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January 1996

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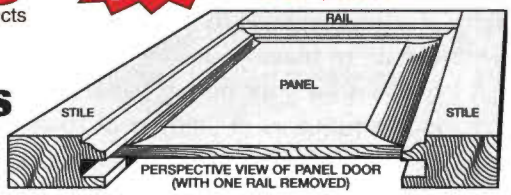

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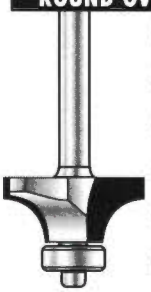
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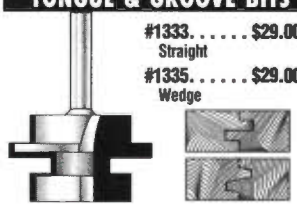
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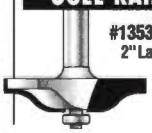
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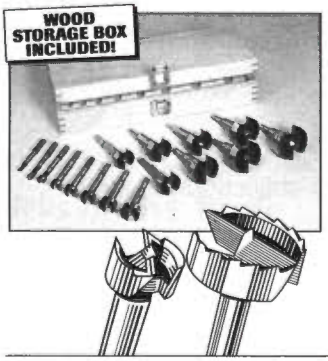

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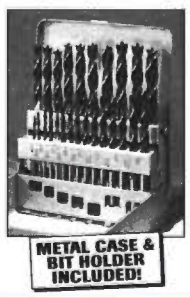

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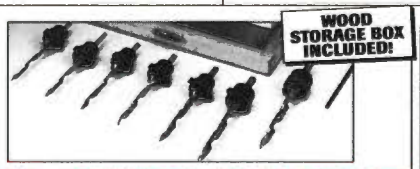

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Like Santa's sleigh, we've filled this special holiday issue of *Popular Woodworking* to overflowing with more than 20 projects that are certain to make your Christmas all the merrier. Whether it's gifts or decorations for your home, you'll find ideas galore to create new heirlooms for years of enjoyment to come. But remember, time's a wastin', so pick your projects and get to the shop. After all, there's only one thing better than receiving a handmade gift — and that's creating one!

SAFETY NOTE

Safety is your responsibility. Manufacturers place safety devices on their equipment for a reason. In most photos you see in *Popular Woodworking,* these have been removed to provide clarity. In some cases we'll use an awkward body position so you can better see what's being demonstrated. Don't copy us. Think about each procedure you're going to perform beforehand. Think ahead. Safety First!

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TURNINGS

From Our Shop to Yours

I've never been accused of being seasonally challenged. A little corny, yes, especially at this holiday time of year. Okay, I admit it, I can get a little carried away, like in this issue. I've given a number of our regular columnists the holidays off so their space could be used to pack 22 projects into this single issue. (I don't know if anyone's keeping track, but that may be a record.) In the next issue, we'll be back to our normal format with Cris Cuts, Tried & True, Business End, Snap Shop and Dovetales, our new column dedicated to women's interests in woodworking. Our March issue will feature a great mix of projects and, as a special theme, woodworking shops, the kind *you* have and want to improve, or dream about owning some day. But in the meantime, let's continue on our break from the routine and celebrate the upcoming holidays.

To help you in your seasonal preparations, we've compiled a list of projects with all the info you need to complete them in time for the big day. And we've found projects that meet a bushel basket full of needs — gifts; for kids, family and neighbors, or for that special person in your life. And you'll find decorating projects (they make great gifts, too) which help trim your home.

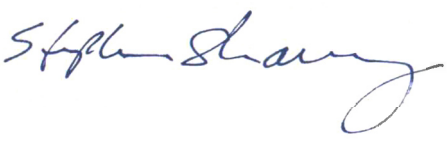
Furthermore, since the holidays are not only a special time of year, but a busy one too, we're presenting projects that won't keep you in the shop burning the midnight oil. We've included an important story ("Short Production Runs") that shows you how to save time by making short production runs of your gift projects. The same contributor, Andy Schultz, shows you how to make a box full of Lincoln Logs in just a couple hours using his router-mounted jig. You can apply the production run principles to other gift projects as well. Consider a half dozen chalk board message centers, clock and barometer desk sets, or table napkin holders. They're all quick, easy, practical, and certain to be appreciated by anyone on your gift list.

One project in particular brings back a fond childhood memory, the Fantasy Fireplace. The one in my boyhood living room was made from cardboard printed with a red brick pattern. We didn't have a real fireplace, but this makeshift hearth and mantle added almost as much fantasy as the Christmas tree. It provided a place to imagine Santa standing as he filled our stockings. (We left the front door ajar for his coming and going since I *knew* there wasn't a chimney and besides, I wasn't leaving anything to chance on this score. And anyway, how could anybody get a bicycle down a chimney?) So, for your children, or grandchildren, or neighbor kids who don't have a real fireplace, Associate Editor David Thiel has given you the step by step to a one day, store in a closet, Fantasy Fireplace project. It's guaranteed to fire the imaginations of kids of *all* ages.

On the subject of fantasies, our readers' Christmas wish list survey was great fun. (Thanks to you all who took the time to respond, especially those who enclosed letters, margin notes and sundry suggestions for tools not listed.) It was rather hurriedly organized this year, but given its success, I'm certain we'll be expanding and improving it in the coming year.

Lastly, thanks for your support during this past year. Your subscription dollars are an act of faith in this magazine and it's a trust we don't take lightly. In fact, *this is your magazine.* And to the best of our abilities, we make every effort to deliver the information about projects, techniques and general woodworking knowledge that you want and need to enjoy and further develop your craft. And when we're off target, let me know, as some of you have this past year.

From our shop to yours, have a wonderful Holiday Season, and a fulfilling (and safe) New Year.



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Advertising
Advertising Sales Manager
Leslie Winters 25 Lewis St.,
Greenwich, CT 06830
Tel. (203) 661-0515; Fax (203) 661-0519

Publisher's Representative
Bill Warren, Buchmayr Associates
137 Rowayton Ave., Rowayton, CT 06853
Tel. (203) 855-8834; Fax (203) 855-9138

Advertising Production Coordinator
Kathy Georg – Tel. (513) 531-2690, ext. 380

Advertising Sales
Cathy Roll – Tel. (800) 283-0963, ext. 315

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Ryobi Biscuit Joiner

Hugh Foster's review of biscuit joiners in the November issue (#87) of *Popular Woodworking* neglected to mention the great value offered by Ryobi's JM80 Biscuit Joiner. Ryobi recently redesigned and upgraded this joiner. The JM80 now has a 6-amp motor that generates 10,000 rpm, micro-depth adjustment, a 10-foot cord and dustbag. Plus, no tools are required to make angle and height adjustments. All this for just $130 at most major home centers.

Frank Coots
Public Relations Director
Ryobi North America, Inc.

Steve responds: *Thanks for bringing us up to date on the JM80.*

The Trouble with Redwood

This is a redwood bird feeder I started to make about a year ago. With the first one, I made a big mistake and used a regular wood glue. About two months after putting it outside, the lattice work started to come off.

It's made entirely of redwood, except the roof, which is ½" CDX plywood. After the first one, I switched to an all-weather and tile glue. I called a local cabinet shop and was told it would be hard to find a glue to hold because of redwood's characteristics. Some other glues that might work are too thick for the small lattice work. I have made seven feeders now with outdoor glue and a redwood stain and sealer. None of the people who now own them have said whether they are coming apart. I like making feeders, but not if they're just going to fall apart! Is there a better glue for redwood?

Jimmy Corkins
Hutchinson, Kansas

Steve responds: *You're making a handsome feeder that deserves a long lasting adhesive. Before I became an editor, I learned as a cabinetmaker that one must be concerned about redwood and adhesion because it has a high tanic acid content that inhibits a good bond. To overcome this, first wipe the surfaces to be bonded with the solvent acetone to dissolve the tanic acid. Then proceed with gluing.*

For outdoor use, Franklin International recommends its "weatherproof" Titebond II if you can apply normal clamp pressure. Unlike regular Titebond, Titebond II will not perform well without sufficient clamp pressure. If clamping is a problem, the gap filling properties of Titebond Construction Adhesive will do the job. If this is your choice, remember that the lattice work joint is not under stress, so a "little dab will do ya."

Variations on a Theme

A customer dropped off a worn copy of your March 1995 issue at our mill shop. The first thing we came across was the Chippendale plant stand, and we just had to try one.

My wife did the turning and I did the rest. We used a kerf/slot on the drawer corner blocks. Hope you don't mind the changes on the base, drawer and top.

We enjoyed building it, and decided to subscribe. What do you think about our first shot at one of your projects?

Win & Patricia Cohoon
Springfield, Georgia

Steve responds: *Your first completed* Pop Wood *project looks terrific. As far as taking liberties with the design, as editor of* PW *I say "bless you." Changing designs and details personalizes any project and makes it more your own. Of course, there's nothing wrong with an exact replica, if it suits your tastes, needs, and abilities. I bet we can all agree that true perfection is a scarce commodity and further, few people, especially in the nebulous area of design, have cornered the market on right and wrong. Even if we conclude our design adventures are sometimes less than successful, we learn from the experience.*

Keep up the good work, and thanks for subscribing. We're always glad to welcome new readers, especially those who write and share their thoughts, ideas, and even criticisms. PW

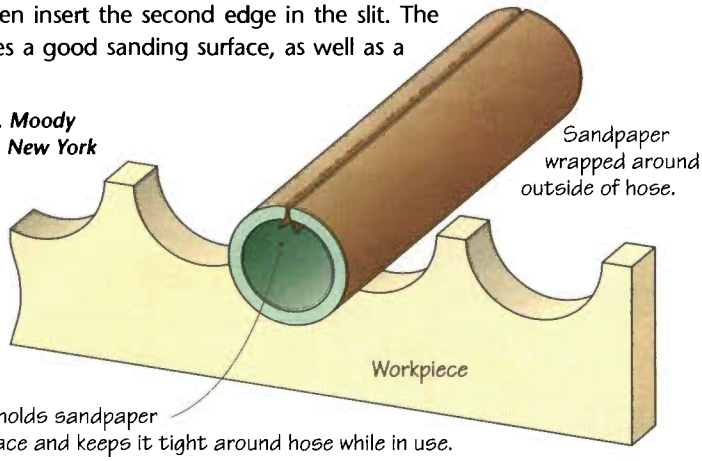
Correction

A number of readers have undertaken the "French Provincial Corner Hutch" project in the July 1995 issue. Indeed, there were dimension errors in the Schedule of Materials as originally published. We are printing the corrected Schedule of Materials in the PullOut™ Plans for the benefit of those who haven't started to build yet. We also want to mention that you should cut a ⅛" x ⅜" rabbet on the outside, back edge of the doors to form the overlay lip. —*Eds.*

Take a Rubber Hose to Sanding Problems

I had difficultly smoothing some of my concave wood surfaces in the shop. To solve my problem, I cut off a short length of old garden hose and slit it lengthwise. To use, cut the sandpaper so that it is the same length as the hose and wide enough to wrap around the hose plus about an inch extra. Load the sandpaper by inserting one edge into the slit, wrap around the hose, then insert the second edge in the slit. The hose provides a good sanding surface, as well as a good grip.

Howard E. Moody
Upper Jay, New York



The Eyes Have It For Gluing

For spreading glue evenly in tight spots, I've found the short bristled, slightly corkscrew shape of a mascara eye make-up brush ideal.

The bristles hold a good amount of glue and the long, slender shaft can reach into the deepest mortise or other hard to get at spot.

Two additional notes: You'll need to wash the brush thoroughly prior to use, and don't "borrow" it without asking your wife. It seems it's about here they draw the line!

R.B. Himes
Vienna, Ohio

Low Cost Solution to "Abrasive" Problem

Have you looked at the cost of wood rasps recently? The price of good rasps in a recent catalogue runs from $10 to $40 for a large size. These prices caused me to look for something more affordable.

You can make an effective substitute at a very reasonable cost that will perform as well as the expensive steel rasp, though maybe not as long.

To make these affordable rasps, shape a piece of hardwood to the size and configuration you desire and bond a piece of cloth backed abrasive to the wood. I recommend cloth instead of a paper backed abrasive because cloth is much more durable. Bond the abrasive to the wood with the adhesive of your choice, polyvinyl acetate, plastic resin, contact cement or epoxy.

When the abrasive wears out, simply strip it off and replace it. The coarse grits perform much like a rasp.

Devore O. Burch
Fort Worth, Texas

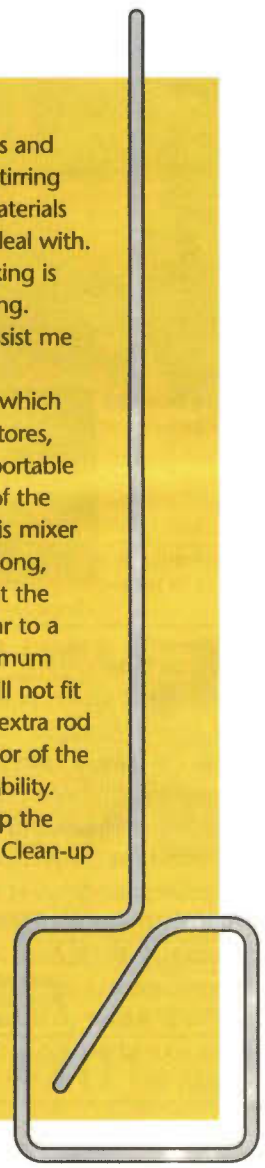
Stirred, Not Shaken

I've discovered there is more mess and unnecessary work involved with stirring paint or mixing stains or other materials than any person should have to deal with. If you're like me, time saved working is time to do other things, like golfing. Hence, I made a simple tool to assist me when I need to mix or stir.

Using a 5/16"-diameter steel rod, which can be found at most hardware stores, make a shaft that will fit in your portable drill. Grinding a flat on one side of the shaft will help the chuck grasp this mixer tightly. With the shaft about 14"-long, bend and form a 4" x 4" square at the bottom to serve as a beater similar to a mixer. Be sure that 4" is the maximum width, or your new mixing aid will not fit into a quart-sized paint can. Any extra rod length can be bent into the interior of the square for additional mixing capability.

Using your drill to stir speeds up the process and insures a better mix. Clean-up is easy with a bucket of water. Unless, of course, your material is oil-based, then use an appropriate solvent. Give it a try!

John Patterson
Canton, Ohio



A Weighty Problem Solved

I needed to haul ten, ¾" x 4' x 8' sheets of cabinet grade birch plywood to my shop using my station wagon. Knowing the weight capacity of my vehicle, I needed to know the total weight of my load to determine if my wagon was up for the task.

To find my answer I cut a 1" square from plywood scrap and weighed it on a postage scale. The weight was .25 oz. The rest was simple math:

48" x 96" = 4,608" (square)
4,608" x .25 oz. = 1,152 oz.
1,152 oz. ÷ 16 oz. (1 lb.) = 72 lbs.
10 pcs. x 72 lbs. = 720 lbs.

My wagon could safely transport the weight!

John Maitland
Columbia, Maryland

Bent In 60 Seconds!

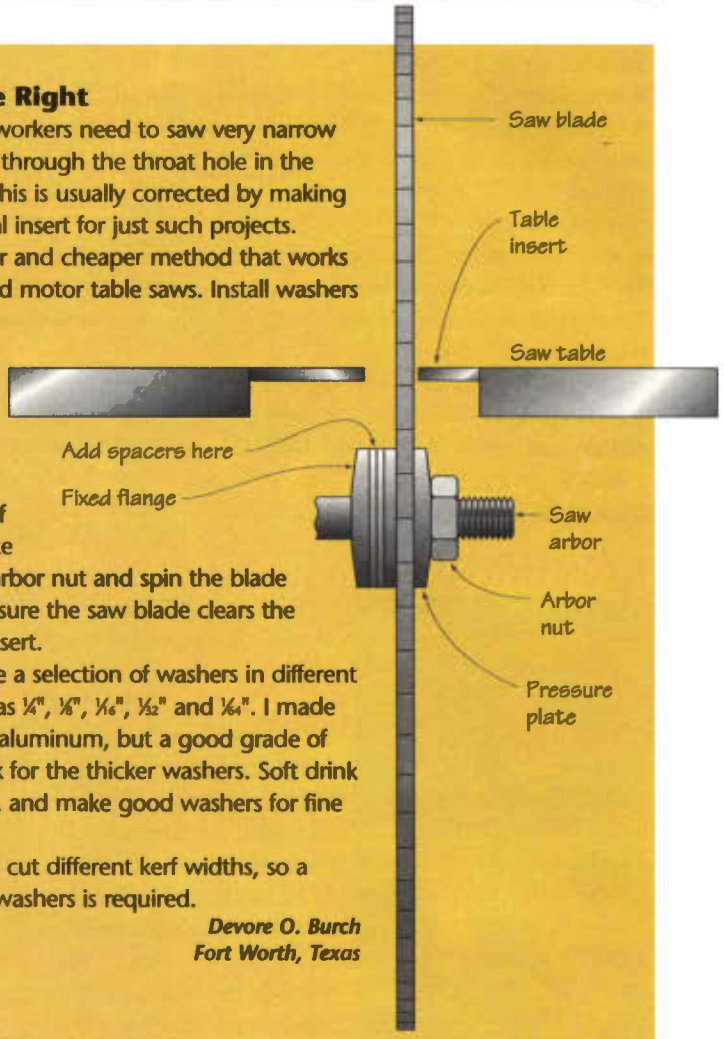
Need a quick way to heat small wood pieces for bending? Wrap them in a wet cloth and put them in your microwave oven for a minute or so.

Michael J. Burton
Ogden, Utah

Shiiiiift to the Right

Sometimes woodworkers need to saw very narrow strips that can fall through the throat hole in the table saw insert. This is usually corrected by making or buying a special insert for just such projects.

Here is a simpler and cheaper method that works for all left-mounted motor table saws. Install washers between the blade and the fixed flange arbor, which are sufficient to move the blade to the right side of the insert clearance slot. Tighten the arbor nut and spin the blade by hand to make sure the saw blade clears the slot in the table insert.



It's best to make a selection of washers in different thicknesses, such as ¼", ⅛", 1/16", 1/32" and 1/64". I made my washers from aluminum, but a good grade of plywood will work for the thicker washers. Soft drink cans are very thin, and make good washers for fine tuning the fit.

Different blades cut different kerf widths, so a selection of shim washers is required.

Devore O. Burch
Fort Worth, Texas

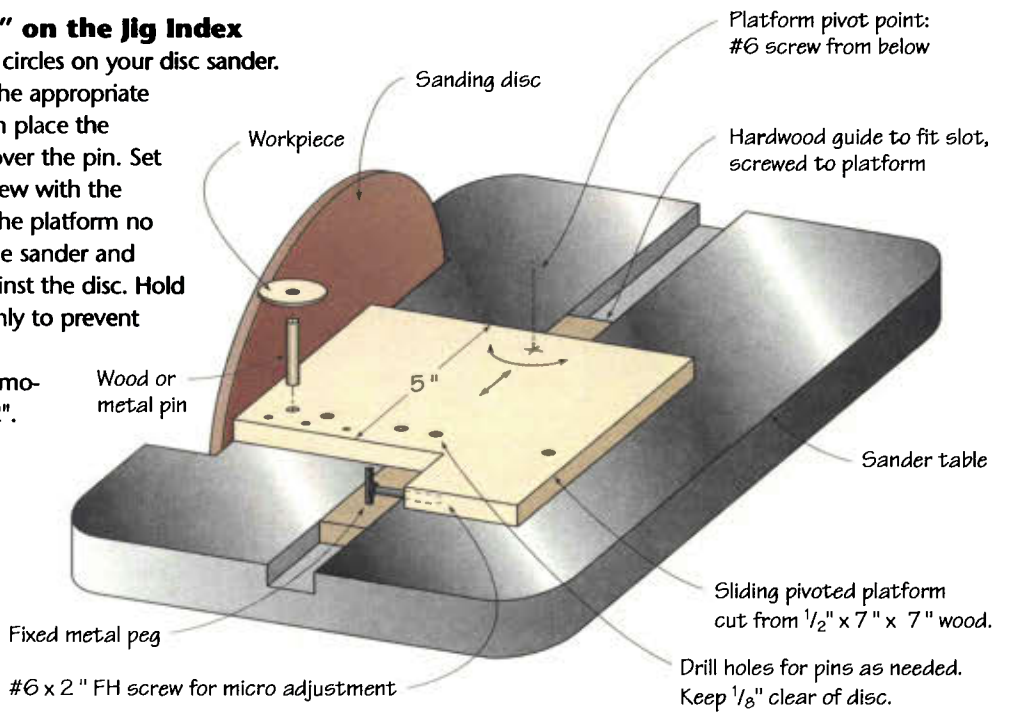
Circle "Disc Sander" on the Jig Index

This jig will make perfect circles on your disc sander.

First, insert the pin in the appropriate hole in the platform, then place the roughed-out workpiece over the pin. Set the micro-adjustment screw with the workpiece overhanging the platform no more than ⅛". Turn on the sander and rotate the workpiece against the disc. Hold small diameter circles firmly to prevent them from kicking-up.

This size jig will accommodate circles from 1" to 12".

Glenn Stonex
Sacramento, California



Two Clamps in One

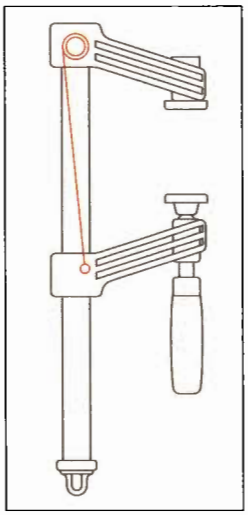
Adjustable Clamp Company has introduced the Jorgensen® **E-Z Hold™ II** clamp line. The E-Z Hold II line features a double sliding head design to offer greater applied force, and a thumb-release clutch disc for one-handed opening.

The new Style 3400 clamp — part of the new E-Z Hold line — can be converted from a bar clamp to a spreader clamp. You simply remove the handle end of the clamp and place it on the opposite end of the clamp bar.

E-Z Hold clamps are available in 10", 16", 22", 28", 36", 40" and 54"-lengths. The 10" clamp retails for about $16, and the 16" retails for about $17. For more information, contact the Adjustable Clamp Company, 417 North Ashland Ave., Chicago, IL 60622; (312) 666-0640.

Circle #130 on the Resource Directory Coupon.

Spring to Action



If you need more hands when you work, perhaps the **Gross Stabil Corporation's** new **Quick-Star** clamp can help. The patented Quick-Star features a spring that connects the two clamping jaws. With one hand, you hold the clamp handle, place it on the work and release — the spring, which runs through the beam, automatically closes the jaws. Then, simply twist the handle to the desired clamp pressure. The clamping jaws are made of fiberglass-strengthened polyamide and the bar itself is a rilled, anti-slip aluminum U-beam with an anodized coating.The Quick-Star has a 3½"-deep jaw and is available in 8" and 12" lengths.

The suggested retail price of the clamp is $23.90 for the 8" span model and $27.50 for the 10" span model. For more information, call (800) 671-0838 or write Gross Stabil Corporation, 333 Race Street, P.O. Box 368, Coldwater, MI 49036.

Circle #131 on the Resource Directory Coupon.

A New Angle in Clamping

Bessey presents the new **Flex K-Clamp**, which can clamp in two different angled directions at once while it holds the workpiece square.

The glue-resistant polyamide jaws are moveable in two directions, which is useful for miter work, multi-angle clamping, irregular shapes and edge gluing.

The suggested retail price of the 6" clamp is $28.50. For more information, contact the American Clamping Corp., P.O. Box 399, Batavia, NY 14021; (800) 828-1004.

Circle #132 on the Resource Directory Coupon.

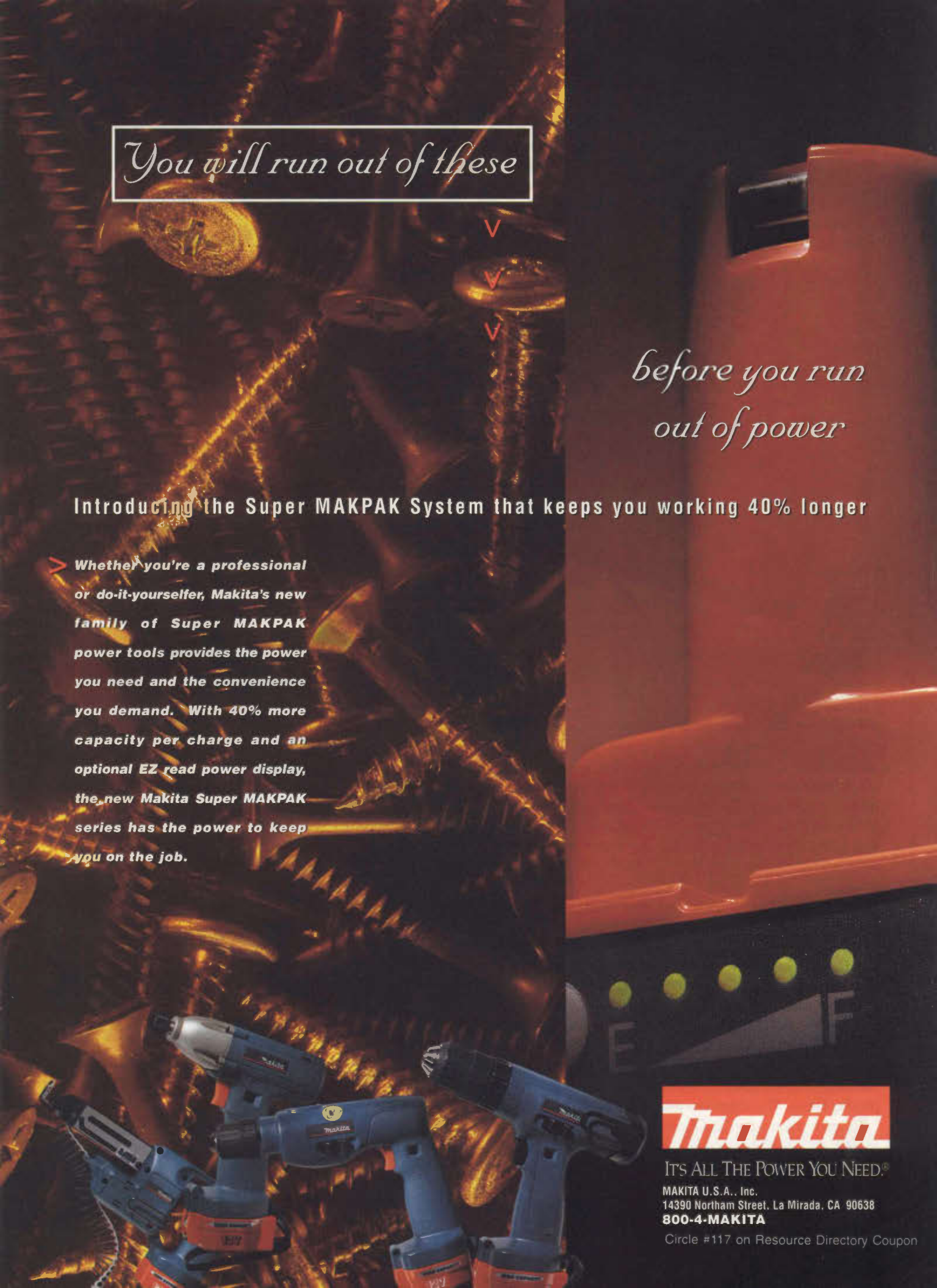
No Job Too Large or Too Small

American Tool Companies, Inc. has expanded its **QUICK GRIP®** bar clamp line to include the new Macro and Micro Bar Clamp/Spreaders. Both clamps feature the same one-handed clamping mechanism as the original QUICK GRIP clamps with added versatility: they also function as spreader clamps.

The Macro Bar Clamp/Spreader offers deeper (5½") jaws for use with hard-to-clamp areas and is available in 10"-, 20"- and 33½"-lengths. The various Macro Clamps retail from $15 to $30. The Micro Bar Clamp/Spreader offers a 4½" jaw designed for clamping small and oddly shaped work pieces. It retails for about $10.

For more information, call (414) 947-2440 or write to American Tool Companies, Inc., 8400 LakeView Parkway, Suite 800, Kenosha, WI 53142.

Circle #133 on the Resource Directory Coupon.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Circle #117 on Resource Directory Coupon

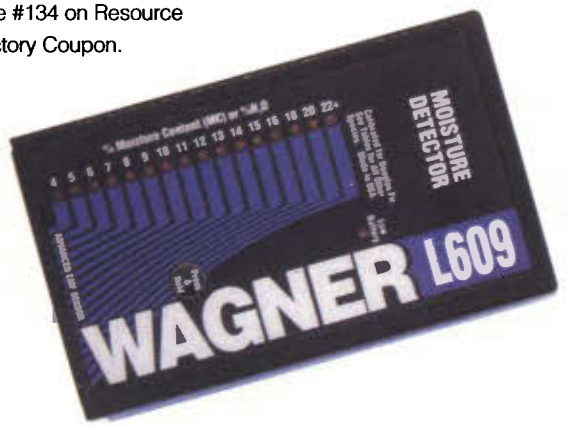
Discover Moisture for Less

Wagner Electronic Products has introduced a compact, hand-held moisture meter. The pin-less **"Wood Friendly™" Wagner L609** features the EMF technology to measure moisture content in hard, soft and imported species. Equipped with LED indicators for convenience in dim light, the L609 reads boards accurately in seconds. It remains unaffected by temperature, humidity, chemicals, stains or finishes.

As part of Wagner's 30th Anniversary celebration, the L609 retails for $129.

For more information, contact Wagner Electronic Products, 326 Pine Grove Rd., Rogue River, OR 97537 or call (800) 944-7078.

Circle #134 on Resource Directory Coupon.



Get Into a Scrape

Veritas® offers a new Scraping Plane Insert that will convert any 2" (or wider) plane into a scraping plane. The patented insert, made of steel, brass and glass-filled nylon, is used in place of the blade/cap iron. The plane's own lever cap holds everything in place, and full use of the depth and lateral adjustment mechanisms is maintained.

The insert fits all standard plane bodies from #4 to #8, and comes with a 2" scraper blade (0.15"-thick), beveled, and honed with a hook. Blades widths of 2⅜" are available for #6, #7 and #8 planes.

The suggested retail price for the scraping plane insert is $25.95. For more information, contact Veritas Tools Inc., 12 East River Street, Ogdensburg, NY 13669; (800) 667-2986.

Circle #136 on Resource Directory Coupon.

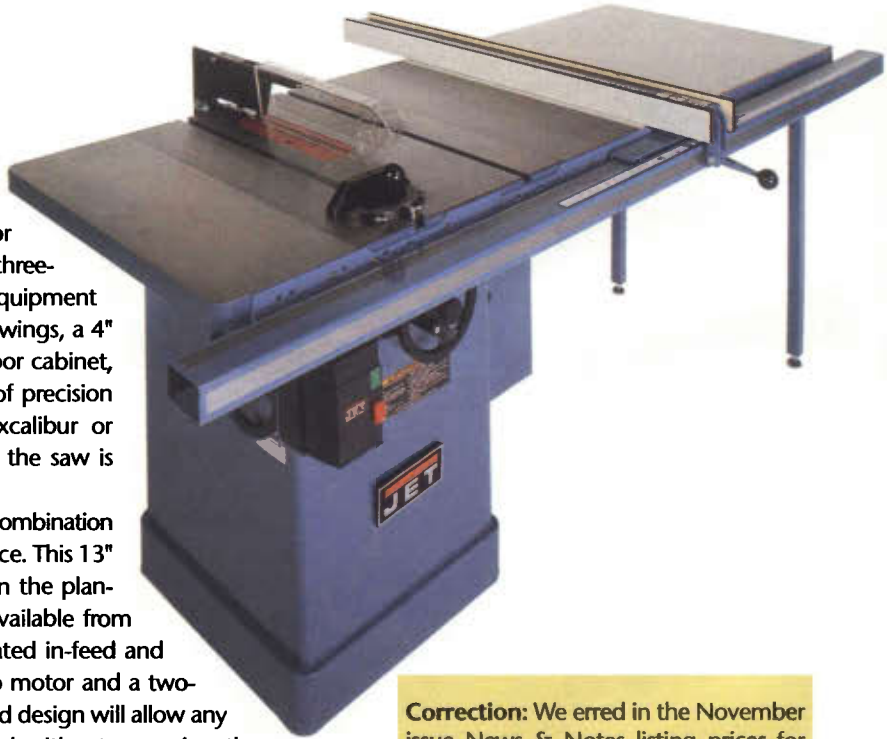
I'll Have the Combo

JET Equipment & Tools presents two new fundamental shop tools: a tilting arbor saw and planer/molder. The new JTAS-10 10" tilting arbor saw is available with either a single phase 3 hp or three-phase 5 hp triple belt-driven motor. Standard equipment includes: two large 27" x 10" cast iron extension wings, a 4" dust port located at the bottom of the angled floor cabinet, an extended bar miter gauge, and your choice of precision after market fences from either Biesemeyer, Excalibur or Vega. The introductory suggested retail price of the saw is $1,399 complete.

If you're faced with limited shop space, JET's new combination JPM 13 Planer/Molder helps save valuable shop space. This 13" planer/molder will take material up to 6⅛"-thick in the planing mode, and uses 40 stock molding cutters available from JET. Features include: fully adjustable, rubber coated in-feed and out-feed rollers, an enclosed under-mount 1½ hp motor and a two-speed feed control capability. The three-cutterhead design will allow any molding cutters less than 2"-wide to be installed without removing the planing knives. The suggested retail price of the planer/molder is $799.

For more information about either of these machines, write JET Equipment & Tools, P.O. Box 1349, Aubum, WA 98071-1349 or call (800) 274-6848.

Circle #135 on Resource Directory Coupon.



Correction: We erred in the November issue News & Notes listing prices for Micro Fence products. The correct price for Micro Fence is $125 including the low and deep profile secondary fences, half-round inserts and 12" guide shafts. The Circle Jig Attachment price is $79, or get both for $198.

RYOBI

TFD222VRK	12V Cordless Drill Kit w/2 Batteries	$135
450	Oscillating Spindle Sander	157
AP12	12" Portable Planer	389
BT3000	10" Sliding Table Saw w/Stand	499
JP155	6 1/8" Jointer Planer	299
RE600	3 HP Variable Speed Plunge Router	219
BE321	Electronic 3" x 21" Belt Sander	139
TS254	10" Miter Saw	182
SC162VS	16" Variable Speed Scroll Saw	163

DAVID WHITE

ALTP6-900	18X Auto Transit Level Package	$469
LP6-20	20X Sight Level Package w/Case	197
LTP6-900	18X Level Package	348

DEVILBISS

SDS100E4G	1 HP Oil-less Pancake Compressor	$229
AFN5	1" to 2 1/2" Finish Nailer Kit	239

SENCO AIR NAILERS

SLP20	5/8" to 1 5/8" Brad Nail Kit	$276
SKS-L	7/8" to 1 1/2" Narrow Stapler	267
SFN1	1" to 2" Finish Nailer	307
SFN40	1 1/2" to 2 1/2" Finish Nailer	379
SN60	Full Round Head Framing Nailer	439

132B	13.2V Cordless Drill Kit w/2 Batteries	$199
2000E	3 1/4 HP Variable Speed Router w/Guide Plus $20 Mail-in Rebate. Before Rebate	203
94100	5 Piece Router Bit Door Making Kit	179
97100	3 Piece Router Bit Cabinet Set	139
SD308	8" Carbide Stack Dado Set	117
SD508	8" Carbide Super Stack Dado Set	165
JS100	Biscuit Joiner w/Case Plus $30 Mail-in Rebate. Before Rebate	157
JS102	Biscuit Joiner w/Tilt Fence & Case Plus $30 Mail-in Rebate. Before Rebate	177
TR215	8 1/2" Compound Slide Miter Saw	349

DK11	3/8"- 1 3/16" Electric Nailer w/Case	$139
DD211	3/4" - 1 1/2" Air Finish Nailer	189
DD37	15" Planer w/Stand	865
NN912X	12" Planer w/Stand	379
EE30	3 HP Wood Shaper	795
DD136	Hollow Chisel Mortiser	199
DD90	14" Band Saw Closed Base 1HP	295
NN720	1 HP Dust Collector	189
NN820	2 HP Dust Collector	279
NN830	3 HP Dust Collector	449
DD126	1 1/2 HP 6" x 48" Belt 12" Disc Sander	399
DD79	3/4 HP 6" x 48" Belt 9" Disc Sander	179
FR400	Edge Banding Machine	174
DD18	18" 3 Speed Band Saw	649
DD606	Universal Surface Grinder	158
MMMT	Miter Trimmer	118
DD221	Coil Roof Nailer	299
DD330	1/2" Crown Air Stapler Gun 1/2"-2" Leg	177
DD340	1" Crown Stapler Gun 3/4" to 1 1/2" Leg	189
DD400	Horizontal Drum/Flap Sander w/Stand	299
DD130	13" Belt Sander	979
DD34	1 1/2 HP Shaper	395
NN910	10" Planer	279
DD55	3/4 HP 12 Speed Floor Drill Press 5/8 Chuck	259
DD65	10" Table Saw	129
EE166	16" Band Saw	449
RT89	Router Table	149

MISCELLANEOUS

3380	ELU Biscuit Joiner	$197
636	Fein Detail Sander w/Case	174
PM2700D	Rousseau Porta Max Stand	215

MAKITA

2708W	8 1/4" Bench Top Table Saw	$329
3612	3 HP Router w/Electric Brake	215
5090DW	9.6V 3 3/8" Cordless Saw Battery & Charger	144
6095DW	9.6V 3/8" Cordless Drill w/2 Batteries	145
6200DW	9.6V Driver Drill w/Battery & Case	114
6211DWE	12V 3/8" Driver Drill w/2 Batteries & Case	173
98202	Water Stone Blade Sharpener	237
LS1011	10" Compound Miter Saw with 60T Carbide Blade	527
LS1211	12" Slide Compound Miter Saw	790

MILWAUKEE

3751	3/8" Close Quarter Drill	$147
4071	12V VSR Drill Kit w/ 3/8" Keyless Chuck, Case, and 2 Batteries	179
6527	Super Sawzall	172
67671	24 Pc. Screw Shooter Kit	137

PORTER CABLE

345	7 1/4" Saw Boss	$104
352	3" x 21" Belt Sander	164
352VS	3" x 21" Variable Speed Belt Sander	171
360	3" x 24" Belt Sander	197
362	4" x 24" Belt Sander	207
447	7 1/4" Framer's Saw w/Electric Brake	137
505	1/2 Sheet Finish Sander	124
511	Lock Installation Kit	157
556	Biscuit Joiner w/Case & Tilt Fence	135
690A	1 1/2 HP Router	138
691	1 1/2 HP Router w/D Handle	153
693	1 1/2 HP Plunge Router	174
695	1 1/2 HP Router-Shaper w/Table	219
5116	16" Omni Jig Dovetail System	267
7116	24" Omni Jig Dovetail System	293
7335F	5" Random Orbit Sander w/Shroud	134
7336F	6" Random Orbit Sander w/Shroud	139
7403	Variable Speed Power Paint Remover	162
7518	3 1/4 HP 5 Speed Router	267
7539	3 1/4 HP 5 Speed Plunge Router	269
7549	Top Handle Jig Saw	133
7810	Wet/Dry Vacuum	259
843	7 1/4" Left Hand Saw w/Electric Brake	134
9444	Profile Sander w/Case	114
9447	7 1/4" Framing Saw w/Case	167
9637	Variable Speed Tiger Saw w/Case	130
97310	Laminate Trimmer Kit	199
9853S	12V Driver Drill, 2 Batteries & Case	163

DELTA

14650	1/2 HP Hollow Chisel Mortiser	$279
17900	16 1/2" Floor Model Drill Press	379
22540BP	12" Planer w/Extra Set of Knives	380
28180	8" 2 Wheel Band Saw	155
28283	14" 3/4 HP Closed Base Bandsaw	759
34444	10" Contractor Saw w/Jet Lock Fence	627
34445	Contractor Saw w/30" Unifence	799
34447	Contractor Saw w/52" Unifence	897
34897N	52" Unifence Only	299
36070	10" Power Miter Saw	161
36210	10" Sidekick Compound Miter Saw	247
36220	10" Compound Miter Saw	199
36250	10" Slide Compound Miter Saw	487
36275	8 1/4" Sidekick Builder Saw	259
36540	10" Bench Top Table Saw	167
36751	10" Cabinet Saw w/30" Unifence	1125
36752	10" Cabinet Saw w/52" Unifence	1199
36755	10" Cabinet Saw w/Jet Lock Fence	949
36820	3 HP Special Edition Unisaw w/52" Unifence	1599
37070	6" Variable Speed Bench Jointer	255
37190	6" Deluxe Jointer w/Stand	434
40640	20" Variable Speed Scroll Saw	299
43505	Router/Shaper	287
46700	12" Variable Speed Wood Lathe	447
50175	"Kick Stand" Work Stand	169

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300B	Transit-Level Outfit	475
SAL1	Contractor's Auto Level Outfit	429

BOSTITCH

S32SX-KIT	7/32" Crown Finish Stapler	$167
BT50KIT	Brad Nailer Kit, Oil, Case & Nails	207
N60FN-2-KIT	Finish Nailer Kit, Oil, Case & Nails	369
BT35KIT	Brad Finish Nailer Kit, Oil, Case & Nails	169
N80SB1	Framing Stick Nailer	329

1194VSR	1/2" V.S. Reversing Hammer Drill	$149
1587VS	Top Handle "Clic" Jig Saw	149
1584VS	Barrel Grip "Clic" Jig Saw	149
1613EVS	2 HP Variable Speed Plunge Router	199
3283DVSK	5" Random Orbit Sander, Case & Accessories	114
B4050	Compact Reciprocating Saw	113

CAMPBELL HAUSFELD

HV2000	HVLP Spray Finishing System	$199
NS289000	28° Stick Framing Nailer	288

DEWALT

675K	3 1/8" Planer w/Case	$159
682K	Biscuit Joiner Kit	217
705	12" Compound Miter Saw	357
930K2	12V Cordless Trim Saw Kit w/2 Batteries	199
935K2	14.4V 5 3/8" Trim Saw w/2 Batteries	249
944K	9.6V Drill w/2 Batteries	134
972K	12V Driver/Drill w/2 Batteries	188
991K	14.4V Driver/Drill w/Case	199

SKIL

1605	Biscuit Joiner w/Case	$134
3400	10" Table Saw	184

HITACHI

C8FB2	8 1/2" Slide Compound Miter Saw	$547
NR83A	16d Full Head Nailer	399
C10FC	10" Compound Miter Saw	239
C10FS	10" Slide Compound Miter Saw	739
NV45AB	Coil Roofing Nailer	434

If your group is hosting an event and you would like other woodworkers to hear about it, please send all pertinent information (date, location, description and fees) at least four months before the opening date to: Calendar, *Popular Woodworking*, 1507 Dana Ave., Cincinnati, Ohio 45207.

Arkansas

White River Artisans School. Year-round courses are available. Class selection includes forged toolmaking, wood-strip canoe making, bamboo fly-rod making and more. For more information, contact: White River Artisans School, 202 South Ave. P.O. Box 308, Cotter, Ark., 72626; (501) 435-2600.

California

The Woodworkers' Place. Ongoing classes at the Woodworkers' Place in La Canada, CA. Learn how to build Shaker and Mission style furniture, among others. Classes given Saturdays and Sundays, with private instruction available. For more information, call (818) 952-3177.

Connecticut

Shaker: The Art of Craftsmanship. September 30–December 3. Held at the Wadsworth Atheneum, Hartford, Conn. Exhibition of handcrafted furniture and decorative arts from Mount Lebanon Shaker Collection, America's oldest and most influential Shaker community. For more information, call (203) 278-2670.

Harris Enterprises. Hands-on, ongoing classes about woodworking, finishing and lathe work, in Manchester, Conn. For more information, call (203) 649-4663.

Kentucky

Woodturning and Joinery Instruction. Classes are offered year-round at Adventure in Woods, Berea, Ky. For more information, call (606) 986-8083.

Maine

Center for Furniture Craftsmanship. Ongoing classes. Call or write for a brochure and registration information: Center for Fumiture Craftsmanship, 125 W. Meadow Rd., Rockland, Maine, 04841; (207) 594-5611.

Massachusetts

The One Cottage Street School of Fine Woodworking. Held at One Cottage Street, Easthampton, Mass. Ongoing fall classes and seminars include beginning through intermediate woodworking and specialty classes regarding woodworking for women, marquetry, veneering, lathe turning, design, hand tools and more. For more information, call (413) 527-8480.

The Woodworkers' Store Classes. Held at The Woodworkers' Store in Cambridge. Ongoing classes in finishing, veneering, router techniques, chair repair and woodturning. For more information, call (617) 497-1136.

Michigan

Shaker Oval Box Workshops with John Wilson of the Home Shop. Classes held January 12 &13 at The Home Shop in Charlotte, and January 19 & 20 at Community Education in Marshall. For more information, call (517) 543-5325.

New Hampshire

Windsor Chairmaking Classes. Make a Windsor Chair with Mike Dunbar in his shop in Portsmouth. Classes scheduled for January 27-31, February 10-14 and February 24-28. For more information, call (603) 431-4676.

Ohio

The Woodworkers' Store Classes. Held at The Woodworkers' Store in Columbus. Ongoing classes in finishing, veneering, scroll saw techniques, chip carving and woodturning. For more information, call (614) 231-0061.

Woodworkers of Central Ohio. Meetings held on the second Saturday of the month in Columbus. For more information, call (614) 457-3704.

Oregon

The Guild of Oregon Woodworkers. Annual Guild Show: November 17-19. Held at the World Forestry Center, Portland, Ore. Monthly meetings held the third Wednesday of every month. For more information, call (503) 492-1515.

Pennsylvania

Traditional Windsor Chair Making. Classes offered year-round in Earlville, Pa. Topics include woodturning and sharpening techniques for beginning to advanced levels. For more information, call (610) 689-4717.

Washington

The Woodworking Shows' Western Washington Show. November 10-12. Held at Seattle Center, Exhibition Hall, Seattle, Wash. For more information, call (800) 826-8257.

Wisconsin

Wisconsin Woodworker's Guild. November 1-5. Held at Red Carpet Lanes in West Allis and Jim Hallada's shop in Merton. Instructor Marc Adams will conduct seminars on Fumiture Making and Router Techniques. For more information, call (414) 258-3132.

The Woodworkers' Store Classes. Held at the Woodworkers' Store in Milwaukee. Ongoing classes in basic and advanced carving, woodworking for kids, biscuit joinery and woodturning. For more information, call (414) 774-1882.

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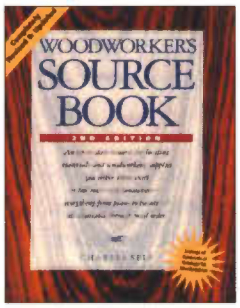

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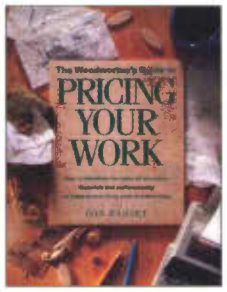

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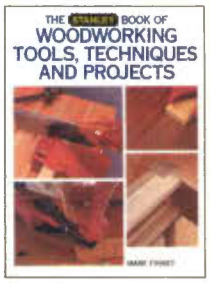

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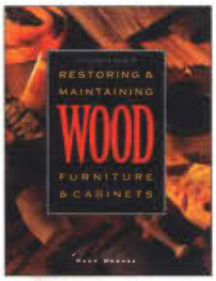

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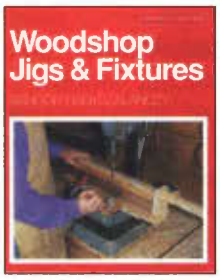

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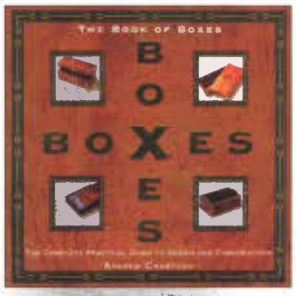

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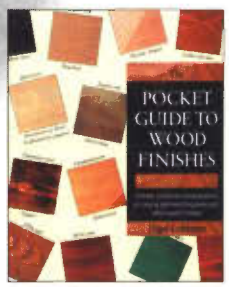

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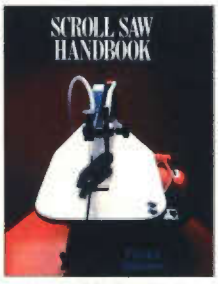

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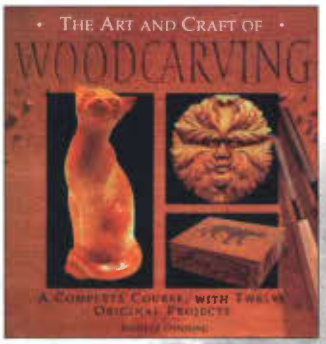

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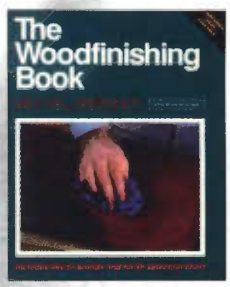

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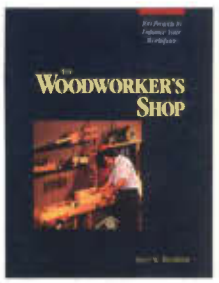

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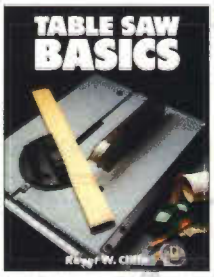

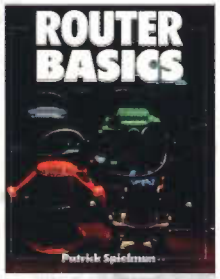

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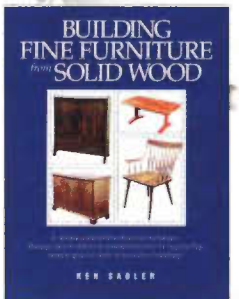

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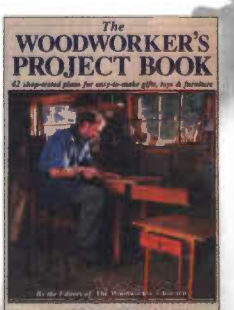

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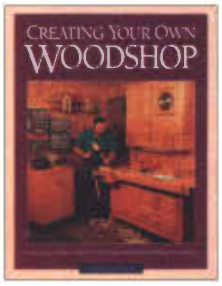

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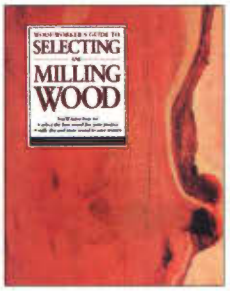

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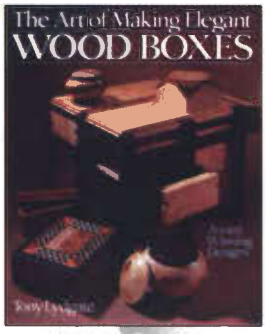

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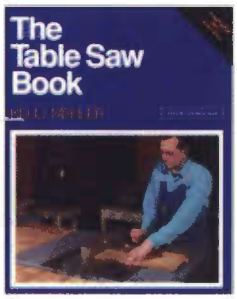

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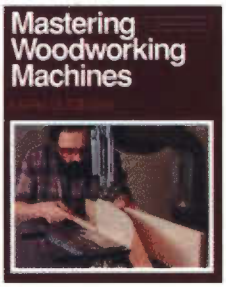

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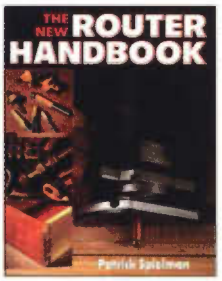

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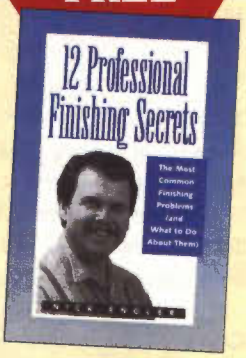

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Western Red Cedar

A versatile wood that's easy to work and good for outdoor or indoor use.

By Ken Textor

Sunlight will dramatically affect the woods' color. After a single season this unfinished planter box will turn a weathered grey color.

Light, durable and versatile, western red cedar is a wood of many uses. Although it's the subject of some controversy in the Northwestern forests logging debate, western red cedar is nonetheless both widely used and widely available.

General Description

Western red cedar (*Thuja plicata*) is also known as canoe cedar, Pacific red cedar, Idaho cedar, pencil cedar, giant arbor vitae, shinglewood tree or stinking cedar. These are local names however, and the lumber is typically sold under the trade name western red cedar.

The growing region for western red cedar is Washington state and southern British Columbia. Idaho, Oregon and northwestern California also have significant western red cedar production. The tree prefers to grow on moist flats and slopes, along the banks of rivers and swamps, and in bogs. The general growing region includes many of the controversial forest lands of the Pacific Northwest. Thus, politics affect both the price and availability of this species.

The tree itself tends to grow slowly, although some individual trees may attain heights of 100 feet, and a diameter of 20", in as few as 80 years. Mature trees reach a height of up to 200 feet, with a trunk diameter of eight feet, in about 300 years. Some specimens up to 250 feet tall and 21 feet wide at the base have been estimated to be nearly 1,000 years old. It is this tendency to longevity that prompts some to say the trees should be left untouched to grow to their full height and remain undisturbed. But because of a shallow root system, thin bark and highly combustible evergreen boughs, the tree is often killed by fire before reaching maturity. Moreover, most older trees develop pecky heart rot and almost all very old trees are hollow-butted, having cores which rotted away inside their trunks. These factors diminish their value as timber for lumber and fuel the argument for a more intensive harvesting program. In any case, western red cedar regenerates itself relatively aggressively.

For a softwood, western red cedar is particularly lightweight, flexible and durable. Indeed, its characteristics are much like its East Coast cousin, northern white cedar (see *PW* #65). It is, however, slightly more brittle than white cedar and, of course, darker in color. In fact, the color of red cedar can range from a light brown and white sapwood, through various shades of reddish or pinkish brown, to a dark, walnut brown. With the exception of the small band of sapwood, the color variation has no effect on the wood's durability. All shades will turn to gray when exposed to sun and weather.

The wood is typically very straight-grained, coarse and soft. It has very low impact resistance and is not particularly strong when measured against other softwoods like white pine (see *PW* #61), tamarack (see *PW* #80) and cypress (see *PW* #74). But it moves little during humidity changes and is readily adaptable to steam bending projects. And its

You're likely to find several color variations among boards in even a small stack of western red cedar.

ability to resist rot is legendary. In fact, one old, blown-down western red cedar was found partially buried. Fourteen hemlocks, each more than 100 years old, had wrapped their roots around the buried portion of the cedar. The sapwood of the cedar had rotted away, providing nutrients to the hemlocks. The heartwood remained sound in every respect.

Traditional uses of western red cedar take advantage of its durability. Cedar shingles, clapboards, siding, fence posts, stockade fencing, pilings, lawn furniture, flower boxes and planters are among the most common uses. It's also used in small boat and ship construction, crating, sashes, doors and general mill work.

Working Properties

Western red cedar is a pleasure to work. It planes easily, both by hand and power planer. When power planing, you can easily take ⅛" off with each pass and still have a board that needs little sanding. You must, however, be careful when power sanding. The wood's softness makes it easy to leave depressions in the surface from sanding.

Most other milling processes — routing, shaping, boring and ripping — offer no problems. Again, the wood's softness can be a slight problem if, for example, you rout with a ball-bearing guide. If the bearing is held too tightly against the wood, it will leave a discemible mark that must be sanded out.

Cross-cutting poses another small problem. Even with saws equipped with cross-cut blades, western red cedar has a tendency to tear when cut across the grain. To prevent this, use a razor knife to score your cross-cut lines, applying a little more pressure to the knife than you would if you were just marking the line.

Lathe work is also a problem with western red cedar. Even when using the sharpest tools, the wood comes off in a lumpy or chunky manner, leaving a surface that requires far too much sanding. In fact, the wood's brittle nature makes it a likely candidate to simply crack or break on the lathe. If you must put western red cedar on the lathe, turn a block that's built up from several thinner pieces glued together. This helps keep the sanding, wood-fiber tear-out and breakage to a minimum.

Typical grain found in western red cedar.

Fastening western red cedar is a snap. Twelve-penny nails or smaller don't need pilot holes — nor do #10 screws or smaller. Where pilot holes are necessary, use a bit that's a size or two smaller than the screw size for best results (use a #10 pilot bit for a #12 screw and so on). This will give the screw a little more wood to bite into. Also be aware that plain iron fastenings (or second-rate galvanized iron fastenings) stain red cedar quickly and permanently. For exterior projects, avoid iron fastenings and use brass, stainless steel or aluminum. Glues and adhesives work fine with this versatile softwood.

Some people have a very strong allergic reaction to western red cedar. It has a more musty or earthy smell than white cedar or aromatic red cedar (see *PW* #53). I've seen a good snort of western red cedar sanding dust cause some people to react with a ten minute coughing and sneezing fit. If you have allergies in general, be careful when working with this wood.

Finishing

In outdoor use, few woods take and hold paints and stains as well as western red cedar. Because of the variability of the heartwood colors, it's best to use full-

bodied, exterior stains to get a uniform result, particularly on house siding. With light stains, the varied colors of the wood may show through. With paints, you'll probably need one base coat and two finish coats to guarantee a uniform color. But otherwise, the wood's very easy to cover.

Clear finishes will be less successful. The wood's softness makes most shellacs, varnishes and lacquers fail. Most failures come when the wood has taken an impact that leaves a dent in the surface and creates hairline cracks (often referred to as crazing) in the finish. If you put a few more coats of finish over the dented area, the crazing can be eliminated.

Therefore, if you plan to use a clear finish on some seasonal project using western red cedar, it's best to renew the finish at the beginning of each new season. Of course, leaving the wood unfinished is also perfectly acceptable. But be aware that until weathered for a few years, western red cedar boards will turn a variety of colors when wetted by rain, dew and so forth. The colors usually are a darkened version of whatever the heartwood was when the wood was first milled. Ultimately, though, naturally weathered western red cedar shingles turn a uniform light silver-gray color many find attractive.

Availability

Western red cedar is widely available throughout the United States and Canada. Prices range from as little as $1 a board foot in its native growing area up to $4.50 a board foot in some East Coast cities. Expect to pay a premium of 10 to 30 percent when ordering particularly long or wide boards. Boards up to 20"-wide and up to 24 feet in length can be readily obtained with some advance notice.

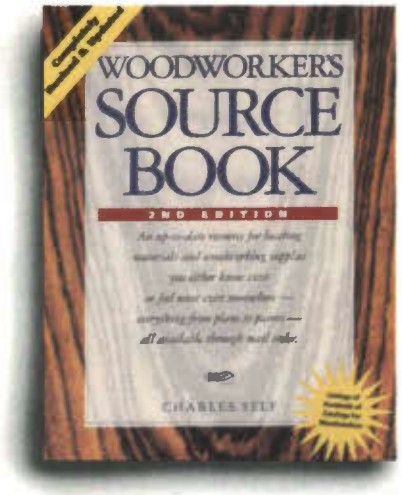
Most western red cedar is sold in 4/4 thicknesses. But you can also obtain dimensional lumber as large as 6 x 6 with some advance notice. With thicker dimensional lumber, be careful to avoid timbers that have ring shake in them. This is a split between two annual rings, often found in the dark wood closest to the heart of the tree. It can run deep into the timber and ruin its strength.

Veneers and turning blocks of western red cedar are virtually unheard of, as is western red cedar plywood.

All cedar prices are subject to the status of the debate over logging rights in the Northwest. If logging limitations increase, expect prices to go up at least temporarily, and vice versa. If the situation remains stable, so too should prices.

In any case, working with western red cedar in the winter is great, particularly for those outdoor projects that will decorate the backyard garden and surround the barbeque in the months to come. To me, working with western red cedar is a sure sign that spring, and the welcome warmer weather it brings, is just around the corner. PW

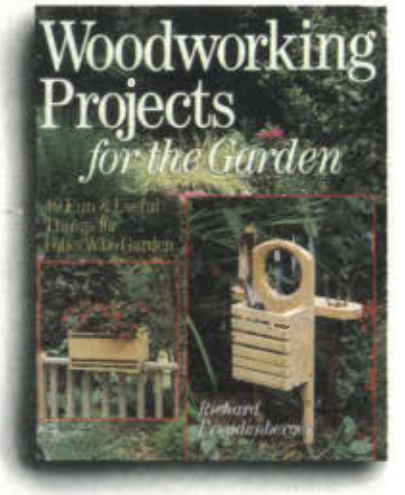
Ken Textor got his start in woodworking as a boat builder. He lives and writes in Arrowsic, Maine.



Woodworker's Source Book, *2nd Edition, by Charles Self. 161 pages, hardcover, $19.99; available from Betterway Books, F&W Publications, Inc., 1507 Dana Avenue, Cincinnati, Ohio, 45207.*

The *Woodworker's Source Book* is basically a catalogue of information for woodworkers, but to call it merely a catalogue of catalogues wouldn't do justice to the variety of information you'll find here. Listed in its pages are sections about shopping by mail, carving, education and training, finishing, hand tools, materials, plans and kits, power tools, shop supplies, tool distributors, wood, and various other supplies and services.

Woodworking, believe it or not, is a rapidly changing field. Author Charles Self has done an excellent job of updating material from the first, now out-of-date edition. The only incorrect entry I could find this time was that for Watco Oil, which during the past few months was dropped by Minwax and picked up by Flecto, and there's no way that a book that's on the market right now could possibly have the most up-to-date information about that! I've long regarded myself as one of the more informed observers of the woodworking scene, and I've learned quite a bit from this volume — there are whole sections that I'll be rereading! Here's hoping that Charles Self and Betterway see fit to update this book on a regular basis. It might even make a great computer on-line service!

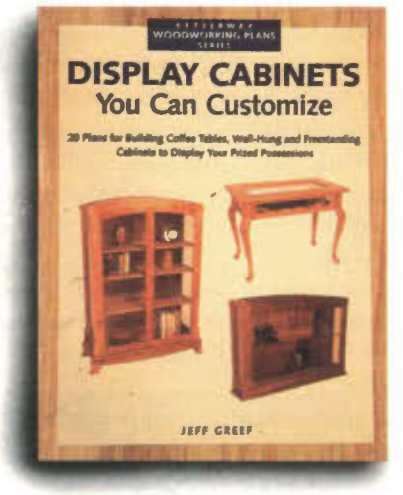


Woodworking Projects for the Garden: 40 Fun & Useful Things for Folks Who Garden, *by Richard Freudenberger. 144 pages, hardcover, $19.95; available from Sterling Publishing Company, 387 Park Avenue South, New York, New York, 10016.*

As my wife and I have become more interested in the flower gardens in our yard, I've sought ways to combine my enthusiasm in woodworking with our interest in gardening. Richard Freudenberger, formerly editor of *Mother Earth News*, now editor of *Back Home*, presents 40 projects for garden accessories, many of which would be useful in my garden. I'll be cutting out his hose guards — to help keep the hose out of the flowers while I'm washing the car — and there are many other handsome, useful projects here.

And if my wife finds this book, she'll have me busy all summer!

True to the Sterling/Lark tradition, the book is illustrated in glorious full color, all the text is very clear, and, most importantly, the projects are easy to build and are both attractive and useful. Sterling has a real winner here; if you're even remotely interested in garden projects, this is a book for you!



Display Cabinets You Can Customize: 20 Plans for Building Coffee Tables, Wall-Hung and Freestanding Cabinets to Display Your Prized Possessions, *by Jeff Greef. 120 pages, paperback, $18.99; available from Betterway Books, F&W Publications, Inc., 1507 Dana Avenue, Cincinnati, Ohio, 45207.*

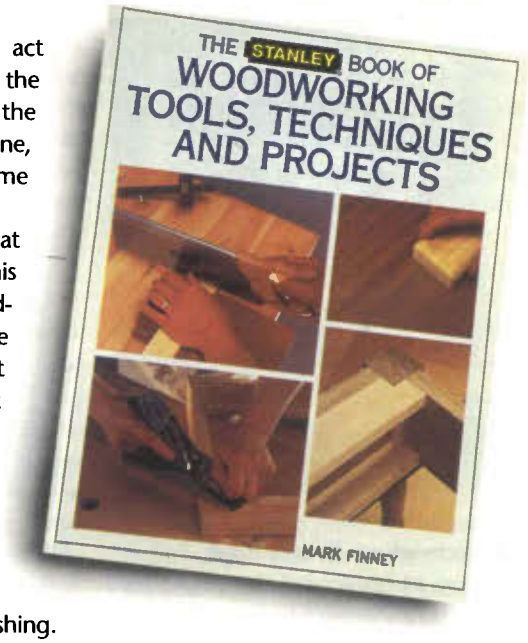
The four-page illustrated table of contents makes the scope of this slender volume seem awfully ambitious; half of it shows the interrelationships between the customized projects, and the other half previews the nine techniques that are most likely to cause woodworkers difficulty. Here's what Greef proposes to show us: three types of tables (end, coffee and buffet) with four types of legs (straight, tapered, turned, and cabriole). Greef also describes curved top and straight top display cases, and six variations on the wall-hung curio cabinet. The techniques are even more impressive. For example, the details presented for holding glass in frames include square sticking for open mortise-and-tenon joinery; mitered sticking for closed mortise-and-tenon joinery; and, router machined cope-and-stick joinery. Also included are making and using jigs, making cabriole legs, "glass, putty and molding," installing hardware, and finishing. A complete index follows the text.

After seeing the thorough table of contents and perusing the chapters, I was sure that a woodworker of even rather modest skills could use this book to customize one of the projects suggested

here. And after you've been through that process a few times, you'll probably be ready to "do the right thing" with plans; good woodworkers I know study plans to get relative sizes, shapes, and attitudes, then they design their *own* projects. This thoughtful, well-illustrated book by one of the rising stars of woodwork authoring will help you to become one of those designing woodworkers. This is a worthy addition to any woodworking library.

The Stanley Book of Woodworking Tools, Techniques and Projects, *by Mark Finney. 160 pages, paperback, $19.95; available from Betterway Books, F&W Publications, Inc., 1507 Dana Ave., Cincinnati, Ohio, 45207.*

This large, handsome volume appears to be aimed directly at the novice woodworker, and I know of no better book to give to novices. It's colorful, and besides telling how to accomplish some woodworking tasks or to make certain joints, it also tells why. You know you're dealing with a class act when the first project suggested by the book is a work bench, and then the bench is actually a pretty good one, one that won't be "old" by the time you advance to intermediate.



Many books offer projects that begin with a list of needed tools; this one prefaces that with a list of needed skills and references back to the earlier pages of the text that describe them. To build the work bench, you need to know: fitting components using wood screws, layout, planing boards flat, edge jointing boards, cutting and fitting mortise and tenon joints, cutting and fitting half-lap joints, gluing up, sanding, and basic finishing. As you move from the first page of the project to these various sections, you find just what you need, both the how and the why. It has always seemed to me that after we understand the why, doing the how gets a lot easier.

Reading the related article boxes headed "important," "good habits," "tip," "technical talk," and the like speeds the process of becoming a knowledgeable woodworker. I know of no better text of its type.

Crafting New Mexican Furniture: A Handbook to Design, Plans, and Techniques, *by Kingsley H. Hammett. 109 pages, paperback, $19.95; available from Red Crane Books, 826 Camino de Mote Rey, Santa Fe, New Mexico, 87505.*

Southwestern furniture continues to be a hot trend in woodworking, wherever you may happen to be.

Kingsley Hammet's handsome new book teaches us the fundamentals of New Mexican design while presenting us with more than two dozen projects, many of which feature beautiful carved sunbursts and rosettes. You're sure to find a project that, when completed, will add cheer to some room in your home Often made of the simplest materials, these projects are also economical to build. To help you adapt the southwestern flavor to your original projects, the author includes a section entitled "Standard Dimensions." I've wanted such a listing for furniture in general, and this alone might be worth the price of the book. Techniques for joinery and decoration are clearly described and illustrated. You're sure to have fun with this book! PW

***Hugh Foster** is a contributing editor to* Popular Woodworking, *a woodworking author, and high school English teacher who lives in Manitowoc, Wisconsin.*

Faux Fireplace

Have a cozy, decorative mantel in every room of your home!

By David Thiel

Stockings should be hung by the chimney with care, but when you don't have a mantel it's a little difficult. So we designed one that can be "dismantled" and put away when 'tis not the season. Set up or break down takes less than five minutes and the whole thing fits in the back of a closet.

To keep this project simple, we went to the local home center megastore for all of our materials, including the moldings. The result is a project that can be built requiring only a circular saw, miter box and a hammer!

We've broken the project into easy construction stages — the mantel, supporting legs and their lower plinth blocks, the back and hearth.

The Mantel

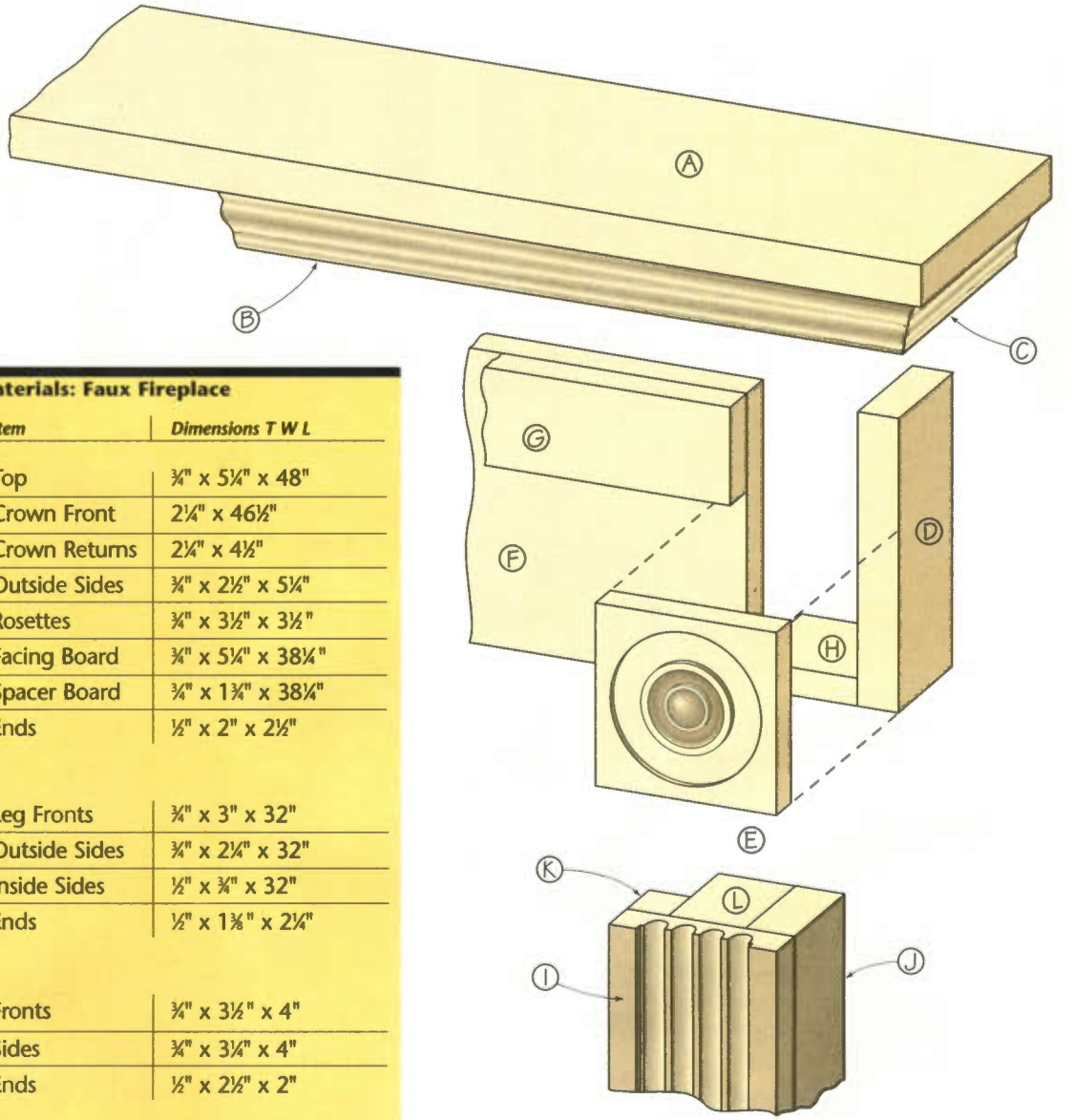
The mantel is made of twelve pieces, ten of which we purchased at the megastore. The other two come from your shop scrap pile. The top piece (A) was purchased at the size listed on the Schedule of Materials and its size determines most other mantel dimensions.

Start by cutting the crown molding front (B) to its 46½"-length, which allows the top to overhang the molding by ¾" at the front and both ends. Crown molding is an excellent material on which to practice the "measure twice, cut once" adage. It's very easy to make a mistake. If you've never cut compound miters for crown molding, here's how. Lay the piece to be cut upside down, profile up and at a 45° angle bridging the miter saw's table and rear fence ***(photo 1)***. The saw is then set to a 45° angle and the cut made. If you don't have a miter box, cut them on the table saw following the instructions in the Tip Box later in this feature.

The crown molding returns (C) should now be cut and checked for fit with the front piece. Make the miter cut first, then trim the other end to length since this is a simple cross cut. If you have a pneumatic pin gun, use it now and save some time attaching the crown molding to the top. If not, use finish nails, glue and a hammer to do the job ***(photo 2)***.

Set this assembly aside to dry and turn to the spacer board, facing board and the rosettes. Glue and nail the spacer board

Photo 1 *Place the crown molding between the fence and table at a 45° angle in the same position as it will be mounted. Set the saw to make a 45° cut. By doing this, a compound cut is made.*



Schedule of Materials: Faux Fireplace

No.	Letter	Item	Dimensions T W L
Mantel			
❑ 1	A	Top	¾" x 5¼" x 48"
❑ 1	B	Crown Front	2¼" x 46½"
❑ 2	C	Crown Returns	2¼" x 4½"
❑ 2	D	Outside Sides	¾" x 2½" x 5¼"
❑ 2	E	Rosettes	¾" x 3½" x 3½"
❑ 1	F	Facing Board	¾" x 5¼" x 38¼"
❑ 1	G	Spacer Board	¾" x 1¾" x 38¼"
❑ 2	H	Ends	½" x 2" x 2½"
Legs			
❑ 2	I	Leg Fronts	¾" x 3" x 32"
❑ 2	J	Outside Sides	¾" x 2¼" x 32"
❑ 2	K	Inside Sides	½" x ¾" x 32"
❑ 4	L	Ends	½" x 1⅜" x 2¼"
Plinth Blocks			
❑ 2	M	Fronts	¾" x 3½" x 4"
❑ 4	N	Sides	¾" x 3¼" x 4"
❑ 4	O	Ends	½" x 2½" x 2"
Misc.			
❑ 1	P	Hearth	½" x 12" x 48"
❑ 1	Q	Back	¼" x 37" x 39"

(G) to the face of the facing board (F) as shown in the diagram. The rosettes (E) are then attached to the facing board, overlapping ⅛", leaving 37" between the two rosettes ***(photo 3)***. This size works well to align the rosettes just below the lower portion of the crown molding, but you may want to recheck the size on your crown to make sure it's accurate.

Next, attach the outside sides to the inside of the crown returns so they extend 3½" below the crown mold. Then set the rosette assembly on the front edge of the outside sides, with the spacer board fitting against the back edge of the front crown molding. Attach the assembly through the rosettes and the back of the spacer board ***(see diagram)***.

To complete the mantel, place the ends in the space formed by the rosette and the outside sides. These should be attached with nails ***(see diagram)***.

Photo 2 *The crown molding pieces are shown attached to the mantel top.*

***Photo 3** The rosettes overlap the facing board, and are set flush to the lower edge.*

***Photo 4** The assembled plinth blocks will be left and right, determined by the location of the groove cuts.*

The Legs

Again, most of the pieces were purchased at the home center store, with the exception of the ends. The leg assembly is comprised of five pieces that make a long, narrow, somewhat irregular box.

Nail the fluted front board (I) to the edge of an outside side (J), and to an edge *(see diagram)* of the inside side (K). Finally, attach the ends (L) by nailing them in place.

TIP If you don't have a chop saw, cut your crown molding compound miters on the table saw. It's easy, and here's how. Set your slot miter gauge to 35° and cock your saw blade to 30°. Lay your stock flat on the saw table and use the miter gauge to make the cut as you would any set of miters.

The Plinth Blocks

The plinth blocks are also simple boxes made with the front (M) mitered to the sides (N). To complete the five-sided assembly, fasten the ends (O) with nails.

On the top outside edge of each plinth block, cut a ¼" chamfer detail. Then, on the two inside sides of the blocks, cut a ⅜" groove (***photo 4***). These grooves accept the "firebox" back. Depending on the material you use for the back, this groove may need to be thicker or thinner.

Assembly

The last pieces required before assembly are the back (Q) and the hearth (P). We decorated our fireplace using linoleum tiles (which we also purchased at the home center store) applied to the hearth and back. This increased our cost, and you may opt to finish your hearth and back with paint, shelf paper or other material. The hearth itself, however, is not an option. It provides stability to keep the piece from tipping over.

The fireplace has been designed to disassemble when not in use. With the plinth blocks attached to the legs, the entire unit breaks down to five pieces — the mantel, two legs, back and hearth.

The back is notched ½" x 5" (vertically) at all four corners and slides into the grooves in the plinth blocks. Screw the back to the legs using 1" screws every 8". The mantel is then attached to the legs using a nut and bolt. Then screw the top edge of the back to the back of the mantel facing board.

With the assembled fireplace laying on its back, center the hearth in position and screw up through the hearth into the plinth bottoms.

Finishing

Now that you know all the pieces fit, take the project apart, set the nails, fill the holes, and finish sand to 220 grit.

We wanted our pine fireplace surround to have an aged, yellow color. To avoid the inevitable when staining pine, we added brown aniline dye to our lacquer and sprayed the color. Since the color was in the lacquer, it laid on the wood's surface rather than penetrating, giving an even color. We then sanded lightly with 320 grit paper and gave it a final top coat of clear lacquer. The "firebox" was painted using flat black quick dry enamel from an aerosol can.

The rest is simple. Find a wall in your house that needs a fireplace and set it up. PW

***David Thiel** is associate editor of* Popular Woodworking.

WOOD´WORDS (wood´wurds) *n.*

Plinth: *A block or slab upon which a pedestal, column or statue is placed.*

Rosette: *A painted, carved or sculptured ornament having a circular arrangement of parts resembling rose petals.*

Wood & Copper Napkin Caddy

Roll out several of these great holiday gifts!

By John A. Corso

Making a few of these table napkin caddies for holiday gifts will be simple since the project lends itself to short production runs. Once your router is set up and the parts are cut to size, making multiples is a snap (see our plant stand project on page 64 for important tips on successful short production runs).

The holder illustrated is designed to fit the standard-size paper napkin sold by grocery stores. Nonetheless, before beginning work on your napkin caddy, check the size of napkins used at your house and make any necessary size adjustments.

Prepare the Pieces

Begin by cutting the three component parts to size using the Schedule of Materials. Choose any wood specie, or whatever you find in your shop scrap pile. I chose walnut because it's easy to work with and always takes a fine finish.

Using a ¾" bit in your table-mounted router, cut a ⅜"-deep groove in the center of each end. Make the groove run from the bottom edge to ½" from the top. Be sure to rout these grooves before you shape the curves on the end pieces while they're still rectangular.

Using the pattern in the PullOut™ Plans, cut the shape on the end pieces. You can use a band saw, scroll saw, saber saw, coping saw, or even a router with a flush bearing pattern bit. While your router is still mounted to your router table, change to a ⅜" roundover bit and proceed to round the outside edges of the ends along the shaped curves. Don't run this detail on the inside edges and leave the bottom edge square.

A length of copper tube, captured between the ends, rides in the previously routed groove to keep the napkins neatly in place. To make this metal part, cut a piece of ½" copper tubing so the length is ⅛" less than the distance between the bottoms of the two ⅜"-deep grooves milled in the ends.

Assembly

With the routed grooves facing inward, fasten the ends to the base using two 1½" x #8 flathead screws for each end. Space each screw 1" in from the outside edge. Carefully countersink the screws so that the heads are flush with the wood.

Finishing

Finish the caddy as you like. I used my favorite finish, a rub-on varnish made by Bartley. It performs well with a minimum of fuss. I covered the screw heads with plastic tap-in-place covers that you can buy from The Woodworkers' Store catalogue. The covers are available in brown or cream colors and press fit in either Phillips or square-drive screw heads.

Polish and lacquer your copper tubing and, when dry, set it in its grooves. Now that your project's complete, fill it with with napkins and display it on your kitchen or dining room table. If its destiny is to be a gift to a friend, find a nice box and get wrapping. PW

John A. Corso, a retired seaman, turned woodworking from a hobby to a profession. He writes about it from his home in Bellevue, Washington.

Schedule of Materials: Napkin Holder

No.	Letter	Item	Dimensions TWL
❑ 2	A	Ends	¾" x 6¼" x 5"
❑ 1	B	Bottom	¾" x 6¼" x 6¾"
❑ 1	C	Copper Tube	½" x 7⅜"
❑ 4	D	Wood Screw	1½" x #8
❑ 4		Screw Covers	

Lacewood Candle Box

A lift-out tray adds versatility to this antique style storage box.

By Steve Shanesy

The highly figured, shimmering look of lacewood can be downright gaudy on large surfaces, but as an accent, or in this case, for a small, delicate looking box, it is very appropriate. I picked up a four-foot length of it that was just under 5" wide, which proved to be just the quantity I needed for this project.

The style is based on the typical candle box of years ago where the top, or lid, slides out one end and a small finger detent in the top is all that's required to slide it in its groove. Since I don't have too many candles to store, I concluded the addition of a lift-out tray would give the simple design a number of new uses. For example, I think this lacewood version will make a nice jewelry box.

If you're considering making holiday gifts, this box affords an opportunity to use up some scrap wood if you make several at once. You can even customize the lift-out tray to suit different needs, or delete it from the project all together.

To make my candle box, I first reduced the ¾"-thickness to ½" using my 12" planer. If you're not so equipped, the finished board widths can be resawn on a 10" table saw. I next ripped my board to the finished width and crosscut to length. I left the sides and ends slightly longer, preferring to make my final cut when I made the 45° miters on the ends. I then rolled my table saw blade over to the appropriate angle and set a stop block on my table saw sled for the correct length. However, I first tested both the angle and the length on a piece of scrap before cutting my lacewood.

After the miters were cut, I then machined the grooves in the top and bottom long edges to house the poplar bottom and make the slot for the lid to slide. Since the bottom sits up ¼" and the ½" top is flush to the sides, I could use the same set up on the table saw for both cuts. Rather than take the time to insert a dado set, I simply used the ⅛" saw kerf and made two passes to achieve my ¼" square groove.

One final cutting operation and the lacewood was ready. The width of the front had to be reduced to allow the top to pass over it. I made the final front width so that, when assembled, it would be about 1/32" lower than the channel for the lid's groove.

SAFETY TIP

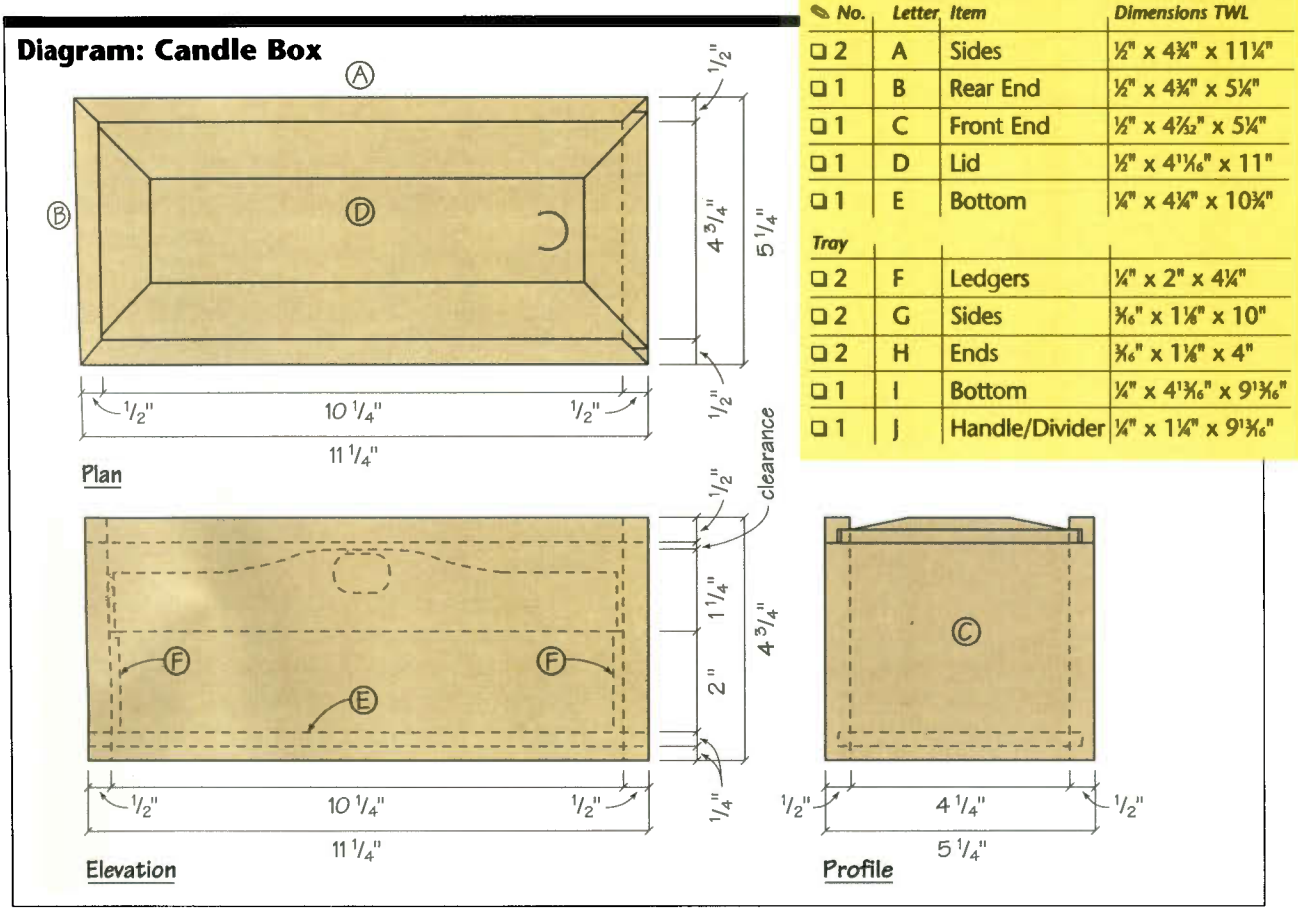
When running stock on edge to cut bevels using your table saw, make sure your table insert opening is only as wide as the saw kerf. A wider opening can allow the short or narrow pieces to slip down, wedging between the whirling blade and the insert throat.

Before I could assemble my box, I had to prepare the poplar bottom. I used solid poplar and thinned it using the planer. You could, however, use ¼" hardwood plywood instead. Finish sand the interior surfaces before assembly, because working in tight interior spaces is next to impossible, even using a detail sander.

With all the box parts ready, I assembled the sides and bottom, gluing the miters and "clamping" the joints in place. I used masking tape to hold the miters securely in place while the glue dried.

As the adhesive was setting up, I double-checked the finished dimensions for the top before cutting it to size. I then cut the beveled edges using the table saw with the blade set to 12°. Make this cut with the fence set so that you leave about 3/16" edge on the lid. With the increasing slope of the bevel, this edge dimension will be right for sliding in the grooves. I made a finger grip in the top using a Forstner bit drilling in at a 30° angle about ¼"-deep.

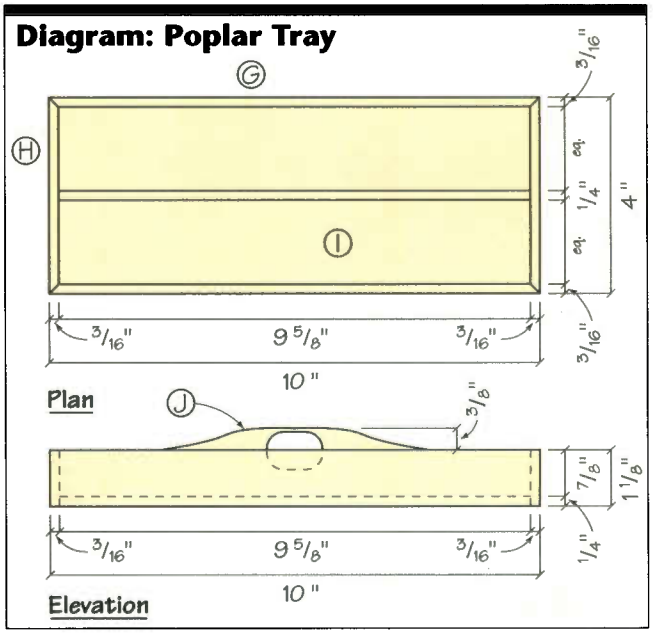
Diagram: Candle Box



Schedule of Materials: Candle Box

No.	Letter	Item	Dimensions TWL
❑ 2	A	Sides	½" x 4¾" x 11¼"
❑ 1	B	Rear End	½" x 4¾" x 5¼"
❑ 1	C	Front End	½" x 4⅞2" x 5¼"
❑ 1	D	Lid	½" x 4 1⅛6" x 11"
❑ 1	E	Bottom	¼" x 4¼" x 10¾"
Tray			
❑ 2	F	Ledgers	¼" x 2" x 4¼"
❑ 2	G	Sides	⅜6" x 1⅛" x 10"
❑ 2	H	Ends	⅜6" x 1⅛" x 4"
❑ 1	I	Bottom	¼" x 4 1⅜6" x 9 1⅜6"
❑ 1	J	Handle/Divider	¼" x 1¼" x 9 1⅜6"

Diagram: Poplar Tray



Poplar Tray

I cut the parts to size, scroll-sawed the oval-shaped grip in the handle, pre-sanded the parts, then glued and wire-nailed the pieces together. The part sizes given in the Schedule of Materials are for mitered corners where the sides and ends overlap the bottom. The handle runs between the ends and is nailed there as well as glued to the bottom. I added two ledgers to the ends for the tray to rest on inside the box. I simply tacked these pieces in place.

Finishing

I sanded the box's exterior and completed the project using two coats of eggshell sheen varnish, lightly sanding between coats. Remember when finishing with varnish to gently stir — not shake — the can to avoid making foam or bubbles. Thin the varnish so that it flows off the brush without leaving brush marks. Brush in only one direction to avoid raising bubbles on the surface. If you haven't done so already, spend some money on a good varnish brush and take good care of it. If you don't think you'll use brushed varnish often enough to justify the expense, your next best choice is an inexpensive, disposable foam brush. PW

Steve Shanesy is editor of Popular Woodworking.

Chalkboard Message Center

A kitchen hang-up for everyday use.

By Steve Shanesy

PHOTO BY HAYES SHANESY

I've had this chalkboard hanging in my kitchen for the last 10 years, and it's safe to say that it gets used every day. When I made it, and a half dozen others as Christmas gifts for friends and family members, I had no idea how popular and useful they would be. But routine visits to the homes that have these handy chalkboards prove they all get a workout.

In the kitchen, there's always a running list of needed grocery items, reminders of appointments, and messages to return phone calls. The chalkboard helps keep track of it all.

It's a simple project that lends itself to making multiples (you can get 10 pieces from one 4' x 8' sheet of tempered hardboard), and it's fast because it uses narrow stock that's readily available in ¾"-thickness. I made mine from various pieces of scrap around the shop — some in birch, some in cherry and a couple in pine.

The tempered hardboard can be made into an excellent chalkboard surface by spraying it with a chalkboard finishing product available in an aerosol can. You can find the spray at most paint stores, and no special equipment is required.

Getting Started

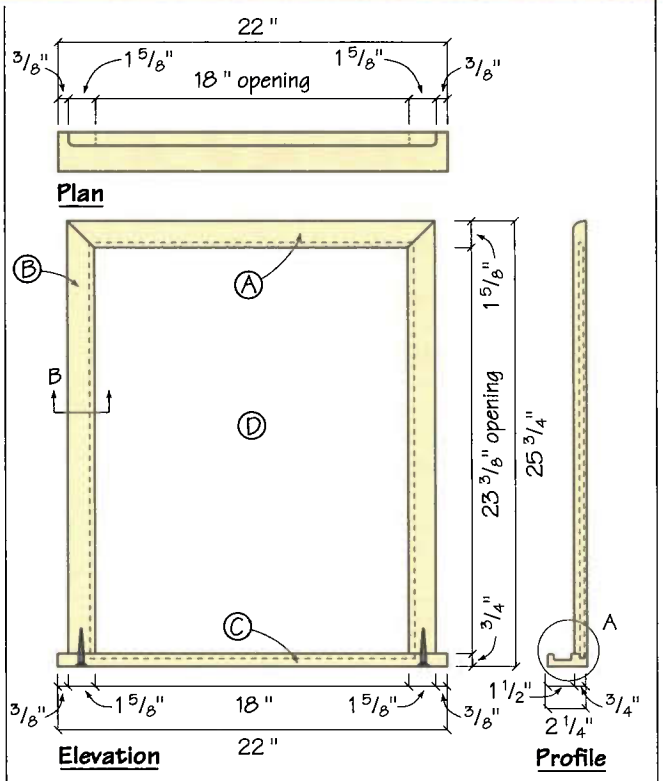
Begin the project by cutting all your material to the sizes given in the Schedule of Materials. The list provides finished sizes for all parts, but at this stage leave the top and side frame pieces long for making your miter cuts later. In fact, if you have long stock to use for the frame parts, leave it long until after you have run the edge profiles and rabbets.

TIP **It's important to properly break in a new chalkboard. If you don't, your first writings will leave indelible "ghosts" that can't be erased. To break it in, hold a piece of new chalk lengthwise and carefully cover the board both horizontally and vertically with a film of chalk. Erase and repeat. The idea is to distribute chalk dust evenly into the tiny pores of the new board. Once this is done, write on!**

You can choose any edge profile that works for you. You may already have a router bit that will do the job. Of course, you could leave the edge square. I used a simple ⅜" roundover profile. I ran this detail on both the inside and outside front edges of the upper frame parts and the front top edge of the bottom shelf. With that done, run a ⅜" square rabbet on the back, inside edges of the top and side frame parts to receive the chalkboard. Next, mill a ¼" square groove in the top of the shelf ***(see diagram)*** which the back will slip into. Note that the groove is stopped on both ends and is set in ⅛" from the back edge. I milled the groove using a ¼" straight router bit with the router mounted in a router table. I marked the stop and start points with a pencil on the router table fence. The groove stops under the ends of the side frames.

Next, I ran the flat bottom cove detail in the shelf that holds the chalk, simply running it all the way through the length of the shelf. I used a cove profile router bit and again mounted the router in a table. If you're not so equipped and don't want to spend the money, you could simply run a wide groove using your table saw by making multiple passes over your saw blade or dado set.

I next cut the frame parts to final length, including the miters for the sides and top. The final step prior to assembly was drilling a clearance hole through the shelf in order to fasten the shelf to the sides with screws.



Schedule of Materials: Message Center

No.	Letter	Item	Dimensions T/W/L
❑ 1	A	Top Frame	¾" x 1⅜" x 20¾"
❑ 2	B	Side Frame	¾" x 1⅜" x 25"
❑ 1	C	Chalk Shelf	¾" x 2¼" x 21"
❑ 1	D	Chalkboard	¼" x 17⅜" x 23¾"

Assemble and Finish

To assemble, carefully position the frame sides in place and secure them with two screws each. Next, glue and clamp the miters at the top. To prepare the chalkboard, cut the hardboard to size and spray paint following directions on the can.

To complete, I slipped the back in place and secured it by nailing wire nails into the frame sides and top, not through the hardboard, but behind it.

To finish, I simply sanded the piece through 150 grit and brushed on a coat of varnish. When it dried, I lightly sanded it smooth with 360 grit and recoated it. PW

Steve Shanesy is a volunteer in Santa's woodshop and edits Popular Woodworking *in the off-season.*

Many Happy Returns

Our Christmas star boomerang will keep the spirit of the holidays coming back year-'round!

By Bruce Woods

Boomerangs do come back. Sure, over the years many of us have been burned by plastic toys that wouldn't return if you tossed them into the teeth of a hurricane. But if you follow a few simple design parameters, and learn the basic throwing techniques, it's not difficult at all to make a real returning boomerang ... even one that looks as unusual as the Christmas star pictured here.

The first step is to reproduce our design in the PullOut™ Plans on a piece of quality ¼" plywood. We used 5-ply, ¼" baltic birch. Hobby shops, particularly those that cater to model airplane fans, can sometimes order wood with seven or more layers per ¼". In general, the more plies the better, for both rigidity and resistance to boomerang-eating trees. If there's any cupping or warping in the wood, center the boomerang on the cup when drawing, so it will affect all of the arms equally.

A scroll saw is the tool of choice for cutting out your 'rang. A sabre saw is a poor second choice. Even with the finest blade on this hand tool, tear-out will probably be a problem. If the wood has a warp in it, mark the 'rang's top and bottom, making sure the finished arms will curve up at the tips.

Once the basic shape is made, form the airfoil (a boomerang is, essentially, a flying wing) on the top of those arms. Each one must have a leading edge and a trailing edge *(see the* ***diagram*** and ***Have a Fling*** on the next page for throwing technique and to determine which edges will be which, remembering that when the 'rang is thrown the leading edge must lead). To form the airfoils, simply draw a line ¼" from the edge of each arm to guide you in shaping the leading edge, and ½" for the trailing edge. Now, using a rasp or sander (I used a random orbit sander with 80-grit paper) remove wood to those lines, effec-

tively removing a wedge, leaving an edge half the original thickness of the plywood, as illustrated.

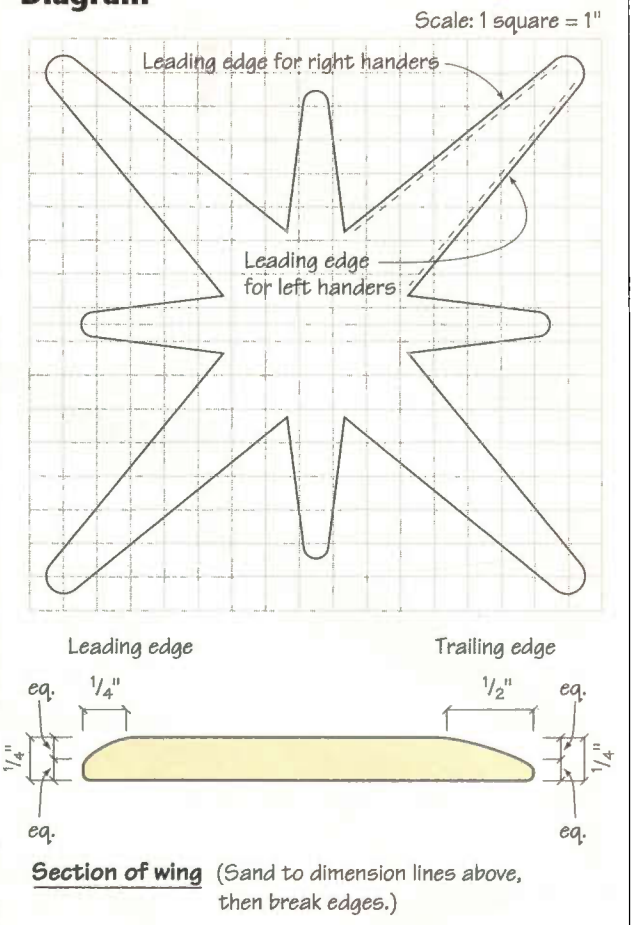
With that done, simply smooth the surfaces to prevent splinters, and you'll be ready to give your boomerang a test flight. Any problems with the flight should be taken care of by following the instructions in ***Have a Fling,*** below. If all else fails, steam the arms over a teapot (carefully — blistered fingers will hurt your throwing form), and bend each arm up slightly toward the upper, shaped surface at the tips.

Once you've successfully thrown your roughed-out boomerang, sand it smooth (I worked mine to 150 grit), being careful to reduce the overall thickness of the wood as little as possible, and finish it as you see fit. Mine simply received a few coats of clear lacquer, but anything that will protect the wood from the worst effects of warping moisture will do the job, and the opportunities for decoration are limited only by your imagination.

There you have it, a simple and fascinating toy that will serve as a reminder that, no matter how much time you think you have to finish next year's gifts, the holidays will be coming 'round again sooner than you think! PW

Bruce Woods is editorial director of Popular Woodworking.

Diagram



Section of wing (Sand to dimension lines above, then break edges.)

Have a Fling

First of all, find a large, open area, free of children who can be conked, cars that can be dented, and so forth. I'd suggest you allow at least 50 yards in every direction ... more while you're learning to throw your boomerang. Don't even attempt to fly a 'rang when the wind is blowing at more than 5 mph; even the best of throwers can lose control of boomerangs in heavy winds, and an out-of-control 'rang can be dangerous.

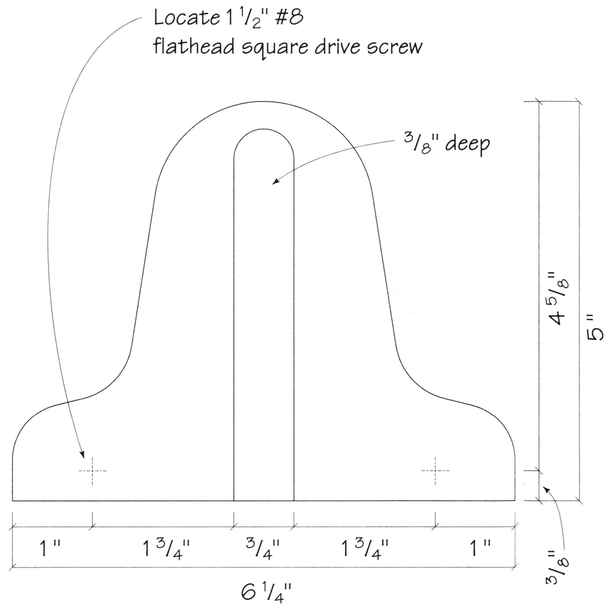
Now, take a comfortable stance and, with the wind blowing from 12 o'clock, face more or less toward 2 o'clock (this is a starting point, depending upon the boomerang and wind velocity, you'll have to adjust your throw for optimum effect, probably ending up somewhere between 1 and 3 o'clock). Hold the boomerang almost vertically in your right hand, with the shaped side facing toward you. Lefties will reverse these directions, and, of course, will have to shape the wings of their boomerang in such a way that the leading edge is always leading as the toy spins through the air. Lean the top of the boomerang a bit away from you (again, the perfect angle will depend upon the wind speed, your angle of attack into the wind, and the individual boomerang used) and throw it forward at an angle slightly above the horizontal. Don't try to throw too hard at first; it's more important to impart spin to the boomerang than sheer force.

Snap your wrist as if you're using a hammer. If everything is as it should be, the 'rang should spin out, gradually arcing and climbing against the wind until, with the breeze behind it, it comes whirling back, spinning like a helicopter rotor, to hover its way to the ground. When you get a particularly accurate throw, you can even impress your audience by catching the boomerang. Remember, though, that those whirling arms can give you a nasty rap on the knuckles.

The correct way to catch a 'rang is to position one hand above it and one below as it hovers down, then slap your hands together, making a boomerang sandwich.

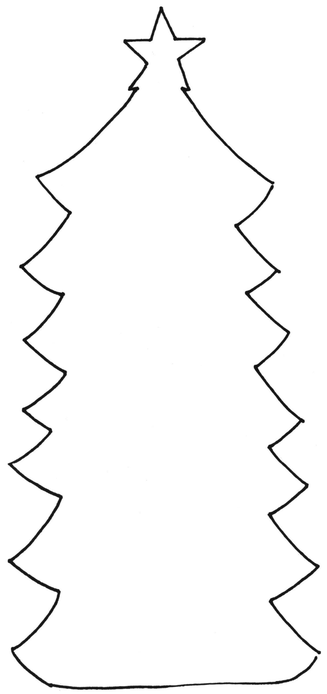
That's all there is to it. Of course, like anything else, boomerang throwing gets easier with practice. Keep after it, varying the lean of the 'rang away from your body and the angle of attack into the wind as necessary, and before you know it what goes around *will* come around ... again and again!

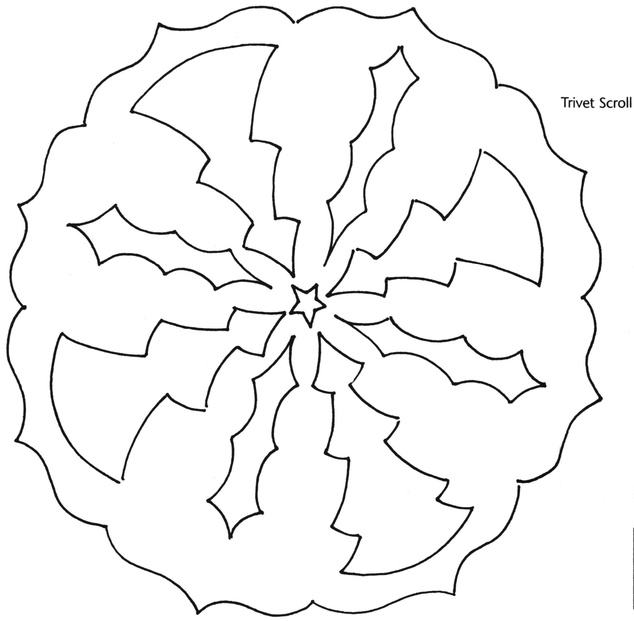
Napkin Holder Full-Size Pattern



Round over outside edge only with 3/8" radius router bit.
Do not round over bottom edge.

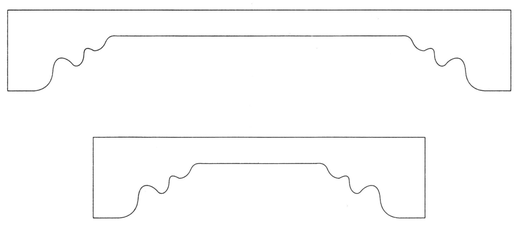
Tree Scroll Saw Pattern





Trivet Scroll Saw Pattern

Music Box Full-Size Leg Patterns



**The following is the WISH LIST that we sent to 500 of your fellow woodworkers.
Take a look at the choices they had, and make a few of your own!
Who knows, if you leave this laying around the house, as a subtle hint,
you may just give someone the right gift-giving ideas!**

$25 *(Gifts for $25 or less)*
- ❒ Sanding Drum Set
- ❒ Mallet
- ❒ Brad Point Drill Set (5-piece)
- ❒ Bar Clamp
- ❒ Rosette Cutter
- ❒ Gallon Wood Glue
- ❒ Glue Spreader Bottle
- ❒ Hearing Protectors
- ❒ 4" Bull Nose Plane
- ❒ Combination Water Stones
- ❒ Japanese Saw
- ❒ Marking & Mortise Gauge
- ❒ Square Corner Chisel
- ❒ 12" Square Set
- ❒ Subscription to *Popular Woodworking*
- ❒ Other_____
- ❒_____
- ❒_____

$50 *(Gifts from $26 to $50)*
- ❒ Roller Stand
- ❒ Respirator
- ❒ Spray Gun for Finishes
- ❒ Smoothing Plane, 9½" base
- ❒ Adjustable Hand Screw
- ❒ Electric Detail Carver
- ❒ Router Template Guide Set
- ❒ Bench Top Drill Stand
- ❒ 8-piece Riffler Rasp Set
- ❒ Other_____
- ❒_____
- ❒_____

$100 *(Gifts from $51 to $100)*
- ❒ Shop Vac
- ❒ Bench Grinder
- ❒ Lathe Chisel Set
- ❒ Carving Chisel Set
- ❒ Dovetail Jig
- ❒ Carbide Saw Blade
- ❒ Moisture Meter
- ❒ Random Orbit Sander
- ❒ 22" Jointer Plane
- ❒ Miter Saw
- ❒ Corner Detail Sander
- ❒ Bench Vise
- ❒ Other_____
- ❒_____
- ❒_____

$150 *(Gifts from $101 to $150)*
- ❒ Right Angle Drill
- ❒ Oscillating Belt Sander
- ❒ 3¼" Planer
- ❒ 12" Dial Caliper
- ❒ Precision Router Fence
- ❒ 18 Blade Combination Plane
- ❒ Finish Sander
- ❒ 8" Band Saw
- ❒ 16" Scroll Saw
- ❒ 7¼" Circular Saw
- ❒ Compact Reciprocating Saw
- ❒ Other_____
- ❒_____
- ❒_____

$200 *(Gifts from $151 to $200)*
- ❒ Wood Lathe
- ❒ 12v Cordless Drill
- ❒ Plate Joiner
- ❒ 13-piece Router Bit Set
- ❒ Anti-Kickback Dado Set
- ❒ Bench Top Band Saw
- ❒ Electric Jig Saw
- ❒ Finish Nailer Kit
- ❒ 12-piece Carving Tool Set
- ❒ Belt Sander
- ❒ Other_____
- ❒_____
- ❒_____

$300 *(Gifts from $201 to $300)*
- ❒ Heavy Duty Drill Press
- ❒ HVLP Spray Finish Unit
- ❒ 14" Band Saw
- ❒ Hollow Chisel Mortiser
- ❒ Dust Collection System
- ❒ Plunge Router
- ❒ Wood Shaper
- ❒ Air Compressor
- ❒ 1½ HP Dust Collector
- ❒ Other_____
- ❒_____
- ❒_____

$500 *(Gifts from $301 to $500)*
- ❒ 10" Table Saw
- ❒ 6" Joiner
- ❒ 1½HP ½" Shaper
- ❒ 12" Planer
- ❒ 6" Belt, 12" Disc Sander
- ❒ Compound Miter Saw
- ❒ Oscillating Spindle Sander
- ❒ Benchtop Lathe
- ❒ Other_____
_____
_____

PullOut™ Plans #88

Popular Woodworking®

Carefully open staples to remove plans, then bend them closed again.

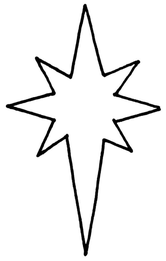
Santa Scroll Saw Pattern

Volive Candle Scroll Saw Pattern

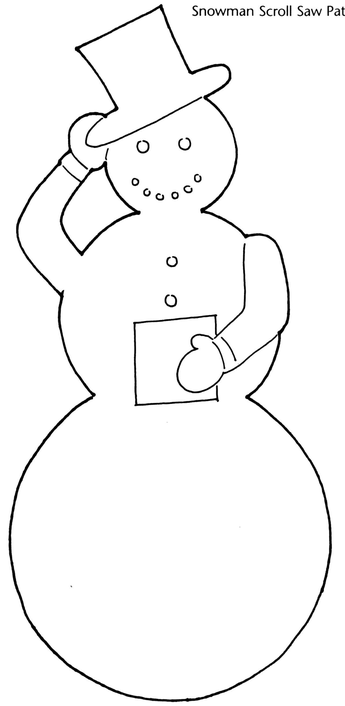
Puppy Scroll Saw Pattern

Corrected Schedule of Materials: Corner Cupboard *(Issue #85)*

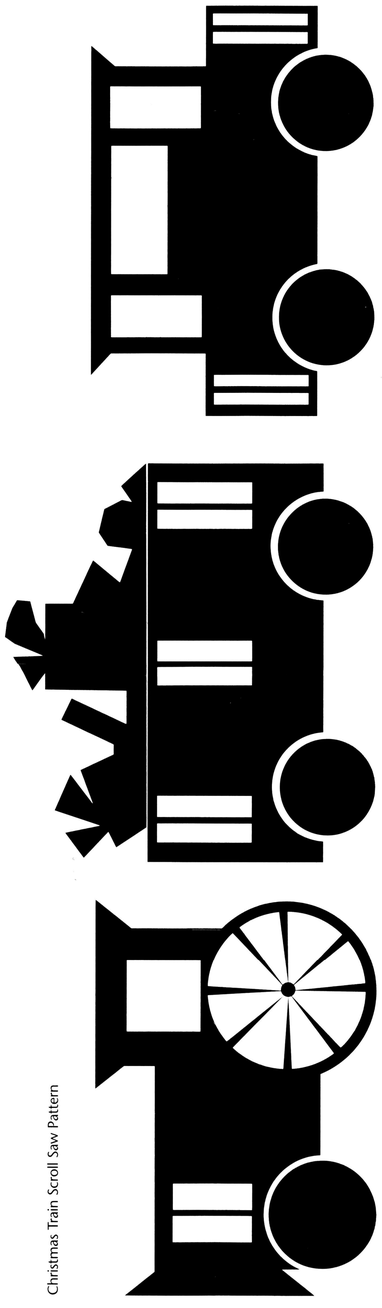
✓	No.	Item	Dimensions THW	Description
		Lower Cabinet		
❑	1	Back	¾" x 25¾" x 35¼"	
❑	1	Back	¾" x 26¾" x 35¼"	
❑	1	Bottom	¾" x 24¾" x 24¾" x 35"	Right Triangle
❑	1	Top Stretcher	¾" x 3" x 35"	
❑	2	Stiles	¾" x 4¹⁄₁₆" x 35¼"	
❑	1	Rail	¾" x 8" x 29¾"	Scroll Cut
❑	1	Rail	¾" x 2½" x 29¾"	
❑	4	Door Stiles	¾" x 2½" x 25¾"	
❑	4	Door Rails	¾" x 2½" x 15¾"	
❑	2	Door Panels	¾" x 11¾" x 21¾"	
❑	1	Top	¾" x 28¾" x 28¾" x 40¾"	Right Triangle
		Upper Cabinet		
❑	1	Back	¾" x 17" x 44"	
❑	1	Back	¾" x 17¾" x 44"	
❑	2	Bottom & Top	¾" x 16¾" x 16¾" x 23"	Right Triangle
❑	2	Stiles	¾" x 3" x 30"	
❑	2	Rails	¾" x 4" x 21"	Scroll Cut Bott.
❑	2	Door Stiles	¾" x 2½" x 22¾"	
❑	2	Door Rails	¾" x 2½" x 21¾"	
❑	1	Crown	¾" x 2½" x 29¾"	
❑	1	Top of Crown	¾" x 4" x 30¾"	



Snowman Scroll Saw Pattern

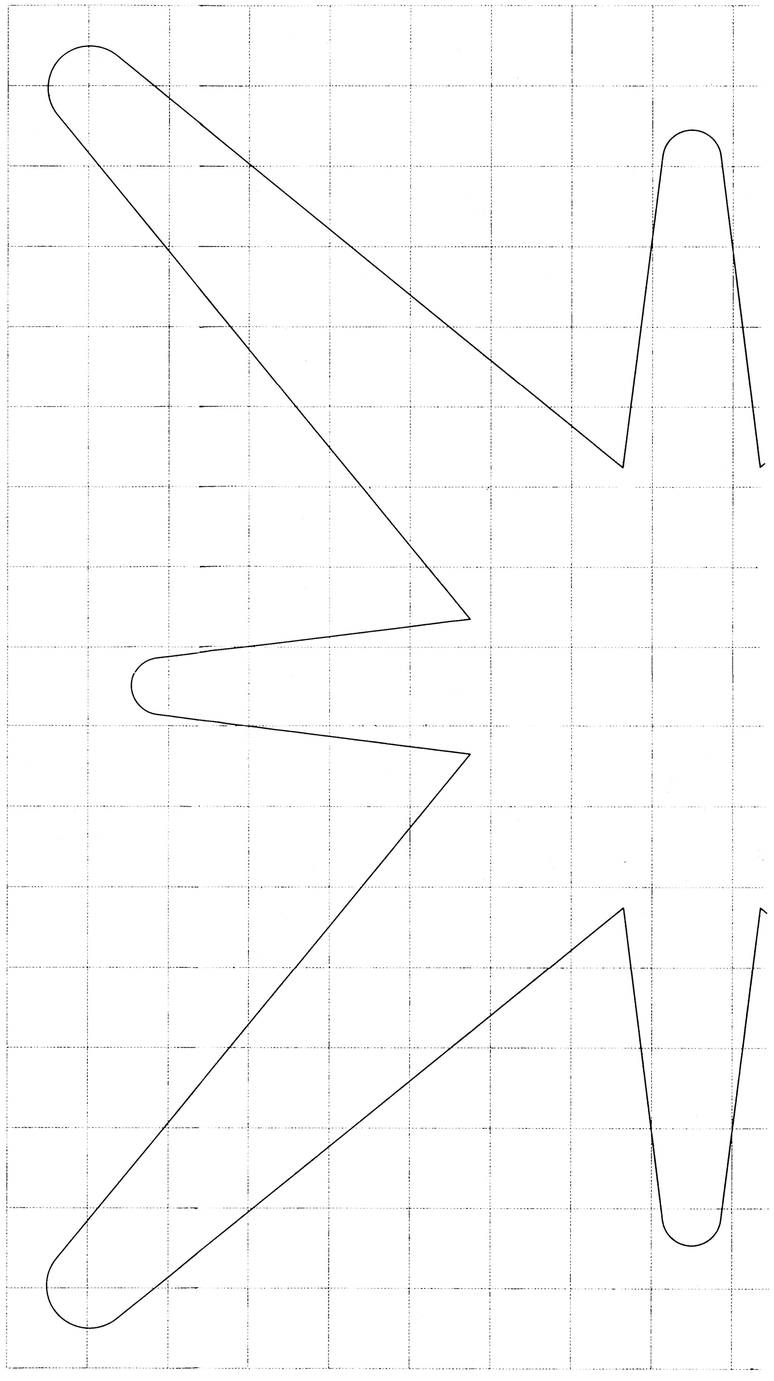


Nativity Puzzle Scroll Saw Pattern



Christmas Train Scroll Saw Pattern

Boomerang Full-Size Pattern



Traditional Top

This classic toy provides great practice on the lathe.

By John Albachten

The wonderful thing about the process of making this traditional top is the singular opportunity to leave a "burn" mark on the wood that you *don't* want to sand out. You've seen this happen many times before when routing or ripping on the table saw. You hesitate for a moment while making the cut and the result is an aggravating burn spot that must be sanded out. In making this top, you *want* to burn the the wood where the dark colored cove detail appears at the top's widest point ***(see photo)***. The dark color is actually an intentional bum mark.

The remainder of the top making process follows standard turning procedures. However, you should keep two things in mind. First, it's very important that the top's dowel stem is centered perfectly and straight. Second, when selecting a wood, remember that the heavier the wood, the longer the spin.

There are two options to turning the top body itself. If you have a Jacobs or other type of clamping chuck for your lathe, start by drilling a hole in the top surface of your turning blank that's slightly smaller than the diameter of the dowel you'll insert there later. Firmly screw a short length of threaded rod, or a machine bolt with the head cut off, into the hole. It will cut its own threads. Then cut to the appropriate length for mounting in your chuck. If you don't have a chuck that will tighten on the bolt, a second option is to use a screw point chuck.

For my top, I started with a walnut blank 3" x 3" x 3" held with the Jacobs chuck. This is where the fun begins. The actual shape of the top isn't critical. The standard "top" shape works well, but you can take this opportunity to be creative. Add grooves, coves, beads or whatever strikes your fancy. It won't affect the performance of the top.

I turned the top using gouges. The slight groove detail at the top's widest point was made with the tip of a skew chisel. And here's where the burning mentioned earlier takes place. The dark color was achieved by "burning" the walnut. To build up enough friction induced heat, I held a wire coat hanger against the groove as it spun on my lathe until it started to scorch.

Sanding and polishing the top while it's still on the lathe is the easiest method (but don't sand the burn out!). Next, remove the top from the lathe, remove the rod, and drill the exact size hole to receive the top stem. Regardless of the method you use, it is important that the stem of the top be precisely centered in the body to insure perfect balance (for the stem I used a piece of walnut dowel rod to match the body; this could be a contrasting wood if you prefer).

Before gluing the dowel in place, a ⅛" hole for the pull string must be drilled. Locate it in the middle of what will be the exposed portion of the dowel after it's inserted in the top.

As a final step in making the top, I used the dimple formed by the live center at the tip of the top and gently nailed in an escutcheon pin as a bearing surface for the spinning top.

To form the handle, I started with a piece of walnut ¾" x 1¼" x 8". Although I shaped the handle on the lathe, it could be sawn and routed to any pleasing shape. This is another opportunity to improvise and exercise your creative instincts while using the lathe. Make your handle as intricate or simple as you like.

The important parts of the handle will be the placement and accuracy of the holes. The 5/16" hole running through the width of the handle must be centered and straight or the top will start spinning with an unfortunate wobble. The ¾" hole through the thickness of the handle is less critical, but it should be centered on the 5/16" hole.

The handle for the pull string can be made of any wood, including a piece of dowel. I turned mine to give it a more appealing shape. Its size is up to you. My handle is ½" x 2½". The string itself is a good quality men's dress shoelace.

To put your top in action, place the stem in the handle hole and feed the free end of the pull string into the ⅛" hole in the stem. Next, rotate the top until all the string is wound around the stem. Set the tip of the top on a table, floor or other flat surface and grasp the string handle. Pull the string rapidly and steadily away from the top, leaving the tip on the flat surface. Once spinning, carefully lift the handle off the stem and stand back! PW

John Albachten *works full-time for the University of Cincinnati Alumni Association, and steals time to work on his lathe whenever possible.*

Scroll Saw Parade

Put Bing on the record player and roll up your sleeves — it's time to get festive!

By Tori Stone

What's most magical to me about the holiday season isn't the gifts and toys — objects quickly unwrapped and sometimes forgotten by nightfall. No, what makes holidays special for me are the traditions I observe year after year, whether it's hanging special decorations, stringing (and eating) popcorn for the tree, or lighting candles in every window.

Special decorations are a big part of my holiday traditions. I like atmosphere, and the more Santas, holly and lights I can get, the better. Of course, there *is* a point where things can get, shall we say ... gaudy? But not with these projects!

Fire up your scroll saw and find the patterns for these decorations in our PullOut™ Plans section. In most cases I used ½" pine, but for the votive candle surround I used ¼" pine to maintain the delicacy of the piece.

Experienced scrollers will know to start by spraying an artist's adhesive on the patterns and firmly affixing them to the wood after it has been wiped clean.

As a new scroller, I found two areas awkward to cut due to the tight turning radius. I've since learned that a spiral blade would have made those maneuvers as easy as the rest. Remember though, spiral blades can cause tear-out. To help overcome this problem, work with ½"-thicknesses as I did. You should have no problem drilling entry holes for unbroken cutting with a ⅛" or 3⁄16" wood-drilling bit.

Once you've cut out your pieces, be sure to sand well. Since I used soft pine which sands very easily, I sanded only with 220-grit paper. The sanding ease of soft pine can also prove useful if you wander off the line, or make a small mistake while cutting. Pine is very forgiving of mistakes and, with a little sanding, the offense is hidden. You'd never guess that I flubbed a few cuts on these decorations ... but don't look too close!

Before painting or decorating, break the edges and remove any residual paper and glue left from the patterns. And don't forget to wipe off sawdust; it can damage your paint brushes.

My favorite paints are DecoArt™ Acrylics, and for this project I used Titanium White, Lamp Black, Holly Green and Santa Red from the Americana™ line. From the DecoArt Dazzling

TRIVET

Adorn your holiday table with this golden trivet. Using the pattern, cut the piece out of ½"-thick pine. The small holes on the top surface were formed by using a ⅛" bit set in the drill press and drilled ⅛"-deep. Later fill these holes with red paint. After sanding, glue four button plugs to the bottom so the trivet will be elevated from the table top. I used 3⁄8" button plugs, so I also used a 3⁄8" drill bit. (Find a handy tip for driving button plugs home in Tricks of the Trade *on page 8.) Paint the surface with gold acrylic. When painting the trees and other designs, paint the centers green or red, then delicately outline the openings on the top of the trivet.*

SNOWFLAKE VOTIVE CANDLE SURROUND

Candles add to the holiday atmosphere, and this project offers a new way to display small votives. Use ¼" pine to make the four sides. You'll notice that two of the sides are ½" shorter than the other two sides — this allows the box to fit together as a square when butt-jointed together. The four sides can still be cut at the same time by centering the two smaller sides on the two larger ones. Then use masking tape to secure all four together, wrapping the edges a couple times.

When cutting out the pattern, note that your objective is to remove the center piece without damaging it, while leaving the larger flake's outline. Drill your entry hole in any one of the main flake points. As you saw, cut small areas away, then move to the next section, working around the pattern. As you can see, the flake has sharp points and gentle curves, so you must have enough room to plan your cut before making it. Be sure to cut all the detail on the center flake as you go. It would be difficult to have to touch-up the center flake after it is removed.

Once you've finished scrolling, drill the series of holes surrounding the flake. Sand the pieces with 220-grit paper.

To join the cover together, brush wood glue on the edges of the two smaller pieces, assemble the cover and set it on its side (it should rest on one of the wide sides). Wait a moment, then gently place a book or block of wood on top to apply a little "clamping" pressure. Let it dry for an hour.

TRAIN ORNAMENT

This set can be hung from your tree or set up to choo-choo across your mantle. Simply adhere the pattern to your ½" pine, cut out and sand. See the PullOut™ Plans for detailed painting instructions.

Metallics™ line, I also chose Glorious Gold. These colors are vibrant and fun, and clean up easily with soap and water, which is something to keep in mind if children will be helping you paint your projects. Just remember — acrylics dry quickly, so keep the caps closed and your brush moist. Dried acrylic paint in brush bristles won't add to your seasonal joy.

When you paint or decorate, you can follow my lead or create designs of your own. As we all know, to grow as a woodworker, you shouldn't be bashful about trying out your own designs.

And that's it! Making decorations could easily become a family holiday tradition. Spend time creating special holiday decorations with your loved ones while you share the magic of the season. PW

Tori Stone *is assistant editor of* Popular Woodworking. *She is proud to carry on a family tradition of woodworking.*

The center snowflakes are suspended by 3" pieces of ⅛" x ⅛" wood strips. Center the flakes on a sliver of wood and glue it down. Then, place a little glue on both ends of the wood strip, slip it inside the cover and set it into place. Make sure the flake is centered in the opening. Of course, wait for this side to dry before turning to attach the next piece.

I left the inside of my cover unfinished; I wanted the light to reflect and dance off the light-colored pine. On the outside, I finished the faces and edges with an oil-based, dark stain. Allow this to thoroughly dry before topping with a clear coat of your preferred finish.

Showcase your candle in the center of the table, and watch the light bounce on the surface as the flame flickers. Be certain that your candle sits in a votive glass, and never leave a burning candle unattended.

MANTEL SITTERS

The puppy, tree and snowman mantel sitters are a fun way to decorate your window sills or other parts of the house. Both the puppy and the snowman have a bevel-cut section. On the puppy, it's her mouth, and on the snowman, it's his arm and handwarmer. To cut those sections, tilt your scroll saw table to about a 5 degree angle. Check the direction of your cut (clockwise or counterclockwise), it will determine which direction the piece pushes to lock in place. After you've cut the outline, you can push that piece forward, and it will step-out, giving your piece a three-dimensional look. When you paint the cut pieces, be sure not to layer on too much paint. This will prevent the piece from sliding easily in and out of position.

The tree is easy enough to paint and decorate. Use green paint for the tree, gold for the star, and red and gold for the ornaments.Wrap ribbon around it for garland, and glue the ends at back.

The puppy is painted with white and three tones of grey. Each tone is black and white, mixed to create dark, medium and light grey. You'll notice she also has a small triangle of white fur on the top of her head. Paint the fur using light brush strokes.

The snowman is entirely white, except for his hat (black), glove (red) and handwarmer (green). Decorative ribbons are used to encircle his neck, hat and hand warmer.

SANTA FRAME

This Santa is a picture frame, and it can sit on a table or hang from your tree (simply drill a hole in his hat with a ⅛" drill bit for the hanger). To accurately cut your picture for the center, place a copy of the pattern over a photo. Hold it up to the light to position the photo. Then, pressing hard enough to make a small indent, trace the outline of Santa's tummy onto the photo. Cut out a thin piece of cardboard to back the photo, and glue the photo to it. The best method is to use rubber cement on both surfaces, then press them together. This is an excellent paper bond. By the way, this little frame is also great for holding cross-stitched crafts, too.

Once you've prepared the photo and cardboard, you're ready to cut the ornament. Adhere the pattern to a ½"-thick piece of pine and cut it out. Cut an entry hole and remove the center as well.

After you've finished cutting, and sanding to 220-grit, you're ready to paint. Santa's face is the only bare wood on the piece. His eyebrows and mustache are grey, which I mixed from a drop of black acrylic and a couple dots of white.

Santa's nose, cheeks and mouth are a bit pink, which you can mix with a drop of red and a couple drops of white.

Walnut Desk Set

Build this clock and barometer set in just a little time, with no pressure!

By Jerry Rymarquis

Here's a project that many people on your gift list will appreciate. It can be used as a travel set, or looks great sitting on a desk at the office or in your den. The final size of the piece will depend on the size of the clock and barometer components you choose. These instruments can be purchased from many mail order woodworking supply companies (***see Source List,*** next page). For the piece described, the overall diameter of each instrument I used was 2¾".

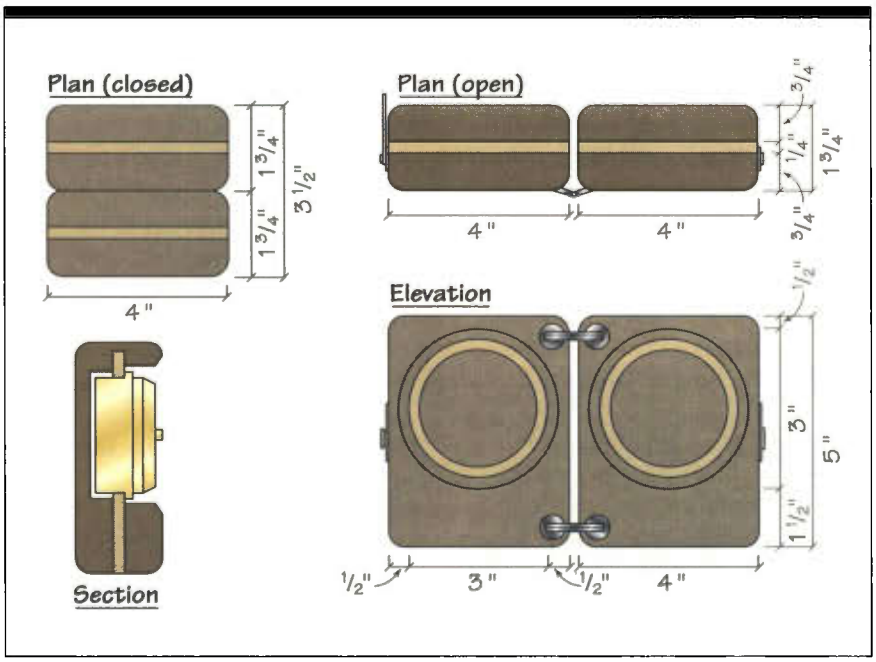
Begin the project by choosing the woods for your clock. I selected walnut as my primary wood, and maple as the contrasting wood. Cut four pieces of ¾" walnut 5" x 4". Cut a piece of maple to the same 5" x 4" dimensions and rip off two ¼"-thick pieces.

The two instruments I purchased required 2⅜"-diameter holes. I wanted these instruments to be at the top of the piece rather than centered along the length, so the center for each hole is 2" from the side and top. Cut a 2⅜" hole in two of the walnut pieces to a depth of ½" and completely through both the maple ones. The diameter of the face of the instruments was 2¾". To provide for this, I cut a 3"-diameter hole in the remaining two walnut blocks, using the same 2" center placement as before, and again, making my cut all the way through the piece.

Next, I used a chamfer bit to rout a decorative edge. To avoid having to worry about cleaning up any glue that might squeeze out when laminating the pieces together, I chamfered both sides of the 3"-diameter hole. This allowed me to laminate the two halves by spreading glue on the walnut back and front pieces, placing the maple section between them and clamping. The interior chamfer keeps any glue squeeze out hidden from the visible part of the maple face.

When dry, sand all faces flush and smooth and rout a slight rounded edge on all of the outside edges. Apply the finish of your choice after drilling the holes for your hinges and latch. I chose to use hidden hinges that I installed ½" in from the top and bottom, according to the manufacturer's instructions. The latch used is a bar latch, and was installed on the length of the side and spaced so that when closed it held the two halves of the instrument tightly closed.

You might like to make several of these for gifts. You can experiment by combining several different species of wood to obtain many different looks. PW



Schedule of Materials: Walnut Desk Set

No.	Letter	Item	Dimensions TWL
❑ 4	A	Walnut	5" x 4" x ¾"
❑ 2	B	Maple Accent	5" x 4" x ¼"

Inlaid Music Box

Put a song in someone's stocking with this simple, stately design.

By Jerry Rymarquis

Just about everyone I've met, no matter what age, seems to be fascinated by the sound of music boxes. If you or someone you know fits this description, then you'll want to try this project.

Begin by purchasing your musical movement. These movements can be found in many of the craft supply stores, or can be ordered from various woodworking supply catalogs ***(see Source List).***

Begin construction by ripping approximately two feet of whatever wood you have chosen to a ½" thickness. This wood should be at least 3¾"-wide. Cut and miter the front and back panels to the measurement of 6¼" x 3¾". The two side panels should be cut and mitered to 4⅛" x 3¾".

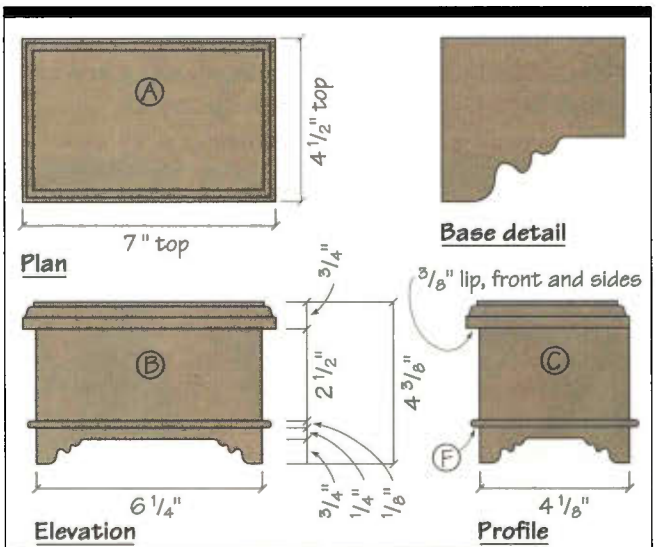
I decided to put a decorative cut-out on the bottom of all four of these panels. For my pattern, see the PullOut™ Plans. Carefully cut the design with your scroll saw and do any sanding required.

To accommodate the ¼" beading, cut a groove approximately ⅛"-deep beginning 2½" down from the top on all four panels. After this is complete, you can glue and band clamp the side panels together. To make the beading, rip a piece of wood to a ¼"-thickness and then round the edges by whatever means you have available. A proper size bullnose router bit, a roundover hand tool or file, or just hand sanding will work fine. Cut the rounded strips ¼"-wide and miter the ends at the proper length for a good fit. Apply a small bead of glue into the ⅛"-deep cuts in the panels and insert the beading.

The top of the music box is constructed of ¾"-thick wood and should be cut to 7" x 4½". These measurements will allow it to overhang the front and two sides by ⅜". Here's another place where you can use your imagination. You might use your favorite router bit design on the edges, inlay the top with edge banding, or as I did, purchase an inlay face that I inserted by routing out a corresponding shape in the top of the lid.

After you complete your final sanding, attach the lid to the case. I used a 6" x ½" piano hinge inserted into a cut in the back. The base of the box can be ⅛" or ¼" plywood. You might cover it with a nice fabric or use spray-on flocking. To hold the base, cut two small strips approximately ⅜" x ⅜" and nail and glue the two strips along the 6¼" panels up ⅞" from the bottom. If you used a different base design, you may have to vary this measurement. Cut the plywood base to fit the inside of the box and, after you have applied the finish to your box, glue the base to the support strips.

To install your music movement, drill a ⅜" hole for the stem in the plywood base and screw the movement to the base. If you have the need, you can construct a small tray to fit inside the music box to hold rings or other special items. PW



Schedule of Materials: Inlaid Jewelry Box

No.	Letter	Item	Dimensions TWL
❑ 4	A	Top	¾" x 4½" x 7"
❑ 2	B	Sides	½" x 3¾" x 6¼"
❑ 1	C	Ends	½" x 3¾" x 4⅛"
❑ 1	D	Bottom	⅛" x 3⅛" x 5¼"
❑ 2	E	Ledgers	⅜" x ⅜" x 5⅜₆"
❑ 1	F	Beading	⅛" x ¼" x cut to fit

Jerry Rymarquis enjoys woodworking from his shop in Edgewood, Kentucky.

Source List

For a selection of wood Inlays, hardware and hinges, contact:
Constantine's
2050 Eastchester Road
Bronx, NY 10461
(800) 223-8087

For a selection of clockmaking supplies and weather instruments, contact:
KLOCKIT
P.O. Box 636
Lake Geneva, WI 53147
(800) 556-9899

Log Cabin Blocks

A router, a table saw and some imagination are all you need.

By Andrew Schultz

***Photo 1** Build this cabin of your dreams by following the cutting list on the next page!*

As a kid I loved playing with Lincoln Logs® and was disappointed when our Chesapeake retrievers, Dukie and Queenie, found them delicious. Like many contemporary loggers, I soon found my career cut short by decreasing materials.

Now that I have kids of my own, I wanted to mill up some log cabin materials, thinking that my youngsters should never suffer the deprivations I did. I wanted to use larger dowels too, knowing that smaller kids would find them easier to work with, so I used ¾"-diameter dowels to make my log cabin materials.

Materials

First, I determined the number and sizes of logs that I needed. Then I drew a crude rendition of a log home and sketched in the ¾"-diameter logs. See the Cutting List for log lengths and quantity required to build the log cabin shown in the opening photograph. You can change the cabin any way you want by adding pieces or increasing log lengths ***(photo 2)***.

***Photo 2** An array of dowels of different sizes enable you to build virtually any cabin.*

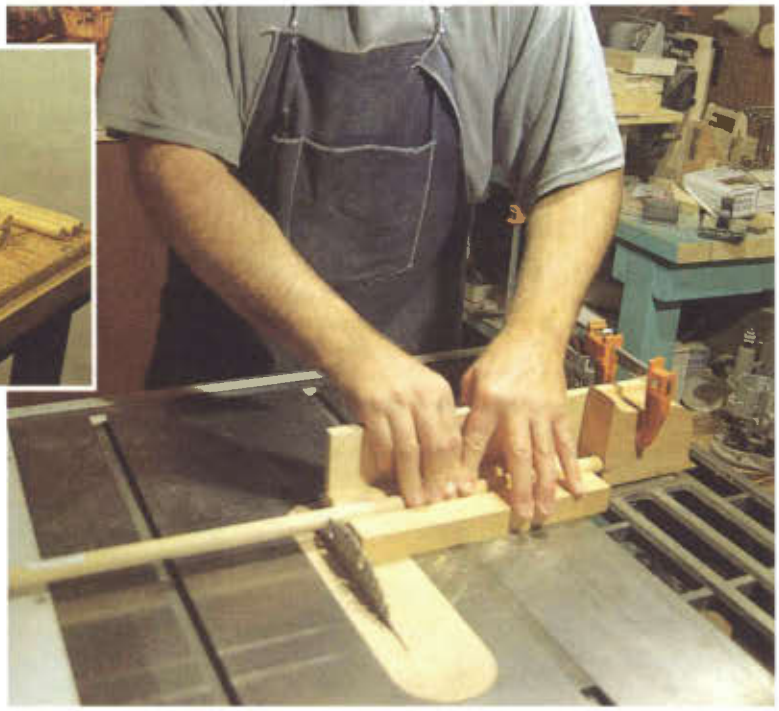
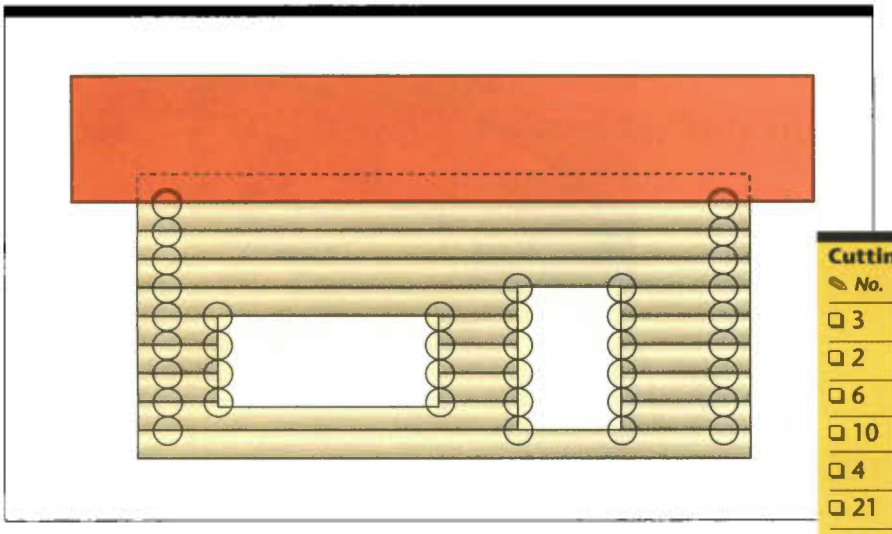


***Photo 3** A good second alternative is cutting dowels to length on the table saw with a V-block and the miter gauge.*



Cutting List: Log Cabin Blocks

No.	Item	Length
❑ 3	Ridge Logs	24"
❑ 2	Foundation Logs	21"
❑ 6	Long Logs	21"
❑ 10	End Logs	15"
❑ 4	Average Logs	12"
❑ 21	Short Logs	6"
❑ 28	Cross Logs	1½"
❑ 10	Cross Logs (2 moon joints)	1½"
❑ 2	Gable Ends	1" x 6" x 24"
❑ 2	Roofing Matts (matt board)	12" x 24"

You can use any dowel you want, but I used the common birch dowels you can buy at virtually any hardware store. Be aware, however, that ramin (*Gonystylus macrophyllum*) is sometimes used as dowel material and some people are allergic to it.

How to Fell Dowel Logs

I used the table saw sled and a stop block to crosscut my dowels to length. Make sure you hold on to both pieces of the dowel as you cut, because it's easy for the cut-off piece of dowel to get angled slightly and trapped between the whirling blade and the stop block. This is disastrous for the wood and potentially dangerous for you. I just hold the longer piece with one hand and the shorter with a block of wood (***photo 4***).

If you haven't gotten around to making a table saw sled yet, use a V-block riding against the miter gauge to hold the workpiece steady. You could also crosscut these dowels to size on the radial arm saw, or with the band saw, and, in the latter case especially, use a V-block for safety (***photo 3***).

Photo 4 *Use hold downs like the one shown here to keep your fingers away from the blade for cutting the short 1½"-long cross blocks.*

Cutting Timber Frame Joinery

The joinery for this log cabin is a coped curve cut in each log that's an exact match for the ¾"-diameter curve of the log's cylindrical shape. How to do it? Well, it's easy if you build my simple jig (***diagram 1, photo 6***).

Chuck a ¾" straight bit in your plunge router and attach the base plate jig. Insert a dowel that has been cut to length in the horizontal hole, turn on the router and plunge. With any luck at all, a half-moon shape is now cut in the "log's" side, spaced exactly ¾" from the end.

Now turn the log around in the jig and clamp the cut end perpendicular. I have ¾" holes bored in my workbench top so it's a quick operation to jam a ¾" dowel in one of the holes and clamp the moon joint you just cut into vertical alignment with the router jig. Plunge once again,

Photo 5 *Framing up a log cabin goes quickly when you've cut all the parts to the same size and all the joinery matches.*

Diagram 1: Half-Moon Joint Cutting Jig

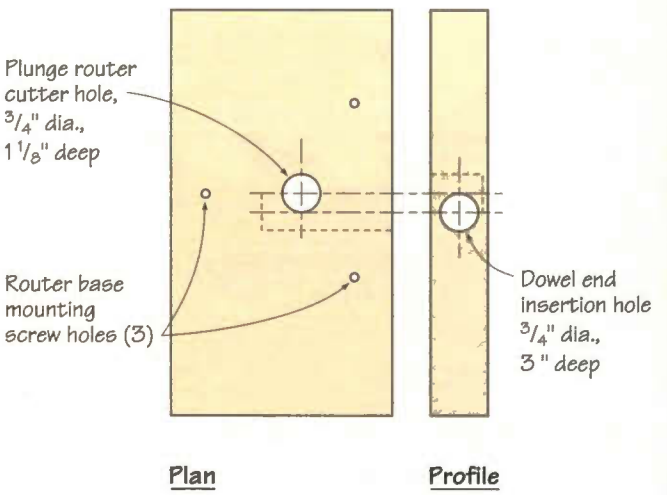


***Photo 6** I cut the half-moon joint with a special jig that mounts on the base plate of the router. I routed parallel joints by holding the log in the correct position vertically.*

and now the log's done — two parallel joints cut in the right location and in the same vector plane.

There are a couple of tricks that will help you when cutting the 1½" stub logs that serve as cross members for doors, windows and gable ends. For these, cut the joinery first and then crosscut them to size on the table saw sled. I actually begin making these short logs first. I take a handful of long dowels, plunge the joinery on each end of each dowel, and cut the short log off each dowel and so on. In this fashion, I deal with long dowels for every operation, rather than trying to handle the short ones with my hands close to sharp blades and bits.

The gable end isn't too tricky either. First, I selected a piece of 1½" x 6" x 24" maple and drew the roof's shape on one face of the board. Then, with the drill press, using a ¾" forstner bit, I bored the holes for the ridge poles and for the gable to fit onto the last course of logs. Next, I cut out the roof line of the gable on the bandsaw ***(photo 7)***. Finally, I planed the bandsawn edges smooth and resawed the maple board into two identical ¾"-thick gables.

After I completed the cabin frame, I made the roof. I had some matt boards left over from a picture framing adventure I undertook a while ago, and I simply trimmed these leftovers with a utility knife to the 12" x 24" size and then stuck the pieces together with duct tape on the underside.

I don't finish the wood at all. I do round the cut ends of the dowels to remove splinters and any sharp edges, but that's it. Using this method, I was able to make enough log cabin pieces for my kids to make virtually any cabin they can imagine. And now that I've got the jig, even if the dog eats some of the pieces, it's quick work to manufacture a few more. PW

***Andrew Schultz** is a furniture maker and woodworking writer who resides in Lincoln, Nebraska.*

***Photo 7** The arbor is simply a big isosceles triangle I cut out with a band saw and planed smooth.*

Puzzling Child's Rocker

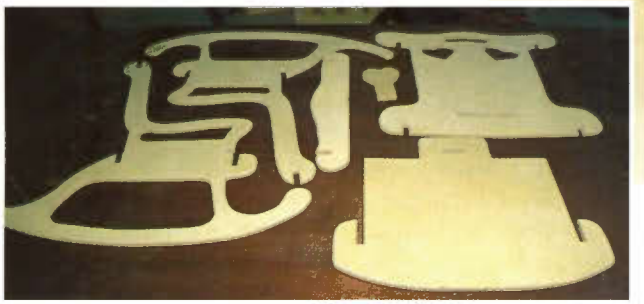
No screws, glue or nails needed for this two-in-one project.

By David Thiel

The heart-shaped key behind the chair's back holds it all together!

We have to give credit to Devore Burch for this design concept, which appeared in *Popular Woodworking* a few years ago. When we came up with the idea to build a simple child's rocking chair, we were reminded we had a design ready to go. Well, we've changed a few things including the size of the chair (the original was designed for toddler-sized children), but the design was too clever not to share it with our readers again. This is also a bonus project because it not only provides a great rocking chair, but if your special petite person gets bored with rocking, she or he can take the chair apart and play with it as a puzzle.

There's not much to this project other than choosing your materials and cutting out the pieces. Material choice will be important, however. We selected ½" Baltic birch, a nine-ply product made of high-quality birch with few or no voids. This choice gave us a light, strong chair that offers stability without the need for thick pieces. Should you choose ½" fir plywood or ½" solid lumber you'll find it lacks the necessary strength. You'll need to increase the thickness of the pieces if using a different ply or solid lumber.



Disassembled, the rocking chair seems to be a big puzzle. Children will enjoy putting it back together with your help!

We've provided scaled-down templates for all the pieces on a "one square equals one inch" scale. As you scale the piece up you may want to tinker with the design a little to personalize your rocker. The design is interlocking with the back slipped over the two sides first, and the support then slipped over the sides. Next the seat is slipped over the sides from the front and, finally, a key is slipped through the tongue protruding through the back, locking the entire assembly together.

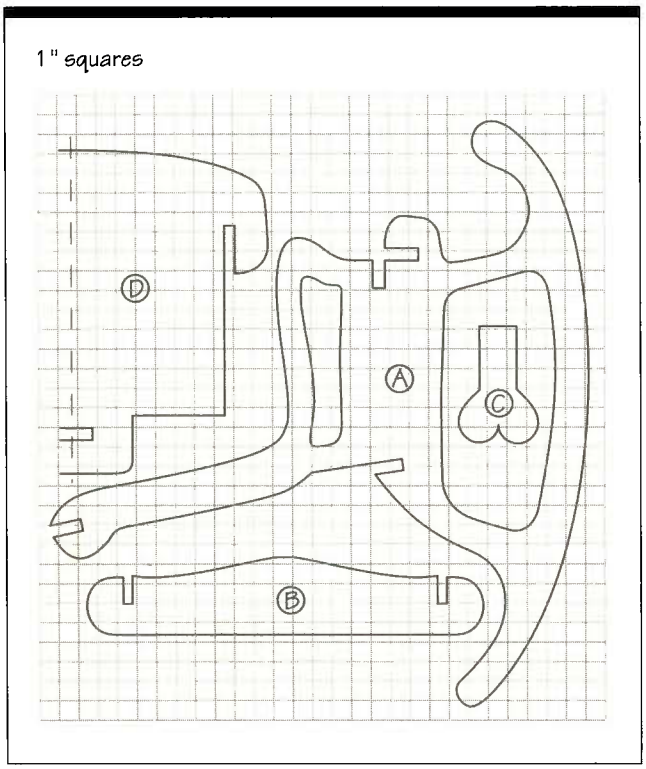
We used a scroll saw to cut all the pieces and then used both a disk sander and a spindle sander to remove all the bumps and grooves left by some less-than-perfect cuts.

As you cut the "slip together" notches you should test fit the pieces to make sure the rocker fits together with little resistance but isn't too loose. As you increase the amount of "play" in the fit, you increase the stress placed on the joints when in use. The better the fit, the less stress on the rocker, which will help it take a beating from kids.

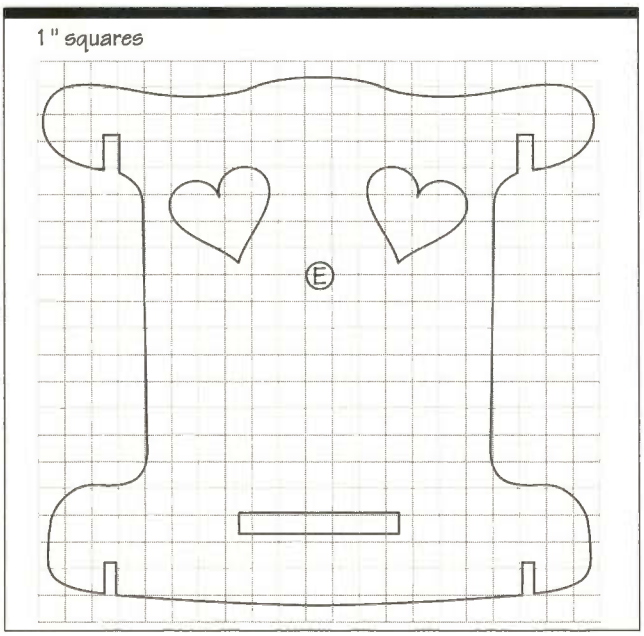
To soften all the edges we used a ¼" roundover bit with a router. If you use a ball bearing bit on ½" material, be aware that on the second pass the bearing may ride on the first pass and make an inaccurate cut. We solved this problem by using a fixed bearing bit that had a shorter profile below the knife edge and rode on the highest part of the first cut.

For the final steps, simply sand through 220 grit and finish the piece. Though we used a couple of coats of clear lacquer, you may prefer a painted finish for your masterpiece. All that's left is to put the pieces together, then rock on! PW

***David Thiel** is the associate editor of* Popular Woodworking.



No.	Letter	Item	Dimensions TWL
❑ 2	A	Side (rough size)	½" x 27" x 30"
❑ 1	B	Support (rough size)	½" x 4" x 20"
❑ 1	C	Key (rough size)	½" x 6" x 4"
❑ 1	D	Seat (rough size)	½" x 16½" x 20"
❑ 1	E	Back (rough size)	½" x 21" x 21"



Kids' Easel

An easel for the budding artist in your family!

By Steve Shanesy

If you'd like to keep the kids' watercolors, crayons and chalk off the furniture and give them their own place to get creative, here's a simple solution that you can knock out in an afternoon.

Although I used poplar for the four easel legs, a couple of straight 2 x 4s that are relatively knot free will work fine. I made mine 1¼" x 1½" x 60", and eliminated all sharp edges by rounding them over, even on the ends, with a ⅜" radius router bit.

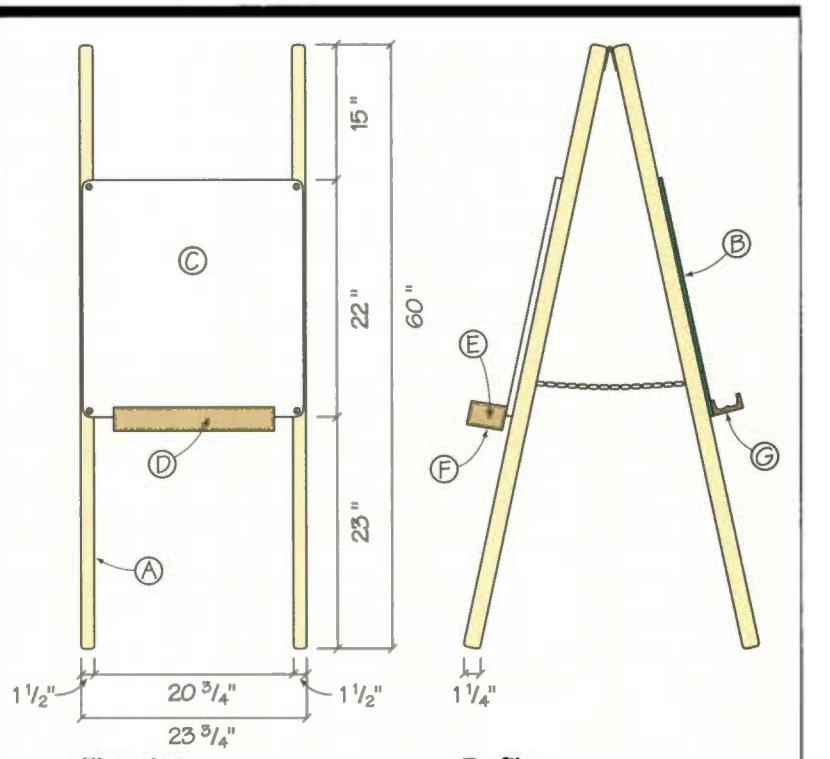
I wanted my easel to be multipurpose, so I put a different board on each side — a chalkboard for one and plastic laminate clad plywood for the other. If you have more than one child, the two-sided easel can also help to avoid toy wars; simply put one child on each side. You need tempered hardboard and a can of aerosol chalkboard spray paint to make your own chalkboard. The chalkboard paint is commonly available in most paint stores and easy to use.

I used plastic laminate on the other side to provide a smooth, flat surface on which to work and clean up easily. I laminated the ½" plywood and plastic laminate using contact cement following the manufacturer's directions. If you haven't done this before, it's really quite simple. I'd recommend you use a non-flammable adhesive and a disposable brush. On a small laminate job like this, I find it easier to make my substrate about ½" larger than finished size. Cut the laminate the same size, glue it down and cut to finished size. This eliminates the need to trim oversized laminate with a router as is normally the method.

I cut each board to 22" wide and 23¾" long then sanded the corners to a 1" radius I had drawn with a compass. I next drilled a clearance hole in each corner for the screws and finish washers that would attach each piece to its pair of legs.

The last woodwork to be done before sanding and finishing was making a chalk tray and paint tray. The chalk tray was made with a dado set and cove bit. I used ¾" stock 2½" wide

TIP **If you're not equipped to work with plastic laminate, you can probably pick up a piece for free or for a nominal charge at a local cabinet shop, especially one that fabricates kitchens. Ask for a piece that's leftover after they make the sink cut-out for a kitchen countertop. It should be just about the right size and already be glued to a substrate (such as particle board or plywood) — all you'll have to do is trim the edges.**



Schedule of Materials: Kids' Easel

No.	Letter	Item	Dimensions TWL
❑ 4	A	Legs	1¼" x 1½" x 60"
❑ 1	B	Chalkboard	¼" x 22" x 23"
❑ 1	C	Paint board	½" x 22" x 23"
❑ 2	D	Paint tray sides	½" x 16" x 2½"
❑ 2	E	Paint tray ends	½" x 4" x 2½"
❑ 1	F	Paint tray bottom	¼" x 3½" x 15½"
❑ 1	G	Chalk tray	¾" x 2½" x 20"

that I "hogged out" with a dado set before taking one last pass with a cove bit to provide a nice inside radius to the bottom inside corner of the tray. I attach to the chalkboard by screwing it from the backside of chalkboard.

The paint tray is a simple box made from ½" plywood using a ¼" bottom. I rabbeted the long sides to receive the ends and used a ¼" groove to hold the bottom in place. Since the box will get messy with paint, it should be easily removable for cleaning. My solution was to mount 1"x #10 pan head screws ½"-deep and 12" apart near the bottom of the board on which it hangs. I then drilled "keyholes" the same distance apart in the back of the tray before I assembled it. I made the "keyhole" shape using two different sized brad point drill bits that were just slightly larger than the screw head and screw shank. The smaller hole was drilled just above the larger one so that the two holes overlapped. I checked the fit on the screws mounted to the board then glued the paint tray together.

After sanding the wood parts, I brushed a clear polyurethane finish on the chalk and paint trays, and on the back and edges of the plywood paint board. I had some fun with the four legs, coating them first with red enamel paint from an aerosol can. After the red paint dried, I misted on silver paint from an aerosol can. It produced a speckled effect over the red that both the kids and I liked. To achieve this effect, just mist the paint on from about two feet away. Use short bursts of spray and pay close attention to the areas you're spraying.

Attach each board to a pair of legs, then hinge each side together at the top using a strap hinge. I used a length of light chain attached with small screws between each pair of legs to prevent the hinged sides from spreading too far apart.

Break in your chalkboard using the directions given in the Tip Box in the "Chalkboard Message Center" project elsewhere in this issue. To keep large pieces of paper in place on the easel, try small spring clamps. PW

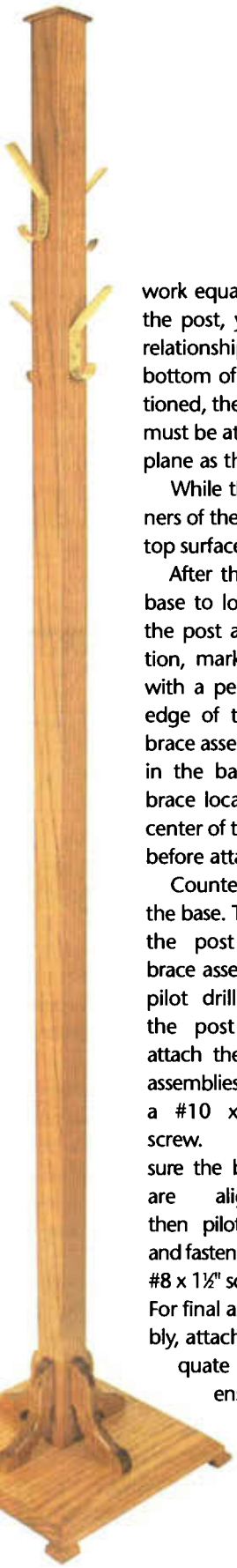
Steve Shanesy *is editor of* Popular Woodworking.

Arts & Crafts Hall Tree

This "stand alone" project will look great in any entryway.

By David Thiel

***Photo 1** This detail shows the shape and attachment of the braces and the bevel on the base and feet.*



This arts and crafts-inspired hall tree features turn-of-the century simplicity. With company coming for the holidays, you can put it to good use immediately. Best of all, it's both quick and simple to build, and you might find enough scrap material in your shop to complete it.

Construction begins by cutting all the pieces to size according to the Schedule of Materials. The sizes given for the braces are for the block size you'll need for each of these four supports. You may get better yield from your material by laying out the patterns in an interlocking arrangement on a larger board rather than using four smaller pieces. It may just depend on what's in your scrap pile.

When all the pieces are cut, work on the 45° bevels that occur on the cap, the base and the four feet. More than just a function of design, the feet give the hall tree stable footing on carpet or solid flooring. By locating the weight and balance on four points rather than a flat surface the chance of tipping is greatly reduced.

The base can be cut on the table saw. The bevel cut should leave ¼" of the edge showing. For the feet and cap you may want to use a disc or belt sander to form the chamfer. This is safer than trying to push these smaller pieces through the saw. As with the base, the feet should have ¼" edge left showing, while the cap should have ⅛" edge left.

With all the bevels cut, turn your attention to the braces. Cut all four to finished shape using a band saw or scroll saw. Don't try to do this with a saber saw. The pieces are really too small to handle. Next, cut the ¼" cove profile into the braces' outside edges ***(photo 1)***. We used a part of a roman ogee router bit mounted in a router table (a cove bit with a bottom bearing works well, too). This proved the safest way to cut the profile, rather than trying to move the larger router over the smaller brace pieces.

***Photo 2** Biscuits were used to join the braces to the post. Depending on your biscuit joiner this may be tricky, and dowels may be a better option.*

Next, sand all the pieces through 220 grit prior to assembly. To join the brace pieces to the post we used biscuits ***(photo 2)***, though dowels would work equally well. When attaching the braces to the post, you must pay careful attention to the relationship of the bottom of the braces to the bottom of the post. If these are improperly positioned, they won't seat correctly to the base. They must be attached so that they are all on the same plane as the base.

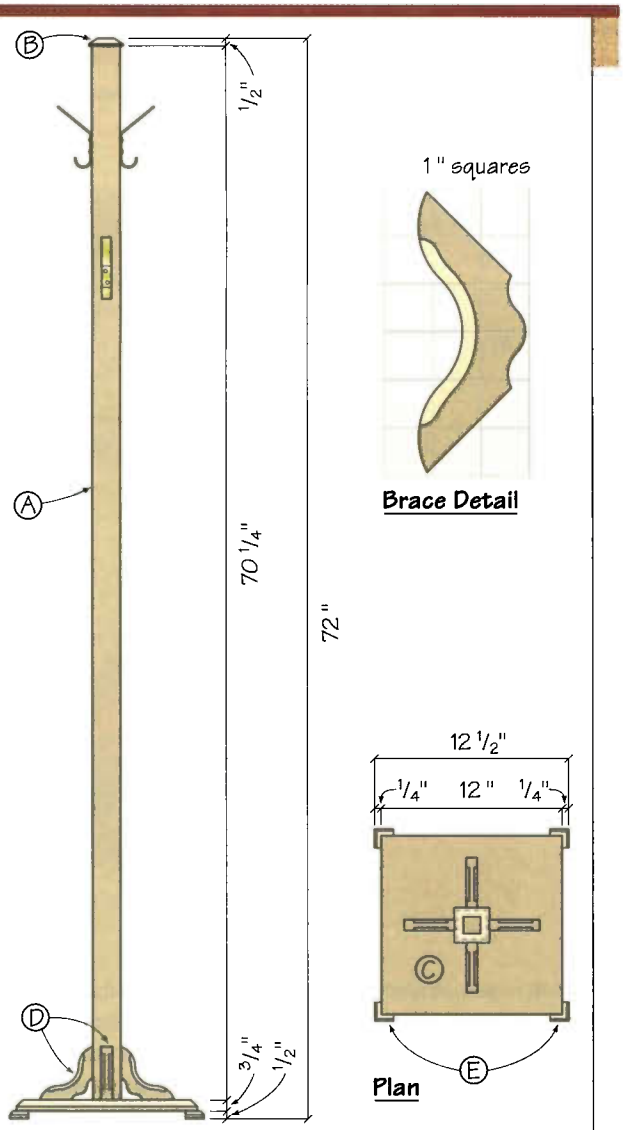
While the braces dry, glue the feet to the corners of the base, allowing approximately ¼" of the top surface of the feet to project beyond the base.

After the glue has cured, set the post on the base to locate the proper spacing for attaching the post and braces to the base. When in position, mark the location of the post and braces with a pencil, and mark what brace faces each edge of the base. Then remove the post and brace assembly. Drill clearance holes for #8 screws in the base at the approximate center of the brace locations and drill for a #10 screw in the center of the post location. Erase the pencil marks before attaching.

Counter sink the holes from the underside of the base. Then, while holding the base in place on the post and brace assembly, pilot drill into the post and attach the two assemblies with a #10 x 2½" screw. Make sure the braces are aligned, then pilot drill and fasten using #8 x 1½" screws. For final assembly, attach the cap to the post. Glue may be adequate for the task, but we added dowels to ensure a strong joint ***(photo 3)***.

***Photo 3** We used dowels to add extra strength to the cross-grain and end-grain glue joint.*

Check the finished assembly for glue squeeze-out, scratches or dings, and sand or repair as needed. Finish the hall tree using a dark oak or English oak



Schedule of Materials: Hall Tree

No.	Letter	Item	Dimensions TWL
❑ 1	A	Post	1⅛" x 1⅛" x 70¼"
❑ 1	B	Cap	½" x 2¼" x 2¼"
❑ 1	C	Base	¾" x 12" x 12"
❑ 4	D	Braces	¾" x 3" x 6"
❑ 4	E	Feet	½" x 1¼" x 1¼"

penetrating stain. We topped the stain with a clear, semi-gloss lacquer (varnish, or even tung oil are other choices). Lastly, we attached the brass hat/coat hook hardware that we picked up at a local store. Your hardware choice will reflect your taste, but keep the project true to the arts and crafts style by choosing simple, hand-crafted hooks. When attaching, place them in a staggered arrangement around the post.

Finally, place your tree near your front door and watch it sprout coats, hats and maybe an umbrella or two. PW

David Thiel is associate editor for Popular Woodworking.

HOLIDAY PROJECTS

Nativity Puzzle

Make this heirloom decoration for years of enjoyment!

By Rich Vander Klok

Lacewood is a good material for this nativity puzzle because it not only has a special way of catching light, it also has a unique appearance that resembles the dappled coloration of various animal furs. Pine is my secondary wood used for the back.

To begin, glue up the stock to net ½" x 11¼" x 13⅜". The pattern (located on the PullOut™ Plans) will fit on this piece with a ¾" border around it. Any excess can be trimmed later. Scrape off any glue squeeze-out and finish sand the piece to 220 grit.

Affix the pattern to the wood with 3M Spray Mount™ adhesive. Prepare for scroll sawing by drilling a hole to insert the blade at the camel's neck where it meets the hump. Start cutting along the outside edge and remove the entire inside block. Now it's easy to cut the remaining pieces following the pattern.

After all the pieces have been sawn apart, cut the lines that individualize the animals' legs and toes. Use a small bit to drill the holes for the animals' eyes and the camel's nostril.

Now, remove the paper pattern and sand off any excess adhesive and/or paper that remains on the wood. Break all the sharp edges on the pieces and make sure they stand up. If a piece doesn't stand, sand its base square to its opposing edges until it does, being careful not to remove too much material.

For the frame and back, measure about ¾" from the inside of the puzzle and mark that distance all the way around the face. With the grain running in the same direction, glue the lacewood to the pine back. Clean up any squeeze-out on the inside of the frame. Once the glue dries, use the scroll saw to cut away the excess and sand to the line. This will insure a uniform edge on both the pine and the lacewood. Affix the star pattern to the pine, drill a hole in the center to insert the scroll saw blade, and cut out the star.

To finish, use an aerosol spray with the clear finish of your choice and you'll have a beautiful nativity scene that can be enjoyed by kids and adults alike for years to come! PW

Rich E. Vander Klok worked as an editorial intern for Popular Woodworking *this past summer. He's a recent grad of Denison University and is currently residing in Philadelphia, Pennsylvania.*

Tabletop Shuffleboard

Year-round, all-weather, day or night family fun.

By Steve Shanesy

Most of us have spent at least a few leisure hours playing shuffleboard on a standard-sized, outdoor court. Now you can play this challenging game of skill right on your kitchen table — rain or shine, day or night.

The court is large enough (just under 40" long) to give you the feel of playing the real game, requiring skills to land your disc in just the right place, either scoring points or sending your opponent's disc out of scoring position. And it's fun. No sooner was the finish dry when members of the staff were giving it a try and planning a tournament!

There are a couple of non-woodworking steps required to make all the game parts, but nothing that presents serious challenges or requires expensive equipment. I used alder for my court, dowels for the cues, ½"-thick solid surfacing material (Gibraltar®, which is used for kitchen countertops) for the discs, and 10 gauge copper electrical wire to fit around the disc at the end of the cues.

Making the Game Board

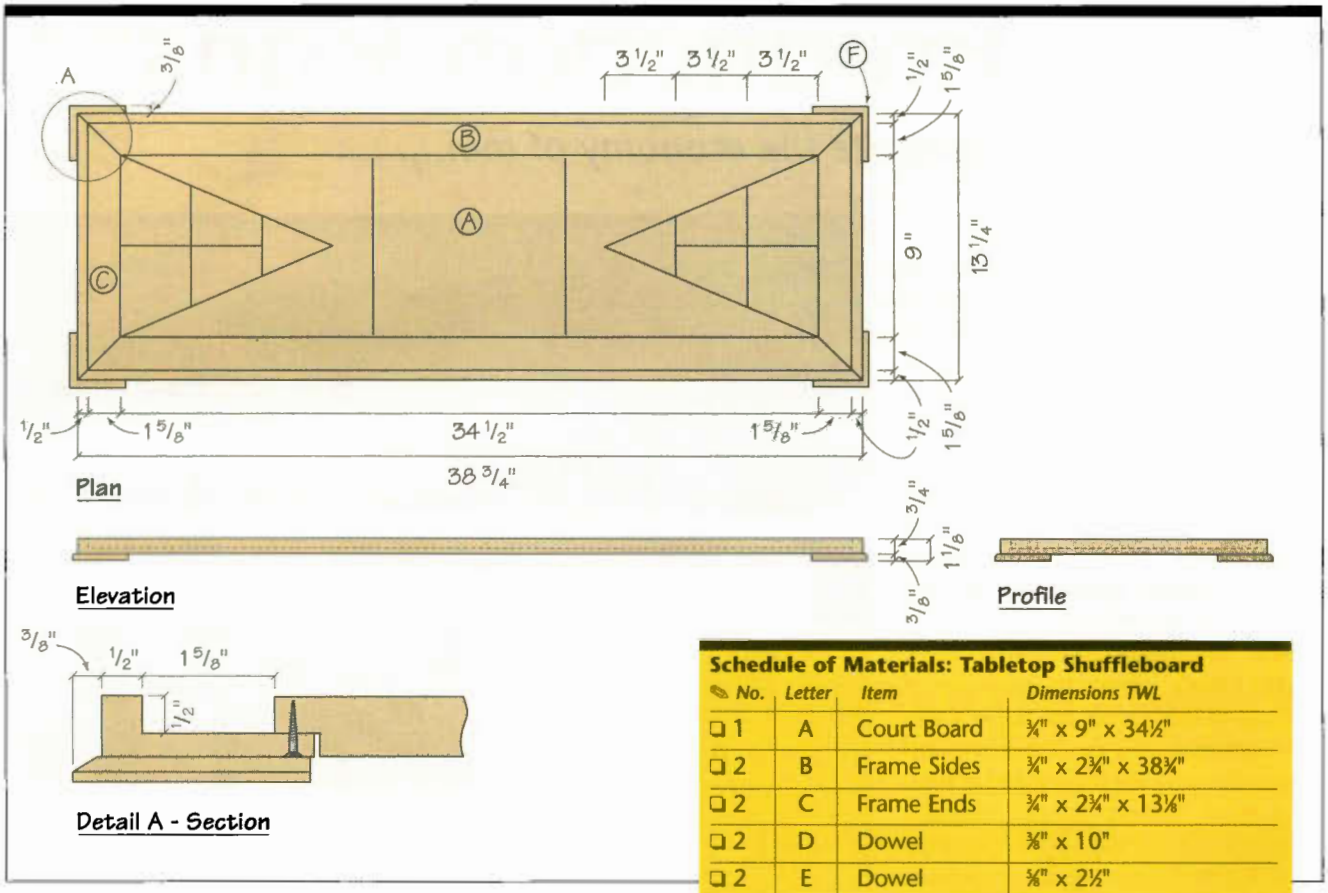
I edge glued ¾" thick alder to yield, after trimming, one board 9" x 34½". I also prepared enough alder to make frame parts that were ¾" x 2 11/16". I needed about nine lineal feet of this stock. With my stock prepared, I next milled the following details. The 9"-wide x 34½"-long court was cut to final size. I then cut a rabbet on the bottom edges that was ¼"-deep x 11/16"-wide. Next, cut a very wide rabbet out of the frame parts that are ½"-deep x 2¼"-wide ***(see diagram detail A)***. I cut my rabbets on the table saw, running the stock on edge first with the fence set to leave the desired thickness. I even used this method to cut the 2¼"-wide rabbet by raising the blade on three successive passes to arrive at the final dimension. The second cut to complete the rabbet is made with the width of the stock down on the table saw. I find this method very accurate, fast, and when used with a featherboard to run stock on edge, quite safe.

To prepare the frame parts for gluing, I cut the 45° miters to give them their final length. To assemble, I simply used glue and drove a small wire nail in each direction in the ½" "fat" part of the frame's outside edge. Once fastened, I used a clamp across each end to provide sufficient pressure to make a sound, mitered glue joint.

While this assembly was drying, I sanded the court board and applied a coat of finish. I sprayed clear lacquer, but brushed varnish or polyurethane would be fine. This first coat of finish, when dry and sanded smooth with 360 grit paper, makes a good surface to apply the lines and numbers that lay out the shuffleboard court. I made these from "press down" type, which you can find at most craft and office supply stores. To apply, simply put the number or line where you want it, then rub over it with good pressure and a burnishing tool (like a pencil with a completely worn down lead and a rounded point). The rubbing pressure transfers the line or number to the finished wood surface. This is an ideal way to apply the lines and numbers since they are crisp, straight, and have almost no thickness build-up as would a coat of paint. And if you misplace a line or number, it can be removed by lightly sanding it with fine sandpaper. Once all the lines and numbers were applied, two more coats of finish protected the markings and completed the finishing of the court.

I sanded the frame, then drilled slotted holes along its long edges for later attaching it to the court using #6 flat head screws. The slots were two holes drilled side by side, anticipating potential expansion and contraction in the 9" wide court board. I did not use screws on the ends, believing them to be unnecessary. Plus, by being so near the court ends, the screws could split the court board when fastening.

I used the fall-off from cutting the wide rabbets on the frame parts to fashion the four feet at the corners of the game board. I kept their ⅜" thickness and cut four equilateral triangles. I simply sanded away the top edges of the feet sides that formed a 90° angle creating a slight bevel. These feet will help the gameboard sit flat and also reinforce the miter joint of the frame. I glued them in place and fastened them with wire nails, driving



Schedule of Materials: Tabletop Shuffleboard

No.	Letter	Item	Dimensions TWL
❑ 1	A	Court Board	¾" x 9" x 34½"
❑ 2	B	Frame Sides	¾" x 2¾" x 38¾"
❑ 2	C	Frame Ends	¾" x 2¾" x 13⅛"
❑ 2	D	Dowel	⅜" x 10"
❑ 2	E	Dowel	⅜" x 2½"
❑ 4	F	Feet (triangular)	⅜" x 1¾"
❑ 6	G	Discs	½" x 1½" diameter

them into the fat part of the frame's outside edges. With the frame complete, I finished it and screwed it to the court board.

The Discs

I picked up a small, free piece of leftover solid surfacing material at a friend's commercial cabinet shop to make the six discs. The material has the weight and smooth surface to make it perfect for the game. This solid plastic material is machined with carbide tooling in the woodshop.

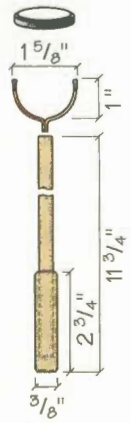
Since I wanted the discs to be 1½"-diameter, I cut a 2⅛"-diameter hole in a piece of ½" plywood. I then used the hole with a ⅜"-diameter collar, a template guide, and ¼"-diameter straight bit with a router to cut out the discs. I made my cuts in two depth passes to make the job easier. Although not necessary, I also made a first cut, only 1/16"-deep, with a ½" collar that gave the top a small, but nice looking, shoulder detail.

After cutting out the six discs, I sanded the edges using a random orbit sander and 150 grit paper. To make the job easy, I put the sander in my bench vise upside down so I could hold the disc on the now stationary sander. A dab of oil on the sanded edges eliminates the dull-looking, abraded surfaces.

The Cues

The cues are made from dowels, ⅜"-diameter for the longer part and ⅝"-diameter for the handle. The "business" end, which is a semi-circle slightly larger than the disc, is made from #10 gauge solid copper electrical wire.

To form the wire, I clipped about an 8" length and stripped the insulation. Then, I bent it in the middle and placed the partially bent end in a vise, cranking it down until both legs were side by side. With the bent end still in the vise about ⅝", I first spread the legs flat, forming a 90° bend to the portion in the vise, then placed a 1½"-diameter chisel handle over the center and then bent each leg up around the handle, forming the better portion of a circle. Satisfied with its shape, I cut the excess wire off leaving a half-circle.



To anchor the wire in the dowel, I merely cut a slot the same depth and thickness of the ⅝"-long wire stem. The slot was then filled with hot melt glue, with the stem placed in the still hot glue. After the glue cooled, I trimmed off the squeeze out with a utility knife. I then wrapped the end with sewing thread to cover the union and to add additional strength. To prevent the clipped ends of the copper wire from scratching the court, I added solder to the tips, forming a slight ball on each.

Finally, I bored a ⅜" hole ¾"-deep in the end of the dowel handle and glued the handle in place after sanding a slight bevel on the edges. I put a couple of coats of finish on the cues, especially on the threaded area to glue the wrapping in place. Then, it was time for tournament play to begin. PW

Steve Shanesy is editor of Popular Woodworking.

Short Production Runs

Ten plant stands illustrate the economy of multiples.

By Andrew Schultz

Production runs often infer a compromise of some sort, whether in aesthetics, detail or quality. In fact, many woodworkers believe that when faced with even a modest run of projects, such as these plant stands, the ideals of hand tool woodworking are soon left behind. Although a short run of ten is small scale, I would argue that a limited production run by the solitary craftsman doesn't necessarily mean the mass production of clone after clone.

Sure, you must standardize in some respect (that's where the economy of production runs comes in), but as a solitary craftsman you can determine just where you apply these principles of mass production. Milling, joinery, shaping, assembly, sanding and finishing are each amenable to industrial practices, even though your factory may only be in your basement. Where you draw your line as an artist, craftsman and businessman determines which, if any, of the commonplace industrial practices has a place in your workshop.

Milling

I admit it. I'm a woodworking philistine. I never saw a board by hand unless I can't figure out a way to get out of it. I never hand plane a board unless it's so warped I can find no other way to salvage it. Nonetheless, I do appreciate hand tool skill and apply it to woodworking when I fit joints, prepare the product for sanding or trim an assembly to size. And I truly believe that the block plane is one of humanity's greatest inventions, right up there with drywall screws and the biscuit joiner.

Although it is physically possible to mill the wood by hand for ten plant stands, I would still be planing if I had chosen to use hand tools for milling. We could argue about this until cows run for Congress, but I will not back down from this assertion: for production runs, unless you're building period reproductions for a discerning audience, you've simply got to mill your wood with machinery.

Given this assertion, you need a minimum of three machines: a jointer, a planer and a table saw. Additionally, you will need some means of sawing the wood to rough length — a circular saw, a radial arm saw, a chop saw or, if you really must get your aerobic exercise, a handsaw.

There are six planes in a rectangular piece of wood: two ends, two edges and two faces ***(diagram 2)***. Your objective, for a production run of furniture, is to make each workpiece's pair of surfaces flat, smooth and parallel to each other, and at 90° to each of the other pairs of surfaces.

The first step in rough milling lumber is to select enough wood for the project. I sort through my stacks tentatively looking for matching species, hues and grain patterns. I select about 10% more wood than I will need for the project as determined in the Schedule of Materials. I mark out the lengths of the workpieces I will need, adding ½" for this first rough cut and then I cut the workpieces to this rough size on the radial

Diagram 2

All surfaces flat, smooth and at 90° or parallel to all other surfaces.

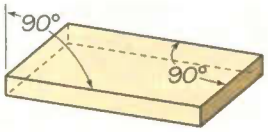


Diagram 3

Hand plane warped surface until it lies flat; then run it through planer until it has two flat parallel surfaces.

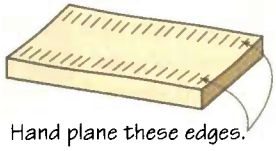
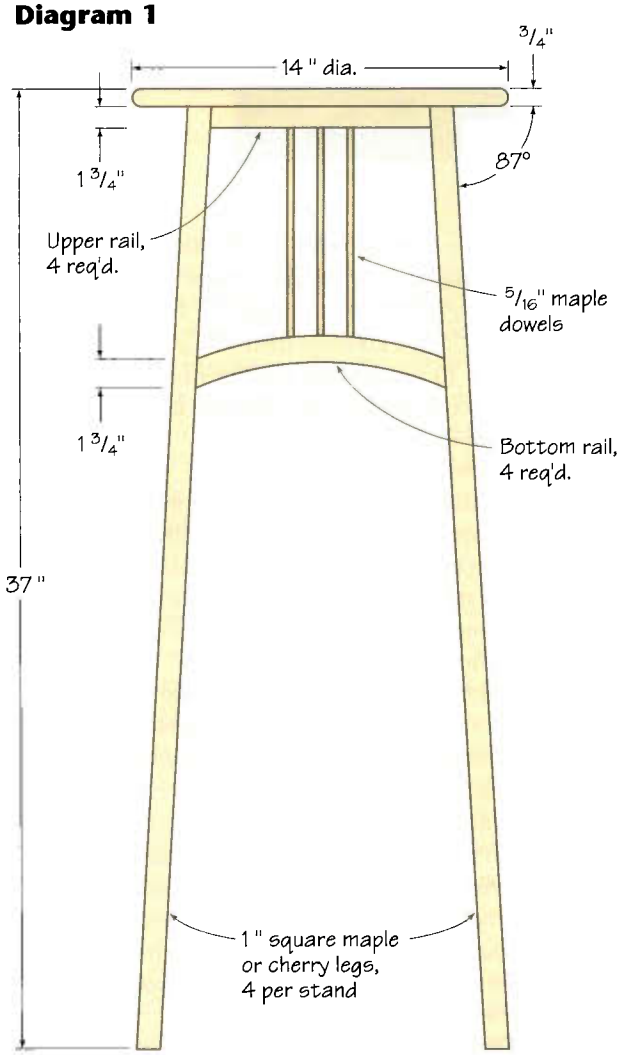


Diagram 1



Schedule of Materials: Ten Plant Stands

No.	Letter	Item	Dimensions TWL	Material
❑ 16	A	Legs	1" x 1" x 36¼"	Maple
❑ 24	B	Legs	1" x 1" x 36¼"	Cherry
❑ 16	C	Upper Rails	¾" x 1¾" x 7½"	Maple
❑ 24	D	Upper Rails	¾" x 1¾" x 7½"	Cherry
❑ 16	E	Lower Rails	¾" x 2½" x 8"	Maple
❑ 24	F	Lower Rails	¾" x 2½" x 8"	Cherry
❑ 5	G	Tops	¾" x 14" x 14"	Maple
❑ 5	H	Tops	¾" x 14" x 14"	Cherry
❑ 30	I	Dowels	⅜" x 36"	Maple

arm saw. Next I establish one flat face. I have an 8" jointer that allows me to surface most of the rough lumber that I buy, but occasionally, I'll meet up with a board bigger than my jointer's capacity. In that case I'll count myself lucky at finding such a board and hand plane it flat enough so it will ride flat against my planer's rollers. That is to say, I only rough plane the board's face along its edges ***(diagram 3)*** and then I run it through my planer until the board is flat with two parallel faces.

If the board is not wider than my jointer, however, I surface one face until it's flat, and then joint an edge flat, smooth and at 90° to that face. I always pencil the face and edge so that I know which are milled true, then set the board aside and move on to the next board. I process all of the boards in this fashion, setting aside any mavericks that need special attention, such as those that are twisted, cupped or firewood.

Once I've completed this first task, I deal with the group of oddballs that need special attention. Most of the time, I can salvage those cupped or twisted pieces by cutting them into smaller pieces or by hand planing them like I did with the oversize boards. Take care when attempting to salvage odd bits of wood, though, because warped wood often has internal tensions that are relieved when you are machining it. Consequently, warped wood is likely to warp further while you're machining it and can pinch a saw blade or split unpredictably.

The next step in milling is either to plane the second face of the wood flat and smooth or to rip a parallel edge. It's a judgment call on your part which to do first, but I generally rip first and then plane. I do this because I figure the smaller the width of the board, the less wear on the planer knives, the longer they will stay sharp. It's much easier to change a saw blade than the planer blades and so I usually rip first.

Ripping is a potentially dangerous table saw operation, particularly so when you are ripping rough stock. Why? Because the workpieces are at their largest, most difficult to manage stage and during rough milling, you cut off the waste where wood defects are located. Often these marginal areas are checked, split or unstable and the cut-off bits can come flying back at you

Photo 1 *Forty legs need four mortises each, which is far beyond my hand tool capacity.*

without warning. After you've ripped a parallel edge on all of the rough stock, plane a face parallel to the face you surfaced flat on the jointer. Plane all of the boards flat and to final size plus a 1/16". Voilá — all of your work is rough milled to perfection, flat, smooth and square. The ends are probably not perfectly square, but that brings us to the final stage of milling.

Final milling brings each part to its finished dimensions. It's pretty much like the rough milling operations — the same machinery at least — but there are some special techniques that help you bring the workpieces to a fine level of accuracy and surface preparation.

First, rip the legs to size. I needed 40 legs, 36¼"-long for the plant stands, one inch square. The rough-milled blanks were 1 1/16"-thick. I ripped the 40 legs to 1 1/16"-wide on the table saw and then gang planed them, four at a time, to their finished dimension.

To crosscut the legs to final dimension, I used a table saw sled and established the 36¼" dimension by clamping a stop block on the table surface 36¼" from the blade. Cut all of the legs using the same set up. I sorted these legs into groups of four at this point, matching patterns of grain and identifying those faces destined to face outward and those that will be mortised.

Sand the rail material through 220 grit sandpaper while they're still long boards and then cut the rails to rough length using a stop block clamped to the table saw sled's fence. Cut them about ¼" longer than their finished dimension, about 7½"-long for the top rail and 8"-long for the bottom ones.

The tops warrant special treatment no matter what kind of wood you've selected. Tops and doors are what people look at first when they notice a piece of furniture. I had located some spectacular wavy grained soft maple, but when I took it to the jointer, I knew immediately that it was going to be a challenge to plane. I was only jointing the edges for the glue joint to assemble 14"-wide pieces, but I knew from the tear out that planing the maple tops was going to be impossible. Luckily there's a cabinet shop with an abrasive planer nearby, so I managed to have all of my tops surfaced to size without any tear out.

Milling: Summary of Choices

The choice between hand milling and production milling seems obvious. Unless you're making truly historic reproductions or one-of-a-kinds, production milling with machinery is the only route to efficient, cost-effective woodworking.

***Photo 2** A jigged up mortising arrangement like this enables you to cut mortises quickly and accurately. This run of 160 mortises took about 27 seconds each, so I was able to complete the whole run in about 80 minutes.*

Joinery

I cut the 160 leg mortises I needed for the 10 plant stands with a router in accordance with the procedures I wrote about in *Popular Woodworking* issue 85 on page 21. I would probably still be chopping them if I'd done them all by hand ***(photo 1)***. It took me about 30 seconds per mortise with this setup and after I had completed all of them, I chopped them square with a ¼" chisel ***(photo 2)***.

The tenons were a little more problematic. First I needed to cut the top rails to their final length and at the 3° angle needed to cant the legs out slightly. I did this by screwing an auxiliary fence on the table saw sled at the appropriate angle and then clamping a stop block to the auxiliary fence ***(photo 3, diagram 4)***. This worked well and I was able to crosscut all top rails in a few minutes.

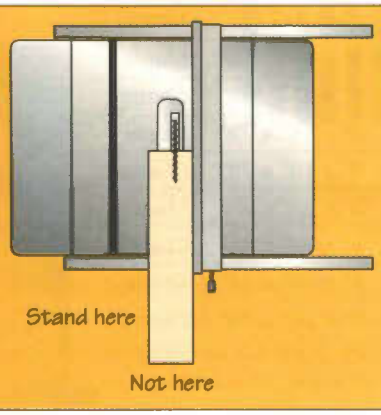
Before I could figure out the final dimension of the bottom rails, however, I needed to cut tenons on one of the upper rails so that I could bang the leg/rail assembly together and gauge the actual fit of a bottom rail. I set up a straight bit in the router table and routed the tenon faces to an appropriate fit in the mortises and then trimmed it to size on the bandsaw ***(photo 6)***. One of my readers had chided me for precutting the tenon shoulders on the table saw in that previous article, saying it wasted time, but trying it his way left me with bad tear out at the end of the routed tenon, so I continue to recommend scoring a shoulder first on the table saw.

Once I had established the successful length of the bottom rail, I crosscut all of these to size against a stop block using the same angle setup on the sled as with the top rail. Finally, I routed all of the tenon faces to size and trimmed the tenons to length on the bandsaw ***(photo 7)***.

Next, I bored the holes for the dowels in the upper and bottom rails on the drill press. It was simple. I just clamped a stack of all identical rails together and drew a center line across the midpoint of the rails, then flipped the square over a couple

TIP I like to use a narrow kerf rip blade for ripping rough lumber. There are several reasons, not the least of which is safety. I find the saw cuts easier, there's less resistance, and I reduce the risk of kickback.

When ripping, stand slightly to the side, not directly behind the workpiece. In this fashion, if kickback should occur, you're less likely to be injured. Use guards and splitters, and wear safety equipment such as safety glasses, hearing protectors and dust masks. I wear a leather shop apron, too. This heavy cowhide apron has stopped several sharp pieces of wood that otherwise might have made quite an impression.



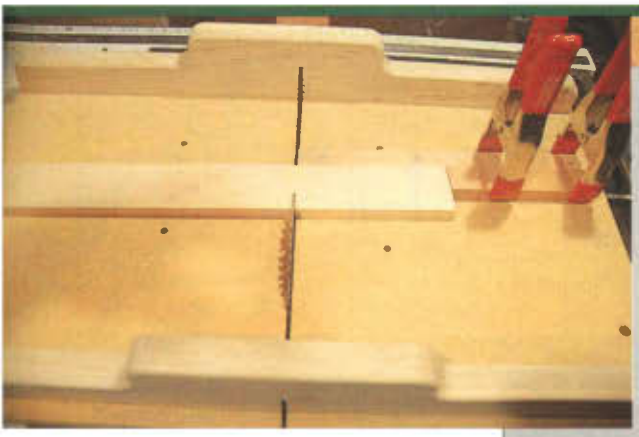


Photo 3 *Screwing an angled auxiliary fence to the sliding table saw sled enables me to crosscut upper and lower rails to size in a few minutes. The stop block ensures they're all exactly the same size.*

Photo 4 *Sometimes the sheer quantity of a production run forces you to compromise on aesthetic concerns, but not quality.*

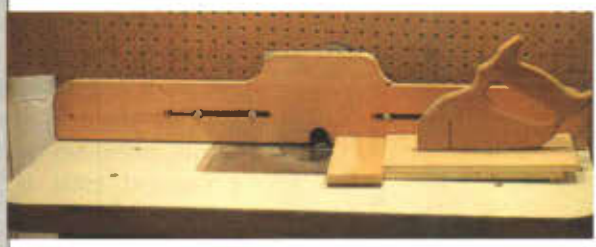
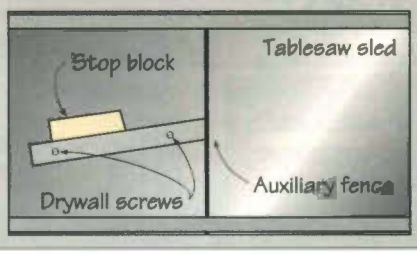


Photo 5 *I used a push stick whose leading edge was cut at 3° to follow the workpiece as the tenon was routed. In this fashion I minimized tear out and managed to hold the workpiece firmly against the fence. It's safer, too.*

Diagram 4



of times to locate the two other holes. In this fashion, there is no measurement error, only an identical layout procedure with a minimized and one-time procedural error, my location of the second and third holes.

Using a fence on the drill press, I located the holes on center with the width of the workpiece and then drilled all of the ⅜" holes to depth, using the depth stop mechanism on my drill press *(photo 8)*. Once I'd bored all of the holes, I assembled a leg assembly again and fine-tuned the optimal length for the dowels. Then I crosscut all of the dowels to final length using the crosscut table and a stop block.

Joinery: Summary of Choices

The choice between cutting joints by hand and production joinery is not well defined for this woodworker. Hand-fitted exposed joinery can lend an air of distinction to one-of-a-kind pieces of furniture and are well worth the effort. However, when faced with an armada of drawers, I'd still opt for the router-cut dovetails. For unexposed joinery in multiples, as in the mortise-and-tenon joints here or with dadoes, rabbets and the like, I'd almost certainly choose machinery-made joints.

Shaping

The difference between an object shaped by hand and one shaped by machine is minimal to my eye. Consequently, I machine most of my edges and shapes. There are subtle differences, however. First, there's the constant irregularity of a hand tool's cuts that lends a certain softness to a hand-hewn piece. A machine-made piece often displays a predictable perfection that smacks of the assembly line. It's similar to the difference between drawing a line by hand or with a ruler.

A second difference lies in the quality of the shape itself. Machined edges often show tell-tale traces of the process, such as burnishing, chatter marks, burns and tear out, which are all visible giveaways. Hand tool shaped edges have their idiosyncratic look, too. Burnishing by hand tools leaves a polished look to the edge and the differences in shaping with the grain or across the grain are readily apparent too. Again, to my eye and for my purpose, which is making good furniture even I can afford, I choose the more efficient methods for shaping, and that usually means machining.

I stack-cut the curved shape of the lower rails on the bandsaw. First, I laid out a pattern *(diagram 5)*, then I bandsawed it to size and shape. After sanding the pattern to shape, I screwed all of the bottom rail blanks together with long drywall screws in stacks of four and traced the pattern's shape on the top of the stack. I cut the top curve first, smoothing it on my vertically mounted belt sander *(diagram 6)* before cutting the bottom curve and then smoothing the bottom curves of each piece on a drum sander on the drill press.

I cut the table top round with a circle cutting jig *(diagram 7)* on the bandsaw *(photos 9 and 10)*. After cutting the round tops, I sanded the sawn edges on my vertically mounted belt

Photo 6 *I used a fence with a drywall screw screwed into it to establish the correct angle for the shoulder cut into the angled tenon.*

Photo 7 *Finally, I trimmed off the waste from the tenon by running the tenon against the fence on the band saw.*

Photo 8 *Bore the holes for the dowels in the upper and lower rail against a fence on the drill press. Use the depth stop to bore the ⅜" holes to the same depth.*

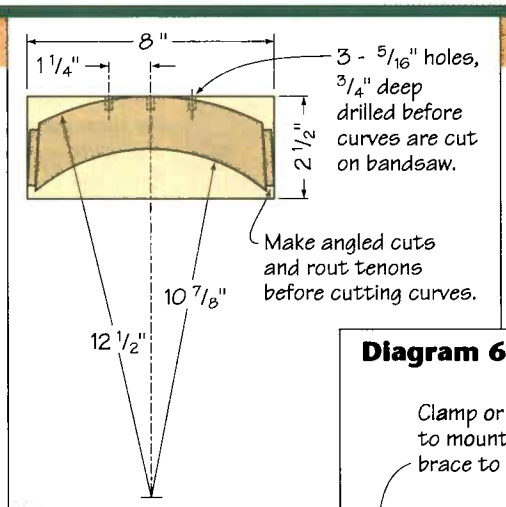
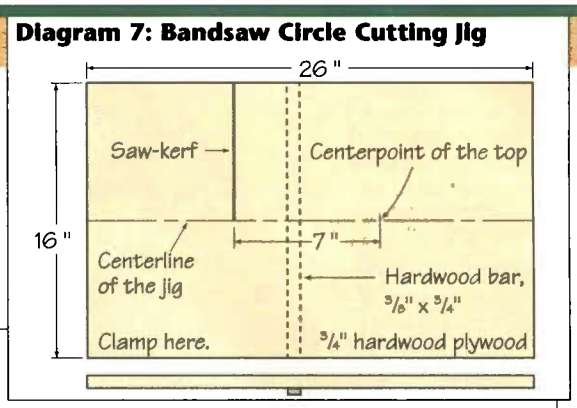
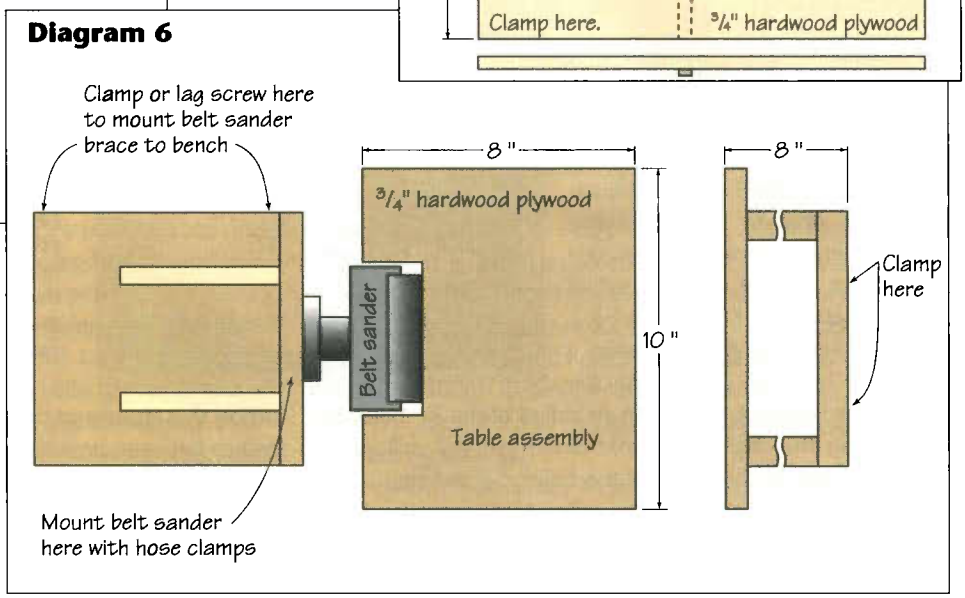


Diagram 5





sander until the saw marks disappeared.

All that remained to complete the shaping process was to shape the edges of the legs and the tops. I rounded over the tops with a ¾" round over bit set in my router table. Finally I beveled the edges of the legs with a block plane and the shaping process was complete. I could have used a beveling bit on the router table instead, but this bit of hand shaping goes quickly and I see no advantage to machining here.

Shaping: Summary of Choices

When choosing between shaping by machine or by hand, no clear rules can be established. You will need to evaluate how much shaping work needs to be done, how machineable or hand-workable the wood you're using is, whether you need to duplicate a historic practice or shape and whether the quality of the machined or hand-rendered shape is more appropriate.

Sanding

For me, surface preparation is where I must compromise the most in the ongoing battle between productivity and fine craftsmanship. The difference between a machined and sanded surface and a hand-planed and scraped surface is subtle, but profound. A hand-scraped surface is alive while the sanded surface seems muted and dull. It's similar to the difference between seeing an eagle soaring or one just back from the taxidermist. If I am building a small, one-of-a-kind item, I will probably scrape the entire project looking for that patina that the scraper puts on wood. If the project is larger, say a desk or table, I may scrape the most visible surface, the top, and sand the rest. On production runs such as this I will usually sand the whole project.

Sanding the plant stand took place at different times to maximize efficiency. I had the glued up top panels sanded to 180 grit, which were sanded to thickness at a cabinet shop. I sanded both faces of the upper and lower rails through 220 grit sandpaper before I crosscut them to size — it's quicker and easier to sand several long pieces than it is to sand 80 small pieces. The legs were sanded through 220 grit after I'd planed them to size and I had finished cutting the mortises.

Sanding: Summary of Choices

I think the choice between producing a scraped or a sanded work really depends on the economics of your situation. For production work I will rely more on sanded surfaces, while for small one-of-a-kind pieces I will probably scrape more surfaces.

Assembly

For a small shop like mine, assembly is labor intensive. Consequently, I make assembly one step so I can take my time and demonstrate my best craftsmanship. Waiting for glue to dry provides this opportunity.

TIP

I used to have one of those two-nut stop assemblies that took forever to adjust on my drill press, but I replaced it with a quick-release stop made from a ½" pipe coupling, drilled out to accommodate the threaded depth rod and, with ¼" x 20 tap, I tapped a hole in the coupling to fit the threads on a ¼" wing-headed machine screw.

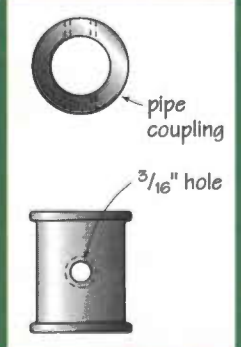


Photo 9 *The best way to cut the circular tops is with a circle-cutting jig on the band saw. As you can see, the jig is simply a sheet of plywood with a ¼" cleat screwed on the bottom that rides in the band saw's miter gauge slot. Advance the jig into the saw blade while the band saw runs until the teeth just meet the centerline of the jig, which runs from the left to the right of the photo. To find the pivot point for the 14"-diameter top, simply drive a nail through the jig on that line, 7" to the right of the saw blade.*

Photo 10 *Once you've marked the center point on the bottom of the workpiece, drill a small hole about ⅛"-deep into the underside of the workpiece and clip the projecting nail off so the workpiece rides flat and securely on the jig's surface. Then start the saw and advance the jig/workpiece assembly until the blade is located right on the centerline of the jig. Clamp the jig in place and rotate the workpiece until the circular top is completely cut.*

Few things are more disconcerting in mass-produced furniture than the odd mismatches of species or the bizarre patterns of grain that you find in some manufactured cabinetry and furniture. It seems in many instances that even the few seconds that it takes to match color and grain are discarded in the hurry to produce goods. You can easily distinguish your work from the truly mass-produced stuff by matching grain patterns and the tonal qualities of the wood now as you begin assembly.

I find that assembly is also easier if you have already applied a coat of finish or two to the parts. Once the stain and one coat of finish has been applied, I sort the legs and rails into mutually compatible groups. I find I am able to better match grain and tonal qualities after a coat of finish, and I can also wipe up glue squeeze out without fear of telltale smudges later.

Assembling the plant stands proceeded in three distinct phases. First I glued, assembled and clamped two legs with dowels inserted and the upper and lower rails in place. I only had enough clamps to clamp up 10 leg/rail sub-assemblies at a time, so I had to go through this twice before I was ready to assemble the stand as a whole. To maximize my productivity, I drilled holes and cut pockets in the inner face of the remaining upper rails where I would attach the top to the base while I waited for the clamped up leg/rail assemblies to dry. Once the glue had set on the second set of leg/rail subassemblies, the second step was to assemble the base completely, gluing the other upper and lower rails in place between a matched pair of leg/rail subassemblies, again inserting the dowels in the appropriate holes.

After the bases were assembled, I trimmed the waste at the top of the base so the top would sit flat on the base. I performed this operation on the same sled with the auxiliary fence I used to crosscut the rails to size. I tilted the saw blade three degrees to make sure that each cut would be at 90° to a plumb line. As a final step, I screwed the top to the base with drywall screws through the pockets I'd cut in the upper rails' interior faces.

Assembly: Summary of Choices

For most small shop owners, the opportunity to use true production techniques and assembly-line equipment, such as pneumatic clamps, special glues, conveyor belts and the like, is severely restricted due to the space and financial requirements associated with such equipment. For most small shop owners, therefore, assembly remains a labor-intensive, hands-on activity with much opportunity for hand fitting and attention to the details of each individual piece. To maximize the distinction between your work and truly mass-produced work, you should make the most out of this opportunity to distinguish your product.

Finishing

Initially I had planned to spray these plant stands, thinking like Henry Ford that "they could have 'em any color they wanted as long as they were black," but as people expressed an interest in these pieces, I realized I'd have to meet their needs. So, I stained three maple stands in golden oak, I painted two bases white and mounted golden oak stained tops on them, and I stained and lacquered three cherry stands with a red mahogany stain and oiled two cherry stands with tung oil.

Finishing: Summary of Choices

The choice between spraying and hand finishing is a balance between customer needs and your striving for cost effective efficiency. I got stuck between paying customers and the efficiency of spraying but I discovered that finishing by hand is just another way to distinguish between your product and those truly mass-produced. PW

Andrew Schultz *is a furniture maker and woodworking writer who resides in Lincoln, Nebraska.*

A Workshop Wish List

Compare your Christmas list with your fellow woodworkers.

By Steve Shanesy with *Popular Woodworking* Readers

If you have *any* reason to hope for more than a lump of coal come Christmas morning, read on! Here's your chance to compare your wish list of shop tools and equipment with the dreams of your fellow readers. Here's what we learned when we recently asked, "What do *you* want for Christmas this year?"

Better still, go ahead and complete our survey (find it in the PullOut™ Plans) *before* reading on, then compare your picks to our winners. Regardless, do complete the list, hand it to some friends or loved ones and see if they get the hint. Think big! Who knows, you might get lucky, especially if you've been good about putting your tools away and sweeping up the shop at the end of the day.

How We Did It

We came up with a list of readers to survey by randomly selecting 500 names from the list of about 225,000 subscribers. We then compiled a list of tools and equipment in seven price categories starting with $25 or less and ending with $300 to $500 (yes, $500, this *is* a wish list). When completing the survey, respondents could check as many items in a category as they wanted, and were encouraged to write in items not listed. In all, we received more than 150 survey responses with a total of 2,096 items checked. Lastly, unlike surveys you hear about on the evening news, I can't tell you what the scientific margin of error is and don't care. We did this for fun!

You should also know that we came up with the tool list by combining the pages of numerous mail-order woodworking equipment and supply catalogs like Woodcraft, Trendlines, McFeely's, Constantines, Woodworker's Supply and Leichtung Workshops. We didn't attempt a complete list but merely wanted a sampling of items we thought would be of interest to you.

And the Really Big Winners Are . . .

Before we open the envelope, if you will, let me say that I'll risk all future credibility by announcing the top vote getters of all categories combined. (Let me assure you, though, that I'm a truthful servant/editor dedicated to the preservation of honest reporting.) First, there was a tie for this coveted title so the honors are shared by (drum roll, please) a dust collection system *and* a subscription to *Popular Woodworking!* (Ah, loyal readers, I've never doubted for a moment that you're the best woodworking magazine readers in the world.) Both the dust collection system ($200-$300 category) and subscription (under $25) received twice as many votes as any other item listed. The next most popular items on our wish list proved to be a boxed router template guide set and a pneumatic finish nailer kit.

Category Winners

$25 or Less

As mentioned, readers chose a subscription to *Popular Woodworking* as the winner of this category, which, when you think about it, is a terrific value. With a subscription cost of less than $3.00 per issue, and with a minimum of four to five project plans in each issue, your maximum cost per plan is in the 60 - 75 cent range. And with that, you're getting all the tips, techniques, tricks, and tool and book reviews for free! With 74 readers out of about 150 total responses, the *Pop Wood* subscription was by far the most often selected of any listing in any category. (Knowing this, we slipped in a few extra of those damed subscription cards so you could pass them on to your friends and family. Just kidding!)

Runners-up in this category included a square corner chisel (always handy for squaring up mortise corners) with 12 percent of this group; a bar clamp (because you can never have enough clamps) with 11 percent; and a five-piece set of brad point spur drill bits with 7 percent.

Popular Woodworker,

$25 To $50 Group

It's not surprising that router tooling and accessories showed up as popular items given the near universal acceptance and application of this important machine. Top vote-getter in this group was a selection of various sized collars making up a set of router template guides, which grabbed 21 percent of the votes cast in this price range. Scoring second was an electric detail carver that captured 16 percent of the votes. A finish spray gun finished next with 14 percent of the selections marked in this category.

$51 To $100 Category

Again, a router accessory dominated this category, although this winner has a specific, dedicated use. A dovetail jig drew a clear preference with 15 percent of all votes in this price range. A detail sander came close behind in the vote getting with 12 percent. It should be a hot item this holiday season as new models and increased popularity come together at the tool counters of your local discount tool stores.

Woodworkers also expressed a strong desire for carbide tipped saw blades, pulling 11 percent of our respondents' votes. Respectable numbers were also generated by a carving chisel set and a moisture meter, which tied at 8 percent.

$101 To $150 Group

The field in this price range was tightly packed with only three percentage points between the first four candidates. And as mentioned earlier, a router accessory walked with the honors. In this case, a precision router fence gamered just one more vote than an oscillating belt sander with 15 percent and 14 percent, respectively. Very close behind were a reciprocating saw (13 percent) and 16" scroll saw (12 percent).

The $151 To $200 Category

Like the previous category, tool preference in this price range was close among the top four items. The only spread was between first and second with a pneumatic finish nailer gathering 17 percent of responses while a 13-piece router bit set pulled 15 percent. And once again, router accessories (in this case tooling) fared well. Close behind was a tie with 14 percent each, between a small lathe and a carbide tipped, anti-kickback dado set.

Joseph W. Hasken, Sarasota, Florida

"I don't wait until Christmas or birthdays to add to my tools. I get them when I need them," wrote Joe Hasken when responding to our survey. And from the project photos he sent along, it looks like he knows how to use them. The jeeps were table favors for his 14th Armored Div. reunion.

Survey contributor Jim Simmons works out of a small (12 foot x 14 foot) shop, but produces some big results. At left, his poplar entertainment center and rocking chair.

Light Heavy Weights: $201 To $300

Numerous equipment items began to appear in this price range. At this level, I thought readers would select items that would help round-out or upgrade existing shop equipment, providing them with greater capability. They clearly had another priority in mind. While I expected an interest in dust collection, I was surprised by how great a preference was expressed for a dust collector that would offer multiple machine hook-ups, enough air velocity and CFM (cubic feet of air per minute) to get the job done. Indeed, a dust collection system received 19 percent of the votes in this grouping, seven points more than the next vote getter.

The rest of the category was tightly bunched together, so much that ties were registered for both second and third places. True to form and as witnessed in other categories, a heavy duty plunge router came in second, tied with a high volume, low pressure (HVLP) spray system. Both held 12 percent of the category. Couple the HVLP rig with the spray gun preference in the $50 group and I see a growing interest in spray finishes among readers, an encouraging trend. Tied in third position, all with 11 percent, were a 14" band saw, a bench top hollow chisel mortiser (which we'll be reviewing next issue) and an air compressor.

And the Heavyweights: $301 To $500

Preferences in this group were very evenly spread. The top candidate in this most expensive price range was a 12" planer with 16 percent of the vote. Does this relate to the popular dust collection system in the previous price range? I think so. Interest in a planer isn't really surprising, since having one provides so many more woodworking options, especially when coupled with a jointer. A high quality, oscillating spindle sander came in at 15 percent. A compound miter saw and a 1.5 HP shaper equipped with a ¾" spindle both won 13 percent of the votes.

The "Other" Question

We also offered our readers an "other" section. Items worth noting here because of the frequency with which they tumed up include a workbench, various sharpening systems, sets of Forstner bits, and panel-door, stile and rail router bit sets.

And Finally, the Priceless Category

Reader John Schickler of Midlothian, Virginia, enclosed a nice letter along with his survey. He explained that both he and his father subscribe and enjoy discussing various articles and projects from the magazine. He goes on to say, "Woodworking is one of my favorite activities." It must be, for John was the only reader to create an entire category when completing his survey. He titled the price range "Priceless" and had only one item entered, "More time for woodworking!"

Perhaps we should all put this one at the top of our lists!

***Steve Shanesy** is editor of* Popular Woodworking, *and the 150 survey respondents are a great group of woodworkers.*

And the Winning Reader Is...

Doug Green of Boulder, Colorado. As a thank-you to survey respondents, we randomly selected a participant's name to win $250 worth of books from The Woodworker's Book Club. Doug, a full-time cabinetmaker, came up the lucky winner! He was taught woodworking by his father starting at age five, worked as a computer programmer after high school but returned to his life-long hobby at age 40. "I guess life does begin at 40, 'cause I'm sure having fun," he says.

RESOURCE DIRECTORY

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Continued from p. 80.

The Moment of Spoof

When we arrived at the lake, Richard feverishly began scanning the dock and the lake, trying to find the nimble profile of our little craft bouncing on the waves somewhere, but it wasn't to be. As we walked down to the slip, we could just see a little triangle of aluminum from our boat's prow jutting up out of the water, the nylon mooring line still attached to the dock. Our boat had sunk!

Apparently the combined effects of the storm and the boat having been in dry dock for so long had caused the other two eye bolts (to which the other mooring lines were still tied) to pull right out of the wood.

There was no joy on the docks that day.

A long, funeral silence hung in the marina air. Richard avoided my looks, and I didn't know what to say. I thought Mary was crying. Then I saw that she was struggling to hold back a giggle. When she saw me looking at her she couldn't hide it anymore, and she burst out laughing and gasping, the tears rolling down her pretty cheeks. Richard and I couldn't sustain our funk and had to join her mirth. Yes, it was a bad day but at least it couldn't get any worse.

It Gets Worse

When Richard got back to his home, he discovered that during his absence his grandson had slammed the sliding glass door on one of his fingers and was now laying in the hospital bed right next to his stepson. The insurance company called, too. The MGB was totaled and Richard's insurance wouldn't cover it because the driver was a stepson who didn't reside with Richard. The car that Ruth had driven down to the accident needed a valve job because of its overheating.

The final insult was the call from the marina wanting $400 for pulling the boat from the water, and "oh, by the way, there's a $250 fine for polluting the lake."

In the end the free boat cost more than $6,000 in its first day, and neither Richard nor I ever took the helm, or even rode in it. Richard, in fact, didn't leave his house for the rest of July.

Common Sense and Free Tools

The German word *giftig* means poisonous, and in Shakespeare's time the word carried that same connotation. He wrote, "beware of strangers bearing gifts."

A bargain can seem like a gift, too. Be sure to look these gift horses in the mouth. If your choice is between a $50 router and a $50 straight edge, choose the expensive straight edge, because the cheap router will cause nothing but heartache while the straight edge will always be true.

And if your uncle has a free table saw he wants to get rid of, you know what to do. Run! PW

__Andy Schultz__, an author and professional woodworker, has positive proof of the adage "A boat is a wood-lined hole in the water into which you pour money." He declined a free tool in lieu of cash for writing this column.

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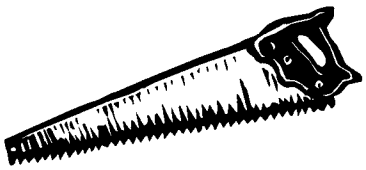

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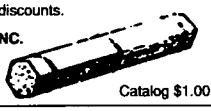

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sponsored by **BOSCH**

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Cheap Tools Make Big Fools

Nothing's more expensive than a bargain tool, except perhaps a free one!

By Andy Schultz

The gift-giving season is upon us, so photocopy this story and mail it to your friends and relatives. Do it now, before they surprise you with one of those universal woodworking tools that also makes pasta and de-bones chicken.

I realize it might be a stretch to liken a boat to a tool, but the following story illustrates my point about the perils of free or cheap tools, or, for that matter, just about *anything* free. As you might have guessed, someone once gave me a free boat.

What a Deal

My friend Richard and I decided we would buy a small runabout to cruise one of the nearby lakes with our families, and we were prepared to pay cash. So, we began hanging around some of the marinas, looked at several boats listed in the newspaper ads, and were set to bid on one when Richard's father-in-law said, "Save your money, I've got a little boat that needs some work. She ran well the last time I used her, and you can have her for FREE." This last word alone should have warned me of impending doom.

She was a sweet little craft, a 14 foot plywood hulled runabout with a 35 hp engine. She came with a trailer, too. We were both excited about the boat and I had visions of cruising the local lakes with my new bride, so we accepted the gift. Then I headed off to Nebraska to get married.

After the wedding, my new wife, Mary, and I took a leisurely motor trip back to California, traveling through several national parks and riding down the coast from Vancouver to Los Angeles, then back to San Bernardino. All the while, I sang the praises of the boat, and told my bride how we'd cruise the lakes, ski and take overnight boating excursions on Lake Powell and Lake Mead.

When we arrived back at our apartment, there was a phone message from Richard, who welcomed us back from our honeymoon and asked if I'd be willing to take him down to the marina to check on the boat this morning. This seemed a little odd to me. Richard was a car aficionado, and had many unique and vintage autos. I seldom got to drive because he loved to show off his cars.

Puzzled, Mary and I drove up the mountain to pick up Richard at his house. During the drive to the marina, he told us the tale.

Happy Holidays

Richard had put the boat in the water for the first time the day before, the fourth of July. Everyone in the family but Richard had driven the boat — the boys had skied behind her — and they'd all had a lovely holiday.

Later in the day, however, a storm blew up. That evening, Richard received a phone call from the marina. They reported that "your boat has taken on just a bit of water." Sunburnt and exhausted, Richard dispatched his eldest stepson with instructions to drive his favorite British racing green MGB convertible down the mountain to the marina, check out the boat and return.

Some time after midnight, Richard received another phone call, this one from the San Bernardino County Sheriff's Department. They reported his stepson had rolled the car down the mountain. He was all right, but was sent to the hospital for observation.

Richard's wife, Ruth, a registered nurse, decided she'd go to the hospital. So she went down the mountain to find the ambulance, while Richard paced by the phone.

Richard continued with his tale as we all motored down the mountainside. It wasn't long before we noticed another of Richard's vintage autos, an old Buick Riviera convertible, parked on the berm with its hood up and I said, "Hey, wasn't that your ..."

It seems the water pump had seized up during Ruth's rapid descent down the mountain. She'd left it there and rode with her son in the ambulance to the hospital. That explained why Richard needed the ride.

We travelled the rest of the way to the marina in an awkward silence governed by Richard's dark mood.

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