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THE CHARLOTTE SAWDUST

The Official Journal of
The Charlotte Woodworker's Association

www.charlottewoodworkers.org

Small Talk

Ahh Winter!

This is the time when we can forget the outdoor activities and work in our workshops without the lure of warm weather. This is the time when we can concentrate on our projects and approach "perfection" in our skills.

I discovered a little rot around the mortise lock on the door of my wooden boat. I thought that I would bring it back to Charlotte where I could repair it "perfectly" in my shop. After examining it under the lights of the shop, I discovered that the rot was a little more extensive than I thought and the former owner had at one time sanded through the teak veneer on the inside, so I concluded that it would be simpler and more satisfying to build a new door.

I built the door with a solid core of mahogany staves and veneered the inside with 1/8" teak veneers that I re-sawed on the band saw and veneered the exterior with mahogany. This was my first attempt of veneering and without a vacuum press I got to use 58 clamps (which was about all that I had). The veneering was successful if I do say so myself and I was proud of my hand-cut mortise joints for the core (around the window) and the deep cut mortise for the lock.

As I was preparing to cut the mortises for the hinges after three weeks of work, I discovered that the original door was not a perfect rectangle but was a parallelogram as was the window in the door. It was just ¼" out of square but the new door was not going to fit the boat. After saying a few things like #@!!#&@, I sawed the bottom edge of the door to the correct angle with my circular saw and sawed and glued a new piece on the top of the door. The inside will be adorned by a new piece of trim at the top edge to hide the joint and the window will have to be out of "parallelogram" with the door.

Ever hear the rule measure twice and cut once? It still applies. Next week I will be getting an eye exam.

See you at next week's meeting.

Sincerely.

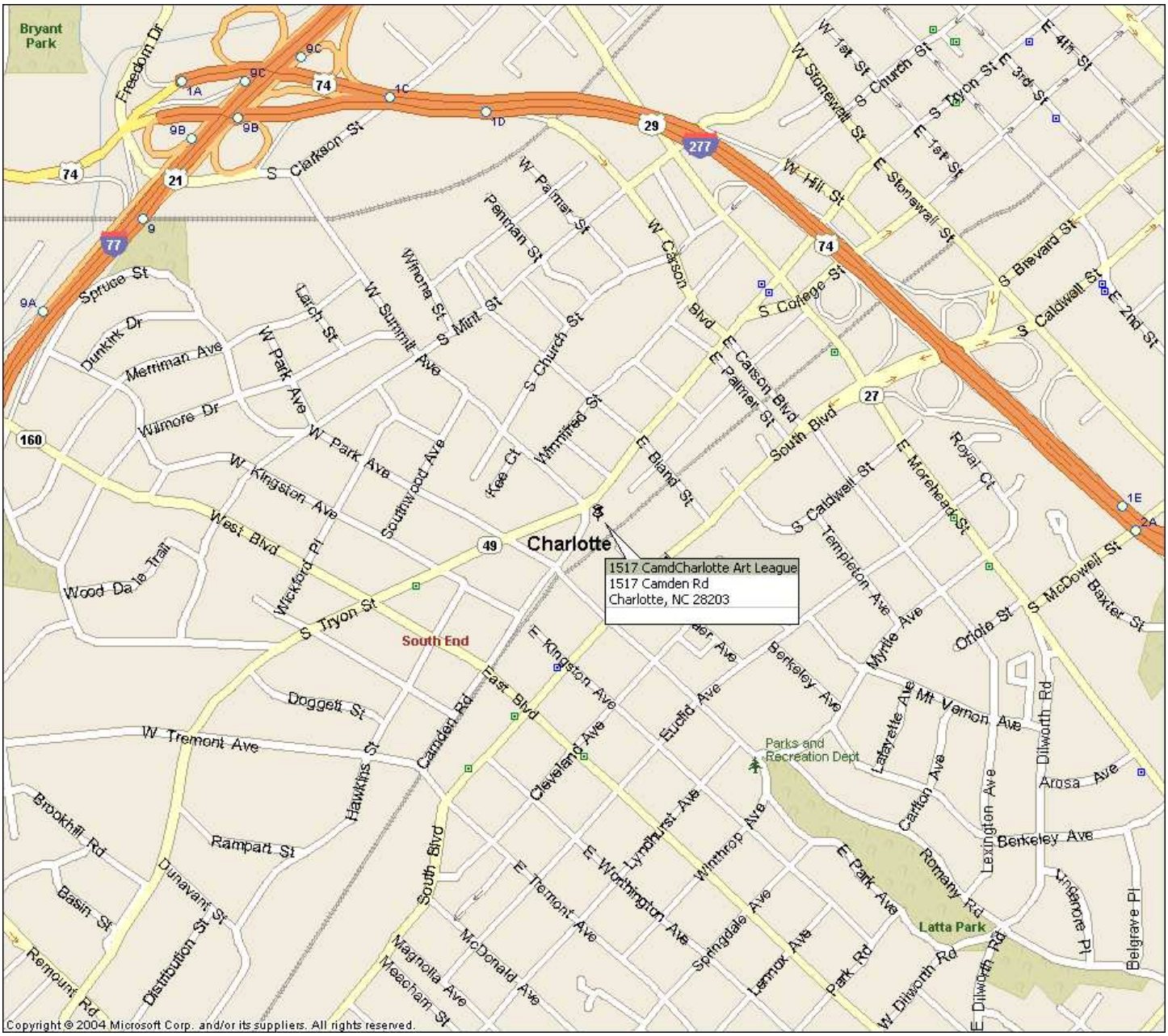
Mike Dyer
mdyer@adwarchitects.com
(704) 379-1919 days
(704) 814-9580 evenings

January Program

Transferring designs from a picture to furniture.

Meeting Time

Meetings of the Charlotte Woodworker's Association are held the third Monday of each month, except for December. Meeting is still to be held at the Charlotte Art League this month. (We getting close to finding a permanent new home hopefully by next month). 1517 Camden Road, Charlotte, NC.



Following a social and refreshment time that starts at 5:30pm, our meetings start at 6:00pm. Get to the meeting early and get to know your fellow woodworking enthusiasts. This will be our first time at our new meeting place but we hope that it will become a great home for us.

Write an article for Sawdust (thanks for all the help from those that have)

Please consider writing an article for The Sawdust, this is your newsletter what do you want from it? What do you want to share with your fellow woodworkers? Everyone likes to share, share your successes, failures, and mistakes, have fun with it and share with others at the same time. Contact Mike Dyer @ secretary@charlottewoodworkers.org or call (704) 379-1919 days or (704) 814-9580 evenings.

CWA Mentor Program

The following members have offered their help to anyone interested in learning skills or new techniques in their area of interest. Contact each person to arrange times to get together if interested.

Name	Area of Interest	Phone	Email
Wayne Cooper	***	704.409.1417	cooper@arconmfg.com
Bill Golden	Shopsmith & Accessories	704.525.9691	popstoyshop@earthlink.net
Dwight Hartsell	Woodturning	704.598.6029	woodwight@aol.com
Wayne Manahan	Sharpening	704.786.0768	wmanahan@vnet.net

Classified Section

$$ For Sale $$

Contact me if you have any tools, wood or services for sale. This section is offered for free.

A Treatise on The Haunched and Drawbored Mortise & Tenon Joint

By Bob Smalser

One of the strongest joints, the haunched and drawbored mortise and tenon is one of the few that resists stresses in any direction, to include tension, and is a joint that will remain fully functional long after any glue has deteriorated to dust. A basic joint used to join structural members, I'll walk you through cutting one today by hand to join the top rail to its post for a small work table done in hard maple. Why by hand? Not because I'm some hand tool reactionary…I use machines for the jobs they do best and hand tools for the jobs they do best…but there are some joinery principles best displayed and photographed using hand tools, and as most teaching today involves machines almost exclusively, newcomers tend to miss the parts where the cheaper hand tool does the job much, much more efficiently than the expensive machine, especially on smaller hobby projects.

Plus, not enjoying any subsidies from major machine or hand tool manufacturers or retailers, I'm free to provide counsel on what's best for you…not what's best for my sponsors.

The basic joinery tools I'll use are shown at left. None except the shop-made mallet are newer than 30 years old and some are almost a century old…yet I could replace all of them in a few months of shopping at flea markets and collectible tool auctions for less than 200 dollars, simply because my first training four decades ago as a teenager in a boatyard was in basic hand tool sharpening and maintenance.

Yes, the shoulder plane is relatively expensive, but they are indispensable even for machine woodworking and sound but scuffed ones like this Stanley #93 can still be had in the 60-dollar range. Three-tined adjustable mortise gauges along with the old Disston saws can be found used for less than 20 dollars, and the large mortise chisel is a recent acquisition as part of a salvage chisel lot that cost less than 5 dollars.

My point is that a newcomer's first steps shouldn't be making furniture for the house or that first fancy dinghy, they should be acquiring and tuning the necessary tools and learning to use them in traditional construction of simple benches, shelves, assembly tables, horses and jigs for your first shop. Why traditional construction? Because it's study, and practice with hand tools will teach you more about your material…wood…than machines will, and it never ceases to amaze me how little even some advanced craftsmen understand about their material. Hand tools allow you to feel how steel wants to move in cutting wood based on the grain of the wood and creates an understanding that applies to obtaining clean cuts using machine tools as well. It will pay off in the long run to your pocketbook, your enjoyment and your skills, as it's easier on all to make those first irreversible mistakes in 50 cents worth of maple than 80 dollars worth of mahogany.

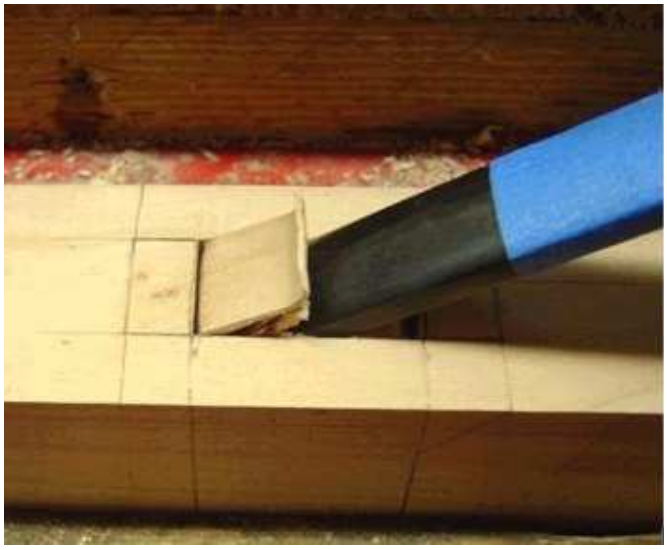
The mortise should be cut first, and I'll chop one with the chisel. This is a long, millwright's mortise chisel made by James Swan almost a century ago. It's not a *framing* or *firmer* chisel as described by many tool dealers or collectors, it was manufactured primarily to chop mortises in window, door and millwork factories more than for tradesmen, who generally used smaller *sash* mortise chisels more easily carried in a carpenter's box or shipwright's chest. All mortise chisels come in widths to match the intended mortise, but these millwright chisels are much longer and easier to hold plumb, much heavier, and combined with the right mallet, much more powerful. And with power comes speed and efficiency.

I set the mortise gage to the exact width of the chisel and use it to lay out both mortise and tenon on the squared-up stock. I darkened my lines with a pencil and drew some otherwise unneeded lines for clarity, but laying out your joints should be done with marking knife and awl, not a pencil. The knife used across the grain and the awl used with the grain is not only more precise, it provides accurate recesses to index chisel or saw, and as you will see, scribes the wood sufficiently to prevent unwanted splitting and chipping while cutting or chopping.

This is a 6/4 by 3" post and a 5/4 by 2" rail, and I'll do a ¾ by 1¼" mortise (+ a 16th of an inch over) deep to house a 1½" long tenon. Mortises should always be slightly over deep to allow room for glue squeeze out. A ⅞" wide mortise would also be acceptable here. The *haunch* is the 45° tenon stub I've drawn on the upper face profiles of the stock that increases the gluing surface and aids in the joint resisting twisting stress.

You can also see in the previous photo that if the rail is to be flush with the post top, then I've crosscut the post too long. You are correct, I have. The post's short grain on the topside of the mortise will be far too fragile to chop a mortise and haunch without pre-drilling…and pre-drilling is unnecessarily slow, so I'll chop my mortises vigorously and trim the tops of the posts later.

The first two chops are plumb to the work piece and just a bit inboard of the mortise ends. Inboard because that lead-weighted hard maple mallet weighs over two pounds, the bevel on this striking chisel is a steep 35°, and hard blows downward tend to push the chisel backwards just a tad. Although it is the cheeks of the mortise that provide the majority of gluing strength, avoiding unnecessary stress or damage at the ends is simply better craftsmanship. I've also marked my required mortise depth on the chisel using masking tape.

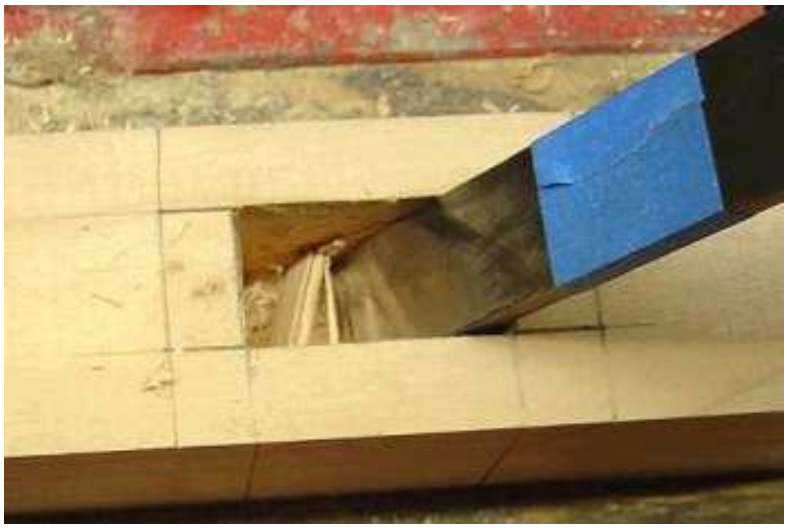


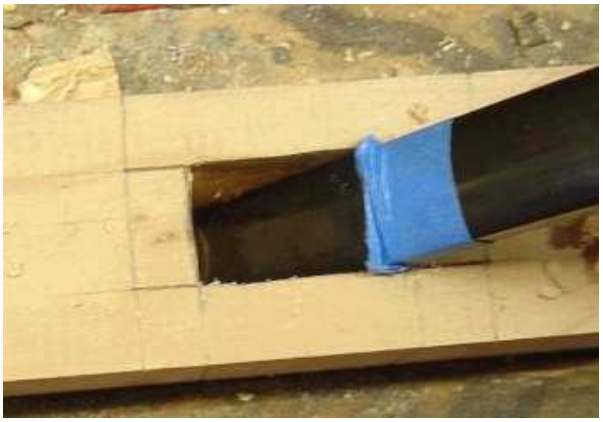
The third blow is taken bevel up about a third of the way along the mortise's length at an angle downward toward the end…

…and the waste levered out, splitting along the grain of the wood. The deep scribe marks from the mortise gage prevent any chip out.

The fourth blow is identical from the opposite direction and that waste levered out. Subsequent blows continue with two plumb blows at each end followed by two angled blows and levering out waste…

…as the mortise gets deeper, the obstruction of the mortise ends force the angled blows increasingly steeper, eventually preventing them from reaching within clean splitting distance from the end blows…the chisel is then flipped and the angled blows struck bevel down to keep the cutting angle sufficiently acute for clean, four-chop split outs.



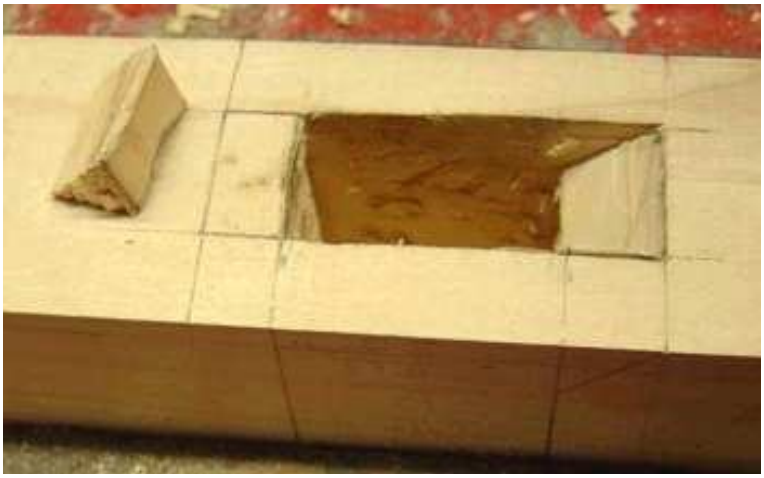


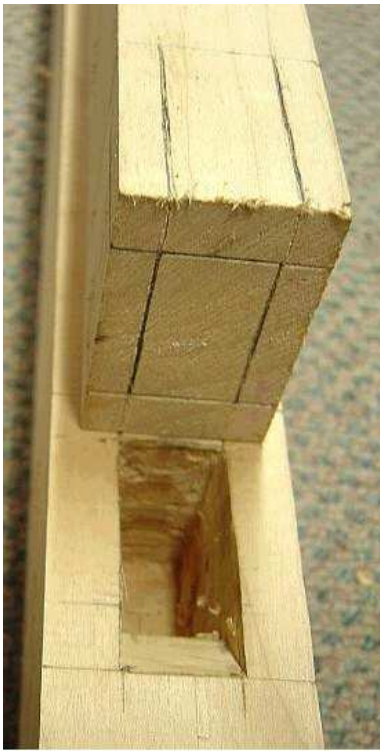
Upon reaching the correct depth, the mortise bottom is squared and cleaned by lightly striking the chisel with the bevel instead of the blade back indexed against the mortise end …

…and the top of the chisel bevel used as a fulcrum to scrape the mortise bottom with the edge of the tool. The added leverage of the longer length and larger bevels of these heavier mortise chisels also make this an incredibly clean and efficient technique to get out that last 16th of depth, if you find yourself a tad short.

The haunch is chopped by lightly striking its outline…

…then using a bevel gauge or sight line to line up one, clean 45° chop. These can also be cut square and a corresponding notch made in the post. Unlike the square ones, the angled one I'm using today is completely hidden…and technically should be called a *miter haunched drawbore mortise and tenon* but that's a bit of a mouthful for a subject line.

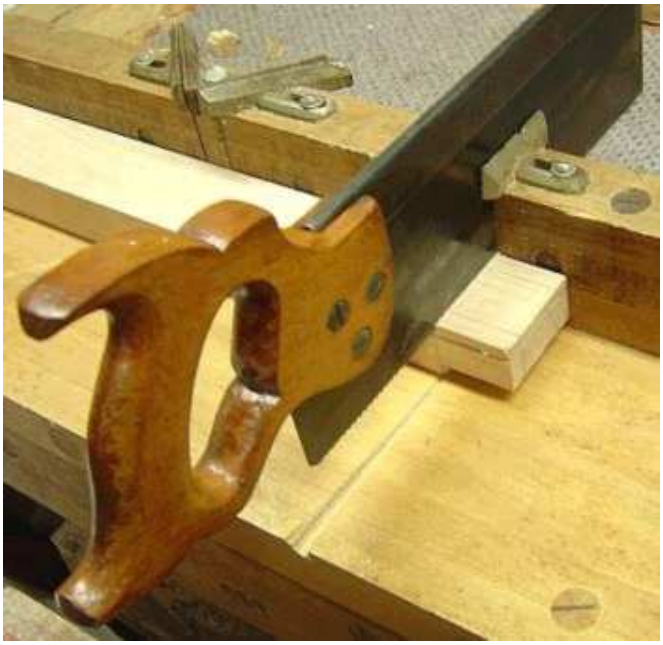




The end result is a clean, accurate mortise done in mere minutes. Depending on the size of the mortise…in average-sized furniture stock and using the right tools, they can be chopped at the rate of between 6 and 20 per hour with very little practice at it…on many pieces faster than the time needed to set up and test a router jig.

The tenon cheeks can be cut with the back saw, table saw and tenoning jig, band saw, or crosscut on the table saw using the stack dado set. It doesn't much matter…just insure that you cut to the **outside** of your scribed lines for a slightly fat fit to be shaved down lightly with the shoulder plane.

Why? Well, this especially applies to crosscutting with the dado set, but to a lesser extent applies to many saw cuts. Sawn surfaces aren't perfectly clean…that fuzzy surface is composed of tiny bits of short grain most noticeable in crosscut tenons…and that short grain does not provide the high quality glue bond a cleaner, planed surface does. Yeah, I know, it's a small point with today's modern glues, but it's a point worth remembering because it can still be overdone, especially by neatnicks using the minimum amount of glue to avoid cleaning squeeze out.



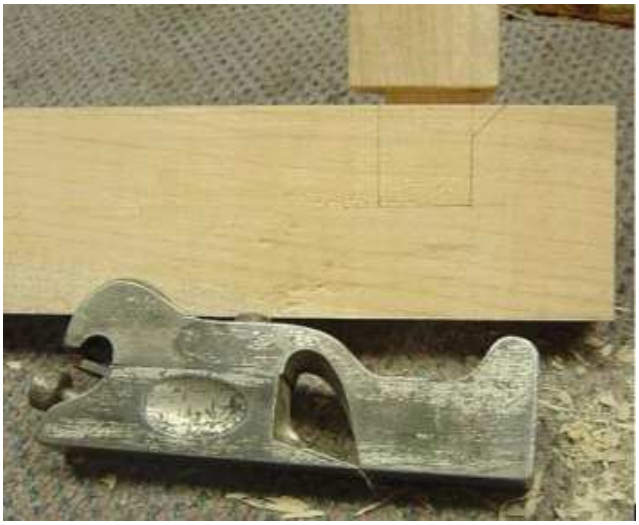
When using handsaws, tilting the workpiece away from you and beginning at a corner is the most efficient technique for hitting the outside edge of those lines on the first try.

I whip out the shop-made miter box to cut the shoulders square…

…rip the lower edge of the tenon and the unmitered section of the upper edge…

…and finish the miter using the dovetail saw. The more perfect my layout and saw cuts, the less plane work will be needed…but providing I remain outside those scribed lines, even my sloppiest cuts…and there are certainly some sloppy ones here…can be easily planed to perfection.

The sawn tenon shoulders are brought into perfect alignment and the tenon cheeks and edges are shaved as necessary for snug fit. A feature I like in the Stanley #93 is it is ergonomically designed to be pulled as well as pushed…because it is easier to keep your planed surface flat and square by alternating the direction of the plane when taking cross-grain shavings…and not having to reposition the work piece makes this technique very fast.



You can see from the relatively small pile of shavings that bringing the tenon from *won't fit* through *drive fit* to *snug, heel-of-the-palm, hand fit* didn't require much work. The edges of the tenon can be relatively loose compared to the tight cheeks, as chopping hard with that steep-beveled chisel has compressed the end grain at the ends of the mortise slightly…and they'll swell back some as the humidity increases.

A technique I use on fine furniture I'm only demonstrating here is to pare the tenon shoulders inward from the edge slightly using a bench chisel. This insures a perfectly tight shoulder-post fit by removing any impediments in the tenon-shoulder corners.

To make the drawbore, I simply point a dowel and drill a plumb hole to match through both mortise cheeks…

…then dry assemble the joint and use an ice pick from my lofting kit to mark the hole center on the tenon.

The joint is disassembled and the hole for the tenon bored a 16th or so *inboard* of the mark for the cheek holes toward the tenon shoulder…

…and I prepare for final assembly. The post is cut to final length, glue is applied, the joint assembled, and that pointed peg driven through the offset holes which pulls those shoulders with considerable force against the post for a bulletproof structural joint that really needs no glue.

One pin or two? Depends on how the piece will be used and scantling size, but every additional hole weakens that tenon, and I tend to use two pins in wider tenons than this one of an inch-and-a-quarter width.

None of this matters all that much if the joint is well constructed. Most mortise and tenon size schedules for the scantlings I'm using today call for a wider and deeper mortise…but on this piece I want some meat left in the posts in case I want to dado in a side shelf some day and if this work table is ever knocked off of the loft ten feet to the concrete floor below, it's gonna break at the center of a post or rail before it breaks that joint.

Slow Setting Plastic Resin Glue

By David Marks

In response to your questions concerning the slow setting plastic resin glue, there are several types that I would recommend. Specifically, I am referring to urea formaldehyde glue such as Weldwood or Cascamite. Weldwood is manufactured by the DAP company, which can be reached at (888) DAP-TIPS. You should be able to find this glue available at most hardware stores. I have also had excellent results with Urac 185, which is manufactured by the American Cyanamid Company in Wayne, NJ. It is available in retail quantities from Highland Hardware. Their phone number is (800) 241-6748. Urac 185 can also be obtained through the Nelson Paint Company, whose mailing address is One Nelson Dr., P.O. Box 2040 Kingsford, Mich. 49802. Their telephone number is (800) 236-9278. Other urea formaldehyde glues on the market are Unibond and Resorcinol.

Resorcinol glue is generally used on boats because it's completely water proof when cured. It does however leave a dark glue line which would be objectionable on light colored woods. Resorcinol can be found at your local hardware store.

Weldwood plastic resin glue is a powder that's mixed with water. This pre-catalyzed urea formaldehyde adhesive has very long open times (it can sit in the mixing pot for four hours at 70 degrees F. and still be used) allowing for unhurried assembly of parts. It can be used to bond laminates to plywood and particleboard, and is recommended by the manufacturer for chopping blocks, cutting boards and furniture.
Clamping times are proportionately long ù 13 hours at 70 degrees F. Protective gear, including a respirator and gloves, should be used when mixing and applying the glue. In November 2004, a 1-lb. tub of the powder cost about $6.

Woodworking Show

As I am sure you are all aware of by now, The Woodworking Show is coming to the Merchandize Mart in Liberty Hall this weekend.

The hours are:	Friday, February 17	12:00 – 7:00pm
	Saturday, February 18	10:00am – 7:00pm
	Sunday, February 19	10:001m – 5:00pm

Hope to see you there.

H & S Lumber
Mr. Robert Boland, Manager
4115 Monroe Road
Charlotte, NC 28205
704.333.3130 (sponsor)

Harbor Freight USA
Mr. Martin Treadwell, Manager
3852 E. Independence Blvd.
Charlotte, NC 28205
704.569.0182 (contributor)

The Woodworking Shop of Charlotte
4728 South Blvd.
Charlotte, NC 28217
704.521.8886 (contributing/sponsor – except power tools and wood)

Woodcraft
Mr. David Boyuka
1725 Windsor Square Drive
Matthews, NC 28105
704.847.8300 (contributing)

Show your CWA membership card at any of the listed places and receive benefits (except for Woodcraft and Harbor Freight USA, which are not able to provide sponsorship in the form of discounts).

2004 CWA Officers

President	Wayne L. Manahan pres@charlottewoodworkers.org	(704) 786-0768
Vice President	Bruce Bogust vp@charlottewoodworkers.org	(704) 321-0979
Treasurer	Jaye Peterman treasurer@charlottewoodworkers.org	(704) 527-8768
Secretary	Michael L. Dyer secretary@charlottewoodworkers.org	(704) 379-1919

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Next Meeting:
February 20, 2006
At the Charlotte Art League