# Orion Speaker Kit Construction

Assembling the Orion speaker kit is easily understood by looking at the manual provided by Linkwitz Lab. This document provides information to correctly assemble the kit.

Tools needed for completion of the Orion kit construction:
A #2 Phillips screwdriver
At least two clamps (one having a 14” or greater opening is best for mounting the side panels)
Mallet (desired for tapping dowels)
Steel rule 12”
Drill and bits (1/4” Forstner, 3/32”, & 3/16” drill bits)
7/16” inch wrench
Center Punch
#2 Square drive screw driver
Masking Tape

Using clamps in the assembly process will help to hold pieces securely in place when installing screws and to achieve tight glue joints. After positioning the side panels per assembly instructions, mark and add pilot holes to the side panels (be careful to not drill through the panels). Use padded clamps to hold the side panels against the woofer enclosure and installed baffle panel to achieve tight connections of the side panels when screwing them in place. With the sides clamped in their proper positions, use soap or paraffin on the screw threads to make it easier to install the screws.

The manual lists 4 pieces of “C” dimensioned wood. The kit has holes in these pieces that make them different.
The kit provides 2 pieces listed as “C-A” as they are the “C” pieces that mount to the “A” pieces and support the baffle boards. This piece has been modified to more easily accommodate the midrange driver bracket, and is now 3” wide rather than 3 ½ inches wide. Please take special care when gluing “C-A” to “A” to make sure the surfaces are exactly 90 degrees. If these are not assembled correctly, you may have difficulty in attaching the side panels in there proper positions and aligning the midrange driver on the mounting bracket.
There are 2 pieces listed as “C-H” as they are the “C” dimensioned pieces that attach to the “H” pieces of the woofer cabinet.

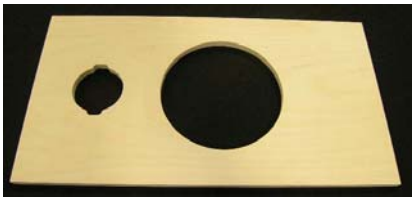
The manual lists 4 pieces of “F” dimensioned wood. The kit has holes in these pieces that make them different.
The kit provides 2 pieces listed as “FT” which are the top pieces for the woofer cabinets.
The kit provides 2 pieces listed as “FB” which are the bottom pieces of the woofer cabinets.

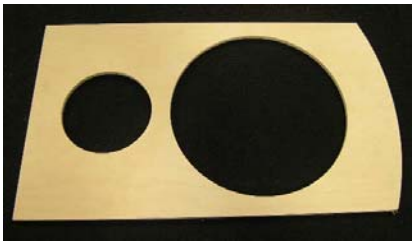
The side mounting corner brace pieces “D” are drilled and have countersunk holes. You may want to radius the upper end as shown in the assembly picture referring to installation of “D”. The countersunk sides are mounted to the inside of the baffle and side panels, so the screw holes are in position to attach the side panels with screws. The “D” pieces are to be glued to the baffle panel edges. The H, I, and J” pieces have countersunk holes on both sides so they may be assembled in either the left or right mounting positions. Pieces “H” and “I” have been modified from the original drawings, to lower the cross braces into a notched cutout, thereby reducing the path of the woofer cone output from directly hitting the edge of the brace. There is no acoustical difference, but this design modification is a bit stronger and is more aesthetically pleasing.

A modification to the original design has been approved by Siegfried Linkwitz. This modification adds a midrange support bracket (sold independently) that is mounted on top of the woofer enclosure.

## *Orion Kit Parts*

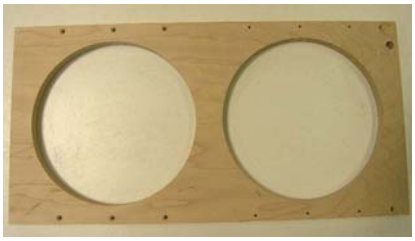

Packaged Kit


Part A


Part B


Part C-A


Parts D


Part E


Part FT


Part FB

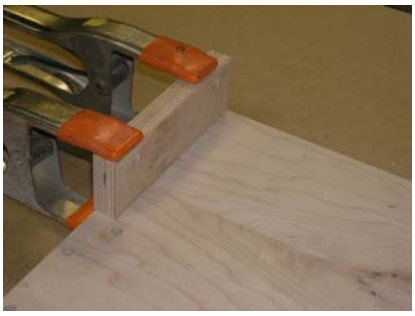

Part C-H


Part G

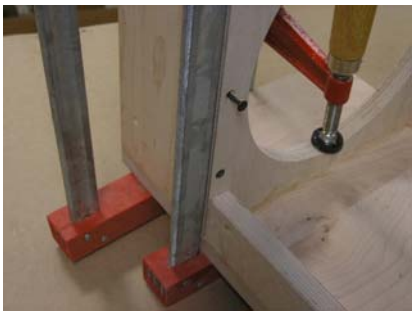

Part H

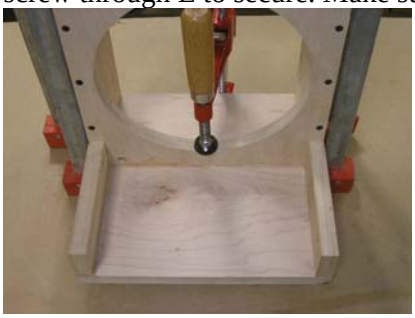

Part I

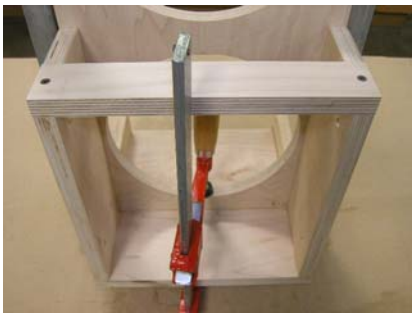

Part J

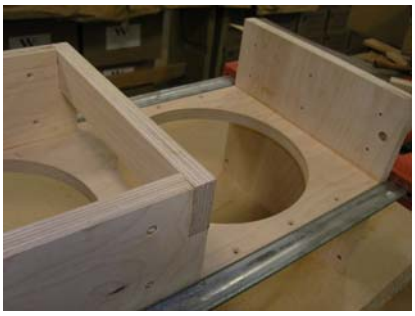

Glue J (2 places) with dowels into FB


Glue E (wire hole down and to the right side) with dowels into FB and screw into J (2 sides)


Glue Parts I (2 places & notch side away from E) with dowels into FB and screw through E to secure. Make sure sides of I are flush with side of E.


Back side bottom shown with all bottom pieces installed


Front side bottom shown with all pieces installed

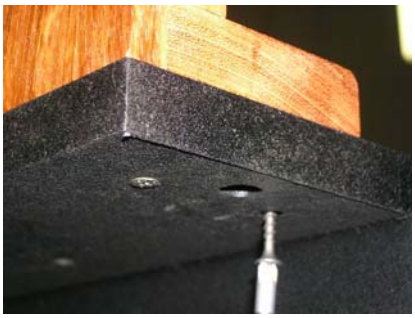

Glue FT with dowels into E


Glue H (two places & notch side away from E) with dowels into FT and secure with screws through E. Make sure sides of H are flush with side of E.


Inserting H into FT (picture showing dowels)


H pieces assembled with C-H cross brace


Completed Woofer cabinet viewed from rear side



Mount assembled Baffle panel using 6 screws through the under side of the front of FT screwing into C-A brace.

**Mounting of side panels** – Drill pilot holes using 3/32 drill after positioning panels. Do not drill through side panels. Mark depth of drill to stop so the hole is no deeper than ½" into side panels.

Measure ½" from front of Woofer cabinet to front bottom edge of side panel. Drill pilot hole.

Screw side panels in place starting with bottom front side. Use a padded clamp to hold sides in place while installing screws. Apply some bar soap or Paraffin to all screw threads before installing to reduce friction.

Make sure the top front edges of the side panels are flush with front surface of the dress panel. Use a padded clamp to hold side panels in place while installing screws. Mark and drill pilot hole in top position of "D" bracket.

Install top screw in side supports “D” of baffle panels. Now mark all the remaining holes in the panel that require pilot holes. Use a transfer punch or a drill bit to mark the side panels where pilot holes are needed. Remove side panel and drill remaining pilot holes (max 1/2” deep). Re-install side panels.

After installing baffle panel side support screws, install side panel screws at rear of woofer cabinet while using clamps to hold sides tightly against woofer cabinet.

The drivers and wiring may now be installed, per the Orion instruction manual unless revision 0.1 is to be installed. This revision provides a different mounting for the midrange driver and requires drilling that will be easier to accomplish if the woofers have not been installed.

Metal bracket style midrange mounting bracket Revision 0.1 shown bolted to Woofer cabinet

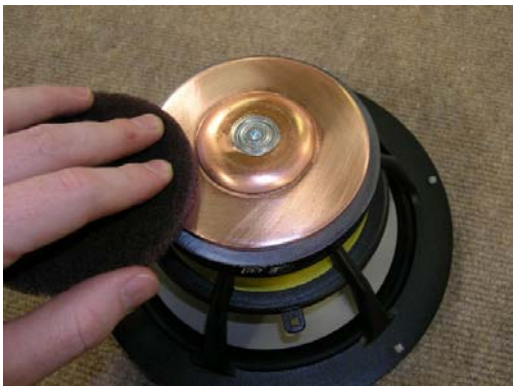
## *Midrange Modification Revision 0.1A with Wood Bracket*

1 Remove the label and plastic from the driver's copper back with a razor blade. Preserve the serial number for your records.

Remove the label and plastic from the driver

The driver after plastic has been removed.

2 Sand the surface with Scotch-Brite™ for better adhesion.



Sand the surface with a Scotch-brite™ pad.

3 Install driver

Using card stock to center the driver on the panel.

Square the driver with the electrical connection toward the top of the speaker.

4 Place two tape strips for alignment (for future reference). Remove three of the six white standoffs (every other one). Make sure the driver is set flat in the panel and mark the three pilot mounting holes using 3/16 drill bit and wooden mallet. Cut the tape with a razor to remove the driver.

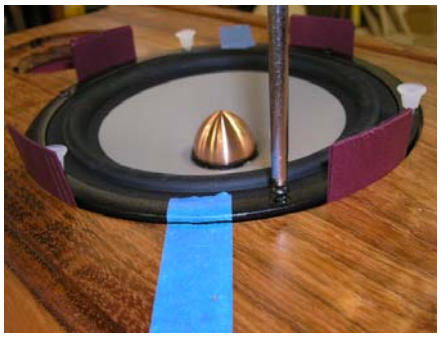
Locate the three mounting holes for the driver. A 3/16 drill bit is shown.

Cut the tape in order to remove the driver and deepen the holes to the proper depth.

5 Using the 3/32 drill bit with tape to mark the depth, drill out the three holes to about 3/8" deep; do not drill through the panel.

A 3/32 drill bit is shown to deepen the three mounting holes to 3/8" deep.
DO NOT DRILL THROUGH THE PANEL.

6 Mount midrange driver



Mount the driver using the three 5/8" long wood screws and #2 square bit.

7 Mount the puck to the bracket using the two ¼-20 1/2" hex bolts and washers.

Bracket with ½" Puck Bolts in tracks

The puck and bracket assembly.
**(**No spacer strips needed in 0.1A revision)

8 Stand the speaker up-right and place the bracket assembly flush with the back of the driver. Make sure the puck is on center of the driver by raising or lowering the puck and using a square to locate the bracket. Use a pencil to lightly outline the foot print of the bracket.

Center the puck and bracket assembly on the driver.

Lightly outline the foot print of the bracket onto the woofer cabinet

9 Using a square and a center punch or drill bit; locate the two mounting holes for the bracket at 2 ½" and 4-½" from the back of the woofer cabinet.

Locate the mounting holes at 2 ½" and 4-½" from the back of the woofer cabinet.

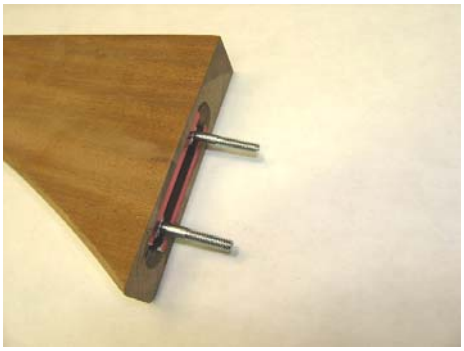
Use a center punch or the 3/16" drill bit and wooden mallet to mark the drill holes.

10 Clamp a backer board under the top of the baffle assembly and drill through the baffle assembly using a 1/4” Forstner drill bit.

Use a clamp and backer board to prevent chip-out of the woofer cabinet during drilling.

Use a 1/4” Forstner bit to drill out both holes in the woofer cabinet.

11 Line up the two ¼-20 x 1-1/4 bolts in the T-slot in the bracket with the two holes in the woofer cabinet. Slide the brace forward until the puck is touching the back of the mid-range driver and tighten the two nuts under top of woofer cabinet.

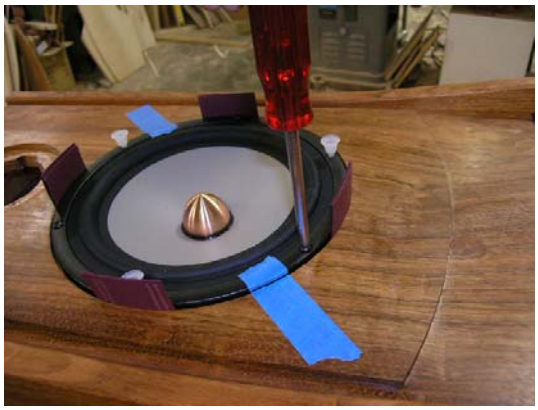


Bracket base with 1 ½” bolts in track

12 If needed, loosen the two bolts on the puck and adjust for centering on the driver and re-tighten the puck on the assembly.

Loosen the puck bolts and adjust for center alignment. Re-tighten the two bolts.

13 Lay the speaker on its back and remove the driver.



Remove the driver from the panel.

14 Stand speaker upright. Mark a light pencil line on the woofer cabinet top at the front edge of the bracket. Loosen the bracket bolts mounted through woofer cabinet top and slide the bracket forward 1/32". Retighten the bracket bolts. When mounting the midrange driver, the frame of the speaker will be 1/32" in front of the baffle board and within the dress panel recess. The 1/32" will be filled with a foam strip at the next step.

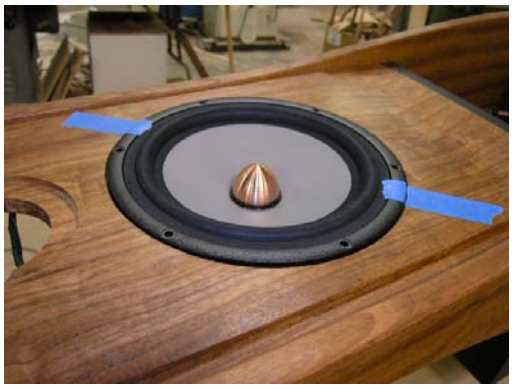
**DO NOT STOP FROM THIS POINT FORWARD UNTIL THE DRIVER IS INSTALLED!**

15 Place adhesive all around the puck, approximately a 1/4" to 3/8" thick bead. Install the 1/8" x ¼" foam around the lip on the panel. Make sure the foam is in the middle of the lip rather than on the outer edge to prevent it from being seen when the speakers are completed. Be sure not to stretch the foam during the installation.

Place ample adhesive on the puck face approximately ¼" to 3/8" bead. Excessive adhesive is easily removed after it has dried.

Place the ¼" wide by 1/8" thick foam seal all around the inside face of the panel. Be sure to locate the foam in the middle of the ring and not on the edges. DO NOT STRETCH THE FOAM.

16 Place the mid-range driver back in the speaker using the blue tape to align the speaker properly. DO NOT USE THE MOUNTING SCREWS FOR THE DRIVER; THIS WILL COMPRESS THE FOAM SEAL. Check to be sure the adhesive on the puck is squeezing out from the edges leaving no more than 1/16" thickness of the adhesive between the puck and the back of the driver. Let the assembly dry for 24 hours before standing up-right.



Gently place the driver in the panel using the tape to center it.

Check to be sure the adhesive is in contact with the whole surface

17 After 24 hours place the speaker up-right and remove excess adhesive and tape from the puck and driver. You have finished mounting the mid-range driver.

Upright speaker with driver shown completed.
Right side speaker shown lying down drying.

The Orion's are truly outstanding speakers that I am sure you will enjoy. Please contact us if we can provide any additional information that will help you in the construction of these enclosures.

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