



Shelf Examination

If you suffer from the anguish of shelf-denial, it's time to build your own bookcase.



Materials:

- White pine - 20' of 1x12, 12' of 1x10, 3' of 1x3, and 3' of 1x4
- Finish nails 1 1/2" or 2"
- Carpenters glue
- Fish glue
- Sandpaper
- Tape

Cut List:

- 2 - 1"x 12"x 48" side pieces
- 3 - 1"x 12"x 46 1/2" back
- 4 - 1"x 10"x 33 1/2" shelves
- 1 - 1"x 3"x 33 1/2" trim piece for the bottom shelf
- 1 - 1"x 4"x 33 1/2" trim for the top at the back

Tools

- Handsaw
- Tape measure
- Pencil
- Carpenter's square
- Router
- Beading and Roman 'ogee' router bits with guide wheel, and a 'V' groove bit without a guide wheel
- Hammer
- Nail set
- Clamps
- French curve or other drawing tool for making curves
- Jig saw with a scrolling blade
- Safety glasses
- Ear protection
- Tiny plane for blind nailing (found in a woodwork specialty shops)

Note: The length of the shelves and trim is determined by width of the three back pieces after gluing the back together. It saves ripping the back ones down if you adjust the length of the shelves and trim instead.

Buy kiln dried lumber if at all possible. When pine is wet it shrinks in width slightly as it dries, leaving unsightly gaps. If a more rustic look is desired, then wood that isn't dry works fine. Leaving wood clamped flat in a warm dry environment for six months to one year would also allow it to dry. Kiln dried (also called kd) costs more but is always better for decorative and finish work.

In any case, the wood should be stacked flat and clamped together until you cut it and put the bookshelf together. Wide boards can warp and cup with surprising speed (like overnight!).

Steps:



Lay the boards flat and clamp them together until used



Glue and clamp together the three pieces for the back

Cut the three boards for the back to a length of 48". Glue and clamp them together. Be sure that the ends line up well. If they don't line up easily, choose one end for the top and make it as even and perfect as possible. The top trim will sit on that edge and will show any deviation.

Let the glue cure overnight.

Measure the width of finished back piece and cut the shelves and the bottom trim to that dimension.

Don't cut the top trim until after the shelves are put together.



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Draw the desired curve for the sides using a French curve



Cut out the shape with a jig saw and scrolling blade



Look for any imperfections in the cut



Sand out the rough spots

On each of the 48" long sidepieces, draw a curved line to give the bookshelf some character. Use a bowl, a French curve, or other drawing tools to help transfer the desired curve onto the wood. Be sure to start right up at one corner so you don't lose any length on the board. Use the jig saw fitted with a scrolling blade to cut to the line.

Don't force the blade through the wood any faster than it wants to go. Any dips and bumps will transfer to the router, so they must be sanded down. Use a palm sander or sand paper on a small block to take out any imperfections. Repeat on the second side piece.



Plunge router with beading bit



With a beading bit, rout the edge of the side pieces and the front edges of the shelves

Rout the edge of the curved sides with a beading router bit. Read all the instructions and be sure to unplug the router when changing or adjusting bits. Each router is different, so please do read the instructions, or take a course in using a router if you want to be a star routerperson.

Test the depth of the router bit on a scrap piece of wood to be sure it will give you the pattern you want. If you haven't used a router much, practice on curved pieces of wood until you get a feel for it. Books on router techniques are also very helpful.



Use a non-skid mat or clamp the wood to the table so that it won't move under pressure while routing. Start the router and move it into the wood at the edge. Move the router counter-clockwise on the outside edge or clockwise on an interior cut (like a hole or window in a piece). Also, most beginners don't usually move fast enough and the bit may burn the wood. Don't be shy, just move through the wood. If you feel you've missed a spot or the router slipped away from the surface, you can always go back and run the router over the same surface again to clean it up.

Route the edge of the second sidepiece and the front edges of three of the shelves with the beading bit. Then sand the edges and the surface before finishing. Because pine is quite fibrous, the end-grain is often a bit hairy after routing, and needs a good sanding.



Set up a guide fence on either side of the router for the 'V' groove



Test for depth and rout a groove along each joint on the back



Choose a bit for the trim and rout an edge on the bottom trim piece

Route a 'V' groove in the back at the joint where the boards are glued together. You will have to make a guiding 'fence' for the router, because otherwise you'll be all over the place with the router.

Place the router in the correct position over the glued joint. Then clamp two straight boards in place on either side of the router so it is held firmly in place. The boards should hold the router so it moves in a straight line, but not so tight that the router binds on the boards.

Unplug the router and install the 'V' groove bit. Set the depth and test on a scrap piece of wood. When satisfied, cut 'V' grooves along the two joints from top to bottom and sand the groove if necessary.

Route a decorative edge on the bottom trim piece as well. A Roman 'ogee' bit with a guide wheel should do the job.





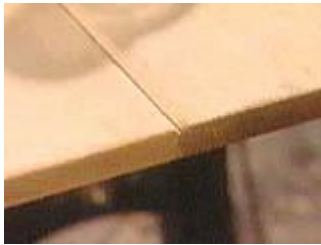
Apply a water based aniline stain with a brush



Control the depth of the color with additional water



Wipe off excess with a rag



For less color on end grain (left) spray with water first

Apply a finish to all the pieces using aniline stains available from [Lee Valley - Aniline Water Stains](#).

Mix the powdered stain in water according to directions, and brush on. Wipe off the stain with a clean damp rag (be careful not to use a coloured rag that will bleed dye onto your work!). Use a spray bottle filled with water to control the depth of the finished color. Either spray it on to dilute the aniline pigment, or even the colour up after brushing it on. You can also spray the wood first to prevent the color from being absorbed too quickly. Spraying with water first works particularly well on the end-grain where the color is absorbed very quickly and is hard to remove.

After staining the wood, apply a water based clear coat to protect the surface if desired.



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After staining, clamp the side pieces and shelves in place



Use two clamps together if one is not long enough

Lay the back on a flat solid surface, stand the sides up with a shelf or two in between them and clamp them in place. This can be pure hell if you're working alone. Phone a friend!

Line up the sidepieces with the back while the pieces are lightly clamped. When you're happy with the alignment, tighten the clamps to secure everything in place.

Note: If your clamps tend to mar the surface of the wood, use a wood block or shim between the finished wood and the clamp.

Put each of the shelves in place.



Square the shelves to the back



Shelves squared, clamped and ready for nailing

Measure the space between the shelves using the books you intend to use on them. Eleven or twelve inches between shelves usually works well. Make an unobtrusive mark and set the shelves in place.

When they are all in place, go back to the bottom shelf. Square it to the back and tack it in place with a nail. Use a 'blind nailing' technique or finish nails and a nail set. Use three nails per shelf on each side, and one nail every ten to twelve inches along the back of each shelf to support the weight of the books.



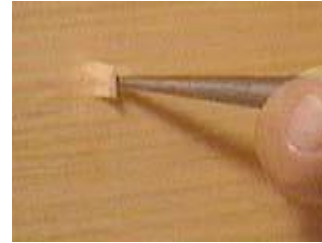
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For blind nailing, use a tiny plane



Lift a shaving of wood in the place where the nail goes



Drive a finish nail into the spot and set it a bit deeper than the wood surface using a nail set



Glue the shaving back in place with high-tack fish glue



Use tape to hold it in place while it dries

Blind nailing is a technique of lifting a sliver of wood using a tiny plane and driving a finish nail under it. The sliver of wood is then glued down again using fish glue, which doesn't stain the surrounding wood. If done correctly, this technique can be quite unobtrusive. However, it takes a bit of practice to make it work well. Blind-nailing kits are available in Canada from [Lee Valley - Invisible Nailing Kit](#).

If you don't care to go to the trouble of blind-nailing, then simply 'setting' finish nails is much easier. To set a finish nail, you sink it a little deeper than the surface of the wood using a nail set, and then fill the resulting pockmark with wood filler. When using wood filler, be sure to do it after applying the color and clear coat to your bookshelf. That way you can accurately match the shade of the finished wood with the correct colour of wood filler.

Pigmented oil based wood filler is Mag's favourite filler. There are many available colors which can be further mixed together to obtain the perfect shade. An added benefit is that, because they are oil based, they don't shrink and fall out of the holes. A final oil or water based clear coat over the filler helps to hide the spot even more.



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Carving on the top trim with a 'v' carving tool



Finished trim at the top on the back with Victorian carving

When the bookshelf is all together, stand it up on the floor. Measure the space at the top both for length and depth. Transfer those dimensions to a 1" x 4" piece of pine. Draw out the shape of the top, fitting it within the sides. The ends of the top trim piece should be the same height where they meet the top of the sides. You can use the three-hump model Mag chose for her trim piece, or any other wavy shape you like.

Cut out the shape using the jigsaw and employ the same router bit you used on the bottom trim in order to shape the edge. Cut the board to the correct length, put a finish on it and attach it to the top. Fit it as tightly as you can because this is the first joint everyone will see. Use carpenters glue on the touching surfaces and finish nails in the ends.

Use a 'v' groove mini-carving tool to cut a decorative shape in the top center space. Patterns can be found in Victorian pattern books. Be sure your carving tool is very sharp. Pine can be persnickety because the grain is coarse, but a sharp tool will make it easy.

Now proudly display your bookshelf. With a shelf-concept like this, you don't even need books to feel good about your shelf.

