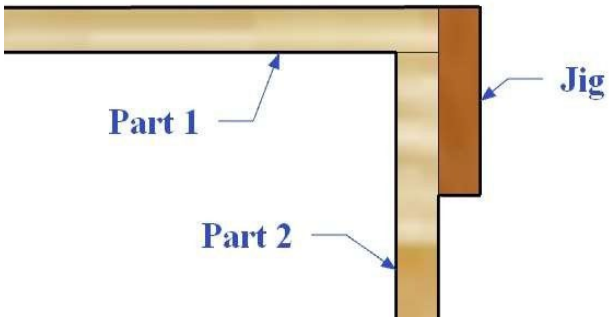
TSQ1845 Enclosure

Design by Bill Fitzmaurice

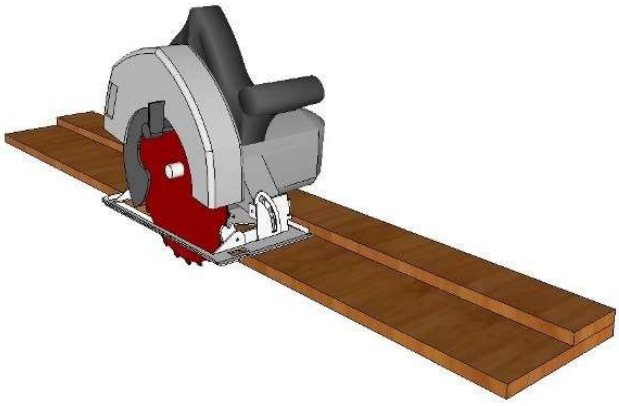
This enclosure is designed specifically for use with the TSQ 1845 subwoofer. It realizes the maximum performance from the smallest and lightest cabinet possible. The material for construction is 12mm (½ inch) plywood with no less than five plies. Preferred varieties are Baltic Birch and Italian Poplar. The extensive bracing results in a cabinet lighter than one constructed of 18mm plywood, while being as structurally sound as one made from 24mm.

All joints are secured with woodworking glue and fasteners. Appropriate fasteners include cabinet screws, piloted and counter-sunk, and 18 gauge brads, installed with a pneumatic gun. For perfect corner joints use a 50mm wide 50cm long scrap plywood jig. Clamp or screw the jig to part 2. Apply adhesive to the joint, clamp or screw the jig to part 1 to pull the joint into alignment, fasten the joint between parts 1 and 2. After fastening remove the jig, so it doesn't get glued to the cabinet.

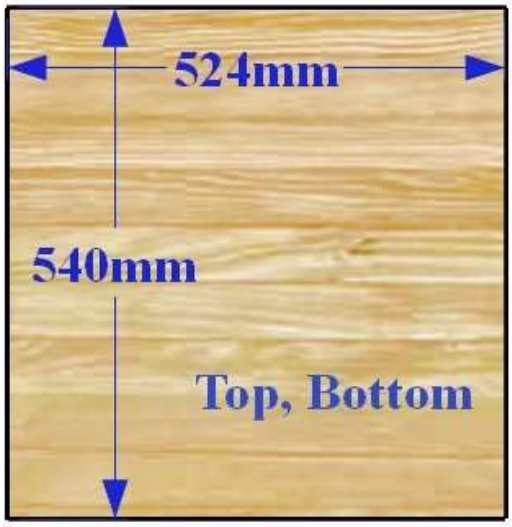


Perfect corner joints using plywood jig

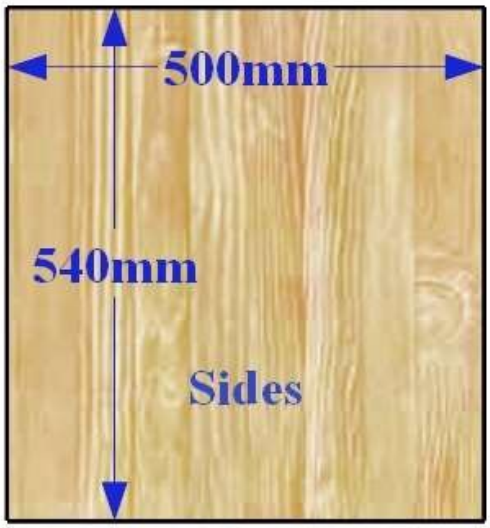
Straight cuts with a circular saw are easy with a saw sled. Cut two pieces of 12mm plywood, one about 20cm wide, the other about 5cm wide. Screw the two pieces together as shown. Run the saw the length of the sled, the shoe tight to the top piece, cutting off the excess from the lower piece. Place the sled edge at the cut line and the saw will cut exactly along that line. Screw or clamp the sled to the cut piece to hold it secure when making the cut.



Cut the top, bottom and sides.



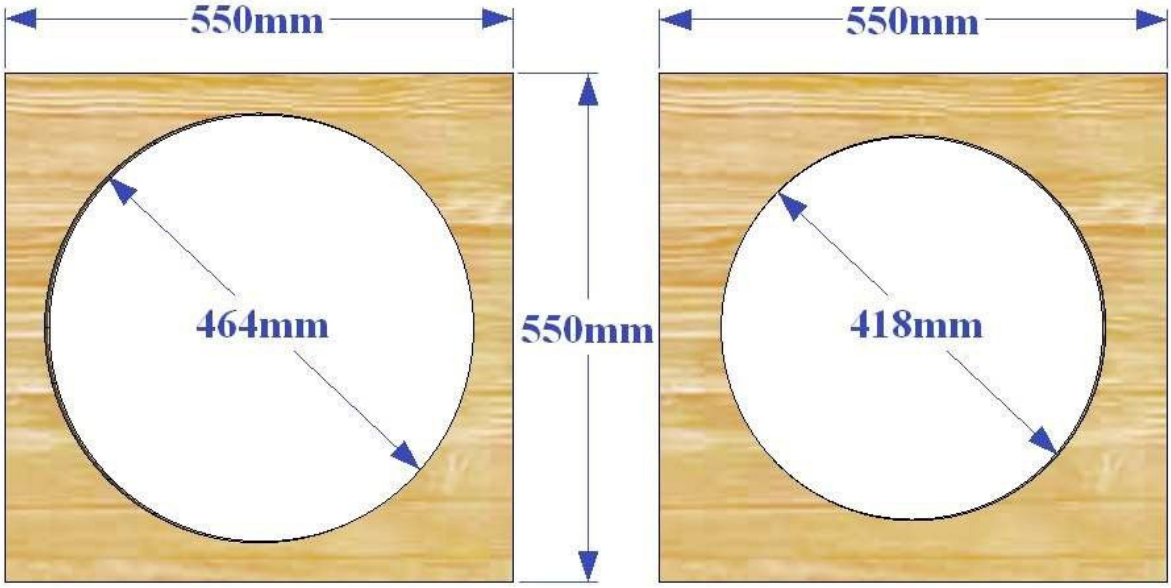
Top, Bottom



Sides

Assemble the top, bottom and sides. The top and bottom overlap the sides, so that the box dimension is 524mm x 524mm, 540mm deep.

Cut the outer and inner baffles, sized identically save for the diameter of the driver holes. Cut the holes, centered.



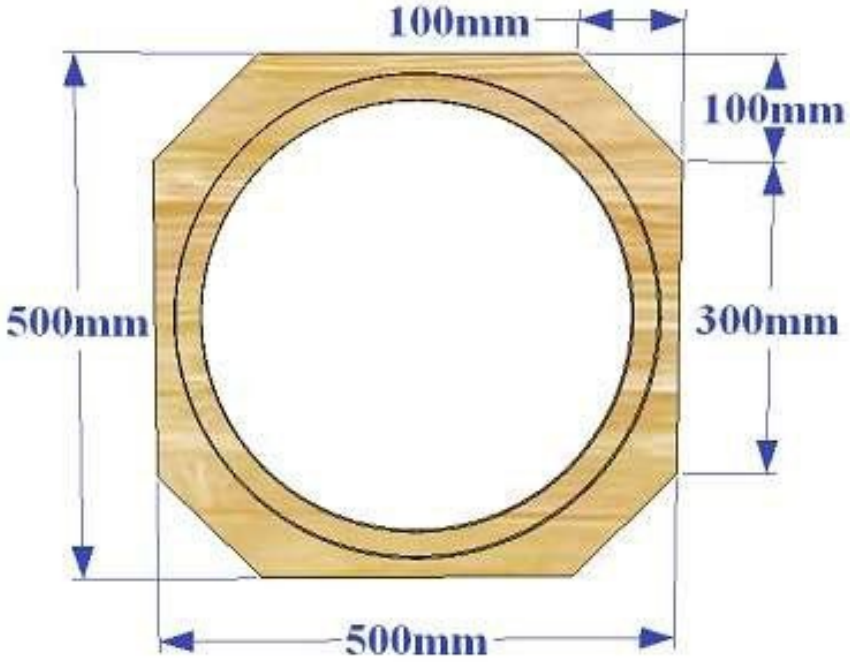
Outer Baffle *Inner Baffle*

Check the fit of the driver into the baffles.

Outer baffle fit

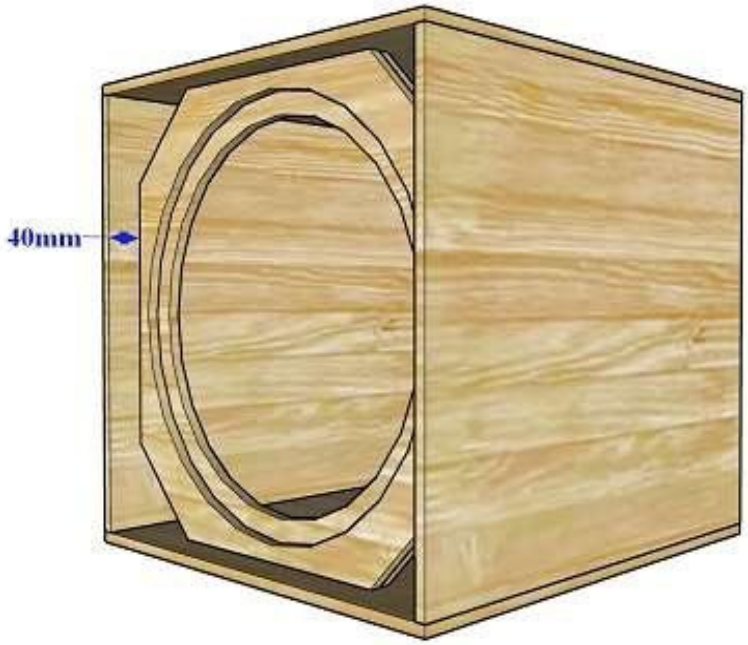
Inner baffle fit

Attach the outer and inner baffles to each other. Then cut the assembly to the finished size. Check again to be sure the driver fits into the baffle.



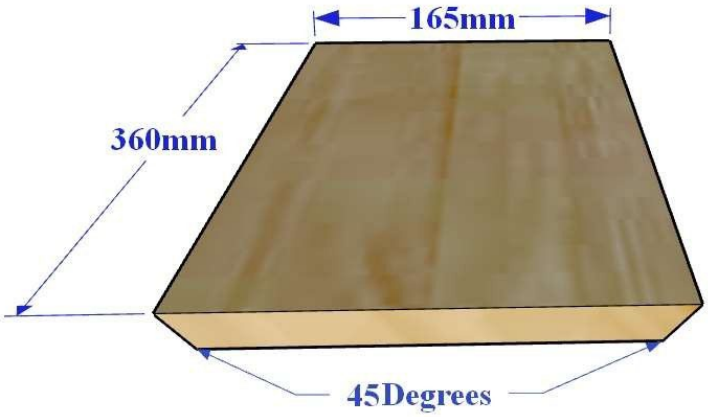
Finished baffle assembly dimensions

The baffle assembly is mounted in the box, inset 40mm. Draw alignment lines on the insides of the top, bottom and sides 40mm from the outside edge. The fit will be tight. If too tight sand the edges just enough to allow it to fit. Spead glue on the baffle assembly edges and on the top, bottom and sides where the assembly mates to them. Tap the baffle assembly in place, aligned to the drawn lines. Fasten the top, bottom and sides to it. Use a damp rag to wipe off excess glue.



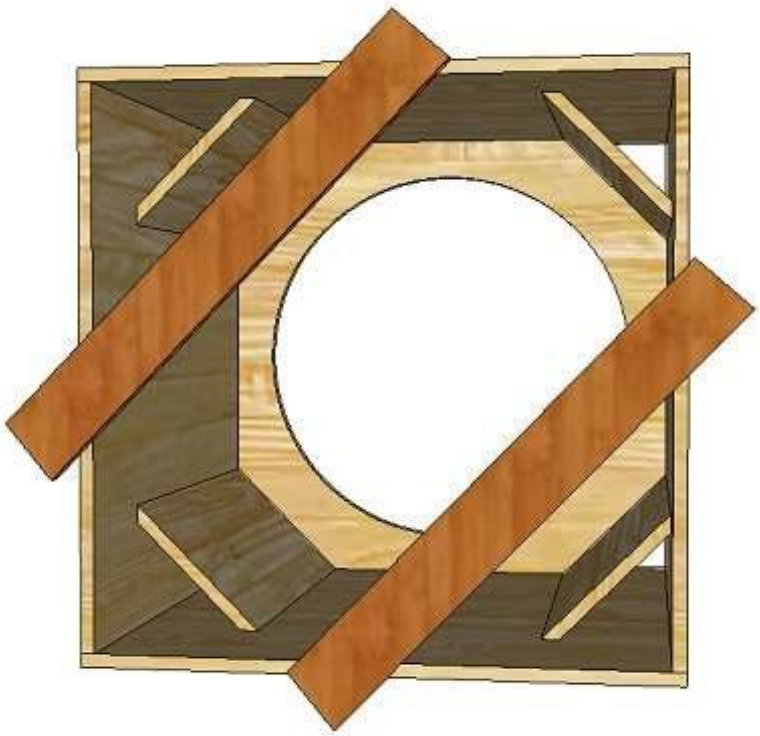
Baffle assembly installed

Cut four port ducts.



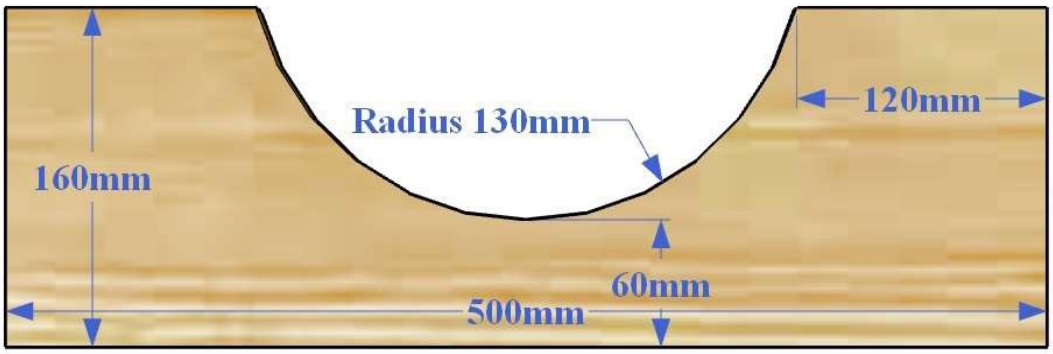
Port ducts

Screw plywood jigs to the edges of the top, bottom and sides to hold the rear of the box square, using a framing square to be sure of the alignment. Install the ducts, glued and fastened to the top, bottom, sides and baffle. After the ducts have been fastened remove the jigs.



Duct installation

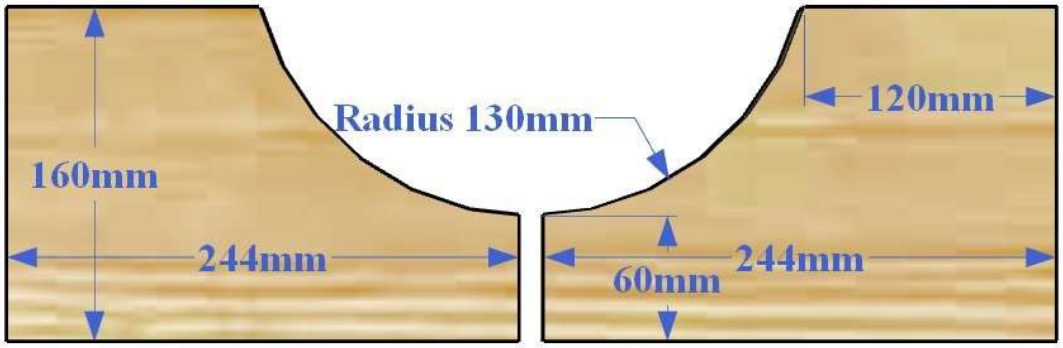
Cut the side brace.



Side brace

The side brace connects the sides, its top 244mm from the top, its bottom 244mm from the bottom, its front edge 150mm from the baffle. Like the baffle the fit is tight, so sand as required. Apply glue to the sides where it mates them and to its edges so when you tap it into place the glue won't all be scraped away.

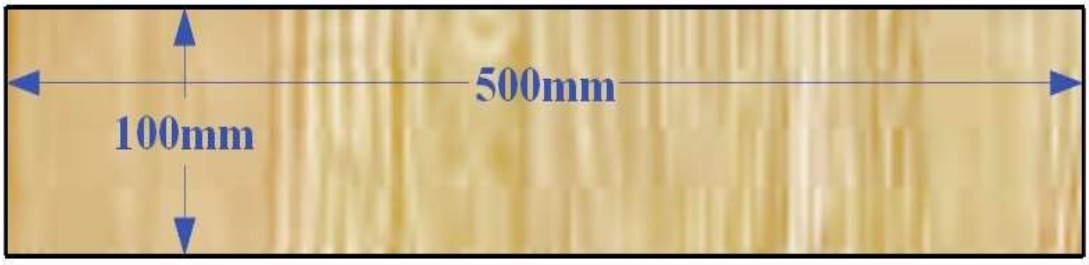
Cut the top and bottom braces. They connect the side brace to the top and bottom. For ease of attachment to the side brace these may be shifted off the center of the side brace by up to 10mm, one to the left, one to the right.



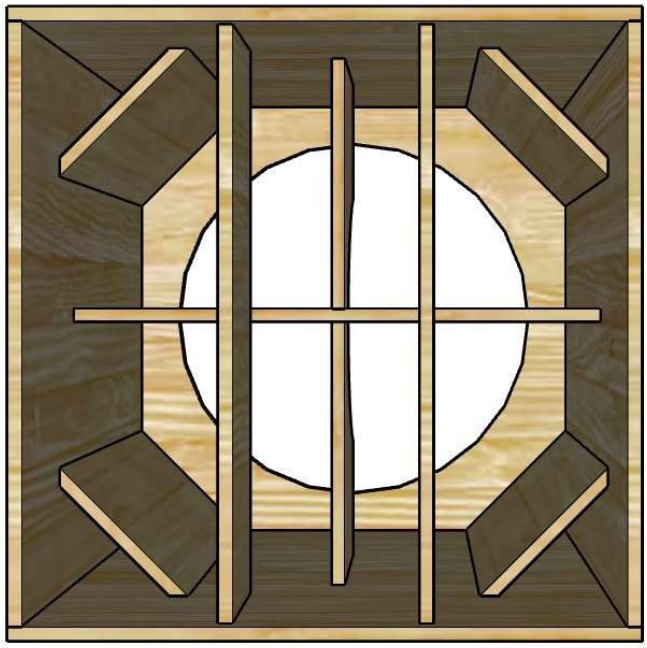
Top and bottom braces.

Side, top and bottom braces installed, 'X-ray' view

Cut and install two back braces. These connect the top and bottom, spaced evenly across the top and bottom, recessed 12mm from their rear edges.



Back Braces

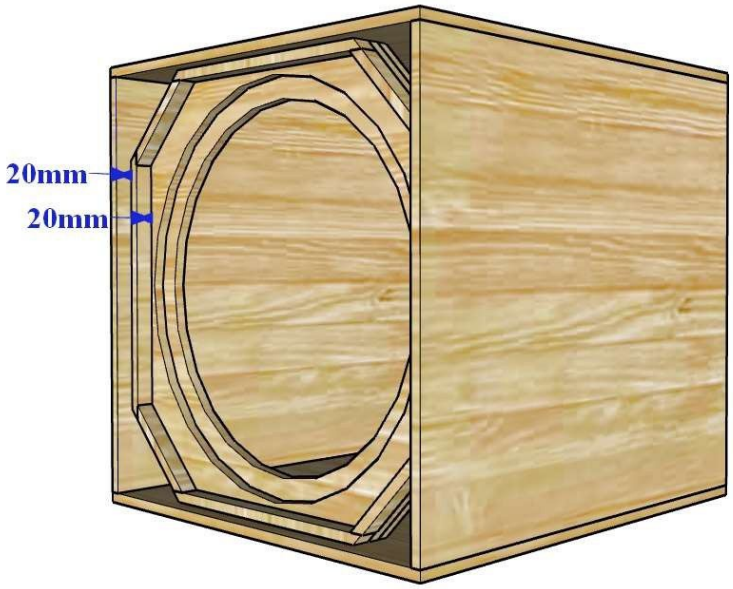


Back braces installed

Cut 20mm wide strips of plywood. Measure and cut them to rim the rear of the cabinet, inset 12mm from the rear edge.

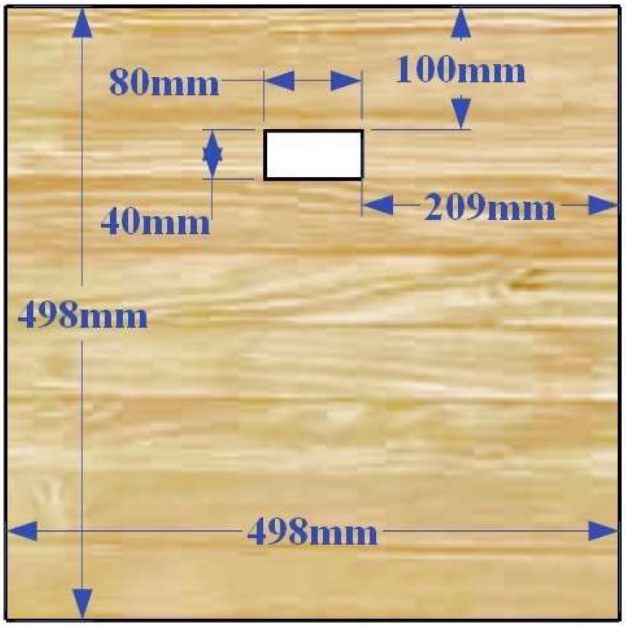
Back mounting cleats

In similar fashion rim the front baffle with 20mm strips. This leaves a 20mm span from them to the leading edges of the cabinet. These are used to mount the grille.



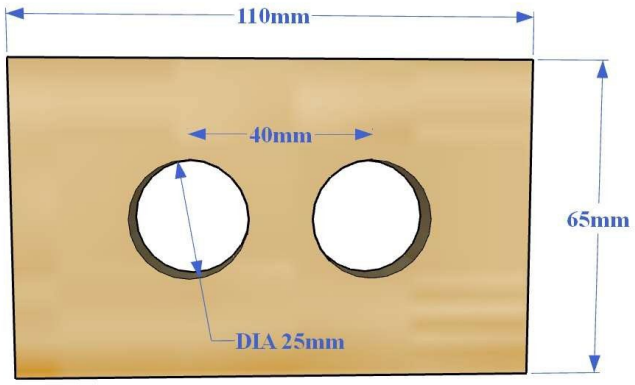
Grille attachment strips

Cut the back. It's sized 2mm smaller in height and width than the box opening for installation ease. The hole is for Speakon connectors.



Back

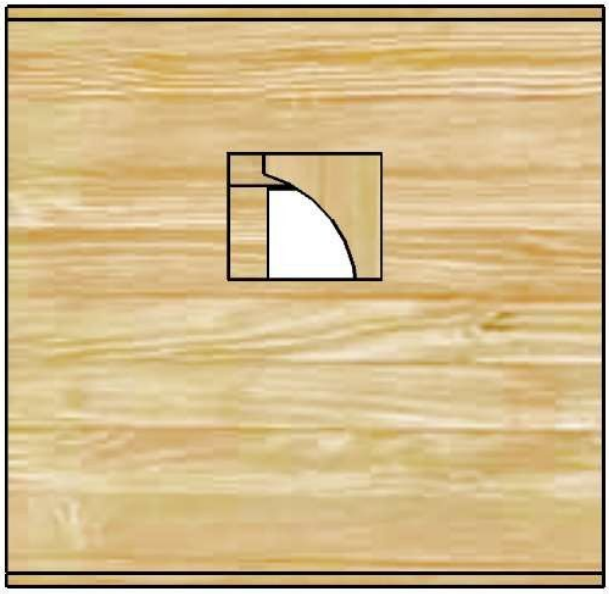
Cut a Speakon mounting plate, attach it to the inside of the back over the hole. Install Speakon jacks, either two or four pole. The jacks are parallel wired for daisy chaining to a second sub. Connect a 1m long 1.5mm two conductor speaker wire to the Speakons. With four pole jacks use pins 1+ and 1-.



Speakon mounting plate

Place the cabinet face up, trial fit the driver. Insert a small Philips screw driver through the holes on the frame, tapping it to mark on the baffle where to drill pilot holes for the fasteners. Remove the driver. Drill pilot holes in the baffle for the fasteners. Use either screws or bolts with T-nuts. Screws are better, as they will not vibrate loose.

Determine the locations for handles, either inset or surface mount. Cut holes for inset handles. Do not interfere with the side braces or port ducts.



Hole for inset handle

Line the back with 50mm thick wadding, either open cell foam or polyester batting, attached with spray adhesive. Avoid where the back will contact the braces and flanges and behind the ports.

Back lined with wadding

Attach the back to the assembly, running the wire from the Speakons out the driver hole in the baffle. If using commercial cabinet corners chamfer the cabinet edges with a router, using a 10mm radius roundover bit. Sand and prep the cabinet as required, apply a finish. After the finish has cured install the driver, connecting the wire from the 1+ terminal of the Speakon to the red connector, that from the 1- terminal to the black connector. Add rubber feet to the cabinet as desired. Install the handles.

Cut the grille from expanded metal, the same size as the baffle assembly less two millimeters to allow ease of fitting. Screw it to the grille flanges, with screws every 10cm or so. To prevent rattling put 3mm thick rubber washers on the screws between the grille and the frame.

The completed speaker, natural and painted finish.

Protect your investment with a high pass filter and limiter. A 35 Hz high pass filter and limiting your amp output voltage at 95 volts will prevent both thermal and mechanical damage.