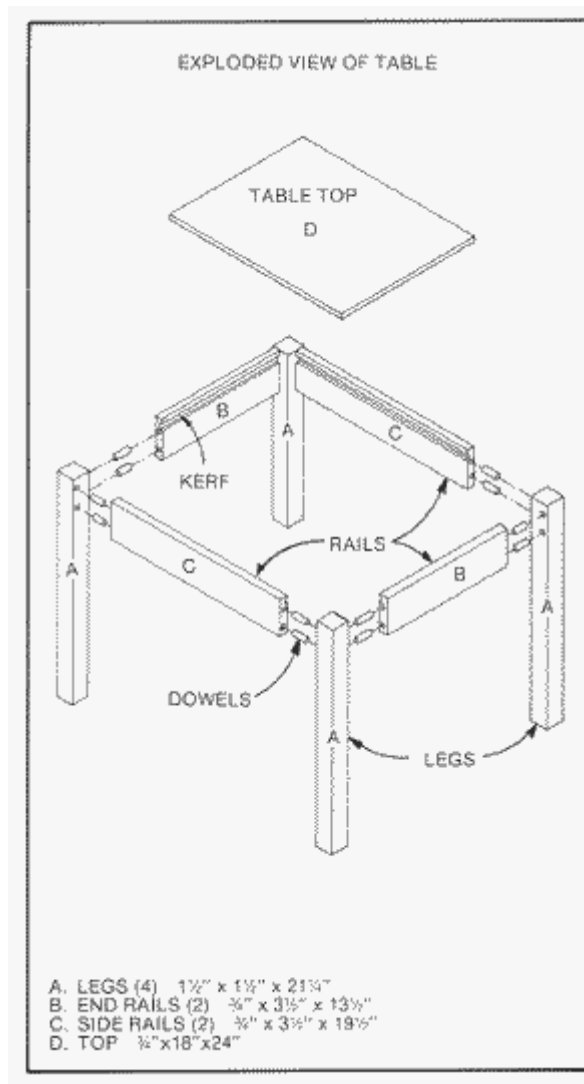


## Woodworking Projects Building Tables - Overview



### Project Introduction

Everyone enjoys the look and feel of fine wood furniture. It has a warmth and elegance that enhances every home. With the prices of quality wood furniture increasing, many do it yourselfers are making their own custom pieces. In this pamphlet, we are going to demonstrate the correct way to build a beautiful end table in your own workshop. We will take you through step by step, from initial planning to the finished product. As you build this project, remember, every new skill and technique you learn building this table can be carried over into other woodworking projects.

### Planning

Review the videotape and pamphlet thoroughly before proceeding with this project. Go through the tools and materials check-list and study your plan carefully. Know the safety standards for the project. Plan ahead and gather the items that you will be using, and place them where you will

build the table. The plans shown here are for the table built on the video. You may want to adapt them to a design of your choice.

Before you begin your project, you will want to become familiar with the wood working terms shown below.

### Terminology

**Miter Cut** - Angle cut across the width or thickness of the board

**Rabbet** - L-shaped cut

**Dado** - Channel cut across the board, into which a second piece of wood is fitted

**Kerf** - Width of the blade

**Countersink** - To set a screw head at or below the surface

**Dowel** - Wooden pin used to provide strength and alignment

**Chamfer** - Corner of a board beveled at a 45 degree angle

**Crosscut** - Cut across the grain

**Ripcut** - Cut with the grain

## WOOD SELECTION

Before you purchase your wood and select a finish for your end table, you should ask yourself some simple questions about how you plan to use and display it in your home. Where will the end table be located? Do the dimensions of the end table fit properly in the space you have allowed for it? Is it a high traffic area? Will people be placing wet glasses, or propping their feet on it?

The two basic categories of wood are hardwood and softwood. Hardwood is more durable and less prone to dents and scratches. It is also more expensive but will finish to a better advantage. Soft woods, like pine, are more prone to dents and scratches and do not have the durability of hardwood. Softwoods are much less expensive and easier to find. Ask your lumber supplier to show you "Class 1 " or "Select Grade" lumber. Make sure it is properly dried, straight, and free of knots and defects. (It may be impossible to be completely free of defects but be sure you understand how to cut around these.)

Wood selection for your end table should be of a durable hardwood. In the video tape the choice was oak. Solid pieces used for the table top will expand and contract with changes in humidity. So that this will not create a problem, be sure all your stock is of a similar moisture content. To allow for seasonal changes, do not glue the top to the rails. Many people use veneered wood to avoid this seasonal problem.

Usually it is best to purchase surfaced stock that is smooth and of a uniform thickness. However, you can use a planer and purchase the less expensive rough stock and finish it at home. Any areas of the wood that show cupping or crowning will need to be planed by using a jointer or table saw as demonstrated in the videotape.

Now that you have reviewed the safety hints, learned the mistakes to avoid, reviewed the basic components and gathered your tools and materials for your end table - you are ready to BEGIN!

## A Step By Step Approach

Don't let the job of building this end table make you apprehensive about beginning. This section makes building an end table easy by dividing the project into six simple, manageable steps. Each step is then broken down into a series of instructions. You will find each step and the instructions for completing them NUMBERED to help you remember exactly what stage of the project you are doing. Refer to the diagrams and the videotape if you have questions.

The steps to follow in making this lovely end table are:

1. Preparing the Stock
2. Preparing the legs and Rails
3. Assembling the top
4. Assembling the frame
5. Attaching the top
6. Finishing the assembled table

## Preparing the Stock

If you did not buy pre-planed stock, start with step 1 of step 1; if you did buy pre-planed stock, start with step 2 of step 1.

1. Make the stock smooth and uniform. To do this use a planer. Plane the stock to a uniform 3/4" thickness.
2. Mark the stock for cutting. Measure carefully and make your marks clearly. Note: Stay away from a circular saw to make your cuts because it is very hard to get a straight cut. Instead use a table saw, radial arm saw, or similar multipurpose tool. Set your guides and use a push stick, fence straddler, or a push block to keep your hands away from the blade.
3. Rip (cut with the grain) the stock to the proper width. Measure carefully and extend mark with steel square to provide a guide for table saw. Cut to the waste side of the wood for proper cutting. Set the fence carefully before ripping. When ripping you must be sure that at least one side of the stock is perfectly straight so the stock can be ripped straight. Use a jointer, or a straight piece of plywood and a table saw to get this straight edge.
4. Crosscut (cut against the grain) the stock to its proper length. Measure and mark the stock carefully. Be sure to cut the stock 1" 2" longer. The stock will be cut to final length after the top is built.

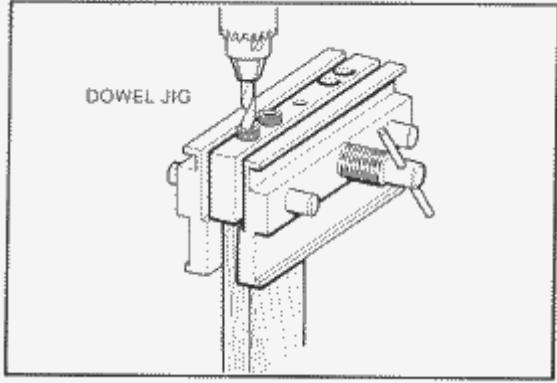
## Preparing the Legs and Rail

Choosing a style for the legs of your end table allows you a great deal of creativity. We have selected the mission style leg which features a taper that is heavier at the top than at the bottom.

- Use a table saw to taper the legs. (A taper jig comes in handy here.)
- Arrange and mark table legs and rails clockwise according to their locations on the finished product.
- To prepare the rails for attachment to the top, your plans will specify exactly the dimensions of each piece. In our example, the rails are cut 3 1/2' by 13 1/2' and 3 1/2' by 19 1/2'. There is a slot on the inside of each rail made by a kerf cut to receive the mirror holder which holds the top. It is 1/8" wide and 3/8" deep and begins 5/16" from the top of each rail. You can use a router or a table saw to make these slots.

## Assembling the Top

The table top will be assembled from several individual pieces of wood and glued together edge to edge. The three pieces will be longer and wider than the dimensions indicated in the plans. The top will then be cut to exact specifications. Be certain that



the edges are properly jointed with no space between the boards. If done correctly, the glue lines will be hard to notice.

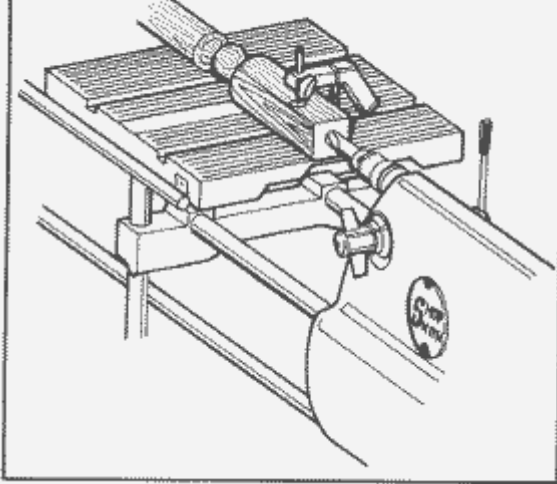
- Arrange the top boards so that the grain is pleasing to you, then mark them according to their location. The videotape shows you how to alternate the annular rings on each piece of board. This arrangement allows for any cupping or warping and ensures the tabletop will remain flat.
- Joint the edges if needed. Use either a stationary or hand jointer, both use a cutter that planes the edges smooth and square, Note: If you don't have a jointer, a table saw is the next best thing for smoothing rough edges. A hand jointer plane does a good job, but requires a greater degree of skill. Whichever method of jointing you use:
  - Check your edges for squareness before you start gluing.
  - Smooth out any roughness with sandpaper to your satisfaction.
  - Glue pieces together with yellow carpenters glue. This glue is usually stronger than the wood itself. Place glue on the piece evenly and on both sides. Once you have begun gluing, spread it evenly across the joint and don't stop until you are finished. Avoid getting glue on the surface of the table.
  - Put waxed paper on the top and bottom of the table to make sure the clamps are not glued to your tabletop.
  - Apply clamps for pressure to make the tabletop as flat as possible. Look for a slight squeeze out of glue which indicates adequate pressure.
    - **Note:** If you plan to use a planer to surface the top, the top will have to be glued in two pieces, so that the pieces can fit through the planer.
    - **Note:** Clamps can mar the wood. In addition to using the wax paper, you may want to use scrap wood to protect the finish of your table top by putting the clamp face on the scrap and gently closing the clamp down. Care must be taken when you slowly tighten the clamps, in case you change the alignment of the table top.
  - Once it has dried, (approximately 24 hrs.) remove the clamps. If the surface isn't smooth use your planer or belt sander. Scrape off any excess glue with a glue scraper being careful not to dig into the top.

### Assembling the Frame

There are many ways to assemble the frame. One of the best ways is to attach the legs to the rails by using dowels because of their strength. Dowels provide strength and easier alignment and can be made of wood, metal or plastic. Dowels can be pointed with spirals; or can have square ends with no spirals. Use pointed dowels with spirals to take out air pockets because they will set more glue and provide for maximum stability.

The frame will be put together by using dowels. The dowels are 3/8" diameter by 1 1/2" in length. The dowel holes are 2" apart (or the setting of the dowel jig) and begin 3/4" from the top. The centers of the dowel holes should be centered on the inside

HORIZONTAL BORING TOOL

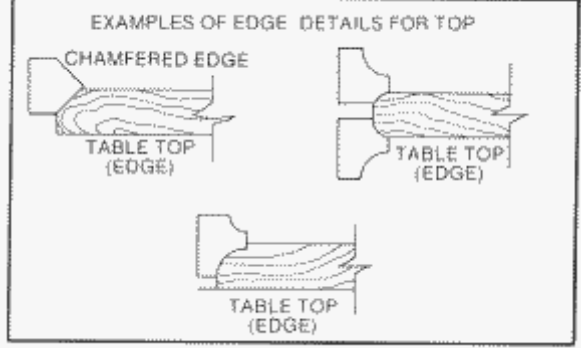
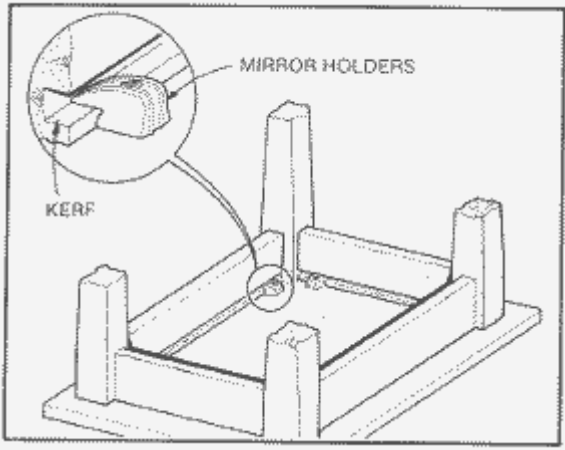


edges of the leg and rails.

1. Drill dowel holes according to the plans, using a dowel jig or a horizontal boring machine. A dowel jig allows for accurate holes (directly in the center regardless of the thickness of the wood) in both the legs and rails. A piece of tape, or a depth gauge acts as a guideline for the depth of the hole (half the length of the dowel plus 1/4").
2. Apply the glue to the dowels, holes, and flat surfaces. Tap the dowels in ? their length with a mallet. Clamp the side rails and legs together.
3. Glue and clamp side rails to the end rails. At this point check the frame for squareness by measuring on opposite corners. If the measurements are the same, then your table is square. Let the glue dry completely (approximately 24 hours).

### Attaching the Top

1. Make sure tabletop is properly dried. Rip tabletop to exact size.
2. Crosscut tabletop to exact size.
3. Use a belt sander until you have removed all traces of glue and have a smooth finish.
4. To add the fancy edge, the videotape uses a router, but a shaper or multipurpose tool could also be used. Start with your end grain first to allow for a small tear out.
5. Draw lines on the underside of the table to make sure it is centered.



There are two ways to attach the top. The first is to use

screw pockets, which attaches the top to the rails. This requires using a brad-point bit with a smaller bit to drill a pilot hole. You need at least two screw pockets per side, for this table the total is eight. Drill your pilot holes into the tabletop, and secure the top with round head wood screws. Be careful not to go through the top. The other method uses mirror holders which attach the top to the rails. Screwed into the underside of the top, these holders project into a saw kerf on the rail. This table requires ten holders, two for each end and three for each side. To use mirror holders to attach the top to the rails, locate and drill holes for the mounting screws and secure tabletop in place. Be careful not to drill through top. Use a drill press to set correct depth, or use a "stop collar" on your hand drill. Never glue the top to the frame as this does not allow for the expansion and contraction of the wood.

## Finishing the Assembled Table

### Sanding

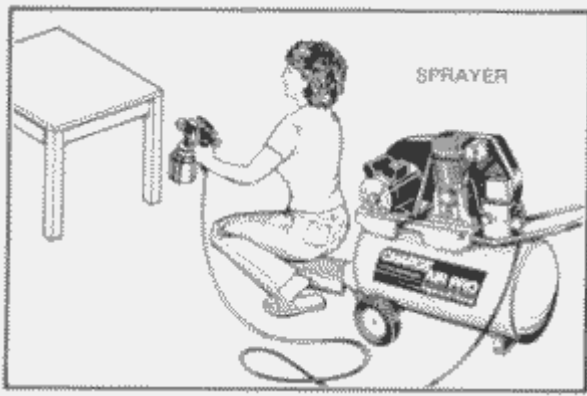
The best time to do any major sanding is BEFORE the main pieces are attached.

Sandpaper is graded as medium, or numbers 60, 80, and 100. Fine sandpaper numbers are 150, 180, and very fine 220, 240, and 280. Medium is usually used for the first sanding, fine for smoother results and very fine for smoothing finishes between coats. Sandpaper can be used wet for some finishes.

You can fill in nail holes with wood putty before sanding if you are not planning to stain the wood. If you are staining, fill the holes AFTER the stain is applied. In either case, match the wood putty closely in color to the stock or use saw dust and wood glue to make your own putty.

1. Sand with a fine, wet sandpaper (start with a 120 grit on plywood and 60-80 grit on other lumber) wrapped around a felt pad or use a pad or orbital sander. Use aluminum oxide sandpaper because its grit material lasts longer.
2. Sand slowly so you get the best job possible. Vacuum frequently to remove dust. Finish manufacturers recommend which grit of sandpaper to use with their specific finishes to achieve the smoothest result. Feel the wood to check on the smoothness as you work because touch is really the only way to get a smooth surface. Make sure that you remove all dust, finger marks and excess glue before applying the finish. First vacuum or brush the entire piece clean and then wipe with a tack cloth.

When it is time to varnish, vacuum the room and let the remaining dust settle for 24 hours. Wear lint free clothes and use the fastest drying varnish available. Use a tack



rag to remove dust before applying varnish and between coats. Do not apply urethane varnish over a coat of shellac or lacquer.

### **Applying Filler**

(Optional Step) The key to a beautiful finish is making sure the surface is as smooth as possible.

1. Countersink all nails and repair all dents.
2. Apply a coat of filler to all surfaces of the table. (Paste wood filler thinned with turpentine or paint thinner is best.) Filler is a compound mixed to the consistency of yogurt which fills all the pores of the wood for a smoother finish. Do not use the wood filler that is sold to repair rotted wood. Work the filler into the wood instead of just brushing it on. A short-bristled brush is best and can be made from an old paint brush. Using the filler gives your table that "Extra" touch of beauty by providing a smoother finish. You can color the filler after thinning for a perfect match of wood and filler.
3. Brush the filler on with the grain of the wood, making sure all pores are filled.
4. Wipe off the first coat of filler. Recoat, this time working across the grain. Make sure the brush is heavily loaded with filler.
5. The instant the shiny wet surface looks dull, start scrapping off excess filler with a straight, sharp edge implement like a playing card, ruler, stiff cardboard or knife with a wide blade (like the knife used to apply drywall).
6. Use a rough cloth like burlap to rub briskly across the grain.
7. Once the surface is as clean of excess filler as possible, let it dry overnight. If you are using a wood with an open grain, you may need two or three coats of filler.

### **Applying the Finish**

Apply your finish in a well ventilated space with lots of room. Cover the floor in the area that you will be applying the finish so that if a spill occurs it will not leave a permanent stain. Be sure the area is clean and dust free and can remain so during the drying period. Follow the manufacturer's instructions. The finish is the first thing you and your friends will notice, so take your time.

The choice in the videotape is a polyurethane finish applied with a foam applicator. You could use an air compressor with a spray attachment or the traditional brush method. Give the surface a fine sanding between each coat for a long-lasting, durable shine.

Your handcrafted table is a personal source of pride and you will want to select a finish which shows it off to its best advantage. Here are some suggestions to consider when you choose your finish.

1. Appearance: do you want a clear finish or do you want a stain to blend with the other pieces in your home. Do you prefer a high gloss or satin look?
2. Texture: Do you want the table to appear smooth and slick or do you want to feel the wood's grain?

3. Durability and protection: how is this piece going to be used, and what are you going to set on it? Do you need minimum protection from water marks and scratches?
4. Ease of application: how do you want to apply the finish? Will you be using a rag, brush, or spray? Why not visit an unfinished furniture store and talk to the staff about your needs. Look at their finishes and don't hesitate to bring a part of your project or a sample of a finish you may be trying to match. Try any finish you are considering on a scrap piece of wood that has been smoothed down to your table's finish. You can save a lot of heartache by taking the time to check BEFORE applying a finish that doesn't work.

Another finish that can be used is an oil finish. The advantage of the oil finish is that after the first coat a fine grit of sandpaper can be used when wet (220) to cause a slurry of dust particles and oil. This mixture is continually absorbed into the wood with each coat. Each coat builds up a very durable surface with a hand-rubbed look. Though beautiful, those oil finishes, do not have the durability and water resistance of the polyurethane finishes.

Some refinishers use a sanding sealer, which makes a light fuzz stiff so that it can be sanded off. Test to make sure that a sealer will not adversely affect the finish by applying to the underside of a shelf and then applying the stain to see if it goes on smoothly.

If brushing on the finish, consider the following:

1. Position the piece in horizontal sections.
2. Apply the paint, varnish or stain across the grain.
3. Brush out the finish with the grain using the brush as a wiping tool. Clean the brush as it collects liquid.
4. Pull the brush across the table's surface with the bristles held almost vertically.
5. Let each side dry between coats.

Check the varnish to see if a certain stain is called for. Read the label for drying times and how many coats to apply. Apply two, preferably three coats of urethane varnish using a good quality natural bristle brush. Between coats wet sand the finish. Rub the surface till it feels smooth. Wipe off any residue and then apply the next coat. Be careful at the edges of the table so varnish doesn't drip or run down the sides. For the final touch, rub down the table using a thin paste of rottenstone. Let the finish dry for a week before buffing with a hard paste wax or lambs wool pad.

Completing this project gives you a beautiful addition to your home. It is an expression of craftsmanship you and your family will be proud of.

### **Tools: (Other than common shop tools)**

1. Table Saw
2. Jointer (optional)
3. A doweling jig or a horizontal boring tool
4. Jig saw



5. Router
6. Orbital sander
7. Shaper (optional)
8. Clamps for gluing

**Materials:**

1. Cabinet grade plywood for carcass
2. Plywood for door, false front insert and kick plate face.
3. 1" x 6" oak for face frame
4. Dowels
5. Hinges
6. Knobs
7. Glue
8. Finishing nails (6d)
9. Flathead wood screws
10. Drawer materials and slides (if needed)
11. Sandpaper
12. Counter top materials