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TRAY TABLE

At first glance, this may seem like another “garden-variety” outdoor table. But the handles are your first clue that this is no ordinary table.



Once you take a closer look at this small side table, you'll notice the top of the table lifts right off to become a convenient serving tray.

But the removable tray isn't the only reason to build this great weekend project.

To start with, the base of the table is constructed with mortise and tenon joinery. So it's built to last, even if it does get knocked around a bit in the yard.

But probably one of the nicest features of this project is that you can easily build it in a weekend. All the parts for the table are cut from three cedar decking boards, which you should be able to find at most lumberyards or home centers.

FINISH. Even though it won't take you long to build, you'll still want to protect this table with a good outdoor finish. And picking an outdoor finish can be a little confusing, particularly if you've never used one before. Be sure to read page 5 for tips on choosing an outdoor finish for all of your outdoor furniture projects.

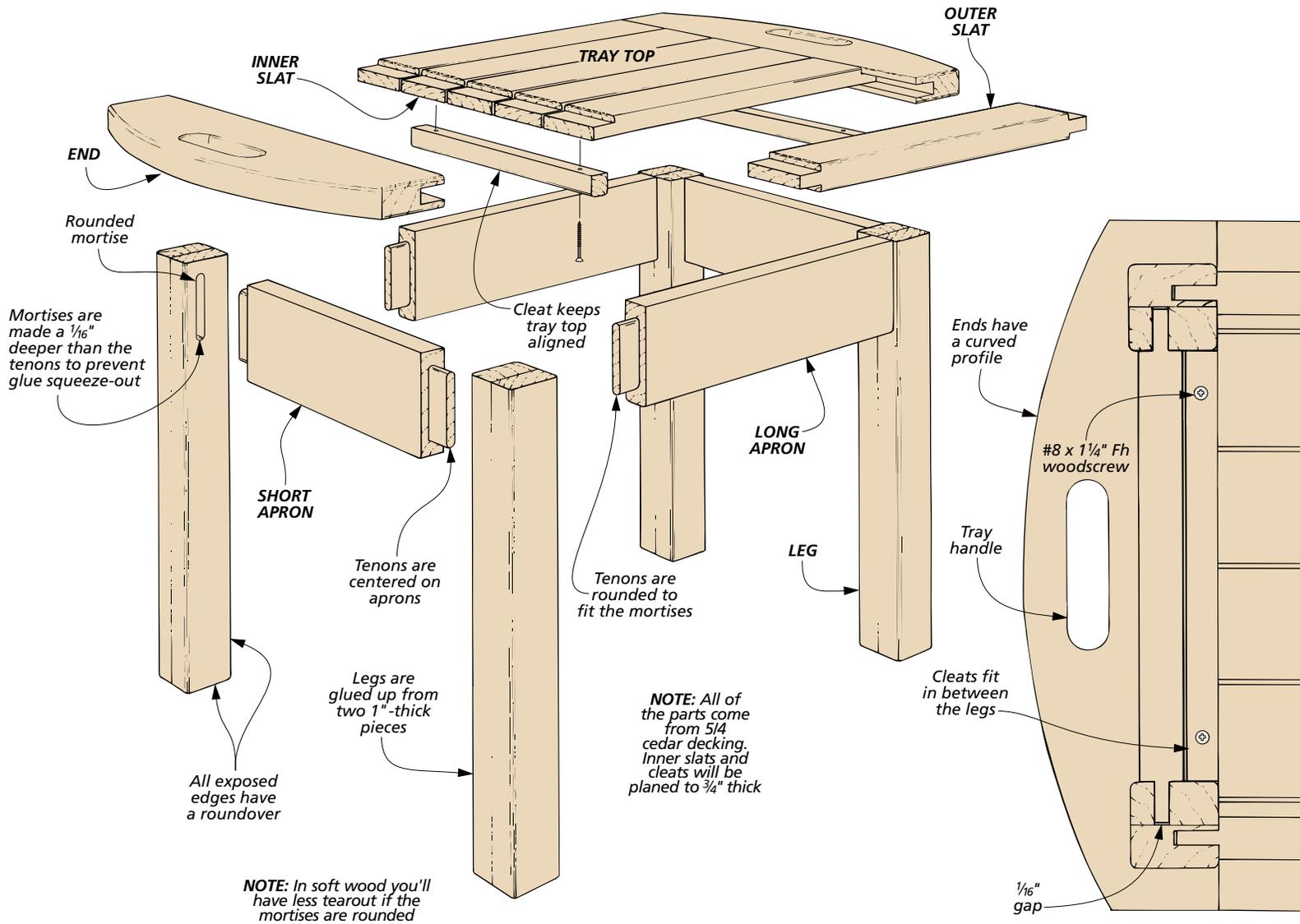
Serving your favorite summer beverage has never been easier. This small outdoor table doubles as a serving tray.



Construction Details

OVERALL DIMENSIONS:
22"W x 16"L x 17"H

Top is constructed with stub tenon and groove joints



MATERIALS, SUPPLIES & CUTTING DIAGRAM

- | | |
|---------------------------|-------------------|
| A Legs (4) | 2 x 2 - 16 |
| B Long Aprons (2) | 1 x 3 1/2 - 15 |
| C Short Aprons (2) | 1 x 3 1/2 - 12 |
| D Ends (2) | 1 x 4 1/2 - 16 |
| E Outer Slats (2) | 1 x 2 9/16 - 15 |
| F Inner Slats (4) | 3/4 x 2 9/16 - 15 |
| G Cleats (2) | 3/4 x 3/4 - 10 |
- (4) #8 x 1 1/4" Fh Woodscrews

1" x 5 1/2" - 72" Cedar (5/4 Decking)

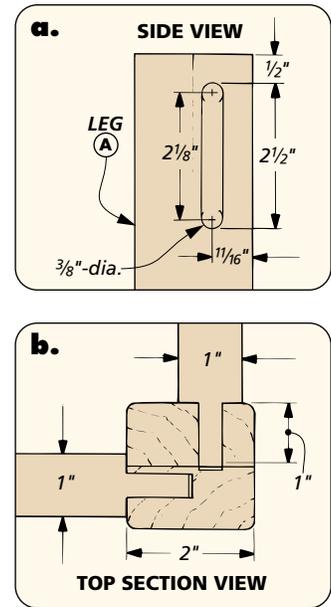
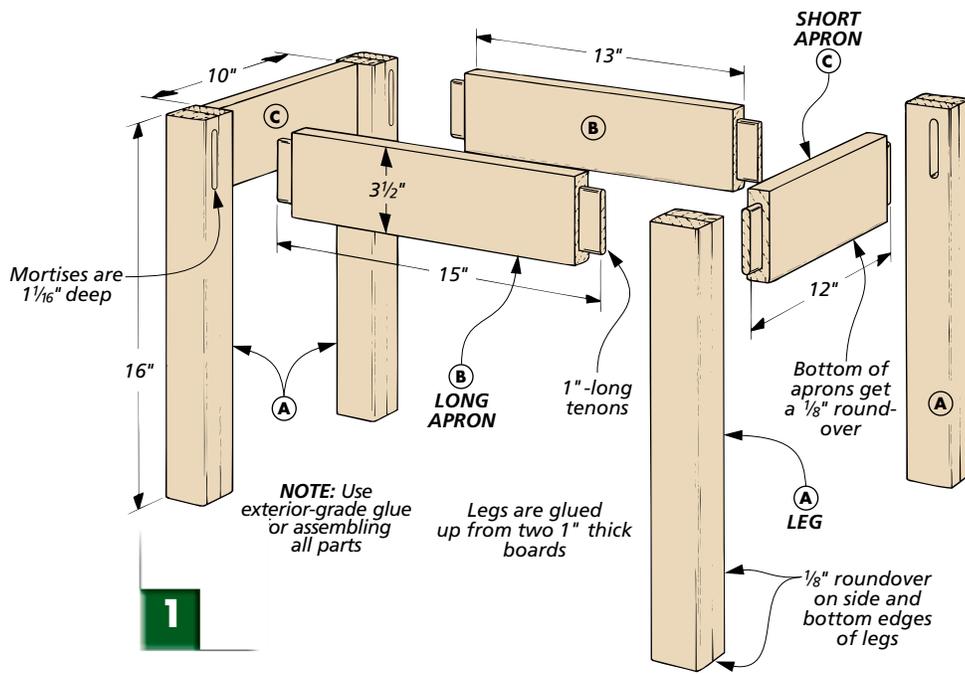


1" x 5 1/2" - 72" Cedar (5/4 Decking)



1" x 5 1/2" - 72" Cedar (5/4 Decking)





Base

The table consists of two parts — a top and a base. I started with the base. It's a set of legs and aprons joined with mortise and tenon joints. But the *legs* (A) are actually two pieces of $\frac{5}{4}$ cedar decking glued up to make the 2" x 2" leg blanks, as in Fig. 1.

MORTISES. Once the legs are cut to size, the next step is to lay out the mortises. As you can see in Figs. 1a and 1b, each mortise is set back from the outer face just a bit. This creates a small reveal between the leg and apron, as seen in Fig. 1b.

Now to make the mortises, I turned to the drill press. I used a $\frac{3}{8}$ " Forstner bit and began drilling holes at the top and bottom of the mortise,

as you can see in Fig. 2. Then the rest of the mortise is made by drilling overlapping holes. And since cedar is a little tough to chisel cleanly, the corners were left rounded (Fig. 2a).

But you'll also notice in Fig. 1b that the mortises are made slightly deeper than the length of the tenons. This small gap is for any excess glue.

TENONS. With the legs complete, the next pieces to make for the base are the *long aprons* (B) and *short aprons* (C). Go ahead and start by cutting the aprons to size.

Now to cut the tenons on the ends of the aprons, I use a dado blade on the table saw (Fig. 3). Start by making a cut on both sides and test the fit.

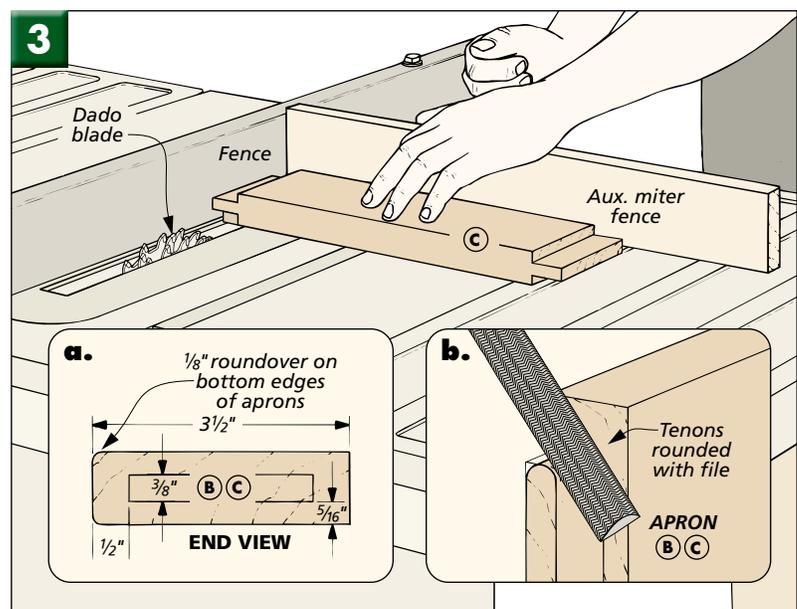
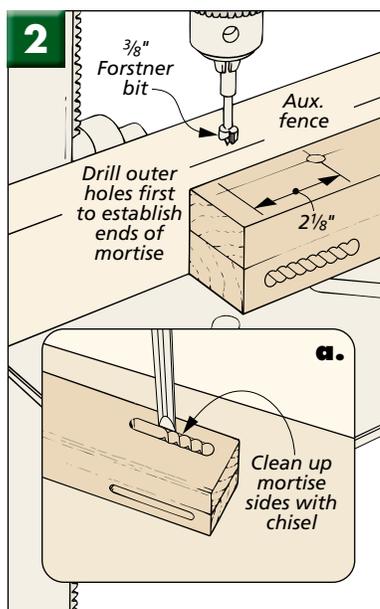
You can sneak up on the fit by raising the blade and repeating the process.

Next are the shoulder cuts for the tenons. All you need to do here is raise the blade to make a $\frac{1}{2}$ " cut for the top and bottom edges (Fig. 3a).

The last step for the tenons is to round them slightly to fit the mortises. As you can see in Fig. 3b, I used a file to make quick work of this.

The final step before assembly is to ease some of the edges of the legs and aprons (Fig. 1). I did this on a router table with a $\frac{1}{8}$ " round-over bit, or you can sand them by hand.

And since it's going outside, I made sure to assemble the base with an exterior-grade glue.



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Tray Top

Once you've assembled the base, you can turn your attention to making the top tray. The top is made of six slats that are "capped" on each end.

GROOVES. I started by cutting the *ends* (D) to final size. Then the next step was to cut the groove along the inside edge. Again, I turned to the table saw with a dado blade. (Since the groove is narrow, you could also make several passes with a regular blade.)

As you can see in Fig. 5 and 5a, I flipped the workpiece around for the second cut. This way, the groove is sure to be centered perfectly.

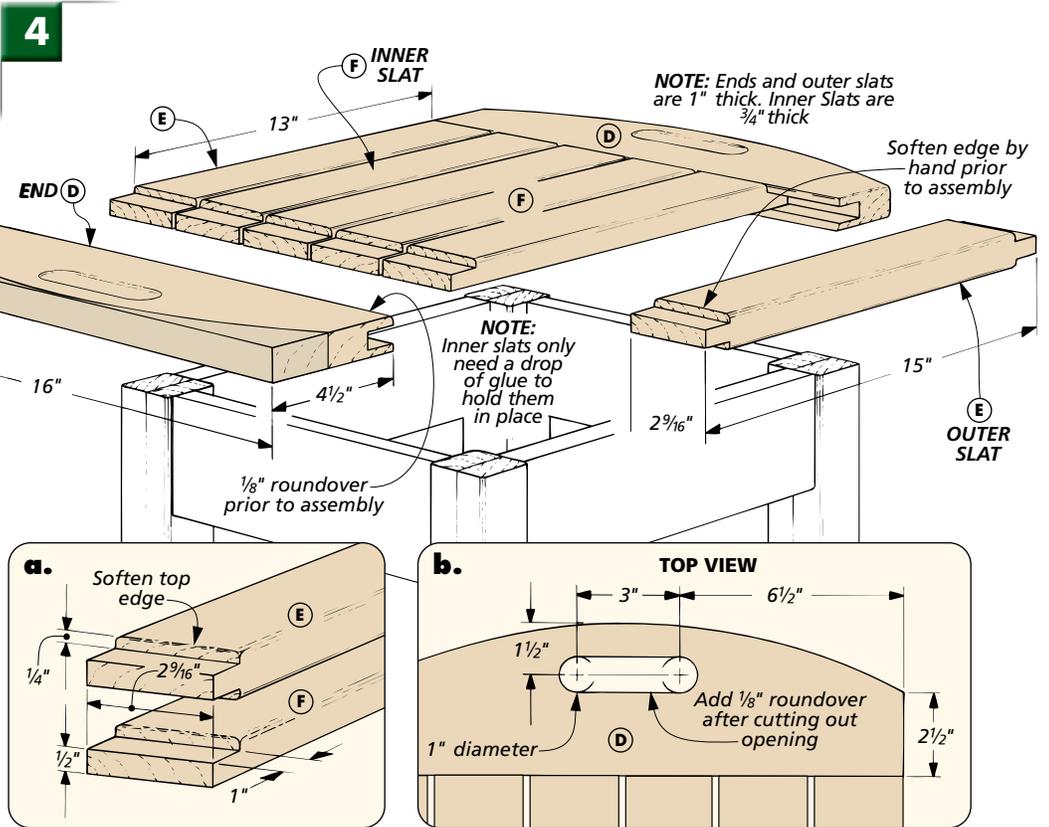
HANDLES. The next step is to make the handle openings. I found the best way to make them was to first drill a pair of 1"-dia. holes, like you see in Fig. 4b. Then go back with a jig saw and cut out the waste in between.

CURVED PROFILE. After the handle is complete, the last detail for the end pieces is the curved profile.

To draw an arc, I took my 36" aluminum ruler (you could use hardboard) and some masking tape to create a "bow" that I use to trace out an arc, just like you see in Fig. 6.

Once you get the curve traced, cut it to shape and then sand it smooth.

SLATS. Although the slats that sit between the ends look the same,



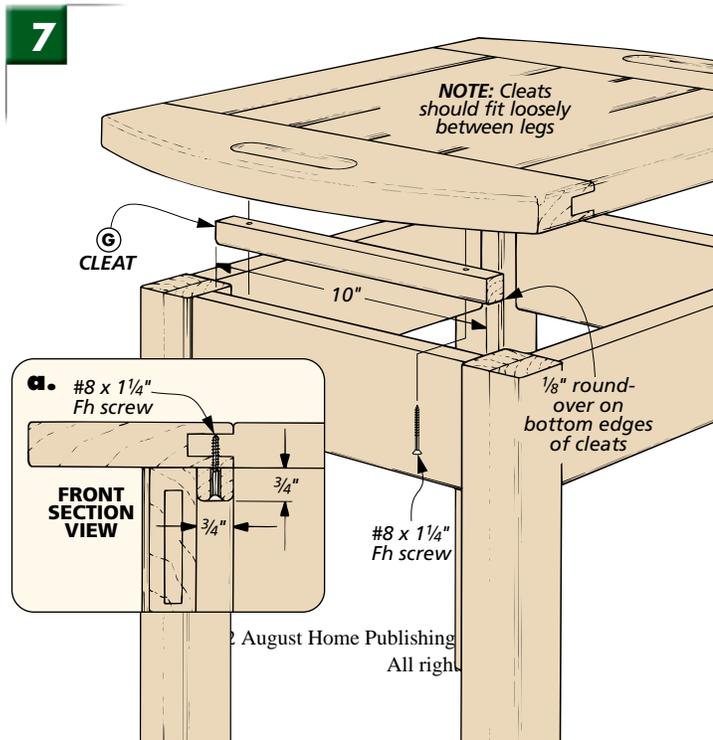
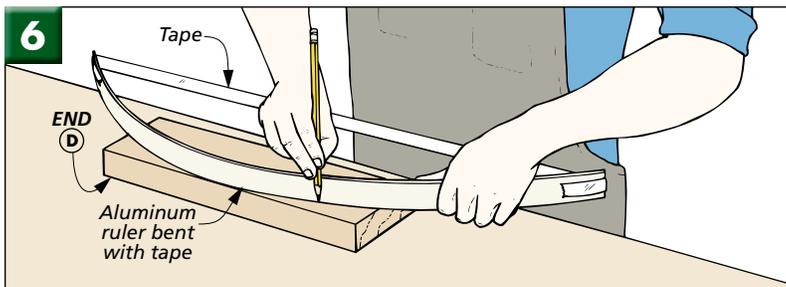
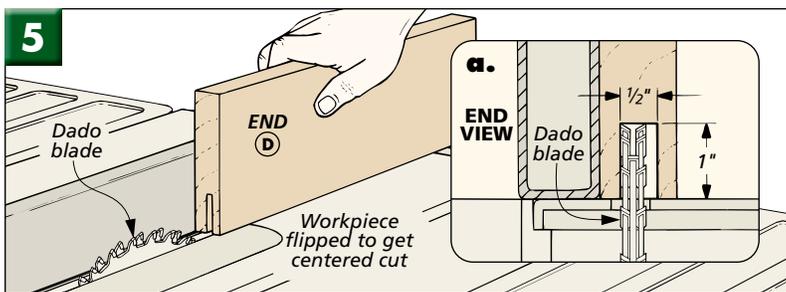
there are some differences. The *outer slats* (E) are a full 1" thick to match the ends. But to keep the weight of the tray down, the *inner slats* (F) are only 3/4" thick. And you can see in Fig. 4a, the outer slats are cut on *both* sides to form a tenon.

Just like with the base, I rounded over all the inner edges before assembling the top. Then glued the top with an exterior-grade glue.

The slats are aligned with the outer ones flush with the edge and the inner slats spaced evenly across the top.

Finally, the *cleats* (G) that keep the tray top aligned can be made. These just attach to the underside of the top in between the legs.

Once the table is assembled, it's time for a finish. I applied several coats of an exterior finish. **W**



OUTDOOR FINISHES

Wondering what outdoor finish to use? If you're going to build an outdoor project and want it to last, here are a couple finishes we use in our shop.

Outdoor finishes have a pretty tough job. Not only do they have to protect wood from rain and sunlight — but they also have to deal with extreme temperature changes.

To accomplish all this *and* let the beauty of the wood show, there are a few different *clear* outdoor finishes.

They can be separated into two categories: film finishes and penetrating oils. They do the same basic job but in two very different ways.

FILM FINISHES

Film finishes are probably the most familiar because they share the same characteristics as many interior finishes. They form a clear, hard barrier on *top* of the wood.

Polyurethanes are most often thought of as an interior finish. However, there are tough, exterior polyurethanes for wood exposed to the elements — like doors or trim.

Exterior-grade polyurethanes are sometimes sold as spar urethane or marine varnish. These “fancy” names refer to a very tough finish originally designed to be used on wooden ships exposed to the harsh and unforgiving environment of the open sea.

But that doesn't mean you can't use them on your patio furniture. In fact, they're ideal for this purpose.

Unlike interior polyurethanes, exterior grade polyurethanes have a higher amount of “solids.” So they go on a little thicker but provide a much harder and more durable finish.

There is one other important difference. Exterior polyurethanes have UV (ultra-violet) inhibitors to protect the wood from the harmful effects of the sun. However, these UV blockers do lose their effectiveness over time.

Polyurethanes do have another downside. When the finish starts to



wear, you'll need to sand down the entire surface to give it some “tooth” before you apply another coat. The advantage is you'll only have to do this once every few years.

PENETRATING OILS

Penetrating oils are just what their name suggests. They're a mixture of oils along with water repellents and UV blockers that soak into the surface. These are often sold as “deck stains” or “water sealers.”

Unlike polyurethanes, penetrating oils don't form a hard finish. They help prevent wood from drying out and keep water from soaking in.

The problem with these types of finishes is that over time they're slowly absorbed by the wood until the surface is left unprotected. Which means on average, you'll have to reapply the finish every year.

But the advantage to these penetrating finishes is that recoating doesn't require any prep work. Recoat the surface, and you're done.

THE RIGHT FINISH

So how do you choose the right outdoor finish for your project? It really depends on how big and what type of project you're building and how much work you're willing to do.

For example, if I was building a shed or deck, I'd use a penetrating oil — mainly because these finishes are less expensive and easy to apply.

But if I built a set of patio furniture (like I did in this issue) I'd use a polyurethane. The reason is simple. I like furniture, even outdoor furniture, to have a smooth, tough finish. So I used the same finishing steps as if they were going inside my house.

After applying a coat, let it dry thoroughly. Then sand it lightly before the next coat. I repeated this for a minimum of three coats.

Note: All of the outdoor projects in this issue were all treated with *Zar's Satin Exterior Polyurethane*.

As you can see there is no mystery to exterior finishes. You just need to choose which one suits you best. **W**

SOURCES

Outdoor Materials

When you build a project that spends most of its time outdoors, it's a good idea to choose the materials carefully. Here are some things to keep in mind for the projects featured in this issue.

WOODS. There are a lot of woods you can build with. As far as decay resistance goes redwood, teak, mahogany, cypress, and white oak are all good choices — but they can also be expensive (and not all are commonly available). So for our projects, we chose another decay-resistant wood: Western red cedar.

One thing to keep in mind is that cedar is sold as dimensional lumber. So the 2x6 boards we used were around 1½" x 5½". And the 5/4 decking was close to 1" thick.

So why mention this? When building furniture

projects, some pieces (like the cleats on the top and seat frames of the table and benches) will need to be sized based on the *actual* thickness of the stock. And it's always a good idea to double check the sizes of the pieces to make sure they'll fit properly.

GLUES. Another consideration for outdoor projects is the glue you'll use. The yellow and white glues you typically build with aren't intended for outdoor applications. But there are a few other options to consider.

For the projects in this issue, I decided to use a glue I've had good results with in the past: polyurethane glue. This glue reacts to moisture, so it works differently than the glues you're used to. (For more on polyurethane glue, check out the free article

in the Online Extras section of our web site.)

A couple other good (and less expensive) choices for an outdoor project would be to use a yellow glue formulated for outdoor use (such as *Franklin's* Titebond II) or a plastic resin glue. (Plastic resins come in powder form and have to be mixed with water.)

SCREWS. Like the glue, you also want to be careful about the kinds of screws you use. There aren't many screws in the outdoor projects in this issue, and the screws aren't visible. But still, you *don't* want to use standard zinc or brass-plated woodscrews. These just aren't meant to be outside and can rust quickly.

However, traditional, solid brass woodscrews are a good choice — at least if you're working with a "soft"

wood like cedar. (With harder woods, solid brass screws aren't strong enough and tend to snap as you're driving them in.)

Solid brass isn't your only option though. There are screws designed for outdoor use. Stainless steel and silicon bronze are both great for outdoor projects, but they're not as commonly available and can be a bit pricey. A less expensive choice for these projects would be to use a common deck screw.

The nice thing about finding supplies for outdoor furniture is that you usually don't have to look very far. Most home centers carry everything you'll need, though some of the options I've mentioned may be available only at woodworking stores or through mail-order catalogs.

Spiral End Mill Bits

An upcut spiral end mill bit is specifically designed to cut mortises. (It's actually a router bit, but can be used in a drill press that's set at its highest speed.)

Unlike Forstner bits, a spiral end mill bit pulls chips out of the mortise, which eliminates heat build-up and clogging. But the longer cutting edge

(and the higher speeds) also makes for a cleaner cut, so the sides of the mortise end up smooth.

These bits are available at local woodworking



stores or online at the WoodsmithStore.com (see at right and below).

MAIL ORDER SOURCES

Similar project supplies and hardware may be ordered from the following companies:

Highland Hardware
800-241-6748
www.highlandhardware.com

End mill bits, Polyurethane glues, Outdoor finishes, Outdoor screws

Jamestown Distributors
800-423-0030
www.jamestowndistributors.com

End mill bits, Polyurethane glues, Outdoor finishes, Outdoor screws

Rockler Woodworking
800-279-4441
www.rockler.com
End mill bits, Polyurethane glues, Outdoor screws

Woodcraft
800-225-1153
www.woodcraft.com
End mill bits, Polyurethane glues, Outdoor screws

Woodsmith Store
800-835-5084
www.woodsmithstore.com
End mill bits, Polyurethane glues, Outdoor finishes, Outdoor screws

Woodworker's Supply
800-645-9292
www.woodworker.com
End mill bits, Polyurethane glues, Outdoor finishes, Outdoor screws

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