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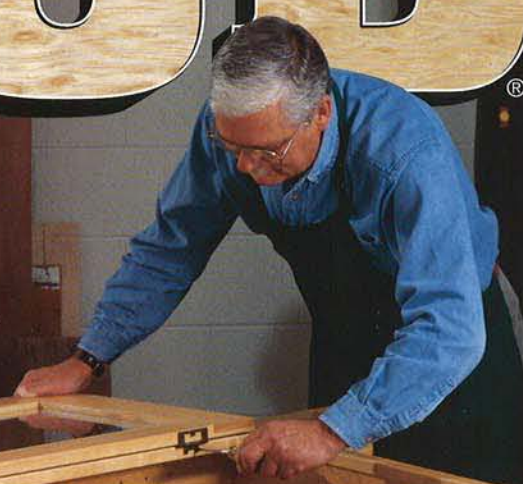
THE WORLD'S LEADING WOODWORKING MAGAZINE
APRIL 1997 ISSUE NO. 96

COUNTRY BUFFET & CUPBOARD

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DUST COLLECTORS

The scoop on
25 models

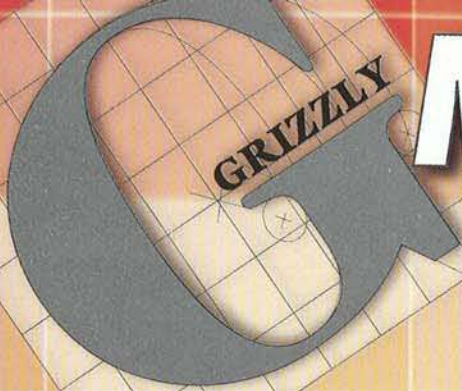


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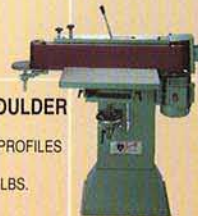
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WOOD ONLINE™ at <http://woodmagazine.com>

- To accommodate the multitude of questions (and responses) posted on our online Discussion Group, we've categorized the site according to your interests. Got a woodworking question? Here's the place to post it. Or, just stop in and offer a little advice.
- Tired of searching through back issues for that special project you always wanted to build, but never had the time? Now, you've got the time, but not the issue? Try our highly visited index for finding that project, feature, or technique.

THE EDITOR'S ANGLE

He Takes the Headaches Out of Finishing Wood



The **WOOD®** magazine gang listening intently as Bob Flexner makes a point about stain penetration during his day-long finishing seminar.

Like most other woodworkers, I would rather walk barefoot over hot coals than spend the time it takes to apply a fantastic finish to my woodworking projects. Nonetheless, it's a chore that must be tended to.

Imagine my surprise, then, when at the International Woodworking Fair last summer in Atlanta, finishing expert Bob Flexner stopped by the **WOOD** magazine booth to chat. (Bob is the author of a 310-page book titled *Understanding Wood Finishing, How to Select and Apply the Right Finish.*)

While at the booth, Bob went on about his thoughts on finishing. After listening for what seemed like a half hour, I was exhausted. But it was easy to see he passionately believed what he was saying, so I asked him to come to Des Moines and give the **WOOD** magazine staff a full-day seminar covering the topics in his book.

He, in turn, promised that at the end of the day, everyone would know all they needed about the subject. How could I resist?

Bob's presentation was informative, alright, so much so that by the end of the day, the staff had

information overload. But I'll try to summarize briefly several of his more interesting points:

- There's a lot of misinformation "out there," so you have to educate yourself and know what each type of product does;
- The FDA has approved all common ingredients used in all woodworking finishes, so you can use any of them on projects that may come in contact with food or children;
- The primary reason you need to finish wood at all involves slowing moisture exchange between the wood and the surrounding environment; and
- Gel stains work well in reducing blotching, but they don't bring out the depth in wood.

I could go on and on, but if you want to learn more, I recommend springing for Bob's book from Rodale Press (800/848-4735), \$14.95 paperback. It's full of easy-to-understand information and advice that will make you a better finisher. Thanks, Bob, for sharing your expertise with us. 🌿

Larry Clayton

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WOOD®

THE WORLD'S LEADING WOODWORKING MAGAZINE

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This issue's cover wood grain: bird's-eye white ash

Independent Tests Reveal New Cordless Drills The Competition.



Model 9862

In head-to-head comparisons, Porter-Cable's new 12 volt cordless drill put the screws to all the rest. Against seven different drills in seven different categories, Porter-Cable came out first in five out of seven and a close second in the other two. With more torque, higher performance and longer life.

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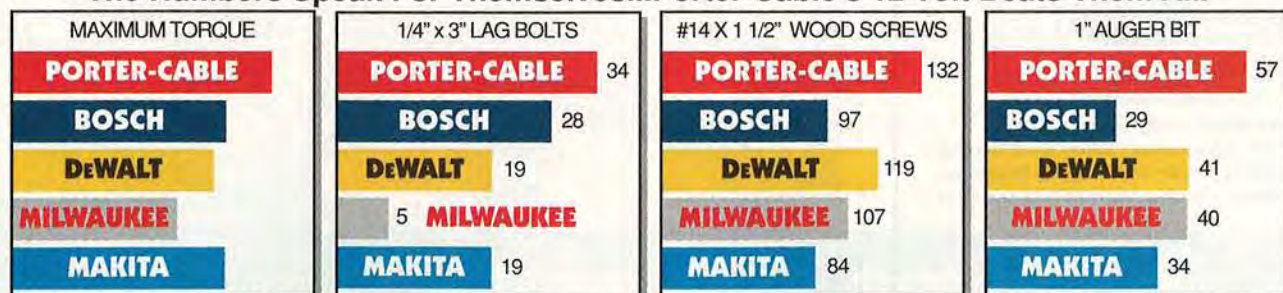
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TALKING BACK

One reader likes the service of Freud

I read the article on carbide router bits in the December 1994 issue, and decided to buy a stile-and-rail bit set. I chose the Freud set and was extremely pleased with the results. Recently, I had reason to be even happier with my decision.

While changing these bits, I dropped the stile cutter onto the floor. I figured I would have to buy a new set, but a friend suggested that



I call Freud to see if it could be repaired.

I phoned the company, and a representative recommended that I send the broken bit

How to reach us

We welcome comments, criticisms, suggestions, and even compliments. And you're sure to hear back from us, perhaps on this page! You can "talk back" by one of several ways:

- **Via mail.** Send your letter to Talking Back, WOOD® magazine, 1912 Grand Ave., Des Moines, IA 50309-3379.

- **Via computer.** Send your e-mail to one of these addresses:

CompuServe: 74404,3516

Internet:

74404.3516@compuserve.com

in for repair. I did so, and a few days later I received a package from Freud containing a complete new set of bits in place of the one I broke. Now I know what its lifetime guarantee means. Thank you Freud!

—William E. Poulson, Martinez, Ga.

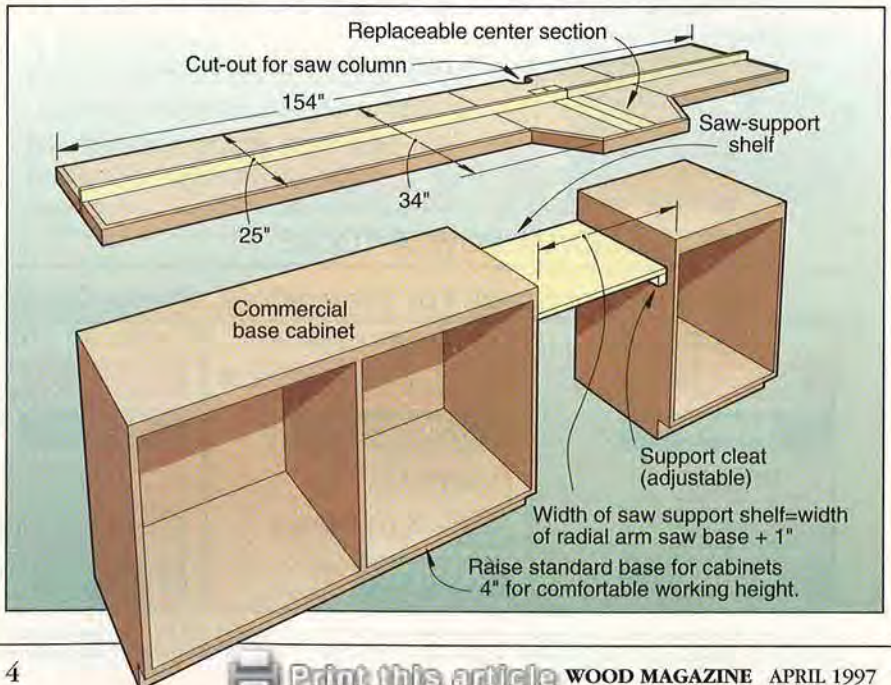
Radial-arm saw support

I've seen pictures of the radial-arm saw in the WOOD magazine shop that appears to be placed on a stand between two cabinets. Do you have plans for this stand?

—Brad Kronsbein, Stockbridge, Ga.

Brad, we haven't drawn up detailed plans for this saw support. However, it's a fairly simple item to build. It consists of a shelf, slightly larger than the base

of the radial-arm saw, placed between two commercially-made cabinets. The top of the saw table support rests flush with the top of the cabinets. This creates a continuous shelf for supporting long workpieces. The drawing below gives the dimensions of the saw shelf and saw/cabinet top in our shop. The saw top includes a replaceable section in the center for saw kerfs. ♣



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How to Price Your Work

Formulas are handy, but you need to know the market, too.



A Windsor chair made by West Virginia woodworker Wes Riggs can sell for \$400 to \$600. Yet Rhode Island cabinetmaker David Kiernan once sold an artistic wood-and-metal chair for \$2,450.

They're both chairs. They're both made by top-notch craftsmen. And while Kiernan's chair probably took twice as long to make as one of Riggs', the labor and material alone can't explain the fivefold difference in price.

Pricing is a tough job in any business, but particularly in fields like woodworking, where the individuality of woodworkers and their products make comparisons tough. Worse still, you may make your first pricing decision on the spur of the moment, such as when a friend sees something you made and asks what you'd charge to make him one. That's why it's important to think about pricing *before* you start selling.

How to establish a formula

The formula approach is one way to set a price. With it, you plug numbers into a formula.

First, you include any material costs. Then you add a *shop rate*, which is an hourly rate for shop expenses (overhead) and labor. To calculate a shop rate, total your annual costs for tools, shop space, insurance, utilities, marketing, and other business-related expenses, and divide them by the total hours you expect to do productive work in a year.

To determine your *labor rate* (what you'll pay yourself), you

can begin by simply using the hourly rate you make on your present (or last) day job. But remember to take into account the cost of health benefits, disability, pension/retirement, vacations, sick days, etc. These can easily equal 30-50 per-

“Generally, you’re safe if you’re in the range of other skilled trades—about \$25 to \$45 per hour.”

cent of your wage. If you haven't included them in your overhead costs mentioned earlier, add them here. Then, combine the new labor figure with your hourly overhead figure to get shop rate.

What makes prices vary

Shop rates vary considerably, and not always how you'd expect. Terry Sawyer, a Kentucky craftsman, builds authentic “new” log cabins with salvaged material from old ones. He charges a mere \$15 an hour. Some top woodturners or carvers may ask \$100 an hour or more. Generally, you're safe if you're in the range of other skilled trades—about \$25 to \$45.

Remember that formulas can oversimplify. You're spreading overhead evenly over everything that you make. But some items take more hours or equipment to make, find supplies for, or market. You may need to adjust prices to compensate.

A bigger problem with formulas is that they don't tell you what people are actually willing to pay. That's why a formula doesn't completely account for the price difference between Wes Riggs' Windsor chair and David Kiernan's art chair. Although most cabinet shops use formulas, woodturners, woodcarvers, or small-craft makers often base prices on a subjective sense of what pieces will sell for.

No matter what you make, researching the market is essential. Check craft shows and retailers, or call other woodworkers to check prices (keep in mind that retail prices often reflect a 100% markup). Also account for differences in quality.

Besides quality, three more subjective, market-driven factors determine the prices woodworkers can command:

- *Originality.* The more unique the work, the higher the price.
- *Reputation.* Once you have a following, you can raise prices.
- *Salesmanship and marketing.* Some consumers will pay top dollar for quality and originality; if you can find those buyers, you'll make more.

Finally, here's the most important advice on pricing: Don't sell yourself short. Woodworkers selling for the first time tend to underprice. You may be better than you think. ♣

Written by Jack Neff, a Batavia, Ohio, business writer and author of *Make Your Woodworking Pay for Itself*.



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DOUBLE-DUTY DUO

Barrel makers got extra work from these tools

Tools that purport to perform more than one task frequently do none of them particularly well. But sometimes a combination works so well it seems a natural. The ordinary claw hammer falls into that category, along with these less familiar tools.



Coopers relied on a number of unique tools when building staved wooden barrels. Most of those tools handled one specific chore. But the cooper's adze, *left* in the photo, and the bung borer, *right*, each combined two functions.

An adze with drive

An adze is essentially an axe with its blade at a right angle to the handle. Used for anything from heavy stock removal to fitting and shaping, the adze, in one form or another, was standard equipment in almost every woodworking trade in the 1800s.

The cooper's adze evolved into a short-handled implement with a narrow, curved blade. But its most distinctive feature is the extended poll forming a square or rectangular hammer head.

Coopers used this adze to cut a bevel (called the *chime*) on the inside top face of the assembled staves. The deeply curved blade and short handle allowed the cooper to swing the adze inside the mouth of the barrel. For ease of sharpening, the handle could be removed simply by undoing a nut at the end.

The tool also served as a hammer. Though coopers used heavier hammers for riveting hoops and driving them on, the adze's hammer head came in handy for many tasks where a heavier hammer would have been overkill, particularly in repairing barrels.

A whole hole with one tool

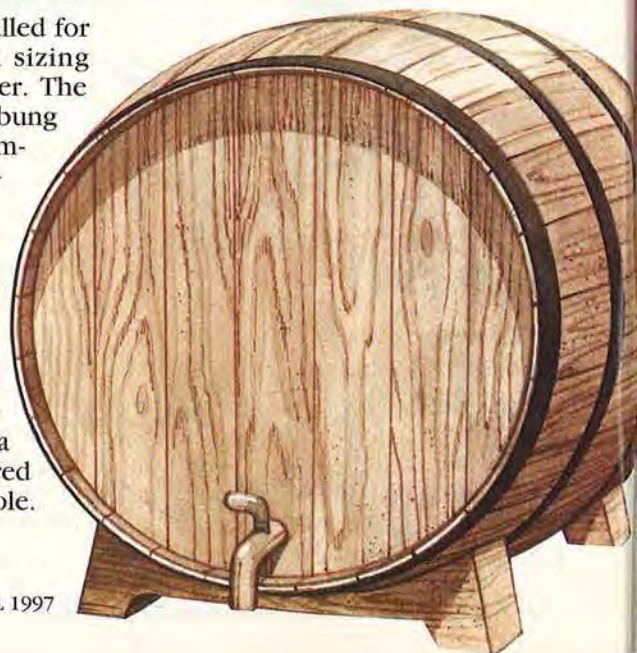
Wooden barrels that would contain liquids (called tight barrels) usually had two tapered holes for filling and emptying—a bunghole in the side near the middle of the barrel and a tap hole through one head (end) near the rim.

Boring these ordinarily called for drilling pilot holes, then sizing them with a tapered reamer. The American-style cylindrical bung borer shown here streamlined the task by performing both steps.

After drilling through the stave or head with the auger bit at the tip, the cooper would simply push the tool's body on into the hole. As he continued to turn the tool, the cutting edges formed by a slot in the side of the tapered hollow body reamed the hole.

Cooper's tools weren't commonplace, but many have survived because the skilled tradesmen who used them usually took good care of them. They're not highly sought after, so moderate prices prevail. One dealer recently listed a bung borer like the one shown for \$35 and cooper's adzes at \$65 and \$75. And we found a bung borer and adze in a flea-market booth, priced at \$85 for both. ♣

Tools from the collection of Paul Gorham, Indianola, Iowa
 Photograph: John Hetherington
 Written by Larry Johnston



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1276DVS	4" X 24" VS DUSTLESS BELT SANDER	226
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H077M	7 1/4" MAGNESIUM WORM DRIVE SAW	172
HD1606-02	BISCUIT JOINER	134
HD27-05-04	12V COLS DRILL KIT W/2 BATTERIES & CASE	128
3400	10" TABLE SAW W/CARB BLADE & STAND	198

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DA250	15 GA. ANGLE FINISH NAILER KIT 1 1/4" - 2 1/2"	219	743K	7 1/4" FRAMERS SAW, LEFT SIDED WITH CASE	128
DA250A	15 GA. ANGLE FINISH NAILER KIT 1 1/4" - 2 1/2"	248	2620	3/8" VSR DRILL, 0-1200 RPM W/CHK	96
FN200	16 GA. FINISH NAILER KIT 3/4" - 2"	162	2821	3/8" VSR DRILL, 0-1200 RPM, KEYLESS	96
FN250	16 GA. FINISH NAILER KIT 1" - 2 1/2"	218	5008	DOVETAIL TEMPLATE	79
FR305	FRAMING NAILER W/CASE 3 1/2" CAPACITY	308	5009	MORTISE & TENON JIG	49
NS100	NARROW CROWN STAPLER KIT 1/2" - 1"	92	5116	OMNI JIG	268
NS150	NARROW CROWN STAPLER KIT 1/2" - 1 1/2"	158	6931	PLUNGE ROUTER BASE	78
100	7/8 HP ROUTER	107	7116	NEW 24" OMNIJIG	292
314	4 1/2" TRIM SAW	152	7310	LAMINATE TRIMMER, 5.5 AMP	97
330	SPEED BLOCK FINISHING SANDER	62	7312	OFFSET LAMINATE TRIMMER	134
332	QUIKSAND 5" RNDM ORB W/STIKIT PAD	72	7335	5" RANDOM ORBIT SANDER	132
332K	332 W/CASE & 100 SHEETS PAPER	99	7336	6" RANDOM ORBIT SANDER	136
333K	QUIKSAND W/HOOK & LOOP, DUSTLS	76	7335K	5" RANDOM ORB W/CASE, 73333 & PAPER	168
333K	333 W/CASE & 50 SHEETS PAPER	106	7336K	6" RANDOM ORB W/CASE, 73333 & PAPER	176
334	QUIKSAND W/STIKIT, DUSTLESS	75	7469	CUTOUT TOOL	68
334K	334 W/CASE & 100 SHEETS PAPER	106	7518	3 1/4 HP FIXED BASE ROUTER-5 SPEED	274
340	1/4 SHT FIN SANDER W/DUST P/U	49	7519	3 1/4 HP FIXED BASE ROUTER-1 SP	249
347K	7 1/4" FRAMERS SAW, 15 AMP WITH CASE	128	7536	2 1/2 HP FIXED BASE ROUTER	208
352	3" X 21" BELT SANDER W/DUST BAG	168	7537	2 1/2 HP FIXED BASE "D" HNDL RTR	224
352VS	3" X 21" BELT SANDER DUSTLESS W/VAR SP	164	7538	3 1/4 HP PLUNGE ROUTER-1 SPEED	274
360	3" X 24" BELT SANDER W/DUST BAG	212	7539	3 1/4 HP PLUNGE ROUTER-5 SPEED	248
361	3" X 24" BELT SANDER	203	7800	DRYWALL SANDER	326
362	4" X 24" BELT SANDER W/DUST BAG	218	7810	POWER TOOL TRIGGERED WET/DRY VAC	258
363	4" X 24" BELT SANDER	213	9118	PORTA PLANE KIT W/CASE, CRBD BLD	228
365	1/2 SHT FIN SANDER	126	9125	3 1/4" PLANNER WITH CASE	138
511	CYLINDRICAL LOCK INSTALLATION KIT	148	9341	1/4 SHEET FINISHING SANDER WITH CASE	58
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552	PRODUCTION POCKET CUTTER	569	9647	TIGER CUB RECIP SAW KIT	129
556	BISC JOINER W/CASE & TLT FENCE	132	9737	RECIP TIGER SAW, 9.6A, QUICK CHNG CHUCK	162
556K	SAME AS ABOVE W/1000 BISCUITS	152	9830	9.6V CORDLESS KIT W/2 BATTERIES, CASE	148
690	1 1/2 HP ROUTER	140	8862	12V CORDLESS KIT W/2 BATTERIES, CASE	178
691	1 1/2 HP "D" HANDLE ROUTER	158	9872	14.4V CORDLESS DRILL KIT W/2 BATT. & CASE	208
691K	691 W/CASE, EDGE GD & TEMP GD KIT	209	97310	LAMIN TRIMM KIT W/3 BASES & CS	168
90690	SPECIAL EDITION 1 1/2 HP ROUTER W/CASE	158	97499	CAMOUT TOOL WITH BITS & CASE	88
693	PLUNGE BASE ROUTER, 1 1/2 HP	178	97549	JIG SAW W/CASE & 3 BLADES	144

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Model 906901K Includes 90690 commemorative router with case, 6931 plunge base, 42160 edge guide, 42000 template guide kit, 39993 routing pad, The Wood of Porter Cable Routers video, and a \$5.00 coupon towards future Porter Cable accessory purchase **OUR PRICE \$284.00**

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C10FS	NEW 10" SLIDE COMPOUND MITER SAW	738
M12V	3 HP VAR SPEED PLUNGE ROUTER	249
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P205B	3 1/4" PLANNER	98
TR12	3 HP PLUNGE ROUTER	188

AIRMARK

AT-220T	2 HP TWIN TANK COMPRESSOR	289
AT-230S	2 HP TUBE TANK COMPRESSOR	249

SENCO

SKS	NARROW CROWN STAPLER	274
SLP20	BRAD NAILER W/CASE 5/8"-1 5/8" CAP	278
SFN40	FINISH NAILER 1 1/4"-2 1/2" CAP	389

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73	1 1/2 HP DUST COLLECTOR	419
75	3 HP JUST COLLECTOR	675
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0241NK	18 GAUGE BRAD NAILER 3/8"-1 9/16" WITH CASE & 5000 NAILS	96
0250NK	18 GAUGE BRAD NAILER 3/4"-2" W/CASE & 5000 NAILS	162
0350NK	15 & 16 GA. FINISH NAILER 3/4"-2" W/CASE & 5000 ASSORTED BRADS	192
0565T	ANGLE FINISH NAILER 1"-2 1/2"	203
0626NK	NARROW CROWN 1/4" STAPLER 1 1/2"-1" WITH CASE & 5000 STAPLES	103
0638P	3/4"-1 1/2" NARROW CRWN STAPLR W/CS	179
8290	STICK NAILER 2 - 3 1/2" CAPACITY	314
EZ-1	SHOOTS 1/4", 3/8", 1/2" CRN STAPLES & BRADS, 5/8" CAP, W/CASE & 5000 ASSORTED FASTENERS	96
EZ-2	SHOOTS BOTH BRADS & STAPLES	149

Makita

5007NBK	7 1/4" CIRC SAW W/CS & BLADE	125
6095DWE	9.6V CDS DRILL KIT W/2 BATT	129
6095DWE2	SAME AS ABOVE WITH FLASHLIGHT	139
6172DWE	7.2V CDS DRILL KIT W/2 BATT	99
B05001	5" RANDOM ORBIT SANDER	67
DA391DW	9.6V ANGLE DRILL KIT	178
LS1011	10" COMPOUND MITER	469
LS1211	12" COMPOUND MITER	708
N800B	3 1/4" PLANNER	134

DELTA

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22-540	12" BENCH TOP PLANNER	279
23-710	NEW SHARPENING CENTER	169
28-185	BENCH TOP BAND SAW	166
31-460	4" BELT/8" DISC SANDER	132
31-685	6" BELT/8" DISC SANDER	346
34-182	TENONING JIG	82
37-070	NEW 6" VS BENCH JOINTER	256
40-540	16" VS SCROLL SAW	192

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DW100	3/8" 4 AMP, VAR. SP. DRILL	66
DW321K	TOP HANDLE JIG SAW KIT	162
DW359K	7 1/4" CIRCULAR SAW W/CASE	129
DW411K	1/4 SHEET SANDER WITH CASE	54
DW420	5" RANDOM ORBIT SANDER, PSA	68
DW421	5" DSTLS RNDM ORB SANDER, VELCRO	74
DW422	5" ROS 2 AMP SANDER W/DUST COLLECT	79
DW423	5" VS DUSTLS RANDOM ORBIT SANDER	93
DW430	3" X 21" DUSTLESS BELT SANDER	169
DW431	3" X 21" DSTLS BELT SANDER VAR SP	183
DW441	6" RIGHT ANGLE ROS SANDER, DSTLS	128
DW443	6" ROS SANDER VAR SP, VELCRO	138
DW610	1 1/2 HP ROUTER, 9 AMP	147
DW615	1 1/4 HP PLUNGE ROUTER, VAR SP	163
DW621	2 HP VS DSTLS PLUNGE ROUTER	218
DW625	3 HP HVY DTY PLUNGE RTR, VAR SP	274
DW670	NEW LAMINATE TRIMMER WITH GUIDE	97
DW673K	7/8 HP LAMINATE TRIMMER KIT	198
DW675K	PLANNER KIT, 7.2 AMP W/STEEL CASE	159
DW682K	BISCUIT JOINER KIT	199
DW705	12" MITER SAW W/CARB BLADE	358
DW936	18V CORDLESS SAW KIT	248
DW972K2	NEW 12V CROLS KIT/W BATTERY & CS	188
DW972K5	12V CDS DRILL & CIRC SAW KIT	274
DW991K2	DW991K WITH TWO BATTERIES	324
DW991K52	14.4V CDS DRILL & CIRC SAW KIT	248
DW995K	18V 1/2" DRILL W/BATT, CHRGR & CS	238
DW995K52	18V DRILL & SAW COMBO KIT	388

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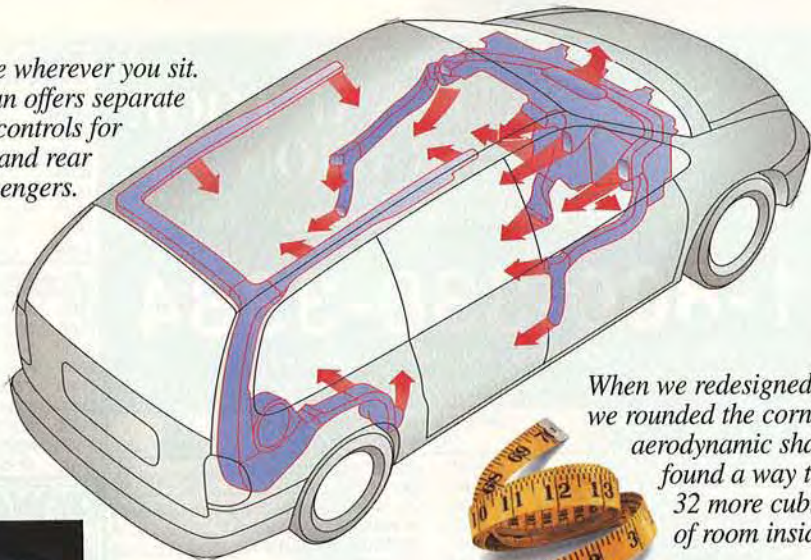
RYOBI

AP12	12" PORTABLE PLANNER	388
DBJ50	DETAIL BISCUIT JOINER	69
DC500K	DETAIL CARVER KIT	62
DS2000K	2" SP DETAIL SANDR W/CS & ACCYS	62
HT20VSK	MULTI ROTARY TOOL W/CS & ACCYS	55
ML18	18" WOOD MINI LATHE	214
OSS450	OSCILLATING SPINDLE SANDER	158
SC162VS	16" VS SCROLL SAW	164
WDS1600	WIDE DRUM SANDER	574

freud

TR215	8 1/2" COMPOUND SAW	348
JS100	BISCUIT JOINER	167
FT2000E	3 hp PLUNGE ROUTER	204
E8100	EDGE BANDING SYSTEM	214
F410	10" X 40T QUIET BLADE	48
F810	10" X 80T QUIET BLADE	73
LM7M2010	10" X 24T FLAT TOP RIP BLADE	36
LU82M10	10" X 60T CROSSCUT/RIP BLADE	46
LU84M10	10" X 50T AB COMBO BLADE	40
LU85M10	10" X 80 T ATB FOR MIRROR FINISH	58
LU87M10	10" X 24T RIP BLADE THIN KERF	42
LU88M10	10" X 60T CROSSCUT THIN KERF	45
LU89M10	10" X 72T TCH NON FERROUS METAL	57
LU92M10	10" X 60T TCH - BEST FOR LAMINETS	57
LU98M10	10" X 80 T TCH LAMINATES OR WOOD	67
SD308	8" SAFETY DADO WITH CASE	116
SD508	NEW 8" SUPER DADO SET	167
TK206	10" X 24T THIN KERF RIP BLADE</	

Get comfortable wherever you sit. Grand Caravan offers separate climate controls for front and rear passengers.



When we redesigned Caravan we rounded the corners for a more aerodynamic shape, and still found a way to get 32 more cubic feet of room inside.



We've made adjustments for everyone. The front passenger seat, for instance, adjusts a full 8".

An optional locking storage drawer under the front passenger seat lets you keep valuables out of sight.

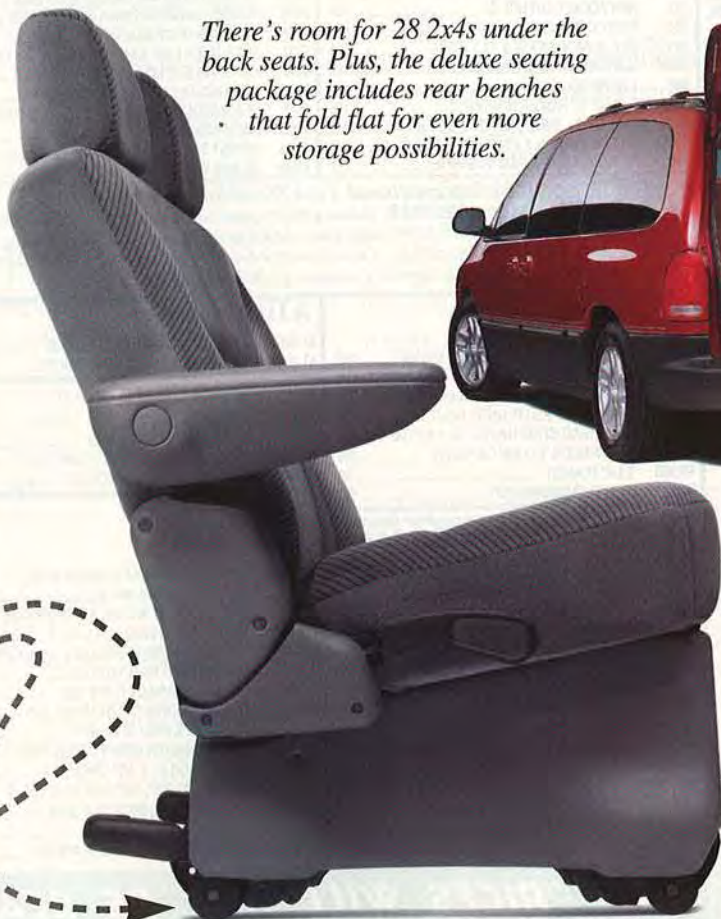


Feel free to rearr

It's so easy to deploy the wheels on our rear benches, you can do it with one hand tied behind your back.



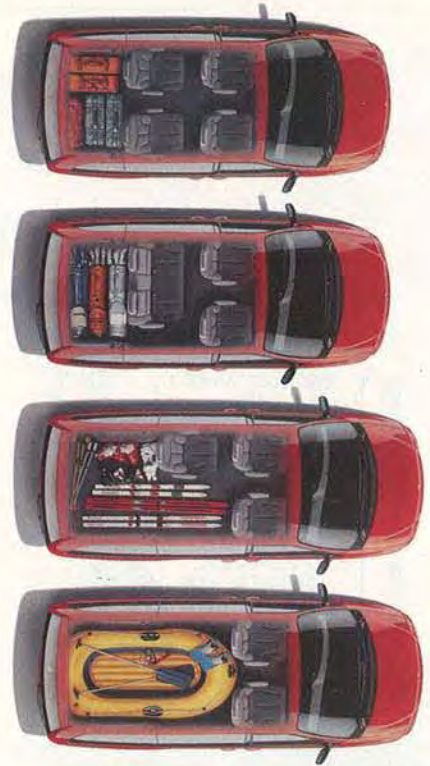
There's room for 28 2x4s under the back seats. Plus, the deluxe seating package includes rear benches that fold flat for even more storage possibilities.



The wheels on our Easy Out Roller Seats™ pop down like landing gear.



Suit yourself ... seat yourself. Caravan comes in two sizes, to fit families of all sizes.



In our Deluxe Seating Package, the middle bench reclines 36° and the rear bench almost all the way back. And all seats are fine-tuned to minimize fatigue.

ange the furniture.



Our single buckle system makes our available integrated child safety seats more convenient for parents.

We've provided up to 14 places to set a cup of coffee, a can of pop, a juice box or even a Big Gulp®.



Caravan  The New Dodge

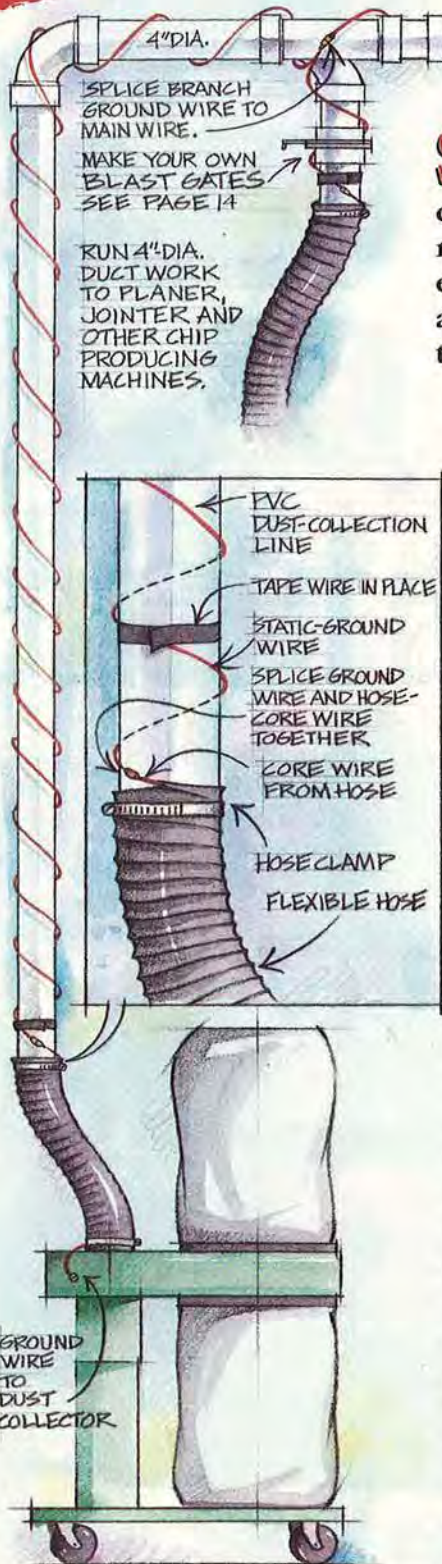
For still more information, call 1-800-4-A-DODGE or visit our Web site at <http://www.4adodge.com>

Big Gulp is a registered trademark of The Southland Corporation.

What woodworkers need to know

Dust Collection

How to set up your system



So, you've bought a dust collector (see our comparison test of 25 models, *page 58*). Now, you must hook it up to your shop equipment. Here are some hints and tips to help you accomplish that more smoothly.

Construct a central system

A central dust collection system provides the most convenient means for connecting a dust collector to several pieces of equipment. The drawing *left and above* shows a typical system. Plastic pipe and fittings make installation relatively easy.

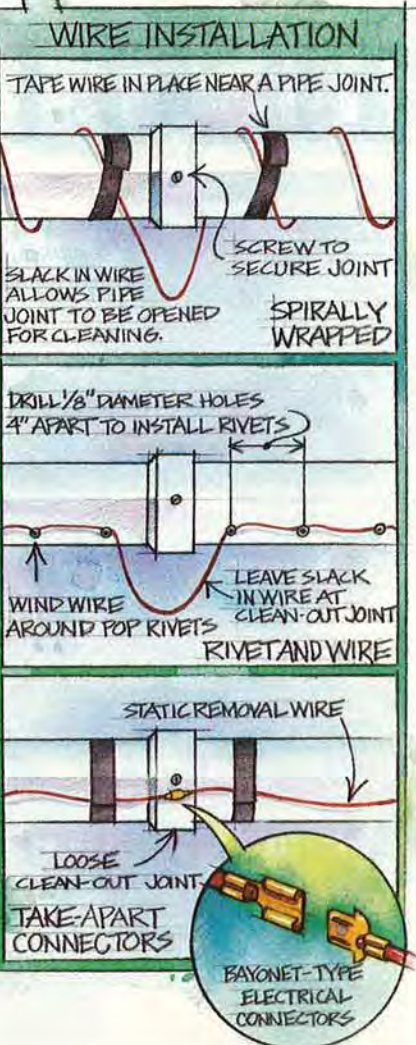
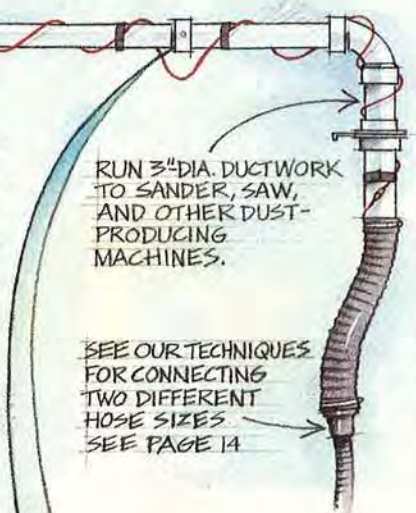
Here are some pointers for constructing your system:

- Use PVC sewer and drain pipe instead of the heavier, more expensive schedule 40 PVC.
- Fasten joints with screws rather than glue so you can open the system easily to dislodge jams.
- Run a 4"-diameter line to your heaviest chip-producers—planer, jointer, etc.—and locate the collector as close to them as possible. A 3" line will adequately serve saws, sanders, and the like.

(For more on central dust collection, see *WOOD® magazine, Issue 43, June 1991, pp. 40-45.*)

Guard against static

Air and wood particles moving through the dust collection system quickly build up static electricity charges in any nonconductive hose or piping (hose or piping not made of metal). When this static buildup discharges, it could ignite the flammable wood dust particles inside the piping. If the sawdust burns fast enough, you have an explosion.



Continued on page 14

Can you carve these?

Sure you can, with CMT TOOLS' exclusive 3D Router Carver™ System

What is the 3D Router Carver™ System?

The 3D Router Carver System is a unique patented method of producing intricate carvings quickly, economically and with complete repeatability.

With the Carver Bit, Carver Templates and your 1/2" collet plunge router you can carve any flat wooden surface with designs that rival the work of a professional carver. In fact, the 3D Carver System's speed, accuracy and economy make it equally attractive to the professional or the serious amateur. Besides your router, the system requires three key elements:

- 1) The 3D Carver Bit:** A 1/2" shank, carbide tipped V-Groove Bit is enclosed in a 45° guide bushing. A threaded shaft within the bit's shank allows precise depth adjustment of the tip of the V-Groove bit. **Bit Specifications:** Shank: 1/2" Cut diameter: 3/4" Cut Angle: 45° Cut depth: 5/8" Guide bushing diam.: 1-7/8"
- 2) Template Holding Frames:** Clamped or tacked to your workpiece, these frames hold the 3D Templates securely in place.
- 3) Carver Templates:** A total of 46 templates produce a host of designs for cabinet doors, panel doors, rails, corners, drawer fronts and many other applications.

How does the system work?

The bit is installed in the router (1/2" collet only) with the plunge mechanism **unlocked** so that the router can move up and down as you route. The 45° bushing follows the slots in the template. As the slot gets wider, the router moves downward, so the v-groove gets wider. As the slot narrows, the router moves up and the groove gets narrower. That's it!

Where can I learn more?

Order our new 3D Carver Pattern set (at right), which includes full-size drawings of all 46 designs packed in a 3-ring binder. Or order the 3D Carver video (below), a step-by-step demonstration of all of the system's capabilities.

3DC-999
3D Carver Video
List: \$13.00 **SALE: \$10.00**

NEW!

Complete 3D Carver™ Pattern Set

Includes 42 pages of accurate, full-size drawings packed in a sturdy 3-ring binder
3DC-900
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CMT TOOLS

**3D Carver
Pattern Set**

Test drive the new American-made CMT bits!

This special introductory offer lets you experience CMT quality first hand! These bits are hot off the line of our new, state-of-the-art U.S. factory. You'll get three bits with all the famous CMT features, like Fatigue-Proof® steel, micro-grain carbide & our trademark orange coating*, all for about half our regular price!

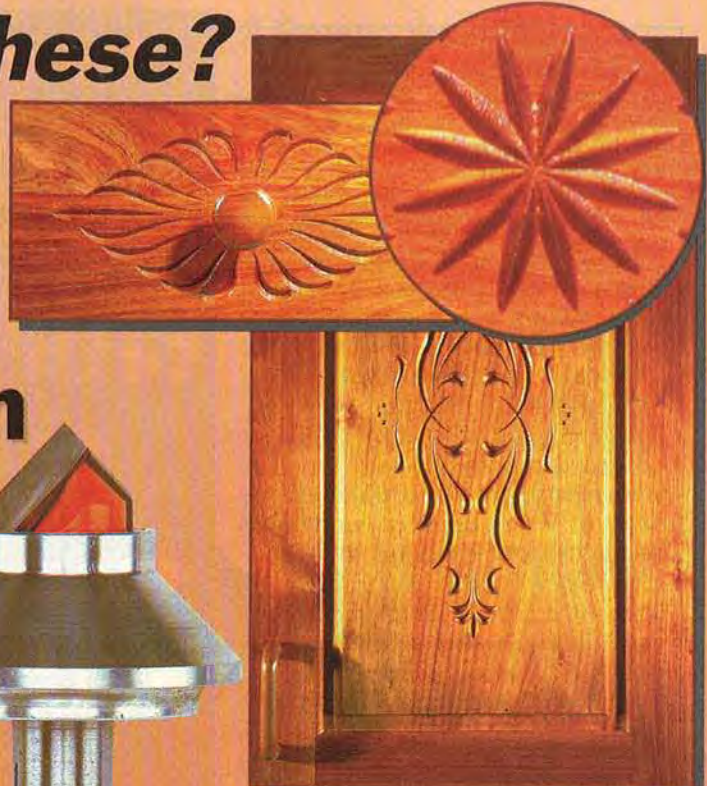
800-701
3-Bit Set, 1/4" Shank,
Reg: \$69.60 **Special: \$34.90**

800-702
3-Bit Set, 1/2" Shank,
Reg: \$72.70 **Special: \$36.90**

1/4" radius Roundover

1/2" diameter Straight

1/2" diameter Flush Trim



What's the best way to get started? With our 3D Carver Starter Kit

You'll get our Classical Kitchen Door and Drawer templates, two holding frames, a 3D Carver Bit and our 3D Carver Video. That's everything you need to carve the beautiful Classical-style door and drawer front shown at right.

499-010X
Starter Kit:
Classical Kitchen Set
with 3D Carver™ Bit & video!
List: \$202.10
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Don't settle for less than a perfect fit!
Our Ply-Groove™ bits match the real thickness of plywood!



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Dust Collection

Continued from page 12

A static ground for nonconductive ductwork can prevent static-charge buildup and potential disaster. To install one, simply run a wire along or around the pipe, as shown in the illustrations *previous page*. Insulated or uninsulated 18- or 20-gauge copper wire, either solid or stranded, works fine.

At pipe joints, leave slack in the wire or install bayonet connectors (Radio Shack has them) to facilitate opening the system in case of a clog. Run a ground wire along each branch, and splice each into the main wire.

Connect the ground wire's conductor to the dust collector's metal frame or housing. The other end should extend to the outlet port on the tool, but it doesn't need to connect to anything, except to keep it in place. (Think of the wire as an antenna rather than as a conductor in a circuit.)

The coiled wire core in some flexible plastic tubing allows easy grounding. Simply strip the plastic away from a few inches of the wire core, then connect the wire to your system ground, as shown in the illustration *previous page*.

Control the flow

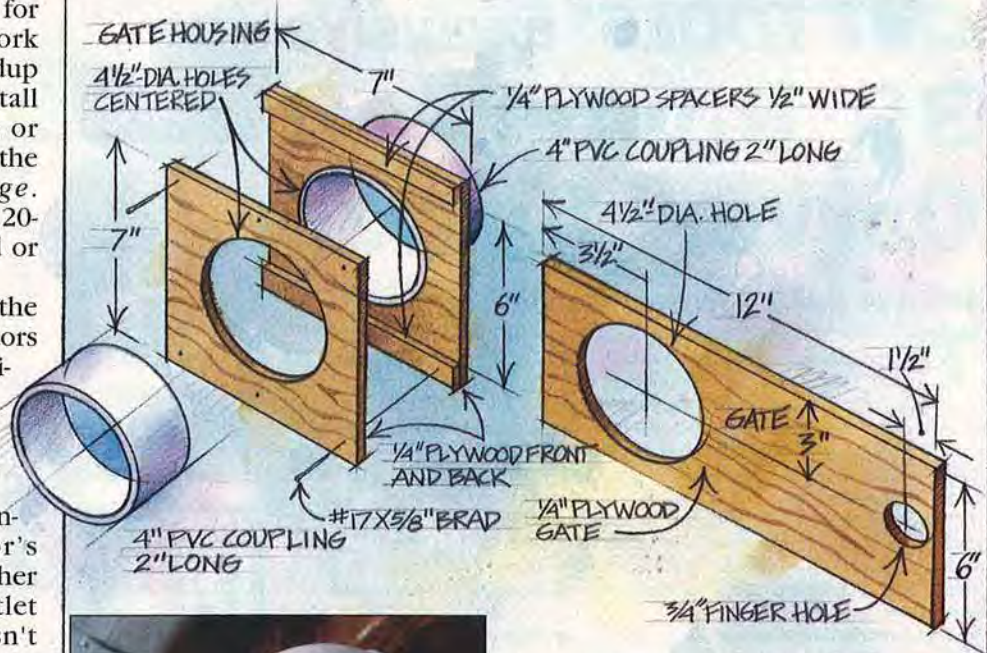
For maximum efficiency in a branched system, shut off the flow from all ports except the one in use. To do that, install blast gates, like the one shown *right*.

You can buy metal or plastic blast gates for various pipe sizes from a number of woodworking-equipment dealers. Or, refer to the drawing *top right* to build a wooden blast gate.

The connectors shown are made from a PVC pipe coupling cut in half and epoxy-glued into place. You can alter the dimensions and couplings shown to fit different sizes or types of pipe.

Making ends meet

To mate the 3" or 4" system to most of your tools, you'll need



A blast gate, *above*, lets you shut off the flow to an unused port. Join hoses of different sizes with an empty can, *right*.



hoses and adapters. Here are two methods for joining a big hose to a smaller hose or connector:

Coffee can connector. Cut both ends out of a 12-ounce coffee can, like the one shown in the photo *above right*. Slide it into the end of a 4" hose, and clamp it. Then, cut a hole in the coffee can's plastic lid to fit the smaller connector. Snap the lid onto the can, and plug in the smaller connector. Seal the joint between the connector and the plastic lid with silicone sealer or tub and tile caulk, if you wish. For a blast gate, cap the can with an uncut plastic lid.

Wooden doughnut adapter.

Make a wooden ring as shown in the blast gate photo from $\frac{3}{4}$ " scrapwood. To make one, first lay out a circle the same size as the outside diameter of the small hose or connector and another concentric one that matches the inside diameter of the larger connector.

Then, bore the smaller hole with a circle cutter, holesaw, or similar tool. Bandsaw or scrollsaw around the larger circle to complete the doughnut. Install the adapter ring into the large port, and plug the small connector into it. Glue or caulk the joints, if you desire. ♣

Illustrations: Brian Jensen

"With no risk, no investment...

**I made \$56,000
my first 5 months
in my own Pace
Business"**

FOR FREE INFORMATION

Call Toll Free

1-800-656-0040

Ask for operator 8194.



A true story by a successful, NEW Pace Distributor

"I was lucky if I made even half that working a full year at my job."

"I was a sub-contractor doing construction work, you know—homes, apartments, remodeling, even mobile homes. I made what I thought was a decent income, but my money just didn't go far enough—especially after all the bills!

"One day, I was reading a magazine and a Pace Products ad caught my eye. I mailed the coupon and in a few days they sent me a packet of information. Their program looked like a good one. But what I liked best was that I could start part-time and still

keep my other job while I 'tested the waters' to see how I could do as a Pace distributor.

"And now look how my life has changed! The money I make is fantastic. I'm my own boss. I used to rent, but now I own my own home and I'm planning to buy a boat for my family. For the first time in my life I have a future."

"What I really like most is there is absolutely no risk. With a lot of companies you end up investing your own money. But not Pace. It doesn't cost a penny to get started.

"And Pace gives you big commissions up front, paid in advance, weekly. Without fail!

A Proven Success!

"What is Pace? It costs a fortune for schools, hospitals, plants and other commercial buildings to have roof contractors repair or re-do their roofs. Pace saves them that fortune, by-passing the contractor. The building owner uses Pace Seamless Spray to apply Pace Roof Renewal Sealant right over the old roof. The cost is so low, the proven results so satisfactory, that there is little, if any sales resistance.

"Pace ships the Seamless Spray application equipment on Free Loan. The customer pays only for the roofing products from Pace. His own men can apply it. Or if you want, you can handle the application yourself. That's what I have been doing... so I make even more money! And the clincher—I get my big commissions paid up front.

"Today my family and I are enjoying a life we never thought possible before—all thanks to my answering that ad."

Easy to get started!

You too can enjoy success with Pace and the best part is you don't have to invest a penny. Or have any special background or experience.

Pace is a proven winner. That's why its products have been used by hundreds of well-known companies all over the world.

Be Your Own Boss!

Wouldn't you like being your own boss and running a successful business, never taking orders again from somebody else? Imagine setting your own hours, taking time off whenever you feel like it.

It's easy to start earning extra income in your spare time—switching to full time when your income exceeds your regular job... or start right out full time. With Pace Products the choice is yours.

FREE Details - No Obligation

Call Toll-Free 1-800-656-0040. Please ask for operator 8194 or simply fill in the coupon and we'll rush you all the details. Everything you need for this once-in-a-lifetime opportunity will be mailed to your home. There's no obligation. No salesman will call.

MAIL TODAY!

Pace Products, Inc. Dept. WH-497
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P.O. Box 10925
Overland Park, KS 66225-9025

WITHOUT OBLIGATION send free materials that tells how I can have my own Pace business. No salesman will call.

PLEASE PRINT

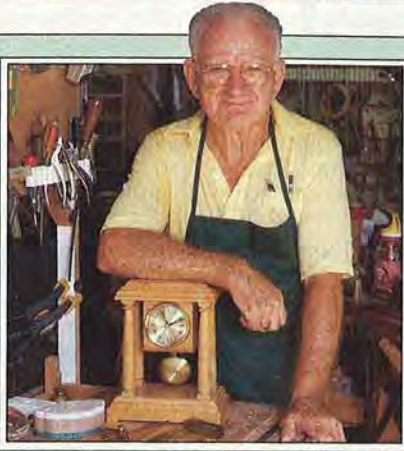
Name _____

Address _____

City _____ State _____ Zip _____

EARLY RETIREMENT?

Thinking of retiring? Being pushed into early retirement? Many have made Pace their Second Career (often resulting in greater success than they ever enjoyed before!)



Wendell Fox shows off some of the *WOOD*® magazine projects he's built.

Corian clocks, boxes, and cheeseboards comprise just a few of the *WOOD* magazine projects that long-time reader Wendell Fox has built. After careers as a locksmith and insurance salesman, our Top Shop Tip winner has returned to working with his hands in his retirement.

Many of Wendell's scrollsawn projects have tiny inside waste cutouts. But, pinned scrollsaw blades often don't fit through the tiny start holes for these cutouts. This situation brought out the inventor in Wendell.

To become a prizewinner like Wendell, tell us how you solved a particular woodworking problem. We pay \$40 for all tips published. If yours is selected as the Top Shop Tip, you'll win a tool prize valued at \$250 or more and be featured in this column. Send a letter, including your daytime phone number, with a photo or drawing of your idea, to:

**Tips from Your Shop
(And Ours)**

**WOOD Magazine
1912 Grand Ave.**

Des Moines, IA 50309-3379

We try to publish original shop tips, so please send your idea only to *WOOD* magazine.

Kerry Gibson

GENERAL-INTEREST EDITOR

Pop out pins to end blade-change hassles

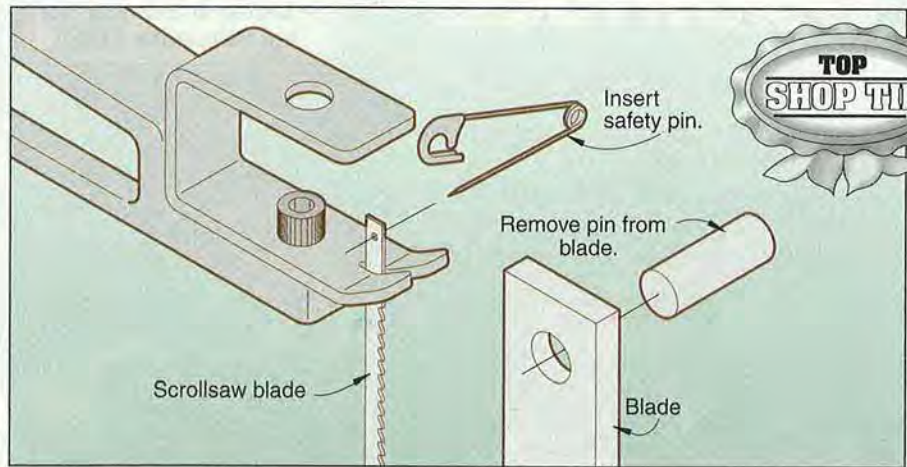
To end the frustration of trying to thread pin-end scrollsaw blades through small starter holes, I knock out the factory-set pins and insert my own removable pin. To pop out the factory-set pin without damaging the blade, I first drill a 1/16" hole in a piece of heavy-gauge steel. Then I place the blade flat on the steel with the pin centered over the hole, and tap the pin through the blade with a hammer and punch. A safety pin, as shown *below*, secures the



For submitting the Top Shop Tip for this issue, Wendell receives a set of four Ryobi detail power tools—a sander, a carver, a biscuit joiner, and a Multi-tool kit.

blade in the upper blade holder, and makes rethreading the blade a snap. I keep a few spares handy in case I happen to drop the pin.

—Wendell Fox, Debarry, Fla.

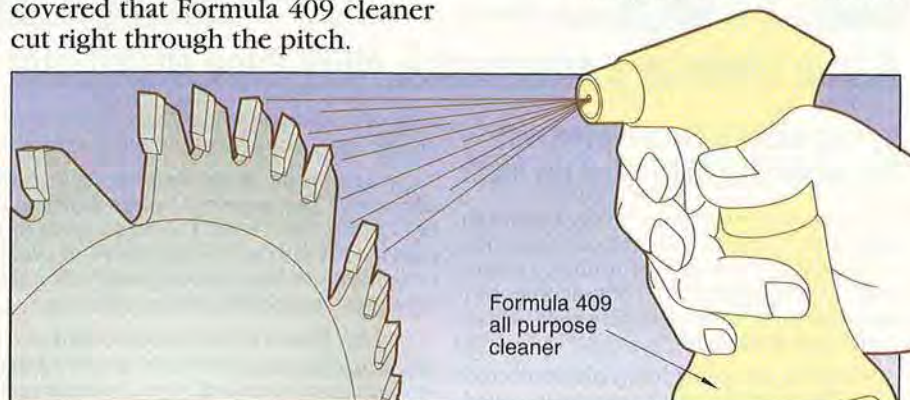


Strike out pitch with Formula 409

When my saw blades and router bits got gummed up, I thought about ordering some of the special pitch remover I'd seen advertised. But, since I needed to use a couple of bits right away, I decided to give some household cleaners I had on hand a try. I discovered that Formula 409 cleaner cut right through the pitch.

I let particularly tough spots soak, then scrub them with an old toothbrush. When my current spray bottle of Formula 409 runs dry, an inexpensive refill will be waiting for me at the nearest grocery store.

—Brian Schaible, Loveland, Colo.



Continued on page 19

FREE Shipping thru 4/30/97
For INFO OR ORDER CALL 1-800-733-7111

10% to 20% OFF (Listed Items)

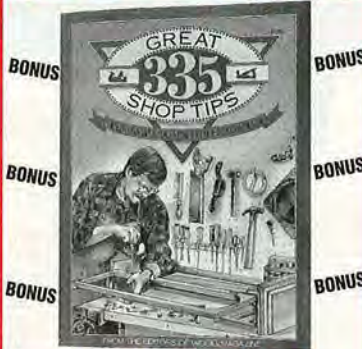
SUPER SPRING COMBO SALE

FREE \$45 IN SHARPENING COUPONS

GOOD ON ALL FORREST OR OTHER MAKES OF CARBIDE
BLADES OR DADO SETS. Coupons expire 12/31/98.

Must mention *WOOD* magazine for discounts & coupons with purchase.

BONUS OFFER



OR 300 Great Shop Tips or Forrest Logo cap FREE with any saw blade or Dado listed & purchased from this ad. You must mention you saw this offer in *WOOD* Magazine, when ordering.

Offer Expires April 30, 1997.

One book per order.

ORDER NOW SUPPLIES ARE LIMITED.

BUY 1 BLADE OR DADO AT **10% OFF** SALE PRICE, OR
BUY 2ND BLADE AT **20% OFF** (EQUAL OR LESSER VALUE)
15% OFF DADO AS SECOND CHOICE.

WOODWORKER II— 6" — 7 1/4" — 14"

With this one ALL PURPOSE blade you can RIP & CROSSCUT 1"-2" ROCKHARDS and SOFTWOODS resulting in a SMOOTH AS SANDED surface. PLY-VENEERS of OAK and BIRCH will crosscut with NO BOTTOM SPLINTER at moderate feed rates.

- DOUBLE HARD and 40% STRONGER C-4 CARBIDE
- Ends blade changing
- Ends scratchy saw cuts
- Ends second-step finishing
- Ends cutting 1/16" oversize to allow for RESURFACING
- BUY AND SHARPEN 1 BLADE INSTEAD OF 3

5/8" holes, boring thru 1-1/4" add \$7.50. Larger at Time Basis — Shipping \$4.50

WOODWORKER II	LIST	SALE	10%	20%
14"x40TX1"	\$215	\$149	\$134	\$119
14"x30TX1"	\$195	\$139	\$125	\$111
12"x40TX1"	\$183	\$129	\$116	\$103
12"x30TX1"	\$162	\$119	\$107	\$95
10"x40TX1/8" or 3/32"	\$156	\$119	\$107	\$95
30T 1/8" or 3/32"	\$135	\$99	\$89	\$79
9"x40T	\$146	\$109	\$98	\$87
30T	\$125	\$99	\$89	\$79
*8-1/4"x40TX 3/32"	\$136	\$99	\$89	\$79
8"x40T 3/32"	\$136	\$99	\$89	\$79
30T	\$115	\$89	\$80	\$71
7-1/4"x30T 3/32"	\$112	\$69	\$62	\$55
**6"x40T 3/32"	\$136	\$89	\$80	\$71

*NEW For Sears & Makita Table Saws **New For Saw Boss

CUTTING PROBLEMS?

Call the factory for **FREE** technical help!!
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FLASH NEWS!!

OUR \$79 - \$89 30T & 40T OUTPERFORMED (E-EXCELLENT)

23 other 40T & 50T premium blades both foreign & domestic on Ply, Melamine, MDF and Oak/Rip!

Fine Woodworking Magazine test Oct. 96 page 43

After installing your blade and 5 in. stiffener the vibration in my saw went down another 20%. I ran several pieces of hardwood through the saw, both **crosscut** and **ripping**, and was amazed at the smoothness. It was like cutting butter, maybe smoother. I have never had a saw blade that **cut this smooth.**

Rick Price

CHOPMASTER FOR SLIDING COMPOUNDS & MITER SAWS

New specs, 5" Neg. Pts. & flat, runs out less than .002 for perfect, tight, smooth, splinter-free miter joints.

TAKE EXTRA **10% - 20% OFF COMBO SALE!**

NEW SIZES AVAILABLE

	LIST	SALE
Delta Sidekick 6-1/2"x40Tx5/8"	\$149	\$89
Sears 8-1/4" & Delta 8-1/4"x60Tx5/8"	\$170	\$99
Hitachi 8-1/2"x60Tx5/8"	\$179	\$109
DeWalt 8-1/2" & Ryobi 8-1/2"x60Tx5/8"	\$179	\$109
Delta 9"x80Tx5/8"	\$204	\$119
Ryobi-Makita & all 10"x80Tx5/8"	\$207	\$129
DeWalt, Makita, B&D, Hitachi 12"x80Tx1"	\$229	\$139
Ryobi-Makita 14"x100Tx1"	\$266	\$179
Hitachi 15"x100Tx1"	\$277	\$189

For good general purpose cuts use Woodworker II 30T & 40T or Woodworker I. Use small stiffener where possible.

THE ONE BLADE THAT LEAVES A SMOOTH-AS-SANDED SURFACE!

SAVE ANOTHER **\$45 to \$90**

AFTER USING SHARPENING COUPONS

WOODWORKER I - CROSSCUT — 7 1/4" — 14"
For TABLE and RADIAL SAW — **10% to 20%**

	LIST	SALE
14"x60Tx1"	\$224	\$159
12"x60Tx1" or 5/8" 1/8"K	\$198	\$139
10"x60Tx5/8" 3/32"K	\$162	\$129
8-1/4"x60T	\$150	\$109
8"x60T	\$150	\$109
7-1/4"x60T	\$150	\$109

OTHER SIZES AVAILABLE — 7 1/4" — 14"

NEW DELUXE DADO-KING!
AS LOW AS \$184 NET
AFTER USING SHARPENING COUPONS

C-4 Carbide Tips — 4 on each chipper with special negative face hooks. Shims & 3/32" Chipper. Cuts 1/8" to 29/32" wide!!

	LIST	SALE	10%	15%
6" D. 5/8" Bore NEW	\$299	\$269	\$242	\$229
8" D. 5/8" Bore	\$321	\$289	\$260	\$245
10" D. 5/8" & 1" Bore	\$389	\$349	\$314	\$297
12" D. 1" Bore	\$499	\$449	\$404	\$382

(Bore up to 1-1/4" Add \$25 — Plus \$5.50 S&H)

DURALINE HI-A/T FOR TABLE & RADIAL SAWS ALL FLAT FACE

5/8" HOLES. Boring up to 1-1/4" \$7.50 extra. Larger holes—time basis. Shipping \$4.50.

	SIZES AVAILABLE	LIST	SALE
Faster feed rates & absolute splinter control. Stops splintering on OAK/BIRCH PLY VENEERS & MELAMINE.	7-1/4"x60Tx3/32" K	\$149	\$129
	8"x80Tx1/8" & 3/32" K	\$202	\$169
	9"x80Tx1/8" & 3/32" K	\$207	\$179
	10"x80Tx1/8" & 3/32" K	\$207	\$159
Other sizes available	12"x80Tx1-1/8"K	\$212	\$181

SPECIAL COMBO SALE
EXTRA **10%-20% OFF**

Above 1" bore standard.
CARBIDE IS THE HARDEST OF THE C-4 GRADES AND 40% STRONGER, NOT WEAKER!
FOR 50% TO 300% LONGER LIFE.

Standard C-2 Carbide (below, left) and FORREST still sharp Oxidation and Corrosion Resistant Sub-Micron C-4 Carbide (below, right). Each shown after cutting 3,500 feet of MDF. Similar results obtained cutting particle board, melamine, and plywood.



STILL SHARP
AFTER 3,500 FEET OF CUTTING!

BLADE DAMPENERS-STIFFENERS

FOR BETTER CUTS on all brands of blades, use our large 1/8" DAMPENERS-STIFFENERS against one side.

4"	\$21
5"	\$24
6"	\$25

7" AND LARGER AVAILABLE

REDUCES NOISE 50%-75%

WE RECOMMEND OUR FACTORY SHARPENING as some local sharpening creates problems with MICRO-CHIPPED EDGES reducing blade life & cutting quality. 3-5 DAYS ON THESE AND ALL MAKES OF FLAT FACE & CONCAVE CARBIDE TIP SAWS. Ship via UPS. Typical 10x40T \$17.00, 60T \$19.00. Add return UPS \$5.00, \$1.00 each additional blade.

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"Your 100% Satisfaction is Guaranteed!"

The 16.8v Cordless SUPER DRILL

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0-900 RPM, variable speed, reversible switch.

Industrial motor delivers 200 in. lbs. of torque.

Heavy Duty 3/8" Jacobs® Keyless Chuck



Superb power-to-weight ratio.

Ergonomic pistol grip

Powerful 16.8-volt Battery for 20% longer running time.

UL Listed

Perfectly balanced T-handle design stands on its own.

Save Big! As part of a nationwide media campaign, the world's largest cordless drill manufacturer has authorized us to introduce their high-powered 16.8v super drill that an unheard of \$89⁹⁵. Plus, you get 2 FREE BONUSES!

More power! Longer running time! Higher torque! Now you can get a fully-loaded 16.8 VOLT cordless drill for about half of what our competition charges for a 14.4 volt drill.

Why settle for less? This really is BY FAR the

2 FREE BONUSES!

If you're among the first 1000 people who take advantage of this exclusive direct-to-you offer, you'll also receive a 300-Piece Drill Kit containing screw-driver bits, twist drill bits, brad point bits, carbide-tipped masonry bits, drywall anchors and case **PLUS** a 21-Piece Bonus Accessory Kit (a \$39.95 combined value) absolutely FREE!



best cordless drill value available today!

TRY IT RISK-FREE

Your 100% satisfaction is guaranteed. If this drill doesn't exceed your expectations, return it within 30 days for a no-questions-asked refund.

To order your 16.8v Cordless Drill/Driver Set with carry case, charger and battery, call toll-free, 1-800-925-2005 or send your check for just **\$89.95** (\$8.95 S&H). Item No. 70-0W4. CA res add sales tax. No dealers.

Extra batteries are \$39.95 ea. (\$3.95 S&H). Item No. 75-0W4.

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HEAVY DUTY CABINET SAW

SPECIAL PACKAGE INCLUDES:

- S3221 MOTOR COVER
- S3226 MICRO ADJUSTER
- S3857 DUST HOOD & FREUD LU82 10" BLADE

S3202

\$995.00

SAW AND FENCE ONLY

\$875.00



25" DUAL DRUM SANDER

- 5 H.P.220 VOLT
- 2 SPEEDS 11 & 17 FPM/REVERSIBLE
- CAST IRON WORK TABLE

S3409

\$1,295.00



1-1/2 H.P. SHAPER

PACKAGE PRICE INCLUDES:

- 1-1/2 HP SHAPER
- 3' CAST IRON DUST HOOD
- ROUTER BIT COLLET
- CAST IRON EXTENSION WING

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\$525.00

REGULAR PRICE **\$575.00**



6" JOINTER

INCLUDES:

- 1-1/2 H.P. MOTOR
- NEW JACK SCREW
- CUTTERHEAD
- DUST COLLECTOR PORT
- WELDED STAND

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SPECIAL INTRODUCTORY PRICE

\$485.00

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(SHOWN WITH OPTIONAL MOBILE BASE)



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SPECIAL PACKAGE PRICE INCLUDES:

- 2 MICRON UPPER BAG
- CLEAR PLASTIC LOWER BAG
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\$325.00

WITH REGULAR BAGS

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20" BANDSAW

- 4" DUST PORT BLADE BRAKE
- 3 H.P. 220 VOLT
- 12" RESAW CAPACITY
- ROLLER GUIDES

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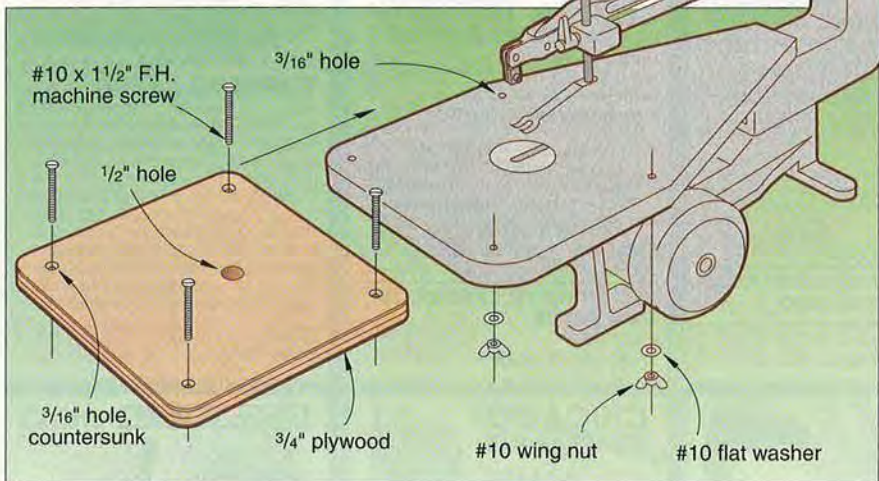
Continued from page 16

Built-up table top doubles scrollsaw blade life

I do a lot of scrollsaw work in a year's time and go through hundreds of blades. Rather than throw the blades away after they dull or lose their set, I mounted an auxiliary top on my saw table as shown below. The

top raises the workpiece up so I'm sawing with "new" teeth on the "old" blades.

—Frank Seiden,
Tucson, Ariz.

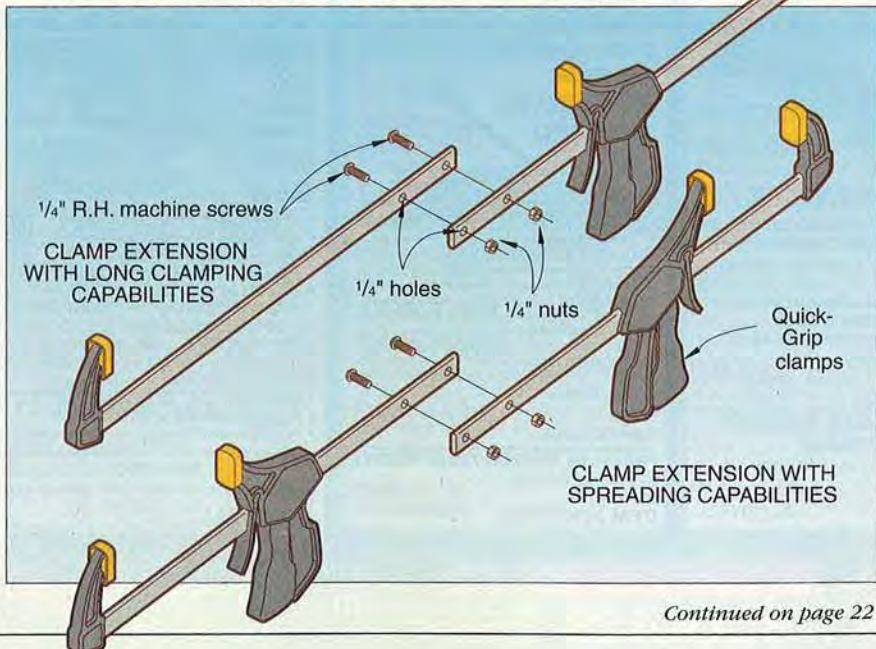


Bolt clamps together for extra-reach capacity

When need arose for some extra-long clamps, I developed this trick for increasing the capacity of my Quick-Grip Bar Clamps. First, I hammered out the retaining pins at the ends of two clamps. Then, I drilled two 1/4 inch holes in the bars where shown below. Next, I removed the movable jaw on one bar, reversed the movable jaw on

the other bar, and screwed the bars together with 1/4 inch machine screws and nuts. To turn this arrangement into a spreader clamp, I bolt them together with both of the movable jaws on the bars in their normal position.

—William McGee,
Westboro, Mass.



Continued on page 22

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Introducing The Glue Anything To Everything Glue.

ProBond™, the super-strong, waterproof glue that can bond virtually anything to anything. Wood, Glass, Ceramics, Metal, Stone, Most Plastics. It's stainable, sandable, scapable and paintable. Requires no mixing, contains no volatile solvents, so it's perfect inside and outside. Pros demand it, so should you.



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FOR ALL ITEMS SHOWN BELOW!

HARBOR FREIGHT TOOLS



CENTRAL MACHINERY

16" SCROLL SAW



- Precision milled 14-1/2" x 8" table tilts 0° to 45°
- Uses pin end blades, 5-1/2" long
- Heavy duty cast iron frame and base reduces vibration • 7/8" blade stroke
- 1/8 HP, 110V, 83 amps
- 1750 SPM blade speed

ITEM 34618-05AA **\$59⁹⁹**

FOOT SWITCH WITH GUARD

Ready to use. Steel housing and 8 ft. cord.

ITEM 00495-65AA **\$9⁹⁹**

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115 PC. TITANIUM NITRIDE COATED DRILL BIT SET



These titanium nitride coated high speed steel bits last up to six times longer than standard bits. Cool turning titanium bits are a must for metal workers. All bits can be resharpened. Straight shanks.

Includes: 29 fractional sizes 1/16" thru 1/2"; 26 letter sizes A thru Z; 60 numbered sizes 1 thru 60; Heavy duty metal drill index

ITEM 01611-15AA **\$49⁹⁹**

115 PC. M-2 HIGH SPEED STEEL DRILL BIT SET W/INDEX

• Same sizes as above
 • M-2 high speed steel

ITEM 00528-15AA **\$29⁹⁹**

CENTRAL MACHINERY

10", 2 HP, BENCH TABLE SAW



Die cast aluminum table 25-3/4" x 16", has adjustable 17-7/8" x 2" rip fence and inch/metric scale for precise cutting.

- Maximum depth of cut at 90°: 3-1/8"; at 45°: 2-1/2"
- Blade capacity: 10" with 5/8" arbor
- Miter gauge adjusts 0° - 60° left and right
- Motor: 2 HP, 115V, 60 Hz, 10 amp, 4500 RPM
- Blade sold separately, below
- Shipping weight: 36 lbs.

ITEM 35715-25AA **\$79⁹⁹**

10" 40 TOOTH CARBIDE TIP SAW BLADE

• 5/8" arbor

ITEM 00529-45AA **\$9⁹⁹**

CENTRAL MACHINERY

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12" x 37" WOOD TURNING LATHE

Index pin contains 36 - 10° spacings for accurate fluting and marking on workpieces. 4" face plate, center assembly tail stock, spur assembly head stock and 6" and 12" tool rests. (Base sold separately).

Distance between centers: 37"; Swing over bed: 12"; Spindle speeds: 575, 980, 1560, 2520 and 3580 RPM; Motor: 1/2 HP, 1725 RPM, 115V, 60 Hz AC, swing mounted to headstock; Drive spindle: No. 1 Morse taper plus 3/4-16 threaded; Tailstock: No. 1 Morse taper; 2-3/8" ram travel; Ship. wt.: 80 lbs.

ITEM 06841-05AA **\$139⁹⁹**

CENTRAL MACHINERY

SAVE OVER 30% FROM OUR FALL '96 CATALOG



6" INDUSTRIAL RABBETING JOINTER

INCLUDES STAND

- Infeed table size: 22-1/2"
- Outfeed table size: 19-1/2"
- Motor: 1 HP, 110V, 4 amp, 4900 to 5900 RPM cutterhead speed
- Maximum depth of cut: 3/8"

ITEM 30289-55AA **\$199⁹⁹**

REPLACEMENT BLADE SET

ITEM 33271-15AA **\$9⁹⁹**

CHICAGO Electric Power Tools



13.2V, 3/8" CORDLESS DRILL KIT WITH KEYLESS CHUCK

- Indicator on drill body notifies operator of low battery charge • 6 torque settings
- Includes 6 pc. drill bit set, 6 pc. screwdriver bit set, magnetic extension bit, charger, battery, keyless chuck & carrying case
- Variable speed, rev.; 0 to 600 RPM

ITEM 33165-25AA **\$49⁹⁹**

13.2V BATTERY

ITEM 33214-35AA **\$24⁹⁹**

21 PC. DRILL BIT SET

• 1/16" to 3/8" by 64ths

ITEM 33417-45AA **\$8⁹⁹**

CHICAGO Electric Power Tools

SAVE 20% FROM OUR FALL '96 BOOK



TRIM ROUTER

Now you can tackle those jobs that were too fine or exacting for a standard router. This compact router weighs only 4 lbs. for easy operation. Includes a straight and adjusting conductor to assist in trimming and engraving in both straight and circular patterns.

- 1/4" collet
- 30,000 RPM no load speed
- 110V, 3-1/4 maximum amp draw
- 8-1/2" overall length
- 4 lbs. tool weight

ITEM 33833-35AA **\$39⁹⁹**

CENTRAL MACHINERY

GREAT FOR ODD SIZED SHAPES



1" BELT/5" DISC SANDER

Remove the belt back plate and sand all types of curves and odd shapes. With the back plate in place, you can apply pressure for faster stock removal.

- Motor: 1/3 HP, 2.4 amp, 60 Hz, 110V, 3450 RPM
- Table: 5" x 5"; tilts to 45°
- Belt length: 30"; 3350 FPM belt speed
- Dust collection for disc sander
- Shipping weight: 19 lbs.

~~\$59⁹⁹~~ **\$49⁹⁹**

ITEM 34951-15AA

DELTA Delta 36-510

LIMITED QUANTITIES



10" BENCH SAW

Big saw capacity in a portable unit. Easy and safe to use with up-front controls and removable on/off switch. Front and rear locking rip fence and miter gauge maintain full sized accuracy.

- Motor: 13 amps, 115V, 4700 RPM
- 5/8" arbor • Table: 16" x 26"
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- Dimensions: 15" x 26" x 19"
- 40 lbs. tool weight

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Use 3-3/4" triangle pads to reach into corners conventional sanders can't.

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- 10,000 OPM
- Hook and loop sandpaper holder
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2 HP, 1200 PSI, ELEKTRA 1.6 GPM PRESSURE WASHER



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• 120V, 13 amps

ITEM 50956-15AA **\$99⁹⁹**

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Increase your cleaning power by 20%!

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DEWALT

DeWalt DW705

12" HEAVY DUTY COMPOUND MITER SAW



- 13 amps; 4000 RPM no load speed
- Spindle lock • Electric brake
- Stainless steel miter scale with 9 positive stops • 40 lbs. ship. wt.
- Includes 32 tooth blade
- 0-48° bevel capacity • 1" round arbor
- 0-48° miter left and right
- Capacities 5-1/4" crown moulding; 2 x 8 at 45° bevel; 4 x 4 & 2 x 6 at 45° miter
- Head lock down with handle for easy transport • 38 lbs. tool weight
- 100% ball bearing construction
- Factory reconditioned, factory perfect

ITEM 51594-45AA **\$299⁹⁹**

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- Electric brake stops blade in seconds
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- 5/8" arbor
- Cutting capacity 2-1/8" x 5-1/8" miter, bevel, and compound cut
- Miter positive stops at 0°, 15°, 22.5°, 30°, and 45° left and right
- Bevel positive stops at 0° to 45° left
- 20 lbs. shipping weight
- Includes free 8-1/4" multi purpose blade

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- Turns your 4" grinder into a cut-off saw
- Plate dimensions: 9-1/2" x 9-1/2"
- Spring returns arm to ready position
- Uses grinders side handle mount
- Maximum vise opening: 4"

ITEM

31848-1SAA

\$9⁹⁹

CHICAGO HEAVY DUTY Electric Power Tools 4" DISC GRINDER

- 115V, 5.18 amps, 10,000 RPM
- 5/8"-11 spindle with 7/8" arbor adaptor
- 11" long, 4-1/2" tool weight

ITEM 01711-4SAA

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CONTROLLED PRESSURE, NON-MARRING HARDWOOD CLAMPS

These hand screws will clamp without scratching or marring your workpiece. Hardwood jaws distribute pressure evenly, and can easily be adjusted for non-parallel surfaces and odd shapes.

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JAW LENGTH	JAW CAPACITY	ITEM	PRICE
8"	4-3/4"	04852-3SAA	\$3⁹⁹
10"	6"	04853-4SAA	\$4⁹⁹
12"	8-1/2"	04854-5SAA	\$5⁹⁹

CENTRAL MACHINERY

1/3 HP



5 SPEED BENCH DRILL PRESS

- 620 to 3100 RPM
- 8-1/4" maximum distance spindle to table • 1/2" chuck
- 2" stroke, 8-1/4" swing
- 22-1/2" high, 49 lbs. shipping weight
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ITEM 05901-0SAA

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DRILL PRESS WITH KEYLESS CHUCK

ITEM 34231-3SAA

\$54⁹⁹

DELTA Delta 22-540

LIMITED QUANTITIES



12" PORTABLE PLANER

- Motor: 15 amp, 120V
- Capacities: 12" width, 6" thick, 3/16" depth of cut • 26.2 FPM feed rate
- 8000 RPM, 16,000 CPM
- Long lasting high speed steel, reversible, double edged knives
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- 27-1/4" x 20-1/2" x 15" overall dimensions
- 68 lbs. tool weight
- Factory reconditioned, factory perfect

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HALF OFF

12-1/2" ROLLER AND BRACKET SET

Double your table saw capacity! Attach to sawhorse or other surface and make your own roller table. Roller is 1-1/4" diameter and 12-1/2" long.

ITEM

30026-4SAA

\$7⁹⁹ \$3⁹⁹

Pittsburgh

2 PC. 3/4" HEAVY DUTY PIPE CLAMP SET

- Pipe not included.
- Handle screw operating range: 2-1/8"
- 1-1/2" throat depth

ITEM 31255-4SAA

SLASHED 57% FROM OUR FALL '96 CATALOG **\$2⁹⁹**

DRILL MASTER

TIN COATED FORSTNER BIT SETS

Titanium nitride runs cooler, cuts easier, and lasts longer than standard steel! Includes 3/8" shanks and individually organized wooden case. Rockwell hardness range from 55-65 HRC.

20 PC. SET

- 20 sizes from 1/4" to 3/4" by 16ths, 7/8", 15/16", 1" to 2" by 8ths

ITEM 31130-7SAA

\$34⁹⁹

16 PC. SET

- 16 sizes from 1/4" to 2-1/8" by 8ths

ITEM 32404-8SAA

\$29⁹⁹

DRILL MASTER

15 PC. TUNGSTEN CARBIDE TIPPED ROUTER BIT SET

With long life tungsten carbide tips and the most used routing shapes, this is the set all serious woodworkers need. Ground to ultra close tolerances for the best finish available. Includes individually organized storage case.

- 1/4" shanks
- Includes: 1-1/4" rabbeting, 1-3/8" cove, 1-1/16" roman ogee, 1-1/4" rounding over, 1/2" flush trimming, 1-3/16" 45° chamfer, 1/2" dovetail, 3/4" straight, 1/2" straight, 3/8" V-groove, 1/4" combination panel, 1/4" straight, 1/2" mortising, 1/4" self-piloting flush trim, 3/16" self-piloting 7° bevel trim
- Includes pilot bearing

ITEM 31164-9SAA

\$49⁹⁹ \$39⁹⁹

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18 GAUGE AIR BRAD NAILER

This unit has the features you need: safety trigger, adjustable nailing depth, durable aluminum magazine, and easy jam clearance.

- 55-95 operating PSI • 1/4" NPT inlet
- 3/8" to 1-1/4" brad length capacity
- 100 brad maximum capacity
- 18 gauge brads • Tool wt.: 2-3/4 lbs.
- Stainless steel driver & cylinder

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\$39⁹⁹

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18 GAUGE BRADS PACKS OF 5000

SIZE	ITEM	PRICE
3/4"	33205-6SAA	\$4²⁹
1"	33206-1SAA	\$5⁹⁹

CENTRAL MACHINERY

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DOVETAIL MACHINE

Just place stock and pull cam handles to positively lock material in place. Allows cutting tails, pins, half blind, and standard dovetails. Accepts stock up to 12" wide and 1-1/4" thick.

ITEM 34102-8SAA

\$39⁹⁹

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DRILL 1/4", 3/8", AND 1/2" SQUARE HOLES MORTISING MACHINE

Make a square hole in the fraction of the time it takes by hand! Fence with hold down clamp keep workpieces from lifting off the table. Large capacity - up to 5" maximum height. Includes fence, workpiece clamp, and 1/4", 3/8", and 1/2" mortising chisels and bits.

- 1/2 HP, 110V, 2.3 amps • 5" throat
- 5" maximum workpiece height
- Accepts .745" chisel shanks
- 3580 spindle speed • 13-3/8" x 6" table
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ITEM 35570-1SAA

\$169⁹⁹

DEWALT

DeWalt DW421

LIMITED QUANTITIES



RANDOM ORBITAL SANDER

Controlled Finishing System keeps pad rotation at a controlled speed whether on or off your work. This gives you better and quicker finishes while channeling dust into the collection canister.

- 2 amp motor • Dust sealed switch
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- Factory reconditioned, factory perfect

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Before it becomes airborne**



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How It Works

Dust produced by sanding is immediately sucked away through holes located in the sandpaper, the bottom of the sander's pad, AND around the outside edge of the pad (a FEIN exclusive). The extracted dust is contained by a powerful vacuum.

Unbeatable Finishes

Typically when you sand with normal sanders, your sander ends up riding on a bed of dust and broken abrasive. With the FEIN Sanding System, this "bed" of dust doesn't exist. Your paper cuts faster, cleaner, and lasts up to 10 times longer. You simply can't get the same finish by any other sanding method.

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TIPS FROM YOUR SHOP (AND OURS)

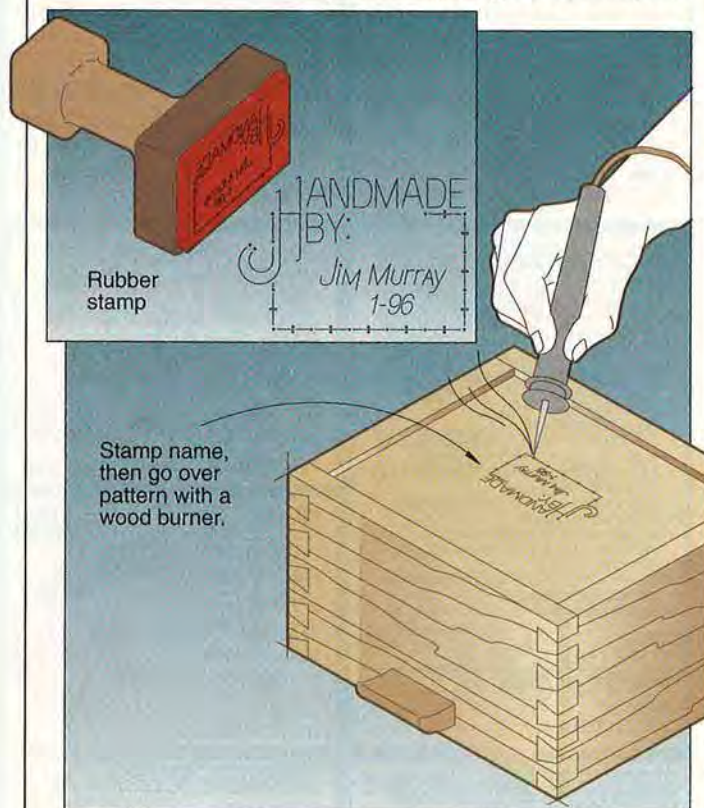
Continued from page 19

Branding-iron alternative

Personalized branding irons work well for putting your mark on projects, but I've found them expensive and lacking flexibility in the information they leave behind. A woodburning pen and rubber ink stamps—available in limitless designs and sizes, as well as personalized versions—provide me with a flexible alternative.

I simply stamp projects with a suitable design, then "trace" the design with the woodburning pen. I sometimes add information such as the date I built the project. I always stamp, burn, and lightly sand the brand before I apply the finish.

—James S. Murray, North Chili, N.Y.



Stamp name, then go over pattern with a wood burner.

A FEW MORE TIPS FROM OUR WOODWORKING PROS

- A simple foot pedal lets you raise and lower the quill of your drill press for oscillating sanding operations. We built the pedal in conjunction with our drum-sanding table on *page 36*.
- To dress up plain plywood panels, consider routing in decorative grooves. Check out the technique we used on the country buffet top, *page 56*.
- Need to apply paint to one part of a project and clear finish to the rest? See how we did just that on our country buffet project, *page 57*. ♣

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THERE ARE ~~NO~~ TWO WAYS ABOUT IT!

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*Better Homes and Gardens®
WOOD® Magazine (Nov. '95)

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Our model 350 delivers 550 CFM of filtered air. This will clean the air in a 20 x 20 x 8 foot area ten times per hour. For larger areas, our dual speed model 8-12 will deliver 800 or 1,250 CFM of filtered air for only \$495. Our model 10-16 will deliver 1,000 or 1,600 CFM of filtered air for \$695.

The JDS AIR-TECH 2000 systems will remove 99% of particles as small as five microns and 80% of the particles as small as one micron.

Our unique design makes both ceiling installation and filter changing quick and easy.

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Another quality product from
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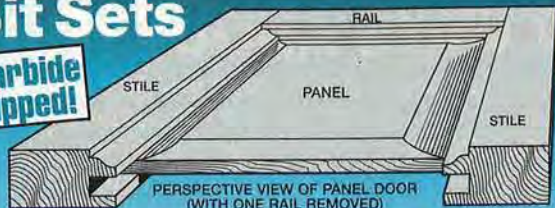
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Model 350

JDS COMPANY
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Save 55% on MLCS Raised Panel Door Bit Sets

Carbide Tipped!

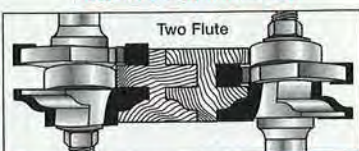


Make Beautiful Raised Panel Doors with your 1/4" or 1/2" Router, or with your 1/2" or 3/4" Shaper.

Our professional production quality router bits make it quick and easy to produce attractive raised panel doors. Our reversible combination bit makes a matching rail and stile frame. The panel raising bit with ball bearing guide makes a perfect raised panel every time!



*Raised Panel Router Bit



*Reversible Combination Rail & Stile Bit
Works with stock from 11/16" to 7/8".

Includes instructions & professional tips!

Carbide Tipped RAISED PANEL DOOR SETS

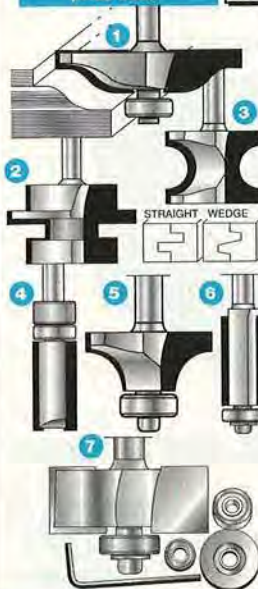
SET#	BIT STYLE	RAISED PANEL LRG. DIA.	SET PRICE
#1301	1/4" Shank Router	* 2"	\$69.95
#1302	1/2" Shank Router	* 3-1/2"	\$79.95
#1303	1/2" & 3/4" Shaper	4-5/8"	\$99.95

*Ball bearing included

QUANTITY DISCOUNT
When ordering 3 or more router bits deduct \$1.00 each!

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- OGEE RAISED PANEL**
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- RABBETING KIT**
Change ball bearing guides and select 4 depth of cuts: 3/8", 7/16", 5/16", 1/4". Set: 1/4" shank rabbeting bit, 4 bearings (3/8", 1/2", 5/8", 3/4") and hex key.
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Bit sizes from 1/8" to 1/2" by 1/64" increments. Bits are deep fluted to clear chips quickly.

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METAL CASE & BIT HOLDER INCLUDED!



Biscuit Joining Set

5/32" Slot Cutter-1/4" Shank and 250 #20 Biscuits

"Biscuit Joining with your Router", Instructional sheet included.

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FAST & EASY



MERLE The ADJUSTABLE CORNER CLAMP®

- Adjustable, uniform clamping pressure on all corners
- Great for wide cabinet frames (for center or edges)
- Forces a frame into perfect square
- Almost NO capacity limitation, ships with 23 FEET steel banding
- Aluminum & Steel construction

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Router Speed Control

Gets the best results with the wood and bit you are using!

- Works with all routers 3-1/4" HP or LESS - 120V 15 Amp
- Full horsepower and torque at all speeds
- Gives your router a feature only available on routers costing hundreds of dollars!

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Includes Dust Cover



SOLID BRASS Router Inlay Set

Makes perfect fitting recesses and inlays!

Easy to use inlay kit follows a 1/4" thick pattern template of almost any shape to produce the recess. Create matched inlays by removing the bushing. Fits Porter Cable®, Black & Decker® or any router with an adaptor for Porter Cable bushings. Includes 1/8" solid carbide downcut spiral bit, brass bushing, brass template guide, brass retainer nut & instructions.

ITEM #1426 REG. \$29.95 **SALE \$21⁹⁵**

*Order Set #1427 for all other brands of routers. Includes Set #1426 plus adaptor bushing, router template guide kit, and downcut spiral bit.

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RED ALDER

The Pacific Northwest's most abundant hardwood

Just as a connoisseur of Eastern ham insists that it be smoked only with hickory, the salmon fisherman of the Pacific Northwest demands his fish be cooked over alder coals. That's entirely fitting to this tree that prefers living close to water.

As the most abundant hardwood species of the region, red alder has for a century been the seafood industry's choice for smoking fish. And loggers who daily fell the mighty Douglas fir prefer the heat of a winter fire fueled by red alder. Until recent years, these were the wood's primary commercial uses in a land ruled by lumber-producing conifers.

In fact, red alder was pretty much dismissed for production because, like a weed, the species popped up in clearings where other trees were felled. Burnt-over tracts also were quickly covered by young alder stands, often threatening more commercially important softwood seedlings. Today, loggers look to the red alder to supply a growing market along the West Coast, in Asia, and in Europe for furniture wood.

Wood identification

Red alder (*Alnus rubra*) grows best in moist conditions at lower elevations throughout its range. The greatest volume occurs around Washington's Puget Sound and in Northwest Oregon, where trees may reach heights of 120' and diameters of 36".

At first glance, you might mistake red alder for aspen or paper birch because the tree has light gray bark with dark mottling.



Older specimens in damp growing conditions feature dark spots of moss. Red alder's leaves also remind you of a birch's, yet they are nearly twice as long, with a furry underside. In the fall, they drop to the ground still green.

The wood of red alder, at 28 lbs. per cubic foot dry, weighs about one third less than red oak. The heartwood and sapwood are both a rich reddish brown with straight, close grain. When red alder is cut in the autumn, the wood color is frequently a golden yellow. Freshly cut logs may stain if not processed within a few weeks after harvest.

Uses in woodworking

Red alder makes excellent core stock for plywood because of its stability and good gluing proper-



Natural range

ties. Also, it's commercially used on the West Coast for production turnings, cabinets, paneling, doors, millwork, unfinished furniture (especially chairs) and waterbed frames. Because it has a close grain and readily accepts stain, red alder can imitate cherry, mahogany, and even walnut. But because it tends to be somewhat softer than these woods, you should avoid using it for tabletops and other projects that take abuse. And always use it indoors; the wood isn't durable.

Availability

Due to increasing demand for commercial use, red alder prices on the West Coast actually are competitive with the cost of many Eastern hardwoods of its caliber. Expect to pay about \$3 per board foot for Selects and Better, the finest grade.

You may be able to buy red alder at retail hardwood outlets in the Midwest. But in the eastern U.S., hardwood species such as yellow poplar and red gum beat its price.

PERFORMANCE PROFILE

red alder (*Alnus rubra*)



Red alder

If you plan to order red alder from a small sawmill or operator be sure to specify normal, uniform color. Although red alder may be about the easiest North American hardwood to dry, it does require a special kiln schedule that avoids discoloration through the oxidation of extractives. This oxidation frequently results in mottling. By introducing steam in the kiln drying, skilled operators can produce colors that range from yellow to dark red, a technique that can enhance the final finishing if red alder is to be substituted for costlier stock. Once you have your red alder, you'll want to keep the following tips in mind.

Machining methods

Although you can work red alder easily with hand and power tools, the wood does have a tendency to blunt cutting edges. So keep

sharp ones handy or resharpen for high-quality cuts.

- Ripping poses no problems with red alder because of its even texture. Crosscutting does require a backing board to reduce any possible tearout.

- If you experience tearout when planing, either reduce the feed rate or adjust the wood to a slight (15°) angle to the cutterheads.

- For routing, slow the feed rate for smoother cuts.

- All adhesives work well with red alder without special preparation of the mating surfaces.

- Red alder is known in the wood products industry for its nail-and-screw holding power. But, pre-drill for screw holes to lessen the chance of splitting.

- Red alder tends to fuzz just a trace during sanding, but unlike rock-hard sugar maple, it won't retain the scratches left behind should you skip a grit.

- Because of its color consistency and pore structure, red alder takes all types of stains equally well without sealing or otherwise conditioning the wood.

- You can use any type of clear finish on red alder. It also holds paint extremely well.

Carving comments

- An even texture, straight grain, and relative softness (similar to butternut) makes red alder easy to carve with both hand and power tools.

- With only subtle figure, this is a wood you'll want to try for naturally finished relief carvings as well as three-dimensional carvings destined for paint or stain.

Turning tips

- Be sure to use sharp turning tools to avoid tearout, otherwise expect red alder to turn with the ease of cherry, only softer.

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions pertaining to this issue's featured wood species appear under bold-faced headings elsewhere on this page. But for all wood species, always practice the following.

- For stability in projects meant for indoor use, work only wood with a maximum moisture content of 8 percent.

- Feed straight-grained wood into planer knives at a 90° angle. To avoid tearing, feed figured or twisted grain at a slight angle (about 15°), and take shallow cuts of about 1/32".

- For clean cuts, rip with a rip-profile blade having 24-32 teeth. Smooth cross-cutting requires at least a 40-tooth blade.

- Avoid using standard twist-drill bits. They tend to wander in the wood and cause breakout. Use brad-point bits and a backing board under the workpiece.

- Drill pilot holes for screws.

- Always rout with sharp, preferably carbide-tipped, bits and take shallow passes to avoid burning.

- Carving hardwoods means fairly shallow gouge bevels—15° or more—and shallower cuts. 🌲

RED ALDER AT A GLANCE

Cost	\$\$\$ \$ \$
Weight	🐘🐘🐘🐘🐘
Hardness	T T T T T
Stability	▲▲▲▲▲
Durability	🕒🕒🕒🕒🕒
Strength	💪💪💪💪💪
Toxicity	☠️☠️☠️☠️☠️
Workability	🪚🔪
Look-alike:	Mahogany

Module Power Tool System... Six Precision Tools In One!

Countershaft

A second countershaft reduces the turning speed to a 1:3 ratio to work with 1/3 the turning speed, but triple the power. (Or triple the speed at 1/3 the power.) Also allows for a rotating center (instead of a tailstock) when working on large wooden pieces.
No. MH162030 **Price \$35.99**

Dividing Attachment

For milling squared wood and metals, or circular drilling. Add a gear milling head to make your own gears. (Needs a second countershaft.)
No. MH162040 **Price \$17.99**

Four-Jaw Chuck

Required for all square and asymmetric work pieces. Jaws can be individually moved and reversed.
No. MH162050 **Price \$19.99**

Three-Jaw Chuck

For fitting round, triangular or hexagonal work-pieces.
No. MH162430 **Price \$26.99**

Tool Grinder

Makes it possible to grind turning tools, turning knives and other tools without changing your set-up. Includes 1 grinding wheel.
No. MH162060 **Price \$11.99**

Drilling Table

Makes it easier to grind, drill and mill precision parts.
No. MH162070 **Price \$5.99**

Flexible Shaft

Approx. 27-1/2" long. Includes four metal collets.
No. MH162440 **Price \$19.99**

Professional Woodturning Gouge

Larger and sturdier than the gouge included with the Unimat 1 System. Will take repeated re-grinding.
No. MH162140 **Price \$11.99**

Fly Cutter

For mitring, making steps or edge pieces in metal. Three slides enable you to do 3-dimensional work. High speed steel, includes 1 bit.
No. MH162200 **Price \$15.99**

Gear Milling Head

Used for making nuts and profiles. To make gears, add a dividing attachment and second countershaft. High speed steel.
No. MH162210 **Price \$14.99**

Outside & Inside Turning Tools

Inside turning tool is used for the inner turning of metals. Outside turning tool (Included with Unimat System) is used for outside turning of metals. One each.
No. MH162230 **Price \$15.99**

Grinding Wheels

For grinding the woodturning knife and sharpening the turning tool. Set of two.
No. MH162270 **Price \$9.99**

Set of Service Parts for Unimat 1

Includes connection elements, thick and thin drive belts, motor ventilator, gear rims, screws, nuts, T-slots, clamping plate, clamping jaw and more.
No. MH162280 **Price \$18.99**

Extra Long Machine Bed

20" (50 cm) machine bed handles larger work pieces.
No. MH162400 **Price \$29.99**

High-Speed Motor

Runs 1.5 times faster (at the same power) than the standard motor included with the Unimat 1 System.
No. MH162420 **Price \$24.99**

Rotating Center

Equipped with smooth ball bearings, it turns with the workpiece. Very useful for woodturning.
No. MH162450 **Price \$12.99**

Brass Collets

Set of ten: 2mm, 2.3mm, 2.5mm, 3mm, 3.5mm, 4mm, 4.5mm, 5mm, 5.5mm and 6mm diameters.
No. MH162460 **Price \$19.99**

Aluminum Stabilizing Plates

Provide increased stability for extra precision. Useful for woodturning, gear milling and turning without the tailstock. Set of two, with nuts and bolts for mounting.
No. MH162470 **Price \$24.99**

Unimat Video

No. MHV51604 **Price \$11.99**

Other Accessories

No. MH162250 Jig Saw Blades, 10 Pc. Set **\$5.99**
No. MH162260 2" Sanding Discs, 10 Pcs. **\$7.49**
No. MH162080 Aluminum Faceplate **\$11.99**
No. MH162180 Micro Clamp **\$16.99**
No. MH162190 Milling Tool Set, 4 Pcs. **\$16.99**
No. MH162220 Miniature Tool Set, 15 Pcs. **\$32.99**
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WOOD TURNING LATHE

Turns all types of wood up to 2" (50mm) in diameter. Woodturning attachment has a 1" (25mm) center height. Distance between centers is 5-1/3" (135mm). Order extra long machine bed to turn longer pieces.



JIG SAW

Short stroke 2,000 RPM jig saw has a 7mm (1/4") maximum cut. Two blades included.



SANDER

Use it as a stationary or off-hand sander. Good for sanding and grinding in various angles. Includes five 2" sanding discs.



METAL TURNING LATHE

Use it on metals and plastics.

VERTICAL DRILL PRESS

Accommodates every type bit or collet from 0.5mm to 6mm in diameter. Also doubles as a hand drill.



HORIZONTAL MILLING MACHINE

Three-dimensional machine with three slides that can be fixed at any angle. Handles all standard milling needs.

6 in 1

A complete power workshop at an affordable price, the Unimat 1 Module Power Tool System lets you set up the machine to fit your individual needs. Six different configurations allow you to create a jig saw, wood turning lathe, metal turning lathe, milling machine, vertical drill press and sander. System includes a plug-in transformer, 2 machine beds (10-1/2" and 5-1/2"), 3 slides, headstock, tailstock, three-jaw chuck, 8 collets, machine vise, woodturning attachment, sanding disc, jig-saw, illustrated instruction book and all necessary pieces for drilling, grinding, sawing, milling, wood turning and more. Power is supplied by a 12 volt 12,000 RPM direct drive motor. The transformer (also included) plugs into any 110 volt household outlet. All components—over 60 individual parts—are made of durable, high impact plastic and aluminum.
No. MH160141S Mfg. List \$395.00 **Sale \$269.99**

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Your bonus package, worth \$61.97, includes the Extra Long 20" Machine Bed for working bigger pieces, the Four-Jaw Chuck for gripping square stock, plus the Unimat Instructional Video. Now, they're all yours—*absolutely free*—with your order for the Unimat 1 Module Power Tool System!

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Turns your work surface into a clamping center.

Step back into yesteryear with
**THE COOPER OF
CAMBRIDGE**

Few things remain as they always were. But the wooden barrel is one that has. Maryland cooper Ken Knox still makes them by the thousands in turn-of-the-century fashion.

Continued

A man with a mustache, wearing a light-colored short-sleeved button-down shirt, is sitting in the middle of a large stack of wooden barrels and buckets. He is looking towards the camera with a slight smile. The barrels are made of light-colored wood with black metal hoops. Some barrels have circular holes in them. The background is dark, making the light-colored wood stand out.

Cooper Ken Knox believes there will always be a need for barrels. Adding berry barrels, buckets, planters, and kegs to his line of slack cooperage has kept the business barreling along.

The Cooper of Cambridge



Above: Outside the cooperage, James Ennals trims raw logs to stave length. A powered carriage moves the 36"-diameter blade forward and back.



Right: Bob Fairbanks feeds the cylindrical keg saw, which quickly cuts each split of wood into a curved stave.

Your grandparents might recall the times when flour, crackers, and other dry staples arrived at the local grocery store in wooden barrels. But to most of us, barrels made of staves and hoops are nothing more familiar than props we see in western movies, or sawn in half, nostalgic containers for our patio plantings. That's why I was surprised to hear about a company on Maryland's Eastern Shore that still produces slack cooperage, the barrels made to ship and store dry materials.

When I telephoned Ken Knox, cooper and owner of Brooks Barrel Company in Cambridge, Maryland, he invited me to come see the barrel-making operation for myself. It turned out to be quite an interesting visit because Ken's knowledge of machines and coopering was a lesson not so much of classic craftsmanship, but in living history.

Peter J. Stephan

Features Editor

Coopers craft wooden barrels. In the days before machines made the work much easier, their hardened hands dressed the ash, gum, oak, pine, or poplar staves with an adze or a saw. Then, with drawknife and jointer plane, they gave them beveled edges and a contoured shape. Using a special tool called a croze, they meticulously cut in each one the special groove that would accept the round barrel head. Of ash, elm, or hickory, they made the hoops that held the container together.

A hardworking cooper of the early 1800s might get up 10 flour casks in a day. The smaller kegs, undoubtably more. The large-capacity hogshead, fewer. But there were customers for each of them because before the widespread use of the cardboard box in the late 1940s, wooden barrels were the world's primary shipping and storage container.

Made in sizes ranging from one- to 60-gallon capacity, wooden



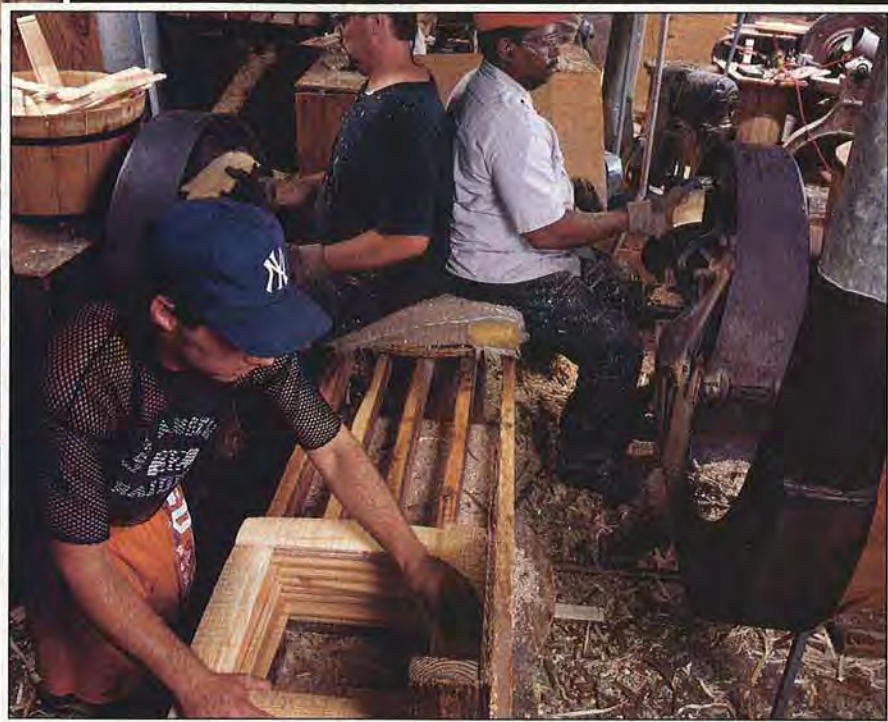
Anatomy of a wooden slack barrel

barrels are one of the strongest containers ever developed. Their double-arch construction (see illustration, above) makes them strong and resilient.

A regular container on wheels, a wooden barrel can be handled by one man even when loaded with several hundred pounds of material. Due to its bilge (middle bulge), a barrel rests only on a



Above: While others take their breaks, Ken sharpens the saws. He also maintains and fixes the other aging machinery in his cooperage, often creating small parts right on the spot.



Right: At the crozer, keg staves are tapered, beveled, and cut with a croze, then piled in stacks of 72 called hacks to air-dry.

small surface when on its side, cutting friction to a minimum. And while on its side, a barrel readily responds to a push in any direction. When rolled, it covers distances quickly with little effort—its own weight moves it down an incline. Because it pivots on a small contact point, a barrel easily can be turned and guided.

Ken Knox, 40, knows all this well. For the past 19 years, wooden barrels have been his life.

Once there were barrels everywhere

“A barrel is a barrel. They haven’t changed much,” says Ken matter-of-factly. In the shipping room of his Brooks Barrel Company, which hasn’t changed much in nearly 50 years either, he stands before a stack of barrels awaiting delivery. Ken wears the fresh, crisply pressed tan shirt and pants bearing the company insignia in which he starts each day.

“At one time, there were cooperages everywhere along the

Eastern Shore because they raise lots of chicken here,” Ken comments. “They packed chickens in barrels for shipping. So where there was a large processor, there was a cooperage. But the cardboard box spelled the end for most wooden barrels. By the 1950s, there weren’t many cooperages left. Paul Brooks founded this business in 1950. He started out reconditioning and recycling barrels. Then he began buying machinery from closing cooperages to make new barrels.”

Ken hired on in 1978, with an understanding that he might someday want to buy the barrel business from Paul (which he did in 1991). “He had five people working when I started, and I began at the bottom,” recalls Ken. “I had to learn every step, do every job, figure out how to fix each machine.”

Why, when other cooperages were closing, would someone want to get into barrel making as Paul Brooks, then Ken, did? “This

is one of six remaining slack cooperages in the country, to my knowledge,” the cooperer replies. “But barrels will always be needed. The slack barrel is still the best way to ship fresh fish, oysters, and crabs to market because they ice them down. As the ice melts the water runs out.

“But barrels have other uses, too. They’re popular as decorative items and as planters. And I’m working on a bid to make yellow poplar barrels for a Jamaican coffee company to ship their beans to Japan in. That’s a potential of 15,000 a year.”

Yet, those barrels would represent only a small portion of production. Ken calculates that he uses nearly 2 million pounds of wood a year for staves and heads—mostly yellow pine from Maryland, Virginia, and Delaware. That goes into a couple hundred thousand barrels and kegs.

Who buys them? Seafood shippers, of course. But also specialty

Continued

The Cooper of Cambridge

shops, home and landscape centers, restaurants, and display companies. Customers even drop out of nowhere. "We have sales reps," Ken notes, "but people just seem to find us. It's not like there's a barrel company on every corner."

Even yesterday's coopers ran machines

Ken likes to say that walking into the Brooks Barrel Company cooperage is taking a step back in time. Although it isn't as visually historic as a visit to Colonial Williamsburg, he is right.

Locals believe that the hodgepodge of buildings that's home to the cooperage had its beginning as a railroad station. That identity has long been lost, although railroad tracks still lie adjacent. The heart of the cooperage, however, does create the din of a busy railroad yard. A cacophony of sound comes from assorted machines as they contribute to making barrels. And it's these machines—coated with a patina of time and toil—that come from the past.

"This equipment isn't made anymore," says Ken. "And when it breaks down, which isn't infre-

quently, I have to fix it." To do that, he draws from an inventory of spare parts accumulated over four decades and knowledge learned on the job. And while breakdowns can occur at any moment, there are set times for regular maintenance, such as saw sharpening. "Just like any aspect of woodworking, saws have to be kept sharp. So when the men [he has eight employees] take their breaks at 10 a.m. and 2:30 p.m., I sharpen the saws because I'm the only one who can."

Ken threads his way between machines, stock, and barrels in process, to the rear of the cooperage and outside. "This is where the staves begin," he says of the operation before him.

Sweating in the summer humidity, James Ennals runs the cutoff saw that trims 18-20"-diameter pine logs to stave length. It takes muscle to wrestle the logs against the 36" blade, even though there's mechanical help.

Just inside, another worker feeds the cutoffs into a bandsaw to halve them. He then places the halves on a table separating him from the keg saw.

The fragrance of fresh-cut pine permeates the old building, but it's especially pungent around the keg saw. Itself resembling a barrel, but of steel, the keg saw cuts the wood fed to it into curved staves of $\frac{3}{8}$ " thickness that will be used for kegs. (Kegs are small barrels under 18" tall.) The larger barrel saw nearby produces longer, but straight, barrel staves.

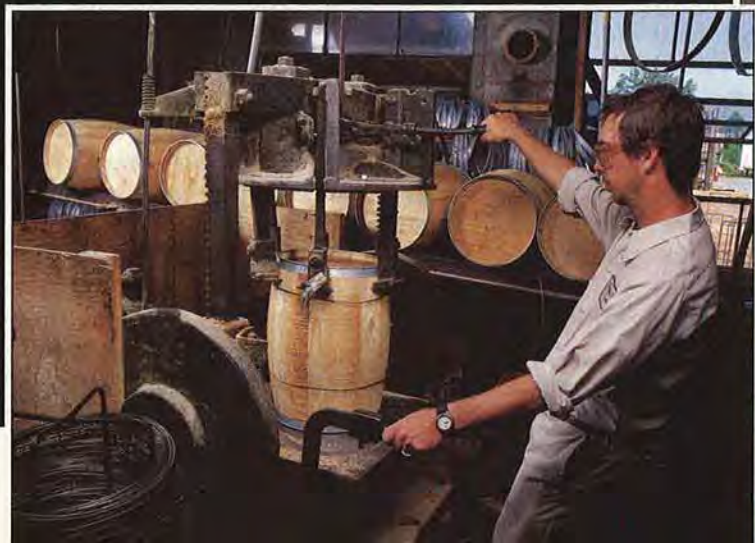
From the keg saw, keg staves pass to a crozer, much like a vertical jointer, where the operator—in one movement—cuts the chamfer, called a chime, on either end, plus the groove labeled the croze, the bevel on each side, and the taper to their length. It takes well-defined body control and timing sense to hold each stave to the machine just long enough to make all the cuts. Barrel staves follow a slightly different path, as you'll soon find out.

"After the staves have been made, we stack them outside to air-dry for a few weeks," explains Ken. "Then, they go to the kiln."

The lead cooper recites the terminology regarding staves. "Staves are always stacked by the hack, which is 72 staves. Then, the

Below: On kegs, hoops of twisted wire take the place of flat steel. A good month will see 10,000 kegs roll from the Brooks Barrel Company cooperage.

Right: Green yellow pine staves air-dry for a few weeks before going to the kiln. A bunk of 864 staves represents only about half an hour of production time.



hacks are usually placed 12 to a pallet in what we call a bunk [see photo below left]. There are 12 hacks to a bunk—864 staves in all. I remember one time when I produced 16 bunks in a day. That's still some kind of record."

Priceless equipment makes up a barrel

"A cooper can put a steel hoop on a barrel only if he has a hoop machine," says Ken, leading a historical tour of barrel-making machines. "This Worthington hoop machine, built about 1915, is one of two in the nation that I'm aware of. It shears rolled, electrogalvanized steel to a width of slightly more than 1", cuts the metal band off to prescribed length and punches two holes in the end, then rolls an edge that enables the hoop to be driven on. I've never run it all day, but it could make maybe 5,000 hoops."

Next in line is the wire machine, which rotates and twists heavy wire into hoops for kegs. "It was made by American Steel & Wire Company of Joliet, Illinois, in 1903," Ken remarks. "I have two of them, and don't know if there

are any more in existence. She's very temperamental."

A few steps from the wire machine stand a pair of hoop expanders, built in 1905 in Chicago by William Gladner Machine Works. "They expand the hoops so that a cooper can more easily put them on the bottom of the barrel," says Ken.

More machines make up the tour, each doing its singular part. None, though, are more impressive than the ones charged with assembly—the trusty 5-in-1 machines. "These were made by the E.B. Holmes Co. in Buffalo, New York," Ken remarks. "The last one was built about 13 years ago to the tune of \$37,000. I have six of them, with three in service. A few years ago, I bought a crate of spare parts for \$4,000. Now, if anybody in North America needs parts, they come here.

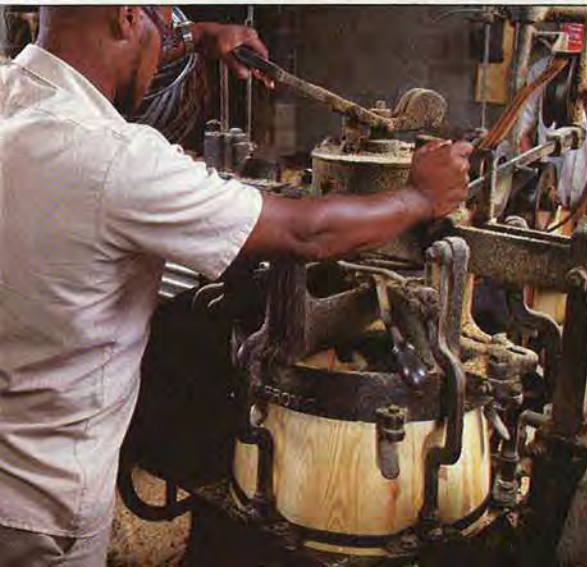
"The way this functions," he continues, "it does five jobs at once. A worker will first grab his setup ring, then enough staves to fill it. An experienced cooper can tell by feel just how many staves he'll need to fill the ring. He next takes the top hoop and pulls it

down on the staves. Taps on the staves with a little hammer make them as even as possible. Then, he pulls the lever and the machine drives the hoop down over the staves (see photo below). When he releases it, part of the machine lowers onto the barrel and it starts rotating. While it rotates, the chamfer knife cuts a bevel on the staves. The croze knife follows to cut a rabbet for the head. Lastly, a lance knife runs along and squares the edge."

Across the aisle from the 5-in-1, a man installs heads in the newly raised barrels. As a barrel comes to him, he reaches with one hand to a stack of $\frac{3}{4}$ " plywood heads and stabs one in the center with a tool resembling a large ice pick. The head in hand, he places it inside the barrel staves, as shown below. With his foot, he hits a pedal, and a large flat plunger lowers itself onto the head and presses it into the croze. A nailer will secure the metal hoops, and another slack barrel will be complete—just like the one before it and the one that will follow. After all, as Ken pointed out, a barrel is a barrel. ♣

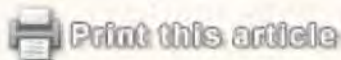
Below: The old 5-in-1 machine raises the staves, drives the steel hoops, chamfers, cuts the croze, and edges the barrel in one operation.

Right: Harry Johnson places a plywood head in the barrel. His machine will seat it in the croze, and he'll pass it along for nailing.



Photographs: Steve Uzzell Illustration: Don Jensen

DISPOSABLE



Do real woodworkers use disposable brushes? We do, but we choose them wisely and restrict their use to specific finishing tasks. Here's what you need to know before selecting a disposable brush for your next project.

Chances are your local hardware store or home center stocks most or all of four types of disposable brushes in widths from 1" to 3". They are: natural bristle (hog hair, typically), synthetic bristle (nylon, polyester, or a combination of both), foam, and 3M NewStroke brushes (with bristles made from a proprietary synthetic material).

These brushes, shown in the photo *below*, normally cost less than \$2. You often can purchase 1"-and-narrower versions of the synthetic-bristle brushes in bulk for as little as 25 cents each.

Because of the low cost, you can pitch disposable brushes after a single use and save yourself the hassle of cleaning them. But, as we'll point out in this article, disposables work better for some jobs than others.

When using a disposable brush makes sense

Make no mistake about it. A high-quality brush (often costing \$10 or more) almost always will outperform a disposable brush.

Better brushes hold more material, and help you apply it more smoothly with fewer bubbles or loose bristles. That's because high-quality brushes have more bristles than less-expensive brushes, and the bristles are better bonded to the brush handle. Also, the bristles are longer, softer, better flagged on their ends, and tapered toward the application end. As you can see in the cut-aways of the four brushes *right*, disposables have short, untapered bristles with little flagging (split ends), and only a small amount of material holding them to their handles.

Nevertheless, disposables make a lot of sense for jobs that don't require a super-smooth finish, or when you just don't want to hassle with brush-cleaning chores. Here's a listing of the finishing or gluing products that we've found most appropriate for use with disposable brushes:

- *Oil-based finishes.* Whenever you apply a finish such as polyurethane, shellac, lacquer, or



Four common choices of disposable brushes include, from left, 3M NewStroke, foam, synthetic bristle, and natural bristle.

BRUSHES

A sensible choice for many application tasks

oil-based stain, you need to thoroughly clean the application tool with solvents such as paint or lacquer thinner. Besides the cost of the solvent and the cleaning hassle involved, you also have to take the used solvent to a proper disposal site (if you can find one).

To use disposable brushes with these products and still get a smooth finish, apply only your base coats with them. Then, apply the top coat with a spray gun, aerosol can, or high-quality natural-bristle brush.

•*Two-part adhesives and finishes, and contact cement.* Products with separate resin and hardening agents, such as epoxy, begin to set up as soon as you mix the two parts. This makes it impossible to clean the brush, so a disposable is your only sensible option. We also use disposable brushes to apply fast-drying contact cements.

•*Finish removers,* especially the more-potent formulations that contain methylene chloride, acetone, or toluene, can dissolve or weaken bristles. The stripping process also loads dirt, paint (possibly contaminated with lead), and other nasty byproducts onto your application tool. So, you might as well use a disposable brush for this task.

Our recommendations

With oil-based finishes we obtained our best results with foam and natural-bristle brushes. Foam brushes yielded the smoothest finishes so long as we were careful to avoid the bubbles that often result from stroking them back and forth too much. The natural-bristle brushes produced finishes nearly as smooth, and were less affected by strong solvents than the foam brushes.

The synthetic brushes were much too stiff and left noticeable brush marks in all finishes. However, you often can find these brushes sold in bulk at unbelievably low prices, so you may want to stock up on them for gluing tasks.

The 3M NewStroke brushes were good performers with a wide variety of finishes. They were a little pricier than the others at the outlets we shopped.

Written by Bill Krier with Dave Henderson
Photographs: Bill Hopkins, John Hetherington

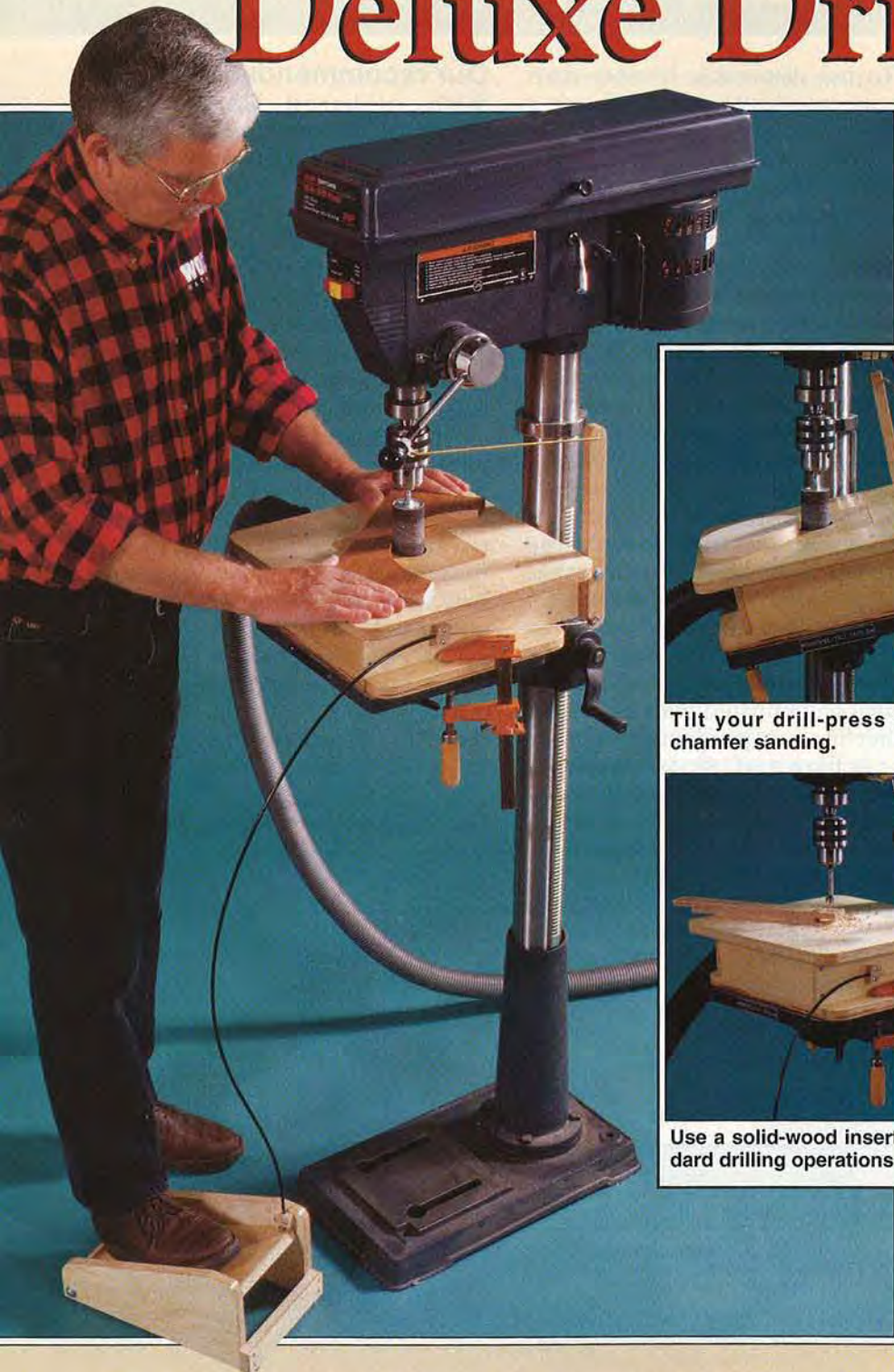


Cutaway views of disposable brushes reveal their low-cost construction. From left, natural bristle, synthetic bristle, foam, and 3M NewStroke.

WHAT TO KNOW BEFORE YOU GO DISPOSABLE										
BRUSH TYPE	PROS	CONS	COMPATIBILITY WITH VARIOUS BRUSH-ON PRODUCTS (1)						APPROXIMATE COST PER BRUSH (3)	
			POLYURETHANES AND VARNISHES	SHELLAC	WATER-BASED FINISHES	LACQUER	OIL-BASED STAINS	DRYING OILS (2)		METHYLENE-CHLORIDE FINISH REMOVERS
FOAM	Low priced. Holds large quantity of finish. An excellent choice for water-based finishes, and also works well with drying oils and polyurethanes.	These brushes will dissolve in contact with strong solvents. Foam tends to tear in contact with sharp edges or rough surfaces. Cannot be cleaned, so you must complete finishing task without stopping.	C	U	C	U	C	C	U	\$.50
NATURAL BRISTLE	Produces good results with all finishes except water-based products. We found that we could get several uses from each brush by cleaning them. Ideal brush for finish removers. Buy versions with the longest bristles you can find.	Do not provide a high-quality finish the way that expensive natural-bristle brushes do. Tend to shed bristles while being used. Water makes natural bristles puffy.	C	C	U	C	C	C	C	1.00
SYNTHETIC BRISTLE	Low priced, but we found few good uses for these brushes. Worked well for spreading woodworking glues and epoxies after we trimmed the brush to 3/4" length.	Stiff, unflagged bristles tend to leave pronounced brush marks regardless of finish being applied. Bristles dissolve in lacquer thinner, alcohol, methylene chloride, and other solvents.	C	U	C	U	C	C	U	.50
3M NEW STROKE	Long handles are made from recycled paper. Nicely flagged bristles apply finishes nearly as well as natural-bristle and foam brushes.	Strong solvents may soften or dissolve bristles. Stiff bristles do not hold much finish.	C	S	C	S	C	C	S	1.50

NOTES:
 1. **C** Compatible. Bristles unaffected by products.
S Bristles will soften after 20-30 minutes of use with this product.
U Unsuitable for use with this product.
 2. Products that include one or more drying oils such as linseed or tung oil. These products include Watco Danish Oil and Deftoil.
 3. Prices we paid locally for 2" brushes.

Deluxe Drill Press

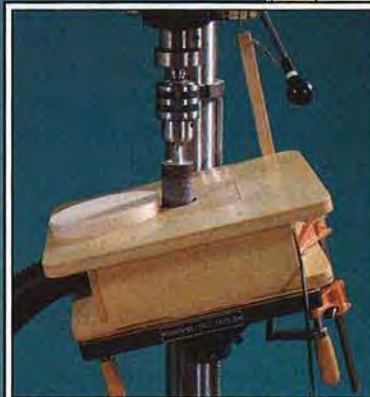


Note: Please see the Buying Guide at the end of the Bill of Materials for our source of hardware and Baltic birch plywood for this jig.

Let's begin with the table base and midsection

1 Cut the table base (A), sides (B, C), and front and back (D) to the sizes listed in the Bill of Materials.

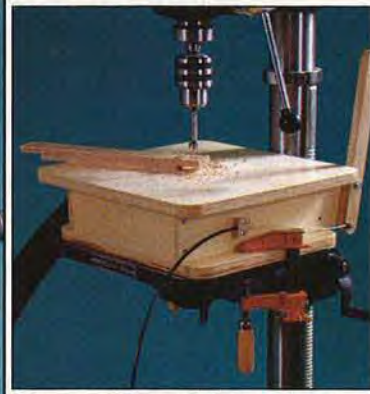
2 Mark and cut the 1" radiused corners on the base (A).
3 Mark and cut the rabbets and dadoes in the sides (B, C) where dimensioned on the Table Exploded View drawing and on the Parts View on the *WOOD PATTERNS*® insert in the center of the magazine.



Tilt your drill-press table for chamfer sanding.

4 Drill or cut a hole to fit your vacuum end, centered in the table side (C).

5 Dry-clamp table pieces B, C, and D together. Drill the countersunk mounting holes through the pieces. Glue and screw the pieces together.



Use a solid-wood insert for standard drilling operations.

6 Position and clamp the table midsection (B, C, D) to the base (A). Drill the mounting holes, then glue and screw together.

Add the tabletop and inserts next

1 Cut the tabletop (E) to size. Cut its corners to shape.

2 Using the Parts View drawing on the *WOOD PATTERNS* insert in the center of the magazine for reference, mark the location of the 5¼"-square opening in the center of the top (E). Drill a ½" hole at each corner, and use a jigsaw to cut the opening to shape.

3 Rout a ⅜" rabbet exactly half the thickness of your top (E) along the top edge of the opening. Leave the setup—you'll use it later to rout the bottom side of the mating inserts (F).

Expand your drill-press' capabilities with this easy-to-make auxiliary table. A simple pedal mechanism, attached to the quill via a bike brake cable, levers, and brass bar, lets you raise and lower the quill and attached sanding drum for oscillating sanding operations. Attach a vacuum hose to the hollow table for dust-free sanding. And, for regular drilling, just add a solid insert in the table.

Add-On

It transforms your tool into an oscillating spindle sander

4 Measure the opening size in the tabletop (it should measure exactly 6"). Now, cut the inserts (F) to the size of the rabbeted opening less $\frac{1}{16}$ ". (We recommend making as many inserts as you have different diameters of drum sanders,

plus a couple extra to use for regular drilling.) Round the corners of the inserts to fit the opening (ours required a $\frac{5}{8}$ " radius).

5 Using the same router setup used in Step 3, rout the bottom side of each insert.

6 Measure the diameters of your sanding drums. Cut or bore a hole centered in each insert (F) $\frac{1}{4}$ " larger than the measured diameters of the drums. The gap allows the dust to be vacuumed through.

Continued

Bill of Materials

Part	Finished Size			Mati.	Qty.
	T	M	L		
TABLE					
A base	$\frac{3}{4}$ "	$11\frac{1}{2}$ "	13"	BP	1
B right side	$\frac{3}{4}$ "	3"	14"	BP	1
C left side	$\frac{3}{4}$ "	3"	$11\frac{1}{2}$ "	BP	1
D front & back	$\frac{3}{4}$ "	3"	9"	BP	2
E top	$\frac{3}{4}$ "	14"	14"	BP	1
F inserts	$\frac{3}{4}$ "	$5\frac{15}{16}$ "	$5\frac{15}{16}$ "	BP	3
G lever	$\frac{3}{4}$ "	1"	11"	BP	1
FOOT PEDAL					
H pedal sides	$\frac{3}{4}$ "	6"	12"	BP	2
I pedal	$\frac{3}{4}$ "	6"	12"	BP	1
J cleat	$\frac{3}{8}$ "	$\frac{3}{8}$ "	6"	B	1
K cleat	$\frac{3}{4}$ "	$1\frac{1}{2}$ "	$7\frac{3}{8}$ "	B	1
L cable blocks	$\frac{1}{2}$ "	$\frac{3}{4}$ "	1"	B	2

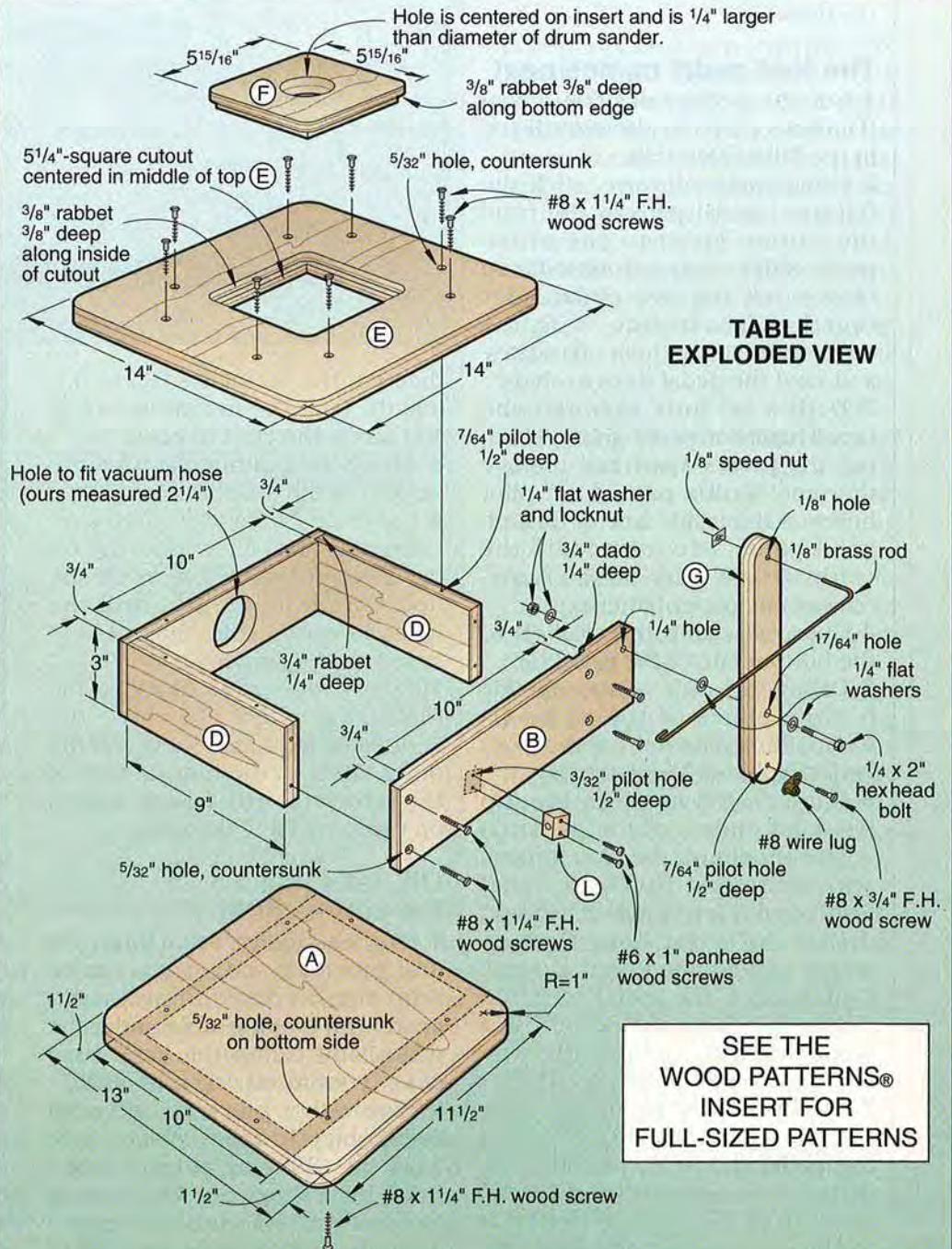
Materials Key: BP—Baltic birch plywood, B—birch.

Supplies: #6x1" panhead wood screws, #8x $\frac{3}{4}$ " flathead wood screw, #8x $1\frac{1}{4}$ " flathead wood screws, #8x $1\frac{1}{2}$ " flathead wood screws, #8x2" flathead wood screws, $\frac{1}{4}$ " hexhead bolt 2" long with three flat washers and locknut, 2- $\frac{1}{4}$ " lag bolt 2" long with four flat washers, $\frac{1}{8}$ " brass rod 14" long with $\frac{1}{8}$ " speed nut, 2-#8 wire lugs, 4 rubber feet, 54" of universal caliper brake cable, $\frac{3}{8}$ " plastic or metal clamp, clear finish.

Buying Guide

Hardware kit. All the hardware in the Supplies listing above except for the finish. WOOD KIT™ DSTJ1, \$19.95 plus \$3.75 shipping. Schlabaugh and Sons Woodworking, 720 14th Street, Kalona, IA 52247 or call 800/346-9663 to order.

Ready-to-assembly kit. All the pieces listed in the hardware kit above, plus all the Baltic birch plywood and solid-wood pieces listed in the Bill of Materials cut to size and shape. WOOD KIT DSTJ2, \$74.95 plus \$12 shipping. Schlabaugh and Sons Woodworking, address and phone number above.



Deluxe Drill Press

Now, make the lever

- 1 Cut the lever (G) to the size and shape shown on the Parts View drawing on the pattern insert.
- 2 Mark the hole centerpoints where shown on the drawing. Drill the holes to the sizes noted.
- 3 Connect the lever to the box side (B) where shown on the Table Exploded View drawing.
- 4 Attach a wire lug to the bottom end of the lever where shown on the drawing.

The foot pedal comes next

- 1 Cut the pedal sides (H), pedal (I), cleats (J, K) to the sizes listed in the Bill of Materials.

2 Using spray adhesive, stick the full-sized pedal pattern (H) from the pattern insert to one of the pedal sides. Using double-faced tape, stick the two pedal sides together face-to-face, with the edges and ends flush. Bandsaw and sand the pedal sides to shape.

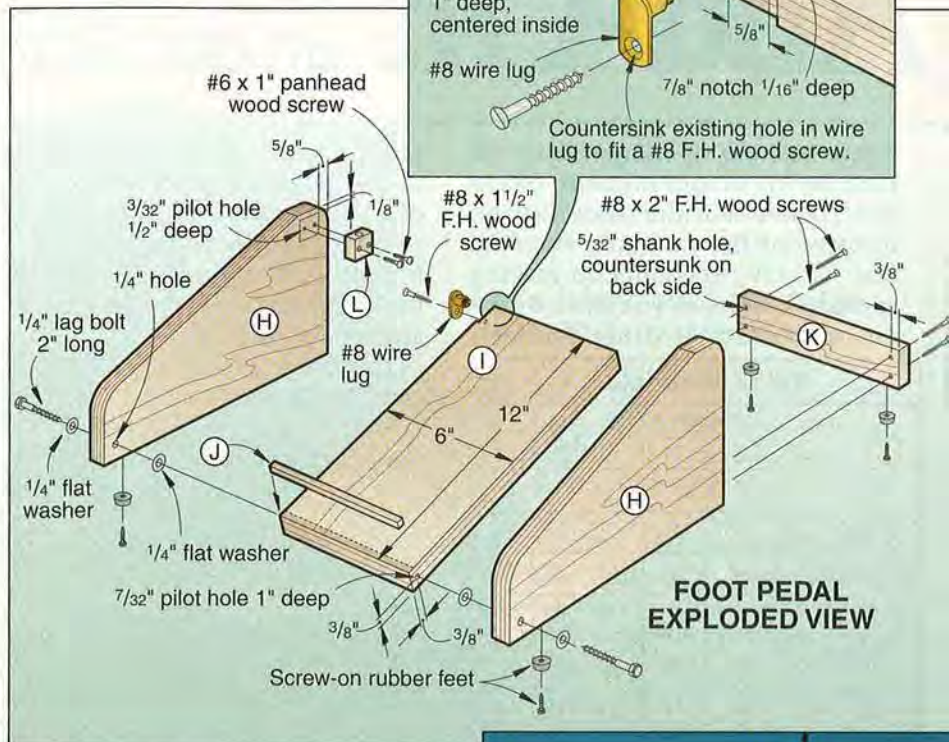
3 Drill a $\frac{1}{4}$ " hole through the taped-together pedal sides. Then, pry the pieces apart and remove the tape. Drill a pair of $\frac{3}{32}$ " pilot holes on the inside face of the left-hand pedal side for adding the cable block (L) later. Now, remove the paper pattern.

4 Glue and clamp the cleat (J) to the bottom end of the pedal (I).

5 Drill a $\frac{7}{32}$ " hole in the outside bottom edges of the pedal (I) where dimensioned on the Foot Pedal Exploded View drawing.

6 Cut a $\frac{1}{16} \times \frac{7}{8}$ " notch in the top left-hand corner of the pedal (I) where shown on the Notch detail accompanying the Foot Pedal Exploded View drawing. Now, drill a $\frac{7}{64}$ " pilot hole 1" deep where dimensioned on the detail. Countersink the metal wire lug where shown on the detail. Use a wood screw to connect the wire lug to the pedal at the notch.

7 Use a pair of $\frac{1}{4}$ " lag bolts 2" long to connect the pedal sides (H) to the pedal (I). Next, measure the distance across the front of the pedal from the outside face of H to the opposite outside face, and



then cut the back cleat (K) to this length. Drill the mounting holes, and screw the cleat in place.

8 Attach four rubber feet to the bottom of the pedal assembly.

9 Cut the cable blocks (L) to size. Using the Parts View drawing on the insert for reference, mark the hole centerpoints, and drill the holes in each cable block where noted on the drawing.

10 Screw one cable block to the foot pedal where shown on the Foot Pedal Exploded View and the other block to the outside face of the table side (B) where shown on the Parts View drawing.

OK, let's make the connections

1 Chuck a sanding drum into your drill press. Fit your sanding table with the corresponding insert, center the sanding table under the drum, and clamp the table base (A) to your metal drill-press table.

2 Purchase a piece of universal caliper bicycle brake cable at least 54" long. (We purchased ours at a local bike shop. See the Buying Guide for a mail-order source.) Trim the inside cable portion to

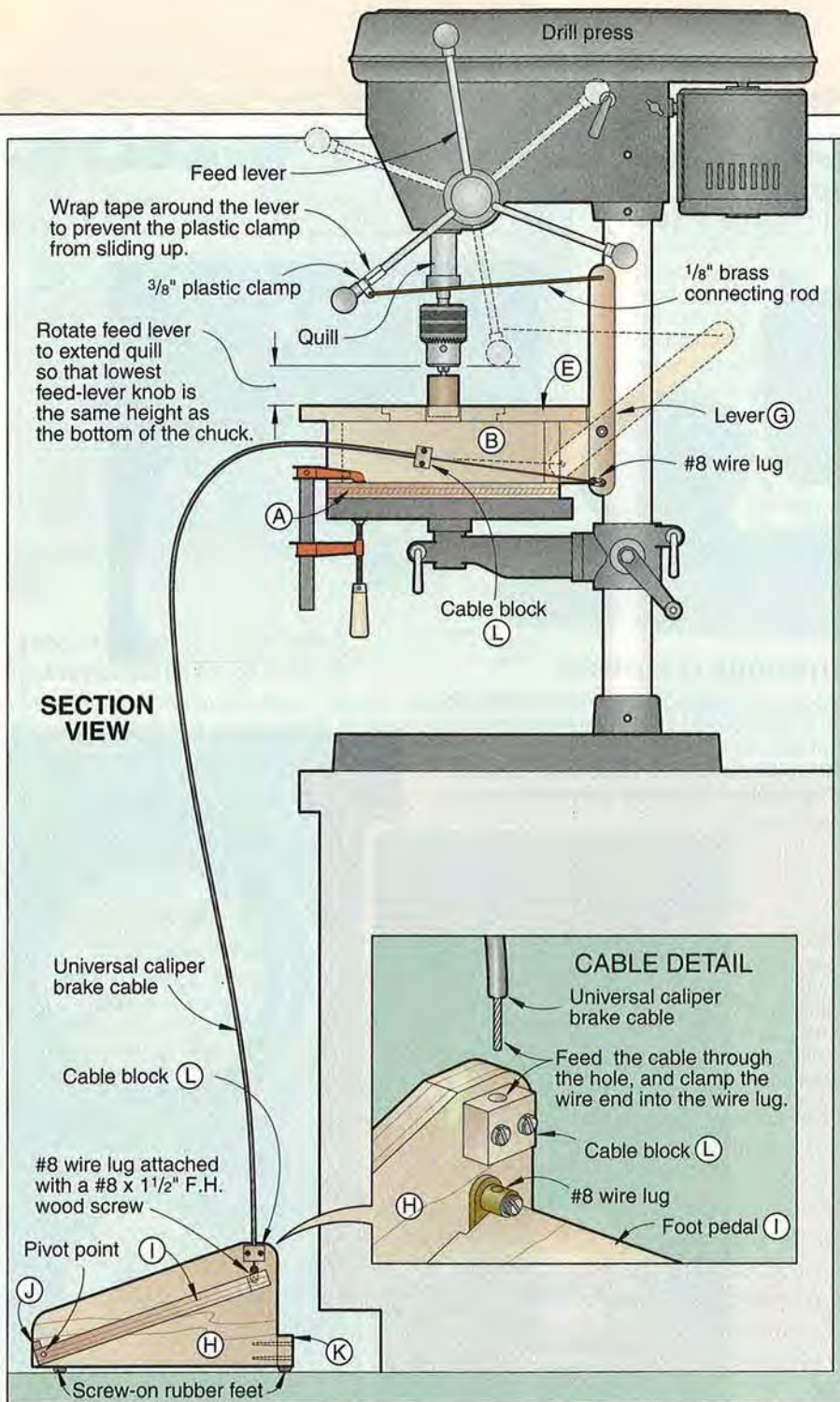


The foot pedal connects to the lever using a bicycle brake cable.

54" in length, and trim the protective housing to 44" long.

3 Run the cable through the cable block (L) attached to the pedal side (H). See the Cable detail accompanying the Section View for reference. Now, attach the cable to the wire lug screwed to the pedal (I). Place the pedal on the floor.

4 Run the opposite end of the cable through the hole in the upper cable block attached to the table side (B). Then, attach the end of that cable to the wire lug secured to the lever so the lever is straight up and down. The lug on



Connect the brass rod to the plastic clamp on the end of the feed lever.

lever. Press down on the foot pedal to make sure the parts work in unison to pull the drill-press feed lever backward, lowering the drum sander. Release the pedal and the spring-loaded feed lever should pull the cable and lever forward, raising the pedal. Lubricate the cable lightly if necessary. You might also need to adjust the length of the brass rod. Raise the metal table on your drill press to the position shown on the Section View drawing. Now, depending on your particular drill press, the feed levers might come in contact with the table or workpiece on the table when rotating the feed levers. If so, follow the directions in Step 7 to correct this problem. If they do not come in contact, proceed to the note at the end of Step 7.

7 To prevent the metal feed lever from coming in contact with the tabletop (E) or workpiece (we found this happens on drill presses with long feed levers), extend the quill where shown on the Section View drawing, and hang onto the feed lever. Wrap tape around the bottom-most feed lever, and add the plastic clamp.

Note: When sanding on the table, we found it best to depress the pedal slowly, lowering the sanding drum. Then, pull the workpiece away from the sanding drum, and release the foot pedal, allowing the drum to rise.

the lever must not be secured too tightly—it must be able to swivel on the lever. The pedal should be in the full raised position when attaching the cable to the lever.

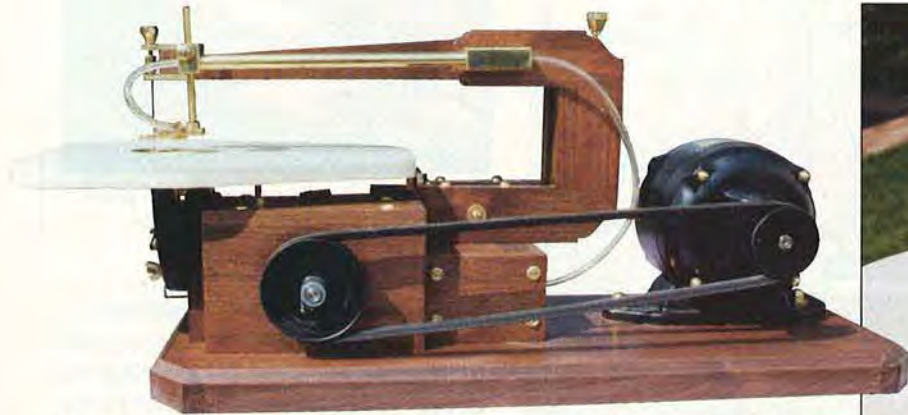
5 Take a 3/8" plastic clamp (available in the electrical section of your local hardware store), and attach it to the bottom forward feed lever on your drill press where shown on the Section View drawing above.

6 Bend a 14"-long piece of 1/8" brass rod to the shape shown on the Parts View drawing to form the brass connecting rod. Secure the connecting rod to the lever (G) with a 1/8" speed nut. Connect the opposite end of the connecting rod to a plastic clamp on the bottom-most feed lever as shown in the photo above right. Wrap tape around the feed lever to keep the clamp from sliding up the

Written by Marlen Kemmet
 Project Design: James R. Downing
 Illustrations: Kim Downing; Lorna Johnson
 Photographs: Hetherington Photography

Project Showcase

We feature your best work



Canadian reader crafts a sumptuous scrollsaw

Canadian reader **Gerry McCudden** says our Collector's Series tools inspired him when he designed and built this sensational scrollsaw. The fully functional, brass-and-walnut beauty combines features from a number of commercial models, and boasts a Corian table that tilts both ways. Gerry, who hails from Regina, Saskatchewan, made the brass parts by hand, and added brass acorn nuts to dress up the washing-machine motor that powers the saw.

Historic clocks click for retired photographer

Retired commercial photographer **Bill Hopkins Sr.** of Des Moines, Iowa, took up woodworking 40 years ago with remodeling projects (including construction of his first darkroom). Later, he turned his skills to building and repairing clocks. For his 14"-tall, half-size Eli Terry pillar and scroll shelf clock (shown *right* in front of his full-sized version), he even made his own lock. Bill's 36" calendar clock *far right* is a replica of an 1868 model that was brought to him for repair.



Woodworkers bring reality to magical movie cupboard

In the movie *Indian in the Cupboard*, toy figures come to life when a boy locks them into an old cupboard. Asked by wishful lads to re-create the special cabinet, two readers spent hours viewing the video and drawing up plans. Retired accountant **Leslie Fontaine** of Weston, Ontario, built the one *left* for his six-year-old grandson, and **Don Hopkins** of Phoenix, Arizona, Chief Financial Officer of a redwood and cedar distributor, built the one *above left* for a seven-year-old neighbor. Neither woodworker mentioned whether his creation actually has demonstrated magical powers.





Special piece of wood spawns server project

When **Roger Hoffman** spotted a figured maple board with a discolored streak at a lumberyard, he decided to combine it with some figured maple and quilted cherry he was saving in his shop for a special project. This two-door server, which now graces the dining room in Roger's Hamilton, New York, home, is the result. The retired biology professor added kingwood and maple inlays to the piece, which stands 36" tall (to the flat top) and is 37" wide.

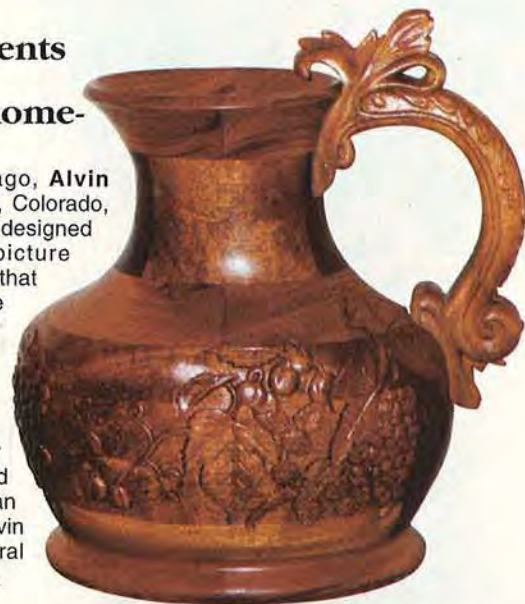
Georgia carver strives for realistic colors and habitat

As a youngster **Frank White** lived a while on his grandparents' North Carolina farm, where he carved his own wooden toys and became interested in art and wildlife. Later, he established a taxidermy studio in Bishop, Georgia. Then, it was a short step to carving wooden fish (like the bluegills *below*) and wild-fowl. For realism, Frank paints his carvings with iridescent taxidermy paints, and places them in lifelike habitats.



Carving accents oval forms turned on home-built lathe

About ten years ago, **Alvin Stark** of Berthoud, Colorado, read about a lathe designed for turning oval picture frames. He vowed that after retirement he would build a lathe for turning not just elliptical frames, but oval vases and other items, as well. This pitcher shows he reached that goal. And, as an added attraction, Alvin carves classical floral motifs on the pieces.



SHOW US YOUR STUFF

We'd like to see your best original work (but, no decks or other home improvements, please). Items built from kits or directly from published plans or patterns are ineligible, as are carvings done in classes or from roughouts. A project adapted from a plan or inspired by something you saw is OK. To submit your project for consideration:

- Send sharp color slides or glossy prints of the item. (We can't use Polaroids.) Include an overall view, plus any other angles or detail views necessary. Photos cannot be returned.
- Avoid cluttered or confusing backgrounds in photos. Include something to indicate function or scale, when appropriate.
- Even if it seems painfully obvious to you, explain what the project is or what it does—we don't want to call your lamp table a plant stand.
- Describe features, wood and finish used, overall dimensions, and anything else of interest.
- Tell us a little about yourself, too. Let us know how old you are, your occupation (or former one, if you're retired), how long you've been a woodworker, and so forth. Include a daytime phone number.
- Then send everything to:

WOOD® Magazine
Project Showcase
 1912 Grand Ave.
 Des Moines, IA
 50309-3379

Note: We cannot provide plans, drawings, patterns, measurements, bills of materials, instructions, or additional photographs, descriptions, or construction details for projects shown in this feature. Nor can we pass along addresses or telephone numbers of Project Showcase exhibitors.♣



Roundtable

A terrific table from a few

Your lathe skills will get a workout building this terrific table—every part is turned.

Project Prep

Tools:

$\frac{3}{4}$ - $1\frac{1}{2}$ " roughing gouge,
 $\frac{3}{8}$ " and $\frac{1}{2}$ " gouge,
 $\frac{3}{4}$ " skew,
 $\frac{1}{8}$ - $\frac{1}{4}$ " parting tool,
 $\frac{1}{2}$ - $1\frac{1}{2}$ " roundnose scraper.

Lathe equipment:

spur or cup drive center,
ball-bearing tail center,
3-4" faceplate.

Turn the spindle first

Draw diagonal lines to locate the centers on each end of a $3\frac{1}{2}\times 3\frac{1}{2}\times 26\frac{1}{2}$ " piece of mahogany. Mount the piece between centers, with a ball-bearing live center for the tailstock. Round it to about $3\frac{1}{8}$ " diameter (but not less than 3"), using a roughing gouge.

At the tailstock end, draw a mark $1\frac{3}{4}$ " from the end of the workpiece. With the lathe running, hold a pencil at the mark to draw a line around the turning marking the bottom of the spindle (Line A on the Spindle Layout drawing).

With a parting tool, cut in to a diameter of $1\frac{1}{8}$ ", slightly on the tailstock side of the line. Using a $\frac{3}{8}$ " gouge or a $\frac{3}{4}$ " skew, establish a square shoulder at the line, and turn a $1\frac{1}{8}$ " diameter tenon to the end. (This is $\frac{1}{8}$ " larger than the finished tenon size.) Make the shoulder square or slightly concave so it will fit snugly against the base.

From this shoulder, measure $23\frac{3}{4}$ " toward the headstock end. Draw a line there (Line B on the

drawing), and turn a square shoulder and tenon. Turn both tenons to 1" diameter.

Now, referring to the Table Section View drawing in the *WOOD PATTERNS*® insert in the middle of the magazine, lay out the details at the bottom (tailstock end) of the spindle. To do that, start by measuring from the bottom shoulder of the spindle (Line A) to each of the first six detail lines on the illustration. Then, measuring from the shoulder at the base, draw the remaining detail lines, shown on the Spindle Layout drawing.

For the details bracketed as 1, rough in diameters $\frac{1}{8}$ " larger than the finished dimensions shown. Then, with a $\frac{3}{8}$ " gouge or $\frac{3}{4}$ " skew, shape them to finished size. When measuring the finished diameters with calipers, turn off the lathe to prevent marring the wood. Sand with 120-, 220-, and 400-grit sandpaper.

Next, rough-in, finish-turn, and sand the transition between the bottom ornament and the central portion of the spindle (the area marked as 2). Do not turn the middle to the small diameter yet.

Move to the top (the headstock end), and lay out the details there. Turn and sand the ones marked 3.

Now, draw a line around the turning 14 " from the base shoulder. With the parting tool, carefully cut in to $1\frac{1}{4}$ " diameter at the line. To reduce drag on the side of the parting tool for this deep cut, gouge out a hollow centered on the kerf when you reach about an inch in depth. (Shown as the relief cut on the Spindle Layout drawing.) Shape the long curve (section 4) with a $\frac{1}{2}$ " gouge or a

Discussion

nights' work

skew. Check the diameters against the pattern at several points.

As you shape the central part of the spindle, particularly as you near the 1" finished diameter at the middle, the spindle may begin to vibrate and chatter. Light cuts with sharp tools will minimize this; scraping will make it worse. You can position a steady rest or place your free hand behind the workpiece to support it, too.

Sand the spindle's center section with progressively finer sandpapers. At each grit change, shut off the lathe and sand with the grain to minimize sanding marks.

Mark the turning and the drive center so you can remount the workpiece later in the same position. Remove the turning and the center from the lathe.

Build a base from discs

Bandsaw a 5½" disc and a 7½" one from 1"-thick mahogany as blanks for base discs B and C. Determine the best orientation for laminating them, and mark the mating faces.

Attach a wasteblock about 1½" thick to a 3-4" faceplate. True the sides and face.

Adjust your compass to the same diameter as the wasteblock face and draw a circle centered on the unmarked face of the smaller disc. Glue the wasteblock to the blank inside the circle, as shown *below*. Cyanoacrylate adhesive (instant glue) will hold it tight while allowing easy removal later.

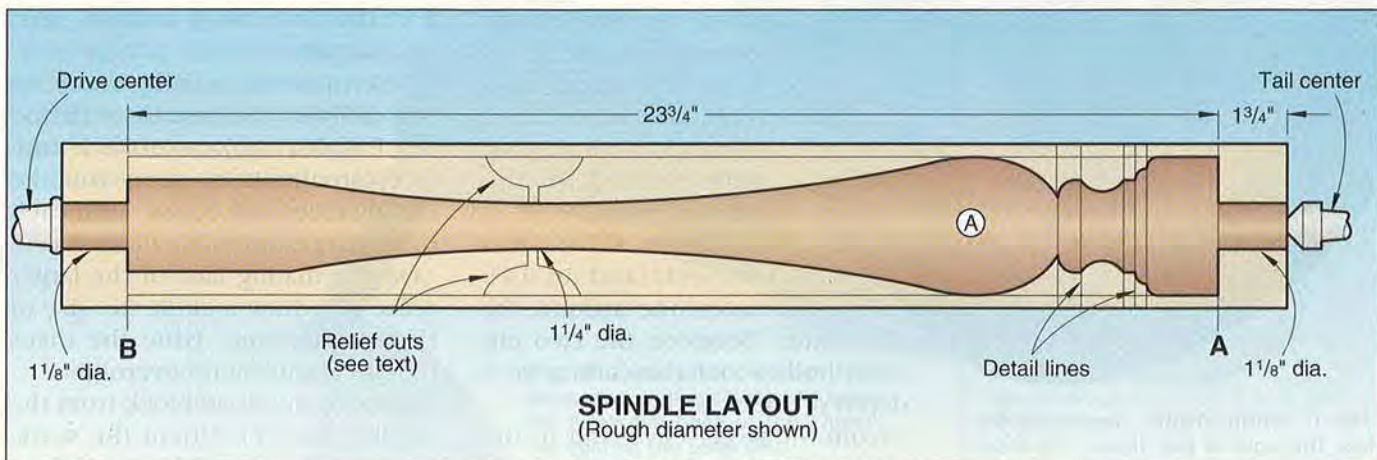
Turn the disc to 5" diameter, and flatten the face. A roundnose

scraper does this well. For a good glue joint, a flat surface is essential. Check it with a steel rule or square. With the lathe running, sand with 120-grit abrasive folded around a piece of scrapwood about 1×2×6". Turn off the lathe, and sand the face with 220-grit and 400-grit papers, going with the grain. Check the face for flatness again, and dismount it.

Continued



Apply cyanoacrylate adhesive inside the marked circle on the blank. Mist the face of the wasteblock with accelerator, and bring the two pieces together.



Roundtable

Mark the faceplate and wasteblock for orientation. Remove the faceplate from the turning.

Make another wasteblock for the faceplate. Glue it to the unmarked face of the larger blank. Turn the disc to 7" diameter, flatten the face, and sand.

Draw a 5" circle centered on the disc. Glue the small blank inside it, using woodworker's glue. Clamp overnight. (The tailstock holds it effectively, *right*.)

Dismount the assembly. With a mallet and chisel, remove the wasteblock from the small disc, as shown *opposite page*. Save it to reuse later. Remount the faceplate with the workpiece attached. True the face of the small disc as you turn it to $\frac{3}{4}$ " thick. Turn the edge profile. Sand, and check for flatness.

Install a drill chuck on the tailstock. With a 1" multi-spur or powerbore bit, bore through both discs. Remove the chuck and bit, and dismount the turning. With a chisel and mallet, separate the wasteblock-faceplate unit from the larger disc.



The lathe serves as a clamp when gluing the base discs together. A plastic bag protects the toolrest and lathe bed from dripping glue squeeze-out.

Remount the wasteblock-faceplate unit on the lathe. Then, turn a tenon $1\frac{1}{16}$ " in diameter and about 1" long, creating a jam chuck for completing the base discs (shown *left*).

Taking small cuts, fit the tenon on the jam chuck into the hole in the base discs (B and C). Press the laminated assembly onto the chuck with the large disc facing out. True the face of the large disc as you turn it to $\frac{3}{4}$ " thick. Turn the edge profile shown. Sand, and check for flatness.

Bandsaw a 13"-diameter disc from 1" mahogany for base disc D.

(We edge-glued two pieces to make wide stock.) Attach a wasteblock and faceplate

to the bottom side of the blank, then mount the assembly on the lathe. True the face, and

turn the disc to $12\frac{3}{4}$ " diameter. Reduce your lathe's speed for the big disc. True the face, and

Draw a 7"-diameter circle and an 11"-diameter one around the center. Between the two circles, hollow out the surface to a depth of about $\frac{3}{8}$ ".

From the larger circle out to the edge, turn the piece to $\frac{3}{4}$ " thick,

then form the edge profile shown. Scribe a circle on the face the same diameter as your wasteblock, and dismount the turning.

Separate the wasteblock-faceplate from the back of the disc, and glue it inside the circle on the front. Remount the turning, and true the bottom surface. To ensure a wobble-free table, form a shallow hollow in the bottom from about 1" inside the edge to the center. Mark the center, then dismount the turning. Drill a $\frac{5}{32}$ " hole through the center, and countersink it on the bottom (the hollow side). Remove the wasteblock-faceplate unit from the disc.

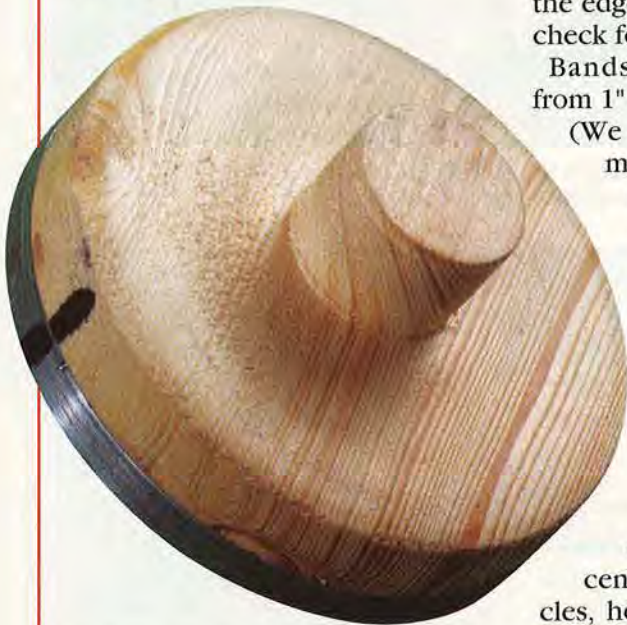
It's time for the top

From 1"-thick mahogany, bandsaw a 9" disc for Part E and an $11\frac{1}{2}$ " one for part F.

Determine the mating faces, as you did with the base discs (B and C). Employing wasteblock-and-faceplate mounting again, true the mating faces and edges. Turn each to the largest possible diameter.

On the mating face of the larger piece (F), draw a circle the size of the smaller one. Glue the discs together, and clamp overnight.

Remove the wasteblock from the smaller disc (E). Mount the workpiece by the wasteblock and face-



The 1" tenon on the jam chuck fits into the hole in the discs. The discs must fit snugly over the tenon.

plate on part F, and true the surface of E, bringing it to $\frac{3}{4}$ " thick. Turn E to $8\frac{1}{2}$ " in diameter, then form its edge profile. Sand.

With a tailstock-mounted chuck and 1" bit, bore $\frac{3}{4}$ " deep into the face of E. If your bit has a long pilot, grind it off; you don't want to go more than $\frac{1}{4}$ " into part F.

Separate the workpiece from the wasteblock, leaving the wasteblock attached to the faceplate. On the end of the wasteblock, turn a tenon $\frac{3}{4}$ " long to fit the hole in part E.

Mount the workpiece on the tenon, and bring up the tailstock to support it temporarily. Round the top (F) to 11", and turn it to $\frac{3}{4}$ " thick, truing the face.

Work as far in toward the middle as the tailstock allows. Then, slide the tailstock out of the way and remove the waste at the center. Slide the tailstock back up to support the workpiece.

Shape the edge on part F. Here's the procedure: Cut a $\frac{1}{4}$ " rabbet $\frac{1}{4}$ " deep around the edge of the disc. On the back of the disc, draw a circle $\frac{1}{2}$ " from the outer edge. Form a cove from the edge to the line. Then, shape the bead around the edge. Sand, taking care to preserve the crisp edge at the top.

Now, hollow out the center of the top. Start by drawing a circle $\frac{1}{2}$ " inside the rabbet edge. With the tailstock still in place, form the hollow from the line toward the middle, using a $\frac{3}{8}$ " gouge. Cut $\frac{1}{4}$ " deep.

Flatten the surface with a roundnose scraper. Slide the tailstock out of the

way, cut away the supporting tenon, and flatten that area. Sand, backing the sandpaper with a foam pad for the curved edge. Finish-sand with the grain, and remove from the lathe.

Put the pieces together

Fit the tenons on the spindle into the top and base holes. If the tenons are too big, remount the spindle on the lathe, aligning the index marks, and sand the tenons to size.

Then, with the corner of a parting tool, cut three small glue grooves around each tenon. Placement isn't critical; space them somewhat evenly along the length of the tenon.

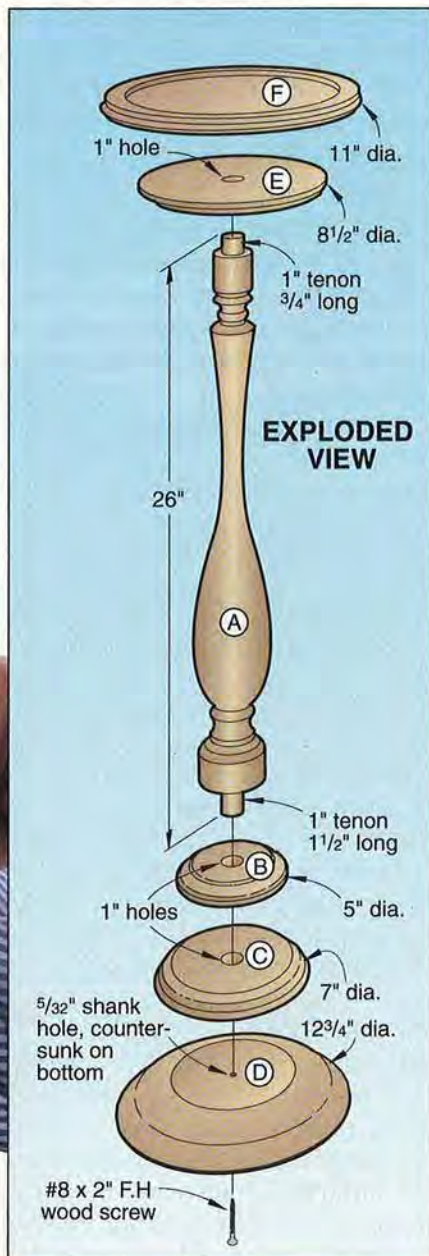
Trim each tenon to length. Make the top one slightly shorter than the $\frac{3}{4}$ " hole depth. The bottom one should fit flush with the bottom of discs B and C.

Apply glue to the top tenon, and press it into the hole in the turned top (parts E and F). Ensure that the spindle and top are per-

pendicular, and let the glue dry. Glue the bottom tenon into base discs B and C. Keep the discs perpendicular to the spindle.

Center base disc D on the bottom, and drill a $\frac{7}{64}$ " pilot hole through the center hole into the end of the tenon. Glue disc D to the base, and secure with a #8x2" flathead wood screw. Apply a clear finish overall. 🌲

Project Design: David Ashe
Illustrations: Roxanne LeMoine; Lorna Johnson
Photographs: John Hetherington



Pop the wasteblock from the base disc with a chisel and mallet. Keep the back of the chisel flat against the base disc.

4 Can't-Fail Finishes

Make your woodworking really shine

Have you ever spent countless hours carefully constructing a project, only to have a mediocre finishing job detract from your fine craftsmanship? There's a good chance we can help.

Depending on the project, WOOD® project builders Jan Svec and Chuck Hedlund get great results using oil-based polyurethane, lacquer, penetrating oil, or water-based polyurethane. Each finish has properties suited for particular projects, as shown at *right*.

The two polyurethanes stand up to both wear and moisture, making them good choices for tabletops, toys, and other heavily used objects. Oil-based poly flows out more evenly than water-based, but it gives off more fumes and takes much longer to dry. The oil-type also imparts a golden tone that enhances the natural color of woods like pine, oak, and cherry.

Lacquer, while durable, works best on projects that won't receive heavy wear or exposure to moisture. Typically available in sprayable or aerosol form, it can cover large surfaces rapidly, as well as small, intricate parts. It

dries quickly, so you can build up several coats in short order. Lacquer dries clear, letting wood's true color show through.

Penetrating oil goes on the easiest, but requires the most sanding preparation. Like lacquer, it's better suited to projects not exposed to heavy wear or moisture.

Water-based poly dries clear, so the wood's true color shows through. It cures hard, but lacks the resilience of oil-based finish.

While these four finishes vary, some finishing basics apply to all four. The following recommendations will help ensure a fine finish no matter which one you choose.

Brush up on the basics

• You can't rush a fine finish

Once the glue dries on an assembled project, many woodworkers feel the urge to get it finished quickly and put it into service. To achieve a fine finish, you need to fight this urge. Jan and Chuck, whose glassy-smooth finishes always draw rave reviews, consider a project at the finishing stage only about two-thirds complete.

• Plan ahead

Just as they plan a project's cutting and assembly steps, Jan and Chuck plan the finishing stage as well. Some pieces, such as inside drawer surfaces, or intricate moldings receive a finish sanding *before* assembly. In even harder-to-reach

areas, mating surfaces get masked off with tape and the finish applied prior to glue-up. To sand round knobs and drawer pulls, our builders simply chuck them in a drill press, then apply finish before installing these parts.

• Clean up glue squeeze-out

During assembly, clean up excess glue squeeze-out to save yourself some additional sanding and avoid finishing problems. You should wipe off excess glue immediately with a wet rag, and rinse the rag often so glue residue doesn't build up. You also can let the glue dry slightly, then scrape off the surplus with a cabinet scraper before it hardens.


• Don't scrimp on sanding

While random-orbit sanders have made sanding less painful, there's still no substitute for hand sanding. Use a firm sanding block, such as a cork-faced piece of wood, to keep workpiece edges crisp and prevent streaks caused by fingertip pressure.

• Control your environment

Apply your finishes in a clean, well-ventilated environment. Airborne dust raises havoc with trying to achieve a smooth finish. Finish fumes pose health risks if breathed and can ignite if exposed to a spark or flame, such as a pilot flame. Note, too, that faster-drying finishes are less apt to collect dust.

Continued



Our resident finishing experts, project builders Jan Svec, left, and Chuck Hedlund rely on four favorite finishes for most of the pieces they create. The type of project and the wood used determine the finish.

Jewelry Case
(from issue #82)
Penetrating oil
enhances the
finely figured grain
of bird's-eye maple.

Buffet
(from issue #95)
Oil-based polyurethane
provides a tough,
water-resistant finish.

Lamp
(from issue #88)
Spray lacquer helps you
get into tight corners.

Sideboard
(from issue #92)
Water-based polyurethane
lets the true color of white
pine show through.

1 Oil-Based Polyurethane

Pros:

Water and alcohol resistant
Resilient
Resists wear

Cons:

Long-drying time
Difficult to apply and repair

Ideal for:

Tabletops
Heavily used furniture
Children's toys

Tough stuff for a hard, long-lasting shine

For a heavily used surface such as a casual dining room tabletop, nothing works better than oil-based polyurethane. Tough and scratch-resistant, it stands up well to water, alcohol, and other beverages that might get spilled on it. Clear polyurethane gives a warm, golden glow to most woods, although a number of companies sell polyurethane with stain mixed into it.

Jan and Chuck use a number of brands with similar success although Minwax's Fast-Drying Polyurethane shortens finishing time. A long drying time—one of oil-based poly's biggest drawbacks—makes working in a relatively dust-free environment even more important, since dust has a longer time to settle onto a project.

Preparation. Finish-sand the surface with 180-grit sandpaper, but



Once dry, oil-based polyurethane finishes, like those here, offer years of protection. Choose between gloss and satin for the desired look.

no finer than 220-grit since a surface that's too smooth will cause bonding problems. Vacuum off the sanding dust, then wipe the piece down with a clean rag or tack cloth.

Application. You can use a poly-foam brush, but Jan prefers a "good" natural bristle brush. Such a brush costs \$10-20, lays finish down smoothly, and won't shed bristles. For small or intricate pieces, oil-based polyurethane comes in aerosol cans.

First coat. Even if you want a satin finish, use gloss polyurethane on the first coat because it lets the wood grain show through and reveals uneven spots better. It also rubs out easier than satin. If you put it down over stain, apply a

second coat, with no sanding between applications.

Between coats. Allow the finish to dry overnight, then use 220-grit sandpaper to rub the entire surface to a uniform dullness. Wipe the piece with a clean dry cloth.

Final treatment. Apply gloss or satin polyurethane, depending on the desired finish, and let the piece dry for a couple of days. On flat surfaces such as tabletops, Jan sometimes lightly drags a dull cabinet scraper across the surface to knock off the dust bumps, as shown at *lower left*. Buff out the finish using a white 3M Scotch-Brite 7445 light-duty cleansing pad. You can set your random-orbit sander on the Scotch-Brite pad and apply only light pressure to speed up the buffing process. For a mirror-like finish, buff out the finish using an automotive-type polishing compound and a power buffer.

Maintenance. Minor surface scratches buff out easily, but deep gouges require sanding and reapplying finish to the entire surface.



2 Spray Lacquer

Pros:

Fast drying
Builds quickly
Easily repaired

Cons:

Not water resistant
Contains highly volatile solvents

Ideal for:

Furniture (except tabletops)
Decorative wood projects



Though lacquer can be brushed on, pros prefer spraying on the finish because of the quicker drying time. They typically can apply several coats in a day.

Speed and sprayability—lacquer's strong suits

When you're working against a deadline, reach for quick-drying lacquer. The solvents in lacquer, primarily acetone, evaporate quickly, allowing you to apply four or more coats of finish in a single day. These solvents slightly dissolve the previous coat, making a strong bond between coats.

Preparation.

Begin by sanding down the entire project, progressing from 100- to 180- and finally 220-grit sandpaper. Vacuum off the

sanding dust, then wipe the piece down with a clean rag or tack cloth. If you apply a stain, follow the stain manufacturer's directions to ensure the stain dries evenly and thoroughly.

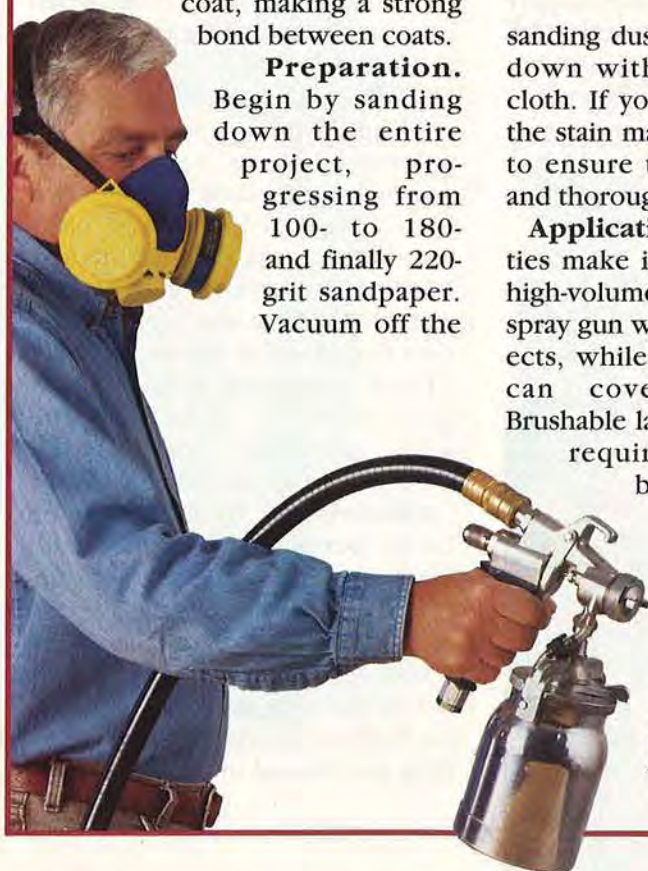
Application. Lacquer's properties make it ideal for spraying. A high-volume, low-pressure (HVLP) spray gun works well for large projects, while lacquer in spray cans can cover small projects. Brushable lacquers dry slower, but require you to use natural bristle brush since the solvents in lacquer can dissolve synthetic bristle and poly-foam brushes. Whether you spray it or brush it, wear an approved respirator and work in a well-ventilated area.

First coat. Apply a heavy, wet coat and allow it to dry. On stained surfaces, Chuck likes to apply a second coat as soon as the first coat dries.

Between coats. Sand lightly between coats with 320-grit sandpaper, to knock off the high spots, then wipe the surface with a clean dry cloth. Normally, Chuck gives most projects three coats.

Final treatment. Generally, a light buffing takes care of any surface blemishes, although rubbing out lacquer with polishing compounds produces a mirror-like sheen people will want to touch.

Maintenance. To remove scratches, buff or lightly rub them with lacquer thinner, then recoat and rub out the finish to match the surrounding area. On stained wood, be careful not to sand down to bare wood.



Continued

3 Penetrating Oil

Pros:

Easy to apply and repair
Enhances figured wood grain

Cons:

Not water resistant
Bleeds on open-grained wood

Ideal for:

Fine furniture not
exposed to wear
Decorative wood projects

Choose penetrating oil for fine furniture or figured grain

Nothing matches a hand-rubbed oil finish for putting a warm glow on a piece of fine furniture. Penetrating oil brings out the highlights in wood and enhances the figure of the grain. Although well-suited to tight-grained woods such as maple, cherry, and walnut, penetrating oil tends to bleed back out of the deep pores of oak. It lacks the durability of the other finishes, but makes up for it in the ease of application and maintenance.

Brands such as Minwax Antique Oil Finish, Deft-Oil, Penofin Oil, and Watco Danish Oil come in clear or several darker shades. Jan prefers the Minwax oil because it takes only two coats to build up a finish while the others require three or more.



Penetrating oils, like those above, work well with tight-grained woods. In addition, they require fewer coats than the other three finishes.

Preparation. Oil finishes require the most sanding preparation. Progress through 220-grit sandpaper, then go back over the piece with 320-grit or finer as shown *below*. Vacuum off the sanding dust, then wipe the piece down with a clean rag or tack cloth.

Application. Use a bristle or poly-foam brush to apply the oil to the wood. Small parts can be dipped in a container of finish.

First coat. Lay on the oil. When it just starts to feel tacky, wipe off the excess with a clean, lint-free cotton rag. If it dries too quickly, reoil lightly, then wipe clean.

Between coats. Let the finish dry overnight, then rub it down with a gray 3M Scotch-Brite ultra-fine abrasive pad. Rub with the grain to prevent cross-grain scratches. Wipe the piece clean, then reapply oil as before.

Final treatment. When the second coat dries, buff the finish with a soft, clean cloth. For added luster, apply paste wax, then polish.

Maintenance. To maintain an oil finish, periodically recoat it with the same oil originally used to finish the piece. This replenishes the surface and hides scratches. Wipe waxed finishes with mineral spirits before applying more oil. Dirty finish can be removed using a Scotch-Brite pad dipped in oil finish.



4 Water-Based Polyurethane

Pros:

- Tough and durable
- Water resistant
- Soap and water clean
- No fumes

Cons:

- Difficult to apply evenly
- Raises grain of wood

Ideal for:

- Furniture
- Floors
- Toys
- Applying indoors



Water-based polyurethane, while it raises grain during application, will not alter the look of wood. Fumes pose no problems and cleanup can be done with water.

Water-based poly dries fast, for true colors, few fumes

While well-suited for many of the same projects as its oil-based cousin, water-based polyurethane has very different properties. First, it dries clear so the color of the wood will not yellow, as illustrated by the pine sideboard on *page 46*.

Because it contains water, this finish raises the wood grain. To minimize grain raising, wipe down the piece with a wet rag, letting it dry; sand off the raised grain.

Water-based polyurethane dries much faster than oil-based poly, but this makes it harder to brush out evenly. Its water composition also requires that you use only synthetic abrasive pads, since the par-

ticles left behind by steel wool rust and leave dark stains in the wood.

Finally, water-based polyurethane is low on fumes and cleans up with water, making it a good choice for shops where adequate ventilation for solvent-based finishes presents a problem. Our project builders have achieved good results applying Carver Tripp's Safe and Simple Clear Poly and Minwax Polycrylic with a brush.

Preparation. Finish-sand with 220-grit, wipe the project with a wet rag or sponge, and allow it to dry. Sand just enough with 220-grit to remove the raised grain.

Application. Brush water-based poly on in thin coats using a quality synthetic bristle brush. Some brands work with a HVLP sprayer, but follow can directions for thinning information.

First coat. Apply a thin coat and don't over-brush it. If you get foaming, dab it up with a clean cloth, then brush out any marks.

Between coats. After the first coat cures, sand lightly with 220-grit sandpaper to remove any raised grain. Vacuum off the sanding dust, then wipe the piece down with a water-dampened rag.

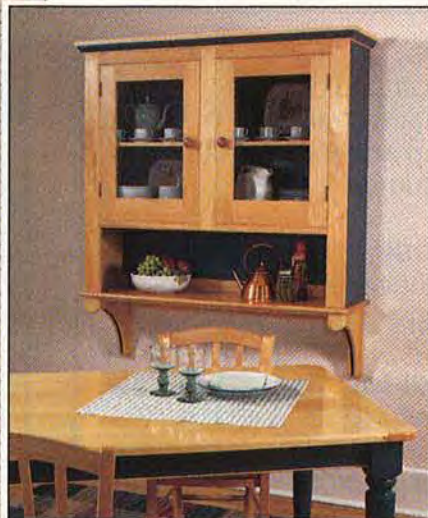
Final treatment. Apply a second thin coat and repeat the steps above. After a final application, allow the finish to cure, then buff it out with a white Scotch-Brite pad and/or polishing compound.

Maintenance. Minor surface scratches will buff out, but deep scratches mean sanding and reapplying finish to the entire work-piece surface. ♣



Written by Kerry Gibson with Jan Svec and Chuck Hedlund
Photographs: Studio Au, John Hetherington

COUNTRY BUFFET



Here's the matching cupboard we promised you for the country buffet we featured in the February 1997 issue (#95). The project looks terrific sitting atop the buffet or alone hanging on a wall.

Both of these projects complement the table we ran in the August 1996 issue (#89). If you want a whole roomful of this style of furniture, you now have everything you need to get started.

Let's start with the carcass

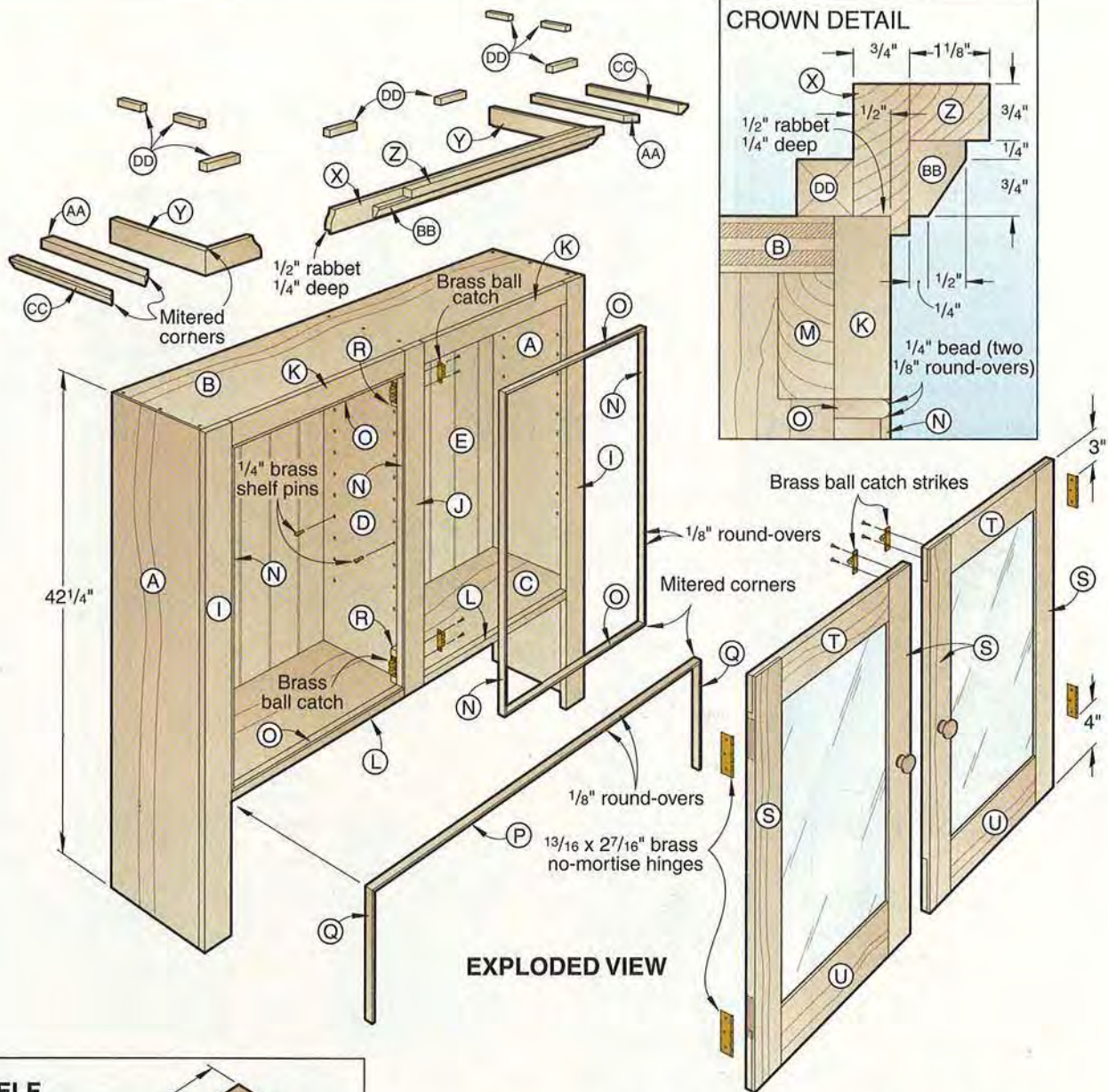
1 From $\frac{3}{4}$ " birch plywood, cut the carcass sides (A), top (B), bottom (C), and center panel (D) to the sizes listed in the Bill of Materials.

2 Install a dado head in your table-saw. Test-cut scrap stock to verify the width of cut. Use shims between the dado cutters if necessary so the width of cut matches the exact thickness of your plywood. Once verified, cut $\frac{1}{2}$ "-deep dadoes and rabbets in the sides (A) where shown on the Carcass drawing *at right* and where dimensioned on the Parts View drawing on *page 70*.

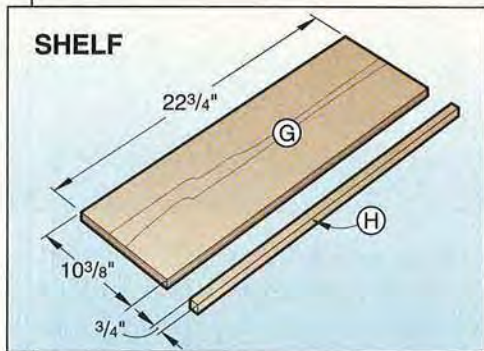
3 Measure and mark carefully, then cut $\frac{1}{8}$ "-deep dadoes on the *bottom* surface of the top panel (B) and the *top* surface of the bot-

Continued

COUNTRY BUFFET & CUPBOARD



EXPLODED VIEW



SHelf

tom panel (C) where located on the Parts View drawing.
4 Cut a 1/2" rabbet 1/4" deep along the back inside edge of the side

panels (A) and top (B) where shown on the Carcase and Parts View drawings.

5 Glue and clamp the top (B), bottom (C), and center panel (D) into their respective rabbets and dados in the carcass sides (A). Take diagonal measurements to check for square, and make sure the front edges are flush.

6 Drill countersunk shank and pilot holes, and screw the top (B) to the side panels (A) and the center panel (D) to B and C.

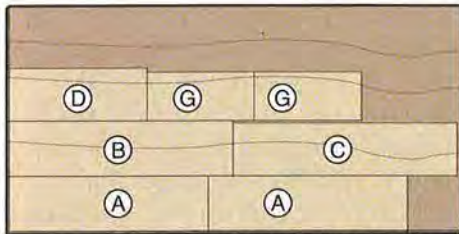
Add the back and banded shelves next

1 Measure the rabbeted opening, and cut the back (E) to size from 1/2" plywood. Then, cut the back rail (F) to the size listed in the Bill of Materials from solid stock.

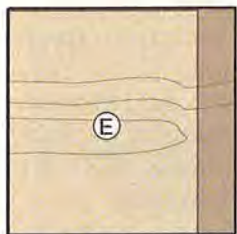
2 Install a 1/8" slot cutter in a handheld router, and adjust it to cut a slot centered in the thickness of the back (E) where dimensioned in the Rabbet and Spline detail accompanying the Carcase drawing. Now, working from the *back*

Bill of Materials

Part	Finished Size			Mati.	Qty.	Part	Finished Size			Mati.	Qty.	Part	Finished Size			Mati.	Qty.
	T	W	L				T	W	L				T	W	L		
CARCASE						BEADING						Z* horizontal front	3/4"	1 1/8"	50 3/4"	M	1
A sides	3/4"	11 3/4"	42 1/4"	BP	2	N* upper vert. bead	1/4"	3/4"	27 3/4"	M	4	AA* horizontal sides	3/4"	1 1/8"	13 7/8"	M	2
B top	3/4"	11 3/4"	47 1/2"	BP	1	O* upper horz. bead	1/4"	3/4"	20"	M	4	BB* molding front	3/4"	1"	50"	M	1
C bottom	3/4"	11 1/4"	47 1/2"	BP	1	P* lower horz. bead	1/4"	3/4"	42 1/2"	M	1	CC* molding sides	3/4"	1"	13 1/2"	M	2
D center panel	3/4"	11 1/4"	29 1/4"	BP	1	Q* lower vert. bead	1/4"	3/4"	11 3/4"	M	2	DD glue blocks	3/4"	3/4"	3"	M	8
E back	1/2"	47 1/2"	40"	BP	1	R catch blocks	3/4"	1 1/8"	3"	M	4	*Initially cut parts marked with an * oversized. Then, trim to finished size according to the how-to instructions. Materials Key: BP—birch plywood, M—maple Supplies: #8x2" flathead wood screws; 2 pair of 1 3/16x2 7/16" no-mortise brass or statuary bronze hinges; 2 pair of 1 1/16x5/16" adjustable brass ball catches with strikes; 2-1 3/4"-diameter Shaker knobs; 1/4" brass shelf pins; #17x1" wire brads, single-strength glass, primer and enamel paint, clear finish.					
F back rail	3/4"	2"	47 1/2"	M	1	DOORS											
G shelves	3/4"	10 3/8"	22 3/4"	BP	2	S stiles	3/4"	3"	27 1/8"	M	4						
H shelf banding	3/4"	3/4"	22 3/4"	M	2	T upper rails	3/4"	3"	19 3/8"	M	2						
FACE FRAME						U lower rails	3/4"	4"	19 3/8"	M	2						
I side stiles	3/4"	2 3/4"	42 1/4"	M	2	V vert. stops	3/8"	1/2"	21 1/8"	M	4						
J center stile	3/4"	2 1/2"	30 1/2"	M	1	W horz. stops	3/8"	1/2"	13 3/8"	M	4						
K top rails	3/4"	2"	20"	M	2	CROWN											
L bottom rails	3/4"	3/4"	20"	M	2	X* vert. front	3/4"	2"	48 1/2"	M	1						
M glue blocks	3/4"	1 1/4"	4"	M	4	Y* vert. sides	3/4"	2"	12 3/4"	M	2						



3/4 x 48 x 96" Birch plywood



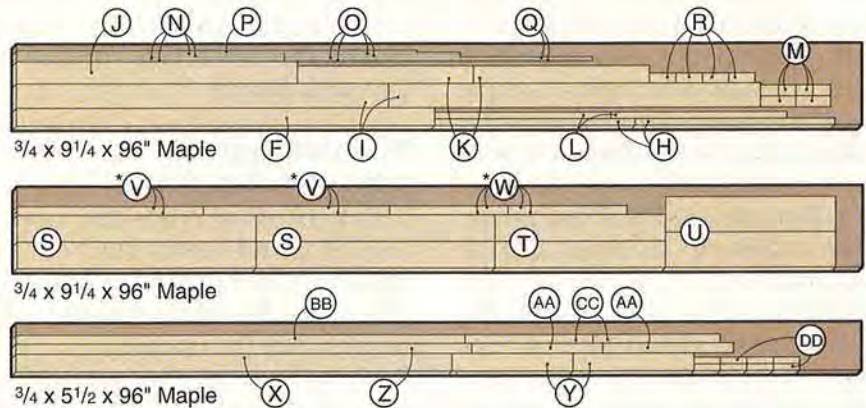
1/2 x 48 x 48" Birch plywood

*Plane or resaw to thickness listed in the Bill of Materials.

CUTTING DIAGRAM

side of the back (E) and rail (F), rout a 1/8" slot 1/2" deep.

3 Using a straightedge and working from the center out, mark the locations of the V-grooves on the front of the back (E) 3 1/2" on center where shown on the Carcase drawing. Chuck a 90° V-groove bit



into a handheld router, and adjust it to cut 1/8" deep. Measure from the edge of the router base to the center of the bit, and cut a scrap of wood to this dimension. Use this block as a spacer to position the straightedge the proper distance from each marked line, and rout the grooves as shown in the photo on the following page.

4 Cut 1/2"-wide rabbets 1/4" deep across the front face of the ends of the back rail (F).

5 Cut a 1 5/16x47 1/2" spline from 1/8" hardboard, and use it to assemble the back rail (F) to the bottom edge of the back (E) where shown on the Rabbet and Spline detail. This assembly will *not* be glued together until after the finish is applied. Clamp the back/back rail assembly into the rabbet in the back of the carcase. Drill counter-sunk shank holes through the back and into the carcase and secure with wood screws.

Continued



Use a straightedge as a guide to rout the decorative grooves in the plywood back. A spacer block is used to position the straightedge from the marked lines.

6 Cut the adjustable shelves (G) from $\frac{3}{4}$ " plywood and the shelf banding (H) from solid stock. Glue and clamp the banding to the shelves, and scrape and sand the banding flush.

Next, build the face frame

1 Cut the side stiles (I) and center stile (J) to size. Sand a slight chamfer on the mating edges of the sides (A) and side stiles (I) where shown on the Carcase drawing.

2 Dry-clamp (no glue) the side stiles (I) and center stile (J) to the cabinet, keeping the outside edges of the side stiles flush with the outside surfaces of the sides (A). Trim the stiles if necessary. Glue and clamp the stiles (I, J) to the carcase.

3 Cut the top rails (K) and the bottom rails (L) to size. Check their fit between the stiles, and glue and clamp them to the carcase. The top edges of the top rails should be flush with the top surface of the top panel (B).

4 Cut the glue blocks (M) to size, and glue them in place.

5 Cut to shape the Shelf-Hole Template shown on the Parts View drawing on page 70. Drill the $\frac{1}{4}$ " holes through the template where dimensioned. Then, use the template to drill the $\frac{3}{8}$ "-deep shelf-pin holes in the sides and divider. (We used a stop on our bit for consistent depths.)

Add the decorative maple beading

1 From the edge of $\frac{3}{4}$ " maple, rip $\frac{1}{4}$ "-wide strips for the beading (N, O, P, Q) to the sizes listed in the Bill of Materials plus 2" in length.

2 Install a $\frac{1}{8}$ " round-over bit into your table-mounted router, and position the router-table fence flush with the edge of the pilot bearing. Then, rout the front edges of each strip, using a feather board for safety and to ensure consistent round-overs.

3 Sand a slight chamfer along the front edges of the face frame members that will receive the beading (N, O, P, Q). Miter-cut the beading strips to length, and glue and clamp them to the face frame where shown on the Exploded View drawing.

4 Cut the catch blocks (R) to size, and glue and clamp them in place on the back side of the center stile (J) where shown on the Carcase drawing. Later, you'll mount the brass ball catches to the catch blocks.

Machine a pair of glass-paneled doors

1 Cut the door stiles (S), upper rails (T), and lower rails (U) to size. Lay out the parts to form the two doors. The door should be $\frac{1}{8}$ " smaller than the opening.

2 Mark the front face and inside edge of each stile and rail. Then, cut $\frac{1}{2}$ " rabbets $\frac{1}{2}$ " deep along the inside *back* edge of each piece.

3 Cut mating lap joints across the ends of the stiles and rails to the sizes noted on the Door drawing and accompanying Lap Joint detail. (We used our tablesaw.)

4 Glue and clamp the stiles and rails together for each door. Check for square, and set on a flat surface to dry.

5 Mark the knob-hole centerpoint on each door. Measure the diameter of the tenon on your Shaker

knob (they can vary in size), and drill the mounting hole.

6 Measure the rabbeted opening, and have single-strength glass cut to size minus $\frac{1}{8}$ " in each direction.

7 Cut the stops (V, W) to size. Drill pilot holes through the stops, and temporarily install the stops and glass panels to check the fit. Remove the stops and glass; you'll finish the doors and stops before nailing the stops in place.

8 Install the doors using the no-mortise hinges. See the Exploded View drawing for hinge locations. Attach the catches and strikes.

Top things off with some decorative crown molding

1 Cut the crown molding pieces (X, Y, Z, AA, BB, CC) to the sizes listed in the Bill of Materials plus 1" in length.

2 Cut $\frac{1}{2}$ " rabbets $\frac{1}{4}$ " deep in pieces X and Y where shown on the Crown detail accompanying the Exploded View drawing. Miter-cut pieces X and Y to length. Then, glue and clamp them to the top of the carcase.

3 Miter-cut pieces Z and AA to length. Glue and clamp them to X and Y, with the top edges flush.

4 Miter-cut the crown molding front (BB) and sides (CC). Check the fit, but do not glue them in place. They're attached after they've been painted.

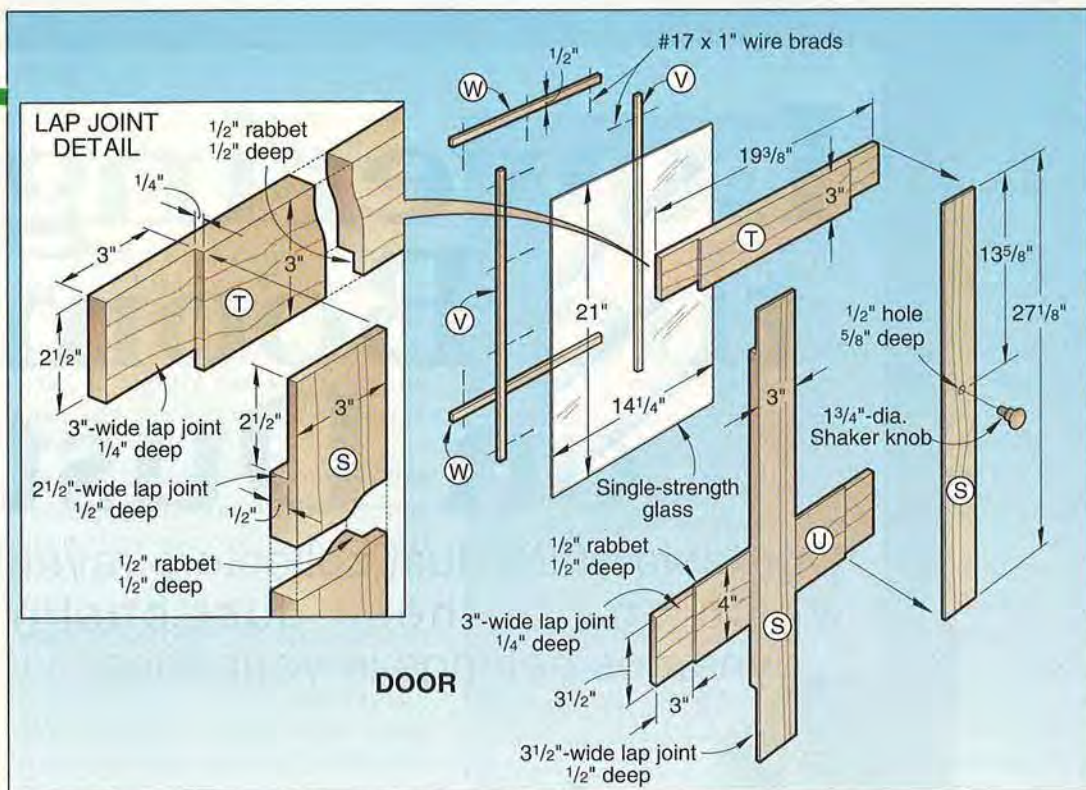
5 To reinforce the bond between the crown and the top of the carcase, cut the glue blocks (DD) to size, and glue them in place.

Finishing and final assembly

1 Remove the shelves, back/back rail (E/F), doors, hinges, and catches. Separate the back from the back rail.

2 Sand everything to 220-grit. (We sanded the knobs by chucking them into a drill press.)

3 Mask the carcase sides from the face frame and the crown. Mask a



5 Remove the masking tape as shown in the photo *below left*. If a gummy residue remains, clean with a cloth dampened with lacquer thinner.

6 Using masking tape, mask off the face frame stiles and prime the carcass sides. Then, prime the back (E) and crown molding (BB, CC). (We used Krylon Sandable Primer, #1315 All-Purpose Primer White.) Sand lightly with 320-grit sandpaper

Note: For use directly on top of the buffet, the construction for the cupboard is now complete. Continue with the next section for the finishing instructions. But, if the cupboard is going to hang on the wall, see the Bill of Materials, Cutting Diagram, and Exploded View drawing on page 72 for the plans to build the sturdy bracket and shelf used to support the wall-hung cupboard.

$\frac{3}{4}$ " strip where the crown molding (BB, CC) will be glued in place later.

4 Apply a clear finish to the inside of the carcass and face frame (just to the sanded chamfer at the joint between the stile and side panel). Add finish to the back rail, door frames and stops, knobs, and adjustable shelves. (We used Minwax Fast-Drying Gloss Polyurethane for the first coat, sanded it with 220-grit sandpaper, and used satin polyurethane for the finish coat.)

per adhered to a sanding block after the primer has dried. Then, paint the primed areas (we used Rust-Oleum American Accents Heritage Satin Finish Teal 7929). Let the paint dry. If necessary, sand with 600-grit wet/dry sandpaper, and add a second coat. Then, remove the masking tape.

7 Glue, spline, and clamp the back rail (F) to the back (E). Screw the back assembly in place.

8 Glue and clamp the crown molding in place. Glue the knobs into the doors. Install the glass panels in the doors and fasten the stops in place. Mount the hinges on the doors and attach the doors to the carcass. Attach the catches.

9 Remove the top from the buffet, and carefully lay out the position of the bottom ends of the sides (A) on the buffet top. To do this, use the same hole locations shown on the bracket shelf (LL).

10 Working from the bottom side of the buffet top, drill counter-sunk holes and form the slots. Screw the cupboard to the buffet top. With the aid of a helper, set the cupboard/buffet top onto the buffet and secure with screws. 🍀



After applying the clear finish, remove the masking tape, including that where the crown molding needs to be glued.

Written by Marlen Kemmet Project Design: Jan Hale Svec Illustrations: Kim Downing; Lorna Johnson Photographs: Bill Hopkins

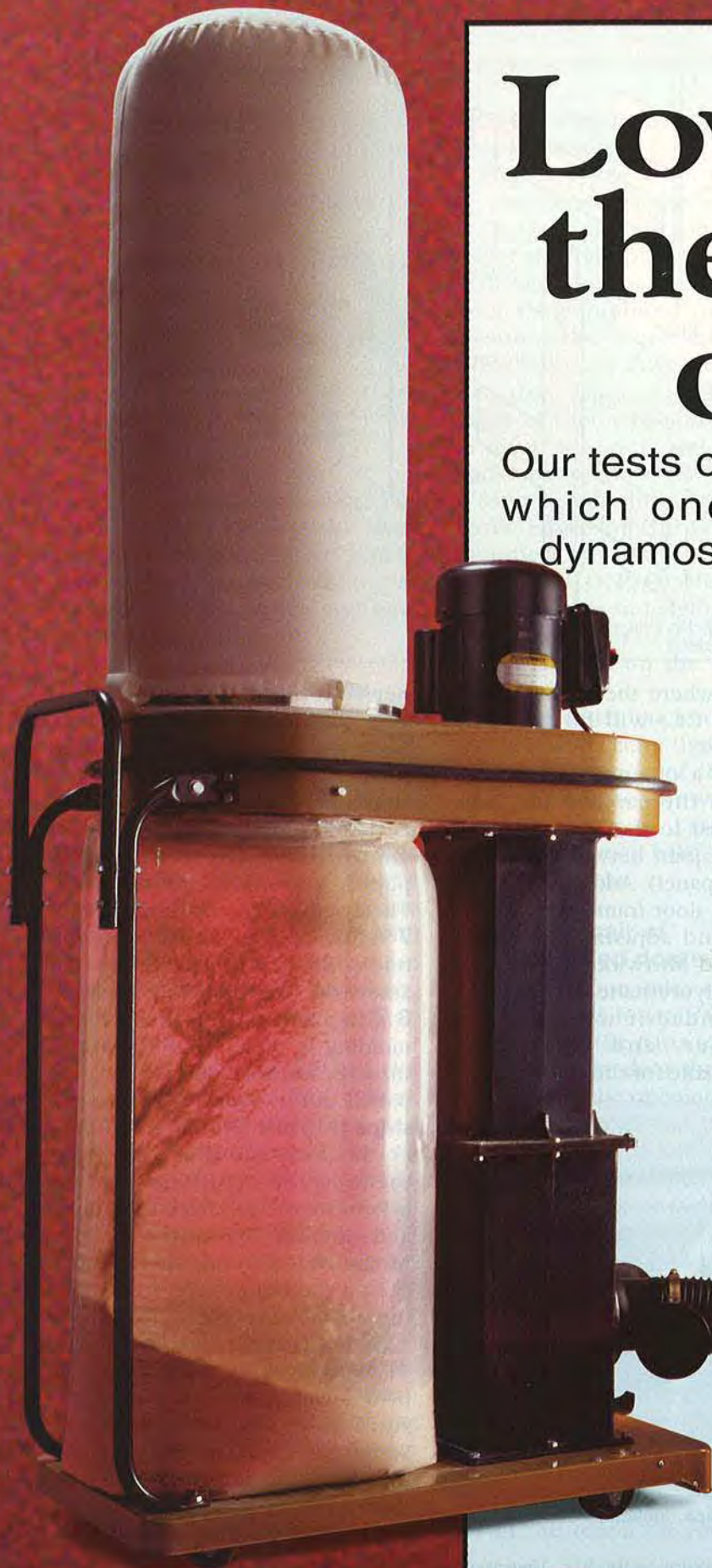
Lowering the Boom on Dust

Our tests of 25 dust collectors reveal which one of these dust-bustin' dynamos belongs in your shop.

If you do any amount of wood-working, you know how fast wood chips, shavings, and sawdust pile up. The big chips create a nuisance underfoot, but the fine dust that sifts into every nook and cranny becomes downright devilish. It can spoil a finish, cause wear and tear on motors, and create a health hazard.

To keep this worrisome dust in check, you need to collect it at the source—your woodworking tools—and contain it. Dust collectors solve both problems, and we tested 25 models to help you choose one to settle the dust in your shop.

 [Print this article](#)



High-volume air flow – the key to dust collection

Most woodworkers own a shop vacuum, so why spend \$175 to \$700 for a dust collector when you could use that money to buy a “real” tool? While a shop vacuum plays an important cleanup role, it simply can’t handle the dust and chips generated by most power tools.

A typical shop vacuum operates with high suction, or static pressure, but moves only a small amount of air—80 to 120 cubic feet per minute (cfm). That’s why vacuums come equipped with 1¼"- to 2½"-diameter hoses—to concentrate the air flow. Unfortunately, these hoses plug quickly when trying to handle the volume of chips generated by tools such as planers.

Dust collectors contain centrifugal impellers, turbinelike fans that move much larger volumes of air—300 to 1,900 cfm. Sustaining such air flows requires 4-6" hoses or ductwork, which also can move large volumes of debris without clogging.

Shop vacuums, with their high-speed, noisy universal motors, are intended for short-term, intermittent use. The slower, quieter induction motors in most dust collectors allow for long-term, continuous duty.

Dust collectors also differ from air cleaners, in which a furnace-type blower pulls dusty shop air through a series of filters and recirculates it. Air cleaners trap dust only after it has become airborne, making them a good secondary line of defense—along with a good dust mask—in the battle against dust.

To win the dust control war, you must collect dust at the source before it has a chance to get airborne. And that’s precisely what a dust collector does.

Fast Facts

- While many of the collectors we tested are built virtually the same, the performance varied greatly based on the filtration capabilities of the collection bags.
- When it comes to filtering out dust, polyester/felt bags do an excellent job without restricting air flow. We’ll tell you which machines offer these as standard equipment or options.
- Cyclone collectors lead the pack in removing even fine dust (15 microns) before the air reaches a filter.

Chalk dust test shows filter bag efficiency

After assembling the collectors—a chore in itself—we sucked up and emptied several loads of chips and dust to build up a dust cake inside the bags. Then we drew air loaded with fine red chalk dust through each of the filter bags backed up with a heavyweight paper towel, as shown *below*, to determine if any of the dust had passed through. If red dust appeared on the paper towel, as it does on the one at *right*, it indicated that the bag wasn’t filtering dust sufficiently to avoid causing health risks.



How much capacity do you need, anyway?

Dust collector air-flow ratings vary greatly, depending on a number of factors, such as the size and number of intakes, and how much dust is built up on the filter material. Small portable collectors rated between 300 and 450 cfm will handle one tool at a time, except high-volume dust and chip producers such as planers, shapers, and large stationary sanders. With bags deflated, you can store these small units under a workbench.

Collectors in the 500-750 cfm range can take on nearly any home shop machine singly and will also work with central dust collection systems in small shop settings. Most of the 1-hp collectors we tested fall into this range, and all will operate on 110 volts. Just remember to keep yours on a separate circuit from your power tools to avoid an overload.

To handle two or more tools simultaneously, you’ll need a collector in the 900-1,300 cfm range. The 1.5- to 2.5-hp machines we tested fell into this range, making them suitable for most central collection systems. While a few will run on 110 volts, their high amperage requirements invite circuit overloads, so consider using 220-volt service.

We tested four machines rated above a whopping 1,800 cfm and these definitely belong in large shop situations where several tools are running simultaneously. All feature 3-hp, 220-volt motors, and take up considerable floor space. Inflated, they reach near ceiling height.

Continued

Dust Collectors

Three different spins on capturing dust

Three types of collectors currently on the market, shown *below* in cutaway drawings, all use impellers. The main difference: They separate the debris at different stages.

The majority of the machines we tested fall into the single-stage category. Typically, these machines have twin bags. After passing through the impeller, heavy debris drops into the bottom bag while the top bag filters the air. On the small portables, one bag both collects the debris and filters the air.

In a two-stage collector the intake air flows into a collection drum first so that the large, heavy particles drop out before reaching the impeller. Only fine dust passes through the impeller and into the filter bag.

Cyclone collectors capitalize on their funnel shape to push both large particles and fine dust into a collection drum.



Impellers: consider noise and fire hazards

Because single-stage collectors pull everything—chips, wood chunks, stray fasteners—through the impeller, they can generate lots of noise. And metal striking a steel impeller can cause a spark, which could ignite highly flammable wood dust.

Nearly all the machines we tested use steel impellers. A few came equipped with plastic impellers. Somewhat quieter, but less durable than steel, the plastic models don't produce sparks.

The cast-aluminum impeller on the Oneida Systems cyclone, at lower *left*, also doesn't produce sparks. If your projects include metalworking, you can avoid sparking problems with a two-stage or cyclone collector. Since the heavy debris, including fasteners or metal fragments, drops out before passing through the impeller, the chance of creating sparks is virtually eliminated.



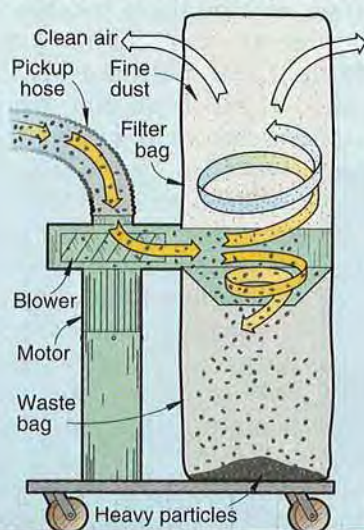
Most dust collectors in our test come equipped with steel plate impellers, as shown above.



SECO's manufacturer installs plastic impellers (above) in all models except the UFO102B.

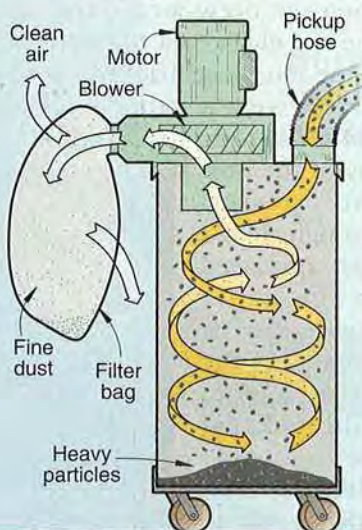
AN INSIDE LOOK AT THREE TYPES OF DUST COLLECTORS

SINGLE-STAGE COLLECTOR



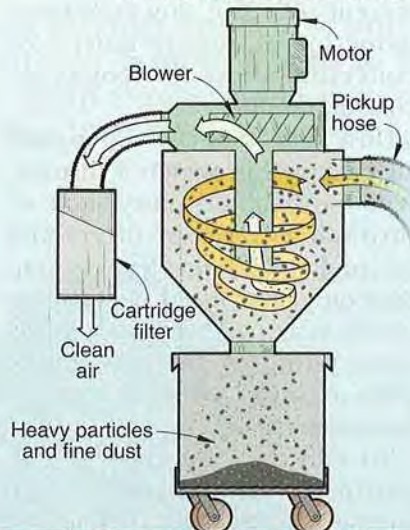
Everything sucked in passes through the impeller. Heavier chips drop into the bottom bag, while the top one traps the dust.

TWO-STAGE COLLECTOR



Heavy chips drop out first, so that only fine dust passes through the impeller. The filter bag then captures the fine particles.

CYCLONE COLLECTOR



Centrifugal force spins even fine dust out against the sides of the cyclone chamber. The funnel then directs it into the waste can.

Containing dust: the mark of a good filter

A dust collector's effectiveness depends on its filter material. If dust passes through the filter, there's little point in collecting it.

Several years ago, manufacturers equipped dust collectors with 50-micron bags. (A micron is a unit of length equal to .001 millimeter—a human hair is about 60 microns in diameter.) Today, most provide 30-micron or finer bags as standard equipment, and many offer 5-micron, polyester/felt bags as a higher-priced option. The inside surface of these bags is singed to prevent dust penetration and clogging.

In our tests, the 50-micron nylon filter bags on the Tradesman 9992 and Central Machinery TI686 (distributed by Harbor Freight) leaked clouds of dust. The makers of Grizzly, and more recently JET, made 30-micron nylon filter bags standard, and we found they performed well once a slight dust cake formed inside the bag. The nylon bags on the SECO machines were excellent at stopping dust, as were the canvas bags on the two Powermatic collectors, and the cloth bag on the Makita 410.

Penn State's three smaller collectors came equipped with polyester/felt bags—and we found them well worth the \$20-\$30 extra cost over the standard bags. The 5-micron bags come standard on Penn State's DC250.

Star Tools' optional polyester/felt top bag stopped all visible dust, as did similar optional bags from Grizzly and JET. These cost from \$30-\$50 for a 14"-diameter bag and \$40-\$70 for a 20"-diameter bag to fit most of the 2-hp and larger machines. Grizzly also sells 14" (\$49.95) and 20" (\$69.95) Gore™ CleanStream bags that filter particles down to .3 micron—virtually every speck.

More points to consider

• **Clamping systems.** As filter and collection bags fill up with chips and dust, they let less air pass through. The resulting increase in pressure can literally blow the bags off—an experience to be avoided at all costs. Therefore, the clamping system should hold the bags on tightly, yet allow for quick and easy emptying.

Most of the machines we tested feature quick-release metal band clamps to hold the bags in place. A few came with hose-clamp bands which worked fine, but required more time and a screwdriver to tighten.

The Sears 29978N had the slickest waste bag clamp system. A tension hoop sewn into the mouth of the bottom bag simply flexes and snaps into place as you insert it inside a rim on the housing.

• **Motors.** The Powermatic and Delta machines had the smoothest starting, quietest running motors. As mentioned earlier, many of the machines are dual voltage. Check the amperage in the chart, on page 63, and consider switching to 220-volt power for collectors which draw 20 amps or more at 110 volts.

• **Safety.** A spinning impeller will inflict serious injury to hands or fingers placed into the impeller housing intake. Makita provides the most effective safety system on its 410—a switch prevents it from operating when the pickup hose is disconnected. The Penn State DC5 has a removable grate over the intake, but it plugs easily when sucking up chips. The best safety precaution is to permanently clamp a hose or pipe to the intake. Should the intake

or impeller get clogged, unplug the machine, then use a stick to clear away the debris.

• **Mobility.** The small portables are easy to move and compact when not in use, but the inflated bags take up significant room. The easy-rolling 1-hp units take up the least amount of floor space when in use. While equipped with casters, the 2-hp models don't maneuver easily. Their weight and size make the 3-hp giants simply too large to move around on a regular basis.



The makers of JET sew elastic into the mouth of its bags to help hold the bags in place while you flip the band clamp shut.



Hose-type band clamps supplement the cinch straps, as shown, on the two larger Grizzly machines. Used alone, the cinch straps can work loose, allowing the bags to blow off.

Continued

Dust Collectors

If we were in the market ...

In the small portable class, we named the Makita 410 as the top performer, despite its noisy universal motor. The Penn State DC3—with its combination of power, high-filtration bag, and two-year warranty—ranks as both a top tool and top value. Grizzly's G1163 offers good performance for a rock-bottom price.

For the same reasons mentioned about its smaller counterpart, the Penn State DC1-B gets the nod as our top pick among the 1-hp collectors. The SECO UFO90 and JET DC650 offer good value for the money. The Sears 29978N also represents value based on the easy bag changing and nationwide parts and service support.

Among the 1.5- to 2.5-hp units, we had a tougher time picking a winner—most of the machines are built identically. We found the smooth, quiet Powermatic 073 to be the best-built machine. Penn State's combination of 5-micron standard bags and 2.5-hp motor make the DC250 a top tool at a great price. The Grizzly G1029 provides good value, even when you spend the extra \$50 for the polyester/felt filter bags.

The Powermatic 075 finished first among the four-bag behemoths, with the Grizzly G1030 chosen as a top value. If you're installing a centralized system, strongly consider the powerful, efficient Oneida Air Systems cyclone. The waste drum empties easily and the filter cartridge needs only occasional attention. Oneida sells the same unit without the blower (\$395) to retrofit an existing dust collector. The Blue Tornado also can add cyclone efficiency to your existing collector system. ☛

Written by Kerry Gibson
Technical consultant: Bob McFarlin
Photographs: Bill Hopkins Jr.; John Hetherington
Illustrations: Lorna Johnson

SMALL PORTABLES



1-HP COLLECTORS



1.5- to 2.5-HP COLLECTORS



3-HP COLLECTORS AND CYCLONES



THE LOWDOWN ON DUST COLLECTOR FEATURES

MANUFACTURER/ IMPORTER	MODEL	TYPE	IMPELLER (1)				FILTER BAG			MOTOR			SIZE (INCHES) (WxLxH)	NOISE (DECIBELS)	AIR FLOW (CFM)	PERFORMANCE (5)					WARRANTY (YEARS)	COUNTRY OF ASSEMBLY (6)	WEIGHT (POUNDS)	SELLING PRICE (7)
			IMPELLER MATERIAL	HOUSING MATERIAL	INTAKES (NUMBER/DIAMETER)	NUMBER	MATERIAL (2)	CLAMPS (3)	TYPE (4)	HORSEPOWER	AMPS	VOLTAGE				BAG FILTRATION	BAG CLEANING	BAG CHANGING	BAG CLAMPING SYSTEM	FIT AND FINISH				

SMALL PORTABLES

GRIZZLY	G1163	Single	SP	SS	1 @ 4"	1	NM	HC	TEFC	1	14/7	110/220	15x53x17	77	450	G	G	E	G	G	G	E	E	1	T	58	\$149.93*
MAKITA	410	Single	SP	SS	1 @ 4"	1	FC	SL	U	N/A	9	110	24x48x24	94	307	E	E	E	E	E	E	E	E	1	J	20	379.00*
PENN STATE	DC5	Single	SP	SS	1 @ 4"	1	PF	HC	U	N/A	5	120	13x14x23	90	914	E	G	E	G	E	E	E	E	2	T	18	189.00*
	DC3	Single	SP	SS	1 @ 4"	1	PF	HC	TEFC	1.5	12/6	110/220	15x54x17	76	760	E	G	E	G	E	E	E	E	2	T	46	214.95*

1-HP COLLECTORS

DELTA	50-180	Two	AL	SS	1 @ 5"	1	FC	HC	TEFC	1	13.6/6.7	115/200	30x56xVar	83	700	E	G	E	G	G	E	P	G	2	U	72	519.95*
HARBOR FREIGHT	T1686	Single	SP	SS	1 @ 6", 2 @ 4"	2	NM	QR	TEFC	1	14/7	110/220	26x38x77	87	750	P	G	F	G	E	--	G	E	90 days	T	143	359.99
JET	DC650	Single	PL	SS	1 @ 4"	2	NM	QR	TEFC	1	16/8	110/220	14x28x57	84	650	F	G	F	G	E	--	E	E	2	T	84	229.95*
PENN STATE	DC1-B	Single	SP	SS	1 @ 5", 2 @ 4"	2	PF	QR	TEFC	1	16/8	110/220	24x28x58	84	700	E	G	E	G	G	E	E	E	2	T	66	239.95*
SEARS	29978N	Single	SP	SS	1 @ 4"	2	NM	QR, TB	TEFC	1	7	120	15x27x60	87	408	G	G	E	E	G	G	E	G	1	T	72	299.99*
SECO	UFO90	Single	PL	SS	1 @ 4"	2	NM	NS	TEFC	1	7	110	14x28x57	77	610	E	G	F	G	G	--	E	E	1	T	75	167.00*
	UFO80	Single	PL	SS	1 @ 4"	2	NM	NS	TEFC	1	12/6	110/220	14x32x66	81	655	E	G	G	G	G	--	E	G	1	T	95	210.00*
TRADESMAN	9992	Single	SP	SS	1 @ 4"	2	NM	QR	TEFC	1	7	110	13x27x64	87	453	P	G	P	P	G	--	G	F	5/1	T	72	249.95*

1.5- TO 2.5-HP COLLECTORS

DELTA	50-181	Two	AL	SS	1 @ 6"	1	FC	HC	TEFC	2	10	230	30x56xVar	84	1100	E	G	E	G	G	E	P	G	2	U	97	699.95
GRIZZLY	G1029	Single	SP	SS	1 @ 5", 2 @ 4"	2	NM	NS, SC	TEFC	2	12	220	31x38x77	85	1182	G	G	G	G	G	G	G	E	1	T	140	275.00*
JET	DC1200	Single	SP	SS	2 @ 4"	2	NM	QR	TEFC	2	30/15	110/220	31x38x77	87	1200	F	G	G	G	E	--	G	E	2	T	143	449.95
PENN STATE	DC250	Single	SP	SS	1 @ 6", 2 @ 4"	2	PF	QR	TEFC	2.5	13	220	34x38x77	94	1350	E	G	G	G	G	--	F	G	2	T	145	354.95
POWERMATIC	073	Single	SP	SS	2 @ 4"	2	FC, PB	QR	TEFC	1.5	25/15	110/220	17x36x73	84	900	E	E	F	G	E	--	E	G	1	T	125	399.95
SECO	UFO101	Single	SP	SS	1 @ 6", 2 @ 4"	2	NM	NS, QR	TEFC	2	24/12	110/220	25x38x77	86	1182	E	G	F	G	G	--	G	E	1	T	140	255.00*
STAR TOOLS	S3820	Single	SP	SS	1 @ 5", 2 @ 4"	2	NM	NS	TEFC	2	12	220	31x38x77	86	1182	G	G	G	F	F	G	G	E	1	T	140	255.00*

3-HP COLLECTORS

GRIZZLY	G1030	Single	SP	SS	1 @ 6", 3 @ 4"	4	NM	NS, SC	TEFC	3	18	220	33x57x77	92	1883	G	G	F	G	F	G	F	F	1	T	165	445.00*
JET	DC1900	Single	SP	SS	1 @ 6", 3 @ 4"	4	NM	QR	TEFC	3	18	220	23x53x93	93	1900	F	G	G	G	E	--	F	G	2	T	198	619.95
POWERMATIC	075	Single	SP	SS	1 @ 6", 2 @ 4"	4	FC, PB	QR	TEFC	3	16	220	27x61x97	93	1900	G	G	F	G	E	--	G	F	1	T	155	679.95
SECO	UFO102B	Single	SP	SS	1 @ 6", 3 @ 4"	4	NM	NS, QR	TEFC	3	34/17	110/220	37x53x77	93	1883	E	G	G	G	G	--	F	G	1	T	180	499.95*

CYCLONES

BLUE TORNADO	102	Cyc	N/A	N/A	1 @ 6"	N/A	N/A	N/A	N/A	N/A	N/A	N/A	36x36x80	N/A	N/A	E	--	E	E	F	--	--	G	3	U	70	325.00*
ONEIDA	1.5 HP	Cyc	AL	SS	1 @ 6"	1	PP	N/A	DP	1.5	13.4/6.7	110/220	22x22x78	94	750	E	F	E	E	G	--	--	G	1	U	92	694.00*

NOTES:

- (AL) Aluminum
(SP) Steel plate
(PL) Plastic
(SS) Stamped steel
- (FC) Fabric cloth
(NM) Nylon mesh
(PB) Plastic bag
(PF) Polyester/felt
(PP) Pleated paper
- (HC) Hose clamp
(NS) Nylon strap
(SC) Steel clamp
(QR) Quick release
(SL) Slide lock
(TB) Tension band
- (TEFC) Totally enclosed, fan cooled
(DP) Drip proof (U) Universal

5. E Excellent F Fair
G Good P Poor

6. (J) Japan
(T) Taiwan
(U) United States
7. Selling prices based on catalogs.
(*) Shipping extra

MANUFACTURERS:

- | | | | |
|---|---|--|--|
| Blue Tornado
800/292-0157 | Harbor Freight
(Central Machinery)
800/423-2567 | Oneida Air Systems
315/476-5151 | Sears Craftsman
Call or visit your
local Sears store |
| Delta International
Machinery Corp.
800/438-2486 | JET Equipment
and Tools
800/274-6842 | Penn State
Industries
800/377-7297 | SECO Investments Co.
800/225-7326 |
| Grizzly Imports Inc.
800/541-5537 or
800/523-4777 | Makita
800/462-5482 | Powermatic
800/248-0144 | Star Tools
888/678-8777 |

A BRIGHT IDEA

You'll love this lamp with a built-in bonus—four handy drawers. Set the country-style beauty on a table beside your favorite chair, where you'll enjoy the extra light to see by—and the drawers to stash away stuff you'd rather not see.

Start with the lamp body

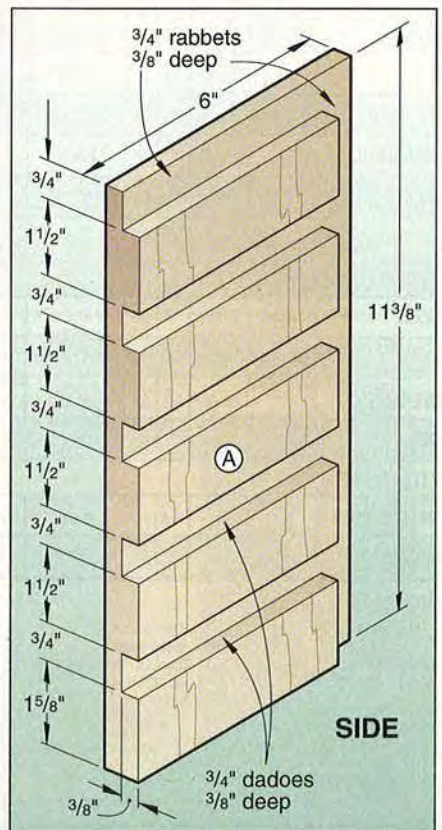
1 Cut the sides (A), drawer supports (B), and back (C) to the dimensions shown in the Bill of Materials, *opposite page*.

2 Referring to the Side drawing, lay out four $\frac{3}{4}$ " dadoes on each side (A) where shown. Mark the top and right edge of one part and the top and left edge of the other for the $\frac{3}{4}$ " rabbets.

3 Install a $\frac{3}{4}$ " dado blade on your tablesaw, and set the cutting depth to $\frac{3}{8}$ ". Equip your miter gauge with a scrapwood auxiliary fence that extends past the dado blade to minimize splintering of the workpiece as the blade exits each cut. Now, saw the dadoes and the top rabbet on each side.

4 Position your rip fence $5\frac{1}{4}$ " from the dado blade. Saw the rabbet for the back on each side.

5 Chuck a $\frac{1}{4}$ " bit in your drill press. On two parts B, drill a hole



This country-style lamp includes handy drawers

$\frac{3}{16}$ " from the back edge, centered from side to side. Change to a $\frac{25}{64}$ " bit, and drill a hole in the same location through each of the remaining three parts B. On one of them, counterbore the $\frac{25}{64}$ " hole with a $\frac{1}{2}$ " hole $\frac{1}{4}$ " deep.

6 Dry assemble parts A, B, and C, referring to the Exploded View and Side View Section drawings. Note that the three drawer supports (B) with $\frac{25}{64}$ " holes go in the top rabbet and the two dados right below it. The counterbored

drawer support goes in the second dado below the top, with the counterbore facing up.

7 Glue and clamp the sides, drawer supports, and back together. After the glue dries, unclamp the body assembly and finish-sand it, using progressively finer sandpaper from 100- to 220-grit.

Add the top and trim

1 Cut the top (D) to the size shown in the Bill of Materials.

Continued

Bill of Materials

Part	Finished Size			Mati.	Qty.
	T	W	L		
A side	$\frac{3}{4}$ "	6"	$11\frac{3}{8}$ "	O	2
B drawer support	$\frac{3}{4}$ "	$5\frac{1}{4}$ "	$5\frac{1}{4}$ "	O	5
C back	$\frac{3}{4}$ "	$5\frac{1}{4}$ "	$11\frac{3}{8}$ "	O	1
D top	$\frac{3}{4}$ "	$7\frac{1}{4}$ "	$7\frac{1}{4}$ "	O	1
E* base trim	$\frac{3}{8}$ "	2"	$7\frac{1}{4}$ "	O	4
F drawer front	$\frac{1}{2}$ "	$1\frac{15}{16}$ "	$4\frac{15}{16}$ "	O	4
G drawer side	$\frac{1}{2}$ "	$1\frac{5}{16}$ "	$5\frac{1}{8}$ "	O	8
H drawer back	$\frac{1}{2}$ "	$1\frac{5}{16}$ "	$3\frac{15}{16}$ "	O	4
I drawer bottom	$\frac{1}{8}$ "	$4\frac{7}{16}$ "	$4\frac{3}{8}$ "	HB	4

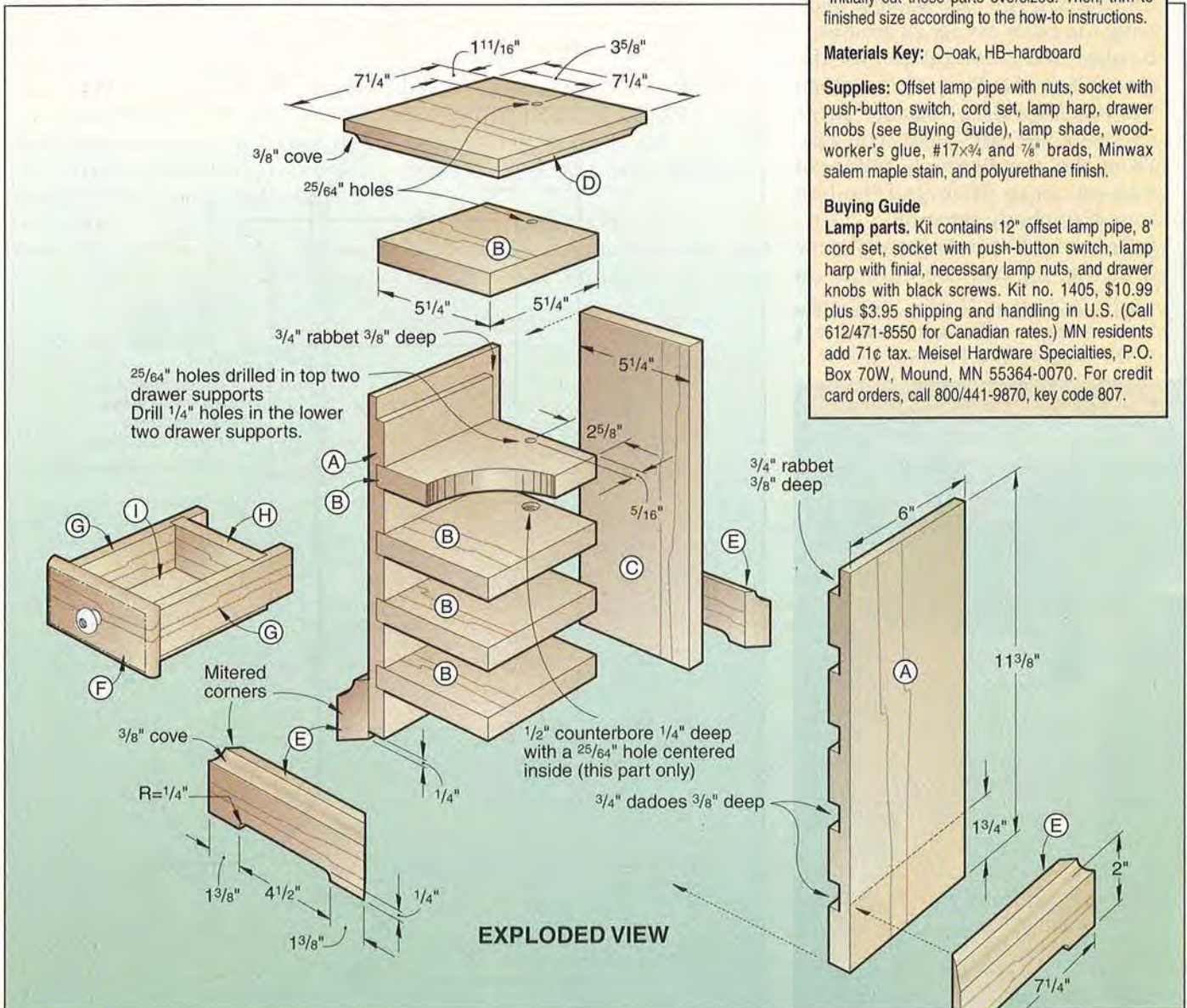
*Initially cut these parts oversized. Then, trim to finished size according to the how-to instructions.

Materials Key: O—oak, HB—hardboard

Supplies: Offset lamp pipe with nuts, socket with push-button switch, cord set, lamp harp, drawer knobs (see Buying Guide), lamp shade, woodworker's glue, #17 $\times\frac{3}{4}$ and $\frac{7}{8}$ " brads, Minwax salem maple stain, and polyurethane finish.

Buying Guide

Lamp parts. Kit contains 12" offset lamp pipe, 8' cord set, socket with push-button switch, lamp harp with finial, necessary lamp nuts, and drawer knobs with black screws. Kit no. 1405, \$10.99 plus \$3.95 shipping and handling in U.S. (Call 612/471-8550 for Canadian rates.) MN residents add 71¢ tax. Meisel Hardware Specialties, P.O. Box 70W, Mound, MN 55364-0070. For credit card orders, call 800/441-9870, key code 807.



A BRIGHT IDEA

2 Install a $\frac{3}{8}$ " cove bit in your table-mounted router. Adjust the cutting depth to $\frac{3}{8}$ ". Then, starting across the grain on one end and working around the piece counterclockwise, rout a cove along the bottom edge of the top.

3 Mark a center $1\frac{11}{16}$ " from the back edge and centered from side to side. Drill a $\frac{25}{64}$ " hole at the mark. Finish-sand the top.

4 Glue and clamp the top to the body assembly. Align the hole through the top with the hole through the upper support (B). (Insert a short length of $\frac{3}{8}$ " dowel rod into the holes to help align the parts.) The top should overhang the body evenly all around.

5 Adjust the cutting depth for the cove bit to $\frac{5}{16}$ ". Rout a cove along the top edge of a $\frac{5}{8} \times 2 \times 36$ " piece of stock for the base trim (E). From the routed stock, miter-cut four pieces to fit around the bottom of the body assembly.

6 Referring to the Exploded View drawing, lay out the cutouts on

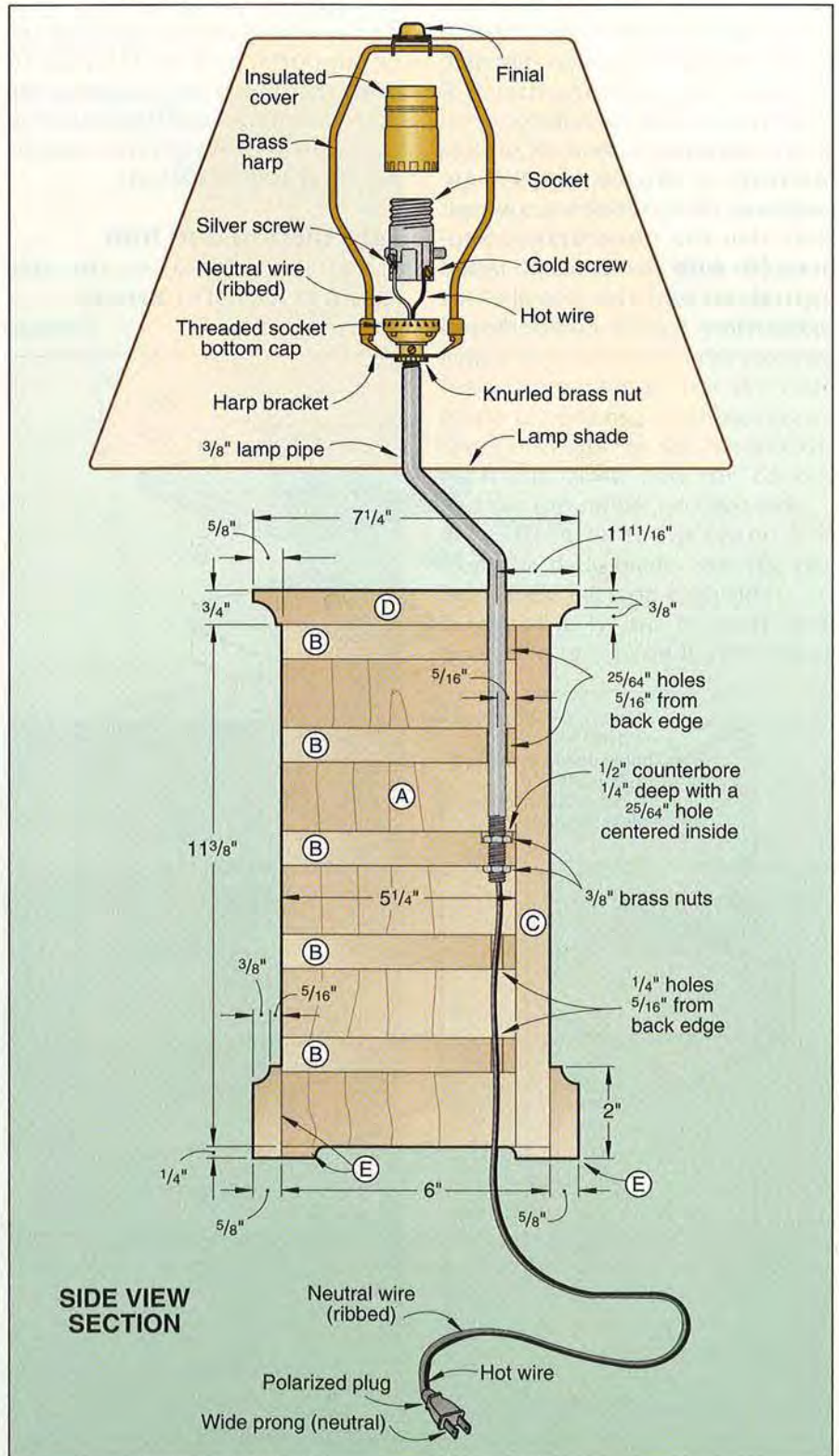
Glue and clamp the miter-cut base trim to the bottom of the lamp body. The cutouts form feet for the lamp.

the base moldings (E) to form the feet. Scrollsaw or bandsaw them.

7 Glue and clamp the base trim to the body assembly, as shown *below left*. Note that the top of

the cutout opening lies flush with the bottom of the body.

8 Allow time for the glue to dry. Then, remove the clamps and sand the base trim.



Now, for the drawers

1 From $\frac{1}{2}$ " stock, cut four drawer fronts (F) to the size shown in the Bill of Materials.

2 Install a $\frac{1}{4}$ " round-over bit in your table-mounted router. Starting with the end grain, rout all around the front edge of each drawer front.

3 Install a $\frac{3}{4}$ " dado blade on your tablesaw, and adjust the cutting depth to $\frac{1}{4}$ ". Using the miter gauge for safety and accuracy, saw the $\frac{3}{4}$ " rabbets where shown by the Drawer drawing.

4 Leaving the cutting depth the same, position the saw's rip fence $1\frac{1}{16}$ " from the blade. With this setup, cut a $\frac{3}{8}$ "-wide rabbet along the bottom edge of each drawer front. Move the fence $\frac{1}{8}$ " farther from the blade, and saw the $\frac{1}{4}$ "-wide top rabbets. Be aware that the stock won't cover the full width of the dado blade in these two cuts.

5 At the center of each drawer front, drill a $\frac{1}{16}$ " pilot hole $\frac{3}{8}$ "

deep. The screws for the knobs will drive into these holes.

6 Cut the drawer sides (G) and backs (H) to the sizes shown. Saw the four drawer bottoms (I) from $\frac{1}{8}$ " hardboard.

7 Set up the tablesaw with a $\frac{1}{2}$ " dado blade. With the cutting depth set to $\frac{1}{4}$ ", saw a dado where shown near the back of each drawer side.

8 Sand all parts. Then, referring to the Drawer illustration, glue and clamp the drawer front, sides, and back (F, G, H). Using a clipped-off brad as a drill bit, drill pilot holes for #17 $\times\frac{7}{8}$ " brads at the drawer front where shown, and drive in the brads.

9 After the glue dries, remove the clamps. Place the bottom (I) in position on each drawer. Drill pilot holes, then attach the bottoms with #17 $\times\frac{3}{4}$ " brads and glue.

Apply the finish

1 Inspect the body assembly and the drawers. Finish-sand, using

progressively finer grits to 320. Clean off all sanding dust.

2 Stain the parts. (We applied Minwax salem maple stain, following the instructions on the product label.)

3 Allow the stain to dry. Apply three coats of semi-gloss or satin clear finish, sanding between coats. (We used Minwax fast drying satin polyurethane.)

Wire the lamp

1 Insert the long part of the lamp pipe through the holes in the top. As you push the threaded end into the second drawer bay from the top, reach in and thread one of the lamp nuts onto it. Run the nut all the way to the top of the threads.

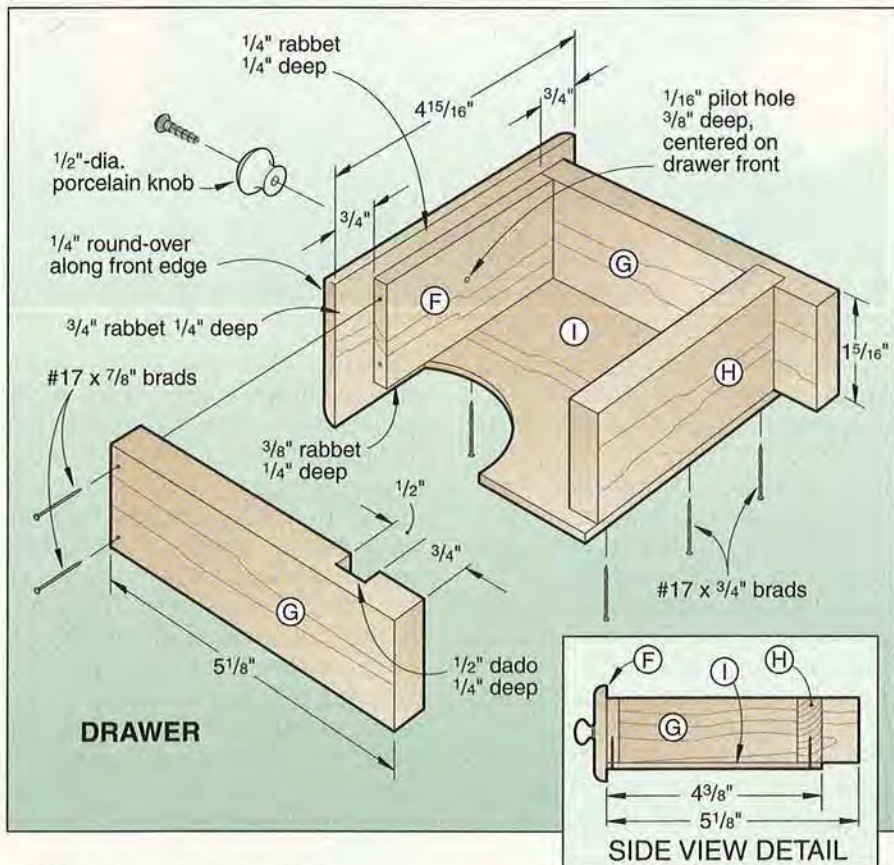
2 Push the pipe on through the hole in the third support (B). Then, reach in through the third drawer bay and thread the second lamp nut onto the pipe, shown in the Side View Section drawing.

3 At the top of the pipe, thread on the knurled brass nut, the harp bracket, and the bottom of the socket. Adjust the pipe to place the socket over the middle of the lamp top (D).

4 Feed the free end of the cord through the holes in the lower supports (B) and push it through the lamp pipe.

5 Separate the wires, and strip the conductor ends. Note that the side of the cord coming out of the wide-pronged side of the plug has narrow ridges molded into it. (You can feel them with a fingernail.) Connect the conductor on this side to the silver screw (neutral terminal) on the lamp socket. The conductor in the plain side (from the plug's narrow prong) goes to the gold screw.

6 Assemble the socket. Install the harp on the bracket. Now, you're ready to screw in a bulb and add a shade to complete the lamp. 🌟



Project design: James R. Downing
Illustrations: Kim Downing; Lorna Johnson
Photographs: King Au; John Hetherington

Birdhouse Gone

A Timeless Project In The Strictest Sense

It might seem a little cuckoo to build a clock that doesn't tell time. It's a smart move in this case, however, for our mock clock is actually a decorative birdhouse that adds nothing but charm to your home or patio.

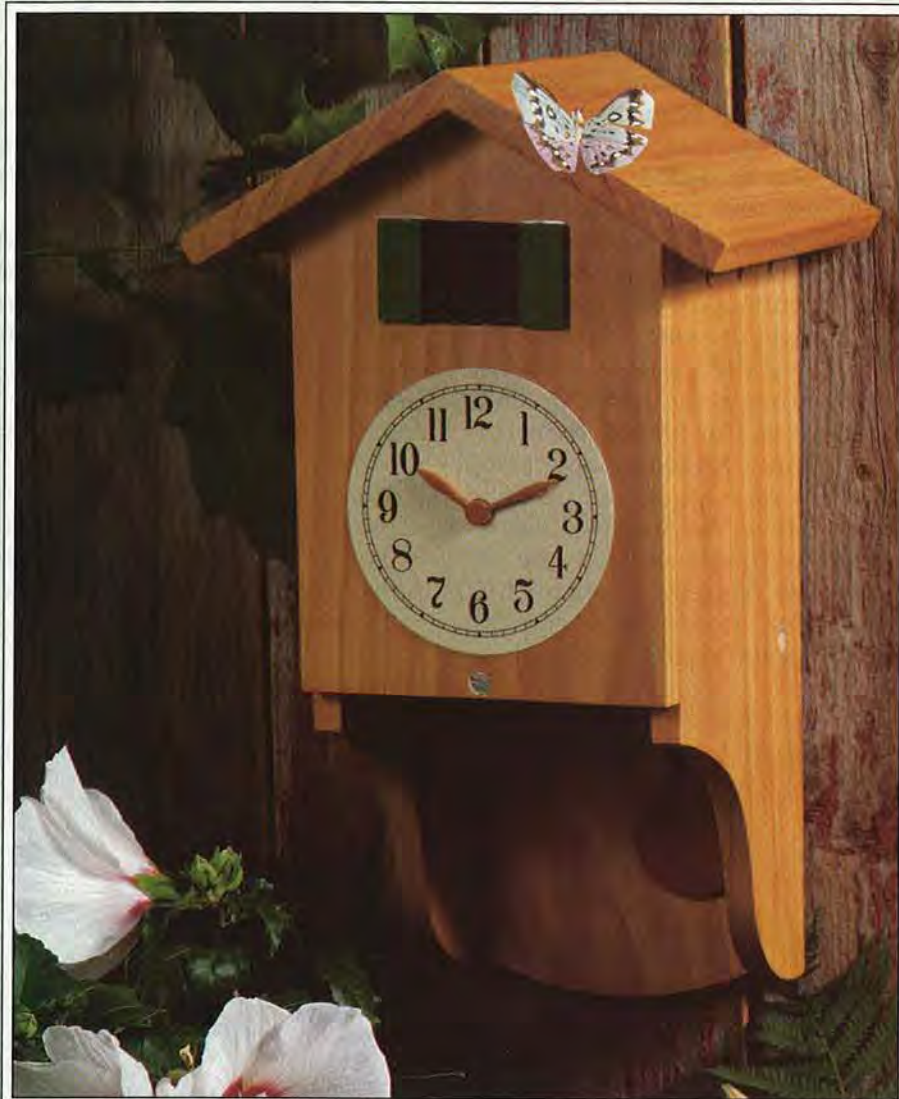
Cut the parts to the sizes shown in the Bill of Materials. Refer to the Parts View drawing *opposite page*, then saw the peaked gable on the back and front (A, D). For a neat job, lay out the cutting line on the front (D). Stack that part on top of the back (A), with the good side of each facing upward. Fasten them together temporarily with double-faced tape. Make sure the top edges and both side edges are flush, then saw the cutting lines on your tablesaw. Separate the pieces.

Copy the full-sized pattern for the lower portion of the back from the *WOOD PATTERNS*® insert in the middle of the magazine. Affix the pattern to the back (A) with rubber cement or spray adhesive, then bandsaw or scrollsaw the curved bottom.

Copy the pattern for the bottom portion of the side. Stack the two side pieces (B) for cutting, with the good sides out. Adhere the pattern to the top piece, then bandsaw or scrollsaw the profile.

Tilt your tablesaw blade to cut a 30° bevel. Saw a bevel along the top of each side, taking care to cut the low side of the bevel on the outside of each piece. Also bevel each roof piece (C) where shown on the Exploded View drawing. On those, the long side of the bevel goes to the outside.

Next, chuck a 3/8" round-over bit in your table-mounted router. Rout along both sides on the back edge of the bottom (E) to create a rounded edge.



Mark the position for the entry hole on the front. Then, with a drill press and holesaw, bore the entry hole. Drill the mounting hole in the back and the three ventilation holes on each side.

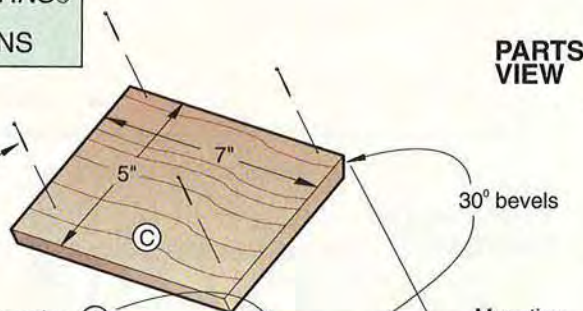
Using #17×1" brads and glue, attach the two sides (B) to the back (A). (If your birdhouse will go outside, use weather-resistant glue such as Titebond II.) The sides fasten onto the edges of the back. Then, nail and glue the front (D) to the sides. The front fits onto the edges of the sides. Set the nails and fill the holes.

Position the bottom (E) inside the assembly where shown. On each side, drill a 7/64" pilot hole through the side (B) into the edge of the bottom. The bottom will pivot on screws in these holes to open for cleaning. Drill a pilot hole centered on the front (D) into the bottom's edge. The screw in this hole will hold the bottom shut. Remove the bottom and drill through the pilot holes in the sides and front with an 1 1/64" bit. Countersink the holes on the outside. Sand the assembled birdhouse and the bottom.

Cuckoo

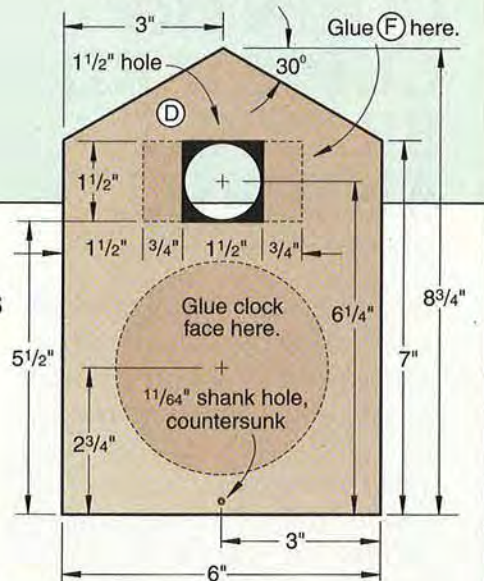
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#17 x 1" brad

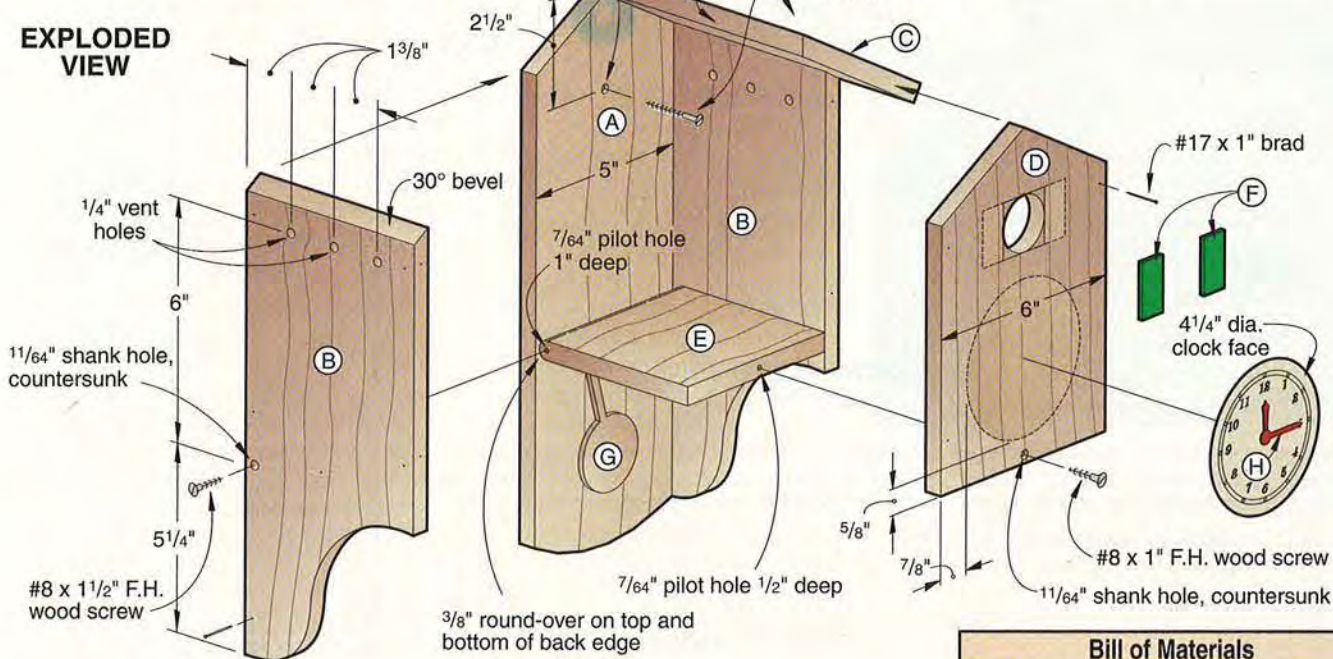


Mounting hole centered on (A).

PARTS
VIEW



EXPLODED
VIEW



Bill of Materials

Part	Finished Size			Matl.	Qty.
	T	W	L		
A back	1/2"	5"	14 3/8"	C	1
B side	1/2"	5 1/2"	12 1/2"	C	2
C roof	1/2"	5"	7"	C	2
D front	1/2"	6"	8 3/4"	C	1
E bottom	1/2"	4 7/8"	5"	C	1
F shutter	1/8"	3/4"	1 1/2"	HB	2
G pendulum	1/8"	2 1/4"	4 1/2"	HB	1
H hands	1/8"	1 1/2"	3"	HB	1

Materials Key: HB—tempered hardboard,
C—cedar

Buying Guide

Clock face. Metal clock face with Arabic numerals, 4 1/4" diameter. Product no. 71236, \$4.99 ppd. in U.S. Klockit, P.O. Box 636, Lake Geneva, WI 53147. Or call 800/556-2548 to order.

Attach the roof pieces with brads and glue. Set the nails, fill the holes, and sand the roof. Using epoxy adhesive, affix the metal clock face to the front where shown. (See the Buying Guide for the face we used. Or, you could hand-paint a face on the front, if you prefer.)

Trace the patterns for the hands and pendulum onto the 1/8" stock. (We cut the hands, pendulum, and the shutters from tempered hardboard.) Scrollsaw the hands and pendulum. Paint them copper or gold. Paint one face and all

edges of each shutter (F) green. Draw a square around the entry hole where shown, then paint black inside it.

Glue the hands, pendulum, and shutters into place. The pendulum should appear to pivot behind the top of the face. Apply two coats of satin polyurethane to the birdhouse and the bottom. Install the bottom, and dab beige paint on the screw heads. 🌲

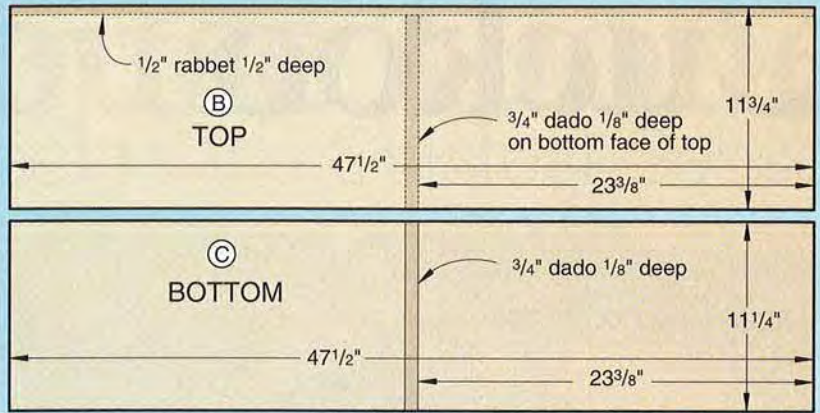
Project Design: © David Ashe,
Workshop Blueprint Co.
Photograph: John Hetherington
Illustrations: Kim Downing; Roxanne LeMoine

COUNTRY CUPBOARD BRACKET AND SHELF

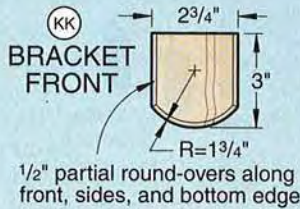
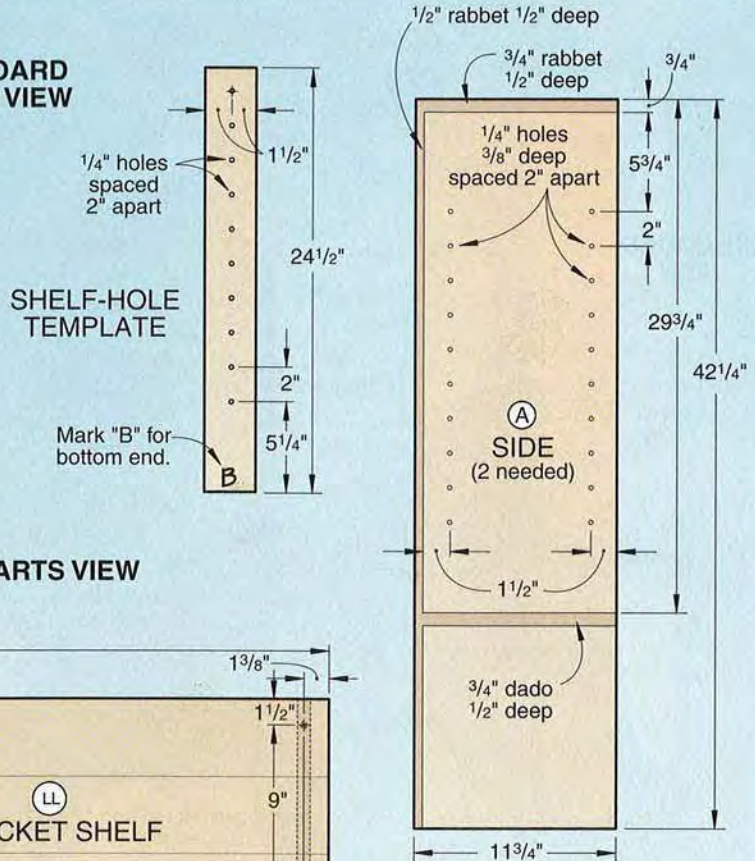
Continued from page 52

Note: If you don't have the back issues with the country-style table and buffet shown on page 52, but would like a photocopy, send an 8½×11" self-addressed stamped envelope and \$4 per article to WOOD Magazine's Country Table and Buffet, 1912 Grand Avenue, Des Moines, IA 50309-3379.

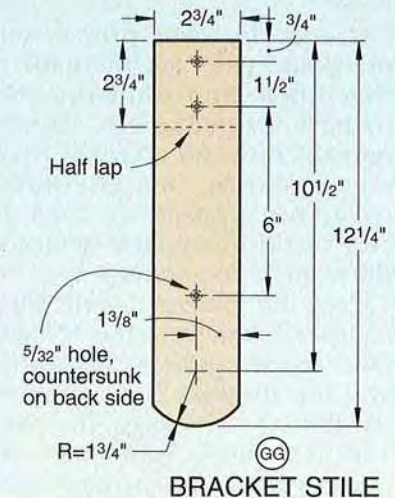
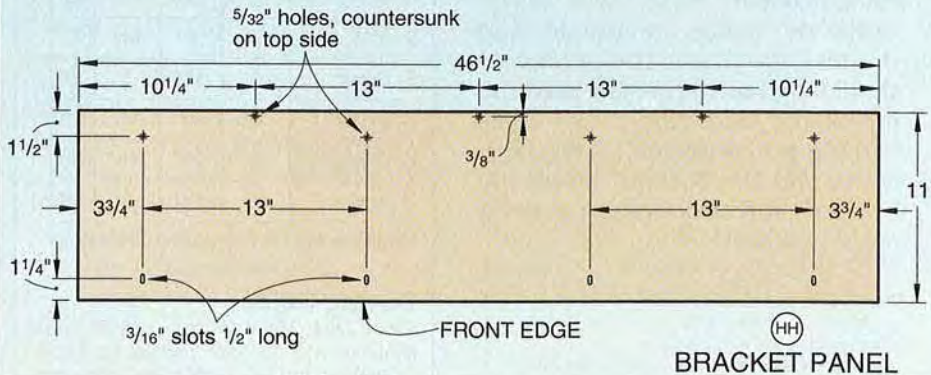
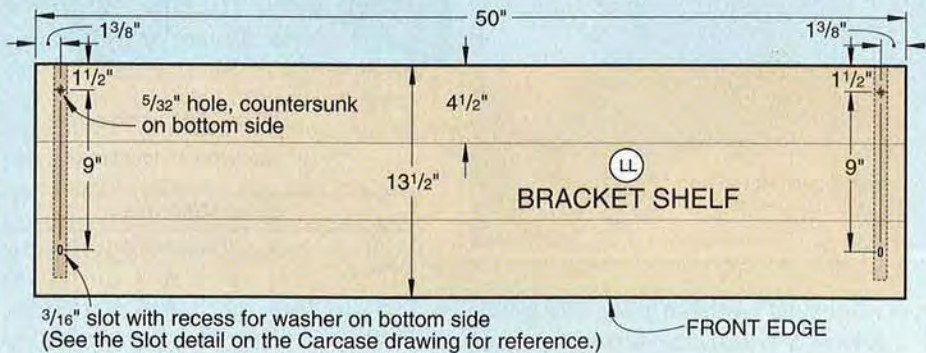
Continued on page 72



CUPBOARD PARTS VIEW



BRACKET PARTS VIEW



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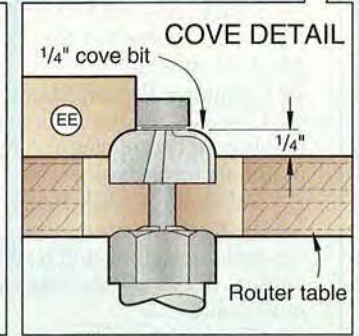
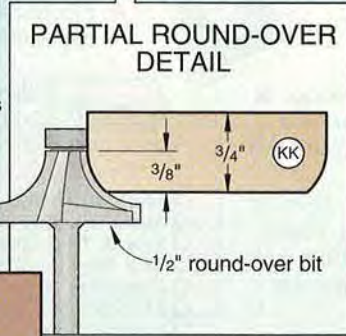
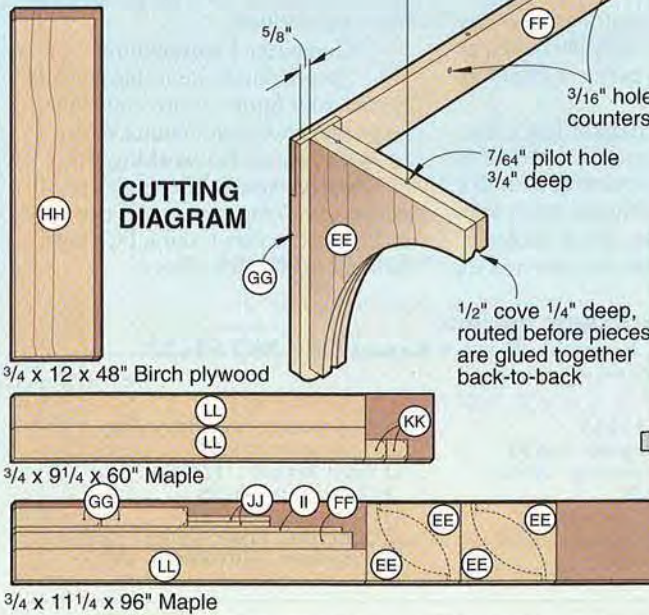
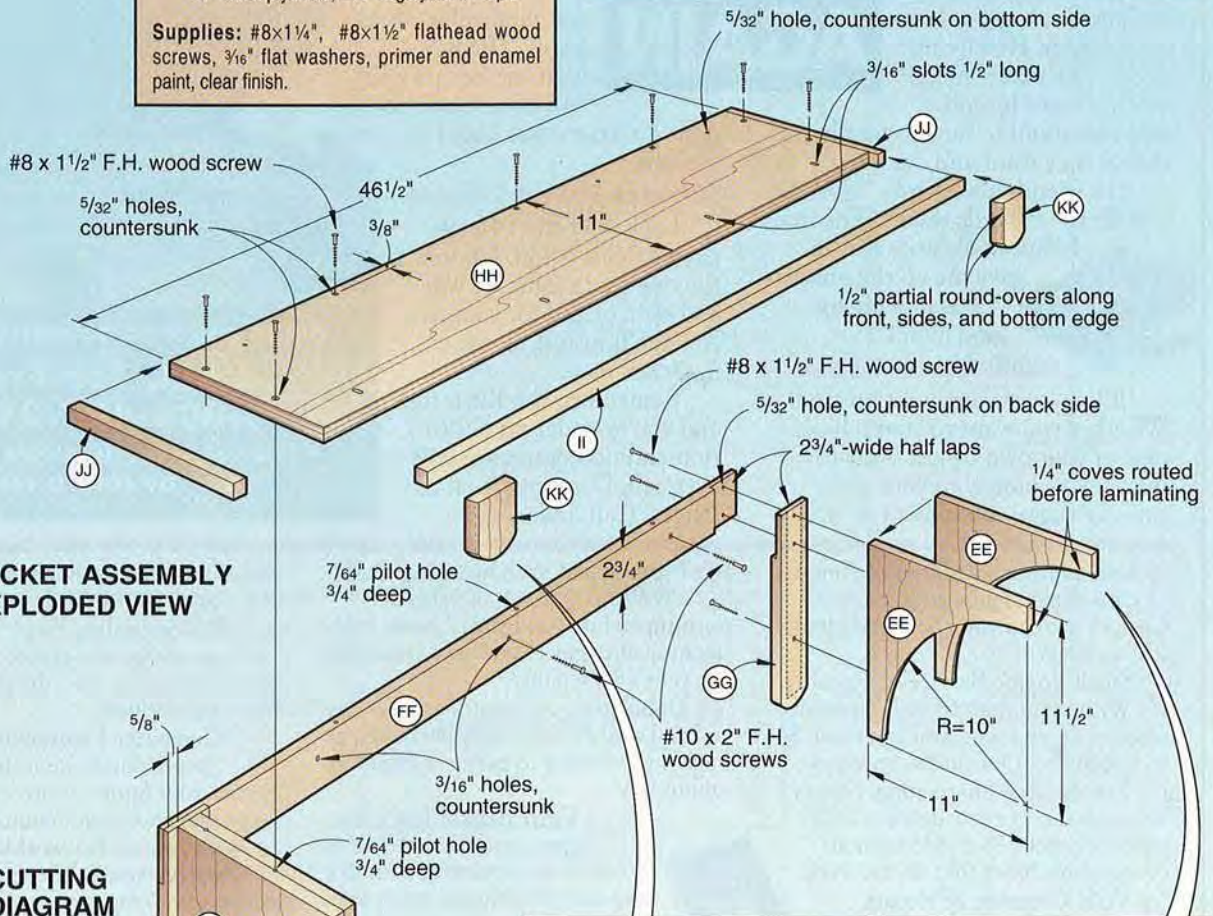
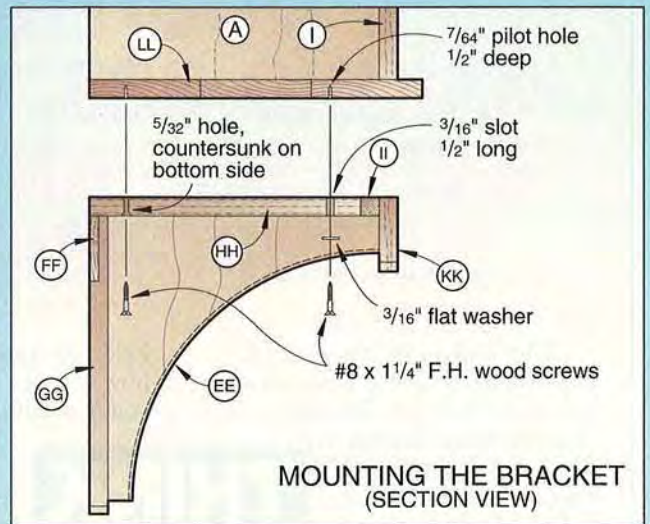
COUNTRY CUPBOARD BRACKET AND SHELF

Continued from page 57

Bill of Materials					
Part	Finished Size			Mati.	Qty.
	T	W	L		
BRACKET & SHELF					
EE brackets	1½"	11"	11½"	LM	2
FF bracket rail	¾"	2¾"	48"	M	1
GG bracket stiles	¾"	2¾"	12¼"	M	2
HH bracket panel	¾"	11"	46½"	BP	1
II panel front band	¾"	¾"	46½"	M	1
JJ panel side band	¾"	¾"	11¼"	M	2
KK bracket front	¾"	2¾"	3"	M	2
LL shelf	¾"	13½"	50"	EM	1

Materials Key: LM-laminated maple, M-maple, BP-birch plywood, EM-edge-joined maple

Supplies: #8x1¼", #8x1½" flathead wood screws, ¾" flat washers, primer and enamel paint, clear finish.



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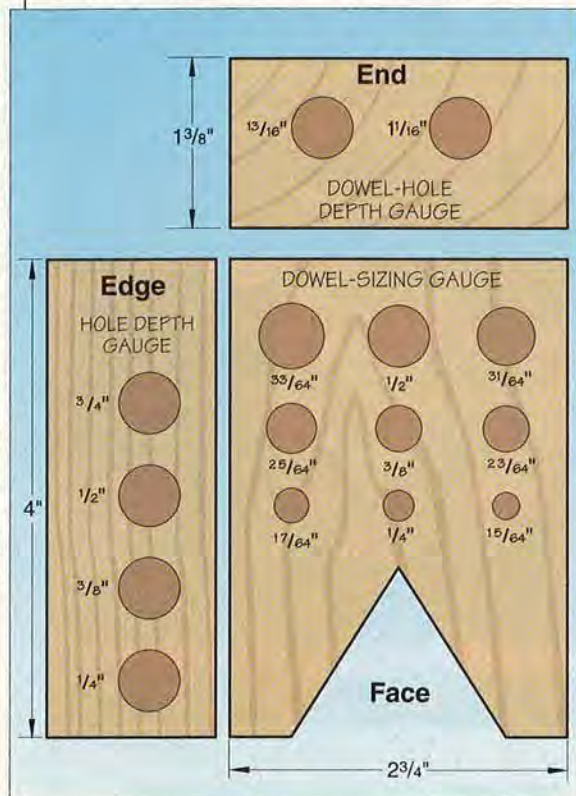
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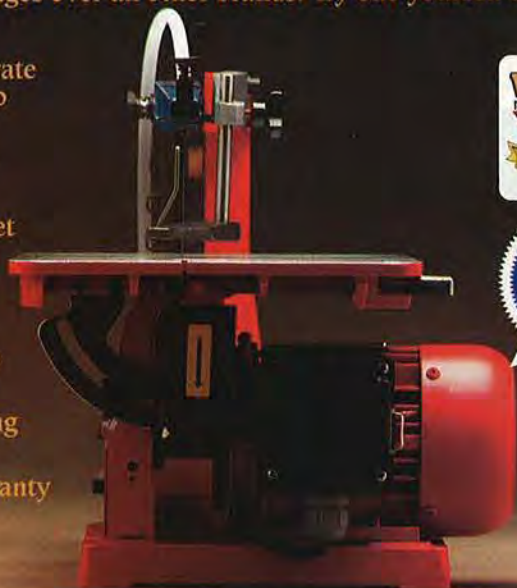


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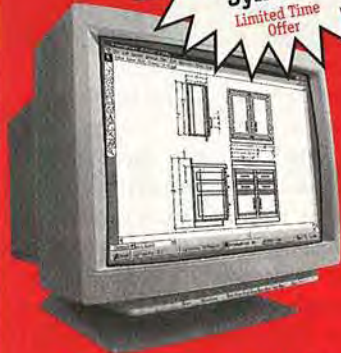
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Continued from page 76

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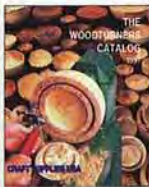
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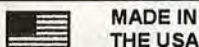


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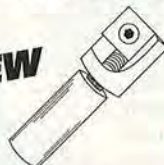
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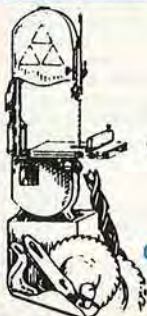
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PRODUCTS THAT PERFORM



Continued from page 78

A ratchet driver set with a high-quality difference

Ratchet driver sets, many of them imported, have been on the market for quite some time. But this one from Hafele distinguishes itself from the rest because of the high quality of its Super Torque ratcheting driver handle, and its reasonable price.

It has several things going for it. First, I found it extremely comfortable to use, thanks mainly to its ridged rubber grip. Second, the ratchet mechanism worked smoothly, and the direction was easy to change. Third, I discovered that the ratchet will swivel up to 90° left or right and lock there to allow you to apply more pressure. And if that weren't enough, you can store frequently used bits below a screw-on cap in the end of the handle.

Having this product in your shop will eliminate the hassle of always looking around for that one socket or bit that you never seem able to find. Hafele also offers a similar set with a straight-handled, non-flexing ratchet for \$11.95.

—Tested by Dave Henderson



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Continued on page 88

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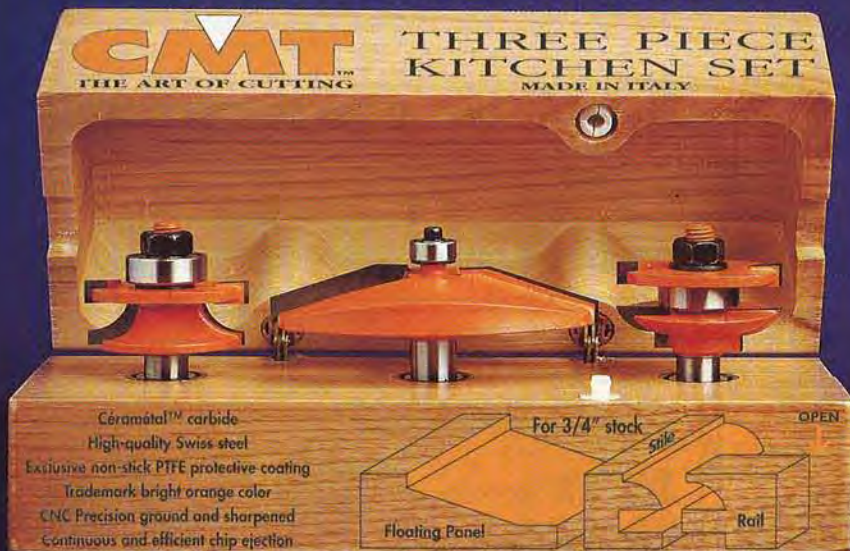
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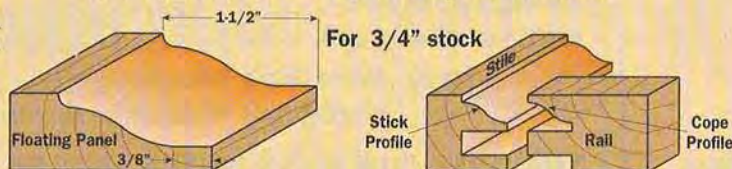


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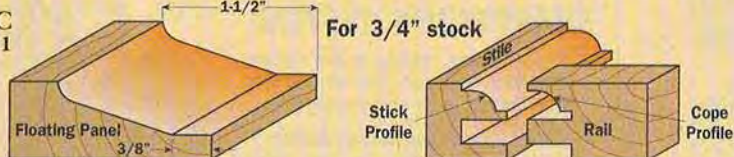
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PRODUCTS THAT PERFORM



Continued from page 86

Brad nailer uses no oil, prevents project stains

Keeping pneumatic nailers oiled is a balancing act—not enough oil and they won't function properly; too much and you get oil stains on your project. Sears solved this dilemma by introducing an economically priced brad nailer that requires no oil.

The Craftsman 18309 18-gauge brad nailer has a composite plastic cylinder that eliminates the need for oil. Plastic components also help make the 18309 about a half-pound lighter than its standard counterpart, the Craftsman 18343.

This nailer, which drives brads from 3/8" to 1 1/4" long, has a nicely finished, cast-aluminum body. The trigger was comfortable, and the contact safety worked well with minimal workpiece marring.

The easy-loading steel magazine holds sticks of 100 brads with a red indicator that shows when you run low. While I experienced no jams during testing, you clear such hang-ups by loosening two setscrews and removing the nose-piece. The oilless convenience and its \$94.99 price make the 18309 a great value. ♣

—Tested by Bob McFarlin

PRODUCT SCORECARD

Sears Craftsman model 18309
18-gauge oilless brad nailer

Performance	★ ★ ★ ★ ☆
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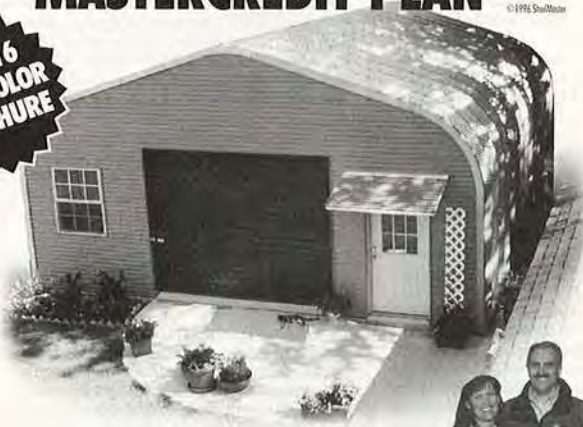
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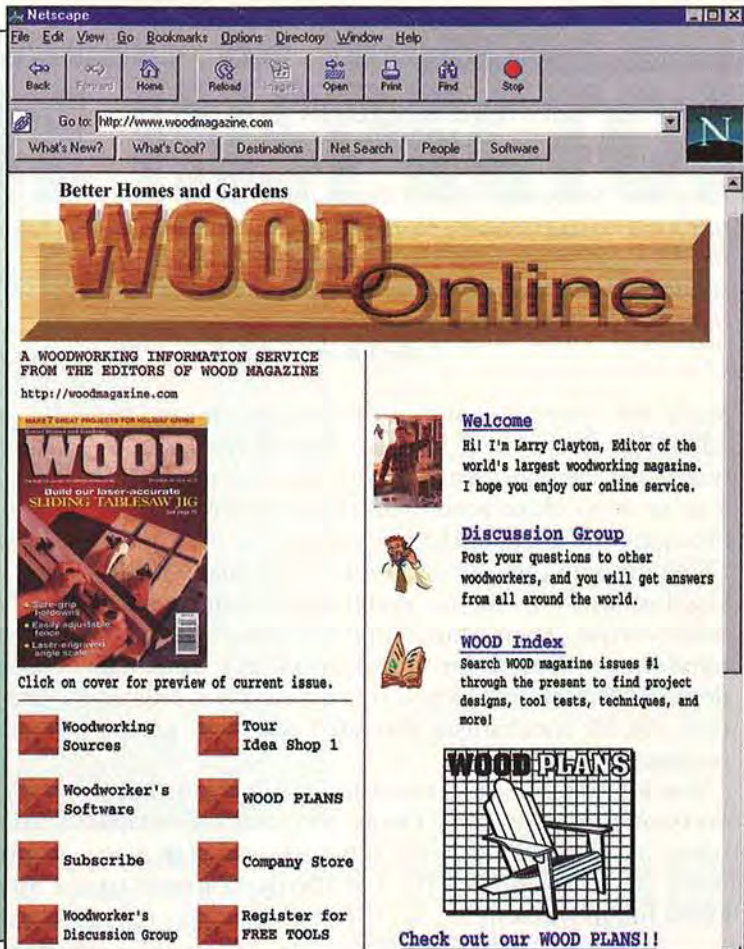
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Cranky tablesaw crank perplexes reader

I have a tablesaw that I have used for 8 years without any problems. However, over the past few months, the tilt-mechanism crank has become difficult to turn, and now the blade won't tilt all the way to 45°. What's the probable cause?

—Mark Buckland, Maumee, Ohio

Mark, we suspect that the tilt-mechanism and its adjusting screw have become fouled with a sawdust/lubricant mix that has built up over the years. You need to clean around all the parts involved in changing the angle of the blade arbor.

First, unplug the saw and remove the blade. Clear sawdust away from the mechanism using a stiff-bristle brush. Then, start tilting the arbor using the handcrank. Watch for and remove any sawdust deposits that appear as you move the arbor. Lightly coat the tilt mechanism threaded rod with grease or a spray lubricant.

You should find movement limiting bolts at both ends of the arbor tilt. These 45° and 90° stops often become fouled with sawdust, and will also need to be cleaned with a stiff-bristle brush to allow full movement.

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Wood movement in a humidior

How should I adjust a cigar humidior plan to compensate for wood movement? Wouldn't the humidity affect the cedar lining as well as the outer wood?

—George Hightower, Burneyville, Okla.

Humidity should have a minimal effect on the Spanish cedar lining, George, for a couple of reasons. First, Spanish cedar is a relatively stable wood, with a very low movement ratio caused by changes in humidity. Second, the dimensions of a cigar humidior are generally small enough that minimal wood movement doesn't cause a problem.



However, here are some ideas from our staff that will help ensure a stable humidior:

- 1 Use quartersawn (also called vertical-grain) wood to make the humidior case. Quartersawn wood will move less across its width than will flatsawn wood. This will allow movement of the hardwood case sides to more closely match the movement of the Spanish cedar linings.
- 2 Allow the top and bottom panels to float in a frame. They should fit without looseness, but not be forced into the opening, either. As moisture enters the humidior, the panels will expand just slightly for a snug fit.
- 3 Use Spanish cedar for the humidior bottom. This will satisfy the requirement for a cedar lining on this surface, and make a good, stable bottom for the humidior at the same time.

Continued on page 98

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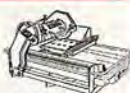
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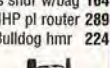
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Panasonic

EY6100EQKW 12 V, 3/8, 21 Position Clutch Kit w/2 Ironman Batteries \$179



Milwaukee

6527 Variable Speed Super Sawzall \$169



6491 10" miter s w/ct bl&bag 329
6494 New 10" comp. saw 319
6496-6 10" slide comp. saw 589
6497-6 10" slide saw w/accy 649
0408-6 12v vsr cdls kit 174
0234-1 1/2" vsr 0-850 mgmn 134
0236-1 1/2" drill w/case 149
6368 7-1/4" saw w/cs & fc 139

DEWALT

DW936K 18 Volt Cordless Saw Kit \$249



DW935K 14.4 cdls saw kit 239
DW625 3 HP VS Plunge Router \$279



DW621 2hp vs plunge router 219
DW670 laminate trimmer 99
DW673K laminate trimmer kit 189

DW705 12" Compound Miter Saw \$349



DW321K vs jigsaw with case 164
DW364 7-1/4" saw w/brake 164
DW361 7-1/4" saw w/brake 109
DW675K 3-1/8" planer w/case 164

DW682K Plate Joiner Kit \$199



DW106 3/8 4 amp keyless drill 74
DW250 0-4000 drywall driver 89
DW254 0-2500 deck screwdrvr 89
DW280Kall purc screwdrvr kit 119

DW212C 5" Hook & Loop Dustless Random Sander w/Case \$74



DW423K5 vs rdm sander w/cs 94
DW443 6" RA H&L rdm sdr 144
DW411 1/4 sheet sand w/bag 59
DW431 3"x21" vs-belt sander 189

DW995K 18 Volt 1/2" VSR Drill Kit \$229



DW991K-22 14.4v3/8" dw/dr k219
DW991KS-214.4v drill/saw kit 349
DW972K 12v3/8vsr dr, 2 bit 184

Hours: M - F 7:00 - 7:00 CST Sat. 8:00 - 4:00 CST

DELTA

36-900 3 HP Special Unisaw w/52" Unifence & Motor Cover \$1699*



36-820 3hp unit 52" unit & v1599*
36-830 3hp unit saw 30" unit 1499*
36-8213hp unit saw w/50" Bies 1599*
36-8313hp unit saw w/30" Bies 1499*
34-7785hp unisaw w/52" unit 1849*

34-445 10" Contractor's Saw w/30" Unifence \$799*



36-460 10" cont saw 28" Bies 729*
36-470 10" cont saw 40" Bies 769*
36-480 10" cont saw 52" Bies 799*
34-444 10" contractor's saw 649
34-555 sliding table attach 329
36-275 8-1/4" bnch table saw 269

28-280 14" 1 HP Bandsaw \$699*



28-275 14" 3/4hp bandsaw 589*
33-055 8-1/4" sawbuck w/legs 619
37-154 6" jointer/stand 1224*
17-90016-1/2" floor drill press 429
34-080 10" mitre saw 219
23-710 sharpening center 174

37-350A 8" Jointer w/Stand \$1549*



43-355 1-1/2hp wood shaper 749*
43-379 3 hp hd 2 spd shapr 1699
31-730 6" belt/12" disc sandr 1349
33-890 12" radial arm saw 1599
33-990 10" radial arm saw 799

36-220 10" Compound Mitre Saw \$209



50-179 3/4 hp dust collector 399
36-906 52" Delta unifence 329
36-905 30" Delta unifence 249
32-100 plate jointer 279

22-675Y 15" Planer \$1149*



37-190 6" jointer w/stand 449
36-850 1 phase stock feeder 499
32-325 13 spindle boring mach 999

31-280 Sanding Center With Stand \$799



36-755 10" cabinet saw 1149
36-751 10" cab w/30" unif 1299
36-752 10" cab w/50" unif 1399

50-901 3 HP, 230V Cyclone 2 Stage Dust Collector \$1849



50-902 5hp3hp cycln colctr 1949
50-903 5hp230v cycln colctr 2249
*Price After Mail-In Rebate
Rebates expire 3-31-97

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JDS COMPANY

AT2000 Air Filtration System \$259



8-12 air filtration system 489
18-34 accu miter ga. w/bar 149

Emqlo

AM78-HC4V 1-1/2 HP Vertical Twin Tank \$309



AM78-HC4V1-1/2hp vert comp 329
K15ABP 1.5hp wheelbarrow 619
K5HGA-8P 5hp Honda whlb 769
045 3/8"x50" Goodyear hose 20

JET

JTAS-10X 10" Jet Saw 3 HP w/50" XACTA Fence & Motor Cover \$1399



JTAS-10LX50-13hp lift flt sw 1699
JWCS-10JF 2 hp sw, Jet fnc 969
JPM-13 13" planr/moulder 799
JWP-12 12" portable planer 389
JWS-18H0 1hp wood shapr 514

JWTS-10JF 10" Saw w/Jet Fence \$599



JWBS-14CS14" 1hp wd bds w 579
JWBS-14OS14" 3/4hp w bsw 499
JDP-17MF 17" h 16 sp dr pr 429

JJ-6CSX 6" Long Bed Jointer \$489



JJ-8CS 8" long bed jointer 1189
JWL-1236 12" vs wood lathe 569
JWP-15H0 15" 3hp w plnr 1099

DC-650 1 HP, 650 CFM Dust Collector \$229



DC-1200 2hp1200cfm colctr 449
DC-1900 3hp1900 cfm colctr 619
JSG-66" belt/12" disc sander 599

POWERMATIC

1660760 66 Saw 3 HP w/50" Accu-Fence \$1999



1270100 #27shpr 3hp 1ph 2099
1610050 8" intr 1.5 hp w/pc 1699
1791210 64 Artisan w/Accu 749
179121164 Artisanw/50" Accu 849
1791208 osc. spndle sdr 299
1791209 New 15" planer 1329
1791051 6" jointer w/stand 549
1791070 1-1/2 hp dust col 399

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Dia.	Grit	Price
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5"	100 thru 320	.45

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3X18	.86 ea	4X36	1.35 ea
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3X23 3/4	.93 ea	6x89	6.24 ea

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4"	\$1.75 ea
6"	2.25
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Circle No. 1229

ASK WOOD

Continued from page 94

How to rip thin strips

I have some Venetian blinds that I want to restore and use in an old house. Part of the work will be making some replacement slats. What is the best way of cutting these 1/8"-thick pieces?

—George C. Finster, Tuckerton, N.J.

George, we suggest you rip these strips on a table-saw equipped with a zero-clearance insert like the one shown below. The insert-mounted splitter will help keep the strips from moving into the blade during the ripping process. And use a wide push-block to move the strips through the blade.

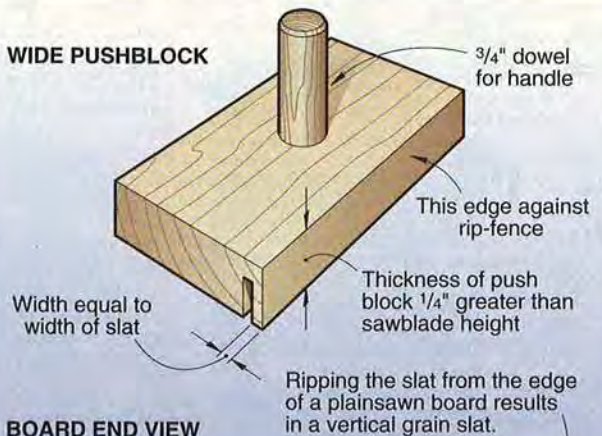
Cut the slats 1/16" oversize in thickness to leave enough extra material to permit removal of saw marks. Then, send them through your planer or thicknessing sander to bring them to the final thickness. Use a plywood backing board to support these strips while planing.

The original slats were probably quartersawn for maximum flatness and stability. You can reproduce this on the new slats by slicing them off the edge of a thick, flatsawn board (see drawing bottom).

To make a zero-clearance tablesaw insert with splitter:



WIDE PUSHBLOCK



BOARD END VIEW



DELTA TOOLS	
Model Description	List Sale
31-280 Sanding Center w/ stand	1250 789
31-695 6" Belt/Dry Disc Sander	441 349
23-700 Wet/Dry Grinder	206 149
23-710 New Sharpening Center	217 169
23-680 8" Bench Grinder 1/4 HP	90 69
11-950 8" Drill Press	176 128
31-460 4" Belt/Disc Sander	193 135
40-50 16" 2" Speed Scroll Saw	230 169
40-540 New 16" var/spd Scroll Saw	249 189
11-990 12" Bench Drill Press	255 184
11-090 32" Radial Bench Drill Press	405 305
43-505 1/2" Bench Router/Shaper	398 299
22-540 12" Bench Top Planer	356 369
26-220 10" Compound Miter Saw	294 199
28-185 Bench Band Saw	213 168
37-070 NEW 6" w/spd Bench Joints	351 259
14-650 Hollow Chisel Mortiser	380 239
33-990 10" Radial Arm Saw	981 779
33-055 8-1/4" Sawbuck comp w/legs	646 665
36-905 30" Uniflex	342 245
36-905 50" Delta Uniflex	444 319
36-755 10" Tilling Arbor Saw	1019 999
17-900 16-1/2" Floor Drill Press	490 399
37-190 8" Deluxe Jointer	603 489
36-275 8-1/4" Builders Saw	358 268
36-210 10" Compound Miter Saw	344 225
36-040 8-1/4" Compound Miter Saw	190 135
36-070 10" Miter Saw	217 165
34-555 Sliding Table	487 325
34-444 10" Contractors Table Saw	546 359
36-250 10" Slide Compound Saw	825 489
36-230 12" Compound Miter Saw	480 345
31-780 Oscillating Spindle Sander	253 188

DELTA REBATES!
Prices shown are before rebate!
Rebates valid thru 3/31/97.

\$25.00 rebate

46-700 12" Wood Lathe 575 465

\$50.00 rebate

28-275 14" Band Saw 3/4 HP Sale 635

28-280/14" Band Saw 1 HP motor Sale 799

34-445 10" Table Saw w/30" fence Sale 838

22-675 NEW DC380 15" Planer Sale 1175

43-355 3/4" Shaper 1-1/2 HP Sale 799

\$75.00 rebate

37-154 6" Jointer DJ-15 Sale 1289

MILWAUKEE TOOLS

6527 NEW Sawzall with case 343 169

6528 above Sawzall w/wired cord 339 185

6537-2 6527 w/quick lok blade change 224 175

0408-6 12V Drill w/keys chuck&2 batt 380 172

0224-1 3/8" Drill 4.5 amp magnum 236 132

0234-1 1/2" Drill 4.5A mag 0-850 rpm 255 129

0235-1 1/2" Drill w/keyless chuck 255 129

0244-1 1/2" Drill 4.5A mag 0-1000 rpm 255 129

0222-1 3/8" Drill 3.5 amp 0-800 rpm 213 119

0228-1 3/8" Drill 3.5 amp 0-1000 rpm 217 118

0375-1 3/8" close quarter Drill 255 148

0379-1 1/2" close quarter Drill 288 165

6546-1 cdc Screwdr 200 & 400 rpm 150 89

6547-1 5/16-1/4" whits. 1/4" chuck & cs 105 89

5399 1/2" D-hdle Hammer Drill Kit 356 194

6507 Original Sawzall with case 278 149

5397-1 3/8" w/spd Hammer Drill Kit 275 145

5371-1 1/2" w/spd Hammer Drill Kit 360 194

3107-1 1/2" w/spd right angle Drill Kit 411 234

3300-1 1/2" w/spd right angle Drill 378 199

5880 Router 2 HP w/collets 367 165

6142 4-1/2" Grinder w/cse & acc. 224 125

6365 7-1/4" Circular Saw 13 amp 229 125

6368 6365 w/fence, blade & cse 259 142

6256 Top Handle Jig Saw 278 149

6490 10" Miter Saw 496 265

6491 6490 w/ carbide blade & bag 594 328

6494 10" Compound Miter Saw 585 315

0431-1 12V Drill w/ 2 batteries 441 239

6266-6 NEW Top Handle Jig Saw 315 165

6496 10" Slide Compound Saw 1050 569

FREUD CARBIDE TIPPED SAW BLADES
5/8" Bore - Industrial Grade

Item Description	Teeth	List Sale
LUF2M010 Gen Pur. A.T.B. 10" 40	69	42
LUB2M010 Cut-off 10"	60	43
LUB4M011 Comb 10"	50	78
LUB5M010 Ripping Cut-off 10"	60	115
LUB7M010 Cut off 10"	60	84
LUB8M010 Thin Kerf 10"	24	72
LUB8M010 Thin Kerf 10"	60	88
LUB9M010 Ultimate 10"	60	128
LUB9M010 Compound Miter 10"	60	88
F410 Quiet Blade 10"	40	95
F810 Quiet Blade 10"	80	135
TK303 7-1/4" Finishing	40	38
TK906 10" Combo	50	53
SD308 6" Dado - Carbide	230	119
SD506 6" carbide w/cse & shims	292	145
SD508 8" carbide w/cse & shims	344	168
FB100 16 piece Forstner Bit Set	338	194
94-100 5 pc. Router Bit Door System	320	169
BF3 NEW Router Table	495	289
FJ85 NEW Top Handle Jig Saw	229	125

The following tools have a \$30.00 rebate thru 3/31/97. Price shown is before rebate.

FT2000C 3-1/4 HP variable speed Plunge Router 410 205

JS102 Biscuit Jointer w/fence & cs 355 179

NEW Freud Carbide Dado Blades

SD608 6" dial-a-width dado 399 199

SD606 6" dial-a-width dado 309 189

SD208 8" economy dado 195 85

WAP VACUUMS

Model Description	List Sale
766RDF 10 gallon turbo vacuum	845 465
766RDF-D "Drywall" 10 gal turbo vacuum	915 549
766RDF-DAS Above vac w/ auto start	950 589

MAKITA TOOLS

Model Description	List Sale
6172DWE 3/8" w/spd Drill Kit w/ 2 batt	222 109
5090DW 3-3/8" Saw Kit 9.6 volt	280 148
DA391D 3/8 angle Drill 9.6V	166 109
DA391DW 3/8" angle Drill Kit 9.6V	341 179
ML900 Incandescent Flashlight 9.6V	18.95

6095DWE 9.6 volt Drill Kit w/2 batt	125
6095DWELE 6095DWE w/flashlight	135
6095D 6095DW Drill only & cse	Special
63200T-4 9.6 volt Battery	47 30
63200Z-4 7.2 volt Battery	39 28
6201DWH 9.6V 3/8" Drill Kit w/2 batt	351 159
6211DWH 12V 3/8" Drill Kit w/2 batt	366 169
6311DWH 12V 1/2" Drill Kit w/2 batt	399 205

NEW CORDLESS DRILLS
WITH 2.0 AMP HIGH CAPACITY BATTERIES

6233DWA 12V 3/8" Drill Kit	325 179
6233DWA 14.4V 3/8" Drill Kit	358 199

SUPER CORDLESS SPECIALS

6073DW 7.2V cdc Drill Kit. Variable speed & clutch. Complete with battery, charger, & case. Super Sale 99

T220DW 9.8 volt Stapler Kit. Complete with battery, charger, & case. Super Sale 99

9900B 3"x21" Belt Sander w/bag	347 179
9924BD 3"x24" Belt Sander w/bag	360 189
4301BV Orb. var. spd Jig Saw 3.5A	282 155
JR3000V w/spd Jig Saw w/case	264 135
9820-2 Blade Sharpener	433 215
1912B 4-3/8" Planer	253 189
19100B 3-1/4" Planer with case	263 129
9192B 4-3/8" Planer	253 189
NO514B 4" Disc Grinder 4.6 amp	118 65
DA3000R3/8" Angle Drill	355 175
2709W 8-1/4" Table Saw	637 300
6405 3/8" Drill Rev. 0-2100 rpm	115 65
6510LVR 3/8" Drill Rev. 0-1050 rpm	188 98
6013BR 1/2" Drill Rev. 6 amp	270 145
9401 4" x 24" Belt Sander w/bag	548 219
9007BNK7-1/4" Circ Saw w/case	250 125
5037NB NEW 7-1/4" Circular Saw	288 148
LS1011 10" Slide Compound Saw	495 429
LS1211 12" Slide Compound Saw	1620 778
3901 Plate Jointer	376 199
3612C NEW 3 HP Plunge Router	492 259
LS1040 NEW 10" Compnd Miter Saw	460 259

SENCO AIR NAILERS

SNF1+ Finishing Nailer 1" - 2" w/ cs	448 345
SN325 Nailer 1-7/8" - 3-1/4"	665 419
SLP20 Pinner w/cs 5/8" - 1-5/8"	422 275
SKS Stapler 5/8" - 1-1/2"	390 275
SN70 Framing Clip Hd 2" - 3-1/2"	725 449
SN60 Framing - Full Hd 2" - 3-1/2"	708 449
SN65 15% more power than SN60709	459 289
SNF40 Finish Nailer 1-1/4 - 2-1/2"	569 389

BOSTITCH AIR NAILERS

N805-1 Stick Nailer	Super Sale 339
N80C-1 Coil Nailer	Super Sale 339
NR45 Coil Rod Nailer 3/4" - 1-3/4	345 369
BNF09-2K Finishing Nailer w/case	557 299
BT35-2 Brad Tacker 5/8" - 1-3/8"	254 155
BT35-2K BT35-2 w/cse, oil, & brads	279 165
CWC100 1 HP Pancake Compressor	440 289
MIF55 Flooring Stapler 15 gauge	902 529
S325X-1 Finish Stapler 1/2" - 1-3/8"	245 155
S325X-1K S325X-1 with case & oil	269 165

SKIL TOOLS

77 7-1/4" Worm Drive Saw	144
77M 77 Mag Worm Drive Saw	165

PANASONIC CORDLESS

EV6181CRK 9.6V Drill Kit w/ 2 batteries, 1 hr charger, & case	307 169
EV6100EOK 12V Drill kit w/ 2 Ironman batteries, 15 min. charger, & case	379 194
EV6100SEK Same as above but has 1 Ironman battery and 1 diagnostic battery	342 204
EV6101SOK 12 volt 1/2" Drill w/ 15 min. charger, diagnostic battery, & case	438 249
EV6101EOK Same as above but has two Ironman batteries	542 249
EY3502EOK NEW 4-3/8" 12V Metal Cutting Saw Kit	500 289

PASLODE IMPULSE GUNS

IM250 Trimpulse Finish Nailer Kit	1130 548
IM325 Impulse Framing Nailer Kit	1130 548
IC325SS Cds Framing Nailer Kit	1120 495

CLAYTON OSCILLATING SPINDLE SANDERS

140 Portable sander w 4-1/2" spindle	625 559
146 Portable sander w 9" spindle	685 609
100 Floor mount snder 4-1/2" spindle	785 709
106 Floor mount sander 9" spindle	845 759

SIoux TOOLS

8030 3/8" var/spd Drill	263 145
8000 3/8" var/spd close qtr Drill	211 125
690 5" Air Random Orbit Sander	228 132

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DW995K 1/2" Drill Kit Sale 229

DW997K 1/2" Drill/Hammer Drill Kit Sale 249

DW936K Saw Kit Sale 249



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DEWALT TOOLS

Model Description	List Sale
DW321K NEW Jigsaw Kit	300 164
DW321K comes w/ Free 8 piece blade set	
DW36 7-1/4" Circ. Saw w/brake	294 158
DW610 1-1/2 HP 2 handle Router	266 152
DW411 1/4 sheet Palm Sander	86 58
DW100 3/8" Drill, 4 amp, 0-2500 rpm	118 66
DW682KBiscuit Joiner with case	448 199
DW705 12" Compound Miter Saw	734 359
DW705K DW705 with 80 tooth blade	359 395
DW625 3 HP w/spd Plunge Router	400 218
DW625 router comes with DW6966 fine depth adjuster and 8-piece template guide set	
DW621 NEW 2 HP Plunge Router	400 218
DW621 comes with Free DW6956 fine height adjuster	
DW675K 3-1/8" Planer with case	292 164
DW431 3 x 21 w/spd Belt Sander	338 184
DW421 5" Palm Ran. Orb Sander	144 74
DW444 6" Ran Orb Sander	266 139
DW443 DW444 w/loop & loop pad	266 139
DW673KNEW Laminate Trimmer Kit	364 188
DW935K 14.4V 5-3/8" Trim Saw Kit with 2 batteries	444 237

DEWALT CORDLESS DRILLS

DW952K 3/8" variable speed w/ two 9.6V XR batteries	284 138
DW962K-23/8" variable speed w/ two 9.6V XR batteries	330 179
DW972K-23/8" variable speed w/ two 12V XR batteries	362 182
DW904 12 volt flashlight	48 29.85
DW972K-2 drill & DW904 flashlight	205

DEWALT CORDLESS DRILLS

DW991K-23/8" variable speed w/ two 14.4V XR batteries	415 209
DW994K 1/2" variable speed w/ one 14.4V XR batteries	450 235
DW994K-2 above drill w/ 2 batt.	549 259
DW996K 1/2" w/spd w/ two 14.4 XR batt	245
Above drill kits come w/ charger & steel case!	
DW991KS-2 DW991K drill, DW935 trim saw, & case	349

HITACHI TOOLS

CFB2 8-1/2" Slide Compound Saw	1169 489
C10FC 10" Miter Saw	533 199
C10FS 10" Slide Compound Saw	1627 739
C15FB 15" Miter Saw	1346 659
NR83A Framing Nailer 2 - 3-1/2 Full Edge	900 389
NR83AA Framing Nailer 2 - 3-1/2	922 375
NV45AB Coil Roofing Nailer 7/8 - 1-3/4	935 435
EC6B 1 HP Oil Compressor	540 279
EC6C 1 HP Oil-less Compressor	580 295
C7SB 7-1/4" Circular Saw	549 89
FDS100VA 9.6V Drill Kit w/ flashlight	99

BIESEMEYER FENCES

B-50 50" Commer. Saw	443 325
T-SQUARE 52 52" Homeshop	360 269
T-SQUARE 40 40" Homeshop	335 249
T-SQUARE 28 28" Homeshop	325 239

PONY CLAMP FIXTURES

Model Description	List Sale	Lots
50 50 3/4" Black Pipe	15.45	8.10 92.50
52 52 1/2" Black Pipe	12.65	6.95 74.95

BOSCH

Model Description	List Sale
1587VS Top Handle "CLIC" Jig Saw	292 139
1587VSC 1587VS saw with case	349 149
1584VS Barrel "CLIC" Jig Saw	288 139
Bosch Metal Case for above Jig Saws	24
Bosch 30 blade assortment for Jig Saws	28.99
1584VS or 1587VS with steel case and 30 Bosch blades	175
3270DVS 3"x21" w/spd Belt Sander	301 165
1276D 4"x24" Belt Sander	379 219
1275DVS 3"x24" vis Belt Sndr	379 219
1276DVS 4"x24" vis Belt Sndr	402 219
1347AK 4-1/2" Grinder w/cs & acc.	172 105
1194VSR 1/2" w/spd Hammer Drill	272 135
1194VSR above Drill w/case	303 169
1604A 1-3/4 HP 2 Handle Router	269 142
1604AK same as above w/cse & acc	337 185
1613EVS 2HP vis Plunge Router	369 199
1615EVS 3 HP vis Plunge Router	538 289
1634VSK 12V Saw 10.5 amp	335 159
3310K 12V Hand Drill Kit	345 175
3610K 14.4V Drill Kit	354 195
3107DVS 3107DVS w/case	165 98
3107DVS 3107DVS with case	195 149
3725DVS 5" Random Orbit Sander	256 118
3727DVS 6" Random Orbit Sander	266 154
B8315 10" Slide Compound Saw	1050 589
B7000 Corner Detail Sander	126 68
B7001 B7000 w/ variable speed	145 89.85
B4050 In Line Jig Saw	206 112
11224VSR 7/8" SDS Rotary Drill	404 229

PORTER CABLE

A special *Queen Elizabeth II* souvenir

Do you bring home curio shop souvenirs from memorable vacations? Victor Carsten, a *WOOD*® magazine reader from Sun City, Arizona, has a better suggestion for fellow woodworkers: Bring wood home and make your own.



"My wife and I took a Dream of a Lifetime vacation last year," Vic explained in his letter. "We sailed to England aboard the *Queen Elizabeth II* (in just under six days) and returned via the *Concord SST* (in 3½ hours). On the ship, I sought a one-of-a-kind souvenir. Spotting a friendly-looking officer, I explained my woodworking hobby and asked if they might have any wood around that I could take home.

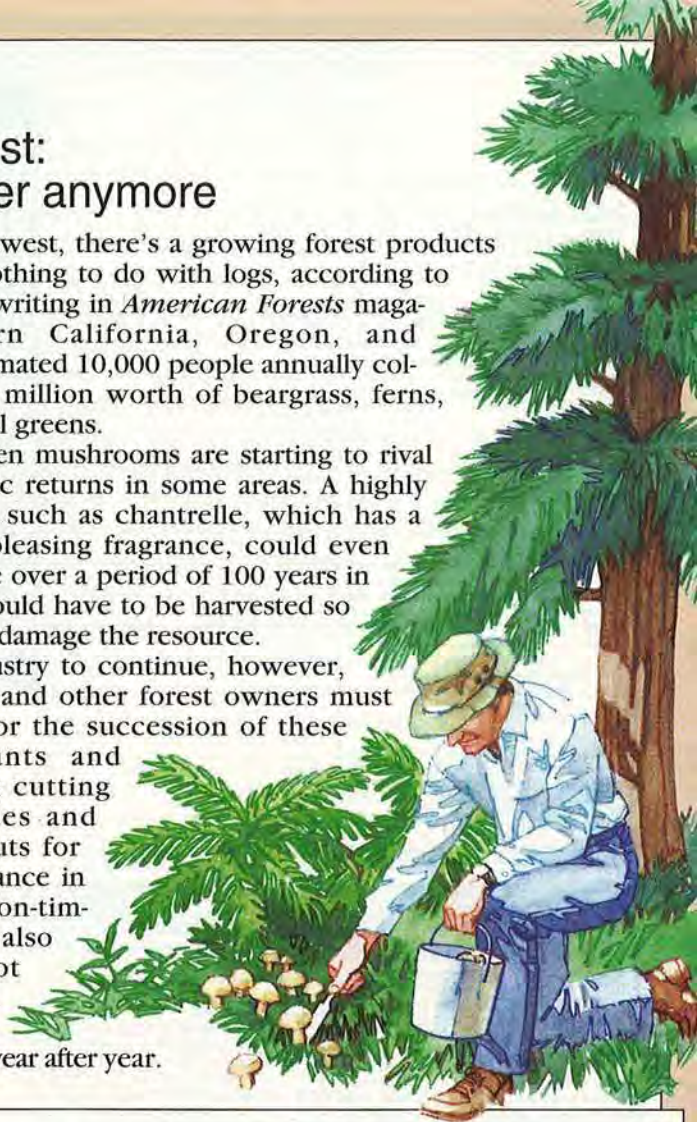
"Within an hour, a 5×14" piece of beautiful oak was delivered to our cabin," he continued. "It apparently was left over from a dance-floor installation, since it has a heavy-duty finish on one side." Vic plans to make lapel pins and bola ties in the shape of the Concord airplane for his wife and him from the souvenir wood. "I don't know what I'll do with whatever wood is left," he concluded, "but its origin will never be forgotten."

Forest harvest: not just timber anymore

In the Pacific Northwest, there's a growing forest products industry that has nothing to do with logs, according to Jane Braxton Little writing in *American Forests* magazine. In northern California, Oregon, and Washington, an estimated 10,000 people annually collect and sell \$12.9 million worth of beargrass, ferns, salal, and other floral greens.

Little says that even mushrooms are starting to rival timber for economic returns in some areas. A highly marketable species such as chanterelle, which has a golden color and pleasing fragrance, could even exceed timber value over a period of 100 years in certain places. It would have to be harvested so as not to deplete or damage the resource.

For this new industry to continue, however, lumber companies and other forest owners must manage to allow for the succession of these niche-market plants and fungi. That means cutting back on herbicides and planning timber cuts for less ground disturbance in gathering areas. Non-timber entrepreneurs also must learn how not to ruin the seed stock so that they can harvest year after year.



Breathe better in the woods

In a vigorously growing young forest, each pound of wood daily removes 1.47 pounds of carbon dioxide from the atmosphere. It then replaces it with nearly the same amount of life-sustaining oxygen, according to studies done by the Southern Forest Products Association.

Bubinga rides the waves

Should you happen to some day board Royal Caribbean Cruise Lines' new ship, *Splendour of the Seas*, check out the hardwood sculptures flanking the main staircase on the fifth deck. The Oslo, Norway, ship line purchased the 42"-high pieces from artist and woodworker Robert Longhurst of Chestertown, New York, as additions to its extensive floating collection of art from around the world.

Longhurst's sculptures, which he named "Arabesque X" and "Arabesque XXXIII" (shown left), were sculpted in bubinga, a non-endangered species from West Africa. He likes bubinga for its rich color, but its stability and hardness allow him to work it into thin, curved shapes without checking or cracking. ♣

◀ Taking a Caribbean cruise? Look for this bubinga sculpture aboard the Royal Caribbean Cruise Lines' ship *Splendour of the Seas*.

Illustrations: Jim Stevenson Photograph: Courtesy of Robert Longhurst

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THE NEW RYOBI DETAIL BISCUIT JOINER

THE DIFFERENCE BETWEEN WOODWORKING AND WOODNOTWORKING.

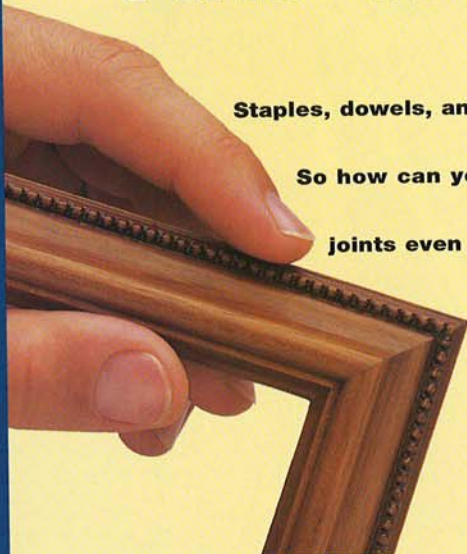
Staples, dowels, and glue won't do. Standard-size biscuits won't fit.

So how can you make neat, tight, professional joints even in small stock? With Ryobi's new

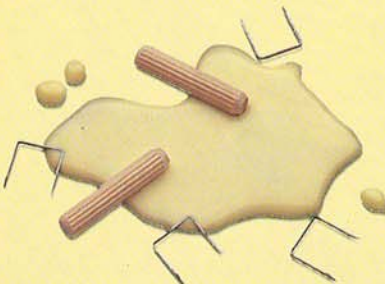
Detail Biscuit Joiner, that's how.



Standard biscuits stick out of small joints, and the mis-match shows, even after you trim the excess.



The new Ryobi Detail Biscuit Joiner uses miniature "Accu-biscuits" for neat, tight, professional joints.



This compact powerhouse cuts smaller slots and uses miniature "Accu-biscuits"™ to fit where standard biscuits don't. And its price is as small as its biscuits. But the Detail Biscuit Joiner is big on performance, from its beefy motor to its die-cast

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your wood working like

never before.



Ryobi "Accu-biscuits" (actual size).



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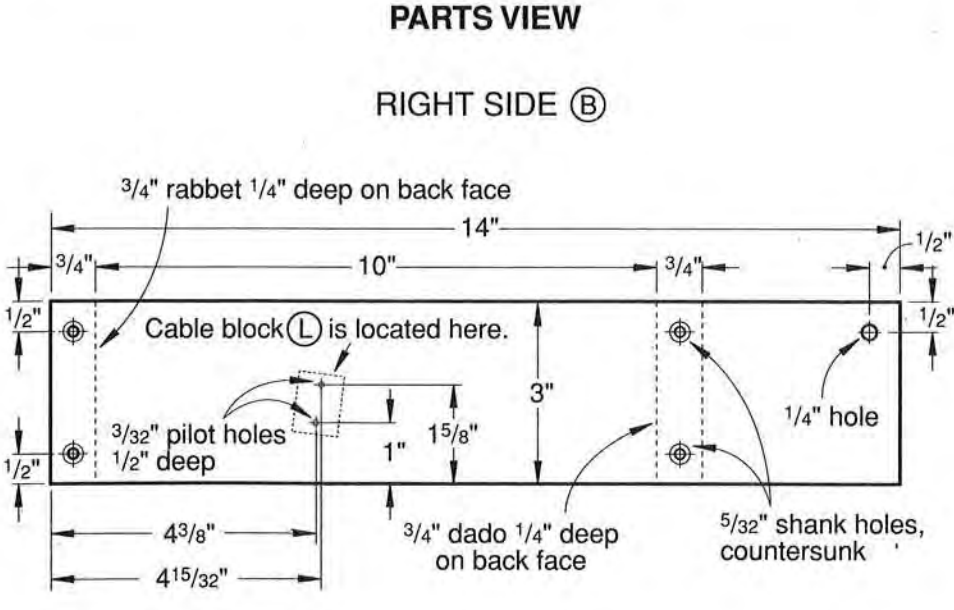
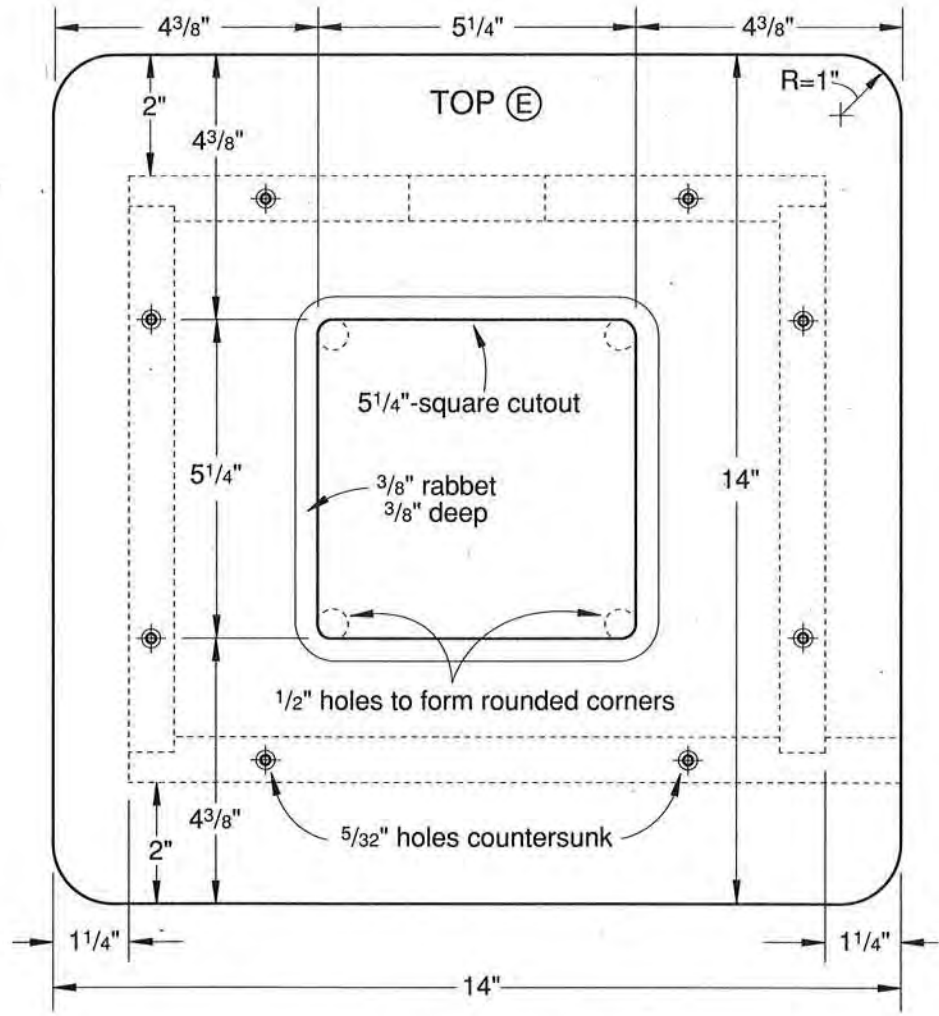
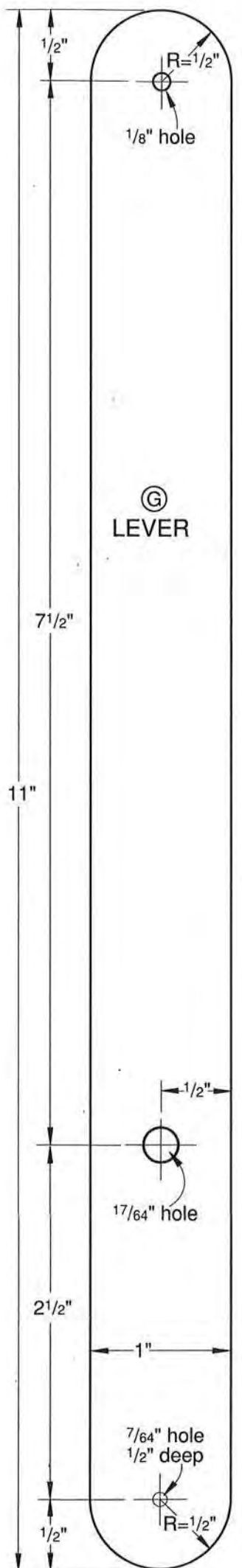
WOOD PATTERNS

Full-sized for your woodworking convenience

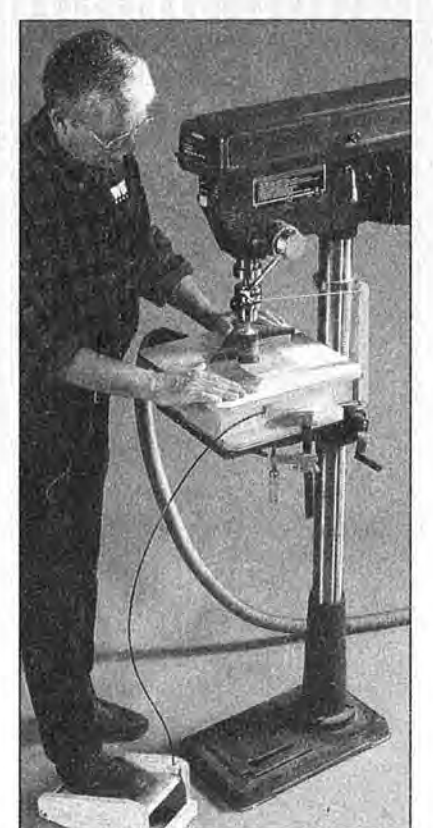
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ISSUE 96

Dear Reader: As a service to you, we've included full-sized patterns on this insert for irregular-shaped and intricate project parts. You can machine all other project parts using the Bill of Materials and the drawings accompanying the project you're building.



- Turned Table
- Cuckoo Birdhouse
- Drum-Sanding Table

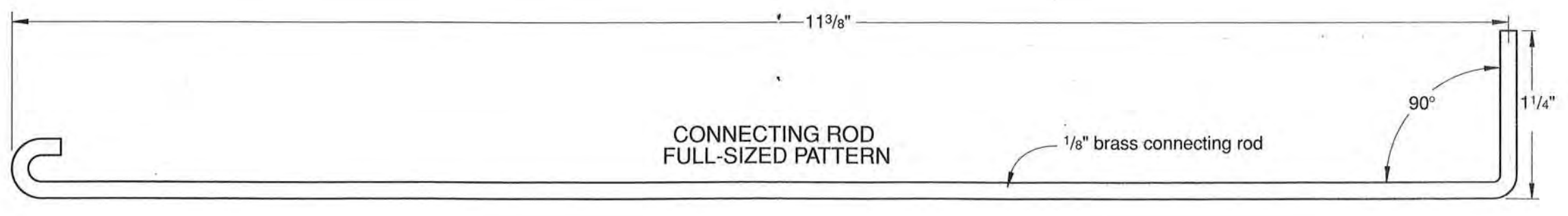
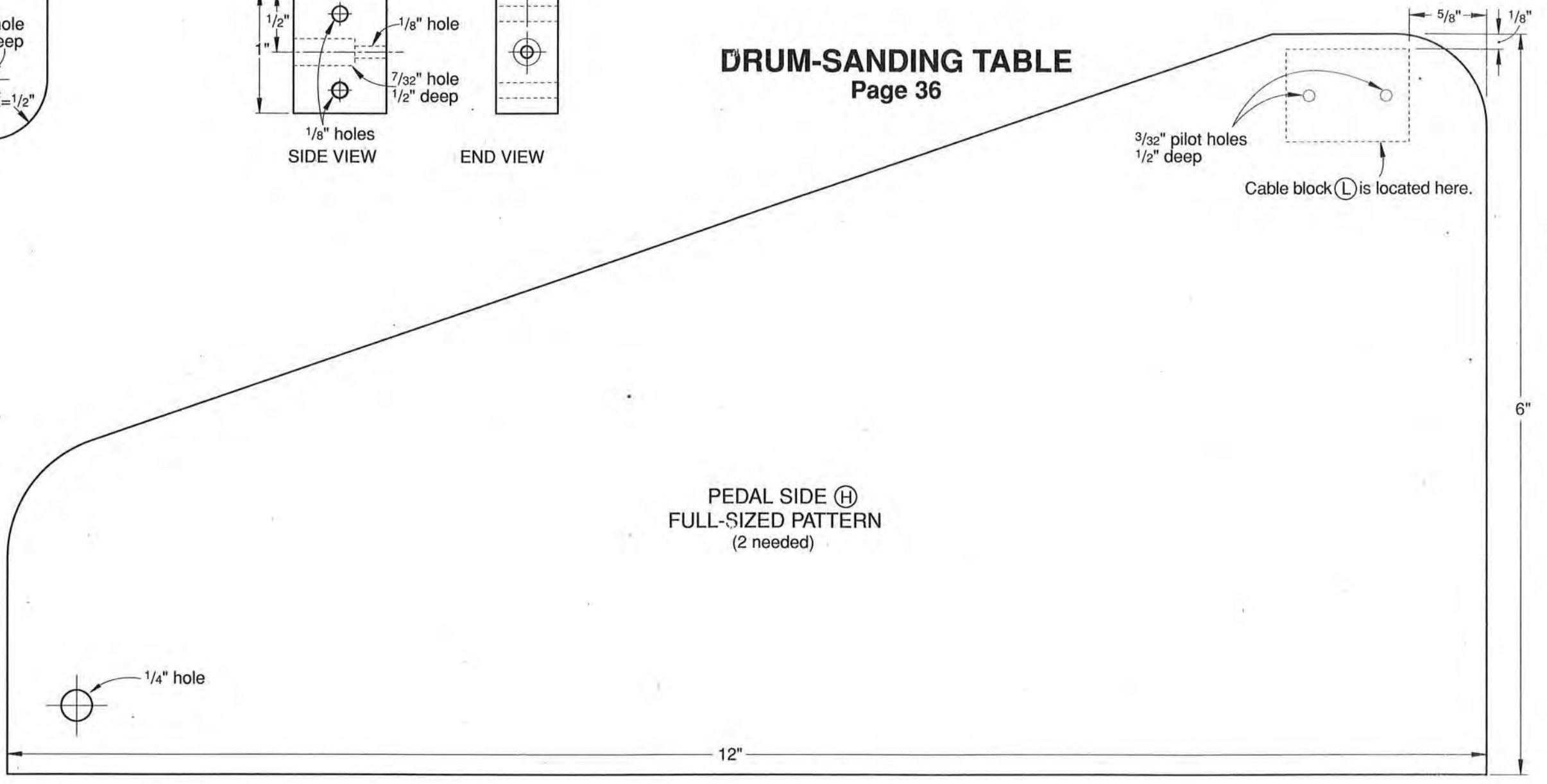


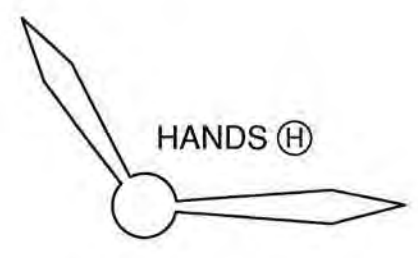
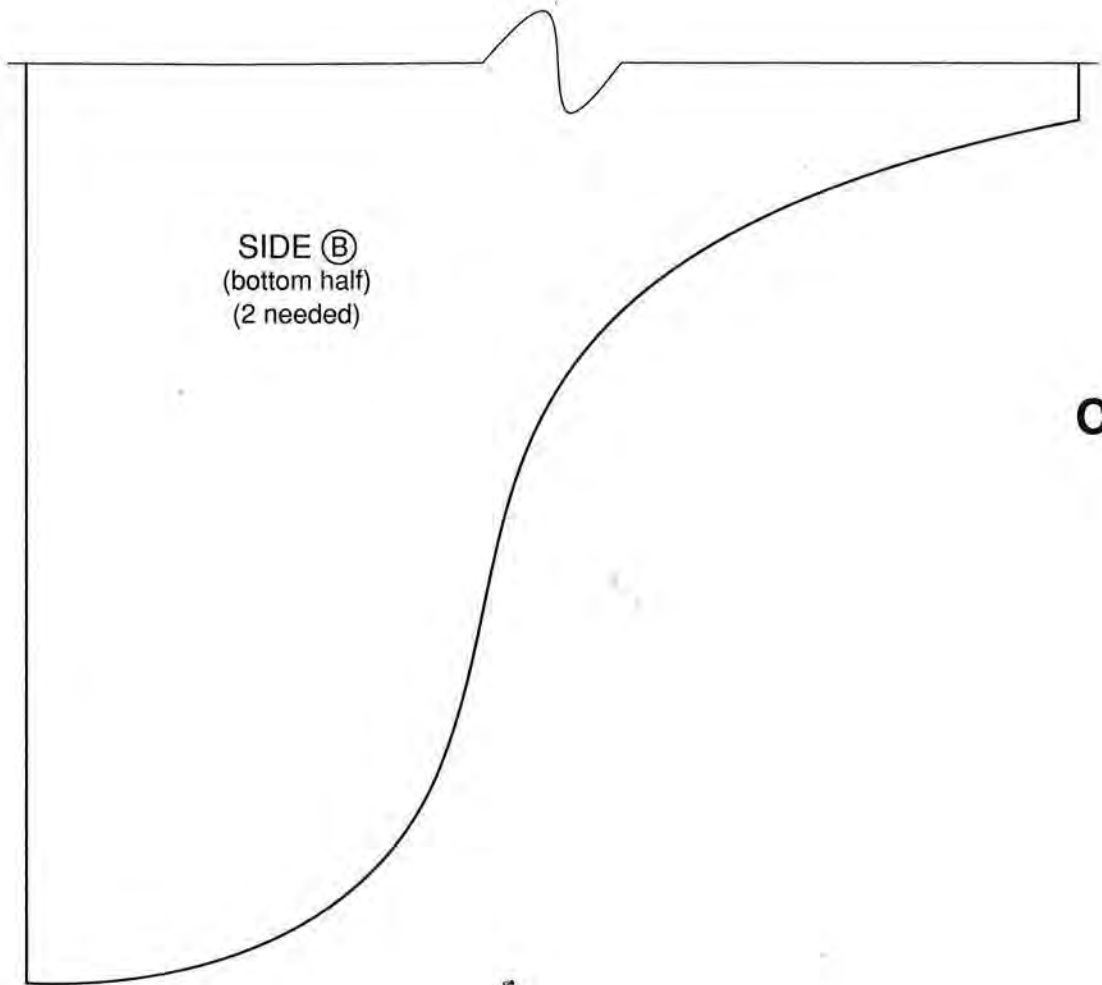
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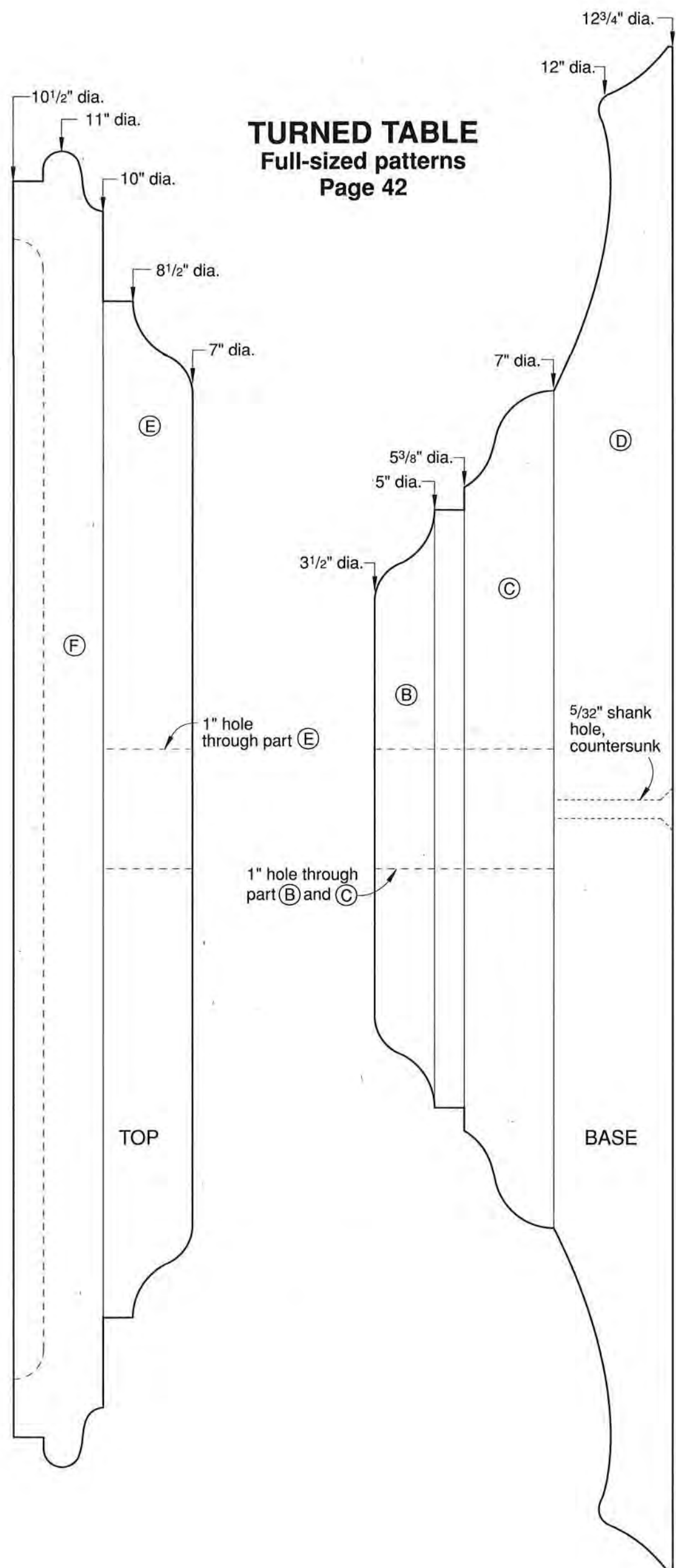
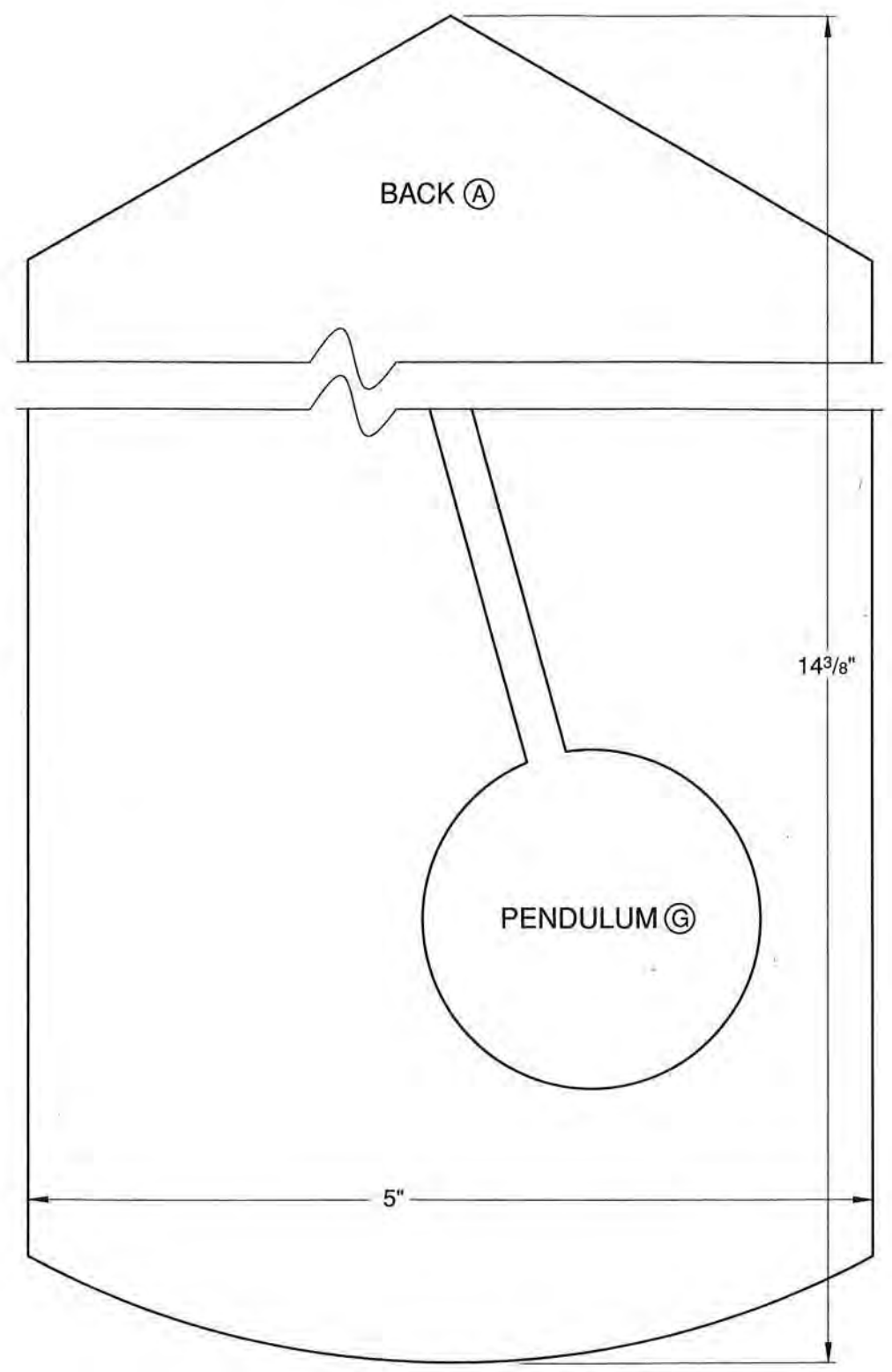
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Full-sized patterns
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TURNED TABLE
Full-sized patterns
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