



**Polk Audio**  
**dX Series**  
Dynamic Balance® Subwoofers

Premium Performance Loudspeakers

Owner's Manual

**dX8** Subwoofer

**dX10** Subwoofer

**dX12** Subwoofer

**Attach your receipt  
here and file for future  
reference. It may  
be required for  
warranty service.**

**X**

### **dX Subwoofers—More Bass, Less Space**

The dX Series of subwoofers use the latest technologies and highest quality materials to provide you with the best bass response and greatest reliability possible. The dX subwoofers have been optimized to give the kind of skull-collapsing performance one would expect from huge enclosures in boxes that take up a fraction of the trunk space. Some of their design elements are:

- **Polymer and graphite composite cones**—the stiffest cones in the autosound industry are able to withstand the enormous pressures generated inside small enclosures without breakup and distortion.
- **High mass cones**—allows awesome low frequency tuning in small enclosures.
- **Thick ABS dustcap**—prevents distortion due to the build up of air pressure behind the cap.
- **High durometer rubber surrounds**—provides a much tighter and more durable air seal behind the cone than foam, paper or cloth surrounds, for deep, tight, quick bass. Also, rubber surrounds do not dry rot like the foam surrounds used by other manufacturers.
- **Extra long, precision wrapped, vented coils**—for superior cooling and high power handling.
- **Four layer, 2" voice coil**—handles the heat generated when your amp is really cranking.
- **Vented pole piece**—lets air circulate over the voice coil to keep it cool and in control even when the bass is really thumping.
- **8 Ohm and 4 Ohm versions available**—allows you to choose the impedance that suits your personal system design, including exotic isobaric and push-pull types.

## Who Is Going To Build Your Subwoofer Enclosure?

Since the subwoofer enclosure is so critical to getting the best performance from your dX subs, you should ask yourself the following questions:

1. Do I really enjoy working with my hands?
2. Do I have good woodworking and mechanical skills?
3. Do I have, or have access to, woodworking and electrical tools?
4. Do I have a solid understanding about musical reproduction in an automobile?

🚗 If you answered NO to any of the above questions, we recommend you choose one of these two possible alternatives: First, there are pre-built subwoofer enclosures on the market from manufacturers like Q-Logic and R/T, or enclosure kits from BassLine and others. The second alternative is to have your authorized Polk Audio dealer design and build a woofer box for you.

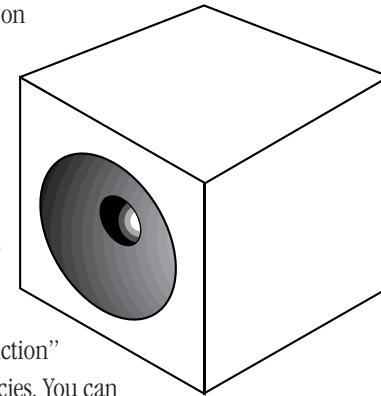
🚗 If you answered YES to all of the above, let's review some basics before you begin.

## Building Your Own Enclosure

The dX subwoofers have been optimized to give you flat bass response in small sealed enclosures. Some listeners may want response other than "flat," or may want to trade-off depth of response for greater efficiency by using a vented enclosure. There is no way we could provide all the information for all of the options here. This manual will give you enough information to build a great sounding, small sealed enclosure. If you are interested in a greater choice of enclosure designs, your Polk dX Series dealer has extensive experience designing woofer boxes and will be more than happy to work with you. If you prefer, you can call our Customer Service Department from 9AM to 6PM, Monday through Friday, Eastern Time at (800)377-7655.

## Acoustic Suspension Enclosures

As the dX subwoofers are optimized for acoustic suspension enclosures, we suggest you use this type of design. The acoustic suspension cabinet is a sealed airtight box, and is the easiest box to build. It also is a very predictable enclosure with easily calculated parameters, and it has a smooth natural sound. Properly built acoustic suspension cabinets have a flat frequency response that begins rolling off at 12 dB per octave at the frequencies below its cabinet resonance. This works very well inside a car because of a natural phenomenon called "room gain" or "transfer function"



that gives you a 12 dB per octave *increase* in bass frequencies. You can roughly calculate at what frequency this gain begins by using the equation  $F = 565 / L$ . F is the frequency at which bass gain begins, and L is the longest dimension of your "room." If, for example, you measured the longest dimension of your car as 5.65 ft., the room gain begins at  $565 / 5.65$  or 100 Hz. If your goal was perfectly flat frequency response you would design your cabinet for this particular car to have a resonance frequency of 100 Hz. Since most people want more bass than a flat frequency response yields, tuning the cabinet at a lower frequency, say 50 Hz, would give you a gain of 12 dB per octave between 100 and 50 Hz and flat response from 50 Hz down. The larger the cabinet, the lower the resonant frequency, and the lower the efficiency. Two identical systems will sound very different in a Honda vs. a Cadillac. The bigger the car the lower the frequency at which room gain begins.

## Tools You Will Need To Build Your Enclosure

If you have decided to build your own enclosure for your Polk dX subwoofers, here is a list of the tools you should have available to you.

- Calculator
- Assorted Drill bits
- Screwdriver bit for drill or manual screwdriver
- Circular saw
- Tape measure
- Drill - electric or cordless
- Jigsaw

## Parts You Will Need To Build Your Enclosure

When building a subwoofer enclosure you will find that there are numerous materials recommended for construction.

- 1) Medium density fiberboard (MDF)
- 2) Marine grade plywood
- 3) Particle board (the smaller the particles the better)

These materials range in price as well as availability. Particle board is the most common, least costly, and can be purchased at most hardware stores. MDF and marine grade plywood, although preferable, are usually much harder to find, and much more costly. Whichever you choose, we recommend that its minimum thickness be 3/4". This will provide the rigidity necessary for optimum performance.

If you've never built an enclosure before we are going to try to make this as easy and painless as possible. If you've built enclosures before you can skip this section and go right to the technical sheet to get your parameters.

Complete Parts List:

- 1) Wood (particle board, MDF, or marine grade plywood) 4' x 8' x 3/4" sheet
- 2) Wood glue (one 12-16 oz. bottle)
- 3) 1 1/4" x #8 wood screws (one lb. box)
- 4) Caulk gun and silicon caulk (two tubes)
- 5) Terminal cup (one per speaker) available at electronic parts stores
- 6) Speaker wire (2-4 ft.)
- 7) Carpet (optional)
- 8) Grills to protect your subwoofers (optional)
- 9) Solderless speaker connectors (available at electronic parts stores)

## Designing Your Polk dX Subwoofer Enclosure Step By Step

1.) How much room do you have to work with in your car or truck?

When designing your subwoofer enclosure, the first thing you need to figure out is, just how large an enclosure will fit in your vehicle. When an enclosure is going in the trunk of a car, you first need to measure your trunk to find the maximum height, width, and depth you can use. Pay attention to trunk hinges and tension bars. If your enclosure is going in an area other than a trunk, make sure you check for similar obstructions. After measuring, subtract 1.5" from each dimension. This compensates for the thickness of the material you use (simply double the thickness, i.e.: if you're using 3/4" material, subtract 1 1/2"; 1" material, subtract 2", etc), and will give you your usable (internal) dimensions. Record these dimensions here for future reference.

### Maximum dimensions

Height: \_\_\_\_\_ inches

Width: \_\_\_\_\_ inches

Depth: \_\_\_\_\_ inches

### Usable dimensions

(Minus 1.5 inches)= \_\_\_\_\_ inches

(Minus 1.5 inches)= \_\_\_\_\_ inches

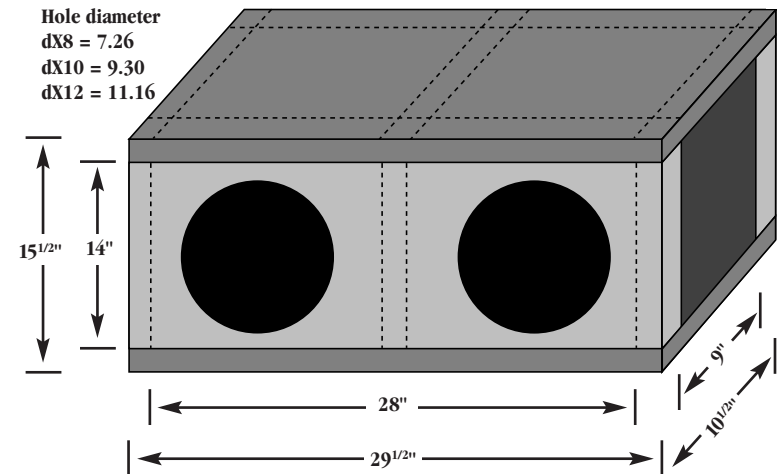
(Minus 1.5 inches)= \_\_\_\_\_ inches

Usable volume= \_\_\_\_\_ cubic inches

Usable volume= \_\_\_\_\_ cubic feet

Multiply your usable Width x Height x Depth. The product will be the usable (internal) volume of your enclosure in cubic inches. Divide this number by 1728 (the number of cubic inches in a cubic foot). This will give you the internal volume in cubic feet. Divide your internal cubic feet by 2 (only if you are using a pair of dX subwoofers). Compare this number to the chart at the bottom of the technical sheet. Choose the recommended enclosure which is closest in size or that fits your desired type of enclosure. Now that you have all of your needed dimensions, you can begin cutting your wood. From the above chart you can tell how big each piece of wood should be.

Here's a sample enclosure:



### Maximum dimensions

Height: 15.5 inches

Width: 29.5 inches

Depth: 10.5 inches

### Usable dimensions

(Minus 1.5 inches)= 14 inches

(Minus 1.5 inches)= 28 inches

(Minus 1.5 inches)= 9 inches

Usable volume= 3528 cubic inches

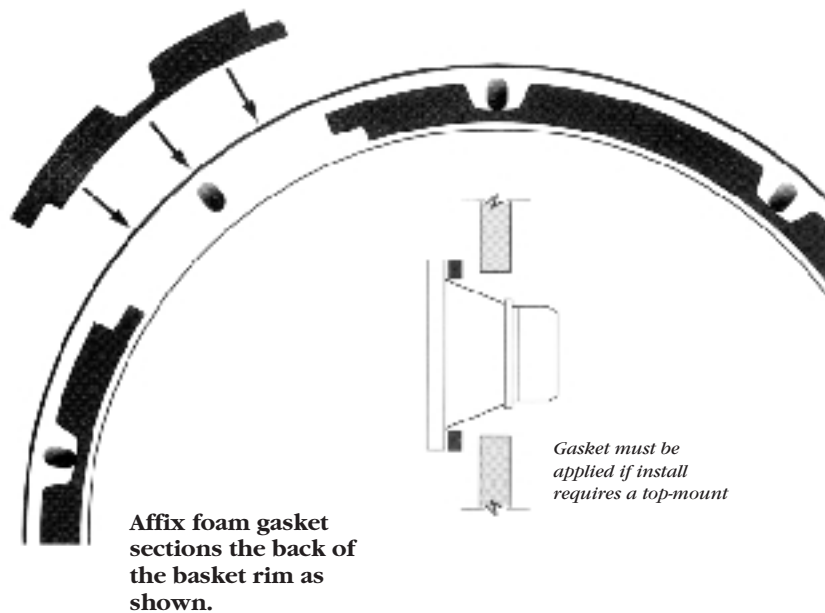
Usable volume= 2.042 cubic feet

By looking at the chart at the end of the technical sheet, you find that this usable volume is slightly more than double the recommended volume for a single dX10, in either a sealed or vented enclosure. Assuming that you will be using a pair of woofers, this will work out well.

If you are using a single subwoofer, you can cut your width in half. Since we will be using a pair of dX10 subwoofers, for our sample enclosure, we now need to determine the center divider displacement. This can be figured out by multiplying the height x depth x thickness of the divider (in our enclosure the thickness of the divider will be the same as the rest of our enclosure, 3/4") and subtracting that number from the total usable cubic inches.

You now have all the dimensions you need to begin cutting out your wood. The illustration on page 7 shows a diagram of the enclosure with all the panel sizes that need to be cut.

After you have cut all of the wood, it's time to start assembling your enclosure. Before you assemble your enclosure there are a few things we recommend doing. You will need to cut out the hole for your Dynamic Balance® subwoofer and your terminal cup, and pre-drill the holes for your screws. The terminal cup is a connector that allows you to plug and unplug the wires from your amplifier into the enclosure. You may want to have a buddy help you with assembly, since it's hard to hold the pieces together and assemble them at the same time. When building your subwoofer enclosure we suggest that you use



wood glue in combination with wood screws for the strongest joint. We also suggest that you use one screw about every three inches along the seams of your enclosure. Assemble the enclosure as shown in the above diagram but leave one side off. We suggest that you leave off the baffle board, this will allow you to seal your enclosure more easily, and an air-tight seal is crucial! The best way to insure an air tight seal is to seal the inside of your enclosure with quality silicone caulk. This also includes sealing around your input terminal cup, and if you are using a ported enclosure, around your port. It is not advised to use silicone around your subwoofer when mounting it to the baffle. Instead, we recommend using the foam gasket weather stripping supplied with your dX subwoofer. When mounting your subwoofer to the baffle board, pre-drill your mounting holes. This will make the mounting of your subwoofer easier and will help prevent damage to your subwoofer from a slip of the drill. When securing your subwoofer to the enclosure we recommend using bolts and tee-nuts, but if you prefer, you can use wood screws. Whichever you use make sure they are at least 1.25" long. This will insure a good grip into the wood.

One last thing you could do to your enclosure before installing it, is stuff it. The primary reason for stuffing an enclosure is to "trick" the woofer into thinking that the enclosure is larger than it actually is. You would want to do this if you build your box smaller than the recommended size. By stuffing the box you can build the box as much as 10% smaller than recommended, and achieve the same net result as the full size unstuffed box. The easiest way to do this is to use dacron pillow stuffing. It can be bought from craft stores fairly inexpensively. The rule of thumb for "stuffing" your enclosure is 1 pound of dacron per cubic foot. When putting the Dacron into your enclosure, do not pack it in, rather place it evenly around the inside the enclosure. When stuffing a ported enclosure it is important not to obstruct the port or the vent on the back of the sub with Dacron.

Although your new dX subwoofers were designed to work in a wide variety of enclosures and configurations, we have included only the most popular ones. For more enclosures and configurations, please contact your local authorized Polk Audio dealer. We hope that this manual has helped to take the mystery out of designing an enclosure for your new Polk Audio dX Subwoofers.

**(Refer to insert for recommended enclosure design)**

### What If I Need Help?

Good luck to you, and enjoy your new Polk dX Subwoofers. If you need assistance or have any questions, call 1-800-377-7655 between 9am and 6pm, Monday through Friday Eastern Standard Time.

**THEILE / SMALL PARAMETERS**

	<b>dX8-4Ω</b>	<b>dX8-8Ω</b>	<b>dX10-4Ω</b>	<b>dX10-8Ω</b>	<b>dX12-4Ω</b>	<b>dX12-8Ω</b>
Freq. Response	20 - 500Hz	20 - 500Hz	20 - 300 Hz	20 - 300Hz	20 - 200Hz	20 - 200Hz
Sensitivity	84dB	84dB	85dB	85dB	86dB	86dB
Impedance (Nominal)	4Ω	8Ω	4Ω	8Ω	4Ω	8Ω
Impedance (Actual)	3.7	8.6	3.7	8.6	3.7	8.6
Max. Power (RMS)	200 W	200 W	300 W	300 W	400 W	400 W
Max. Power (Peak)	400 W	400 W	600 W	600 W	800 W	800 W
Resonant Freq. (Fo, Fs)	30 Hz	34 Hz	28.7 Hz	31.2 Hz	26.3 Hz	26.7 Hz
Qms	6.52	6.99	6.99	7.65	6.71	7.64
Qes	0.48	0.60	0.53	0.70	0.63	0.79
Qts	0.45	0.55	0.49	0.64	0.58	0.71
Vas	14.29L .51 ft <sup>3</sup>	13.00L .46 ft <sup>3</sup>	33.4 1.18 ft <sup>3</sup>	32.9 1.16 ft <sup>3</sup>	79.3 2.80 ft <sup>3</sup>	87.5 3.1 ft <sup>3</sup>
Cms	222.5 μm/N	202.3 μm/N	218.1 μm/N	215.3 μm/N	213.1 μm/N	235.3 μm/N
BL	13.4 TM	17.1 TM	13.4 TM	17.1 TM	13.4 TM	17.1 TM
Sd	.0214m <sup>2</sup> .230ft <sup>2</sup>	.0214m <sup>2</sup> .230ft <sup>2</sup>	.0330m <sup>2</sup> .355ft <sup>2</sup>	.0330m <sup>2</sup> .355ft <sup>2</sup>	.0514m <sup>2</sup> .553ft <sup>2</sup>	.0514m <sup>2</sup> .553ft <sup>2</sup>
Winding Width	25.4mm 1.00in.	22.9mm .90in.	25.4mm 1.00in.	22.9mm .90in.	25.4mm 1.00in.	22.9mm .90in.
Xmax (Linear)	8.70mm .343in.	7.48mm .293in.	8.70mm .343in.	7.48mm .293in.	8.70mm .343in.	7.48mm .293in.
Xmax (Mechanical)	25.4mm 1.0in.	25.4mm 1.0in.	25.4mm 1.0in.	25.4mm 1.0in.	25.4mm 1.0in.	25.4mm 1.0in.
Le	1.5mH	2.5mH	1.5mH	2.5mH	1.5mH	2.5mH
Mms	125.9 g	107.2 g	141.4 g	121.4 g	172.6 g	152.6 g
Driver Weight	3.7kg 8lb.3oz.	3.7kg 8lb.3oz.	3.7kg 8lb.3oz.	3.7kg 8lb.3oz.	3.7kg 8lb.3oz.	3.7kg 8lb.3oz.
Magnet Weight	1.1kg 2.5lb.	1.1kg 2.5lb.	1.1kg 2.5lb.	1.1kg 2.5lb.	1.1kg 2.5lb.	1.1kg 2.5lb.
Vd (Volume of Driver)	.022 ft. <sup>3</sup>	.022 ft. <sup>3</sup>	.042 ft. <sup>3</sup>	.042 ft. <sup>3</sup>	.062 ft. <sup>3</sup>	.062 ft. <sup>3</sup>
Driver Cut out Diameter	7.26 18.4cm	7.26 18.4cm	9.30 23.6cm	9.30 23.6cm	11.16 28.3cm	11.16 28cm

**dX Series 1 Year Warranty**

Polk Audio, Inc. warrants the original purchaser only that this Polk Audio dX Product (the Product) will be free from defects in materials and workmanship for a period of (1) one year from the date of original retail purchase from a Polk Audio Authorized Dealer. However, this warranty will automatically terminate prior to the expiration of the (1) one year period if the original retail purchaser sells or otherwise transfers the Product to any other party. The original retail purchaser shall herein after be referred to as “you.” To allow Polk Audio to offer the best possible warranty service, please fill out the Product Registration Card(s) and send them to the Factory at the address provided in the Registration Card within (10) ten days of the date of purchase.

Defective Products must be shipped, together with a proof of purchase, prepaid insured to the Authorized Polk Audio Dealer from whom you purchased the Product, or to Polk Audio, 2550 Britannia Blvd., Suite D, San Diego, CA 92154. Products must be shipped in the original shipping container or its equivalent; in any case the risk of loss or damage in transit is to be borne by you. If, upon examination at the Factory or Polk Audio Authorized Dealer it is determined that the unit was defective in materials or workmanship at any time during the Warranty period, Polk Audio or the Polk Audio Dealer will, at its option, repair or replace this Product at no additional charge, except as set forth below. All replaced parts and Products become property of Polk Audio. Products replaced or repaired under this Warranty will be returned to you, within a reasonable time, freight prepaid.

This Warranty does not include service or parts to repair damage caused by accident, disaster, misuse, abuse, negligence, inadequate packing or shipping procedures, commercial use, voltage inputs in excess of the rated maximum of the unit, cosmetic appearance of the cabinetry not directly attributable to defects in materials or workmanship, or service, repair, or modifications of the Product which has not been authorized or approved by Polk Audio.

This Warranty is in lieu of all other expressed Warranties. If this Product is defective in materials and workmanship as warranted above, your sole remedy shall be repair or replacement as provided above. In no event will Polk Audio, Inc. be liable to you for any incidental or consequential damages arising out of the use or inability to use the Product, even if Polk Audio, Inc. or a Polk Audio Dealer has been advised of the possibility of such damages, or any other claim by any other party. Some states do not allow the exclusion or limitation of consequential damages, so the above limitation and exclusion may not apply to you. This Warranty gives you specific legal rights which may vary from state to state.

This warranty applies only to Products purchased in the United States of America, its possessions, and U.S. and NATO armed forces exchanges and audio clubs. The Warranty terms and conditions applicable to Products purchased in other countries are available from the Polk Audio Authorized Distributors in such countries.



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