

Stand Alone Wine Rack





Router Bits Used:

- # 7804/5504 1/2" Flush Trimming Bit
- # 7779/5479 3/4" Straight Bit
- # 8650/6350 1/8" R Round Over Bit
- # 8731/6431 1/8" R Point Cutting Round Over Bit
- # 7852/5552 Drawer Lock Bit
- # 8365/6065 #20 Biscuit Kit
- # 8655/6355 1/2" R Round Over Bit
- # 7693/5393 Rabbeting Bit
- # 8834 Multi-Flute Cutter Bit
- # 7762/5462 1/2" Bull Nose Bit
- # 8842 Double Round Rail and Stile Set (Special Wine Rack Sale Item #1250)
- # 8694 Ogee Fillet Raised Panel Bit (Special Wine Rack Sale Item #1252)
- # 7695 1" diameter 14-degree Dovetail Bit

Additional MLCS Items Used:

- # 9580 Router Table Top + Plate + X1 Fence
- # 9012 Merle Multi Corner Clamp (Special Wine Rack Sale Item #1254)
- # 9008 Taper Jig (Special Wine Rack Sale Item #1253)
- # 9779 Router Table Crosscut Sled
- # 8711/6411 Half-Blind Dovetail Jig + 1/2" Bit with 5/8 Guide Bushing
(Special Wine Rack Sale Item #1248/1249)
- # 9563 "U-Turn" Lift (Router Raiser)

Additional Equipment Used:

- Table Saw
- Thickness Planer
- Miter Saw
- Sander
- Drill
- Woodworking Clamps (Various from 2" to 24")
- Kreg Pocket Screw System

Materials Used:

- Approximately 40 board foot of Maple Wood
- 2 pieces of 2 ft x 2 ft x 1/4" Plywood
- Wood Glue
- Various wood screws

This wine rack is made up of 3 assemblies: the Top Cabinet Assembly, the Table Top Assembly and the Bottom Cabinet Assembly. This unit should be made out of a hardwood.

The Top Cabinet Assembly is made up of an exterior shell, 2 lattice-work panels, exterior trim, interior trim, interior lining and a back panel. The Table Top Assembly is made up of the table top and 2 mounting cleats. The Bottom Cabinet Assembly is made up of 4 legs, an exterior shell, a drawer with a raised panel front and some additional supports (See Figure 1). Figure 2 below shows the Top Cabinet Assembly and the Table Top Assembly together.



Figure 1



Figure 2

There are two pieces of equipment that are most invaluable. They are the “U-Turn” Router Lift and the Crosscut Sled. The “U-Turn” Lift allows you to change the height of the router bit in infinitesimal but predictable amounts. With that you can do very precise work. You will see the value of the Cross Cut Sled as you progress through these instructions.

Making The Lattice-Work Panels

Our manufacturing process is going to start with the top assembly. The first parts we need to make are the two lattice-work panels. A lattice-work grid is shown in Figures 3 and 4. The lattice-work panel is the grid trimmed and a border installed around it.



Figure 3



Figure 4

For the first process we are going to use a 3/4" straight router bit (7779) and the Router Table Crosscut Sled. Position the fence on the crosscut sled at a 90-degree angle to the direction of travel of the sled.

We will be machining 16 pieces of 3/4" thick x 1" wide x 30" long material. First, make a helpful jig to assist (See Figure 5 on next page). Use a flat 3/4" thick board that is approximately 3" wide and 20" long. Clamp this board to the fence with the 3" width or edge against the fence and the 20" length on the sled and positioned to make a cut about 2" from one end of the board. It is recommended to use two clamps so that it is held securely in place. Set the cutter height to about 5/16" and make a through cut. Now check to see if the 3/4" dimension of the stock you are going to use for these 16 pieces fits snugly into the dado cut you made. If the stock is slightly oversize you will need to plane it down to get that snug fit. Once the stock is the proper size, make a small piece which measures 3/4" wide x 1/4" thick x 2" long. This piece acts as a registration "key" and is then inserted into the dado cut you made in the 3" wide piece above.

Clamp the jig to the sled fence. First, decide what size openings you want in the lattice grid. We chose 4-1/8" because that seemed to be a good size opening to handle a variety of different sized bottles: .75L, 1.5L and Champagne. However, it is an arbitrary dimension. Once you have determined your size, place the jig against the fence and position it so that the dimension

between the edge of the insert closest to the cutting bit and the edge of the cutting bit closest to the insert is the dimension you want the opening to be. Clamp the jig to the fence (See Figure 5).



Figure 5

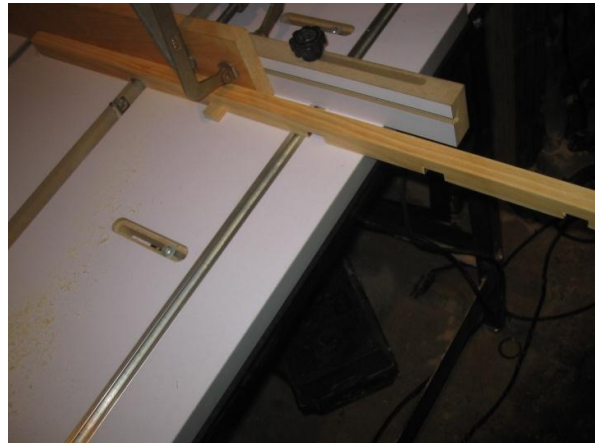


Figure 6

Next, prepare the 16 pieces of 3/4" thick material 1" wide by 30" long. After cutting these pieces from the stock run them through a thickness planer to make sure the 1" width is uniform. We will be making 6 dado cuts in each of the 16 pieces. Make the cuts in two passes to produce a cleaner cut, the first being 1/4" deep and increasing to exactly 1/2" deep on the second pass. Make the first pass on all 16 pieces before moving on to the second pass. For the purpose of these instructions we will assume the orientation of the person operating the router will be facing the router table with the sled moving from their right to their left as they move the work over the cutter head.

To make the first cut on each piece, clamp the stock to the jig, which is clamped to the fence, with the 1" side vertical and against the jig. Position the piece so that about 2" of the length is on your side of the cutter head and the remaining 28" on the other side. Mark this end so that when we proceed to the second pass we can begin with the same end of the piece. When cut, remove the clamp and move the piece toward you and push the dado you just cut onto the insert in the jig. It is important that once the first cut is made using the insert of the jig that the jig not be moved during the balance of machining these 16 pieces. Proceed moving the piece toward you after each cut locking onto the insert each time until all 6 cuts are made (See Figure 6). You will want to clean any burrs off of each cut before locking on to the insert.

We cannot say enough about the Router Table Crosscut Sled (#9779). If you follow these instructions, you will be amazed at the uniformity of the resulting lattice grid.



Now, we will proceed to the second pass. Raise the router cutter height to exactly 1/2". Referring to the mark you made on each piece showing the cut you made first, take the second cut and place it on the insert of the jig. Orient the piece so the first dado is now over the cutter head and the balance of the length is between the insert and you. Make the second pass on the first dado. Now take this first dado and place it on the "key" of the jig, the second dado over the cutter head and the balance of the piece on the other side of the cutter head away from you. Now proceed with the rest of the cuts on all 16 pieces as you did in the first pass. After this is complete remove the sled from the router table.

We are going to make two more decorative cuts on the pieces. We are going to divide the 16 pieces into two groups of 8 pieces each. We will call them Group A and Group B. We will maintain this designation from here through the assembly of the grid. The first decorative cut we will make will be a 1/8" R round over using Round Over bit (#6350). Set the height of the bit so we get just the round over without a fillet. On the 8 Group A pieces we want to round over the edges on the 3/4" face having the dados. We want to round over both edges the complete length of the piece plus the top edges of each of the dados. On the Group B pieces we will round over the two 30" long edges on the face opposite the dados.

Next, we want to install the 1/8" R Point Cutting Round Over bit (#8731). Again, we want to install it so it makes the round over cut without a fillet. Here we will need the router table fence installed. Set the router table fence 3/8" from the center of the router bit. We want to make this decorative cut on the 30" length of all pieces of groups A and B. We want it down the center of the 3/4" wide face on which we put the 1/8" round over cuts (See Figure 7).

Once we have completed the above there is one more step before assembly. We want to separate out half of the pieces from group A and half from group B. We want to take these pieces and cut each piece into two pieces. One piece we want to have 4 dados and one piece 2 dados. The cuts should be made approximately midway between the dados. This will result in us now having, from each group, 4 pieces 30" long, 4 pieces 20" long and 4 pieces 10 inches long. These lengths will be approximate.

Now, we are ready for assembly of the lattice grids. We can see what the assembled grid looks like, prior to trimming (See Figure 4). Take 2 of the Group A 30" long pieces and place them side by side about 4 inches apart with the dado side up. Then take 2 of the Group B 30" long pieces, with dado side down and perpendicular to the Group A pieces, mate the 2 middle dados with the two middle dados of the Group A pieces. Next, take two of the Group B 20" long pieces and, placing them on either side of the Group B 30" long pieces, mate the two center dados with the next dados on the Group A pieces. Similarly take two of the Group B 10" long

pieces and mate them with the remaining dados on the Group A pieces. Once all of these mating dados are firmly pushed together, flip the assembly over and place 2 of each of the Group A 20" long and 10" long pieces in the remaining dado slots.

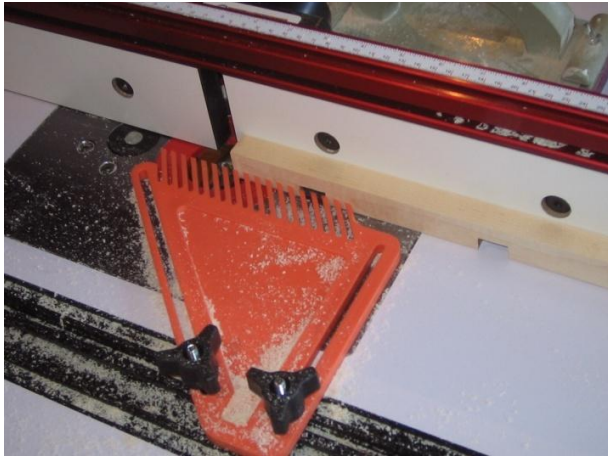


Figure 7



Figure 8

Now, you can either glue this assembly together or screw it together. We chose to screw ours together using 3/4" long #6 wood screws from the back side. Countersink and install a screw at each dado location being very careful not to countersink too deep.

Ready to trim the grid assembly. Here again, we made a jig to help, this time for the table saw (See Figure 8). We used a piece of plywood large enough to firmly hold the lattice grid. We also made a piece of hardwood to fit into the miter slot of the table saw. With this piece of hardwood in the slot, set the plywood on top and aligned almost touching the saw blade. Screw the plywood to the hardwood in the track. Establish a pencil line on the plywood to match exactly the location of the miter slot. Draw a 45-degree line from this line to the saw blade. This 45-degree line should start about a third of the distance up from the base of the plywood. Cut a small plywood block that would be just slightly smaller than the opening in the lattice grid. We made the piece about 4-3/32" x 4-3/32".

We wanted to trim our grids just at the point where the 2 members first touch (See Figure 9). To do this, lower the saw blade below the table top, set the grid on the 45-degree line of the jig and aligned with the point where we want to make the cut just over the saw blade. Then put the small, square piece of plywood inside the opening of the grid (See Figure 9). Mark that position, removed the grid, and fasten the square plywood in place making sure that the edge of that square lay exactly on the 45-degree line established earlier. We then laid the grid back on the jig, pulled the grid away from the blade so the members of the grid were snug against the edges of

the small square closest to the blade, and check to see if the cut is going to be made where we want. Make your cuts by placing the grid openings over the small square of the jig, hold the grid snug against the square as we did earlier and move the jig in the same manner the sled moves on the router table. Make only the cut right next to the small square of the jig. To make the next cut, move the grid on the jig so the next opening on the grid is over the small square of the jig.



Figure 9



Figure 10

The next thing we are going to do is put a border around each grid. Measure the dimension across the grid in both dimensions. You should have a perfect square. We want to prepare 4 pieces of 3/4" thick material, 1" wide and long enough so that we can construct a square with an inside dimension equal to the overall dimension of the grid. We will miter the ends of these pieces at a 45-degree angle. These miters are to be cut across the 3/4" face so that the 1" wide dimension on the border will match the 1" wide dimension of the grid. Now, place these pieces around the grid and with the aid of a Merle clamp glue these pieces together (See Figure 10). While the glue was setting up I installed a 1-1/4" #8 wood screw at each point where the border touched the grid to make sure I had a tight fit.

Now, we want to determine which of the lattice-work assemblies will be the front and also which side of that lattice assembly will be the back. The only determining factor here is the appearance that is most satisfactory to you. Put one more strip of wood on the bottom of this assembly. This will just be a 3/4" thick x 1" wide strip, whose length will be the width of the assembly, and the ends will be cut square. Screw this piece into the bottom of the lattice assembly so that the top to bottom of the assembly will now be 3/4" larger than the side-to-side dimension. Lattice-work assemblies are now done.

Constructing The Top Cabinet Shell

To construct the exterior shell of the Top Cabinet Assembly, we will be using a Half Blind Dovetail Jig (#8706) and the 1/2", 14-degree dovetail bit which comes with the jig (See Figure 11).



Figure 11

This shell will be in the shape of an upside down “U” with square corners. Except for the depth the dimensions of the “U” will be dependent upon the dimensions of the lattice-work assemblies. I made the depth of mine 10”. The top of the “U” will be the top of the cabinet. We want to prepare 3 pieces of 3/4” thick stock for the shell. You can use either a 1” x 12” or join together 2 pieces of 1”x 6” as I did. Use #6065 or #8365 if you don’t already have a biscuit system. Then you should trim the pieces to the 10” wide dimension so that you have nice smooth edges on both sides. For this you can use Flush Trim bit #7804.

Now, we want to measure the overall dimensions of the lattice-work assemblies. That will determine the lengths of the stock we need. Keep in mind that we want the lattice-work assembly to slide inside of the “U”. The lengths for the 2 pieces for the sides of the shell will be the bottom to top dimension of the lattice-work assembly plus the 3/4” stock thickness. The length of the piece for the top of the shell will be the width of the lattice-work assembly plus twice the 3/4” stock thickness. We made our 2 sides about 1/4” longer knowing that we could trim it after the joint was made. The top length is more critical. Once your joints are made you cannot change the resulting inside side-to-side dimension. At this point prepare your stock and proceed to make the “U”. Once you have cut your dovetails, fit your pieces together to see if you have the proper fit and size to match your lattice assembly. Once satisfied with the size, do any trimming necessary and glue the assembly together. Make sure you are gluing these pieces at a 90-degree angle.

After the glue has set up, sand the dovetail joints and the entire exterior to a smooth finish.

Making The Four Tapered Legs

Now, we are going to put aside the top cabinet pieces we have made and go to the Bottom Cabinet assembly. Here we are going to start with the 4 legs. We want the legs to be approximately 27" long overall. We are going to make them from 1-1/2" square stock. We did not have that size stock so we glued together 2 pieces of 3/4" thick material, 1-5/8" wide for each leg and then ran it through the planer to get the final dimensions. The legs are going to be tapered from the bottom up to 8-1/2" from the top. We want the bottom of the legs to be about 3/4" square. The taper is going to be equal on all sides.

We cut these tapers on the table saw with the aid of the #9008 Taper Jig (See Figure 12).



Figure 12



Figure 13

The taper jig was set at 2-degree, supported by the fence on the table saw. After these tapers are cut, sand them smooth. Next, add some decorative cuts as we did on the lattice grid pieces. Put a 1/8"R round-over profile on three edges of the leg the whole length **EXCEPT** for the inside edge. On the inside edge we want to stop the round-over 9" from the top.

After completing these round overs, put a decorative profile on the two outer faces of the leg from the bottom to the top. On the two inside faces, we want to stop the cut at the same point that we stopped the round over previously. We will use the 1/8" R Point Cutting Round Over bit (#8731) as we did on the members of the lattice grids. To make this cut we will use the fence on the router table along with a jig (See Figure 13). The jig is made up of a spacer and a stop fastened together. The thickness of the spacer needs to be such that the center of the leg is held 3/4" away from the fence. The other end of the leg (out of the picture) is the top and is 1-1/2" square so the center of the leg is held 3/4" away from the fence along the whole length. Remember, only 2 faces get the profile cut along the entire length. The other two stop short. Once this is done the legs are finished.



Constructing And Assembling The Bottom Cabinet

Next, make the Exterior Shell of the Bottom Cabinet Assembly, like the Top Cabinet Shell. This will be a “U” with square corners and half blind dovetail joints but in the final assembly will not be upside down. The top cabinet assembly will be 10-1/2” deep when the trim is applied. In the interest of stability, we want the bottom cabinet to be deeper. We made ours 13-3/4” deep. To achieve this depth the shell needs to be 10-3/4” deep. The additional 3 inches will be added during assembly as you will see later. We also wanted it to be wider than the Top Cabinet, strictly for aesthetic purposes. We made ours 25-3/4” wide, which is 3/4” wider than the Top Cabinet. You should make your Bottom Cabinet 3/4” wider than your top. The sides of the Bottom Cabinet we want to be 8-1/2” tall.

Follow the same procedures that you did making the Top Cabinet. After you get the shell constructed and sized, you will want to sand the exterior. Then, you want to add a 1/2” radius round over profile on the dovetail corners where the sides meet the bottom. Use Round Over Bit #6355 or #8655.

Next, we are going to assemble the legs to the front and back edge of the Bottom Shell. For this assembly, refer to Figure 14. We secured each leg to the shell with 3 pocket screws and glue. To make the legs protrude from the cabinet sides, a 5/32” thick spacer was used. The spacer was placed on a flat surface with the shell placed on top of it. Then, the leg was set directly on the flat surface (not on the spacer). Make sure the top of the leg is even with the top of the shell and the non-tapered portion of the leg is flush against the shell. When mounting the legs, make sure the decorative profiles are visible. Apply glue and clamp in place until the glue dries.

Next, extend the bottom edge of the shell on both the front and back (See Figure 15). Notice the additional piece of wood coming out from the leg toward you in the picture below. When we make the front of the Bottom Cabinet next, it will mount to this. We will use 3/4” thick stock. It is sized so that when a 3/4” thick front is mounted to this piece, it will leave the leg protruding past the front, the same 5/32” as it protrudes past the shell on the side. In our case, we made it 11/32” wide. This piece runs between the two legs both the on front and back. Glue and clamp the pieces to the shell.

Now, we are ready to make the front. The front is simply a rectangle face frame made from 3/4” thick pieces 1” wide. It is made to fit side-to-side snugly between the two legs and from the top of the legs to extending 1/8” below the bottom of the shell. Make the sides first, then make the top and bottom pieces to fit snugly between the two side pieces. Glue the face frame together. Once the glue has set up, sand the assembly. Check to see how it fits between the legs. It should be a good tight fit. If necessary you can remove a little off the sides. Apply glue to the bottom

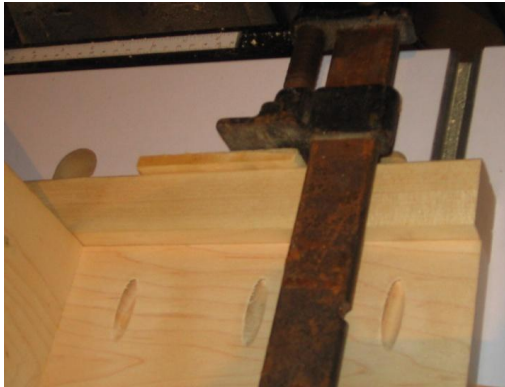


Figure 14



Figure 15

of the shell and the legs. Clamp the face frame in position until the glue dries. Make sure that the top of your front is lined up exactly with the top of the legs. The bottom of the face frame will extend 1/8" above and below the bottom of the cabinet.

Repeat the entire procedure to make a face frame for the back of the cabinet. The only difference is that, after you have glued the face frame, you want to cut a rabbet around the inside of the back of the face that will accept the plywood back that will be installed at the end. You can use Rabbeting bit #5393 or #7693. Make the height of the rabbet to match the thickness of the plywood you will use. Use a corner chisel to square up the corners of the rabbet.

Now, install 2 cleats that will eventually be attached to the Table Top Assembly (See Figure 16). These pieces fit between the front and back legs. Use 3/4" thick material. Make them about 1/32" less than the depth of the shell. In our case that was 10-3/4" long. Make the width of the cleats about 2" wide. Slightly taper the ends of the pieces as you can see in the picture, and cut 1/2" round over profile on the bottom edge of the piece on the face that makes contact with the shell. Screw these 2 pieces to the inside of the shell making sure that they are flush with the top of the shell. Use two 1-1/4" wood screws on each piece. Countersink them, but make sure they don't come through the side of the shell.



Figure 16



Making The Table Top Assembly

We made ours, so that it overhangs the front and sides by 1/2". The back is flush with the back legs. It is made up of one wide 3/4" thick board with an edge band around it so that the end grain does not show. The table top can be made by joining two or more pieces together. It is better to use biscuits when joining these pieces together. Once the glue has dried, sand the table top, so it is flat.

The edge band will also be made of 3/4" thick stock. The edge band will be glued to the two sides and the front, but not on the back. It can be approximately 1" wide. The 2 front corners of the edge band will be miter joined at a 45-degree angle. The back end of the edge band on the sides will be cut square and cut flush with the back edge of the Table Top. Our table top measures 27-1/4" by 14-1/4", so our wide board measures 25-1/4" by 13-1/4". The pieces for the edge banding measure 1" by 14-1/2" (2 pieces) and 1 piece 1" by 27-1/4". These are glued on to the table top without the aid of biscuits. We glued both sides on and then after they set, we glued the front border on. When fitting the front piece of edge bandings, because it's mitered on both ends, cut a little at a time until a good fit is achieved.

On the 2 sides and the front of the table top we will cut a 1/8" R round over profile, on both the top and the bottom edge. The back edge of the table top is left square. Then, as we did on the lattice-work, we will put a point cut round-over profile in the very middle of the 2 sides and the front. This will need to be done on the router table utilizing the fence.

Next, we need to fasten the table top to the two cleats which are temporarily attached to the bottom cabinet. Two screws will be installed through the top of the table top into each cleat. Place the table top on the bottom cabinet centering it from side to side. You can stand the table top on its back edge and make sure the center point is between the cleats. Measure from the back edge of the back leg to a point about 1" onto the cleat. Transfer these measurements to the table top. This establishes a point for one screw into each cleat. The second screw will be placed 7" closer to the front of the table top keeping the same distance from the sides as the first screws. Now, before drilling any holes, take the top shell and put it on the table top, positioning it so that it is centered from side-to-side and as far forward from the back that you want yours to be. Ours sits 5/8" from the back. At this point make sure that the shell is going to cover the screw locations. We are doing this to make sure that the screws will not be seen once the top cabinet is assembled to the table top. Also, try to make sure that the hole locations do not coincide with the screws holding the cleats to the bottom cabinet. As an alternate mounting method if the holes will not be covered by the top shell, you can use pocket holes to attach the cleat to the table top.

Now, clamp the table top in place making sure that it is positioned on the bottom cabinet exactly where we want it to be. Drill the holes for the four screws. Countersink them so they do not



protrude above the top. You want to use screws at least 1-1/2" long. Once the top is secured to the cleats remove the screws that were holding the cleats to the bottom cabinet. The cleats are now secured to the table top. Remove the table top from the bottom cabinet.

Finish Construction And Assembly Of Top Cabinet

The first thing we want to do is cut a rabbet around the inside of the top shell on the back edges of the rear of the cabinet. This is to accept the rear panel. It should measure 1/2" deep by 1/2" wide. Here you can use Rabbeting bit #5393 or 7693 as you did on the back edge of the bottom cabinet. You will end up with a radius in the rabbet where the sides of the shell meet the top. This you can either square up with a chisel or round the corners of the back panel.

We will now attach the top shell to the table top. To do this we want to clamp the front and rear lattice-work panels inside of the shell. You will need 8 small clamps. The reason for clamping these panels to the shell is so the width, at the bottom of the shell will be kept square. Lay the shell down on a flat surface with the back of the shell facing downward. Place spacers underneath the shell to raise it up off the surface the distance that you want the shell to be off-set from the back of the tabletop. Ours was 5/8" as stated earlier. Then place the tabletop against the bottom of the shell, with the top of the tabletop contacting the bottom of the shell. Center it from side to side. You can clamp two cleats, one on each side of the shell, to the tabletop to hold the shell in position. From the underside of the tabletop, you want to put 3 screws through the table top into each side of the "U". These screws should be at least 1-1/2" long and countersunk. We want to check and make sure that the sides of the shell are pulled tight to the table top.

The front trim is going to go around the shell and across the table top. It is actually going to cover the front edges of the shell, the border of the front lattice-work panels and the 3/4" strip we put on the bottom of the front lattice-work panel. The finished dimensions of the trim will be 1-3/4" wide and 1/2" thick. We are going to use Multi-Flute Cutter bit #8834 on the face of this trim to create a decorative multi-flute profile. Measure the outside dimensions of the shell and then cut 4 pieces of 3/4" thick stock, 2" wide. Make the length of 2 pieces the width of the shell, plus 1/2" and add the length of the other 2 pieces (the Height of the shell plus 1/2"). Run all 4 pieces through the thickness planer and the 2" edge to a width of 1-27/32". Take 1 of these pieces and run it through the planer again and reduce the width to 1-25/32. This will be the piece that sits on the table top at the base of the shell. Then, run the pieces through the planer to reduce the thickness of each piece from 3/4" to 1/2". We are going to put a 1/2" diameter Bull Nose on the one edge. Use Bull Nose bit #5462 or #7762. Run all 4 pieces, through the Bull Nose cutter. Make the 3 flute profile cut on the face of the trim using bit #8834 (See Figure 17A). We ran our pieces through this process with the Bull Nose edge face down on the router table (See Figure 17B). Set the center of the cutter to be 1" above the table. This centers the design on the flat

face of the trim. (After completing this process we want to cut them to length to fit the face of our shell).

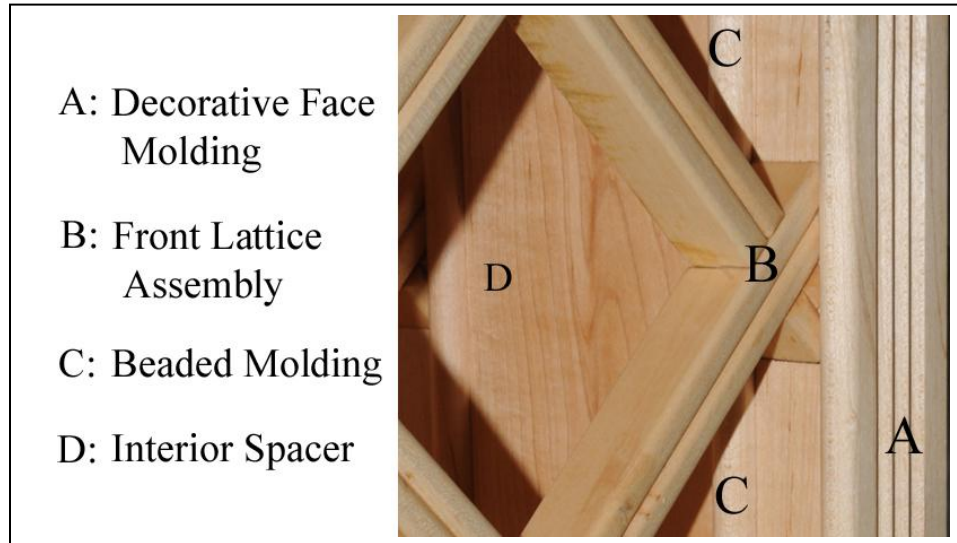


Figure 17A

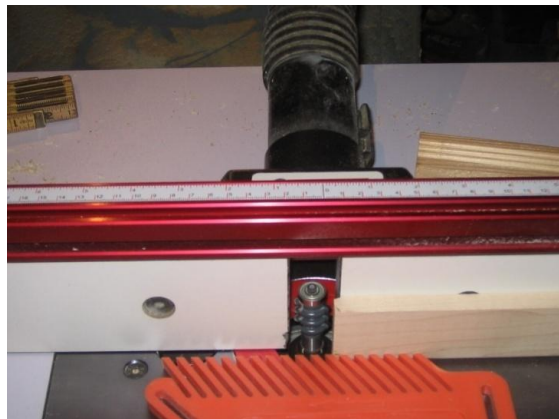


Figure 17B

The corners will be joined with a 45-degree miter joint. Cut the bottom piece (1-25/32" wide) and the top piece 1/8" longer than the outside width of the shell. Cut the two sides 1/16" longer than the distance from the table top to the top of the shell. We want to cut 45-degree miters on both ends of all 4 pieces. You want to trial fit all 4 pieces before gluing. We can use the Merle clamp to clamp them together and glue them. Because the lengths of the sides and the top and bottom are very close make sure you keep track of which is which. Once that assembly is dry we



can glue it to the face of the upper cabinet but we only want to glue the assembly to the edges of the shell at this time. This means that the bottom piece will only be glued at the miter joint. Because we cut the pieces long they should be sticking out about 1/16" past both sides of the shell and the top. Be careful not to glue any of these pieces directly to the table top. Once this glue has dried we can glue the front lattice-work panel in place. You can glue the border of the lattice-work panel to the back side of the trim we just installed. Clamp the lattice-work panel tightly to the trim all the way around and tight to the inside top of the shell.

Once the glue has completely dried, we want to remove the Top Assembly from the Table Top. As a precaution you might want to clamp the back lattice-work panel temporarily in place to hold the sides of the shell solid. Remove the 6 screws that hold the Top Assembly and the Table Top together. Sand the exterior of the shell. Sand the edges of the trim flush with the shell. Then we want to take our 1/2" R round over bit and create a round over profile on the top edges of the "U" as we did on the Bottom Shell.

Now, we can attach the Cabinet Assembly back to the Table Top. Measure from the back of the front lattice-work panel to the edge of the rabbet that we cut in the back of the shell. Cut 3 spacers 3/4" thick x 1-1/2" wide x the length we just measured minus 1/8". Screw these spacers to the table top, on the inside of the shell, with the 1-1/2" face against the table top and flush to the back of the front lattice-work panel to the rear of the cabinet. Place one along each corner where the shell meets the table top and the third midway between them. Make sure that they do not extend into the rabbet cut on the back of the cabinet. These spacers are going to raise the trim we are going to install inside the shell 3/4" above the table top.

Our interior trim is going to be similar to the trim we made for the front of the Top Shell. It will be 1/2" thick but only 1" wide when finished. We need 12 pieces. The finished length of 6 pieces will be the inside width of the shell and the remaining 6 pieces the top of the spacer to the inside top of shell dimension. To start, cut them all the same length, leaving a little longer than the finished length. If you have not already planed them to 1/2" thick then do so now. Set the router and router table fence up as you did for the front trim and run the 1/2" diameter bull nose profile on each piece. These 12 pieces are going to make up 3 beaded moldings, one immediately behind the front lattice-work panel, one directly in front of the rear lattice-work panel and the third directly behind the rear lattice-work panel.

Set aside 8 of these pieces and work with 4, to make the first beaded molding, the one directly behind the front lattice-work panel. Take one piece at a time and cut a 45-degree miter on each end, cutting the miter across the 1" face. The bull nose will be facing the inside of the top shell. Cut each piece to fit precisely and then move on to the next piece. None of the inside trim and linings need to be glued into place as it will all be sandwiched together with pressure from the



back panel of the cabinet. Place the 4 beaded moldings in the top shell from the back, so they are against the back of the lattice-work panel.

Next, make the first interior lattice spacer. This will go right behind the trim we just put in place. This spacer is made using $\frac{3}{4}$ " thick material $4\frac{1}{8}$ " wide and wraps around the inside of the shell with the $4\frac{1}{8}$ " width flat against the walls of the shell. Record the dimensions, side-to-side and top of shell down to top of spacers. Prepare the boards so both edges are smooth.

Miter cut the ends of each board to 45-degree angles. Cut each piece to length with the miter cuts across the $4\frac{1}{8}$ " dimension. Then glue these together in the form of a rectangle with the aid of the Merle clamp. When the glue has dried, remove the Merle clamp and insert the spacer into the top shell. Place it flush against the beaded molding.

Now, with the lattice spacer in place, we want to repeat exactly what we did previously with the beaded molding, using 4 of the remaining 8 pieces of beaded molding stock. Place this against the lattice spacer. Once this is done, find the rear lattice-work panel and slide it into place behind the just installed beaded molding. Then, using the final 4 pieces of beaded molding stock, repeat again making the third beaded molding and place it directly behind the rear lattice-work panel.

Once that is all in place we are ready to make the final rear lattice spacer. To get the width of this spacer, measure from the back side of that last ring of beaded molding to the edge of the rabbet cut in the back of the shell. The width we want to make rear lattice spacer will be this dimension plus about $\frac{1}{32}$ ". This extra $\frac{1}{32}$ " will allow us to put pressure on the inside components when we install the back panel. Now proceed as you did in making the first lattice spacer. This will complete the inside of the Upper Cabinet.

Now, we are going to make the rear panel. Cut a piece of $\frac{1}{4}$ " plywood to fit inside of the rabbet cut in the rear of the shell. Make a layer of what will have the appearance of a beaded panel to mount to the inside surface of the plywood. Cut a bunch of strips out of our $\frac{1}{4}$ " thick stock. They are going to be installed vertically on the plywood so cut them about $\frac{1}{16}$ " shorter than the dimension from top to bottom of the plywood. How many do we need? Here we can be a little flexible. First we need to know how wide we are going to make them. I made mine a finished width of 2". Determine the finished width your pieces are going to be and divide that number into the width of the plywood. Divide that number by 2 and round the result to the next higher whole number. That is the number of $\frac{1}{4}$ " pieces you will need. Cut the slats to the finished width you want.



Set your router table up with the 1/8" radius round over bit and put a round over on the edge of each piece. Once the order of the pieces is decided, you can start gluing them in place being careful that they do not overhang the edges of the plywood.

Once the beaded strips are secured and the glue has dried, you can install it in the rear of the cabinet using screws. Pre drill a hole around the perimeter every 6" and screw it in place. At the bottom of the panel you can put the screws 1-1/8" above the table top. This will screw into the back lining.

The Top Cabinet Assembly is done.

Constructing The Drawer

The drawer consists of the drawer front and the drawer box. The drawer we are making is going to be an inset drawer with a raised panel drawer front. For the drawer slides, we are going to be mating dovetail pieces made of wood.

The first thing we are going to do is make the drawer box. Let us determine the size of the box. We want the width of the box to be 1/4" less than the width of the opening in our cabinet front. The length of the box has to be less than the distance from the back side of the cabinet front to the front of the cabinet back. The height of the box should be about 2" shorter than the height of the opening in the cabinet front. To make the drawer box we are going to use the router table and drawer lock bit #7852 or #5552. Because we are making an inset drawer we will make a flush joint. We will be using the Drawer Lock bit #7852.

Let us first prepare our stock. Because we are making a flush joint the length of the material for the front and back should be equal to the desired width of the box. To determine the length of the pieces for the drawer side from your desired drawer depth, subtract the combined thickness of the front and back. To this measurement, add 3/4" to compensate for the joint overlap on each end.

Cut your stock to length and plane them to the desired thickness. After the joints are cut, dry fit them together to make sure they fit properly. Once you have the proper fit, we want to cut a groove 1/4" wide in all 4 pieces to receive the drawer bottom. Set the router table up with 1/4" diameter straight router bit #5468. Set the fence at least 1/4" from the edge of the bit. Set the height of the bit to 1/4". Then place each piece **inside face** down on the table with the bottom edge against the fence and cut the groove along the full length of both side pieces. On the front and back pieces the groove only runs between the groove cut by the drawer lock bit. Then re-assemble the pieces and determine the length and width of plywood required to fit the bottom.

Then, cut a piece of 1/4" plywood to these dimensions. Slide the bottom in place, reassemble all 4 pieces and proceed to glue and clamp using the Merle clamp.

Now, we are going to make the drawer slides. We are going to cut these, utilizing a 1" diameter 14-degree dovetail bit (# 7694), on the router table using the fence. The drawer slide system consists of a dovetail groove in the sides of the drawer box and dovetail slides on 2 pieces of wood that will become part of the cabinet. First measure the distance from the back of the drawer front and the front of the drawer back. The 2 pieces must be of hardwood. Prepare 2 pieces of 3/4" thick material, 5" wide and the cut to length. The dovetail slide must fit tightly in the cabinet. Set the dovetail bit to a cutting height of 3/8". We are going to cut a small amount at a time making multiple passes on each side of the boards. After making a pass on each side move the fence a little (1/4") and make another pass. Continue doing so until the dovetail measures 2" wide (See Figure 18).



Figure 18

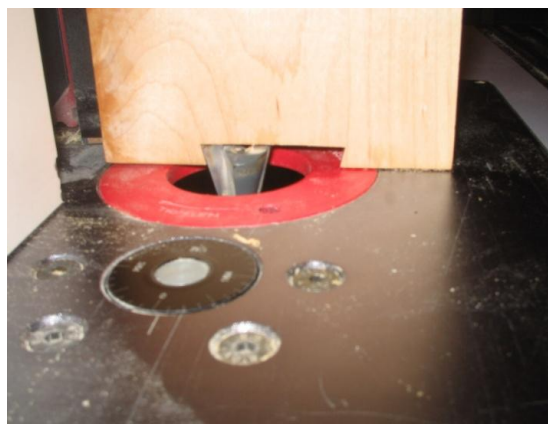


Figure 19

A corresponding dovetail groove gets cut into the sides of the drawer box. Leaving the bit at the same height begin cutting the groove in the drawer box by making the first pass in the very center of the drawer side (See Figure 19). Adjust the fence a little at a time flipping the box direction to make a cut on both sides. As we get close to the 2" width, we want to check the fit with the male dovetail slide. The male dovetail should slide with little effort, but not drag in the drawer side.

The male pieces will not be installed in the cabinet until we make and attach the drawer front to the drawer box.

Making The Raised Panel Drawer Front

Now, we are going to make the Raised Panel Drawer Front. This consists of 5 pieces; 2 stiles, 2 rails and a raised panel. We are using #8842 Double Round Rail and Stile set of bits to cut the Rails and Stiles and #8694 Ogee Fillet Raised Panel bit for the raised panel profile.

First prepare 2 pieces of 3/4" thick stock for the rails to the width you want. Ours was 1-3/8", and the length is equal to the opening in the cabinet front minus 1/8" for drawer inset clearance. Run these two pieces face down, through the "stile" cutter to create the profile and panel slot (See Figure 20). Using a fence mounted featherboard will insure proper pressure is maintained through the entire length of the cut.



Figure 20



Figure 21

Once these two pieces are cut measure the width of both of your faces of the rail. To determine the length of stock you need for the stiles measure the height of the opening in the cabinet front, deduct 1/8" for drawer inset clearance and width of your two rails. Then, add 3/4" for the joinery overlay. Cut your stiles to the length. Make the same cut on these stiles that you did on the rails. Then, set up the router with the "rail" cutter. Put the fence in position with respect to the ball bearing on the bit and make your cuts, face down, across both ends of the stiles (See Figure 21).

To get the width and length of the raised panel dry fit the rails and stiles together to form the frame of the drawer front. Measure the inside dimensions of the opening. Add 3/4" to the length and width measured. Subtract 1/16" from this to allow for expansion and contraction of the raised panel. Cut the raised panel to the finished dimension.

We are going to use decorative Raised Panel bit #8694 to cut the profile on this panel. This bit has a ball bearing guide on it. Adjust your fence flush with the ball bearing guide. Lay your work piece face down on the router table. The thickness of the resulting tongue created on the outside of your panel should end up at 1/4", the width of the grooves in your rail and stiles. Make the profile cut in incremental passes, increasing the bit height gradually between each pass. It is best to make the cuts that are across the grain first in case there is any tear out.

Once that is done you can dry fit the pieces together to make sure that they fit properly (See Figure 22). When fitting this up during the gluing process, make sure that the ends of the rails are flush and square with the sides of the stiles.

Now you are ready to install the handle or knob of your choice to the drawer front. When doing so, make sure that the screw heads are countersunk enough in the back so when we attach the drawer box the screw heads do not interfere. Now attach the drawer front to the drawer box. Center the box on the back of the drawer front both up and down and from side to side. Fasten them together with screws, making sure that your screws are sized so they don't protrude through the front face of the panel.

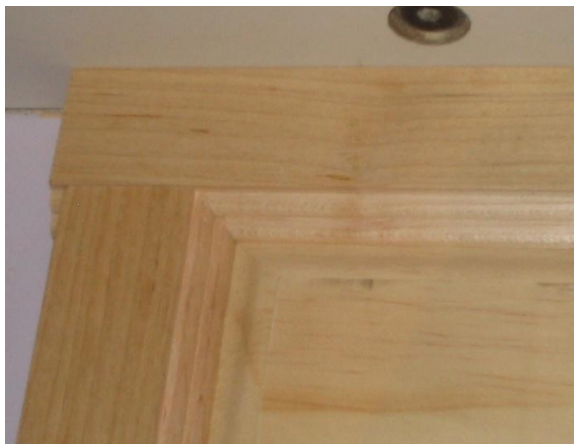


Figure 22



Figure 23



Installing The Drawer Slides

Now, we are ready to install the drawer slides (See Figure 23). As you can see the slide piece fits in between the back of the cabinet front and the cabinet back. Put the slides in place, keeping them raised an inch or so off the bottom of the cabinet. Because we made them fit tightly, they will stay temporarily in place. Use the drawer box to raise or lower the pieces to line up with the female dovetail opening in the drawer box. Slide the drawer in all the way. Now, make any final adjustments to center the drawer front in the opening.

Carefully remove the drawer from the cabinet making sure not to move the slide pieces. Use a pencil to mark the position of the slides in the cabinet. Remove the slides and apply glue to the front and back of the cabinet where the slide will be mounted. Install the slide pieces matching the position we marked. Then, temporarily, slide the drawer back in to make sure the slides are in the right positions. Carefully remove the drawer and let the glue dry. Once the glue has dried, we can put a couple furniture screws into the slide pieces from the rear of the cabinet to reinforce the glue joint.

Once that is done, cut a piece of 1/4" plywood to fit the opening in the back of the cabinet.

Now, you can mount the top assembly to the bottom assembly. You should be able to get your screwdriver to clear the slide pieces and install screws into the cleats in the same holes we originally used to fasten the cleats. Again, make sure that the screws you use are the same length that you originally used to the bottom assembly.

Now, you can put a finish on your project. Tung Oil gives a nice luster and, because of all the detail, does not require sanding in between coats. When you are doing the finishing, because much of the interior trim in the upper cabinet is not glued in place, you can remove the back panel and the interior trim up to and including the second lattice panel and have a much easier time of finishing.

Enjoy your fine piece of furniture that is sure to become a family heirloom.