



RECTANGULAR VERSUS TRAPEZOIDAL ENCLOSURE SHAPES

Until the 1980's it was uncommon for loudspeaker enclosures to have a trapezoidal profile. The classic shape was rectangular. The rectangular geometry offered good internal volume and since low frequency response was proportional to internal volume, the greater the internal volume the greater the low frequency output.

In the 1980's the trend for loudspeaker arrays and "tight packing" generated the need for enclosure shapes that would pack closely together and still product the desired horizontal radiation patterns. (The technical merit of these arrays will not be discussed in this "white paper".) The trapezoidal enclosure shape gained popularity rapidly and almost totally replaced the conventional rectangular shape for most "professional" loudspeaker systems. The rationale was that with a trapezoidal shape a user could construct a loudspeaker array if necessary. Unfortunately, the trapezoidal shape represented a compromise. Although the shape allowed groups of loudspeakers to be closely spaced into arrays, the geometry also represented a reduction of internal volume. So, low frequency response was compromised, and unless the enclosure was made taller or wider to offset the loss of volume the low frequency performance suffered.

After almost 30 years (It is hard to imagine that 1980 was almost 30 years ago!) it is time to revisit the basic shape of loudspeaker enclosures. The trapezoidal shape allows for easy and simple arrays that can be "tight packed" but suffers from reduced low frequency response. The rectangular enclosure, as compared to the trapezoidal shape, offers improved low frequency response but cannot be tight packed. The low frequency response can certainly be equalized in trapezoidal enclosures but equalization will reduce amplifier headroom and increase the low frequency transducer excursion. This increased excursion results in increased loudspeaker system distortion and reduced reliability.

So, what enclosure shape is "optimal"? The answer is relatively simple.

If a single enclosure is to be suspended, and this occurs far more frequently than arrays, then a rectangular shape is superior to a trapezoidal shape. If a single enclosure is suspended there is no reason to use a trapezoidal enclosure and sacrifice low frequency response.

At ONE SYSTEMS® we wanted to optimize system performance, not compromise so that one model could “do it all”. If an installation requires a single hang then why sacrifice the low frequency performance?

ONE SYSTEMS offers both trapezoidal enclosure geometries as well as rectangular geometries. If an application does not require an array, and most don't, then we recommend the rectangular geometry.

This philosophy is illustrated in our 115TW and 115RW models. The 115TW is a trapezoidal geometry, hence the “T” reference in the name. The 115TW is designed for permanent installations where multiple 115TW's are to be suspended in arrays. These arrays may be of multiple 115TW's or also include 118Sub-W's as well.

The 115RW consists of the same components and the height and width of the enclosure are identical to that of the 115TW but the enclosure geometry is rectangular. The 115RW offers additional low frequency output and can still be suspended. The 115RW is designed for single hangs or exploded arrays. (The 115RW also includes handles for portable applications).

This same philosophy applies to the ONE SYSTEMS 215RW. The 215RW is a 2 x 15 inch two way system. It is very unusual for 2 x 15 inch systems to be suspended in tight pack arrays so the enclosure geometry is rectangular. Again, the advantage, particularly in the case of the double 15 inch, is that the rectangular enclosure offers increased low frequency output. Like all ONE SYSTEMS enclosures, the 215RW may be suspended in single enclosure hangs or in exploded arrays. Because it is often common for 215 enclosures to be used in portable applications, the 215RW also includes handles.

ONE SYSTEMS offers both trapezoidal and rectangular geometries in selected models because optimizing performance is critical. All ONE SYSTEMS products may be suspended but not all installations require tight pack arrays so ONE SYSTEMS offers a choice to optimize the installation and not sacrifice performance.



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