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WOODWORKER'S JOURNAL

CONTENTS

June 2021

VOLUME 45, NUMBER 3

PROJECTS



Rolling Task Light

By A.J. Hamler

This articulating solution brings cordless raking light to finishing jobs.

Page 48



Cloud Lift Dining Table

By Rob Johnstone

Greene brother influences and sturdy Beadlock joinery combine to form this compact, stylish table.

Page 26

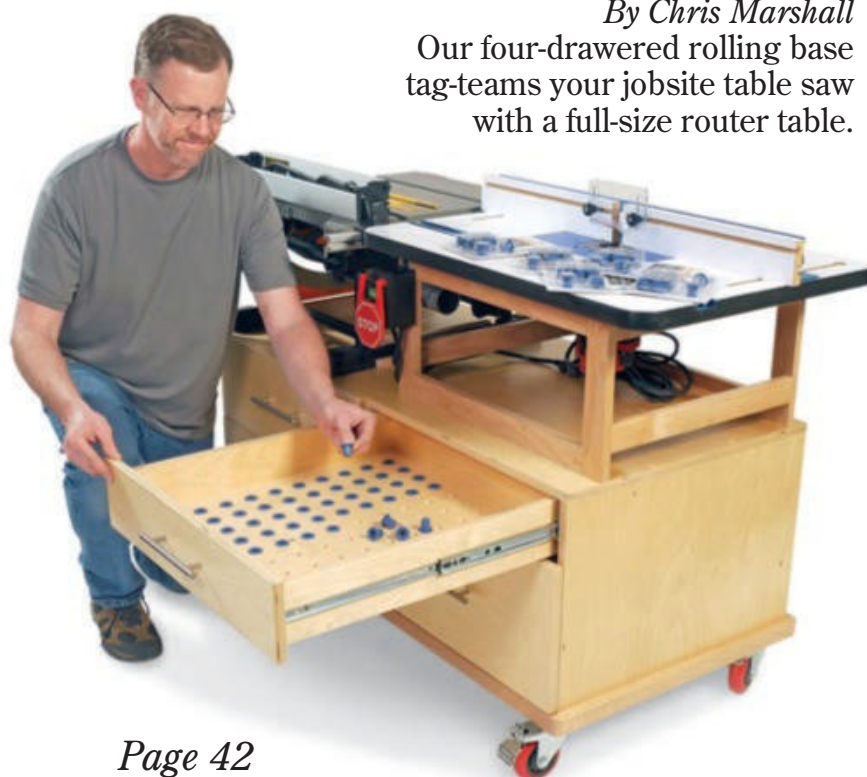


Cedar Potting Bench

By Kimberly McNeelan

Here's a sturdy outdoor project that offers plenty of room for pots and plants while it beautifies your yard.

Page 36



Benchtop Tool Cart

By Chris Marshall

Our four-drawer rolling base tag-teams your jobsite table saw with a full-size router table.

Page 42

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DEPARTMENTS



- | | | |
|--|---|---|
| <p>8 From Our Readers/Stumpers
Readers' thoughts about sealing epoxy with open-pored woods and which option might be food safe.</p> <p>14 Tricks of the Trade
Building a steady rest with in-line skate wheels and magnets, plus a simple way to clamp mitered parts.</p> <p>16 Shop Talk
Woodworkers build desks for distance learning; Rockler expands lumber offerings in stores.</p> <p>20 Woodturning
Carbide-insert tools offer an easy entry-point into turning, but are they the be-all, end-all solution?</p> | <p>52 Getting Started
Understanding wood figure and how to capitalize on it can give projects that crowning touch.</p> <p>54 Tool Tutorial
Our author sheds some light on how a few extra lumens will brighten up many shop tasks.</p> <p>58 Buying Lumber
Roughsawn lumber is wallet-friendly if you shop wisely. Here's what you need to know.</p> <p>60 Tool Preview
Castle USA's 110 Pocket Cutter: a benchtop joint-making solution with an industrial pedigree.</p> | <p>62 What's In Store
General Finishes eco-friendlier poly blend and more economical foam drawer liners from Rockler.</p> <p>64 Finishing Corner
Best practices to keep oil-based poly from bubbling when it's applied and how to harvest burl.</p> <p>66 Hardworking Woods
Longleaf pine might seem better suited for floor joists, but it's a surprisingly apt furniture lumber.</p> |
|--|---|---|



Greene & Greene Dresser

This seven-drawer dresser (plus three hidden drawers!) will give you a woodworking workout. Quartersawn ribbon mahogany used here is consistent with Greene brothers' wood preference. The drawers are assembled with wide box joints to add to the visual feast of this substantial build.

Editor Picks: Greene & Greene Bedroom Set

Architects Charles and Henry Greene were premier designers of homes and furniture. Their distinctive style was popular at the turn of the 20th century and remains so today. Here are three bedroom furniture pieces that are influenced by their designs. You can buy each as a single plan or all three in a combined plan. Originally built by senior editor Chris Marshall, they are elegant heirloom furniture projects. Purchase these plans at www.woodworkersjournal.com/wjfeaturedplans

—Rob Johnstone

Bed in the Greene Brothers' Style

Here's a queen-sized bed suitable for royalty. Its cloud lift motifs adorn the legs and crest rails of what's sure to become a family heirloom.



Greene & Greene-Inspired Bedside Tables

Breadboard ends, ebony accents and cloud lifts combine in these stylish tables. They're the perfect complement to the bedroom set shown here or as standalone projects.



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This downloadable collection includes every project, technique and tool review published in *Woodworker's Journal* throughout 2020, including a Miter Saw Station, English Garden Bench, Five-Spindle Bench and suggestions for gifts from a serving tray to a candlelit centerpiece! We also have plans that include epoxy pouring techniques, tips on moving heavy shop equipment and six guides for getting a perfect finish on any project. Plus, every issue includes tips and tricks to increase your woodturning and finishing skills. This is a perfect addition to any digital woodworking library!

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FROM OUR READERS

Full Speed Ahead!



LOOK OUT, I AM SHIFTING GEARS!

The last year or so I feel like I have been trying to play the game, but someone keeps changing the rules. But even with the pandemic jamming up the gears, I am not complaining. I have been extremely fortunate over the course of the pandemic and my family has done well. Compared to others, my path has been relatively easy. But at the same time, it seems as though I have been stuck in a traffic jam that just keeps

creeping along. You can do this ... oops, not that! Meeting with close family must be delayed to an undetermined future date. Sometimes it seems as if it might speed up a bit ... and then there is a detour, for crying out loud! For all of my good fortune I still have been frustrated by the many pandemic limitations.

But all that is changing now. And if the pandemic year has taught me anything, it is to take nothing for granted. It is truly a cliché to say that little things mean a lot, and taking the time to value them is a good policy. But clichés exist for a reason — they often represent a nearly universal truth.

My plan going forward is to swing out into the fast lane and step on the gas. I don't know how long it will be before giving my sister a hug or shaking the hand of a person I just met becomes normal again. I think it will be some time. Still, soon I will be talking to my neighbor face to face and petting the neighborhood pooches as they are walked past my yard.

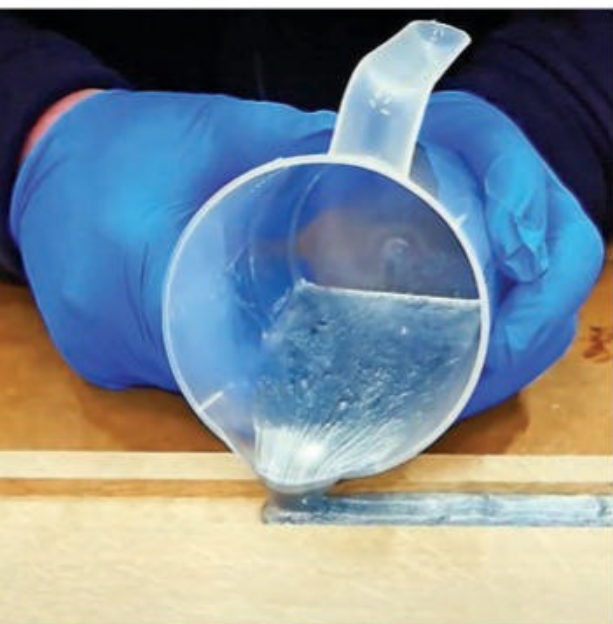
But don't worry, woodworking will still be a main event in my life. I just plan on being that annoying guy who will be telling everyone I meet about my last project!

— Rob Johnstone

LETTERS

Food-safe Epoxy Option

In the October 2020 issue, page 10, Rob Johnstone mentions that



the majority of epoxy manufacturers do not produce food-safe epoxy. I have found that Stone Coat Countertops (stonecoatcountertops.com) offers some terrific FDA food-safe epoxies. Anytime you introduce color or additives to epoxy, it makes it no longer food safe. But Stone Coat's clear epoxy is food safe, and they always suggest adding a clear flood coat. Their Ultimate Top Coat is also food safe and capable of being applied directly to a wood or hybrid wood/epoxy piece.

Joseph B. Ligon
via the Internet

Continues on page 10 ...

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ALYSSA TAUER *Associate Publisher*

CHRIS MARSHALL *Senior Editor*

JEFF JACOBSON *Senior Art Director*

DAN CARY *Senior Content Strategist*

COLLEEN CAREY *Video Production Assistant*

MATTHEW HOCKING *Internet Production Coordinator*

Founder and Chairman

ANN ROCKLER JACKSON

Contributing Editor

ERNIE CONOVER

IN MEMORY OF NORTON ROCKLER

Advertising Sales

ROB JOHNSTONE *Advertising Sales*

rjohnstone@woodworkersjournal.com

(763) 478-8255

Editorial Inquiries

editor@woodworkersjournal.com

Subscription Problems/Inquiries

(800) 765-4119 or

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rjohnstone@woodworkersjournal.com

Safety First Learning how to operate power and hand tools is essential for developing safe woodworking practices. For purposes of clarity, necessary guards have been removed from equipment shown in our magazine. We in no way recommend using this equipment without safety guards and urge readers to strictly follow manufacturers' instructions and safety precautions.

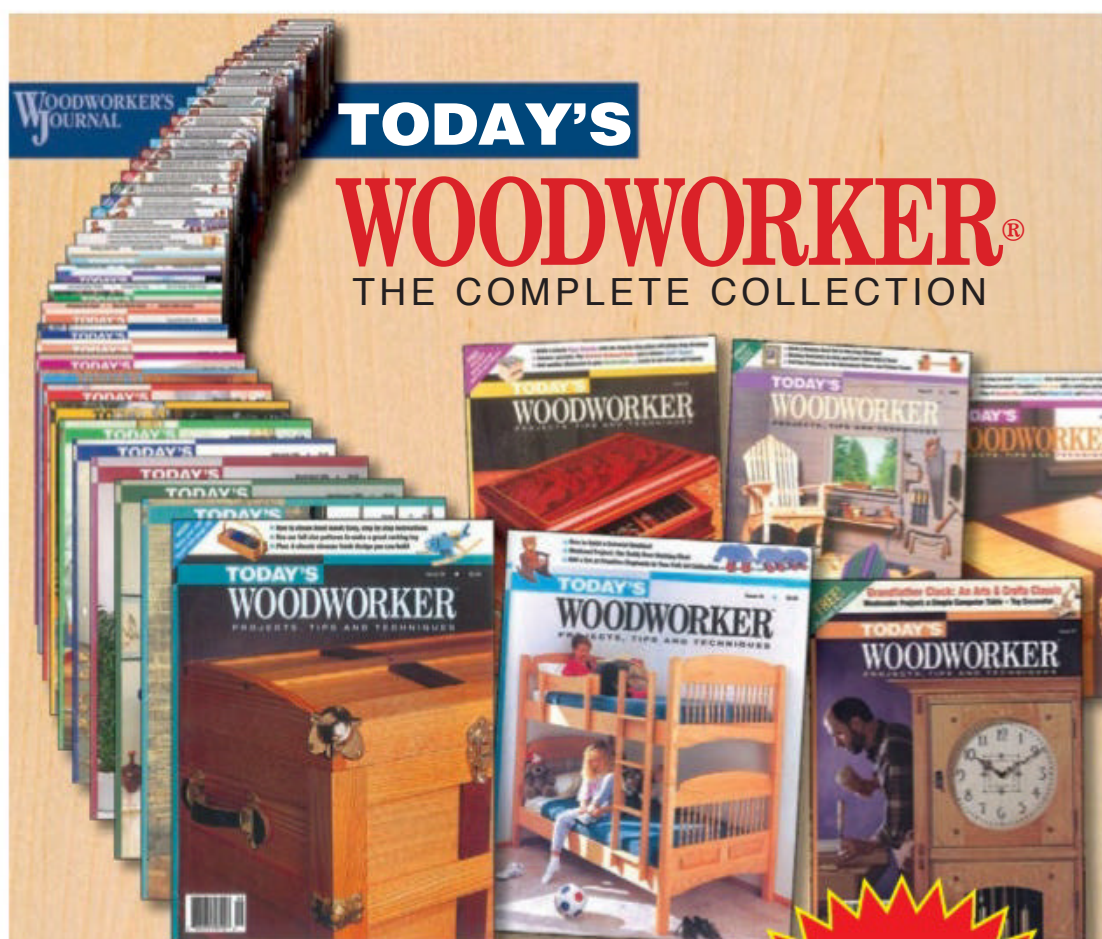
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Should I Use Red Oak Now or Let It Sit First?

I'll be buying kiln-dried and surfaced red oak from my



local big box store for a dry bar project I want to build. I don't have a jointer or planer. Should I work with the wood immediately once I get it back home to avoid warping, or should I let it acclimate in my house where it will be installed

before working with it? I've read a lot of inconsistent answers online and in magazines, so I'm stumped.

Stephen Bellotti
Toronto, Ontario

Rob Johnstone Responds:

I can understand why you have found inconsistent answers to this question, because wood can be mad-deningly unpredictable when it distorts. While I do usually allow wood to acclimate in my shop, it almost never distorts during that period of time. That brings us to your specific situation. Without a

jointer or planer, you really have no way to deal with a piece of wood that might go wonky on you. My advice is to take the time to see if there are any problematic pieces in your batch of lumber. If you have a place to store it, I'll recommend purchasing an extra amount of the oak, just in case a piece or two goes around the bend on you. This way, you'll be able to reject a distorted piece before you start building, and you'll have enough extra stock so that being down a piece or two won't stop you in your tracks. I

READER PROJECTS



Reader's Version of Sandry's Ginkgo Leaf Table in Cherry

Willie Sandry's talent for design really came through in his "Ginkgo Leaf Table" project [October 2020]. I built my iteration of it using black cherry with ornamental cherry from a friend's yard for the legs. The finish is polyurethane with no stain in order to let the beautiful natural cherry colors shine.

Sim Galazka
Crozet, Virginia

Archival Dictionary Stand Plan Delivers

I've been a *Woodworker's Journal* subscriber since the 1980s, and I save every issue. So when my 1929 Webster's dictionary needed a stand, I built one using a plan I found in the July/August 1986 issue. I constructed it from lumber I harvested from a walnut tree in our yard that had died of natural causes. My sincere thanks. Your plans never let me down!

Ted Waller
Durham, North Carolina



usually add 30 percent to the amount of lumber I purchase for a project. This extra wood also allows for cutting out flaws or when I make an occasional mistake. Since you're a new woodworker, you might even want to up that percentage. There's no way to prevent wood movement, but planning for it ahead of time can help you cope with it.

Safe Way to Cut “Shorts” on a Miter Saw?

I'm a very new woodworker with a 10" miter saw. I can't figure out how to safely make cuts on smaller pieces of wood when the workpiece is too short to be held in place with the saw's hold-down clamp. I also want to cut thin rectangular pieces of wood lengthwise. Is there a clamp or jig that could help

me make these cuts without losing a few fingers?

Jarvis Elizabeth
via the Internet

Chris Marshall Responds: Smart move on your part asking for help before making unfamiliar and potentially dangerous cuts — and both of the two examples you mention are *Continues on page 13 ...*

There's more online at
woodworkersjournal.com



Check online for more content covering the articles below:

Woodturning (page 20):
Watch a demonstration of carbide-insert turning tools (video)

Cloud Lift Dining Table (page 26): Overview of the complete building process, plus using Beadlock joinery, glazing technique and routing inlays with Shaper Origin (videos). Leg and apron template patterns (PDF).

Benchtop Tool Cart (page 42): Take a tour of this project's various features (video)

What's in Store (page 62):
Featured tools in action (videos)

SURVEY

WE ASKED OUR SURVEY GROUP ABOUT VENEER

Veneering has been around since ancient Egypt and is a way to add detail and variety to your work. Here's what we learned about its popularity.

Have you ever completed what you would consider a significant veneering project (tabletop, cabinet carcass, etc.)?

Yes 32.02%
No 67.98%

If you do not use veneer in your woodworking, why not?

I do use veneer regularly	16.06%
I don't know how to apply it	3.92%
I don't like how it looks	4.7%
I don't know where to buy it	1.83%
I don't do that sort of woodworking	20.5%
Never really considered it	26.37%
Other	14.1%

Is veneering something you would like to learn more about?

Yes 47.45%
No 52.55%



STUMPERS

February's Reptilian Wrench

Your Trains of Thought About It

What's This?



Mike Walker's T-handled mystery tool has what appears to be five pointed cutters that each are held in place with a slotted screw. "I would like to restore and use it if I can figure out what it's for," he says. Do you know what this tool is and how it might still be useful today?

Email your answer to stumpers@woodworkersjournal.com or write to "Stumpers," Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340.

Pat Graeser, who purchased February's mystery tool, will have a fair amount of information about its former uses, thanks to your guesses and even direct experience with wrenches of this sort.

There were a couple of farther-flung hunches at what this unusual wrench might be for. "It looks like a jar lid opener," offers **Jim Thompson**. "This is a faucet wrench," said **Kenneth Salsman**, "and it's for removing the top nut to replace the faucet washer."

Well, nice guesses, guys, but your fellow sleuths will beg to differ with you here.

The general verdict that rose from the murky swamp of history is that this wrench's jaw style points to its purpose. You'll recall that the jaws open like a "V," and only one of them is toothed.

"It's an alligator jaw adjustable wrench," say **David Hayward** and **Robert Yearwood**, among others. **Smokin50** adds that the tool's manufacturer is likely Elgin, although he doesn't qualify why.

Thad Spates also agrees that the wrench might be an Elgin, and he says he hopes he's right about how it's used and by whom. "At least in the trades I saw, it was used by pipe-fitters as a kind of slip ratchet. This is why there are teeth on one side and the other (jaw) is slick. Basically, it would fit bolts, rods and small pipe of odd sizes. The idea is that one side would



Denny Mandeville's fixed-jaw "fitzall" wrench (above) was handy in the days before standardized fastener sizing. The smooth jaw registered against a nut's flat, and the toothed jaw engaged its corners (inset). **Pat Graser's wrench (top photo)** is an adjustable version of the same basic style.

grab or bite into the metal/steel, and the other would slip. This would allow a ratchet-like action with a back-and-forth movement. One side would tighten while the other would loosen."

Paul Dino is in agreement with Thad about who might have kept this wrench in a tool bag. "(Its) alligator-shaped mouth was used to turn iron and steel pipes and rods that could not be turned with a regular wrench. A pipe-fitter often used such a tool in fitting or removing air and water piping from a locomotive."

Paul Duffield's thoughts about the wrench turn to choo choo trains, too. "Possibly it was used to get spots on locomotive or early automobile pipes," he speculates. "The adjustable design and the screwed cover is what makes it so unusual."

"It's meant for square bolts, suggests **Tyler Lorenz** of New Braunfels, Texas, "and this happens to be an adjustable model. We once came across a very similar wrench while cleaning out

my great-grandfather's old shop that had been accumulating random tools and odd auto parts since around 1900. Based on his memory, it was used during his time on trains to work on steam and water pipes, more so than square bolts."

"Pat's wrench is an adjustable takeoff of the early fixed-jaw 'fitzall' wrenches," adds **Denny Mandeville**, hailing from Sedonia, Arizona. "In the days of square-head nuts and bolts, before common sizing was established, these wrenches were a way to speedily run the fasteners. When you bought a piece of equipment or a car, it came with wrenches to fit that manufacturer's sizes ... The tooth side gripped the edge of the nut, and the smooth side offered a fulcrum. You didn't have to take the wrench off the flats like an open-end wrench. Just slip it to the next corner and pull. As you could imagine, the teeth could do some damage to the edge of the nut, so they were really only for industrial usage."



The long line and “no hands” symbol embossed into the table near the rim of this miter saw’s protractor scale marks the “danger zone.” Anything inside this area is too short to be held in place by hand for cutting.

just that. If you’re crosscutting very short workpieces that the saw’s clamp can’t even reach, you’re tempting fate. Miter saw tables are marked with a “danger zone” for hand-holding workpieces, and it’s wise to honor it. Find a longer workpiece that the clamp can reach or that you can hold safely, and crosscut your short workpieces from that instead. As to making a long-grain “rip” cut on those rectangular pieces — your second example — please don’t do it. A miter saw is never the right tool for rip cuts. That’s a job for a table saw or band saw instead.

Sealing the Deal

I decided to make my own version of the “Lollipop Clock” [December 2020, page 44] on my Next Wave Shark HD4 CNC machine. While Rob used walnut, I made mine from red oak and took his advice to seal the wood with shellac before filling with epoxy the pockets I had routed out. But despite my efforts, I could not remove all the air bubbles in the epoxy with my heat gun before it cured. I called the epoxy manufacturer and was told that since red oak is open-grained, shellac is not enough to seal the grain.

It will keep off-gassing, causing the air bubbles to continue while the epoxy cures. Lesson learned. While I enjoyed making the project, I would like to advise other woodworkers who are new to using epoxy as an inlay or a final coating to be mindful of the type of wood and to take the appropriate steps to seal the grain. I found out the hard way, and I hope others can learn from my mistake.

Jim Fox
Hartford, Iowa



Rob Johnstone Responds:

I am relatively new to using epoxy as an accent, and I’ll bet my results might have been the same as yours if I had worked in oak or ash. I am guessing (and it is just that at this point) that if a person was to apply three heavy coats of shellac and then one coat of polyurethane, the combination would seal the grain sufficiently. In any case, I’m sorry these challenges occurred for you. Thanks for sharing your findings!



TRIVIA

Just Say No to Silicone Spray in the Shop

Silicone-based products work well for rust prevention and general lubrication but can be vexing in the wood shop. Silicone seems to find its way onto everything in the shop either by contact with fingers or other carriers, or by atomization when sprayed. And because nothing likes to stick to silicone, it will interfere with glue adhesion and finish application when and where you least expect it. The safest solution is strict avoidance: do not allow silicone in your shop in the first place. Ever. Period.

Ron Hock

The Ultimate Guide to Sharpening for Woodworkers
Popular Woodworking Books; ISBN: 1440329958



TRICKS OF THE TRADE

Fresh Ideas for Bracing Miters and Turnings



Clearing Spray Nozzles

Instead of inverting cans of spray varnish and blasting the nozzle to clear them, I pull off the nozzles and soak them in a jar of mineral spirits. I leave the nozzles submerged in the solvent until I need them again. It saves propellant and finish while ensuring that the nozzles never get gummed up with dried varnish between uses. I've used this method for years with good results.

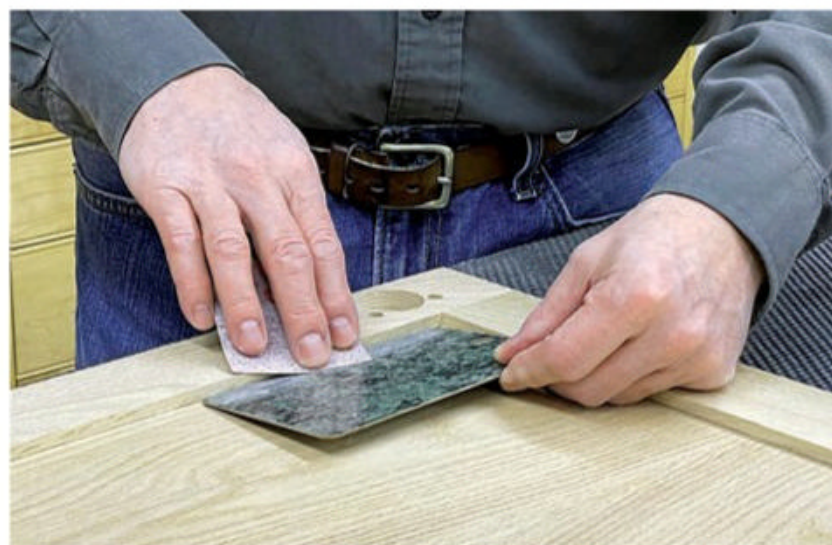
Dennis Weber
Glendale, California

Scratch Awl from Scratch

Discarded screwdrivers tend to become paint can openers, but here's another way to give them a second life. When I needed a scratch awl, I took one of my Phillips screwdrivers and re-shaped the tip on my bench grinder. I followed the grinding by sharpening the tip to a point on a piece of plate glass with sandpaper adhered to it. The whole process only took about 15 or 20 minutes. Now it's the only awl I use.



Alejandro Balbis
Longueuil, Quebec



Cabinet Door Sanding Shield

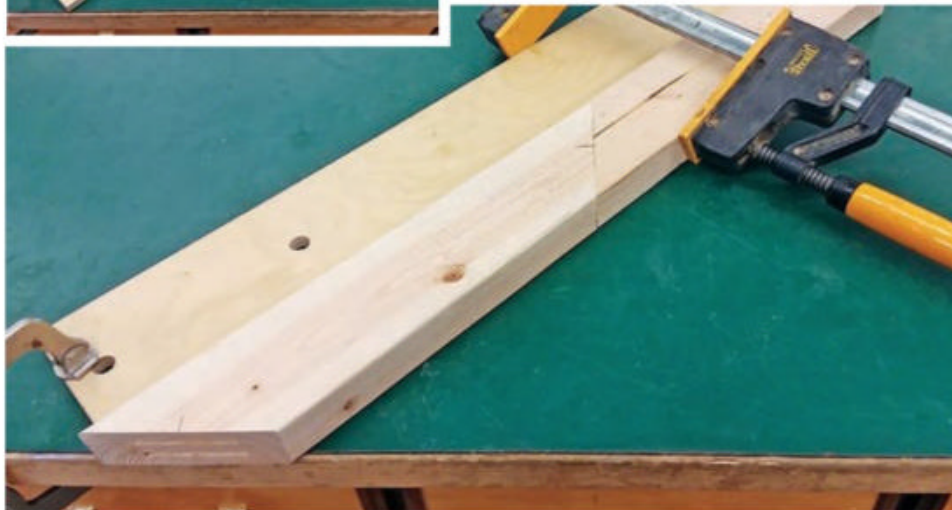
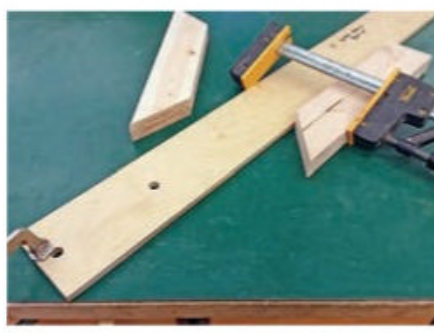
I've built a lot of traditional style frame-and-panel cabinet doors with flat panels. The challenge is sanding the inside edges of the rails and stiles without scratching the panel, whether that panel is prefinished or not. My solution is to use scrap pieces of plastic laminate to protect the panel's surface as I sand the inside frame edges. Slide the "protector" along as you sand the edges. In the past, I used thin cardboard as my protector, but it wears out quickly. Plastic laminate holds up to sanding much longer.

Bruce Kieffer
Edina, Minnesota

Holder for Mitered Workpieces

Here is a convenient and easy way to secure mitered workpieces when you need to cut biscuit slots into their angled ends. Just clamp a long scrap rail across the bench, and clamp a second mitered scrap to it to act as a stop. Align this setup on your bench so you can insert your mitered workpieces into it and access the part end easily with the biscuit joiner. I use this method when I need to create a lot of mitered frame parts, because it really speeds up the slot-cutting process.

Dan Martin
Galena, Ohio



PICK OF THE TRICKS

Magnetic Homemade Steady Rest

Here's a homemade steady rest system I've created for woodturning. I built it using the wheels and mounts from a pair of old in-line skates. I fashioned the articulated joints for each of the three rests from hardwood and bolts. They mount to my Excelsior mini lathe's bed using 150-lb break-away Magswitch magnets (item 21910) I purchased from Rockler. Once the rests are positioned and the magnets are turned on, tightening the bolts on the rests holds the wheels in place against a bowl or spindle. The system works great, and it can easily be retrofitted to any lathe.

Al Fletcher
Mahtomedi, Minnesota



In addition to our standard payment (below), Al Fletcher of Mahtomedi, Minnesota, will also receive a Milwaukee M18™ Rover™ Dual Power Flood Light for being selected as the "Pick of the Tricks" winner. We pay from \$100 to \$200 for all tricks used. To join in the fun, send us your original, unpublished trick. Please include a photo or drawing if necessary. For your chance to win, submit your Tricks to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340.

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SHOP TALK

“Space to Learn” Desks Build Community

By Colleen Carey

WJ staffer joins in the fun to help Minnesota distance learners.



Colleen Carey, Woodworker's Journal's video production assistant, delivers one of 20 desks she made for “Space to Learn.”



A templated plan for the “Space to Learn” desk ensured that all desks would be constructed uniformly and meet program guidelines.

As a “newbie” woodworker, I get excited about the little things, like when a part actually fits into a dado or when my cutting board pattern lines up! I am sure this sounds silly to many of you, but these feelings of accomplishment are what fuel my passion for this craft.

In mid-November 2020, a local television station publicized that the Minnesota Tool Library was organizing a “Space to Learn” project. The purpose of “Space to Learn” was to build desks for students in the St. Paul public school system who are studying from home but don’t have a “space” of

their own to do homework. I thought getting involved would be a great way to practice my skills.

I learned that the Minnesota Tool Library (mintoollibrary.org) is a member-based, volunteer-driven nonprofit that empowers people to “Fix Their Stuff and Fix the World.” They have over 5,000 tools to borrow, a community woodshop/maker space and they provide DIY classes and workshops. Its mission is to cultivate a more resilient and equitable community, reduce waste and empower residents with access to tools, training and workspaces.

The demand for desks was high, I was told. After

Client members checking out a variety of more than 5,000 loaner tools at the Minnesota Tool Library, prior to the beginning of the 2020 pandemic.



the news story aired, the Minnesota Tool Library said they received between 1,500 and 2,000 requests for desks. Organizers had to limit the distribution to one desk per household, due to time and resources, except for families with many distance learners.

The organization created a template for the “Space to Learn” desk and originally thought they could build the majority of the desks in socially distanced volunteer groups at their facility. But because of the tightened restrictions in the state, they had to readjust to at-home builds and smaller in-person efforts instead.

Stab in the Dark

I decided to build the desks in my garage shop, along with about 80 other volunteers/households. They sent the template and plan to me, and off to the store I went for materials. I committed to building four desks in about three weeks, which was a total stab in the dark as I had never built a desk before and had no idea how long it would take.

Needless to say, it took me a lot longer than three weeks, but I finished them! I delivered the desks to Minnesota Tool Library so they could do their quality check and distribute them to the community. What happened next came as a complete surprise: I pulled into the facility, and a feeling washed

over me that I wasn’t expecting. To see the hundreds of desks other woodworkers and community members had made for these kids was overwhelming. It gave me goosebumps!

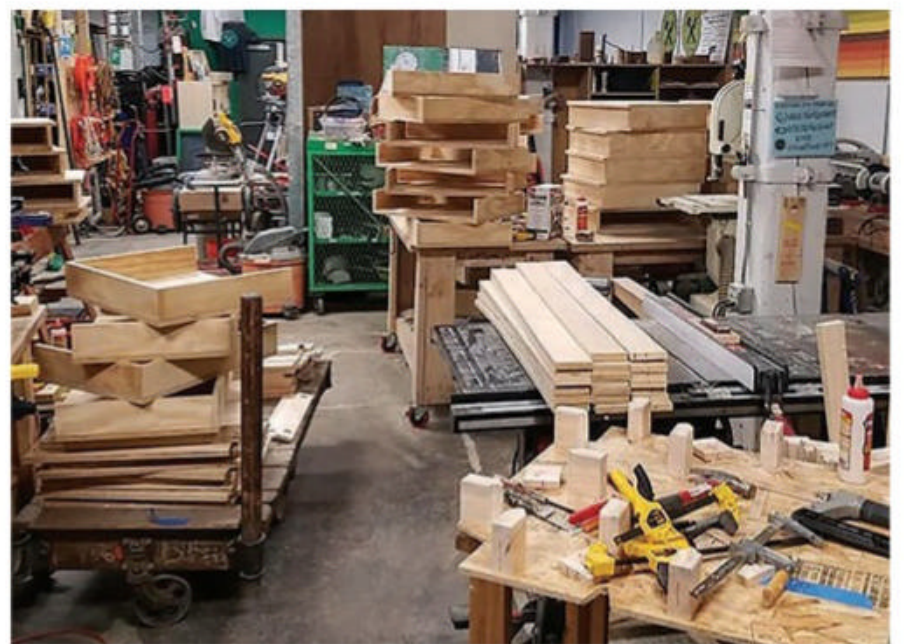
This was WAY bigger than me learning some new skills. Our community had come together and provided a “space” for these children to call their own. A space they could be proud of and continue to learn in these very difficult times. But I learned there was still a lot of work to do. It was mid-December, and while 300 desks had been built, the goal was to have 500 made by the beginning of January.

I immediately signed up to help assemble more desks for a four-hour shift on a Saturday. I also took building materials home to help fulfill the need. All in all, I made about 20 desks. During the process, I improved my ability to make angle cuts. I also learned that patience during big projects really pays off.

When people come together it matters, and we woodworkers can make a difference. More than 600 families were able to give their children a space to



With safety glasses and masks in place, St. Paul Desk Build volunteer team leaders Katheryn and Chris busily assemble desks.



Some 500 desks were built at the Minnesota Tool Library and other smaller build venues and home shops to help Twin Cities area school children distance learn from home.

learn, thanks to woodworkers getting involved! I am proud of the woodworking community in St. Paul, and I can’t wait to see what we can build together in the future.

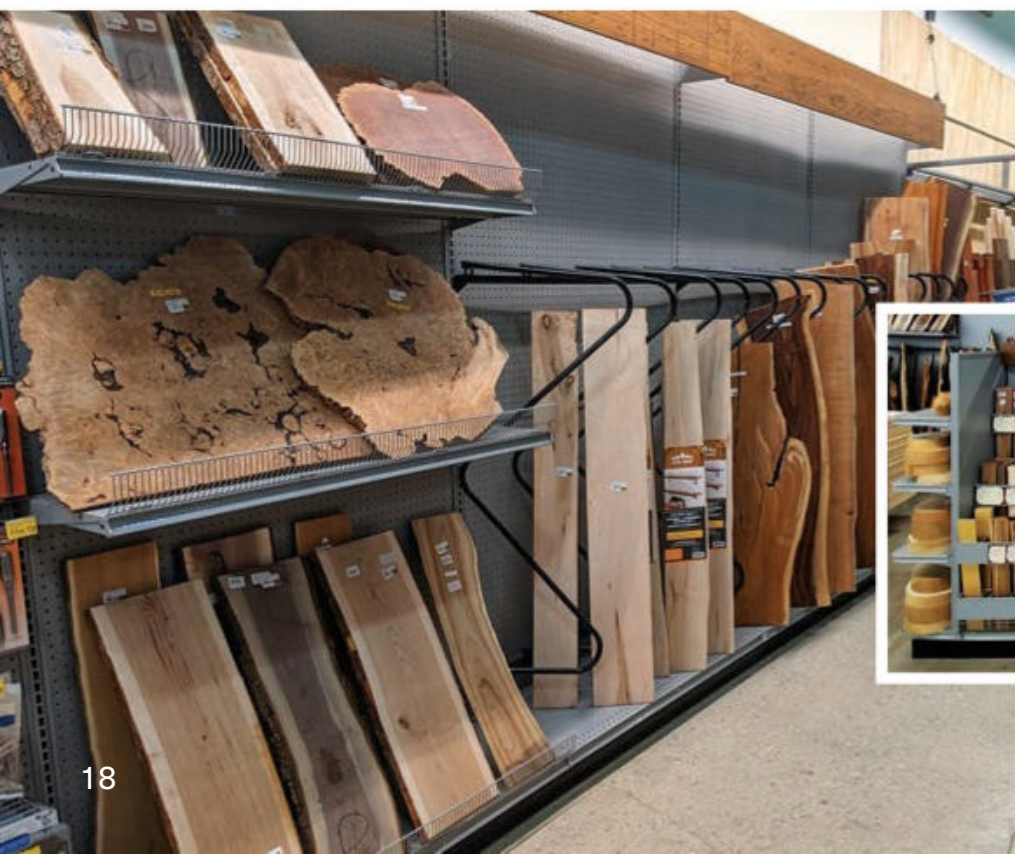
More Lumber, More Variety

Rockler responds to customer demands for lumber by expanding these resources in select stores.



To help meet customer demand, many Rockler retail stores are more than doubling the amount of in-store lumber supplies.

Along with more surfaced flat lumber, Rockler has expanded the slab and live edge selections as well as turning blanks.



After testing out the concept at a couple of choice locations, Rockler Woodworking and Hardware stores are moving forward to expand lumber offerings. The goal is to make visiting a Rockler store an even more complete one-stop destination for project needs.

"Across the country there has been a significant increase in our customer demand for quality lumber

Joe Kester, Rockler's vice president of retail.

In many stores, these expansions of lumber inventory are significant. For example, in Maplewood, Minnesota, the store's lumber area has increased from 800 square feet to 2,600 square feet. The Sandy Springs, Georgia, store has also expanded its lumber display from 800 to 2,600 square feet. In Seattle, Washington, the store now offers 1,800 square feet of floor space for lumber — up from the previous 400.

So what's on the racks? Shoppers will find hardwood such as walnut, hard maple, cherry, red oak and poplar,

to support home improvement, woodworking and other DIY project needs," says

plus exotic species like mahogany, padauk, purple-heart, zebrawood and black limba. An expanded selection of high quality Baltic birch plywood in several sizes is also available for cabinet construction and small projects.

Rockler now carries more live edge slabs for one-of-a-kind tables, an impressive variety of turning blanks for pens, handles and bowls, and a diverse assortment of veneer, including many fitch cut book-matched varieties.

More Lumber Services

These new areas are staffed by lumber experts who can help customers plan their material lists and select the right species and boards. Stores will also cut boards to length for free, so customers pay for only what they need. If additional milling is desired, the staff can rip or plane the lumber to the desired size for a fee.

Rockler is also expanding its online lumber offerings at rockler.com. If you haven't visited a Rockler store, a locator on the website can help you find a location near you.





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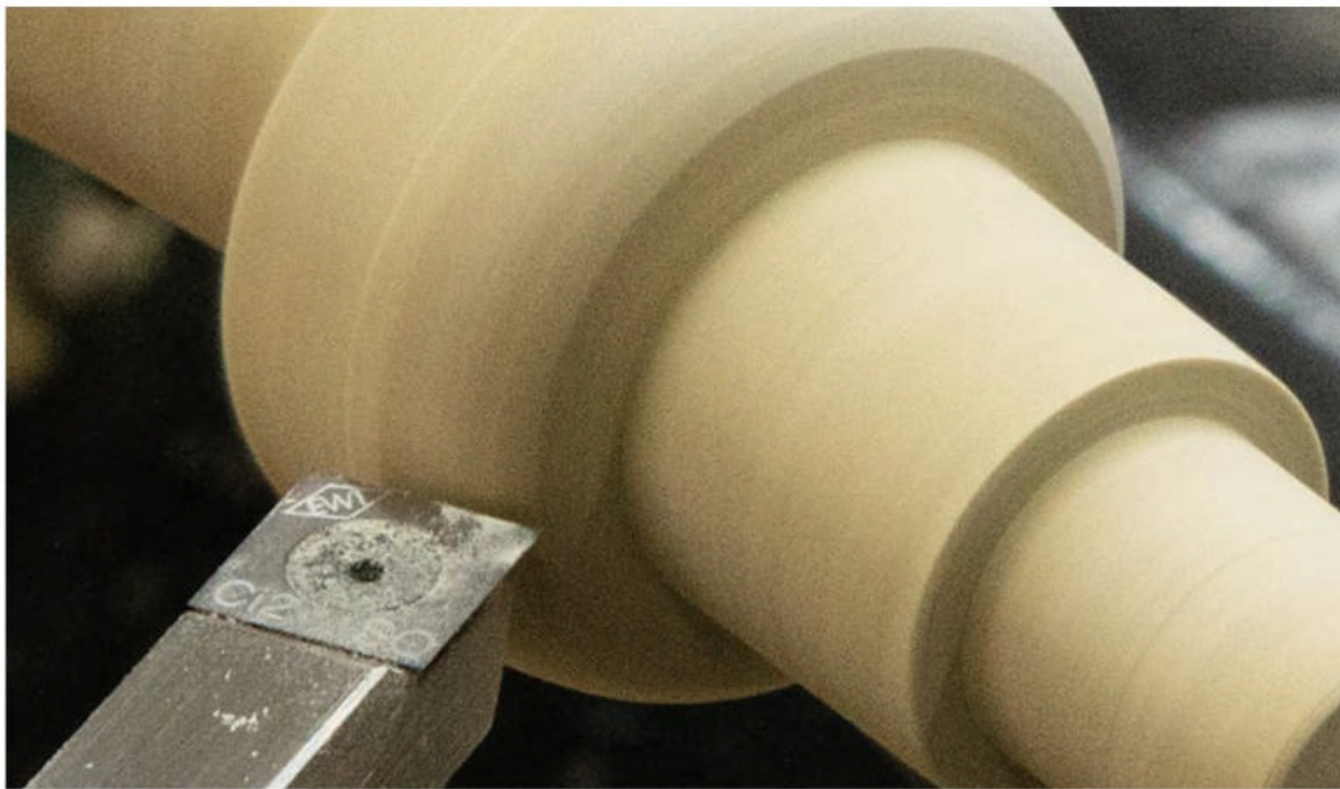


WOODTURNING

Carbide-insert Turning Tools

By Ernie Conover

Easy to use without sharpening, these tools answer the call for some situations. But keep in mind, no tool is a turning panacea.



up better. Holders for square inserts allow using perfectly square inserts with sharp corners, or the edges of the square may be radiused.

Carbide: Pros and Cons

Tungsten carbide is about twice as heavy as steel and extremely wear-resistant; it holds an edge for an incredibly long time. However, it can only be ground with CBN (cubic boron nitride) or diamond particles. For this reason, most users cannot sharpen carbide inserts on these tools. But the whole idea of the system is that they are cheaply replaceable, so expendable. Finding the right mix of carbide and tungsten is critical to having an insert that can be brought to a thin edge and holds up in service, so it is best to buy good quality replacement inserts for these tools, even if they cost a bit more.

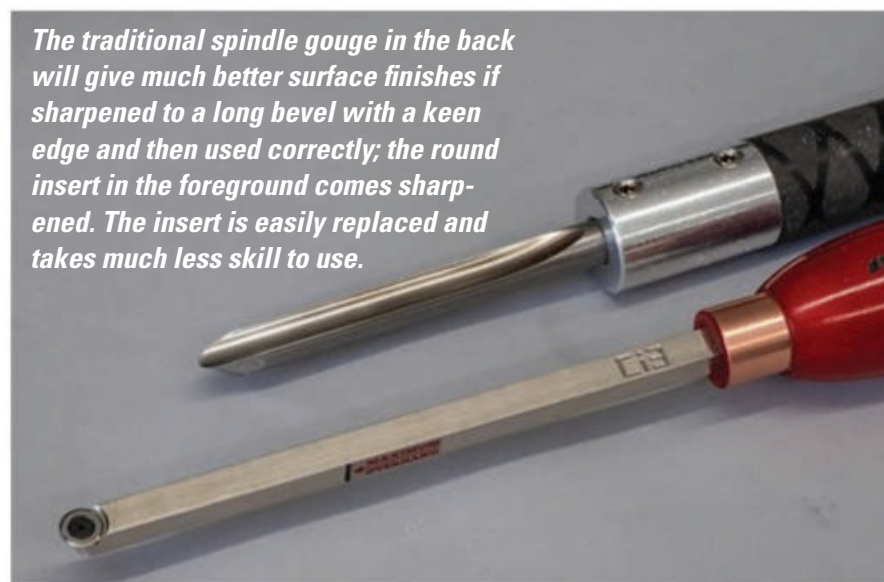
There is a downside to carbide and that is that it cannot be brought to as

square and diamond shaped inserts. Typical inserts are flat-topped with a slope in the sides that gives the tool clearance or allows it to be pointed slightly uphill for a shearing cut in woodturning. Some are trepanned behind the top edge, giving them a much thinner upturned cutting edge that results in better chip forming and breaking the resulting swarf

Tungsten carbide insert tooling has been used in metalworking for many years. Typical insert tooling consists of a shaft or block with a pocket for the tungsten carbide insert (cutter) which is mechanically held in the pocket either by a clamp or with a socket head or (more recently) a Torx screw. Rather than removing the tool for sharpening the insert may be turned or replaced.

That this technology should be applied to woodturning tools is logical. Carbide-insert woodturning tools consist of a handle with a shaft that ends in a pocket, into which an insert can be attached with the aforementioned socket head/Torx screw. Most companies offer three different tools with pockets shaped for round,

The traditional spindle gouge in the back will give much better surface finishes if sharpened to a long bevel with a keen edge and then used correctly; the round insert in the foreground comes sharpened. The insert is easily replaced and takes much less skill to use.



MORE ON THE WEB



Watch the author compare carbide-insert and conventional turning tools by visiting woodworkersjournal.com and clicking "More on the Web" under the Magazine tab.



The tungsten carbide inserts on these tools come in three basic shapes: diamond, round and square. A fourth square profile with radiused edges is also available.



Conventional steel turning tools must be routinely sharpened, and that takes gear. This array of sharpening equipment costs a minimum of \$400.

thin an edge profile as steel. In the case of scrapers it cannot be brought to a burr. Using the tool is very much akin to using a conventional scraper, albeit level rather than sloped downward. On spindle turning the results from insert tools needs more sanding than properly sharpened conventional tools in experienced hands. This last sentence is my disclaimer of the sort often said at breakneck speed in TV drug commercials. On bowl turning, especially hollowing the inside of a bowl, the results are often about the same as a gouge, in the hands of new or inexperienced turners.

Insert Tool Advantages

While many, whether they turn wood as a hobby or professionally, bristle at the mention of carbide tooling, they are sloughing off the instruction, time and practice it took to become proficient. They also neglect to mention the countless pieces fed into

the wood stove during their learning process. Many who buy or inherit a lathe lack a bench grinder that will be necessary to sharpen conventional turning tools. In addition to a grinder, they will also need some jigs if they are to obtain consistent results. With insert tools, there’s no need to sharpen, so there’s no need to invest in the required sharpening equipment. For the furniture maker who just wants to make some legs, stretchers or finials, carbide makes a lot of sense. Likewise, the grandparent who wants to turn some spindles for a cradle for their first grandchild, on the old lathe that has been gathering dust for decades, can use insert tools at a great cost savings. A young person can turn pens without being intimidated by process, because insert turning tools require very little finesse to use properly: hold the tool level and so the cutter is even with the axis

of rotation. Push the edge into the wood to start cutting, keeping the tool level. Insert tools also enable you to turn soapstone, alabaster and resins. On stone, carbide tools outperform conventional scrapers, which dull so fast that you need to resharpen them every few minutes.

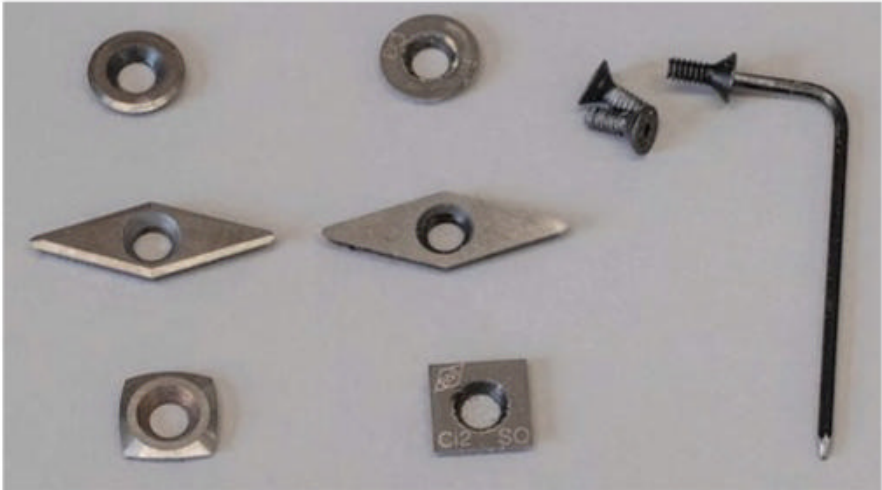
Attack Angles

Every substance has an optimum attack angle at which a chip will be raised. For wood and most metals, a positive angle, in which the top of the tool is sloped toward the cut, works best. For brass, copper and resin plastics, such as acrylic, a negative rake is desirable. The top of the tool is dragged but a chip

Positive rake cut in wood

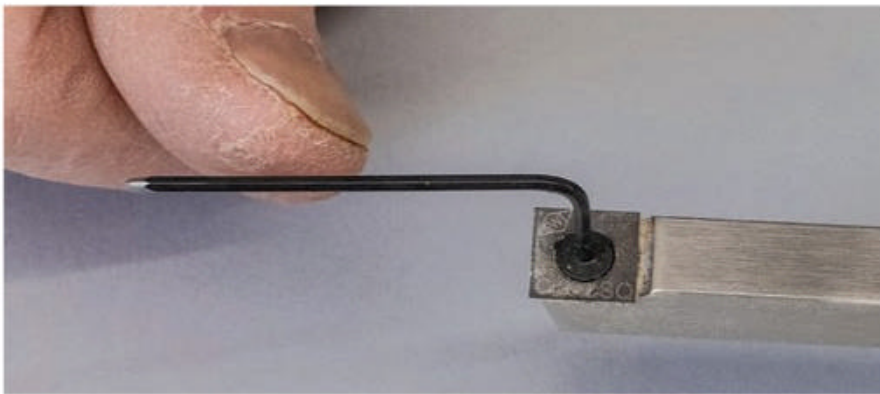


Negative rake cut in resin plastic



Easy Wood Tools has design patents on each of the negative-rake inserts on the left. They are good for turning resin plastics, ivory nut and very hard woods. Equivalent standard inserts on the right are for general spindle and faceplate turning.

Advantages and Disadvantages of Carbide-insert Woodturning Tools	
Pros	Cons
No sharpening necessary or equipment needed	Cannot be brought to long bevels or to a burr
Short learning curve for use	Much more difficult if not impossible to make some spindle shapes
Tools with larger shafts for long rest overhangs are great for material removal from the inside of tall, deep hollow forms with small mouth openings	Finish is not generally as good as achieved by a properly raised burr dragged on the centerline. However, a conventional scraper often has to be ground with a negative rake to accomplish this.
Perform well for bowl work, especially hollowing out the interior	Seldom give as good a cut on end grain transitions as a properly sharpened and presented gouge will



When changing or rotating an insert, it is most important to get all of the dust out of the hex or Torx recess in the screw so that the wrench bottoms out. On this hex key, the author has ground one end to a point to clean out the hex recess in the screw before attempting to loosen or tighten it.



Using a square insert tool to scrape a bead.



Using a round insert tool to cut a cove.



Using a diamond insert tool to cut a groove.

is still formed. For machining brass, a negative five degrees of rake is optimum and the same goes for resin plastics. Easy Wood Tools has recently introduced negative rake inserts for their tools specifically for cutting resin plastics and very hard woods. They hold three design patents, one for each shape of cutter they offer.

Insert Tool Disadvantages

If insert turning tools have an Achilles heel it is the screw that affixes the insert in the pocket. It is prone to becoming impacted with swarf, dirt and finish, making it difficult to fully engage a hex/Torx wrench to the bottom of the recess. Cleaning out the recess with a pointed tool is imperative if you are not to strip the fit with the wrench, whereby it's impossible to remove the screw. I often grind the long end of the hex or Torx wrench to a point, making this tool dual-purpose. An occasional drop of lubrication on the screw threads is good preventive maintenance, too.

The wood you turn makes a big difference in finished turning regardless of the type of tooling you use — conventional or insert. Maple is very easy to bring to a pleasing finish with almost any tooling. Poplar and most pines need sharp tools with a rubbing bevel. Teak wears tooling so fast that, like stone, you keep the grinder nearby and running. Examples one and three are good candidates for carbide-insert tools.

What's My Verdict?

If you have not guessed by now, the purpose of this article is to take a neutral stand between conventional steel turning tools and carbide-insert options. I have endeavored to give you the pros and cons along with cases for each, and let you decide your best path. With ten thousand hours of turning many times over, I am a confirmed conventional tool junkie, but that may also be a streak of hubris common to many skilled craftspeople.

I admit to having a stock of carbide-insert tools that I lend to students who are struggling. I reach for them myself when they do the job better, most frequently when I'm deep-hollowing through a small mouth opening of hollow-form vessels.

If you are unsure of your inclination toward turning, a good strategy might be to start out with insert tools and make some projects. If you find turning to be fun, you can then buy some conventional tools and segue into them, along with the sharpening methods you'll need to learn, as your skills improve. Carbide-insert tools are a great way to entice someone who has never turned into a great pastime. Conversely, if you find turning to be drudgery, you have saved a lot of money on grinders and jigs but can still turn out the parts you want as needed.

Ernie Conover is the author of The Lathe Book and Turn a Bowl with Ernie Conover.



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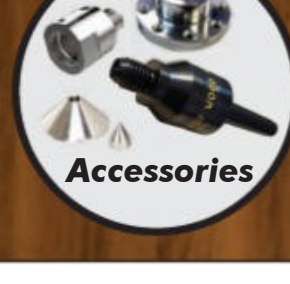
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Cloud Lift Dining Table

By Rob Johnstone

With a nod to the Greene brothers, this compact dining table offers style and functionality in a sturdy furniture piece.



When you stop and think about it, we spend a good bit of our lives sitting at our dining tables. It is a place where family spends time together eating, doing home-

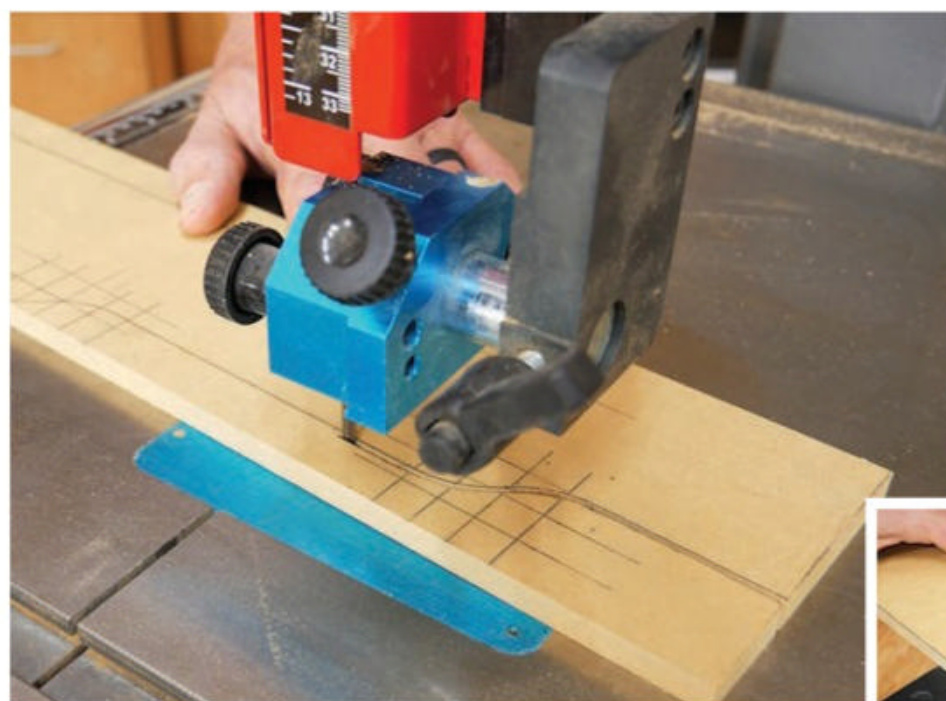
work, playing games, paying the bills and more. It is a valued place in most of our homes and for that reason, it makes some sense to have a quality table as the nexus of all this togetherness. This table project here is only 40" square, so it would not work for seating a big family. But it is perfect for an apartment — a mom, dad and a young one or two. When it's time to progress to a larger dining table, move this one to a family room and voilà ... you have a game table! One thing is certain: with its substantial white oak construction, this table will take the wear and tear of family life, perhaps for generations.

I mentioned that it is made from white oak lumber; the quartersawn stock is 1¼" thick for the tabletop, the legs are 2½" in section and the aprons are ¾" thick. There are four corner braces hidden under the top that add significant strength to the piece. It is indeed built to last.

We borrowed the cloud lift motifs on the aprons and the gentle curves on the legs from the Greene brothers. It is not a Greene and Greene reproduction by any means, but their inspiration adds stylish details to this table's relaxed design.

Templates are the Key to Success

Making multiple matching curved pieces like these legs and aprons is best done by employing templates to guide your cuts, be they on the band saw or with a guided router bit. Use the gridded drawings on page 29 or download and print out the same patterns in PDF form from our website to make your own. Soon Rockler will have templates for this table for sale as well. However you start, making these templates accurately from MDF will get you a long way down the road to success.



The key to success with this little table is creating accurate templates from which to make the legs and aprons. You can find scale drawings of the leg and apron components in the Drawings on page 29. You can also obtain downloadable and printable PDFs of those scaled drawings at woodworkersjournal.com by clicking on the "More on the Web" link. Later this year, Rockler will be selling full-sized cardboard templates for this table with a printed plan.



High-tech Templates? Yes, Please!

Because I am a woodworking editor, I have access to some exceptionally cool tools. One new product I have been learning is the Shaper Origin. In this instance, I actually cut the templates for my table with the Shaper Origin from 3/8" MDF, and I have to say it was very successful. While not for everyone, using high-tech tools to make templates is one advantage to CNC technology that is often overlooked.

— Rob Johnstone





Crosscutting and ripping stock for the legs was the author's first step. He cut enough to glue up five leg blanks. At this time he also selected the stock for the tabletop and cut those pieces to length.

Selecting Stock, Harvesting Parts

I ordered my supply of quartersawn lumber surfaced on two sides at 1¼" thick and in random widths and lengths. I was disappointed with the amount of sapwood I found in the boards, so part of my stock preparation was avoiding the sapwood as I harvested pieces for the legs and the tabletop. Unfortunately, I was not 100 percent successful in my goal.

The leg's final dimensions are 2½" square in section and 29¾" in length. I ripped enough stock to make five legs, because if a flaw or a significant machining problem were to come up, I would not have to go back and glue up another one. I was glad I did this for a couple of reasons I'll share later. I ripped the stock to 2⅞" wide and a hair longer than their final length. I glued them up two at a time (see photo, above

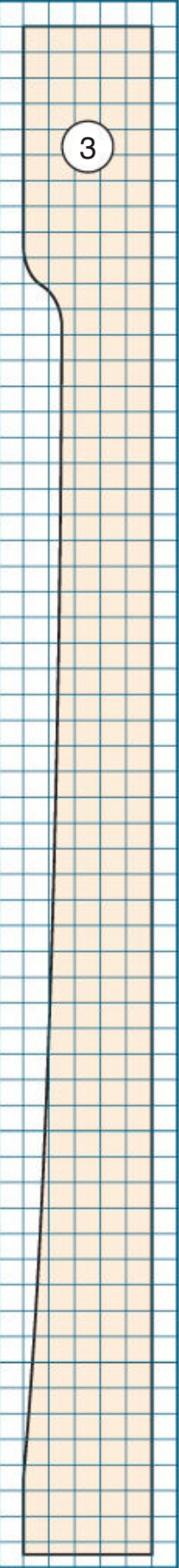
right) using Titebond III for the job. I like its longer open time and the fact that it is a bit darker in color, perfect for white oak. Of course there was the fifth leg to glue and clamp by itself.

Selecting the pieces for the tabletop had its challenges. First, there was the sapwood to avoid. Next, the figure of the boards varied significantly in terms of how dramatic the medullary ray flakes presented. A couple of boards had very pronounced flake figure, one had less and another had almost none. So I decided to put the highly figured lumber in the center of the top, use the less figured stock on either side of those pieces and arrange those with little flake at the edges. I would have preferred a uniform flake pattern across the entire top, but that was not to be, so this was my best option. After I had cut the pieces to rough length, squared up the edges on

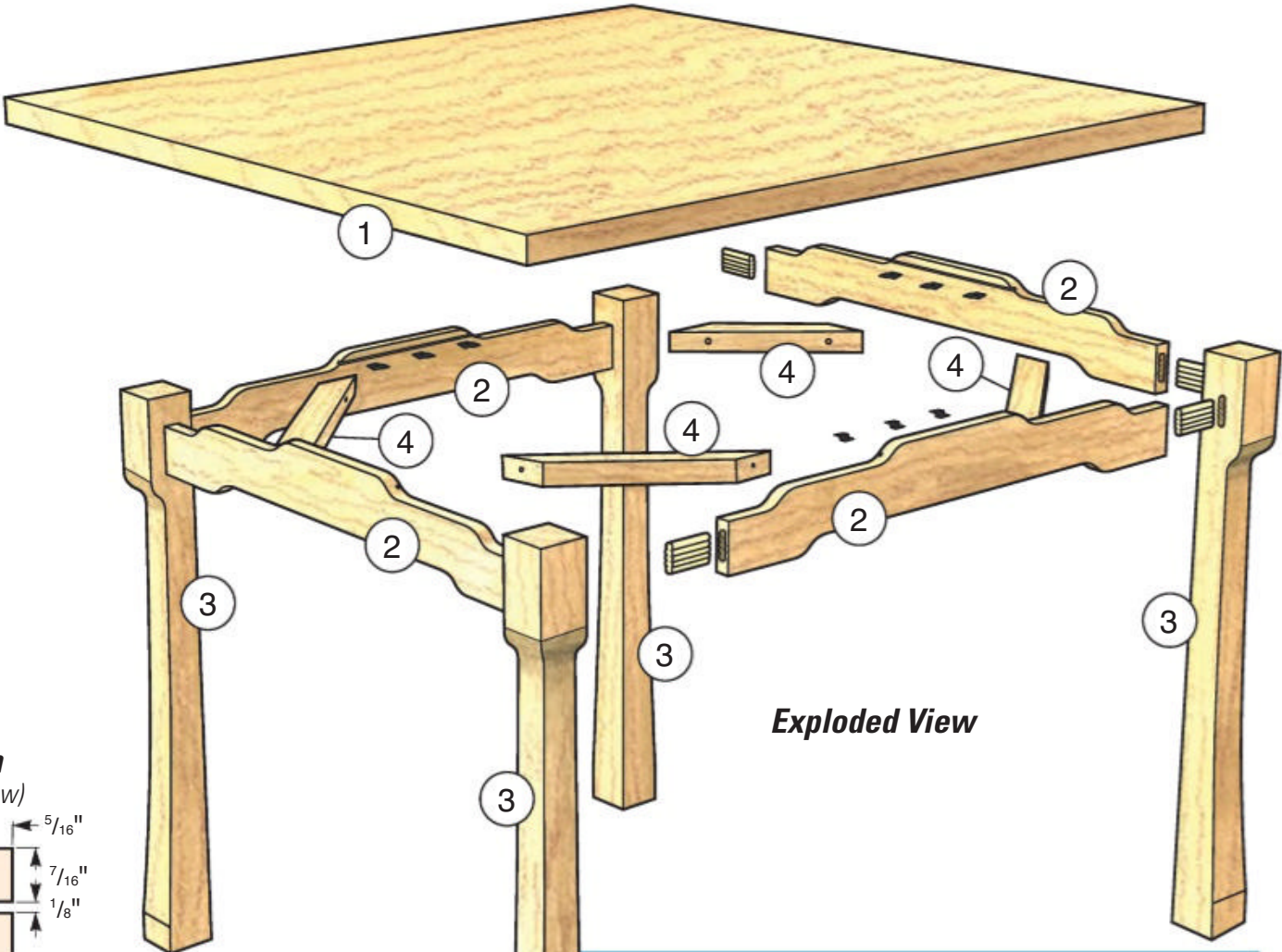


Taking time to select the nicest-looking stock for the tabletop was an early step in the process. The author placed the most highly figured wood in the center of the panel and the less showy stock on either side of those planks. To make the assembly process more manageable, he glued up the top in two sections, then flattened and sanded them smooth.

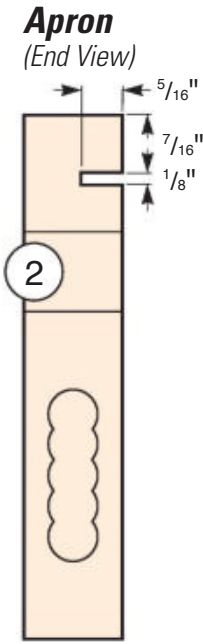
Leg Pattern
(Front View)



Each square = 1/2"



Exploded View

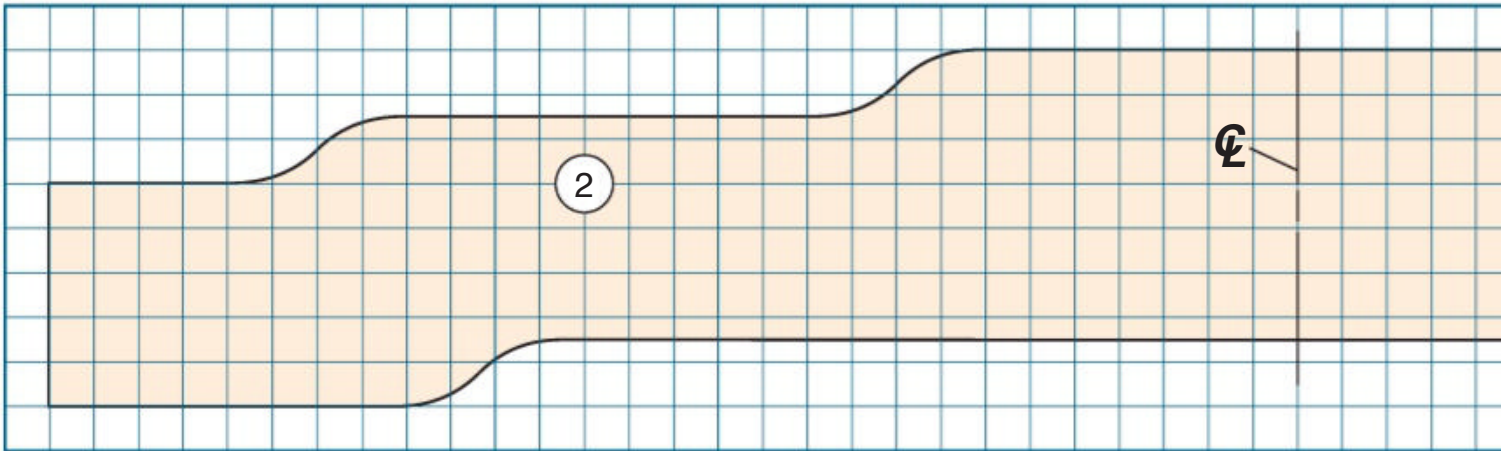


Apron
(End View)

Apron Pattern
(Front View)

MATERIAL LIST

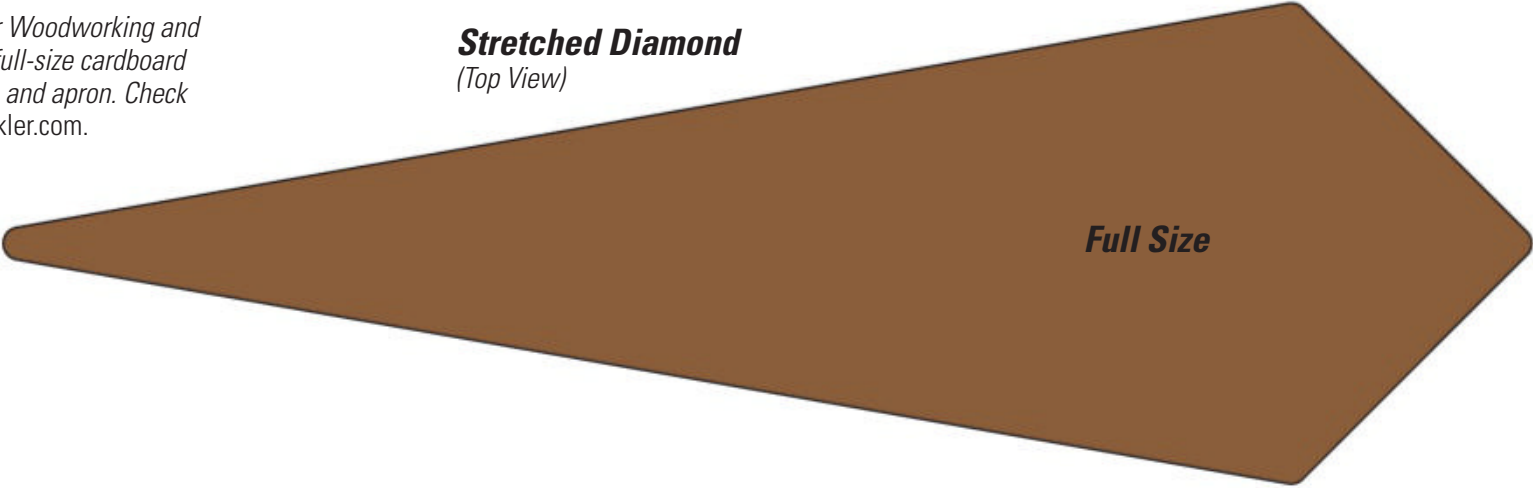
	T x W x L
1 Top (1)	1 1/4" x 40" x 40"
2 Aprons (4)	3/4" x 4" x 28"
3 Legs (4)	2 1/2" x 2 1/2" x 29 3/4"
4 Corner Braces (4)	1 1/4" x 2" x 15 3/4"



Each square = 1/2"

Later in 2021 Rockler Woodworking and Hardware will have full-size cardboard templates for the leg and apron. Check for availability at rockler.com.

Stretched Diamond
(Top View)





Gluing the two tabletop subassemblies together reduced the number of wet glue joints to just one — a helpful convenience for clamping. Even so, a dry assembly proved valuable. While not overly large, the tabletop is substantial due to the thickness of the lumber. Managing that heft was part of the overall gluing and clamping effort involved here.

the jointer and removed the sapwood, the top was about 3/4" too narrow. (Sometimes a guy just can't buy a break!) So I processed another piece of stock, ripped it in two and located those pieces just inside of the outermost boards in the glue-up. The pattern of symmetrical figure looked good to me.

Even at just 40" square, this thick tabletop weighs a good bit, so I chose to start the assembly process by gluing up two halves of the top. After the joints cured, I flattened and sanded them smooth. Then I glued the two together to complete the blank. That allowed me to only have to align one glue joint for the final clamping step — much easier. Working smart is something I have learned to appreciate over the years.

Trimming the tabletop down to its final size was a two-step process. First I marked a line at 90 degrees to one edge of the table. Then I used a track saw to cut the marked edge. If you don't have a track saw you could use a handheld circular saw with a fence clamped to the tabletop, or even a handheld router guided along a fence. With that done, I hefted the tabletop over to the table saw and cut the opposite edge parallel. I took a few moments to use a 4" x 24" belt sander to clean up the

center glue line and ensure the top was flat by sanding across the grain. I then sanded the top up through the grits to 150 and set it aside to move on to the legs and aprons.

Shaping the Gently Curved Legs

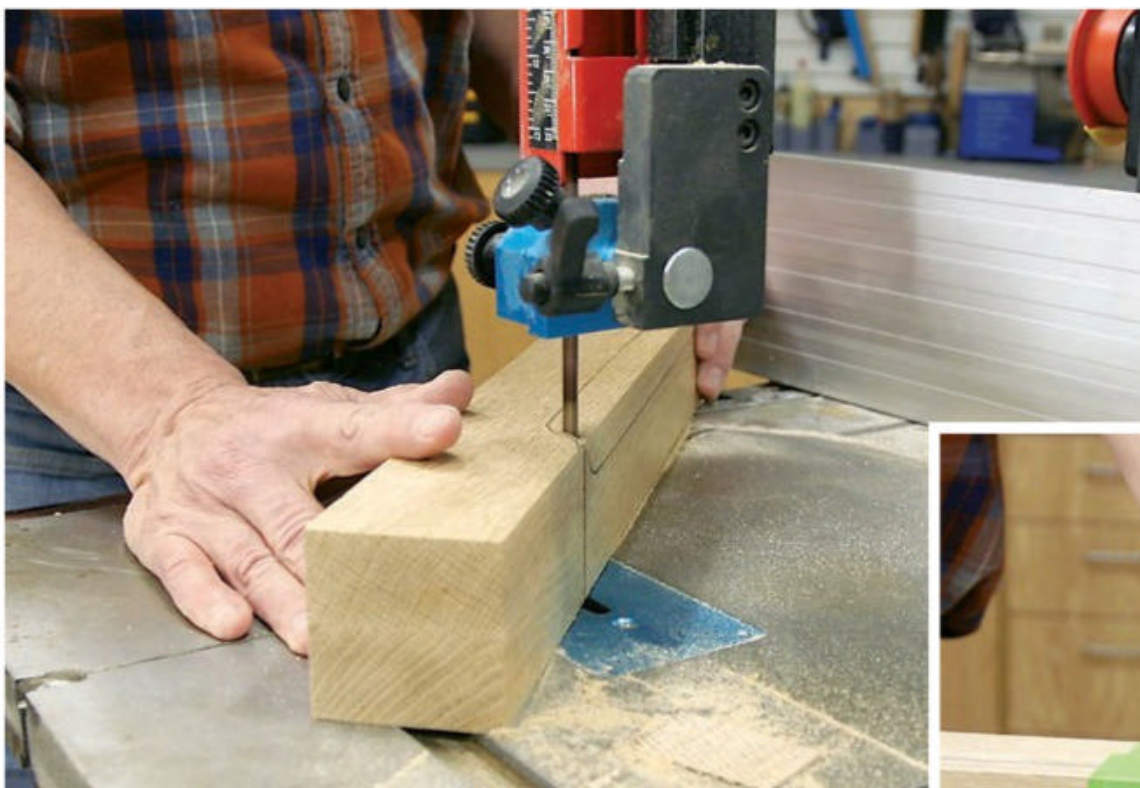
The shape of these table legs suggests Greene brothers design. The Greenes were strongly influenced by the Asian exhibits they found at the World's Columbian Exposition of 1893 in Chicago. The sweeping curves in their work has a distinctly Asian feel, and these table legs evoke the same.

I began the machining process by squaring my glued-up leg blanks. I ran one edge-glued face of each leg over the jointer to create two clean 90-degree faces per leg. Then I stepped to the planer so I could clean up the other joined face and square the legs perfectly. Using my leg template to set up a stop on the miter saw, I cleaned up each end of the legs by cutting them to length. Then it was time to start shaping them.

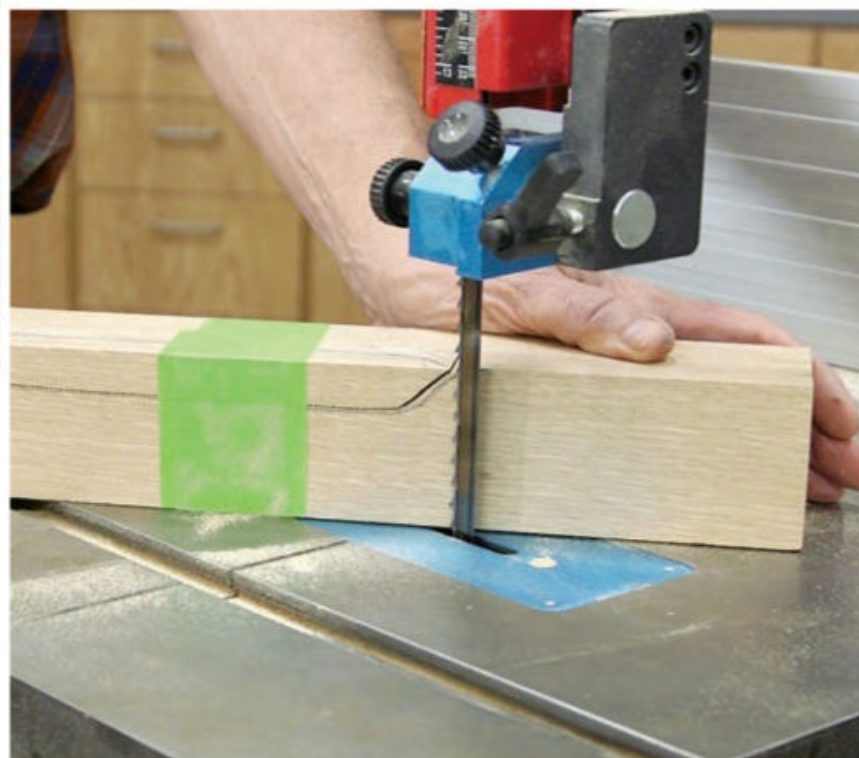
Start forming the two long curves on each leg by scribing the template shape on two adjacent leg faces and toting them over to the band saw. Then, as you would when making a cab-



After the last glue joint in the tabletop cured, it was time to cut the blank to size. The first step was squaring up one end with a track saw, then cutting the opposite end to length on a table saw. Finally it was cut to width, again on the table saw.



Start shaping the legs by tracing the template on two adjacent faces. Use the band saw to cut out one of the marked faces (photo at left). Stay just outside the pencil lines. Next, tape the waste material back onto the leg blank and cut out the other marked face (photo below).



riole leg, carefully cut just outside the lines on one of the leg faces. I installed a 1/4" blade in order to make these cuts accurately, especially the tight curve at the top of the legs. With the first cut done, grab the waste piece you just removed, and tape it back in place (see photo at right). Then cut the second marked face in the same manner. Repeat this process for all four legs to ready them for some template-routing.

Flush-cut Routing in Two Stages

One challenge with shaping the legs on the router table is that my longest bit for the task had a 2" cutting limit. However, including the 3/8" thickness of my template, the overall thickness I would need to accommodate for routing was 2 7/8". My 2" bit literally would not cut it. That's why shaping each face required two operations. Start by chucking a 3/4"-diameter, 2" pattern router bit (with the bearing near the shank) into the router table.

Attach the template to the leg blank with double-sided tape and carefully remove the material with a slow, controlled pass. Take extra care at the tight radius near the top of the leg. One of my legs fractured during that cut, breaking off about a 1/2" chunk of oak. The extra leg blank then came to the rescue! (I could have repaired the tearout, but it would have been time-consuming.) Template-rout both contours of each leg this way, then switch to a flush-trim bit with the bearing at the tip. Use it to trim off the small bit of remaining waste with the bit's bearing rolling along the routed portion of the first passes.

Next, I used a benchtop belt sander to smooth the legs and remove the machin-



Template-routing the legs is a two-step-per-face process. Start with a 2"-long pattern bit with a bearing next to the bit's shank (shown in photo). With the template affixed to the leg, run the edge of the template against the bearing to form the shape. Then switch to a flush-trim bit with the bearing at the top of the cutters. Set its height so the bearing follows the routed edges formed by the pattern bit. The author used a 1/2"-diameter, 1 1/2"-long flush-trim bit for this second routing step.



All of the quartersawn white oak was purchased as 1 1/4" thick, surfaced two sides and in random width and length. To make the aprons, the stock was resawn to 3/4" thick at the band saw against a point-style fence.



Transfer the shape of the aprons from the template to the workpieces. Then cut the aprons out on the band saw, staying just outside the lines.



ing marks. Be careful to keep a clear break where the leg's curve transitions to the square "foot" of the leg. After they are sanded smooth, set the legs aside.

Making the Cloud Lift Aprons

The first order of business when making the aprons is to cut the stock to length and width. Since I had purchased all of my lumber at 1 1/4" thick, I needed to resaw them to their 3/4" thickness. In the photo at left you can see that with the aid of a "point" style fence on the band saw, removing the extra wood was an easy task. I completed this thicknessing and cleaned up the sawn face of the pieces at the planer.

The tabletop will attach to the aprons with metal tabletop fasteners. To make that possible, I plowed a 1/8"-wide, 5/16"-

deep saw kerf the length of the aprons while they still had flat edges. You can find the location for this kerf in the *Drawings* on page 29.

Shaping the aprons will repeat most of the same steps you took to form the legs. Prepare for template routing by tracing the apron shape onto the boards. Make sure the saw kerf is properly located when you draw the template. It needs to bisect the top cloud lift.

Move back to the band saw and rough out the shape of the aprons. Cut about 1/16" outside of the pencil lines. Then head back to the router table one more time so you can trim off the waste using the same flush-trim bit you used to machine the legs. Attach the template to each leg with double-sided tape for this process. You'll find this operation is less of a heavy lift when compared to the legs — thinner stock makes the template-routing process more manageable.

Joining the Legs and Aprons

To attach the legs and aprons, I tried out the latest version of Rockler's Beadlock jig and used the premade tenon stock. I was able to form the mortises with the new jig pretty effortlessly. I chose to use the 3/8" thick tenons for these joints, and they were really solid when I was done. Here's how to use the jig.

Cut the aprons to length and then template-rout them to their exact shape. Attach the templates with double-sided tape. The aprons can be shaped with a single pass of the router.



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For videos demonstrating a complete build of this table, using the Shaper Origin to do the inlay, glazing the legs to match the stain color and how to use the Beadlock jig, plus downloadable patterns for the legs and aprons, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

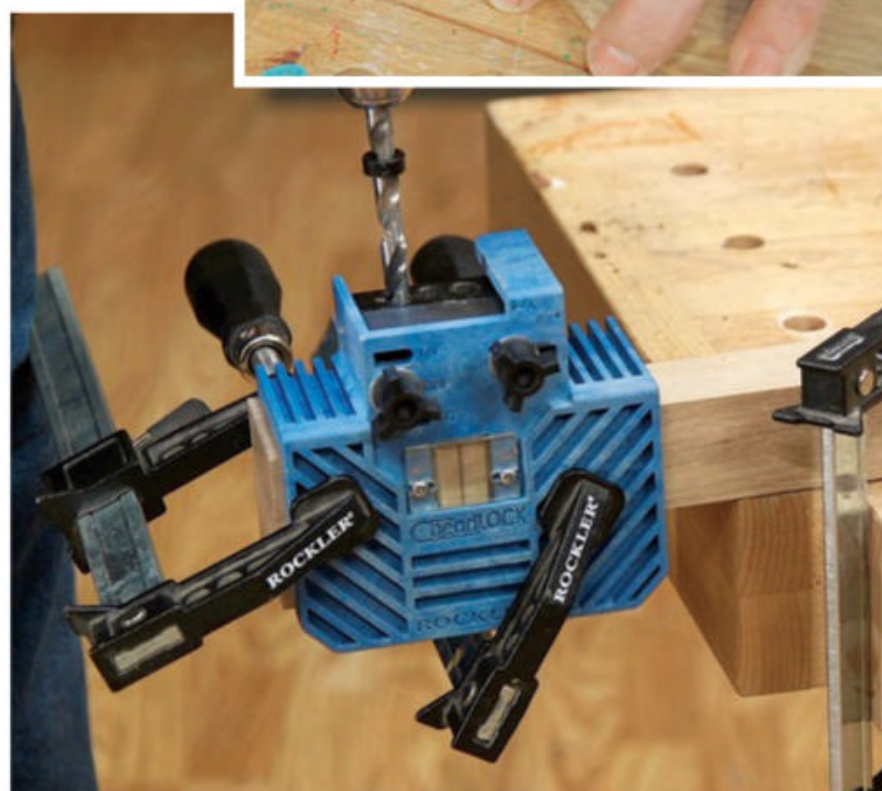


Position the aprons on the legs so the top edge of the center cloud lift is aligned to the top ends of the legs. The author checked his measurements using a straight-edge on a workbench.



With Beadlock you use a standard twist drill bit to drill out the mortise waste in a series of side-by-side holes, guided by a metal bushing in the jig (see top photo). In this regard, it's very much like the Kreg pocket-hole system. Here, the bushing is held in the jig by two bolts, as you can see in the photo at right. There are two positions — A and B — and you start out (in the case of the 3/8" tenon stock) by drilling three 3/8"-diameter holes. There is a depth stop that you locate on the drill bit to control the depth of the mortise. After you drill the three holes at position A, you shift the guide to position B to drill out two more holes. This second step clears out the remaining material left between the three original holes to create a multi-ridged mortise that perfectly fits the shaped tenon stock (you can see one of these tenons pictured above).

The Beadlock kit includes shims of differing thicknesses that allow you to place the mortise where you need it in stock of different thicknesses. Here I centered the mortises in the 2½"-square leg tops and 3/4"-thick aprons simply by switching out the shims. For this table, it is important to align the top of the apron's center cloud lift with the top of the legs. This will allow you to tightly secure the tabletop to the base using the



Rockler's Beadlock system uses a drill bit and a two-position drilling guide block to form a multi-holed mortise for the Beadlock tenon stock. This loose-tenon system creates very strong joints.



A 1/8" roundover bit was used to break the edges of the tabletop. Later the tabletop was sanded up to 400-grit. The last two grits were hand-sanded.

tabletop fasteners. To do that, I bumped the top of the legs up to a long straightedge that I had clamped to my workbench. Then I put the apron against the straightedge, mimicking how it should align when assembled. With that done it was easy to properly locate the center points of my mortises for registering the Beadlock jig. And here's another important note: Be certain to place the mortises on the proper faces of the legs. There are two outside faces of the legs — the shaped ones — and two inside faces — the flat ones. Please don't ask why I am making such a big deal about this ...

Other loose-tenon systems such as Festool Dominos would work on this table, as well as dowel joints or any other joinery methods you are comfortable with. But I did find the Beadlock system to be accurate, easy to use and affordable.

Final Steps to the Finish

With the mortises drilled, you are nearly done with the machining process. I thought it prudent to dry assemble the leg set at this point in order to make certain the joinery was sound. With the legs and aprons clamped together, I went ahead and made the corner braces and temporarily mounted them on the aprons. I marked the inside of each apron and cross brace so that I was confident they would go together smoothly when it came time for final assembly.

Looking at the tabletop, I decided that I wanted the edges rounded over slightly, so I used a 1/8" roundover bit chucked into a handheld router to complete that task.

My next design step is entirely optional. I decided to put some accent inlays in the corners of the tabletop. They are

Corner Inlay Options



This simple corner inlay is an optional accent for the tabletop. In truth, the table would look great without them. Even so, with all of its edges being straight, this stretched diamond is an easy inlay to cut out by hand. Instead, I gave it a go with the Shaper Origin handheld CNC machine. Its precision programming enabled the wenge inlays to fit perfectly.

— Rob Johnstone





The author chose to finish all the pieces of the table before assembly. That choice made applying the stain and clear finish much more controllable. Old Master's Red Mahogany stain came first, followed by two brushed-on coats of Zinsser SealCoat. The shellac was lightly sanded and followed by three wipe-on coats of gel polyurethane. After the poly cured, final assembly could begin.

a very basic shape — I'll call them a stretched diamond, but some cheekier members of the staff call them the carrots. They are fairly easy to inlay the old-fashioned way (there is a "More on the Web" video of me doing just that. You can watch it at woodworkersjournal.com). But once again I decided to give the Shaper Origin a spin on this table project. I chose 1/8" wenge I found at Rockler for its dark contrasting color along with the red highlight it displays. Truthfully, I think the table would look just lovely without the inlays. So don't let them throw you off if you don't like how they look.

Once the stretched diamonds were glued in place, it was time for more sanding. I sanded the table all the way up to 400-grit. While others may think that's excessive, I prefer to have a super smooth surface to finish. I broke the edges of the legs with 320-grit by hand to remove the sharp edges.

I chose to apply the stain and finish to the table components before assembling them. Working on individual pieces is so much more controllable and you can inspect them very closely as you work. I find it avoids drips and errors. To make that happen, I masked off the mortise areas on the legs with painter's tape. I mounted the legs on a scrap piece of plywood by driving a single screw up through the plywood into the center of the bottom of the legs. For the aprons, I temporarily put short Beadlock tenons in one end and then clamped the tenon stock between two boards. Then those boards were clamped to another piece of plywood. It may sound like a lot of prep work, but it wasn't hard, and I think I got great results because of the extra effort at this stage.

I applied Old Master's Red Mahogany wiping stain to all the pieces and let it dry. Following that I brushed on two coats of Zinsser® SealCoat™ shellac. Having taken the time to sand the surface so finely, the shellac laid down really well. When that cured — and shellac dries fast — I wiped on three coats of polyurethane. I think the stain, shellac and poly combination finish makes this table look like a million dollars.



Glue and clamp the legs and aprons together to form a leg set. Not shown here are the corner braces that add strength to the table's undercarriage. The tabletop is attached to the leg set by 12 tabletop fasteners that fit into saw kerfs in the aprons and screw to the underside of the tabletop.

So that's it. Considering that it's a fairly basic table, it was still a pretty intricate build and a truly enjoyable experience. As I mentioned at the beginning of this article, while the table is compact, it is substantial and built to last. If you work carefully and patiently on it, generations of your family will be able to sit at this beauty and enjoy all the ways we fellowship around a table, whatever those may be.

Rob Johnstone is publisher of Woodworker's Journal.

Cedar Potting Bench

By Kimberly McNeelan

This spacious and stylish fixture for your gardening needs can also double as an outdoor bar with beverage cooler!





Roughsawn cedar timber like this will require some initial surfacing to smooth its faces and reduce its thickness to 1½" for many of the parts. Flatten one face on a jointer before planing the other face parallel to it.



After the author planed her stock to 1½" thick, she flattened one reference edge on the jointer. This will allow you to rip the bench's workpieces to width, yielding parts with straight, parallel edges.

A few years ago, I designed and built this potting bench for Jonathan Wright, who is deputy director for Horticulture and Natural Resources at the Indianapolis Museum of Art and a professional gardener. He provided insight for what his ideal structure would be to support both gardening tasks and play. I say “play” here because the project’s galvanized steel soil bin can be washed out and used as an optional beverage cooler for entertaining. Jonathan has since used this bench as a bar for outdoor get-togethers.

You’ll notice in the opening photo that I’ve shaped the wide front apron and bottom shelf with a “wave” style edge to create a sense of visual movement. That same shape is repeated across the top of the bench’s slats by using a large template to cut and rout the slats from a glued-up blank. (You can learn more about making this “artisanal” top on page 40.) But all these curves aren’t necessary. Straightedged timber would also work for the front apron, top slats and shelf. That’s the version of the project shown in the *Exploded View Drawing* on page 39. How artsy you want your bench to be is up to you!

Getting Started with Stock Surfacing

I use roughsawn western red cedar for almost all of my outdoor projects, because it stands up to the outdoors well and I love its color variations. But it needs some initial surfacing to make it suitable for this bench. So my first step was to run the stock for the 1½"-thick parts across my jointer to flatten one face, then send it through my planer to smooth the other faces and reduce the boards to correct thickness. Do the same to your cedar if you’re also starting with thick, rough stock.

With that done, joint one edge of each board flat so you can use that reference edge to rip workpieces to width for the bench top slats, four aprons, lower shelf pieces, inner cross bracing and soil bin lid battens. See the *Material List* on page 39 for these part sizes. Now go ahead and crosscut these parts to final length. I broke this stock down at my miter saw, using a stop block on my miter saw station’s fence to make sure the same-length parts would be cut accurately.

The 4x4s I purchased for the legs and bottom stretchers were already milled quite nicely, with flat, smooth faces and square edges. So I just cut the legs and stretchers to length

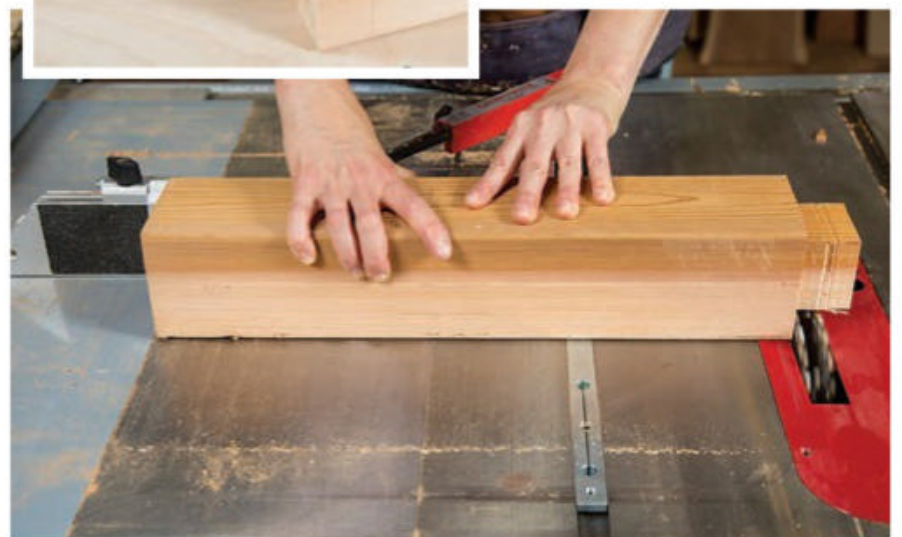
without any further surfacing at the planer or jointer.

Making Joinery

Now it’s time to mill some mortise-and-tenon joinery to attach the stretchers to the legs. Start by laying out the tenons on the ends of the stretcher blanks. Set a marking gauge to 1½" so you can scribe shoulder lines for the tenons all the way around the ends of the parts (see inset photo below). Then install a wide dado blade in your table saw and raise it to ¾" high. I set up a stop on my miter gauge’s long auxiliary fence so all of the shoulder cuts would line up around the workpieces. Make these shoulder cuts



Here the author uses a stop block, clamped to her miter saw station’s fence, to set the length for cutting multiple same-sized parts. It’s an efficient and accurate sawing strategy.



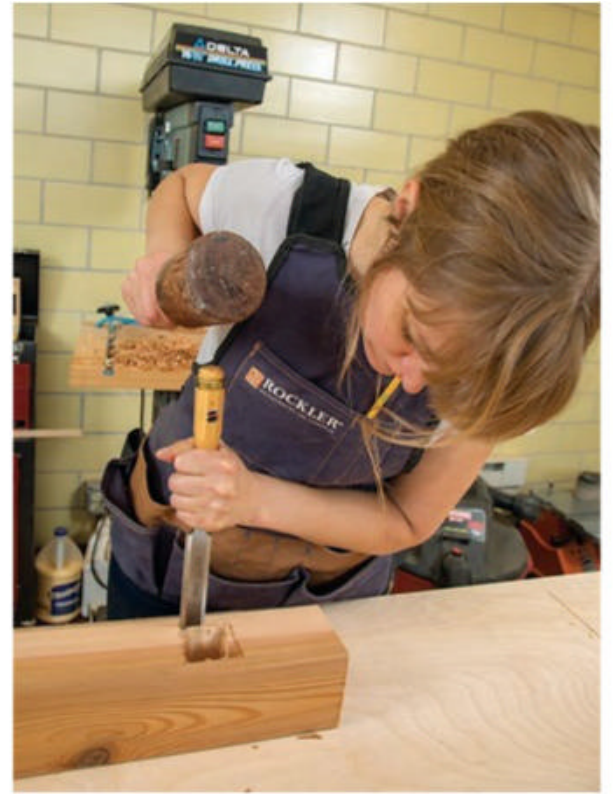
Score or pencil layout lines around the ends of the stretchers to establish the shoulders of these 1½"-long tenons. Saw away the waste with a wide dado blade raised to ¾". Back up these cuts with a miter gauge.



A combination square makes quick work of laying out the top and bottom layout lines for the leg mortises. The author used a marking gauge to scribe the mortises' side layout lines instead.



You can hog out most of the waste inside the leg mortises at the drill press with a large Forstner bit. A series of overlapping plunge cuts will take care of most of this stock removal.



Square up the corners of the mortises and flatten their walls with a sharp chisel and mallet. It's important to hold your chisel perpendicular to the leg faces when refining these openings.

on both ends of each stretcher, then remove the stop on the miter gauge and saw away the rest of the material in the tenon areas with more side-by-side passes to complete them.

With the tenons done, use their 2" x 2" proportions to lay out a corresponding mortise on each of the legs. Locate these mortises 4³/₄" up from the bottoms of the legs, centering the mortises on the leg thicknesses. Now step over to your drill press to drill out as much of these mortises as you can. I used a big Forstner bit for this job and set the drilling depth to just a tad deeper than 1¹/₂" so the stretcher tenons would fit fully into them. Drill out the waste in several overlapping plunges.

Tidy up the mortises with a sharp chisel and mallet so their walls are flat and smooth and the corners are square. Now try out the tenons in the leg mortises; they should fit together without needing to "persuade" them into place with a mallet.

You're nearly ready for some assembly, but first decide if you want to shape the bottom edges of the potting bench's front apron like I did with a wave pattern. Or leave its bottom

edge flat. I drew the swooping shape (see page 40) on a long piece of 3/4"-thick scrap to serve as a template so I would be able to trace the same curvature onto all of the bench's sculpted parts. Cut out the template's shaped edges and sand them smooth. Then trace its profile onto the front apron blank, rough-cut the wavy edge and template-rout it to final form. Ease any sharp edges that are left, and sand smooth all the workpieces you've made up to this point.

Assembling the Bench Frame

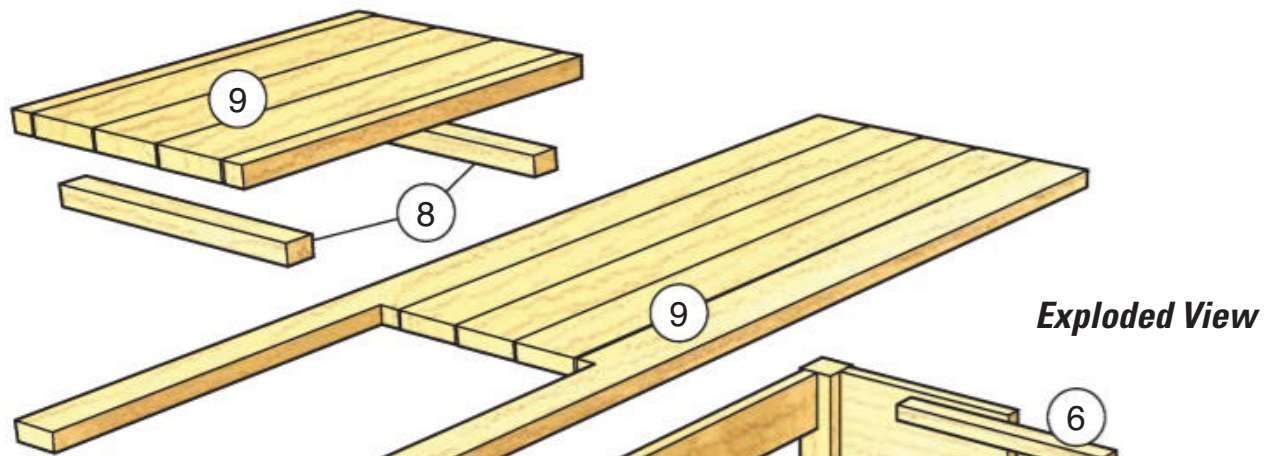
Tenons can be challenging to cut on really long workpieces. So for ease of assembly, I drilled the inside faces of the four aprons for pocket-screw joints instead. I created two subassemblies for the bench frame by gluing the bottom stretcher



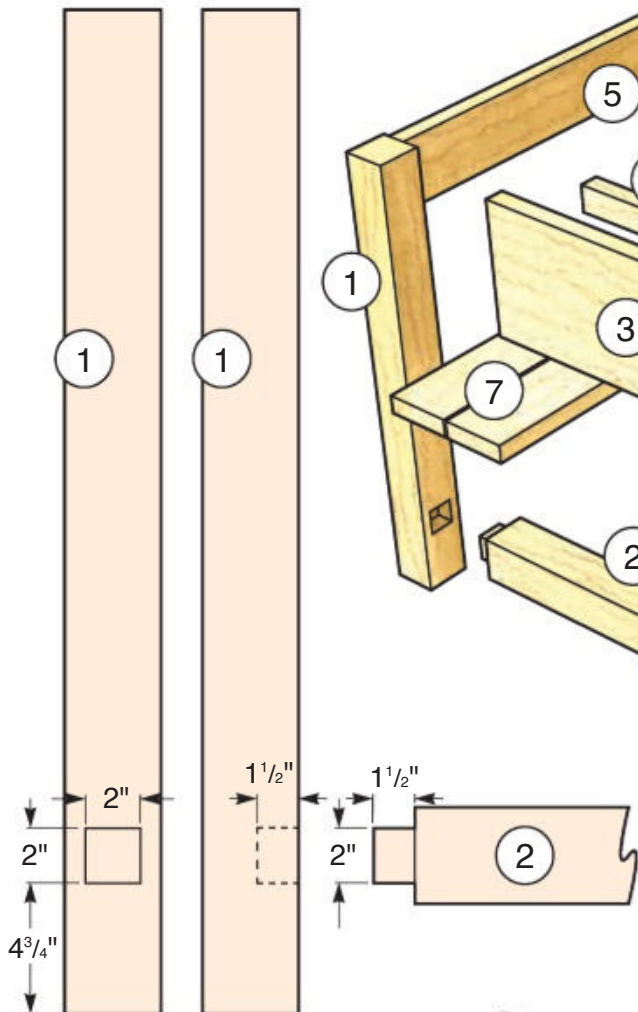
Cedar is prone to splintering along its edges. To safeguard against injury and make the potting bench more enjoyable to use, break any sharp part edges with a router and 1/8" roundover bit, a file or a sanding block.



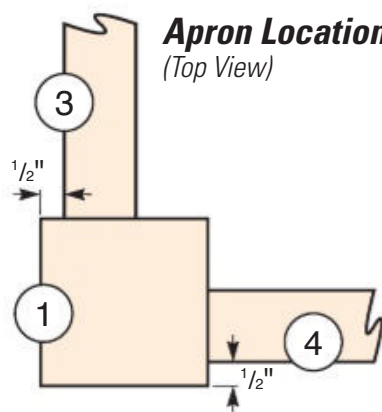
Pairs of interlocked pipe clamps helped the author hold the front and back aprons in place before she drove 2¹/₂"-long pocket screws through them to secure the joints. Scrap blocks prevented marring by the clamp heads.



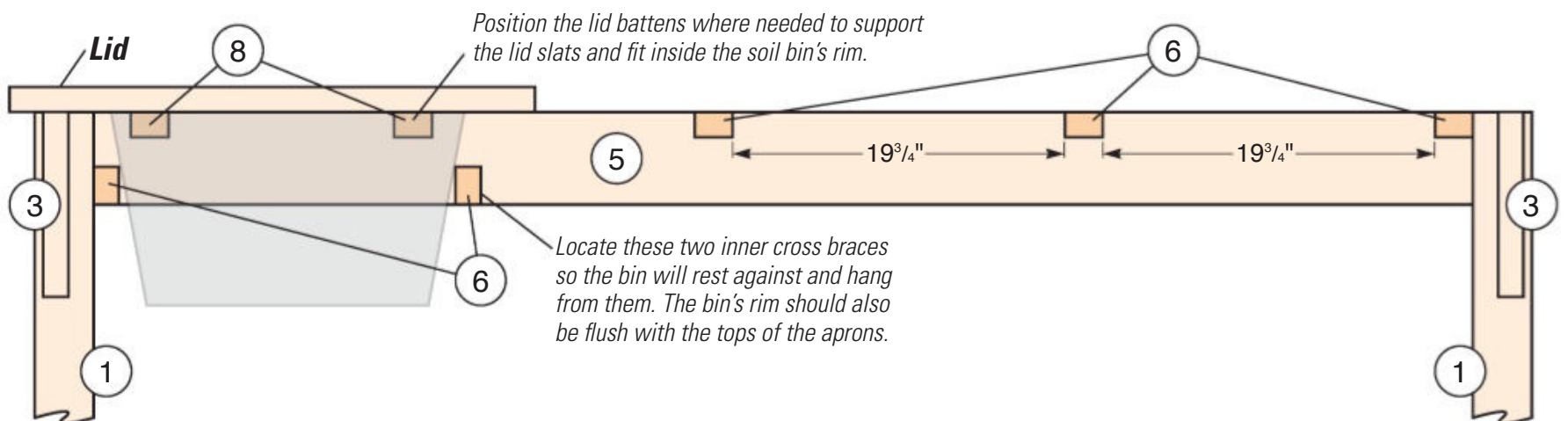
Leg Mortise Locations (Inside and Front Views)



Apron Locations (Top View)



Inner Cross Brace Locations (Front View)



MATERIAL LIST

	T x W x L
1 Legs (4)	3 1/2" x 3 1/2" x 36 1/2"
2 Bottom Stretchers (2)	3 1/2" x 3 1/2" x 21 1/2"
3 Short Aprons (2)	1 1/2" x 11" x 18 1/2"
4 Front Apron (1)	1 1/2" x 11" x 82"
5 Back Apron (1)	1 1/2" x 5 1/2" x 82"
6 Inner Cross Braces (5)	1 1/2" x 2 1/4" x 21 1/2"
7 Lower Shelf (2)	1 1/2" x 5 1/2" x 92"
8 Soil Bin Lid Battens (2)	1 1/2" x 2 1/4" x 19 1/2"
9 Top Slats* (5)	1 1/2" x 5 1/2" x 92"

* An artisanal top requires a 32" x 92" glued-up blank

Creating Wave-shaped Artisanal Top Slats

The key to recreating the author's optional wave-shaped details on this potting bench's top slats, front apron and bottom shelf boils down to basic template routing. A single long template with the sculpted profile on both edges is all you need to trace, cut and rout this shape over and over again. Here's how it works.



Draw the wave-shaped profile along both edges of an 8-ft. piece of scrap plywood, MDF or solid stock to serve as a template (see the Drawing above). Cut the template to shape and sand its curved edges smooth.



Trace the template onto the front apron, glued-up top panel (for top slats) and bottom shelf piece shown here. The same template is used for every shaped part.



Use a jigsaw or band saw to cut the wavy profile into each workpiece. Cut about 1/16" outside of your layout lines. Make sure to have outfeed support in place for band sawing long stock like this.



Pin nail the template to the workpiece so the rough-cut edges extend beyond the edges of the template. If you don't have a pin nailer, double-sided carpet tape works well, too.



Install a long piloted flush-trim or pattern bit in your router or router table, and adjust the bit so its bearing can roll along the template. Rout away the waste edges.



Once the author had cut and routed her bench's curvy tabletop slats to shape, she nested them together in their final order to cut a lid for the soil bin. A track saw guided these straight cuts.

tenons into their leg mortises and driving 2½" exterior pocket screws to attach the short aprons to the upper ends of the legs. I inset the short aprons 1/2" from the outside faces of the legs. After that came the long, unwieldy front and back aprons. To install those, I first clamped them in place between the subassemblies, setting them back 1/2" from the faces of the legs as well, then drove their pocket screws home. Working alone as I do, long clamps sure made this step easier!

Next you can install two of the five inner cross braces between the aprons near one end of the bench. I positioned these to straddle the tapered sides of Jonathan's galvanized

steel soil bin (see the *Inner Cross Brace Locations Drawing*, previous page). The bin simply wedges between these cross braces and hangs from them. Position the braces so the rim of the bin will be even with the top edges of the aprons. This way, the bin's rim will support the removable soil bin lid when that is set into place. Again, I turned to pocket screws to attach these two bin cross braces to the aprons.

Choosing and Building the Benchtop

Now's the time to choose either my wave-shaped "artisanal" top for your bench or go with straight slats instead. The

“straight-slat” approach requires five 5½"-wide boards cut to 92" lengths. If you want to create a sculpted top, however, start by gluing up enough 1½"-thick stock to create a 32" x 92" solid panel.

The process for making each wave-shaped, sculpted top slat is pretty easy. Use the long template you made for shaping the front apron’s lower edge to trace a repeating pattern of slats across the panel. Space these layout lines about 1/4" apart so you’ll have room to cut each of the slats free. You’ll see in the top right photo on this page that the shape of my template enabled me to offset each slat in the layout so the wave pattern appears to “drift” diagonally across the bench’s top. It’s a nice effect!

Once the slat pattern is drawn on your panel, use a jigsaw or band saw (if you have adequate support around it) to saw the slats to rough shape. Cut just outside your layout lines. Then mount your template temporarily to each slat with pin nails or pieces of double-sided tape so you can rout the slat edges flush to the template. Use a long piloted pattern- or flush-trim bit for this task. Clean up all the top slats this way, then break their sharp edges with a 1/8" roundover bit in a handheld router to keep splinters at bay.

Whether you’ve decided to use straight or sculpted slats, their installation procedure is the same. Flip all the slats upside-down and set them together with their ends and edges aligned. Separate them with some 3/16"-thick scraps. Then get a buddy to help you flip the bench over as I did, and position it carefully on top of the slats, adjusting for an even overhang. My bench’s top overhang was about 1½" all around. Then set the remaining three cross braces you’ve made into place inside the bench frame aprons, spacing them evenly along its length. These will support the top slats and serve as attachment points for them in the area beyond the soil bin cross braces (refer again to the *Inner Cross Brace Locations Drawing* on page 39). Mark these three “loose” cross braces for pairs of screws at every benchtop slat location.

Installing the Benchtop Slats and Shelf

Once my three braces were laid out for screws, I marked and bored a pair of pocket-screw holes on each end into their top faces. We flipped the bench right-side-up again so I could install the three cross braces flush with the top edges of the aprons using 2½" pocket screws. And while the bench was off the top slats, I marked them so I could cut a 20¾"-wide x



The client’s galvanized bin fits down inside the bench and wedges against a pair of inner cross braces. A slatted lid, shown here, covers the bin opening in the top.



With the top slats arranged bottom-side-up and spacers installed, set the bench frame into place and mark three cross braces for screw locations.



Drill countersunk pilot holes through the cross braces at the screw locations you’ve marked (left photo). Attach these braces to the aprons with pocket screws, then drive in the screws that attach the braces to the slats.



31¼"-long lid for the soil bin. When those slat portions are cut free, space them 3/16" apart and line up their cut edges. Position the two soil bin lid battens on the bottom face of the lid segments and spread them evenly apart. Drive countersunk 2½" exterior-rated screws through the battens and into the lid slats to fasten the parts together.

With the lid now done, carefully invert the bench frame and set it on the slats again, realigning the parts. Drive 2½" exterior-rated screws into the cross brace pilot holes you drilled earlier to fasten the top slats in place.

I shaped the edges of the two shelf boards with the wave template to continue that theme there. And since the bench was still upside-down at this point, I drilled countersunk pilot holes through the stretchers so I could fasten the two shelf boards to them from below with 4" exterior-rated screws.

You can choose to stain and/or finish your bench if you like, but Jonathan and I both agreed that it would look nice with no finish at all. It’s now aged to a lovely silvery gray color.

Kimberly McNeelan is a woodworker, artist and woodworking teacher. Follow her on Instagram at ksm_woodworker.

Benchtop Tool Cart

By Chris Marshall

A jobsite table saw and router table join forces on this easy-to-build four-drawer workstation.



There are few upsides to this pandemic, but it has prompted a lot of folks to start woodworking. If you're one of them, welcome to the club! To support your new hobby, maybe you've bought a jobsite table saw like the DeWALT saw shown above. But you've probably discovered it's lightweight, it offers very little support behind the saw table when you're cutting really long workpieces and it could use a more stable, sure-footed stand.

Well, this mobile workstation can give your new saw the "home base"

it deserves. The substantial drawer cabinet on wheels raises your saw to a comfortable 36" working height. Behind the saw there's a full-size router table on a base you can build with ordinary pocket-screw joinery. The router table serves as a spacious outfeed table for your saw while it also opens up lots of new possibilities for your woodworking pursuits — shaping edges, making joinery, template-routing and more. Best of all, I've designed this compact cart to be very easy for a new woodworker to make, and I bet you'll have fun doing it.

Building the Carcass

We'll start by building the carcass that houses the drawers. Measure, mark and cut the top and bottom panels to size, according the *Material List* on page 45. Cut the carcass's two sides to final size. Their length should match the width of the top and bottom panels. Now cut the divider to size. Note that it is shorter than the side panels by one thickness of the plywood you are using. The divider is shorter because the back panel will overlap its back edge when the parts are assembled.



Splitting large sheets of heavy 3/4" plywood down into smaller, more manageable pieces is often safer and easier to do with a circular saw and clamped straightedge rather than a small jobsite table saw.



Install the "cabinet" side components of the drawer slide hardware on the carcass side and divider panels before continuing the construction process, while these workpieces are still loose and can be laid flat.

Drawer slides are often installed after a cabinet carcass is assembled, but waiting until then can actually make the slides harder to hang inside a deep but short carcass like this. So we'll install the slides on the sides and divider now, while these parts are still loose and easy to work with. Mark the inside faces of the side panels so you'll know which one is left and right on the project. Mark the left side panel with two layout lines that extend from the panel's front to back edges. Position these lines $3\frac{13}{16}$ " and $12\frac{1}{16}$ " up from the bottom edge. These are center lines for locating the two drawer slides that will support the workstation's pair of medium, same-sized drawers (under the table saw).

Mark one face of the divider panel with these same layout lines. On the other side of the divider and the right-side panel will hang the drawer slides that support the shallower drawer on top and a deeper drawer below. Mark centerlines for these drawer slides $5\frac{3}{16}$ " and $13\frac{9}{16}$ " up from the bottom edges of the divider and right-side panel.

Unclip the drawer slides' two components — a wider "cabinet" side component and a narrower "drawer" side component. Mount the "cabinet" components to the carcass side and divider panels. Center each of these eight drawer slide parts over your layout lines and so their front edges are flush with the front edges of the carcass parts. Drive three screws per slide through the hardware's slotted holes, centering the screws on the slots so you can adjust the slides slightly if needed later.

Now we can begin to assemble the carcass. Set the side panels so their outside faces are flush with the ends of the carcass bottom panel. Drill countersunk pilot holes up through the bottom panel and into the sides so you can drive #8 x 2" flathead wood screws to fasten the parts.

Mark layout lines across the bottom and top panels that will center the divider panel on them. Set and clamp the divider in place so its front edge is flush with the front edge of the bottom panel. Drill pilot holes up through the bottom panel into the divider, and fasten the parts with more 2" screws.

Set the top panel into place on the carcass. Make sure the front edges of top, sides and divider are flush and that the divider is adjusted to its layout line. This time, drill counterbored (deeper) pilot holes for the attachment screws so you can hide the screwheads with wood plugs. Attach the top panel to the sides and divider with 2" screws.

The last big panel we need to install on the carcass is the back. Measure its opening to verify how those dimensions compare with the *Material*

Measure the carcass's opening, and cut a back panel to those dimensions. Install the back panel with 2" screws driven through the side, top and bottom panels.



Drive #8 x 2" countersunk screws through the bottom panel and into the carcass side and divider panels. Make sure the divider is carefully centered on the bottom panel.

List. Cut the back panel to fit the opening. Set it into place on the carcass, and install it by driving counterbored screws through the side and top panels into the back panel. Drive counterbored screws through the back panel into the divider, and finish with countersunk screws driven up into it through the bottom panel.





Glue and nail or screw short and long plywood cleats to the cart's bottom panel. Keep the fasteners clear of where the casters will be installed.



Drive a 1/4" x 1" lag screw with washer into each of the four mounting holes of the casters to attach them to the cart's bottom cleats.



Round the ends of the short skirt boards before installing them with 18-gauge brad nails. Or hand nail this trim with 1 1/2" 4d casing nails.

Adding Cleats, Casters and Trim

Notice in the *Drawings* that the bottom of the workstation has pairs of short and long cleats attached to it. They stiffen the bottom panel and provide extra thickness for installing lag screws to attach the casters. Rip and crosscut these four cleats to size. Invert the carcass, and attach the cleats to the bottom with glue and either 18-gauge brad nails or #8 x 1 1/4" flathead wood screws. Locate these fasteners so they won't get in the way of the four mounting holes for each caster plate. Then go ahead and install the casters with 1/4" x 1" lag screws and washers.

We'll hide the edges of the bottom panel and cleats with 3/4" x 1 1/2" solid wood skirt boards. Rip long strips for this trim work from a piece of solid wood, and crosscut these parts to final length. The short skirt boards on the ends of the carcass overlap the ends of the long skirt boards on the project's front and back edges. I rounded the outside corners of the short skirt boards with 3/4" radii on a disc sander to give them a neater look and to make them hold up better to wear and tear. Glue and nail the trim pieces into place.

Building Stone-simple Drawers

A shop project like this really doesn't need hard-to-build drawers. Butt joints, screws and glue can create incredibly strong corner joints without special tools or skills. So that's the drawer-building approach we'll take here.

Start by cutting two sides for the two medium drawers, the shallow drawer and the deeper drawer from plywood. Be very careful that these parts have square corners and that opposing parts match so the drawers will be square when they're assembled.

Now measure for the drawer fronts and backs. Their lengths are particularly important: making them too long can create drawers that bind against the slides and won't open and close smoothly. If the parts are too short, the slides might not clip together properly or even disconnect during use. So to verify the correct length for the drawer fronts and backs, measure the distance across the opening between each pair of slides,



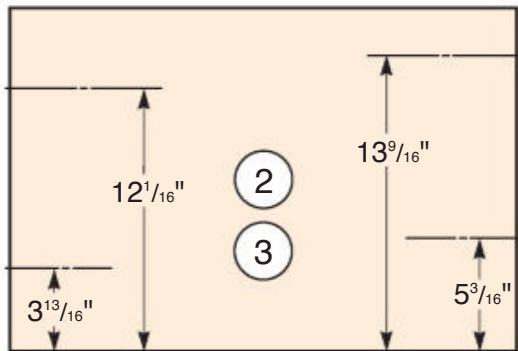
Set two drawer sides together against one drawer slide, and measure across the opening to the other drawer slide. This distance equals the length of the drawer fronts and backs.

and subtract twice the thickness of the plywood you're using (the drawer fronts and backs fit between the drawer sides). Cut the fronts and backs to length.

Sand the faces and edges of the drawer parts up to 180-grit. Then assemble each box with glue and counterbored #8 x 2" screws, arranging the pieces so the drawer sides overlap the ends of the drawer fronts and backs.

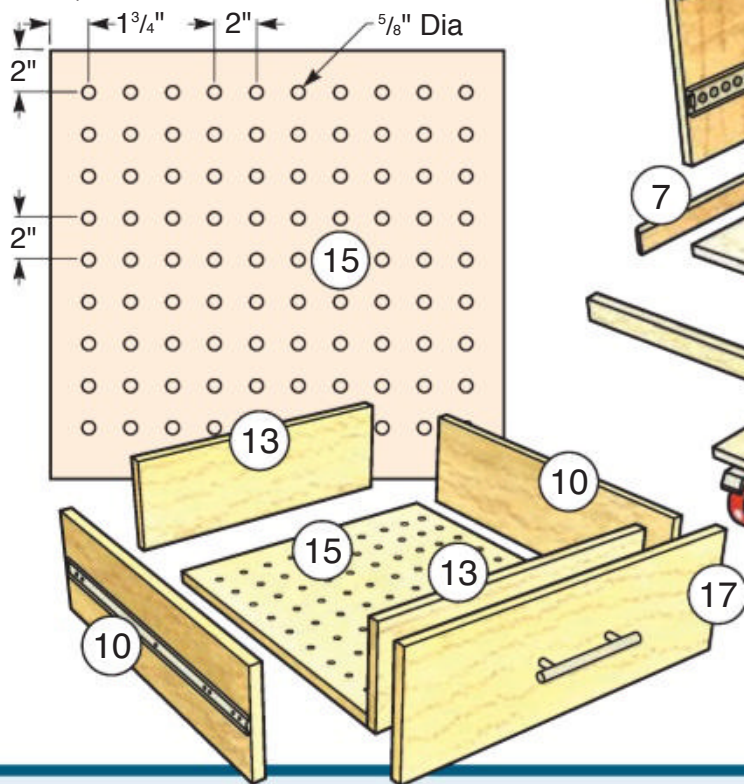
Next, measure and cut the drawer bottoms to size. Install the bottoms in the two medium and one deep drawers with counterbored 1 1/2" screws.

Right Side

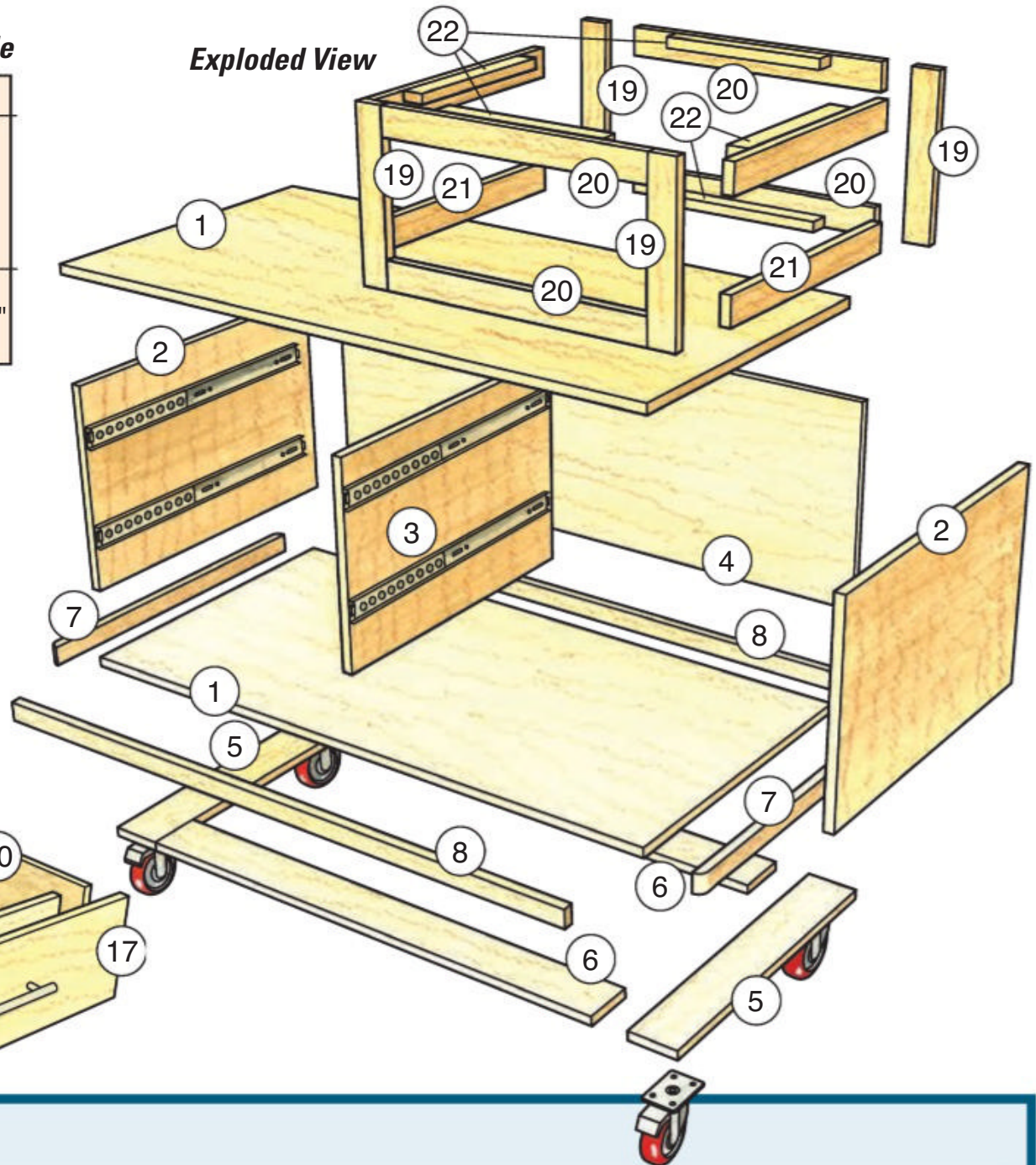


Router Bit Insert Hole Locations

(Top View)



Exploded View



MATERIAL LIST

T x W x L		T x W x L	
1 Top/Bottom (2)	3/4" x 24" x 48"	12 Medium Drawer Fronts, Backs (4)	3/4" x 7" x 20 ⁷ / ₁₆ "
2 Sides (2)	3/4" x 24" x 15 ³ / ₄ "	13 Shallow Drawer Fronts, Backs (2)	3/4" x 4" x 20 ⁷ / ₁₆ "
3 Divider (1)	3/4" x 23 ¹ / ₄ " x 15 ³ / ₄ "	14 Deep Drawer Fronts, Backs (2)	3/4" x 9 ⁷ / ₈ " x 20 ⁷ / ₁₆ "
4 Back (1)	3/4" x 15 ³ / ₄ " x 46 ¹ / ₂ "	15 Drawer Bottoms (4)	3/4" x 20 ⁷ / ₁₆ " x 21 ⁵ / ₈ "
5 Bottom Cleats, Short (2)	3/4" x 4" x 24"	16 Medium Drawer Faces (2)	3/4" x 8 ³ / ₁₆ " x 23 ¹⁵ / ₁₆ "
6 Bottom Cleats, Long (2)	3/4" x 4" x 40"	17 Shallow Drawer Face (1)	3/4" x 5 ¹ / ₄ " x 23 ¹⁵ / ₁₆ "
7 Short Skirt Boards (2)	3/4" x 1 ¹ / ₂ " x 25 ¹ / ₂ "	18 Deep Drawer Face (1)	3/4" x 11 ¹ / ₈ " x 23 ¹⁵ / ₁₆ "
8 Long Skirt Boards (2)	3/4" x 1 ¹ / ₂ " x 48"	19 Router Table Legs (4)	3/4" x 2" x 11 ⁵ / ₈ "
9 Medium Drawer Sides (4)	3/4" x 7" x 23"	20 Long Rails (4)	3/4" x 2" x 19 ¹ / ₂ "
10 Shallow Drawer Sides (2)	3/4" x 4" x 23"	21 Short Rails (4)	3/4" x 2" x 18"
11 Deep Drawer Sides (2)	3/4" x 9 ⁷ / ₈ " x 23"	22 Router Table Cleats (6)	3/4" x 1 ¹ / ₂ " x 12"

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MORE ON THE WEB



 Take a video tour of this benchtop tool cart by visiting woodworkersjournal.com and clicking on “More on the Web” under the Magazine tab.



These drawers are easy to assemble with butt joints and counterbored screws, and they'll be plenty strong. All the drawer components are 3/4" plywood, including the bottom panels.



The author dedicated the shallow drawer to router bit storage. It's large enough to stow 90 router bits with shank holes spaced 2" apart.



I decided to dedicate the shallow drawer to storing router bits; it holds up to 90 of them if you space the holes about 2" apart. I'll suggest you consider using Rockler's nylon router bit inserts (item 57223), which will hold

either a 1/4"- or 1/2"-shank bit. These inserts require a 5/8"-diameter installation hole. Lay out and drill holes for these inserts in the drawer bottom before installing it in the shallow drawer box with counterbored screws.

You're ready to hang the drawers in the carcass. To do this, install a "drawer" side component on each side of the drawers, centering it, top to bottom. Attach this hardware with three screws per slide. Choose the slotted holes in the hardware for these screws so you can do some minor adjustments to drawer fitment, if needed. Engage the slide components with one another to hang the drawers.

Finish the drawer construction by cutting four drawer faces. Size these parts to leave about 1/16" of space between each drawer and its neighbor as well as above the front bottom trim piece. Sand the drawer faces and ease their edges.

Set the drawer faces into place on the project, and use playing cards as spacers to separate the faces from one another. Then use short pieces of double-sided carpet tape to stick each drawer face to its drawer front. Carefully open each drawer, clamp its face in place and drive four counter-

Fasten the "drawer" side slide components to the drawer sides, centering them top to bottom. Clip the slide hardware together to hang each drawer in the carcass.



Stacks of playing cards make handy spacers when positioning the drawer faces on the drawer fronts. Double-sided tape holds the faces in position for clamping.

sunk #8 x 1 1/4" wood screws through the drawer front into the drawer face. Wrap up by installing the drawer pulls.

Turning to the Router Table Base

This benchtop tool cart makes use of Rockler's standard 1 1/4" x 24" x 32" laminated router tabletop, but you'll need to build a base framework for it. Since job-site table saw heights can vary, set your saw on the workstation and measure its exact height. This dimension, minus the thickness of the router tabletop, determines the length of the legs you'll need to make for the router table base.

Rip and crosscut four legs to size from either more 3/4"-thick plywood or some solid wood. Then cut four long and four short rails for the base to size, following the *Material List* dimensions.

Continuing our goal of keeping this workstation easy to make, we'll assemble the base with pocket screws. Mark the inside faces of all eight rails for a pair of pocket holes on each end. Set up your pocket-hole jig, and bore these holes. Arrange pairs of long rails between two legs to form two rectangular frames. The ends of the rails should butt against the inside edges of the legs. Drive 1 1/4" pocket screws into the holes.

Mark the inside face of each frame to locate the four short rails. Position



Pocket-hole joints are a simple means of assembling frameworks like this router table base. Use a commonly available pocket-hole jig to bore a pair of holes on the inside faces of all the long and short rails.



After you've assembled the longer rails and legs into two frames, connect these frames with the shorter rails to complete the base. The bottom short rails are located 2" up from the bottom ends of the legs.

the top short rails so their top edges will be flush with the top edges of the frames and their outside faces will be flush with the outer edges of the legs. Set the bottom short rails 2" up from the bottoms of the frames. Clamp these four rails between the two frames, and drive pocket screws to secure the joints.

Now cut six 1½"-wide x 12"-long cleats from scraps. Install four of these cleats around the inside top of the router table base. Center the cleats on the rail lengths and position their top faces flush with the top edges of the rails. Fasten the rails to the cleats with glue and pocket screws. Attach the remaining two cleats in the same way to the base's bottom long rails.

A durable finish will keep this project looking great. I applied water-based varnish to the workstation, router table base and drawers at this point.



Attach the router table base to the tabletop by driving pairs of countersunk 1½" screws through the top cleats and into the bottom face of the tabletop.

Mounting the Machines

When the finish dries, set your jobsite table saw and router table components on the workstation, and adjust them evenly from front to back and end to end. I aligned one of the table saw's miter slots with the router table miter slot, but this isn't crucial for operating either tool. When everything is situated, mark the underside of the router table where the base should be installed.

Turn the router table and base upside-down, and locate the base on it. Drill a pair of countersunk pilot holes through each of the four cleats, and drive 1½" screws through the cleats to attach the base framework to the tabletop.

You're now ready to mount the base of the table saw and the router table to the workstation with screws driven into the top. You may need to add some additional blocking underneath the saw, depending on the machine you own. Be careful that the attachment screws don't go all the way through the workstation's top, or they could interfere with the travel of the top drawers.

Install the fence on the router table and set the router plate in place with the router

installed on it. I added an On/Off safety switch to the router table, which plugs into both the router and a power source. It makes the router easier to turn on or off without reaching under the table to do so.

Press a router bit insert into each of the holes in the router bit drawer, if you've purchased them, and load the drawer up with bits. Then roll this handy workstation into place in your shop. It's now ready to go to work on your next project!



Chris Marshall is senior editor of Woodworker's Journal.





Rolling Task Light

By A.J. Hamler

Whether used as a raking light for finishing or for quick, wherever-you-need-it illumination, this articulating task light is on a roll.



For brushing finish without missing spots, a “raking light” angled to reflect off the wet surface is indispensable. Whether finishing a high tabletop or bookcase, a low coffee table or even the sides of a cabinet, the articulated arm of this rolling task light adjusts to shine wherever it’s needed.

Getting Started

Plane 3/8"-thick stock for the arms, the center layer of the three-part base and the light’s mounting plate. Hardwood

such as oak is best to make the articulated arm sufficiently rigid, and heavier stock in the base keeps the center of gravity low.

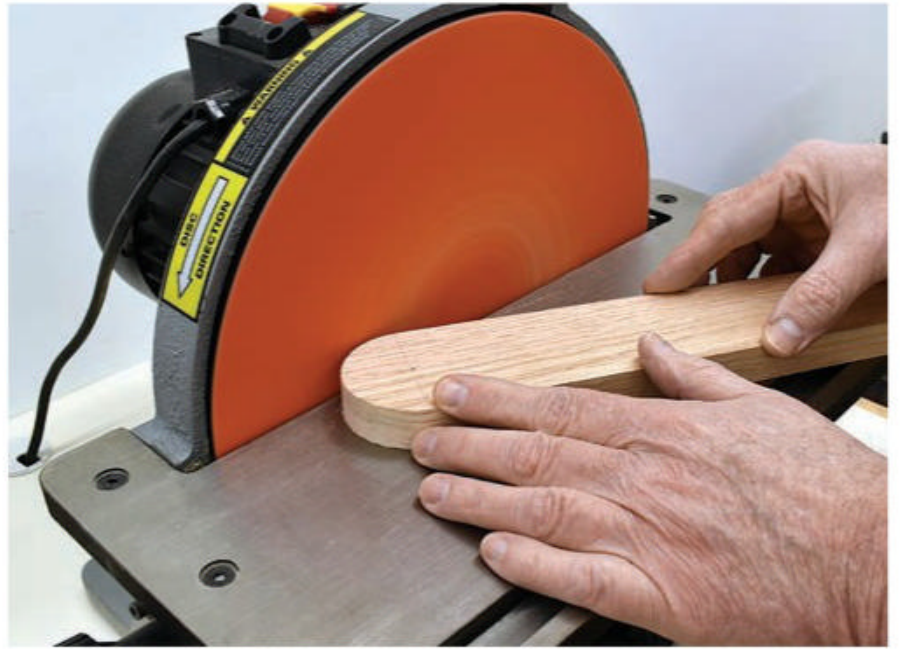
The base platform is 12" wide, while the vertical base components measure 14½" wide, so glue blanks up from multiple pieces. This not only gives you the needed width, but carefully arranging individual pieces also helps to avoid warping in the completed components.



Plane solid stock to 3/8" for the articulated arm, inner base and light mount plate components.



Follow the Drawings to lay out the arm components for cutting. There is a continuous taper that runs through both upper and lower arm sections.



Save time and create identical curves by stacking the lower arm components first for cutting, then when refining their ends on the disc sander.

Creating the Arms and Base

Rip a 40"-long piece of 3/8" stock to 2 1/2" wide to make the upper arm and one of the two lower arms. Cut another 2 1/2" x 24" piece for the second lower arm.

The longer workpiece allows you to mark a continuous taper from one end of the two-part arm to the other, starting at 2 1/2" wide at the bottom of the lower arm and reducing to 1 5/8" wide at the top of the upper arm. If you prefer, plot patterns onto your stock (see page 50).

Now draw the rounded ends. The compass's pinpoint (see *Drawings*) marks the exact spots for drilling bolt holes later. Separate the two arms from the longer piece then cut just the upper arm to shape.

The most efficient way to process the lower arms is with the workpiece you've laid out atop the other unmarked workpiece. Join them with a single 23-gauge pin nail through the compass points (or use carpet tape), then cut and sand at the same time to make identical

workpieces. Afterward, pry the pieces apart. Pull out the nails with pliers.

The base platform is just a trapezoid that measures 3 1/4" wide at one end and 12" at the other. Mark it to shape and cut it out. Create a paper or cardboard pattern, using the gridded *Drawing* on page 50 as your guide, to lay out two outer bases and one inner base piece. Cut these to shape, but don't cut the top end of the neck round just yet.

To minimize sliding, glue and clamp the inner base to just one of the outer base pieces. Allow the glue to set, then glue and clamp on the remaining outer base piece. When it dries, use sanders to refine and smooth both base components.

Now drill 1/4" pivot holes through the arms on your compass marks. (Again, stack the lower

use a compass to mark the round end of the neck for cutting. Cut it out and drill a 1/4" hole through the neck on the layout mark.

Making the Light Plate

Mark and cut out the light mount plate and the two sides of the light mount swivel. Stack the swivel pieces and drill a 1/4" hole through them, per the



The three base components — two 3/4" thick and one 3/8" — get identical profiles from a single pattern. However, the thinner middle component has an extended "neck" for attaching the articulated arm.

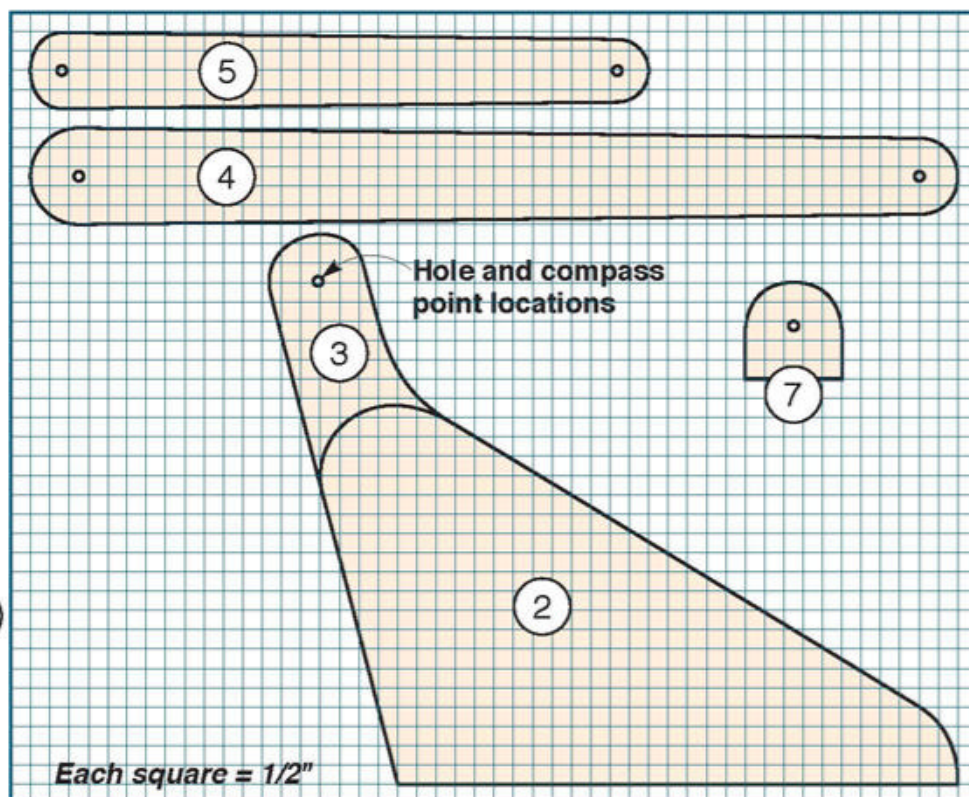
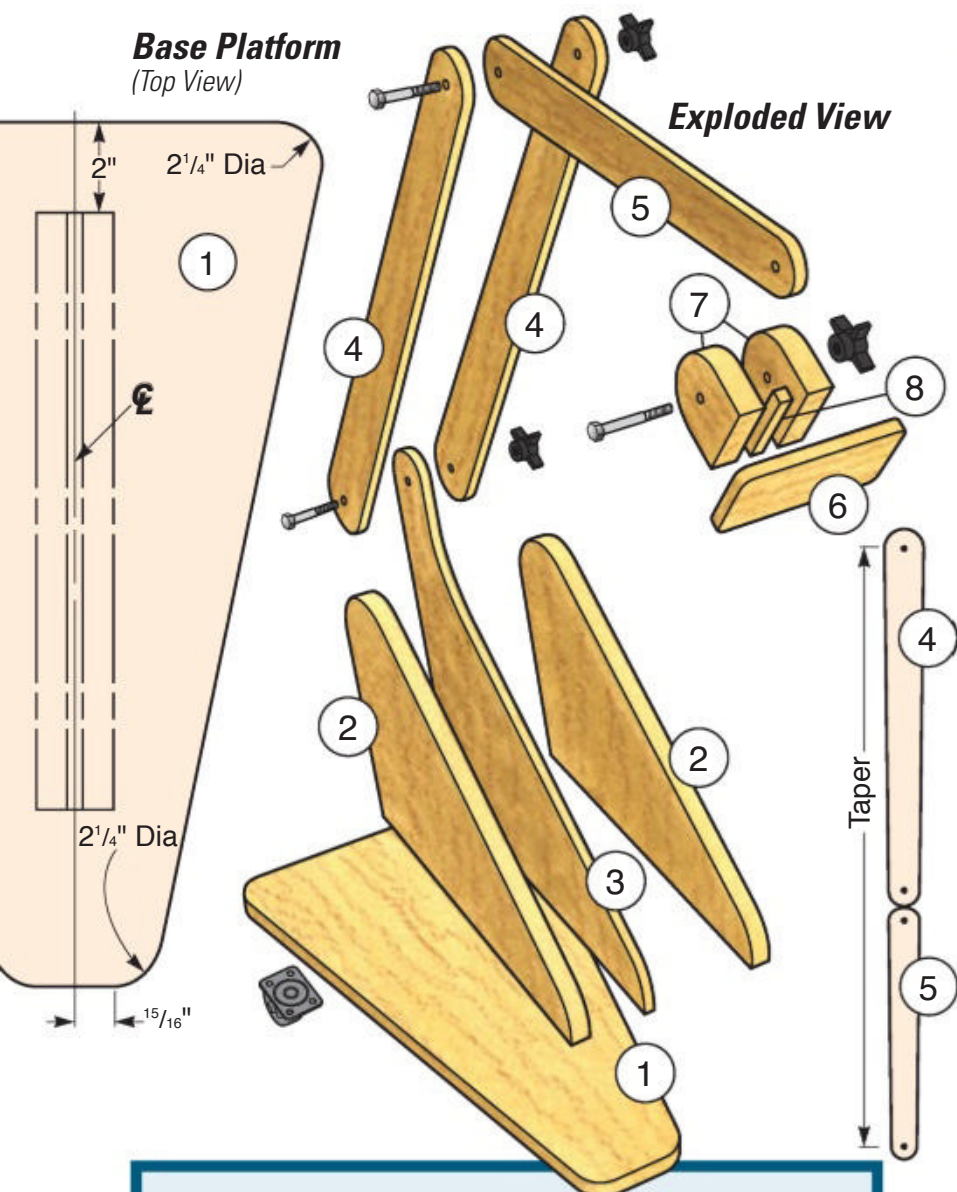
arms to do this.) To get the lower pivoting action correct, lay a lower arm component along the top of the base so the arm's wide end lines up with the center of the base's extended neck. Pencil a mark onto the neck through the pivot hole, then



Glue and clamp the thin inner section to the inside face of one of the outer base components. When the glue sets, add the other outer base section. This process keeps the parts from shifting.



Glue the 3/8" spacer to set the opening for the mounting swivel, and clamp up till dry. A 1/4" drill bit aligns the two pieces.



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MATERIAL LIST

	T x W x L
1 Base Platform (1)	3/4" x 12" x 21"
2 Outer Bases (2)	3/4" x 10 1/4" x 14 1/2"
3 Inner Base (1)	3/8" x 14 1/2" x 14 1/2"
4 Lower Arms (2)	3/8" x 2 1/2" x 24" *
5 Upper Arm (1)	3/8" x 1 5/8" x 16" *
6 Light Mount Plate (1)	3/8" x 2 1/2" x 4 3/4"
7 Light Mount Swivel Sides (2)	3/4" x 2 1/2" x 2 1/2"
8 Light Mount Swivel Spacer (1)	3/8" x 3/8" x 2 1/2"

* The lower and upper arms form a continuous taper from 2 1/2" at the widest part of the lower arm to 1 5/8" at the narrowest end of the upper arm.

When the glue dries, center the light mount swivel on the light mount plate, and glue and clamp it into place.

Final Assembly

Center the base on the base platform 2" in from its rear edge, and mark the location. Lay out the base's bottom face for three installation screws so you can drill countersunk pilot holes for them.

Drill pilot holes in the corners of the base, and attach the casters with screws and washers. Now apply glue to the bottom of the base, set it atop the base platform and secure it from underneath with 2" screws.

Give everything a final sanding before applying a finish. Then assemble the arm and light mount swivel with 1/4" x 1 1/2" bolts and star knobs. Install the lower arm on the base with a 1/4" x 2 1/2" bolt and star knob.

To secure the light itself, apply hook-and-



Attach the light with hook-and-loop tape to the mounting plate. This option makes it easy to remove the light when replacing the batteries.

loop tape to the back of the light and to the face of the light mount.

I chose this particular battery-powered light because it's very bright with two settings (120 and 900 lumens), weighs only 3.6 ounces and there's no power cord to get in the way. If you use a different light, adjust the size of the mounting plate accordingly. If the light you choose is heavier, you may need beefier bolts and knobs, and perhaps some thin neoprene washers, to keep the arm tightened in position.

A.J. Hamler writes frequently for Woodworker's Journal.

pattern. Glue them up with a 3/8" x 3/8" spacer at the bottom. Keep the bolt holes aligned when clamping the parts.

corners of the base, and attach the casters with screws and washers. Now apply glue to the bottom of the base, set



Before installing the base on the platform, drill pilot holes for the casters and attach them with #10 x 3/4" screws and washers.

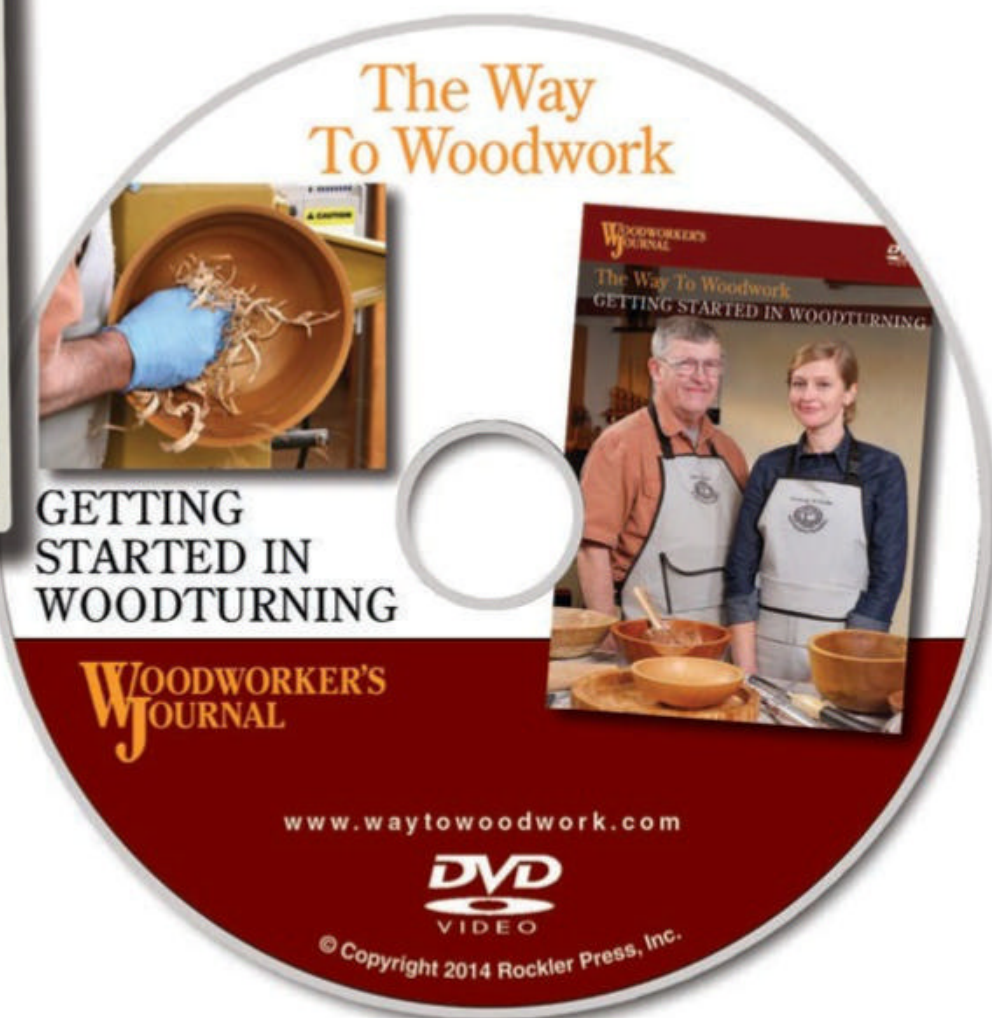
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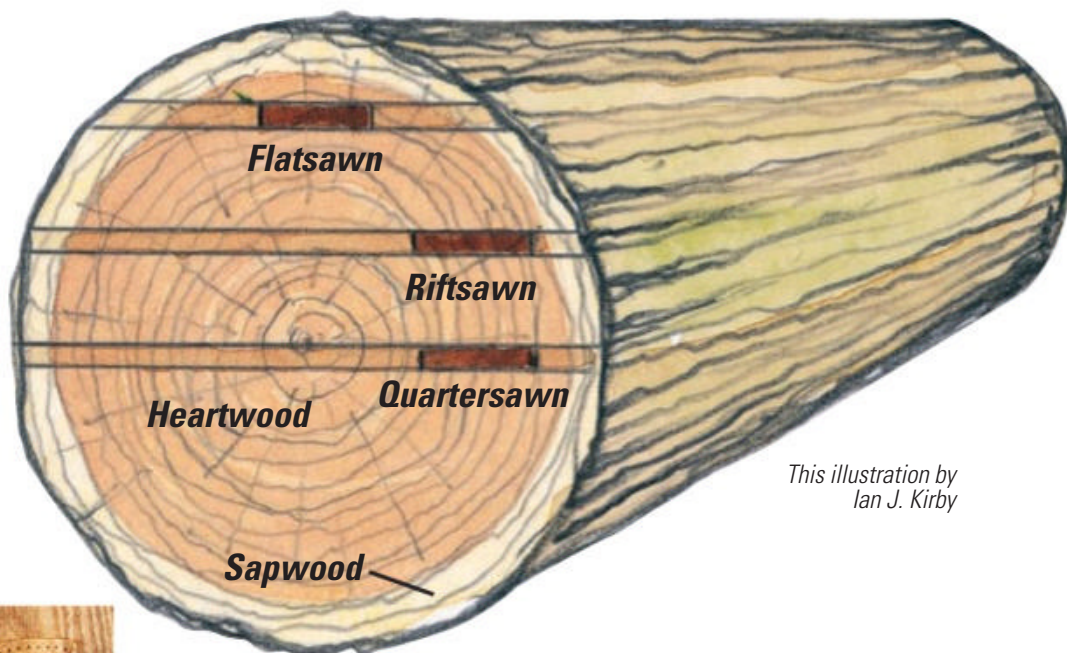
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Figuring Out Figure

By WJ Staff

As long as wood figure is not obscured by paint or concentrated stain, it will strongly affect the appearance of your project.



*This illustration by
Ian J. Kirby*



Beautiful quartersawn white oak displayed in the frame-and-panel cabinet (left) versus an expertly carved flatsawn white oak panel (right).

Where a piece of wood is sliced out of a log affects the figure it will present (see the illustration above). And the figure of the wood, often called the grain pattern or just the “grain,” strongly affects the appearance of your project. Within a single board you can sometimes find sections of flatsawn or cathedral grain, riftsawn and quartersawn grain. In addition, a board may often contain both heartwood (generally darker in color) and sapwood (often much lighter in color than the heartwood). How you make use of these variations as you create a

project is one of the ways to lift your woodworking from regular to regal.

When Does it Matter?

If you are building a set of storage shelves for your laundry room, worrying about the figure of the wood is an unnecessary step. Your concern there is strength and usability. (Can it hold all the laundry detergent and can you reach it?)

In the same way, the interior and back of a cabinet or chest of drawers are often not seen and as such don't benefit from a fancy figure. That's why those components are regularly made



Ash exhibits a strong contrast between vertical grain, used in the sideboard (above), and cathedral grain, in the rustic bench at left (inset).



This box's lid panel highlights the difference between walnut's light-colored sapwood in the center and darker surrounding heartwood.

from a less fancy secondary wood such as poplar or pine, because while they are structurally sound, they are also less expensive.

Where figure comes to the fore is in exposed areas that are the show faces of your furniture, such as the top of a table (see photo, below right) or sideboard, the drawer fronts on a chest of drawers or the doors of a tall cabinet. That is where you want to help your project show off and draw the viewer's attention. It has the effect of a nice shirt and tie worn over a white cotton undershirt.

Other Considerations

Once you become aware of the different types of figure available, even within a species, it is a great way to spice up the look of your projects. But just as food can become too strong to eat with an overload of spice, so too can excessive figure overpower a piece of furniture.

A large project constructed entirely of wood with a crazy-wild figure can come off visually as a bit over the top. To keep that from happening, builders will often use exceptional grain in a specific area of a project only — say the top of a chest of drawers or the doors of a tall cabinet. And they will offset that feature with subtler figured wood of the same species to extend a sense of harmony throughout the design. This is one area where handmade furniture has a huge advantage over production pieces: you can choose where to accentuate with figure.

Another place where

intense figure is not best used is where there is a lot of machining or carved detail. Using quartersawn white oak in the carved panel on the opposite page would have the figure fighting with the shape of the carving.

You are the Boss

You may have noticed that the directions here have been in the form of guidelines as opposed to rules. All of these choices are subjective, and there are likely no right or wrong decisions. Experimenting with the options is the best way to find your preferences. As stated earlier, this is one of the ways to truly enhance handmade furniture. Learning about figure in lumber is a fun way to advance your skill in the craft.

Quartersawn mahogany's ribbon-stripe figure is an eye-catching feature of this Arts & Crafts design.

Grain and Figure

Grain and Figure are often used interchangeably, as they are like two sides of a coin.

Grain: orientation of the fibers that make up a piece of wood as it is cut from a log

- Flatsawn (annular rings run roughly parallel to board faces)
- Quartersawn (annular rings run perpendicular to board faces)
- Riftsawn (annular rings run 30 to 60 degrees to board faces)

Figure: pattern that the wood's grain displays when cut from different sections of a log

- **Vertical and/or Straight:** relatively straight grain lines created by a quartersawn or riftsawn cut from a log
- **Cathedral:** arched grain lines achieved when a log is flatsawn
- **Flake:** flake-like appearance that occurs in a quartersawn piece of wood when the species has large medullary rays. Seen dramatically in white oak and red oak and to a lesser degree in riftcut lumber.
- **Curly:** pattern created when a tree has twisted grain fibers
- **Fiddleback:** a pattern of twisted grain fibers that are exposed across the surface of a board. Most often found in maple.



TOOL TUTORIAL

Spotlight on Task Lighting

By A.J. Hamler



Supplemental lighting options can make shop tasks easier, safer and more enjoyable.



No matter how much light you have in your shop, there are times when just a bit more illumination right where you're working makes all the difference in how efficient your work is, and how safely you perform a particular task. Whether it's needing a better look at what's going on while running a machine, being able to closely examine a process

that's just not that easy to see, or even working in a darker area your regular shop lighting just can't normally reach, having adequate lighting for the task at hand will always "lighten" the load for the better.



Even if you have a brightly lit shop and have followed all the guidelines for estimating the number of ceiling fixtures and lighting intensity you need, there are probably still a few instances where a lighting boost here or there yields better visibility to individual tasks. The best way varies with the task, of course.

Let's take a look at five typical areas where a bit of extra lighting goes a long way to achieve better and safer woodworking.

Machines and Tools

Most powered woodworking equipment involves dangerous cutting edges, so it only makes sense to have the best view possible of what's being cut. Unfortunately, some stationary equipment such as band saws or drill presses — and your own body in the case of handheld power tools — can block direct light during use.

Manufacturers have addressed this in recent years, most notably by providing LED lights on drill/drivers and impact drivers. Some cordless nailers are now outfitted with LED lighting, too. In addition to being a general aid for any assembly



When replacing older tools, always opt for a new one that features a built-in work light, like this 12-volt cordless driver.

or drilling task, these lights, although small, are a huge benefit when working in or under something. Doing a cabinet install, securing tabletop clips, hanging shelves — all are typical jobs ambient light doesn't reach. If you're still using a drill or impact driver without a built-in light, it's time for an upgrade.

Not a lot of other tools include lighting yet, but until then you can still brighten things up. Any small light can be added to a tool using that shop standby: duct tape.

When routing, the tool itself can block light, but affixing a small flashlight angled toward the bit highlights the contact point. You can do the same thing with a jigsaw, recip saw, oscillating tool ... anything, really.



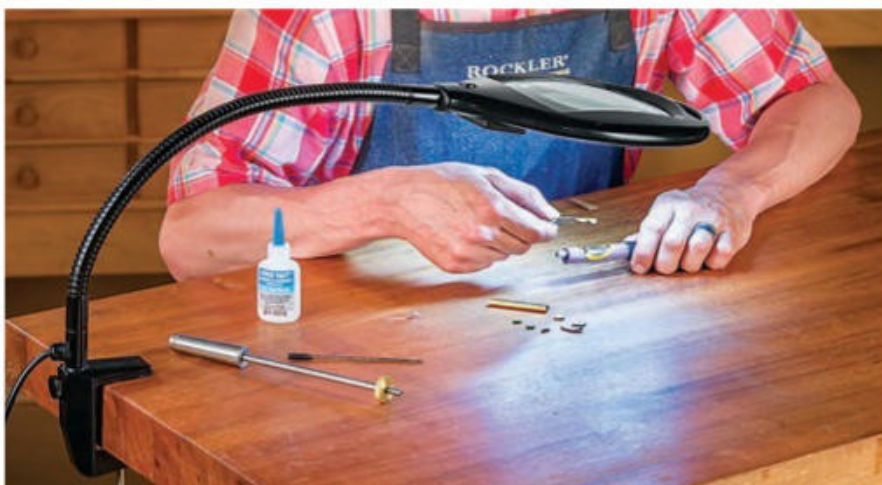
Taping a small utility light to a router is a quick fix that works wonders for lighting up the bit area.

The same idea works for stationary tools too, and manufacturers offer a variety of add-on lights. Featuring magnetic or clamp-on bases, just attach the light and aim it to where the action is. Tool lights come as both corded



A dedicated adjustable light mounted to this band saw makes following a cut line simpler, and the blade is easier to keep an eye on.

TOOL TUTORIAL CONTINUED



For close work on small items, an adjustable clamp-on magnifying lamp attaches to almost any work surface in your shop.



No more missed spots! A raking light is an enormous help in laying down a good brush-applied finish.



and cordless, and they typically are inexpensive enough to add one to every machine that needs a bit more light.

Better Visibility — at the Bench or on Your Person

Benches and worktables are typically in brighter areas of the shop, but there can still be visibility issues. When doing precision work — carving, detailed drawings, small components, dovetails — an adjustable light brought to bear directly over the work helps tremendously. Combine the light with a magnifier, and even the smallest aspects of a task will be easier to see.

When brushing a final finish on projects at the workbench or anywhere else, a beam of “raking light” reflected off wet finish readily shows missed spots. Setting a light just right can be tricky, but a dedicated light with an articulated arm pivots to any angle. Add wheels, and not only can the raking light move easily from

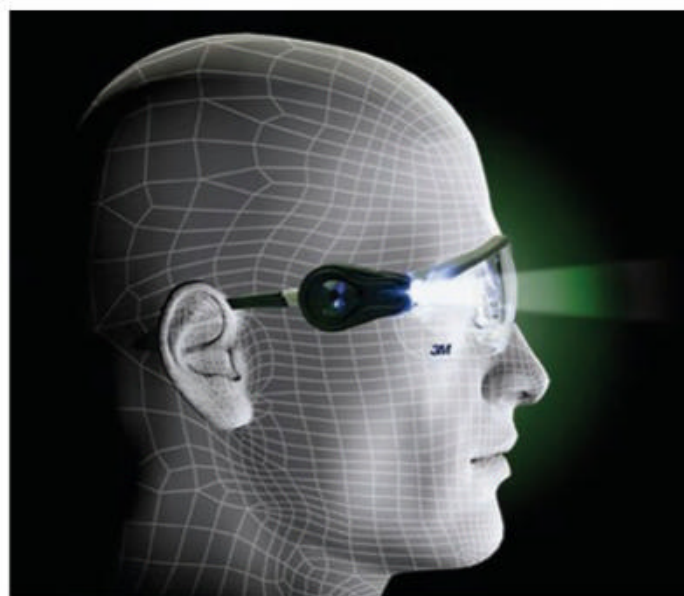
Need a close-up look and still keep your hands free? A neck-lace-style magnifier, like this illuminated model from OttLite, makes anything easier to see.

workbench to shop floor, but it’ll also provide light for anything, anywhere you want to aim it. You’ll find plans for a handy finishing light project you can make in this very issue (see page 48).

Sometimes it’s most efficient to have extra lighting right on your person. Remember that magnifying light described earlier? A smaller version, easily looped around your neck, allows you to move around with the light. Whether leaning in close to check details on a project or relaxing after a hard day in the shop with your favorite woodworking magazine, you’ll never have to strain your eyes again.

Speaking of your eyes, you already wear vision protection while working, so why not add light right to your shop glasses? With tiny, battery-powered LEDs on each side, you’ll direct a soft glow anywhere you look. Illuminated shop glasses like these are typically available two ways: plain for those with 20/20 vision, and versions with a range of diopters for woodworkers needing minor vision correction.

And if you need to use tools in a dark spot — like



Personal lighting and eye protection in one, these 3M Light Vision shop glasses aim light wherever you look.



For hands-free lighting anywhere, a headlamp may be “old school,” but it’s a tried-and-true solution that still makes great sense.

Under a cabinet or over any work area with a wall behind it, a combination power strip and task light like this Volt King power station provides multiple solutions for working visibility.



repairs under a sink, say, or out on the deck at night — an old-fashioned headlamp is a perfect hands-free solution. Unlike what an old-timey coal miner may have used, these modern headlamps are battery-powered or rechargeable, and they sport ultra-bright LEDs.

Under-cabinet Lights

By their nature, cabinets block light. Ordinary under-cabinet lighting available at any home center can help, but consider a specialized version that incorporates other useful features. The Volt King 10-outlet power strip shown at upper right, for example, has two separate lights than can be individually aimed. More outlets than you’d ever need, plus a pair of USB ports for charging other devices, make these true multitaskers.

LEDs and cordless technology have exploded in this category, creating numerous inexpensive lights in sizes that can be mounted anywhere. I use the 9" Ecolight (see the white bar light on this page) inside the shop cabinet where my 3-D printer lives. It’s just the right size, and it has a small remote that controls three light levels and even toggles between “warm” light and “daylight” temperatures.

Cordless and controllable, this Ecolight under-cabinet light offers three intensity levels, both “warm” and “cool” light settings and a small remote.

Banish Dark Corners

Finally, let’s shine a light on the dark nooks every shop seems to have. Whether in storage areas, around corners or over solitary tools (like my drill press) that seem to get marooned in the shadows, sometimes a quick solution is best.

Super-bright individual lights are increasingly available, again thanks to LED tech. These usually take the form of sci-fi-looking screw-in fixtures needing only a regular socket to shed amazing amounts of light, making them perfect for underserved areas.

Finally, don’t forget about task lighting that’s been around for decades in the form of plug-in “work” lights. Some use the latest in LED light sources, while others have a simple socket for a regular or compact fluorescent bulb. Wherever you need temporary directed light, these provide it in a



Light up a dark area using a single socket. This LED utility light provides a dazzling 5,000 lumens.



Portable LED spotlights and compact florescent “clip-on” lights are useful, cheap and available at literally any hardware store or home center.

hurry. Best of all, they’re the cheapest lighting around and you’ll find them anywhere, from the largest home center to the smallest dollar store.

A.J. Hamler writes frequently for Woodworker’s Journal.

New

BUYING LUMBER ROUGHSAWN LUMBER

Ins and Outs of “Roughing It”

Woodworking lumberyards often carry unsurfaced hardwoods. Here's what to expect when buying these diamonds in the rough.



Dark outer surfaces on the walnut sample (above left), might be hiding lighter sapwood areas underneath. “Skip planing” (left), will reveal at least some of the actual figure and color you can expect. This maple board attests to it here.



Many hardwood lumberyards stock “roughsawn” lumber. And just as the term suggests, the board faces and edges will be pretty rough. That’s because while the lumber will be kiln- or air-dried and ready for woodworking, it hasn’t been planed and joined smooth and flat. What you’re buying are boards in the state they were in when they were originally cut from the log and dried.

The upside to roughsawn lumber is that it’s generally more economically priced than if it were pre-surfaced smooth and flat. Less processing by a mill means lower unit cost to them — and ultimately to you.

A downside to buying “in the rough” is that these boards haven’t been corrected for natural defects that often occur during the drying process. Some amount of bowing, cupping, twisting and checking are likely — and either you’ll need to

correct for it with your shop machines or the lumberyard might do it for you for a fee.

What Lies Beneath?

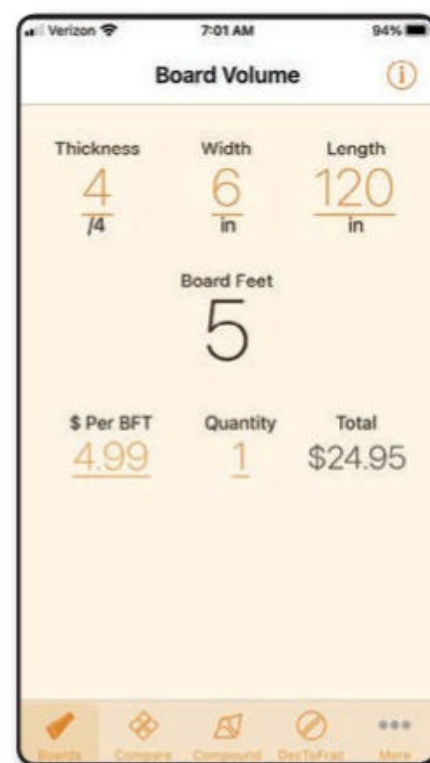
With some species, it can be very difficult to tell what the grain pattern and color of a board is under that rough exterior. The murky, dark-colored top layer of walnut and cherry in particular can mask lighter sapwood areas. If grain pattern and color consistency is important to your project, ask the yard if they are willing to “skip plane” it for you. This light planing pass will reveal at least some of the board’s characteristics, which can help. You’ll pay a nominal extra fee for skip planing.

Roughsawn lumber has a quartered thickness, such as 4/4, 5/4, 6/4, 8/4, 12/4 and



Roughsawn lumber is shelved and sold by its quartered thickness. Here, 8/4 ash (about 2" thick) will have a finished thickness of about 1 3/4", and 5/4 ash (about 1 1/4" thick) will plane down to about 1" smooth.

16/4. Expect to see a wide range of widths and lengths, too — that’s the advantage of selling by volume instead of by “1x” or “2x” standardized lumber sizing. It’s sold volumetrically in “board feet” instead of a “per foot” price.



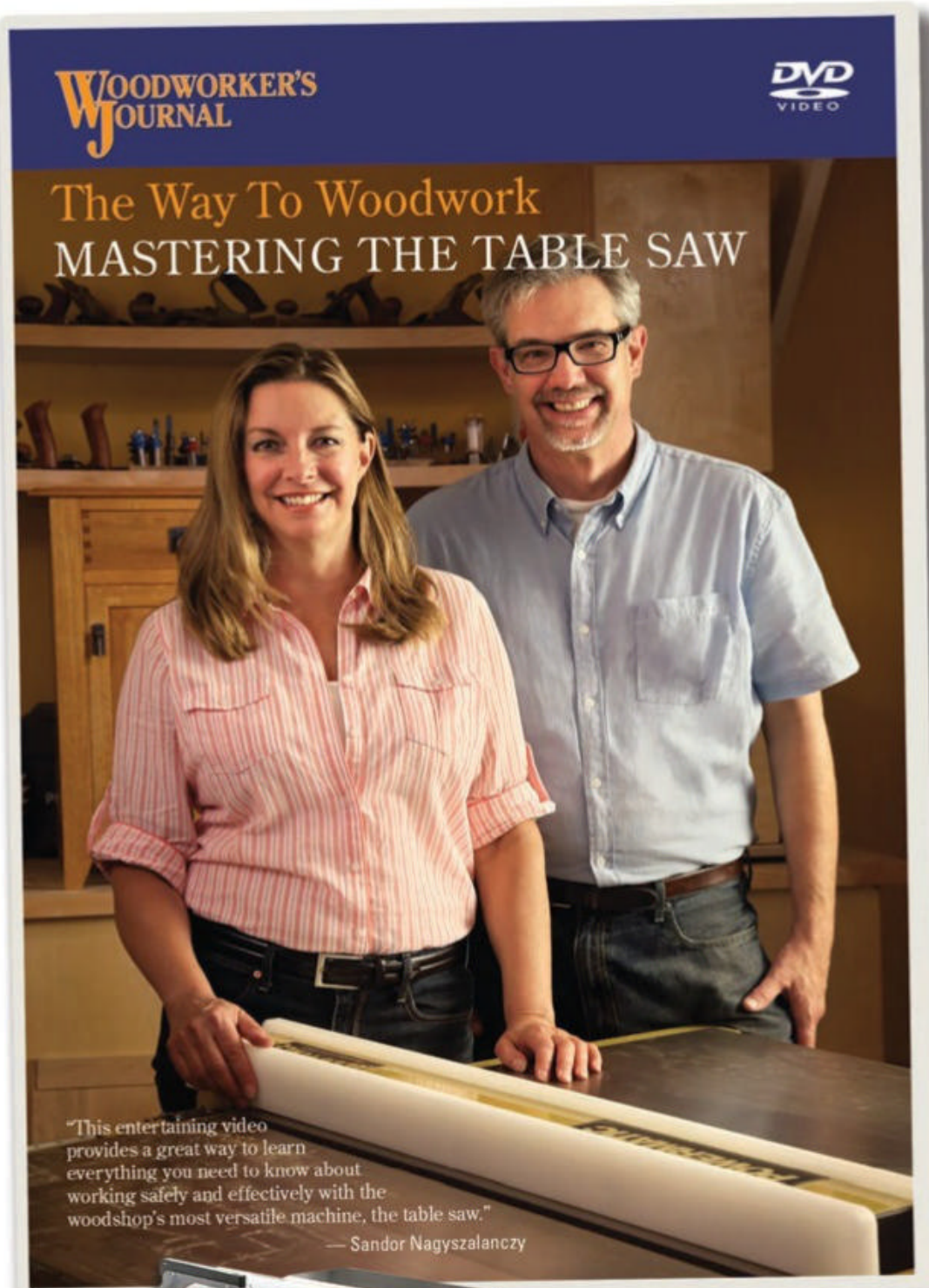
The “Woodshop Widget” mobile device app makes quick work of board foot and price calculations.

So you’ll need to know how to calculate each board for the number of board feet it contains (where one board foot equals a piece 1" thick

x 12" wide x 12" long). But if math isn’t your strong suit, mobile device apps such as “The Woodshop Widget” (woodshopwidget.com) can tabulate it instantly. An app like this can be a big help!

WOODWORKER'S
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The Way To Woodwork: Mastering the Table Saw



Learn to safely and confidently operate the most important tool in your workshop with the latest installment in *The Way To Woodwork* series: *Mastering the Table Saw*. Our experts teach everything, from the basics of ripping and crosscutting, working up to more advanced techniques. You'll also discover how jigs add versatility, safety and accuracy to your table saw. Expert or rookie, this DVD has something for every woodworker.

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TOOL PREVIEW



The Castle 110 cuts tidier screw pockets and pilot holes (right in photo) than typical stepped drill bit options (left in photo). Special Torx/star drive screws are required.

through (see left example in the above photo). That crumbly extra wood debris can contaminate the glue joint or prevent the components from meeting flush.

Mismatched joints aren't uncommon, either. That's because screws are driven into the undrilled mating workpiece at roughly a 15-degree angle. The force and angle of the screw can shift the joint out of alignment as it's driven down into place.

Castle USA's Solution

Castle USA's new 110 Pocket Cutter — a benchtop version of the company's larger, professional-grade pocket joinery machines — is designed to solve these problems. First, instead of a 15-degree angle of approach for the screws, Castle opts for a shallower 3-degree angle. Screws install at less of a bias to the grain this way, which helps to draw joints together flush.

This machine also cuts the screw pockets differently. Rather than using a drill bit, the Castle 110 has a 450-watt router inside with a spiral carbide bit to mill the pockets. Pushing down a lever in back of the machine rotates the router up so the bit can

Castle 110 Pocket Cutter

By WJ Staff

Manufacturer of industrial-grade screw pocket machines launches pro-quality benchtop version for small shops.

As pocket-hole joints have become ubiquitous, so have the consumer options for creating them. Typical systems use a stepped twist bit inserted at an angle into a drilling guide clamped to the workpiece. The drill bit's larger flutes bore a deep pocket for the screwhead, and a smaller-di-

ameter tip drills a pilot hole for the screw's shank.

While this process is simple, the end result isn't always flawless. The angled pocket often has a ragged opening. And if the drill bit's stop collar is set too deeply, end grain fibers can pop out of the workpiece where the pilot bit nearly pokes



Routing pockets and drilling pilot holes for screws is a three-step operation:

1) Adjust the upper clamping plate until it touches the workpiece and press the clamp lever down to lock it.

2) Start the router and push the rear pocket-cutting lever down until it stops to mill the screw pocket.

3) With the included 5/32"-dia. twist bit installed in a drill/driver, insert the bit into the rear drilling guide to bore a 3-degree angled pilot hole for the pocket screw.

pass through a slot in the machine's work deck. The arching motion cuts a crisp, clean, flat-walled pocket quickly and easily.

Pilot holes for the screws are drilled in a separate

Imperial layout lines and a centerpoint that make it easy to know exactly where screw pockets will be located.

Castle calls the solid material ahead of the screw pocket the "web." The 110 offers five settings to vary the width of this web to suit the joint and screw length at hand. These web adjustments are easy to make by shifting a notched gauge on the side of the machine.

Pro Pedigree

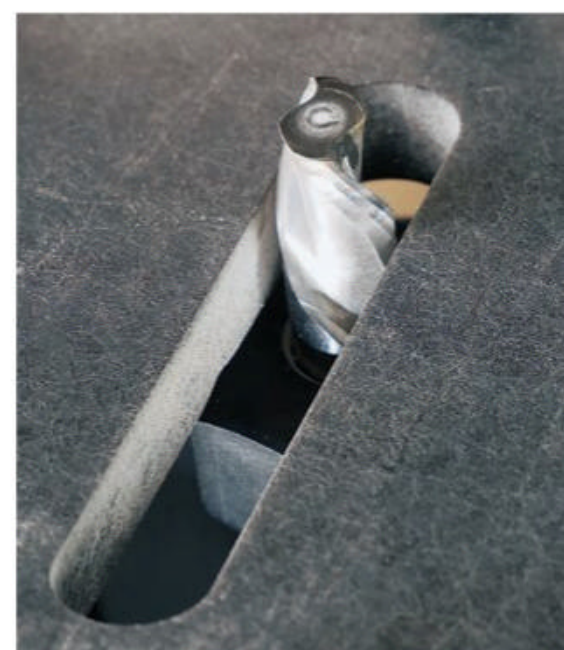
Built mostly of aluminum and stainless steel, the 9¼-lb Castle 110 seems bulletproof,

wrenches. A dust hose port and openings for clamping the machine to a work surface are other good features.

The shallower screw angle of these pocket holes require that Torx/star drive "cheese" head screws be used, instead of the typical square drive washerhead screws of other pocket-hole joinery systems. But Castle provides 250 each of its 1¼"- and 1½"-long screws with the machine.

Two optional work stops (\$40, shown here) install above the 110's work deck on either side for quicker workpiece positioning.

Learn more about the Castle 110 Pocket Cutter at castleusa.com.



A solid-carbide 5/16"-dia. downcut spiral bit mills the screw pockets cleanly and efficiently.

Castle 110 Pocket Cutter

Street Price:\$399
Motor:450-watt
No Load Speed:30,000 rpm
Net Weight:9¼ lbs
Bit:5/16" carbide
Pocket Hole Depth:7/16"
Stock Thickness:1/2" – 1"
Screws: Torx drive "cheese" head

operation. After you've milled the pocket, the Castle 110 has a hardened drill bushing in back that enables a 5/32" pilot hole to be drilled into the end of the workpiece rather than from inside the pocket. That eliminates loose end-grain fibers that can muck up the joint.

A stout clamping lever on top of the tool presses an adjustable clamping plate down against the workpiece to hold it securely. The plate is helpfully marked with

and its build quality suggests that this machine is ready for rigorous daily use. Its 8 mm router collet is easy to access when the downcut spiral bit should need to be serviced. A clear plastic overlay plate for milling 1/2" to 5/8" stock is included. So are the required 4½"-long drill and 6" driver bits and a pair of collet

The Castle 110's router can be accessed by pulling off a front cover plate. Here the router and bit are shown raised to the maximum cutting height for a screw pocket cut.



WHAT'S IN STORE

Auto-adjust Table Saws, Pocket-Hole Jigs

Contact Information

General Finishes
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generalfinishes.com

General International
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generaltoolsusa.com

Kreg Tool
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kregtool.com

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With three sizes of *Dust Right® Stacking Dust Ports*, you'll be able to connect hoses up to 4" in diameter to hoses as small as 1¼", plus a wide range of popular sizes in between. The glass-reinforced polypropylene adapters, which come as a set, are molded in different colors and clearly inscribed with the compatible hose/fitting or the outside diameter. The black adapter fits a 4"-diameter hose or Dust Right 4" Quick Change Handle (item 55027, sold separately) on one end. It has a 3" O.D. opening on the other end. The gray adapter fits into the black adapter and also has a 2½" O.D./2¼" I.D. port. The blue adapter mounts either way to both the black and gray adapters with a 2¼" O.D./2" I.D. port on one and a 1½" O.D./1¼" I.D. port on the other end. All three friction-fit together for easy assembly or disassembly. **Rockler's** Dust Right Stacking Dust Port Adapter Set (item 61247) sells for \$12.99.



Rockler Dust Right Stacking Dust Port Adapter Set

General International's 850 SMART® Auto Digital Table Saws feature an innovative automated rip fence system with an LCD display in front, rather than a locking lever. Once the T-style fence is zeroed out, its digital display enables a user to program the fence to exact distances from the blade for setting up precise



rip cuts. The fence moves to that position automatically. The same fence controller also programs the arbor and heavy-duty trunnion assembly to tilt and raise or lower the 10" blade for accurate bevel and depth-of-cut setups. A 3hp, single-phase motor drives the blade by way of two V-belts on balanced cast-iron pulleys. A cast-iron table, laminated side table, deluxe miter gauge and 4" dust port are other standard features. These left-tilt SMART Table Saws come either with 36" ripping capacity (model 850-3-36; \$3,899.99) or with 52" ripping capacity (model 850-3-52; \$3,999.99).

General International 850 SMART Auto Digital Table Saw





Kreg Tools 720PRO Pocket-Hole Jig

Enduro-Var II — a water-based, oil-modified polyurethane topcoat — is now made with 70 percent renewable resources. It is reformulated using more sustainable materials, including plant oils and proteins, to help decrease its carbon footprint. Compared to the original En-



General Finishes Enduro-Var II

duro-Var, Enduro-Var II has improved chemical and water resistance as well as better adhesion qualities. This extremely fast-drying finish can be brushed, rolled or sprayed onto interior projects and imparts a warm amber tone, similar to oil-based varnish. Available in flat, satin, semigloss and gloss sheens from Rockler, **General Finishes** Enduro-Var II comes in quarts (\$39.99) or gallons (\$109.99).

Kreg® Tools has reimagined the design of its pocket-hole jigs in order to offer the

new 720 *Pocket-Hole Jig* and 720PRO *Jig* options. Both feature Automaxx™ one-motion clamping: pushing down a paddle lever automatically adjusts the ramped drilling fixture to fit workpieces ranging from 1/2" to 1½" thick. GripMaxx™ locks them in place. A steel-reinforced spine ensures rugged durability, and a chip ejection port for vacuum attachment helps to minimize mess. Both 720 jigs come with an easy-set 3/8"-diameter drill bit, two lengths of driver bits and a material thickness gauge that all stow on the tool. But the 720PRO also includes a pair of Docking Station material support wings, a repeatable stop and a clamp for securing the jig. Kreg's 720 Pocket-Hole Jig (Rockler item 63166) sells for \$129.99 and includes 60 pocket screws. The 720PRO (item 66710) is packaged with 160 screws and a project plan you can build. It's priced at \$149.99.



Rockler Foam Organizer Sheets

Customize tool drawer storage as you like while isolating tools from damage and protecting sharp edges with **Rockler's Foam Organizer Sheets** (item GRP41168). Simply lay tools out on either the 1½"- or 2¼"-thick expandable polyethylene foam, trace the shapes and cut the outlines with a utility knife. Then peel out as many laminations as the tool requires until you reach the desired depth. The 24" x 48" sheets cut easily to size on a table saw, band saw or with a knife. Single sheets of foam cost \$9.99 (1½") or \$19.99 (2¼"). Three-packs of 1½" foam sell for \$24.99; 2¼" three-packs cost \$49.99.



FINISHING CORNER

How Do I Avoid Bubbles When Varnishing?

By Tim Inman and WJ Staff

Thinning varnish first and using a better applicator can help prevent those pesky little bubbles.

Tim Inman is a professional woodworker and finishing expert and the author of *The Art of Classical Furniture Finishing*.



To remove burls for woodturning and other project uses, cut under the bark a little below where the burl is attached to the log.

Q Every time I apply polyurethane finish, I get hundreds of tiny bubbles in it. I've tried different types of brushes and strokes and even mixing techniques but I still have the same problem. Any advice you could offer would be greatly appreciated.

A Is your finish water-based or oil-based? If it's water-based, thin it 5 percent or so with water and then use a flat painter's pad (with the short nylon bristles) or a 3" or 4" foam paint roller. If it is oil-based poly, thin it 15 percent with mineral spirits and use a good quality varnish brush. Don't work the finish back and forth with your applicator. Try to just lay down one smooth coat per application and leave it to flatten out. I'm actually a fan of the wipe-on poly variety. It is easy to apply and lays down smooth.



One way to prevent tiny bubbles in varnish when applying it is to use a better applicator. A foam paint roller can work well for water-based varnish. Use a high quality brush instead for applying oil-based varnish.

You just need to put a few more coats on to get the same degree of protection.

— Rob Johnstone

Q I have a large eucalyptus log with a burl on one side that projects three inches and measures 16 by 28 inches. What is the best way to harvest this burl for future turning?

A Burls are abnormal tree growths that can occur on a tree's stem (bole), on the roots or on a branch. Their cause is not completely understood; the theories include a genetic tendency or a reaction to either a virus or a fungus. Possibly, all of these factors contribute to a varying degree. Some sources also attribute it to injury. The comparative rarity and unusual beautiful appearance

of these wood growths adds to their appeal for woodturners and other woodworkers. Removing a small burl from a tree is straightforward: simply cut under the bark a little below where the burl is attached. (Excerpted from "Harvesting Burl," *Woodturning*, June 2019.)

— Ernie Conover

Harvest it with a saw in one hand and a bucket of waxy sealer in the other hand. Immediately after cutting the burl, seal that cut side. Seal it again. Seal it again in a week. Store it where it is cool and out of the sun. Be patient. I have one about that size I cut from my grandmother's giant maple tree in 1979. It is doing fine. I'll find something worthy of it one of these days and see how it turns.

— Tim Inman



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June 2021

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HARDWORKING WOODS

Longleaf Pine: *Pinus palustris*

By WJ Staff

A standout among common pines, here's a promising furniture contender.

When you compare longleaf pine to most of its cousins, it actually has more in common with hardwood lumber — in terms of density, durability and workability — than softwoods (say Norway or white pine, for example). Its resinous nature makes it moderately rot-resistant. Quartersawn longleaf pine presents a lovely straight-grained figure that evokes old-growth Douglas fir, but with a creamier background offset by rich reddish and orange hues. It can be stunningly beautiful to look at.

While it is a true softwood, to think of longleaf pine in terms of its more common pine lumber cousins would be a serious disservice to this unique wood, akin to comparing a Ferrari to a Ford Focus simply because they both have wheels.

Trial by Fire

Longleaf pines grow up to 130 feet in height and three feet in diameter. They are the longest living of all southern yellow pines, known to live more than 300 years. They produce the highest quality wood of all North American pines. Their self-prun-

ing growth leads to few knots. Growth rings are thin and tightly spaced.

Frequent fires in its natural habitat developed the longleaf's system of sporadic seed production. It sprouts but does not begin growth for six to 10 years as it puts down a taproot. During this stage, the seedling is known to be in the "grass" stage because it looks very similar to bunch grass. These seedlings wait for some natural event that removes the canopy, providing sunlight to the forest floor and allowing the seedlings to begin to grow. During the grass stage (and any other time they are not actively growing), they can survive intense fires, as can the mature trees.

Longleaf pine once grew in the coastal plain from southeastern Virginia into

southern Florida and west into eastern Texas, as well as in the low mountains of Alabama. This ecosystem had occupied up to 94 million acres, but by 1995 it had shrunk to just three percent of its native range. This is mostly federal and state lands and a handful of large plantation estates. Luckily, what remains is managed and responsibly harvested.

Presently, most newly harvested longleaf lumber goes into the building trades for flooring and structural uses where extreme strength is required. But woodworkers are beginning to rediscover the beautiful nature of longleaf and use it more and more in furniture making.



Shop Scorecard

Uses: Construction lumber, porch decking and exterior trim. Furniture construction and panels.

Hardness: Medium density with good strength properties. High resin content resists bending.

Area of Origin: Southern United States

Workability: Cuts and planes cleanly with power tools. Can be difficult to hand plane. Hard resin structure produces crisp profiles. Glues, nails and screws well, although thin drill bits can wander.

Finishing: Contrasting grain density stains inconsistently. Prefinishing with shellac is advisable.

Cost: Wide availability and sustainable harvesting make this an inexpensive softwood.

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The Freud logo is displayed in a red, stylized font within a black octagonal border. The background of the advertisement features a large, detailed image of a Freud CNC router bit with a red cutting edge, set against a blurred industrial background.

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