

Is One Subwoofer Enough?

Subwoofers, possibly the most room size dependant speaker in the performance stakes. The role of a sub may not be the most glamorous, it is however a crucial part of your overall listening experience. Position within and size of the room considerably influences the performance of the subwoofer.



To produce bass you need to move a lot of air.

Having a bigger more powerful subwoofer in a large room will not work as well as two subwoofers approximately half the size in the same room.

The simple aspect of room loading can achieve additional 36db of low frequency performance from two subwoofers up against 18db of power even if the subwoofer was more than twice the size.

Due to the length of the sound wave produced by a sub, (sine wave lengths ranging from approximately 2 to 20 meters) the construction materials used in the building itself and the size of the room play a larger roll in bass performance than most will give credit for.

For further explanation on sound waves, see the physics of sound wave article.

The most common surround sound formats are – Dolby Digital and DTS - **5.1** Just in case you didn't already know, the '5.1' in 'Dolby Digital 5.1' and DTS refer to the five mono channels of full range material, plus the mono channel (.1) of low frequency information specifically recorded to be handled by the subwoofer. 6.1, 7.1 are the same but with extra rear channel speakers. Does adding a subwoofer to these formats make them **.2**? The short answer NO!

Does adding a subwoofer improve the bass response capable from one sub, even if the two subwoofers are half the size of one huge one? In certain situations, yes, but be careful.

A case of two subs is better than one.

Room size and shape has an impact on the bass response of subwoofers, some of the most significant issues include standing waves and phasing problems, all due to the room.

Positioning of a single subwoofer within the room produced significant standing waves in the Low frequencies. The use of a single subwoofer promoted the waves where the addition of a second subwoofer very easily resolved all major low frequency issues.

Due to the size and shape of the room the standing waves occurred regardless of the size of the subwoofer and the cost of the subwoofer.

Room B on the other hand didn't have an issue with standing waves rather a lack of bass issue, also due to room size in this case it was length of room rather than

shape of room. Putting a bigger and bigger subwoofer did not rectify this issue in a cost effective way.

Once again the amount of money invested in your system has little relationship to the performance returned.

1 Sub or 2?

One large 300W 12" subwoofer selling for \$3000 or

Two 8" 150W subwoofers selling for \$1200 each

Look carefully at the examples:

Purely based in physics, two 8" drive units each in their own enclosures with their own amplifiers positioned in corners within the room will produce more than 30db more bass, more efficiently than a single 12" 300W subwoofer. Where does the extra 30db of bass come from you ask?

Room loading, positioning any subwoofer in a corner can increase SPL of the bass by as much as 18db purely by corner loading the subwoofer. This effect increases exponentially with multiple subwoofers; this performance of bass improvement is free bass: bass that comes without financial cost. What would you do spend \$3000 on one subwoofer and not be satisfied with the bass or invest \$2400 in Two subwoofers and have amazing returns for your money?

Getting it Right

The first thing that you need to realise is that subwoofers are not created equal. Not only does the price vary dramatically, but more importantly the quality. The quality of the sub that you require is going to depend on a number of factors.

- **Distortion** is also important or rather the lack of distortion. When the subwoofer cone moves in and out and dramatically so during heavy bass passages, distortion is introduced. The better the amplifier usually found with

an improved damping factor, higher current, the more control exercised over the driver, and thus distortion is reduced.

- **Power** output and size also matter. Experience has shown that in many cases it is better to have two smaller subwoofers than one bigger more powerful unit. Remember, we are dealing with the laws of physics and some units, regardless of size and power cannot fill the shoes where multiple units are required.



- **Placement.** Low-frequency sound waves are omni-directional, so you have a great deal of flexibility when it comes to subwoofer placement. However, any subwoofer will give more bass when located in a corner where the wall is usually stronger and less bass when located near an opening like a door.
- **Goal** should be better bass, not more bass! It is not difficult to build a sub that will produce low notes, and which will play loud, provided you are not looking for a clean, defined sound. Many (most?) inexpensive subwoofers tend to produce a very monotone bass. Plenty of it, but all the bass notes sound the same. Listen to various subwoofers on music, rather than just movies.

- The price is usually a good guide to performance and products that deliver an excellent price/performance ratio. These models will perform very well in most medium priced systems. If your system is more exotic, then you may need to double or even triple this amount! For more modest requirements or systems, then there are some good smaller units priced between \$850 and \$1200. If you think you only need to spend \$500 or less – forget it! You are just kidding yourself and either haven't had a proper demonstration of the differences or have unrealistic expectations. If funding is a problem, wait a while until you can spend the extra.

Conclusion

The quality of your existing system and the size of your room are very important when choosing a subwoofer. If you have a top-notch Home Cinema you will be doing it a great injustice to try to get away with a cheap, low grade sub. Also the larger the area, a better sub will be required, (possibly even two of these), with the emphasis on the word better. Your present speakers should also influence the final choice.

Most large floor-standing speakers deliver good bass response. Still, if you're using them in a home cinema, or if you demand rich, full sound from your stereo music, plan on including a powered subwoofer for an added dose of really deep bass content. Bookshelf speakers have a more difficult time reproducing lower frequencies and, in general, provide less bass response. For these speakers, the extra punch of a subwoofer is crucial.

The market today sees an avalanche of brands available to the consumer. Understandably, this can be very confusing for the majority. So where do you start? Easy! In a shop that specialises in audio visual systems, has dedicated staff who are able to explain the differences and who can give a meaningful demonstration from a number of respected brands. So, what constitutes a respected brand? Simply the opposite to a 'no-name' brand! Respected brands usually have brochures and a web site available for you to visit. Most will have also had their products reviewed in the press in some way or another. If the brand you are considering cannot meet even the basics listed here, then choose something else that does!

Final piece of advice is to listen. Listen to several models if you are unsure, even ones costing much more than you plan on spending. This will give you a reference point and help you determine what the differences really are between the various models. This will give you confidence in yourself and you may even be surprised at what you actually hear.

Audio Trends have had a long association with several subwoofer manufacturers dating back to the late 70's. We are ready and willing to help you with the right subwoofer choice.

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