

Patrol Box Plans

by David J. Yarusso

Troop 609

Materials List:

1. One 4'x8' sheet of ½" thick cabinet grade (birch or oak) or AC plywood. If using AC grade, use the A grade surface on the outside for a clean paint finish.
2. Four 2"x3" (nominal; actual dimension is 1 ½" x 2 ½") pine, 4' long. (I was able to find 2"x3"s at my local lumber yard but if you can't, you will have to buy 2"x4"s and rip them to 2 ½" width. You will also want about an extra 4' of this material for making a guide jig.
3. One 2"x4" pine, 3' long.
4. Stainless steel decking screws, 1 ½", 1", and ¾" long.
5. One piano hinge that can be cut to 27" long and associated mounting screws.
6. One bolt throw latch small enough so that the bolt receiver can be mounted on the edge of the ½" plywood.
7. Two drop-front desk supports and associated mounting screws. Get detailed instructions on mounting these. The spacing of the mounting points relative to the hinge is critical. If mounted incorrectly, the front will not operate.

Cutting the box pieces:

You will need to use a panel saw (or a circular saw with a cutting guide) to make these cuts as the straightness of the edges is very important for the assembly of the boxes. As the pieces get small enough, you may want to use a table saw. Refer to the cutting diagram to understand the directions below.

1. Make the 17" rip cut along the length of the 4'x8' sheet of ½ inch plywood from which will come the pieces for the back, front, and two sides.
2. Crosscut this long piece to get the pieces for the back, front, and two sides. Measure for each cut. Don't mark it all ahead of time or you will end up short due to the thickness of the saw blade.
3. Cut the remaining large piece at 28 ½" from one end.
4. Make the 16" rip cut to form the top.
5. Rip remaining small piece to four 3 ½" wide strips for drawer front, back, and sides.
6. Trim these to length (2 pieces at 14", 2 pieces at 13 ¾").
7. Make the 15" rip cut from which the bottom, divider, and drawer bottom will come.
8. Crosscut these to specified dimensions.
9. Make the 15" rip cut from the remaining section of plywood for the two shelf pieces.
10. Cut off the two shelf pieces to length.

11. Rip remaining section to 8" for bracket sides.
12. Cut these pieces to length.
13. Using waste sections of plywood, cut six pieces, 1" x 14" to use for shelf supports.

Cutting legs and parts for leg brackets:

If you have 2x3 stock, cut legs according to diagram. If you are starting from 2x4 stock, you need to rip them to 2 1/2" wide and then make the cuts as shown. Save the triangular cutoffs for the bracket construction. Cut four additional pieces of this 2 1/2" wide stock about 1' long to be used for assembly jig construction. Cut the ends of two of these pieces to match the top end of the leg, which fits into the bracket.

Cut the remaining pieces for the bracket blocks from the 2x4 stock according to the diagram. Either a hand saw or a band saw can be used to make the angled cuts on the ends of the leg pieces. Save the triangular cutoffs from the ends.

After you have cut off the triangular pieces, you will need to run the leg pieces through a thickness planer or over a jointer to reduce the thickness by about 1/16" from the original 1 1/2" so that the legs slip easily into the brackets without binding. Do not plane the blocks used to construct the bracket and do not plane the board before cutting off the triangular piece since you will use it to make the side bracket.

Main Box Assembly:

All of the joining of plywood pieces will be done with countersunk 1" screws. You need to line up the two pieces to be joined, drill a pilot hole with a bit which is the same diameter as the shaft of the screw (smaller than the threads) through the first piece of plywood and into the edge of the second as deep as the length of the screw. Then use a bit which is slightly larger than the threads of the screw (but smaller than the head) to widen the hole in the first piece (with this piece removed from the second piece). Finally, use a countersink bit to create a pocket to allow the screw head to be slightly recessed below the surface of the plywood. Then you can join them with a screwdriver. A cordless power screwdriver will save a lot of wear and tear on your wrist.

1. Mark off 1/2" strip down back edge of the insides of the two side pieces. This is where the back will attach. Mount the drawer and shelf support strips in the appropriate places taking care to avoid interference in the marked off regions. Measure down from the top of each piece. You will need to use screws which are about 3/4" long for this step and don't countersink too far so the screws don't protrude through the side. It is easier to do this before the box is assembled. About three screws along the length of the strip should be sufficient.
2. Mount the shelf and drawer support strips on the center divider piece at the appropriate locations. Measure down from the top of the piece so the measurements are the same as those used on the side pieces. Be careful not to put the screws in the exact opposite locations when mounting the strips on the two sides of this piece.
3. Join the bottom to the back using 4 screws. Note that the back piece covers the edge of the bottom piece.

4. Join the two sides of the box to the back and bottom using 3 screws on each joint. Note that the side pieces cover the edges of the back and bottom.
5. Measure and mark on the outside of the back and bottom for the proper location of the center divider. Mount the center divider by drilling and screwing through the bottom and the back with two screws in the back and one in the top.
6. Join the top to the box with three screws into the top edge of each side piece and four screws into the top edge of the back and one screw into the top of the center divider.
7. The shelves on the right will simply rest on the shelf supports so they can be removed. Check their fit and adjust if necessary.

Assembly of Side Brackets:

1. Mark the space for the handhold in the outside bracket cover. Drill ½” diameter holes at the corners with the outside edges of those holes just touching the lines forming the boundaries of the handhold. Insert a jigsaw into one of the holes and cut along the lines to remove the waste piece.
2. Make a guide jig by cutting a piece of scrap plywood the same size as the outside bracket cover. Mark this piece showing the locations of the rectangular and triangular blocks according to the Bracket detail diagram. Use screws or glue to mount the four 1’ pieces of 2x3 stock in the places where the legs will go into the bracket. The two pieces you cut to match the shapes of the tops of the legs should be fitted together as the legs will when the box is standing up and the other two are just lying parallel to one another (with a 1/8” gap between them) as the legs will when they are being used to carry the box.
3. Mark desired locations for the screws to mount the bracket cover to the blocks. I used two screws in each of the rectangular blocks, two in each of the large triangular blocks, and one in each of the small triangular blocks. Drill holes in these locations with a bit slightly larger than the threads of the 1 ½” screws.
4. Arrange four triangular and two rectangular pieces of block material in the guide jig, fitting them around the mounted pieces taking up the space where the legs will fit. Don’t fit the bottom two triangular pieces too tightly. You want the legs to slip in and out easily.
5. Place the outside bracket cover piece over these arranged blocks and align it.
6. Attach the cover piece to the blocks with 1 ½” screws. You do not need to drill pilot holes for these. The screws can be driven directly into the relatively soft pine blocks with a power screwdriver.
7. You should now be able to lift the bracket cover piece with the blocks attached to it.
8. You will attach this piece to the side of the box after the box and the bracket piece have been painted.

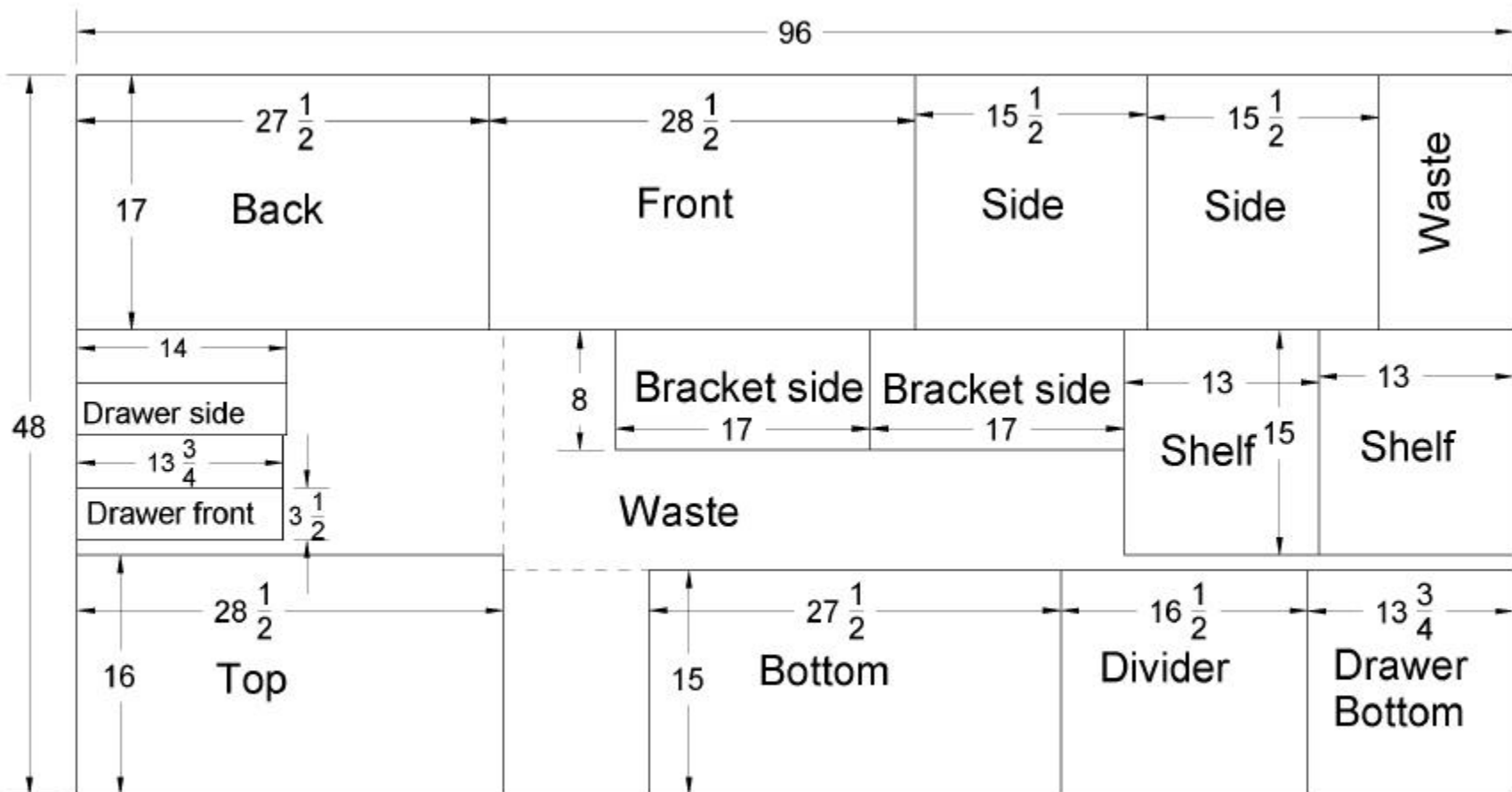
Assembly of Drawer:

1. Drill a 1 inch diameter hole in the front piece to use as a finger pull. A brace and bit can be used for this purpose.

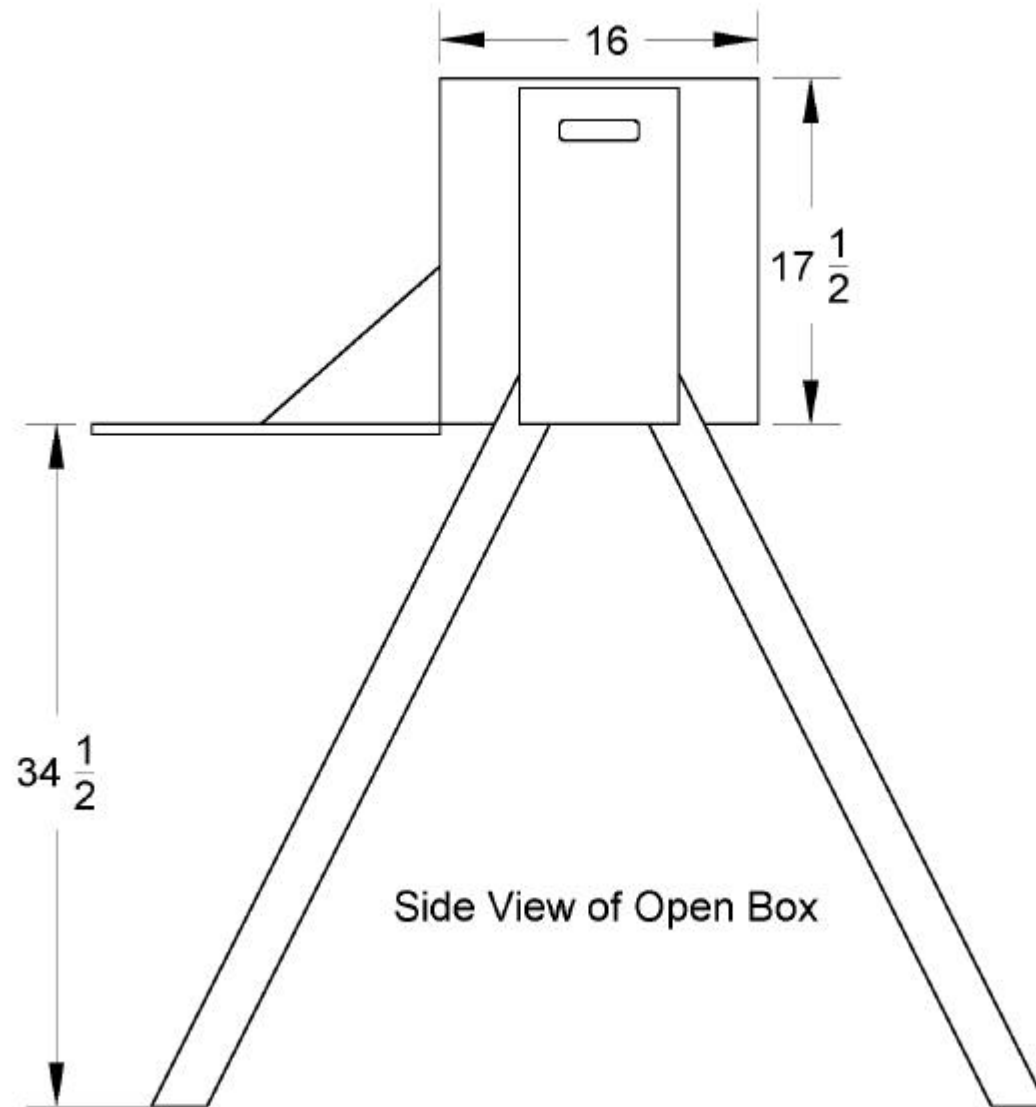
2. Drill and screw through the bottom into the drawer sides with three screws along each edge. Note that the front and back pieces cover the edges of the side pieces.
3. Drill and screw to join front and back to two sides with one screw in each joint near the top.

Finishing the Box:

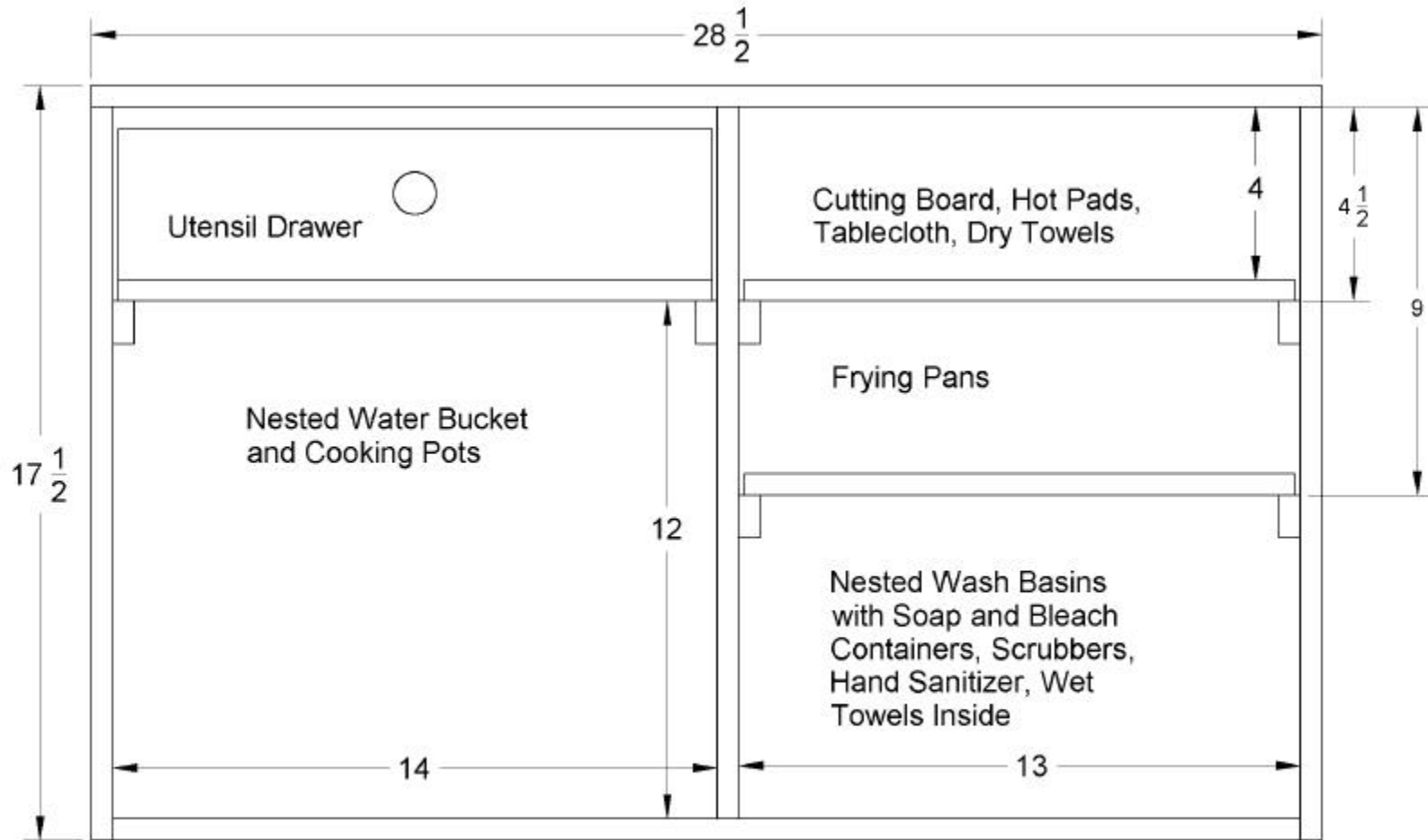
1. Apply two coats of marine grade polyurethane varnish to the inside surfaces of the box and to the inside and outside of the utensil drawer.
2. Apply two coats of marine grade polyurethane varnish to the legs. Avoid any large blobs, which will make it difficult to insert the legs in the brackets.
3. Apply one coat of exterior primer and two coats of floor and porch enamel to the outside surfaces of the box, to the entire front door piece, and to the inside and outside surfaces of the side brackets.
4. After the finishes have dried, mount the side brackets to the box with the bottom of the plywood sides flush with the bottom of the box and with the side brackets centered on the box. Use 1 ½” screws driven from the inside of the box into the 2” stock pieces. A drilling jig made from a piece of scrap plywood is useful here to make sure the holes are placed in the right locations so they hit the blocks and don't protrude into the spaces where the legs need to go.
5. Mount the front door to the box bottom with the piano hinge (cut to 27” length). You want to attach the hinge leaves to the bottom of the box and the inside surface of the front door as shown in the hinge detail drawing. The screws will probably extend through the opposite side of the plywood and you will have to file off the excess until the screw is flush with the surface. It will be unavoidable to scuff the finish. You will touch this up later.
6. Mount the drop front stop mechanism. The positioning of the points must be very precise for these to work. Get detailed directions from your source of this hardware. Again the mounting screws will probably extend through the plywood. File off the excess until flush.
7. Mount the bolt throw latch on the front door with the catch mounted on the edge of the top piece. File off screws, which will probably protrude through the drop front door.
8. Touch up the finish where the screws have been filed off.
9. Paint on your patrol name and emblem and use your patrol box proudly!



Cutting Diagram for 4'x8' sheet of 1/2" plywood

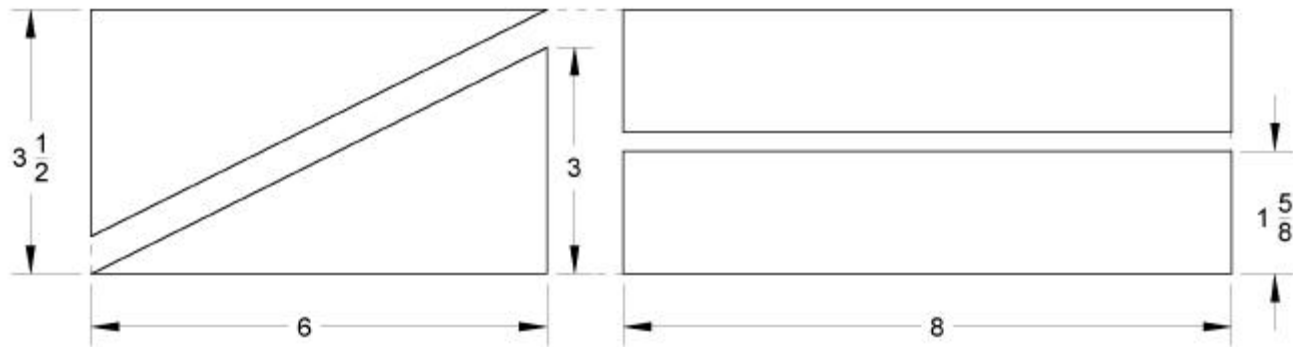


Side View of Open Box

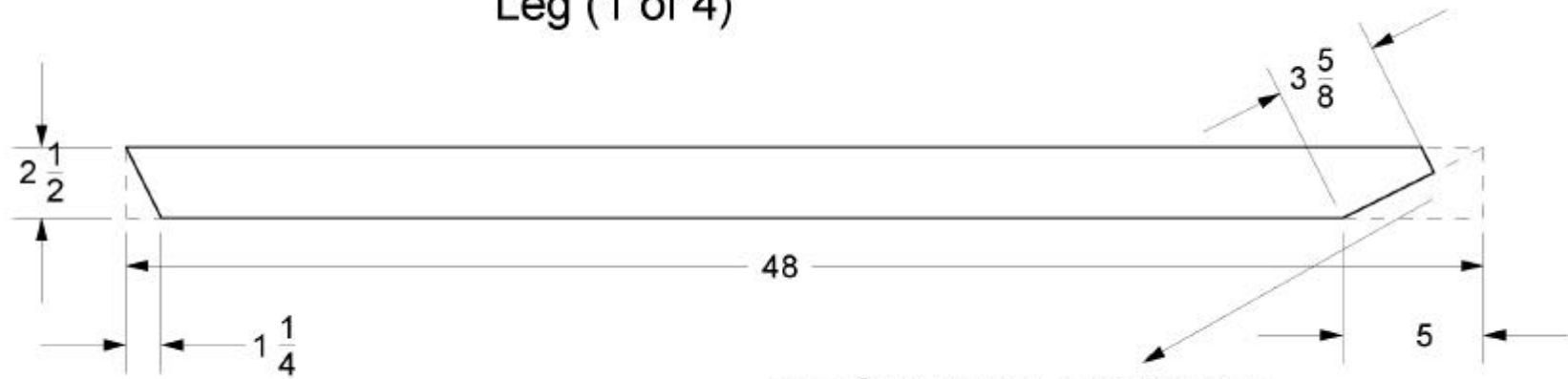


Front View of Open Box

Bracket blocks from 2x4 stock

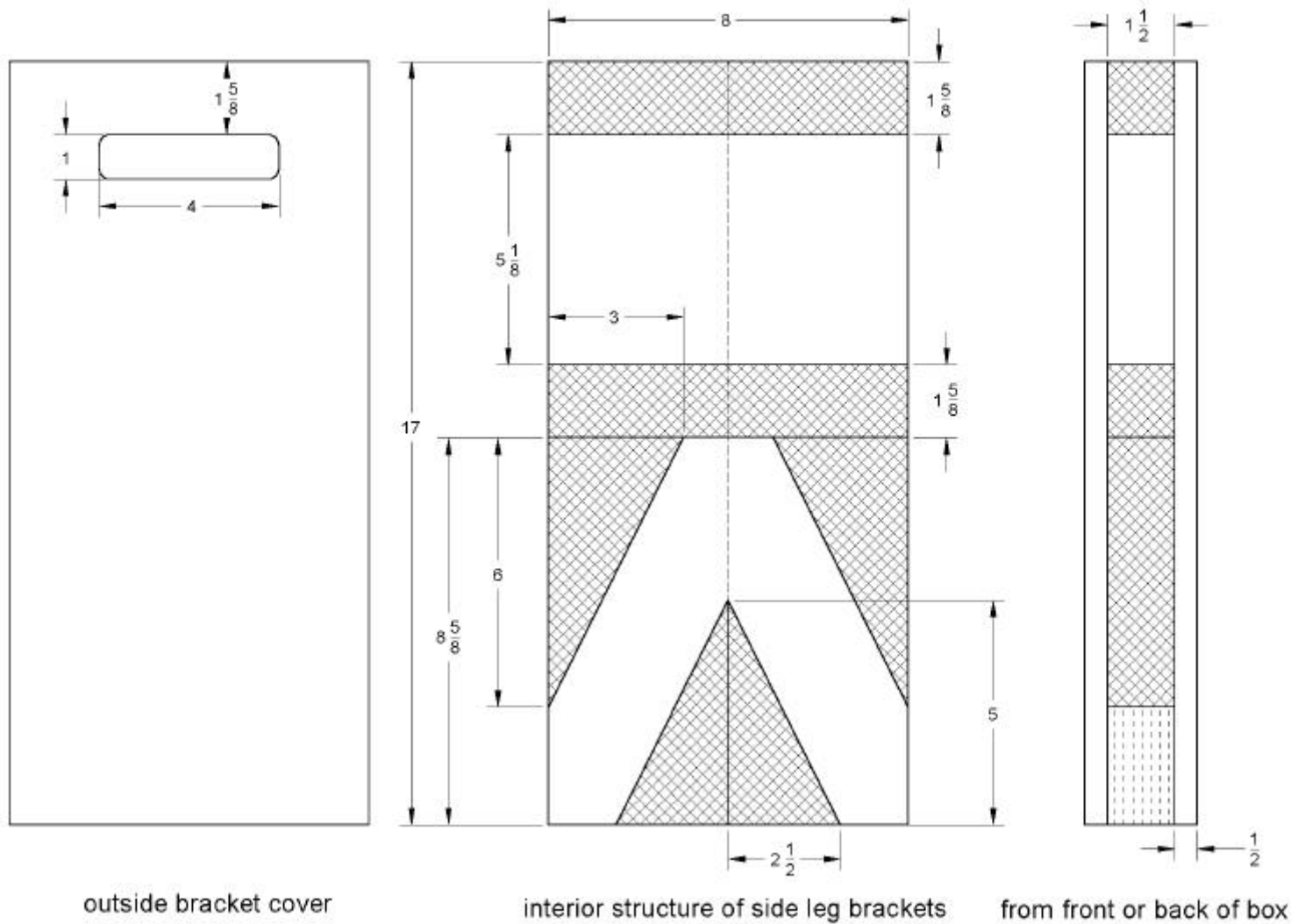


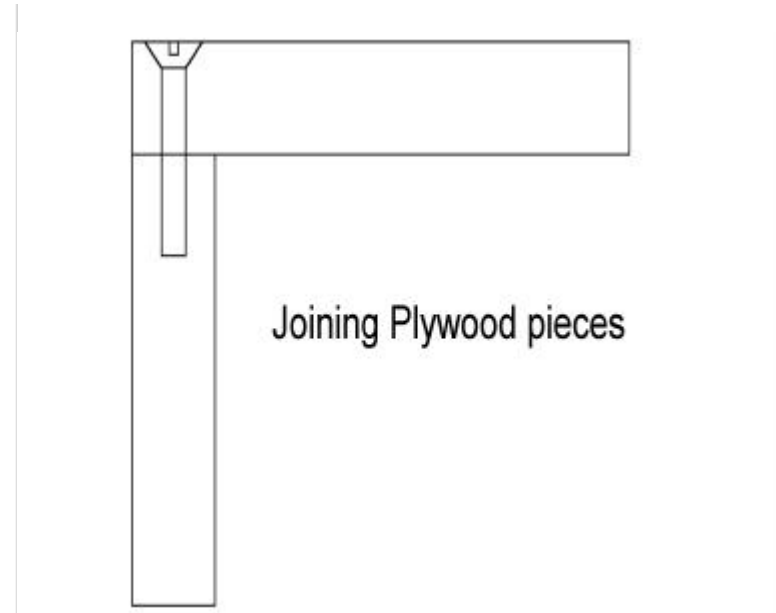
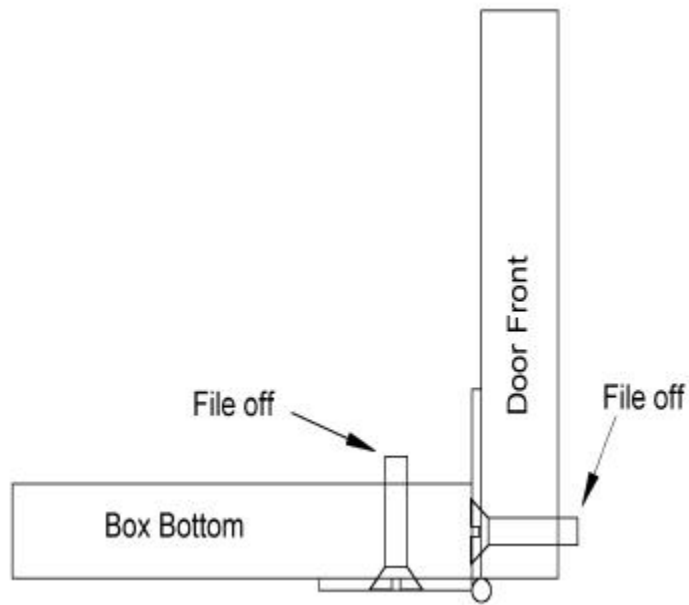
Leg (1 of 4)



Use for bracket construction.

Bracket Detail





Door Attachment