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40
YEARS

Mid-Century Modern Inspired Nightstand

Page 70

INSIDE:

- Field Desk
- Shaker Chair
- Measuring Tricks

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PORTABLE BOARD GAME STORAGE BOX



Page 38





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Projects

Shaker Chair

By Ernie Conover

Take the fear out of chair building with this comfy turned model based on a 19th century Shaker design.



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Portable Board Game Storage Box

By Kimberly McNeelan

Gather family and friends around this "old-fashioned" entertainment center that provides tidy storage for game boards and game pieces.

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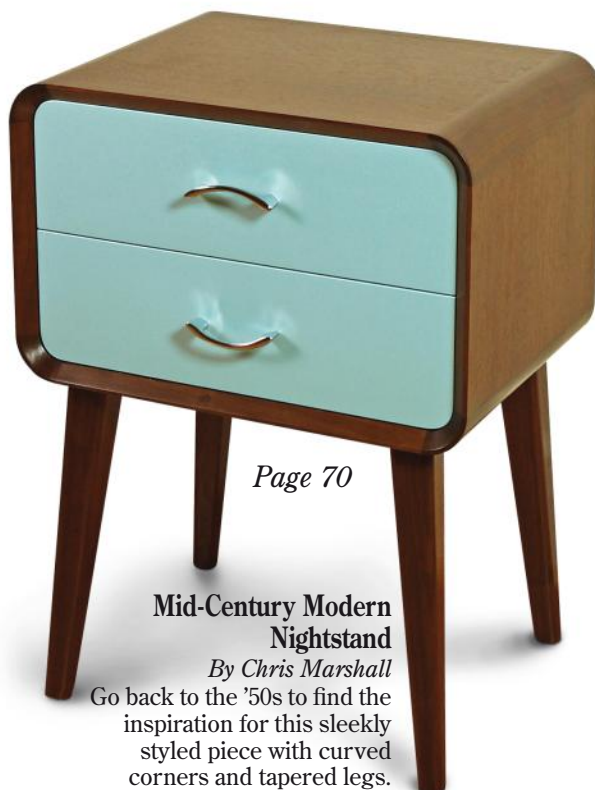
19th Century Drop Front Desk

By A.J. Hamler

Make it modern or period-correct: this portable "field desk" draws on features from the Civil War era.



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Mid-Century Modern Nightstand

By Chris Marshall

Go back to the '50s to find the inspiration for this sleekly styled piece with curved corners and tapered legs.

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It's show time! Well, it was show time. We just returned from the International Woodworking Fair in Atlanta. This every-other-year event brings together the major players in woodworking supplies and tools. We did our best to bring you the newest and coolest stuff we found. Maybe you were among the thousands who followed our coverage. In case you missed it, you can still go back and watch all of the videos on our IWF blog at www.woodworkersjournal.com/IWF2016 or on our YouTube channel.

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— Dan Cary





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Letters

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OUR SURVEY OPENED MY EYES ...

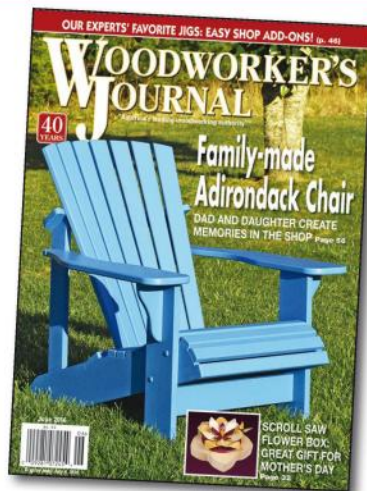
I eagerly anticipated the results of our survey asking "What type of woodworking do you do?" Every time I get a chance to find out more about what woodworkers are doing, it really lifts my spirits. The diversity of projects (everything from small turnings to 12-string acoustic guitars to intarsia reproductions of classic art) gives me new challenges and fun ideas to follow. And even though we did not specifically ask why you all were building these things, the message came through loud and clear. We asked about projects you were proud of and got answers like: my granddaughter's crib, a kitchen table for my daughter, the bunk beds for my children, my sister's kitchen cabinets ... and the number of projects built for spouses was truly impressive. So it is clear to me — as I am one of you through and through — that the prime motivator for our work is love. Sure, we build things to save money (if you can find a more frugal group than woodworkers, I would be interested in knowing who they are), but for the most part, our efforts in the shop are to make life better for someone we care about — or even someone we don't know (toys donated to shelters, projects donated to veterans and nursing homes, and more). Altruism is rare, but not among woodworkers. I am proud to know you and to make this magazine serve such a fine group. You are the best.

— Rob Johnstone

Adirondack Blues?

For Mother's Day 2015, I made an Adirondack chair using the plans from the July/August 1986 magazine. I let my wife choose the color and was apprehensive about light blue, but it came out very "spring" looking. Imagine my surprise when I saw the cover of the June 2016 magazine and saw the same chair on the cover. The shade of blue is almost identical. I was glad to see the change in the upper back slat from 4½" to 5" in width. I made mine wider after the first one seemed a little on the narrow side. I used pine for mine and it seems to be weathering well in this dry Arizona climate.

David Ortega
Cave Creek, Arizona



Turn on the cable, dish, etc. and what do you see? 99% repeats, or reruns as they used to say. Lots of new advertisements, though. Watch a 1½-hour movie and see another 30 minutes to one hour of commercials. Looks like WJ

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is doing the same thing with the dreaded Adirondack chair. Subscribe to a wood magazine for 10 years and you'll get 10 plans for another uncomfortable Adirondack. Just like termites swarming in the spring. Hey, this one is different. It is blue. All I can say is "Good Grief, Charlie Brown," enough is enough!

Glenn MacRill
Houston, Texas

Mailbox Meltdown

Thanks for such a great magazine. I love every issue! Dude, I can't even imagine the amount of hate mail you're getting for printing an article (*Finishing Thoughts*, "Wonders of Watercolor Pencils," June 2016) about how to fake dovetails, bird's-eye maple and spalting! Holy Moses, your mailbox must be blowing up by now! I think it's funny, but I can just picture purists' heads turning red and quivering uncontrollably before they simply burst with rage. You got guts, Kid. Keep it up!

Andrew Thiessen
Charlotte, North Carolina

One Sweet Lid

I just wanted to share a photo of a project I just completed using part of Carole Rothman's "Compound Cut Flower Box" article in the June 2016 issue. The timing of the article was perfect, because I was trying to come up with an idea for a new lid for a clear cookie jar my wife had just broken. So instead of making the box to attach



the flower to as Carole did, I incorporated the flower into the new cookie jar lid.

The size of the patterns transferred perfectly to my lid, so all I had to do was turn a flat base to attach the flower onto. I made the flower colors the same as Carole did but decided to use a green base to add more contrast. I didn't have the same woods, but was able to get the same look using other species and some TransTint® dye. I used birch flooring scraps for the two larger-size petals. I left the middle-size petals natural and stained the larger bottom petals and stamens with yellow TransTint dye to mimic the yellowheart, then used what I believe to be bloodwood for the smallest petals (instead of purpleheart). I only had a small piece of purpleheart, but it was just enough to use for the main wings of the butterfly. I then used yellow acrylic for the wing inserts. Lastly, instead of mounting the butterfly directly onto one of the petals, I mounted it to the base with thin spring wire so it had movement when the lid was removed.

John E. Brady
East Berlin, Pennsylvania

Look, Then Leap

Finally getting through my February issue of the magazine and I need to comment on the DeWALT battery adapter [*What's in Store*]. I have 18-volt tools that stay in the shop; batteries are old and tired. Twenty-volt stay on my truck for everyday use on the job. I first heard of the adapter and looked into getting one: here's the rub. As far as I can tell, the adapter is NOT designed to work on the circ saw, jigsaw or recip saw. It is ONLY for drill use. I hope readers



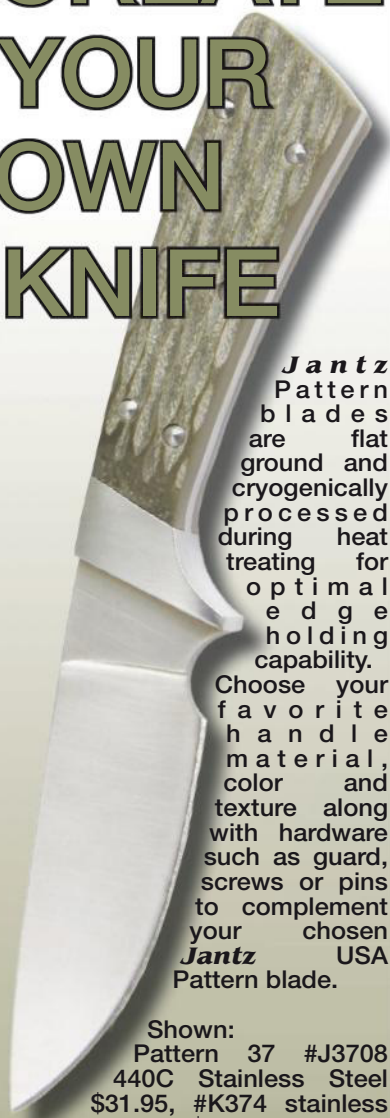
figure this out before they rush out to buy it. In my case it was cheaper to buy a new 20-volt kit than to replace all of my batteries!

Will Machauer
Califon, New Jersey

Continues on page 12 ...



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Pet Protection

In response to Father Chrysanthos's question about dogs in the shop and

Dr. Jim Randolph's

answer [*Questions & Answers*, June 2016], I suggest that another shop condition is critically important for dogs: power tools and dogs' hearing.

Dogs have very acute hearing that is far better than human hearing and includes excellent hearing at high frequencies that we cannot hear. Noise from power tools can destroy our hearing if we do not use hearing protection, and it can do at least that much damage to dogs' hearing. Because we cannot hear all the things that dogs hear and because dogs cannot tell us when they have lost hearing, we cannot know how much damage our power tools have done to the hearing of dogs that spend a lot of time in the shop.

And, unfortunately, flop ears do not give dogs protection from the noise of our power tools. Dogs with flop ears have hearing just as acute as dogs with upright ears.

Enjoy having dogs in your shop when you use hand-powered tools, but give them a break and shuttle them out of the shop when you rev up power tools.

Roger A Powell
Professor Emeritus
North Carolina State University

I want to add to Dr. Randolph's comments about dogs in the woodshop in the June issue. There was a study published in the JAVMA this year looking at black walnut toxicity in dogs. The information surprised me. And, like Dr. Randolph, I have been practicing for a long time (29 years). The remarkable thing in the report was that two dogs were sickened by just licking black walnut sawdust off the owners' shoes. So, as Dr. Randolph mentioned, it may even be a good thing to change clothes and brush the sawdust off your boots before interacting with a dog after working in the shop!

Bob Gaston, DVM
Okeana, Ohio

What Goes Around

I read and enjoyed your article about "8" Helical-head Jointers" [April 2016]. Just now reading Jim Gier's response to the article that these bigger machines don't belong in a hobbyist shop [*Letters*, August 2016]. That just doesn't pan out for a lot of us. I have a circa 1911 J.A. Vance 12" jointer that I use regularly, and I often wish I had a wider jointer, having to use a friend's 20" jointer. Big trees are cut down every day here. These trees are typically ground into mulch. It's a tragedy. When I see a valuable species I stop and ask if I may have the trunk for free. Never been turned away. I take it to a guy south of town who mills it with his



Wood-Mizer® for pennies per bd/ft. As a result, I have plenty of 10-26" wide lumber (need any 14" wide dogwood boards?) in my climate-controlled basement ... more than I'll ever use. Of course, I have to face and edge joint all this and plane it before use.

Andrew Thiessen
Charlotte, North Carolina

Double Drill

In the "Dovetail Chiseling Jig" in the June 2016 issue, the photo on the top right of page 42 showed T-nuts hammered into the underside of the jig without counterbores.



If the jig, as photographed, is used directly on your workbench, as shown in the lead photo on page 41, the T-nuts would dent your workbench as you're working.

Hendrik Varju
Acton, Ontario

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MORE ON THE WEB

Check online for more content covering the articles below:

Questions & Answers (page 16):

Technique for using a random orbital sander (video)

Woodturning (page 24):

Techniques for turning identical spindles (video)

Portable Board Game Storage Box (page 38):

Using a table saw to cut inlay (video); chess pieces on band saw (PDF)

Shaker Chair (page 44):

Shaker weaving vise (PDF); weaving taped seat (video)

Tool Preview (page 52):

Overview of JET JWSS-22 22" Scroll Saw (video)

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Tool Preview (page 56):

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Techniques (page 58):

Measurement and layout techniques (video)

Technology & Woodworking

(page 68): NOVA Voyager DVR Drill Press speed chart and depth stop (video)

Weekend Projects (page 70):

Edging plywood; using Rockler Corner Radius Templates (videos)

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Tricks for Better Routing, Crosscutting



Pullout Shelf Stages Parts at the Miter Saw Station

Recently I built a new miter saw station, and I wanted a way to stage parts during the cutting process so they'd be close at hand but not in the way. So, I added this pullout shelf under one of the side support tables. It's hung on full-extension drawer slides. This way, I can pull it out when needed to hold workpieces. Once I'm done cutting them, I clear the shelf and push it closed until next time. The front of the shelf looks just like a drawer.

Jerry Reed
Lake Ariel, Pennsylvania



Cutting Board Routing Sled

It can be hard to safely control narrow workpieces, like drawer sides or faces, when you have to rout dadoes or dove-tailed slots across the grain. But a simple sled like this, with toggle clamps mounted to a scrap fence, gives you the added stability needed. I made the base of my jig from a 3/8"-thick, 12" x 18" polyethylene kitchen cutting board. A 3/4" or 1"-wide slot, routed down the middle, enables me to use the sled on my router table. Install a guide collar in your router table that matches your sled's slot width, to control the cutting path.

Serge Duclos
Delson, Quebec



Which Way to Turn? Just Mark Your Chuck

Do you ever get confused about which way to turn your drill press chuck key for tightening or loosening? Invariably, I would turn it the wrong way until I made this simple notation. Using a black permanent marker, I labeled it with an "L" for loosen, a "T" for tighten and a double arrowed line in-between. A piece of clear tape on top keeps the marker from rubbing off. Now I never guess, especially when the jaws are hidden inside the collar.

David Long
Lexington, Kentucky



Dual-Bar Crosscut Fence Jig

Table saw miter gauges are OK for crosscutting short workpieces, but they aren't stable for long stock — as designed, they cantilever bad. I think I've improved on the concept by using both miter slots! I simply attached two aluminum miter bars to a long hardwood crosspiece with bolts and screws, then attached a block on top to act as a blade guard and extra support (the metal disk on top is a rare-earth magnet for storing the fence). My fence jig adds dead-on square precision, plus more stability, when crosscutting long workpieces.

Bill Wells
Olympia, Washington

PICK OF THE TRICKS



Sponge Makes Draining an Air Compressor Cleaner

I once added nipple extensions and a ball valve to my air compressor's tank drain, making it easier to reach. That still didn't change the way it sprayed rusty, dirty water all over the shop floor when I opened the valve. So, here's how I've remedied the problem: I added an elbow to the ball valve first, to direct the spray downward. Then, under the elbow, I placed a grout sponge in a plastic food container. Now, the sponge traps the water spray to keep the floor clean and dry, and the sponge dampness evaporates quickly. It's an easy solution!

Wille Sandry
Camas, Washington

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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Questions & Answers

I Bought a ROS. How Do I Use It?

THIS ISSUE'S EXPERTS

JoAnne Liebeler is a nationally known home improvement expert and television host.

Tim Inman is owner of Historic Interiors (restoration and reproduction) and author of *The Art of Classical Furniture Finishing*.

Rob Johnstone is the publisher of *Woodworker's Journal*.

Contact us

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Winner!

For simply sending in his question about proper spacing of dog holes, Bill Rector of Canton, Michigan, wins a General International 7-piece Deluxe 8" Dado Blade Set (item 55-185). Each issue we toss new questions into a hat and draw a winner.

Q I recently purchased a Bosch random orbital sander (ROS). The operating instructions mostly described how to maintain the machine and how to apply and remove sanding disks. Unfortunately, there was no instruction or recommendation as to how to actually use the machine. Over the past few years, I've read articles about random orbital sanders in Australian, U.S. and U.K. publications. Funnily, there was a variety of explanations on how to start and apply the machine to the timber. "Start the machine and lower it gently to the surface to be sanded" and then another said, "Place the stationary machine on the surface and start it and proceed to sand."

I used the former recommendation as it seemed totally logical and the result I obtained seemed great to me, but I am wondering whether that is actually the right method.

So I ask, what do the gurus at WJ recommend?

Ian Butler
Pearl Beach, New South Wales,
Australia

A G'day Ian, we're here to help! I personally choose to start the sander with it sitting on the surface, held by both hands. Once it is going, I shift to just one hand to drive the machine. But here is the most important technique for using a



The secret to using a ROS machine correctly is to SLOW DOWN! Let the machine do the work and get your sanding done quicker by moving slower.

ROS regardless of brand: go slow. Ideally, you should only be moving the machine about 1" per second. So if you were sanding a board that was a foot long, you would count slowly to 12 as you moved from one end to the other. I know this seems crazy slow, but if you let the machine do the work at this pace, and move the sander methodically across the wood — this method will actually save you time! Almost everyone moves their sander too fast, but in this case you must slow down to save time.

— JoAnne Liebeler

Q When buying plywood, what is the difference between rotary-cut veneer and plain-sliced veneer? The plain-sliced sure seems to be a lot more expensive, even for the same species.

Phoebe Dawson
Oshkosh, Wisconsin

A The short answer is: Flat-cut or plain-sliced veneer is a lot more work and a lot more involved from tree to cabinet, so it costs a lot more.

First is the way the log is cut. For rotary-cut veneer, envision a roll of paper towels

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MORE ON THE WEB



For a video on the proper way to use a random orbit sander, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

being unwound from the holder. To cut the veneer, the log section (flitch) is mounted in something akin to a giant lathe. The knife is advanced into the spinning log a few thousandths of an inch per revolution (the thickness of the veneer required), and off comes the veneer in a huge continuous sheet. Just like a roll of paper towels being unwound, the log unwraps into yards and yards of veneer.

Quick and cheap, but ugly — at least for the most part. There are some applications, like doors on shop fixtures, where looks aren't everything, and in that case, it's fine to save a few bucks and go for the rotary-cut veneer.

As for the plain-cut, the log is mounted onto a giant slicer and passed over a huge knife. Like a slicing machine at the local butcher shop cutting roast beef or cheese, each pass of the log cuts one slice of veneer. Each of those slices is caught and individually stacked in exactly the order it is cut from the flitch. Then it is all dried and graded to sell. Each slice keeps its place relative to its neighbor throughout the entire process. This is slow, painstaking and, hence, expensive. But it is much prettier!

That's the sort of veneer you'd want to use in a fine furniture project that will showcase your plywood. It comes out looking a lot more like edge-glued boards and, in fact, sometimes you can't tell the difference in a finished piece.

And then there are all kinds of other patterns and ways to cut the log, each giving its own benefits and detractions.

Here's a handy way to remember the distinctions between the two you've asked about: Rotary-cut = yards of paper towels. Plain-cut = fine stationery sheets stacked neatly in a box.

— Tim Inman

Continues on page 18 ...



It doesn't get any better than the Excalibur Deluxe Table Router by General International. *Fine Woodworking* called it the best overall table and lift combination." *Popular Woodworking* agreed, saying, "Four corner-positioned lift screws raise this design above the competition." You control all four corners simultaneously for smooth and precise above-the-table height adjustments. The kit includes a 24" x 32" cast-iron table. Quick-engage mobility kit makes it easy to relocate. Full-length router fence provides tool-free adjustments.

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**Plain-sliced
veneer**

Stumpers

Rim Shot

Readers never “tire” of mystery tools.



What's This?

Travis Glessner of Berlin, Pennsylvania, found this tool in a drawer at his parents' house. They don't know what it is. Do you?

Send your answer to stumpers@woodworkersjournal.com

or write to “Stumpers,”

Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340 for a chance to win a prize!



Woodworker's Journal editor Joanna Werch Takes compiles each issue's Stumpers responses — and reads every one.

A couple of issues ago, we presented a mystery tool belonging to **Darrel Mathieu** of Luck, Wisconsin, who said he learned what it was “many years ago.” According to Darrel, “It could still be used today for its intended purpose.”

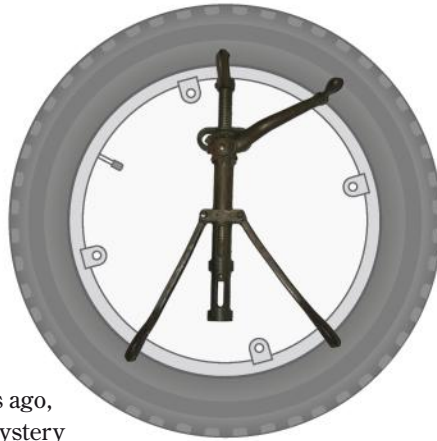
It does, however, look very similar to a tool used for another purpose, leading **André Chappot** of Fribourg, Switzerland, to think “it's a machine to cork wine bottles.”

While **David R. Yost** of Sturgeon Lake, Minnesota, who sometimes makes homemade wine, says his “floor corker looks different, this appears to function about the same.”

While the functions might be similar, Darrel knows that his tool is actually a rim tool, “a tool used to change tires on split rims on antique cars,” as described by **Karl Haak** of Moberly, Missouri.

David Cain of Spokane, Washington, has “used this type of tool while helping my dad and brother work on Dad's Pierce Arrow and Franklin automobiles.” And **Don Waymire** of Greenfield, Indiana, used it to remove the tire from a split rim on a 1929 Chevy. “It did work well,” he said.

Winner! David Cain of Spokane, Washington, wins a **RIDGID 18V Stealth Force Pulse Driver Kit (R86036K)**. We toss all the Stumpers letters into a hat to select a winner.



Darrel Mathieu says that, now that tire rims are no longer made of steel, his mystery tool is obsolete.

Russ Grunewald of Benbrook, Texas, shared further details. According to him, “These were used for auto wheels that used ‘split’ rims. Rather than a solid rim, the split could be split and reduced in diameter to make it easier to remove a tire from the rim rather than having to use flat tools to pry the tire off. And, the tool also could be used to push the rim back to its full shape after a tire was installed.”

Russ also quoted a 1920s ad, which listed the price as \$3.95: “For Contracting and Expanding Split Rims. No matter how rusty or stiff your rim may be the ‘Three Point’ makes mounting and dismounting tires on the rim easy and safe. It is adjustable to any size rim. The three point extension insures against twisting the rim out of shape. Place the hooks on the rim — work the lever a few times — remove the tire. That's all.”



Questions & Answers

continued

Q I plan to drill some dog holes in my bench. I have made a jig for locating the holes but was wondering if there is a formula to use to come up with proper spacing for the most efficient use of the dogs?

Bill Rector
Canton, Michigan



A Bench dogs make a classic workbench much more useful, especially when working with oddly shaped projects like the guitar body above. When it comes to spacing, it is more a function of how much cranking of your end vise you are willing to do than a spacing formula or a tradition set in stone. Several recommendations from bench makers I've read call out three to four inches at the maximum, but it is really up to you.

The great thing about laying out your own dog holes is that if you have some type of work you do all the time, you can adjust the locations to make clamping that specific thing fast and easy.

— Rob Johnstone

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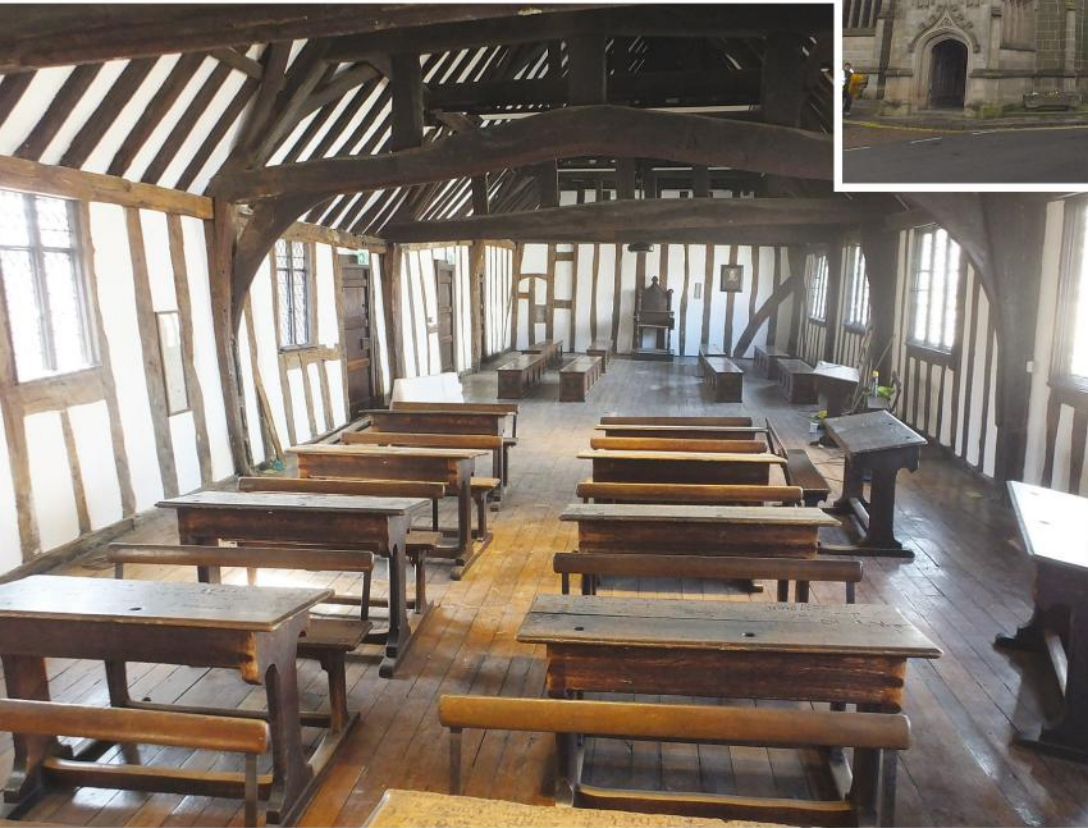
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Shop Talk

Shakespeare's School



In the Guildhall (above), Shakespeare likely studied at a bench like those in the back of the room.



photos by Danny Keaney

An engraving of a rural classroom from Shakespeare's era shows undisciplined boys, and no desks.



Schoolboy Bard's "Desks" Recreated

April 2016 marked the 400th anniversary of the death of William Shakespeare. As part of the commemorations, Tim Ross Bain recreated 18 oak benches and 12 oak rapier chests that would have been familiar

to 16th century boys when The Bard was a pupil at what is now King Edward VI School in Stratford-upon-Avon.

Open to the public for the first time this year is the room in this building, the old Guildhall,

where young Shakespeare is thought to have studied. Part of the experience is the opportunity to sit on the reproduction oak benches upon which Shakespeare and his fellow pupils would have been seated during their lessons.

An engraving in the book *Catechismus Parvus* by Alexander Nowell depicts a rural classroom in Shakespeare's time. According to King Edward VI School trustee and Shakespeare scholar Professor Ronnie Mulryne, "Boys in the back row are behaving as boys do. The Master has access to his birch, for discipline, as well as a dish of apples

for reward. It's a crowded environment with no desks. It's been estimated that 40 to 60 boys aged from seven to 16 were taught together by one master in schoolrooms such as this."

The oak trees providing the wood for recreating this schoolroom came from a nearby 10-acre wood that was once part of the Loxley Estate owned by the husband of Shakespeare's granddaughter, Elizabeth Nash. It's now the home of timber merchant John Hutsby. Four of his 200-year-old oaks, the largest nearly one meter in diameter, were air-dried for several years and later kiln-dried to finish them off.

Antique Processes

Hutsby is a friend of Tim Ross Bain, whose classical reproduction work adorns many leading country houses in the United Kingdom and whose furniture commissions have included a dining table, chairs and sideboard for Princess Anne and former husband Mark Phillips.

Tim is most comfortable using the tools of his 17th and 18th century predecessors.



The reproductions of the Shakespearean era schoolroom furniture have been finished to create an aged look and to mimic 16th century repairs, plus wear and tear.

He uses modern mechanized power tools mostly to cut the timber to smaller sizes upon which he can then use hand tools; his collection includes wooden spokeshaves, molding planes and over 60 carving chisels, some of which are more than a hundred years old. Many of the tools bear the names of the craftsmen who first used them.

"I find the steel used in the old carving chisels is much harder and holds its edge much better. They're easier to sharpen, too," Tim said.

When creating furniture inspired by the Tudor era of the 1500s, Tim uses traditional joinery that "compresses

the dowel slightly so when you hammer it into the wood it expands. We use square dowels into a round hole."

For some of his other projects as well, and for the benches and chests in Shakespeare's classroom, Tim said, even though "I'm not a blacksmith in the traditional sense, I made all the metalwork, such as the nails and hinges, which are handcarved."

For the Shakespeare benches, to create the "old" appearance, Tim used a combination of finishing techniques and distressing. "We colored the benches and rapier chests with original earth pigments and oil stains

such as linseed to darken the oak, and applied chemicals like ammonia before beating them up to distress them."

The distressing process involved using chains, a draw knife, and different implements such as

little axes, hammers and screws inside a bag, to make the finer marks. "We've even created areas where it looks as if carpenters have carried out repairs to the chests and benches," Tim said. "It's a part of a tried and tested process employing techniques we've used for more than 40 years."

The final part of the process is to wax the surfaces using an old recipe made from beeswax, turpentine, methylated spirit and ammonia. "We build up the polish first and then cut it back with wire wool, creating a soft luster and patina for the final finish," Tim said.

"Perfectionists never get 10 out of 10, but I'm particularly pleased with the tops and the color, and when I see them in the schoolroom I'll be very happy."

— Dale le Vack



Some of his carving chisels are over 100 years old and bear the names of their original owners.



A 16th century cabinetmaker would likely feel at home today in Tim Ross Bain's shop.



All the metalwork for the project, including hundreds of traditional nails, was done in this forge.



The hinges on the benches and chests are hand-carved metalwork.



Jeffrey D. Shaw's piece "Stagecoach" took second place in the Miscellaneous/Turning division.

Indy Winners' Project Love

A common theme emerged from the entrants in this year's Indianapolis Rockler Store's Adventures in Wood Contest: The people I spoke with at the show's opening all make projects for people that they care about.

Several men told me that they made a project because their wives wanted it. Many people collaborate with respective spouses to create projects, too.



Dale Smith's first place entry in the Miscellaneous/Turning division is a 1925 Indy car reproduction.



Dale Smith, winner of the Miscellaneous/Turning Division, works with his wife, Sharon, to make wooden model replicas of historic cars. For his 1:5 scale model of a 1925 Miller car that placed second in that year's Indy 500 race, Sharon made the miniature flag and upholstered the car. They really enjoy working together. Dale said, "The fun is in building it, and talking about the project with my wife." The cars also represent a tribute to Dale's father, who started as a "grease monkey" at Buick Motors and worked his way up to being an owner of a Buick dealership over the course of 60 years.

Furniture Division winner Jim Daugherty hopes to sell his "Thread to the Past" spinning wheel to someone that will get good use out of it. The reason Jim is selling



"Thread to the Past" is Jim Daugherty's third fully functional spinning wheel.

this project is for his granddaughter's college fund. He said that all the other projects he has made are gifts for his family.

Scott Jones won second place in the Furniture Division with a concealed top nightstand that he made for his son. The top of the stand has a secret compartment accessible by sliding the top. Scott makes all the projects he can for his family, including dollhouses, doll furniture, bedframes, nightstands, etc.

These projects and more were displayed for two weeks, allowing Rockler customers to cast 754 votes to elect nine winners in the Box, Miscellaneous/Turning and Furniture divisions.

I know I've found that the projects I make are much more enjoyable when they become personal. Sharing your craft means sharing some of yourself. There is something very special about sharing your craft with friends and family that cherish you as well as your work.

— Kimberly McNeelan

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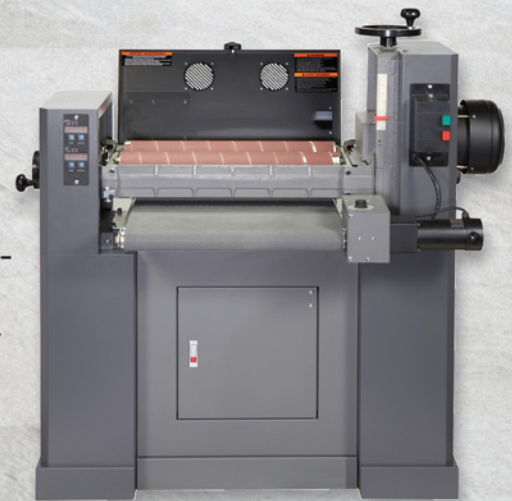
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Woodturning

Making Two Turnings Look Alike

By Ernie Conover

Artistic turners brag that they never turn two things alike. What they are not saying is — that is because they can't!



Earlier this year, two friends joined me to build reproductions of a unique "great wheel" spinning wheel design that was built in Brantford, Ontario, Canada about 1900. The spokes for the wheel not only had to be good copies of each other, but they also had to be fairly equal in weight. Find a link to a video with highlights of this week at the More on the Web section of woodworkersjournal.com.

My grandfather used to say, "Any fool can make a product but you have to sell it." The adage was a bit of a swipe at my father, the engineer that designed my grandfather's products. My father's unvarying reply was, "Any fool can make one of anything, but making a myriad of them is the trick!" In the spirit of my father's witticism, I would like to share a gaggle of tricks that will help you make any number of turnings look exactly alike — or, more realistically, enough alike that no one will notice the differences.

Let's start with the raw material, a wood billet. Also called a blank, this is the square of wood that you chuck in the lathe to make your turning. Having accurately milled billets that are exactly square and of

the same length cannot be overemphasized. To achieve this, I run the face and one edge of the plank I will cut billets from across the jointer and then rip squares from this board with a good carbide blade in my table saw. I am rewarded with perfect squares that are straight.

Sometimes I crosscut the jointed plank to length first and then rip finished billets. Other times, I rip squares and then crosscut finished billets from the squares. It depends on the wood and the length of the billet.

While it is tempting to cut billets 1/8" to 1/4" oversize with the idea of creeping in on the largest diameter, this is a mistake. I mill to about 1/32" over the diameter of the piece. Turnings such as table legs will have a square area called the pommel at the top. This is where the aprons will be mortised in to form the frame of the table. While the extra thirty-second does not affect diameter much, it gives me some cleanup room



Billets of identical sizing are key to duplication. I joint one face and one edge of the plank I start with, then rip perfect squares with a good carbide blade. All crosscutting is with a stop so that pieces are identical in length.



Find exact center with a center finder and a scribe (don't use a pencil, it is not as accurate) and center punch for accurate centering. This will give consistent major diameters just by turning.

to hand plane the pommel nice and smooth after mortising.

You will need to accurately find the exact center of both ends of your freshly milled blank. I use a machinist's center finder and a sharp awl to accomplish this: a pencil line marks to the side of the center finder, while an awl hugs it. I then center punch the exact intersection of the two resulting lines and catch the punch marks with my centers when I chuck the billet. Chucking off-center decreases the diameter you obtain by the mis-centered amount. Chucking on-center gives you the full diameter of the blank without measuring; simply turn until the blank is just round and you have the major diameter of the piece. No need for calipers; just lightly touch your fingers to the back of the rotating piece until you feel the flat spots just go away.

Accurate Layout is Key

The human eye is much better in picking up differences in the height of key elements on several turnings than in judging differences in diameter. Of course, the larger the turning's diameter, the more irregularity you can have without anyone noticing.

Most furniture turnings are between 1" and 2" in diameter, so my comments address this size range. While no one will notice a 1/8" difference in diameter between several turnings, 1/32" in heights of any of the elements will bring scrutiny. Precisely placing all of the elements on a turning boils down to accurate layout. Here are some methods that will help immensely in achieving that goal:

Master Part: Turn a good example of what you want or what the plans suggest. Display this master turning in front of your lathe by either hanging it on the wall or setting it on a shelf or stool. All measurements are now taken from the master turning, and it acts as a comparison to guide you in turning the rest of the pieces.

Rulers and Tapes: I do not use tapes very much, as they are hard to hold against a turning and bend around turnings with large differences in diameter, giving a false reading. I like folding wood rulers much better. Measure key elements on the master and transfer these distances to the piece you are turning with a sharp pencil. It is generally best to only measure



By lightly touching your fingers to the back of the work, you can sense when the spindle is just round with no flat spots. This technique creates a consistent diameter without the use of calipers.

from one end; measuring from both ends can introduce errors. The longer the turning, the more this is so. An exception is where you want a tenon of a specific length on one end but are measuring from the other. In this case, using dividers to mark the length of the tenon is fine if all the billets are of exactly the same length.

Calipers and Dividers:

Both these instruments are necessary to duplication. You cannot have enough of these stalwart friends in a variety of sizes. The ones that woodworking stores sell today tend to be big and clunky. I have good luck finding really good ones at house sales, flea markets and antique shops for reasonable prices.

MORE ON THE WEB



For a video on the techniques the author used to turn identical spindles for a spinning wheel, as well as a link to a video highlighting the building of the wheel, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.



Turn an example of the piece to be the master part. Take measurements for all the turnings from this part, and compare them often. The author prefers wood folding rulers or steel rulers over steel tapes for laying out turnings.

Woodturning continued



The author's assortment of calipers and dividers were mostly purchased used over the years. The calipers resting on the piece tell him the depth of the cove and the biggest diameter of the shaft. The dividers at right tell the length of the head, the length of the two half beads and intervening cove. The third set tells the width of each cove. The final set at the left set off the length of the tenon, which is 1/2".



The Galbert Caliper is the invention of Windsor chairmaker Peter Galbert. It is simply pushed against any round between 1/2" and 2 3/4" and gives a direct reading. It can be used with the work spinning. The author's accurately milled billets have yielded exactly the 1 1/2" diameter desired.



Wrench to size tenon: An open-end wrench is the perfect set of calipers to size tenons to a drilled hole. Here the author is sizing a 1/2" tenon with a wrench.

As outlined previously, you can obtain the major diameter of a piece by milling the blank to that size. I set a pair of calipers at each of the lesser diameters on the master turning. (Actually, I set them about 1/32" larger so that I have some room to finalize each diameter.) I use dividers extensively to set the width of coves, beads and tenons, as well as the distances between elements. I use my largest caliper or dividers for the greatest diameters and distances. I then try to graduate them size wise as the diameters and distances lessen. A perfect caliper for tenons is an open-end wrench. It will give you a press fit with a drilled hole (1/2" hole, 1/2" wrench).

Story Stick: This turning aid is great for long runs (50 pieces or more) or where you are going to be turning this part regularly. Start by drawing the part full-size; shelf paper is good for longer turnings. Extend lines from each of the key elements and glue the drawing to a thin piece of wood. Cut the resulting piece to the major diameter of the turning, and cut small notches where each of the lines meets the edge. You can now hold this story stick up to the turning, place a pencil in the appropriate notch and draw a line on the work at exactly the same place every time. You can also directly set calipers and dividers to key diameters and distances on the story stick. Drill a hole in it and hang it on the wall for next time.

Don't Push Your Tool Ability: You do need to be an OK turner to duplicate, but you don't need to be an ace. One of the biggest mistakes I see people make is insisting on using a skew for final smoothing of the columnar sections of the turning or, even worse, cutting the beads. A skew is a tough tool to use regularly, and a poor time to gain the necessary skill to use it with aplomb is when turning the legs for a table you plan to finish the day after tomorrow. I am a huge believer in the spindle roughing-out gouge and a 1/2" spindle gouge. A really well sharpened spindle roughing-out gouge is difficult to have a catch with and will leave a finish almost as good a skew. Practice with the skew after the table is finished and use it next time.

Use Appropriate

Speeds: For 1" to 2" spindles, 800 to 1,600 rpm is a good speed range. I generally turn at 1,200 to 1,400 rpm but slow down to 600 to 800 rpm for skew work. Too much speed causes vibration with resulting chatter marks in the work. However, too slow invites catches. For sanding, you can speed the lathe up again. But keep it at 1,800 or under — then take your time and sand well.

Best Duplicator? You

I am frequently asked, "What is the best duplicator for my lathe?" My reply is, "You are!" You can buy duplicators, but one that is within the budget of workshop enthusiasts is a sorry affair. It will only scrape duplicate with a flat tool that cuts without a burr. Such tools do not produce smooth finishes or deep grooves between elements such as beads. For small production runs of four to eight pieces, you will spend more time setting up the duplicator than it would take for hand turning. The duplicate work also needs to be heavily sanded, starting at 60- or 80-grit. This further erodes crispness between elements, leaving very lackluster turnings.

We go to live concerts because there is a chance that the artist will make a slight mistake. I think it is the same with handbuilt furniture. If you want all the parts to be exactly the same, save the trouble of turning them and take a trip to IKEA.

Ernie Conover is the author of The Lathe Book and The Frugal Woodturner.

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19th Century Drop Front Desk

By A.J. Hamler

This portable work surface serves as a handy home office. The author provides both modern and period-correct construction techniques.

Today, a desk is a large work surface with drawers and storage underneath. If not used as a desk, it really doesn't have much other purpose. In the 19th century, however, furniture often did double duty. A desk in those days was typically a portable cabinet with a drop-down door that could be used anywhere. Set it on a table and you have an office; move it out of the way, and you've got your table back.

Their compact size and portability appealed to Civil War officers, who frequently took them into the field when they went off to war. So popular were they, in fact, that they quickly picked up the name "field desk," a moniker that stuck. A Google search for "field desk" turns up hundreds of these from all time periods, whether they were actually used in the field or not.

These desks are just as versatile in the modern home. The one presented here isn't a reproduction of any single desk, but I've borrowed details from a few historical examples — the carcass trim and lidded top are similar to Gen. Thomas "Stonewall" Jackson's desk, while the tall dividers are patterned after those in a desk belonging to Capt. Edwin Stivers of Illinois. And although the design is 100% authentic to 19th



Dovetailed drawers, plus secret tills, are among the features of the type of portable desk commonly used by Civil War officers.

century samples, I've updated it some with 21st century hardware and material conveniences. Don't worry, though, I'll include suggestions for a "period-correct" desk, too.

Getting Started

I've chosen cherry for this project, but feel free to use your favorite hardwood. Likewise, these desks came in an unbelievable range of sizes, so alter dimensions any way you like.

Mill your stock to the appropriate thicknesses per the *Material List* on Page 31, then cut all the individual workpieces to rough size. There are a lot of parts here, so label or mark them to keep everything straight. Also, some parts move — door, drawers, shelves, etc. — and need a bit of clearance to



The two sides receive a 3/8"-deep x 3/4"-wide rabbet on the inside bottom edges, and a 3/8"-deep x 3/4"-wide dado 3" from the top.



The 1/2" sides of the center module go into 3/8" x 1/2" dados cut into the inside faces of the desk top and bottom components.



move freely. With that in mind, note that I've sized everything on the *Material List* to match the openings into which they fit, but you may need to shave a tiny bit of stock off one edge or another for smooth operation. For example, the door stiles are sized at 15½" high on the *Material List* to match the 15½" door opening; however, you'll want to ease that fit to allow a tiny gap at top and bottom to accommodate hinges and free movement.

Begin construction of the main carcass by cutting the necessary joinery. The desk sides receive 3/8"-deep by 3/4"-wide rabbets on the inside bottom edges for the desk bottom, which I cut with a dado blade on the table saw. Now, leave the blade set where it is and cut a 3/8"-deep by 3/4"-wide dado across the inner face of the two sides at 3" down from the top. When assembled, the open area will be 16" high.

Now change to a 1/2" cutter and make a pair of 3/8"-deep dados on the inner faces of the desk top and bottom for the center drawer module, as in the photo at left. The center module accommodates drawers measuring 7" wide, so once cut, the open space on either side is 8¼" wide.

Finally, cut a 3/8"-wide x 1/4"-deep rabbet along the inside back edge of the desk sides for a 1/4" plywood back.

Dry-assemble the carcass and check the joinery. Note how the 1/4"-narrower desk bottom and top meet flush with those rabbets you just cut on the sides. If everything checks out, dismantle the carcass and set it aside for now.



With all rabbets and dados cut, do a dry assembly of the carcass to check all the case joinery.



A router table dovetail jig makes fast work of the half-blind drawer dovetails. Although not visible, the drawer front is cut at the same time.



Cut the grooves for the drawer bottoms so they fall within the bottom tail. Once assembled, the groove will be invisible.



A large Forstner bit makes the initial round mortise for the flush pull. Do a test cut in scrap, and set the drill press depth stop appropriately. Finish the drawer front mortise by rounding out the bottom to accept the rounded back of the flush pull.



Assemble the two drawers, check for square, and clamp up till dry. In the modern drawer fitting technique, you slide the bottom into a groove cut in the four sides, then attach the final drawer side.

Making the Drawers

Most desks like these had at least one drawer, while others were filled with them; still others had none at all. I've done two drawers, but feel free to delete one or add another as you wish — and it is fine to use stock that is not cherry for your drawer sides and backs.

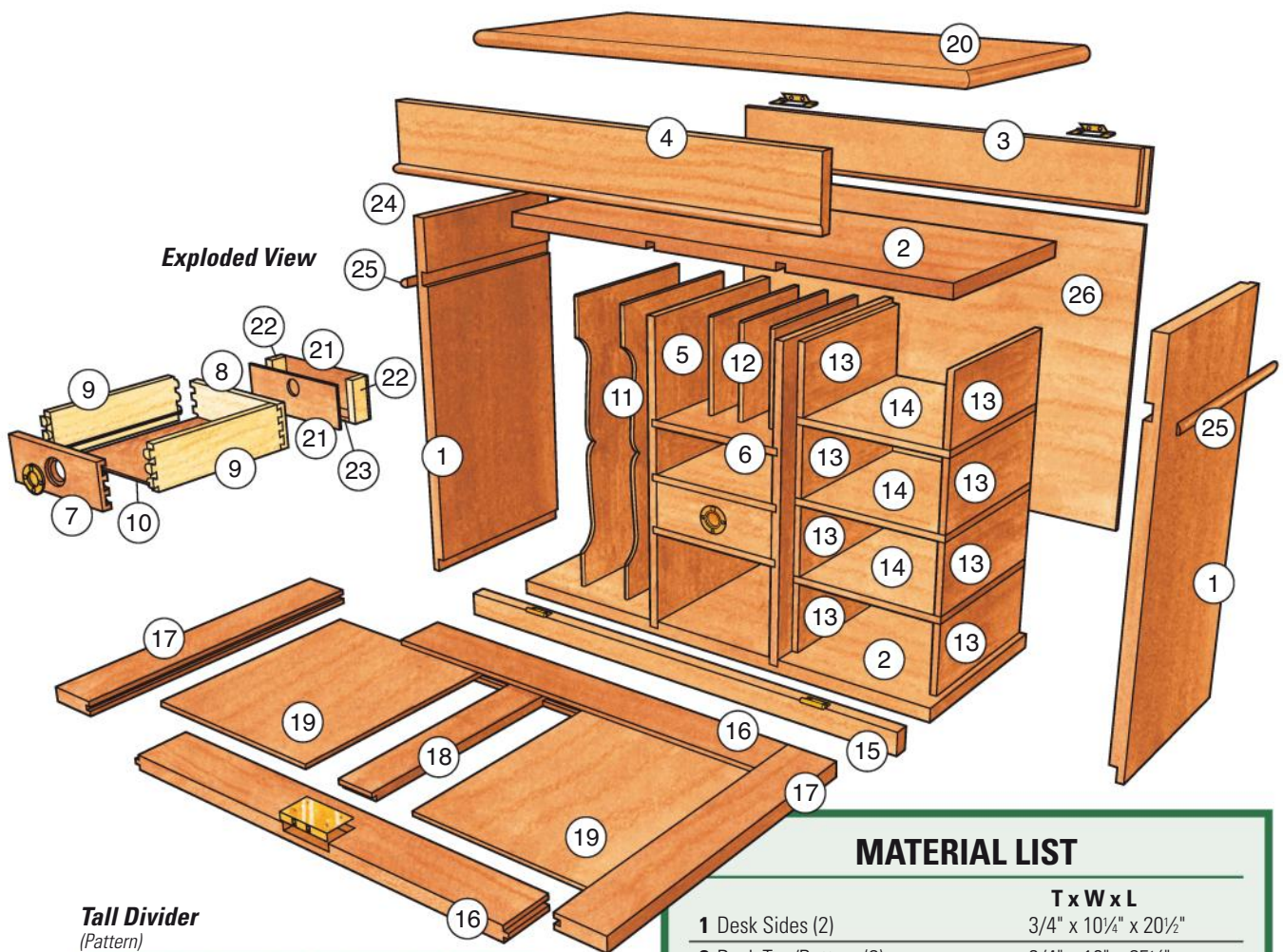
You can use any joinery you wish on the drawers, but I went with half-blind dovetails cut with a router table dovetail jig, as seen in the top left photo above.

Drawer pulls can be as simple as a small hole drilled into the drawer front, but I love the look of brass and opted for brass flush pulls. You'll need to do a bit of "layered" mortising for these, but this is pretty straightforward with a drill press. Here's how to do it for the pulls I use: Set the depth stop to the thickness of the outer portion of the pull, and use a Forstner bit to drill the first mortise. A 1½"-dia. Forstner bit is perfect. Follow this up with a smaller Forstner bit to mortise a relief for the pull's pivot. Finally, make room in the

center for the curved back of the pull. For this, I chucked up a bullnose router bit into the drill press to excavate a relief area. It worked like a charm.

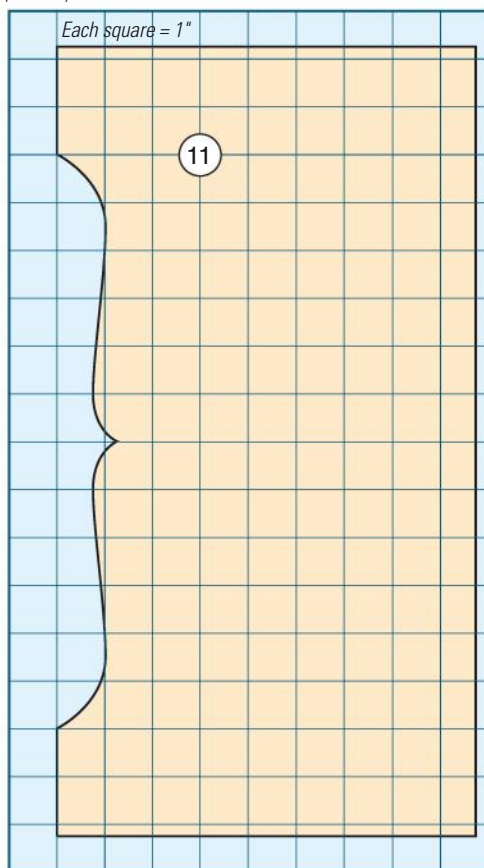
On the table saw, cut a shallow 1/8"-wide groove for the plywood drawer bottom, locating the groove so that it falls within the bottommost dovetail as you can see in the top right photo, above. This groove won't be visible once the drawer is assembled.

I mentioned earlier I'd point out period-correct ways to do a few things, and the drawer bottom is one of them. Modern drawers typically "capture" the bottom, so for these you'd cut a groove in all four sides, partially assemble the drawer, slide in the bottom and then attach the final side. In the 19th century and earlier, drawers were often fully assembled first. The drawer front and both sides had a groove, but the drawer back was cut off right where the groove would go and the bottom was inserted later. The drawer bottom is slightly longer, and simply nailed or tacked into place at the back after assembly.



Exploded View

Tall Divider
(Pattern)



MATERIAL LIST

	T x W x L
1 Desk Sides (2)	3/4" x 10 1/4" x 20 1/2"
2 Desk Top/Bottom (2)	3/4" x 10" x 25 1/4"
3 Storage Compartment Back (1)	3/4" x 3 3/8" x 25 1/4"
4 Storage Compartment Front (1)	3/4" x 3 3/4" x 26"
5 Center Module Sides (2)	1/2" x 10" x 16 3/4"
6 Center Module Shelves (3)	3/8" x 10" x 7 1/2"
7 Drawer Fronts (2)	1/2" x 2 1/2" x 7"
8 Drawer Backs (2)	1/2" x 2 1/2" x 7"
9 Drawer Sides (4)	1/2" x 2 1/2" x 8 1/4"
10 Drawer Bottoms (2)	1/8" thick, sized to fit
11 Tall Dividers (2)	1/4" x 8 3/4" x 16 1/2"
12 Short Dividers (3)	1/4" x 5 5/16" x 7 3/4"
13 Shelf Stack Sides (8)	3/8" x 3 3/4" x 8 3/4"
14 Stack Shelves (3)	3/8" x 8 1/4" x 8 3/4"
15 Door Mounting Strip (1)	3/4" x 1 1/4" x 26"
16 Door Top/Bottom Rails (2)	3/4" x 2 1/2" x 21 1/2"
17 Door Stiles (2)	3/4" x 2 1/2" x 15 1/2"
18 Door Center Stile (1)	3/4" x 2" x 11"
19 Door Panels (2)	1/4" thick, sized to fit
20 Desk Lid (1)	3/4" x 11 1/2" x 27"
21 Secret Till Fronts/Backs (4)	1/8" x 2 1/2" x 7"
22 Secret Till Ends (4)	1/2" x 1" x 2 1/2"
23 Secret Till Bottoms (2)	1/4" x 1" x 6"
24 Front Trim Molding (1)	1/2" x 1/4" x 26 5/8"
25 Side Trim Moldings (2)	1/2" x 1/4" x 11 1/4"
26 Back (1)	1/4" x 17 1/8" x 25 1/4"



Clamp up component pairs with inside faces upward, then pencil in guide-lines for routing dados for the dividers. A T-square ensures accuracy.



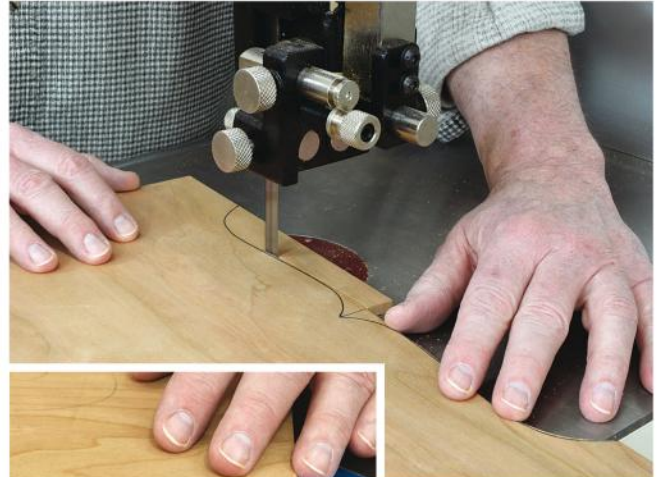
To set up the locations for the dados for the drawer openings, it's easiest to use the drawers themselves as a guide. Note here that the author uses scrap of the same thickness as the drawer shelves as spacers. With the drawer module sides clamped edge-to-edge, rout the dados for the drawer shelves. The clamps not only hold the workpieces together, but are also placed to act as guides for the router.



Dadoes and More Dadoes

We've already cut the dadoes in the desk bottom and top for the center module, but there are plenty more inside the desk. These are easier to do by clamping up component pairs, then measuring, marking and cutting them as a unit.

The dividers slide into stopped dadoes from the back. For the tall ones, clamp the desk bottom and top together, back edge-to-back edge, and mark the stopped dado locations. I used a T-square for the task, evenly spacing the two 8 3/4"-long dadoes on the left side of the desk. Once marked, use a clamp-on edge guide to rout 1/4" x 1/4" stopped dadoes on your marks. Because these are clamped together, you'll rout each set of dadoes simultaneously in a single 17 1/2" pass.



Cut out the profile of the tall dividers on the band saw as here, or with a jigsaw or scroll saw. Round over the straight edges on the fronts of the tall dividers. The short dividers also have their front edges rounded over.

For the short dividers in the middle, clamp the desk top piece (one of your Pieces 2) and the top shelf of the center module (piece 6) together, also back-to-back, and mark three evenly spaced locations for stopped 7 3/4"-long x 1/4"-wide x 3/16" stopped dadoes. (Use another of the 3/8" center shelves to raise the top shelf up to the same thickness as the desk top.) As before, rout the dadoes using a clamp-on guide.

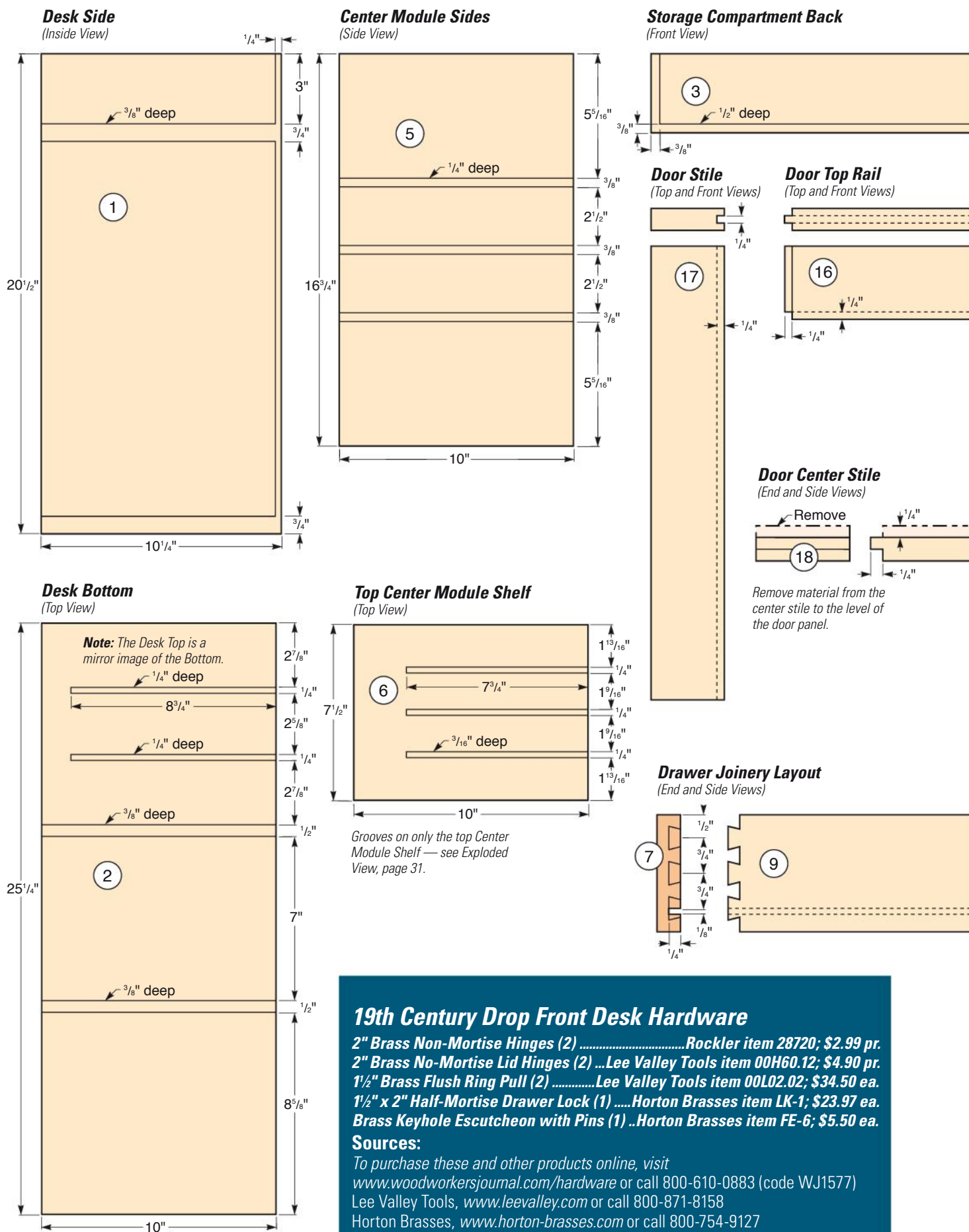
The drawer shelves in the center module need dadoes, too, with one slight difference. These are through-dadoes visible in the finished desk, so clamp the two sides of the module together front-to-front; when cutting the dadoes in a single pass, the router exits the cut on a back edge. If you get any slight tearout, it'll be hidden on the back.

The middle drawer shelf goes right in the center; once it's marked, use the drawers themselves to lay out the other two. (See center photo at left.) Some scraps of the same 3/8" stock used on the drawer shelves will help lay them out. As before, use clamp-on guides and rout across both workpieces in a single long pass.

The last task before assembly is preparing the tall and short dividers. The tall ones receive a nice profile on the front edge typical of the period, and you can cut this on the band saw or with a jigsaw, scroll saw or coping saw.

To match the round front of the stopped dadoes, use a 1/8"-radius bit to cut a roundover on both sets of dividers. The entire front of the short ones get the roundover, while just the top and bottom straight portion on the tall ones. While you have your router table set up, swap the small roundover bit for a larger one and mill a bullnose edge on the front and both ends of the desk lid.

Finally, give everything that will be on the inside of the desk a good sanding — it's easier now than after assembly.



19th Century Drop Front Desk Hardware

2" Brass Non-Mortise Hinges (2)Rockler item 28720; \$2.99 pr.
 2" Brass No-Mortise Lid Hinges (2) ...Lee Valley Tools item 00H60.12; \$4.90 pr.
 1 1/2" Brass Flush Ring Pull (2)Lee Valley Tools item 00L02.02; \$34.50 ea.
 1 1/2" x 2" Half-Mortise Drawer Lock (1)Horton Brasses item LK-1; \$23.97 ea.
 Brass Keyhole Escutcheon with Pins (1) ..Horton Brasses item FE-6; \$5.50 ea.

Sources:

To purchase these and other products online, visit
www.woodworkersjournal.com/hardware or call 800-610-0883 (code WJ1577)
 Lee Valley Tools, www.leevalley.com or call 800-871-8158
 Horton Brasses, www.horton-brasses.com or call 800-754-9127



Begin the assembly with the center module, being sure to orient the top drawer shelf with the dadoes facing upward.

Assembling the Desk

Assemble the center drawer module first, taking care that the drawer shelf with the slots for the short divider is on top, dadoes facing up, as shown in the photo above. Apply glue inside the shelf dadoes and clamp up the assembly.

Attach the desk's top and bottom to the center module, again ensuring that the divider slots are oriented correctly. In the photo below, I'm clamping the assembly upside down so I can see those dadoes on the underside of the desk top. Better safe than sorry.

The upper storage compartment is boxed in with front and back pieces. The front is a simple piece of 3/4" x 3 3/4" x 26" stock installed onto the upper front of the desk with glue and biscuits. The back piece, however, has 3/8"-wide x 1/2"-deep rabbets cut on the inner surface of each end and along the bottom, and is glued and screwed into place. You can see in

the photo at the top left of the next page how the back piece creates another shallow rabbet underneath it. This teams with the rabbets on the back edges of the sides to form a recess for the desk back.

This is also a good time to attach the door-mounting strip on the bottom front. This is almost entirely a long-grain to long-grain joint, so glue alone is fine.

With assembly complete, test-fit all the dividers and adjust as necessary. These should slide easily in and out and be flush with the rear edges of the desk. Don't glue these into place; the desk back holds them in. This is not only easier, it's also period-correct — they were almost never glued in.

The shelves on the right side of the desk could be installed in a number of ways. If you prefer, you can cut even more dadoes to create shelf slots in the inner surfaces of the carcass before assembly. Since these shelves pull out, you'd need to

make those through-dadoes. However, for visual balance I set the shelves back the same distance from the front as the tall dividers on the other side, and I didn't want empty slots in front of the shelves.

You could cut dadoes into a separate interior wall, but I've done something easier by creating a "shelf stack." This method simulates dadoes, creating a solid and attractive means of mounting the shelves, yet allows them to be removed. The concept of stacked shelves is simple: Attach a series of wooden strips to the sides of the shelf compartment, topping each with a shelf.

Cut the side strips to width (the desired height of the shelf), and then it's simply a matter of gluing and stacking. Start by gluing/clamping



When the center module has dried, attach the desk's top and bottom components.



Glue and screw the back of the upper storage compartment into place. This creates a rabbet underneath that will later accept the desk back.



Once carcass assembly is done, give each of the dividers a test fit. Too tight? Ease the fit with a sanding block.

the two bottom side strips in place, then top with the first shelf (photo below). Then glue the next two side strips into place, top with the next shelf, and so on. Be careful not to get glue on the edges of the shelves or you won't be able to remove them.

I've evenly spaced three shelves, but you can do more or fewer, and alter the spacing as you like. By the way, if you really make the shelves *exactly* evenly spaced, considering that the interior height is 16" and the shelves are 3/8" thick, you'll end up with some tough-to-work-with fractions. Instead, make the first three sets of the side strips 3 3/4" high as noted on the *Material List*, then just trim the top ones to fit. That top set will be about 1/8" shorter but completely unnoticeable.

Finish off the desk carcass with a back cut from 1/4" plywood, attached with 1/2" screws — I used cherry plywood, but a different species is fine; original desks of this type often used a different wood on the back. If you want absolute period-correctness, use tongue-and-grooved or lap-jointed solid wood slats instead of ply.

Making the Door

The drop-down door is basic frame-and-panel construction, with a couple of options. Cut components to length, and then mill a 1/4"-deep groove down the inside edges of the frame pieces, and on both edges of the center stile. Since I'm using 1/4" cherry ply for my panels, I've sized these grooves accordingly, but adjust yours for the panels you plan to use.

Now, install a 1/4"-wide dado set in your table saw (or a 1/4" bit in a router table) and cut 1/4"-long tongues on the ends of the top and bottom rails and the center stile. (See photo on page 36.)

You'll find it easier to install the desk's half-mortise lock on the top rail now, before assembly. Clamp the rail to your workbench and lay the lock even with the top-inside edge of the door. Trace around the lock with a knife or sharp pencil. Keep in mind that most locks don't have the key post in the center, so mount the lock slightly off-center in order to have the keyhole centered on the outside.

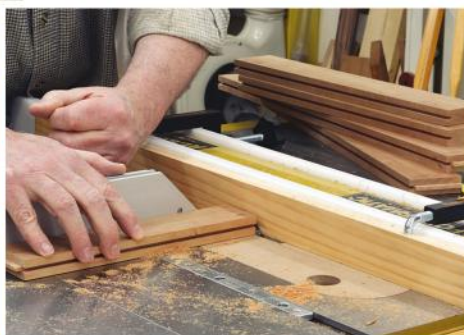
Define the mortise edges, then carefully clean out the waste with a chisel. Check the mortise depth frequently as you work by putting the lock in place upside down until the depth matches the thickness of the lock face. Now, mark the door edge for the shallow mortise that allows the top of the lock case to sit flush with the door edge.



Creating the "shelf stack" is simply a matter of gluing and stacking the shelves and side pieces. Start by gluing the two bottom side pieces in place. Top with the first shelf and follow with the next set of sides.



Cut the 1/4"-deep grooves for the frame-and-panel door on the table saw.



With all the frame grooves cut, create tongues on the ends of the top and bottom rails, as well as on the vertical center stile.

Use a square or straightedge to mark the inner mortise for the lock mechanism. Speed things up for this deeper mortise with a Forstner bit on your drill press, being sure to set the depth stop. Remove most of the waste, then square it up with a chisel.

To locate the keyhole, rub pencil on the key post and press the lock firmly in place. The lock won't lay flat because of the key post, but the graphite on the post marks the correct spot for drilling the keyhole. The hole need only be large enough to allow the key to pass through, but it's best to size the hole to match the opening in the escutcheon you plan to use.

Flip the rail over and hold the escutcheon in place over the keyhole, and pencil in the keyhole outline. Shape the keyhole by removing most of the waste with a drill, then fine-tune it with a chisel, knife or round file.

I mentioned you had options on the door. On many original desks the door was the same inside as out, and if that's your preference then assemble the door now. However, most included a formal writing surface on the inside that was smooth all the way across the panels. You can achieve this by making the center stile thinner so it's flush with the panels. In the photo at the top left of the next page, I removed most of the inner face on the band saw. Go easy on this, as you don't want to go beyond the level of the tongues on each end. Best, in fact, to leave it a hair high for now and then level things out with a sander after assembly.

Assemble the door as you would any other frame-and-panel piece. The rails first, then slide in the panels, then the outer stiles. By the way, I wiped a light coat of oil on the panel fronts to see what they'll look like *before* locking them in place. (Glad I did; I didn't like the look of the first panels I cut.) I rarely use glue with panels, but in this case that center stile doesn't have a closed groove — removing the back portion turned it into a rabbet — so I ran a thin bead of glue on that one panel edge when installing it.

Give the door a good sanding all around, including the center of the writing surface, to do any final leveling.

To create the mortise for the lock's bolt, first attach the hinges on the bottom, 3½" from each end, then mount the door to the desk. (If you plan to dismantle it later for finishing, no need to use all the screws now.) Rub pencil marks over the top of the bolt and, with the door held closed, engage the



With the top rail clamped to your work surface, create the initial mortise for the desk lock.



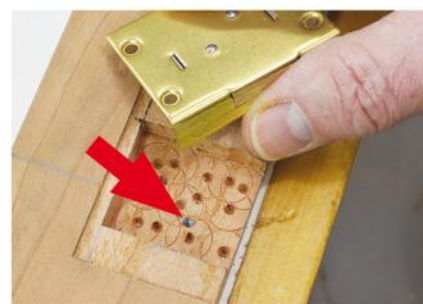
Check the depth of the initial mortise by setting the lock in place upside down.



Measure and mark the initial mortise for the secondary mortise that will accept the body of the lock.



Use a small Forstner bit to clear out most of the waste from the inside of the secondary mortise. Be sure to set the drill press depth stop.



Rub pencil on the end of the key post, and press the lock into place to mark the mortise for drilling the keyhole.



Resaw most of the back side of the center stile on the band saw, then follow up with a hand plane and/or sander.



Give the completed door a good sanding, working your way up through the grits. Also, sand the center stile flush with the panels.

lock so the bolt rises up into the underside of the desk's top. This leaves a guide mark for cutting the bolt mortise. Make a series of shallow drill holes on this mark to create a slot, then clean and square things up with a thin chisel. You can add a strike plate over the bolt mortise if you like, but they weren't typically used on desks in the 19th century.

Finishing Up

So, why are the drawer openings 10" deep, but the drawers only 8 $\frac{3}{4}$ " long? Well, that's a secret — a location for a secret till, that is. Hiding places were common in these desks, and I've included not one, but two, of them.

These are simple, butt-jointed boxes; they're so small that wood movement just isn't an issue. Center a finger hole near the top of each front piece, then just glue and clamp them up. Use any wood you want for these (they're perfect scrap bin projects), but the facing pieces should be a dark wood so they're less visible inside the drawer openings.

The last touch is an optional strip of 1/2" half-round cherry molding that visually separates the lidded top of the desk from the lower portion. Miter the corners of the front piece and simply glue and clamp it into place; all the grain matches so wood movement isn't an issue. That's not the case on the desk sides, though. Attach the side pieces with a bit of glue at the front — the first 1 $\frac{1}{2}$ " inch or so — then a single pin nail in the center and one at the back.

Give the desk the finish of your choice. A drying oil was common in the 19th century and that's what I've used — oil on cherry is my favorite finish in the world — but use whatever you prefer. If you've opted for the full writing surface as in the project desk, don't apply any finish inside the panel area.

I used thin leather, adhered to a 1/8"-thick piece of hardboard, for the blotter here. Attaching the leather to a sub-surface first with contact adhesive makes installing it way easier. You don't have to mess with a lot of adhesive on the inside of the door at all, as you would gluing loose leather in place. Instead, with a few dollops of regular wood glue scattered around inside the door an inch or so from the stile/rail edges and a few in the center, you just drop the hardboard into place and you're done. If you should decide to change the leather down the road, removing it is much easier, too.



Glue and clamp up the secret tills. Once dry, round over the two ends slightly to prevent them from jamming inside the drawer openings.



The front trim can be glued into place, since wood movement isn't an issue, but nail on the side trim to account for the cross-grain situation here.

Now, if you disassembled things for finishing, the last step is to reattach any hardware you removed — hinges for the bottom of the door, lid hinges for the back of the desk lid and the flush pulls on the two drawers.

A.J. Hamler is the former editor of Woodshop News and the author of Civil War Woodworking, Volumes I and II.

Portable Board Game Storage Box

By Kimberly McNeelan



This project provides you with a variety of classic entertainment options, and a place to keep them all.

I remember being snowed in one Christmas vacation when I was a child. The roads were closed. We had already watched *White Christmas* and *Miracle on 34th Street* too many times. It was before Christmas so we didn't have new toys or books for our amusement. My sisters and I played in the snow until our mom was sure we'd get pneumonia. Then the cabin fever started. Thankfully, we had a checker-

board, cribbage board and The Game of Life. We played game after game after game. I was the youngest, but you know I won my fair share!

Of course, board games are a wonderful way to spend face-to-face time with loved ones. After that vacation, we started playing checkers quite often. Even my dad would play and he never intentionally let me win. I had to earn it!



Rip the parts to width. For narrow rip cuts like this, use a push stick once the cut is underway.



A crosscut sled and clamped stop block ensure that project parts can be cut to lengths that match one another exactly.



When cutting dados, make sure to hold the workpiece flat against the saw table. On narrow parts, such as shown in the inset photo, use a push stick to keep your fingers clear of the blade.



With the ever-advancing cellphone and computer games, I think it's important to find amusement without the distractions, flashing lights and noises of technology. This portable board game storage box is a classy way to have at least five games at the ready for your entertainment. I'm prepared for the next snowstorm!

After purchasing lumber, you'll start the project like most woodworking. Mill the wood a couple of inches longer than what is called for on the project's *Material List*. To avoid a glue-up for the box sides, get lumber that is 7" wide or wider (as long as your jointer can handle it). I chose hard maple for this project because game boards can be exposed to a lot of wear and tear, and the color goes well with the inlay, too. One can barely dent hard maple with a fingernail because it is so dense.

Glue and Cut Pieces to Size

After joining and planing the project stock to the appropriate thickness and crosscutting them to length, you will need to glue up the game boards themselves (pieces 8) so they are the right size. Do this now to give the glue plenty of time to dry before you continue working on them. Rip the sides of the box, molding, drawer parts, and extra drawer scrap to exact width.

Cut the plywood squares to use for the chessboard and security panel just over the final dimensions. Then glue on the edging. When the glue dries, cut the chessboard, security panel and bottom to exact size at the same time using a stop block on the table saw. Cut the game boards about 1/8" smaller than the top chessboard so that they will

slide easily in and out of the box. While you are at it, cut the drawer bottom, too.

Dadoes and Miters

Dado the sides of the box to fit all the parts that will be housed inside. Set up your dado blade to remove 3/4" for the game board slots/box bottom. You can make several passes to remove enough material for the top. Then set up for a 1/4" dado for the security panel. While you have the 1/4" dado set up, go ahead and cut the dado for the drawer bottom, too.

Change the blade setup to miter the corners of your game box. Make sure to use a stop so that the box sides come out exactly the same length. Fit the box sides to the chessboard top. It is helpful to line up the box sides/back with the chessboard top and then use your combination square to draw a line to creep up to.

Drill an 11/16"-dia. hole for the lock in the back of the game box.

A cam lock, located in back of the game box (inset), secures the drawer. Bore the 11/16"-dia. lock hole through the back panel at the drill press.



The author marked the game box's corner miters to 45°, using the chessboard top as a reference (inset). She cut the miters on a crosscut sled for best control and accuracy.





The author used finishing expert Michael Dresdner's process of masking off with tape (see page 82) in order to create the chessboard squares with spray paint.



If the game box parts are cut carefully and accurately, gluing and clamping them together at once will be easy work with enough clamps.

Making Chessboard Squares

Prepare for making the chessboard grid by first sanding the top lightly. Now cover the board with 2"-wide blue painter's tape, and use a combination square and a razor blade to cut eight 1½" squares 1" in from the edges. (See Michael Dresdner's *Finishing Thoughts* article on "Masking Off" on page 82 for

more tips on this tape-and-paint process.) Scribe the outside edge lines first so that you know where to stop cutting the other lines, and then use tick marks for a reference to cut uniform squares. Try to make each line in one long, firm pass with the razor blade so that the lines will come out clean and crisp. Peel off every other square on the board before spray-painting it black. Once the spray paint has dried, carefully peel off the rest of the blue tape.

Assembling Boxes

It's time to assemble the game box! Glue the chessboard, security panel and bottom in place while you are gluing the mitered corners. Since the sides and back are cut to fit the internal panels perfectly, they keep everything lined up. This glue-up should be easy if you keep the clamps parallel and perpendicular to the box.

Change back to your crosscut setup, and cut the drawer parts to length. Make sure to have a few extra drawer scraps that are greater than 6", with square ends, to use as test pieces for cutting. Check that the front and back pieces fit in the box with at least a 1/16" gap on both ends so that the drawer will have room to move. Once again, use a

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MORE ON THE WEB



For a video on using a table saw to cut inlay, plus a downloadable plan for making chess pieces with your band saw, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

stop block to ensure your parts come out exactly the same length. Select which of the pieces has the better grain pattern for the drawer front, and label it.

Now set up a wide dado blade to notch out the back of the drawer box for the lock (see *Drawing*, page 42). Or, you could also use a 1/4"-wide dado; that way, you'll be ready for cutting the drawer joints, which come next. Test the blade height on a scrap piece before cutting the real drawer back.

The drawer's rabbet-and-dado joinery is fairly simple and so satisfying to put together. Using a piece of extra scrap, test your 1/4" dado blade height by cutting 1/4" in from the end of the piece. The result should be a 1/4"-wide, 1/4"-deep dado that's 1/4" from the end of the board. This is the test cut for the dadoes you'll cut in the drawer front and back pieces.

I used the test piece to determine where to clamp a stop block in my crosscut sled to cut the drawer's front and back joints. Once you've cut the dadoes on the inside faces of the drawer drawer front and back, cut rabbets on the ends of the drawer sides to fit them.

Drill a 3/16" hole centered on the front of the drawer for the knob. Then glue and clamp up the drawer parts.

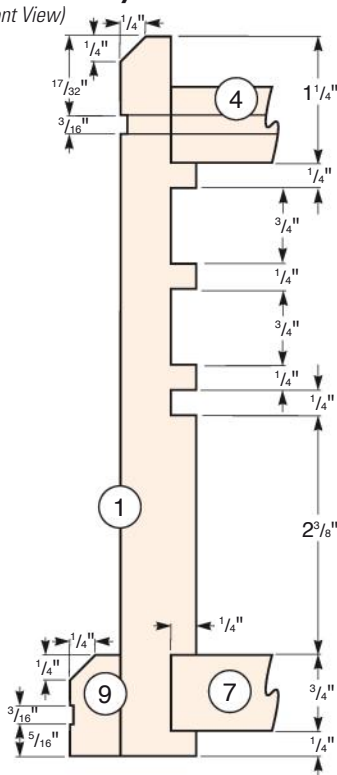
Molding and Inlay

Prepare the game box molding and glued-up game box for inlay strips by plowing 3/16"-wide by about 1/28"-deep dadoes in them. Again, use scraps to check the settings. My dado blade doesn't cut this narrow, so I used a regular ripping blade, then barely moved the rip fence to widen the inlay cut.

Glue the inlay in place on the molding. Use clamping cauls covered with

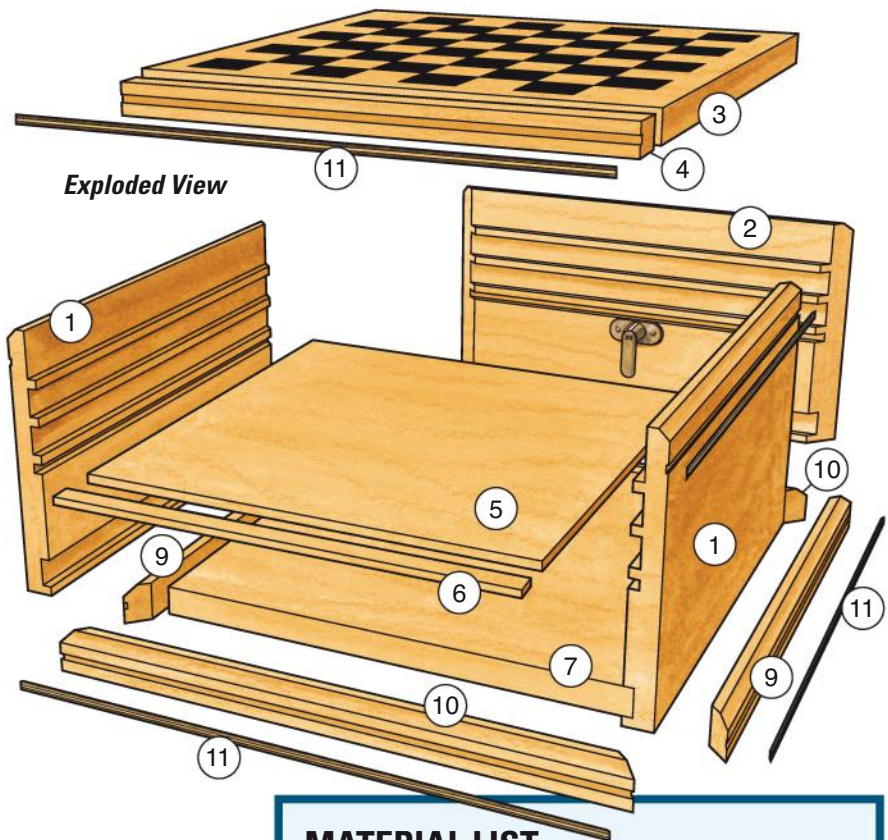
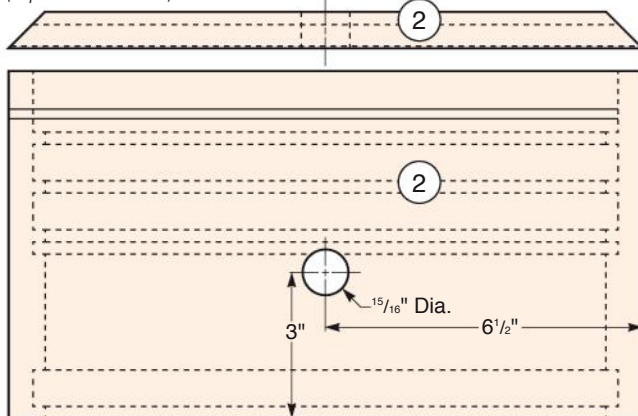
Side Assembly Detail

(Front View)



Back

(Top and Front Views)



MATERIAL LIST

	T x W x L
1 Sides (2)	3/4" x 7 1/8" x 12 1/2"
2 Back (1)	3/4" x 7 1/8" x 13"
3 Top (1)	3/4" x 11 1/4" x 12"
4 Top Front Trim (1)	3/4" x 3/4" x 12"
5 Security Panel (1)	1/4" x 11 1/2" x 12"
6 Security Panel Front Trim (1)	1/4" x 1/2" x 12"
7 Bottom (1)	3/4" x 12" x 12"
8 Game Boards (2)	3/4" x 12" x 12"
9 Side Moldings (2)	1/2" x 1" x 13 1/2"
10 Front and Back Moldings (2)	1/2" x 1" x 14"
11 Inlay (1)	1/28" x 3/16" x 110"

Portable Game Storage Box Hard-to-Find Hardware

JIG IT® Game-Drilling System for Original Cribbage #34531	\$49.99 pk.
JIG IT Game-Drilling System for Tic-Tac-Toe/Last Man #34506	\$47.99 pk.
Chinese Checkers Template #34515	\$49.99 pk.
9/32" Self-Centering Bit #34368	\$16.99 ea.
#10 Insty-Drive Self-Centering Bit #69007	\$12.99 ea.
Marble Drilling Bit #41463	\$26.99 ea.
Wooden Cribbage Pegs #21741	\$5.49 pk.
Wooden Game Pegs #41043	\$5.99 pk.
Marbles for Tic-Tac-Toe #41022	\$3.49 pk.
Marbles for Last Man Standing #41029	\$2.99 pk.
Marbles for Chinese Checkers #41015	\$4.99 pk.
Universal Cam Lock #35982	\$17.99 ea.
Solid Brass 3/4" Smooth Top Knob #36459	\$7.99 ea.
Black Maple Striped Inlay Banding, 3/16" W (2 pks.) #44968	\$7.99 pk.

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Or, call 800-610-0883 (code WJ1577).

Not intended for use by children.
CAUTION: Choking hazard/Sharp
Edges. Small parts and sharp edges.
Not for children under 8 years of age.



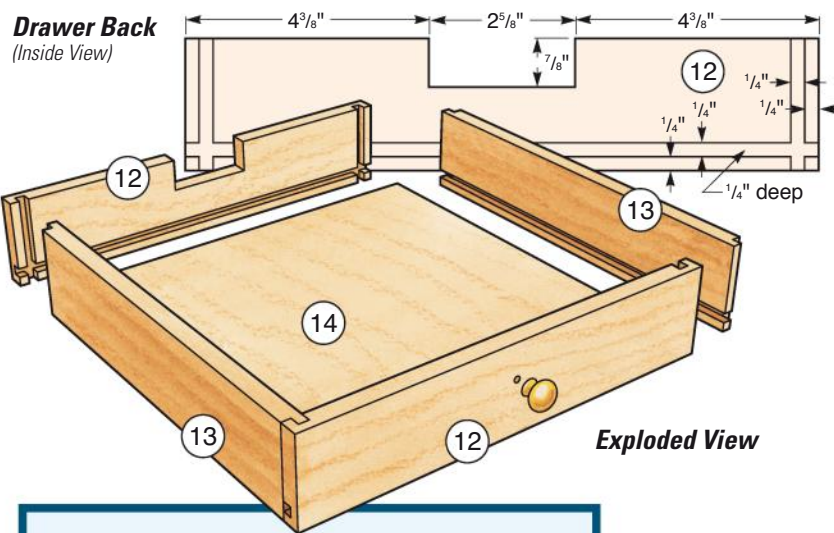
Cut the drawer joinery. It is a good idea to use a backing board when cutting dados that are smaller than the hole in your crosscut sled.



Notch the top of the drawer back with a wide dado blade to accommodate the cam lock hardware that passes through it.



Because of the simplicity of the joinery, only two clamps are really required to assemble this drawer.



MATERIAL LIST

	T x W x L
12 Drawer Front and Back (2)	1/2" x 2 3/8" x 11 3/8"
13 Drawer Sides (2)	1/2" x 2 3/8" x 11 1/4"
14 Drawer Bottom (1)	1/4" x 10 7/8" x 11 1/4"

packing tape to make this step easy. Now hold the inlay up to the game box, and mark where to cut it to length. Use a chisel to make tiny miters on the inlay so that the corners are nice and neat. Then glue the inlay into its dados. I could have installed the inlay on the game box before even cutting the corner miters or assembling it, but waiting until now guarantees that the inlay aligns perfectly all around the box.

Set the table saw blade back to 45°. Rip 1/4" chamfers on the game box top and the game box molding. After lightly sanding any glue residue off the face of the molding and game box, rip 1/4" chamfers on the top of both. Rip the 3/16" chamfers on the game board edges now, too.

It's time to miter-cut the molding to fit the box. Cut each of the molding pieces just a little bit long, and slowly shave off little cuts until you get the exact size.



The depth of the dado should result in the inlay being flush or a tiny bit proud. You can sand a hair's thickness off the inlay if necessary.

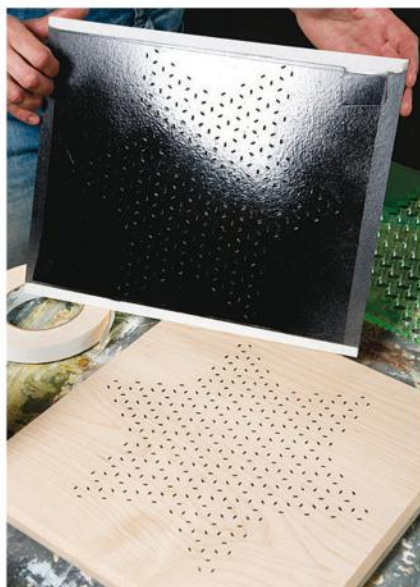
Hold the molding in place to check the fit. Then finish-sand the game box, game boards and drawer before you glue on the molding pieces.

Boards for Specific Games

I chose tic-tac-toe, last man standing and Chinese checkers for my game boards. For most of these, the purchased game board templates I used (see the sources under the *Material List*) came with both painting and drilling templates. The cribbage board is the exception — it doesn't have a painting template — so you can drill the holes before or after spray painting the other boards.



You can quickly and easily add accents to your game boards with painting templates.



Although the author chose classic black paint, you can use the color of your choice.



After painting, the author used the drilling template from the set to create the indentations.

For the other games, I did the template painting before drilling the holes. Use a combination square and blue tape to place the painting templates on the boards. Be sure that the tape covers the edges to protect them from overspray. Then spray paint three or four light coats of color over the templates. Black was my color of choice.

After the paint dries, align your drilling jigs with the newly painted marks and tape them down with double-sided tape to hold the game templates in place for drilling. Then drill the corresponding holes/marble divots. (Note: you'll want to drill a couple of test holes on scrap wood first.)

Hold the game board with one hand while using the other hand to drill. Take your time, and the holes will come out cleaner. Make sure to check the depth of hole on the cribbage board drill bit because it's adjustable. Turn off the drill press and clear accumulated chips out of the drill bit flutes frequently. Do any finish sanding where the drilling may have made a rough spot.

To clearcoat this fun and simple project, I used a spray-on semi-gloss lacquer. I applied three coats with about 25 minutes of dry time between each thin coat. Then I made the whole thing feel

silky by lightly applying wax with steel wool before buffing with an old T-shirt.

Now install the lock in the back of the game box. You will need to adjust the lock to the appropriate setting for 3/4"-thick stock, and the straight cam should be installed on the lock with the help of an Allen wrench. Using a rubber mallet, carefully tap the gold ring piece into the hole from the outside. Check the direction the cam will move before inserting the lock cylinder into the hole from inside the box. You may need light taps from a rubber mallet again.



Double-sided tape keeps the template secure during the drilling process. The author recommends frequently cleaning the chips from the drill bit.

Install a knob on the drawer face, and try out the lock. This lock and the security panel keep your playing pieces safely contained in the drawer when you're not using them. Game time is a lot more fun when you don't have to hunt for the playing pieces first!

Before I made this game board storage set, Chinese checkers wasn't a game I had played. Now it's a regular activity. My nephews and niece love playing last man standing and tic-tac-toe when they come over. This project was a lot of fun to make, but I think the real reward is the quality time I'm spending with loved ones.

In addition to making the portable board game storage box, I decided to turn my own chess pieces. I used maple and spray painted one set black before clearcoating these pieces, too.

There are so many creative options for creating chess pieces! If you'd prefer not to turn, we've also provided a free downloadable plan in the More on the Web section of our website for making a chess set on the band saw. (Keep in mind that these bigger pieces won't fit in your storage drawer, though.)

Happy making and playing!

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

Making Shaker Work Chairs

By Ernie Conover

Some turning and a simple-to-make fixture yield a useful chair.



Many people are daunted by chairmaking because of all the mortises that have to be drilled at precise angles, but a simple fixture and a drill press iron out that problem. The turning is very simple spindle work: essentially, you only have to turn large diameter dowels for the legs. At 35 $\frac{5}{8}$ " even the back legs can be turned without a steady-rest. The same for the seat rails, but the stretchers are improved by tapering them to the tenons. In short, Shaker work chairs are perfect to impart understanding of chairmaking in general.

The work chair I detail in this article is pictured on page 77 of *The Book of Shaker Furniture* by John Kassay (ISBN 0-87023-275-4). The chair is originally from the Canterbury (New Hampshire) Shaker Settlement, and it is now in the collection of The Shaker Museum in Old Chatham, New York. That's where I had the privilege of examining it and taking measurements some years ago. This was designed to be a tough, yet comfortable, work-all-day chair. The Shakers used chairs like this in any work situation such as at shop benches, laundry and ironing tables, looms and spinning wheels. I shortened the design to make the chair better for the latter two tasks. At the original height, it makes a great bar or kitchen counter seating.

Ample use of stretchers makes it immune from racking, and the tape seat is like having a myriad of band clamps to reinforce the glue.

While the original example was painted, these chairs can be made from figured wood and clear finished to stunning results.

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Shaping the Legs

I turn the legs almost entirely with a spindle roughing-out gouge. While I will plane straight-grained wood with a very sharp skew chisel, curly wood is best sanded smooth. I finish the legs and stretchers, but not the seat rails, before glue-up.

Finish Options

The original Shaker chair in the museum is maple with a wash of red paint, but I have made these chairs in curly maple with



If you've chosen a clear finish, it is easiest to apply several coats in the lathe.

a clear finish to stunning effect. If you want to use the original Shaker finish, then leave the wood bare and remove all traces of excess glue. Mix a thin solution of milk paint and brush on an even coat. Once thoroughly dry, apply a coat of oil finish such as Waterlox®.

On the other hand, if you have picked striking wood, a clear finish is easy to apply. A couple of coats in the lathe make sanding much less tiresome.

Marking and Drilling the Legs

I like to bundle the leg posts together as they will be in the assembled chair and put masking tape or a pencil line (the distance up from the bottom of each leg) where the mortises will be drilled, as seen in the photos at right. This keeps me organized and saves me from turning a post in the wrong direction when drilling the second line of holes.

To drill the holes in the legs, I created a marking and drilling jig that you can see in the photos and *Drawing* on the next page. With this jig, I also use a 10° alignment ramp and an alignment stick. The alignment stick is a 1"-square billet with a 5/8"-dia. by 7/8"-long tenon turned on one end. The tenon should be a tight slide fit with the hole drilled by the auger bit that will be used to drill the mortises in the leg posts for the rails and stretchers.

Clamp each rear post in the Drilling Fixture and drill the mortises for the back rails/stretchers first. The 5/8"-dia. holes should be drilled 7/8" deep to fully bottom the 3/4" tenons. Making a story stick like I am using in the top photo at right helps to get things right, even if you are only making one chair. The story stick should be 1 1/16" wide (slightly small-



It is worth making some story sticks, even for one chair. By making the story sticks 1 1/16" wide, it is easy to center them on the 1 1/2"-dia. legs.



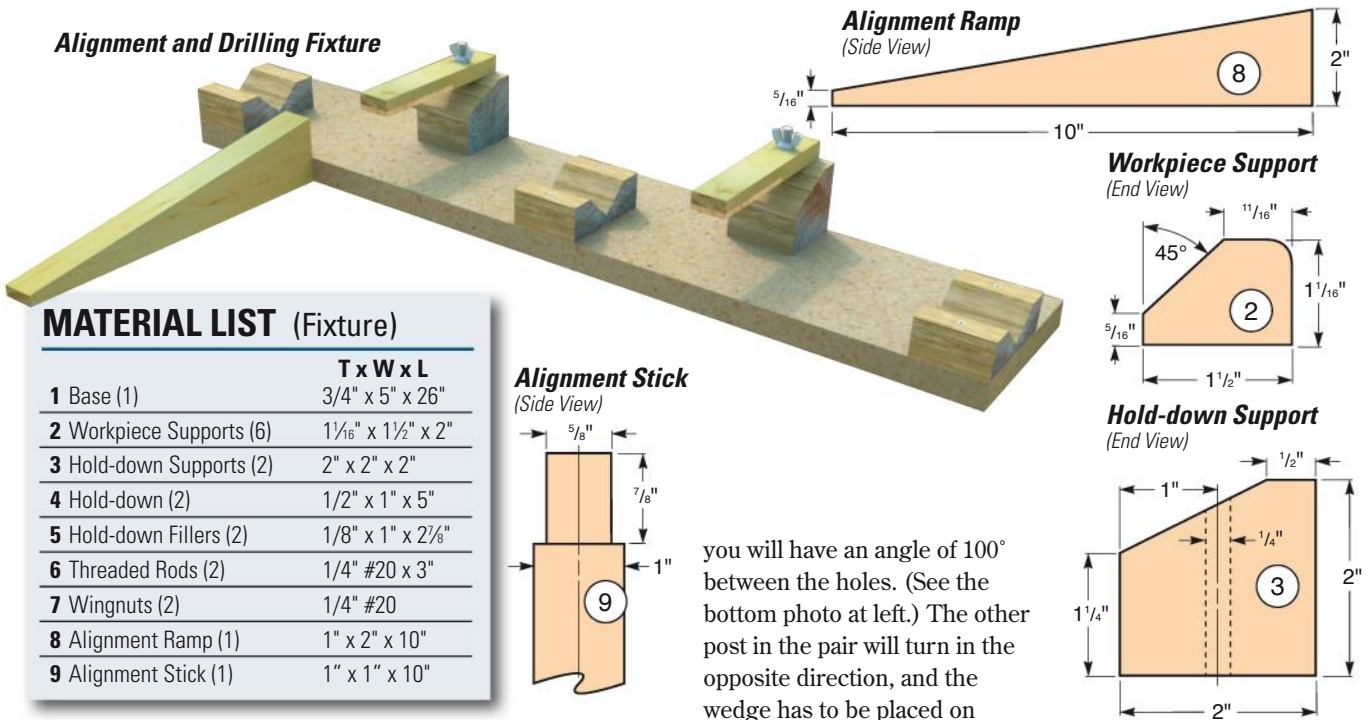
Locating the borings that will accept the tenons of the stretchers and rails is key to this project. The author bundles a group of four legs for each chair as he marks them. To do this accurately, he created a fixture to aid both marking and drilling. (See the next page.)

er than the 1 1/2" diameter of your leg posts); it helps greatly in centering the holes as you mark them. Be sure to center punch the location before drilling.

After drilling the back rails/stretcher holes in the back posts, insert the alignment stick in the bottom hole and rotate the leg so that it is parallel to the alignment stick with the big end toward the jig. A note about the alignment stick and the alignment ramp: They are used as a reference — sometimes the surface of the stick lies directly on the alignment ramp, but sometimes you eyeball the relationship. See it in use in the photos on the following page. You should see the second pencil mark, meaning you turned in the correct direction, and



Alignment and Drilling Fixture



you will have an angle of 100° between the holes. (See the bottom photo at left.) The other post in the pair will turn in the opposite direction, and the wedge has to be placed on the other side.

In the *Drawing* above, you see the big end of the wedge as it would be used for the back posts. Making the alignment stick parallel to the wedge makes the angle between the rows of the holes 100°— what you want for the back posts. Use the small end for the front posts.

Making Rails and Stretchers

The seat rails are essentially dowels with a 5/8"-dia. by 3/4"-long tenon on each end. I turn them with a spindle roughing-out gouge and leave a spiral pattern, which helps prevent the tape from which the seat is woven from slipping to the back. (For the same reason, you won't want to finish the seat rails!)

To quickly size the tenon, I use a beading and parting tool and a 5/8" open end wrench as a gauge.

The eight stretchers can also be a dowel with a 5/8"-dia. by 3/4"-long tenon on each end, but they look much more

elegant if they are tapered from the center to about a 1/16" shoulder at each tenon.

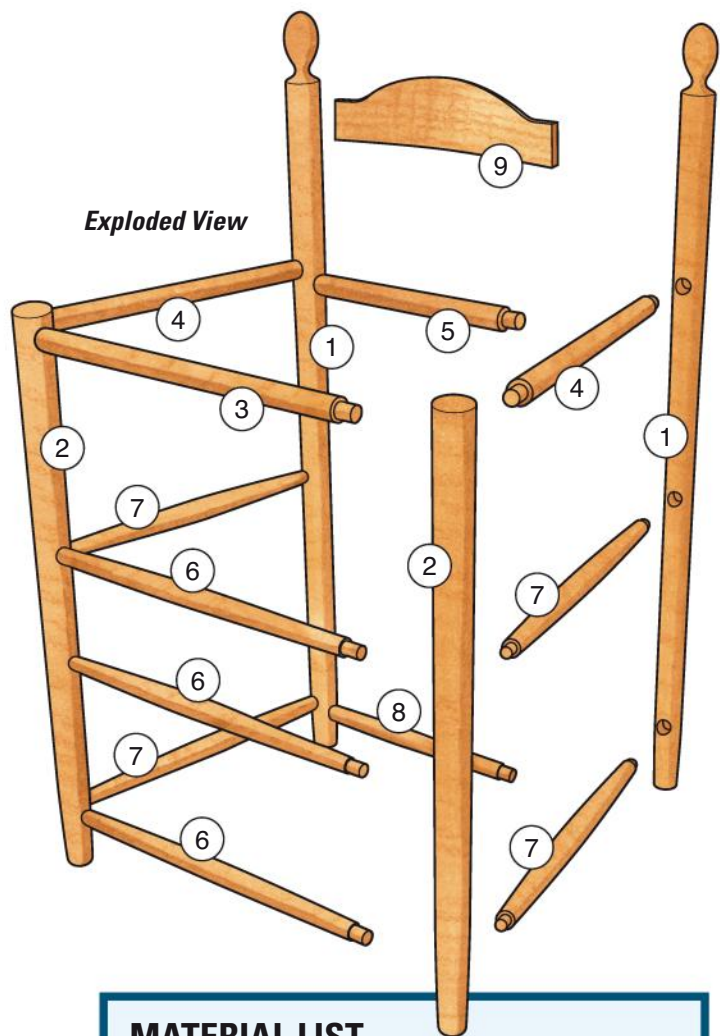
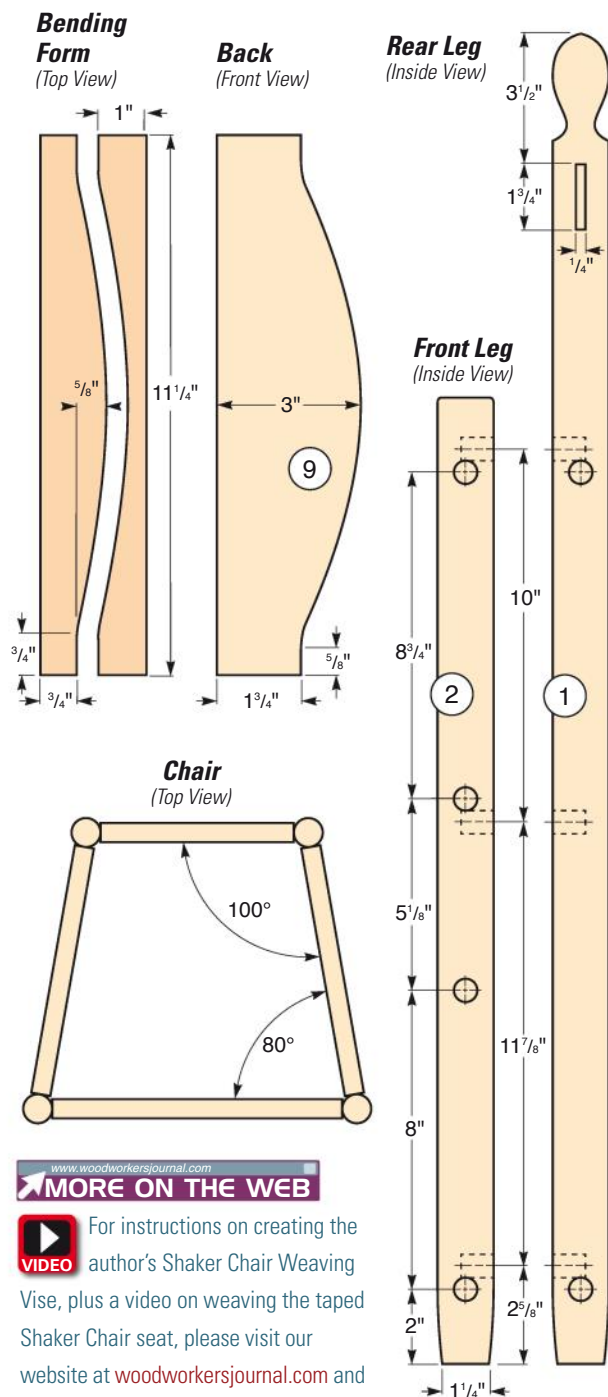
When you're placing the rails and stretchers into your chair assembly, you'll need to note that all the side seat rails and bottom stretchers are slightly higher than the front and back rails/stretchers. The distance is 5/8", or just a bit more, so that the holes do not interfere with each other. Other stretch-

The alignment ramp is used in various positions, but always to provide an accurate way to locate the stretchers and rails at either 100° or 80° from the center of the legs. In the photo above left, the alignment ramp is slid under the leg on the base of the fixture. In the lower photo, it is on the workbench, but the alignment stick is next to the ramp to eyeball the proper angle.



For his drilling fixture, the author glued V blocks to a base and secured them with drywall screws through a hole at the edge. The clamping arms are secured with 1/4"-20 threaded rod epoxied into the block.





MATERIAL LIST

	T x W x L
1 Back Legs (2)	1 1/2" x 1 1/2" x 35 5/8"
2 Front Legs (2)	1 1/2" x 1 1/2" x 25 7/8"
3 Front Rail (1)	1" x 1" x 16 1/2"
4 Side Rails (2)	1" x 1" x 14 1/2"
5 Back Rail (1)	1" x 1" x 11 1/2"
6 Front Stretchers (3)	1" x 1" x 16 1/2"
7 Side Stretchers (4)	1" x 1" x 14 1/2"
8 Back Stretcher (1)	1" x 1" x 11 1/2"
9 Back (1)	1/4" x 3" x 11 1/4"
10 Cotton Tape (1)	1" x 3'

MORE ON THE WEB



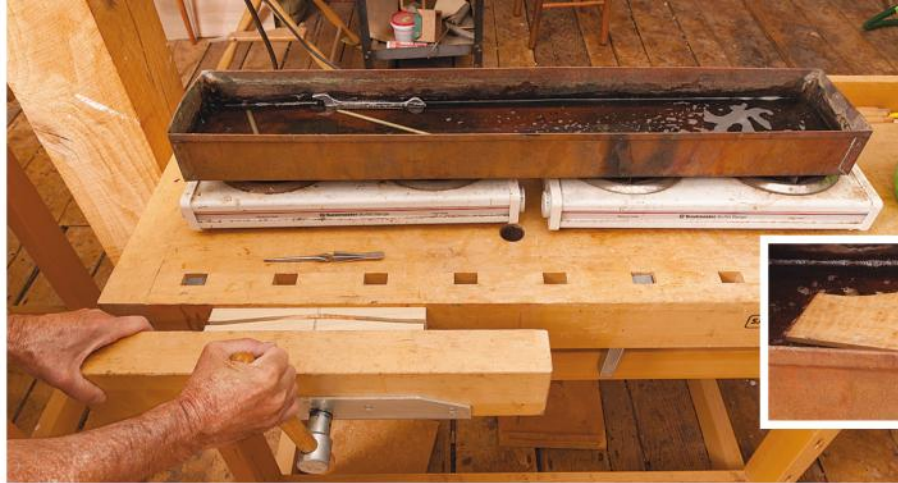
For instructions on creating the author's Shaker Chair Weaving Vise, plus a video on weaving the taped Shaker Chair seat, please visit our website at woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

Some Background on the Shakers:

In the middle of the eighteenth century, many in England had converted from the Quakers to the United Society of Believers in Christ's Second Coming. In their worship services, they would dance and tremble to "shake" off sin. Outside observers derisively labeled them "Shaking Quakers," which morphed into "Shakers."

The founder of American Shakerism was Ann Lee (born Lees), who immigrated to the Colonies in 1774. Known as Mother Ann, her key

edicts were: celibacy, separation from the world, communal living, equality, confession of sin and pacifism. The well-ordered Shaker communities had complete equality between men and women, who lived in separate dormitories. Unlike the Amish, the Shakers embraced technology. Their communities had running water and even electricity ahead of nearby towns. Shakers read the latest scientific periodicals and many important ideas and inventions are to their credit.



The wrench serves as a weight to keep the piece submerged in the hot water.

To create the curve in the chair back, the author poached the piece in simmering hot water for 15 to 20 minutes, then immediately clamped it into his bending form. Work quickly to retain the heat.

ers are placed to reduce racking. You can see the placement distances for these in the *Drawing* on page 47; all distances are for the center of the hole location.

Seat Back: Boiling to Bend

To create the curve in the seat back, I employed the process of poaching in a hot water bath. I built a bending form, as seen in the *Drawing*, to accomplish this. The form was easy to build: simply saw the shape down the center of a 2"-thick by 3"-wide by 11¼"-long piece of wood. I use maple, but any wood will do. The shape may be laid out by bending a thin strip of wood between nails pounded into the top at about ¾" from each end. You will need to sand each half smooth; otherwise, rough saw marks will imprint in the wood that you're bending.

To bend, wood needs to be 180° or hotter and have 20% moisture content. You can easily accomplish both needs by poaching your back piece in simmering water or steaming for 15 to 20 minutes. A cake pan and a hot plate or camp stove will work. I find it useful to put some round bars in the pan so the piece is slightly off the bottom, and to place a weight like the wrench you can see in the photos above to hold it down on these bars.

and close the vise. Your piece should stay in the bending form for a minimum of 12 hours.

Once you've removed your back piece from the bending form, it will spring back a bit, leaving about 3/8" of deflection.

Cutting the mortise for the back support is best accomplished with a hollow chisel mortiser. I put the alignment stick in one of the holes and vertically align it in the mortiser. If you don't have a mortising machine, hand mortising works well, as does a router with a 1/4" spiral bit and a suitable jig.

Final Assembly

Once you have all of your wooden pieces ready, it's time to glue up and assemble your chair. Glue with a long open time is best; I like Titebond® III or 90-minute epoxy. Two strap clamps will pull all of the tenons to full depth and usually bring the chair square.

Just after clamping, if the chair is out of alignment, I become a chair chiropractor. I simply grab the tops of the back posts, place a foot on one of the bottom stretchers and muscle the parts around until the chair sits level and looks square. This is why long open time glue is very, very good!

Weaving the Seat

My wife, Susan, weaves the seats for our chairs with cotton tape, which is available in several colors as "Shaker Tape" from Royalwood Ltd. (www.royalwoodltd.com; 800-526-1630). She shows the simple weaving process in a video found in the More on the Web section of woodworkersjournal.com.

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

Once you've removed your piece from the simmering water, it's very important to have it fully clamped into your bending form within one minute. Waiting longer than a minute will most likely result in the piece dropping below 180°: breakage, rather than bending, will be the result. Wearing leather gloves during this process is a good idea. I simply put the form in a bench vise, align the hot part between the two halves,

When it's time for final assembly, the author physically adjusts the chair pieces to fit them correctly. It's helpful to use a glue with a long open time.



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Reader's Survey

What Woodworkers are Doing

By Woodworker's Journal Staff

Variety is clearly the spice of a woodworking life. This time around, we asked you all: What type of woodworking are you doing? We got a medley of answers; here's just some of what we learned ...

Go ahead, grab a **CHAIR!**
Furniture Making is identified by more than **25%** of woodworkers as their primary woodworking activity.



The **THREE** things that woodworkers said they would most like to learn more about:



Woodturning

#2 Furniture Making



Shop Projects

Scotty, I need more **POWER!**

67% of woodworkers identify as primarily power tool woodworkers. Only **2%** say they do most of their woodworking with hand tools.



Only **8%** of woodworkers use a hand plane often to surface wood

Now, you've been BUSY!
49% of woodworkers say they build between 4 and 10 projects a year. **14%** say they build between 11 and 20 each year!



Gimme that **OLD-TIME** woodworking: **53%** of woodworkers say they enjoy making "historically based" projects": Civil War, Stickley, etc.



The most popular type of wood

Red oak
20%

Cherry
15%

Walnut
14%

Make that a clear coat ...

Water-based poly just edges **(28%)** out oil-based poly **(26%)** as the finish of choice for most woodworkers.



Proud Of ...

We asked, "What is the project you made of which you are most proud? Here are just a few of the hundreds of answers:

- Greene & Greene end tables
- Icebox
- The one I make next ...
- Windsor chair
- Baby cradle
- Children's puzzles
- Hope chests for twin granddaughters
- Toy construction crane
- Demilune table
- Toybox
- My original designs
- Morris chair
- Daughter's crib
- Art Nouveau chair
- Adirondack chair
- Stickley Poppy table
- Church door restoration
- Gun rack
- Cat tower
- Lamp with laser-cut shade
- My sister's kitchen cabinets
- Appalachian-style banjo
- Bible box for my parents
- Flag case display
- Toys for grandkids
- Grandfather clock
- Kitchen island
- The last one
- Guitars
- Wooden bracelets
- Table with 16 chairs
- Beehive
- My house
- Tile table for my son
- Continuous feeding worm bin
- Piano stool, threaded seat
- Sleigh bed
- Malooof rocker
- Birdfeeder
- Jewelry chest
- Limbert #340 bookcase
- My casket
- Murphy bed
- Altar for our church
- Highboy dresser
- Bathroom vanity
- Cypress-strip canoe
- Custom 186-piece jigsaw puzzle

Tool Preview

JET JWSS-22 22" Scroll Saw

by Carole Rothman

Innovative new mid-priced scroll saw features a tilting arm rather than tilting table.

It's been a while since a new scroll saw appeared on the scene, and JET's new JWSS-22 (\$989.99 as a kit with stand and foot switch) has created considerable interest among serious

scroll saw users. It has also provided an option for new or occasional users looking for a mid-priced saw they can grow into, rather than out of.

Prior to the saw's arrival, I asked experienced scrollers,

all of whom were familiar with JET's promotional material, for their impressions and concerns. Armed with their feedback, I set out to write a review that would be both helpful and comprehensive.

The saw arrived in good condition, and assembly was easy. Before starting my assessment, I squared the blade to the table and adjusted the blade oscillation for a vertical cut. Then, I addressed three concerns all

scroll saw users share: ease of blade change, vibration and sawdust control. JET's tool-less system combines upper blade clamping and tensioning into one simple operation. I secured the blade to the lower clamp with the convenient built-in wrench, slid the assembly through the blade slot into its holder, placed the top of the blade in the upper clamp, and

flipped the cam lever to secure and tension the blade. In general, the system worked well: using blades ranging from #2/0 to #12, I found that only the largest and smallest required adjustment of the upper clamp's set screws. If necessary, blade tension can be increased by lifting and rotating the cam lever.

To assess vibration, I used the "nickel test," increasing the saw's speed from 400 to 1,550 strokes per minute. The nickel remained on edge at first but keeled over once sawing began. Nevertheless, vibration was minimal.

The JET's articulated air nozzle effectively clears sawdust from the cutting line. Its dust collection system, which uses a standard shop vacuum, worked very well, but only when the workpiece did not block the small holes in the table, to the right of the saw blade. When these holes were covered, the



The author's "nickel test" gave her feedback on the scroll saw's vibration.



In assessing the JET 22" Scroll Saw's blade change capabilities, the author used features like a built-in wrench (left photo, above), a cam lever that secures and tensions the blade (right photo, above) and set screws for the upper clamp (photo at right).





The author used an extra hose fitting (not shown) to reduce suction from the dust collection feature and allow her workpiece to move more freely.

suction created prevented the workpiece from moving freely. To reduce the suction, I cut a channel into an extra hose fitting and attached it to the hose. I also called JET's technical support to see what solutions they could offer, and I was told that a "Y" connector could be put on the hose, leaving one side open, and removed if more suction was needed.



The author used an oval box as a test. The saw cut sides that were absolutely vertical.

The ability to make accurate cuts in wood of all types and thicknesses is the mark of a quality scroll saw. I assessed the saw's ability to handle thick (1¼") pieces of hard maple and red oak, using a pattern for a small oval box. I cut out the solid oval center and evaluated the quality of the cut. I was pleased to find no burn or blade marks, and sides that were absolutely vertical. However, during the cutting process, I discovered a slight misalignment at the blade slot that occasionally interfered with movement

of the workpiece.

Next, I cut a piece of fretwork. This type of work typically uses thin wood, and it requires multiple blade insertions through small entry holes. Feeding the blade through the wood from the bottom was quick and easy; the spring-loaded arm provided ample room to access the underside of most projects, and the table slot was useful for larger workpieces. Top feeding, however, was not feasible, since the blade could not be removed from the lower clamp while in its holder.

Unlike most scroll saws, which have a table that tilts and an arm that doesn't, the JET has an arm that tilts, and a table that doesn't. I tested this design by making different types of cuts at steep angles. First, I cut a small piece of 3/4"-thick maple at 45°, then checked the results with my

combination square. Dead-on accurate!

Next, I cut rings for a small scalloped bowl, using angles varying from 20° to 40°. The saw turned in an impressive performance, handling the sharp curves with ease. The tilting arm and large (23.62" x 12.67") level table definitely made these cuts easier than they would have been using the conventional tilting table.

After putting the saw through its paces, I concluded that while this new, mid-priced tool may not be for everyone, its innovative features, solid performance, and impressive technical support make it a worthy addition to the scroll saw marketplace.

Carole Rothman is the author of Creative Wooden Boxes from the Scroll Saw. She blogs at the URL scrollsawbowls.blogspot.com.



A spring-loaded arm provides easy access to the underside of projects like fretwork.



The author cut steep angles to test JET's tilting arm (rather than tilting table) design.

www.woodworkersjournal.com **MORE ON THE WEB**



For a video overview of the author using the JET JWSS-22 22" Scroll Saw, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.



Tool Preview

Festool Portable Circular Saw Duo

by Woodworker's Journal Staff

Corded and cordless versions bring track saw technology to the circular saw.



The Festool HK 55 is pictured at the right on a 16½" Crosscut Rail with the cordless version, the HKC 55, on a 9⅜" Rail to the left.

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MORE ON THE WEB



For a video demonstrating cuts with the Festool HK 55 Portable Circular Saw, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

Festool has introduced a groundbreaking new circular saw, and it's going to change things for house framers and carpenters who love compound sliding miter saws because of their accuracy. However, bowing, crooking and the sheer inertia of lumber longer than about 8' makes accurate placement in a miter saw easier said than done. With Festool's new HK 55 Portable Circular Saw and its cordless cousin, the HKC 55, however, circular saws bring the miter saw to the work.

Straight out of the Systainer®, the HK 55 looks and operates much like any sidewinder circular saw — because that is what it is. It tilts from 0° to

50°, and the blade may be extended out of the shoe to a maximum depth of 2½" at 0°. It also has a nifty lever to retract the pendulum guard (which has a built-in riving knife to prevent kickbacks) for plunge cuts. It may also be used on a standard Festool Track Saw Rail for cutting sheet goods.

Festool also has new Crosscutting Guide Rails designed specifically for the new sidewinder saws: the FSK 250 (9⅞"), 420 (16½") and 670 (26⅜"). A slot in the saw shoe traps the T-rail in the center of these tracks, locking the track and saw together. The saw slides easily on Teflon™ strips, while a bungee cord buried in the track returns the saw to the back end. Two buttons under the track align it with the edge of the board being

crosscut. The left button has click-stop notches, facilitating placement ahead of or behind the right button. Degree calibrations on the notches provide accurate crosscuts from 0° to 45° to the left and from 0° to 60° to the right, while the blade tilts from 0° to 50° for easy and accurate compound cuts.

Like Festool's Guide Rails, the Crosscutting Rails have a replaceable splinter guard strip that the user trims with the running saw during the first use. Thereafter, the left side of the blade cuts exactly where the edge of the splinter guard is placed.

To crosscut, simply set the saw to slightly more than the thickness of the material:



Move the left button under the track to one of the notches calibrated to specific degrees, for exact angle cuts.

there are two sight lines on the adjuster: one for the bare saw and one under it for use on the Crosscutting or Track Saw Rails. Place the splinter guard on the layout line, start the saw, and push it forward, across the work. Ease up the forward pressure, and the saw follows your hand back



A conveniently placed thumb lever retracts the pendulum guard for plunge cuts or when using on a Track Saw Rail.

Simply pinch the green lever to set blade depth. Twin cursors allow setting the blade depth for use with or without the Crosscut Rail. In this case, blade depth would be an actual 1/2" but it would be 1/8" when mounted on the Crosscut Rail or Track Saw Rail.



To crosscut, just register the two bumpers against the edge of the board with the splinter guard on your layout line. Hold down the rail with your left hand on the left-hand ridge.

to your end of the track. Hold the track down by placing pressure on the raised edge along the left side of the rail. This puts the user in a very safe place, with hands well clear of the blade.

It seems Festool has given up on making America metric: the saw has very welcome calibrations in inches. Another improvement is a bayonet connection to the dust extractor hose. This requires a new connect fitting for the end of your dust extractor hose. The fitting (Festool part 487071) has the bayonet thread on the outside and the old ridges on the inside, allowing compatibility with all Festool

products, past and present.

While you can use a dust extractor on the HKC 55 saw as well as the HK 55, the cordless HKC 55 doesn't allow the extractor to be tool-triggered. (How about some Bluetooth there, Festool?) Festool's solution for the cordless version, and for situations where a dust extractor is impractical with the corded version, is a nifty dust bag, the SB-TSC (sold separately). Attaching to the dust port with the same new bayonet mount, it catches an amazing amount of the dust and debris: probably 95% or better. Once empty, the internal wire frame collapses flat for storage with the saw in its Systainer case.

Both the corded HK 55 and cordless HKC 55 come with 18-tooth blades. A wide variety of special purpose blades are also available.

A final general improvement Festool has made is a redesign of the shape of the



The new dust extractor fitting (Festool part number 487071) fits the new bayonet connection as well as all existing ports on Festool products, like their track saw or random orbital sander.

battery charger for the HKC 55. It has a groove to wrap the cord around the base, allowing it to fit nicely in the allotted compartment in the Systainer. This beats wadding the cord up and stuffing it into a nook while pushing the Systainer lid closed with your knee.

The HK and HKC 55 are groundbreaking tools that will be widely adopted by framers, for sure, and probably trim carpenters as well. The HK 55 cuts with more than enough accuracy for carpentry, probably better than the Kapex sliding compound miter saw for long, heavy material. That being said, for fussy trim work in fine woods that will be varnished, you're probably still better off wheeling in the Kapex. The HK 55 would cut T1-11 siding just fine on a track saw track, but the TS 55 Track Saw would be more appropriate for sizing fine sheet goods for cabinetwork.

As for the HKC 55 cordless version, with the two extra batteries supplied, you can do an extraordinary amount of cutting before needing a recharge. It also stops much faster than the corded version. Pricing for the saws was not available at press time.



The new charger for the cordless HKC 55 is designed with a groove to wrap and store the cord.



Both the corded HK 55 and cordless HKC 55 come with fairly aggressive 18-tooth blades. The add-on 32-tooth blade at right gives better finish but takes more power, while the 12-tooth rip blade at left will cut with the grain much more efficiently.



Anti-skid strips on the bottom of the crosscut rail promote stable placement. Point the saw slightly uphill while you register the buttons, then tip it down so the anti-skid material holds, to make accurate placement easier.

Tool Preview

Triton Workcentre

by Chris Marshall

One portable workstation can triple as a workbench, router table or table saw, depending on the module options you choose to buy.

Triton has sold iterations of this TWX7 Workcentre abroad for many years, but for the first time it's now available in North America. If you like the idea of modular tools, or

your shop is really short on floor space, Triton's multipurpose approach might be the integrated system for you.

The Workcentre is an aluminum-framed table with folding steel legs. Its tabletop has a large opening into which clamping, table saw and router table modules fit. The

Two 3/8" x 3/4" T tracks straddle the table opening, and they're flanked by filler pieces with a dimpled black laminate coating to help ensure a slippery smooth, easy-to-clean work surface.

A pair of small leg casters make the 75 lb. Workcentre easier to move around when erected. There's also a built-in power switch with a large "knee-able" stop button for controlling the table saw, a router or other power tools.

One module comes standard: the Clamping Table. It's made of MDF and perforated with 40 standard 3/4"-dia. bench dog holes. Those will help secure workpieces during sanding, routing or even scraping and planing, using your bench dogs and clamps (none are included).

Of course, the Clamping Table could serve as an assembly or finishing station, too. And it, along with the other power tool modules, simply pivot down into the table opening and lock into place with two recessed, sliding finger locks. The TWX7 Workcentre base unit and Clamping Table Module sell for \$429.99 through Rockler.

Add a Router Table

The optional Router Table Module (model RT001; \$219.99) doesn't come with

Clamping Table Module

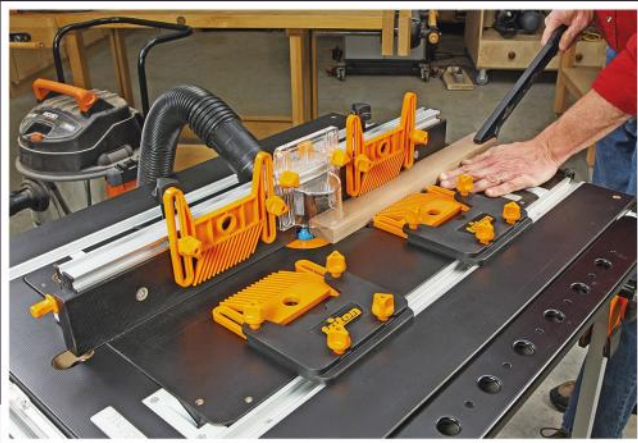


Three interchangeable modules pivot down into the table opening. Then, a pair of recessed sliding finger locks (inset) ready them for use without tools.

Workcentre measures 29" wide x 40 3/4" long, and it stands 35 1/2" tall. When you loosen four large knobs to hinge the legs closed, the unit folds down to just over 1 ft. tall for flat storage on its base.



Router Table Module



a router, but it fits all three of Triton's plunge router options. Their bases simply twist and lock into keyhole slots in the router table. The

port, so I had to tape it on.

You get four adjustable featherboards that mount to the Workcentre's T slots and router table fence, plus three insert rings to suit various bit diameters. A metal guide pin will help start cuts that can't follow the fence. All in all, here's a full-featured routing solution.



An onboard power switch plugs into both a wall outlet and power tools, to give you easy on/off control from the Workcentre's infeed end.

table also accepts the routers' crank handle for above-the-table height adjustment.

Triton outfits this module with a 3 $\frac{3}{4}$ "-tall aluminum fence that has two adjustable fence facings with the same dimpled laminate coating as the table. I had to do some shimming to get my fence squared up and the facings coplanar, but with a bit of tweaking, it worked well for general routing jobs. There's also a pair of "cruciform" plastic rods that slip behind the left fence facing so you can offset it for jointing tasks. A clear bit guard and rear dust port help to channel debris into your shop vac. Oddly, my 2 $\frac{1}{2}$ "-dia. hose nozzle was a tad too big for the

How About a Table Saw?

The Contractor Table Saw Module (model CS001; \$379.99) will remind you of today's jobsite saws, in most regards. It comes with a standard 10" carbide blade and 15-amp universal motor, which proved powerful for cutting both solid wood and sheet goods. A tool-less blade guard system installs easily, and a 2 $\frac{1}{2}$ " shrouded dust port beneath was quite effective for channeling dust away.

The saw cuts 3 $\frac{3}{4}$ "-thick stock at 90° or to 2 $\frac{1}{4}$ " when tilted to 45°. One crank both raises and tilts the blade. An included full-size miter gauge with elongated fence will guide crosscuts and miters.

This saw's dual-rail rip fence is a departure from typical styles. It must be adjust-

Contractor Table Saw Module



ed parallel to the blade for every rip cut with two ruler scales on the fence rails, then locked down with four plastic cam clamps. That takes a bit of getting used to. Still, the configuration enables the saw to rip material up to 30 $\frac{1}{2}$ " wide — impressive compared to its jobsite saw competition.

Other optional Workcentre accessories include pull-out side and outfeed table supports (\$39.99; \$29.99) extended in the right photo, above. Or consider a Rugged Transit Kit (\$39.99) that includes a 6" lugged wheel set and carry handle (shown installed, below), so you can roll the Workcentre wherever your project duties call.

MORE ON THE WEB

For a video overview of the Triton TWX7 Workcentre and modules, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

Chris Marshall is Woodworker's Journal's senior editor.



Techniques

Measurement and Layout Advice

By Sandor Nagyszalanczy

Measuring twice and cutting once is sound advice when it comes to taking measurements and marking parts. But there's a lot more you can do to make measuring and layout tasks easier and less frustrating.



measurements, about the only advice most of us receive is to “measure twice and cut once.” Yes, being doubly sure of all dimensions before cutting parts is important, especially when you’re about to cut up a \$150 sheet of plywood! But there are other lessons one can learn for handling everyday measurement and layout tasks that can help prevent mistakes and make these tasks easier and even more precise. While there’s enough to say on this subject to fill up an entire book, in this article, I’ll share with you some of my favorite measuring and layout tips and techniques — some of which I learned the hard way — that I’ve gained during my 45+ years of professional woodworking. Let’s begin with a very important step: making sure all your measuring tools agree with each other.

Calibrate Your Tools

One sure way to fail at taking precise measurements is by using tools with scales that don’t match. Believe it or not, there’s often an amazing amount of disparity in the scales on various rulers, tape measures, yardsticks, try squares, etc. So, before you start your next project, do this simple test: Lay all your scaled tools side by side and compare them. The first time I did this, I was shocked

MORE ON THE WEB

 For a video of the author demonstrating these measuring and layout techniques, please visit our website at woodworkersjournal.com and click on “More on the Web” under the Magazine tab.

Imagine what the world would be like if it lacked a system of standardized measurements: Every hinge, screw or nail sold at your local hardware store would be a bit different in size, and working with them would be a nightmare. Thank goodness that’s not the case. Regardless of whether you work with the metric system (meters, centimeters and millimeters) or the Imperial

system (feet and inches), we have a variety of measuring tools at our disposal — rules, tape measures, yardsticks, calipers, etc. to use throughout the building process. They help create scale drawings, lay out joinery and cut and machine parts to accurate dimensions — all steps necessary for the successful completion of any project.

But, despite the importance of achieving accurate

to see that the spacing of graduations on some of my rules — even some high quality ones — were subtly different! The solution was simple: I kept only the rules, tapes and squares with scales that matched perfectly.

When checking tape measures, make sure the tape's end hook is fully pulled out, for outside measures, and fully pushed in, for inside measures. Don't be too surprised if even your best tape measure won't take both inside and outside measurements accurately; most tape's end stops are notoriously prone to error. In my shop, I purposely calibrated a pair of tapes, one for only taking outside measurements, the other for inside measurements; I did this by crimping the rivets that hold their end stops in place. I also labeled the tapes, so I don't mix them up. Having two tapes not only makes for more accurate measurements, it also does away with a classic mistake that most woodworkers have made: To circumvent any inaccuracy stemming from the sliding end stop, you measure by aligning the 1" mark with one end/edge of the workpiece, read the measurement, then add one inch to it, as seen in the middle photo on this page. Only thing is, it's all too easy to forget that

last step and end up with parts cut exactly one inch short!

Another step towards assuring measuring consistency in your workshop is to check and calibrate the scales all on your machines so that they match your rules and tapes. This includes rip fences on table saws, end stops on cutoff saws, thickness scales on planers, etc. Start by comparing one of your "vetted" tapes to the machine's scale, and make sure the graduations match along their entire length. Now set the cursor (on a rip fence) or position of the scale relative to the blade or cutterhead (on a cutoff saw fence or planer) so that when you set the machine for, say, a 5" cut, you get a part that measures exactly 5 inches long, wide or thick.

Accurate Length Measure and Marking

Checking the length of a part seems like a pretty straightforward process, but there are several possible stumbling blocks that can mess things up. First of all, if you're using a tape measure, make sure the tape's sliding end stop yields accurate measurements (see the calibration section) or get rid of it. A great alternative to a tape measure for outside measurement and layout work is



Think the graduations on the scales of your measuring tools all match perfectly? A comparison test will reveal that's not necessarily the case.



The "classic" method to avoid inaccuracy caused by a tape measure's sliding end stop is to measure by aligning the 1" mark with one edge of the workpiece, then add one inch to the resulting measurement.



A hook rule's hook precisely aligns zero with the end of the workpiece.

a hook rule, which is just like a regular rule with a hook at one end, as seen above. The only way a hook rule may yield an incorrect measurement is if the hooked end of the workpiece isn't square;

Techniques continued



The Kreg Multi-Mark's built-in rule makes it easy to set precisely for marking out joinery, rabbets, hardware mounts, etc.



Unless regularly sharpened fastidiously, wood pencils draw a line that gets thicker with each use. A mechanical pencil's line has a fixed width.

when in doubt, check the end with a try square first. Another handy measuring tool that's a cross between a hook rule and a traditional marking gauge is the Kreg Multi-Mark (item 37338 at rockler.com). Its built-in rule makes it very easy to set precisely.

Marking the surface of the work during layout is a pretty straightforward process. But when precision counts, it's important to use the best tools for the job. For best accuracy, don't use a regular taper-pointed wood

pencil. Unless you sharpen it religiously, the thickness of the pencil's line gets slightly fatter each time you use it. By switching to a mechanical pencil, which uses a cylindrical lead with a fixed diameter, every marked line has the same width. You can buy mechanical pencils that use lead as thin as .7 mm or .5 mm (that's half a millimeter ... about as thick as six pieces of paper). One downside is that mechanical pencil leads are typically of "HB" (medium) hardness, which makes a line that may not be



A knife line makes it easier to register the tip of a chisel (or tooth of a hand saw) to the marked line when you're ready to cut the part.

dark enough to see clearly on darker woods, such as walnut or rosewood.

When a project calls for really precise layout work, such as marking out joinery or mortises for mounting hardware, I put the pencils away and reach for my marking knife. I like marking with a knife for two reasons: First, instead of just creating a graphic line on the surface of the work, a knife actually incises the work surface with a very thin groove that shows up well on both light- and dark-colored woods (TIP: to see a knife mark better, shine a light at a low angle across the surface). Second, this physical cut actually makes it easier to register

the tip of a chisel or tooth of a hand saw to the marked line when you're ready to cut or machine the part. A marking knife is also terrific for marking recesses for mounting hardware: Clamp the hinge, strike plate, escutcheon, etc. to the work, then trace around it with the tip of the knife. To mark a dimension with dead-on precision using a rule, slide the knife lightly across the scale until it "clicks" into the desired graduation groove on your rule, then pivot the blade down to make your mark (see photo below). The only downside of marking with a knife is that if you make a mistake,

Continues on page 62 ...



Use a quality rule with machine-cut (not just photo-etched) graduations to make dead-on precise knife marks.

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Fast switch-out modules transform the Workcentre between modes from clamping table (supplied as standard with the Workcentre), to router table to table saw or project saw.



TWX7

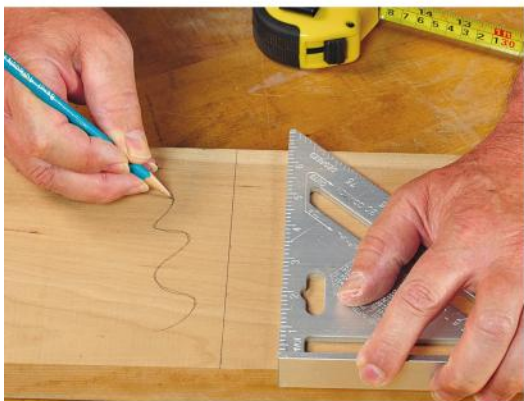
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Techniques continued



A squiggly mark helps you remember which side of your line is the “waste” (so you don’t cut on the wrong side of the line).

you can’t erase the mark. But, unless the cut mark ends up in a prominent spot on your final project, it’s unlikely anyone will ever see it.

Regardless of whether you use a pencil or knife for your marking tasks,

a very common mistake many of us make is to cut on the wrong side of a marked line and end up with a part that’s exactly one saw blade thickness too short or narrow. An easy way to prevent this problem is to simply make an arrow or squiggle to remind you which side of the

line is the “waste” side, as in the photo at left.

Transfer Measurements

Here’s a workshop measurement problem that’s all too common: You measure an opening on a cabinet carcass for a door, but by the time you get to the saw to cut the door’s stiles and rails, you’ve forgotten or (worse) remembered the dimensions incorrectly. Writing measurements down on a notepad is an obvious solution but often isn’t practical. Here are two workable solutions: 1. Use your smartphone to record the dimensions, then play the audio back when you’re ready to set the saw to

make your cuts. 2. Write the dimensions directly on the side of your tape measure. FastCap tape measures come with an erasable notepad surface you can write on with a pencil. (The tape measures and stick-on notepads are available at rockler.com.)

Another common measuring mistake can occur when transferring measurements from plans or drawings created in scales other than full size. To avoid errors, don’t use a regular ruler to measure your plans and then convert the dimensions; it’s just too easy to screw up (quick: If 1/4" equals 1", then 13 11/16" equals how much?). Instead, switch to an architect’s rule

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FastPads are round self-sticking notepads that mount on just about any regular tape measure.

and use the scale that matches the scale of your drawing. A typical architect's rule is triangular in cross-section, with six different commonly used scales: 1" = 1', 1/4" = 1', 3/8" = 1', etc. The correct scale will show part dimensions directly; no conversion necessary. To avoid accidentally using the wrong scale, mark the correct one with a piece of tape, as seen at right. Take special care when

reading/transferring measurements for ready-made windows and doors from a manufacturer's drawing or spec sheet. The standard for windows and doors is to show or

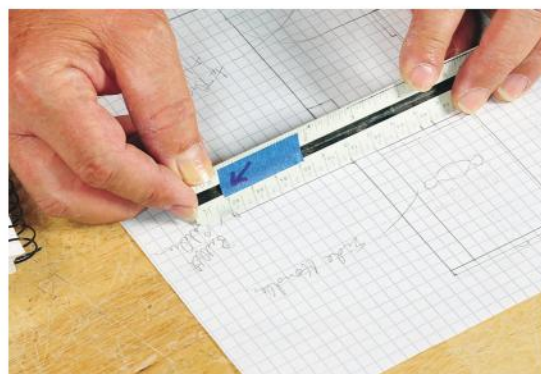
describe them in terms of feet and inches. For example, a 60"-tall by 18"-wide window would be "5-0" x "1-6". It's easy to accidentally interpret the 5-0 measurement as 50 inches. Further, a window of any certain specification may not be drawn to precise size on an architect's drawing or builder's plan. If you're building a project from plans published online or in a book or magazine article, make

sure to check all measurements carefully before cutting out expensive stock. Despite the best efforts of authors and editors (including me!), gremlins do sneak in at times and foul up the dimensions shown on plans and in cut lists.

When to Measure and When to Cut

When you've got a big project ahead of you, it's tempting to cut all parts to final size following the dimensions shown on your cut list. But it's better to plan your cutting

Continues on page 64 ...



Use a piece of tape to mark the scale on an architect's rule that matches the scale of your drawing.

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Techniques continued



Marking identical joinery across a blank allows you to gang-cut parts with the same dimension.



Take an inside measurement with two rules: the measurement equals one rule's full length plus the amount a second rule extends past it.

mortises for rails and stretchers) across the blank using a good square before ripping the individual legs to width.

Any time you have construction where one piece must fit accurately between two or more others —say, the bottom of a box or the bulkhead of a cabinet — it's good practice to first build or dry-assemble the box or cabinet, measure the exact size of the necessary parts, then cut

strategy out so that your workflow is efficient, and you don't end up with mis-cut parts. In terms of efficiency, any time you have a series of parts that are all the same in some dimension — slats for a louvered window shutter or stiles and rails for a cabinet frame, etc. — it's often possible to measure, mark and cut them in gang fashion. For example, say you need four chair legs. Start by cutting a wide blank to the final leg length, then mark out any identical joinery (in this case,

and fit them. This way, you can compensate if the parts need to be slightly smaller or larger than the original cut list called for.

Here's a useful technique for taking accurate inside measurements using two rules: Butt the zero end of each rule against an opposite side of the assembly, holding the pair together so that they overlap each other. The measurement equals the full length of one rule added to the amount that the second one extends past it. (See the middle photo at left.) You can also use rules and yardsticks this way to measure the inside diagonals of any rectangular carcass; if the diagonals are equal, the assembly is square.

Even when you measure and set your machines carefully, it seems that all too often parts can end up being just a few hairs too short or narrow. Here's a technique you can use to virtually guarantee a tight fit every time: The idea is to "sneak up" on the perfect fit by cutting the part just a little big at first, say just a scant $1/32$ " over the measured dimension. If, after trying the fit, the part is still a tad too large, here's how to trim it by just a hair at a time. (Please note that during the following procedure, it's imperative that you keep your hands well away from the saw blade, and NEVER start the saw with the workpiece in contact with the blade). To trim the length of a part, set it against the fence of your crosscut saw (compound miter, radial arm, etc.) and then swing the blade partway into its cutting position. Gently press the end of the workpiece

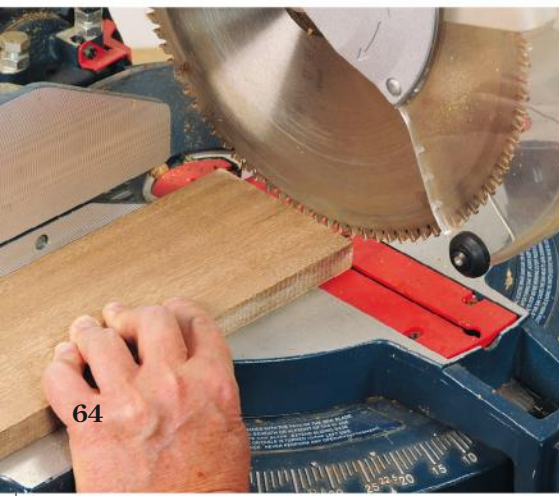
against the blade to deflect it slightly, taking care to keep your finger off the trigger switch. With the work tightly held in place, return the saw blade to its original position, then switch on the saw and take the cut. To reduce the width of a piece on the table saw, set the work against the rip fence and slide the fence in until the workpiece deflects the blade slightly (once again, do NOT switch the saw on at this point). Lock the fence, withdraw the workpiece, then make your cut. Now check the fit of the part and repeat the trimming process as necessary.

Dealing With Non-standard Size Materials

Wouldn't it be great if all "standard size" materials were really standard? Imagine 2x4s that are actually 2" thick by 4" wide. But real-world discrepancies, like $3/4$ " plywood measures only $45/64$ " thick, can make it a real pain to work with these materials. Here's one way to deal with this issue: Say you have a box with butted plywood sides that needs to be exactly 12" wide. Instead of using math to calculate the exact length needed for the box's top and bottom, take two scrap pieces of the plywood you're using and clamp them together. Now align your tape's 12" mark with the outer edge of one scrap. (See top left photo, next page.) The mark that aligns with the outer edge of the other plywood scrap equals the exact length you'll need to cut the box's top and bottom, $10\frac{15}{16}$ " in this case.

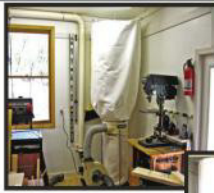
Another strategy for dealing with non-standard-

Continues on page 66 ...



Trim a workpiece a hair's breadth by deflecting it against the blade — with your saw OFF!

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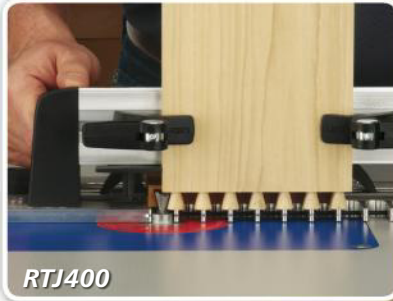
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Butternut	4/4	2C	2.50	1C	3.25	8/4	1C	3.75	4/4		\$100.00	8/4		\$129.00
Cedar	4/4	1C+Btr	2.00			8/4			4/4		\$ 87.00	8/4		NA
Cherry	4/4	1C	2.75	Select	4.90	8/4	.....	5.75	4/4	.....	\$126.00	8/4	.....	\$139.00
Cypress	4/4	.....	.....	Select	3.00	8/4	.....	4.00	4/4	.....	\$ 99.00	8/4	.....	\$109.00
Hickory-Pecan	4/4	1C	2.00	Select	3.00	8/4	Select	3.50	4/4	.....	\$110.00	8/4	.....	\$137.00
Mahogany (African)	4/4	.....	.....	Select	5.25	8/4	Select	5.55	4/4	.....	\$124.00	8/4	.....	\$127.00
Maple (Hard)	4/4	Select (N)	3.00	Select (W)	3.65	8/4	Select	4.50	4/4	.....	\$118.00	8/4	.....	\$126.00
Maple (Soft)	4/4	.....	.....	Select	2.60	8/4	Select	3.00	4/4	.....	\$ 97.00	8/4	.....	\$107.00
Oak	4/4	1C	2.10	Select	2.80	8/4	Select	3.95	4/4	.....	\$107.00	8/4	.....	\$129.00
Oak (White)	4/4	1C	2.20	Select	2.80	8/4	Select	4.95	4/4	.....	\$107.00	8/4	.....	\$135.00
Poplar	4/4	1C	1.30	Select	1.80	8/4	Select	2.00	4/4	.....	\$ 87.00	8/4	.....	\$ 91.00
Walnut	4/4	1C	3.25	Select	6.25	8/4	Select	7.00	4/4	.....	\$129.00	8/4	.....	\$149.00
White Pine (Soft)	4/4	FG	1.40	.....	.....	8/4	.....	1.80	4/4	.....	\$ 80.00	8/4	.....	\$ 86.00
Yellow Pine (Soft)	4/4	Clear	2.20	.....	.....	8/4	.....	2.60	4/4	.....	\$ 92.00	8/4	.....	\$ 99.00
Western Red Cedar	4/4	2C+Btr	2.50	.....	.....	8/4	2C+Btr	2.50	4/4	.....	\$101.00	8/4	.....	\$107.00

Above prices are for approximately 20 bd. ft. bundle of clear 1 Face (except for cedar and white pine or lumber listed as 1C+Btr. which have tight knots) 4" - 10" wide x 3' - 5' long. Lengths and widths are random. Add 15% to price of bundle if you specify particular lengths and widths. Lumber is surfaced two sides (13/16" on 1" stock - 1 3/4" on 2" stock) or rough. Some of the heavy woods are skinned to meet the 70 lb. limit even though rough lumber is specified. Prices include delivery prepaid in the Continental U.S. Sap wood in walnut and cherry is no defect. Please Specify Rough or Surfaced Stock. *Add \$5 if Rough. (Shipped in 2 bundles) Add \$5 if over 5' Long.

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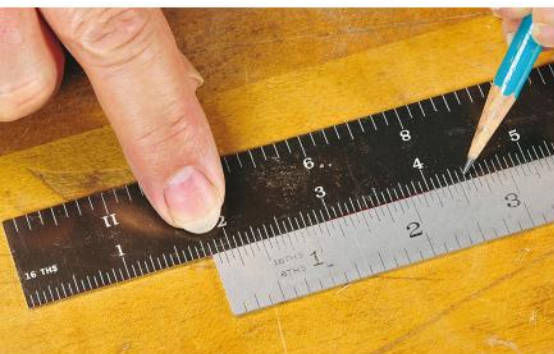
Thru

Dec. 2016

Techniques continued



Ganging parts and subtracting their thickness from the length of what you're building can yield lengths of adjacent parts.



Here, the author uses two rules side-by-side to add fractions $1\frac{13}{16}$ " and $2\frac{9}{16}$ ". The total measurement (read on the black rule) is $4\frac{7}{8}$ ".



To divide a workpiece into equal thirds, slant a rule so 0 is at one edge of the piece and 9" at the other, then mark the 3" and 6" points.

sized materials is to design and build your project so that the odd dimensions of such components don't come into play. For example, in the case of the box described in the previous paragraph, if the final width doesn't have to be exactly 12", just pretend that the plywood is actually $\frac{3}{4}$ " thick and cut the top and bottom $10\frac{1}{2}$ " long. The final box may end up being just $11\frac{29}{32}$ " wide, but no one will notice that it's $\frac{3}{32}$ " short.

Sidestep Math Calculations

If you're not crazy about dealing with numbers and fractions when you build, here are a couple of handy tricks. To add up two fractions in a hurry,

set two rules (let's call them A and B) with matching scales alongside each other.

The end of rule A is aligned with the mark on rule B that equals the first fractional number you wish to add. (In the example shown in the center photo at left, it's $1\frac{13}{16}$ ".) Now on rule A, find the second fractional number you wish to add ($2\frac{9}{16}$ "

in the photo). The number opposite it on rule B equals the sum of the two numbers.

Want to divide a part perfectly into equal segments without having to calculate measurements? It's easy using a regular ruler or tape measure arranged to slant



A story stick that identifies all crucial project measurements is especially great for setting table saw rip fences and fence stops on crosscut saws.

diagonally across the workpiece. Here's an example: To divide a workpiece into thirds, line up the rule or tape's zero mark on one side, angle it to read 9" on the other edge, then strike marks at 3" and 6" with a fine pencil point. For best accuracy, keep your marks as short as possible; otherwise, they'll be slanted lines that don't clearly show where the exact divisions fall. The key is to select a measurement that's long enough to reach across the workpiece, yet which divides easily into the number of even segments you desire. Another example: To divide a sheet of plywood widthwise into eight segments, line up the zero and 80" graduations and make a mark at 10" intervals across the sheet.

Trade Tapes and Rules for a Story Stick Instead

If the idea of doing less measuring appeals to you, consider trying the story stick method. A story stick is basically any straight stick or rod that has been marked with all the dimensions necessary for a particular project — dresser, vanity, birdhouse, etc. Start by transferring all part dimensions from your cut list to the stick, marking each line the proper distance from the same end of the stick. Be sure to use a good tape or rule, doublecheck all your measurements and

label each mark with the name and/or number of the part. Now you can retire your tapes and rules and use the story stick for all part measurement and layout tasks. When your project is done, you can keep the story stick and use it again, should you wish to build the same project again in the future.

Another option for doing away with measurements is to use the work itself for marking and/or layout. For example, if you've cut one part and need another of the same length, simply lay the cut part atop the stock, and use it to mark the length of the new part. When possible, you can even use the part to directly set a table saw's rip fence or stop on a cutoff saw fence: Set one edge or end of the part against the saw blade, slide the fence or stop into position and lock it in place. Slide the old part out of the way, and you're ready to cut new stock.

Even following the best practices, measuring mistakes can still creep in and spoil your woodworking fun. If that happens, it's best to take a break, laugh it off (if you can) and return to the shop when you're fresh.

Sandor Nagyszalanczy is a furniture designer/craftsman, writer/photographer and contributing editor to Woodworker's Journal. His books are at amazon.com.

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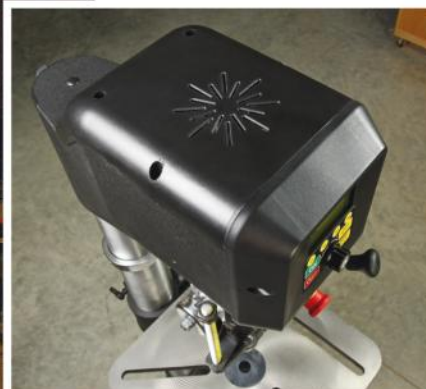


Technology And Woodworking

NOVA 18" Voyager DVR Drill Press

By Woodworker's Journal Staff

Computer-controlled DVR motor is poised to revolutionize woodworking drill presses.



Unlike typical drill presses, this one is truly smart, and its DVR "brain" brings many benefits. For instance, instead of a jolt of electricity at startup, which creates heat that shortens the life of a typical AC induction motor, DVR dials down the magnetic field so the motor starts quietly and cool, with no power surge or energy wasted. The solid steel rotor has no wire windings, brushes, permanent magnets or electrical connections to moving parts, so there's little that will develop heat during use or wear out over time.

Notice another big difference on top: the typical hinged case, pulley clusters and grimy rubber belts are gone — DVR makes a mechanical drive system obsolete. To change speeds infinitely between 50 and 5,500 rpm, just twist a dial and tell the computer the speed your job requires. It will set that rpm precisely and hold it there without fluctuating chuck speeds. DVR perpetually maximizes the motor's torque efficiency.

On a typical belt-driven drill press, you follow a chart to set the approximate speed range for the bit size and the material you're drilling into. But, it's a guesstimate at best. Maybe you're uncertain about what that speed should be. With Voyager, you don't

What would you change about a drill press to make it better? That's the question the folks at NOVA Teknatool took seriously when they developed the all-new Voyager 18" Drill Press, available through dealers this month.

While the machine has a 16½"-square cast-iron table that's easy to clamp to, a 5/8" chuck and 6" of quill travel for deep drilling, those are just side benefits. It's what's on top that's revolutionary: Voyager includes NOVA's 1.75hp DVR magnetic motor and LED screen CPU to control it — it's a proven and user-friendly drive system that's powered NOVA's DVR wood lathes for many years.

DVR stands for Digital Variable Reluctance — in effect, the computer constantly monitors the motor's spinning rotor and feeds it just the right amount of magnetic field to meet its needs for rotation speed and torque.





Full-range variable speed control is at your fingertips by twisting a dial — there are no dirty belts and pulley clusters to fiddle with. Voyager's CPU will maintain the exact speed you want.



Uncertain of the correct speed for a task? Just select the bit or cutter style, its diameter and the material type you're drilling into. The drill press will determine the optimal speed instantly.



Want to drill a hole that's exactly 4.388" deep, or any depth up to 6"? Tell the computer those parameters, and Voyager will beep to alert you when you reach it, then turn off automatically.

need a physics degree to figure it out. Just click through to the speed chart on the LED screen and choose the bit type and size you plan to use — the machine knows all the common options, from twist bits and brad points to Forstners, hole saws and fly cutters. Select a bit graphic, then its diameter and what you're drilling into. DVR will set the proper drilling speed.

Ever wished for a more precise depth stop system? Voyager has that covered, too. There's a threaded mechanical post/ruler stop if you prefer to set drilling depth the old way, but it's really unnecessary. Instead, you can toggle over to another screen on the display to let the computer set drilling depth. Then lower the bit until it touches the workpiece, zero it out on-screen, and tell the drill press how deeply you want to drill. As you pull the quill handle, Voyager will begin to beep to alert you that you're getting close. And

when it reaches the preset depth, plus or minus .05", the chuck stops. You can't under- or over-drill. Or, set Voyager to slow down and reverse direction at that point to clean out the debris.

The CPU provides many other unique features, too. You can tell the machine to start spinning when you pull the quill handle and stop when you retract the handle. Or, set Voyager for drilling pilot holes — the feature starts the chuck at a low speed to keep the bit from wandering, then ramps up when it senses full engagement with the material for an accurate, centered pilot hole. There's a tapping feature for cutting threads in metal, and another feature that enables you to save up to four of your favorite bit and speed combos for drilling tasks you commonly do.

Safety measures are built in here, as well. If the drill press should tip, or if a workpiece suddenly comes loose

while you're drilling it, the CPU will sense the torque change and stop drilling. You can even set a password to prevent unauthorized use.

A USB port makes Voyager's CPU programmable, and NOVA plans to provide software updates over time with more or improved features.



Clearly, this isn't grandpa's drill press! NOVA has made a machine for our times. And \$1,499.99 will put one in your shop. Learn more about DVR at dvrsmartmotor.com.

www.woodworkersjournal.com **MORE ON THE WEB**



For a quick video of Voyager's speed chart and depth stop functions, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

A spacious 16½" cast-iron table that tilts 45° left or right should suit most any woodworking drilling situation.

Weekend Projects

Mid-century Modern Nightstand

By Chris Marshall



While the 1950s are forever in our rear-view mirror, Mid-century Modern furniture is very much back in vogue.

And this little nightstand project can add a bit of retro flair to your bedroom, living room or home office — wherever you can use a couple of drawers and a place to set a book, alarm clock, a few mementos or a lamp. Its rounded corners, slender, tapered legs and sleek styling give a nod to Mid-century Modern's European design origins. I built this nightstand from black walnut and walnut veneer plywood with a dark brown dye finish, but you could use any wood species and stain color you prefer. My drawer boxes are made of maple, and the faces are just poplar with a spray-painted metallic finish (poplar takes paint beautifully). Of course, the drawer faces could be made of the primary project wood and stained instead, for an all-wood look. This nightstand will be a tall order to build in two days, but with some hustle, you'll have it fit for Ward Cleaver's den in about two weekends.

Tapering the Legs

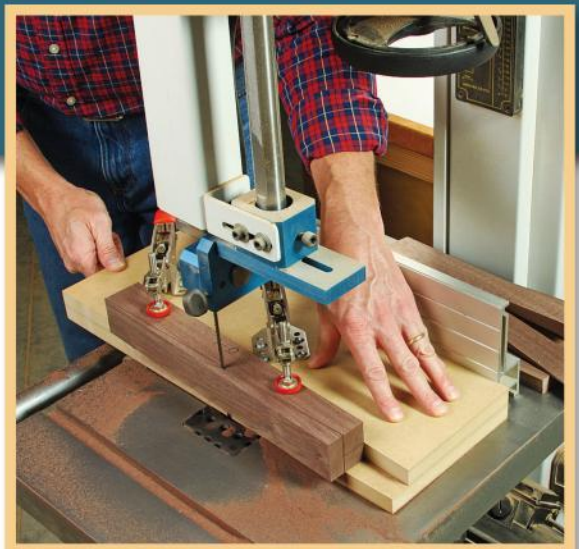
Let's get started by preparing four 1¾" x 1¾" leg blanks. Cut them to length, according to the *Material List* on page 72. Using a tapering jig at the band saw, rip two tapers from top to bottom to form the legs' inner faces and 1"-square feet.

You also need to miter-cut the tops and bottoms of the legs to form their splaying stance. I used a scrap V-groove jig to hold the untapered (back) edge of each leg securely and correctly while I made these two cuts on each leg. Tilt

your miter saw off of vertical to a 5.5° angle, and trim the top and bottom ends to this angle. Be careful that both cuts face the same direction. Then set the legs aside for now.

Adding Wood Edging

Rip and crosscut a top, bottom and two side panels for the carcass from veneered plywood. Use



Two taper cuts form the inner angled faces of each leg. These rip cuts are simple to make at the band saw with a shop-made jig.

Edging Plywood



ONLINE
VIDEO!



Covering plywood edges with solid wood is a common method to hide the core material. If you do this carefully, you almost can't tell it's still plywood. On this project, the edging also provides extra wood for milling deep chamfers around the nightstand's front face. A short tongue on the edging fits into a centered groove in the plywood to join the parts. By forming the edging on wider blanks (left photo), the narrow strips are safer to make at the router table and table saw. Then just glue and clamp them in place. Simple!



A scrap V-groove jig can hold the legs securely while you trim their top and bottom ends to 5.5° at the miter saw. The author used CA glue to fix a stop block in the jig's groove. It ensured matching leg lengths.

a sharp blade to cut the plywood's face veneer cleanly, because on this project, those cut edges will show. To help minimize splintering as much as possible, trim the plywood "best face" up.

Now, mill a centered, 1/4" x 1/4" groove along the edges of the carcass panels that will face front and back. I used a 1/4"-wide slot-cutting router bit. This will give the solid wood edging, to come next, a locking connection to the plywood as well as a glue bond (see the "Edging Plywood" technique, above).

Prepare enough blanks of 3/4"-thick, 2 1/2"-wide solid wood to form pairs of

edging strips for all four carcass panels. Try to choose your edging stock from wood with a grain pattern and color that's consistent with the plywood veneer so it will blend in nicely. Mill the 1/4" x 1/4" tongues along both edges of each piece at the table saw buried partially in a sacrificial fence. Or, go with the same slot

cutter you used to make the grooves.

It's a good idea to refine your tongue-cutting setup on a test piece first so you can dial in a perfect fit in the panel grooves—you want a good,

The tenon holes are easiest to drill through the bottom panel and into the legs when the parts are first assembled with carpet tape and brads (inset). Add a scrap block under the leg to brace it when drilling.

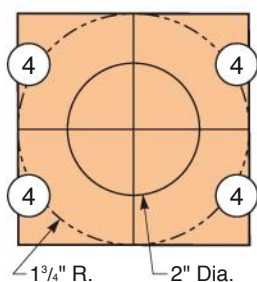
snug connection. Once the tongues are milled, rip the edging strips to width, cut them to length and glue them to their panels. Plane, scrape or sand the edging flush to the plywood faces, if needed.

The nightstand's legs will attach to the carcass with dowel tenons, so we'll drill holes for those next. Carefully lay out the leg positions on the carcass bottom panel: they're located at the corners

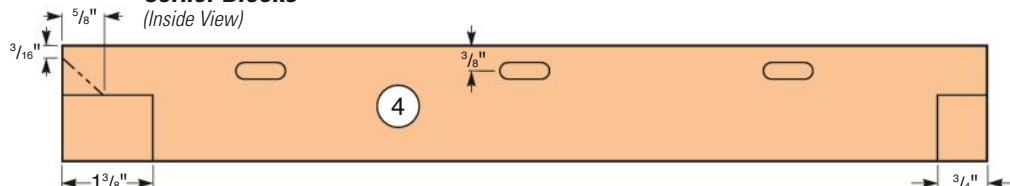


Weekend Projects continued

Corner Blocks
(End View)



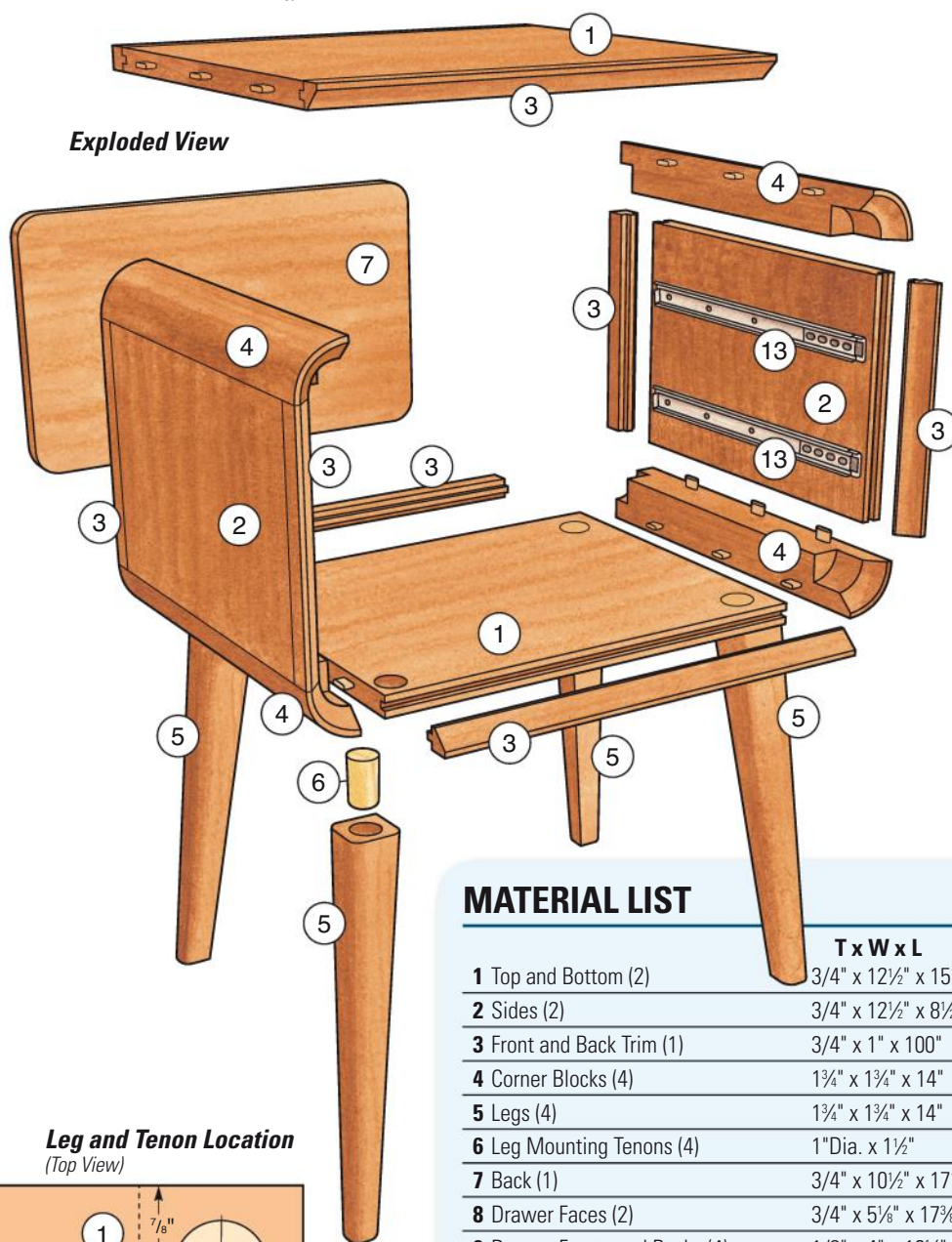
Corner Blocks
(Inside View)



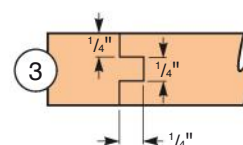
The four corner blocks have a single front boring drilled into their end grain. This recess allows the drawer faces to be housed within their radii.

A 3/4"-deep boring into the rear end of the four corner blocks accommodates the back panel.

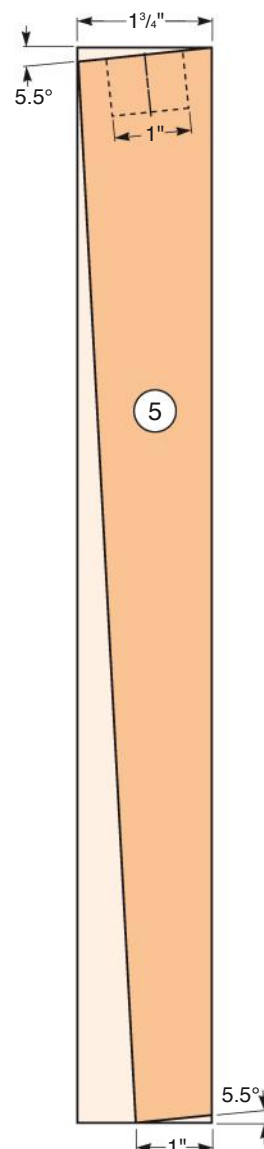
Exploded View



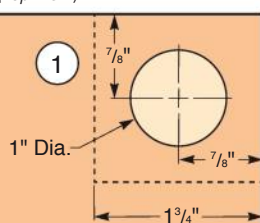
Trim Detail
(Front View)



Leg
(Side View)



Leg and Tenon Location
(Top View)

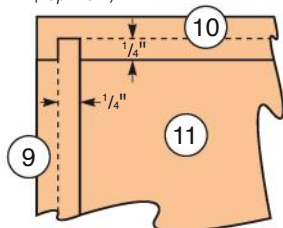


MATERIAL LIST

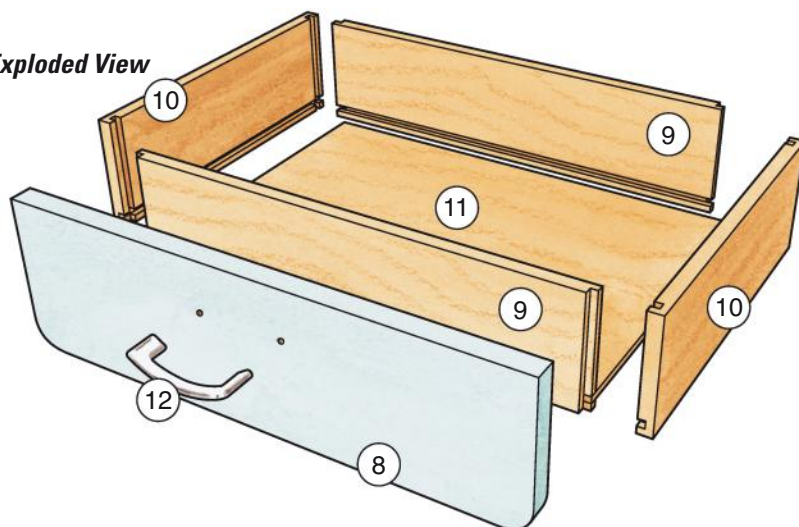
	T x W x L
1 Top and Bottom (2)	3/4" x 12 1/2" x 15 1/2"
2 Sides (2)	3/4" x 12 1/2" x 8 1/2"
3 Front and Back Trim (1)	3/4" x 1" x 100"
4 Corner Blocks (4)	1 3/4" x 1 3/4" x 14"
5 Legs (4)	1 3/4" x 1 3/4" x 14"
6 Leg Mounting Tenons (4)	1" Dia. x 1 1/2"
7 Back (1)	3/4" x 10 1/2" x 17 1/2"
8 Drawer Faces (2)	3/4" x 5 1/8" x 17 3/8"
9 Drawer Fronts and Backs (4)	1/2" x 4" x 16 1/8"
10 Drawer Sides (4)	1/2" x 4" x 11 3/4"
11 Drawer Bottoms (2)	1/4" x 11 1/4" x 16 1/8"
12 Drawer Pulls (2)	3/16" long, Chrome
13 Drawer Slides (2 pr.)	12" Full-extension

VIDEO For videos on edging plywood and using Rockler's Corner Radius Templates, please visit woodworkersjournal.com and click on "More on the Web" under the Magazine tab.

Drawer Joinery Detail (Top View)



Exploded View



Drilling deep holes into the end grain of the corner block bundle is tough going. Work up in bit sizes if you have a modest drill press like this.

of the plywood, flush with the edging. Center and mark a 1"-diameter tenon hole within each of the four leg areas.

While the tenon holes run straight through the bottom panel, the legs are splayed, so these holes penetrate the legs at an angle. And, you'll want the legs to align with the bottom panel holes precisely. Easy solution? Stick the legs to the bottom panel with carpet tape to position them, then secure them for drilling, temporarily, with two 1½" brads.

You're now ready to drill those dowel holes, but first study how I set this up in the bottom right photo, page 71. With the bottom panel resting on your drill

press table, drill the tenon holes through the bottom panel and 1" into the legs. Brace underneath the leg with a scrap block when drilling its dowel hole. Once the four tenon holes are done, pry the legs free from the panel, pull out the brads and peel off the tape.

Making Corner Blocks

Shaping the nightstand's large, rounded outside corners would be impossible on plywood, so we'll use wood blocking here instead. Prepare four 1¾"-square blanks for the corner blocks, and crosscut them to match the width of the carcass panels.

You'll notice that the inside corners of the carcass are also rounded, so let's start with those curves first. We'll form them in the corner blocks simultaneously with a 2"-dia. Forstner bit. Start by taping the four corner blocks together in a bundle. Arrange the blanks so their best-looking ends are together. These will face front on the nightstand.

Unlock and tilt your drill press table to vertical, and clamp the bundle securely to



The author used Festool's Domino system to create loose-tenon joints for assembling the nightstand's carcass panels and corner blocking. Biscuits or dowel joints are suitable options, too.

the table so it's centered exactly under the chuck. If you've got a powerful drill press, bore a 1¾"-deep hole down into the centerpoint of the bundle with the 2" Forstner bit. Then flip the bundle over and reclamp. Bore a ¾"-deep hole into this end for the carcass's back panel. To manage drilling into this tough end grain with my modest-sized drill press, however, I had to use a range of Forstner bit sizes, working up to a 2" diameter, to keep the drill press from stalling.



Trace the large outer corner radii of the carcass with a template or a compass, then shape them with a spokeshave. It's easy and enjoyable hand tool work.



Weekend Projects continued



A chamfer around the carcass face reduces its perimeter edge to a thin, clean detail. Several deepening passes help to avoid bit burn marks.

It was time-consuming but doable. Just be patient with the slow drilling process.

With these inner curves completed, you're ready to assemble the carcass. I used a Festool Domino machine to reinforce the corner joints with three floating tenons, but biscuits or dowels would also work fine. Dry-assemble the carcass pieces to check their fit, and mark them to keep the part order clear.

Now sand the inside faces of the carcass parts up to 180-grit, and apply stain and finish. Then go ahead and glue and clamp the carcass together.

When the clamps come off, round the outside corners of the carcass to 1 $\frac{3}{4}$ "-radii. I did this by first trimming off the sharp corners at the table saw with the blade tipped to 45°, then removed the rest of the waste with a spokeshave. It's a great way to gain some experience with a classic hand tool, and the process is remarkably quick and enjoyable if your spokeshave is good and sharp. Sand these curves smooth and so they meet the carcass panels flush.

The inside front edge of the carcass receives a deep chamfer all around. You can mill it with a large piloted chamfering bit at the router table. Feed the carcass clockwise against the bit, removing material in several deepening passes. Make the final chamfer 5/8" deep and so about 3/16" of material is left around the outer edge of the carcass face.

Final-sand and finish the outside surfaces of the carcass to complete it.

Detailing the Legs, Adding Tenons

Grab the four legs again so you can soften their long, sharp edges. I eased the outer three edges to 3/8" radii with a router and roundover bit, then switched to a 1/8"-radius bit for the fourth edge that will face inside the legset. Sand the legs smooth, then stain and finish them.

Glue 2" lengths of 1"-dia. dowel into the four holes in the legs. When the glue dries, test-fit the legs on the carcass without glue, and mark the top protruding ends of the tenons for a flush fit. Remove the legs so you can trim the tenons to final length. Do this back at your miter saw with the blade tipped again to 5.5° off of vertical. Face the outside edge of the legs down in the V-groove jig as you did before. This will create the proper cutting angle to trim the tenons neatly to your layout lines.

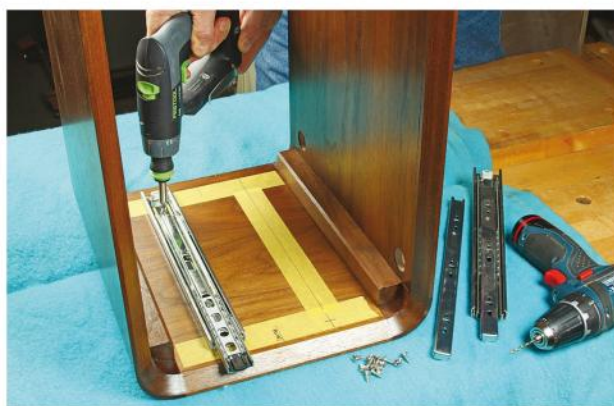
Building the Drawers

Before you build the two drawers, go ahead and install the drawer slides inside the carcass so you'll know if you need to adjust the *Material List* dimensions of the drawer parts to suit your nightstand's actual inside dimensions. Better to be safe than sorry! Locate the centerlines of the slides 2 $\frac{1}{8}$ " up or down from the corner blocks.

Now prepare enough 1/2" stock for the drawer fronts, backs and sides, then rip and crosscut these parts to final size. I assembled the drawer boxes with simple 1/4" x 1/4" rabbit-and-dado corner joints. They're easy to mill at the table saw with a 1/4"-wide dado set.



Install the legs on the carcass "dry." Then mark the protruding tenons for a flush fit with the bottom panel. Trim off this excess at the miter saw with your V-groove jig.



Install the drawer slides in the carcass before building the drawers. This way, you can measure between the slides to check for accurate drawer part sizing.

Routing Corners with a Jig



Plow 1/4"-deep dados across the inside faces of the drawer sides, front and back, 1/4" from the part ends. Then cut rabbets on the ends of the drawer fronts and backs to fit the drawer-side dados. Dial in your saw settings on test pieces first, so your final joints will be spot on.

Next, leave the dado blade in your table saw to cut 1/4"-wide, 1/4"-deep drawer bottom grooves around the inside faces of the drawer parts. Dry-fit the drawer boxes together, and measure the span between those grooves before cutting your two drawer bottoms to size.

You're ready to sand the drawer parts up to 180-grit, and assemble them with glue and clamps. When the clamps come off, give the drawers a couple coats of clear finish to protect them. After it dries thoroughly, install the metal slide components on the drawer boxes so you can hang them in the nightstand.



Rockler's new Corner Radius Templates (item 57510) can help to both draw the curved corners of the drawer faces and rout them to final shape. These ABS-plastic templates, with four different radii per template, register with the corners of a workpiece blank automatically, thanks to pins and tabs that protrude down through the clip-on blue handle. For these drawer faces, you'd use the 1" radius template corner. Trace the template curves, then trim off most of the waste with a band saw or jigsaw. Bring the curves to final shape by guiding a top-bearing flush-trim bit in your router table along the template edge (see inset photo).

Finishing Up

The drawer faces are the only parts left to make. Measure the inside opening of the carcass carefully, then cut two drawer face blanks to width and length. Mark 1" radii on their outside corners. (For a nifty new template system that makes this easy, see the *sidebar*, above.) Trim off most of the waste, and rout or sand the curves to shape.

I sanded my drawer faces super smooth and eased their edges with a tiny chamfer, then spray-painted them with six light coats of metallic lacquer. Let them

dry thoroughly.

Mount the drawer faces on the drawer boxes temporarily with carpet tape to help position them. Now locate and drill pilot holes through the drawer faces and boxes for the screws that secure the metal pulls. Install that hardware.



Carpet tape can help you position and hold the faces in place on the drawer boxes, so you can drill pilot holes accurately for the pull screws.

One more piece of round-cornered plywood will form a back for your nightstand. And once that's fixed in its opening, glue and install the legs to wrap up this snazzy little retro project.



These light-duty drawers have rabbet-and-dado corner joints made at the table saw with a dado set (see inset).



Nightstand Hard-to-Find Hardware

Rockler Corner Radius Routing Templates (1) #57510 \$49.99 ea.
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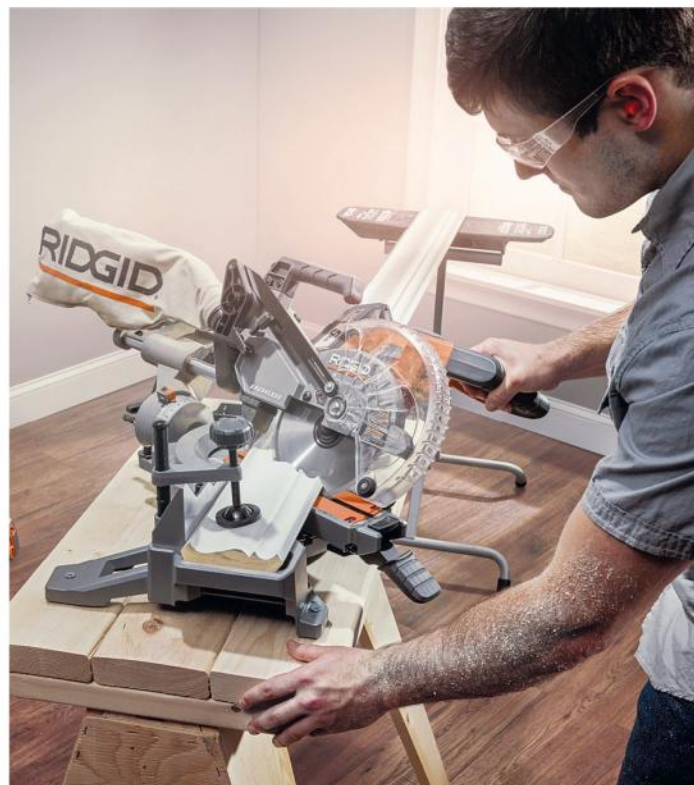
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RIDGID's new 18V 7¼" Dual Bevel Sliding Miter Saw, Model R48607K, launched in August, is a cordless miter saw that runs on a brushless motor for longer runtime and motor life. According to RIDGID, it delivers over two times more cuts per charge than a competitor's professional grade miter saw kit. The R48607K has left and right bevels with positive stops, allowing the saw head to move instead of the material. Positive bevel stops are at 0°, 33.9°, 45° and 48°; positive miter detents are at 0°, 15°, 22.5°, 31.6° and 45°. Built-in dust collection ports work with common 1¼" wet/dry vacuum adapters. The R48607K weighs 24 pounds and is priced at \$399.

Milwaukee's new M18 FUEL™ 10" Dual Bevel Sliding Compound Miter Saw is a cordless 18-volt unit with a 6" vertical and 2x12 horizontal cut capacity. Equipped with the new M18™ REDLITHIUM™ HIGH DEMAND™ 9.0 Battery pack, the 4,000 rpm saw can make more than 400 cuts in a 3x2" base material on one charge. Instead of a laser indicator for a cut line,



RIDGID 18V 7¼" Dual Bevel Sliding Miter Saw, Model R48607K

the saw uses LED illumination to create a shadow line directly beneath the blade's edge, providing an accurate cutting guide reference that is easy to see in various lighting conditions. A chop stop feature allows you to toggle a lever and push the saw's carriage back to lock the sliding miter saw as a non-slider. Adjustments to bevels and detents at common angles are also accomplished with a paddle on top of the tool. A detent override allows you to lock the saw at uncommon angles. Carry handles are a feature of the 45-pound tool (47 pounds with battery pack); the rails slide into and out of the body of the saw for portability. Pricing for the tool is \$549 bare; \$699 with a 9.0 amp-hour battery.

DeWALT's new FLEX-VOLT™ batteries are the first batteries to automatically change voltage when the user changes tools. The two new batteries include a 6.0 amp-hour battery (DCB606), available now, and a 9.0 battery (DCB609), available early next year. Put two batteries of the same amp-hour together, and they will power the tools from DeWALT's new



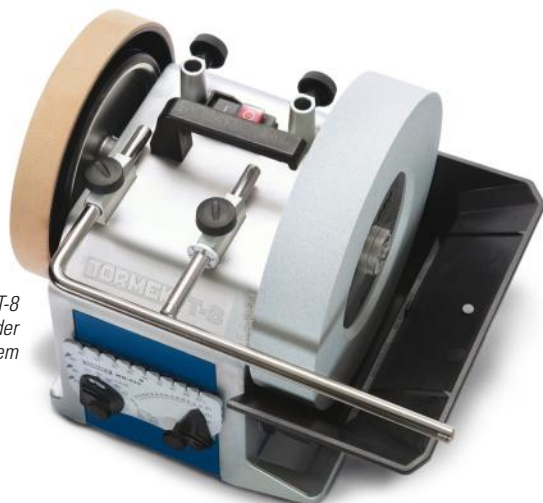
DeWALT FLEXVOLT batteries



Milwaukee M18 FUEL 10" Dual Bevel Sliding Compound Miter Saw



Tormek T-8
Wet Grinder
Sharpening System



Rockler Pipe Clamp Jaw Extenders

120V MAX* line-up; individually, each of the batteries is also capable of powering tools in a 60V MAX* DeWALT tool — and they're backwards compatible with DeWALT's 20V MAX* tools, where the FLEXVOLT battery provides more than three times the battery power versus an 18-volt DeWALT NiCad. The patent-pending technology is also backwards compatible with the 20V MAX* chargers. Some new tools in the 60V MAX* FLEXVOLT line include a circular saw, reciprocating saw and table saw; in the 120V MAX* FLEXVOLT line, there will be both a fixed head and a sliding head compound miter saw. DeWALT says the new batteries will provide both additional power and runtime to users' tools. Each of the FLEXVOLT batteries (without charger) will be priced at about \$149.

The **Bernzomatic TS3500 Comfort Grip Torch Head** has uses beyond equipment repair and grill lighting, such as providing heat for steam

Bernzomatic TS3500
Comfort Grip Torch Head



bending, or adding a patina to finishes. The Torch Head fits onto a 14 oz. propane cylinder and has a two-finger ergonomic grip for comfort and control. An intuitive automatic ignition switch keeps your hands away from the flame, which is regulated to provide consistent output at any angle, including upside-down. The flame is also pressure-regulated for consistent performance, no matter the weather. The TS3500, available in September, is priced at \$34.99 and, like other Bernzomatic products, is manufactured in the U.S., in Wisconsin.

Tormek's new *T-8 Wet Grinder Sharpening System* has upgraded its mounting system for the machine's universal tool support, modified the plastic water trough and added an updated SE-77 Square Edge Jig. The mounting system's sleeves are incorporated into the T-8's full casting to remove unwanted play while improving control when using the support with Tormek's various jigs. A screw lift allows easier fitting of the water trough, and a magnetic scraper provides more efficient cleaning. A movable slide and new adjustment screws on the SE-77 Square Edge Jig add

versatility by allowing you to perfect slightly out-of-square blades or create cambered cutting edges on your tools. The T-8 has a constant-speed motor that spins Tormek's 10" x 2" grindstone and 8 3/4" x 1 1/4" genuine leather honing wheel at 90 rpm, even under full load. Price on the T-8 Wet Grinder Sharpening System is \$699.99.

Rockler has introduced two new accessories that expand the versatility of the Sure-Foot Plus® 3/4" Pipe Clamp. The *Rockler Pipe Clamp Jaw Extenders* fit over and bolt to the faces of Sure-Foot and Sure-Foot clamps to provide a full 4 5/8" of throat depth, giving them the reach of an F-style clamp. Mounting holes in the Jaw Extenders align with those in the Sure-Foot clamps. The *Pipe Clamp Mounting Brackets* attach to 2x stock, anchoring a standard 3/4" pipe clamp. Each bracket swings open to accept a 3/4" pipe in a reinforced nylon ring clamp fitted with a rubber gasket. The Pipe Clamp Jaw Extenders (item 58516) are priced



Rockler Pipe Clamp Mounting Brackets



Continues on page 78 ...

What's In Store continued



Norton ProSand
5" Multi-Air
Sanding Disc

at \$19.99 per set of two, and the Pipe Clamp Mounting Brackets (item 54725) are priced at \$34.99 per set.



With the **Norton ProSand 5" Multi-Air Sanding Disc**, hundreds of holes are laser-cut into the disc in spiral patterns. This allows for maximum dust extraction regardless of the hole pattern of your sander: it's compatible with any 5" hook-and-loop random orbital sander. The premium ceramic abrasive cuts quickly and lasts a long time, while a No-Fil coating resists clogging and loading. A fiber-reinforced latex/paper backing resists tears. The discs are available in grits ranging from 60 to 320 and priced at \$14.99 for a 10-pack.

WORX 2.5-amp Oscillating Multi-tool



The new **WORX® 2.5-amp Oscillating Multi-tool** features industry-first Universal Fit™, which enables this tool to accept other brands of multi-tool accessories without requiring a special adapter. Weighing 3.2 lbs., the corded Oscillating Multi-tool has a variable speed dial, for speeds ranging from 11,000 to 20,000 oscillations per minute, with an oscillating

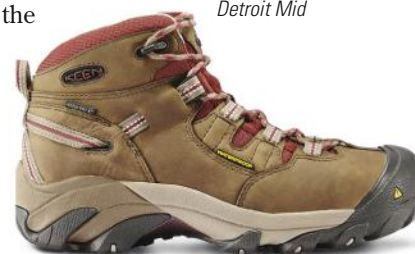
angle of 3.2 degrees. The tool's built-in dust extraction can be connected to a 1½" or 2" (with adapter) vacuum hose. The oscillating tool comes as a kit with a 1⅜" standard wood end-cut blade, sanding pad, three sanding sheets, two-piece dust extraction adapter and Allen key. The **WORX 2.5A Oscillating Multi-Tool (WX665L)** is priced at \$59.99.



KEEN Utility Tacoma
XT CSA



KEEN Utility
Detroit Mid



KEEN® Utility's new work boot lines this fall include the Tacoma Series of boots. The *Tacoma XT CSA* is a heavy-duty, non-metallic safety boot that features asymmetrical composite toes, metal-free eyelets and a lightweight, puncture-resistant midsole plate to reduce the possibility of injury caused by sharp objects that can penetrate the bottom of a boot. The *Tacoma XT* is made from leather that resists the damaging effects of oleic acid, urea, sodium chloride and ammonium hydride. The non-marking rubber outsole is oil- and slip-resistant. The *Tacoma XT CSA* comes in men's sizes 7-15 (half sizes through 12) in D and EE widths; a pair sells for \$240. Keen's collection also

includes women's safety footwear, built on a last specific for women. Among these options are the hiking-boot-inspired *Detroit Mid* work boot, with a **KEEN.DRY™** waterproof membrane and hydrophobic/hydrophilic lining to repel moisture and maintain breathability. A **Cleansport NXT™** liner delivers odor control through natural microbes, while asymmetrical steel toes offer contoured toe protection. The *Detroit Mid* is available in women's sizes 5 to 11 (half sizes through size 10), in medium and wide widths. Price per pair is \$155.

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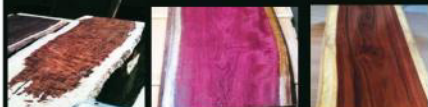


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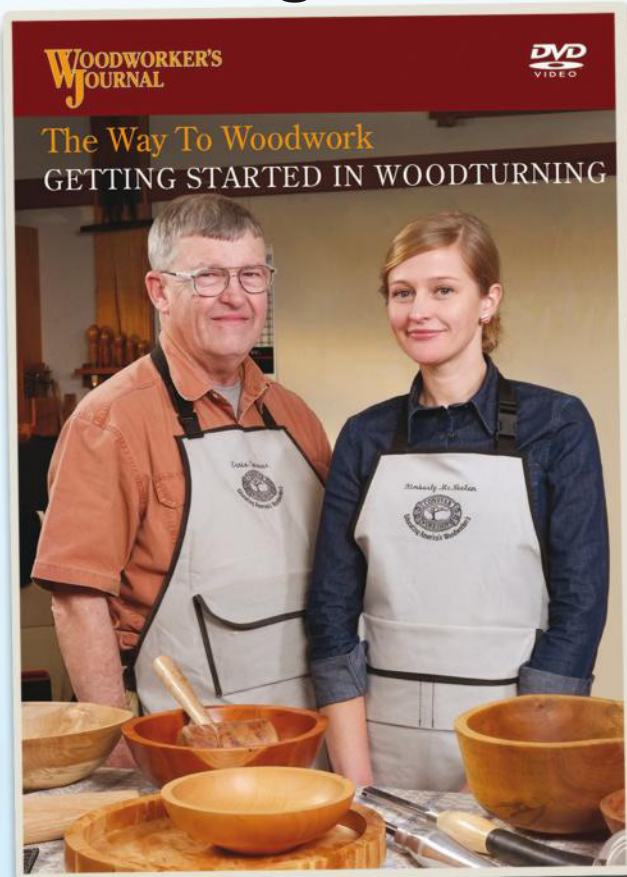
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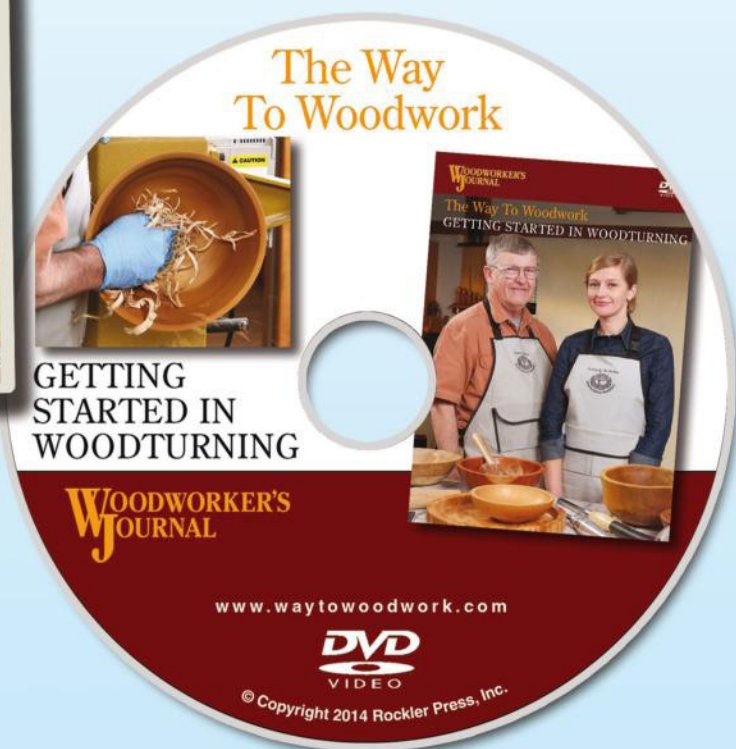
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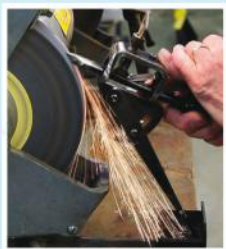


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Finishing Thoughts

Masking Off — Color Contrast the Easy Way

By Michael Dresdner

*Building the chessboard in this issue's "Portable Board Game Storage Box"?
Finishing a piece with contrasting colors? This article's got you covered.*



Michael Dresdner

is a nationally known finishing expert. He shares his expertise on the DVD *The Way to Woodwork: Step-by-Step to a Perfect Finish*, available through the store at woodworkersjournal.com.

Instead of gluing up contrasting blocks of wood or veneer to create a chessboard, you can do it with just dye, stain or paint, and masking tape. Applying masking tape isn't challenging, but there are a few tips that might just make the job easier and, more importantly, neater. Let me share what I think are the best tapes, tools and techniques.

Before You Tape

It's often wiser to dye, stain or seal the wood before you mask. For instance, you might start with a dye or stain for the lighter colored squares. Flood dye over the entire surface and wipe it all off immediately. When it's dry, seal it with a coat of dewaxed shellac to prevent bleeding. Once that's dry, mask every other block, then

color the open squares with a darker pigment stain or contrasting paint color.

For paint over paint, apply the lighter paint color over the entire surface. Once it's dry, mask and apply the darker paint over the first. On fresh paint, use delicate surface or low-tack masking tape.

Dye will creep under any sort of tape, since it goes through the wood itself. To get a crisp edge with dye, you must seal the area underneath the masking tape first. It means taping twice, but it's worth it. Tape the area that will be dyed, then seal the adjoining areas with dewaxed shellac. After it is dry, reverse the taped and untaped areas before applying water-soluble dye.

Working with gold or silver leaf? Start by creating a filled-pore, high gloss finish over the entire surface in the color of the non-leaf blocks. Mask, then apply gilder's



Using stain? Daub instead of scrubbing or wiping, if possible. Here, the author is using a dark pigment stain. Note that the borders are masked.



Miniature paint rollers actually work better than brushes on masked surfaces, since they apply paint more evenly and don't scrape across the tape dam.



To stop dye from bleeding under tape, first seal the area that will be taped with dewaxed shellac. Here, the author has used green high-tack lacquer tape.



Let it dry, then reverse; put edge seal tape (such as this FrogTape) over the shellacked border and dye the unsealed area.

varnish, also called gold leaf size. When it is dry enough to squeak, apply the gold or silver leaf and rub it with a clean, dry cloth before removing the masked squares.

Choose Your Tape Wisely

Not all tapes are equal in all applications. For lacquer, shellac, or oil-based materials, I prefer Scotch™ green lacquer tape, more common

in auto parts stores than home stores. For water-based, you'll get clean edges with Scotch Edge-Lock™ tapes (blue) or FrogTape® (green). These are designed to stop water from seeping under the tape, and they do actually work quite well. In a pinch, regular painter's tape will work.

For paint-over-paint masking, use delicate surface

or low-tack tape, which is less likely to lift the recently applied paint. Because it has lower tack or grab, make sure to smooth and press down the edges carefully after affixing it. When masking over paint, give the base color at least 24 hours to dry before masking, even when using low-tack tape.

Continues on page 84 ...

Contact us
with your finishing questions by writing to Woodworker's Journal, 4365 Willow Drive, Medina, MN 55340, or by emailing us at: finishing@woodworkersjournal.com. Please include your address, phone number and email address (if you have one) with your thoughts or questions.



Because many look so similar once unwrapped, write the type of tape clearly on the inside of the roll.

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Finishing Thoughts continued

The Full Coverage Method

Sometimes using more tape and a sharp razor can actually save you time. The three photos below show how that works. Cover the whole surface by pressing down each tape edge securely using a brayer (a small hand roller that applies firm, uniform pressure). Then, with a sharp, single-edge razor blade and a straightedge, cut the tape to create the shapes you desire (64 blocks for a chessboard). When you're ready to remove the tape, don't just pull upward to do so: start at a corner or edge and then pull the tape back over itself at an angle away from the painted edge.



You'll notice I have not mentioned the traditional beige masking tape. My advice is to avoid it completely, as it yields sloppier lines and does not peel off either cleanly or easily.

Apply the tape without wrinkles, then press the edges down with a brayer or squeegee. For a crisper line, let the tape sit in place overnight before you paint or stain.

Waste Tape, Save Time

What I'm about to describe may seem odd, but there's method in my madness. For something like a chessboard, I'll use wide rolls of tape and cover the entire surface rather than creating 64 blocks with many small pieces of tape. About the tape edges carefully, leaving no spaces whatsoever, but avoid overlapping.

Even at best, the tape edge will form a dam where paint or stain can well up and form a ridge. We want to keep that to a minimum, and thicker overlapped points make it worse, in addition to creating small spaces where



To create a "faux miter," lay a piece of 80-grit sandpaper at 45° on the corner, grit side down. Start with the bristles on the paper and drag the brush away from it, through the stain.

finish can creep under the intersection.

Now that you have an unending sea of tape, use a straightedge and sharp razor blades to cut your chess block squares, then peel off every other one. I buy boxes of 100 single-edge razor blades at the home store for just a few dollars, and switch to a new, sharp one frequently. Don't worry if you cut through into the wood as well, since it will barely show, and it may even make the chessboard look more like cut blocks or veneer. After all, that's what we are trying to mimic.

Small Dams, No Puddles

Try to brush your paint or stain away from the masked edge and towards the center. Dragging the brush over the edge of the tape will form a puddle of excess paint at the edge, which dries slower, chips more readily and leaves an unpleasant ridge of paint.

Miniature paint rollers actually work better than brushes on masked surfaces, since they apply paint more evenly and don't scrape across the tape dam. Using stain? Daub instead of scrubbing or wiping, if possible.

Removing the Tape

Don't just pull upward to remove tape. Start at a corner or edge and pull the tape back over itself at an angle away from the painted edge. This will give you a cleaner line with less paint lifting.

To level the blocks, build up several coats of non-amber clear finish, sand without going through to your color layer, and repeat. For water-based paint and stains, use water-based clear finish, which is already colorless.

Don't Forget the Border

These same techniques work to create a mitered border around the chessboard. You can even add a stringer of contrasting color just inside the border. My favorite technique for glazed mitered borders is to apply gel stain atop a sealed surface, then add grain texture by dragging a dry brush through it.

Lay a piece of 80-grit sandpaper at 45° on the corner, grit side down. The coarse grit won't smear the glaze. Start with the bristles on the paper and drag the brush away from it, through the stain. Move the sandpaper to the grained side to create the adjoining miter edge.



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Limit 1 coupon per customer per day. Save 20% on any 1 item purchased. *Cannot be used with other discount, coupon or any of the following items or brands: Inside Track club membership, Extended Service Plan, gift card, open box item, 3 day Pickling Lot Sale item, automotive lifts, compressors, floor jacks, saw mills, storage cabinets, chests or carts, trailers, tractors, lawnmowers, Admiral, Redland, CoverPro, Daytona, Dakota, Earthquake, Franklin, Grant's, Hot, Super, Lynx, Madox, Portland, Predator, Sisk, Sta. Smeralda, Union, Vanguard, Viking, Wotvold or other purchases. Warehouse transferable. Original coupon must be presented. Valid through 12/31/16.

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FREE

WITH ANY PURCHASE

1" x 25 FT. TAPE MEASURE
PITTSBURGH

SAVE \$4.97 VALUE



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SCISSOR SUPER COUPON

2.5 HP 21 GALLON 125 PSI VERTICAL AIR COMPRESSOR



SAVE \$837
\$159.99
comp at \$497

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SCISSOR SUPER COUPON

12" RATCHET BAR CLAMP/SPEAKER



SAVE 85%
\$2.99
comp at \$20.76

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3-IN-1 ELECTRIC BLOWER VACUUM MULCHER
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SAVE 35%
\$44.99
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1/4" TRIM ROUTER
drillmaster



SAVE \$79
\$19.99
comp at \$99

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2500 LB. ELECTRIC WINCH WITH WIRELESS REMOTE CONTROL
PORTLAND



SAVE \$100
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comp at \$100

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SCISSOR SUPER COUPON

1060 lb. capacity 14,600 cu. in. of storage



SAVE \$623
\$329.99
comp at \$952.99

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WOW SUPER COUPON
TORQUE WRENCHES
PITTSBURGH



SAVE \$179.99
\$29.99
comp at \$29.99

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3-IN-1 PORTABLE POWER PACK WITH JUMP STARTER
CENTECH



SAVE 20%
\$47.99
comp at \$59.99

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SCISSOR SUPER COUPON

17" SLIDING COMPOUND DOUBLE-BEVEL MITER SAW



SAVE \$259
\$139.99
comp at \$399

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29 PIECE TITANIUM HIGH SPEED STEEL DRILL BIT SET
PITTSBURGH



SAVE \$59.97
\$14.99
comp at \$59.97

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2 HP INDUSTRIAL 5 MICRON DUST COLLECTOR
CENTECH



SAVE \$200
\$179.99
comp at \$379.99

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SCISSOR SUPER COUPON

77" x 50" MOVING BLANKET



SAVE 66%
\$5.99
comp at \$17.97

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1650 PSI PRESSURE WASHER
PACIFIC HYDROSTOK



SAVE \$70
\$149.99
comp at \$179.99

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SCISSOR SUPER COUPON

1/4" TRIM ROUTER



SAVE \$79
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2500 LB. ELECTRIC WINCH WITH WIRELESS REMOTE CONTROL
PORTLAND



SAVE \$100
\$159.99
comp at \$100

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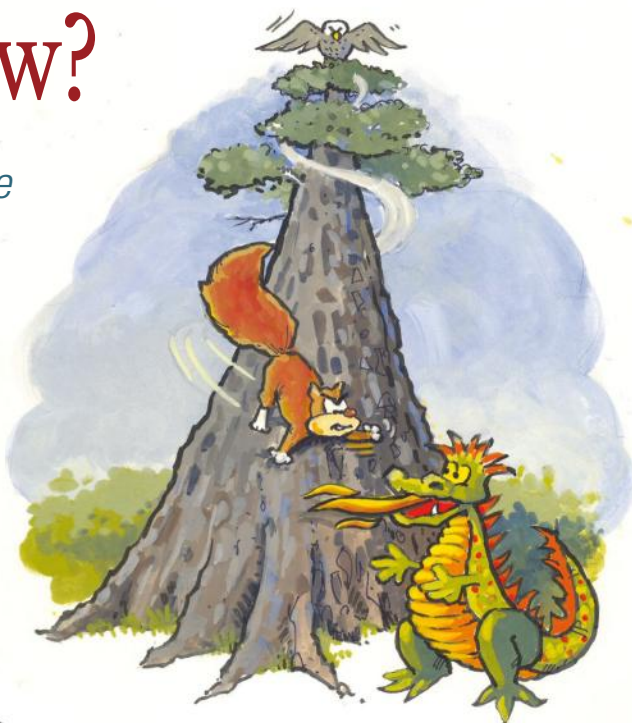
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HEY Did You Know?

Woodworking trivia: myths and more

In Norse mythology, a squirrel named **Ratatosk** runs up and down the **World Tree**, Yggdrasil, carrying insults traded between the eagle at the top of the tree and the dragon at the bottom.



What Does It All Mean?

A quick guide to terms from the world of woodworking.

Tongue-and-groove: A variation on a mortise-and-tenon joint, formed by mating a groove cut along the length of a board's edge with a tenon formed along the mating piece

Proud: Protruding slightly above the wood's surface

Queen Anne: English furniture design based on the Baroque style developed during the reign of England's Queen Anne, 1702-1714



What wood plane is not a "woodworking plane"? A **spill plane**. Its design purpose is to make "spills" used as matches before the common people could afford to buy them.



Photo courtesy of Lee Valley Tools



Digital image courtesy of MichalKnit/Bigstock.com

In Cherapunjee (or "Cherrapunji"), India, often called the "rainiest place in the world," residents have long created **bridges by using sliced betel nut tree trunks** to train the higher, secondary root systems of the *Ficus elastica* (rubber tree) to grow across rivers.

Submit your own trivia ...

Send in a curious fact about your favorite topic and ours: **woodworking**. If it is selected for use, you will win an **awesome prize!**

Submit your Trivia to Woodworker's Journal, Dept. Trivia, 4365 Willow Drive, Medina, MN 55340. Or send us an email: trivia@woodworkersjournal.com

Your Trivia Test:

QWhat species of tree is Yggdrasil, the World Tree of Norse mythology, commonly believed to be?

Answer
Most think that Yggdrasil is an ash tree.



Marvin "Butch" Ostman of Hudson, Wisconsin, will receive a Senco FinishPro 23SXP 23-ga. Headless Pinner, 1 Gallon Finish & Trim Air Compressor (model PC1010N) and pack of 23-ga. Pins (item A101009) for having his contribution selected for the Trivia page.

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