" Shank
WL-1169 1/8" \$10.
WL-1170 1/4" \$11.
WL-1171 3/8" \$13.
WL-1172 1/2" \$14.
WL-1173 5/8" \$18.
WL-1174 3/4" \$20.

Chamfer Bits

1/4" Shank • Degree
WL-1180 15° \$10.
WL-1181 25° \$10.
WL-1182 45° \$12.
WL-1183 45° \$14.
(for up to 3/4" material)
WL-1184 45° \$10.
WL-1185 11-1/2° \$12.
WL-1186 15° \$12.
WL-1187 22-1/2° \$12.
WL-1188 30° \$14.
WL-1189 45° \$15.
WL-1190 45° \$22.
(for up to 1-1/4" material)



Rabbeting Bits
1/4" Shank • Kerf
WL-1220 1/2" \$11.
WL-1220-2 1/16" \$10.
WL-1220-3 1/8" \$10.
WL-1220-4 1/4" \$10.
WL-1220-5 3/8" \$10.
1/2" Shank
WL-1225 1/2" \$11.
WL-1225-2 1/16" \$10.
WL-1225-3 1/8" \$10.
WL-1225-4 1/4" \$10.
WL-1225-5 3/8" \$10.
WL-1225-6 3/4" \$12.

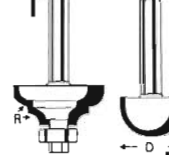
Roman Ogee Bits
1/4" Shank • Radius
WL-1230 5/32" \$13.
WL-1231 1/4" \$15.
1/2" Shank
WL-1235 5/32" \$13.
WL-1236 1/4" \$15.

Double Roman Ogee
1/4" Shank • Radius
WL-1240 5/32" \$18.
WL-1241 1/4" \$20.
1/2" Shank
WL-1245 5/32" \$18.
WL-1246 1/4" \$20.

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Classical Ogee Bits

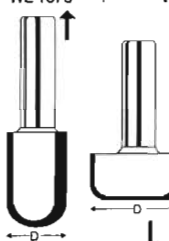
1/4" Shank • Radius
WL-1250 5/32" \$18.
WL-1251 1/4" \$20.
1/2" Shank
WL-1252 5/32" \$18.
WL-1253 1/4" \$20.



Core Box Bits

1/4" Shank • Diameter
WL-1370 1/8" \$10.
WL-1371 1/4" \$8.
WL-1371-1 3/8" \$9.
WL-1372 1/2" \$10.
WL-1373 3/4" \$12.

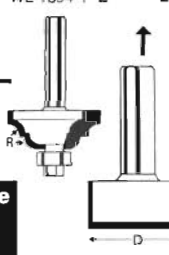
Roundnose/Core Box
1/2" Shank • Diameter
WL-1375 1/4" \$8.
WL-1375-1 3/8" \$11.
WL-1376 1/2" \$12.
WL-1377 3/4" \$14.
WL-1378 1" \$16.



Bowl & Tray Cutter

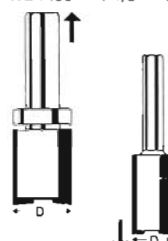
1/4" Shank • Diameter
WL-1380 7/16" \$13.
WL-1381 3/4" \$15.
1/2" Shank
WL-1385 3/4" \$15.
WL-1386 1-1/4" \$18.

Dado & Planer Bit
1/4" Shank • Diameter
WL-1390 3/4" \$12.
1/2" Shank
WL-1391 3/4" \$12.
WL-1392 1" \$14.
WL-1393 1-1/4" \$15.
WL-1394 1-1/2" \$16.
WL-1394-1 2" \$28.



Pattern Cutting Bit

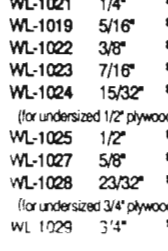
1/4" Shank • Diameter
WL-1400 1/2" \$12.
WL-1401 5/8" \$12.
WL-1402 3/4" \$12.
1/2" Shank
WL-1405 3/4" \$15.
WL-1406 1-1/8" \$16.



Straight Bits

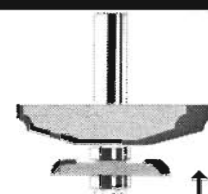
1/4" Shank • Diameter
WL-1001 1/8" \$10.
WL-1002 3/16" \$5.
WL-1002-5.5 5.5mm \$5.
(for undersized 1/4" plywood)
WL-1003 1/4" \$5.
WL-1004 5/16" \$5.
WL-1005 3/8" \$5.
WL-1006 15/32" \$5.
(for undersized 1/2" plywood)
WL-1007 1/2" \$6.
WL-1008 9/16" \$6.
WL-1009 5/8" \$7.
WL-1010 23/32" \$8.
(for undersized 3/4" plywood)
WL-1011 3/4" \$9.
WL-1012 1" \$10.

1/2" Shank
WL-1020 15/64" \$5.
(for undersized 1/4" plywood)
WL-1021 1/4" \$5.
WL-1019 5/16" \$5.
WL-1022 3/8" \$5.
WL-1023 7/16" \$5.
WL-1024 15/32" \$5.
(for undersized 1/2" plywood)
WL-1025 1/2" \$6.
WL-1027 5/8" \$8.
WL-1028 23/32" \$8.
(for undersized 3/4" plywood)
WL-1029 3/4" \$9.

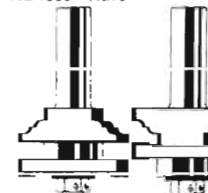


Corner Lock Mitres
For up to 5/8" material
WL-1420-2 1/4" shank \$25.
For 1/2" to 3/4" material
WL-1420-1 1/2" shank \$30.
For material 3/4" to 1-1/4"
WL-1420 1/2" shank \$38.

For the Shaper
Lock Mitre WL-1581 \$40.

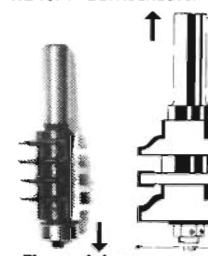


Horizontal Panel Raiser 3-1/2" Dia.
with Undercutter • 1/2" Shank
WL-1346 Ogee \$49.
WL-1347 Traditional \$49.
WL-1348 Convex (Cove) \$49.
WL-1359 12° Facecut with Quarter Round \$49.
WL-1363 Wave \$49.



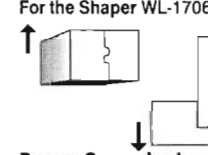
2-piece Rail & Stile Cutter Sets
1/2" Shank Set
WL-1360 Ogee Profile \$59.
WL-1361 Roundover \$59.
WL-1362 Cove & Bead \$59.

1-piece Rail & Stile Cutter Sets
Just raise the cutter to make the matching cut. No changing or reversing.
1/2" Shank
WL-1365 Ogee Profile \$49.
WL-1366 Roundover \$49.
WL-1367 Cove & Bead \$49.
WL-1368 Wedge \$49.
WL-1374 Dbl Roundover \$49.



Finger Joiner Router Bit WL-1429 \$39.
For the Shaper WL-1580 \$89.

Reversible Glue Joint
WL-1430 1-3/4" Diam \$35.
For the Shaper WL-1706 \$35.



Drawer Corner Lock
Makes drawer side separation virtually impossible
1/2" Shank
WL-1435 For 1/2" material \$30.

SHAPER CUTTERS

3/4" BORE

Corner Round
WL-1509 1/8" \$22.
WL-1510 1/4" \$24.
WL-1511 3/8" \$26.
WL-1512 1/2" \$26.
WL-1513 3/4" \$30.
WL-1514 1" \$32.
WL-1515 1-1/4" \$38.

Bead
WL-1520 1/4" \$24.
WL-1521 3/8" \$26.
WL-1522 1/2" \$26.
WL-1523 3/4" \$28.
WL-1524 1" \$30.

Flute
WL-1530 1/4" \$24.
WL-1531 3/8" \$26.
WL-1532 1/2" \$26.
WL-1533 3/4" \$28.
WL-1534 1" \$30.



Rabbeting/Straight

WL-1540 1/4" \$24.
WL-1541 3/8" \$26.
WL-1542 1/2" \$26.
WL-1543 3/4" \$28.
WL-1544 1" \$30.
WL-1545 1-1/2" \$32.
WL-1546 2" \$48.



WL-1500 WL-1501 WL-1502 WL-1503

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WL-1502 Cove & Bead \$89.
WL-1503 Dbl Roundover \$89.

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WL-1602
WL-1603
WL-1604
WL-1605

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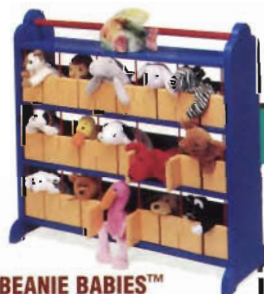
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Try a Little Makita Macho

By John English

Makita's new 18-volt tools come with a universal charger: it works with all the battery voltages in the company line.



Makita just may have come up with enough raw power to satisfy even the likes of television's popular Tim "The Toolman" Taylor. Their new duo of cordless tools features an 18-volt power plant that delivers so much torque, they had to redesign a couple of the tools to handle it. For those of us who can still remember the first feeble generation of cordless tools, the initial word on this macho series was "test for steroids before using."

With that in mind, we decided to give these new tools an informal weekend workout in the shop. Like most woodworkers, we were interested in finding out how their weight would impact steady usage and how much power (and lasting power) they would really deliver.

I took home the 6343 DWAE drill and asked contributing editor Rick White to run the circular saw through its paces.

New Twist on Drills

The first time I picked up the 6343 drill, its size and weight seemed a bit daunting for a cordless. At 5.5 lbs, this would not be my first choice for driving screws into a drywall ceiling all day. I did test it in some overhead positions, and, while it is certainly heavy at odd angles, it's far from unmanageable.



The 6343DWAE drill stood up to tests on several materials. Its 18 clutch settings allow the end-user to choose the amount of torque.

Of course, there's a good reason for all that weight — the 18-volt, 2.0 ampere-hour battery has to be fairly sizeable to deliver its 404 in./lbs. of torque. According to Makita, that makes it the most powerful, longest running cordless drill/driver on the market.

Aside from its weight, the 6343 proved to be a real winner. I tested the drill on several materials, running 1/4" x 3 1/2" lag screws into green oak, plywood and several composite boards. In the oak, I was running 50 of these screws on a single charge with no problem.

Compared to other 18-volt units I've worked with, this drill is very strong. It recharged fully in about 30 minutes, and the fact that it comes with two batteries and a charger means there's no downtime on the job. I like the case, too. It's heavy-duty and keeps everything safe and well organized, especially when you're on a site.

To deal with the enormous torque this drill creates, Makita incorporated several new features into their design. The gear and clutch mechanisms are enclosed in a metal housing, a detachable second handle is included with the drill, and the chuck sleeve is made of metal. Speeds range from zero to 1,400 rpm, and there are 18 clutch settings.

As I said, the size of the battery makes it a little clumsy, and the 1/2" keyless chuck may be a hair undersized, but overall this drill makes a solid addition to the shop.

Tools by the Numbers

6343 DWAE DRILL-DRIVER

Maximum Torque.....404 in/lbs
Net Weight.....5.5 lbs
Speed.....0 to 1,400 rpm

5620 DWA CIRCULAR SAW

Blade Size.....6½"
Weight.....7.3 lbs
Speed.....2,900 rpm

A Cut Above the Rest

"I could have used this a couple of months ago when we put on our new roof deck."

That was Rick's first comment when he reluctantly handed back Makita's 5620DWA cordless saw. He tested it high up a ladder as well as in the woodshop, and was very impressed with its performance. The same high output 18-volt power plant that runs the drill gives this 6½" saw all the power it needs to cut through all kinds of sheet goods and solid hardwoods. Despite extensive testing, the battery never did run down fully. But Rick would like the unit to be shipped with two batteries, rather than the single one it comes with.

The 5620's widely available 6½" blade can cut through 2 X material like studs and planks at

both 90° and a 45° bevel (the saw bevels to 50°). The motor features easily replaceable external brushes, delivers 310 maximum watts of power and spins at 2,900 rpm. A built-in safety lock prevents accidental starts; a shaft lock permits easy blade changes, and an electric brake stops the blade quickly.

Makita's 18-volt universal charger revives all voltage batteries, (both Nickel-Metal Hydride and Nickel Cadmium) and comes with its own carrying case.

Both new tools are covered by Makita's one-year limited warranty and can be serviced at over 350 service centers nationwide.

At 7.3 pounds, the new 5620DWA circular saw is both portable and powerful.



The only **AFFORDABLE-PORTABLE** band sawmill that can be easily carried to the jobsite and operated by one person.



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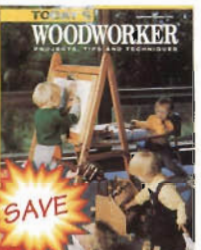
2 Armoire, magazine rack, bentwood curio shelf, European hinges.
38422.....\$4.95...\$2.47



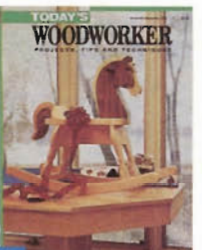
3 Adirondack chair, jewelry box, turning wood, drawer slides.
38430.....\$4.95...\$2.47



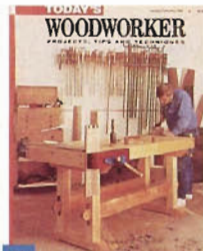
4 Futon sofa bed, KD fittings, blanket chest, antiques techniques.
38448.....\$4.95...\$2.47



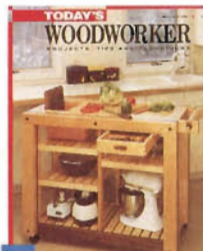
5 Children's activity center, folding footrest, easel, model airplane.
38455.....\$4.95...\$2.47



6 Holiday ornaments, pedestal table, rocking horse, mixing finishes.
38463.....\$4.95



7 Breakfast tray, stamp holders, heart box, European workbench.
38471.....\$4.95



8 Candlestand table, kitchen work station, rolling pin, step stool.
38489.....\$4.95



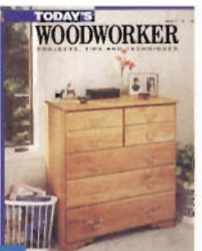
9 Chippendale mirror, continuous grain box, porch glider.
38497.....\$4.95...\$2.47



10 Scroll sawn trivet, cherry corner cabinet, fishing net.
38505.....\$4.95...\$2.47



11 Bookcase, spinning string tops, kid's step stool, desk tray.
38513.....\$4.95...\$2.47



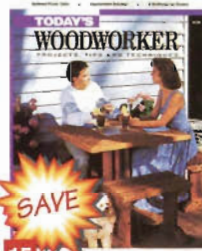
12 Shaker swivel mirror, bureau, deep-reach hand screw clamps.
38521.....\$4.95



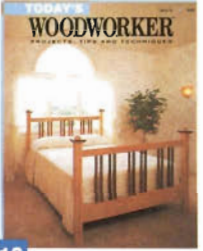
13 Router table, bar stool, tips on buying a new biscuit jointer.
68700.....\$4.95...\$2.47



14 Toybox, Craftsman style rocking chair, compact disc holder.
66860.....\$4.95...\$2.47



15 Picnic table, turned birdhouse, dulcimer, joiner's mallet.
66878.....\$4.95...\$2.47



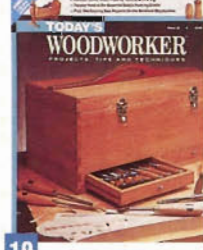
16 Maple and padauk bed frame, mantel clock, coffee table.
71639.....\$4.95



17 TV cabinet, bureau caddy, angler's mobile, toddler's tractor.
72181.....\$4.95



18 Bunk bed, teddy bear rocking chair, Shaker table.
72199.....\$4.95...\$2.47



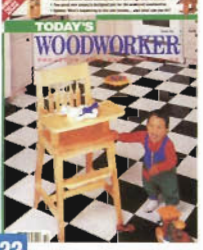
19 Toolbox, swinging cradle, salt and pepper shakers, bookcase.
79582.....\$4.95



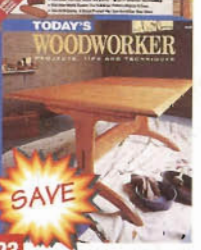
20 Queen Anne desk, carved grizzly bear, table lamp.
79665.....\$4.95...\$2.47



21 Adirondack chair, scroll saw project, deck set, sofa table.
79673.....\$4.95...\$2.47



22 High chair, tavern mirror, display case, weekend bird feeder.
79681.....\$4.95



23 Trestle table, drill bit cabinet, three weekend gift projects.
79699.....\$4.95...\$2.47



24 Serving tray, dining chair, entertainment center, tree ornaments.
79707.....\$4.95...\$2.47



25 Flammable storage cabinet, workbench, toy car, country settle.
88965.....\$4.95...\$2.47



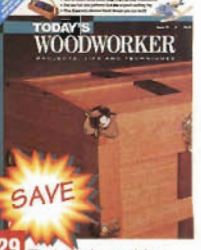
26 Futon sofa bed, crosscut jig, side table, tambour breadbox.
88973.....\$4.95...\$2.47



27 Southwestern desk, folding magazine rack, dovetail layout tool.
88981.....\$4.95...\$2.47



28 Garden bench, fold down bed, whirligig, desktop accessory set.
88999.....\$4.95



29 Toddler's rocking fish, bentwood carryall, steamer trunk.
89004.....\$4.95...\$2.47

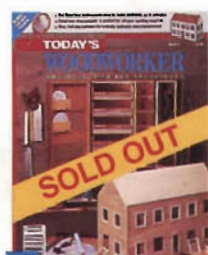


30 Crib, plate rack, rush-covered stool, barnyard animals.
89012.....\$4.95

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31 Mirror, coat rack, dollhouse, sanding supply cabinet, OUT OF STOCK



32 Computer desk, 18 wheeler, cherry end table, CD holder. 97255\$4.95.....\$2.47



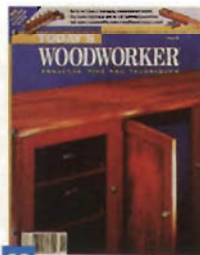
33 Icebox, band saw fence, woodworker's whirligig, deck table. 97263\$4.95.....\$2.47



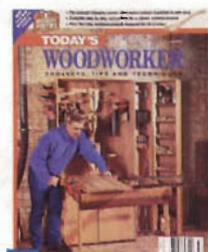
34 Kid's workbench, birdhouse, bookcase, jelly cupboard. 97271\$4.95.....\$2.47



35 Jewelry box, tilt table for drill press, hutch, toy tanker. 97289\$4.95.....\$2.47



36 Pencil box, logging truck, baker's shelf, entertainment center. 97297\$4.95



37 Clamping station, cherry dresser, spice rack, soup spoon. 58784\$4.95



38 Coat rack, phone center, Scandinavian sideboard, tea table. 58792\$4.95



39 Toy car and truck set, antique collector's cabinet, steamer chair. 58990\$4.95.....\$2.47



40 Filing cabinet, loon whirligig, rocking pony, Arts & Crafts end table. 59006\$4.95.....\$2.47



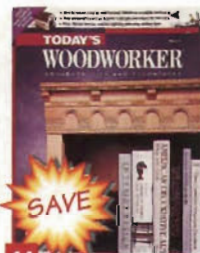
41 Shaker vanity mirror and bench, Stickley fern table, V-block jig. 59014\$4.95.....\$2.47



42 Hobby box, card player's coasters, salmon cutting board, race car. 59048\$4.95.....\$2.47



43 Outfeed/assembly table, chest, mantel clock, crocodile desk. 17419\$4.95



44 Bookcase, toy barn, Greene & Greene hall mirror, golfer's whirligig. 17287\$4.95.....\$2.47



45 Dart caddy, Shaker table, router surfacing jig, gardener's bench. 17295\$4.95.....\$2.47



46 Mahogany humidor, LEGO® center, redwood arbor. 17302\$4.95.....\$2.47



47 Scroll saw blade caddy, steamer trunk, jewelry box, toy Jeep. 17310\$4.95.....\$2.47



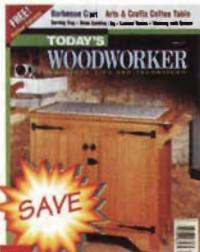
48 Chessboard, toy road grader, kaleidoscope, Chippendale table. 17328\$4.95.....\$2.47



49 Wooden clamp, CD storage cabinet, router table, entryway bench. 21775\$4.95.....\$2.47



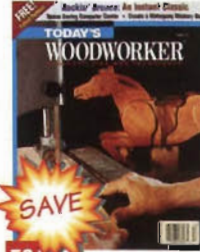
50 Arts and Crafts wine rack, yard wagon, entertainment center. 21783\$4.95.....\$2.47



51 Greene & Greene table, barbecue cart, ceramic serving tray. 21791\$4.95.....\$2.47



52 Bookshelves, folding bench, Beanie Babies® bedroom, cupboard. 21858\$4.95.....\$2.47



53 Compact computer desk/cabinet, rockin' bronco, memory box. 21866\$4.95.....\$2.47



54 Brawny bulldozer, kitchen table, sewing machine cabinet. 21874\$4.95



55 Veneered humidor, rocking doll cradle, shop-built panel saw. 22431\$4.95.....\$2.47



56 Stickley bookcase, Chinese checkerboard, collector's coffee table. 22444\$4.95



57 Grandfather clock, weekend computer table, toy excavator. 22457\$4.95.....\$2.47

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Tackling Larger Projects



My First "Big" Project

Enclosed is a photograph of the entertainment center I recently built for a neighbor, using Rick White's instructions from issue 50 of *Today's Woodworker*. This was my first project of this magnitude. My neighbor requested a few changes, but everything went smoothly, thanks to the plans in your magazine.

Chuck Taylor
Hillsboro, Ohio

WJ responds: Your version is a great piece of furniture, Chuck. We've featured three of these big entertainment center projects so far, and all have been popular.

First-Time Builder

Here is a photo of a blanket chest I built from the plans in *Today's Woodworker* issue 43. This was my first attempt at woodworking of this kind. The carcass is made from oak and the lid and raised panels of cedar.

Ronald Yonish
The Dalles, Ohio

WJ responds: The contrast between hard and softwood is striking, Ronald. Bringing cedar into the picture was a great idea.



Wobble-free Spinning Wheel

I sure had fun making the European Spinning Wheel featured in the January 1983 issue of *Woodworker's Journal*. Construction of the outer wheel rim varied some from the plans with the use of two biscuits in each joint. Surprisingly, the wheel turned out true, no wobble. It is made of cherry and is now part of our living room furniture. It also served as a birthday gift to my wife.

Ken Rankin
Van, Texas

WJ responds: A truly beautiful job, Ken. Judging by the photo, we aren't the least bit surprised the wheel spins true!

A Great Encore

I am sending you a picture of the rocking chair and crib combo from *Today's Woodworker* #55. I made mine out of oak and learned how to make mortise and tenon joints in the process.

Henry A. Schlimm
Menominee, Wisconsin



Henry Schlimm, age 84, last tackled the Yard Wagon (right), featured in issue 50 of *Today's Woodworker* magazine.



WJ responds: It's good to see you're still learning new tricks at



A happy birthday gift for another woodworker's spouse!

the young age of 84, Henry. The rocking doll cradle was the perfect project to work on your mortise and tenon joinery.



Winner! Ronald Yonish will receive a Bosch 1275 DVS sander for his contribution to *End Grain*. Send your letters and photos to: *End Grain*, *Woodworker's Journal*, P.O. Box 261, Medina, Minnesota 55340. If we publish yours, we'll throw your name in a hat for our free tool drawing. Photos of projects from the *Woodworker's Journal* or *Today's Woodworker* are eligible.

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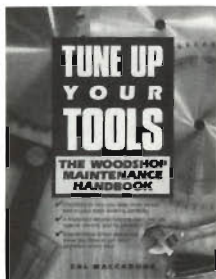
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9"x40T	\$146	\$109	\$98	\$87
30T	\$125	\$99	\$89	\$79
*8-1/4"x40TX 3/32"	\$136	\$99	\$89	\$79
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See American Woodworker April 1998, pp. 64-69.

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DeWalt 8-1/2" & Ryobi 8-1/2"x60TX5/8"	\$179	\$109
Delta 9"x80TX5/8"	\$204	\$119
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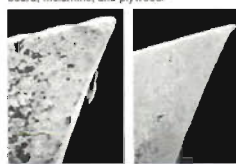
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10" x 80T x 1/8" & 3/32" K	\$207	\$159	16" x 80T x 1"	\$262	\$223
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