



SHAKER WORKBENCH

Design, Construction Notes and Techniques

"Don't make something unless it is both necessary and useful; but if it is both necessary and useful, don't hesitate to make it beautiful." –Shaker Dictum



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· INTRODUCTION & DESIGN ·

“Whatever perfections you may have, be assured people will find them out, but whether they do or not, nobody will take them on your word”

Canterbury, New Hampshire, 1844

When I first laid eyes on the workbench at the Hancock Shaker Museum in Pittsfield, Massachusetts I had a pretty good idea of the configuration of my next workbench. I think it would be safe to say that I was inspired. However, designing a workbench that is inspired by a Shaker icon can be intimidating as well. I had to do justice to the original and keep in mind what might be considered acceptable. Luckily, most are aware that the Shakers were quite accepting of new technologies that could be practically applied, so this did allow a fair amount of leeway in regards to using more recent workholding devices on this bench. In the end, I did want the look to be very representative of the Shaker Ideal.

“Tis a Gift to Be Simple” is an over used Shaker pronouncement, however I often think it’s meaning is misinterpreted. I believe it means having freedom from making things unnecessarily complicated. There is a certain vanity in ability. The inclination to use complicated techniques in order to boast abilities, especially in the context where a simpler method is adequate, is frowned upon in the Shaker view. Therefore, when I set about designing this bench I wanted it to contain only what was necessary to make a good, solid woodworking tool and I did not want it to showcase complicated elements that were unnecessary to it’s function.

My goal was to design a bench that could be built using case-good skills that most woodworkers posses, and could be constructed using readily available materials in lieu of sourcing large amounts of seasoned thick timbers. I also wanted the techniques used to build the movable parts of the bench, cabinet doors and drawers, to be quick work and not require a great investment of time. After all, when one is building a workbench this encroaches on the time available to build the objects that the workbench will assist in creating.

In this endeavor simpler is better, and if I met my goal I would set the plan for a project that would have met the approval of a Shaker cabinetmaker who was frugal with his time. So as you set about this project remember:

“The shortest answer is doing the thing”

–Henry C. Blinn, Canterbury New Hampshire

–Ron Brese, May 2011

· CONSTRUCTION NOTES & TECHNIQUES ·

Building a project of this size requires knowledge and skill in basic to intermediate woodworking processes and techniques that fall beyond the scope of these notes. It will be assumed throughout these instructions that you are familiar with a range of woodworking terms and techniques. If you are just getting started in woodworking or do not have basic to intermediate skills, get some experience under your belt first by taking some classes, or learning from a friend or local club. Please feel free to contact us at info@benchcrafted.com if you have any questions about the plans or the bench.

· Important Note About Safety ·

With any woodworking project using hand or power tools, your own personal safety should be your first concern, and is your own responsibility. Under no circumstances should you perform an operation or technique if you feel unsafe or unsure of yourself. Use guards and safety measures at all times. Keep in mind that the parts for the bench, once assembled, are very large and very heavy and take a bit of effort and strength to move around the shop and process through machines. Get help if you think you'll need it, and make your physical well-being your first priority. You are responsible for how you work, and what happens in your shop.

· Additional Resources ·

In order to keep these instructions concise we've intentionally left out certain techniques that apply generally to installing our vises. This information, and much more, is available on the FAQ page on our website. Please read through the FAQ before starting your build.

· Each To His Own ·

When designing the carcass joinery for the Shaker bench we decided early on that it would be impossible to include every joinery technique for creating strong cases. Instead, we've designed the plans to reflect the dimensions of each component as if it were constructed with simple butt joints. We made this decision in order to simplify the process for woodworkers who may be familiar with a wide

range of carcass construction materials and techniques. Traditional woodworkers may want to build up the elements using solid wood frame-and-panel elements, while others may be more comfortable working with high-quality plywoods. The range of joinery techniques and equipment available today is quite broad and everyone has their preference. Using biscuits, dowels, dominoes, pocket holes, splines or even screwed butt joints, we've designed the carcass to be robust and monolithic once assembled. Using strategic layout of components, the carcass assembles quickly and easily, building up strength as each component is added. And once the enormously strong solid-wood half-lapped face frame is glued and nailed in place, the carcass becomes extremely rigid, in effect taking on the properties of a massive torsion box. This bench, like many extant Shaker benches, should last for generations with proper use. Nevertheless, in order to provide at least one construction method, we'll be describing how we built the prototype in detail.

· Materials ·

For our prototype bench, we used commonly available materials. Common to our neck of the woods that is. The point is, you don't need special material to build this bench. Our local hardwood dealer had some beech in stock from a large commercial project and agreed to sell it to us for a good price, so we chose to use this for the top, vises and accessories. Beech is the ultimate traditional bench wood, and for good reason. It's durable, uniform in color and texture, stiff, relatively inexpensive, and easy enough to work. If you can't get beech (and in many areas its hard to find) here's a list of woods we'd recommend for the top and accessories.

- Soft Maple

We built our original Split-Top Roubo bench from soft maple, and Ron Brese also built his Shaker bench using this inexpensive and widely available species. An excellent choice.

- Hard Maple

America's traditional bench wood. Hard, stiff, and heavy. Makes a great bench in every way. Well, almost. Its a bear to work due to its hardness and weight. And it can be expensive in some areas. A great wood if you can handle it.

- Ash

Lighter than hard maple, but quite stiff. A bit easier to work as well. You may not like the open pores if you work metal near your bench. Develops a nice color over time. Commonly available and inexpensive.

- Softwoods

Although you can build a completely functional bench from softwoods like yellow pine and fir, we think you should build your bench from one of the above choices. This bench has an aesthetic that calls for higher quality wood. Our top choices would be beech or one of the maples.

The carcass is made from commonly available sheet goods. We use American or Canadian-made softwood plywood with thick veneers for the carcass components. Under no circumstances should you buy plywood from Asia. It is complete junk, often filled with voids, stress, and who-knows what other foreign material. Do yourself a favor and never buy the stuff.

One advantage of using a softwood plywood is ease of handling. The stuff is light enough, but plenty strong enough once assembled. However, in the interest of overbuilding (never a bad idea) we would highly recommend using Baltic Birch plywood, or a comparable Russian or Finnish product. We are fortunate in that our local big-box store carries 4x8 sheets of the stuff. Call around, you might be surprised what you find.

The remaining elements of the cabinet (the face frame, doors, end panels and drawers) are made from solid wood. We used poplar for our bench, but soft maple would also be a fine choice. Yellow pine, if you can get it in your area, is also an excellent wood. Poplar is available anywhere and is always inexpensive. It's easy and fun to work with hand tools, and takes paint nicely.

· Ordering Lumber ·

You'll need about 35 board feet of 8/4 lumber for the top, including the dog hole strip and front laminate. The end cap, leg vise chop, leg vise leg, deadman and deadman rail take about another 10. These parts you can harvest from 12/4 stock, but most will find it easier (and cheaper) to laminate 8/4 stock to get the thickness

required. The face frame, drawers, end panel and shiplapped panel, and drawer fronts are all taken from 5/4 stock and planed down to full 1" thickness. This makes for a robust structure. 30+ board feet should get you there. A note on these numbers. These are all conservative estimates. You may have more or less waste depending on the width of your boards. Sit down with the plans and make yourself a cut list (this is the best way to familiarize yourself with the various parts--that's specifically why we don't include a cut list) so you know the best widths of boards to pick at the lumber yard. This will save you time and money. The foot that the cabinet rests on will take about 5 board feet, and you should make this out of a tough wood like hard maple. You'll need two sheets of 3/4", 4x8 material. You'll also need some 1/4" material (Baltic Birch highly recommended here) for the drawer bottoms if you elect to use sheet goods here instead of solid stock.

· Get Everything Together ·

Don't start to cut wood unless you have everything you need to finish the bench. This includes the entire Benchmaker's Package and any accessories you intend on adding to the bench after its built, like holdfasts for example. Also, read completely through the Glide and Tail Vise instructions (available on our website for free download) before starting the project. This bench, if built correctly, will last the rest of your life and those of future generations. Don't take any shortcuts, and don't rush it.

· Working From The Measured Drawings ·

The measured drawings are comprehensive and include some dimensions that you won't necessarily need, but are included for reference. For example, when you layout the dog holes in the top you should use the dimensions for reference, but do the actual layout with a set of dividers for the best spacing. Follow the sequence outlined in these notes, and in the vise installation instructions, and the reference dimensions will become apparent. Use the measured drawings to guide your build, but don't be a slave to them. It's always better to lay out joinery by transferring locations and sizes than by measuring. It sounds counter intuitive, but measure as little as possible and you'll make fewer mistakes. We recommend the use of story sticks as well. These are real thought and effort savers.

· Build The Carcase First ·

The first thing to build is the carcase. All the other parts of the bench, including the top, build directly off the carcase. If you build it accurately, you'll have very little measuring to do and spend less time studying the plans. Since you're building the carcase from sheet goods, which may vary in thickness, you'll have to adjust some of the dimensions from the plans based on the thickness of the material you have. The dimensions of the carcase components are nominal in order to make the sizes easy to interpret. 3/4" plywood is shown as 3/4", not 23/32" for example.

Since many woodworkers are familiar with different carcase construction techniques, we're going to describe the one we used only. If you happen to like using biscuits, or the Festool Domino, splines, tongue and groove, etc. feel free to use those techniques which you feel most comfortable with.

It's important to cut the carcase panels very precisely, whatever joinery method you use. We don't have a fancy shop here at Benchcrafted, no sliding table saw, no panel saw. But we did invest in a Festool TS55 circular saw with guide rails to build the Shaker bench prototype. Although we have no affiliation with the company, we heartily recommend this saw. It has changed our opinion of working with sheet goods in a small shop. The cut quality is simply amazing, and the offcut edge is as clean as the workpiece edge, meaning your cutting time is cut in half. We were able to cut all the panels for the carcase before lunch, and the edges were dead flat and the panels dead square and precise with no chipout. If you don't have access to one of these saws, make sure your crosscut sled on your table saw is running true and you're using an appropriate and sharp blade.

Once the panels for the carcase are cut you're ready to assemble the parts. Don't be alarmed. We use butt joints, glue and screws to assemble our carcase. Seriously. We've arranged the parts so none of the strength of the base is dependant entirely on the glue bond or the threads giving out.

Some comments on screws. Make sure you purchase Spax brand, available from suppliers like Lee Valley and McFeely's. They are also available at some big-box stores. Do not use hardware-store variety screws which are too soft--you can twist the heads off quite easily. We've switched entirely to Spax, which have the distinct advantage of not only being superior in every way, but are actually cheaper!

To assemble the carcase start by laminating the bottom supports at the base of the carcase to the carcase sides. Use glue liberally and drive 1-1/4" screws. Make sure you get good flat laminations and pre-drill properly to avoid bridging.

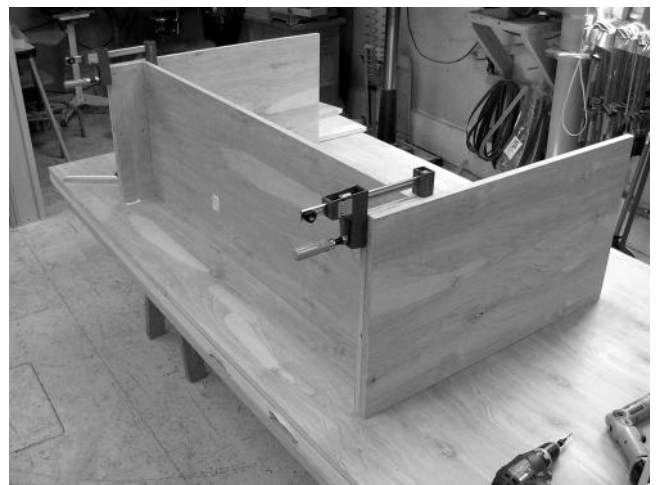
Next, clamp the bottom between the sides then drill and countersink for #12 x 2" screws. And here's the trick to making these joints even stronger. Drill each hole at a slight angle off perpendicular. It's the same principle that makes a dovetail joint so strong. Drill and drive one screw at each end, then continue drilling in between each screw, about every 6" or so. Remove the two end screws, apply a healthy bead of glue to the edge of the panel, spreading it to the edges with your finger. Reassemble the panels and drive all the screws. You should have nice squeeze out all along the joint.

Joining the bottom supports to the carcass sides first allows easy positioning of the bottom for joining to the sides. No need for careful layout lines here. The dimensions of the pieces themselves allow for easy assembly.



Joining the bottom supports to the carcass sides (left).

Getting ready to join the sides to the bottom (above). The bottom supports provide automatic positioning of the sides.



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Using the angled screw technique to join the sides to the bottom.



The center dividers and bottom long supports in place.

· The Face Frame ·

The face frame is joined with enormously strong half-lap joints. Mill the 5/4 stock to 1" thick and rip the various parts to final width. Begin making the joints at the four corners first. There are a lot of joints here to manage, and it's easier if you keep to one joint at a time. The quickest way to cut these joints is to set up a dado stack on the table saw. Cut the joints a little fat, then fit them with a rabbeting block plane and shoulder plane. If you don't own these planes, now would be a great time to get them. Lie-Nielsen Toolworks or Lee Valley are great sources. Once the four corner joints are fit you can move to the joints in the middle of the face frame. Focus on one at a time. Cut one half of the joint, fit it over its mate, then scribe the shoulders onto the other piece. Sneak up on your scribe lines with the plane for a snug fit. The end panel can be made with half-lap joints or mortise and tenon.

Once the face frame and end panels are complete, join both parts to the carcass and each other using glue along all joints. Since the face frame and end panels are visible, we use cut nails from Tremont Nail Company in the 7D size (2 1/4"). Cut nails hold incredibly well. Make sure you align the tapered section so it bites into end grain as you drive the nail. If you drive the taper the other direction you'll wedge the board apart and cause a split. Don't countersink the heads, just drive them flush. They will look quite authentic once the bench is finished. Also drive a few screws around the perimeter of the face frame for good measure. Pre-drill for 3/8" plugs to hide some of the screw heads. The ones near the top of the face frame don't need plugs, they'll be hidden by the benchtop. Mill and attach the 1" corner block to the back edge of the end frame.

The back of the carcass is made from 3/4" plywood. To give it the look of solid boards we set up a straightedge and route three long V-grooves along the length of the back. Once that's done, glue, nail, and screw the back to the carcass.

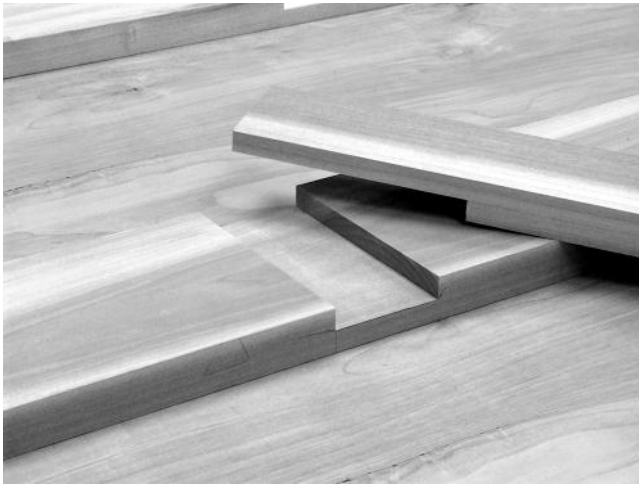
Next, mill the spacer blocks for the shiplapped panel at the right end, the shiplapped boards themselves, then attach them all to the carcass with glue, screws and cut nails. Don't nail the shiplapped boards along each edge, but rather keep the nails closer to the middle of the boards to allow for some wood movement. Finally, nail and screw the face frame to the shiplapped boards from the front.

A note about sizing and aligning the face frame to the inside of the cabinets. You'll want to size the lower rail and stiles so the edges extend past the faces of the carcass panels into the cabinet space by about 1/16". This allows for some wiggle

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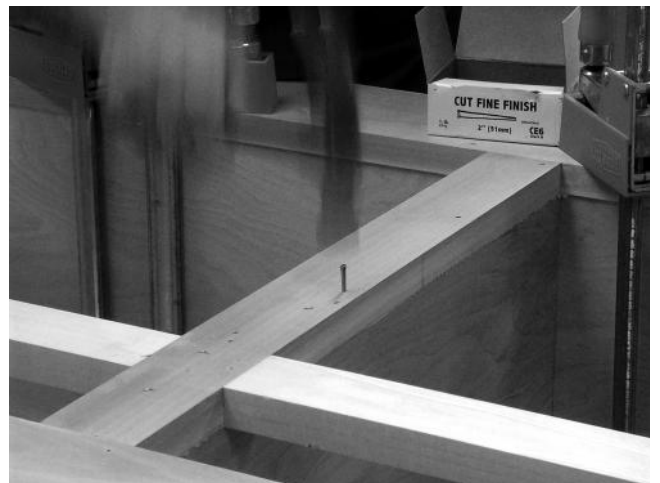
room during assembly, it helps keep the edge of the plywood strong, and it makes it very convenient to finish the edges of the face frame.

To complete the carcass, make and attach the 1" thick foot with glue and screws. The corners are mitered.



A half-lap joint fit and ready for assembly.

Using cut nails to join the face frame to the carcass.





Face frame and end frame
joined to the carcass.

Back and shiplapped end
boards joined to the carcass.



· Door and Drawers ·

The doors are made with board-and-batten joinery. Mill your 5/4 stock to 1" and cut chamfers along one long edge of each board. Position these edges in the middle of each door assembly, facing out. To attach the battens, apply some glue just to the ends of the battens (the middle of the boards should be allowed to move) and position them on the backs of the boards. Using more cut nails or screws, fasten the battens to the boards. We prefer cut nails since they allow some wood movement. Use cut nails that are longer than your board and batten combined thickness, and then clinch the protruding nail by pounding it back into the batten like a staple. This locks the battens to the boards permanently. If you want the nitty-gritty on clinching nails, read [The Joiner And Cabinetmaker](#) available from Lost Art Press (url).

The drawers are built with half-blind dovetails and dados to capture the back. The bottom slides in under the back in grooves along the sides. We designed the drawers so the backs are positioned forward a bit. This way you can pull the drawer out and view all the contents with plenty of drawer side still in the case for support. The drawer sides are sized so the front of the drawers are flush with the face frame when the sides contact the inside of the carcass back. It's easy to make adjustments by trimming the ends of the sides. If you're going to store heavy items in the drawers, like planes, you may want to substitute a thicker, solid-wood drawer bottom.

The drawer runners are simple to install and adjust. Drill some oversize holes in the runners for some pan head screws, one at each end, and attach only the lower runners to the insides of the cabinets below each drawer. The oversize holes in the runners allow you make fine adjustments to their position (you still need to position them accurately initially).

Next, mill some thin strips of hardwood to act as lateral runners for the drawers. Plane them to the correct thickness until the drawer runs in and out smoothly without binding (you can test them in place without glue). Once you're satisfied, glue the strips into the inside of the cabinet right above the lower runners.

After the drawers are positioned vertically, and the lateral strips are installed, drill for some more screws (flat heads here) to lock the runner in position. Set the upper runners on the drawer sides and install the pan head screws. Make your fine adjustments so the drawer runs smooth. You may add more screws to the upper runners, but it's not critical unless you will be really loading the drawers with lots of weight.

Mount the doors with the hinges. The spinners that hold the doors shut are quick and easy to make. Turn the knobs for the doors and drawers on the lathe. We use a traditional Shaker style profile with a robust tenon, glued into a tight-fitting mating hole. Here's a trick to making a perfect tenon on the end of your knobs. Use a plug cutter in a drill press, cut away the square corners, then chuck the tenon in your lathe and turn the knob. You can also buy Shaker knobs if you'd rather not turn them. Try Whitechapel (<http://www.whitechapel-ltd.com/>) for a good selection.

To finish up the cabinet, mill and install the top attachment cleats. We use #12 x 3" Spax screws, two per end. Keep the top surface of the cleat below the top surface of the cabinet by 1/8" or so. That way when you attach the top it will sit firmly on the perimeter of the cabinet, not just on the cleats. This will make the bench monolithic.

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Drawer and runners showing adjustable screws in the runners.



Board and batten door.



Left-end top attachment cleat.

· Glide Leg Vise ·

IMPORTANT NOTE: If installing our current Glide Crisscross, refer to the Glide Crisscross installation instructions for details. Also note you'll need to make a longer and full thickness chop than is shown in the Shaker plans.

After the cabinet elements are complete you can begin working on the Glide Leg Vise. Mill the leg to final dimensions, cut the tenon at the top, drill the clearance hole for the vise's screw, and cut the mortise for the parallel guide. Radius the bottom of the leg if you like. This is a purely aesthetic choice. If you like you can keep it square and let it rest on the floor. You'll need to notch it around the foot if you do this. Reference the Glide Instructions during this phase of the build.

Now position the leg on the face frame and transfer the locations of the hole and parallel guide mortise onto the face frame. Cut out the hole and the mortise in the face frame using a jig saw. These aren't critical holes, so don't sweat making them look perfect. They'll be permanently covered by the leg, so you'll never see them. Just make sure they aren't smaller than their mating areas in the leg, you don't want the vise's screw or parallel guide rubbing.

Next, attach the leg to the face frame with eight #12 x 3" screws, driven from inside the end cabinet through the back of the face frame. Make the Glide chop, parallel guide, roller brackets and support bracket and finish installing the Glide.

The upper roller support bracket attaches from inside the left cabinet with two Spax lag screws. See the alternate roller bracket configuration in the plans if you don't want to mount the lower roller bracket inside the cabinet. You'll get a bit more toe-in at the top of the jaw by mounting the lower Glide roller outside under the chop, and moving the upper one forward.

Make sure you keep the top of the Glide's chop a little long. You'll cut it to final length after the top is flattened.

Attach the parallel guide to the chop using a mortise and tenon joint. You can also drawbore the joint for added strength if you wish.

· Build the Top ·

The top is made from three sections. The main part of the bench is made up from 8/4 stock, flattened to as thick as you can hold it to. We were fortunate when building the prototype to find two single beech boards that were dead flat and wide enough for the necessary 22". Incidentally, you don't need exactly 22" here. An inch or two plus or minus is fine. You'll just have a different overhang at the back. The front section includes the dog hole strip, backing strip, and front laminate. Finally, the end cap completes the top.

Glue up the main section and plane it flat. Then mill the stock for the front section and rout the dog holes. Make the dog hole strip extra long and rout an extra hole for the vises's dog block, then cut it free and cut the dog strip to length. For info on routing dog holes, see the Benchcrafted FAQ. Next, glue on the dog hole backing strip. Drive a few small brads along the center of the dog strip and clip off their heads leaving a small point. This bites into the backing strip and prevents it from sliding around as you apply clamping pressure. You can establish the mortise for the top of the leg in the dog hole strip by cutting it out before you glue the front laminate on. Now glue the front laminate onto the dog hole strip assembly, using brads or biscuits for alignment.

Make the end cap next and fit it to the end of the main section of the bench with the splines. Leave the ends long at this point. Clamp the front section to the main section of the bench (we like to use a few biscuits along the front edge for alignment purposes) and position it so it contact the inside of the end cap. Check the width of the dog block slot. It should be consistent from end to end. Lay out for the lag screws that hold the end cap on, then remove the end cap and drill the holes

for the lag screws. Pick a bit that's the same diameter as the root diameter of the screw. You will also need to lay out the position of the tail vise at this time and drill the holes for the screw and flange. Reference the vise installation instructions for info and templates. You won't need to rout a cavity for the nut block though, so skip that part. You'll build up the area for the rear tail vise rail to mount to later. Once the holes are drilled, remount the end cap and using the holes you just drilled to guide your drill bit, drill into the end of the top and front section for the lag screw threads. Once the holes are drilled install the lag screws and cinch them down. Check the alignment of the end cap with the top sections. Everything should be relatively flush. If you need to make adjustments to the end of the front laminate where it mates to the end cap, now is the time. Make sure the dog block slot is still consistent in width. Mark the ends of the end cap for length, remove the end cap and cut it to final length. Now enlarge the two holes in the end cap towards the rear of the bench. This will allow the top to move during seasonal changes. Drill another hole alongside the existing one with a forstner bit, then pare or rasp the web that remains. You want to make the hole larger horizontally, but not vertically. This helps keep the top of the end cap flush with the top surface of the main section.



Main top section with dog hole strip in position. Mortise for leg cut from dog hole strip. Front laminate rests behind on bench top. Biscuits for alignment.

Get ready to glue up the entire top by staging all your clamps. Install the end cap onto the main section of the bench with the lag screws. You may want to glue the splines for added strength. Only apply glue to the forward spline though, to allow the top to move. Have your socket wrench handy. Apply glue to the front edge of the main section and place the front section in place. Clamp it lightly at first with just a couple clamps, then drive the two lag screws through the end cap into the end of the front section until it draws up tight. Now apply the remaining clamps.

With the top complete, flip it over and install the riser block. Finish installing the tail vise by routing the mortises for the guide rails. You didn't forget to make a dog block while you were routing the dog hole strip did you? With the top flipped over, rout the slot in the front section for the deadman to ride in. Finally, attach the top to the base with the lag screws and then flatten the top. You may have to tweak the fit of the top on the leg tenon at the leg vise. Some side to side play is fine here.

It's time to flatten the top. Use your longest plane (22" or so) to flatten the top and bring all surfaces level. If you assembled the top accurately and built it flat to begin with, this should be a relatively quick and easy process. Don't forget to chamfer the far edge of the top, tail vise slot and dog holes to prevent splashing as you traverse the top.

With the top flat you can now cut the Glide's chop to final height.



End cap ready for final installation prior to gluing the front section.

· Deadman ·

Make and install the deadman and the deadman rail. Mill the rail long and cut the bevel on the top, then from the extra length cut off enough material for the five supports. Rip the support board to width, then cut the five supports from it. Drill the holes and countersinks in the rail and supports and install the rail. You may want

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to flip the base on its back to make this task easier. You'll need to tap the face frame to receive the machine screws provided for attaching the rail. See our Glide Leg Vise instructions for info on tapping wood for machine screws.



· Alternate Configurations ·

The bench in the plans features two drawers and two cabinets with doors. This may not appeal to you. If you'd like to fill the entire cabinet, or at least one side with full banks of drawers, its easy. Here's how to do it. Decide on the quantity and sizes of drawers you'd like, then add in 2" (or so) for an additional face frame rail between each drawer, joining them to the rest of the face frame with half-laps. Make the drawer runners so they are a tad wider than the face frame rails so the lower runners for each drawer also act as the upper runners for the drawers below them. It's imperative that you keep the runner's edges parallel if you use this method. The bottom drawer can run on thin strips glued to the floor of the cabinet. Using this drawer hanging method many configurations are possible. If you'd like to build the bench taller or shorter you should add or remove material from the area of the cabinet between the lower rail and middle rail. An inch or two plus or minus won't affect the proportions of the bench. Make sure you take these changes into consideration when building the leg vise. If you change the height, go through the plans with a fine red pen and note the changes directly to plans.

· Finishing The Top ·

The top and accessories should be finished lightly. One coat of Minwax Antique Oil (or other oil-varnish blend) followed by a rubdown with 0000 steel wood, then a coat of past wax is plenty. If you'd like to finish the Glide chop, leg, deadman and deadman rail to a higher degree, feel free. But the top should have a minimal finish for best grip. Don't be tempted to make it thick and slick. Tacky is best. We often flatten the benchtop by taking a final pass with a dead sharp jointer plane, set for a fine cut, and planing directly across the top. This makes a slightly toothy texture that prevents workpieces from moving around.

· Finishing The Base ·

The cabinet base is finished in a traditional way using modern materials. Many of our customers have commented on the beautiful milk-paint finish we applied to this bench. They are surprised when we tell them no milk paint was used to

finish the bench. Ron Brese finished his Shaker bench with a unique recipe that we decided to follow. It allows the wood grain to show just like milk paint, only its easier to apply and widely available.

As with any project, the first step in finishing is surface prep. For the solid wood parts of the base, we recommend a smoothing plane as the final prep. Since the back of the base is plywood, a light sanding is sufficient. Break all the corners generously with a block plane and some light sanding.

Instead of milk paint, we use Sherwin-Williams Deckscapes Exterior Acrylic Solid Color Deck Stain. It's available in a wide range of colors (we used Blue Spruce for this bench, Ron Brese used Cape Cod Red for his) that fit right in with the Shaker look. And there is a Sherwin-Williams store in practically everybody's back yard.

Apply the first coat of Deckscapes stain (we use a 2" foam brush) and let dry. It's a bit thinner than typical latex paint, so watch for runs. Lightly scuff any dust nibs and bits of raised grain with a gray Scotch-Brite pad. Wipe or vacuum off the dust and apply a second coat. Let this coat dry for at least a day or two. You'll notice that the color is uniform and opaque, but still allows the woodgrain to show. This stain is not high in solids like a typical heavy-bodied paint.

To further emphasize the grain and richen the color a coat of pigmented wood stain goes on next. We use Varathane Dark Walnut gel stain. The gel gives you more control during application. Wipe on a generous coat over an area about two or three square feet at a time, then immediately wipe off the excess with clean rags, moving with the grain. Some of the gel stain will stay in the pores, and less will stay directly on the surface of the wood. Use long strokes when wiping off the gel stain to prevent swirls. You can easily control the amount of color that stays on the surface by changing how vigorously you remove the stain. We recommend working through this entire finishing schedule on scrap before finishing the bench. You can apply one stage at a time at the end of each bench building session. Your sample board will be done before the bench.

Once you've applied the gel stain let it dry for several days. Being an oil-based product it will need this time to fully cure. After its thoroughly dry, its time to apply the topcoat.

Another option instead of using the gel stain is to use a pigmented oil finish, such as Danish oil. Watco brand is widely available in dark walnut, and other colors. This has the advantage of staining and finishing in one step. We find that the gel stain gives better-looking results, but your experience may vary. Make some test samples.

Once the gel stain has thoroughly dried a protective topcoat is applied. Since a certain amount of the pigment is simply sitting on the surface of the Deckscapes stain, using an oil finish may remove more of the stain than you would like. If you have access to spray equipment you can apply a coat of satin lacquer directly over the stain and call the finish done. We chose not to spray lacquer but instead to apply a more traditional finish: shellac. Using a wide flat artist's brush (golden taklon) brush on a coat of Bull's Eye Seal Coat, which is a 2lb. cut dewaxed formula. It's important when brushing shellac to flow on an even layer and move on. Don't brush it too much. Apply one full coat. You're looking to mostly seal the gel stain, and provide a bit of sheen and protection. Once the shellac has cured overnight, rub lightly with 0000 steel wool or gray Scotch-Brite and apply a good quality dark furniture paste wax. Let the wax build up around the heads of the cut nails. The finished base will look like its seen a bit of age and use. This is, after all, a workbench. It's going to get scratched and worn over time. That will only add to its character and charm. The drawer fronts are finished like the rest of the cabinet, but don't apply any finish to the drawer sides. Smooth plane them and apply paraffin or paste wax only.

· Make a Mark ·

You've just finished a lifetime project. Something that you'll use to build fine furniture for yourself, family and friends, and perhaps customers. With time, you may become quite attached to it, not necessarily because of what it is, or how you built it, but maybe because of what it represents—a means to connect with other people through your craftsmanship. In this day of mass-produced, poor-quality disposable objects, a traditional, handcrafted workbench is akin to a family heirloom. Carve or stamp the date and your name onto an inconspicuous area of your bench. Future generations will appreciate finding the craftsman's name who produced it.

—Benchcrafted

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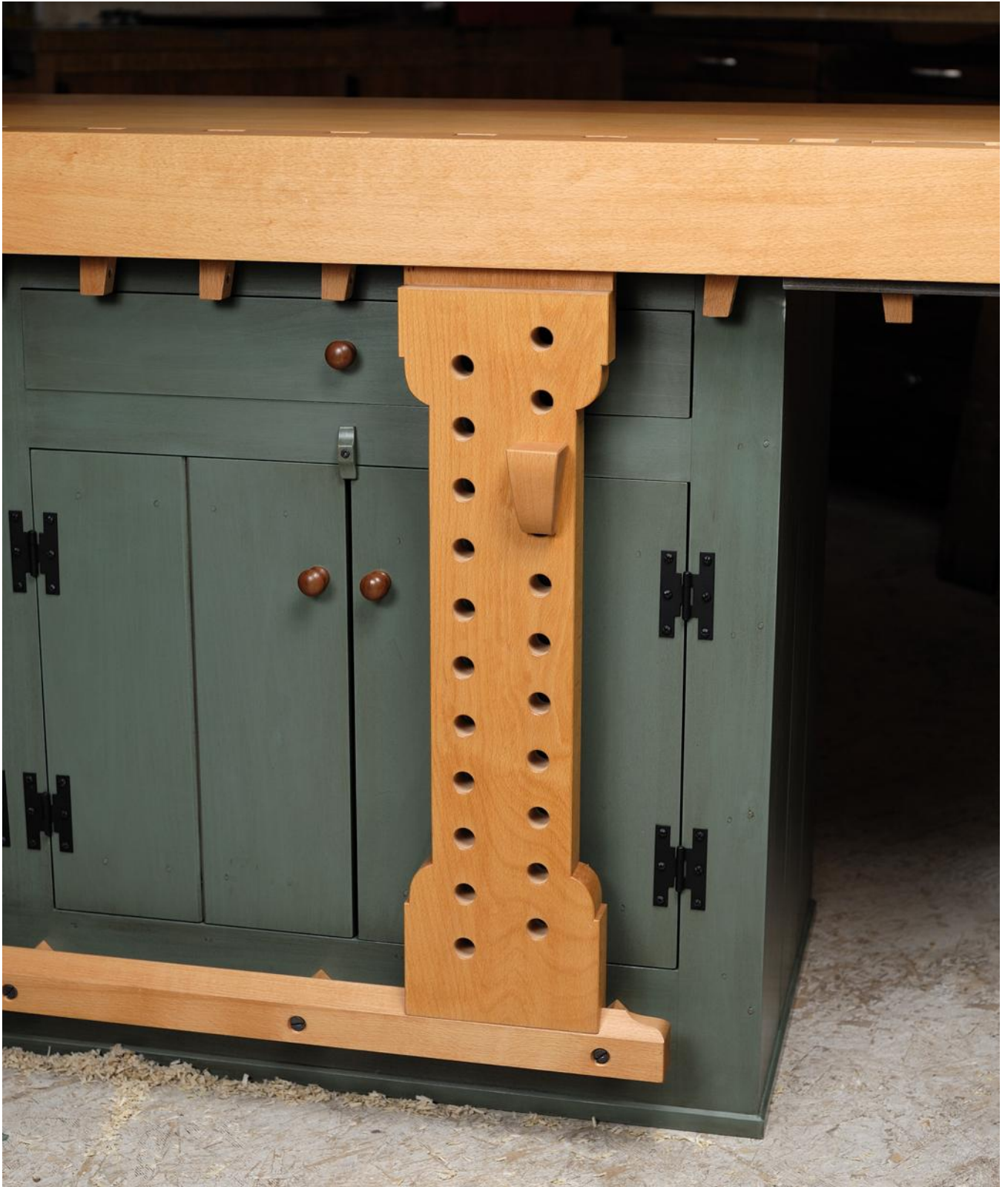
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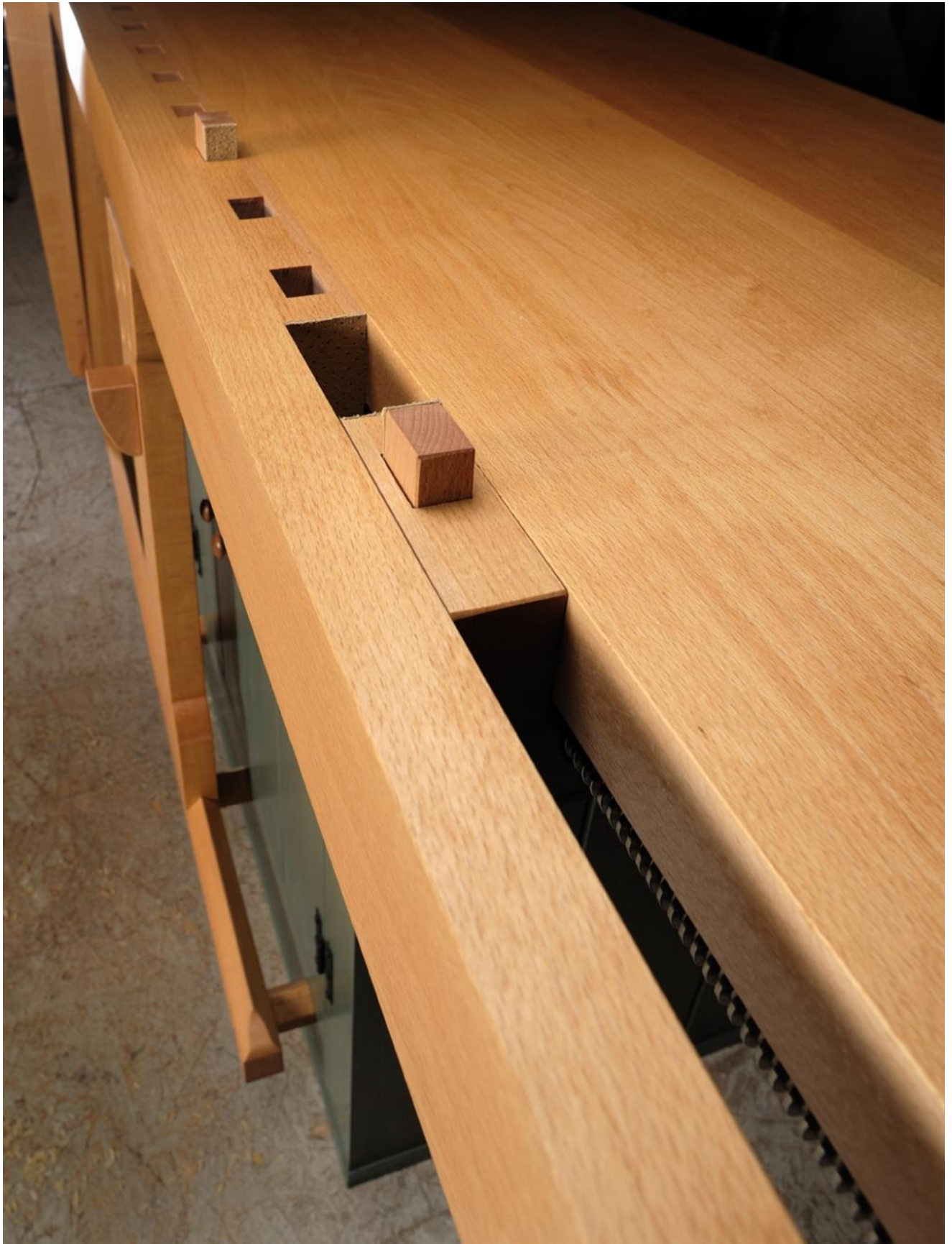
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