

OUR TOP **10** TRIM ROUTER TECHNIQUES (page 60)



WOODWORKER'S JOURNAL

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(page 50)

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INSIDE:

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Box**

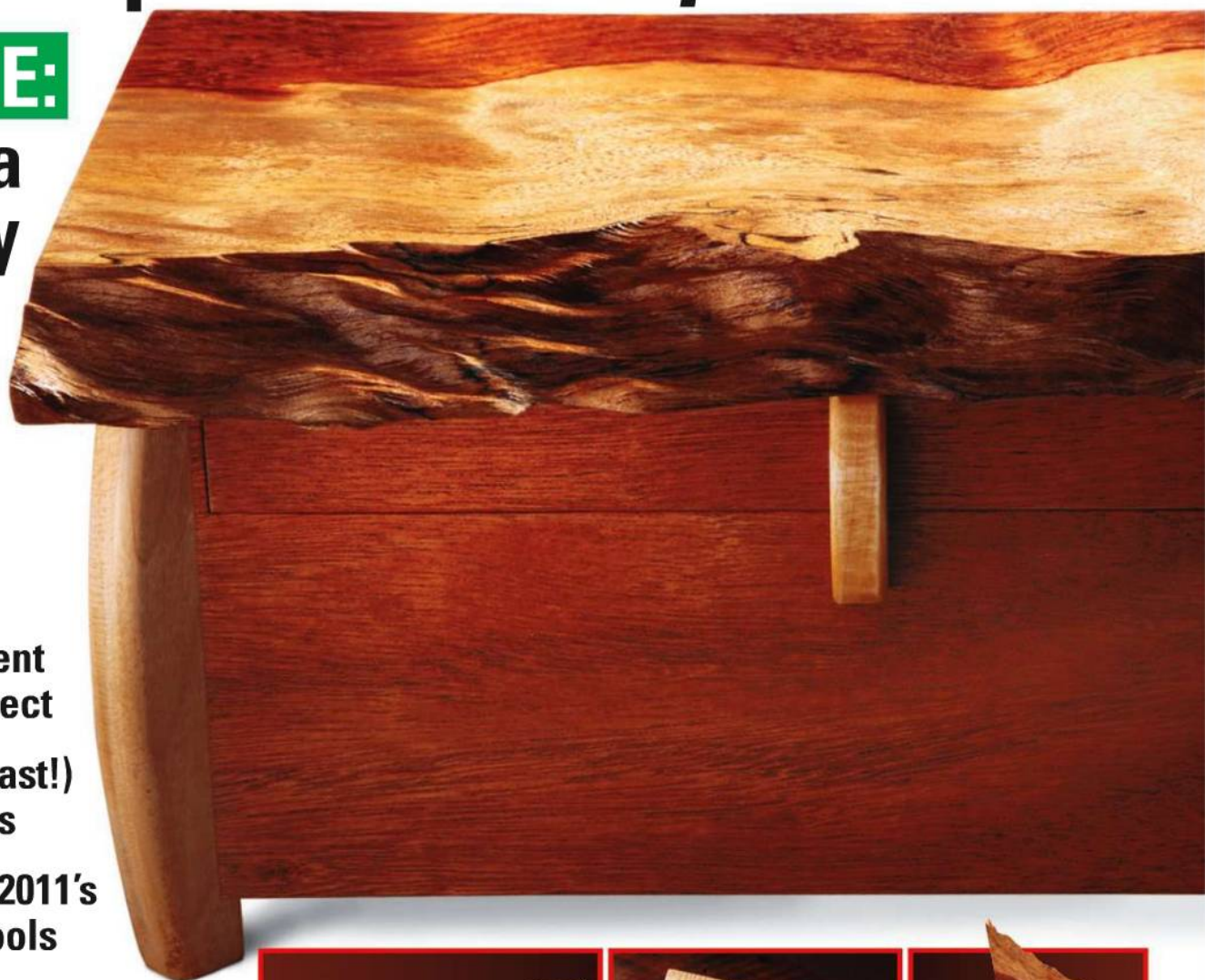
(page 38)

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Woodworker's Journal

Contents

December 2010

Volume 34, Number 6



Page 30

30 Entertainment Center

By Kerry Pierce

The classic Arts & Crafts style is modernized to meet the needs of video gamers and couch potatoes.

38 Waney-edged Box **GIFT!**

By Brad Becker

An unusual piece of wood became the spark for a lovely little project.

42 Airplane Toy **GIFT!**

By Rob Johnstone

Baby barnstormers will be delighted with this wooden toy.

46 12-Piece Puzzle **GIFT!**

By Chris Marshall

Turn a favorite photo or a page from a children's book into a cherished gift.

Departments



Page 26



Page 50

6 Editor's Note and Letters

Who do you build for?

14 Questions & Answers

Is melamine dangerous?

16 Stumpers

A frightening new stumper ...

18 Tricks of the Trade

Your workshop A B Cs.

20 Shop Talk

An Ivy League woodworker.

26 Woodturning **GIFT!**

A kitchen helper from your lathe.

50 Today's Shop

We pick 10 must-have router bits.

60 Shop Test

Trim routers; sometimes less is more.

68 Mid-size Router Round-up

Do you need a router? We can help.

72 What's In Store

Our editors survey 2011's new tools.

80 Finishing Thoughts

Tips for last-minute gift builders.

82 Skill Builder

Five steps to chopping a mortise.



Page 42



Page 38



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Letters

Readers Look for Clarity ... or Clarification

THE GIFT OF GIVING

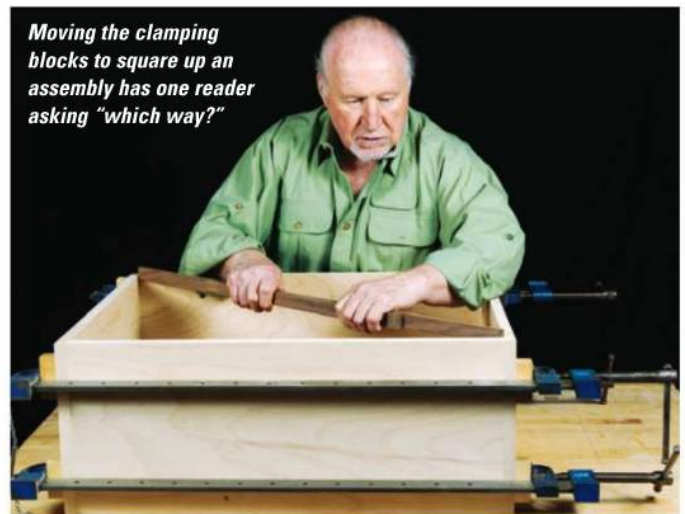
Perhaps I am wrong, but I am guessing that most of you are like me



in one important way — a good portion of your woodworking is done for the purpose of giving it away. There is something soulfully satisfying about building a project with the thought of handing it over to someone special. Sometimes

I spend a good deal of time coming up with just the right gift for someone and, on other occasions, an idea just springs into my head as if by magic. Usually I conceive and design a project with a specific person in mind, but just recently I offered a couple of my small turned bowls to a charity auction — which brought that same contented feeling. So what about you? Is gift giving a significant part of your woodworking routine? Drop me a line and let me know.

— Rob Johnstone



Moving the clamping blocks to square up an assembly has one reader asking “which way?”

“U1588.” I checked their website, and the product is apparently still available. Unfortunately, they don’t seem available for an online purchase. Further research should reveal a retailer or dealer for the product. The UPC on the back of the package is 2887401588.

I don’t know when I purchased the bits nor from where; however, they may be 30 to 40 or more years old — sorry, A.J., I don’t mean to date us — but the bits have proven well worth the investment. In fact, the back of the package has a “Satisfaction Guaranteed” statement that, “If you are not completely satisfied with any Black & Decker screwdriving accessory, it will be replaced free of charge.” I don’t know if the new products carry the same guarantee. However, unless I lose or carelessly break mine, I believe the countersinks will outlast me!

Frank Markham
Grand Junction, Colorado

A.J. Hamler Responds: I’ll be darned; looks like those bits are still around.

Moving Clamping Blocks

In the August 2010 issue, [in the article] “Squaring Up Like An Old Master,” Mr. [Ian] Kirby says to move the clamping blocks to make the diagonals equal. Could you please explain which way you move the clamping blocks, and how that changes whether or not the case is square?

Thank you.

Joel Sandrik
Brooklyn, Michigan

W.J. Responds: If, when measured corner to corner, the carcass is not square, the idea is to move the clamping blocks side to side and then reclamp ... but which direction is a bit hard to describe. After you do it a few times, it will get easier to guess which way to shift them. But even after many years, I still guess incorrectly some times. So here is the most important thing to know: if you move the blocks and the carcass is farther out of square, you simply have to move them in the opposite direction. That’s really the bottom line.

— Rob Johnstone



Old-style Countersink Bits Not Sunk

In response to A. J. Hamler’s note in your Letters to the Editor department (August 2010): I, too, have a set of the countersink bits A. J. refers to in his photo. And, at the risk of being classified with the TV character Monk, I still store mine in the original package. There should have been five bits in the set initially. Fortunately, the packaging lists the Black & Decker product identification,

Readers continue to be fascinated with the old-school countersinks that A.J. Hamler likes so well.

SketchUp Add-Ons

I read with interest the article by Jeff Jacobson in the August issue on Google SketchUp ["3D Design, For Free"]. I use SketchUp for all my woodworking projects. I have used CAD programs of all kinds over the years, and none compare to SketchUp.

Oddly, though, he says "there is no way to make a material list of the parts." A search on the web shows that there is a vast array of woodworking-oriented plug-ins available for SketchUp, most free. Included are some very fine material list plug-ins. Others available are direct one-step insertion of boards, dadoing, making mortise and



Woodworking with your family is simply the best, according to our reader.

tenons, drilling, etc. SketchUp has a very simple method of creating extremely complex macros or plug-ins. Most users of SketchUp tap this vast array of tools to make SketchUp do whatever they want it to do.

Joel Houtman
Nevada City, California

Special Bonds

Just a quick note to let you know how much I enjoyed this [Shop Talk] section in the August 2010 issue, specifically the "Heirloom Cradle" [article]. Woodworking is one of those hobbies that creates a special bond between those that share it. I've recently begun working together with my dad, and the time together along with our accomplishments are very meaningful. I hope to see more articles similar to this.

Mike Tuxen
Elgin, Minnesota

Letters continues on page 8 ...

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Too Tiny?

I'm a long-time subscriber to *Woodworker's Journal* and always find something useful in every issue. In the August 2010 issue, I particularly liked Brad Becker's piece on the lawn game, Kubb ["Kubb: the Perfect Lawn Game"]. I plan to make one for myself. One thing, though: one of his measurements is $1\frac{13}{32}$ ". What? For a game that was probably, as you say, played with firewood by Vikings? Who in woodworking has eyes to distinguish $1/32$ ", let alone $1/16$ ", unless it's in joinery? I can't even see them on my steel rule!

R.L. Matson
Falconer, New York

While constructing the jig for cutting the bevels on the casting pins and the Kubbs, I decided to build the jig with the 1" and $1\frac{1}{16}$ " dimension on the right side of the jig and attach the other on the left side of the jig to cut the smaller dimension for the casting pins, thus eliminating the need for the $13/32$ " spacer as described in the write-up for the project. Now I cut the wide bevels and then flip the jig end for end and cut

the narrow ones. So far it is working well, and hopefully it will continue, as I have 10 sets to build for my great-grandkids for Christmas!

Lee Roy Van Lew
Platte City, Missouri

Still Learning Lessons

While my wife was in the doctor's office, I sat in the waiting room re-reading past issues of *Woodworker's Journal*. In your December 2008 edition, you wrote on "Life Lessons from the Shop." My life lesson, which I keep forgetting, is: "Always put a paper towel or rag over the lid as you use a mallet to seal the can of paint." I was building six small 8" sailboats with masts and booms for use by the teaching staff for the junior sailors at our yacht club last week when I put a lid on a can of red paint and sealed it with a mallet, without a rag, and splattered paint on a walnut lid that I had made for a jewelry box for my wife. I got the paint off quickly, but not before the paint had seeped into the wood.

I put the lid through a sander and got the stain out,

Letters continues on page 10 ...

DECEMBER 2010

Volume 34, Number 6

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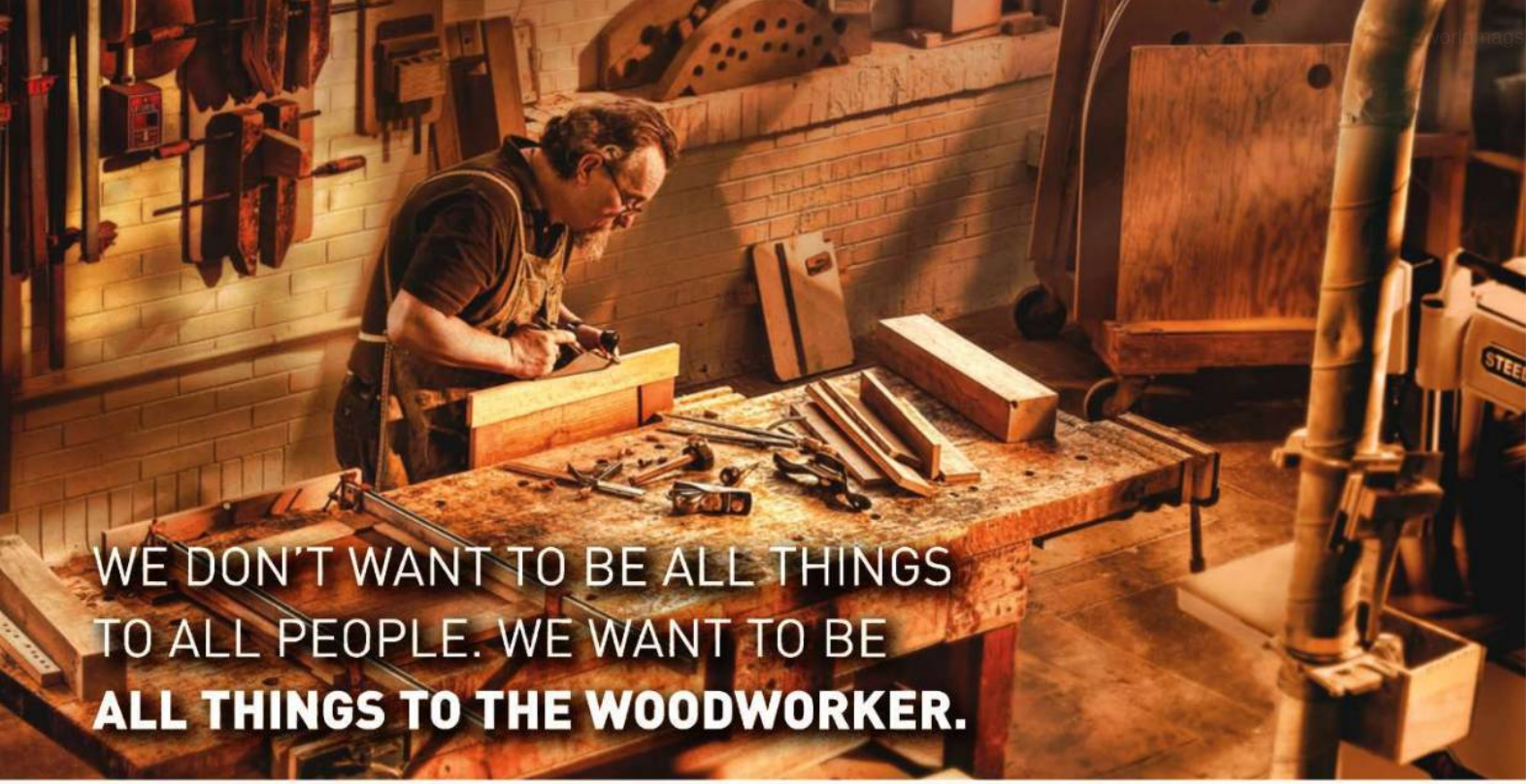
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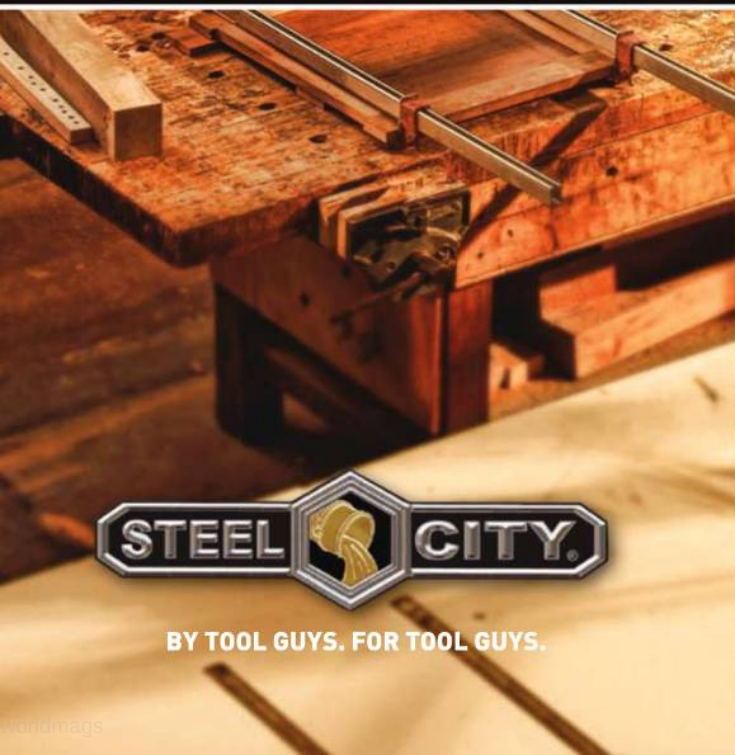
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Letters continued



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An expert turner and retired high school shop teacher shares some important pointers regarding proper turning form with our editor in chief.

but now the wood backing, used because of the knots I widened or pushed through, is thicker than the top. Oh, well — lesson learned, again!

As you said, "You are your own worst critic, the recipient will never see it!"

Cheers from the garage!

Doug Slade
Holland, Michigan

Super Sled

Sandor's table saw dovetail jig was a game-changer for me ["Table Saw Dovetail Sled," August 2010]. However, I did have one problem that I solved by changing the assembly sequence. The problem is that I'm great at measuring dimensions; not so great at angles. Is that angle 7.5 degrees or 8.1 or 8.5?

Then it occurred to me that it doesn't matter! The thing that matters is that the pin and tail angles are identical.

Here's what I did, and it turned out great: I cut the jig base and pin fences as instructed, followed by the ramps. I then scribed a line one inch in from the leading edge of the base and clamped

Table Saw Dovetail Sled

By Sandor Nagyszandor

In many ways, dovetails make the essence of woodworking. There are several methods available to form dovetails, by hand and with a variety of manufactured jigs. Here is an ingenious shop-made jig for the table saw.



two ramp pieces to the base along the line. I used the ramps to establish the angle of the pin fences. Now that I've completed the jig, it works beautifully.

E. John De Waard
Marshall, Michigan

Poor Form?

I'd like to thank you for the many years of issues of *Woodworker's Journal* that I have enjoyed reading and finding great projects in. I'm a retired high school shop teacher with a particular interest in woodturning. I've been turning for over 40 years and have a good number of pieces which I am quite proud to exhibit and also sell. I'm past president of our local American Association of Woodturners chapter. I have taught many woodturning classes too.

I mention these points not to pat myself on the back but rather to establish my credentials in the turning field.

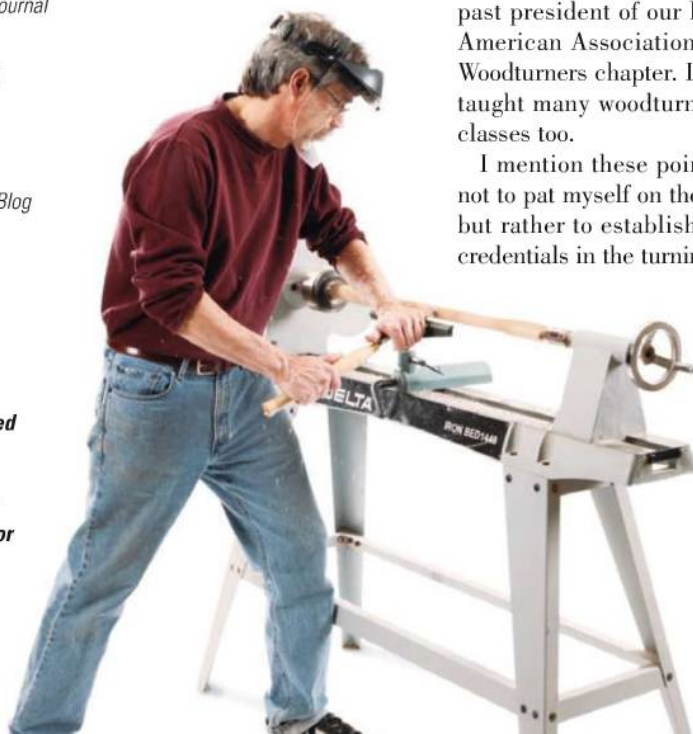
That said, I wish to comment that the photo of you on page 32, August 2010 issue ["Shaker End Tables"] illustrates one of the worst positions I have seen regarding the correct approach and tool application for spindle turning. If I may, the body should be parallel to the lathe bed, not perpendicular. The right arm/elbow should be in solid contact with the body. These two improvements allow the turner to have excellent control of the tool while riding the bevel.

Please accept these friendly suggestions. I mean no disrespect. I always appreciate good advice from another fellow woodworker.

Jim Vasi
Williamsville, New York

Rob Johnstone Responds:

Thank you for your email. I really appreciate hearing from our readers, and I am happy to be taught how to improve my technique. I am very fond of woodturning, but I confess that I am not an expert by any stretching of that term. So thank you for taking the time to "straighten me out" and have no worries regarding how your comments might be taken — I think they are just great!



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Questions & Answers

A Couple of Chemical Queries

THIS ISSUE'S EXPERTS

Tony O'Driscoll is vice president of sales and marketing at Composite Technologies Co., LLC.

Rob Johnstone is editor in chief of *Woodworker's Journal*.



Melamine has been commonly used for many years, as melamine encased sheet goods (shown in the cabinet above) and as the main component in plastic laminate kitchen counters — with no ill health effects.

Contact us

by writing to "Q&A,"

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by faxing us at (763) 478-8396

or by emailing us at:

QandA@woodworkersjournal.com

Please include your home

address, phone number and

email address (if you have one)

with your question.



Is the melamine that poisoned our pet food the same thing that we use in the shop? Are woodworkers at risk?

Q In the past two years or so we have seen big news about poisonous melamine in pet food and in baby formula — both from China. Is this the same melamine we see used as a finish on particle-board in this country? If so, are we putting ourselves in danger of kidney failure by working with this material? Am I completely off-base?

Bill Needham
Morris, Illinois

A I'm a polymer chemist (30 years or so in the lab, sales, product development and marketing) by day and a woodworker on the weekends and by night.

Not to get too technical, but melamine is a chemical with a lot of nitrogen. It was used in the recent pet food scandal because they sell their product based on protein content. The simple QC tests for protein look only for

nitrogen, not the proteins themselves. Since protein also has a lot of nitrogen in it, the bad guys could make their product look like it had a higher protein content by adding melamine. The tests, looking for nitrogen, couldn't discern where the nitrogen came from and so, upon testing, the product looked good. Dishonest, unethical and dangerous!

Melamine resin (plastic laminate) is made when the chemical melamine is combined with formaldehyde. Yes, that formaldehyde. But not to worry, both of these are chemically changed and locked up in very large molecules that are not biologically active: they're unavailable to react badly in people. The non-chemist fear-mongers out there worry about combining two poisons to make a kitchen counter. Still, Formica has been around

since 1912, and I know of no one dead or injured by their countertops.

The only danger I know of to a woodworker using melamine resin laminates is the dust hazard — just like sawdust. The small particles are the problem, not their chemical composition.

— Tony O'Driscoll

Q Years ago, in school shop, we used to work with something called Plastic Resin glue, made by Weldwood® and others, that was a urea-formaldehyde formulation (brown powder) you mixed with water to produce amazingly strong joints. I've been searching for it lately, and it seems to have disappeared from the shelves. Has it been pulled because of new regulations or simply replaced with something that's significantly better?

Also, I read more and more

about the usage of epoxies for bonding wood, yet I also remember reading that experts agree that epoxy is not the best glue for wood because it depends on surface adhesion, rather than actual penetration, and it tends to produce a joint that is not as strong as one might think. Can you comment on this, too?

Dan Prochaska
Elgin, Illinois



Epoxy is available in formulations with open times ranging from 5 minutes to overnight. If you are planning to use epoxy for wood-to-wood joinery, use a product with as long an open time as is practical.

bonding agent: I have never personally seen a well-made joint fail when it was bonded with epoxy. For me, its main drawbacks as a day-to-day

wood glue are many: it's expensive, it's putzy to use, it's messy, it leaves very visible glue lines, and it's kinda stinky. But I have no argument with its capabilities to bond two pieces of wood together. With that said, I recommend using an epoxy with a long open time in wood-to-wood operations, because those formulations are slightly more elastic when they cure.

Of course, epoxy's primary benefit is its durable water-proof nature. Boat makers have used it for years and in a type of construction where glue joint failure is not acceptable.

—Rob Johnstone



Winner!

For simply sending in his question about melamine, Bill Needham of Morris, Illinois, wins an Osborne Miter Gage by Excalibur (from General International).

Each issue we toss new questions into a hat and draw a winner.

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Stumpers

Pre-twine Device Fools Many Readers

*But a few old threshers recall their
early years in the fields.*

After publishing the mystery tool from Jim White of Chapin, South Carolina, in our August issue, we heard from readers, like **Frank G. Anderson** of Plainfield, Connecticut, who commented, "That tool is indeed mysterious! ... What looks plausible is that the tool is a cutter. But for what, I do not venture to say ..."

Luckily, other readers were willing to take a guess. **Thomas White** of Grand Marais, Minnesota, thought it was a tool "to remove the oakum from wooden boat planking." **William Sheerin** of Whitesboro, New York, speculated that



What's This?

Harvey Gillispie of Pedro, Ohio, keeps this thing sitting around his house, along with — some other, related stuff (that, for now, is top secret). Do you know what this object is? Send your answer to stumpers@woodworkersjournal.com for a chance to win a prize!

Winner! Bernard Millis of Clyde, Ohio, wins a DeWALT Compact Router (model DWP611PK). We toss all the Stumpers letters into a hat to select a winner.



it was "a pruning tool used to lop off branches from a tree." And **Doug Chapple** of Seneca, New York, thought it was a "rawhide cutter, maybe from a glove factory or vest factory."

John Clark of McDonough, Georgia, thought it was "designed for skinning animals, most likely cattle, for leather-making."

And **Bill Fleming** of Shelbyville, Kentucky, commented, "The hook shape reminds me of an old can opener, so I'm guessing this might be an old tin roof cutter."

Well, Bill, to paraphrase the rock group the B-52s: "Tin roof? Busted."

You see, we also heard from **Russell F. Ellis Jr.** of Springfield, Massachusetts, who identified the mystery tool. "The item in the August magazine is a Band Cutter. It is also called a Wire Band Cutter. [It is] a device used to cut and remove wire ties from bundles of grain before threshing. The Band Cutter snips the wire and grasps one end so that it can be pulled free from the bundle."

Gary Gortsema of Fairfield, Washington, expanded further. "Wire was later replaced by twine, which did not need to be cut, as the threshing machine ate it up. We used to pull a binder that cut the wheat and tied the bundles, and we also had a threshing machine. We ran these machines at local fairs."

While we may not have many old threshers among our readers, it's clear that you appreciate old tools.

—Joanna Werch Takes



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Tricks of the Trade

Shop ABCs ... Acetone, Bondo® and CA Glue



Add safety to your routing routine with some dried silicone caulk.

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.

Router Bit Bumpers Eliminate Guesswork

Router bits should not bottom out in the arbor shaft of a router, because it can compromise tightening them properly in the collet.

I used to follow the usual convention of bottoming the bit out, then pulling it back up 1/16" to 1/8" or so. But I was never sure if the bit was slipping back down when I tightened the collet. Here's a foolproof solution: Squeeze out a 1/4" bead of silicone caulk onto a scrap of melamine, plastic laminate or other

non-stick surface and let it fully cure. Then cut it into 1/8" slivers to use as spacers under your router bit. Drop one into the collet hole, and you'll never bottom out the bit again.

Serge Duclos,
Delson, Quebec

Homemade Saw Tire

I once had a band saw tire come off of its wheel and get damaged by the blade. While I waited for the replacement to arrive, I came up with a

temporary fix. I wound several layers of masking tape onto the wheel, followed by vinyl electrical tape. While this wouldn't be a good fix for an industrial shop, I was surprised when my "tape tire" worked for several months. If you try this trick, wind the wheel clockwise to keep the blade from unravelling it.

Lawrence Davidoff
Stouffville, Ontario



PICK OF THE TRICKS



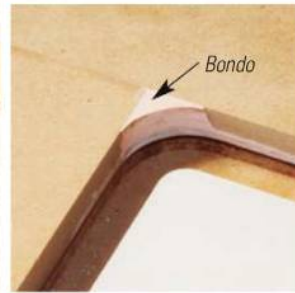
CA glue comes to the rescue.

CA Glue Helps Line Up Lids

When installing hinges on small box projects, it can be challenging to get the lid perfectly aligned with the box. Recently, I figured out a simple solution to this problem. I fastened the hinges into their mortises on the lower portion of the box first. Then I squeezed a drop or two of cyanoacrylate glue in between the holes on the top hinge leaves. I carefully set the lid on the hinges

and lined it up flush on all sides. It was easy to do before the glue set. I let the glue dry for a full 10 minutes. With the lid glued temporarily in place, I could raise it and mark the exact mortise locations. This done, I gently twisted the lid to pop it loose from the hinges and proceeded with the installation. Works great!

Jim Brown
Liverpool, New York



Scrap MDF and Bondo combine to create a perfect router insert template.

Poor Man's Router Table Insert Template

The best way to cut an insert opening in a router table is by guiding your router with a flush trim bit against a template made for the insert plate. I make mine from shop scraps and auto body filler. Here's how: Rip 3"-wide pieces of MDF or other scrap into strips that are about 6" longer than each of the sides of your insert plate. Your template material can be 1/8" to 1/4" or so thicker than the plate and still work fine. Wax

the corner areas of your plate to keep glue from sticking to it, and place it on a flat, waxed paper surface. Stagger the strips around the plate so each strip extends past the next. Epoxy the strips together, making sure that all four strips fit tightly around the plate. Now mix up some quick-set two-part auto body filler and pack it into the corners of the template up to the insert plate to fill the gaps. When the filler dries, carefully tap the plate free and shave away any extra filler from the corner curves. You now have an inside template that matches your router plate's shape perfectly. The longer "ears" of the template make clamping easier, too.

Alan Schaffter
Washington, North Carolina



A scratch awl provides pinpoint drilling accuracy.

Brad Point Bull's Eye

Even after having cataract surgery, I find that my tired old eyes don't see as well as they used to for close-up work. But I don't let that keep me from woodworking — I just find tricks that help. For instance, here's how I hit the pencil line crosshairs when marking the centerpoint for drilling: I use a scratch awl to

create a starter hole large enough to insert the tip of my brad point bit. That way, I can find the centerpoint by feel and know that the bit will be centered precisely. I did this for 50 holes on a recent project with great success.

Ernest L. Taliaferro
Tallahassee, Florida



Liquid Pencil Eraser

While prepping wood for finishing, I've discovered that acetone will wipe away pencil marks. It's faster than erasing or sanding them, and the acetone dries quickly without raising the wood grain.

Mark Thiel
Coral Springs, Florida



Remove marked-out lines quickly and easily with this handy trick.



Winner!

In addition to our standard payment (below) Jim Brown of Liverpool, New York, will also receive a Stanley-Bostitch CPACK300 Combo Kit for being selected as the "Pick of the Tricks" winner. We pay from \$100 to \$200 for all tricks used. To join in the fun, send us your original, unpublished trick.

Please include a photo or drawing if necessary. Submit your Tricks to Woodworker's Journal, Dept. T/T, P.O. Box 261, Medina, MN 55340.

Or send us an email: tricks@woodworkersjournal.com

Shop Talk

Re-used, Recycled Wood Finds New Life



An Ivy League woodworker leans toward reclaimed and found wood for his projects. The found objects spark creativity and foster a climate of sustainability.

Trash to Treasure “Found” Resources

Yoav Liberman has been using found materials to create items since his childhood: “If I had a regular cell battery, and it ran out of juice, I’d take the battery apart and keep the part that’s a protrusion to use it for something — maybe a wheel, or a part of a spaceship,” he said.

Now, as an adult woodworker — he’s currently teaching woodworking and furniture design at Harvard University — Yoav is still using found objects, including wood. “It’s natural to me to borrow from what people leave behind or trash. When I visit a friend’s woodshop, I always see what’s going on in the fireplace bin.”

He also finds his materials from other sources, like items left behind by college students when they move on, university discards from the Harvard Surplus Center and trash bins — including the trash behind the Cambridge Rockler Woodworking and Hardware store.



Found wood can provide unique challenges for Yoav Liberman — like unidentified finishes gumming up a plane — and unique opportunities.

“I was going to buy supplies from the local Rockler store, and I discovered a big dumpster in back with a lot of signage and display pieces that had been discarded,” Yoav said. Since the staff is familiar with him, they knew what he was doing as “the manager and assistant manager came out and saw me picking through the trash,” he said.

Yoav used the 40" to 50" long 3/8"-thick birch strips he found as false drawer fronts on a piece he called a Cantabrigian Highboy. The highboy also incorporated discarded museum specimen trays, sewing machine stand legs and a Harvard University

emblem Yoav cut from the back of an old chair.

When working with such reclaimed material, Yoav said, often, “you need to come up



Here Yoav removes a Harvard logo from a chair back. It was used with other found objects to make the highboy at left.



Yoav Liberman did some dumpster-diving to find the wood for his “Cantabrigian Highboy.”

Case of
Drawers



with solutions.” For example, “Sometimes a board is beautiful, but it has a distinctive crack. You have to choose what to do: get rid of it? Fill it with colored epoxy?” In those cases, he will often choose to use black pigment as a gap filler — but sometimes he emphasizes the irregularity by putting a dovetail key or some other design element in the spot.

“Sometimes, you just need to work with what you have and improvise. I actually like that. If it’s an item from an old age, in a way it actively participates in the decision-making process.” Such items, Yoav said, “have a say. Ideally, people learn from them, and are inspired to a more cautious, informed way of utilizing our past for our future.”

For instance, one of Yoav’s favorite pieces from the past came from some heart pine beams left over when the larger post and beams had been removed from an old mill building in Massachusetts. “I really look forward to using that,” he said. For hardware, he has tubes and posts from old fireplace sets and brass from old chandeliers. He also has some of the Rockler signage left over — some with decals saying “nuts,” “bolts,” etc., that he’s considering using as a visible portion of another piece.



Old mill beams find new life as heirloom heart pine in some of Yoav’s pieces (photo above).

Sometimes, the older materials do present some challenges. For instance, Yoav recently spent some time trying to plane two sides of a trashed Harvard College bookcase he suspects was from the 1920s, only to have it continually clog up his plane. He then realized that the oak finish was probably created with shellac at the time. He dipped a rag in some alcohol for clean-up, which worked fine. “I could

have used a belt sander, but I prefer not to use electrical hand tools if I can help it,” Yoav said. “It’s just a lot of noise and dust.”

He does use a planer and a jointer, however — with very light passes. “If you suspect nails and steel in reclaimed lumber, you have to be like an airport detector,” in finding them before ruining your tools, he said.

Still, Yoav said he always encourages his students to at least consider the use of

reclaimed items for their projects. “People tell me, ‘I’m inspired by the way you used abandoned material instead of having this stuff end up in the dump,’” he said. “I get positive feedback from my fellow woodworkers and artists. That makes me happy.”

— Joanna Werch Takes

Shop Talk continues on page 22 ...

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— *Knight's American
Mechanical Dictionary*,
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Gyrojaw

Brothers Seek Better Grip

Brothers Ron and Mike Iacobelli have been working on a better solution for vise clamping for nearly 15 years — they call it the Gyrojaw. Along the way, they've experienced their share of challenges.

In a nutshell, Gyrojaw is a pyramid-shaped fixture that fits against a jaw of a metal vise. A carriage bolt is embedded into one end, and its curved head allows the Gyrojaw to be pivoted to many angles and then clamped tightly against a workpiece.

The idea came to Ron in the mid-90s while he was working as a machinist for Michigan's automotive die and modelmaking industry.



A lifelong woodworker, Ron knew that, "When you're woodworking, you need to clamp things like pediments, spindles or tapered spindles and legs that don't have parallel faces."

His first crack at a design consisted of a wooden block with a ball bearing fitted into one end. Early on, Ron joined forces with his brother Mike, a tool designer with a CAD background, for help with

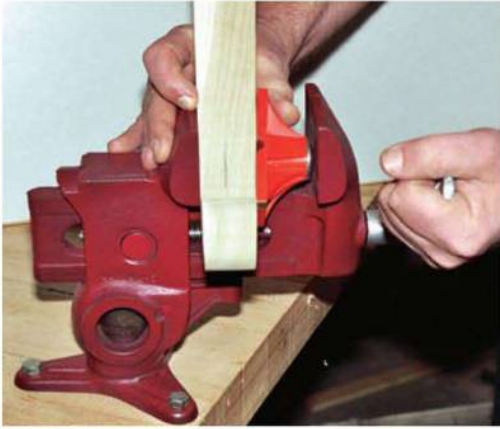


Field editor Chris Marshall
*learned the story of personal
sacrifice behind this unique tool.*

details like creating a cost-effective injection mold. Mike experimented with various ribbing solutions to make Gyrojaw sufficiently strong but still lightweight. He also needed to determine the optimal size for Gyrojaw. The Iacobellis took their

THE SMALLER ROUTER THAT'S

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Gyrojaw development has evolved from a wooden model to a nylon prototype to the current glass-reinforced nylon.

design to a local mold-maker to build the final tooling, and he in turn found them an injection molder to mass-produce the product.

Making a functional, affordable vise accessory took years of development, but it was only the tip of the iceberg. In order to help contain costs, Ron and Mike began to seek a manufacturing partner. An automotive company required a 3,000-order minimum to

cover tooling costs before they would commit to a long-term contract — that didn't pan out. The Iacobellis have also pursued several vise makers for partnership, but those efforts haven't proven successful either. So, Ron and Mike are covering their own manufacturing costs, along with two investor friends.

Between the tooling and manufacturing expenses, the legal fees involved with

patenting and their marketing efforts, Ron and Mike have shouldered around \$50,000 of costs to bring to market the Gyrojaw (priced at \$14.95; gyrojaw.com). This number could have been much higher, Ron believes, were it not for their tool and die experience.

"We're both retired, and it's hard to replace that cash with expenditures we continue to make," Ron says.

So, why stick with it? Logically, both men hope to see a return on their investment up to this point, but sheer determination plays into it, too. Ron and Mike are convinced that a Gyrojaw should be sitting next to every shop vise. As Ron said, "We're just looking for that door of opportunity we haven't quite opened yet."

— Chris Marshall

Shop Talk continues on page 24 ...

The Turtle-backed patternmaker's vise (also known as the Emmert Patternmaker's Vise) was invented by Joseph Emmert in Waynesboro, Pennsylvania in 1891.

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Shop Talk continued



"Patience" by James Meeks



Natural Edge Vase by Jeffery Neff

Winners in Wood

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For the past several years, *Woodworker's Journal* has been proud to be one of the prize sponsors for the Design in Wood show that the San Diego Fine Woodworkers Association puts on every summer.

Looking at some of the year's winning entries from various categories is a feast for woodworkers' eyes. If you want to be in the running for next year's prizes, check out the details at www.sdfwa.org or call 858-755-1161.

photos by Andrew E. Patterson



"French Mirror with Drawer" by Larry S. Olson



"Chance Encounter" by Bill Churchill



"Wandering" by Bruce R. Lewellen

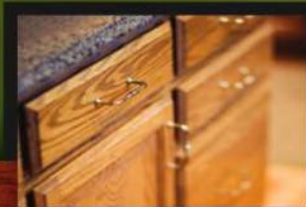


"Chiffonier" by Kelsey D. & Gary A. Clark



"Life is a Beach" by Kelsey D. and Gary A. Clark

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Woodturning

"Counter Cat" Holiday Gifts

By John Gien

Fire up the lathe (and a few other basic tools) and get ready for the holiday season.

Here's a simple recipe holder that will be just perfect for your mother-in-law.



The Cat's Meow!

Stay above the grease and splatter with this simple recipe holder that you can turn in an afternoon!

When it comes to "quick and easy" gifts, turners have an advantage over most woodworkers. This simple project can be "turned out" in an afternoon or evening, and it lends itself to production work. The Counter Cat is a great cook's companion, holding those recipes and instructions above any spills or splatters that hit the countertop. Once you get all the steps set up, you'll find you can make a half dozen of these gifts in a day.

Aside from turning, the skills necessary to complete one of these projects are pretty basic. Get started by selecting the wood you want to use: a 2" x 2" x 6" blank for the body and a 2" x 2" x 4" scrap for the head.

Creating the Body

Mount the body blank onto the lathe, holding one end with your scroll chuck and supporting the other end with the tailstock. For your chuck, it may be necessary to turn a tenon on one end first. Rough the blank down into a cylinder, leaving it as large as feasible. Remove the tailstock and round off the ends, leaving enough to support the blank at the headstock. The cat's body should be about 4½" long with a sausage-like shape slightly bulging at the center. Sand and part it off. Carefully make a flat area on the body by sanding or cutting. This will be the bottom or belly.

Secure the body for drilling holes (see photo at right). At the tail end, centered and

close to the top, drill a 1/4"-diameter hole 3/8" deep for the tail. At the head end, drill a 3/8"-diameter hole 5/8" deep, centered and about 45° above the horizontal axis. For the feet, drill two 1/2"-diameter holes 3/8" deep and about 1/4" apart on the front end of the body, sloping slightly downward near the end of the flat area.

Round off the end of a 1/2" dowel and color it black with a marker or shoe dye. Cut off a 3/4" piece from the end to make one foot, and repeat. Trial fit the feet into the holes in the body. When placed on a flat surface, you want the feet to slightly raise that end of the cat. Adjust as needed and glue the feet into place. After the glue is set, place the body on sandpaper on a flat surface



Our author mounts a blank into the lathe chuck and supports the opposite end with the tailstock to get it ready for turning (top left). Once everything is secure, he roughs the body to shape with a spindle gouge or skew chisel (top right). When the body is the correct diameter and shape, he removes the tailstock and rounds one end (bottom right), then the other end before parting it free.

and sand the feet flush with the bottom of the body. Now clamp the body securely against the miter gauge of your band saw, using the flat bottom for positioning. Cut five slots into the back of the body for holding recipes or notes. Start them about 1½" back from the front, angling them about 30° backward. Cut about halfway through.

Turning the Head

Mount the head blank in the chuck and rough it down to a cylinder, rounding off the end, as shown on the next page. Turn a sphere that is 1/8" to 1/4" smaller than the body's diameter. Leave a tenon next to the chuck that is 3/8" in diameter and 1/2" long. The shape of the sphere is not really critical (ever see a cat with a perfectly round head)? Sand well and part it off.

Test fit the head tenon in the hole in the body. Allow clearance between the end of the tenon and the bottom of the hole for excess glue. With the head in place, use a soft pencil to mark the locations for the eyes, nose and ears. Remove the head and secure it for drilling. Bore two 1/4" holes 3/8" deep for the ears, two 3/16" holes 1/8" deep for the eyes and one for the nose that is 3/8" diameter and 3/8" deep. Using a black marker, darken the two eye sockets. Round off the end of a 3/8" dowel for the nose. Color it black and cut it off to 1/2" long. Glue it in place.

Creating Ears and Tails

Now it's time to make a paper template for the ears, using the drawing on the next page. Cats' ears are leaf-shaped and pointed. The point of the ear



The body is secured so that the hole for mounting the head can be drilled with a 3/8" Forstner bit.



Here, one foot is being trial fit and the other is ready to be installed. Note that the belly of the cat has been sanded flat.

Standing Steady:

Two feet are added to the base side of the cat and then they, along with the back end of the belly, get a sanding to ensure that your recipes don't tip over.

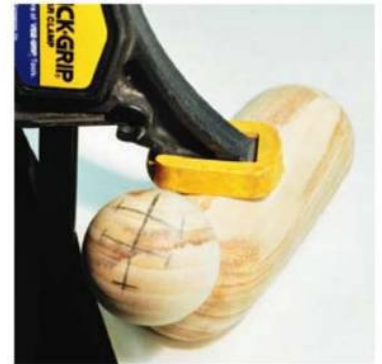
Woodturning continued



Turn the body and head separately, and join them with a tenon on the head.



Turn the head blank into a sphere, and include a 3/8" tenon for mounting before parting the head free from the lathe.



Once you've trial fit the head on the body, sketch location lines for the nose, eyes and ears.



In this photo, the nose and one eye have been drilled. Be sure to adjust the hole locations as needed as you progress.



Use a black marker to darken the holes for the eyes and ears. Seal your wood first, to prevent bleeding.

Trim the whiskers to an even and appropriate length.

Wipe on clear lacquer or an equivalent finish to complete your recipe holder.

John Giem is a writer and woodworker living in northern Colorado.

The Cat's Right Ear

Use the drawing below to make a template for the cat's right ear. Note that its point is offset and that the bottom tab is wider than the 1/4" hole drilled for the ear. Form the left ear by flipping the template over.



Full size

should be slightly offset from center. The "stem" should be about 3/8" wide so that the ears will be cupped when inserted into their mounting holes. Cut out the template and label it "R" for the right ear. Turn it over and label it "L" for the left ear. Cut out and form the template into an arc, placing the template into the appropriate ear hole in the head. The ears should be held in a cupped shape by the narrow ear hole with the cupped surface toward the nose. Be sure that "R" is toward the nose for the right ear and the "L" for the left ear. The points of the ears should be toward the center of the head. Adjust the template until your cat "looks right."

Find yourself some thin leather (mine came from an

old billfold) and identify which side you want facing the front of the cat. Transfer the template shapes onto the leather, and cut out both ears using scissors or a craft knife. Glue the ears into place.

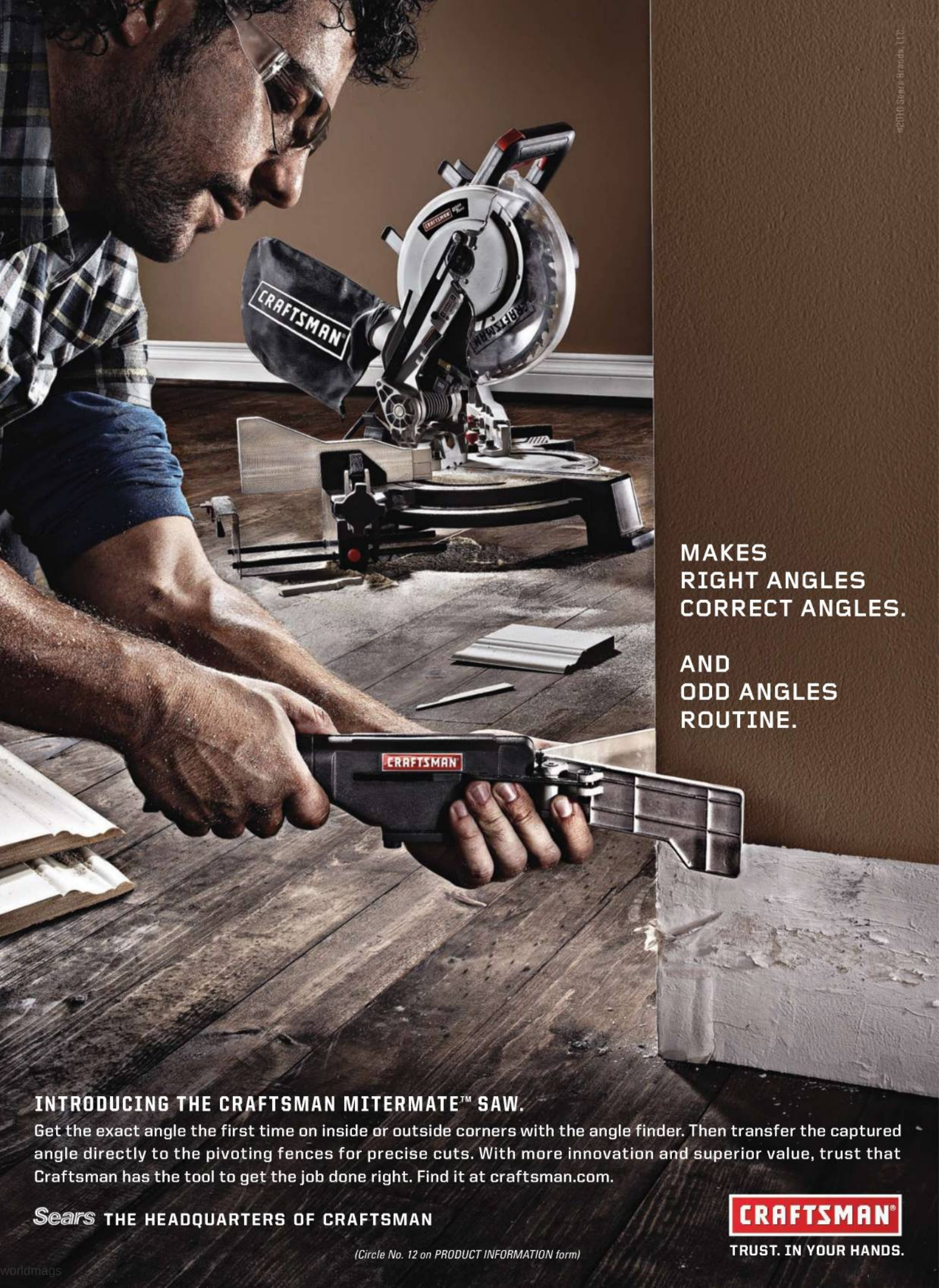
Cut a 1/4"-wide strip of leather for the tail. Adjust the length as desired. Glue it into the tail hole in the body of the cat.

Adding Whiskers

Next, find some material for the whiskers, leaving them long to ease handling. I used a few broom straws, which worked great. Secure the cat in a padded vise with the face in a convenient position and lightly mark the positions for three whiskers on each side. Using a rotary cutter or similar tool, cut short grooves at each mark. Now spritz the grooves with CA accelerator, and drip a small amount of glue onto one end of each whisker. Place them into their prepared grooves. The CA glue will rapidly cure to hold the whiskers in place. Repeat for the other whiskers.

Cut three small grooves on each side of the nose for the whiskers with a rotary tool. Attach them with accelerator and drops of CA glue.





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Entertainment Center

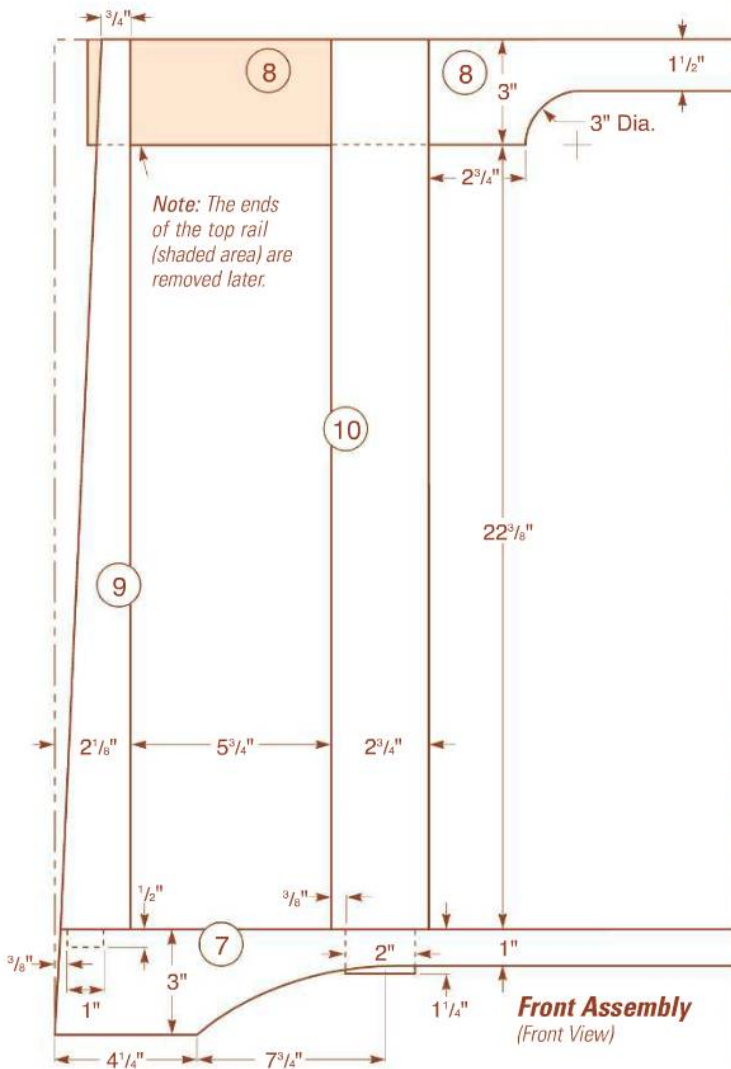
By Kerry Pierce

Woodworkers' kids simply need to complain about their cheaply made furniture to get a project going. Just ask our author ...



The entertainment center is a relatively new addition to the lexicon of American furniture forms, one that was necessarily developed long after the era of the Arts and Crafts movement. Nevertheless, it's possible to design an entertainment center reflecting this traditional style by bringing to the piece some of the identifying characteristics common to the Arts and Crafts movement, a style that dominated quality American furniture making at the dawn of the 20th century.

This entertainment center (which I built for my son Andrew) was designed to provide support for a large video gaming monitor as well as the game systems and storage for the game cases. Fortunately, those game cases are the same size as DVDs, so it will store them equally well. To that end, I borrowed and compiled design elements from classic Arts and Crafts examples: rectilinear details, tapering front rails and the repetitive lines of the exposed storage area are a few examples.



Constructing the Front

The case is constructed of three subassemblies: the plinth, which lifts the piece from the floor; a solid-oak front (a modified face frame), which creates the shape of the entertainment center's silhouette; and a central box that holds the center's various storage compartments.

I built the front from solid oak, tenoning the various stiles into the bottom front rail, while the top rail sits behind the stiles and is screwed to their back faces. In my original drawings of the entertainment center, the top rail was mortised to receive tenons on the stiles, but — at least to my eye — the presence of that top rail created a visual dead space over the storage slots.

In a bit of an unusual technique, I glued and screwed the back of the bottom rail to a cleat that would catch the lip of a rabbet on the plinth deck, as shown in the photo at right.

The most complicated feature of the entertainment center's construction was the installation of the tapered stiles. In order to open up the spaces above the banks of storage slots, I decided to stop the top rail at the stile on either side of the central compartment. This would have left those tapered stiles unsupported (with no rail connected to them) at the top prior to the installation of the unit's top. In order to stabilize the tapered rails, I temporarily ran the top rail long, across the top of the storage slot openings, attaching it to the tapered stiles with screws. Later, I cut the ends free after the front was screwed in place. (Note: these rails are tapered only after they have had the tenons formed on one end and test fitted in the front.)



After cutting the mortise-and-tenon joints at the bottom of the front's rails and stiles, the author dry-assembled the joints, trued them with a framing square, and marked the angles on the tapered stiles.



This photo shows a back view of the front assembly. Notice that the top rail is screwed to the back of the stiles (and the tapered stiles are temporarily attached to the top rail), rather than being tenoned.

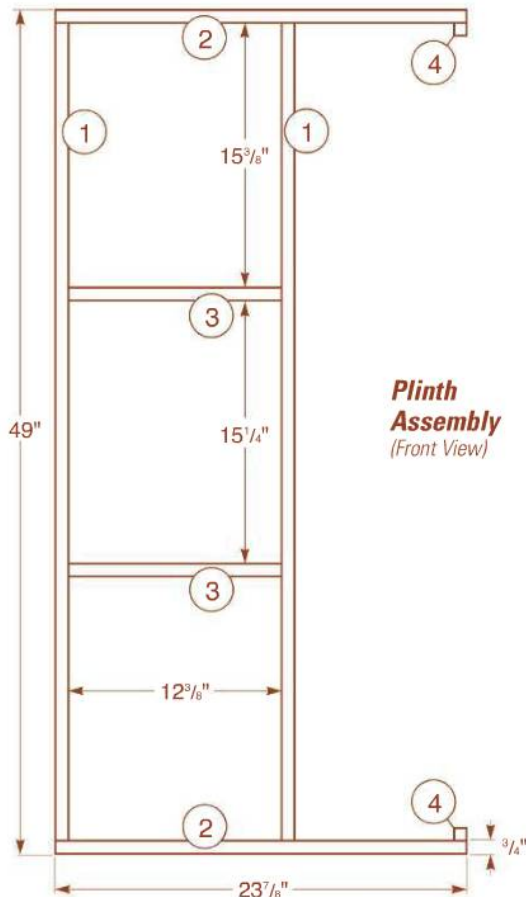


A solid oak cleat supports the front edge of the plywood plinth deck. The author cut the rabbet on the bottom front edge of the plinth deck using a moving filletster made in 1840 (shown at right). Cutting a single rabbet in this manner is not only quicker than it would be with a router or table saw (you don't have any cutters to change when you're using a moving filletster); it is also infinitely more pleasant to perform the work with a hand tool that saw its first use in a shop lit by candles or gas lamps.





The plinth (or base) is assembled with 1 $\frac{1}{8}$ " drywall screws. The front edge of the plinth deck is screwed to the 3/8" x 3/8" cleat using 3/4" screws. More screws were then used to attach the bottom to the plinth. Notice that the front and plinth are already joined via the small glue blocks on either end of the plinth. (The corner block detail is visible only in the top photo.)



Making the Plinth

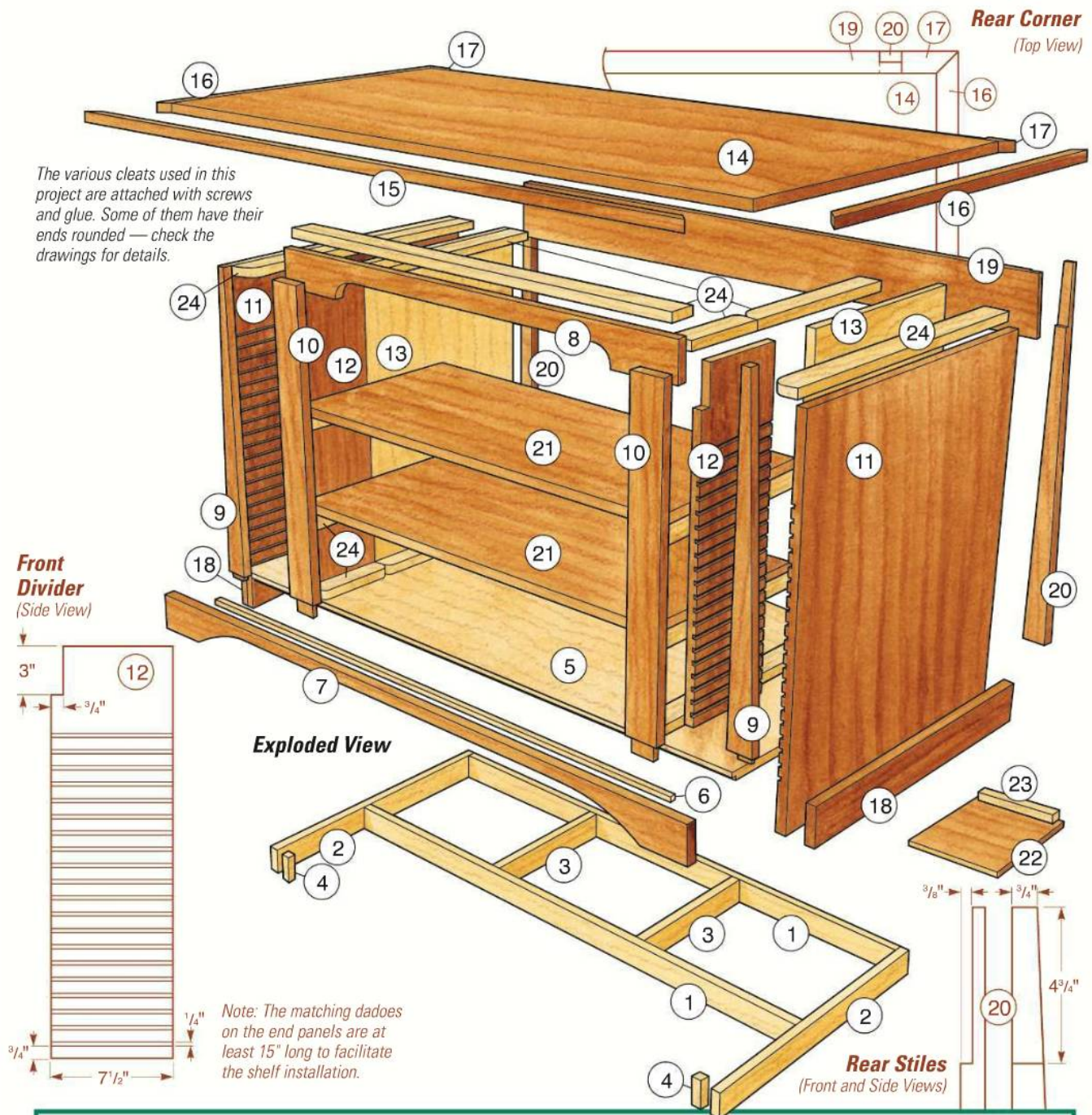
My dad was a cabinetmaker for much of his working life, building custom cabinets for dozens of kitchens and bathrooms, as well as dozens of commercial offices in northern Ohio. The plinth — or base — for each of his cabinets was constructed of 1 x 3 material nailed together into a ladder-like frame to which the cabinet front was attached and on which the cabinet was constructed. This is the approach I used for building the plinth of this entertainment center.

I built a ladder from spruce furring strips ripped to a 2 $\frac{1}{8}$ " width that I fastened together with 1 $\frac{1}{8}$ " drywall screws. The ladder was built without a front rail in order to create visual space under the arc at the bottom of the cabinet front.

I then attached two glue blocks on the inside front end of the ladder's long end pieces. These provided me with my initial attachment points for joining the plinth to the front. This attachment was reinforced as other components of the case were installed, by attaching them to the front and to the plinth.

Assembling the Case

The case of this entertainment center is fabricated from oak plywood. Plywood is much better for the case than glued-up panels of solid oak for several reasons. First, plywood panels need only to be cut to size. It isn't necessary to glue up narrower boards and then surface them before sizing them. Second, plywood is dimensionally stable. It doesn't shrink across the



MATERIAL LIST (CASE)

Plinth

	T x W x L
1 Plinth Runners (2)	3/4" x 2 1/8" x 47 1/2"
2 Plinth Ends (2)	3/4" x 2 1/8" x 23 3/8"
3 Plinth Crossmembers (2)	3/4" x 2 1/8" x 12 3/8"
4 Glue Blocks (2)	3/4" x 3/4" x 2 1/8"
5 Plinth Deck (1)	3/4" x 23 3/8" x 49"
6 Plinth Cleat (1)	3/8" x 3/8" x 49"

Front

7 Bottom Rail (1)	3/4" x 3" x 53 1/4"
8 Top Rail (1)	3/4" x 3" x 50 5/8"
9 Tapered Stiles (2)	3/4" x 2 1/8" x 25 5/8"
10 Inner Stiles (2)	3/4" x 2 1/4" x 26 5/8"

Case

	T x W x L
11 End Panels (2)	3/4" x 23 3/8" x 28 5/8"
12 Front Dividers (2)	3/4" x 7 1/2" x 25 5/8"
13 Rear Dividers (2)	3/4" x 16 3/8" x 25 5/8"
14 Top Panel (1)	3/4" x 26" x 53"
15 Front Edge Band (1)	3/4" x 3/4" x 54 1/2"
16 End Edge Band (2)	3/4" x 3/4" x 27 1/2"
17 Back Edge Band (2)	3/4" x 3/4" x 2" (to fit)
18 Bottom End Trim (2)	3/4" x 3" x 23 3/8"
19 Rear Trim (1)	3/4" x 4 1/4" x 50 1/2"
20 Rear Tapered Stiles (2)	3/4" x 2" x 30"
21 Middle Shelves (2)	3/4" x 15" x 35 13/16"
22 Solid Oak Small Shelves (40)	1/4" x 7 1/2" x 6 1/4"
23 Shelf Stops (40)	1/2" x 1/2" x 5 3/4"
24 Cleating	3/4" x 2" x 20 lineal feet



Plywood corner brackets, which stabilized the end panels during assembly, were temporarily screwed to the inside surfaces of the cabinet. Notice that the top rail of the front has been cut off and planed flat at this stage of the assembly.



Cleats (left) create strong glue joints in plywood cases, but care must be taken so that their installation screws extend through the cleats no more than 5/8" when used with plywood that is nominally 3/4" thick. Glued and screwed cleats were applied to the inside top surfaces of the end panels, then to the underside of the top.

grain, which eliminates the need for frame-and-panel construction. Plywood is also much less expensive than enough solid wood to create the top and end panels. And finally, plywood is much lighter, and speaking from the point of view of someone who carried one end of this cabinet into my son's second floor apartment, a heavier cabinet would not have been wise.

The plinth deck is a sheet of paint-grade plywood which is rabbeted on its front bottom edge so it could be screwed to the oak cleat on the front's bottom rail. I then screwed the bottom to the plinth with 1 1/2" drywall screws, giving me a solid base for the rest of the construction.

Next I removed the screws attaching the front's top rail to the tapering outside stile and cut that rail off on the outside of the stiles, planing the end grain flush with their outside edges.

The end panels are made from oak veneered plywood, but to economize on the oak plywood, I created the interior walls from two pieces of plywood (the front and rear dividers). The front section was oak plywood, but the back section was paint grade ply. The end panels and the front dividers require careful preparation: 1/4" x 1/4" dadoes need to be milled onto these surfaces to accept the ends of the short oak shelves that will be housed there (see the *Drawings*, previous page). The dadoes on the end panel must be long enough (15") to allow the shelves to be slid in from the back of the cabinet (photo at left) prior to the installation of the rear dividers. The front edge of these dadoes are blocked by the cabinet front.

Once the top was installed on the cabinet, solid-oak banding was applied to hide the raw plywood edges.



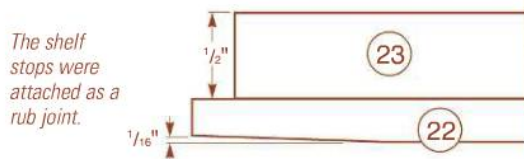
After I finished those dadoes, I plowed the slots for the game case shelves. It was now time to install the two end panels. To stabilize them until the top had been installed, I first temporarily placed corner brackets into position, screwing these brackets to the base of the cabinets and the inside face of the end panels (top photo, opposite page). I typically use these brackets to ensure that case pieces remain square while the glue is drying, but I've found them useful in many other assembly contexts as well.

I screwed the bottom of each end panel to the plinth, and at the same time I applied glue to the forward edge of the end panels and clamped them to the front until the glue had cured. Following that, I installed cleats (see the *Drawings* for details) on the top inside face of each end panel. These cleats are the primary means of attaching the top. From oak plywood I cut out the top and secured it to the cleats, then I removed the corner brackets.

Once the top was attached, I put the cabinet face down and installed cleats on the top and the plinth deck to which I would screw the front and rear dividers. First I had to notch the front dividers to accommodate the top rail. Then I secured the front divider to the cleats with glue and screws. Now is the time that you need to put the solid oak shelves into the 1/4" x 1/4" dadoes that you cut earlier. As I was preparing to mount the small shelves that would contain the game boxes, I realized that a narrow band of the paint-grade plywood I used for the bottom of the cabinet would be visible below the bottom shelf, so I removed the top veneer layer of the paint-grade plywood from that visible section and replaced it with a strip of oak veneer. Sometimes late "discoveries" like this happen even to very experienced woodworkers. After that repair, I glued the shelves into their grooves, fitting each with a few strokes of a block plane. As I did so, I glued the shelf stops on each shelf with a quick rub joint. (Note: As you can see in the photo at right, the rear divider isn't installed until after all the small shelves are in place.) Four additional cleats hold the two large shelves — mount them as shown in the drawings. Then attach the shelves to the cleats ... I made mine from oak plywood with a solid oak facing on the front edge.

Small Shelf and Shelf Stop

(Front View)



The small shelves were thickened to the exact width of the dadoes in which they would be installed. That meant that the underside of the edges had to be relieved with a block plane during fitting.



This narrow strip of inlaid veneer hides the paint-grade plywood below the bottom small shelf. The author weighted the veneer strip in place during gluing with an electric motor positioned on a strip of hardwood.

The back is left open in order to facilitate the cooling of the electronics being housed in the cabinet. I also attached a six-outlet strip with built-in circuit breaker to the inside rear of each end panel.

The edges of the top remained uncovered plywood, so I glued and clamped the top's edge banding into place and planed it flush to the top. To wrap up the cabinet section I applied the bottom end trim, securing it with glue and screws driven through the end panel. Then I mounted the rear trim to the back of the cabinet. It sticks up beyond the plane of the top by 7/8" — to keep things from falling off the back of the top. It has 3/8" deep x 1" wide rabbets on each end, see the *Drawings* for details. I made this piece a bit overlong for a reason that will soon become evident. The final parts to make and install are the rear tapered stiles. They mirror the tapered front stiles but have a 3/8" deep notch formed on one face. This notch matches the rabbets on the rear trim. Glue and clamp the rear stiles in place. The back trim will extend past the stiles at the lap joint ... trim it flush to the stile.





Door tenons were milled to rough size at the table saw using a stack of dado cutters, then fine-tuned with a shoulder plane to fit their mortises.



The author turned to his table saw to cut grooves in the rails and stiles for housing the floating door panels. It took a few quick passes per stile and rail.



The back of the door panels were raised with a sharp jack plane: cut down to pencil lines running around the edges of each panel with pencil lines on the back surfaces.

Building the Doors

The doors are made from solid oak using frame-and-panel construction. I first chopped the mortises in the stiles and cut matching tenons on the rails, fitting each to its mortise with a shoulder plane. (See the *Drawings* for details.) Then, on the table saw, I plowed the 5/16" x 5/16" grooves in the rail and stile stock that would receive the edges of the door panels, after which I turned my attention to the raised panels that would be fit inside the frames.

The flat front face of each door panel is decorated with walnut stringing made with a quick-and-dirty inlay technique. I first used a hollow-ground planer blade on my table saw to cut clean grooves on the face of each panel. I left that same blade in the saw to rip off thin strips from a walnut panel I had thickened to the exact width of the grooves. After applying a little glue to the grooves, I tapped the strips into place. I completed the process by planing each strip flush with the surface.

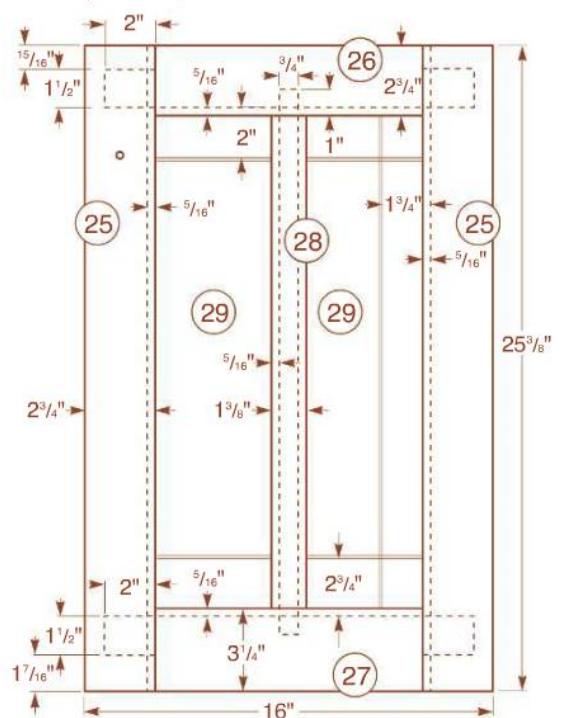
Since the door panels show their flat faces in front, I raised the back surface of each panel by planing wide bevels all around to reduce the edge thickness. The bevels were laid out by marking one line on the edges of each panel about 5/16" from the front surface and a second on the back surface of each panel about 1 1/2" from the edge.

After dry-assembling each door to check the joinery, I glued the mortises and tenons and clamped the assembled door, leaving it to cure on a flat surface.

My setup for mortising door hinges employs a vise, a catch block and one of the corner brackets I used earlier when installing the end panels. This presents the door at a convenient height for handwork and keeps it stable under the force of chisels and a mallet. The mortises on the door frame, however, have to be chopped

Door Assembly

(Front View)



Installing the Hinges and Doors



A pencil line (left) gives the author a guide line for planing the top edges of the doors to achieve a consistent gap. A tapered center punch (top center) creates a dimple in the exact center of a screw hole. This dimple (bottom center) can then be used to reference the point of a drill bit. The author also uses a piece of scrap (top right), with a rabbet the same depth as the pin diameter, as a hinge-setting gauge on both the door and the frame for accurate hinge installation. He marks the high section of a door with a pencil scribble (bottom right), then planes it away to bring the door stile flush.



Door Exploded View

on the assembled cabinet in less convenient circumstances. The process is shown in the photo sequence above. However, despite my gauge and my careful installation, I still managed to goof in the installation of one door. I could have filled the hinge screw holes and re-installed the hinges. (Like I said, things can happen ...) Instead, I decided to fix the error with a plane. To do this, I marked the high section with pencil scribble, then removed the hinges and planed those scribbled high areas flat.

Now that my machining and joinery was completed, I moved to sanding the project smooth up through the grits, and applied three coats of oil-based polyurethane — this sort of project takes a bit of abuse.

All that remained to do was to bring it to my son's apartment, which unfortunately meant carrying it up a few flights of stairs. Maybe the next time I offer to build something for him, delivery will not be included in the bargain!

Kerry Pierce is a master craftsman and author of many woodworking books who lives in Lancaster, Ohio.

MATERIAL LIST (DOORS)

	T x W x L
25 Outer Stiles (4)	3/4" x 2 3/4" x 25 5/8"
26 Top Rails (2)	3/4" x 2 3/4" x 14 1/2"
27 Bottom Rails (2)	3/4" x 3 3/4" x 14 1/2"
28 Center Stiles (2)	3/4" x 1 3/8" x 21 3/8"
29 Panels (4)	3/4" x 5 1/16" x 19 9/16"
30 Door Pulls (2)	Bronze with Back Plate
31 Hinges (4)	1 1/2" x 2 1/2"
32 Stringing	1/4" x 1/4" x 8 lineal ft.

Waney-edged Box

By Brad Becker



One man's trash is another man's treasure — or so the old saying goes. In the case of the small piece of wood that was used on the top of this little box, that saying was spot-on. I found a couple of pieces of waney-edged bubinga in the burn pile at work, and I saved them from a sad and fiery fate.

In most cases, a woodworker selects specific wood to suit what he or she is building. In this case, I decided to build myself a small box to show off the piece of wood. Its uneven natural edge appealed to me — as did the coloration of its heart- and sapwood. While a waney edge might not be everyone's cup of tea, to me, the contrast between the clean lines of the box and legs and the uneven edge of the bubinga was very nice to look at.



The sides and ends were ripped to width and then mitered to length. The author's miter saw was large enough to handle the miters (above). Band clamps held the box square as the glue cured.



Building the Box

The sides and ends of the box (pieces 1 and 2) were simply ripped to their proper width and then miter cut to length on my miter saw. My saw has the depth of cut necessary to make these cuts; you may need to set this up on your table saw. Speaking of the table saw, I moved over to mine to plow the grooves that would

capture the bottom (piece 3). Check out the *Drawings* on page 41 for all the construction details required for this project. Go ahead and cut the bottom from 1/4" plywood and you are ready to glue up the box pieces.

Test-fit the pieces to be sure that your miters are tight and the bottom is properly sized. When you have done that, apply a

This elegant little box was designed to show off a lovely piece of wood the author found on its way to a sad fate.



thin coat of glue to the corner joints (no glue for the bottom!) and clamp it up until the glue cures. I prefer band clamps for this task.

While the glue is curing, set up a 1/2" dado head in your table saw and make a shallow test cut in some scrap lumber. Surface some maple down so that its thickness fits perfectly into your test dado cut. Now you are ready to mill the legs (pieces 4) to the dimensions listed in the *Material List* on page 41. Strike a curved line on one of the pieces, as shown in the *Drawings*. Cut the curve on your band saw and sand it smooth to the line. Now use that completed leg to trace the curve onto the remaining leg blanks and repeat the process for each of them.

As shown in the photo below (left), I rounded over the curved edges of the legs using a roundover bit in my router table. Note that I used a screw clamp to hold the leg during this operation. It would be too dangerous to try to hold the pieces with your hands.

What in the World is Waney Wood?

Waney is the term for the rough and uneven natural edge on a board. Often there will still be bark and bits of fiber remaining.



The author cut a gentle curve onto the legs with his band saw (above) and then moved to the router table (below) to shape the edges with a roundover bit. He used a screw clamp to hold the legs for that process. To plow the dados into the corners of the box (right), the author created a sled jig that he attached to his table saw's miter gauge.





I built the sled by gluing together four layers of 1/2" plywood and trimming it into a 5" x 16" rectangle. Then I set my table saw blade to exactly 45° and bisected it across the 5" dimension. I flipped one piece over, and the exposed bevels created two 45° faces. I clamped the bases between two long "fences," gluing them in place. After adding a tall fence in back to clamp to the box, my sled was done.

Go ahead and cut the dados for the legs and glue them in place. Once again, the band clamp is a good choice here.

When the glue cured, I cut out an opening for the drawer. With a hand saw, I carefully cut down 1" as shown in the *Drawings*. (The cuts align with the inside face of the box ends.) Then I set up my router table with a straight bit and a couple of stops on the fence, and routed the drawer opening. It took a few passes, raising the router bit about 1/4" for each pass.

Building the Drawer and Top

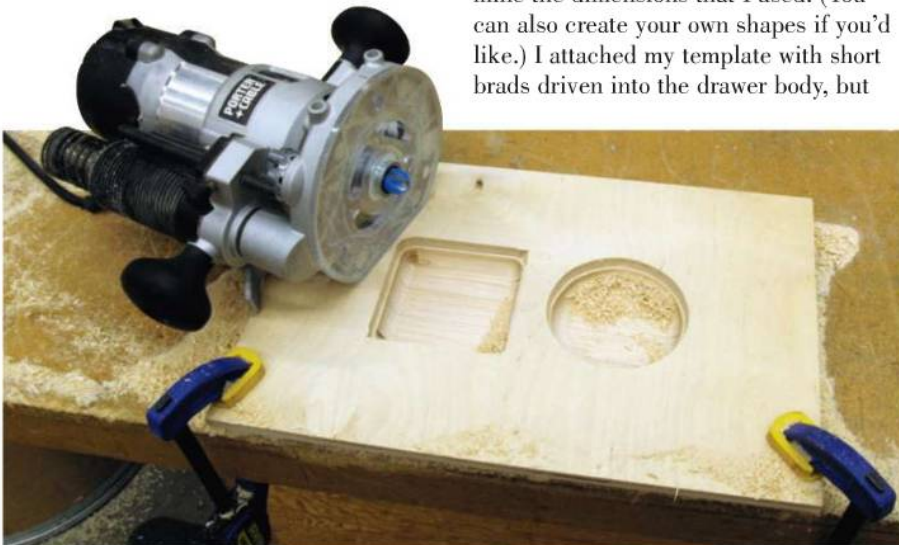
I mounted drawer supports (pieces 5) inside the box, level to the drawer opening. The drawer consists of a solid piece of wood that forms the drawer body and a drawer face made from the same material as the box (pieces 6 and 7).

As you can see in the photo below, I used a core box bit guided by a rub collar and a template to form the recesses in the drawer body. Use the *Drawings* to determine the dimensions that I used. (You can also create your own shapes if you'd like.) I attached my template with short brads driven into the drawer body, but



Soss hinges are mounted in small mortises (top photo). The author used a drill press to remove a good bit of the waste and followed up with a sharp chisel to complete the task (bottom).

Once the legs were completely machined, I was ready to move on to forming the corner dados. The legs are housed in dados on the four corners of the box. I cut them using a sled that held the box at 45° to the dado head. I secured the sled to my table saw's miter gauge with a couple of screws, and it worked like a charm (see previous page).



This little piece of wood from Africa went from the burn pile to becoming the focus of a classy little box.



The author used small brads to secure his routing template to the drawer body. Double-sided tape is another good solution.

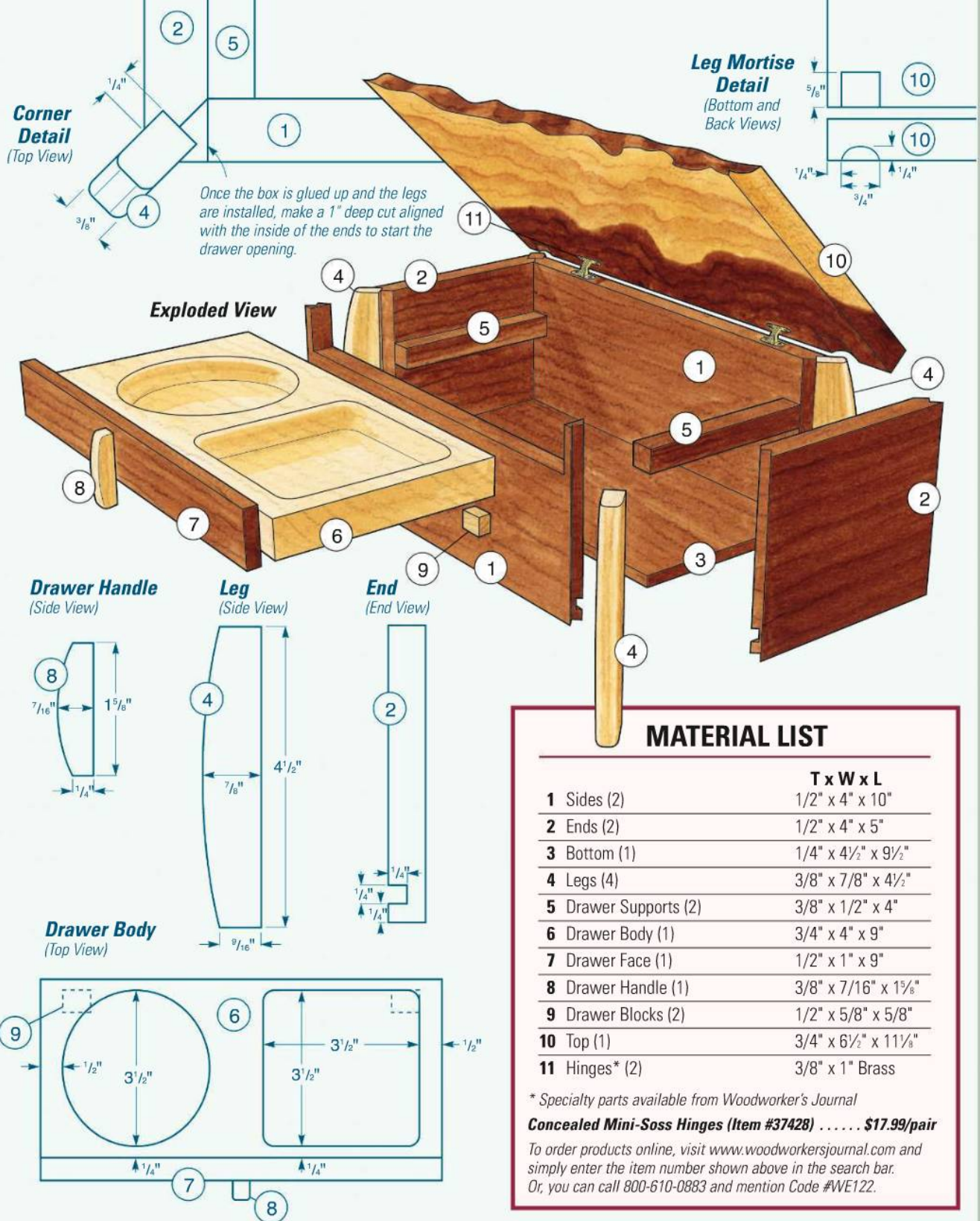
double-sided tape would work, too. When you've completed the routing, place the drawer body in the box and locate the drawer front on the body. Mark the location with a pencil and then glue the face to the body. Now you can make the drawer handle (piece 8) in the same manner as you made the legs. Locate it in the center of the drawer face, and glue it flush to the top edge. With that done, make the drawer blocks (pieces 9) and glue them to the bottom of the drawer body (keep them just far enough from the edge to clear the drawer supports). These blocks and the pull form three legs upon which the drawer sits when it is removed.

Here's a fine opportunity to give the whole box and the drawer a good sanding, taking it up through the grits.

Adding the Top

Now you are ready to make the top (piece 10). As I stated at the beginning of this article, my top was made from a really interesting piece of bubinga. I cleaned up the wane edge of the top with a brass brush, to remove any loose pieces. In truth, this box would look good with a pretty piece of wood of any species — that will be up to you to decide. But there are a couple of important details that you should know about the top.

To shape the storage areas, a template guided a router fitted with a rub collar and a core box bit removed the waste from the drawer body.



I used Soss hinges (pieces 11) in the top because they are strong and attractive. Sadly, they are also a bit of a pain to install. Drill out mortises for the hinges in the box first. I used a drill press to remove most of the waste and then followed up with a sharp bench chisel for the final fitting. When you've got that done, carefully transfer the hinge locations to your top workpiece. Repeat the procedure and then temporarily mount

the top. Now mark where the legs meet the underside of the top when it is opened. I used a Dremel tool to carve out two little mortises that allow the top to open to a full 90°. Sand the top and you are ready to apply the finish.

In this case, I applied a wash coat of amber shellac thinned 25% out of the can with denatured alcohol, just to add a bit of amber coloring to the wood and to seal the pores. Then I sprayed a couple of coats of

lacquer, de-nibbing between the applications. When the finish cured, I remounted the top and the box was completed.

It is funny how things work out. This little piece of wood from Africa went from the burn pile to becoming the focus of a classy little box. Now I'll always take a second look at waney-edged scraps!

Brad Becker is a professional woodworker and a regular contributor to the Journal.

Build a Toy Airplane

By Rob Johnstone

Building wooden toys makes for great fun in the shop — and you end up with “heirloom” quality gifts at the end of the day! This little plane can be made from leftovers in your scrap lumber bin.



It was the middle of the 1980s, I was self-employed, times were lean, and the holidays were fast approaching. Although my children were small, I still wanted to give them something special — and, as I had more time and wood than I did money, I decided to build each of them a wooden toy. This airplane is based on the one that I gave

my son that year. This version has a couple of improvements ... it has a pilot that is secured by a magnet, and it has wooden axles and pegs where the original had screws, but all in all, it is the same airplane that was played with for many years after that Christmas.

First Things First

Wood selection for this toy is pretty much up to you, but a variety of species will add a little color. I used walnut for the wheels, pine for the wing and propeller and cherry for the fuselage. Other than the axles, magnets and the little pilot, I had all this material lying around my shop.

Art director Jeff Jacobson made the scaled drawings you will find on

pages 44 and 45, and I used them to fabricate templates for the wings, propeller and fuselage from 1/4" hardboard. Even if you are making only one of these, I would take the time to make templates. If you decide to make a few, they're a must-do task.

The fuselage (piece 1) is made from 1 3/4" stock. You can glue up stock to get to that thickness if you need to. Mill the fuselage blank to size and then trace out the shape using your template. Mark the fuselage with the locations of the axle holes and the pilot's seat as shown in the *Drawings*. Although it may seem odd, the next thing to do is to chuck a 7/8" Forstner bit into your drill press and bore the hole for the little pilot (piece 2). With that done, move to the band saw and saw out the tail section of the plane, leaving the



rest of the blank squared up. The reason for this is that you will now narrow the tail section on your jointer. (If you don't have a jointer, you can do this on the band saw.) As you can see in the bottom right photo, the way I skinnied-up the tail section of the plane was by setting my jointer to its deepest cut, clamping a stop block onto the outfeed table and carefully advancing the blank over the cutterhead. Note that I used a shop-made push block that is almost as long as the fuselage blank. The part of the blank that remains squared up is held securely against the fence. Do this to both sides.

Now you can take the fuselage blank back to the band saw and cut out the front section of the fuselage. Go ahead and drill the axle holes and peg hole for



Here the author forms the 7° angle on an over-long piece of stock. He chose to make the piece long enough to easily make two wings.

the propeller, then set it aside for now.

Make the wing (piece 3) out of 1/2"-thick stock. Before you cut the wing down to length, it is a good idea to cut an over-long piece to width so that it will be easier and safer to cut the 7° angle onto the top face of the wing (as shown in the photo above). Note that I used a featherboard and push stick for this procedure.

At this point, you can go ahead and trace the wing's end shapes onto the blank and saw it out using a band saw or scroll saw. Bore the mounting peg holes and set the wing aside.



Mark out the shape of the airplane's fuselage with the aid of a template. A template will allow you to make several toys with ease.

Smoothing It Out

While sanding is necessary, it is not the most fun you will have in the shop. Sanding the wing and fuselage is best done on a spindle sander, or in my case, an oscillating belt sander. I was actually able to completely shape the propeller of the plane (piece 4) by using just the sander (see photo on following page).

Where possible, I rounded over the edges of the wing and fuselage with an 1/8" roundover bit in my router table, but not every part of the plane can easily be reached by the bit. The remaining edges of the plane must be broken by hand using sandpaper. I also finish-sanded the pieces by hand up to 150-grit paper.



Bore the hole that will hold the pilot while the fuselage blank is still squared up. The author used a 7/8" Forstner bit in his drill press.



Begin by cutting out the tail section of the fuselage blank. Leave the front section squared up to assist with the jointing step.

To narrow the tail section of the fuselage, the author took a single pass on both faces with his jointer set at 3/16" deep. In the inset photo, the guard is removed to illustrate the stop block, cut and full-size push block.





Sanding the airplane parts smooth is done more easily with a power sander of some sort. The author uses an oscillating belt sander. Below, he shapes the propeller on the sander (inset).

Rolling Along

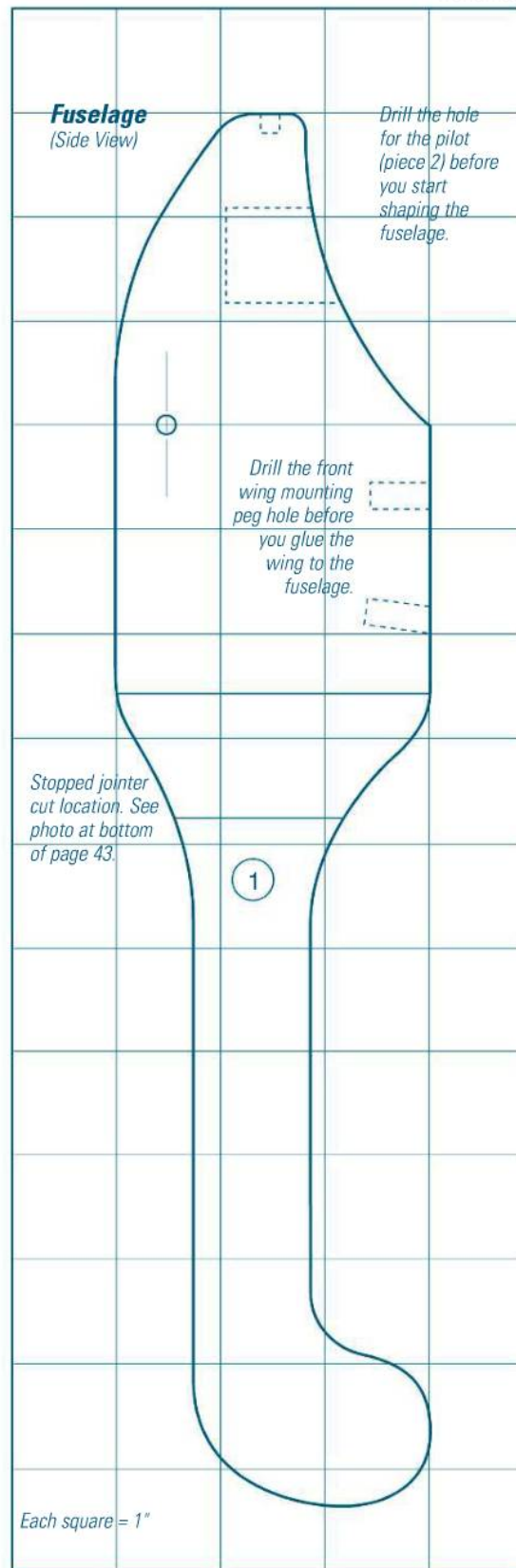
A toy like this would be pretty lame without operational wheels (pieces 5). The wheels in this case are made in a sequence of drilling operations on the drill press, as shown at left. First, using 1/2" stock, rip a strip to 3 1/2" wide. Next, mark lines every 4" and strike a center line. Chuck a 1 3/8" Forstner bit in the drill press and bore the hubcap holes 1/8" deep (photo 1). Switch to a wing cutter bit set to form a 3" circle and bore right in the center of the hubcap holes (photo 2). Only cut halfway through the stock. Flip the stock over and complete the cut from the other side, aligning on the holes bored through the stock (photo 3). I sanded the edges of the wheels smooth by mounting a pair on a carriage bolt with a wing nut, chucking it into the drill press and sanding as shown in photo 4. You will need to expand the axle hole to a full 3/8" to mount the wheels.

To attach the wing to the body, drill only one of the peg holes in the top of the fuselage as shown in the *Drawings*. Apply glue to both pieces and use the peg to help locate the wing. Clamp the wing to the fuselage, checking to be sure it's square to the body. After the glue cures, drill for the second pin and glue it in place.

I found a can of spray shellac to be an effective way to apply a good clear finish to the toy: I used three coats with a rub-down of 0000 steel wool between them. Finish the wheels and propeller separately before you glue them in place.

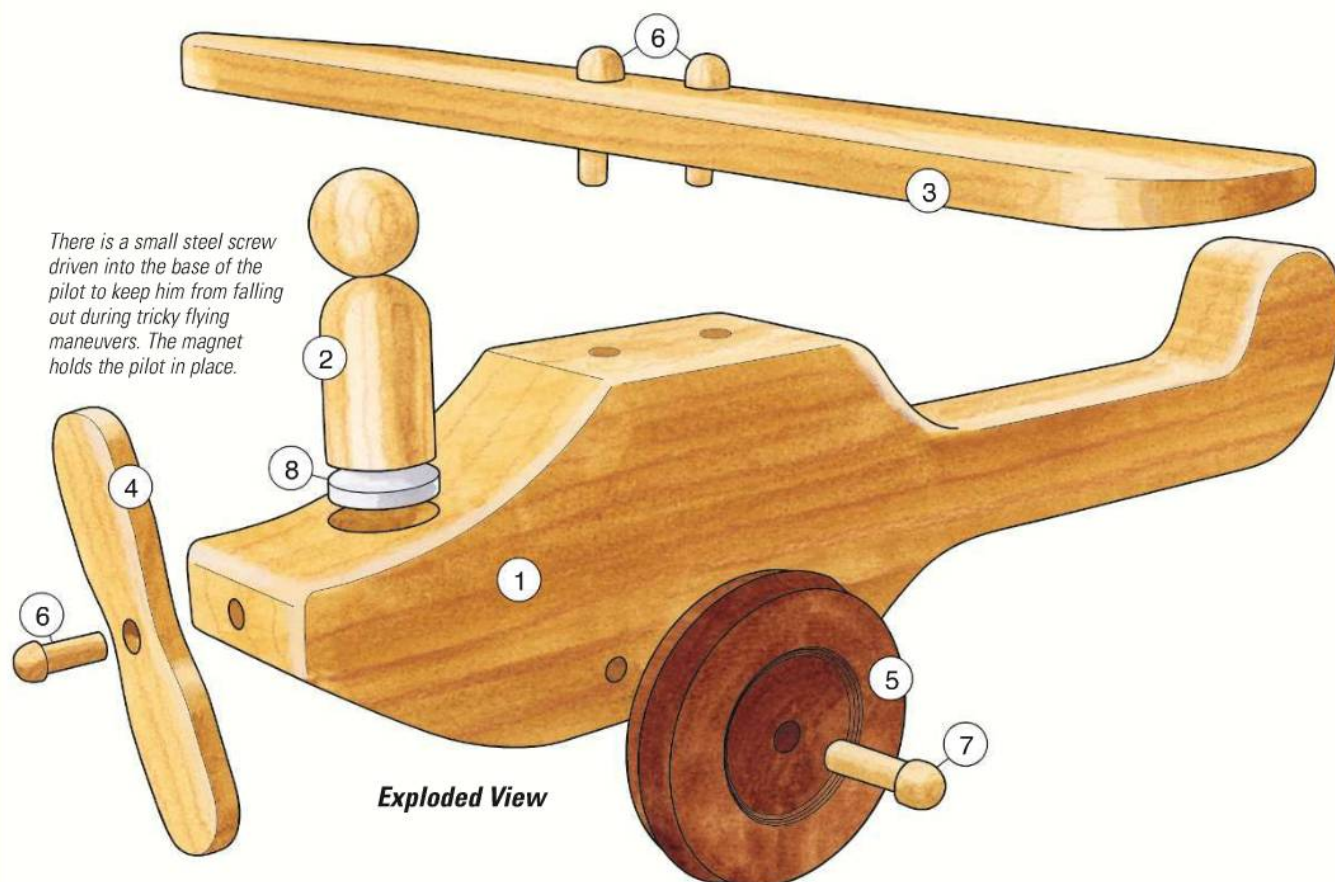
You will need to cut the pegs for the propeller and the axles (pieces 6 and 7) shorter using a hand saw as they are too long out of the package. Before you attach the wheels, put a light coat of beeswax on their inside face. Attach the wheels with the axles, allowing the wheels to spin freely. Mount the propeller in the same way and allow the glue to cure.

Make the Wheels

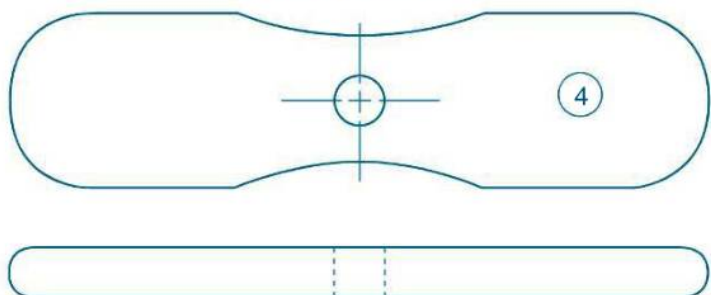


The last task is to drill a small counter-sunk hole for a screw in the bottom of the pilot and then epoxy a rare earth magnet (piece 8) into the hole you drilled for the pilot. Now he won't fall out during acrobatic maneuvers. Now all that's left is to find a deserving 4-year old!

Rob Johnstone is editor in chief of the Woodworker's Journal.



Propeller
(Full-size Top and Side Views)



MATERIAL LIST

	T x W x L
1 Fuselage (1)	1 3/4" x 3" x 13 1/4"
2 Pilot (1)	7/8" Dia. x 3 3/8"
3 Wing (1)	1/2" x 2 1/2" x 13"
4 Propeller (1)	3/16" x 7/8" x 3 1/2"
5 Wheels (2)	1/2" x 2 1/2" Dia.
6 Small Pegs (3)	7/32" Dia" x 1 1/4"
7 Axles (2)	11/32" Dia. x 1 5/8"
8 Magnet (1)	1/8" x 3/4" Dia.

Wing
(Top and End Views)



Toy Airplane Supplies

The following supplies are available from Woodworker's Journal.

Maple Pegs (1 pack required) #21691.\$1.29 pk.

Maple Axles (1 pack required) #21725\$1.49 pk.

Pilot (1) #21865\$1.09 ea.

Rare Earth Magnets (1 pk of 10) #37554\$16.99 pk.

Wing Cutter (1) #42887\$32.49 ea.

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Twelve-piece Puzzle

By Chris Marshall

Here's a tessellating teaser to get little ones interested in a classic pastime — and a fun project you can make in an afternoon.



Kids today are excited by ultrarealistic video games and 3D movies that take them into virtual worlds. But, put a classic picture puzzle in front of these junior cyber wizards, and they might just do the same thing we did when we were their age: dump it out and start shuffling the pieces together. There's something about an old-fashioned puzzle that can still captivate kids, especially if you start them young.

This beginner's puzzle is sturdily made and simple enough to keep a little one engaged but not frustrated. We're using the otter image shown here by permission; it's from a new book titled *Saving Squeak: The Otter Tale*, by Jennifer Keats Curtis (Schiffer Publishing, 2010 ISBN 978-0-7643-3588-4), it was

illustrated by Marcy Dunn Ramsey. While we can't provide the image for wider distribution, you can download the puzzle piece grid using our "More on the Web" link, or mail us a self-addressed and stamped envelope and we'll send you a copy (see page 48). You can choose any image or photo for your puzzle's theme, provided it can be trimmed to a final 8" x 10½" size.

Applying the Puzzle Grid and Face Image

Quarter-inch-thick MDF makes a good substrate for the puzzle pieces, because both faces are tempered and smooth and there's no risk of splinters. Cut an 8½" x 11" blank (piece 1) to shape.

The basic process to prepare the puzzle pieces for cutting involves applying the puzzle grid to one face and the main image to the other. Your first inclination might be to spray-mount or glue them both in place, but I'd like to suggest a different



It's easy to transfer the puzzle piece grid to your MDF blank by wiping acetone over the back of the paper template. The solvent releases laser printer toner and fixes it to the MDF.

approach. If you affix the puzzle grid paper to your substrate, you'll probably want to sand it off when you're finished. That's a tedious and unnecessary job. All you really need is the outline of the shapes anyway, and here's how to get it: Print out the grid using a laser printer. Then, position it print-side down, and wipe the back of the paper liberally with acetone. The solvent will release the black toner onto the MDF and transfer the grid (see top photo). If you have an ink-jet printer, you can accomplish the same result using special inkjet transfer paper (available from craft stores or online) and ironing the printout with a household iron set to high heat.

With the grid applied, flip the puzzle blank over and mount the face image. I used spray adhesive, but you could also brush on a thinned washcoat of white or yellow glue. Flatten the image with a J-roller or a piece of scrap wood wrapped in a towel. When the adhesive cures, spray aerosol shellac over the face to seal in the image and stiffen the paper fibers. It will help prevent tearout during the cutting stage. I applied three light coats.

Trim the puzzle piece blank to its final size of 8" x 10½" now.

Cutting Out the Pieces

Ragged edges are the enemy of these puzzle pieces, so I took two preemptive measures: First, I drilled a tiny hole in the center of a large piece of scrap plywood to act as zero-clearance support around my scroll saw blade. Stick this backup board to your saw table with a strip of double-sided carpet tape.

The contours of these puzzle piece shapes certainly aren't intricate fretwork, but I still selected one of the finest-tooth blades available for my saw: a 5R 12.5 tpi reverse tooth. It left clean,

When cutting out the puzzle pieces, keep the cut moving smoothly to avoid rough spots on the edges. The author used a backup board taped to his table and a fine, reverse tooth blade to help prevent ragged cuts.



Attach the project's face image to the other side of the puzzle piece blank with spray-mount adhesive or thinned glue. Roll it to flatten any air bubbles trapped underneath, then topcoat with spray-on shellac.

crisp edges on both the top and bottom faces of the pieces — exactly what I wanted. Instead of cutting the puzzle pieces out one at a time, I sliced off a row of four from the larger blank and cut the row apart. Just bear in mind that it's more important that your puzzle pieces have smooth, flowing edges than that they follow the pattern grid exactly. Keep the puzzle stock moving through the blade in one continuous operation, and don't stop. Hesitation can lead to rough edges.

Making the Frame Parts

The puzzle's frame consists of a base piece of plywood or MDF wrapped with rabbeted and mitered rails. Cut your base (piece 2) to size. I made mine about 1/32" larger in length and width to provide a slightly looser fit around the puzzle pieces when they are assembled. Sand the faces of the base up to 180-grit.

The long and short frame rails (pieces 3 and 4) are only 1/2" thick and 1" wide, and they require a 1/4" x 1/2" rabbet to fit around the base. That's not a





On stock this thin and narrow, one way to introduce more safety into the operation is to mill two rails at once from wider stock, then rip them free after the frame rabbets are cut. Control the stock with a featherboard.



Miter-cut and dry-fit all four rails onto the frame base to make sure the joints will close properly during the gluing stage. A small band clamp like this one can provide even clamping pressure all around the frame.

lot of stock between you and a spinning dado blade. So, I made my rails from wider material for safety and ripped them free. To prepare the saw for milling the dadoes, I buried my dado blade partially into a sacrificial fence clamped to my saw's rip fence. Raise the blade to 1/2" and extend it 1/4" out from the fence. Install a featherboard in the infeed side of the blade to keep the rail stock pressed firmly against the fence when you make your cuts (photo above). I also used a thin push stick engaged in the shoulder of the rabbets to feed the wood over the blade. After rabbeting, cut the rails to final width.

Fitting the Mitered Rails

When it comes to fitting mitered corners, no matter how large or small, I wish I knew some magic tricks. I don't. My method is to make a few test cuts on scrap to dial my miter saw carefully to 45°, then mark and cut the pieces one at a time. I tend to work my way around a frame so I can cut and fit each joint in sequence. The last corner is never easy, but make the fourth rail a hair longer than needed, and creep up on the final joint with your miter saw or with a disc sander.

Spread glue on both the rabbets and the edges of the frame base, and install the moldings with clamps. I have a small band clamp with corner fixtures that make this job a whole lot easier! I clamped up the entire assembly at once and adjusted the corner fixtures as needed until the joints closed properly.

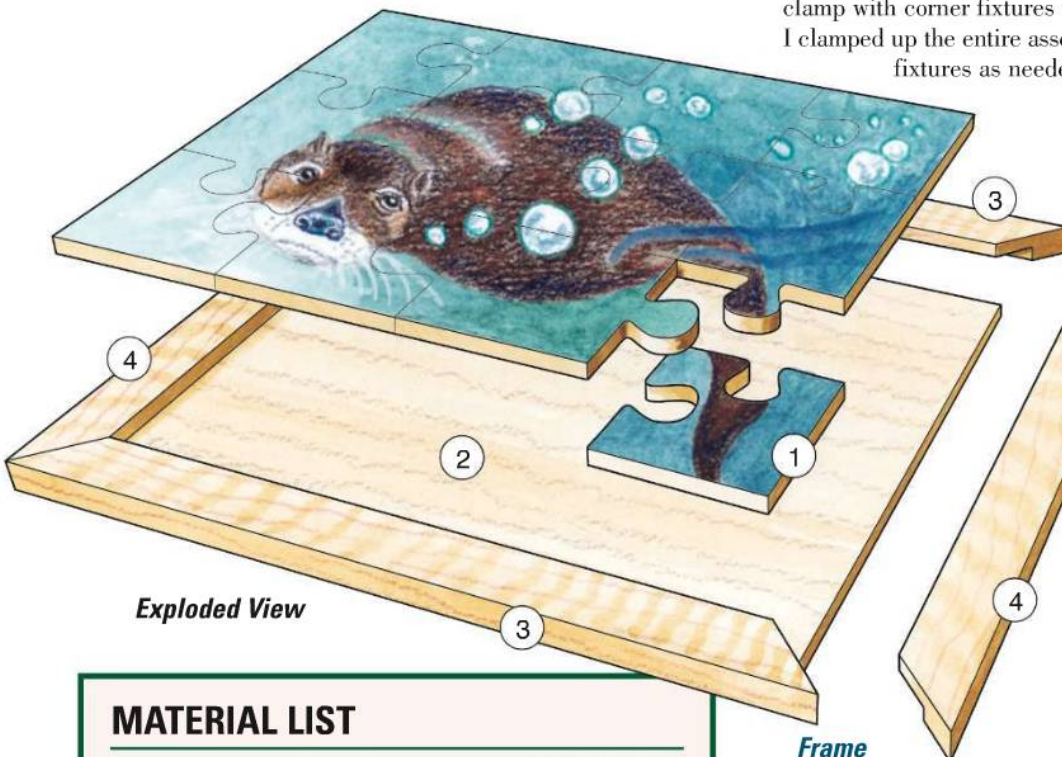
Finishing Things Up

My puzzle's frame stock is curly maple. To "pop" the figure, I sanded the wood up to 400-grit and wiped it with boiled linseed oil. It really accentuates the depth. Once the oil dried, four coats of spray lacquer wrapped the project up. Now, all I have left to do is give this puzzle away ... that is, after I assemble it a few times myself.

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

MORE ON THE WEB

For a free, downloadable PDF version of the puzzle piece pattern, please go to woodworkersjournal.com and click on the icon shown above. For a printed pattern of the puzzle pieces, send a SASE to: Woodworker's Journal, Puzzle Pattern, 4365 Willow Drive, Medina MN 55340.

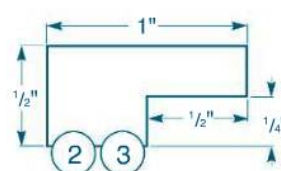


Exploded View

MATERIAL LIST

	T x W x L
1 Puzzle Piece Substrate (1)	1/4" x 8" x 10 1/2"
2 Frame Base (1)	1/4" x 9" x 11 1/2"
3 Long Rails (2)	1/2" x 1" x 12 1/2"
4 Short Rails (2)	1/2" x 1" x 10"

Frame
(End View)





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Today's Shop

10 Must-have Router Bits

By A.J. Hamler

Every bit changes a router into a different tool, making it the most versatile machine in today's shops. Here's one woodworker's choice of 10 essential bits.

There's a huge range of router bits out there; we take a look at the ones that should always be at the head of the line.

It's a router bit jungle out there. The various profiles alone would account for several score, but considering that each router bit you'll find

comes in a range of diameters, lengths, angles and other variations, the number of available bits increases exponentially — there are literally hundreds.

If your routing needs are decorative, you'll find numerous bits that create attractive edge treatments,



Flush
Cutter

Straight
Bit



*Rabbeting
Bit*



*Roundover
Bit*



*Cove
Bit*



*Chamfer
Bit*



*Stile/Rail
Bit*



*Slot-cutting
Bit*

moldings, panels, fluting and millwork. Likewise, if you look at your router as an essential joinery tool, you'll find bits for dovetails, dados, rabbets, locking miters, finger joints and more. And if you have some other way to use

this tool, consistently cited as the most versatile in the shop, you'll undoubtedly find a router bit specifically for that purpose, too.

A router's not really a tool at all, just a spinning motor. It doesn't become a tool until you chuck a bit into it. But once you do add that bit, it defines the kind of tool that

router becomes. How you define it is up to you.

With that in mind, you could stock up on every bit there is. Or, you could buy 10 of the most useful bits and you'll be covered for 99 percent of what you'll need in the workshop. But which bits make up the perfect top 10?

I'm glad you asked ...



*Roman
Ogee*



*Dovetail
Bit*



*Pattern
Bit*

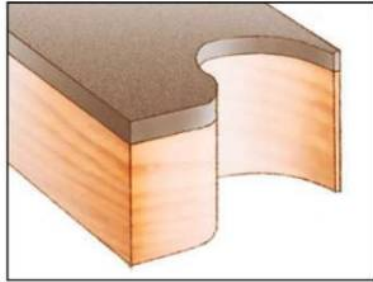
Today's Shop continued



Flush Cutter

Flush cutters are the go-to bits for achieving a smooth, flush edge on laminate countertops.

Pattern Bit



When used with a template, the shank-mounted bearing on a pattern bit helps turn out multiple parts, all identical.

Flush-trim/Pattern Bits

Would you like to be able to make identical curves or shaped details on more than one piece of stock? Then you need a flush-trim or a pattern bit. With the bearing at the top (the end opposite the bit's shank), it's called a flush-trim bit and, as the name implies, trims one surface flush with another. The most obvious use is trimming applied

laminates level with the edge of a countertop — that one function makes a flush-trim bit the most common bit used with laminate trimmers — but it can really make just about any two surfaces flush. The bit does this with cutting edges that are exactly even with the guide bearing. As the bearing rides one surface, those cutting edges level the adjacent surface with the first.

Move that bearing to the bit's shank, and it becomes a pattern bit. It functions in the same way with cutting edges that are even with the bearing's rim, but in this case the bearing generally follows a removable template affixed to the top of a workpiece rather than a permanent surface. By rough-cutting the workpiece slightly larger than

the template, the bit will turn out multiple finished pieces, each matching the template exactly. All you need to do is temporarily attach the template, use it to guide the pattern bit, then remove the template and attach it to the next workpiece.

While they can be used in table-mounted applications, flush-trim and pattern bits are most typically used in a handheld router.

Straight Bits

If you could only have one bit, one that would still make your router the most versatile tool you own, it would be the jack-of-all-trades straight bit. Used with a fence on your router table, a beefy straight

Today's Shop continues on page 54 ...

A Few More Desirable Bits to Consider ...

There are lots of bit profiles out there beyond the 10 must-have bits. Here are a couple more you might find useful.

Round-nose bits (also called core-box bits) — Because they cut rounded grooves, they're ideal for sign making, fluting, decorative grooves, finger-pulls, moldings, millwork and more. Typically used with plunge routers, but in a router table with fence or handheld router with an edge guide, they'll also cut coves.

Raised-panel bits — Create the profiled edges on door and other panels. Single-cutter bits shape only one face, but two-cutter bits form the front and back of a panel at the same time. These bits are among the most massive and must always be used in a table setup. They also take off lots of stock, so multiple passes are necessary.

Specialty molding bits — These are use-them-once-in-a-blue-moon cutters. They'll never see daily duty in your shop, but for a special project requiring an intricate edge, they're well worth their price. The one shown at far right below makes a beautiful table edge.



Round-nose or core-box bit



Panel-raising bit



Specialty molding bit

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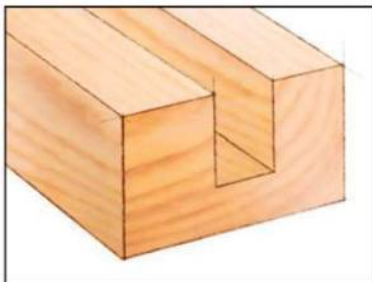
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Because it has so many applications, the straight bit is easily the jack-of-all-trades of router bits.

Straight Bit

bit can make rabbets and tenons, while a narrow-diameter straight bit cuts spline-slots, grooves and inlays like a champ. Paired with the right jig, it'll turn out perfect box joints.

Need dados? A straight bit can make 'em fast on a router table or via a handheld router used with a guide. Routing handheld with the appropriate guide or jig, a straight bit can cut hinge, lock and joinery mortises, and can even level a tabletop. With a suitable fence arrangement, a straight bit turns your router table into

an edge jointer. And that's just getting started — as you just read, if you add a bearing to a straight bit, it becomes a whole different kind of cutter.

Because they can do so much, straight bits come in probably the largest range of sizes — both diameter and length — of any standard router bit, meaning that you can more easily size the bit to the job. Straight bits are often sold in sets offering different diameters and lengths. Specialized straight bits are also available, such as slightly undersized bits for creating perfectly snug dados to house plywood that often

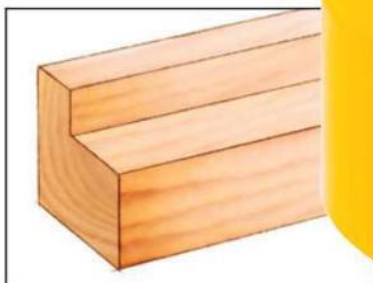
arrives undersized of its nominal thickness.

Rabbeting Bits

Yet another adaptation of a straight bit, a rabbeting bit sports the same cutting edges but places them on a shorter, wider body. The top-mounted bearing rides the workpiece, while the cutting edges create the rabbet. The diameter of the bit combined with the depth of cut determines the size of the rabbet.

Rabbeting bits can be purchased in a variety of sizes depending on your joinery needs, but there is a one-size-fits-all version that uses a single bit with interchangeable bearings. Although the bit diameter doesn't change, the different-size bearings alter how much of the cutter length is exposed to the edge of the workpiece. Typically, these adjustable rabbeting bits come in a set with bearings that will create rabbets from 1/8" in width using the largest bearing, to 1/2" wide with the smallest. The number of bearings included varies with manufacturer, and some sets even include a bearing that exactly matches the overall diameter of the cutting edges, which can effectively turn the rabbeting bit into, you guessed it, a flush-trim bit.

Rabbeting Bit



Interchangeable bearings allow rabbeting bits to be adjusted for cutting several rabbet sizes.

Today's Shop continues on page 56 ...

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Large and small roundover bits

Roundover bits are sized by the radius of their curve. Shown here are a 3/4" bit (above) and a 1/16" bit.



Roundover Bits

The perfect choice for easing sharply squared edges, roundover bits are sized by radius. (Imagine that curved edge as part of a circle — the bit size corresponds with the radius of that full circle.) Sizes start at 1/16" radius (middle left photo) that barely breaks a square edge — in fact, unless you have a lot of edges to do, you might be better off using a sanding block for that kind of roundover — on up to a 1 1/2" radius bit that is probably far larger than most shops would need. (Even larger roundover cutters exist, but they're more suited to industrial applications.) You can buy a set with several bits, but if you're like me, you'll probably use the 1/4", 3/8" and 1/2" radius bits most often.

Roundover bits are normally used to create a smooth, even curve on a workpiece, but they also have one sharp cutting edge at the bottom of the radius that creates a 90-degree cut at the top of the roundover if the bit is fully extended. Used in this manner, a roundover bit makes a decorative thumbnail edge. A variation on the roundover bit has these 90-degree cutting edges both top and bottom, and it is often called a beading bit. The bit creates a curve bounded on each end with a 90-degree corner.

Cove Bits

Cove bits are the mirror image of roundovers, creating a concave profile. Useful and attractive in their own right for decorative edges on tables, they are often used in combination with other bits to create intricate moldings (nearly every molding I've

seen incorporates at least one cove). Paired with a matching roundover, you can create rule joints for drop-leaf tables.

Like roundovers, cove bits are sized by their radius and are often sold in sets. As with most sets, you'll likely find yourself not using the bits at each end of the size range; unless you regularly make a lot of molding or have other needs for concave routing, you're probably better off getting multiples of the specific sizes you need. For creating coves on the edge of 3/4" stock, a 3/8" or 1/2" bit will prove the most useful.

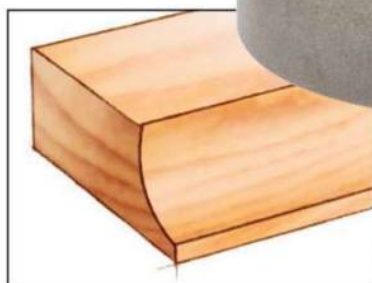
Because they're round (looking at a cove bit edge-on, it's really a hemisphere mounted to the shank), there's a lot of metal there, making for a heavy bit. Larger radius cove bits should always be used in a router table.

Ogee Bits

When it comes to edge profiles, few are more attractive than the ogee. Ogee bits come in a huge range of shapes and sizes, but all are based on some form of the basic "S" shape. This S-curve can be shallow or deep, narrow or extremely wide. A plain ogee bit (see photo on next page) is a simple S-curve, but it still lends an elegant profile to workpieces. A Roman ogee bit (see page 51) creates a profile that has a steeper curve to the S-shape, and adds a 90-degree cutting edge at the bottom of the curve that creates a bead at one end of the profile. The shape of the profile can get quite intricate, with any combination of notches and grooves as part of the curve.

Today's Shop continues on page 58 ...

Cove Bit



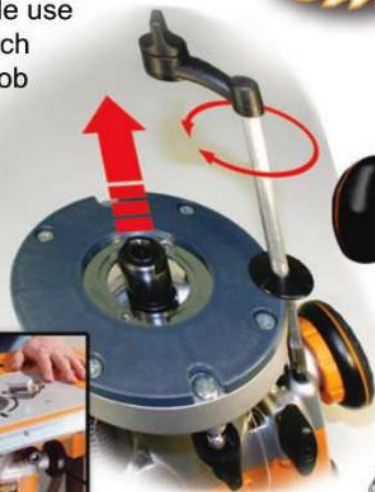
By themselves, cove bits are most useful for edge treatments; but combined with other profiles, they are frequently the basis for intricately shaped moldings.



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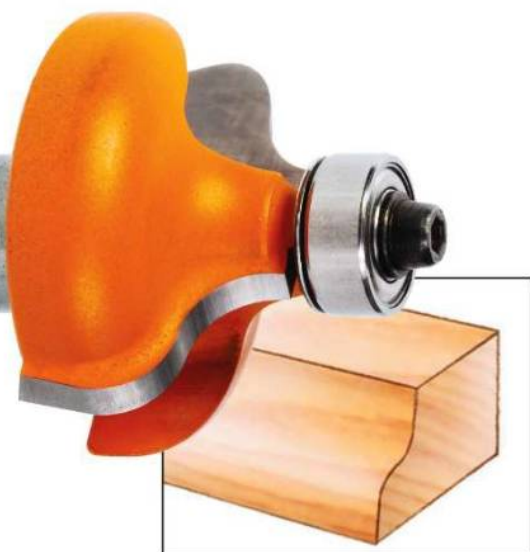
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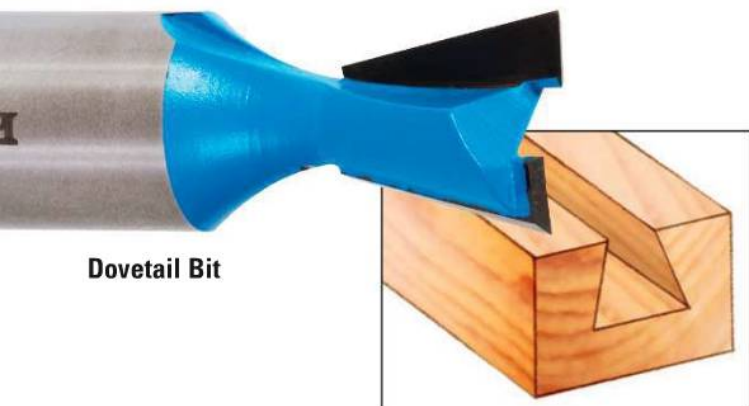
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Ogee Bit



With a graceful S-curve at their heart, ogee bits lend themselves well to both decorative edge treatments and moldings.

Dovetail Bit



Dovetail bits, used in a router table or with a jig, are the fastest and most accurate way to cut perfect dovetails every time.

Chamfer Bit



The angled profile of chamfer bits makes them a good choice for creating miter joints, cooping and doing basic edge treatments.

As with cove bits, ogees are often combined with other bit profiles when creating molding. Ogee bits with extremely wide diameters are often used to create profiles on tables and, not surprisingly, are sometimes called table-edge bits. For safety, these large-diameter bits should always be used in a router table setup, and preferably with a variable-speed router so the rotational speed can be lowered a bit. The cutting edges of wide bits travel very, very fast; lowering the speed increases safety and reduces burning — multiple passes are recommended.

Dovetail Bits

For machining dovetails, there's really only one choice, but it's a perfect one. Dovetail bits make dead-on angled slots in a single pass, and they can be used with a number of jigs and templates. (For template use and for many commercial jigs, you'll want a dovetail bit with a shank-mounted guide bearing.) These bits excel at making traditional dovetails, of course, but used in a router table with a fence, they're also your best choice to create sliding dovetail joints useful for carcass joinery. These sliding dovetail joints are like dados on steroids: They have the strength of a regular dado, plus the locking power of a dovetail. Unlike traditional jig-made dovetail joints that are made with a combination of dovetail and straight bits, sliding dovetails use the same bit for both the angled groove and the tongue — a single pass is all you need for the groove; one pass on each side makes the tongue.

Dovetail bits are available in a variety of angles, from 7 to 18 degrees, with 14 degrees being the most commonly used. For sizing your dovetails, you'll find bits in a range from about 1/4" to 1" in diameter.

All router bits should be kept sharp, but this is especially the case for dovetail bits — a dull bit makes for truly ugly dovetails with lots of “furry” tearout.

Chamfer Bits

Chamfer bits make a single kind of cut — a straight angled edge — but, depending on the bit's cutter angle, you can make it do a number of tasks. A 45-degree chamfer bit can create perfect miters for boxes. Other angles can be used for cooping (a 11.25-degree bit makes the correct edge angle for a 16-segment polygon). Like a roundover, a chamfered edge can ease sharp corners. Laminate installers often use a chamfer on countertop edges.

Available cutter angles depend on the manufacturer, but you should be able to easily find 11.25, 15, 22.5, 25, 30 and 45 degrees. You'll probably use a 45-degree chamfer more than any other. Since the size of a chamfer is controlled by how far the bit is extended from the router, it's not surprising that there are somewhat fewer sizes of chamfer bits available than other styles.

Slot-cutting Bits

You can cut slots on the table saw, but doing them on the router table with a slot cutter has some definite advantages. For one thing, you'll get perfect flat-bottomed cuts,

something not all saw blades can do. And, because they cut horizontally, creating slots in the edges of extremely wide stock is far easier and safer than attempting to balance the same workpiece vertically against the fence on your table saw.

You can also buy slot cutters in a variety of thicknesses — usually 1/16" to 1/4" — and in versions with and without guide bearings. As with rabbeting bits, some slot cutters come with a set of different-sized bearings to adjust the slot depth. Slot cutters typically come with either three or four cutting edges or “wings.” However, some newer slot cutters use a pair of two-wing cutters that stack atop one another on the shank, using thin shims to adjust slot width the way a set of dado blades does.

A slot-cutting bit can also be used to turn your router table into a biscuit joiner. In fact, some manufacturers sell cutters specifically sized to commonly available biscuits.

Stile and Rail Bit Sets

Stile and rail bits — sometimes referred to as “cope and stick” bits — most commonly come as a set of two bits that facilitate the creation of truly accurate frame-and-panel joinery. Because cut profiles on stiles and rails must match perfectly, it’s not surprising that the bits are mirror images of one another. Some “sets” are really single bits that stack one arrangement of cutting edges above the other, making for a fairly tall bit.

In use, you would first make all of your stiles (or rails). Then remove the bit and install its mate in the table, using one of the finished workpieces as a guide to get the height set correctly for machining the mating rails (or stiles). Using a single-bit stile-and-rail cutter is the same process, but there’s no need to remove the bit. When finished with your first set of parts, raise or lower the bit as appropriate so the new cutters come into contact with the workpieces, then cut the matching profiles.

Getting these bits set up accurately can be a trial-and-error process, so be sure to make some expendable practice workpieces to get the setup just right before routing your real workpieces. Once you have the bit set to your liking, cut off and save a short segment of that practice

workpiece; it’ll make setting up and repeating the cut that much faster in the future.

Stile-and-rail bits must always be used in a router table. These heavy bits have a lot of metal and a lot of cutting surfaces and angles, making them difficult to control in handheld routing. Restricting their use to the router table is not only much safer, but the rigidity of the table-and-fence setup also makes for better control and more accurate routing.

*A.J. Hamler is a regular contributor and the author of the book *Civil War Woodworking*.*

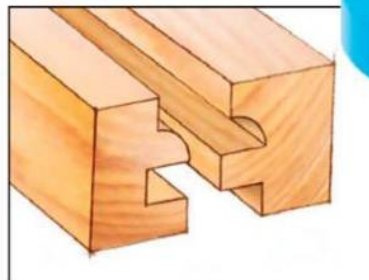


Slot-cutting Bit

Like a mini saw blade in your router table, slot-cutting bits create perfect thin grooves. Unlike a table saw, however, they can also cut short slots for biscuits.



Stile and Rail Bit Set



For making frame-and-panel doors, stile/rail bit sets are the perfect one-two punch for exactly matched stiles and rails.



10 Trim Router Techniques

... none of which involve laminate!

By Chris Marshall

Here are 10 ways to get your half-pint router out of the cobwebs and into the action much more often.



It's a sweet thing indeed when you get more than what you bargained for in a tool. Trim routers are a good example. They're lightweight, surprisingly powerful and small enough to go places other bulky routers can't. If you only use yours for trimming plastic laminate, think again. Here are 10 ways to get that half-pint router out of the cobwebs and into the action much more often.

Trimming Shelf Lipping

One of my favorite uses for a laminate trimmer is shaving solid-wood lipping flush on plywood shelving (top photo, right). The Festool MFK router shown here has an optional base that lets you flush-trim using a straight bit with the router resting on the shelf face for maximum stability. You can do the same thing with an ordinary laminate trimmer and a piloted flush-trim bit if you stand the router on the shelf edge. A trim router's compact size makes it a safe choice for this balancing act. Just set the bit a tad deeper than the edging thickness and zip the overhang away. Quarter- or 1/2"-thick edging is a breeze, but I've even used mine to flush-trim thicker 3/4" lipping or to bring face frame edges flush with cabinet carcasses. Bits with a sheer cutting angle leave a cleaner cut, especially on hardwood.

Profiling Edges

A laminate trimmer is a router, after all — just a small one. And, with horsepower ratings on some of these machines

achieving one or even 1½hp peak, that's plenty of power for routing edge profiles (bottom photo, right). I regularly grab mine for cutting tiny chamfers or roundovers to knock off sharp edges. In fact, I keep a 1/8" roundover bit in a spare trim router all the time so it's ready when the need arises.

But you don't have to stop here. Larger ogees, coves, beading and other edge shaping is certainly possible, too. Just follow good routing practices and use a sharp, clean carbide bit to remove the waste: start shallow on the first cut, and make a series of deeper passes after that, removing more wood each time. Make the last pass just a whisper deeper to clean away any last burn marks that may still be present.

Cleaning Up Veneer

Occasionally, I make veneer from pieces of resawn stock. I leave the veneer panel larger than necessary when applying it to its substrate. Then, a quick pass with a trim router brings the veneer edges into perfect alignment (top left photo, next page).

With thin veneer, you can use a climb cut when necessary and not be concerned with the router grabbing erratically. It's a good way to keep the veneer from chipping or tearing out at the corners. A solid-carbide laminate trimming bit or a flush-trimmer with a sheer cutting angle are both good choices for this application.

Continues on page 62 ...



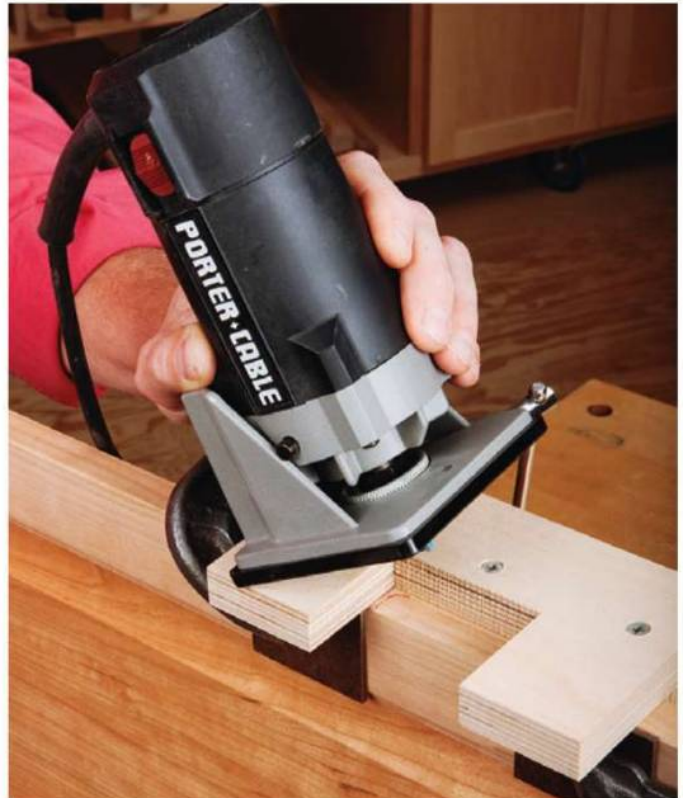
There's no reason to risk sanding through delicate face veneer when you can use a trim router to bring solid-wood lipping flush (above). Edge profiling (below) is well within a trim router's bag of tricks, provided you sneak up on the final cutting depth with several rounds of passes.



Shop Test continued



Pint-sized but potent, trim routers can flush-cut veneer (above left), mortise door hinges (above right) or handle part duplication with a piloted bit (below).



Cutting Hinge Mortises

There's nothing wrong with using a chisel and mallet for cutting door hinge mortises, but a trim router sure makes the job fast. I use a 1/4" straight bit inside a standard guide collar for this task.

With this setup, hinge mortising (top right photo) becomes a standard template-routing operation. I make a U-shaped template from scrap and fasten it to a base that I can clamp against the door frame. The template opening is sized to match the hinge leaf proportions, plus the amount of offset between the outer rim of the guide collar and the bit's cutting edges. The template not only creates one uniform mortise after the next so you can cut them production style; it also creates a larger platform to help steady the router. The process is downright foolproof.

A number of trim router models come with bases that take guide collars; if yours doesn't, you can usually buy an accessory sub-base that

will. Or buy a universal sub-base for larger routers, cut it to size and screw it to your machine.

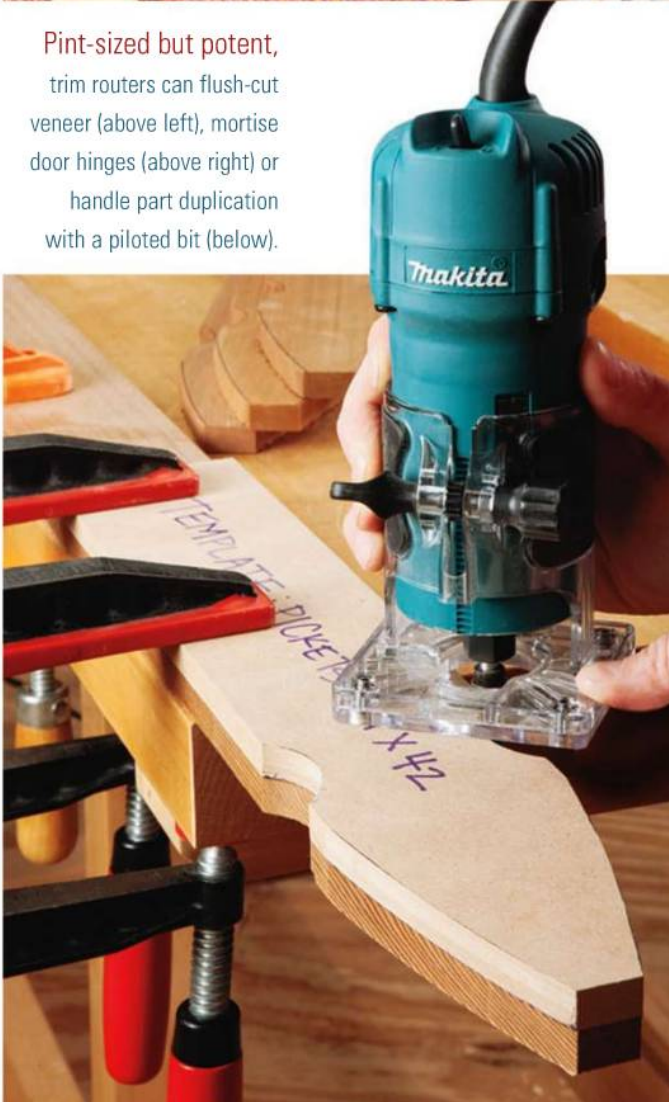
Duplicating Parts

OK, Chris, you really just mean template-routing, right? Yep, good old garden variety template work isn't just for mid- or full-sized routers. Think about it: it doesn't take 2hp to shave off 1/16" of material to bring 1x or thinner stock flush with the edge of a template (left photo). A trim router equipped with a top-bearing pattern bit will do this job just fine. Or, mount your template below the workpiece and use a long flush-trim bit instead. It works so well you might wonder why you need a bigger, heavier machine to do it — especially on smaller or narrow parts.

Leveling Plugs

On a recent project, I had 70-some wood plugs to trim flush. Of course, there are options to

Shop Test continues on page 64 ...





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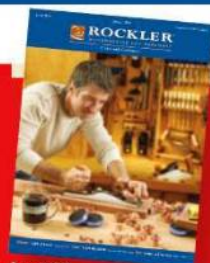
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Flattening wood plugs

(above left) is quick and easy with a small straight bit, as is excavating for inlays (above right).

perform the job — flush-cut saw, multi-tool, chisel. But, I grabbed my trim router and a straight bit (top left photo). If you use a thickness or two of office paper as a spacer for setting bit depth, you can shave plugs nearly flush in no time flat. Nibble them away with gentle, sweeping strokes. Follow up with a little sanding, and you're done. I even trimmed plugs on my

project's vertical surfaces this way, thanks again to the tool's small stature and light weight. I doubt I could have worked any faster with other tools.

Mortising Inlays

Inlays require a shallow excavation to seat them flush with the surrounding wood. You can get the job done with other routers too, but a trim router is my first choice. Its small size offers several

advantages for precision work like this. Trimmers are much lighter weight than mid-size machines, so you can guide them right up to a knifed outline of your inlay with better control. I use a 1/8" or 1/4" straight or spiral bit. If you have a steady hand and a good eye, there's no need for a template here; just guide the machine freehand. And, if you're

Shop Test continues on page 66 ...



Features Worth Shopping for in a Trim Router



If you have an older model laminate trimmer, it probably has a fairly limited range of features. It was, after all, designed for the singular purpose of countertop fabrication. You can still do a lot more with it, especially if the base accepts template guides. Maybe you're out of the trim router "loop," in which case you might appreciate



knowing that there's an evolution occurring in this category. Today's newer trimmers are looking and performing more and more like mid-size routers. Soft start, electronic feedback circuitry to maintain torque

output and microadjustability are some key improvements that are helping to make these machines more capable and precise. Plunge bases are also an excellent addition. Trend realized this years ago and offers a full-featured plunge base with their tool. I'm happy to see other companies now stepping up with plunge capability (see page 72). I believe it unlocks their potential and makes them a much broader go-to solution for woodworking.

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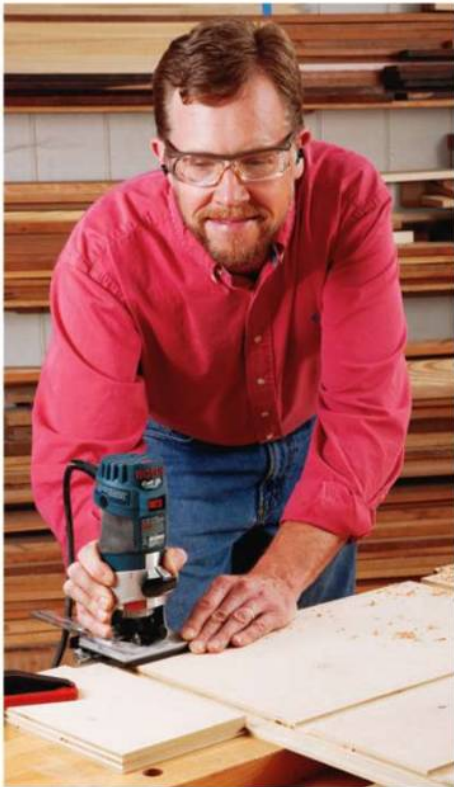
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Shop Test continued



A trim router probably won't be your primary tool for cutting joinery, but it's not out of the question for rabbets, dados and other joint parts (above left). Signmaking (above center) and hole drilling (above right) are other reasons to put these little routers to better use.

Brand-new trim routers

from DeWALT and Porter-Cable were just released last August, concurrent with the International Woodworking Fair (see page 72). Aside from other solid features, both models can be purchased with plunge bases as well as the fixed bases shown here.



mortising a narrow apron or small box side, a trim router's little footprint really helps. A few new machines, like RIDGID's Model R2401, even have an LED light to brighten up the cutting area — and that's a big bonus for this sort of exacting work.

Cutting Joinery

A trim router isn't a panacea for every routing operation, of course. Big bits and deep cuts spell trouble with a tiny router, so use common sense. Still, you can cut rabbets, dados, laps and other joint parts with a trim router, the same way you would with larger tools. Run the edge of the base against a clamped straightedge; install an edge guide or use a piloted bit to limit cutting depth. The key is to take reasonable cuts so you don't overwhelm the motor or the bit. In the top left photo, I used a trimmer to cut all of the back panel rabbets and shelf dados for a small cabinet to store cans of finish.

The cuts turned out every bit as accurate and crisp as if I had made them with a dado blade or my mid-size router. Would I use a trim router for cutting joinery on every project? No. Three-quarter-inch through dovetails? Forget it. Nada on deep mortises, too. I would choose my bigger routers, router table or some other method for safety's sake on tough jobs like these. But, some joinery *can* be cut with a trimmer. Give it a whirl.

Signmaking

Here's a fun way to burn an hour or so of shop time: rout a sign. It's easy to do with a set of letter templates and a trim router equipped with a template guide. At first blush, this technique would be improved with a plunge base, and most trim routers don't have them. But, here's how to get it done with a fixed base. Use a softwood for your sign stock. Position the bit over the widest part of each letter, and start here. Hold the router

base firmly with one edge pressed against the template, and slowly pivot the machine down into the wood. Once the base is resting flat, you're golden. Rout away!

Hole Drilling

The concept of using a plunge router for boring shelf-pin holes isn't revolutionary. But, thanks to plunge models such as Trend's T4, DeWALT and Porter-Cable, hole drilling is fair game for trim routers too. Make a shelf-pin template with holes sized to fit a guide collar bushing, and install 1/4" upcut spiral bit in the machine. A router works as well as a drill here, and perhaps even better.

Maybe I'm just one of those guys who roots for the underdog, but I think it's time for our trim routers to get more credit. Try these techniques with your trim router and see if you agree.

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



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Mid-size Router Tally

Back in 2008, we rounded up information on every router for sale at the time and put them all in a big chart — similar to the one below. This year we turned the chart into an online searchable database that we have updated for 2011! You can access it by going to www.woodworkersjournal.com and clicking on the More on the Web icon. The sampling below includes all the mid-size routers currently available. Many woodworkers consider these mid-size machines to be the “sweet spot” of the router world, offering enough power and features to make easy work of template routing, edge-profiling, joinery and practically any other application you can think of.



Manufacturer	Model	Price	Base Style	HP / Amps	RPM	Collet(s)	Dust Port	Other Features	Contacts
Black & Decker	RP250	\$59.99	Plunge	2HP / 10 Amp	8,000-27,000	1/4	Yes	VS, SS, SL, EG	www.blackanddecker.com 800-544-6986
Bosch	1617	\$169	Fixed	2HP / 11 Amp	25,000	1/4, 1/2	No	ATA	www.boschtools.com 877-267-2499
Bosch	1617EVS	\$174	Fixed	2.25HP / 12 Amp	8,000-25,000	1/4, 1/2	No	VS, EFC, SS, ATA	www.boschtools.com 877-267-2499
Bosch	1618EVS	\$222	D-handle	2.25HP / 12 Amp	8,000-25,000	1/4, 1/2	No	VS, EFC, SS	www.boschtools.com 877-267-2499
Bosch	1613AEVS	\$219	Plunge	2.25HP / 12 Amp	11,000-22,000	1/4, 1/2	Yes	VS, EFC, SS, SL	www.boschtools.com 877-267-2499
Bosch	MRF23EVS	\$227	Fixed	2.3HP / 15 Amp	10,000-25,000	1/4, 1/2	No	VS, EFC, SS, ATA, WL	www.boschtools.com 877-267-2499
Bosch	MRP23EVS	\$245	Plunge	2.3HP / 15 Amp	10,000-25,000	1/4, 1/2	No	VS, EFC, SS, ATA, WL	www.boschtools.com 877-267-2499
Craftsman	17517	\$149.99	Plunge	2HP / 10 Amp	15,000-25,000	1/4, 1/2	Yes	VS, SL, Digital display	www.craftsman.com 800-383-4814
Craftsman	17540	\$89.99	Plunge	1.75HP / 9.5 Amp	25,000	1/4, 1/2	Yes	SS, SL, WL	www.craftsman.com 800-383-4814
Craftsman	17541	\$79.99	Fixed	1.75HP / 9.5 Amp	25,000	1/4, 1/2	Yes	SS, SL, WL	www.craftsman.com 800-383-4814
Craftsman	17542	\$89.99	Fixed	2HP / 11 Amp	12,000-25,000	1/4, 1/2	Yes	VS, EFC, SS, SL, EG, CC, WL	www.craftsman.com 800-383-4814
Craftsman	Professional 28190	\$129	Fixed	2.25HP / 12.5 Amp	12,000-25,000	1/4, 1/2	Yes	VS, EFC, SS, SL, EG, CC, WL	www.craftsman.com 800-383-4814
DeWALT	DW616	\$139	Fixed	1.75HP / 11 Amp	24,500	1/4, 1/2	No		www.dewalt.com 800-433-9258
DeWALT	DW618	\$169	Fixed	2.25HP / 12 Amp	8,000-24,000	1/4, 1/2	No	VS, EFC, SS, SL, CC	www.dewalt.com 800-433-9258
DeWALT	DW618D	\$199	D-handle	2.25HP / 12 Amp	8,000-24,000	1/4, 1/2	No	VS, EFC, SS, SL	www.dewalt.com 800-433-9258
DeWALT	DW621	\$219	Plunge	2HP / 10 Amp	8,000-24,000	1/4, 1/2	Yes	VS, EFC, SS, SL, EG, CC	www.dewalt.com 800-433-9258
Festool	OF 1010 EQ	\$370	Plunge	8.5 Amp	10,000-23,000	1/4, 8mm	Yes	VS, EFC, SS, SL, CC	www.festoolusa.com 888-337-8600
Festool	OF 1400 EQ	\$470	Plunge	11.7 Amp	10,000-22,500	1/4, 8mm, 1/2	Yes	VS, EFC, SS, SL, CC	www.festoolusa.com 888-337-8600
Hitachi	M12VC	\$129	Fixed	2.25HP / 11 Amp	8,000-24,000	1/4, 1/2	No	VS, EFC, SL	hitachipowertools.com 800-829-4752

Features Key: AB = One or more accessory bases included; ATA = Above table adjustment; CC = Carry case; DSL = Dual switch locations;

Woodworkers, Find your Router!

Are you looking for a router with specific features? Perhaps you want a D-handled router with dual switches, dust collection and a carrying case ... All you have to do is enter those criteria into our online searchable database and you will find your router (if it actually exists). For an interactive and searchable list of all the routers we could find on the market (more than 80 different models!), go to www.woodworkersjournal.com and click on the More On the Web icon.

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



Manufacturer	Model	Price	Base Style	HP / Amps	RPM	Collet(s)	Dust Port	Other Features	Contacts
Makita	3606	\$119.99	Fixed	1HP / 7 Amp	30,000	1/4	No		www.makitatools.com 800-462-5482
Makita	RP0900K	\$159.99	Plunge	1.25HP / 8 Amp	27,000	1/4	No	EG, SS, CC	www.makitatools.com 800-462-5482
Makita	RF1101	\$199.99	Fixed	2.25HP / 11 Amp	8,000-24,000	1/4, 1/2	No	VS, EFC, SS	www.makitatools.com 800-462-5482
Makita	RD1101	\$229.99	D-handle	2.25HP / 11 Amp	8,000-24,000	1/4, 1/2	No	VS, EFC, SS	www.makitatools.com 800-462-5482
Milwaukee	5615-21 Bodygrip	\$169	Fixed	1.75HP / 11 Amp	24,000	1/4, 1/2	No	ATA, CC	www.milwaukeeetool.com 800-729-3878
Milwaukee	5616-21 EVS Bodygrip	\$199	Fixed	2.25HP / 13 Amp	10,000-24,000	1/4, 1/2	No	VS, EFC, SS, ATA, CC	www.milwaukeeetool.com 800-729-3878
Milwaukee	5619-20	\$169	D-handle	1.75HP / 11 Amp	24,000	1/4, 1/2	No	ATA	www.milwaukeeetool.com 800-729-3878
Porter-Cable	690LR	\$149	Fixed	1.75HP / 11 Amp	27,500	1/4, 1/2	No		www.deltaportercable.com 888-848-5175
Porter-Cable	9690LR	\$149	Fixed	1.75HP / 11 Amp	27,500	1/4, 1/2	No	CC	www.deltaportercable.com 888-848-5175
Porter-Cable	690LRVS	\$159	Fixed	1.75HP / 11 Amp	10,000-27,500	1/4, 1/2	No	VS, SS	www.deltaportercable.com 888-848-5175
Porter-Cable	691	\$175	D-handle	1.75HP / 11 Amp	27,500	1/4, 1/2	No		www.deltaportercable.com 888-848-5175
Porter-Cable	891	\$229	Gripvac	2.25HP / 12 Amp	10,000-23,000	1/4, 1/2	Yes	VS, EFC, SS, SL ATA, CC, DSL	www.deltaportercable.com 888-848-5175
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Ryobi	R163K	\$59.97	Fixed	1.5HP / 8.5 Amp	25,000	1/4	No	SL, ATA, CC, WL	www.ryobitools.com 800-525-2579
Ryobi	RE180PL	\$99	Plunge	2HP / 10 Amp	15,000-23,000	1/4, 1/2	No	VS, SS, SL	www.ryobitools.com 800-525-2579
Skil	1810	\$64.99	Fixed	1.75HP / 9 Amp	25,000	1/4	No	SL	www.skiltools.com 877-754-5999
Skil	1815	\$79.99	Fixed	2HP / 10 Amp	25,000	1/4	No	SL, CC, WL	www.skiltools.com 877-754-5999
Skil	1820	\$85.99	Plunge	2HP / 10 Amp	25,000	1/4	No	SL, CC, WL	www.skiltools.com 877-754-5999
Triton	MOF001C	\$259	Plunge	2.25HP / 13 Amp	8,000-21,000	1/4, 1/2	Yes	VS, EFC, SS, SL, EG, ATA, CC	www.tritontools.com 888-874-8661

EFC = Electronic feedback circuitry; EG = Edge guide; SL = Spindle lock; SS = Soft start; VS = Variable speed; WL = Worklight

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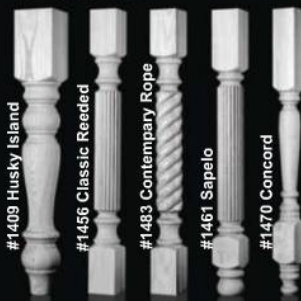
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December 2010



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Journal editors' travels this year took us to Atlanta for the IWF (International Woodworking Fair) — the year's biggest trade show and an introduction to many of the new tools that kick off the woodworking season. We'll be talking about those tools throughout this issue's *What's In Store* department — plus, check out our videos, highlighting even more tools, at woodworkersjournal.com.

DeWALT and **Porter-Cable's** new trim routers both offer a plunge base option. Released at this year's IWF, the **DeWALT Compact Router (DWP611)** comes as either a fixed-base or in a fixed/plunge-base combination kit (**DW611PK**) — as does the **Porter-Cable Model 450** (standard is the fixed-base; the fixed/plunge combo kit for the P-C is 450PK). Both router brands have 1½ peak HP motors, soft-start, 12 internal detents on the motor shaft and 1/4" collets. The plunge bases both include sliding and locking depth stop rod and clear sub-bases. With motors installed in the plunge bases, both weigh about six pounds. DeWALT's 611 comes with variable speed control, while the P-C is a single speed; DeWALT's fixed base has a D-shaped sub-base; Porter-Cable's is square. The DeWALT also comes with two internal LED lights. Pricing for the DeWALT fixed-base standalone is \$139; \$199 for



The International Woodworking Fair in Atlanta, right before the doors opened.

the combo kit; for Porter-Cable, it's \$129 for the fixed-base; \$189 for the two-base kit.

In response to requests from customers without access to 220-volt power, **SawStop** has now introduced a **1.75 HP Professional Cabinet Saw** that runs on 120 volts. In addition to the SawStop blade braking system that automatically

detects flesh contact with a spinning blade and stops it in milliseconds, the SawStop 1.75 HP Professional Cabinet Saw has a heavy-duty cast-iron table, steel cabinet and cast-iron trunnion. It weighs in at over 360 pounds and sells for \$2,299.

Continues on page 74 ...



SawStop 1.75 HP Professional Cabinet Saw



DeWALT Compact Router (DWP611)



Porter-Cable Model 450



NOTE: See Quik-Link at woodworkersjournal.com for web links to all of these products.

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Bessey EZS One Hand Clamp



Bessey® Tools's handy new entry in the world of clamps is their *EZS One Hand Clamp*, which comes in sizes of 6 inches to 36 inches. The jaws exert a clamping force of up to 445 pounds and have been engineered to transition smoothly to positions for clamping or spreading. Prices start at \$20.



Ryobi P260 ONE+ Impact Wrench

If you've ever felt the need to have more of an impact on fasteners you're struggling to remove, you may be interested in the *P260 ONE+ Impact Wrench* from **Ryobi**. It puts the power of an impact driver into a wrench — plus, with an included 1/4" adapter, it actually functions as an impact driver, too. The P260 has 200 ft/lbs. of torque, a 1/2" square chuck and a built-in LED light. It sells for \$99.

COLT®'s *MaxiCut Forstner Bits* combine the advantages of Forstner and boring bits to create clean cuts, even in side or end grain. The RotaStop® Shank System automatically locks into any chuck, stopping rotation that could lead to damage on the shank, and the RotaStop polygonal section on the outside of the bit reduces surface contact to three points — reducing friction and leading to faster work. The cutting head design has a self-

cutting center point that offers no resistance as it cuts through ahead of the main cutters, asymmetrical chip breakers to cut swarf into chips rather than swirls and relieved side cutters for easier resharping. The *COLT MaxiCut Forstner Bits*, which are made in Germany, are suitable for half, inclined and overlapping bore holes, as well as for deeper holes. They come in sizes ranging from 1/2" to 2 1/4" diameters, with prices starting at \$27.

The new *5/8" Hollow Chisel Mortiser* from **General International** (75-040 M1) comes with a four-piece mortising chisel and bit set in sizes ranging from 1/4" to 1/2". Included adapter bushings accommodate both 5/8" and 3/4" sized chisel shanks. A gas head-cylinder controls the stroke for smooth operation, while a dual depth stop provides control of downstroke depth and upstroke travel. The large feed handle has a



General International 5/8" Hollow Chisel Mortiser

multi-position arm for better leverage, and the workpiece stop is adjustable. Telescopic extensions on the 14 1/4" x 11 1/8" table increase its side-to-side size to 35" for enhanced workpiece support. The 75-040 M1 has a list price of \$532.

Tormek's newest attachment now makes it possible to sharpen drill bits on a Tormek Water Cooled Sharpening System. The *Drill Bit Sharpening Attachment (DBS-22)* can be set at any point angle between 90° and 150° and four different clearance angles in order to achieve the geometry that works best for each drilling operation. The DBS-22 works with the Tormek system to sharpen with water,

Continues on page 76 ...



COLT's MaxiCut Forstner Bits



Tormek Drill Bit Sharpening Attachment (DBS-22)



A perfectly sharpened bit.

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What's In Store continued



Amana's E-Z Change
replaceable head router bits



Quik-Link takes you directly to the web page on which these products appear! No navigation necessary ... just go to woodworkersjournal.com and click on the Quik-Link icon shown above.

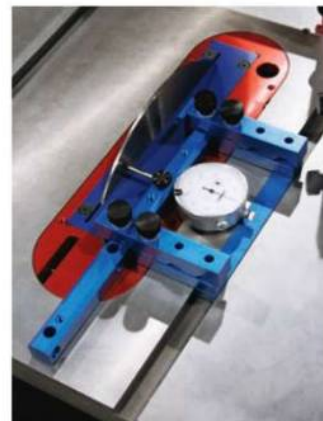
continuously cooling the edge of the bit and reducing the risk of overheating, which can cause steel to lose hardness or gain microcracks. The DBS-22 fits all Tormek models and works with drill bits from 1/8" to 7/8". It's priced at \$249.99.

Amana's E-Z Change replaceable head router bits let you swap out a cutting head without changing an entire router bit or sharpening the cutting edges. The disposable carbide-tipped cutters are mounted on alloy steel arbors and come in plunging/template, flush-trim, dado cleanout, bevel and no-file profiles. Each contains a shank body, carbide-tipped cutter and a bearing. (Replacement parts are also available for each profile.) The E-Change profiles offer woodworkers a less expensive option for router bits, with prices starting at \$18.75 for the template profile.

IRWIN®'s new *Vise-Grip Curved-Jaw (CR) Locking Pliers* have a self-energizing lower jaw that delivers three times more gripping power than traditional locking pliers: the jaws

tighten for maximum grip as torque is applied to the tool. With their slotted geometry leading to more torquing power, this also increases the clamping power of the pliers; and their multiple contact points on a workpiece provide a tighter grip. The Vise-Grip Curved Jaw Locking Pliers have a patented curved jaw, and the Fast Release version has a one-handed, triggerless release. The pliers are available in 5", 7" and 10" models, and come in Original and Fast Release versions, with prices ranging from \$11.99 to \$13.99.

Betterley Industries Inc. has introduced the *Una-Gauge Universal Alignment and Adjustment*. The dial indicator jig provides instant incremental readings of .001" — while you're making your adjustments. It clamps to steel or iron surfaces on your tools via rare earth magnets and accurately measures up to 3" in height and 2" deep with an accessory contact point. The modular design provides multiple vertical or horizontal indicator positions along the support bar. Its universal design accommodates adjustments and alignment on almost any tool or machine: simple repositioning of the legs bridges the indicator over a variety of blade or bit



Betterley Industries Inc. *Una-Gauge*
Universal Alignment and Adjustment



openings as well as allowing cantilevered support. Suggested price is \$199.

Rick Christopherson (of **RTS Engineering and Waterfront Woods**) has not only used a Festool® Domino® joiner, he's written instruction manuals for it — and, upon taking notice that there was a feature lacking, he invented an accessory to solve the problem. The *Multi-Position Guide Stop (MGS-20)* allows

Continues on page 78 ...



IRWIN Vise-Grip Curved-Jaw (CR) Locking Pliers



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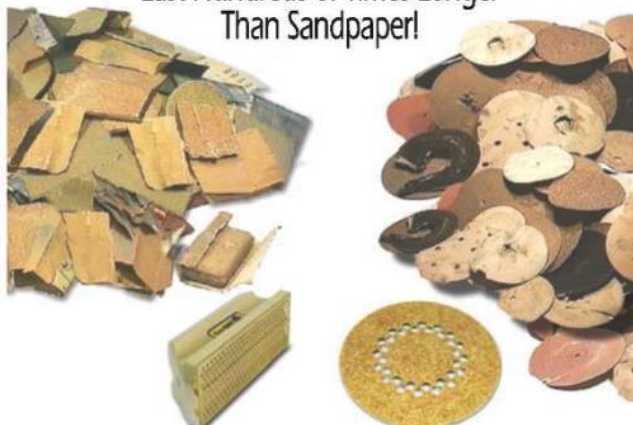


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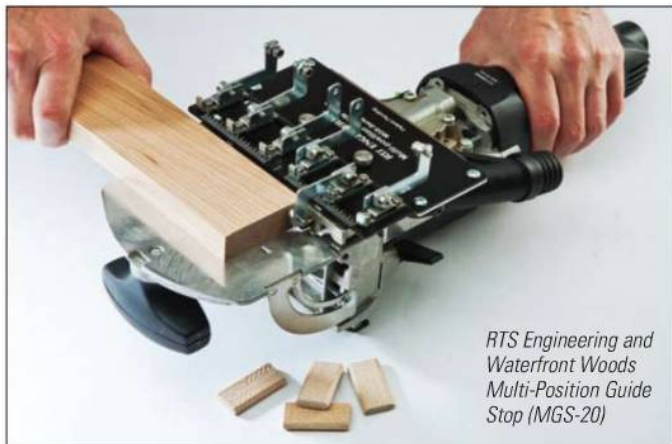
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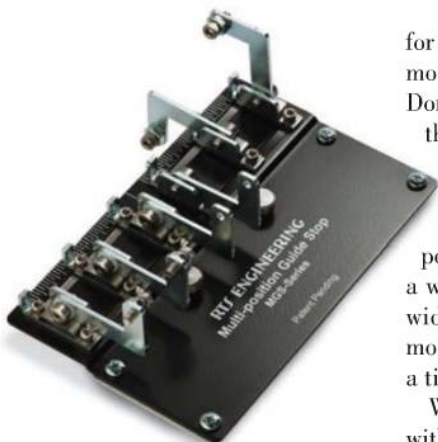
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What's In Store continued

worldmags



RTS Engineering and Waterfront Woods Multi-Position Guide Stop (MGS-20)



for versatile positioning of mortises created with the Domino anywhere you need them: the guide stops can be positioned anywhere from $\frac{3}{8}$ " to $2\frac{5}{8}$ ", and the tenons can be positioned in the center of a workpiece from $\frac{3}{4}$ " to $5\frac{1}{4}$ " wide. You can also locate more than one position at a time.

While the MGS-20 comes with two pairs of locator stops, you can add additional ones, up to a total of six pairs. When using a position stop, you can flip unneeded ones out of the way without removing them, allowing you to dedicate position stops for your commonly used dimensions. The MGS-20 is sold separately from the Domino joiner for \$99, with two pairs of guide stops and two stainless-steel mounting thumbscrews included.

Rockler Woodworking and Hardware's new *Caliper Gauge/Center Finder* incorporates two different functions frequently used by woodturners into one tool. The calipers can be set at any eighth-inch increment between $\frac{1}{8}$ " and 5" by setting them on the gauge and sliding along the "sawtooth" edges until the calipers click onto the desired indexed step. When they're set, turners can instantly gauge the diameter of their turning simply by holding the calipers up to it. Using the center finder entails slipping any round or square stock into the back of the gauge and striking two perpendicular lines through the window to prepare it for clamping between centers. The Caliper Gauge/Center Finder (item #34010) sells for \$5.99.

Dremel's latest addition to their tool line is the *Trio™*, a multi-purpose tool that incorporates the functions of a rotary tool, jigsaw, edge sander and detail router into



Dremel's Trio

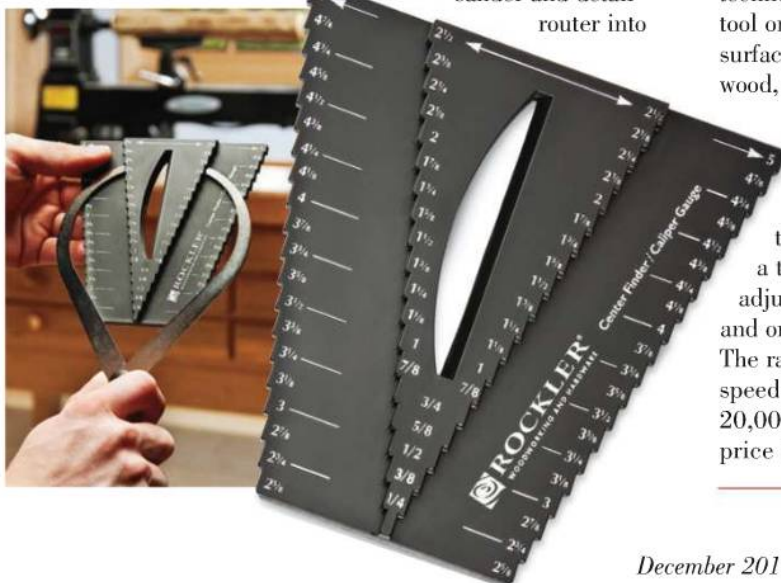


one tool. A 90° pivoting handle and 360° cutting technology let you use the tool on horizontal or vertical surfaces, in any direction, on wood, drywall and other materials.

Plunge-cutting capacity is also incorporated into the Trio, which has a telescoping foot adjustment for depth control and onboard dust extraction. The range of the variable speed tool is 10,000 to 20,000 rpm. Suggested price is \$99.99.



Rockler Woodworking and Hardware's Caliper Gauge/Center Finder





Two MagJigs + One Universal Base = Hundreds Of Possibilities.

Introducing The Magswitch Workholding System.



**Workholding System Starter Kit
with Reversible Featherboard**



Resaw Guide



Dual Roller Guide



Ultimate Thin Stock Jig



**Vertical Featherboard
Attachment With Risers**



Universal Tracks 18" and 36"

A collection of clever tool attachments that feature essential workholding capabilities and a new dimension of safety benefits:

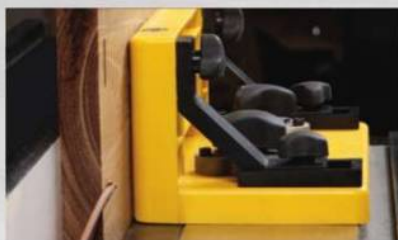
- › Super fast set ups – precise positioning.
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No need to buy expensive workholding solutions for each of your table tools, Magswitch fits all your tables, and is affordable.



Resaw Guide

- › Solid ball bearing support. Angled in/out feed to allow for blade drift adjustment.



Dual Roller Guide

- › Dual sets of ball bearings for extra firm support and control of tall panels.



Ultimate Thin Stock Jig

- › Three tools in one! Thin stock hold down and rip guide.



**Vertical Featherboard Attachment
With Risers**

- › Adds vertical hold down or stack feature to Reversible Featherboard.



Universal Tracks 18" and 36"

- › Make your own jigs, fixtures, stops, fences and more! Accepts all standard mounting hardware.



Reversible Featherboard

- › Reversible for cuts on right or left side of blade.

Available at Rockler Woodworking and Hardware. To order by phone, call 800-229-4441.

To order online or to find a retail store near you, go to www.rockler.com.

(Circle No. 62 on PRODUCT INFORMATION form)

Finishing Thoughts

Last-Minute Toy Toppings

By Michael Dresdner

*'Twas the night before Christmas and all through the state,
Grandmas and grandpas were staying up late.
They were trying to finish those last-minute toys
They had crafted of wood for their grand-girls and boys.
(Sorry Clement!)*

Dynamite Detailing

Building toys and other gift projects allows you to add those important final details that take a gift from good to great. But what if you are in a hurry? Michael Dresdner comes to the rescue with fast and effective holiday toy finishes.

The fun of making wooden toys and gifts is second only to seeing the joy in the faces of those who receive them. Unfortunately, having to finish them quickly at the last minute is less festive. To help out, here are some easy-to-use, fast drying finishes that are safe both for kids' toys and for the loving folks who make them.

Simple, Safe and Clear

The simplest clear finish is one coat of shellac to seal the wood, followed by paste wax to leave a smooth, silky feel. Buy either shellac or Zinsser SealCoat®, which is

pure dewaxed shellac mixed to the perfect wipe, brush and spray consistency. Both are available in liquid and aerosol cans.

Flood it on liberally and wipe it off immediately to seal the wood. Small parts can be dipped, then wiped off. For larger parts, brush, spray or wipe it on liberally, then quickly wipe off all you can with paper shop towels or rags. Set the parts to dry in a warm spot for 15 or 20 minutes. Once dry, rub the surface with 0000 steel wool dipped into paste wax, which will smooth any subtle roughness. Wipe off the excess wax thoroughly.

Want a thicker, shinier finish? Skip the wax and steel wool and instead, once the first wiped-off coat of shellac is dry, lightly sand it with 400-grit paper. Add two or three more thin coats of shellac with a soft brush, or spray it from an aerosol can. Give each coat 30 to 60 minutes to dry. Once dry, the steel wool and wax treatment will give it a soft sheen and a silky feel.

Though it is not quite as people friendly, lacquer in an aerosol can will dry about as fast if you keep the coats very thin. If you have a bit more time, you can use water-based finishes, though they do dry somewhat slower. They, too, are available in both liquid and aerosol can versions. All these finishes are kid-safe once they are dry.

Versatile, fast-drying acrylic craft paint is the last-minute finisher's ace in the hole.



A dip in shellac followed by a quick wipe makes short work of sealing wood. Once it is dry, fine steel wool loaded with paste wax smooths the surface nicely.



But Wait; I Want to Decorate!

The flood-on and wipe-off method of applying Zinsser SealCoat, an ideal sealer, also creates the perfect primed base for paint, should you decide that color is called for. Painting over sealed wood helps the paint stay where you put it instead of allowing it to seep through the wood and muddy your crisp color lines.

Go to any craft store and you'll find ready mixed acrylic

artist paint in two-ounce squeeze bottles. It comes in hundreds of colors so you won't have to mix your own, and its low price means you can afford a wide array of hues. Pick up some small artist's brushes while you are there.

A thin layer of this water-based paint will dry in an

hour or so, and you can, in a pinch, help it along with a hair dryer set on low. The acrylic will hold up fine by itself, but if you want a bit more shine, you can go over it, after the paint dries, with a thin spray of shellac, SealCoat or water-based finish in an aerosol can.

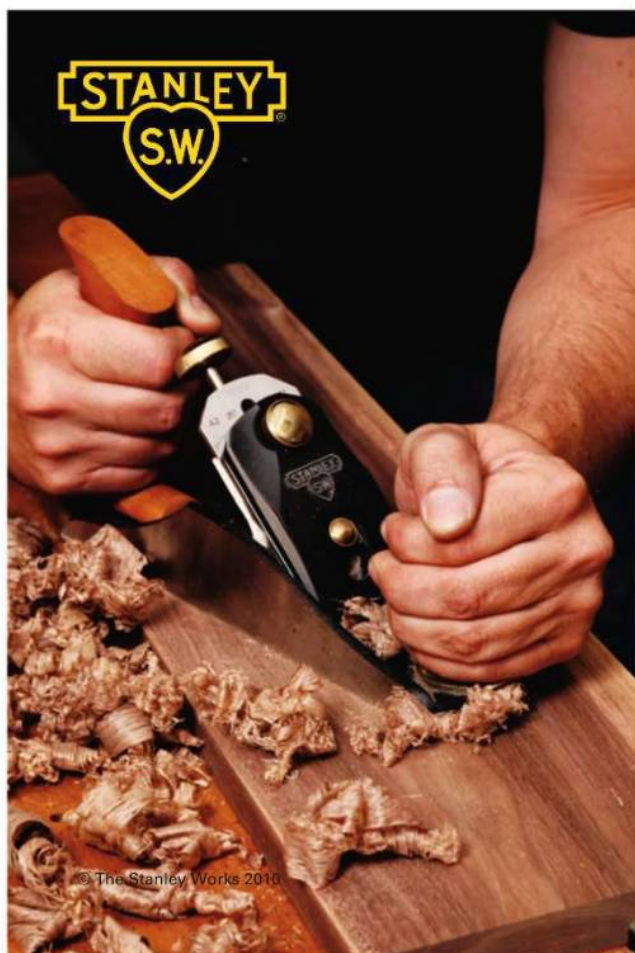


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Please include your contact information with your thoughts or questions.



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Hand-cutting Mortises

A mortising chisel, joiner's mallet and five cuts make quick work of this task.



MORE ON THE WEB

For a detailed article on hand-cutting both mortises and tenons, visit woodworkersjournal.com and click on the "More on the Web" tab shown above. Or send a large SASE to Woodworker's Journal, Skill Builder 18, 4365 Willow Drive, Medina, MN 55340.

A mortising chisel basically does one job, but it does it exceedingly well. While there are many ways to chop a mortise employing a variety of different machine tools, mortising by hand feels like "real" woodworking.

The first step in this process is accurately marking up the joint. Use a mortising gauge for this task to set both the mortise width and position. To set the depth of your mortise, simply place a piece of blue masking tape on the chisel back.

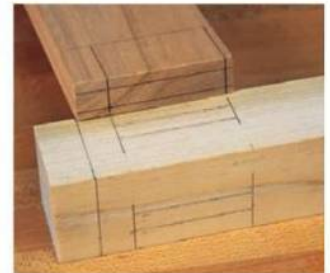
Position the chisel with two hands as shown below, then firmly tap the chisel with a

joiner's mallet to set the edge into the stock.

Now you have a decision to make. Do you chop to the full depth of your mortise in one process, or cut the mortise in "layers"? We'll describe the layered process here. The layered approach will take five chisel cuts before you remove the first waste:

Cut 1: Set the chisel about 3/16" from the far end of the mortise. Tap the chisel lightly to set it — then hit it hard. It will take a few blows to drive it in to the first level.

Cut 2: Move the chisel about 3/16" towards you, set the chisel, and then give it three hard smacks. It will go a bit



Careful joint markup

deeper than your last effort because of the space created by your first cut.

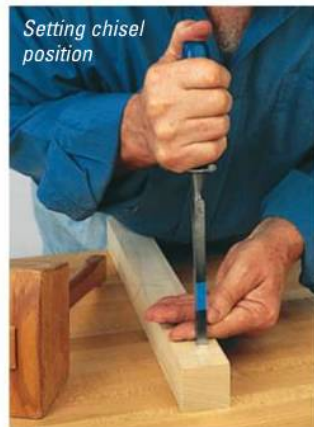
Cut 3: Again move the chisel about 3/16" toward you. Set and smack it three more times. You will drive it a bit deeper than for Cut 2.

Cut 4: Reposition the chisel as before, set and drive it to the same depth as in Cut 3.

Cut 5: Now position the chisel, back face away from you, 3/16" away from your last cut. Drive the chisel in, lay the mallet down and lever the chisel handle toward you. Take care to keep it aligned with the mortise sides. Then scoop out the waste.

To remove the second layer, go ahead and repeat the five cutting steps again.

Once the bulk of the waste is removed, square the ends of the mortise by placing the chisel on the marked line, with the chisel's back face to the end you are cutting. Align your chisel against a square, then drive it down cleanly. NOTE: you will not get a flat-bottomed mortise chopping by hand. Make sure the depth is sufficient across the whole of the mortise. You've now completed your mortise.



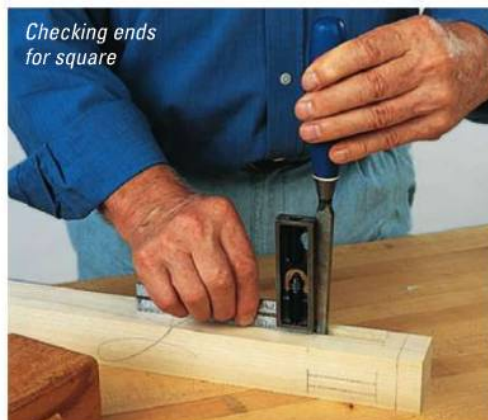
Setting chisel position



Cuts 1 through 4



Cut 5: Levering waste



Checking ends for square

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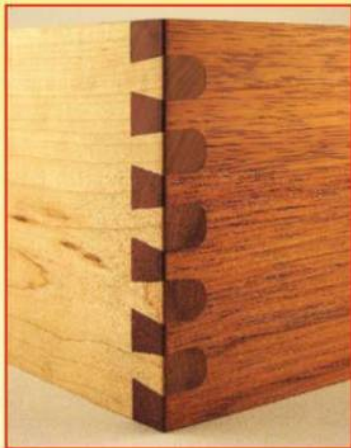
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(Circle No. 26 on PRODUCT INFORMATION form)

Patent Pending



How Do You Create Endless Cabinet Door Making Possibilities?

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Profile Shown:
Round Over
(#99-760)



Patented design allows for multiple rail & stile project combinations

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Now with Freud's new, patented Premier Adjustable Rail and Stile router bit system, you are able to build any style of cabinet door in a wide range of door thicknesses and sizes! This extremely easy-to-use solution gives you unlimited creative freedom, and solves the long-standing limitations of existing frame and panel door construction.

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Four profiles are available; **Round Over** (#99-760), **Ogee** (#99-761), **Round Over Bead** (#99-763), and **Bevel** (#99-764).



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Extended tenons for strong joints in larger doors

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