



M4S Assembly Instructions



Designed and manufactured in Australia by The Loudspeaker Kit
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You will need:

- Phillips head screwdriver
- Woodworking glue
- Damp cloth
- Good quality masking tape
- Ratchet tie down strap (optional)
- Brick or other weight (optional)

Preparation

Lay the contents of the box out and check you have everything you need to complete the kit (see parts list on back page). Find a suitable work surface and make sure it won't be ruined if you spill some glue. If covering the work surface, avoid using newspaper as newsprint may rub off onto your kit. Baking paper is a good choice.

Easier assembly with mitres

LSK kits now employ mitre construction, which offers greater ease of assembly with much less sanding. Butt joints are eliminated, avoiding visible hairline cracks that often appear after painting. Mitre construction puts the joint right on the edge where it is less visible. Most constructors avoid using mitres due to the difficulty in getting the angles correct. Our manufacturing process provides a level of accuracy that is very difficult to achieve in a home workshop.

Masking tape

We recommend avoiding cheap masking tape, which tends to break when applied under tension. If you aren't using the weight and ratchet strap, you are relying on the masking tape along to apply pressure to the join as the glue sets.

Lay out the rear, side, top and bottom panels as shown with mitres facing the work surface. Align carefully and arrange so that all panels are touching at the edges, with no gaps.



Tape all four joints where the rear panel meets the side and top panels. It's a good idea to avoid covering the corners so that you can ensure all panels remain aligned during taping.

Lift the panels using the hole for the terminals, turning them over to the other.





Tip: placing masking tape as shown assists with folding up the panels.

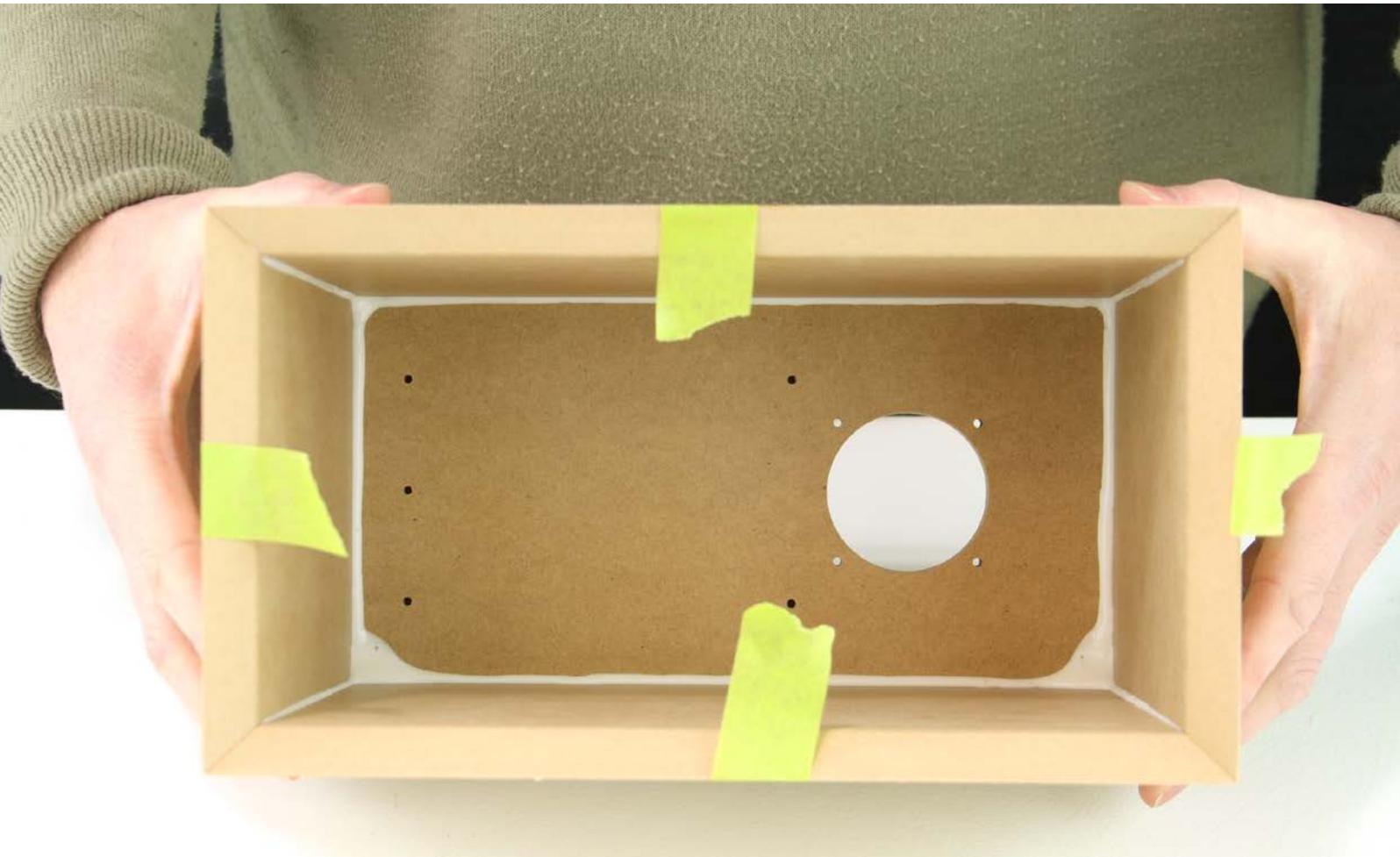
Apply a bead of wood working glue to the bottom of the mitre joint. Then apply a second bead. Since the glue will tend to run down towards the bottom, it's a good idea to apply the glue above half way up to ensure even coverage.

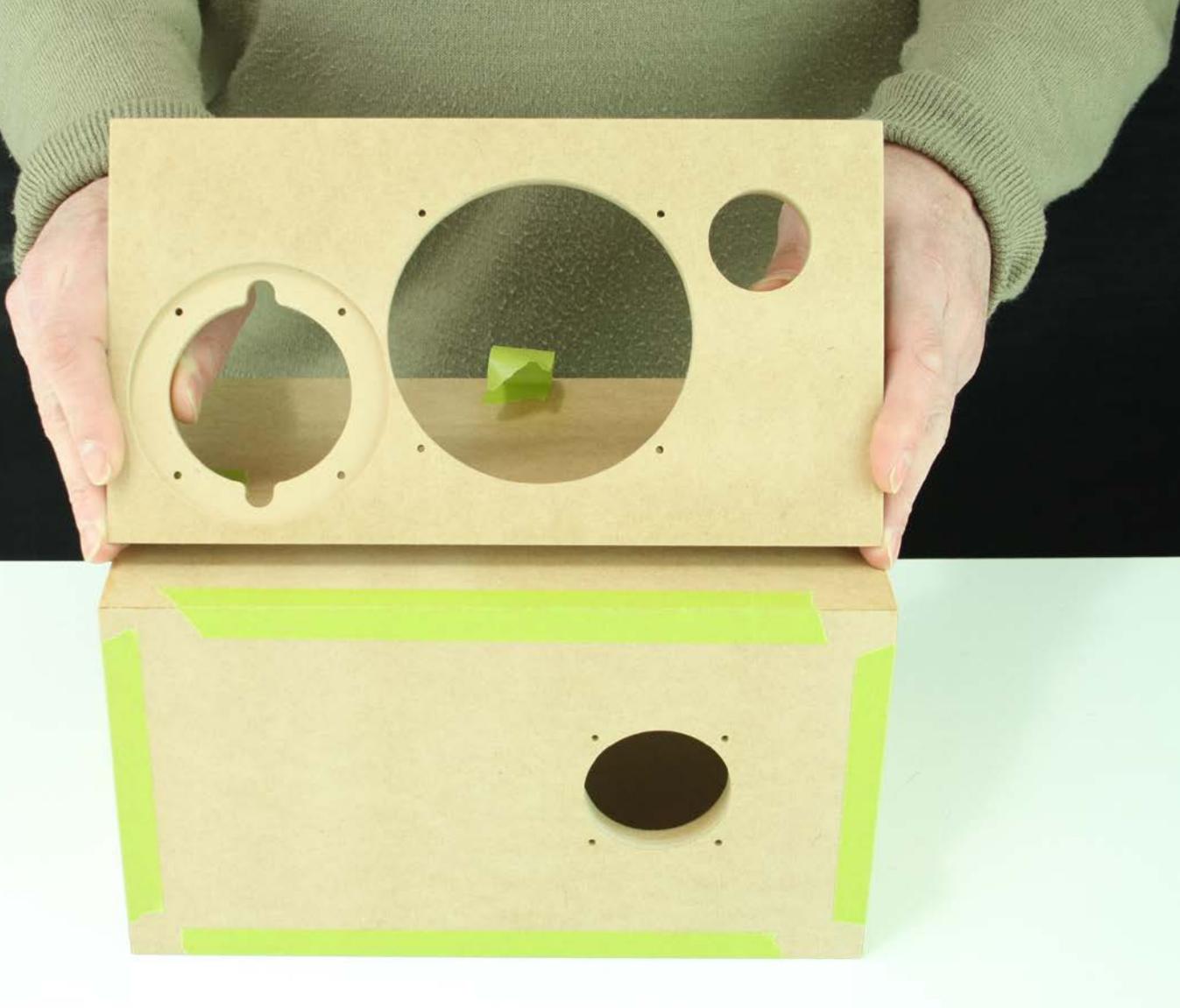


Confirm the amount of glue applied by folding up the first panel. The glue should cover the entire surface in contact. It's preferable to see the glue ooze beyond the joint slightly. This provides visual feedback on whether the glue has set. Once set, PVA glue becomes transparent.



Apply a single thick bead for the top and side panels. Test the first pair of mitres to confirm glue coverage, then glue and fold up all the other panels. It is best to fold up and then tape one join at a time. Ensure the glue covers the joint before moving on to the next step.

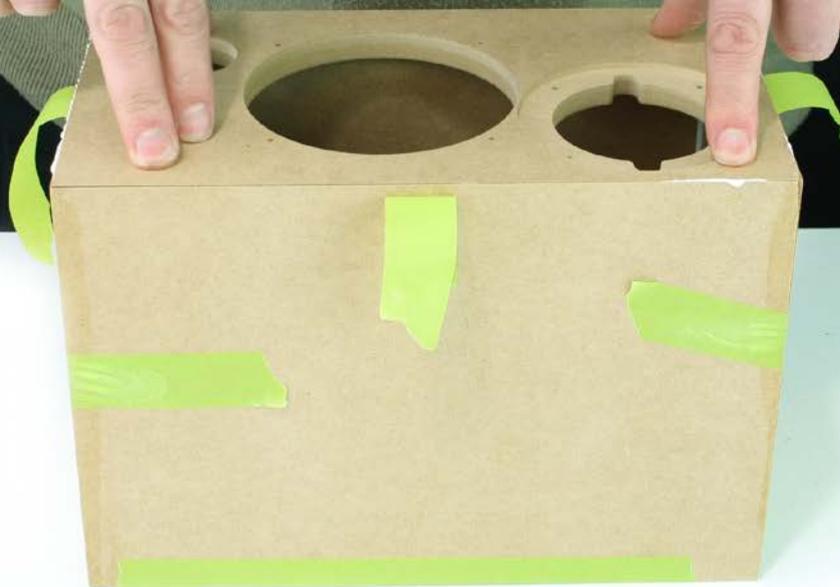




Ensure the front baffle has the correct orientation. The port on the front and terminals on the back should be oriented so they are both on the bottom. In the picture above they are both on the right as the speaker is placed on its side.

Apply a thick glue bead around the internal surfaces of the mitres. You may prefer a zig zag pattern with a thinner bead. It's a good idea to remove the panel and confirm even coverage.

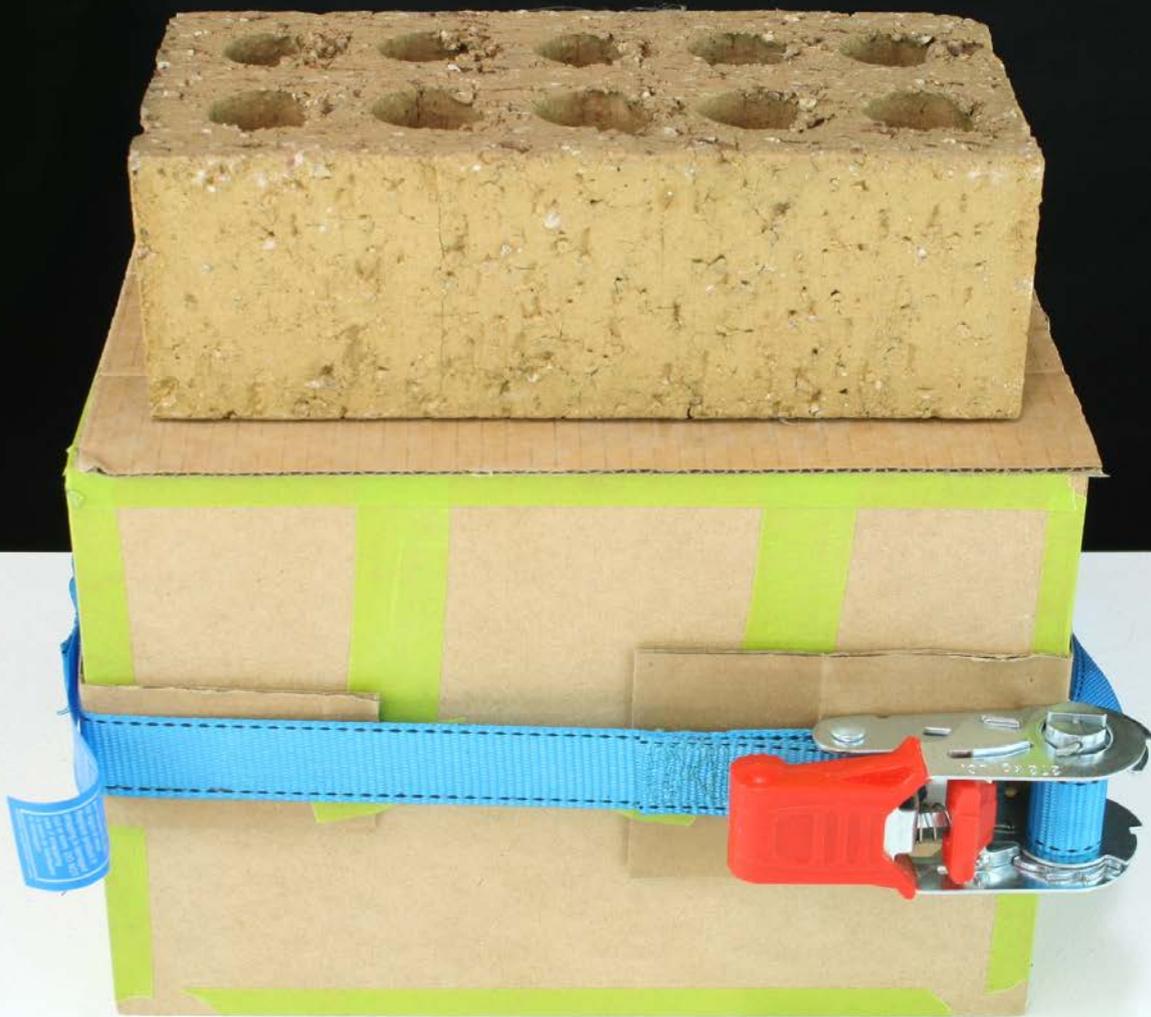




Once you have confirmed adequate glue coverage, press the baffle into place and wipe off all excess glue with a damp cloth. Secure panels firmly with masking tape. Apply pressure when pressing the tape into position. The tape holds the panels together as the glue sets.

Cover all joints with tape, as shown below. An optional step for improved clamping pressure is securing top, bottom and side panels together with a tie down ratchet strap. Avoid damage to the surface of the MDF by placing cardboard strips under the straps at all four corners. Be careful to avoid applying too much force, which can damage the corners of the MDF.





Place a cardboard protector on top of the baffle then a brick on top to apply pressure.

We don't recommend using F clamps due to the risk of forcing panels apart. The advantage of using a brick is that this avoids the temptation to use excessive force.

Drying time

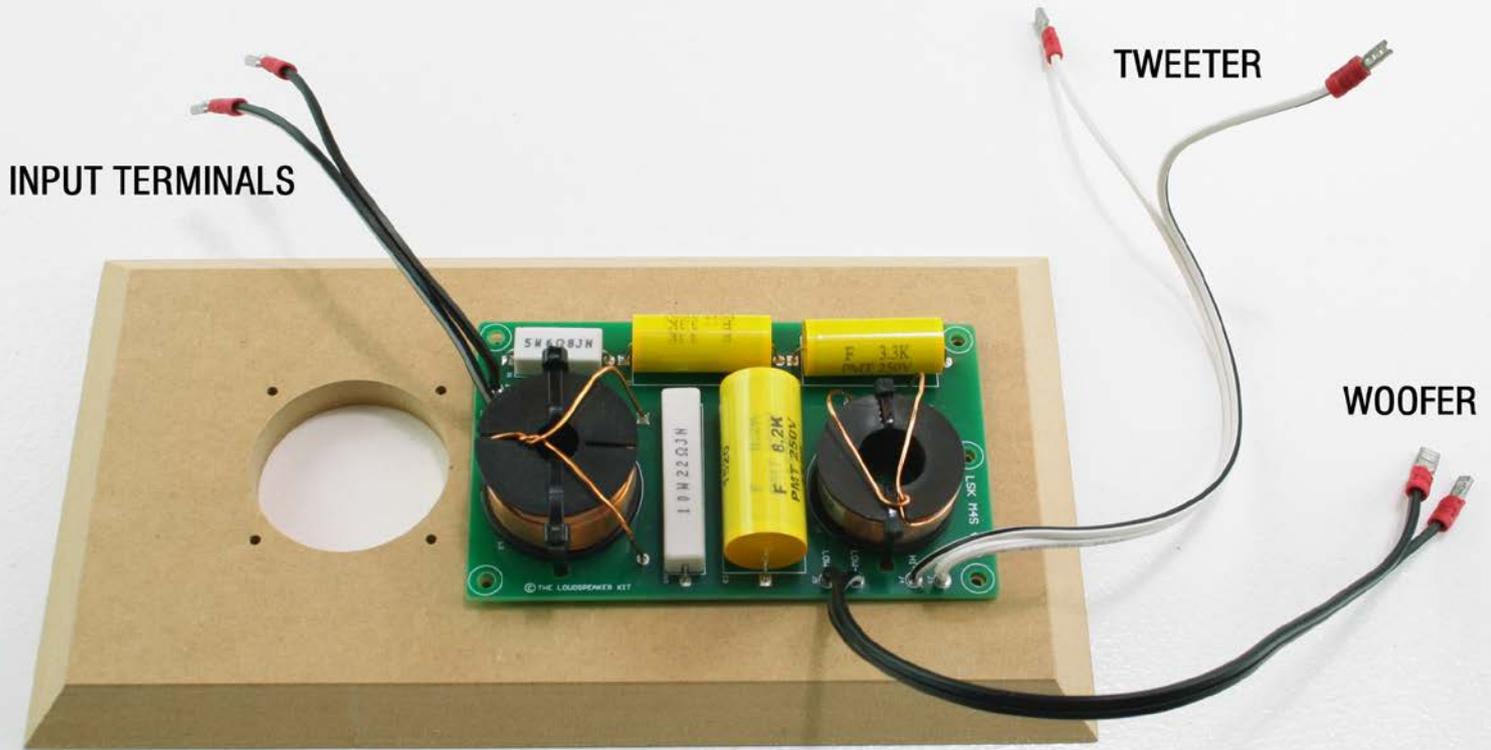
Typical wood glues can achieve moderate strength in as little as 30 minutes. If you are using PVA glue then a good indicator that it has set is the transparency. PVA becomes transparent once set. Ideally it's best to leave the enclosure clamped over night before moving on to assembly or finishing.

Grille assembly

This kit uses a clever neo magnet attachment system that avoids the use of traditional grille clips. Flat packs contain neo magnets which have been concealed in the front baffle and grille.

Sequence tip

Final assembly should be done after you have applied your chosen finish. Otherwise, drivers and terminals will get damaged and the internal lining will be covered in MDF dust.



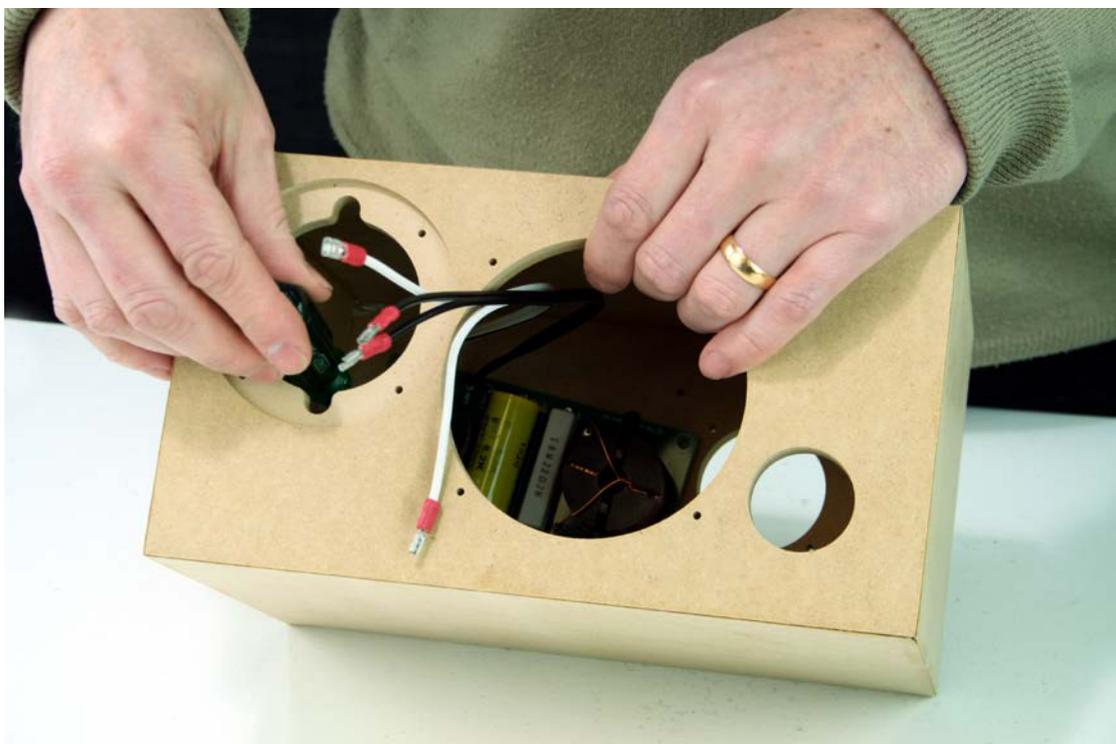
Installing the crossover board

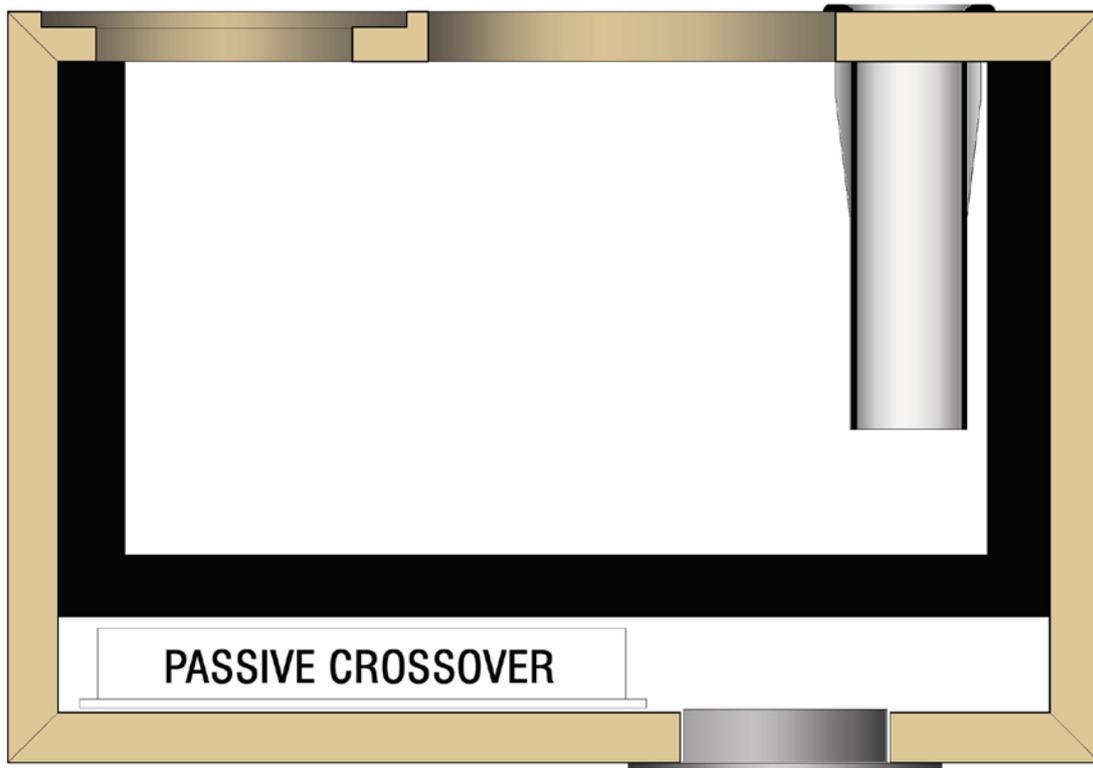
There are three sets of cables:

- **Input terminals:** located near the larger inductor on the end of the board.
- **Tweeter output:** easily identified by the white cable
- **Woofers output:** black cable next to the tweeter outputs

The board is fixed in place with 5 short button head self tapping screws. It's best to screw them in place with a screwdriver by hand. Driver cutouts allow access as shown below.

Sequence tip: Normally this step would follow finishing the speaker. Otherwise sanding will get MDF dust over the crossover.

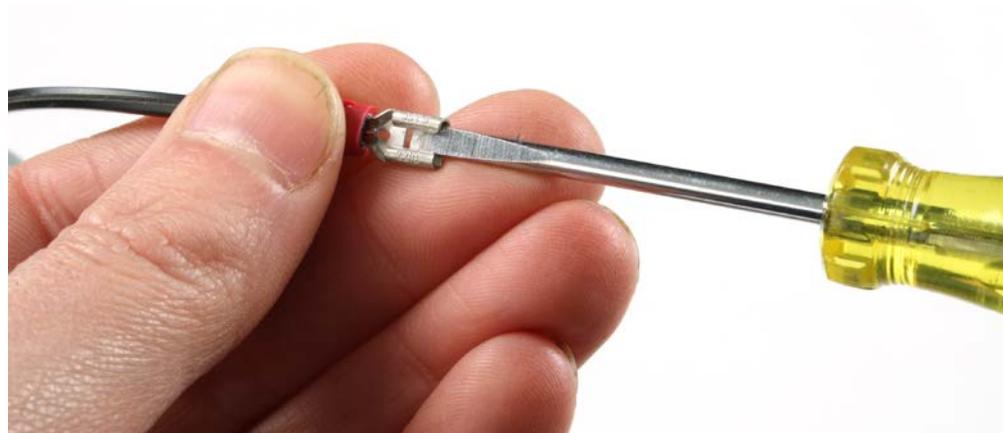




With the passive crossover in place, find the input terminals and feed them out through the rear opening. insert the black acoustic lining, which covers the rear, top and bottom internal faces of the enclosure. Check that it does not block the internal opening of the port. Glue is not necessary.

Installing terminals

Tip: It's often necessary to open out the connector slightly with a flat head screwdriver, since the fit is quite tight.



Note: The cable with the white strip goes to the negative terminal



We recommend using a Phillips head screwdriver, as some powered drivers are more likely to cause damage if the head slips off the screw head. Impact drivers should be avoided. If using a powered driver, it's best to use one which has a clutch, so that once the screws are adequately tightened, the driver will not over-tighten. This avoids stripping the MDF pre drilled holes or damage to the screw heads. If using a screwdriver, your left hand can hold the shaft to avoid slipping.

Installing drivers

Find the white wire loom for the tweeter and push the connectors onto the driver tabs.

The connectors are designed to prevent mixing up positive and negative terminals. Avoid excessive force, which can damage terminals. Lower the tweeter into its recess, aligning the terminals with the cutout slots. Then secure in place with the provided screws.

The remaining black wire loom is for the woofer. Press the connectors into place and screw the woofer in place.





Grille assembly

Masking

On the backside of the grille, you will notice a cut line inset from the edges. This cut line defines the area where the cloth will be glued to the frame. The area inside this line needs to be masked, so the spray adhesive is applied only to the strip around the edge. This allows you to use spray contact adhesive, which provides flat and even coverage in addition to a fast application. To protect from overspray, cover your work surface.

Adhesive

Spray contact adhesive is the simplest and quickest to use and it goes on evenly. Be sure to carefully read the instructions on the can as each one is slightly different. Shake the can for at least one minute or longer if specified on the can. Spray contact adhesive onto the small strip (approx 8mm wide) between the cut line and edge. Hold the can at a distance indicated on the can and move fairly quickly, applying two or three passes until you get good coverage.

When you've finished spraying, turn the can upside down and spray briefly until you notice the amount of spray reduces. Usually after about one second, the paint stops but the solvent continues. This cleans out the nozzle and avoids blocking next time you want to continue using it. Check the nozzle to ensure that it looks clear. If you see any glue there, wipe with a clean cloth with mineral turpentine to clean.

Glue is only required on the back surface as shown here – no glue is required to the sides or the front.

You can start applying the grille cloth right away but we recommend waiting 2 minutes. Peel off the mask with care. A small flat head screwdriver is helpful here to prevent the frame from lifting up or flipping over as you remove the masking tape. Hold the frame down with the screwdriver in one hand, gently pulling back the tape with the other. Then lay the frame over the grille cloth as shown below.



Now press the cloth onto the glue on the back of the frame. Start with one side but avoid the corners, which should be pressed on last. It's critical that the corners are done as the final step to avoid wrinkles bunching up. Next press the cloth onto the opposite edge. You may notice wrinkles appearing. This is an indication that sufficient tension has been applied.

Repeat with the other two sides, still avoiding the corners, as shown below.





Wrinkle free corners

The biggest challenge in assembling a grille is the corners. If not done correctly, these will bunch up. With a little care, you can avoid this problem and get a professional looking grille.

Gather the fabric at the corners with both hands, as shown above. Pull the cloth at a 45 degree angle to each edge, stretching the fabric to eliminate as many wrinkles as possible. You can see in the photo above that there are some potential wrinkles here, which we can remove in the next step.

Keeping the tension on the cloth, transfer the fabric to one hand, so that your other hand is free. Press out any wrinkles with your finger as shown below.

If there are some wrinkles you can't press out this way, the adhesive provides some work time during which you can lift up the cloth and press it down again. When lifting up the cloth from the frame, stretch the cloth more tightly than before. Then press it down again. Avoid lifting any more of the cloth than necessary.

You may have several wrinkles around each corner. Work through each one until you have Now at this point, you should have removed all wrinkles between the edge of the frame and the cut line.





Trim the cloth

Now you can use your thumbnail to find the cut line. Pressing your nail into the trench, score all the way around. This helps to confirm that you've effectively avoided wrinkles. Then with a sharp blade, slowly and carefully cut away the grille cloth, using the trench as a guide. You may like to use a straight edge, but it's not essential.

Tips for a better cut:

- Choose a knife with snap off blades like the one below – Stanley knives are usually too blunt for the job
- Start with a new blade – snap off the previously used part of the blade
- Cut with multiple passes – avoid the temptation to try to cut all the way through in one pass
- Cut slowly and carefully, ensuring that the blade stays on track
- Cut with a shallow angle as shown below – this avoids any tearing away at the fabric

This step now completes the build.





Parts List:

- 2 x SB Acoustics 4½" Woofer SB12PFC25-8
- 2 x SB Acoustics Tweeters SB19ST-C000-4
- 2 x Pre-built Crossover Networks
- 2 x Round input Terminals
- 12 x Panels of CNC machined MDF featuring mitre joints
- 2 x CNC machined black MDF grille frame with grille cloth
- 34 x Self tapping Screws
- 2 x 25mm Tuning Ports
- 2 x Pieces of Acoustic Lining

SPECIFICATIONS:

Woofer:	4½" SB Acoustics woofers SB12PFC25-8
Tweeter:	¾" SB Acoustics SB19ST-C000-4
Frequency Response:	60 Hz - 20 kHz
Impedance:	Nominal 8 ohm
Sensitivity:	84 dB
Power handling (AES)	30W
Power handling (program)	60W
Recommended Amplifier:	15 - 60W
Dimensions (mm)	260mm high x 145mm wide x 180mm deep
Weight:	3 kg