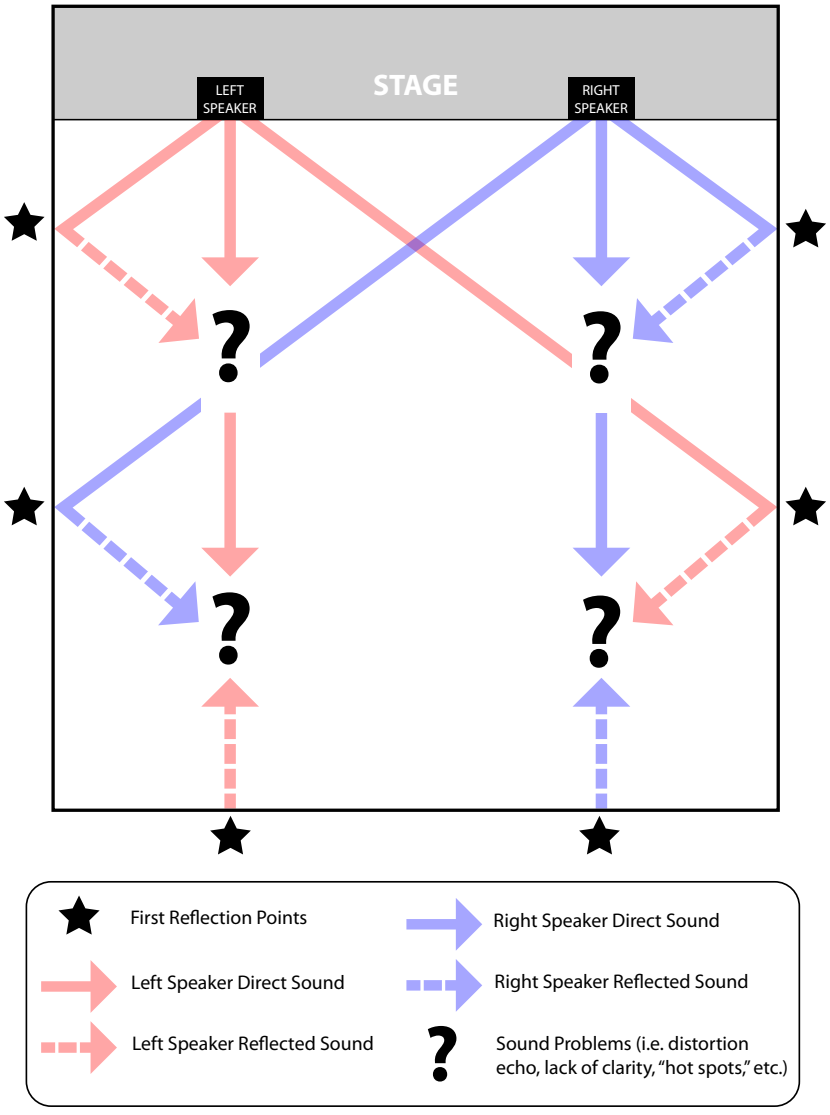
Common Sound Reflection Problems

Most sound problems are due the different ways in which sound reaches the listener in a room. A person not only hears direct sound waves, but also ***reflected*** sound waves. And it's the convergence of those two wave forms on a person's ears that cause problems.

In the diagram below, you can see an example of how this works in a room with a basic sound system. Sound waves disperse from both the left and right speakers, and some of them reach the listeners directly while others reach them just milliseconds later after being reflected off the walls, ceiling and floors. The result of this convergence is distortion - whether it be in the form of too much echo and reverberation, lack of clarity, too much volume at certain frequencies, or overall sound imbalance. If you're reading this article, then it's safe to assume that you're experiencing some of these problems.

Some of these distortion issues can be improved upon by installing an expensive sound system and having a skilled sound technician on the sound board. But the only truly effective remedy is to apply some sort of acoustical treatment to the hard reflective surfaces in your room so that a significant portion of the reflected sound waves are either absorbed altogether or dispersed in multiple directions so that a distortion-free listening zone is achieved. The most economical way to do this is to install high quality acoustical panels to your walls in the right places.



Determining the Right Amount of Sound Treatment

In order to determine how much sound treatment you need for your space, you'll need to answer a couple of simple questions:

First, ***how big is your space?*** Measure length, width, and height of the room. If you cover somewhere between 10-20% of the total running feet of wall space with our 4' x 4' x 2" thick acoustic panels, you'll notice a significant improvement. (NOTE: Rooms with ceilings under 14' can be treated effectively with a single row of 4' x 4' acoustic panels. For rooms with ceilings over 14', we recommend adding additional rows of panels vertically, depending on the height. Please contact us for more information.)

Second, ***what is your space used for and what are your sound treatment goals?*** Depending on what your space is used for, you may have different goals. If it's a classroom or fellowship hall with no amplification, but you want to reduce the echo and improve sound clarity when a lot of people are in the room talking, then you can probably achieve your desired results with fewer panels strategically placed. But if your space is a worship center with a sound system, where a full contemporary worship band is leading music, then you'll probably need more panels and maybe some corner bass traps or diffusers as well.

Speaking of bass traps and diffusers, we recommend placing bass traps in the back corners of the room if you need to control overbearing low-end frequencies. If your ceilings are higher than 14' we suggest stacking at least two traps in each corner. Diffusers are helpful if you want to preserve more of the room's natural acoustics and "liveliness." Instead of absorbing sound waves, diffusors redirect and scatter them, which reduces echo and increases clarity without reducing volume and deadening the overall sound in the room. For most applications, however, the right amount of acoustic panels placed in the right locations will achieve satisfactory results and save you money.

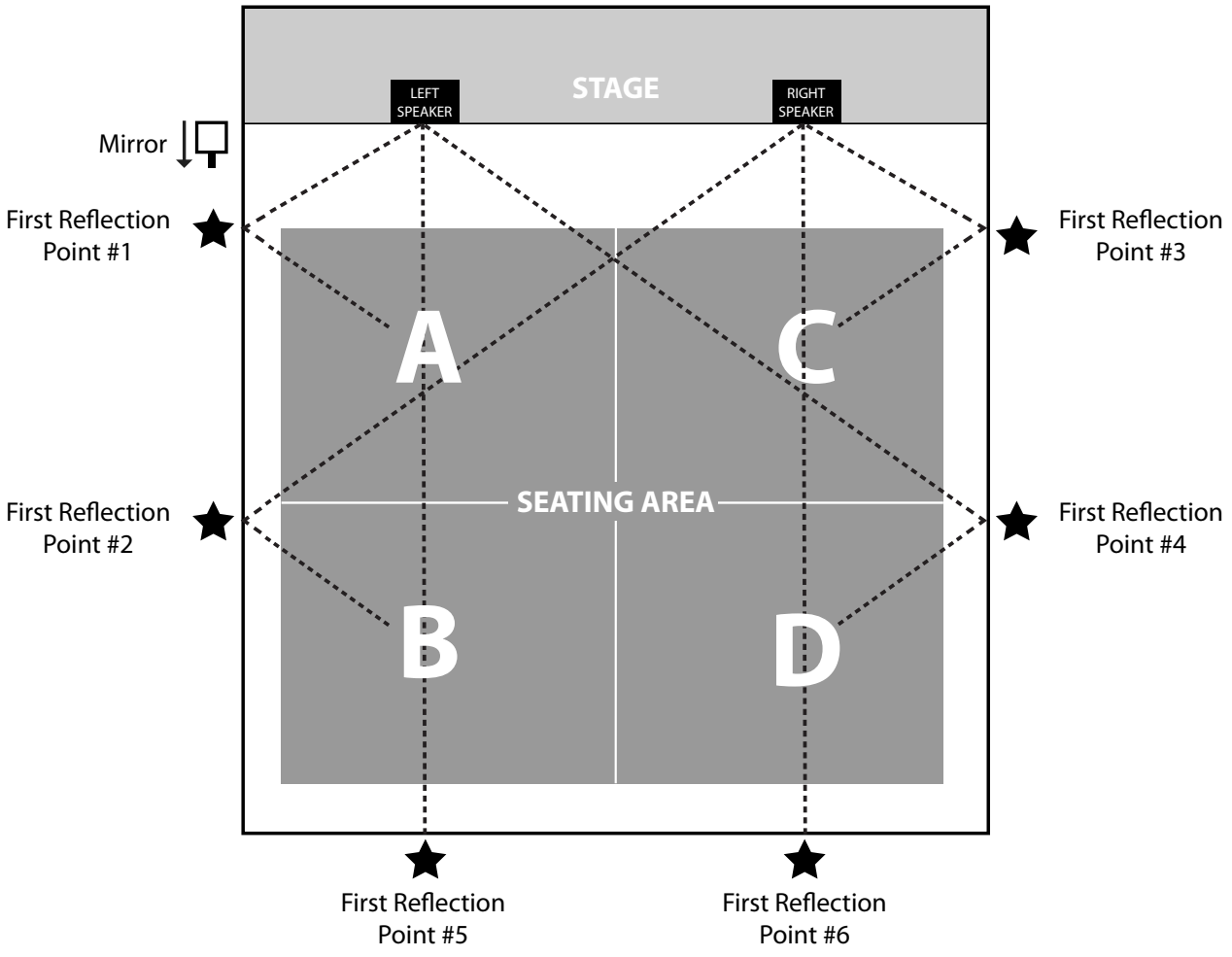
First Reflection Points

Once you've determined how much sound treatment you need, you need to determine where to place your acoustic panels. This is done by determining your room's first reflection points, where the sound being dispersed from your speakers is first reflected off of the side walls and the back wall. These are the most important points to cover with acoustic panels. And the bigger the room, the larger they'll be, so the more panels you'll need to effectively treat them. Here is an easy way to find the first reflection points in your room. All you need are a friend, a mirror, a chair, and a pencil:

First, determine where the primary seating area is in the room and divide that area into four quadrants.

Second, take a seat near the middle of the front left quadrant of the room facing the front, directly in front of the left speaker if possible (position "A" in diagram below). Have a friend hold a mirror up against the left wall at speaker height. If the speakers are high up, you'll need to fasten the mirror to a broomstick (duct tape works great). Starting at the front of the room, have him slowly move toward the back of the room. If the speakers are high up and facing downward at an angle, have him follow that angle as closely as possible. When you can see the reflection of the left speaker in the mirror, mark that spot and call it First Reflection Point #1.

Third, take a seat in the back left quadrant of the room, and repeat the same process, but this time, you're looking for the right speaker in the mirror. Once you see it, mark that spot and call it First Reflection Point #2. Repeat the same steps on the right side of the room to find First Reflection Points 3 and 4 on that side of the room. Finally, mark the points on the back wall that are directly across from the left and right speakers, and call them First Reflection Points 5 and 6, respectively. Now you're ready to place your acoustic panels!

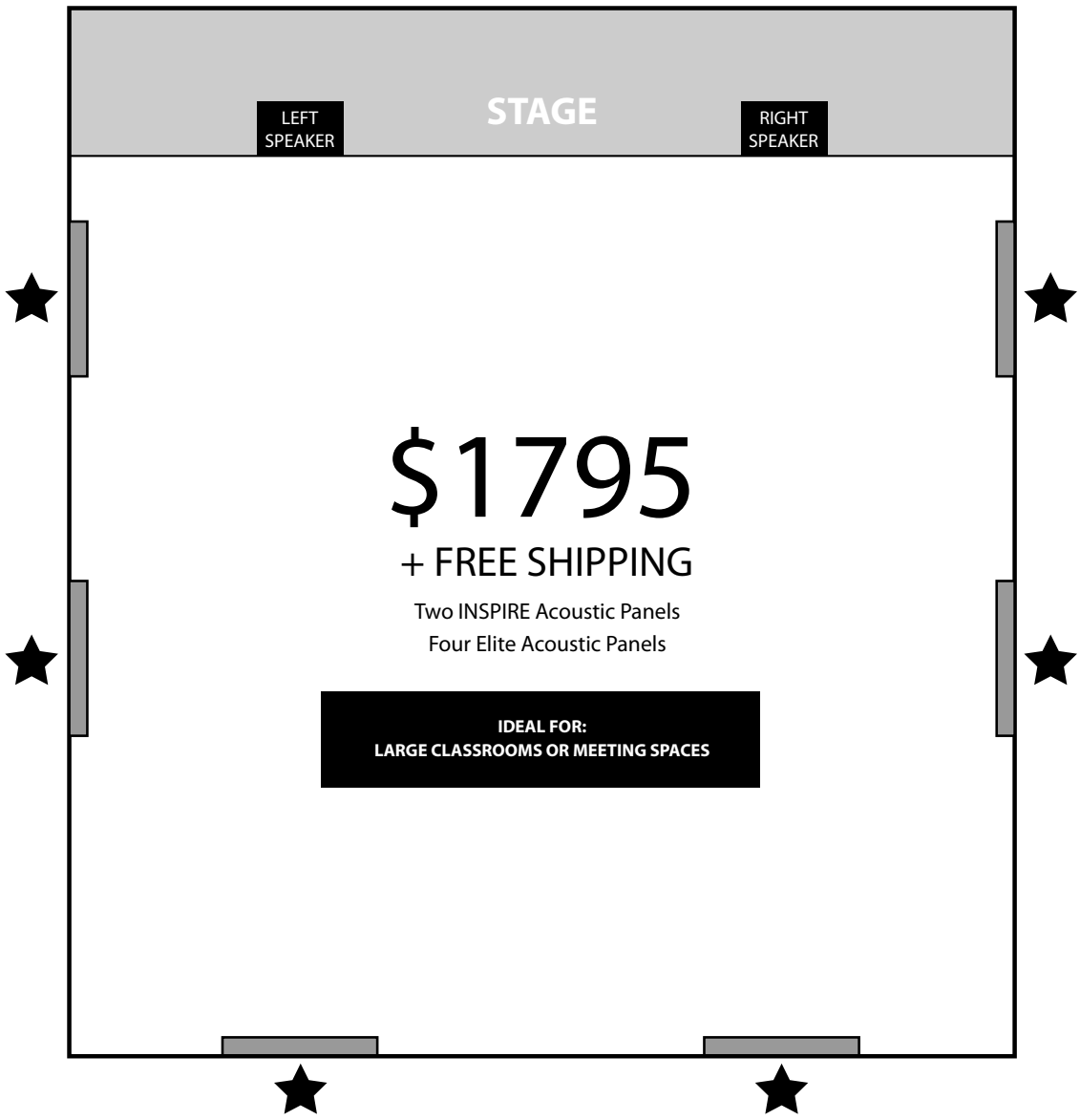


Package Options and Panel Configurations

In the pages that follow, you'll see suggested acoustic panel configurations based on the size of your room and first reflection points. Please note that each of these packages are designed to give you somewhere between 10-20% wall coverage. If you want more coverage, we recommend either upgrading to a bigger package, or simply adding additional panels to your order.

Basic Package

(Suitable for rooms smaller than 1000 ft.^{2})

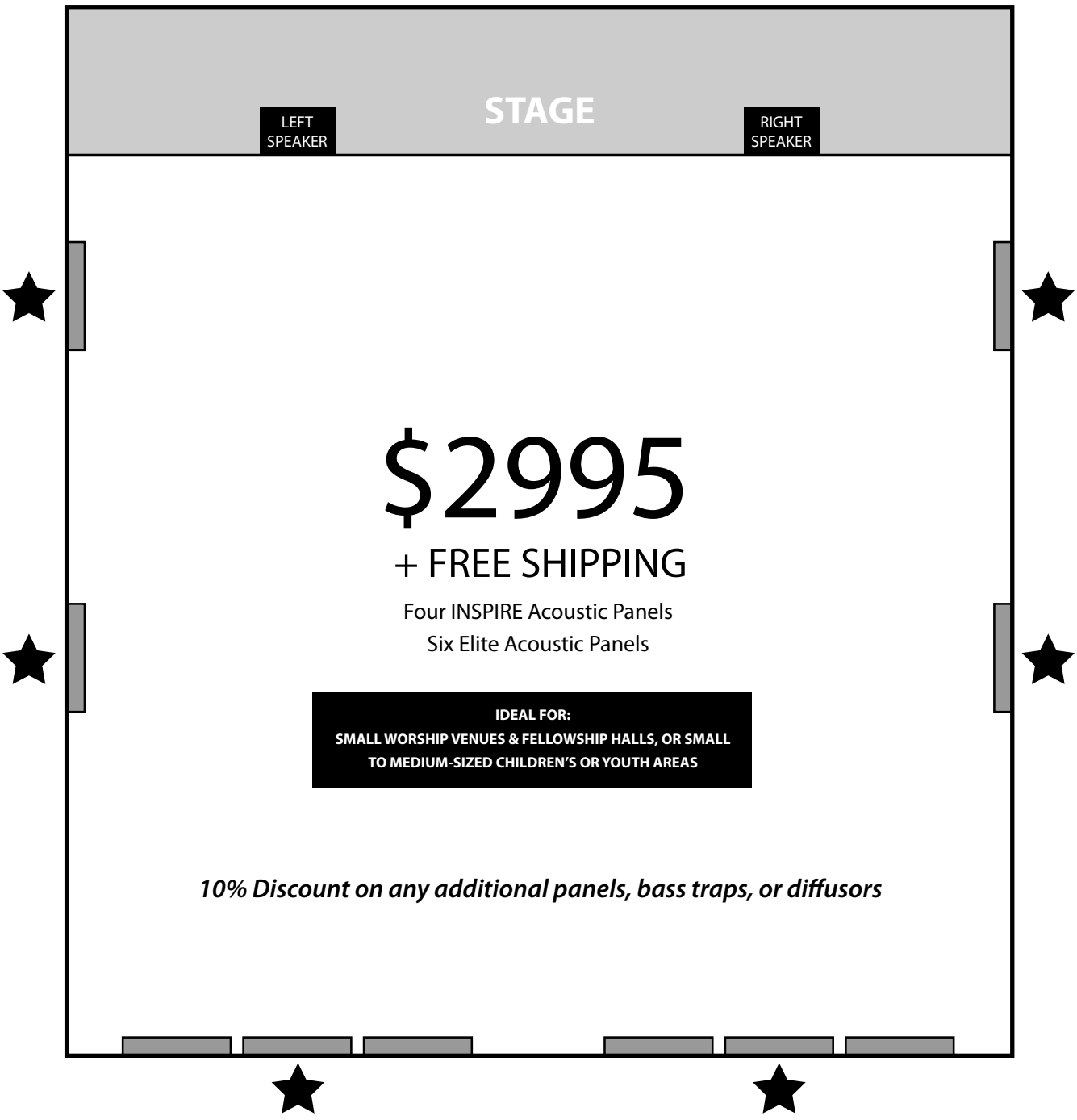


Place 4' x 4' acoustic panels at each of the first reflection points in the room. This will improve clarity and reduce echo and distortion.

NOTE: If stage monitors are being used, we recommend placing additional 4' x 4' acoustic panels on the front wall to reduce stage volume and distortion. We also recommend adding additional panels if ceilings are higher than 14'.

Deluxe Package

(Suitable for rooms 1000-1800 ft.^{2})



$2995

+ FREE SHIPPING

Four INSPIRE Acoustic Panels

Six Elite Acoustic Panels

IDEAL FOR:
SMALL WORSHIP VENUES & FELLOWSHIP HALLS, OR SMALL TO MEDIUM-SIZED CHILDREN'S OR YOUTH AREAS

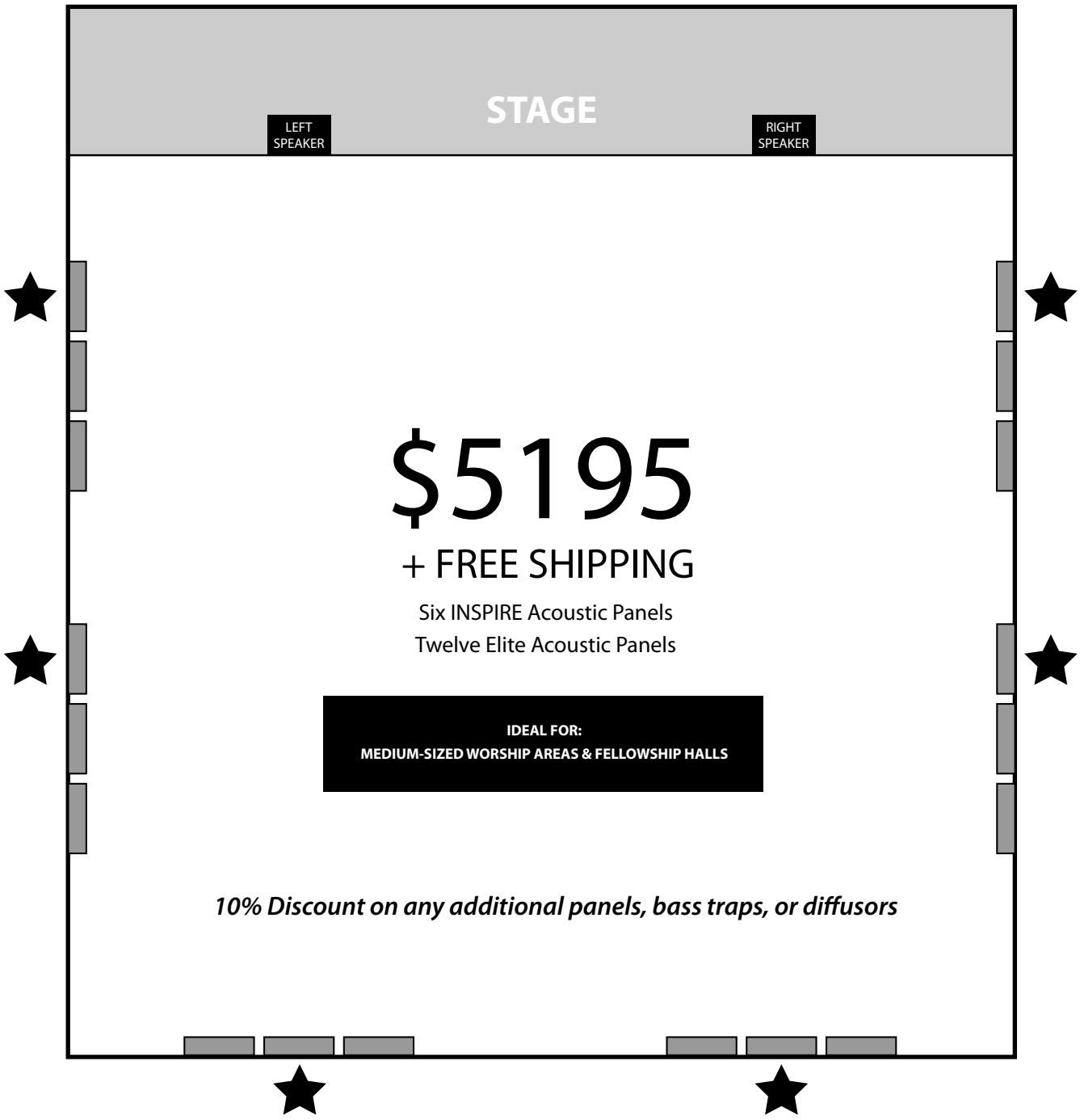
10% Discount on any additional panels, bass traps, or diffusors

Place 4' x 4' acoustic panels at each of the first reflection points on the side walls. Place a set of three 4' x 4' panels centered on each of the first reflection points on the back wall. This will provide an even greater degree of sound clarity and reduction in echo and distortion.

NOTE: If stage monitors are being used, we recommend placing additional 4' x 4' acoustic panels on the front wall to reduce stage volume and distortion. We also recommend adding additional panels if ceilings are higher than 14'.

Premium Package

(Suitable for rooms 1800-3000 ft.^{2})

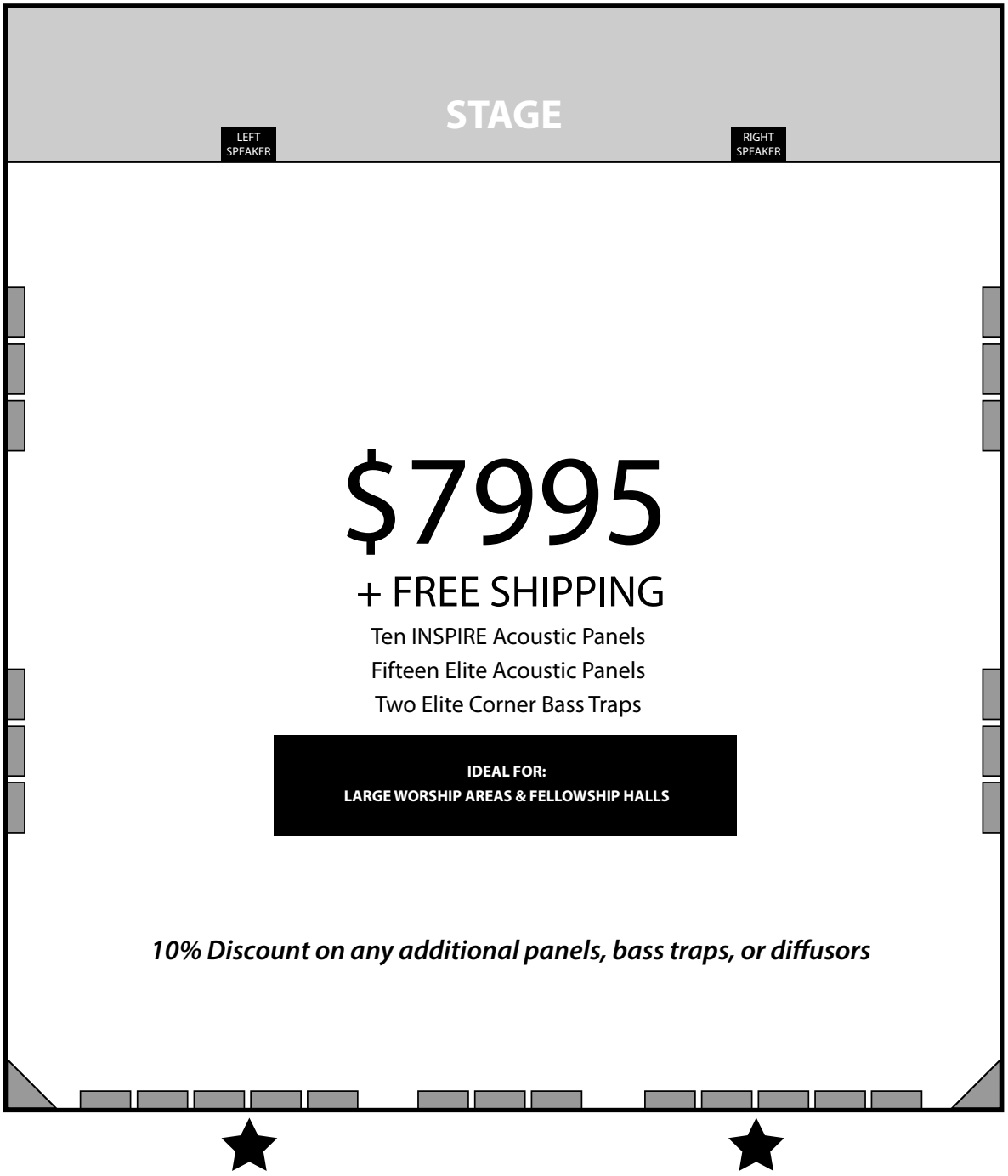


Place a set of three 4' x 4' acoustic panels starting at each of the first reflection points on the side walls. Place a set of three 4' x 4' panels centered on the first reflection points on the back wall. This will provide an even greater degree of sound clarity and reduction in echo and distortion. It will also reduce the low end frequencies in the back corners of the room.

NOTE: If stage monitors are being used, we recommend placing additional 4' x 4' acoustic panels on the front wall to reduce stage volume and distortion. We also recommend adding additional panels if ceilings are higher than 14'.

Elite Package

(Suitable for rooms over 3000 ft.²)



$7995

+ FREE SHIPPING

Ten INSPIRE Acoustic Panels
Fifteen Elite Acoustic Panels
Two Elite Corner Bass Traps

IDEAL FOR:
LARGE WORSHIP AREAS & FELLOWSHIP HALLS

10% Discount on any additional panels, bass traps, or diffusors

Place a set of three 4' x 4' acoustic panels starting at each of the first reflection points on the side walls. Cover the entire back wall with 4' x 4' acoustic panels and place one Elite Corner Bass Trap in each back corner. This will provide excellent bass and echo control in larger venues without losing the natural liveliness and acoustic feel of the room.

NOTE: If stage monitors are being used, we recommend placing additional 4' x 4' acoustic panels on the front wall to reduce stage volume and distortion. We also recommend adding additional panels if ceilings are higher than 14'.