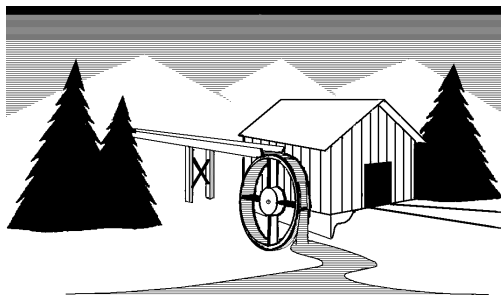


North Creek



Music Systems

Big Kat North D28

Loudspeaker Cabinet

**High Performance Loudspeaker System featuring
dual Scan Speak 15W/4530K000SC Woofers and
North D28-06S tweeter in a vented enclosure**

North Creek Music Systems

Big Kat North D28 Kit Contents

The woodworker's kit portion of this loudspeaker system was shipped in two cartons.

Carton #1 contains:

- (1) Instruction Package.
 - Cabinet Manual
 - Response Curves
 - The North Creek Cabinet Handbook
 - The North Creek Wiring Guide

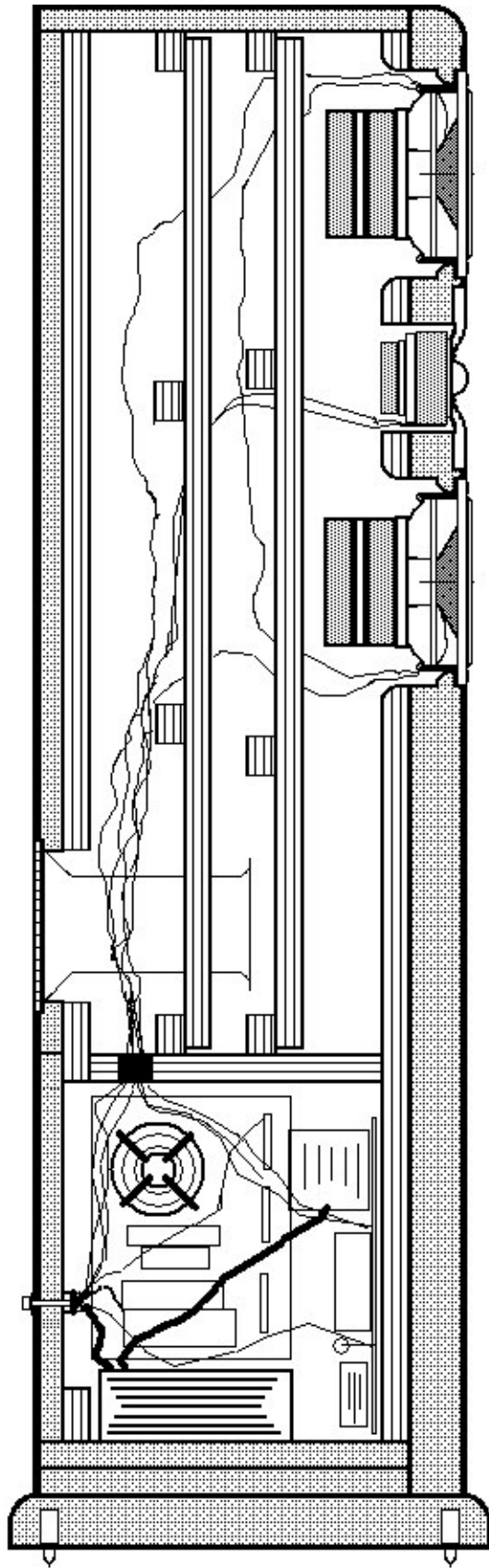
- (2) 3" x 5" Flared Port Tubes assemblies.
- (150) Drinking Straws
- (1) Bottle of Aleene's Super Tacky Glue
- (2) Roll of 1/16" gasket tape.
- (28) #6-1" pan head black screws.
- (20) #6-1 5/8" flat head black screws.
- (8) #10-2" flat head deck screws.
- (2) Sets of Big as Texas Binding Posts.
- (1) Set of Big Toe Spikes.
- (1) Set of Very Big Toe Spikes.

- (2) Woofer Crossovers.
- (2) Tweeter Crossovers

Carton #2 contains:

- (2) shielded North D28-06S Tweeters.
- (4) shielded Scan-Speak 15W/4530K-00SC Woofers.
- (2) 6 oz. Rolls of Dacron stuffing.

You will need to purchase a tube of silicone sealant. These items should be available at your local garden shop.



Big Kat North D28 Cabinet

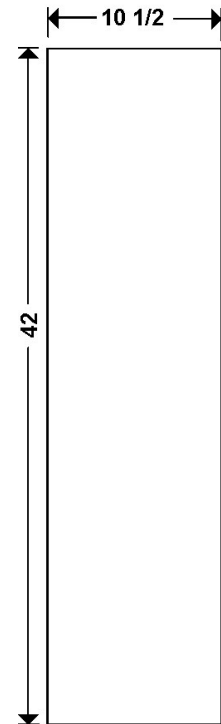
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Sides

4 Pieces

3/4" MDF (may be pre-veneered)

10 1/2 x 42

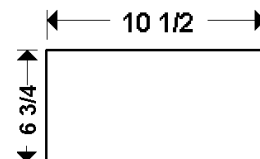


Top/Bottom

3/4" MDF

10 1/2 x 6 3/4

6 Pieces

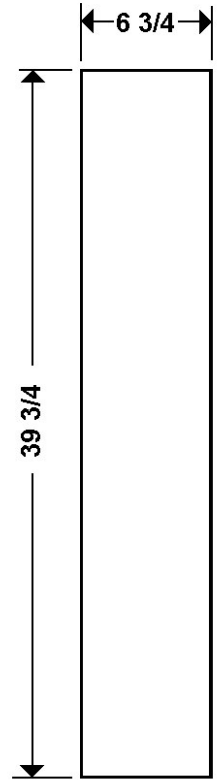


Inner Front, Inner Back

3/4" Plywood

6 3/4 x 39 3/4

4 pieces

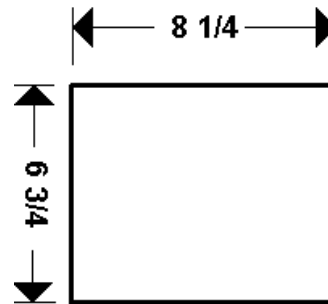


Horizontal Shelf Brace

3/4" plywood

6 3/4 x 8 1/4

2 Pieces

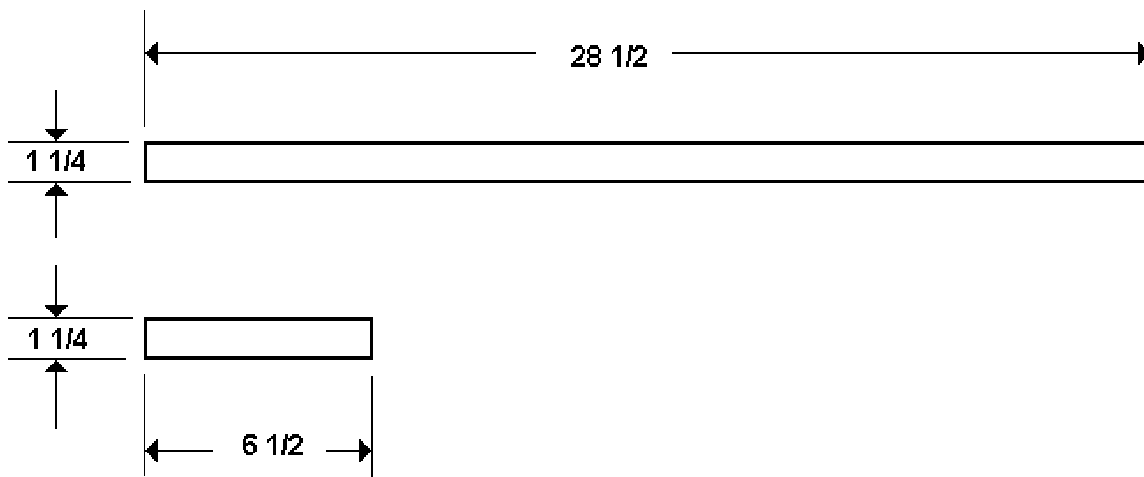


Ladder Braces

3/4" plywood

1 1/4 x 28 1/2 4 pieces

1 1/4 x 6 1/2 16 Pieces

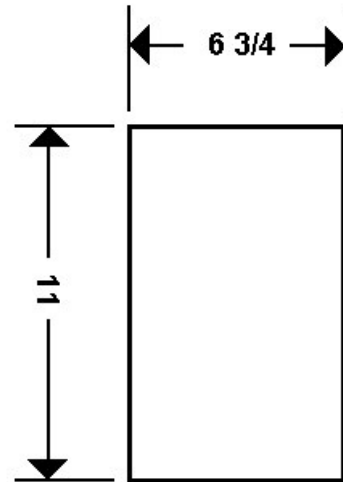


Lower Back Cover

3/4" MDF

6 3/4 x 11

2 Pieces



Outside Upper Back

3/4" MDF

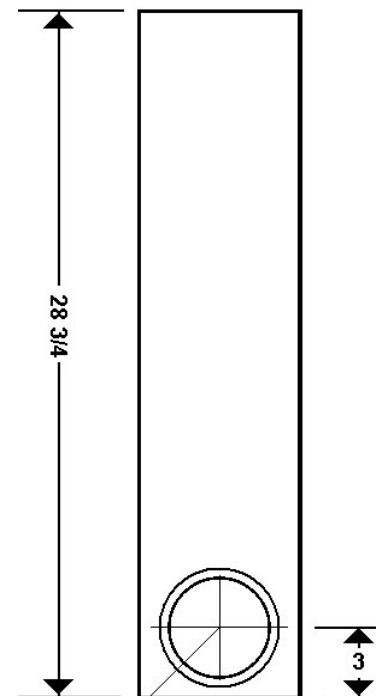
6 3/4 x 28 3/4

2 Pieces

Port Cut Out::

Countersink

To be determined



DIAMETER:
Countersink $6 \frac{3}{16}$, depth $\frac{1}{8}$
Through $5 \frac{5}{16}$

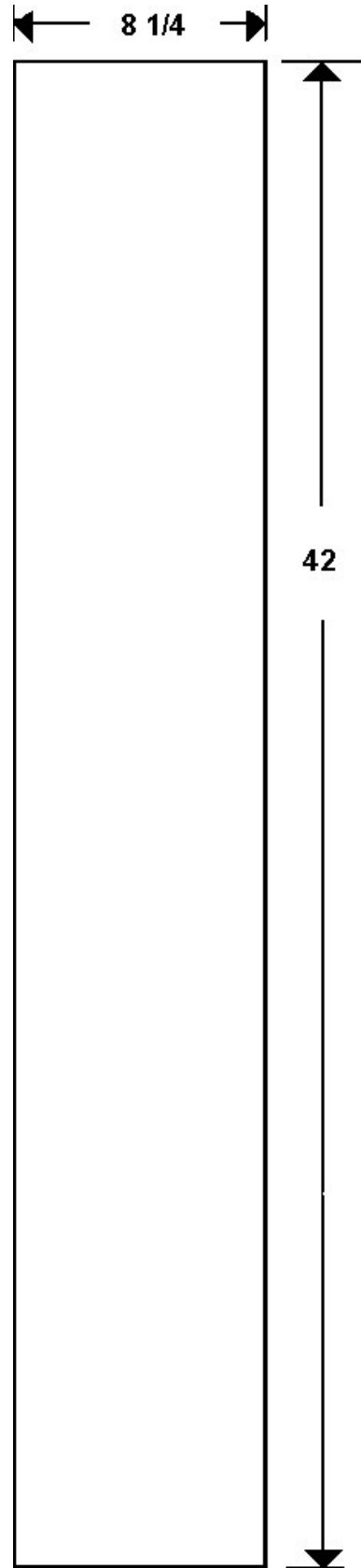
Fascia

1½" MDF (may be double ¾", laminated)
If laminating, use a hard glue such as Titebond.

or Solid Hardwood

8 ¼ x 42

2 pieces (4 if using ¾" MDF)



Plinth and Plinth Detail

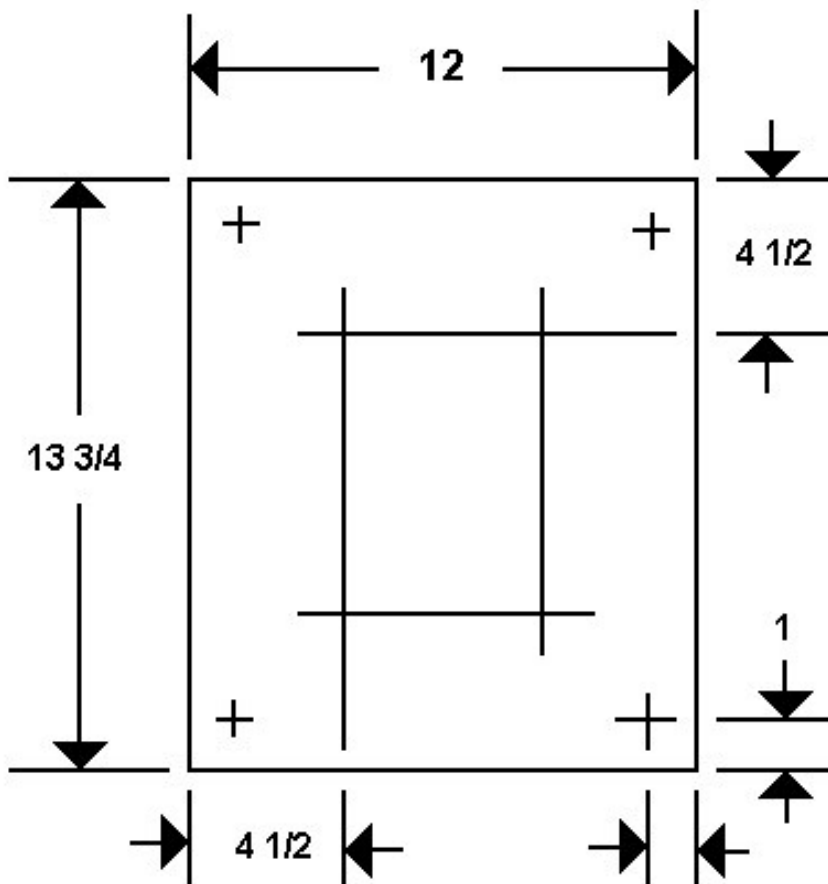
3/4" MDF

12 x 13 3/4

4 Pieces (laminated)

Spike holes are on the outside corners, 1/2" diameter, 1" deep. Spike inserts are installed with a 10 mm hex drive.

Four holes to attach to the bottom of the cabinet take #10 - 2" deck screws.



Fascia Detail

Fascia: Material is 1 1/2" MDF, cut 8 1/4 x 42 and rounded over 1" on the front side edges.

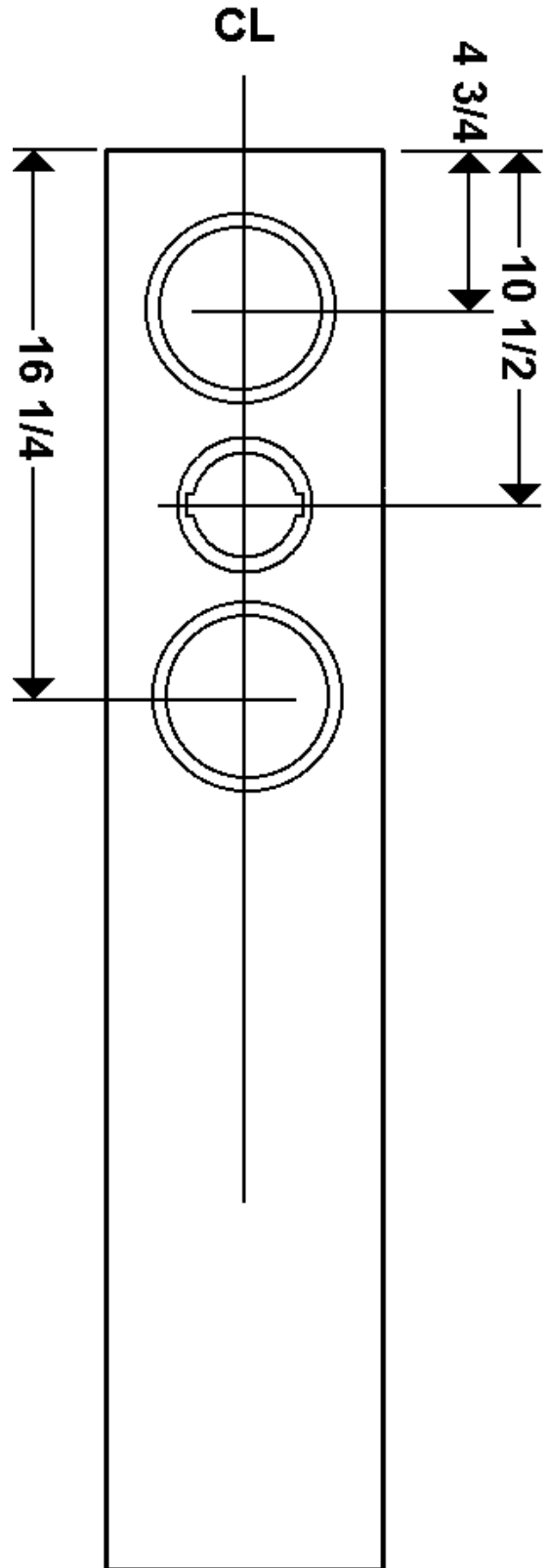
It is much easier to lay out the driver and screw hole positions before this piece is machined. The woofer screw holes need to be drilled at a slight angle for the screws to bite fully.

Cut Outs:

See the detailed drawing below for flare information

Scan-Speak 15W-4530K00SC:
Countersink diameter 5 15/16",
depth 7/32", through 5"

North D28-06S:
Countersink diameter 4 1/8",
depth = 5/32", through 3 1/8"
Note ears.

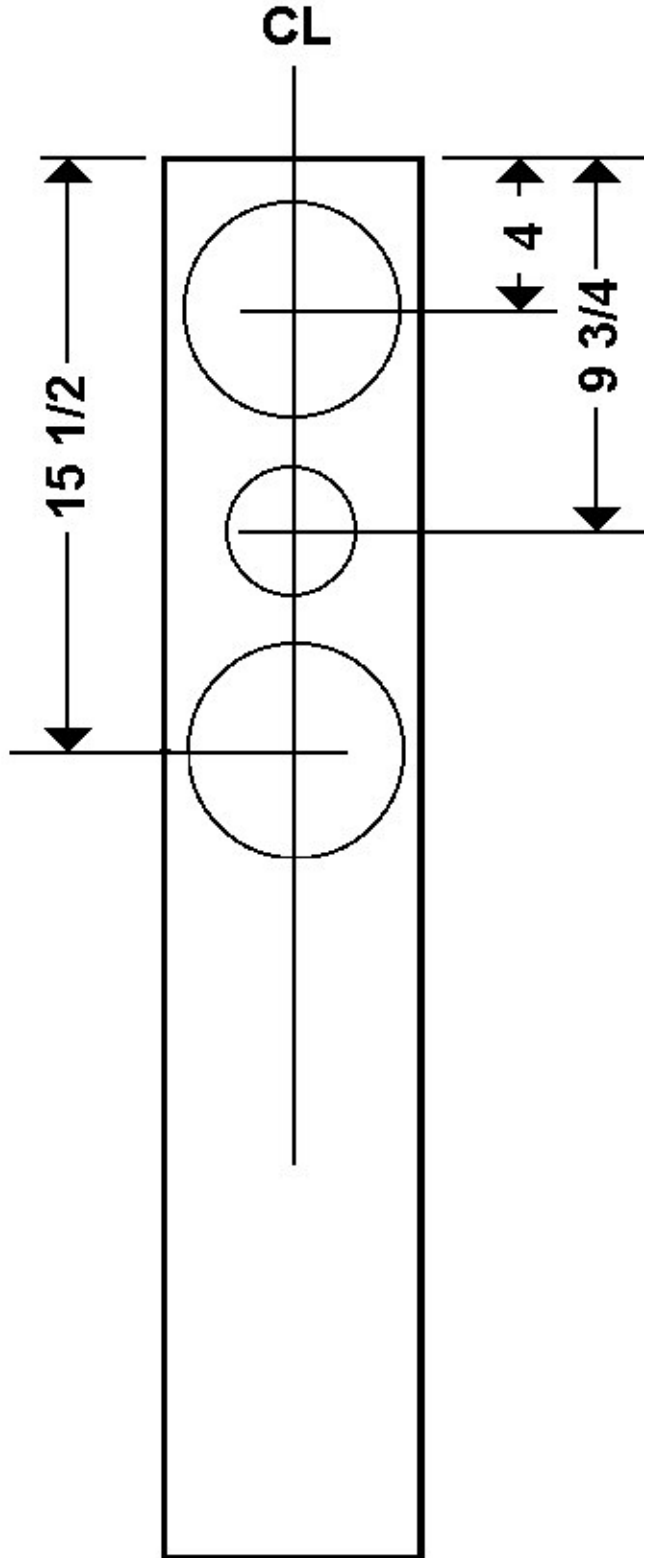


Inner Front Detail

Cut Outs:

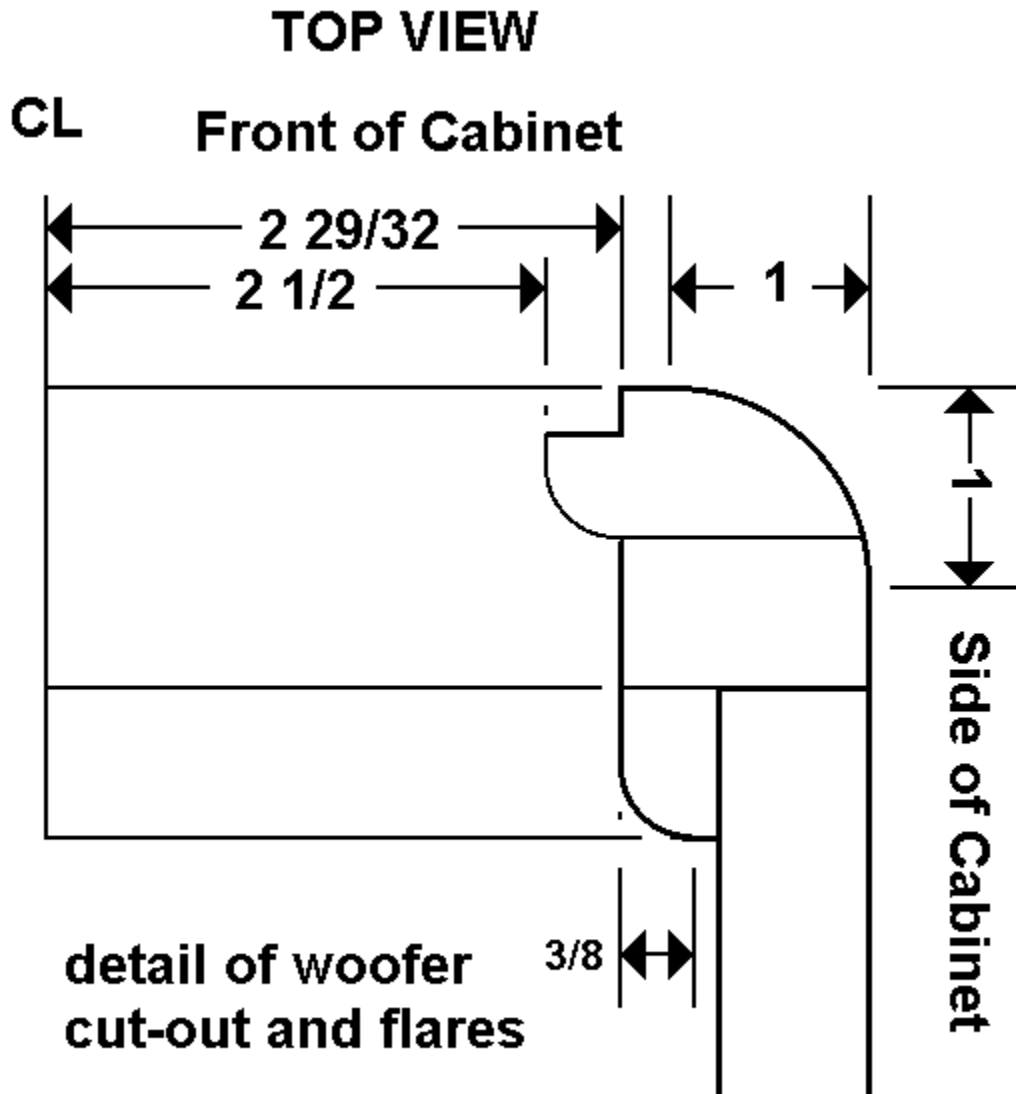
Scan-Speak 15W-4530SC: through diameter $5 \frac{3}{4}$ " , flared on the inside edge of the cabinet. The flare bit should be a quarter round of $\frac{3}{8}$ " radius. See below for a detailed drawing.

D28 through diameter $3 \frac{1}{2}$ ".



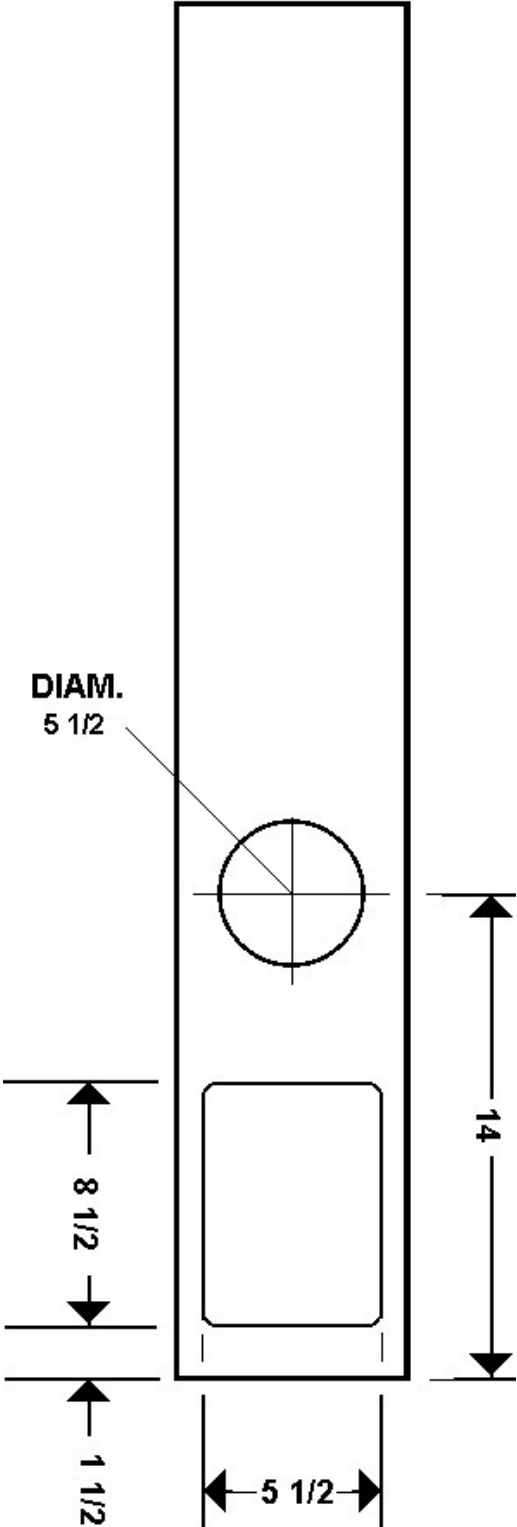
Driver Cut Out Close-Up Top View

Note that we suggest a "double flare" -
the first immediately behind the front edge of the driver,
the second as the inner front meets the cabinet.
The magnet is quite large and the double flare is required to allow the cone to breath.



Inner Back Detail

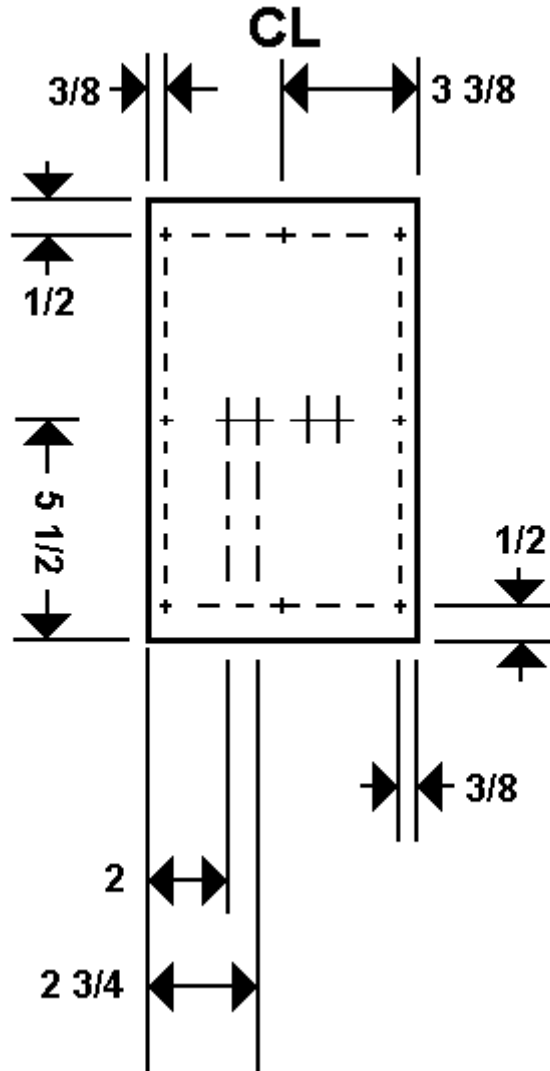
The cut outs are large enough to allow mounting of the crossover boards.



Lower Back Cover Detail

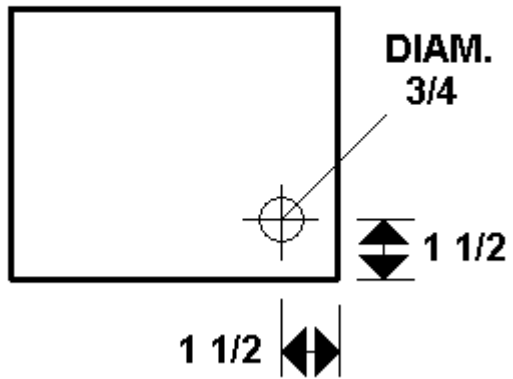
The holes along the edge are sized to accept #6 x 1 5/8" drywall screws.

The center holes are 9/32" to accept North Creek Texas Posts. Drill two holes for single wiring or four holes for bi-wiring.



Shelf Brace Detail

The through hole is 3/4" diameter



Cabinet Assembly

- 1) Pre-assemble all parts without glue, to view the cabinet inside, bracing structure, and test the fit.
- 2) Mark "FRONT" and "TOP" directions (and use arrows) on the inside of all panels. Use a large black marker.
- 3) Mark the ladder brace edge and corner distances from the front of the cabinet sides on the inside of all side panels. Make sure to leave enough room at the top edge for the top panel, and do not go too low or the ladder braces will be in the way of the shelf brace.
- 4) Begin the gluing process by laying up the inner back and outer back with North Creek Soft Glue. A few well placed 1" brads will assure the panels will not flow. Also, attach the ladder braces to the side panels with hard glue. They will try to move, so it is easiest to hold them in place by tacking them with a 1 3/4" or 2" brad.
- 5) Begin the main gluing process, starting with side/top/back. Break several hours between steps to allow the glue to dry. (Or use the "two drill method" outlined in the North Creek Cabinet Handbook.)
- 6) Gluing order is side/top/back, inner front, horizontal shelf brace bottom, side. It is easiest to install the cross braces with pinch clamps. See the drawing next page for the brace positions.
- 6) Test-fit the Lower Back Cover. It may need to be trimmed a touch to be a perfect fit.
- 7) Drill the pilot holes through the Lower Back Cover into the Inner Back. The pilot holes should be 1/8" for #6 - 1 5/8 drywall screws.

Advice

When pre-assembling, take your time to make sure the panels fit together perfectly. This usually means rotating and revolving panels until a set is reached that works just right. Label each panel carefully on the inside with a large black marker to assure the sets do not get mixed up during assembly.

Use a lot of glue. It's much easier to get the glue between the panels before they are glued together.

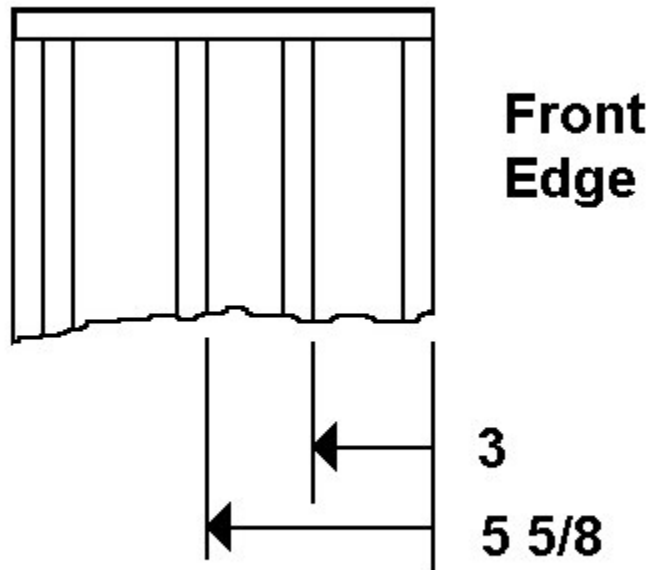
Remember, when clamped, panels tend to "flow" to relieve the pressure. An inexpensive air brad nailer and a variety of nails is invaluable in stabilizing the panels while they dry.

Pinch clamps for the cross braces are invaluable. To get pressure on the top or shelf brace, use scrap wood through the woofer holes with a long clamp to make a wedge.

Brace Positions

This detail is a side-view of the center of the cabinet.

The measurement is taken from the front edge of the cabinet, before the fascia is attached.



Fascia Installation

The main cabinet and fascia should be finished separately.

The fascia should be filled, primed, and painted prior to attachment to the main cabinet.

1) Coat the rear of the fascia with a thin layer of Aleene's Super Tacky, and lay it face down on top of a heavy plastic bag, on a smooth flat surface just slightly larger than the fascia.

2) Position the cabinet and clamp the cabinet to the surface below the fascia.

3) One may add a few 1 5/8" drywall screws through the inner front and into the fascia via the crossover chamber.

Plinth Installation

The plinth should be finished separately. The best results are by rounding, filling, and sanding smooth the top edged, then painting black.

- 1) Lay the cabinet on its back, resting on several slats of 3/4" material.
- 2) Position the plinth and drill pilot holes through the bottom of the plinth and into the bottom of the cabinet.
- 3) Remove the plinth and enlarge the pilot holes if necessary.
- 4) Attach the plinth to the cabinet with #10 by 2 1/2" deck screws.

Woofers Crossover Installation

1) With the cabinet on its front, liberally coat the inside of the front with silicone or mastic adhesive. You may also use hot melt but you will need to be quick. Place the woofer crossover board on the inside of the front of the cabinet such that the small red inductor is at the bottom. Let it dry several hours or overnight.

2) Feed the long red and black wires terminated with 1/4" quick connects through the upper 3/4" hole of the Shelf Brace and into the driver chamber

Make sure the black ring-connector termination is still free in the bottom of the cabinet.

Tweeter Crossover Installation

1) With the cabinet on its right side (as you face the front of the speaker), liberally coat the inside of the right side with silicone or mastic adhesive. Again, hot melt will work but be quick. Place the tweeter crossover onto the adhesive, with the large inductor as close to the shelf brace as possible. Let it dry several hours or overnight.

2) Feed the white and blue wires terminated with 110" gold quick connects through the lower 3/4" hole of the Vertical Divider and into the driver chamber

3) Seal the wiring and shelf brace with a liberal supply of silicone. Make sure there are no leaks - it is very important that this seal is air tight.

Connecting to the Binding Posts

Binding posts fit in the horizontal holes of the rear cover, as follows: on the outside goes the hex-head, ring and stop. On the inside goes the gold-plated star washer and one nut. Tighten to prevent spinning. Next comes the gold-plated crossover connector (described below), followed by a second gold plated nut.

1) Attach the Big as Texas Post™ binding posts to the rear covers in the order of Red-Black-Black-Red.

2) Attach the loudspeaker internal wiring to the binding posts as follow:

White (tweeter +) to Red Post #1.

Blue insulated (tweeter -) to Black Post #1.

Black insulated (woofer -) to Black Post #2.

Coil lead (woofer +) and long red lead to Red Post #2.

3) Make sure the nuts are good and tight, the dab nail polish on the thread of the binding posts to prevent the nuts from coming loose.

Woofer Inductor Installation

With the cabinet standing up on its Plinth, liberally coat the bottom and corners of the large woofer inductor with silicone or mastic. Set the inductor on the bottom of the cabinet such that the bottom and two coated corners are touching the back left corner of the cabinet (as viewed from the front). Add more adhesive. Let dry overnight.

Back Cover Installation

Spray paint the heads of the 1 5/8 screws jet black. Fusion Satin Black works best.

Adhere gasket tape to the inner back and attach the back cover.

Driver Chamber Stuffing

- 1) Carefully place the cabinet on its back. Locate the white and blue wires terminated with .110" quick-connects. Extend these wires through the tweeter cut-out.
- 2) Locate the red and black wires terminated with the .250" quick-connects. Extend the Red through the upper woofer hole and the Black through the lower woofer hole..
- 3) Cut the two rolls of Dacron in thirds long ways, so there are six half rolls total. Install three into each cabinet:
The first section goes all the way down to the shelf brace, along the back of the cabinet. The second section goes behind the lower woofer and snakes around the middle cross braces.
The third section goes against the back of the cabinet behind the upper woofer.

Tweeter Installation

- 1) The North D28 tweeter is built with the gasket attached. Do not add gasket material.
- 2) Attach the white wire to the tweeter positive (marked with a "+" or red dot).
- 3) Attach the blue wire to the tweeter negative (marked with a "-").
- 4) Position the tweeter with the flange lining up with the screw holes, and attach with the #6 phillips head screws provided.

Woofer Installation

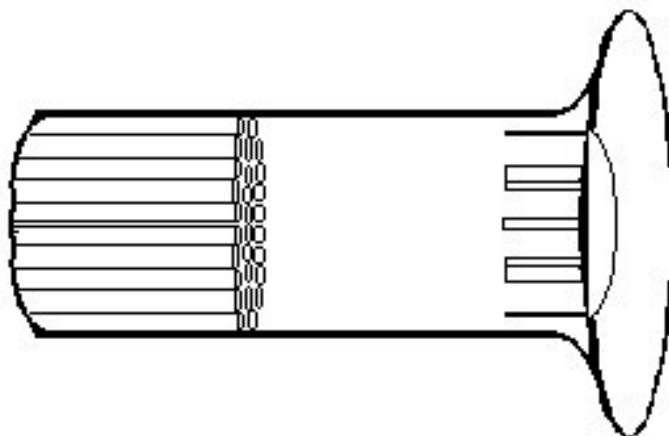
- 1) The Scan Speak 15W/4530K-00SC's are built with the gasket attached. Do not add additional gasket material.
- 2) Attach the red wire to the upper woofer positive (marked with a "+" or red dot).
- 3) Attach the black wire to the lower woofer negative (marked with a "-").
- 4) Attach the Black end of the Series Jumper to the upper woofer negative.
- 5) Attach the Red end of the Series Jumper to lower woofer positive.
- 6) Position the woofer frame to line up with the screw holes, and attach with the #6 phillips head screws provided.

Spikes

This loudspeaker was designed with the Big Toe spikes in the back and Very Big Toe spikes in the front. This arrangement allows for considerable tilt back. The spikes should be adjusted such that they all pierce the carpet and tilt the cabinet back slightly. The driver integration is smoothest when the listening axis is just above the tweeter axis.

Port Optimization

North Creek Loudspeaker Kits can be tuned over about an octave by adjusting the length of straws inside the port tube. The following facilitates port tube removal:



- 1) Add a 2" section of straight tube to the flared port tube assembly. Reserve the rest for later.
- 2) Cut the straws into 5" lengths. Insert the straws into the end of the tube with one inch sticking out. The fit should be so tight that the straws begin to go out of round (about 125 straws for a 3" port).
- 3) Wrap the straw bunch sticking out of the port tube with tape. This secures the straws and makes it easy to adjust the length emerging from the port.
- 4) Add gasket tape to the rear of the port tube flange. Install the port tube into the cabinet. The fit should be tight but the tube should still be removable with a little pulling.
- 5) Secure the port with screws.

One can adjust the length of straws emerging from the port to adjust the tuning frequency by ear. We have found the optimum to be between 1" and 2½".

Once the "perfect" tuning is reached, the port can be fixed by dipping the entire assembly in clear shellac or black paint.

For those that are curious about the origin of this procedure, to the best of my knowledge it was first discussed in writing by Dr. Neville Theile himself. The earliest reference I know of was in an article by Dr. Theile in an ASA journal from the mid '60's, on non-linear port behavior. Which article and year it was precisely is now unknown to me. -GS

Fine Tuning the North Creek Big Kat Loudspeaker System

There are two adjustments that can be made to "fine tune" the sound of the loudspeaker system to match the sound of the room and associated equipment. These are as follows:

Low Frequency Balance:

The extreme low end output of the Big Kat loudspeaker is controlled by the length of straws in the port tube. There is a section in the manual regarding port tuning, but following is a brief description of what to expect:

A port tube with long straws will have very deep bass but at a reduced level. One can tune the Big Kat as low as 25 Hz, but the low end output will be greatly reduced and extremely overdamped.

A port tube with short straws (or no straws) will have a lot of output but higher in frequency. One can tune the port as high as 48 Hz, and the Big Kat will produce a whole lot of boom at that one frequency.

We target a tuning between 32 and 35 Hz. This is achieved by using 5" straws pushed through the port such that they stick out 1" beyond the end of the port tube and into the cabinet. This is the optimum "QB3" alignment.

One must note it is not carved in stone what tuning will be best for the room and equipment. The loudspeaker has the ability to be tuned anywhere in the octave between 25 and 50 Hz, which an output control of about 6dB.

Placement

The Big Kat is capable of an extraordinary three dimensional presentation. However, improper placement in relation to room boundaries may emphasize room frequency response aberrations, while proper placement may eliminate them. Experimentation is mandatory.

Do not underestimate the importance of this procedure.

As a starting point, the loudspeakers should be three inches from the back wall, six feet apart and slightly toed in. Move the loudspeakers out from the wall in one inch steps, then apart in six inch steps, until the bass is tight and crisp. Then, adjust the toe in by quarter inch steps until the image focuses properly and the sound stage extends beyond the loudspeaker positions. Last, adjust the spikes by single turns until the image floats above and behind the speaker positions. When it locks in, you will know.

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