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#85

Popular Woodworking

July 1995

The Jig's Up on Mission Style Furniture p.21

Steamless Wood Bending, It's Child's Play p.60

An Easy Country Corner Cupboard, (Really!) p.28

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Kit Furniture Review

We Test 8 One-Day Wonders

Starts Page 52

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On the Cover

On the Cover

If you haven't yet explored the world of kit furniture, there's a brave new universe out there, regardless of your skill level. Our review of eight kit furniture projects opens the door to this realm of new opportunities. Especially suited for those pressed for time, kit building can help you get the job done, maybe even *today*. On the cover are kit projects including a beautiful sleigh bed, handsome tilt-top table, authentically styled sack-back Windsor chair and a versatile porringer table.

Safety Note

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

Popular Woodworking®

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Some diagram work by Fox Art.

Turnings

Near Instant Gratification

When the grass is growing faster than you can cut it, the garden needs tending, the car begs to be washed, and the kids are waiting to be driven to ball practice, you know it's summer. It's the only time of the year your shop begins to accumulate real dust, instead of sawdust. Yes, good ol' relaxing summertime. Not!

But if you can steal away to your shop for even just a few hours, you ought to consider a kit furniture project. You'll complete it in a fraction of the time it would take to complete a "from scratch" project and maybe even have it done by dinnertime. Really! Check out our Kit Furniture review and consider "collaborating" with a manufacturer to complete a project you'll really be proud of. Among the many kit options available (not just those presented here) you're certain to find something you need that will give you "instant" woodworking gratification, that wonderful feeling you might otherwise miss until all those now green leaves have turned colors, fallen, been raked, shredded and consigned to the mulch pile.

Hands Across the Water

Please join me in welcoming Tobias Kaye to *Popular Woodworking*. Tobias is an extremely talented turner from England who, I think, has an equal talent for explaining and presenting his specialty craft. His first article discusses the fundamentals of spindle turning, and from there he'll progress in his efforts to help us all increase in our skill and appreciation of lathe work. Tobias has written numerous articles for the British woodworking magazine, *Good Woodworking*, and we are presenting his work for the first time in North America. Tobias makes his living turning full-time, producing for specialty manufacturers and his own clientele. Even with two assistants to help, Tobias says he's booked solid for the next year.

Material Guy

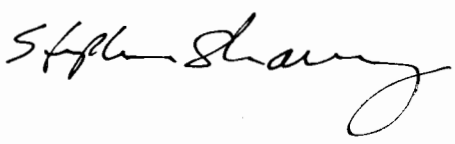
Sometimes, all you can do is shake your head. I met Jerry Rymarquis at his home in Northern Kentucky when I went to see him about writing his hurnidor story. While we talked wood and box making, his wife interjected that Jerry "sure had a lot of wood in the garage," and Jerry would just grin. I should have "gotten it" when he mentioned his tree farm and stand of "a few thousand walnut trees." Concluding our discussions, Jerry offered to show me his shop and the wood collection.

I was ushered into his shop/garage and there it was; floor to ceiling, taking up most of his two-car garage. Walnut (his favorite, could you guess?), cherry, mahogany, a bunk of exotics, and more walnut. He plans to retire in a few years and concentrate full-time on his woodworking. Then he'll have a chance to make a serious run at that garage full of beautiful lumber. He's committed to leaving more quality board footage behind than he uses and, with his tree farm, I'm certain he'll easily accomplish his goal. Hats off to Jerry and others like him who are the custodians of future woodworkers' material needs.

Have Shop, Will Travel

I found the photos and manuscript for our Provincial Corner Cupboard project in a large box handed down from our former editorial staff. I called the number listed for woodworker Sal Maccarone but it was no longer in service. Putting my investigative skills to work, I called the only other Maccarone in Mariposa, California who, it turns out, are Sal's parents. "Got a big job and took his shop to Washington," said the senior Mr. Maccarone. "He'll be there a year or two," he added. One new phone number later, I was talking with Sal, who tells me he's been commissioned to restore an historic Victorian home in Port Townsend, Washington. We welcome Sal to the pages of *Pop Wood* and thank his dad for passing on that new number!

I hope you like our "summer schedule" of projects. We've tried to present options that will let you get some quality, if limited, shop time in and still have a few minutes left to head down to the Dairy Queen with your significant other.



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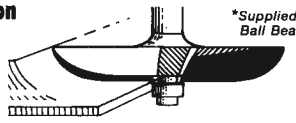

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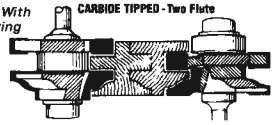

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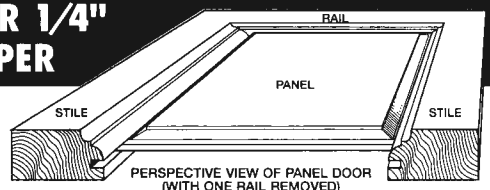

PERSPECTIVE VIEW OF PANEL DOOR (WITH ONE RAIL REMOVED)

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#1315	ROUND OVER - 3/16" Radius	1/4"	$11.00
#1368	ROUND OVER - 1/4" Radius	1/4"	$12.00
#1316	ROUND OVER - 5/16" Radius	1/4"	$14.00
#1369	ROUND OVER - 3/8" Radius	1/4"	$15.00
#1370	ROUND OVER - 1/2" Radius	1/4"	$17.00
#1317	ROUND OVER - 1/4" Radius	1/2"	$12.00
#1318	ROUND OVER - 3/8" Radius	1/2"	$15.50
#1319	ROUND OVER - 1/2" Radius	1/2"	$17.00
#1320	ROUND OVER - 3/4" Radius	1/2"	$21.00
#1333	TONGUE & GROOVE - Straight	1/4"	$29.00
#1334	TONGUE & GROOVE - Straight	1/2"	$29.00
#1335	TONGUE & GROOVE - Wedge	1/4"	$29.00
#1336	TONGUE & GRDOVE - Wedge	1/2"	$29.00
#1337	FLUSH TRIM -3/8" Diameter -1" Cutting Length	1/4"	$ 7.50
#1338	FLUSH TRIM -1/2" Diameter -1" Cutting Length	1/4"	$ 8.00
#1339	FLUSH TRIM -1/2" Diameter -1-3/16" Cutting Length	1/2"	$ 8.00
#1340	PATTERN / FLUSH TRIM -1/2" Diameter	1/4"	$15.00
#1341	PATTERN / FLUSH TRIM -3/4" Diameter	1/4"	$17.00
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#1351	LOCKMITRE -7/8" Cutting Length	1/4"	$32.00
#1352	LOCKMITRE -1-1/8" Cutting Length	1/2"	$45.00
#1353	OGEE RAISED PANEL -2" Large Diameter	1/4"	$28.00
#1354	OGEE RAISED PANEL -2-3/4" Large Diameter	1/2"	$32.95
#1389	SPIRAL UPCUT - 1/8" Diameter (solid carbide)	1/4"*	$ 9.95
#1390	SPIRAL UPCUT - 1/4" Diameter (solid carbide)	1/4"	$13.25
#1391	SPIRAL UPCUT - 1/4" Diameter (solid carbide)	1/2"*	$15.45
#1392	SPIRAL UPCUT - 3/8" Diameter (solid carbide)	1/2"*	$26.45
#1393	SPIRAL UPCUT - 1/2" Diameter (solid carbide)	1/2"	$33.00

*PROPER ADAPTER WILL BE SUPPLIED

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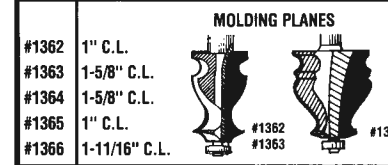
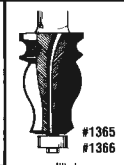
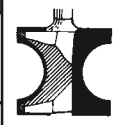
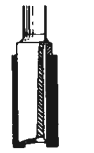
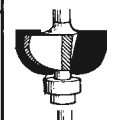
#1363	1-5/8" C.L.	1/2"	$29.95
#1364	1-5/8" C.L.	1/2"	$31.95
#1365	1" C.L.	1/4"	$31.95
#1366	1-11/16" C.L.	1/2"	$31.95
#1330	BULL NOSE - 1/2" Diameter of Circle	1/4"	$16.00
#1331	BULL NOSE - 3/4" Diameter of Circle	1/4"	$21.00
#1332	BULL NOSE - 3/4" Diameter of Circle	1/2"	$21.00
#1371	STRAIGHT - 1/4" Diameter	1/4"	$ 6.50
#1372	STRAIGHT - 3/8" Diameter	1/4"	$ 6.50
#1373	STRAIGHT - 1/2" Diameter	1/4"	$ 7.00
#1374	STRAIGHT - 3/4" Diameter	1/4"	$ 9.50
#1375	STRAIGHT - 3/8" Diameter	1/2"	$ 7.50
#1376	STRAIGHT - 1/2" Diameter	1/2"	$ 8.00
#1377	STRAIGHT - 3/4" Diameter	1/2"	$10.00
#1378	COVE - 1/4" Radius	1/4"	$12.00
#1379	COVE - 3/8" Radius	1/4"	$13.00
#1380	COVE - 1/2" Radius	1/4"	$14.00
#1381	COVE - 1/2" Radius	1/2"	$15.00
#1382	ROMAN OGEE - 5/32" Radius	1/4"	$16.00
#1383	ROMAN OGEE - 1/4" Radius	1/4"	$17.00
#1384	ROMAN OGEE - 1/4" Radius	1/2"	$18.00











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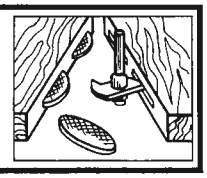

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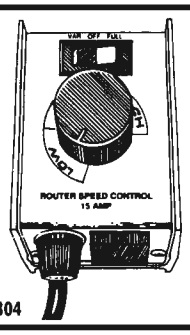

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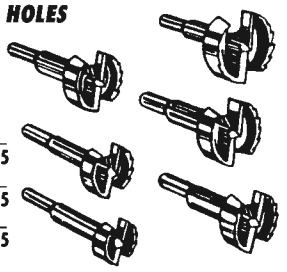

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Letters

We welcome your comments, pro or con, about articles we publish. We also want to see color pictures of what you're building. Send your letters and photos to: Letters, *Popular Woodworking*, 1507 Dana Ave., Cincinnati, OH 45207. Letters may be edited for publication.

Solution to board snipes

I often use small pieces of wood in varying thicknesses for my projects, using a small thickness planer to prepare my material. The problem with most thickness planers is they cut a little deeper at the start and end of the board about 2" in, leaving a "snipe" at both ends. In these days of wood shortages and expensive exotic and domestic woods I find this wastage unacceptable.

My solution has been to glue pieces of scrap wood to the ends of my small exotic woods. This way the snipe occurs in the scrap material.

Doug Adams
Merrickville, Ontario

ED. The snipe you refer to is caused by the pressure feed rollers forcing the board up against the knives. Most planers have adjustment for both the in-feed and out-feed rollers located in the planer tables. Eliminate snipes by lowering the rollers below the plane of the table. You may want to check this option before spending the extra time to glue up extra wood.

Staged project

In response to a letter in the January 1995 issue, we received the following letter and photo from another handy reader.

I am sending a picture of a stagecoach a friend and I built from the bottom up. We looked at a couple of stagecoaches in a museum for the measurements, and

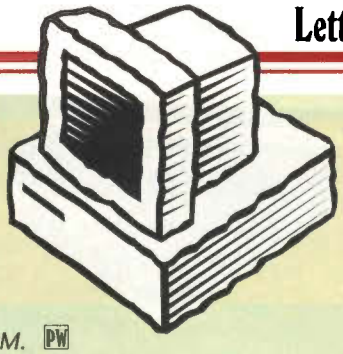
the wheels are from some old wagons. We had a lot of fun building this.

Philip Gerlach
Stillwater, Minnesota

ED. We've received a number of requests for plans for stagecoaches and in particular the process used to make wagon wheels. If any reader out there has a set of plans or information on the subject, we'd be happy to pass it on.

The jig is up

In issue #32, (September, 1986) there was a Jig Journal on page 45. If I order



Detail on E-Mail

In the last issue's letter section we let you know how to get in touch with us through your computer. We want to repeat that address and let you know where to find us.

Contact us directly through CompuServe at: Bruce Woods, 75463,3377, or leave a message in the Woodworking Section of the CompuServe Crafts Forum.

Our America Online screen name is Wudworker. To leave us a message without using the mail system, look for the Exchange's Woodworking Center.

Those of you who are on another online service can write to us at Wudworker@AOL.COM. PW

issue #32 would this be the only issue with that number and would it be the only Jig Journal?

Leland Clark
Bothell, Washington

ED. The Jig Journal was a special column which ran for a number of years in Popular Woodworking. Jig Journals appeared in issues 25, 26, 27, 30 and in issues 31, 32, 33, 37 and 39 which are still available by ordering back issues. If your interest is jigs and construction techniques, we'll be providing more of this information in sidebars relating to projects in upcoming issues.

Foot out of joint

In reading and re-reading the article for the handkerchief table (Jan. 1995), I didn't notice any mention of placement of the foot on the Queen Anne style legs. By this I mean, should the foot protrude from the side or the comer of the stock.

The legs aren't mounted to the rails in the same fashion. Three are mounted square and one is mounted with a 45° turn. If all the feet are to the corner of the stock, one foot will be facing directly out toward the corner of the table, while the others will be 45° off the corner. Is this correct or should all the legs be facing straight out of the corner?

Waiting for a reply with lathe spinning.

Cosmo C. Crane
Marrick, New York

ED. We checked with Dean Gutzwiller who confirms that all legs are turned the same way. When off-setting the leg to turn the leg taper, the off-sets are in-line with a corner. If you look closely at photo 10 in the article, you'll see the two dimples left from the lathe centers are the same. Legs should be mortised so that the foot turns out from the corner of the table top.

Tricks of the Trade

Tricksters Everywhere, ATTENTION

You like this column, right? You read it regularly, right? You've probably used a trick or two in the past. Isn't it time you share some of *your* secrets? We're looking for good tricks, baskets of them. Sit down after dinner and get a couple in the mail to me. Let's hear from you!

SS, the Editor.

Pipe Dream Clamp!

My hobby is making wooden toys. I find that making a number of the same model toy at the same time is easier and faster; however, I've had a problem with clamps. I need spring clamps and C-clamps, and I need a bunch of them.

I tried rubber bands, but they didn't work well. I found a piece of 3" Schedule 40 PVC drain pipe left over from a household project, and I cut it into ½" and ¾" sections. I next cut a small section out of the individual rings and tried them out. They worked beautifully. A 3" clamp can be spread to hold a 4½" lamination. You can buy PVC in lots of different sizes, and I've found it to be quite economical.

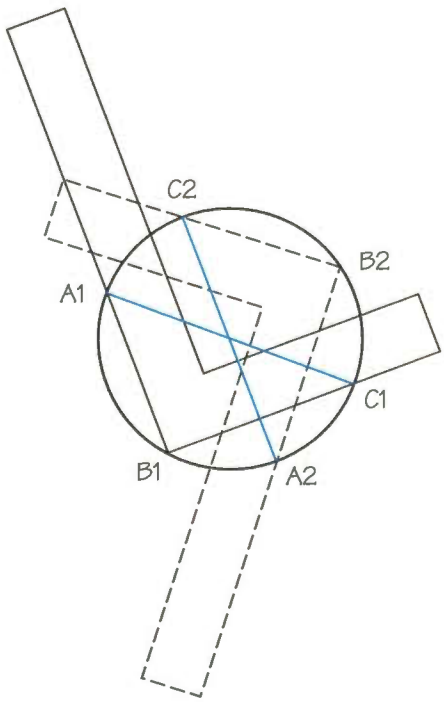
Warren Wingerter
New Orleans, Louisiana

Squeeze That Nickel 'Til It Screams!

This one's proof that woodworkers are a frugal lot!

I buy the economy pack poly-foam brushes in 1", 2" and 3" sizes to use for my many finishing needs. When the foam wears out I take it off and use the plastic support blade to spread glue in small areas, using it like a flexible putty knife. It's also great for cleaning off excess glue by using it as a scraper. When the plastic gets too beat up I use the wooden handles for axles on toys and in a pinch they make pretty good dowels!

LLoyd L. Pogue
Rockford, Illinois



The Center of Our Attention

It's easy to locate the center of any circle with a carpenter's square. Place the square over the circle in the first position as shown by the solid line, with the outside of the heel of the square touching the circle at point B. Then mark the points A and C. Turn the square over and place it in the second position shown by the dotted line. Mark as before and join the pencil lines at points where the tongue and blade of the square bisect the circle. The point where these lines intersect will be the center of the circle.

Thomas LaMance
Prewitt, New Mexico

Flush with Success

To trim plugs, dowels or through tenons flush with the project surface, I use a router with a straight cutting bit and a few scrap plywood strips or blocks. The strips hold the router base above the end of the plug and the bit is then adjusted to trim just above the surface. Use a weaving motion to trim across the end of the plug.

Daniel Cassidy
Medway, Maine

Dad Gum It All

I've tried 2-sided tape before, transparent, thin, very disappointing. At a home improvement store I found "cloth carpet tape", sticky on both sides. It came in a 42' roll, 1½" wide for about $5. I used tiny pieces to stick ⅛" plywood to make multiple pieces for a project, then got to thinking.

I made my own sanding pads for my detail sander using this tape, works great! Better (I think) than the sticky pads you buy at about 40¢ each. I figured that by using this tape, I can make pads for about 1½¢ each plus sandpaper.

I also tried it on my disk sander. Superb! Easy to remove the old tape when changing, just roll it with your finger and discard. Then I tried it on sanding sticks. Beats waiting for glue to dry. I even pushed the tape and wrapped a 5/16" dowel. Two weeks later it's still holding!

W.L. Wardle
Las Vegas, Nevada

Medical Science To The Rescue

The thin rubber tourniquet used by doctors and nurses when taking blood samples can also work as clamps for hard to hold joints. A tourniquet wrapped around the top and side of this broken chair held the joint in position until the glue set. The tourniquet did not slide or mar the mahogany of the chair. A spline cut into the edge of the joint accepted a triangular piece of ⅛" mahogany that was then trimmed and stained to match the refinished chair.

Alice and Robert Tupper
Canton, South Dakota

You Light Up My Bench

For flexible bench lighting, search out a "swing-arm" lamp at garage sales (they're usually cheap because the mounting brackets are gone). Drill holes at the appropriate locations on your bench to accept the lamp shaft, then move to the required position. (If they're really cheap, buy two!)

Fred White
Honolulu, Hawaii

This One's a Real Grabber!

To keep my small wrenches and tools handy at my table saw or router, I use a round 3" disc magnet taken out of discarded microwave oven Mag tubes. These are very powerful magnets and can be obtained from most any appliance repairman. Just stick it to the side of your saw!

Charles Hunsecker
Marion, Pennsylvania

Tricks of the Trade shares readers' tips for making woodworking tasks easier and safer. Send your original, unpublished ideas to Tricks of the Trade, *Popular Woodworking*, 1507 Dana Ave. Cincinnati, Ohio. We pay $35 for each TOT we publish.

"What Can I Do Now?"

Bernie Wolfard faced this question after a debilitating accident and his answer was starting a business.

This story is not about a young man who lost the use of his legs in a hang gliding accident and through grit, determination, and with great courage learned to walk again. Instead it's about Bernie Wolfard, who crashed his hang glider in the Equadorian Andes, wound up in a wheel chair, and when the doctors told him he would never walk again, asked himself, "what can I do now? I can sit around for the rest of my life feeling sorry for myself and looking for sympathy from others, or I can adapt to the situation and get on with my life!" He chose the latter. This is the story of the business he built, and is still building, and how he did it.

A native of Oregon and a graduate of the University of Oregon, Bernie Wolfard has lived most of his life there. After college he started Nest Aircraft Works, manufacturing hang gliders. "I got a Master of Hard Knocks business degree", he says, "when my partner in Nest stole all of the company assets." After that he went to work for a competing company and drove around the country demonstrating hang gliders. He went to Ecuador in 1976 to help some friends with an archeological dig, taking his glider along. While hang gliding in the Andes, he fell 3,000 feet and wound up a paraplegic. "Surviving Ecuadorian medical treatment was probably more risky than the fall," was his comment. He was brought back to the US, was in a Portland hospital for about two months, and was finally told that he had an irreparable spinal cord injury and would have to learn to use a wheelchair.

Ken Sadler is a master craftsman who lives in Portland, Oregon. He is the author of a number of books and a Contributing Editor to Popular Woodworking.

Bernie Wolfard builds prototypes of many of the boat designs his business is built on.

How did you react to the diagnosis?

At first I was pretty devastated, but then I looked at it as more of a challenge than anything else. I could either give up and feel sorry for myself, or I could accept the challenge of learning how to get around in the chair. After I got out of the hospital, I collected Social Security for a while and then went to work in rehabilitation. I worked as an employment counselor for St. Vincent DePaul Rehabilitation. After staying with them for eight months I was hired by The Epilepsy Foundation of America managing a local program for about nine years. It was a good job for me because I started with no idea what rehabilitation was and all of a sudden I was managing rehabilitation programs. I found I didn't like social work at all, but it taught me a lot about management; fiscal management, personnel management, how to deal with a lot of people, and how to deal with office politics. During that time I built a lot of furniture and an airplane. Then I crashed the airplane so I decided to build boats and get out of flying all together.

You said you built furniture, where did you build it, did you have a shop?

Yes, I had a multi-car garage separate from the house that I converted to a woodworking shop.

Did you have to develop certain techniques in order to build furniture from the wheel chair?

I don't think so. The problems I had were deciding what kind of major equip-

The deck of one of Bernie's many boats during production. Wolfard offers more than fifty boat designs which provide information written for the first-time boat builder.

ment to buy. For example, whether to get a table saw or a radial arm saw. While table saws are generally considered more dangerous than radial arm saws, because of my position and the way I'd have to use it I thought the radial saw would be much more dangerous, so I went with the table saw. That was about the only decision I made because of being based in a chair.

During this time I put my wife through medical school. When she graduated she decided to take her residency in Baltimore. Just before we left, I got a letter from the man I had been buying boat plans from. He said that he had had a major stroke and couldn't run the business any more and that he would like to will it to me. As I read through the rest of the letter it turned out that he wasn't so much willing it to me as he was selling it to me. His very reasonable terms asked that I pay him a small percentage of gross sales instead of a fixed amount, so that I could have the business and not pay money out of pocket.

We went to Baltimore and shortly after we arrived we got divorced. But I had this little boat plans business. It was really a hobby as it wasn't producing enough income to live on. So I got a job in rehab, which was not what I wanted to do, but would pay enough to keep a roof on the house and beans on the table. I ran the boat plans business as a hobby for about a year and a half. I eventually decided I wanted to come back to the northwest and called my parents and asked them if they'd help me get back. When I arrived in Portland in 1989 I made a commitment that I would run the boat plans business full time to see if I could make it work. It was a tough decision at that time because the business didn't produce enough income to support a reasonable living

How much money did you need to make it a full time business and where did you get it?

It wasn't so much how much I needed as how much I had. When I got the business I set aside $500 to make it go. When I came back to Portland I really had no money at all so my investment was $500 out of pocket. I also owed $10,000 to the former business owner. However, that was to be paid from a percentage of the sales so it was a debt to be paid off over time.

What did you live on?

I lived off the income from the business.

Once you began doing it full time, you got enough income to live on?

To begin with I sat down and figured out what I needed to survive, which was around $1,000 to $1,200 a month. The business at that point was producing about $800 to $1,000 a month. So I took about $600 out of the cash flow and increased my advertising. That first year it was touch-and-go as to whether I was going to make it. I used a credit card for some expenses to keep the business alive that year. Now it produces enough income for me to live on, but not as much as I'd like it to produce.

Exactly what kind of business is your Common Sense Designs?

It is an international boat plans mail order business. We focus on entry level boat building projects. I sell plans of boats that are designed for first time boat builders and that also provide all the information and other non-tangible resources that somebody would need to build a boat without any prior experience.

Were the designs already created when you took over the business?

Actually no, when I took over the business we only offered six plans. Now I offer about fifty four.

Who designed the additional boats?

All the boat designs except for one were done by the same designer, a man named Phil Bolger.

What kind of financial arrangement do you have with him?

I pay him a royalty on each plan sold. A small percentage, as most royalties are, but it's ongoing. If I commission him to design a set of plans, one that I think will fit a market niche, I pay him $1,000 to $2,000, depending on the size of the boat, and then I pay a royalty of 5% on each plan sold. The arrangement I have with him is that I pay him 25% of the gross sales of those plans until the base amount is paid off. That way I don't have to pay any money out of pocket.

How are the plans prepared for sale?

When I get plans from Phil I get prints done on vellum paper. I work with a blue-

printing company and they keep a set of my vellum plans on file. When I need a set I call them, they make the set, fold them, and I go pick them up. The plans are keyed with each piece in the boat having a number. There is a written key that corresponds to that number, telling what each piece is, what type of material to make it from, and any kind of special information you need to be able to produce that piece. I write the keys on a word processor. I also have materials that I have written on basic boat building that go with each set of plans. If any questions come up during the building, I'm available by phone. I spend a lot of time hand-holding people through the starting phases.

Did you design your catalogue or have someone do it for you? How big is it? What did it cost?

I did the whole thing. In the past I sent out Xeroxed sheets, a different sheet for each boat, it was very unprofessional looking. I put those together in a catalogue and found a way to bind it very inexpensively. Now I've reconfigured my computer system so that I can do professional layout and type setting. Now I scan pictures, write all the descriptions of the boats, collect testimonials from satisfied builders, collect performance data and type set the whole thing. Then I have a printer produce the catalogue.

What's your cost to publish each catalogue, and how many do you print?

I run about 1,500 to 2,000 catalogues a year, which is about what I sell. They cost approximately $2.34 each to produce in that quantity. Mailing third class is $1.56. I charge $10.00 for it. I've found that in mail order, you have to price an item at least twice what it costs. In the beginning, when I had a smaller catalogue, I sold it for $5.00 and it cost me about $4.25. The business really couldn't prosper that way. By increasing the size of the catalogue, basically making it a better looking and more professional piece, I'm able to charge twice as much for it, but it costs less to produce.

You sell by mail. Where and how do you advertise?

My advertising is really focused. There is one national publication called Wooden Boat Magazine *which seems to be the most productive source. Almost everyone who is thinking of building a boat sees* Wooden Boat *sometime or another. There's a small publication called* Boat Builder *and a biweekly called* Messing About in Boats *that I advertise in regularly. I've done test marketing in lots of other magazines and I haven't found anything very productive. There used to be a magazine call* Small Boat Journal, *a national publication, a real nice magazine. Their pitch was that small boats are better for you than big boats. The magazine attracted as much interest as* Wooden Boat, *but it couldn't sell enough advertising to keep alive. When it folded it cut my effective advertising sources in half.*

"There is an old saying in anything to do with boats, 'the way you make a small fortune is to start with a large fortune.'"

How do you track your ads to find out if they're paying off?

I code the ads in different magazines in my address line. For example, in a Wooden Boat *ad I put my entire address then add WB.*

That only tracks the magazine, it doesn't track the ad. I run the same ad over and over changing it no more than once a year, and usually every two years. What I found to be very important is to run the same ad over and over and never change it. I'd rather be creative and write a new ad every month, but that doesn't seem to work. People need to see the same thing over and over before they make a decision to respond to it. If you change it, you lose the continuity and people don't respond.

What percentage of the catalogues sent out return orders for plans?

Once through the design phase, the printing phase, the purchasing phase and the construction phase, the final product is ready to go into the water.

The data is so tough to read that all I can give you are ball park figures. I get about an 8 to 10% return. It's hard to track because I get sales directly from the ads and I've had orders from catalogues that I sent out years ago. There is a really long time delay for many people in responding to an ad or buying from a catalogue. Another problem is a company named International Marine Publishing, *with a huge mailing list, puts out a catalogue of marine books. They have, as of the middle of last year, picked up my catalogue as a book, so now I'm getting orders from those catalogues and I have no way of knowing when or how they got out there. I'm considering coding my order forms so that I can figure out from where the orders come.*

Do you run your business from home?

Yes, actually that's very important because if I didn't run it from my house I couldn't afford to have a business. Working at home has several advantages, reducing the overhead of the business and reducing the cost of running the house, as well as offering tax advantages. As long as I don't have employees, it works well. The only down side is that I'm somewhat isolated, so I have to make an effort to get out, otherwise I talk the mailman's ear off and drive him crazy.

You're obviously making a living from this business. Is it a comfortable living or are you just getting by?

I think I'm just getting by, but a lot of people would think that what I make is a very comfortable living.

Are you content with this?

I'm not content with my net return on the business, what I personally make from it. I think there's room for growth. I'm very content with what I'm doing, I love the business, it keeps me in contact with woodworkers and people who like working with their hands. It also allows me to work with my hands on a regular basis without being dependent on that for my living, because I don't think it's realistic to think I can make money as a carpenter anymore.

Then you do feel that you can increase the plan business over the next few years?

Yes. Currently there are two so-called plan supermarkets in this business. There's no way of knowing what they're actually earning, but one of them has to be making at least $250,000 a year. Those two are in the top tier and I'm in the second tier. I'm a ways away from them, but I'm way above everybody else.

What are your gross annual sales?

A ball park figure would be about $60,000. I net about 50% of that. The important thing about this kind of business is cost control. I've got to watch my expenses continually. My gross could go way up, while my net would go down. It's better to wring more net out of a fixed gross that it is to have a runaway gross where costs can't be controlled. The best way is planned steady growth. The first three years in business full time my enterprise grew 50% a year. That got it to a point where the business was comfortable, ongoing and I knew I wasn't going to

starve. If I can double it now, then I'll be financially comfortable. I think the plans business will grow quite steadily as long as I'm aggressive and careful about my advertising. The main growth will come when I get to the point where I can start producing kits for the boats for which I sell the plans. The trouble with that is my capitalization costs will go through the roof. I've got a gap of about a year before I'll be receiving enough income to cover those capitalization costs. I'm moving very carefully with this idea. There is an old saying in anything to do with boats, the way you make a small fortune is to start with a large fortune.

Do you, personally, ever build prototypes of the boats in the plans you sell?

Unless a plan is so much like another that I know it's going to work, I insist on having a prototype built to the plans and tested before the plans are offered for sale. I've built and tested several prototypes myself, but mostly because I was intrigued by the design. I also have a program for people willing to build a prototype off the plans at almost no cost for the plans, with the only stipulation being they follow the plans without making a lot of changes and give me feedback on how it goes. I make necessary corrections in the dimensions, making sure they actually go together as I say they will. I also make sure the boat stays right side up and does what I say it will do.

How do you handle this from a wheelchair?

I live in a wheel chair so I don't see it as any different than standing up. I make accommodations in terms of the height of my work places, I adjust the height of benches I work on and I don't stack materials very high because I can't reach them. As long as I can reach it, I can do just about the same kind of work as somebody walking. When a piece gets too big, I ask for help.

Do you have a special work bench?

I prefer a bench that doesn't have anything underneath it, where the top is high enough that I can get my knees under it, but low enough that I can still look down on it. I make my own accommodations all the time, I have people tell me they can't believe how twisted and contorted I get while fastening certain pieces in place.

When the pieces get too big, where do you get the help?

I've got lots of friends, I just phone people that I know are interested in boats. Right now I'm working on a boat at a place called Riverswest Small Craft Center. That's an organization that has lots of interested boat builders that aren't working on their own projects and are willing to help. There are occasions during any project when it's important to have help whether you're disabled or not. I can lay the same piece out five different times and get five different shapes for it. If I have someone to read the numbers to me while I do the layout, or me read the numbers and they do the layout, the result will be much more accurate than if I do the whole thing myself. I like to have that check, particularly in a piece that controls the shape of the boat.

That's Bernie's story. It shows that if your ambition is to own a business, there is no obstacle that can't be surmounted to get it. PW

If you would like to purchase one of Bernie Wolfard's catalogues for $10, write to:

Common Sense Designs
11765 Ebberts Ct.
Beaverton, OR. 97005

Finishing Forum

by Tom Wisshack

The Finishing Forum is an ongoing discussion about the art of wood finishing. If you have a question or a problem, we'd like to help. If you have a tip or secret to share, or you recently tried a new product, write: The Finishing Forum, c/o *Popular Woodworking*, 1507 Dana Ave., Cincinnati, OH 45207. Letters may be edited for clarity.

Trying To Get The Red Out

I've enclosed a picture of a rocking chair that I am trying to bleach. I need to "get the red out." I have stripped off the finish and am down to the base wood. Now, I need to bleach out the red mahogany stain. I'm not sure what kind of wood it is, but I do know that it's not oak or mahogany or maple—it could be ash. The design in the back is pressed wood. Any suggestions you could give me will be appreciated.

Bud Randall
Hacienda Heights, California

The red stain you are experiencing has plagued many woodfinishers. It's caused by traces of an aniline dye that was not completely removed during the stripping process. This dye was an attempt on the part of furniture manufacturers to imitate the deep tone of mahogany, though in my opinion they usually got carried away. Furniture with this dye dates from the Colonial Revival period, beginning from the late 1800's and spreading into the early 1900's. My guess is your rocking chair is made of birch. Birch was commonly used at this time because it took the dye well, enabling the manufacturer to give the impression of the more costly mahogany used in veneer form on the flat surfaces of his furniture. Birch is, in fact, a wood that can be made to resemble other woods fairly easily.

Removing the red dye begins in the stripping process. After the remover has loosened up the varnish, you'll need to follow up with a soap and water-wash. Add trisodium phosphate (TSP) to a bucket of hot water and scour your surface with medium coarse steel wool drenched in the solution. This will continue the stripping action and loosen up the dye. (Most paint and varnish removers can't do this without a little help). The next step is to hose the piece off and then dry it immediately with cloths. As long as you don't let it stay wet for an unusually long time you won't damage the wood. Let it dry thoroughly and then apply a solution of oxalic acid, available at most hardware stores. Add the acid crystals to hot water in the proportions recommended by the manufacturer. You should wear gloves when working with the acid, though it won't usually harm you unless you have an open wound. The acid will kill most of the remaining dye. Placing the object in the sun helps speed up the process. When it's dry, rinse repeatedly with water. (Some manufacturers make a compatible oxalic acid neutralizer. You can also use baking soda in cold water as a neutralizing agent but adding too much powder may cause the unwanted color to return, so I usually just rinse with water, sometimes aided by scrubbing the surface with the solution and a Scotch-Brite abrasive pad).

After your wood dries out, sanding usually removes most of the remaining traces of red dye. Wear a mask in case traces of the acid are still present. You'll probably never get it all out, and a light staining will be necessary to camaflouge whatever remains of the dye. In case you might have wondered, household bleach, in spite of what some people seem to think, is not nearly as effective as oxalic acid in situations like this and the two-part wood bleaches offered by manufacturers are dangerous and unpredictable. Oxalic acid has the unique ability to remove the unwanted stain, dye or blemish without altering the natural color of the wood. PW

***Tom Wisshack** is a woodfinishing consultant and makes and restores fine furniture in Galesburg, Illinois.*

Cris Cuts

Joinery

Where beauty's more than skin deep...
...And knowing your material will help predict its behavior.

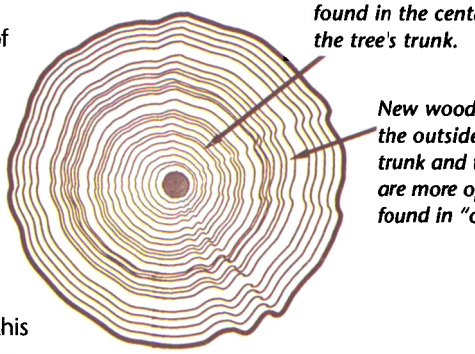
There's more to most woodworking projects than meets the eye. Reaction to the appearance of your finished work is subjective, a factor that eludes definition. But beyond the outward appearance, buried below the finish, lies something tangible. It greatly affects the quality and permanence of the project. These invisible details, the woodworking joints we make, demonstrate both our knowledge and skill. There are choices made along the route to a finished work, but little room for compromise. A joint will hold, possibly forever, or it will fail. Accepting the nature of your chosen wood and working accordingly is as important as accurate cutting.

Knowledge of wood and its characteristics, even the subtle differences from one species to another, is an important ally in your campaign to make lasting joints. Start with our understanding of how a tree grows—outward from its center, each year adding a roughly concentric ring of new wood. The cells or pores of the "new" wood are more open than the center ones, so wood from that area is subject to greater shrinkage and expansion. The changes in wood, after it is sawed into boards, is natural and continuous; the dryness/dampness of the environment affecting the degree of change.

To counteract varying degrees of contraction and expansion, when joining boards to form a slab, be certain to place new wood against new wood—old wood against old. It's the most that can be done to guard against uneven joints caused by humidity.

R. J. "Cris" DeCristoforo is a contributing editor to Popular Woodworking *who writes about and works with wood from his home in Los Altos Hills, California.*

There are several points of view regarding the best methods of minimizing warpage (or cupping) when joining boards edge-to-edge. A common practice, with a single board, is to rip it into thirds and to rejoin the pieces after inverting the center one. Whether this will be a solution can be determined by judging the degree of warpage. If it is extreme, each of the pieces will have its own "cup" and the assembly will require considerable planing and sanding ***(diagram 1A)***. My own procedure with a "bad" board is to save it for when I need narrow strips.



The most efficient way to form a slab is to join "old" wood to "old" wood, and "new" wood to "new" wood, as above.

Alternate boards (for a slab) are often inverted to compensate for cupping caused by shrinkage ***(diagram 1B)***. This system can result in a washboard surface that will be difficult to pin down, and it's possible that alternate pieces will contain a lot of sapwood. When the boards are not inverted, the assembly will form a gentle arc that requires little surface treatment and that will actually be easier to pin down ***(diagram 1C)***. Also, there is more opportunity to place the boards for compatible grain pattern.

The strongest glue joint occurs when long grain connects to long grain. Thus, the vital consideration when joining boards is the condition of the mating edges. They must be square and flat, although the extra step shown in the drawing is often included ***(diagram 2)***. The slight concave edge, that can be accomplished with a plane or on a jointer, causes a slight pressure at the end of

Diagram 1

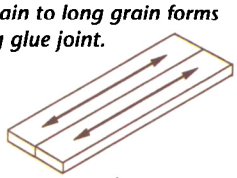
A. A board ripped into thirds and reassembled with the center piece inverted will correct some cupping.

B. Cupped individual boards can be assembled with alternate pieces inverted to avoid cupping in a slab.

C. Without some consideration to cupping, your slab may end up looking like these boards with no pieces inverted.

Diagram 2

Long grain to long grain forms a strong glue joint.



Slightly concave edges put some pressure at the ends–avoiding splits as wood moisture (at the ends) decreases.

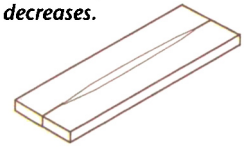
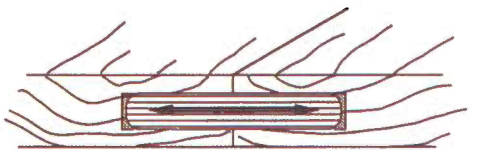


Diagram 3



The "long-grain" of the dowel runs "across" the grain of the boards causing a stable wood/unstable wood match.

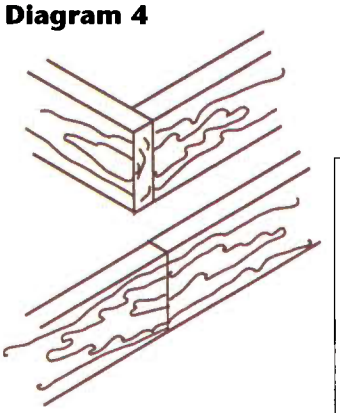
the boards. The pressure is released as the wood gives off moisture, thus guarding against end-splits. If wood breaks when joined this way it will not break in the joint. In fact, tests to break the connection prove that the glue line holds while areas around it break apart.

There is evidence that dowels used to reinforce an edge-to-edge joint are unnecessary and can actually cause harm ***(diagram 3)***. For one thing, the dowel, being long grain, remains fairly stable, but the wood it enters may not. This can result in splits around the joint area. If I use dowels I rely on them only for alignment of components, so I don't glue them.

A butt joint between end grain and long grain typifies a weak glue joint that requires reinforcement ***(diagram 4)***. Even screws don't help much since the bulk of the screw will penetrate end grain. One way to add strength is to insert a dowel into the long-grain piece so the screws will have something to bite into ***(drawing 5)***.

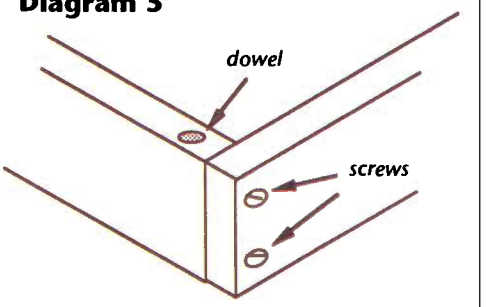
End grain to end grain joints are almost a lost cause, but here, dowels *can* provide strength since they and the wood make long grain contact ***(diagram 6)***. PW

Diagram 4



End grain to long grain and end grain to end grain joints have little strength and will likely fail.

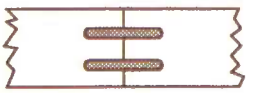
Diagram 5



Screwing into a dowel is one way to reinforce an end grain to long grain butt joint.

Diagram 6

Using dowels will reinforce an end grain to end grain joint since dowels and the wood make long-grain contact.

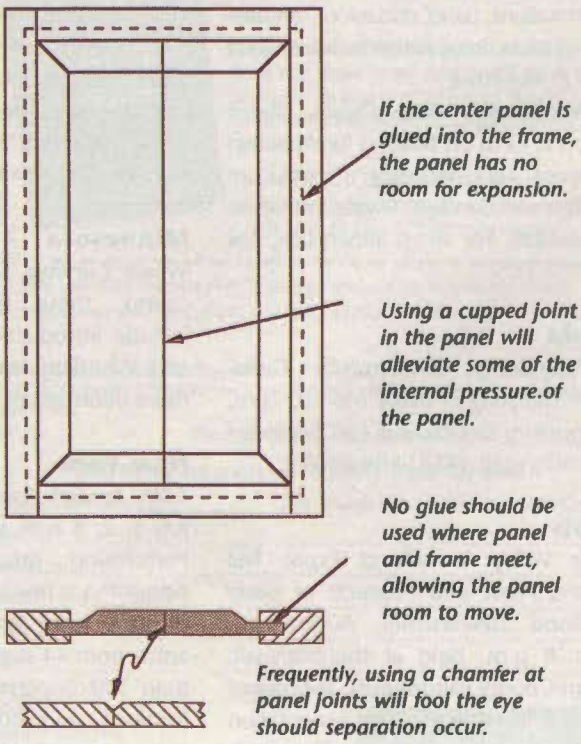


TYPICAL GLUING ERRORS

Glue is a "fastener" so, to avoid splitting, we should avoid using it when a component needs to move. An example is a panel door with a solid wood insert. When the panel wants to "move" but is held tightly around its entire perimeter, its only choice is to split or separate near the glue line. The frame must be solid and tight, but the insert piece should be free.

Another example concems narrow boards used at the ends of solid wood slabs. This makes sense, but not if the boards are glued their entire length. They will remain constant in length but the width of the pieces in the slab may change, and they can split if they don't have freedom to move. The solution is simple—use glue, or a dowel, only at the center of each of the pieces in the slab.

With end boards, you can use the same "extra" technique we mentioned for edge-to-edge joints. That is, use a plane or jointer to slightly concave the edge of the board that butts against the slab assembly. The board will continue to exert pressure after the center area is forced in with clamps.



If the center panel is glued into the frame, the panel has no room for expansion.

Using a cupped joint in the panel will alleviate some of the internal pressure.of the panel.

No glue should be used where panel and frame meet, allowing the panel room to move.

Frequently, using a chamfer at panel joints will fool the eye should separation occur.

Calendar

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

Arkansas

White River Artisans School. Year-round courses are available. Class selection includes forged toolmaking, wood-strip canoe making, bamboo fly-rod making and more. Call (501) 435-2600.

California

The 1995 Woodworking, Machinery and Furniture Supply Fair, August 4–7. Held at the Anaheim Convention Center, Anaheim, Calif. The theme of this year's show is "Expand Your Marketing World." For complete information, call (310) 477-8521.

American Association of Woodturners 9th National Symposium. July 6-8. Held at The University of California, Davis, Davis, Calif. The event will host approximately 500 lathe turners, collectors, teachers and lovers of the craft from around the world. Includes demonstrations, panel discussions, an auction and trade show. For more information call (612) 484-9094.

The Woodworkers' Place. Classes, offered year-round focus on building furniture. No experience is necessary; conducted Saturdays and Sundays. Private instruction also available. For more information, call (818) 952-3177.

Florida

St. Petersburg Woodcrafters Guild. Fourth Thursday of every month, 7pm, Montgomery Electric and A/C. For more information call: (813) 898-0569.

Illinois

Illinois Valley Woodland Expo: The Pleasure, Profit and Products of Good Woodland Stewardship, August 26, 8 a.m.–8 p.m. Held at the Marshall-Putnam County Fairgrounds. Sponsored by Prairie Rivers Resource Conservation and Development, a non-profit organization. This show includes demonstrations, exhibits, wood/natural crafts marketplace, seminars and more. For complete information, call (309) 364-3979.

Iowa

1995 International Woodcarvers Congress. June 22-25 at the Putnam Museum in Davenport. Offering woodcarving displays, seminars and competitions. For more information call: (319) 359-9684.

Kentucky

Woodturning and Joinery Instruction. Classes are offered year-round. Topics include woodturning and joinery. For complete information, call (606) 986-8083.

Maine

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

Massachusetts

Woodworking Summer Intensives. July 3 –23. One Cottage Street School of Fine Woodworking. Classes in turning, carving, furniture design, finishing, hand tools and more. For more information, call (413) 527-8480.

Minnesota

Wood Carving School. Offered year-round, these woodcarving classes include Introduction to Wood Carving and Whittling Angels and Hearts. For more information, call (612) 927-7491.

New York

19th Annual American Crafts Festival. July 1, 2, 8 & 9. Lincoln Center for the Performing Arts, New York City. Admission is free with program offering displays from America's finest craft-artists from 44 states. There will be more than 300 displays including traditional furniture and home furnishings. For more information, call (201) 746-0091.

North Carolina

Country Workshops. June 11-17, Topic: Ladderback Chair making. June 26-July 1, Topic: Toolmaking for Woodworkers. July 9-15, Topic: Windsor Chair making. Marshall. For more information call: (704) 656-2280.

Pennsylvania

Traditional Windsor Chair Making. Classes are offered year-round. Earlville. Private instruction available. Topics include woodturning and sharpening techniques for beginners to advanced levels. For more information, call (215) 689-4717.

Tennessee

Arrowmont School of Arts and Crafts. June 5—August 11. Gatlinburg. One- and two-week workshops on multiple woodturning topics including: Turning Green-From Tree to Finished Piece; Wood: Tools of the Trade; and Woodturning–Artistic and Functional. For more information call: (615) 436-5860.

Texas

Woodshop Inc., Woodworking School. A full range of classes (offered year-round) are available. For complete information, call: (214) 466-3689.

Washington

Quilceda Carvers "Artistry In Wood". September 23 & 24. Evergreen State Fair Grounds, Monroe. 10th annual competition/show and sale, includes carving classes, mailed entries are accepted. For more information call: (206) 743-1425.

Wisconsin

Wisconsin Woodworkers Guild: June 7, Topic: Old Woodworking Tools. Red Carpet Lanes in West Allis; June 10, Topic: Saw Mill Field Trip, Kettle Moraine Hardwoods, Hartford; July 5, Topic: Making Dulcimers. Red Carpet Lanes in West Allis. For more information call: (414) 258-3132.

Book Reviews

by Hugh Foster

Build Your Own Mobile Power Tool Centers, *by John R. McPherson, paperback, $19.99, available from Betterway Books, 1507 Dana Ave., Cincinnati, Oh 45207*

Build Your Own Mobile Power Tool Centers is directed toward the small shop woodworker. If that's you and you want your shop to appear more "professional", this set of plans may be just the ticket. Addressed to "newer" woodworkers, or to those of us who are dissatisfied with our present shops, this volume tells us not only how to build these projects, but also why they're designed the way they are.

Based on a lifetime's woodworking experience, the text, drawings and parts lists are all first class. The components are integrated elements of a complete modular work station system. The author reached these finished designs by building, repairing and refinishing custom furniture, always working by himself.

Hugh Foster is an English teacher, woodworker and author from Manitowac, Wisconsin.

The introduction describes the garage as the ideal location for a workplace, because we usually have to modify it very little to provide space, power, light, ventilation and access. He regards the table saw and a good router as the primary tools for a workable shop. Other very helpful tools include a drill, a jigsaw, a finishing sander, an orbital sander and some cordless drill/drivers.

The four workstations McPherson builds are for the table saw, router, assembly and for sanding and gluing. These workstations provide among the very best organizational support for a woodworker that I've encountered. His router station is basically one of the very best router tables you're likely to find.

He starts by describing the workstations, then details the building of them. Following this he tells us how to build the accessories for the various stations and includes 65 pages of detailed drawings which further illustrate these projects. The book closes with some related projects for storage and with a useful index, bibliography and appendix.

It's hard to study this without being struck by its logic and clarity. As you look at the photo of the cover, you're sure to see at least one module from this system that would be ideal for your shop. I'll bet that you'll follow its construction with one of the other three units presented here. Highly recommended. PW

News and Notes

New products to announce? Send a press release and color transparency or slide to the Products Editor, *Popular Woodworking*, 1507 Dana Ave., Cincinnati, OH 45207, and we'll consider them for News and Notes.

One Woodshop, To Go

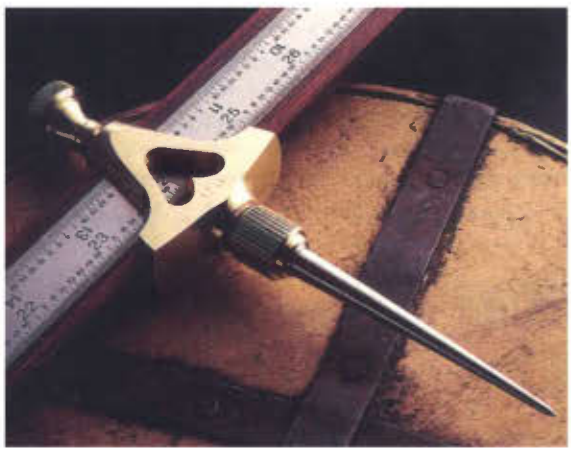
Black and Decker has taken their revolutionary Workmate a step further with the introduction of the **ShopBox**. The portable ShopBox weighs about 13 pounds and doubles as a tool box with a liftout tray and compartment for storing tools.

The ShopBox's 18" x 12" wood work surface will support up to 250 lbs. and includes vise jaws which are controlled by two front-mounted cranks. The vise allows vertical and horizontal clamping. Four included swivel pegs can be inserted into the vise jaws and used to clamp items that are too large for the jaw openings.

The ShopBox retails for under $50. For more information, write: The Black & Decker Corporation, 701 East Joppa Rd., Towson, MD 21286, or call (410)716-7143.

A Trammel from Tiffany's?

Bridge City Tool Works, Inc. has added the **PT-1 Precision Trammel Set** to their line of fine woodworking tools. The trammel set is designed for large geometric construction and layout; in general, picking up where a compass or dividers leave off.



The set includes two half-hard brass trammel heads, one of which has a cursor window for setting measurements and scribing lines, while the other is used as a pivot point. Each is drilled and tapped to receive a locking knob at the top and a stainless steel collet at the bottom. The locking stud is made from solid brass and drilled to receive a Delron pad which keeps the stud from gouging the wooden trammel bar when locked.

The trammel points measure 5" in length and will accept a number of pencils or other drawing instruments. Each trammel body has a milled T-slot which allows the tool to be attached to the one meter Juara™ wood trammel bar. The bar itself is inset with a photochemically etched satin-chrome rule.

Each set retails for $210.00. For more information, write: Bridge City Tool Works, Inc., 1104 N.E. 28th Ave., Portland, OR 97232-2498, or call (800)253-3332.

Strike While the Mallet is Soft

Sorbothane, Inc. introduces the **Soft Blow Mallet** designed to reduce marring and denting on all types of surfaces and assemblies, including wood, glass, metal and plastic.

The mallet is made from Sorbothane®, a visco-elastic material that absorbs energy on impact and dissipates it within the material. This produces low rebound and allows the mallet to achieve maximum surface contact reducing damage during assembly. The head design allows the user to utilize both the face and sides during use.

The Sorbothane® Soft Blow Mallet retails for $9.95. For more information write to: Sorbothane, Inc., 2144 State Route 59, P.O. Box 178, Kent, OH 44240, or call (216)678-9444.

New Gun in Basic Black

Binks new **Model 95 Spray Gun** is a compact balanced gun body with a sure-grip design that helps to reduce operator fatigue. An extra wide trigger control fits comfortably in large or small hands and is easy to hold and regulate. Air and fluid flow controls are large, knurled knobs which are offset at the rear of the gun body for easy adjustment.

The Model 95 may be used to spray most coatings including a wide range of finishes. The gun has a lightweight, aluminum body, with all interior fluid-contact surfaces made of stainless steel to avoid corrosion even when used with waterborne materials.

The Model 95 includes the field-proven Binks 60 Series air and fluid nozzles, providing spray patterns from 1" to a 3' wide band. The Model 95 retails for $207.00.

For more information write to: Binks Manufacturing Co., 9201 Belmont Ave., Franklin Park, Illinois 60131-2887, or call (708)671-3000.

Just Charge It, and Make It Quick

Hitachi's new model UC12YB 9-minute **Rapid Battery Charger** for their standard batteries maximizes battery life while increasing working capacity. You can recharge it over 1,000 times without damaging the battery. The system will charge all current Hitachi battery types and the automatic cut-off system helps to extend battery life.

In addition to the new charger, Hitachi has introduced the G-battery high capacity series. This new generation of batteries allows more charges over the life of the battery and 40% longer use between charges. The high capacity G-battery series will charge in 12 minutes.

The UC12YB retails for around $300. For more information, write: Hitachi Power Tools USA Ltd., 3950 Steve Reynolds Blvd., Norcross, GA 30093, or call (404) 925-1774.

Of Bits, Bites, and to a Degree, Angles

Two new products from Woodcraft® will make your shop safer and angle cutting set-ups more accurate.

Five profiles of carbide tipped **vertical panel raising bits** reduce the size necessary for the wings, thus reducing risk. The bits have ½" shanks and retail for $64.95 each.

The **Miter Matic Angle Setter** allows an accurate, uncomplicated way to set up common angles like 90°, 45°, 30° or 22½° on your saw's miter gauge, while also doubling as a tool for setting those same angles on the table saw blade. The tool is constructed of ⅜" thick acrylic and retails for $19.95.

For more information on either product, write to Woodcraft® Supply Corp., 7845 Emerson Ave., P.O. Box 1686, Parkersburg, WV 26102-1686, or call (800)225-1153.

Routing Mortise & Tenon Joints

Use these machining techniques for quick, reliable joinery.

By Andrew Schultz

Anyone who knows mission-style furniture also knows the style is a study in mortise-and-tenon joinery. As I sketched out the plans for two mission-style coffee tables, I was suddenly faced with cutting 80 mortises and 80 tenons—far too many for a delicate lily such as myself. I'm certain even the burly, hamfisted woodworkers of yore wilted before such tasks. The job ahead looked like 20 miles of bad road.

But, given the impetus of a couple of paying customers, it didn't take me long to figure out a way to rout mortises safely, accurately and, most importantly, fast. Using the jigs I developed, I was able to rout all 80 mortises in 32 minutes, including the time it takes to switch from one piece to another. I accomplished most of this machinery magic with an 18" X 24" rectangle of ½" Baltic Birch plywood and some obscure flotsam from my hardware collection (fender washers and toilet bolts to be specific).

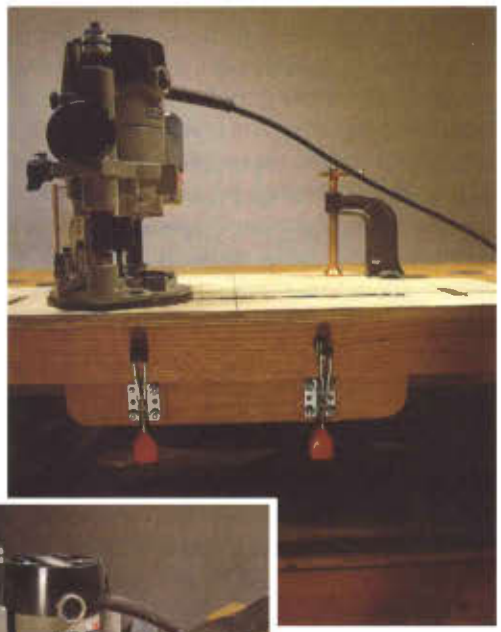


***Photo 1** Andy has his slat mortising jig set up and ready to run. Using this and the vice-mounted jig at left, he milled 80 mortises in just 32 minutes.*

***Photo 2** The vice-mounted mortising jig uses a plunge router base and even includes vacuuming hoses to clear the dust.*

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

Slat Mortising Jig

(Photo 1 and PullOut Plans™) I designed this jig to fit on my bench top using an 18" X 24" x ½" piece of Baltic Birch plywood. Other plywoods would work well too, but avoid anything with voids. I'd also avoid using hardwood since such a wide expanse is sure to warp and you need a flat surface. Avoid medium density fiberboard (MDF), particleboard and all other manufactured woods as well; they're generally not strong enough to survive repeated use.

My bench has bolts recessed into the top so I can pop them up and fit on bench hold downs ***(photo 3)***. That's why the jig has its odd pan-handled shape—obviously you will need to conform the shape to fit your needs. Also, if you need to rout seven, nine or any other equally spaced odd number of mortises, you will need to adjust the length of your plywood accordingly. I needed to cut three mortises in the end rails of the coffee table and five on the front and back rails. It turned out that 24" was perfect for a jig that enabled me to cut five mortises. One caution: When you cut your plywood rectangle, make sure you have a square workpiece. You will use these edges as reference for slot cutting, so each edge must be perpendicular to its adjacent edges.

I'd made another mortising jig prior to this one but it was fussy and it was almost certain that I was making slight measurement errors with it. So, on this new slat-mortising jig, I took steps to limit my measurement error ***(diagram 3)***.

Here's how I did it. I added up the space needed to rout five 1¼" long mortises. As I factored in the variables, the length of the mortises, the 1" washers and the Porter Cable ½" OD template guide I was using, I found that I needed to mount the 1" fender washers every 2½" on center with the slot that I would rout for the ½" template guide ***(photo 4)***. That, I knew, was easy to do. First, mount a ½" solid carbide two-flute bit in your router. I have found this type of bit best for mortising.

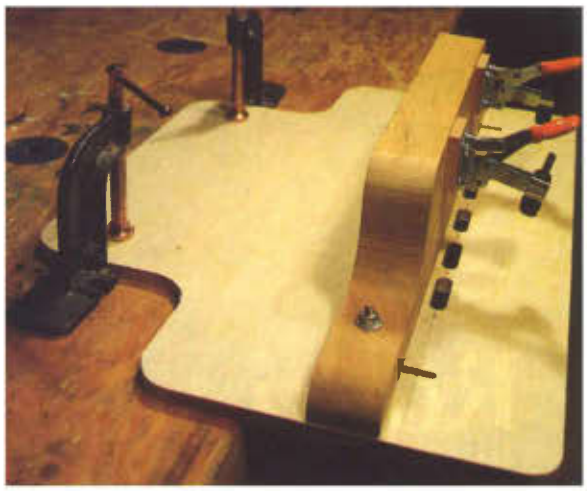


Photo 3 *The slat mortising jig viewed upside down to show fence and toggle clamps which hold the work in place.*

Next attach a router fence to the router, adjusting it to cut a slot centered about 4" from the front edge of the jig. Remember to use safety glasses and ear protection when using a router.

Turn the router on and lower the bit so it barely drags on the jig surface. Rout about 6", then shut the router off and raise the bit. Now that you can see exactly where the slots are going to be, carefully lay out the center line of that slot all the way across the length of the jig. Carry this line over the edges and across the bottom of the jig. Measure from both ends, and find the center of that line and mark it, also carrying it over the front edge and back across the bottom of the jig. What you've just done is establish the center point of the middle slat mortise. Now measure and mark 1¼", 3¼" and 6¼" to the left and right of the jig's center which marks the center of each spacer.

Next chuck a 7⁄64" twist bit in your drill press to drill the pilot hole for the ½"x #8 flathead wood screw that will secure the 1" fender washer.

While the drill bit is still in the last hole, take a 2½", 8d finishing nail and insert it through the first drilled hole. Pound it about ½" into the wooden auxiliary table. Unlock the quill, raise the drill bit and pull the finishing nail out. Using a hand drill and a ⅛" twist bit, drill into the same hole that you pulled the nail out of. The nail will now slip into the hole in the table fairly easily and is slightly tight through the hole in the workpiece. Finally, drill all of the center holes for the washer screws, all equally spaced with the fence locating the center of the slot

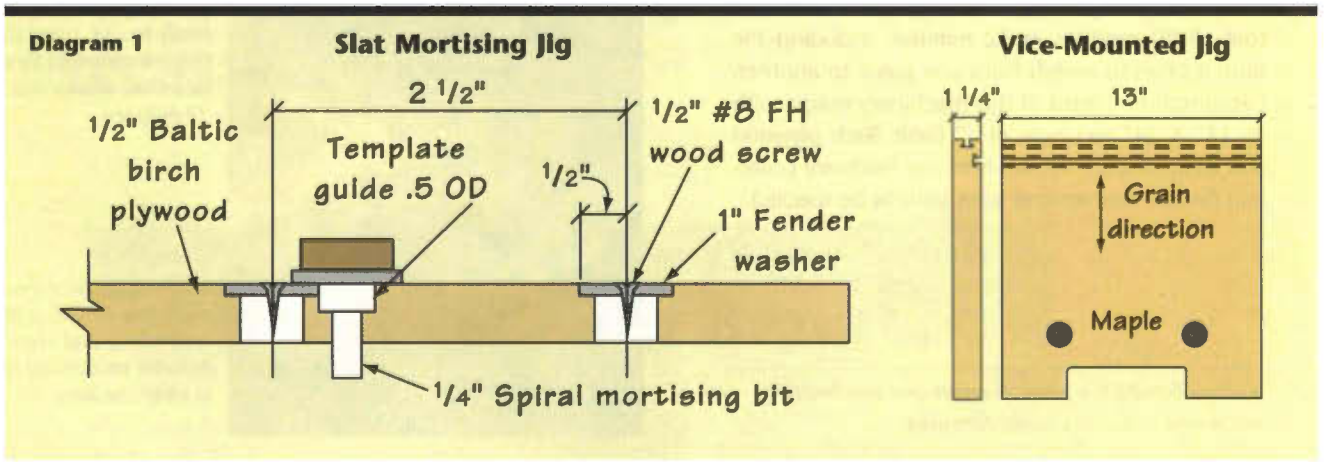


***Photo 4** The jig has the fender washers properly placed along the slot. Their accurate spacing, along with the router template guide, will produce the proper sized mortise.*

and the nail locating the center of the spaces between mortises.

Using the center holes and nail, proceed in the same fashion to counterbore the location of the washer with a 1" Forstner bit. You want to remove just enough material so that the washer sits flush with the jig surface. Use the nail and the fence to make sure all these shallow holes are on center.

Once you've cut the holes for the washers with the Forstner bit, cut the slots, through, with the router setup described above. Leave at least ¼" of wood on each side of the screw hole so that the screw threads have something to bite into. Using the same router set up, rout 1/16" deep slots parallel to and 4" from either end of the jig. Change bits to a ¼" spiral cut mortising bit and rout ¼" slots, through, on the same centerline as the 1/16" deep slots you just cut. The toilet bolt heads ride in this slot and carry your fence nearer or farther away from the mortising slots as needed. Remove the fence from the router, install the ½" OD template guide on the router base, and you're almost ready to rout some slat mortises.

Select material for a fence thick enough to sit square and solid when you lock down the nuts on the toilet bolts and tall enough so that you can mount a couple of toggle clamps below where the rail stock will fit into the jig. You want to be able to hold the workpiece against the jig bottom with one hand while aligning the centerline of the rail with the one you scribed on the jig's top. Close a toggle clamp with your other hand. Careful placement makes switching workpieces a quick, effortless task.

Diagram 2 A self-centering center line jig you can easily make.

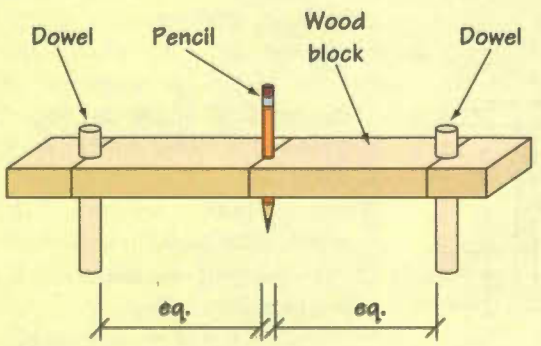


***Photo 5** The leg mortising jig tightened in the vice for stability with the piece to be mortised held in place.*

Vice-Mounted Mortising Jig

I've seen a commercial, self-centering centerline jig a few years ago which operated on the principle that if the endpoints of any line are tangent to a board's opposite surfaces, the midpoint of that line marks the midpoint of the board ***(diagram 2)***. I thought this principle could be applied to routing mortises. The idea I came up with is a vice mounted mortising jig ***(photos 2 and 5)***. One part consists of two fixed bolts carrying guide bearings which ensure that the mortising bit cuts the mortise in the exact center of the workpiece. Two other bolts with guide bearings slide in a slot so that you can remove any unwanted movement in the jig operation ***(photo 6)***.

The second part of the vise-mounted mortising jig is two vise faces that screw onto the iron vise jaws ***(diagram 1)***. These wooden vise faces project above the vise and bench top about 6". They allow the workpieces to be clamped rapidly into position for routing. The vise faces carry stop blocks to position the workpiece and to limit router travel.

To build the vise faces, first select some ¾ maple. Then glue-up enough stock so that you have two pieces ¾ X 12" X 13". Bandsaw out a slot so the faces can sit down over the lead screw on the vise and the rods that connect the two faces of the vise. My vise has four 5/16" threaded holes for bolts to attach the vise pads, so I just put my ¼" dowel centers in these holes to mark where the holes should be drilled in the vise faces for the attachment to the iron vise jaws.

Drill these holes and counterbore a hole to accommodate the head in with a 1" Forstner bit. Before attaching the vise faces, route keyhole slots on the top of each jaw face and one on the inside face of one face, the jaw face that's attached to the unmoveable jaw of the vise. These keyhole slots allow you to position stopblocks for limiting router and workpiece positions.

Use These Jigs to Make Our Mission-Style Coffee Tables

***Photo 6** Oak Mission Style coffee table with inset glass top.*

Both of these mortising jigs performed well. Given the assembly-line nature of limited production runs like this for these mission-style coffee tables, ***(photos 6 and 7)*** stock preparation is critical and all parts must be square and identical.

To use the slat-mortising jig, first draw a centerline on one workpiece edge both horizontally and vertically for the initial setup. Align the horizontal line with the long centerline you drew on the bottom of the slat mortising jig ***(photo 3)***. Move the fence into position, check to see that the fence is parallel with the edge, and test rout a mortise in a piece of scrap milled to the same thickness as your rails. Check the mortise to see that it is centered in the workpiece. Make adjustments if needed. Now draw vertical centerlines on one edge of each of the rails. These centerlines serve as the means of alignment for the workpiece in the jig. Insert a workpiece, clamp, rout and then go on to the next piece. Voilá, your slat mortises are done.

To use the leg-mortising jigs, mount the wooden jaw faces in the vise. Mark the face of each leg to be routed so that you know which surfaces face outward. Draw lines on one leg to mark the length of the mortise. These mortises were 1½" long and located ½" and 10" respectively from the top of the 16" long leg. Position a leg at the bottom of the vise and another at the top, aligning the leg surface with the ends of the jaw faces to minimize the stresses. Tighten the vise and slide a stop block down the inside of the jaw face until it abuts the top of the clamped leg. Then position the router with the leg-mortising base plate on top of the wooden jaw/leg assembly. Cant the router at an angle until both of the fixed bearings are aligned with the jaw face sides.

Now adjust the adjustable bearings

Schedule of Materials
Oak Mission-Style Coffee Table

No.	Name	Size T x W x H	Material
❑ 6	Slats	⅜ x 2 x 7¼	Oak
❑ 1	Top	1 x 25 x 48⅜	Oak
❑ 1	Shelf	¾ x 18½ x 40	Oak
❑ 4	Legs	2 x 2 x 16	Oak
❑ 2 upper	Front & Back Crosspieces	¾ x 2⅜ x 41½	Oak
❑ 2 lower	Front & Back Crosspieces	¾ x 2 x 41½	Oak
❑ 2 upper	Side Crosspieces	¾ x 2⅜ x 17	Oak
❑ 2 lower	Side Crosspieces	¾ x 2¾ x 17	Oak

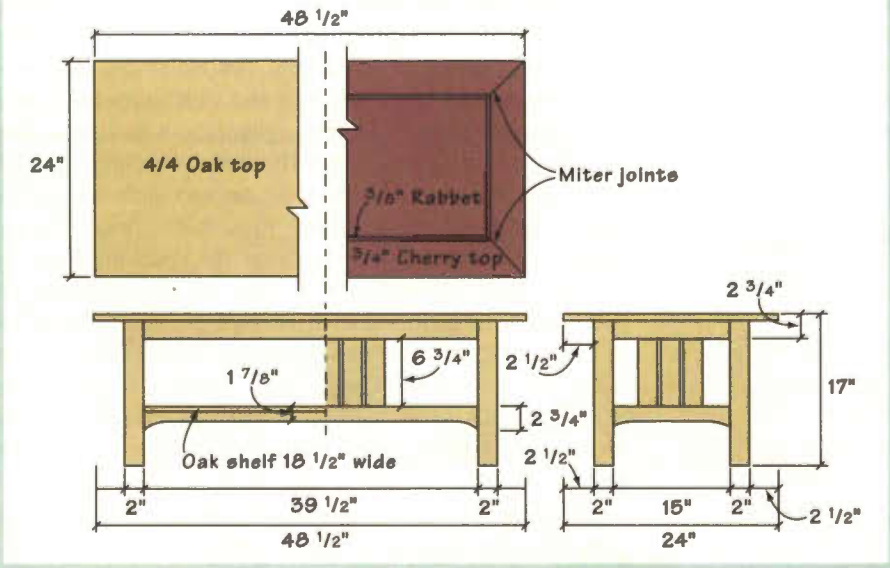


***Photo 7** Solid cherry coffee table.*

Schedule of Materials
Cherry Mission-Style Coffee Table

No.	Name	Size T x W x H	Material
❑ 16	Slats	⅜ x 2 x 7¼	Cherry
❑ 1	Top (with 14 x 38 recessed) (⅜" beveled glass insert)	1 x 25 x 48⅜	Cherry
❑ 4	Legs	2 x 2 x 16	Cherry
❑ 2 upper	Front & Back Crosspieces	¾ x 2⅜ x 41½	Cherry
❑ 2 lower	Front & Back Crosspieces	¾ x 2¾ x 41½	Cherry
❑ 2 upper	Side Crosspieces	¾ x 2⅜ x 17	Cherry
❑ 2 lower	Side Crosspieces	¾ x 2¾ x 17	Cherry

so that they also ride against the jaw face sides. The router should now slide back and forth along the jaw faces and atop the leg with no side-to-side wiggle. Lower the ½" spiral bit until it's just above the leg. Then move the router until the bit is adjacent to the top line you drew when marking the mortise location. Move a stop block down the keyhole slot on the top of the wooden jaw faces until it abuts the router base plate ***(photo 5)***. Now lock down the stop block, and do the same thing to limit the length of the mortise at the bottom line. Plug in the vacuum hoses, put on your ear and eye protection, turn on the router, and rout the mortise. After you arrive at the depth of cut you want, you should be able to lift the router off the jaw/leg assembly. Quickly turn the leg to the next surface to be routed. Because I lock each of the stop blocks with wing nuts on each of the two toilet bolts, I had to loosen the wingnuts on the fixed jaw face so that I could loosen the vise jaws to turn the leg. This made changing the leg a little more cumbersome than I like. I suspect I will redesign the stopblocks to remedy this slight problem. Other than this, the jigs work great.

I cut all of the tenons on the router table with the workpiece laying flat on the table. Initially I established the tenon shoulder on the table saw, thinking that this would prevent tearout ***(photo 10)***. However, I experimented with using a pushstick without having cut the shoulder on the table saw, I found that I could eliminate one operation and still get good quality tenons without tearout ***(photo 11)***.

I trimmed the tenon to size by crosscutting it on the table saw ***(photo 12)*** and then bandsawing away the waste ***(photo 13)*** Finally, I trimmed the tenons round with a chisel, ***(Photo 14)*** glued them up and hammered them home. Lickedy-split, I had two mission-style coffee tables almost ready for my customers. Now, if I could only figure out a jig to do the sanding for me!

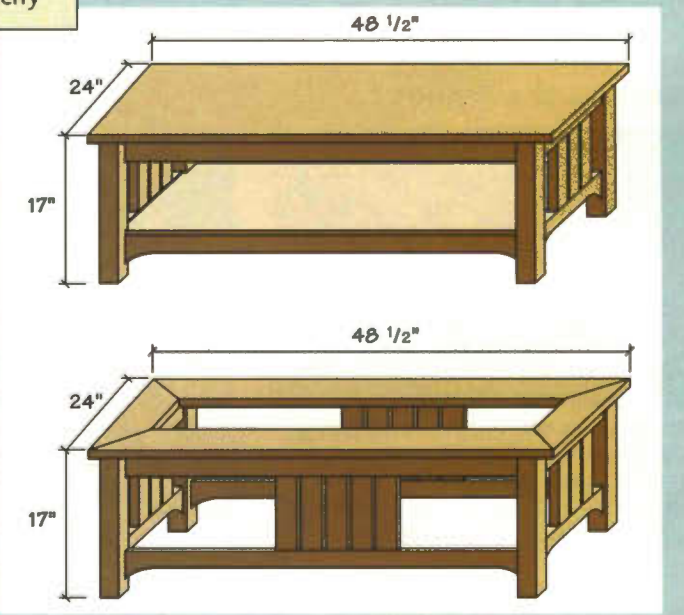


Photo 8 (above) *The completed shoe for the vice-mounted jig with two fixed bearings, two adjustable bearings, and other holes for router bit, mounted holes and vacuum holes.*

Photo 9 (left) *The shoe is mounted to the plunge-router base and router. The "tail" is the vacuum tubes.*

Router Base Plate Fixture

To build the base plate for mortising, *(photo 8 and PullOut Plans™)* buy a 12" X 12" x ¼" thick piece of Lexan®. Find the center point of the Lexan® blank by drawing diagonal lines through the corners with a straightedge. Take one of the base plates off the plunge router you're going to use to rout the mortises. Center it approximately on the Lexan® blank. Use it as a template for drilling holes through the piece for the base plate mounting screws. Once you've drilled and countersunk the holes, mount the smallest diameter bit you have in your router and screw the Lexan® blank onto the router. (I have an ⅛" diameter bit that's perfect for this operation.) Now turn the router on, plunge the bit through the plastic blank, then remove the base plate from the router.

Now you need to figure out how far apart to locate the two fixed bearings. Decide what is the narrowest and widest stock you're going to be routing mortises into. For my work, I wanted to be able to rout mortises in stock ranging from ¾" to 3" thick, so I added the thickness of the two jaw faces, 1¼" each, plus the 3" maximum and arrived at the total of 5½". The guide bearings I use are 1" OD shaper bearings. Therefore, ½"of each bearing diameter was added to the 5½" total, bringing it to 6½". I added another inch to make sure the jig would always be canted at a slant—I didn't want to find these fixed bearings riding nearly perpendicular to one another on some thick stock, because then I couldn't get the adjustable bearings close enough to the vise faces to be effective.

I tallied my numbers, and they read 7½" center to center. Using the center hole I'd drilled with the router, I struck an arc with a compass set to 3¾" on each of the diagonal lines I'd drawn. I drilled two ½" holes through the plastic blank at these marked points on one diagonal line. Machining plastic is different than machining wood. Though it is soft enough to be cut with woodworking machinery, plastic machines more like metal. Drill in ⅛" steps, starting with an ⅛" twist bit. Then use the ¼" twist bit, and so on. Also, clamp your workpiece down as plastic is apt to be drawn up by the bit and a spinning 12" plastic blade is nothing to stick a fin-

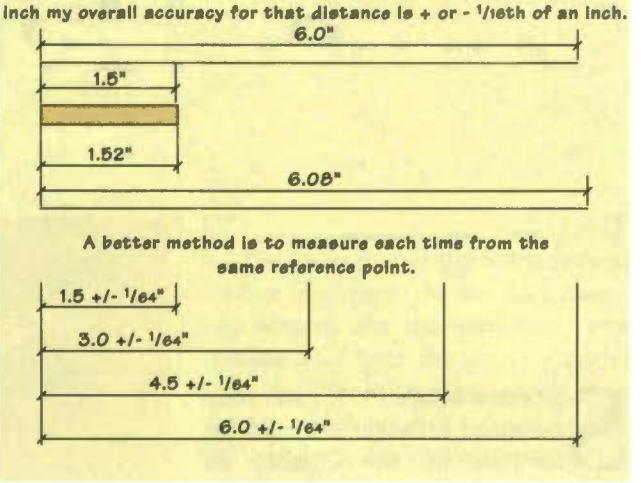
Cutting the Tenons

Photo 10 *Initially, Andy established the shoulder and prevented tearout by cross cutting on the table saw. When he discovered this step was unnecessary, he went directly to the router table, saving time.*

Photo 11 *Using the push block on the router table helped move the work over the router bit and added a good margin of safety. It also prevented tearout when the knife exited the cut.*

Photo 12 *The length of the tenon was milled by cross cutting on the table saw. A gauge block clamped in place assured accurate, repetitive cuts.*

Diagram 3



ger into. These two holes will carry the fixed guide bearings. After you finish drilling, rout two short arcs (2–3" long) with a ½" spiral cutter all the way through the base plate on the same centerline as the two holes. These slots carry the adjustable guide bearings. These ½" holes and slots are appropriate for my 1" diameter shaper bearings because they have a ½" ID hole. If you are using some other sized bearing, modify the hole and slot size as needed.

Shape the front and back edges of the base plate so that the stops will work effectively. I just struck a wide arc from the center point of the Lexan® base plate and bandsawed the waste off.

With the ½" spiral cutter mounted in the router, attach the Lexan® base plate and plunge the router bit through the base plate. I made a vacuum attachment with a couple feet of ½" plastic tubing. These tubes fit into two holes I drilled into the base plate right next to the hole the router bit made ***(photo 9)***. Vacuuming the mortise as you make it really improves the quality and speed of the cut. PW

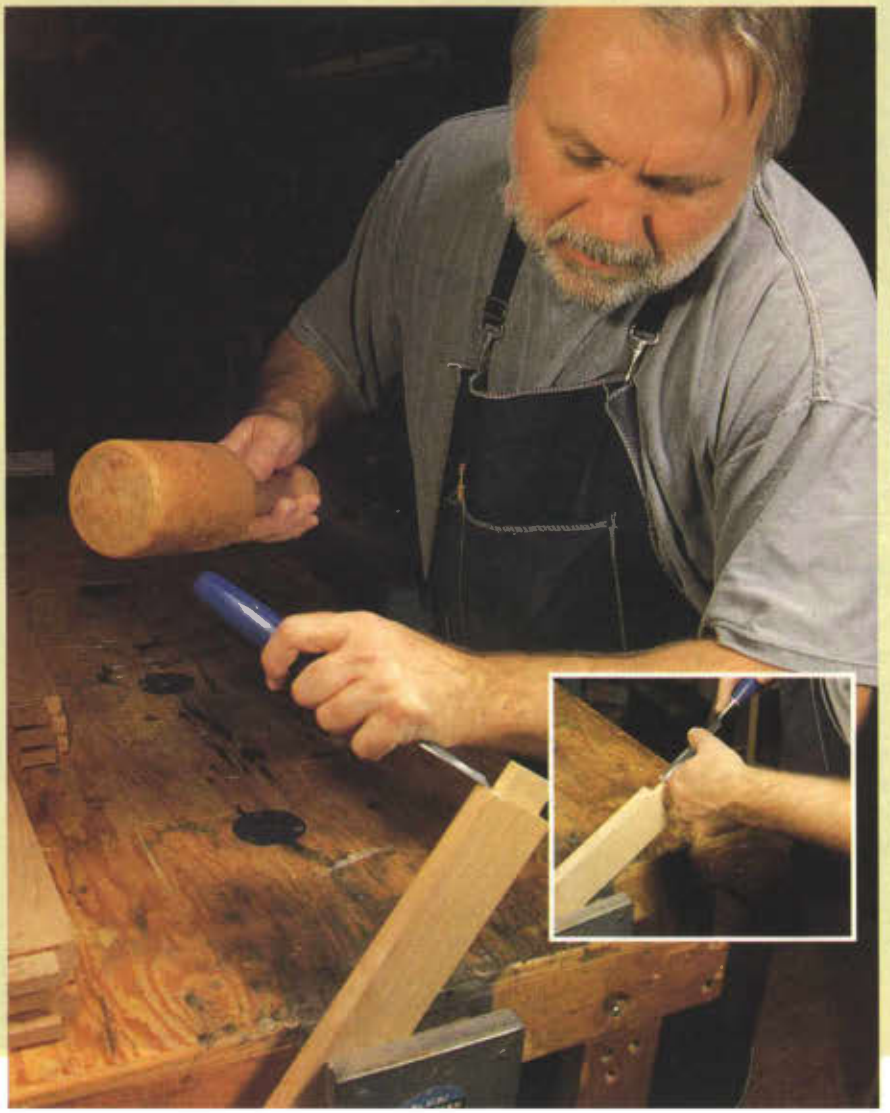


Photo 12 (below) *Tenon shoulder waste is trimmed on the bandsaw. A stop block is clamped behind the blade to prevent cutting too deep. A vacuum hose is taped to the saw table to collect dust.*

Photo 13 (left and inset) *Andy chisels away corners of the tenons, rounding them to fit the radiused mortises cut by the router bit. It's much easier to round the tenon corners than it is to square the mortise corners!*

French Provincial Corner Hutch

A deceptively easy to build cupboard with authentic styling.

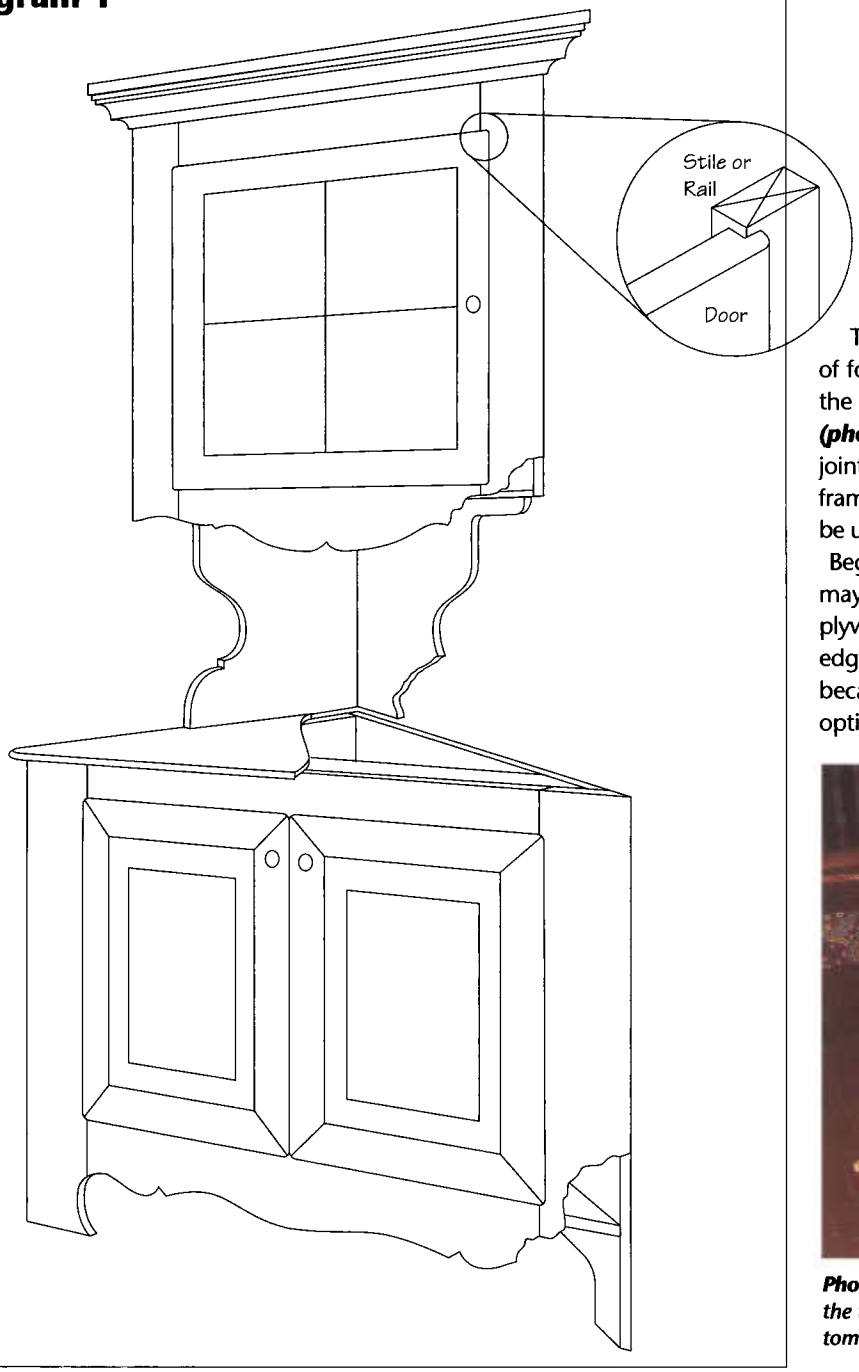
By Sal Maccarone

Sometime in late 1991, I was commissioned to design and build the furniture for the Chateau du Sereau, a provincial castle/hotel near Yosemite, California. Since the hotel is considered by many to be one of the finest examples of French Provincial architecture in the country, it was a wonderful privilege to have been chosen for the job. Working closely with the owner, a renowned expert on the period, we proceeded to create the 80 pieces of furniture necessary to furnish this exquisite structure. Among these pieces was a corner hutch to set in the south breakfast nook. Like most of the pieces we designed, the hutch required a specific set of dimensions to custom fit its designated location. Often times, this would mean reproportioning or, as in this case, even re-configuring the design in a way that worked well for the whole room. So instead of being an authentic replica, we have an original piece that is true to the style and flavor of the period.

The beauty of this hutch, from a cabinetmaker's standpoint, is that it can be made entirely from ¾ material, which eliminates the need for a planer. I made the original piece at the Chateau (pictured right) from willow because the tone worked well in the room. I believe, however, that this design would look good made of any wood specie. As in any project, there should be a systematic and simple approach. This corner hutch was designed to be separated into three sections: the lower cabinet, the upper cabinet, and then the doors for each.

***Sal Maccarone** is a cabinetmaker, wood sculpter and artist who is currently restoring a 19th century Victorian home in Port Townsend, Washington.*

Diagram 1



The Lower Cabinet

The lower part of the hutch consists of four main parts: the two back pieces, the bottom and the front face frame ***(photo 1).*** I favor the use of a biscuit joint for my edge-glued panels, face frames and doors, but a dowel jig may be used if you don't have a biscuit cutter.

Begin with the two back panels. They may be made of laid-up, solid stock or plywood panel because none of the edges will be visible. I prefer solid lumber because it's traditional and gives me the option of adding an edge detail between

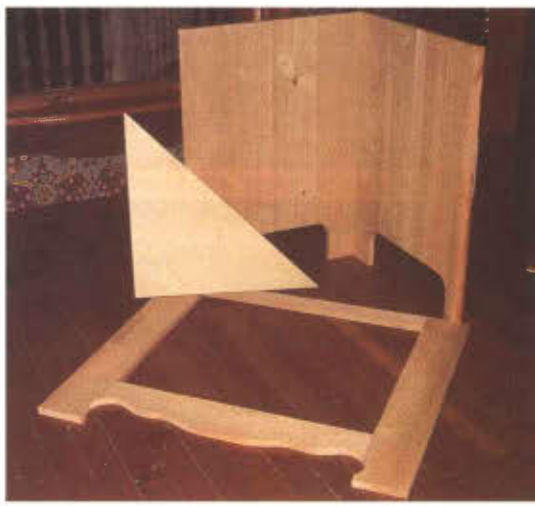


Photo 1. *The lower cabinet is shown with the two back pieces attached, and the bottom and face frame loose.*

Schedule of Materials for the Corner Hutch

Lower Cabinet

✎ Qty.	Item	Th x W x L	Notes
❑ 1	Back	¾ x 25½ x 34½	
❑ 1	Back	¾ x 26¼ x 34¼	
❑ 1	Bottom	24⅝ x 24⅝ x 34¾	Right Triangle
❑ 1	Top Stretcher	¾ x 3 x 34¾	
❑ 2	Stiles	¾ x 4¹⁵⁄₁₆ x 35¼	
❑ 1	Rail	¾ x 8 x 29⅝	Scroll Cut
❑ 1	Rail	¾ x 2½ x 29⅝	
❑ 4	Door Stiles	¾ x 2¼ x 25½	
❑ 4	Door Rails	¾ x 2¼ x 10⅝	
❑ 2	Door Panels	¾ x 11½ x 21¾	
❑ 1	Back	¾ x 26¼ x 34¼	

Upper Cabinet

✎ Qty.	Item	Th x W x L	Notes
❑ 1	Back	¾ x 17 x 44	
❑ 1	Back	¾ x 17¾ x 44	
❑ 2	Bottom & Top	16 x 16 x 22¹³⁄₁₆	Right Triangle
❑ 2	Stiles	¾ x 3 x 29	
❑ 2	Rails	¾ x 4 x 21	Scroll Cut Bot.
❑ 2	Door Stiles	¾ x 2¼ x 22¾	
❑ 2	Door Rails	¾ x 2¼ x 17¼	
❑ 1	Crown	¾ x 2½ x 29⅝	
❑ 1	Top of Crown	¾ x 4 x 30¾	

Photo 2. *Gluing-up the back panels using solid stock. This allows the option of adding an edge detail between the glued boards.*

TIP

Inexpensive, Old Glass Adds Authenticity

*To make antique reproduction glass doors look **really** authentic, find old glass with uneven, wavy, and distorted clarity. You can often get it for the hauling if you find an old house being demolished or the original windows being replaced. It really isn't hard to find in most parts of the country. With a little practice, you'll find cutting glass—even old glass—a simple task.*

the glued boards ***(photo 2).*** Next, cut the back pieces to size with a 45° angle cut on the front edge only. Before assembling the back panels, bandsaw the bottom edges to form the back leg ***(photo 3).***The back corner is a simple butt joint, but remember that each piece will be a different width since one overlaps the other. Once these are assembled, put the triangular bottom in place and fastened about an inch above the back leg. The upper cleat, or stretcher, should then be attached. It serves as backing for the face frame, and also provides a means to later attach the top.

The face frame for the lower section can now be laid out. Assemble it before the 45° angle is cut on the two edges. This way the delicate corners are not crushed while the frame is being glued and clamped ***(photo 4).*** The scroll work at the bottom ***(see Pull-Out Plans)*** should also be done after the frame is

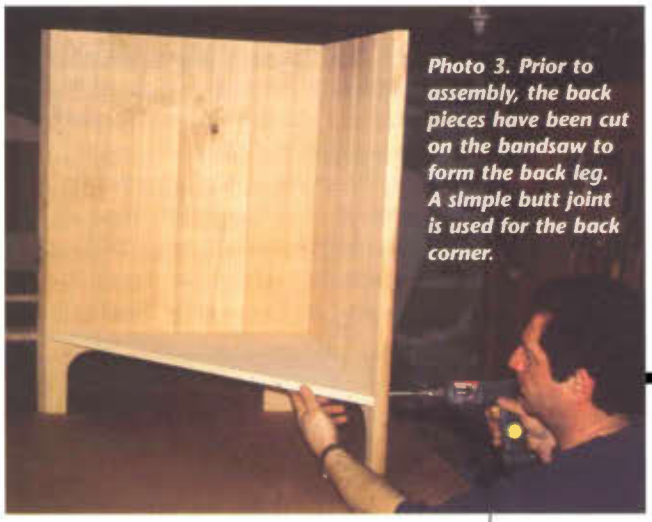
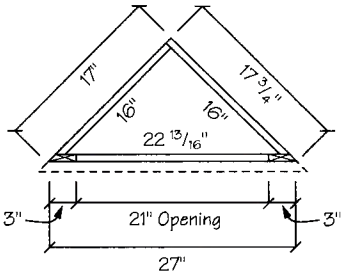


Photo 3. Prior to assembly, the back pieces have been cut on the bandsaw to form the back leg. A simple butt joint is used for the back corner.

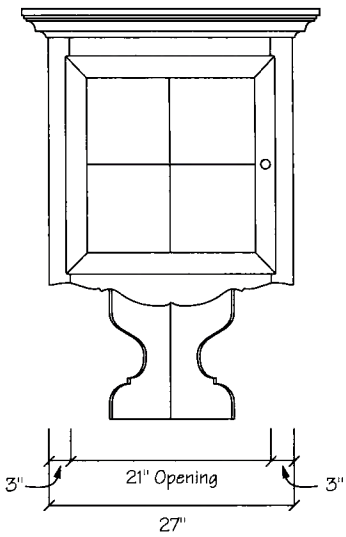
Photo 4. *The front face frame is ready for assembly. Note the 45° degree angle on the edges are not cut until after clamping.*

Photo 5. *After the face frame has dried, the 45° angle is cut on the stile edges.*

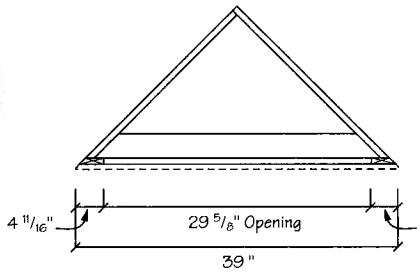
Diagram 2



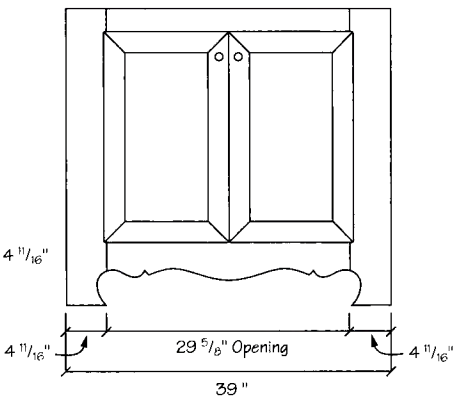
Plan, upper



Elevation, upper



Plan, lower



Elevation, lower

Photo 6. *The scroll work curves between the upper and lower cabinets. It should be cut and sanded prior to assembly.*

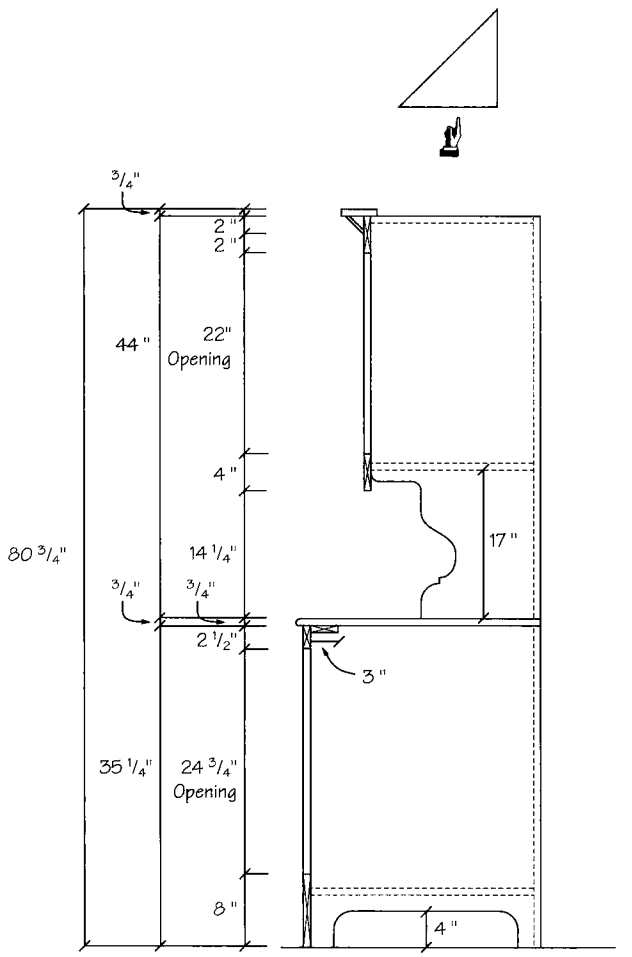
Photo 7. *After the back pieces are screwed together, attach the triangular top and bottom using screws or nails from the back of the cabinet.*

glued. Use a saber, band or scroll saw to make the cut. The frame can then be turned upside down and filed (with the grain) to smooth the curves before sanding. Next, the angles on the edges can be cut using the table saw ***(photo 5).*** Now the frame is ready to be attached to the case. Once the bottom section is complete and stands alone, you're ready to start the top.

The Upper Cabinet

The upper cabinet is assembled in much the same manner as the bottom. Begin with the two back pieces. This time, however, you must make them from laid-up, solid stock because the lower part of the edges are exposed. These exposed curves are located between the upper and lower cabinets. You must pre-cut the scroll work before assembly ***(photo 6 and Pull-Out Plans)*** and, of course, pre-sand. For safety purposes, make sure that the 45° angles are cut before the scroll pattern. It's a lot easier to handle the panels while they are still in rectangular form. Once these back pieces are screwed together, the triangular top and bottom of the upper cabinet can be installed. These will be screwed or nailed in from the back. ***(photo 7).*** At the very top , attach the 4" wide board. Make sure it protrudes forward enough to overlay the crown molding. Both the crown and the other piece are cut at a 45° angle on the ends before installation.

Photo 8. *The counter top for the lower cabinet is attached to the upper assembly. Edge detail and sanding should be completed before assembly to the upper section.*



Profile

A third triangular piece is needed at the bottom of the entire top assembly. It serves as the top of the lower cabinet, but should be made as part of the upper cabinet (you will later attach it to the lower cabinet using cleats on the inside top edge of the bottom case.) It must also be made of solid wood with the grain parallel to the face of the cabinet. This "disassembly" point makes it easy to move the piece if need be. Size this common piece to the bottom cabinet, first allowing a ¾" overhang in the front only. Once sized, a simple, traditional, edge detail can be routed on the front edge. Pre-sand the part before it's attached to the top section ***(photo 8).***

Make the face frame for the top section as you did for the lower cabinet. Be sure to cut the scroll shape ***(see Pull-Out Plans)*** and mill the angles on the edges before attaching.

Making the Mitered Doors

Now we can move on to the doors for both cabinets. The two bottom doors are solid frame with beveled, or raised, panels. The top door is a frame only and is rabbeted to accept a leaded or simple glass panel of your choice. All three door frames can be milled at the same time since they are all of the same mitered-corner construction. The hutch doors are all lipped, overlay style doors which are slightly larg-

TIP

Distressing for an Antique Look

One of the secrets to successfully distressing new furniture to achieve an antique appearance is to wear and distress the wood and finish in the appropriate places. Distress the wood where it would have most likely occurred during normal day-to-day use—that's on the edges of tops and on the top surface, at the feet, shelf edges, etc. Wear the finish down on top surfaces, shelf edges and surfaces, around knobs and pulls, and on the top corner of a lower door at the closing point, or at the bottom corner of an upper door at the closing point.

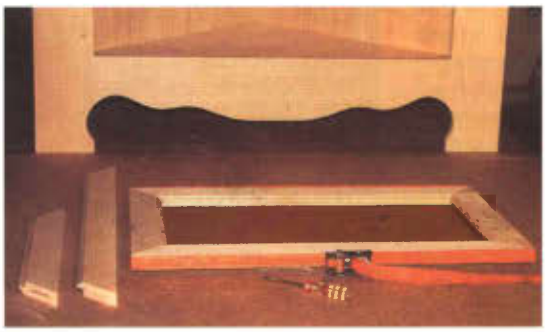


Photo 9. *A band clamp makes easy work of gluing-up the cabinet door frames.*

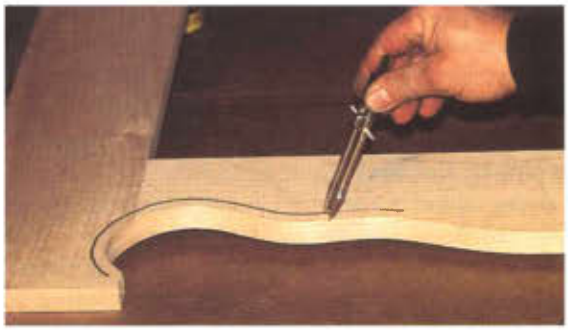


Photo 10. *A cockbead can be added prior to hanging the doors by using a compass to mark the line ½" from the scroll edge, then use a hand grinder or chisel to carve the V-groove.*

er than their openings. I used an antique, pin-type hinge for my original piece, but any type of overlay hinge will work. Sometimes, if you ask around at antique stores, the owners will let you look through their miscellaneous hardware. Often, you can come up with enough matching hinges for a piece like this. If not, there are many catalogs available which offer all types of reproduction hardware.

Once you have the actual outside dimensions of the doors, you can rough cut the stock to be used. This can then be dimensioned to between ¾"and ⅞" in thickness and 2" and 2½" in width. A ⅜" square rabbet is then cut into what would be the inside corners of the back of the door frame. Then these pieces are mitered for each frame. A biscuit joint may be used on the miters, or they can be screwed and doweled after the frame has been glued.

An inexpensive band clamp is very helpful for the assembly of these frames ***(photo 9)***. The two solid panels for the lower doors can be sized to fit within the ⅜" rabbet on the inside edge of the frames. A beveled cut is then made on the edge of these panels, which will leave about 5/16" of thickness on the outside edge. This way the panel will be flush in the back of the doors, and a molding can be added to trim out the seam. Now the upper door is ready to go, with the exception of the glass. It is set in place using silicone caulk and a molding on the back of the frame covering the glass and frame edge. The pull knobs on my piece where made of walnut, but any attractive wooden knob would maintain authenticity.

Before the doors are hung, a cockbead can be added to the scrolled edges of the top and bottom cabinets. This is most effectively done with a small, high-speed grinder and a V-shaped bit or chisel. Using a compass against the scrolled edge, draw a line about ½" from the edge ***(photo 10)***. Follow this line with your tool and lightly incise a V-groove forming the bead. The rest of the detail should then be shaped and sanded by hand.

The stain and finishing aspect is a matter of personal preference. My original piece was lightly distressed to give a warm antique feeling. I achieved this by sanding or scraping (never banging), in the appropriate places. I do this through layers of stain, which is what would occur on an authentic, well maintained antique. My final finish was a dark paste wax. PW

Just What is French Provincial?

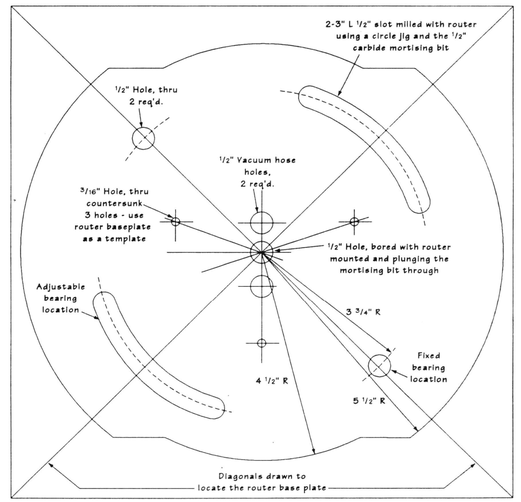
As you might expect, the French Provincial style comes from the "provinces" of France and was developed as a distinct style during the reigns of Kings Henry XIV and XV in the latter part of the 18th century. The country style, which copies principal elements of the more elaborate and highly detailed court furniture, usually features such elements as the cabriole leg, scroll work, and some carving and fluting. Its simpler style was not only better suited to the country lifestyle, but was also simpler to build. The French Louis monarchs brought (conscripted?) the best cabinetmakers to court, leaving the less talented to work for the country folk. The king also warehoused the best cabinet lumber, such as French Walnut and mahogany from the New World, leaving the fruitwoods, like cherry, for country cabinetmakers. Hence, original French Provincial furniture was always made from more common wood species.

ARMOIRE PHOTO COURTESY OF THE CINCINNATI ART MUSEUM, GIFT OF MRS. RUSSEL WILSON.

This armoire is typical of French Provincial design and detailing.

Inside
Popular Woodworking®
PullOut™ Plans

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



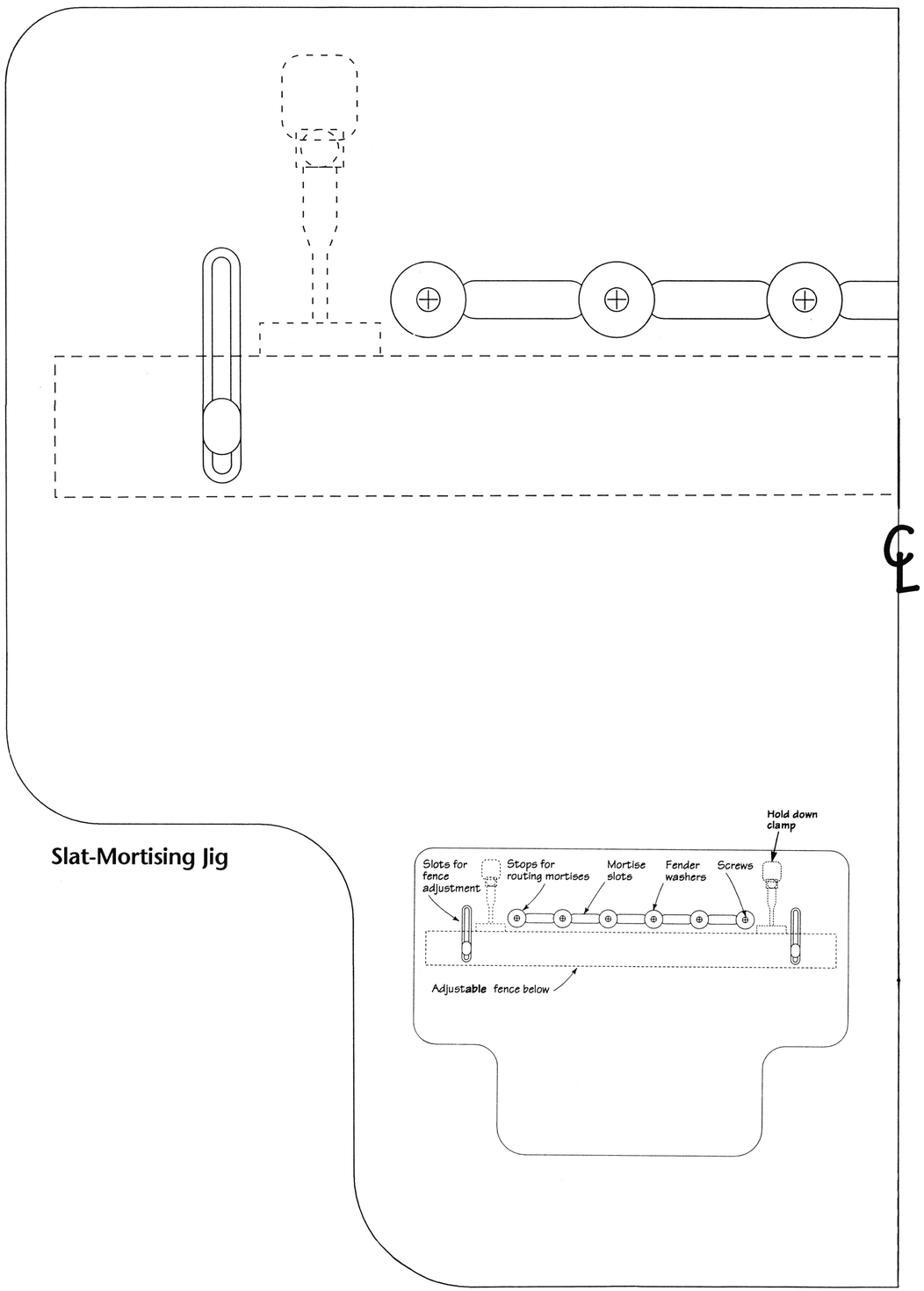
Router Baseplate

Corner Cupboard Scroll Patterns

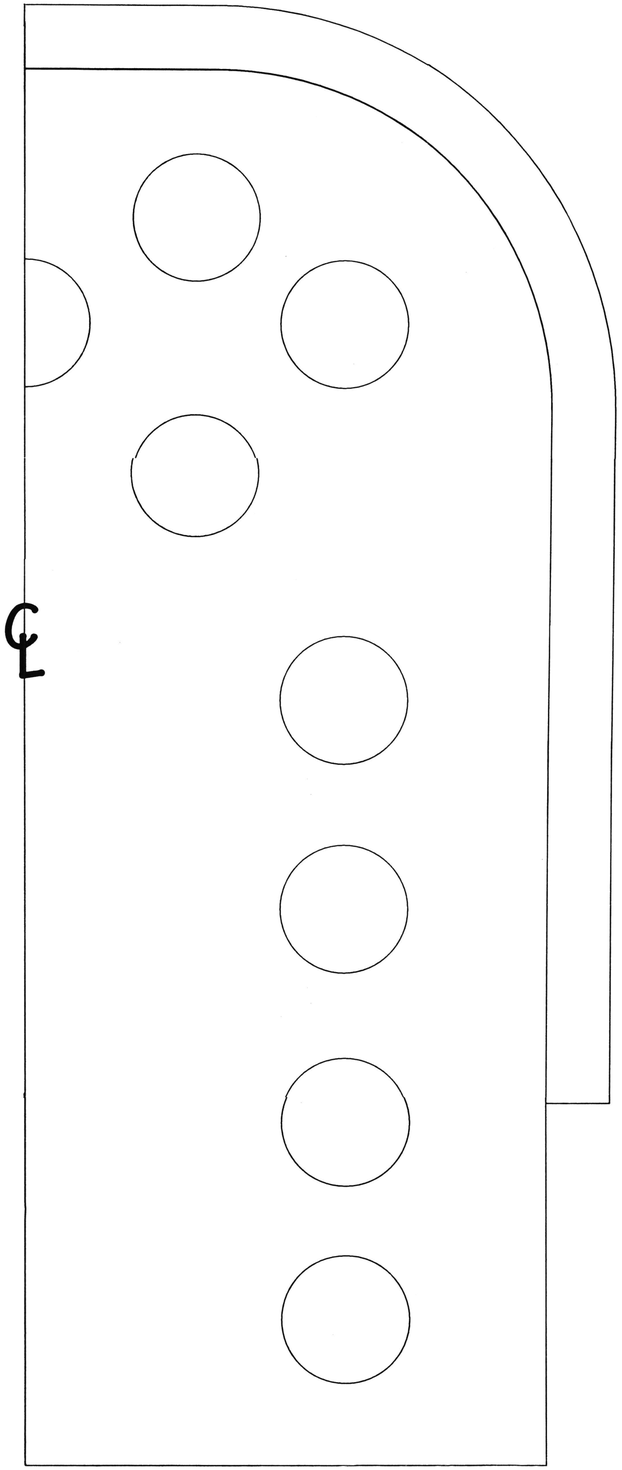
Upper cabinet back

Upper cabinet base

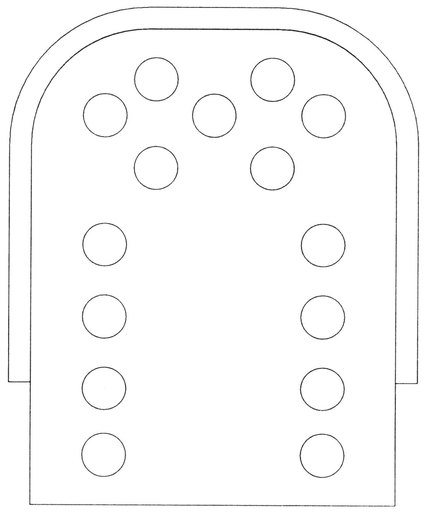
Lower cabinet base



Slat-Mortising Jig



Child's Chair Arm Pattern and Bending Form



An Aficionado's Humidor

"...But a good cigar is a great smoke," if properly stored.

By Jerry Rymarquis

The author's humidor uses a sassafras liner, a barrier which prevents off-gassing of finish to the cigars. In this case, the liner also serves to form the seal between the lid and the case. Below, the purpleheart strip accents the lid.

For the last ten years, I've been selling my woodworking at craft fairs. During one of these I was asked to use one of my box designs to create several sizes of humidors to be sold at a local smoking club. I'm happy to say the humidors have been selling well, and I'd like to share their construction techniques with you.

Cigars come in many sizes, so the final measurements for your humidor will depend on its contents. Do a trial layout with your favorite types of cigars, then add an extra inch to the length and width for the proper inside dimension to allow better air circulation which is important in cigar storage. I use ⅞" thick material so add 1¾" to each of the measurements given above for the overall length of the side panels. For the purposes of this article, I'll be describing a humidor with outside dimensions of 12" long x 11" deep x 4¾" high.

I chose walnut with a purpleheart accent for this humidor, though any hardwood can be used. Begin by surfacing your stock to the desired thickness, and join the two long edges parallel. Rip enough stock to a 4" width to make the two 12" ***(part A)***, and two 11" ***(part B)*** panels. I allow ½" extra for my initial cut lengths, then cut to finish size, squaring the pieces in the process.

The top ***(part C)*** is 12½" long and glued up to 11" wide plus a little extra for ease in working. One of my trademarks is to include a contrasting strip of wood to the top. With walnut, a

Jerry Rymarquis *is an accountant by trade, but has enjoyed working with wood for the past 18 years. He also has a tree farm on which he has planted over 10,000 walnut trees.*

Humidity and Tobacco

Ben Thorman, owner of the Private Smoking Club, in Cincinnati, Ohio, advises that the desired relative humidity for the storing of tobacco products is 70%. To obtain this level, there are several humidifying units that can be purchased from many tobacco stores. These units are installed on the inside lid of the humidor.

The simplest unit contains a removable sponge which is kept wet. Another type has a ceramic clay tablet or disc which holds the moisture. According to Thorman, the best humidifying unit on the market today uses a chemical clay compound which stops releasing the water when the humidity reaches the desired 70% level. The unit is manufactured by Credo, and is available is two sizes: the smaller is sufficient for our 12" x 11" humidor.

To install these units in the lid of your humidor, I would suggest cutting an additional square or rectangular piece of wood and cut the instruments into the piece. The edges can be routed using the same shaped bit you used on the humidor's edges, then sanded and finished to match the humidor. Attach the piece to the inside of the lid using countersunk screws and black or brass finished screws. The instruments can then be placed into the holes, and attached as per the manufacturer's instructions.

The Credo humidifying unit can be ordered from the Private Smoking Club, 3195 Linwood Avenue, Cincinnati, Ohio 45208. Their price including shipping would be $20 for the small unit, and $35 for the large.

Photo 1. *The side pieces are shown with dovetails already cut. These joints make the humidor more visually appealing.*

Photo 2. *The band clamp shown was used to clamp a corner-mitered version of the humidor. The corner miter offers a simpler version.*

Photo 3. *When clamping up the dovetail joints, standard bar clamps are still your best bet for a tight joint.*

light wood such as maple looks good. Purpleheart or padauk are also very attractive.

After you've arranged the cut pieces to a grain pattern that suits you, glue them together, and sand them smooth when after drying.

The sides can be assembled in a variety of ways. If you have a dovetail jig, use it here. A simple 45° miter joint made on your table saw also makes for an attractive piece.

Before assembly, rout a 3/16" x 3/16"rabbet on the inside bottom of each panel to accept the bottom. If you're using a dovetail jig, you'll have to stop your rabbet short of the ends so you don't have a hole in the outside when the panels are assembled. Next cut your miters or dovetails, making your cuts so the final assembled measurements are 12" x 11". ***(Photo 1)***. After you've finished your cuts, sand the pieces then glue and clamp the panels. Use a band clamp if you've made miter joints ***(photo 2)***, or a bar clamp if you've used dovetails ***(photo 3)***. Be sure to use a square to check all of your corners.

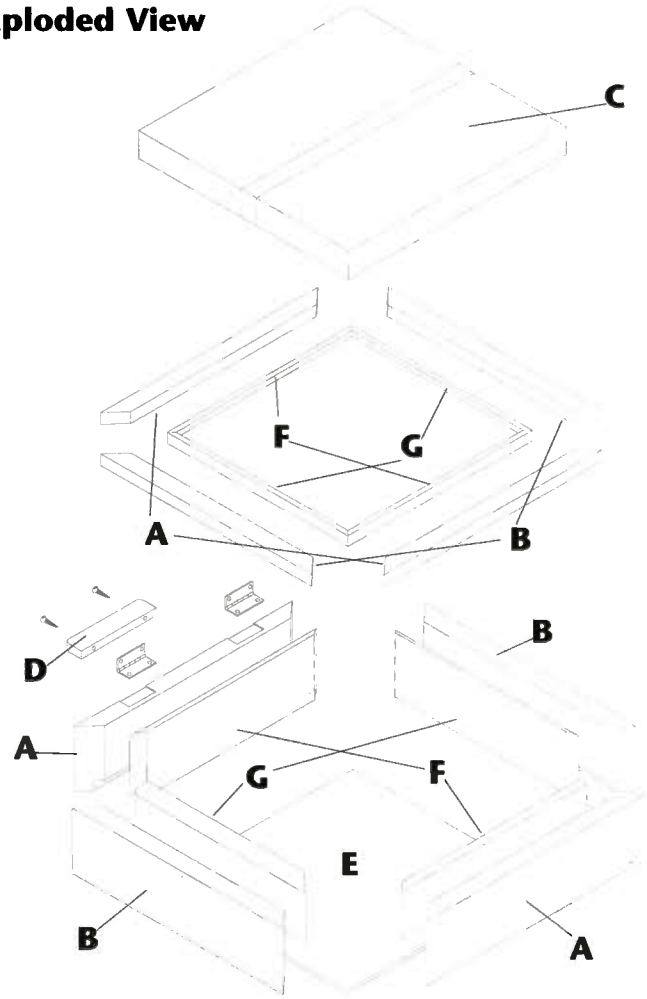
When the top is dry, remove excess glue so the top will lay flat. A sharp chisel works best for me. Also check the rabbet on the bottom of the box assembly for glue squeeze out. If you've used a dovetail joint, you may need to clean out a little wood where your rabbet stopped short of the end so you can fit the plywood bottom in easily.

Now sand the top edge of the box which will be glued to the top. Lay the box on the underside of the top with one long edge flush. Mark the outline of the box leaving 1/16" on each 11" side and 1/8" on the one 12" side.

Apply a bead of glue on the top of the panels, and lay the top leaving a 1/16" overhang on all sides. Use two scrap boards on the bottom and clamp the top to the panels ***(photo 4)***.

When dry, sand the top flush with the sides, keeping the top and sides at a 90° angle.

Exploded View



Schedule of Materials

No.	Letter	Dimensions	Item
❑ 2	A	7/8" x 4" x 12"	Front & Back
❑ 2	B	7/8" x 4" x 11"	Sides
❑ 1	C	7/8" x 11 1/8" x 12 1/8"	Top
❑ 1	D	7/8" x 3/8" x 4"	Support Strip
❑ 1	E	1/4" x 10" x 11"	Bottom
❑ 2	F	1/4" x 4 1/2" x 10 3/4"	Front & Back Liner
❑ 2	G	1/4" x 4 1/2" x 9 3/4"	Side Liners

Photo 4. *The top is glued and clamped to the assembled box. Notice the scrap boards used to protect the bottom edge of the box.*

Photo 5. *Carefully separate the top of the box from the side using your table saw. Particular care should be taken on the final cut.*

Photo 6 & 7. *Using a round over bit, rout the top side of the box, and both the top and bottom of the lid.*

Next separate the humidor into its two main parts. Set your table saw fence to 1⅜" and make your first cut on the side that will be the front face ***(photo 5)***. Continue until all four sides are cut. Care should be taken when cutting the fourth side to avoid snipes.

After you've separated the humidor into its top and bottom, rout the top side of the box ***(photo 6)***, and both the top and bottom sides of the lid ***(photo 7)***. I like to use a ⅜" round over, but several other shapes would be equally functional. Do any final sanding at this time.

Choose hinges that allow the lid to make a good seal with the sides and don't interfere with the installation of the liner. I use brass butt hinges placed 2" in from the end of each side. To get a tight seal, you'll need to mortise the side. If you want the lid to stay upright without holding it, cut and sand a small strip ***(part D)***, rounding the ends as shown in ***photo 8.*** Drill and countersink screw holes ¾" in from each end. Center this piece on the back of the humidor right at the end of the round over so that when the lid is open to about a 100°, it will rest on this strip.

Finish the humidor with a material that can withstand a constant high humidity level. I've used a product called Waterloc very successfully. Follow the manufacturer's recommendations. Once dry, the bottom can be installed. I use ¼" lauan plywood ***(part E)*** with a self adhesive plastic shelf liner on the inside. Measure the size of the plywood necessary to fit inside the rabbet slot previously made in the bottom and cut and nail it into place with ⅝" or ¾" brads.

The final, and somewhat critical, step is the installation of the liner. Traditionally, the liner is a light colored wood which is left unfinished. This is to eliminate any danger of odor from the finish transferring to the cigars. I like to use either poplar or sassafras.

Begin the liner by cutting parts ***F*** and ***G,*** ripping your stock to a 4" width. Then, sand both sides of the pieces and rout a decorative edge on one long edge of the four pieces. I like to use a ⅜" beading bit set in a router table ***(photo 9)***. Next rip a 7/16" edge off each of your pieces. These will form the liner for inside the top. Miter all four corners of the lid liner pieces, carefully measuring to form a press-tight fit, then glue into place.

Next, cut the remaining pieces to approximately 3 7/16". These will form the liner for the box itself. The routed edge goes against the inside of the humidor, and should be up past the top lip just enough to meet the portion of the liner glued into the lid. Cut miters on one piece and close the lid to test the fit. If the lid will not close tightly, make a slight cut off the bottom edge of the liner and test again. A good seal is important so. When you've found the perfect fit, cut the remaining three pieces to width and make your miters as before. Then slide the pieces into place.

Now that you've completed your humidor, you can head to your favorite tobacconist to pick up your favorite panatelas. Humidors also make great birthday or holiday gifts for your stogie smoking friends. PW

Photo 8. *The lid support strip is shown attached to the rear of the box.*

Photo 9. *A decorative bead can be used on the edge of the liner to provide a more attractive finish.*

Another humidor by the author using white ash with an accent strip of purpleheart.

A Kit Furniture Sampler

Welcome to the world of mail order furniture, where some assembly (and finishing) is required!

By Sanford Wilk

I COULD BUILD THAT. Every woodworker has looked at something made of wood and made that claim at one time or another. And the truth of the matter is most woodworkers *can* make what ever they want, all it takes is time and the application of techniques. But it can take a great amount of time to design a piece of furniture, select the boards, mill the wood, cut the pieces, glue and finish the piece. Some of us do this every day- some for a living, others for a hobby. But for many woodworkers, the dream of building an heirloom piece of furniture remains just that. The time-demanding realities of job, family and home keeps that dream of building complex furniture just that – a dream.

But fear not, there is hope for those of us cursed with other responsibilities, and even for the "wanna be" who would like to build furniture but needs an instruction manual for any tool more complicated than a screwdriver. If you fall into one of these categories (or even if you simply want the quick satisfaction of an easy project), you should consider kit furniture. It's available in pieces ranging from tea caddies to grandfather clocks, many of which can be assembled in a weekend.

From bent bow to scooped seat, this Windsor chair comes ready for assembly.

There are several companies bringing the dream of furniture making well within the grasp of anyone who can use a few basic tools. These firms produce furniture kits that are not unlike the plastic models that many of us put together as kids. Only these are made from wood and use wood glue instead of plastic and model glue.

There are many advantages to building furniture from kits. First, all the pieces come cut to size, so you're not going to risk turning several hundred dollars worth of good wood into expensive sawdust. Furthermore, many of these pieces are copies of antiques, so if you can't find or afford the originals you can possess authentic reproductions at a fraction of the cost.

Over the past year, we have put together furniture kits from four different manufacturers. These kits range from the simple to the complex, with many different levels in between. We also picked a range of projects that we hope cover the spectrum of kits the homeowner and woodworker would want.

Finishing

One of the major differences between a good piece of furniture and a great piece of furniture is the finish. This was all too clear to an associate of ours who recently purchased a dining room set from a major furniture manufacturer. When the set was delivered, the finish was terrible. Our associate had the furniture shipped back to the dealer, who had the manufacturer inspect the pieces. They said they met the companies standards, but when presented with a ten page list of complaints agreed to replace the set. Only the best furniture companies spend a lot of time finishing their pieces. The rest get them in the spray booth, slap a finish on and ship them out.

Sanford Wilk is a builder, architect, woodworker and writer who lives in Boston, Massachusetts.

The finish you get with kit furniture will be directly related to the effort you put into the task. This means taking the pieces and sanding them before assembly, then again after assembly. The better the surface you start with, the better your results will be.

We chose to coat most of our sample kits with a water-based finish. Although it is much better for the environment overall, it does raise the grain of the wood and requires extra sanding after the first few coats.

One thing that is important to remember is you cannot apply the finish in coats which are too thin. Many thin coats with light sanding using very fine sandpaper will result in a smooth-as-glass finish. Trying to apply thick coats as a shortcut will result in globs of finish that can run and take forever to dry.

Required Tools

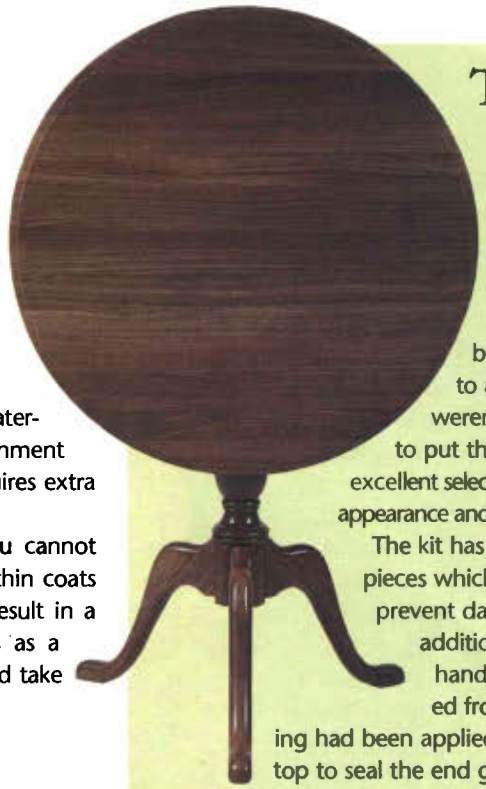
There are a few tools required to assemble these kits. The first is a good cordless drill with clutch settings for driving screws. A cordless drill is such a versatile tool, you won't have to worry about buying it for the kits and never using it again. The features to look for are at least 9.6 volts of power, a keyless chuck and clutch settings. However, if you don't mind a little more work, a plain old human powered screwdriver will work just fine.

The next thing you'll need is a supply of clamps. These come in a variety of styles and strengths. We recommend two five-foot pipe clamps, four three-foot light-duty bar clamps and an assortment of spring or C-clamps. We prefer spring clamps because they are much faster to use, cheaper, and often have deeper throats.

The cheapest (and one of the most important) required item is an acid brush. These are available at your local hardware store for brushing pipe compound or flux onto pipes before joining, but they're also great for gluing. They're cheap, throw away items, so keep a bunch on hand.

Lastly, you'll need to finish your kit. This means lots of sandpaper and either a sanding block or a power sander. A scrap piece of wood works for the sanding block. If you want to use a power sander we recommend a random orbit sander. These sand without leaving marks (depending on your choice of grits) that will spoil an otherwise fine job. You'll need plenty of sandpaper, ranging from medium to extra fine. Then there is the matter of applying the finish. Sponge brushes are good for applying the stains and some finishes. Read the directions on the can to determine which type of brush is appropriate for the finish you chose.

If you want to spray your finishes, we recommend you avoid the airless spray guns and get an HVLP sprayer. The airless sprayer will not give you an acceptable finish for furniture. HVLP's range from under $200 for single stage units and up to several thousand for professional models. With the exception of the walnut table (on which we used a hand rubbed oil finish), we used a High Volume/Low Pressure (HVLP) sprayer by Lexaire.



Tilt Top Table,

Adams Wood Products

We decided to talk about this tilt-top table from Adams first because it's the simplest kit to assemble. Not that there weren't several other reasons to put this kit first, including its excellent selection of wood or its elegant appearance and graceful lines.

The kit has a grand total of five pieces which were well packed to prevent damage during shipping. In addition to the protection from handling, it also came protected from the elements. A coating had been applied to the edge of the table top to seal the end grain from moisture. This ounce of prevention significantly reduces the chances of expansion and shrinkage due to moisture absorption or loss.

Assembly took half an hour, and if you can use an open end wrench, you can put this piece together. The legs have hanger bolts which go into the column through predrilled holes. The legs are then secured with a nut and washer from the inside of the column. The hinge assembly comes attached to the top and simply needs to be attached to the top of the column. When this is done, the table is ready for finishing.

Assembly of the Adams Tilt-Top Table required only 30 minutes and a wrench.

In this world there are few perfect combinations; walnut and oil are among them. There is something about the look of an oil finish that brings out the beauty of walnut. After sanding off the coating on the edge of the table top, we sanded down all the surfaces. We then built up several coats of oil, allowing them to dry overnight. A Japan Drier can be added to the oil to speed the process, but keep in mind that some of these contain lead. We prefer to allow the oil to soak into the wood. After a film started to build up, it was lightly sanded with 400 grit paper. A few more coats of tung oil and a light sanding in-between coats leaves a beautiful finish. This kit will give the woodworker a great deal of satisfaction and a beautiful piece of furniture. We'd recommend this kit to woodworkers at all levels of experience. The only tools required are a wrench and a rag to wipe on the oil, there's no gluing or cutting.

Sheraton Field Bed,

Cohasset Colonials

The Sheraton Field bed is a reproduction of a style of bed developed by Thomas Sheraton around 1790. These field beds were intended for military officers and designed so that they could be easily assembled, disassembled and moved when camps were moved. Because of these design parameters, the field bed lends itself to being produced as a kit. It is assembled by bolting the rails to the posts. The posts are two sections, turned and square, that are glued together. Once the bed is assembled, the canopy is placed on the tops of the posts with a dowel through the ends, and the dowel is capped with a finial. Once assembled, the angle brackets which hold the bed are screwed into the rails and the hand knotted lace netting (sewn at a small town in Virginia and optional at an additional cost) is draped over the frame. Drop in the mattress and box spring, make the bed and take a nap.

After we unpacked the bed and went to fit all the pieces together, we found a problem. There was no hole on one end of a rail. This was remedied by placing the rail in the mortise, then drilling a new hole using the existing hole in the post to align and guide the ½" drill bit.

Once everything was dry fit, we took the pieces to the finishing room. We stained the bed with a gel stain and a semi-gloss polyurethane. We then took the bed to its final

After dry fitting, this bed went straight to the finish room.

Sleigh Bed, *Bartley*

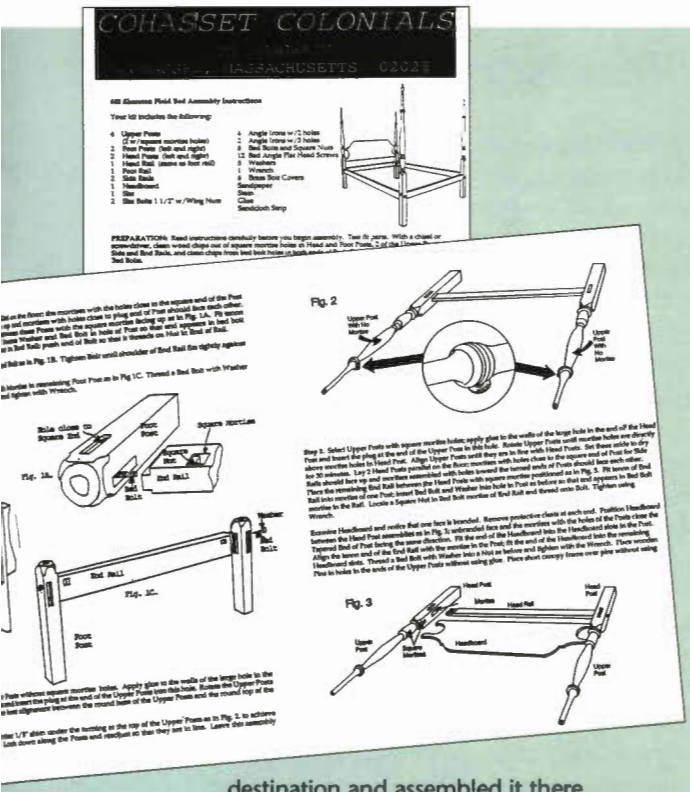
French in origin, the Sleigh bed became popular in America during the 19th Century. The name comes from its resemblance to the horse drawn sleigh of the 1800's. The bed features posts with the S-curve of an inverted cabriole leg, which carries down to the bed rails and flare at the ends to carry the lines from front to back. This S-curve feature is carried across the head and foot boards, which were typically covered in a highly figured veneer such as crotch mahogany.

The sleigh bed from Bartley is a faithful reproduction of the style, right down to the curved head and foot boards. Many reproductions use a flat panel which is much cheaper and easier to manufacture. The veneer on the end pieces is not as highly figured as the originals, but it does have an attractive grain and is not prone to cracking like crotch mahogany.

A feature we found particularly helpful was the identification number on each part (a feature we found in all the Bartley kits we assembled). The instructions for this kit were

superior to those of the other kits. From the concise instructions and detailed figures, to the directions on how to use the miter box (one was included in the kit), these instructions make assembly a cinch.

All the parts fit together very well, but this isn't to say the project is easy. We recommend you have someone help you, particularly when tackling the head and foot boards. Trying to assemble a frame around a five foot wide curved panel


COHASSET COLONIALS

destination and assembled it there. Assembly is very quick, and the kit even comes with the wrench needed to tighten the bolts.

You could start assembling this bed when the 11:00 p.m. news starts and be tucked in just in time to catch the Tonight Show's monologue. We think it's safe to say you'll get more use out of this kit than any of the others. In fact, you'll probably get more use out of it than all of the others put together. Except, of course, for the other bed kit we reviewed.

Chippendale Desk on Frame,

Bartley

The desk served a dual function in colonial homes. It was used as a writing surface and also as storage for documents and writing materials. Early desks were simple boxes with slanted lids which were placed on tables and moved when the table space was needed. The desk eventually got a frame of its own.

The Bartley Chippendale Desk on Frame is based on a piece from New England in the late 1700's. It is a simple frame on Chippendale legs. The desk itself has simple lines with ample writing space and six cubby holes in the gallery, three of which have drawers.

The selection of wood for this kit was excellent. The only sapwood was on the back side of the rear legs. Assembly was very easy because all the pieces were numbered and fit together well. There was some work that had to be done to square off the corners on mortises and dadoes. The mortise for the hinges have square comers, and the mortises were routed with round corners and not cleaned up. Also, the rabbet on the front comers of the legs that receive the desk had to be squared. One area requiring some adjustments was putting the parts for the cubby holes together. This required fitting the tenons to the mortises.

One thing we didn't like was the way the top was joined to the side. The two panels were joined with a miter joint that was strengthened with biscuits. There is a cross grain situation here. When glued according to the instructions, the top panel may split because it would expand or contract much more than the sides. We compensated for this by only gluing the front third, and left the back section to float. The structural integrity of the case is not compromised and the risk of the panel splitting is eliminated.

For a finish we chose a dark stain. However, this piece would look good in any tone. We put a water-based satin lacquer on the piece because we didn't want a high gloss finish.

Precisely machined and easily identified parts helped simplify assembly of the sleigh bed and Chippendale desk from Bartley.

and clamp it before the glue sets can be a challenge. Still, the only real difficulty we encountered was connecting the top and bottom post sections. This required placing the sliding dovetail on the end rail into the top and bottom sections while also aligning a dowel. The assembly step requiring the most clamps was gluing the top molding on the side rails. To make this straight molding conform to the flared ends of the side rails took three clamps on each end.

This kit required that some pieces be cut to length. It was the only kit that required cutting, and in this case asking the buyer to cut to length is preferable to precutting. In particular, consider the top molding that has to be mounted on the rails- since the rails have curves, a precut piece may not be aligned properly and would make assembly much harder.

We wouldn't recommend this for the first time kit builder, but anyone with a little experience in gluing and clamping should have no problems. The selection of wood was very good, with no visible defects on the finished product. For finishing we used a cherry stain and sprayed several coats of gloss spray lacquer.

The assembly of this project was made much easier because we had a lot of clamps available. Not only can assemblies be held easier, but having an adequate supply of clamps allows you to clamp up more than one assembly at a time.

Queen Anne Entertainment Center,

Emperor Clock Company

Although not a true reproduction since the invention of the TV and VCR were more than a couple centuries after the Queen Anne period, this piece has the design elements typical of Queen Anne furniture. The arched raised-panel doors, cabriole legs and apron let it blend in with a Queen Anne decor.

This kit came packed in two boxes, each filled with shredded newsprint. We salute Emperor for this environmentally friendly packaging and recycling. This kit was in two sections - the base with drawer and the case for the TV/VCR.

Assembly of the base went rather smoothly. All pieces fit together well and were square when assembled. The only things we didn't like were the mortise and tenon legs and sides. These were only about ⅜" long and should have been double that for strength. The drawer was installed using full-extension drawer slides. Although this feature would not have been found on an original Queen Anne piece, it was welcome because it provides access to the very back of the drawer.

The top case presented us with some problems. The case was comprised mainly of four glued up panels: top, bottom and two sides. The top had cleats screwed to the underside to keep it flat. The other three pieces, however, were rather warped. We got them as flat as we could, but still ended up with a bow on the sides. The instructions added further woes since they were not very clear and the few illustrations didn't help much.

There were a few other things we were disappointed with. First was the selection of wood. There was a lot of sapwood showing on the sides of the case. We don't mind having sapwood where it isn't visible, but large stripes in the middle of a visible surface disappoints us. Another disappointment was the hardware. The pulls were inexpensive stamped pieces. We ended up replacing these, a change which added a lot to the appearance of the piece.

To finish, we stained the piece a red mahogany color. This darkened it and concealed the differences between the heart and sapwood. Then using our sprayer, we applied six coats of clear lacquer sanding after the 2nd, 4th and 5th coats. This left a smooth-as-glass, high gloss finish.

Bowback Windsor Arm Chair,

Cohasset Colonials

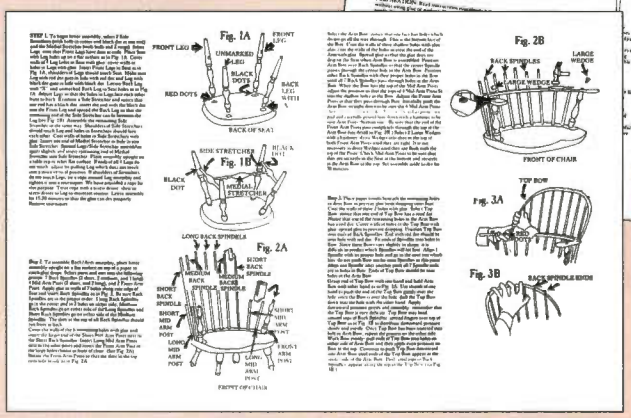
The Bowback Windsor is a reproduction of a chair found at Independence Hall in Philadelphia. This classic piece follows the age-old practice of using different wood species in a chair for different purposes. The result is a light, airy creation that appears delicate yet is very strong.

The soft pine is comfortable for the seat, maple is used in the legs for strength and ash is used in the bows for strength and flexibility.The assembly of this chair was very easy and the only tool required was a rubber mallet. All the pieces fit together perfectly. The wedged tenons hold the spindles and bows securely in place. The wide base makes for a stable chair and the sculptured seat is comfortable.

Finishing a chair can be a challenge, and a chair with three different woods can add more challenges still. Because the maple, ash and pine will all take stain differently, we used a gel stain to help balance the color. The woods still look different but there is not a drastic difference between the closed grain maple and the porous pine. On top of the stain we sprayed a water-based, satin polyurethane. Two coats can be applied with a brush, but the varied and changing surfaces are much easier to coat with a sprayer.

The result is a chair that is as beautiful as it is strong. We recommend this kit for all skill levels, including young woodworkers. In fact, a project like this can be a lot fun for the whole family.

Some Manuals Help More than Others



Of major importance to the process of kit furniture making is the presentation of assembly instruction and drawings. After all, precisely sized and machined parts from perfect lumber could still become a nightmare in a complicated kit if adequate instructions were not provided. Even experienced woodworkers need reasonable instructions.

Chippendale Writing Desk,

Emperor Clock Company

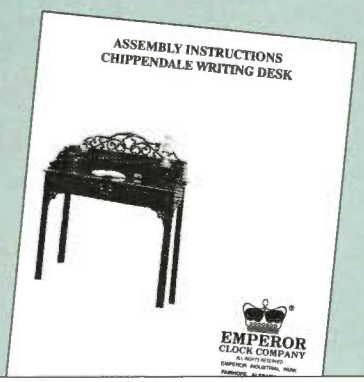
This version of the writing desk is more formal than the desk on frame described elsewhere. The Chippendale writing desk from Emperor Clock company was our favorite piece from them. It has elegant lines and the wood selection was excellent.

All the pieces fit together well, with the exception of the fretwork brackets on the legs. The shoulders on the tenons were not all cut at the same depth and required some adjustments to fit properly. To do this, we used a chisel and mallet, but it can be done with sandpaper and a block.

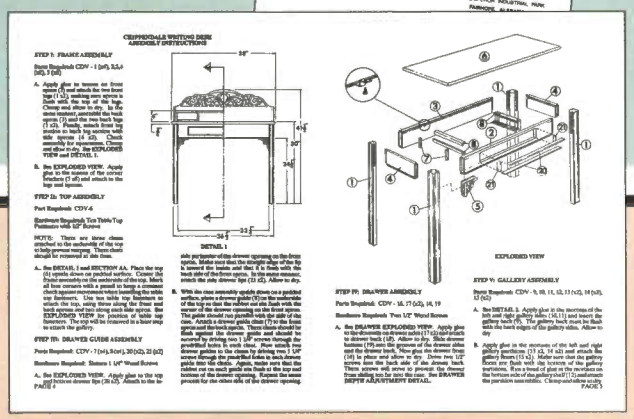
For a finish we used a cherry stain. This color enhances the cherry without masking the grain. The color of the cherry will continue to darken with age and it will look even better with time. We sprayed a semi-gloss polyurethane for a durable, final finish. Our spray system allowed us to not only put on a smooth finish, but to change the spray pattern to cover a small area, such as inside the fretwork, without developing runs or sags on the face.

Gluing and clamping the Chippendale writing desk from Emperor Clock was simple.

Using an HVLP sprayer simplified finishing. The adjustable spray pattern helped when spraying intricate details.

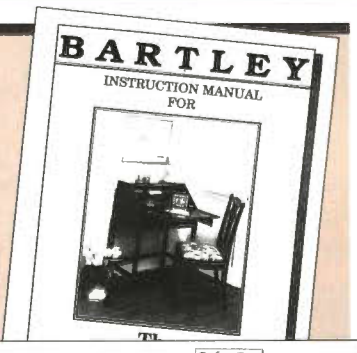

ASSEMBLY INSTRUCTIONS
CHIPPENDALE WRITING DESK

EMPEROR CLOCK COMPANY


CHIPPENDALE WRITING DESK
ASSEMBLY INSTRUCTIONS

EXPLODED VIEW

Simple kits, such as the tilt-top table and desks presented in the accompanying article, are fairly self-explanatory and poor instructions would not be likely to influence the success or failure of the kit project. However, following the instructions for the sleigh bed and grandfather clock were important. The Bartley instruction manual presented clear, step-by-step text with equally clear drawings and diagrams.

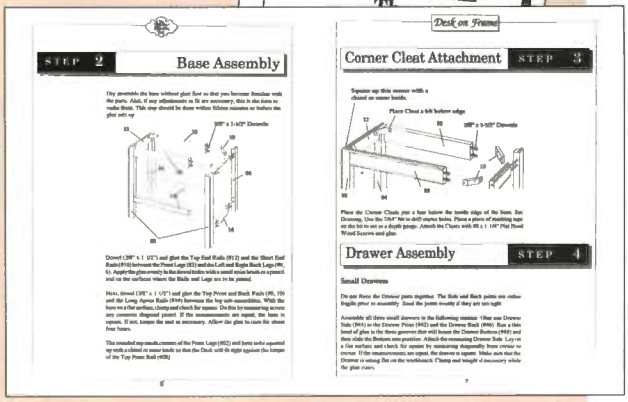

BARTLEY
INSTRUCTION MANUAL
FOR

While instructions from Cohasset Colonials were adequate, the printing was somewhat blurry on the bed manual. Their chair instructions were better, and we enjoyed the brief historical background included for each piece.


DON'T GET RID OF THOSE ANTIQUE CHAIRS!

SUGGESTIONS FOR TIGHTENING CHAIR LEGS AND RUNGS

Emperor Clock's six-page manual for their writing desk was good, but could have provided more detailed drawings instead of relying exclusively on exploded diagrams.


Desk on Frame

STEP 2 Base Assembly

Corner Cleat Attachment STEP 3

Drawer Assembly STEP 4

Queen Anne Porringer Table,

Cohasset Colonials

The Queen Anne porringer table features cabriole legs, an apron cut to resemble knee brackets, and a top with porringer or turret corners. Many original tables survive today, and their numbers imply that these were widely used. Their small size makes them very portable and versatile. The corners could be used for many purposes, such as placing a candle or a drink when dining or possibly to accommodate chips or coins, since gaming was popular in that period. In essence these tables were the predecessor to the modern day tray table. This table is based upon a classic example of the style located at the Shelburne Museum (located in Shelburne, Vermont) noted for its collection of Early American furniture and tools.

This kit was one of the easiest to put together. With nine pieces and eight glue joints it can be assembled in about an hour. The kit comes with a length of rope to wrap around the legs and aprons pulling the pieces together. This is done by tying the rope in a loop around the top with a few thicknesses of cardboard on the corners for protection. As if you're using a tourniquet, use a screwdriver to twist the rope pulling the joints together. We opted to assemble one side at a time and use a pipe clamp to hold the sections instead.

An optional step in the instructions is to drill two holes in the leg so that they pass through the tenon, then place a length of dowel in each hole. This is called pinning and adds strength to the mortise and tenon joint. We recommend that this step be taken because it ensures that the joint will remain sound even if the glue fails. An added benefit is that it speeds assembly. For each side, glue and clamp the legs and apron together, then drill the holes and insert the pin. Once the pins are in place, the clamp can be removed since the tenon cannot back out of the mortise. This lets you use a single clamp to assemble the whole table and not have to wait for the glue to dry. The table top is then centered on the base and fastened. For this piece we matched the finish on the Windsor chair.

The porringer table was safely packed and one of the easiest kits to assemble.

By pinning the mortise and tenon joints, the table was assembled using just one clamp.

Grandfather Clock,

Emperor Clock Company

The Stratton Grandfather clock kit from the Emperor Clock Company is a contemporary interpretation of a grandfather clock. It maintains a lot of the design elements from antique clocks, but with adjustments to facilitate it being used as a kit.

Since this was the most complicated kit, we saved it for last. As the company name implies, Emperor specializes in clocks, and the quality of this kit reflects this. Considering its complexity, we were concerned about how this kit would go together and look after assembling. However, with the exception of some defects in a molding, the wood selection was good and the pieces fit well.

The instructions for assembly were explicit and easy to understand. Although we would have preferred close-up detail drawings in addition to exploded views, assembly went very smoothly. We took all the pieces out of the box and laid them on the floor. We then verified we had everything. This also made assembly go faster since we didn't have to go sorting through a pile of pieces at each step. We did need a few bar clamps to assemble the clock, but found that ten spring clamps (resembling large clothespins) were the most often used.

The kit does not lend itself to building up different assemblies then mating them together, except mounting the clock on the base. We couldn't glue-up other sections while we were waiting for the previous section to dry. This is due to a layered type of construction that forces you to move through the assembly layer-by-layer. It's no big deal and it doesn't complicate the construction; but unlike other kits that allow multiple sections to be worked on at

Although the clock required a series of glue-up assemblies, most of the complex assembly was completed at the factory.

once, you'll need to go step-by-step following the sequence. It took us ten hours to complete construction by spending an hour or two each night over a week's period. If we had more clamps it would have gone faster, while having to make due with fewer clamps would definitely slow things down.

To finish we continued with our cherry stain, then sprayed seven coats of gloss lacquer. We chose the solvent-based finish because it would not raise the grain like a water-based lacquer. With the many and varied surfaces of the clock we did not want to sand the raised grain after just sanding the whole case before finishing. We did, however, give it light sanding after every other coat.

A warning on solvent-based lacquers. These are very flammable, so don't use them where there is any chance of a spark. (Avoid working around wood stoves, space heaters, or pilot lights from water heaters or furnaces.) Also, if using a sprayer, keep the turbine away from the spray area since a motor spark could ignite the vapors. Be sure, too, the area is well ventilated.

The clock kit is not difficult. Many of the difficult subassemblies come assembled from the factory. If you take your time and follow the instructions and dry fit everything first, the final product will proudly reflect the work you put into it.

Source List

Adams Wood Products
974 Forest Drive
Morristown, TN 37814
(615) 587-2942

The Bartley Collection
29060 Airpark Drive
Easton, MD 21601
(800) 227-8539

Cohasset Colonials
10 Churchill Road
Hingham, MA 02043
(800) 288-2389

Emperor Clock Company
Emperor Industrial Park
Fairhope, AL 36532
(800) 642-0011

In Closing

There's a lot to be said for kit furniture making, although you can't always count on the piece being 100% ready-to-assemble. This should not present a problem since, being woodworkers, you'll probably find minor adjustments will be easy. The bottom line is that these kits are easier to complete than it would be to build equivalent furniture from scratch. They'll also help develop complete self-confidence in woodworking and give you a good feel for how some complicated parts go together when making larger assemblies.

To get started, call the manufacturer and ask for a catalog. Even if they charge a couple of bucks, it'll be worth the investment. You'll get the full range of what each offers, and you'll probably be on the firm's mailing list for awhile. Keep in mind that all kit makers change styles and are always offering new products, so if you don't see what you want in the spring catalog, it may appear in summer. Many manufacturers also assist customers with special requests, and some can even adapt their kits to custom sizes. PW

Furniture to Grow On

Master cold lamination bending while building this child's table & chair set.

By Stephen Shanesy

I once read that proportionally sized objects give children a greater sense of well being, as well as comfort, in their smaller world. Confidence and security follow; important developmental factors for all youngsters. A scaled down table and chairs can give the little one in your life a place that's special. The set presented here could serve as a project center for art or craft work, a place to enjoy games or puzzles, or a good spot for eating with friends- any or all of which will be more fun when done at the young ones' own special table that's just their size.

And you can benefit from the project as well! Making the chair arm and base curved parts will give you the opportunity to learn about cold laminated wood bending, a technique you'll find useful for all sorts of future projects. (You'll also end up with a chair that actually serves as a two-step stool when turned over, or a chair for an especially small child.)

Cold Lamination Bending

The bending process is a great place to start. Cold lamination is a bending alternative with advantages over the more traditional steam bending process. It results in less "sping back," the tendency of wood to try to return to its original shape, and, if you choose, allows the use of thin plywood sheets, not just narrow strips of wood. As is inherent with all laminated wood, it makes for extremely sturdy construction.

The chair arms and bases used for this project are just one application of cold bending. Other uses include making curved ends for cabinets, or even curved doors, headers for circular windows and doors, railing and stringers for circular stairways, and cylinders for contemporary table bases or pedestals.

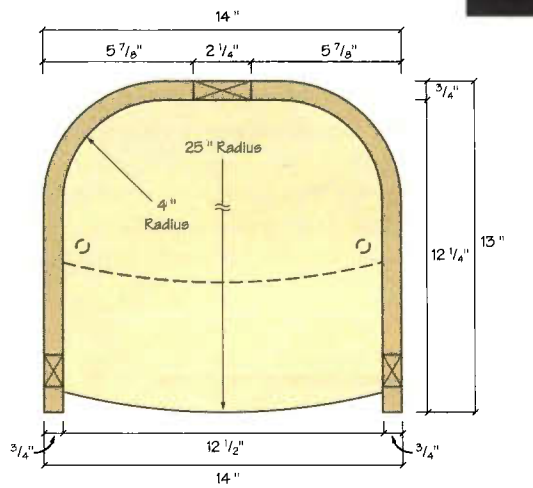
While thin plywood is used for making larger surface bends, we'll focus here on bending solid wood for applications similar to those called for by the children's chairs.

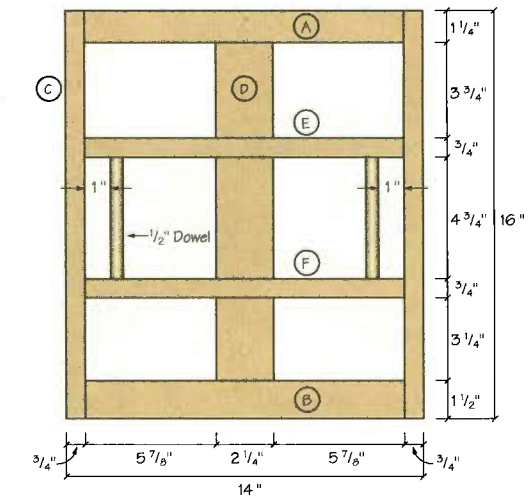
Select the Right Materials

Bending solid stock to small curves usually requires an open pore wood like ash, oak or hickory. The stock should be quartersawn to further reduce the risk of splitting out. To make my chair parts, I bought an eight foot length of eight quarter plain sliced ash and crosscut the rough board in half. I face and

Steve Shanesy is editor of Popular Woodworking *magazine.*

Chair Plans





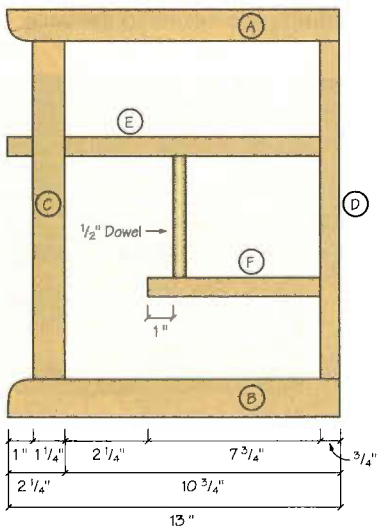
edge jointed one surface each and then began ripping my two boards into strips 5/16" thick. (The rippings are now quarter-sawn since the edge of the original wider board is the width of my strips.) I kept these rippings in sequence as they came off the saw. By gluing the stacks back together in the same order, the bent, finished piece will still look very much like a single board.

I selected Weldwood Plastic Resin Glue from Dap for gluing the strips together. Checking with DAP's tech department, I learned that regular yellow glue would work, but Plastic Resin Glue, a urea formaldehyde based adhesive, develops greater adhesion in pounds per square inch and requires less clamping time than yellow aliphatic resin glue. Even so, the plastic glue required 12 to 14 hours of clamp time at 70°. The yellow glue would have required 24 hours. The Plastic Resin Glue comes in a powder form that is easily mixed following label directions.

I calculated that I'd need eight pieces, each 3/32" thick, to achieve the final 1/4" thickness for my curved chair parts. I moved to the planer, taking material from each side to give me a consistent thickness and good glue surface. (It's possible to get good results from simply sawing and gluing without the planing step.) Since your planer may not adjust to a 3/32" thickness, you may need to make a simple fixture to adjust the bottom table height. Take a wider piece of plywood or particleboard that's slightly longer than the planer bottom table and securely attach a cross piece at one end of the board. With the machine turned off and thickness setting greater than the insert piece, slip the board into the planer. Use the cross piece on the bottom of the insert as a heel, preventing the insert from pushing through when the machine is later running. If your planer has bottom feed rollers, set them below the table.

Schedule of Materials

No.	Letter	Dimensions	Item
❑ 1	A	1/4"x1 1/4"x35"+/-	Curved Arm
❑ 1	B	1/4"x1 1/2"x35"+/-	Curved Base
❑ 2	C	1/4"x1 1/4"x14 3/4"	Front Vert. 3/4" tenons
❑ 1	D	1/4"x2 1/4"x14 3/4"	Back Vert. 3/4" tenons
❑ 1	E	1/4"x12 3/4"x12 1/4"	Seat
❑ 1	F	1/4"x7 3/4"x12 1/4"	Step (optional)



Make the Bending Form

I started with a glued up blank that was slightly larger than my finished form using three pieces of particle board glued to 2 1/4"x13"x17". When dry, I squared the blank and cut it to my finished dimension of 12 1/2"x16" long. Next, I used a compass to draw the four inch radius on the two back comers. I then bandsawed to this line and cleaned up any irregularities by

Photo 1. *When applying glue to the eight strips to be bent, keep them in a stack after brushing on a moderate amount of glue. By stacking, you slow the drying of the glue, providing more time for clamping on the form.*

Photo 2. *After marking the approximate center of the glued up stack of strips, set the center of the stack at the top of the form and set the first clamp here. Make sure all the pieces are pushed down flat.*

Photo 3. *With the top clamp set, pull one side around to the end and loosely set a second clamp. Keep this clamp loose so that the stack can slide through it as other clamps are placed, taking out the gaps.*

block sanding by hand. Make sure you maintain a square edge to the surface or you'll end up with a chair that won't sit level.

When I completed the form, I secured it to a larger board. I used staples, placing them where they wouldn't interfere with the location of holes drilled for clamping. Clamping around the tight radius corners is what this whole process is about, and clamp placement around the corners is critical. Since it's important to always clamp directly across or perpendicular to the glue surface, the use of large holes to place the clamp head works best (see Pull-Out Plans™ for the form's layout).

To prevent gluing the finished part to the form, I took two precautionary steps. First, I attached a series of ¼"x¼"x2" strips around the form, spacing them about 2" apart. This gives the glue squeeze-out on the bottom a place to go. Next, I used a piece of plastic laminate and glued it, with contact cement, to the wall of the form. The time had come to assemble the clamps, mix the glue and get ready for bending.

Glue The Strips

I took nine pieces in sequence from my stack of rippings and trimmed the rough edge to a width of 1½". I began brushing glue on all surfaces (except the two outsides) in double time ***(photo 1)***. I didn't want a lot of messy squeeze-out so I spread the glue thin. As each surface was glued, I continued stacking to prevent the glue from drying too quickly. When all eight pieces were done (the ninth piece included earlier was an extra to have on hand should a piece crack during bending, although none did), I marked the center from length and placed this in the middle of what will be the back of the chair. I pressed all the edges down flat and clamped ***(photo 2)***.

Next, I bent one side all the way around to the end ***(photo 3)*** of the form and loosely clampped it. I repeated this on the other side ***(photo 4)***. Now I returned to the center and began clamping around the corner, to one side and then the other, until I reached the flat part of the sides ***(photo 5)***. As the clamps were applied, I cleaned up glue squeeze-out while it was easy to get. I didn't worry about the bottom. I finished clamping the flat part until done and checked along the way to made sure the stack was flat and pushed down on the form ***(photo 6)***. The finished part remained in the clamps for 12 to 14 hours. I repeated this process each day for four days until the four parts I needed were completed.

Next, the curved parts were cut to rough length. I then used my jointer to make a clean edge square to the side ***(photos 7 and 8)***. To arrive at the final width dimension, I set up a quick fixture on the table saw for an added measure of safety. A block 1¾" thick was cut on the bandsaw to a 6½" diameter (slightly smaller than the radius of my inside curve). I made the first pass with the saw blade raised only an eighth inch to make a scoring cut on the piece. This prevents tear-out. I then raised the blade to made the full cut ***(photo 9)***. I repeated this process for the 1¼" wide parts.

Lastly, I trimmed to final length, 12¾". I measured and marked each cut by placing the back against a straight board and measured out from the board. The final step was cutting the mortises for the chair uprights. I used my bench top mortiser and milled ½"x1"x1⅜" deep slots starting 1⅛" back from the front edges and simply centered in the back.

Photos 7 and 8. *With the jointer fence moved to the left for safety, the top edge of the part on the form (the edge you could clean the glue from) is jointed flat and square to the side. When jointing, use special caution keeping your fingers on top of the work only. First run the part with the machine turned off to get a feel for the turns and placement of your hands.*

Photo 4. *Next, pull the other side around and clamp loosely. Check both sides to make sure the bottom edge of the stack is seated down on the form.*

Photo 5. *Return to the top of the bending form and work from the center out setting clamps around each corner. Clean top glue squeeze as you go while removal is easier.*

Photo 6. *The eight strips fully glued and clamped around the bending form. In the foreground, a previously bent part is out of the form. Note that it holds its shape with no perceivable spring back!*

The Uprights

The rest of the chair is easy and takes little time. The front uprights are ¾"x1¼"14¼". The back is the same except the width is 2¼". In each of these parts I machined a tenon that was ½"x1"x ¾" deep. This leaves a ⅛" shoulder all around the The Uprights. The back has a longer shoulder on the width dimension. Dadoes, ⅛" deep x ¾", were cut on the uprights to receive the seat and steps.

The Seats and Steps

Stock was glued up and cut to the final dimensions as shown on the cutting list. To shape the back corners and front edge, I made a template of ½" plywood. The back corners are a four inch radius to mimick the curves in the arm/base. The front is a sweeping curve I arrived at by bending a thin stick one inch out and traced the arc it formed. I traced a line on the seat and step parts from these templates and jigsawed to within ⅛" of the line. The templates were then clamped in place and a router with a ½" straight bit and bearing on top cut the final profile on the parts.

To assemble the finished components, I first glued the uprights to their curved top and base parts and left these sub-assemblies in the clamps to dry for a couple hours. I then laid out the hole locations for the ½" dowels used in the combination chair/step stool. I drilled these about a half inch deep and then discovered the "½" dowels were actually a heavy 7/16". Rather than continue with a sloppy joint, I simply made a bandsaw kerf in each end and then cut tiny wedges to insert.

After removing the clamps from the sub-assembly, I routed a ⅛" radius detail on all the edges. There are some places the router just won't reach because of the base. The detail is small enough that sanding to match takes just a little extra time. Next, I drilled, from the outside, a ½" hole about ⅜" deep and centered in the dado of the front uprights with two holes located similarly in the back uprights. I then drilled a clearance hole for a #8x1½" screw. Next, I set the seat and step parts in place and drilled a pilot hole. Rather than glue, I simply screwed them together since the grain direction wasn't lending itself to a glue joint that was worth much. Lastly, I used a plug cutter and drilled ash plugs which I glued in place, then later trimmed and sanded flush.

Make the Table

The table has a top that's 28" square and 21" high. Using a 3¾" apron, the chair arm passes underneath. For my table, I used legs that were 2¾" square and then turned round from just below the junction of the apron and leg. If you don't care to turn the legs, a square or tapered leg would also work well.

I milled all my lumber first and glued up the top to a dimension that was slightly larger than my finished size. While the top was drying, I cut the mortises ***(photo 10)*** then turned the legs ***(photo 11)***. I cut them to a depth of 1 3/16", since I planned to make the tenons ¾" long. Because I wanted the apron to set back ⅛" from the leg, I offset the ½" thick mortise, cutting it ¼"

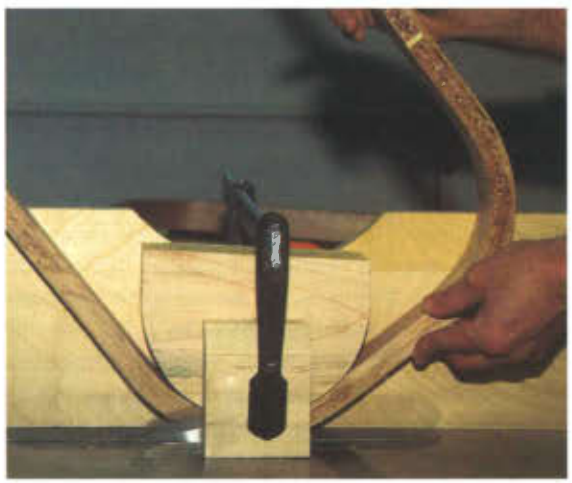


Photo 9. *After jointing one edge, the finished width was cut on the table saw using an auxiliary fence which included a corner turning block. The higher fence, turning block and outside cover block helped stabilize the part preventing kickbacks. The blade actually extended up into the turning block for the final trim after a scoring cut was made first to prevent tear out on the exit side of the cut.*

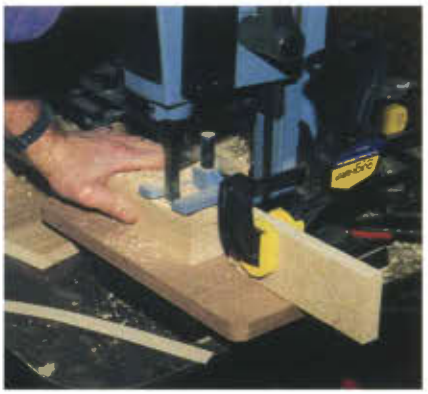


Photo 10. *The mortises for the legs were cut using a bench top mortising machine with a ½" hollow chisel.*

Photo 11. *After mortising, each of the four legs were turned to a cylinder beginning at a point just below the junction of the leg and apron.*

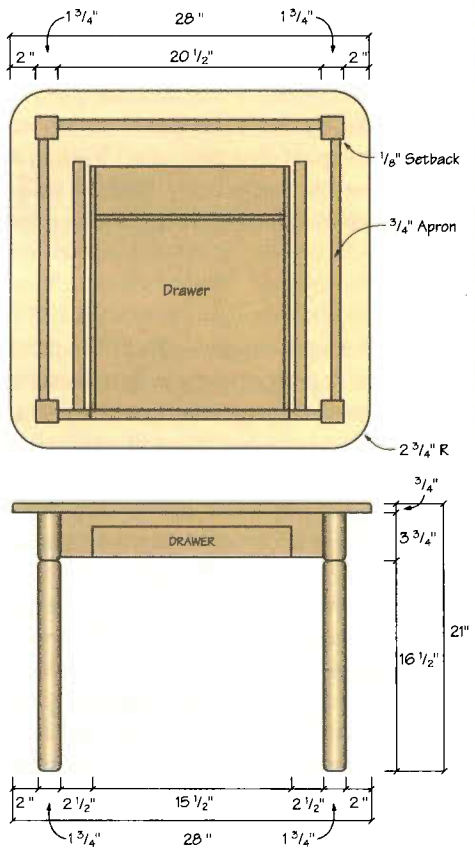
Photo 12. *The table apron tenons were cut using a mortising jig and table saw. A filler block is necessary when tenoning the apron with the drawer front cut out.*

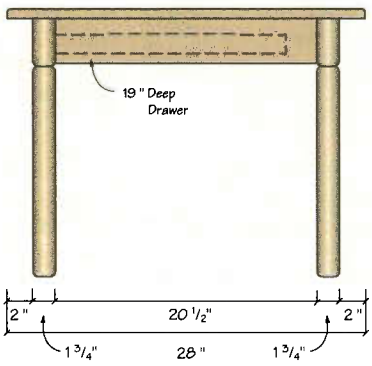
back from the face edge of the leg. This allowed a ⅛" shoulder on the width dimension of the aprons. I made the mortise and the tenon 2¾" long.

Since one apron was to have a drawer, I first cut it ⅛" wider than my finished width and ¼" longer than finished length. This allowed me to rip ¾" from one long edge, and crosscut the off-fall twice to make my drawer front from the same board, grain intact, and now the correct width and length. I next glued the ¾" top of the apron to the "fall-off" ends of the drawer front, thus putting my drawer apron, sans front, back together. Just make sure you mark these pieces adequately so you put the pieces back together properly. After all, matching the grain is what this extra trouble is for! When dried, I cut all the apron tenons using the tenoning jig on the table saw ***(photo 12)***.

With the aprons and legs ready, I made one additional part to give strength back to the side from which the drawer front was cut from the apron. I used a piece of ½" plywood, 3" wide, to fit between the aprons perpendicular to the drawer side. I cut slots with my biscuit joiner in the plywood ends to mate to the flush bottom edge of the apron sides. I dry fitted the base parts ***(photo 13)*** and, satisfied with the fit, glued them together. I checked for square with regard to the apron/apron and apron/leg relationships.

Table Plans





Schedule of Materials

No.	Letter	Dimensions	Item
❑ 1	A	¾"x28"x28"	Top
❑ 3	B	¾"x3¾"x22	Aprons incl. ¾" tenons
❑ 1	C	¾"x3⅞"x22¼"	Apron incl. ¾" tenons and cuts for drw. front
❑ 4	D	1⅞"x1⅞"x20¼"	Legs
❑ 1	E	½"x3"x22½"	Brace below drawer
❑ 2	F	½"x2⅛"x20"	Drawer sides
❑ 1	G	½"x2⅛"x15"	Drw. sub front
❑ 1	H	½"x1⅞"x15"	Drawer back
❑ 1	I	¼"x14½"x19¾"	Drawer Bottom
❑ 2	J	1"x2⅞"x21"	Drawer Mounting Blocks
❑ 1	K	¾"x3"x15¼"	Drawer front

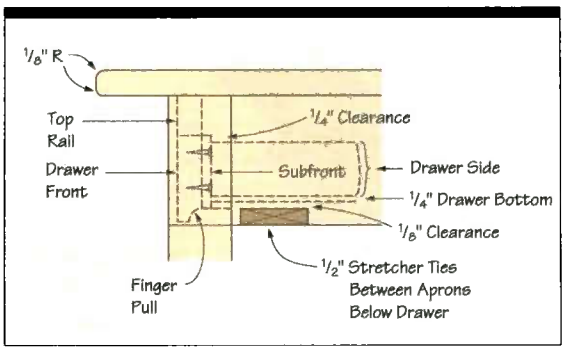
Photo 13. *The table base was dry fit prior to gluing the parts.*

Photo 14. *To make the radius cut on the table top corners,first pencil on the finish cut line using the template, then jigsaw cut the waste just wide of the line.*

Photo 15. *Next, clamp the template in place and trim with a top-mounted bearing flush bit chucked in the router. Avoid tear-out by climb cutting the end grain.*

They were fine, so I next moved on to trimming the top to finished size. I had to level out the edge joints of the top in a few spots, so this gave me an opportunity to try out my new cabinet scraper. After reading up on how to properly sharpen and set the blade of this tool, I went it to work, first on the bottom side to test my skills, and once satisfied with the results, I moved on to the top side. I had used regular wood scrapers before with good results, but after using the cabinet scraper, I'm hooked (for you scraper fans and sharpening aficianados, no pun intended).

With the base dry and top sized and scraped, I assembled them using cleats along three aprons and drilling directly through the ¾" part of the apron at the drawer opening.



Make the Drawer

I cut the drawer parts using simple lap joints on the front edges of the sides and sub-front, and the dadoes for the back. I sized all parts to make the overall width just ⅛" smaller than the width of the opening. I set the back in about 4" because I wanted extra long sides to support the drawer runners when it "appeared" the drawer was fully opened. Because the drawer was shallow, I set the bottom in a ¼" rabbet on the bottom edge of the sides and sub-front to gain an extra ¼" of inside drawer depth. Before assembling the drawers, I milled a ¼" deep x 13/16" wide groove in each drawer side. This groove will mate to ¾" drawer runners that will be mounted to blocks to support the completed drawer.

The drawer mounting blocks were cut just wide enough to fit between the top and the ½" plywood stretcher just behind the drawer opening. I attached the drawer runners to them so that about ¼" clearance was above the drawer side and ⅛" was below when the runners rested in the drawer side grooves. As with the top, I attached the drawer mounted blocks to the underside of the top using cleats and screws. Once attached, I slid the drawer box in place after pre-drilling screw holes in the sub-front. Before aligning the drawer front to the opening, I cut the finger pull on the back side of the drawer front. I used a half cove profile milled with my router. A simple angle cut on the table saw would also work well. To stick the front in place, I "made" two pieces of "double-sided" tape from duct tape by looping small pieces around. I carefully set the drawer front in position and gave it a squeeze to stick it to the drawer box. I then simply opened the drawer and screwed it securely to the sub-front.

Shape the Top

The last steps in completing the table involve router work. To radius the table top comers, I made a radius template that was 2¾". This gives me a consistent 2" overhang all around the table. Use the template and router ***(photos 14 and 15)*** as discussed earlier in shaping the chair seats. When this was done, I put a ⅛" radius detail on the top and bottom edges of the table top to match the profile of the chair edges.

Sanding and Finishing

I like to do most of the "serious" sanding using 120 grit paper. I then progress to 150 and sometimes 220 grit depending on the project and the wood. Except for breaking edges or getting into spaces the sander won't reach, I use a random obit machine because it cuts fast and doesn't leave those pesky swirl marks that really compromise your furniture and your finish.

Since the table and chair set will take a lot of abuse, ranging from marker pens and water colors to glue and spilled milk, I wanted a durable finish. I chose a water-based polyurethane lacquer and sprayed it with an HVLP rig. I applied two coats of finish, sanding between with 360 grit paper. This scuff sanding knocks off the nibs and levels the first coat as preparation for the second coat. The next application was a wet coat that leveled out nicely. Two coats of this material is a good finish since water-based materials have a higher solids content than most sprayable solvent-based finishes.

After the finish was allowed to cure for a couple days, I let the kids get busy using the set for their first art project. I must say, the table top really looks good with crayon marks on it! Ugh.... PW

Spindle Turning Fundamentals

Turn a candlestick and learn basic techniques along the way.

By Tobias Kaye

Spindle work seems to be the oldest form of turning. There are pictures of ancient Egyptians turning shapes onto what seem to be chair legs. In recent times (the last 300 years), an alphabet of designs has evolved that can be combined in many permutations to create pleasing spindle designs. In other words, the fatter and thinner parts of a spindle, and the area in between them, all have names.

Arranging these to form a pleasing design is more complex than it seems at first. Many spindle designs on furniture or architecture are overly fussy and overly heavy. It is worth looking closely at examples you see when visiting older houses. Copy down those that please you, but mainly just study them to get a feel for what other turners have achieved.

Designing Spindles

When designing a spindle, I start with the overall feel of what I want. This way I establish the height and width first, then decide whether I want the major feature at the top or the bottom, or whereabouts in between. This is all done with sweeps of a pencil on paper.

Next I fill in various sections of the design, starting with the most prominent. Having completed the drawing, I ask myself whether it is possible to simplify the piece without losing its appeal or the overall impression. Simplicity is a great virtue in all forms of design. A simple design carries more power than a fussy one. The crux of good design is its ability to carry a subtle message in a simple fashion.

The vocabulary of forms involved is large, but the basics of spindle work are limited to half a dozen shapes. First is the bead. This describes almost any half-round convex that adorns turned work. Its counterpart is the cove, a term used to describe most half-round concaves. Beads and coves are nearly always separated by a short flat surface called a shoulder.

Another major feature of spindle design is the baluster shape that gives its name to the balustrade or row of spindles that often supports hand rails. This baluster shape can be used with the fat part either at the top or bottom. It is defined as the convex shape flowing into a concave shape, that then expands wider again, but only by a small amount usually; a pear shape to anybody else, opening up at the top.

In Italian gardens many a balustrade with massively fat balusters runs for miles, while in Regency furniture the baluster became highly stylized with little or no curve. In the latter case, the linear purity is often accentuated with reeding or fluting to draw the eye along its slender length.

The ogee curve is a similar combination of concave and convex, but is used as a transition between points along a length. These are most often used at the top or bottom of a shape to give the impression of the capital of a pillar or to provide a supportive feel for a large candle, as in this project.

Very often spindles have a square section, unturned at one end or both. In the case of balusters for a stair rail, these parts are nearly always found at each end. Woodturners often refer to these square

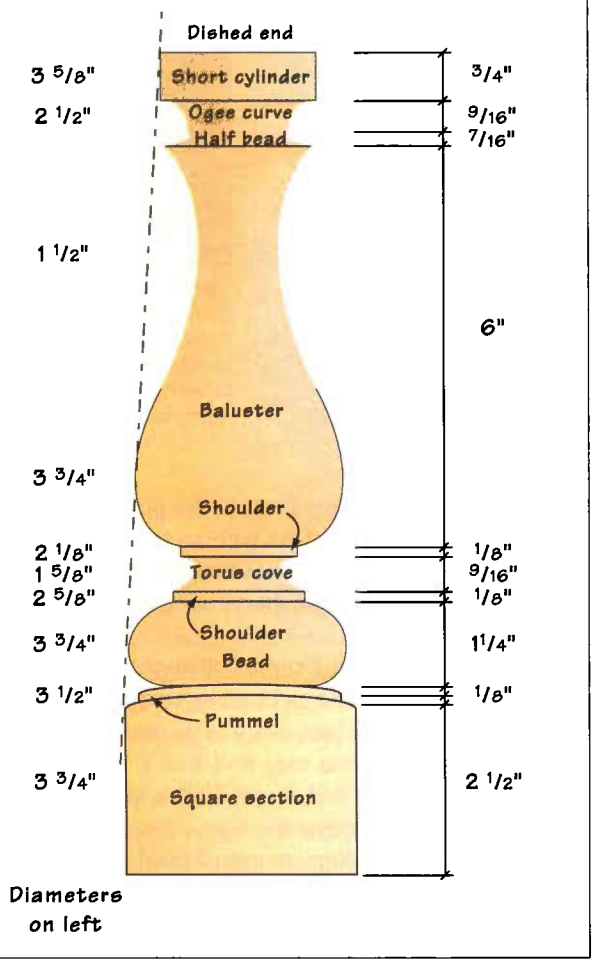
WARNING

At the start of a coving cut with a fingernail gouge the blade tends to catch and skitter across the work. Avoid this by rolling the gouge well over with the handle very low. The trick is to pivot the cutting edge into the wood by raising the handle, rather than sliding the gouge forward, which is riskier.

The candlestick at left is a project to practice basic spindle turning techniques including coves, beads, shoulders, ogee shaped baluster and a dished-out end.

Tobias Kaye is a professional turner who also teaches and writes about his woodworking specialty from his home in Devon, England.

The Dimensions of a Candlestick



parts as pummels. Architects and joiners use the word pummel to denote the middle, turned section. I believe the correct use is to describe the pummel as the surface that joins the square to the round.

The pummel can be shaped in three particular ways, and it is worth studying to see how this feature has been approached. Most commonly the pummel is sloping toward the turned area, resulting in a curved end to the flats. If the pummel is turned with a concave sweep, a duplex curve is produced on the flat. Near the comers the curve is concave, but as you approach the center it becomes convex.

A straight line across the flat can be made by a perpendicular cut into the wood. Traditional designs using the straight cuts were often decorated with fiddly shapes on the comers.

One other shape that is worth considering is the torus curve. Torus is used to describe an asymmetric curve, which has its point of focus above or below its natural center. This can be used to give lift or emphasis to a piece of turned work.

Coves and the Techniques

"Cutting the wood as the wood likes to be cut," is a maxim advanced by Frank Paine (often called the father of modem woodturning) in his book *The Practical Woodturner.*

Pursuing this goal of cutting wood takes a little longer to learn than scraping the shape, but the satisfaction and the degree of finish to be gained are immeasurably greater. The

TIP Round the edges of the bevel behind the long corner of the skew chisel with a slipstone to take off the sharpness for working on concave curves. Unless you do this there is a risk that you will scratch the smooth surface.

crisp feel of wood being cut as it likes to be cut is one of the main joys of woodturning. Though the same process of swing, roll, lift and swing, as recommended for beads, is used for coving, but in reverse, turning a cove is easier than beading.

Start with the tool rest just below the center line. Choose a small gouge; I use a ⅜" roundbar, shallow-flute gouge, sharpened to a long fingernail shape, with its bevel at about 35°. Lay the gouge on its side, with the flute facing the center of the intended cove. Lift the handle to engage the wood, and continue lifting as you slide into the cut. Swing back to create the curve, rolling the flute upwards as you go. Keep the bevel rubbing all the time and make sure the edge is cutting to the downhill side of the fingernail.

Do not attempt to cut up the other side of the cove. You will be working against the natural run of the grain, and the cutting edge will not by supported underneath by the bevel. It is likely to catch. Instead, start again at the other side and repeat. Remember the golden rule of spindle work: *When you cut to the right, use the right-hand side of the tool. When you cut to the left use the left-hand side of the tool.* For maximum flexibility, good turners will often change hands to turn the other half of a cove or bead, as ambidexterity is a very useful skill for turning.

TIP Listen to the work when turning between centers. A change in sound can mean the tail center is working loose. Stop the work and check the tailstock.

The fingernail grind on the gouge makes this process easier. Spindle gouges do not come with a fingernail grind. The trick is in swinging and rolling the gouge as you grind. Start the grinding operations at the center, swinging evenly, while rolling. It is a technique that I teach in my courses, but I find few people know how to do it. It makes spindle turnings so much easier.

Further Techniques

Cutting a pummel is often done with the long corner of a skew. Cut the corner, not the sharpened edge, using the ridge that runs up to the point as a bevel to support the cut. Angle

MARKING OUT THE CANDLESTICK AND TURNING THE BASE

1 *Start by marking the outline of the candlestick on your blank to show where the features need to be cut.*

2 *Cut the pummel, in this case curved, with the long point of the skew, keeping the edge of the skew away from the wood to prevent snags.*

HOW TO TURN THE OGEE CURVE AND THE DISH ON THE TOP OF THE CANDLESTICK

1 *First, roughly shape the half bead above the baluster, before working on the ogee. Roll and swing the gouge as you turn the bead.*

2 *Have the handle of the fingernail gouge trailing as you start the ogee curve. The flute must face forward, not upwards, for safety and control.*

the skew until the cutting edge is very close to the cut but not actually touching it. That way you get the finest cut without the point digging in. This is the best way for the straight or convex pummel, but you will need a fingernail gouge for cutting the concave shape, using a coving technique, to produce the curve.

Baluster shaping can be done with a combination of tools. Cutting the main fat curve at one end is the same as beading, using a skew or small gouge. For the long curve a skew is best, but a large gouge—such as as a ¾" roughing gouge—does nicely. You may find that if the curve of the baluster becomes more prominent it is more difficult to control a skew, especially the wider ones. For that reason the tight curve at the end of the baluster is best done with a small gouge, or even a bowl gouge, using the technique for turning coves.

Shoulder cutting can be done in two ways, both using a parting tool. The easiest way is to cut down to the diameter you require, producing a shoulder the width of your parting tool. This tends to tear the grain, and does not always produce a clean result.

A better way is to rough cut the shoulder to size and then slide the parting tool across, taking a fine cut with no more than the point. You will need to have the handle trailing for this cut, with the bevel rubbing but with the trailing corner rolled and raised out of the way. This tends to produce a bet-

3 *Having cut the shoulder with a parting tool, and turned one half of the bead, continue with the skew, using the lower third of the edge.*

4 *Roll the skew over as you work round the bead, cutting into the waste stock in front of the edge. Always keep the bevel rubbing.*

5 *By the time you reach the bottom of the V, the skew chisel will be vertical and the handle up, still cutting with the lower portion.*

3 *As you turn the concave part of the ogee, use a scooping action, with the handle raising and swinging round.*

4 *Then start to roll the gouge onto its side as you begin to turn the convex part of the curve. Continue to raise and swing the handle.*

5 *As you reach the bottom of the curve the gouge will be almost on its side, but with the handle trailing by about the angle of its bevel.*

6 *Before removing the candlestick from the lathe, dish the top. Do not try to part a place of this size. The stub can be drilled for the spike.*

ter finish than using the width of the parting tool.

The ogee curve starts off like a cove and finishes like a bead. Go in sideways with the tool rest at mid-height, as for a cove, rolling out the gouge. Then tip it back on its side and raise the handle to push in the point of the fingernail gouge neatly.

TIP

When setting up a blank in the lathe, using a dead center, run the work for a moment while keeping the tailstock wound up tight. Then remove the piece and smear the area that the dead center has warmed with polishing wax. Do not use candlewax, as it ceases to lubricate once hot. Replace the work in the lathe, and bring the tail up only snugly.

Practice with a Candlestick

During a course last year, I was sketching out these parts of spindle design for a woodturner when I realized that the resulting shape would make an excellent candlestick. It has worked well, and gives a turner the chance to try each of the shapes and produce a useful object at the end.

The beauty of a large candlestick is that it gives you plenty of opportunity to practice your skills. If you prefer to make it smaller, then you can tum it from 2" x 2" stock and reduce the lengths by half. The shapes become more intricate, and one or two passes of the chisel may make or mar them for good. Only reduce the cove to ½" long as it will be too difficult to cut if half the length of the larger candlestick. The bigger the candlestick, the more practice you get. I once made a 34" long floor-standing version. It could also be used as a lamp base.

This one is of Cyprus macrocarpa, which cuts smoothly. The warm honey color and velvety feel make it a firm favorite of mine. But any wood will do, be it softwood or hardwood, though I do not recommend exotics. Most of them do not give as much feel to the tool. This makes learning techniques more difficult. There is also a virtue in working with a wood that allows one to practice without heavy costs. I often use cheap pine, knots and all; it looks beautiful polished up.

6 *For the first cut of this half cove, Tobias has the fingernail gouge right over on its side with the handle forward to stop the tool from catching.*

Eight Steps to a Candlestick

1 For roughing off, mark the pummel line and a line at the top to remind yourself not to take too much off there. For roughing, I find a skew quicker and crisper than a gouge. Having taken most of the length down to the round, work away from the pummel, make a V-cut to mark the wide top flange, and rough down nearer to the final shape. Use the long corner of the skew to cut back the pummel, and finish roughing with the short corner working up to the pummel.

2 Shape the lowest shoulder, just above the pummel, with a parting tool, then separate the shoulder from the lowest bead with the long corner of a skew. Finish off the shoulder with the corner of the parting tool, now that you have gained access to the shoulder by forming the "V" between it and the bead. Use the parting tool to mark the length of the bead, then cut the bead with the short corner of a skew. Do this by laying the skew on top of the bead with the handle trailing by 10-15°, engaging the edge and swinging the handle further, before rolling and swinging the tool back towards you. Do the same for both sides. I find that a slightly round grind on the skew helps. You can create this by swinging the tool as you grind.

COVING CUTS

To stop the gouge from catching when starting the coving cut, use a finger on the tool rest as a security pin and pivot the handle up.

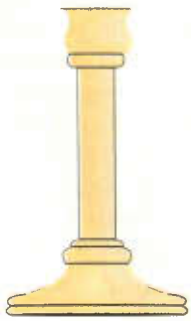
As the cut progresses and the gouge bites into the wood, Tobias is able to bring the handle towards the perpendicular while pivoting the handle up.

Halfway down the cove, and Tobias is rolling the gouge over in a scooping action, cutting all the time on the downhill side of the gouge.

Three Steps to Candlestick Design

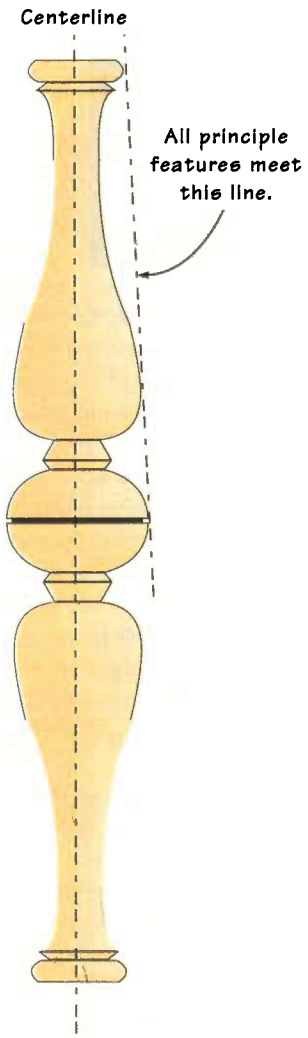
Tobias starts with a rough idea of shape and movement.

He works out how to make the piece and develops form.



Finally, he refines shape..

Chair Stretchers



When turning stretchers for chairs and tables, make the center point the thickest and make each feature progressively thinner to the ends.

3 Use a fingernail gouge to remove the waste from the cove, and then refine the shape into a torus curve. Make the first cut of the cove with a gouge on its side –the flute facing the cove–and make sure you are cutting with the lower portion of the cutting edge. If the tool skitters away on contact, as often happens, smooth the surface and try again. Start with the handle high so that the tool is pointing at the center of the rotation. Once you are safely in, drop the handle down again. The first cut must be advanced slowly. Ensure the gouge is rolled well over. Another method is to engage the cutting edge in the wood with a pivoting action by raising the handle from low down, instead of sliding the tool forward into the cut. I find it helps to have one finger behind the gouge pressed onto the tool rest as a security pin for the gouge to rest on.

4 Cut the big end of the baluster as if it is a bead, and then shape the rest of it with a roughing gouge, using a skew to refine the curve. The top end of the baluster, with its tight curve, can be cut with a spindle gouge. A tip for making this easier is to use a bowl gouge. Usually this fits so nicely that little effort is needed to create the curve, with the gouge doing it all for you.

5 On this candlestick I did most of this curve before cutting the half bead at the top of the baluster down to size. For quick removal of waste I use a skew, but with it lying flat on the tool rest, using most of its width, and with the bevel rubbing, almost as a parting tool. It is not a technique I recommend for inexperienced turners. I also used this technique to reduce the size of the flat-sided cylinder at the top of the design.

6 The shape below this cylinder is created in the manner of an ogee curve. Lay a ⅜" fingernail gouge on its side and start to cut the ogee. As you move into the cut, roll the flute upwards and swing away in a coving action, then roll back and reverse the swing in a beading action. Once you have shaped the ogee, turn the half bead at the top of the baluster, rolling the fingernail gouge into the gap created by the ogee. The meeting point can be cleaned up with the long corner of the skew.

By the time the cove is almost finished, the gouge is on its back with the handle up and at right angles to the rest, if not trailing a fraction.

7 To cut the dish in the top, move the tool rest across the end, at right angles to the bed, and use a fingernail gouge. I find that a ring-type dead center gives the steadiest support, without digging too far into the wood. A live center is more prone to vibration.

8 Having sanded and polished your candlestick, drive a brass screw into the top, take it out again and file or grind away most of the head. Leave just enough head to drive it back in, or remove it all and use pliers.

Finishing Touches

Try mixing wax with linseed oil for finishing turned work. I use Fiddes Light Wax, mixed half-and-half with boiled linseed oil. Melt some wax in a jar under a spot lamp, with the bulb right up against the rim of the container. Add an equal quantity of boiled oil, place a lid on the container and shake gingerly at first until the air in the jar has heated, and then shake well. Leave to cool. Apply this polish liberally to the stationary workpiece, then buff it spinning until the surface is very hot to the touch. This heat re-boils the oil, which causes it to set, sealing the grain. As the wood cools it draws any residual polish in, giving a deep lustrous look not to be compared to the surface gloss of a friction polish. PW

(*Ed. Note:* This article originally appeared in *Good Woodworking*, a popular British woodworking magazine edited by Nick Gibbs.)

CUTTING PUMMELS

The convex pummel is best cut with the long point of the skew. Roll and swing the handle as if you were cutting a bead, but with it trailing less.

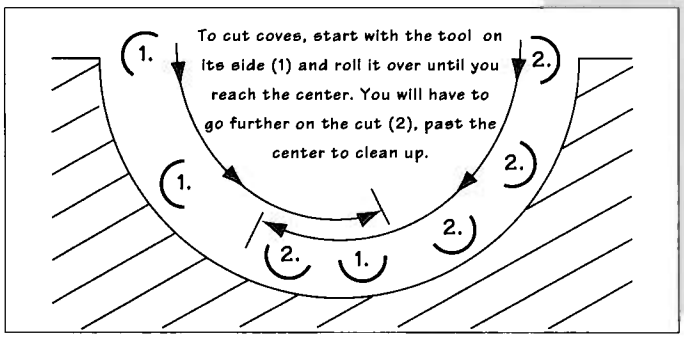
From behind the chisel you can see how it is angled toward the cut to start a convex pummel. Tobias does not always change hands to turn.

Again, the long point of the skew is best for the straight pummel, but keep the handle forward and the tool angled slightly to keep the edge clear.

A concave pummel actually produces a duplex curve on the flat. This cut is best made with a fingernail gouge, using a scoop and roll action.

Good Turning vs. Bad

The difference between good spindle-turning (above left) and bad (above right) is determined by the rounded bead and half bead, the shallow pummel, the rounded cove, even curves and steeper angles. Pummel shapes can be turned (right), from concave, to straight and convex.



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Basswood

Quick! Name three things you can do with Basswood besides carving.

By Ken Textor

Long known as the carver's favorite medium, basswood is actually more than that. From beehives to venetian blinds, basswood has a lot more going for it than just wood carvings.

General Description

In general, basswood is available to woodworkers is two species. American basswood (tilia americana) is the most commonly available native basswood species. But white basswood (tilia heterophylla) is often mixed in with commercial shipments of basswood. It's also possible some other members of the tilia genus may be mixed in too. But for woodworkers, there are no important differences among the various species. Just ask for basswood, or white basswood, and you'll get the lumber described here.

Confusingly, when growing in the forest, and sometimes at retail lumber outlets, basswood trees are sometimes referred to as linden, or American linden, trees. This is probably a throwback to the days when Colonial Americans felt they needed a native response to everything British. There is a similar European linden tree, highly prized by the English and sometimes called–just to confuse matters further–a lime tree. No, it doesn't bear the tropical fruit of the same name. This is just more British quirkiness, I'd say. At any rate, the widespread American linden is most commonly called basswood, so named for reasons that remain obscure. Basswood trees are found in just about any forest east of the Mississippi from well north of the Canadian border to the Gulf of Mexico. However, the heaviest concentrations of usable timber are found north of the Mason-Dixon in the Midwest and Lakes States. The tree prefers moist loamy soils but can tolerate drier soils. It regenerates itself quickly after cutting, sprouting numerous new trees from its extensive root system. The tree grows relatively quickly, reaching an average height of 80 feet in about 100 years. When grown in the forest, the tree's trunk is cylindrical and without much branching for the first 20' or so. Basswood bark was prized by Native Americans and early settlers because it was very fibrous and could be easily woven into ropes and rough sacking. Basswood trees flower profusely in midsummer, bearing a small fragrant yellow flower that is highly attractive to bees.

For a hardwood, basswood lumber is relatively light, moderately soft and generally uniform in color. The sapwood is creamy white and merges without a noticeable line of demarcation into the heartwood, which is a slightly darker creamy, or brownish-cream, color. Occasionally there will be some reddish hues too. Both the heartwood and sapwood darken very slightly when exposed to sunlight. The wood's relatively large, closed grain is not very prominent and is generally fairly straight. Sometimes, there is some dark gray streaks in basswood as well as dark grayish imperfections caused by bird peckings. These anomalies generally do not affect the wood's strength, which is considered below average, on about a par with eastern white pine (see PW #61). The wood's weight is about half that of an oak or hard maple. The wood's stability is also somewhat deficient when compared with common hardwoods like oak (see PW #58 & 59) and hard maple (see PW #60). But basswood seldom warps or checks once it has been properly dried. Basswood is not very hard either, being about twice as prone to dents and dings as other

***Ken Textor** works wood and writes about it in Arrowsic, Maine.*

common hardwoods. It is not readily adaptable to steam bending and is very prone to rotting when exposed to the weather. It is resilient when subjected to impacts and resists splitting through a wide range of humidities.

Basswood has traditionally been a woodcarver's wood. But it also has been considered valuable for use in apiary supplies, woodenware, pallet and crating stock, moldings, venetian blinds, window sashes and door frames, slack cooperage, and as shipping and packing shavings known as excelsior.

Working Properties

Basswood is a pleasure to work, yielding excellent results in most machining processes. In power planing, you can take up to a 3/16" off in preliminary passes, moving to 1/16" in the final passes. The shavings come off smoothly, with virtually none of the chipping that characterizes power planing of many other hardwoods. With the planer blades set well and sharp, power planing can nearly eliminate sanding chores.

With the exception of lathe work, all other woodworking processes–hand planing, power sanding, boring, crosscutting, ripping, shaping and routing–are a breeze. Unless you get an unusually cross-grained board of basswood, all of these procedures will yield better-than-average results. And basswood lives up to its reputation as a wood easy to cut with hand chisels, knives, gouges and the like.

Carving basswood with chisels, gouges, veiners and the like necessitates razor sharp edges, primarily because of the wood's softness. With tools of inadequate sharpness, removing chips leaves a rough surface, particularly when cutting across the wood's grain. This is because basswood "gives" when an insufficiently sharpened blade tries to penetrate it. This "give" can make chips tear out of places where you wanted the wood left unscathed. With really dull tools, you get torn surfaces even when cutting with the grain. A harder, denser wood like maple is therefore easier to carve with gouges and chisels because it does not require constant sharpening of tools.

This problem with basswood's softness also affects power carving. High-speed power rasping tools will tend to leave extensive burrs next to the areas where basswood has been ground off. This is particularly true when carving two dimensional printing blocks. Removing the burrs requires an extra step or two, something you could avoid if you used a true block printer's wood like harder denser holly (See PW#81).

The big downside with basswood comes in lathe work. Chips tear off turning blanks in a lumpy way, leaving the turned surface very rough and in need of lots of sanding to look presentable. Fine details in turned basswood are nearly impossible to obtain, the opposite of what you'd expect from a wood in which you can carve small details with hand tools. In all cases, basswood has no discernible odor, creates little dust when sanded with power tools and is not generally associated with allergic reactions.

Fastenings in basswood are easier to drive than in most domestic hardwoods. Pilot holes for #10 and smaller sheetrock screws are not generally necessary. But the wood does hold screw fastenings and nails better than most softwoods in which pilot holes can be similarly omitted, such as pine or spruce. Basswood is also very resistant to splitting, even when fastenings are driven without pilot holes into the end of a board. All common glues work well with basswood.

Finishing

As a carving wood, basswood is noted for its ability to take both paint and clear finishes nicely. But steer clear of water-based finishes here. Water finishes raise the grain and make the project look as if you forgot to give it that last sanding with a fine grit sandpaper. This is another reason to avoid block printing with basswood, particularly with water-based inks. Also, because the wood tends to absorb waterbased printing inks quite readily, a second inking in a different color may be contaminated by the first ink used. To avoid this you should seal basswood printing blocks in a clear lacquer before printing.

Staining is also a little difficult to control in basswood. If you're trying to stain the entire piece, there's no problem. But trying to confine the stain to one area–as you might with a decoy or other figure–basswood is not well suited. The stain tends to spread beyond the defined area.

All other clear finishes including acrylics look good on basswood. But since the wood's grain is a little uninspiring, a clear finish is often only appropriate when the piece is a highly detailed carving. Otherwise you'll probably want to try paints.

Availability

Basswood is widely available throughout the United States, even on the West Coast and in the Rocky Mountain States where it is not an indigenous lumber. This is due to the high demand created by woodcarvers. Still, the price of the wood has not suffered because of the demand. Basswood is $2 to about $4.50 per board foot, depending on the premium placed on it. Premium prices are often placed on larger dimensional pieces of basswood. For instance, a four-foot length of 10"x10" basswood might

Wood Types

amount of wood found in ten one-inch boards, four feet in length. The reason for this premium pricing is simple: a 10"x10" length of clear basswood is much more difficult to find than boards of a similar grade. As noted earlier, the tree just doesn't grow very big. Basswood in veneer form is virtually non-existent, as is basswood in plywood form. In general the lumber tends to come in shorter lengths (under ten feet), partly due to the way the wood grows and partly due to the lack of demand for longer lengths. Wide boards (over 12 inches) are also seldom seen.

Nevertheless, basswood is one of those species that every woodworker ought to have around in at least a small quantity. After all as one old wood carver once told me, "You never know when you might get the urge to create a pile of chips." PW

Out of the Woodwork

continued from page 80

out to the shop perched high on the threshold of my success. She looked at the joint and said, "Very good sweetie, when are you coming in?"

Success aside, I still hungered for the "right tool," and four months later when I graduated from college, we sold our house. I pulled $500 out of the profits to purchase a real jointer.

I excitedly anticipated this, my first major woodworking tool investment. I'd be able to produce light-tight joints in seconds! I bored Margaret, family members and new co-workers with my eagerness.

And then I actually mader it to the tool store! I asked the salesman if I could see some jointers. He replied, "What size?" I shrugged my shoulders. Was it my imagination, or did he rub his hands together eagerly. Anyway, his next question was how much money did I have to spend? Proudly I replied, "up to $500." A voice from across the room said, in a clipped British accent, "you will buy junk for that price." I replied that I knew I could buy a jointer from a major department store for only $350. He shrugged. "Like I said, you will buy junk! You can buy a good *used* one for $500, *if* you know what to look for." Obviously, I didn't know what to look for in a used jointer. My heart was sinking fast. The English gentleman seemed to take pity on me. "Buy a jointer hand plane," he advised. I turned to the salesman. "Does he mean one of those things you push on the edge of a board," I asked. The salesman said yes, and asked if I knew who the English gentlemen was. "That's Ian Kirby," he explained. "He wrote an article about hand planing for a major woodworking magazine." Since I had two cut-off pieces of birch for my sister's long-suffering bookcase with me, I asked the salesman to demonstrate edge jointing using the 07-jointer plane. Taking pity on me, he jointed, glued and clamped the boards, using bar clamps. While they were still in the clamps, he hand surfaced the boards using the 07-jointer plane. I couldn't believe my eyes. The joint seemed to disappear.

With stars in my eyes, I took Mr. Kirby's advise and purchased an 07 Record plane with three Japanese water stones. I drove to my in-law's house, where all were waiting to see the wonderful "jointer machine" I'd gone shopping for. I opened the trunk of the car with a magician's flourish, revealing the plane and sharpening stones. The in-laws grumbled under their breath and went back inside. My father-in-law's thoughts were plain from the look on his face. "I tried to talk some sense into Margaret before she married him. Hand planes! Where's this boy coming from"

When we got home that weekend I headed straight for the shop and found success. In fact, I soon decided to build a European style work bench. The Work-Mate was far to light, I decided, for serious hand planning.

I've since built that work bench, and have made a ton of wood shavings on it. And I've never regretted purchasing the hand plane. I've made invisible joints over six feet in length. People who see my woodwork sometimes ask where they can purchase wide boards like the ones I use. When I tell the surfaces are actually several boards joined together, they're amazed.

As my skills have grown, I've even had the opportunity to teach a few shop class kids how to use and maintain bench planes. My feelings concerning this tool's importance in precision woodworking are downright evangelical. On occasion a novice woodworker will ask, "what's your secret to building quality furniture?" My reply is always the same. "Attitude...and a well tuned hand plane!"

By the way, I eventually found a 16" jointer at a machine tool auction and stole it for $100. But when it comes to edge jointing, I'll always take a final pass with my 07 jointer plane prior to glue-up. After all, it's the right tool for the job. PW

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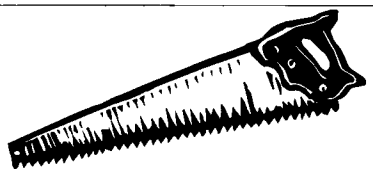

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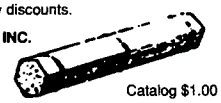

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"Someone's at the door George. I hope it's Harry Houdini or David Copperfield."

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by Dale Lenz

"What's a Jointer?"

A journey of discovery leads to the "plane" truth.

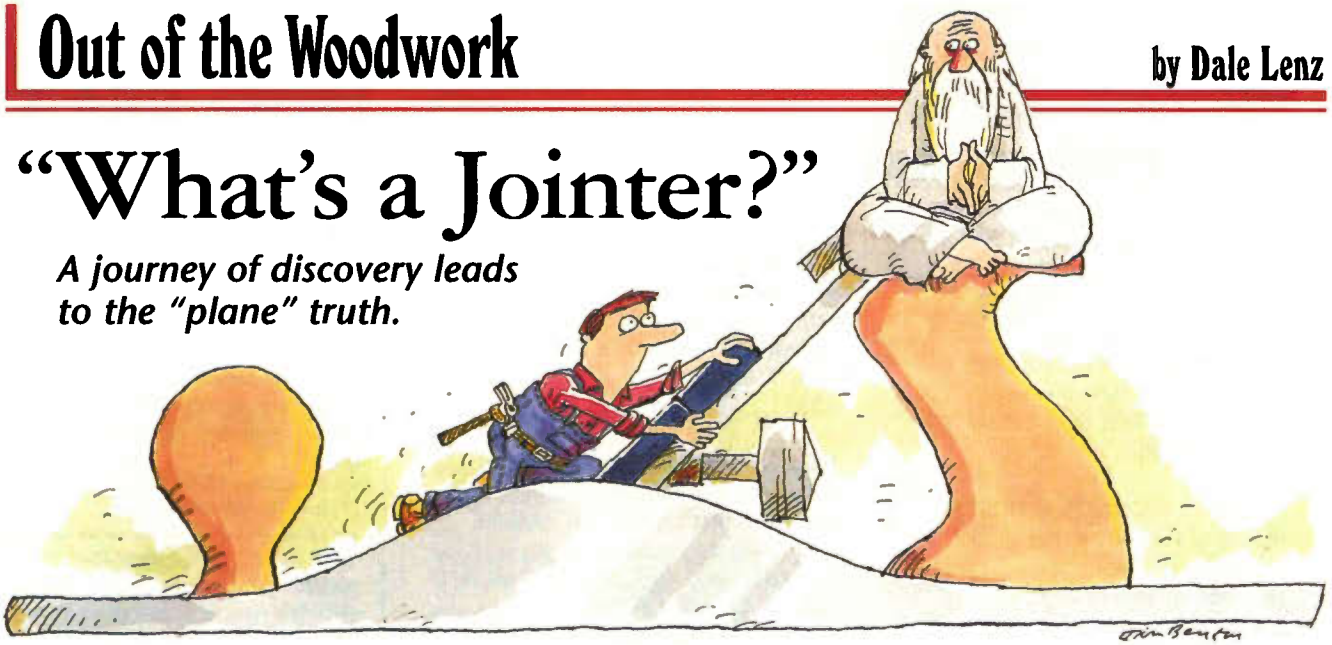

ILLUSTRATION BY JIM BENTON

I took up woodworking thirteen years ago, the dream of building quality furniture shimmering in my imagination. I read every bit of advice I could get my hands on, but as is the case with most beginners, my first pieces of "furniture" were constructed with sheet material. As my confidence grew, however, I began moving to solid wood designs. I wanted to get the "honest feel of wood" I'd read so much about.

And then the moment of truth arrived; my sister wanted a book case, and I agreed to build her one. I found a set of magazine plans that suited her and myself, swallowed hard, and purchased a supply of birch lumber. Most of the boards were 12" in width, though, and I'd read that one should never use boards wider than 4" without ripping them down and rejoining them, alternating the growth rings. I understood the reasoning behind this, but the old adage "if it ain't broke, don't fix it" kept whispering in my mind. Still, I did want to do this right, so the perfectly clear 12" wide boards were soon reduced to clear 4" narrow strips. And then I began the process of trying to put the ripped boards back together.

A few months earlier I'd purchased a "multi-tool" table. I could, I'd been told, attach a circle saw, router, or a saber saw underneath this surface. What a concept! Unfortunately the top of this wonderful device was a bit concave. Thanks to the cupped table, a $1.50 saw blade, and a Mickey Mouse rip fence, I couldn't produce a straight rip in solid wood to save my life. My dream of achieving satisfactory joint lines was rapidly becoming a nightmare.

On occasion a novice woodworker will ask, "what's your secret to building quality furniture?" My reply is always the same. "Attitude... and a well tuned hand plane!"

I tried everything. A belt sander and hand files were recruited in my efforts to saw, scrape, or cut a straight line. I figured that "old timers" had used hand planes for this task, so I borrowed a neighbor's block plane and rushed home to my shop, but my strenuous efforts produced only dust. I even tried to sharpen the blade (with a file), but clearly, that plane would not ever do the job I needed done.

"If in doubt, ask questions," my Mother always told me. So while at the lumber yard buying yet another supply of birch (I'm nothing, if not stubborn), I cornered the salesman and asked what to use. "A jointer," he replied. "What's a jointer?" I asked. "It's a planer," he responded. "What's the difference between a planer and a jointer?" I wondered aloud. He scratched his head.

I left the lumber yard with my birch boards and more questions than answers.

Despite my confusion, one thing seemed clear– I'm trying to make an edge joint, and that must be the function of a joint. I took the problem to my wife, Margaret, and we agreed that after graduation I could purchase a jointer. Suddenly there was light at the end of the tunnel.

But I was still faced with jointing the birch boards. I decided to put a router in my multi-tool table and cobble up some fences. When I invited a woodworking neighbor over to show him my jointing contraption, Phil examined the set-up and smiled. "You've made a jointer," he told me. I was flying high; I'd actually reinvented the jointer without ever seeing one.

Unfortunately, Phil couldn't tell me why I couldn't get a light-tight joint with my invention. I eventually decided the culprit must be my shoddy table.

I continued to fiddle and finally, I tried using my four foot level as a straight edge. I fit the router with a straight bit and made several superficial passes. I made light-tight joints! By this point I didn't give a damn if the annual growth rings were alternating or generating– I had light tight joints! I called Margaret

continued on page 76

***Dale Lenz** is a Service Forester for the Oklahoma Department of Agriculture and resides in Park Hill, Oklahoma.*

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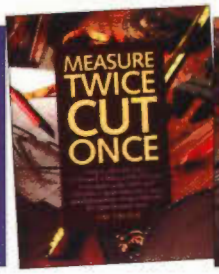

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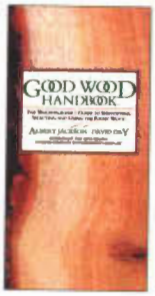

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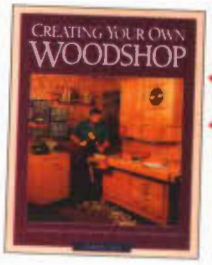

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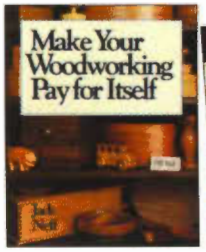

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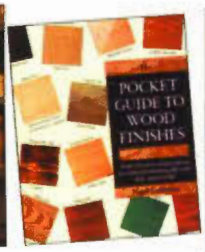

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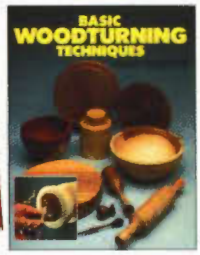

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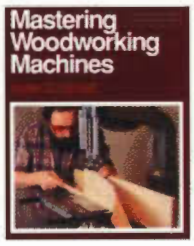

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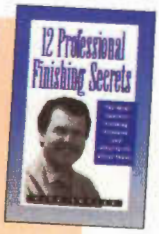

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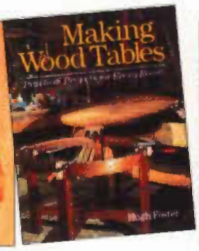

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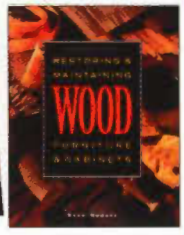

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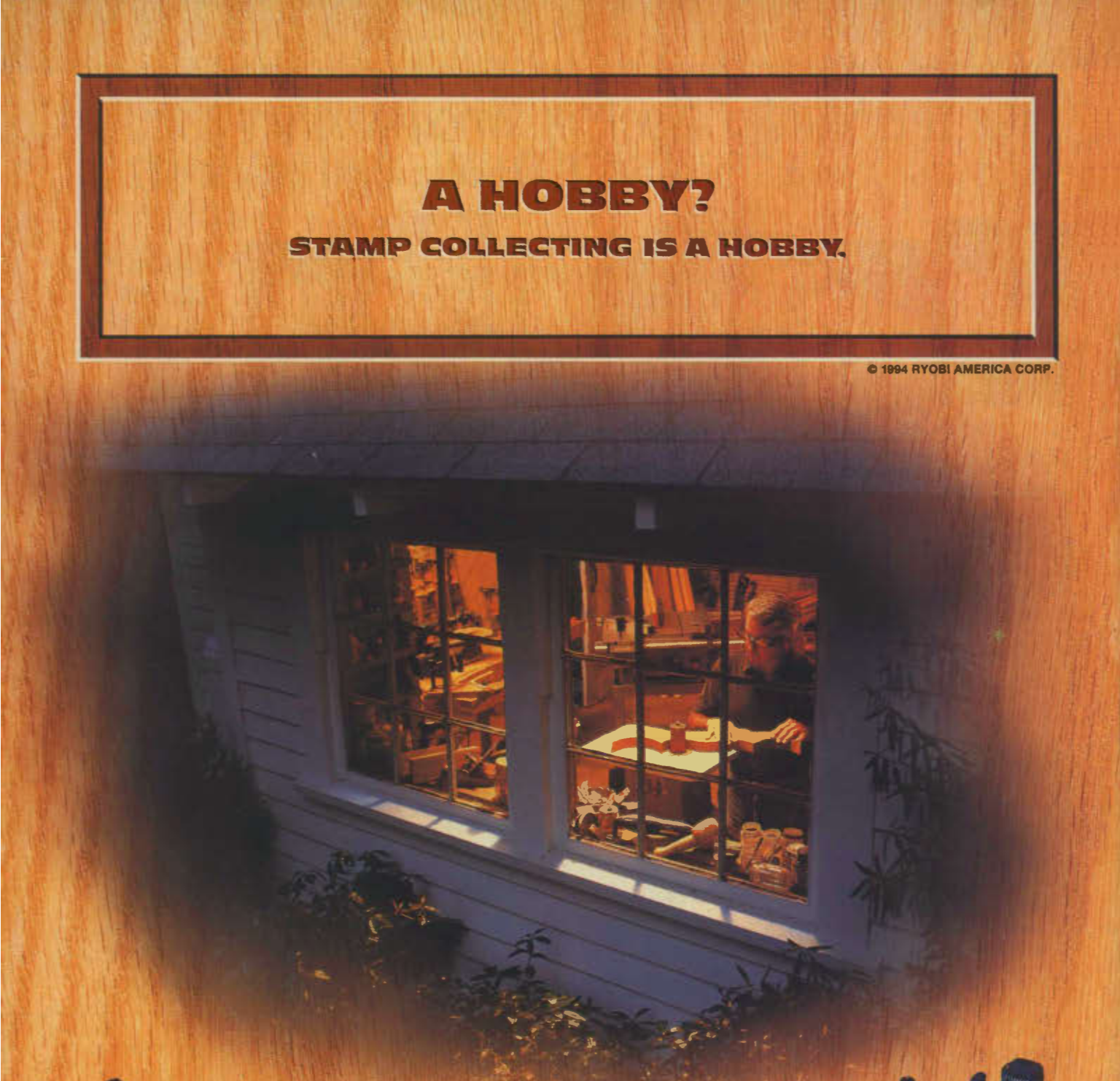

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