Wine rack

Materials:

- Bronze (or copper, brass, aluminum, fiberglass) bug screen (available from wire goods supply places, or home centers) - you need a piece at least 30" x 63"
- 10' of 5/8" polycarbonate tubing (available from a plastics supply house)
- 14" of 3/8" dowelling
- Scrap lumber for jigs
- Rubbing alcohol
- Brass hardware - 40 sets of acorn nuts,
- 1" machine screws, washers
- 8 brass grommets
- Silk tassels or whatever you like to decorate finished rack

Tools

- Clamps
- Rotary knife
- Straight edge (long board)
- Safety glasses
- Putty knife
- Rolling pin
- Saw
- Permanent marker
- Drill bits designed for drilling into plastic; one small, and one that is large enough to match the diameter of your brass machine screws
- Drill
- Hammer
- Binder clips
- Grommet tools - punch, set and block
- Awl, ice pick or

- Phillips screwdriver with diameter that matches your hardware
- Rag
- Hex head driver
- Slot head screwdriver

Steps:

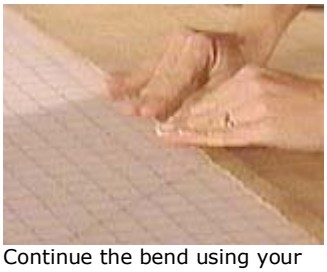

Rotary knife


For a cutting surface, use a plastic fabric-cutting mat or a piece of plywood


Use a piece of wood or other straight edge as a guide for the rotary knife

Using a rotary knife, cut two pieces of screen measuring 14 ½" x 63". To make sure you get a nice even line with your knife, use a straight edge as a guide.


Use a putty knife and the straight edge to bend the screen up


Continue the bend using your fingers


Press it down again using the putty knife


Use a rolling pin to burnish the crease

Use a putty knife to bend the screen up ¾" at each edge. Then make a hard crease in the screen with the putty knife. Give it a final pressing with a rolling pin. Repeat these steps again so you have a double fold.

Cut the polycarbonate tubing to length with a fine-toothed saw

Polycarbnate tubing is more flexible than other types of tubing (i.e. acrylic)

Cut ten 1' pieces of polycarbonate tubing, using a fine-toothed saw.

Build a 90 degree wooden jig

Measure and mark the jig at the drill points

Use the jig to mark the tube

Make an L-shaped jig by nailing together two 14" pieces of trim lumber.

Place marks along the top edge of the jig at ½", 4", 8" and 11 ½".

Lay the first tube in the jig. Draw a straight line along one edge of the tube by setting a permanent marker against the bottom edge of the jig and dragging it along the tube. This will give you a nice straight line to drill holes into, so that all the holes line up in the same plane.

Using the same jig, make marks on the tube corresponding with the marks you made on the jig - at ½", 4", 8" and 11 ½".

Slide a tightly fitting dowel into the hollow tube

Drill holes in the ends of the dowel and nail them down to make a clamp

Insert a 14" piece of 3/8" dowel into the 5/8" tube.

Drill holes in each end of the dowel where it sticks out of the tube.


Nailing the dowel and tube down stabilizes the tube for drilling


Drilling holes in plastic requires a special drill bit


Start with a small bit and increase to the desired size


After drilling, use a hammer to pry the tube and doweling up

Nail the dowel through the drilled holes to a scrap piece of lumber. Now the tube is snug and stable so you can drill the holes without it rolling.

Using a drill bit specially designed for drilling into plastic, and keeping the drill as vertical as possible, drill holes at the marks. The drill bit goes through wood just as easily as plastic, so your piece of dowelling won't be a problem. Drill the holes with a smaller bit. Once that's done, ream each hole with the larger bit so it will fit your hardware.

Repeat the above steps until you have holes drilled in all 10 tube pieces.


Square the two pieces of bug screen and clip them together with binder clips


Mark for the grommets

Lay out the 2 hemmed pieces of bug screen, one on top of the other. Square them. Clip the edges together with binder clips.

Mark for grommets, measuring down ½" from the top edge and ½" up from the bottom edge. Draw marks that echo the placement of the holes you've just drilled in all the tubes - at the ½", 4", 8" and

11 ½" points (the two outside grommets will have to be set in a little deeper than ½" so that the grommet punches through as many layers of the folded screen as possible.)

Put 4 grommets along the top edge, and 4 along the bottom edge.


Place the punch over the mark and strike it with a hammer until it has pierced all layers of screen


Push the male half of the grommet through from the bottom and place it on the seat


Insert the setting tool and strike with a hammer


Place the female grommet piece on top


Finished grommet

To make a grommet, follow these steps.

Put a piece of scrap lumber under the marked screen.
Place the "punch" over one of the marks.
Punch through the layers of screen by striking the punch with a hammer.
When you feel the punch bite into the scrap wood, you are all the way through.
Remove the punch and insert a "male" grommet piece up through the hole; place a "female" grommet piece on top.
Place the "block" under the grommet assembly.
Place the "set" in the top opening of the male grommet.
Whack it several times with a hammer.
Remove the set; if it's stuck, pry it loose with a small screwdriver.

Mark screen with marker for placement of tubes and holes

Push an awl through the screen and into the drill holes on the wooden jig

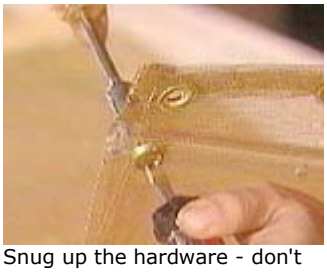
On the bug screen, mark for placement of the tubes, and also for where the screen needs to have holes that match the holes in each tube.

The first tube goes 2" down from the top, then tubes follow ever 6 ¼". The final tube is 2" up from the bottom.

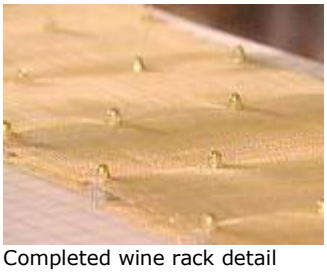
Make the process simpler by using the piece of scrap lumber that you used for drilling holes through the tubes. On the scrap lumber, draw a thick line that passes through the center of the four drill holes. Then slide it underneath the screen material.

Use an awl (or ice pick or Phillips screwdriver) to push through the screen at each mark, gently pushing individual wires aside to give you an opening large enough to pass your brass hardware through.

Slide the tube in between the layers of screen, line up the holes and install the hardware



Snug up the hardware - don't over-tighten



Completed wine rack detail

Completed wine rack with a bottle