AUDIO TRENDS

L E A R N I N G C E N T R E

The Importance of System Design.

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The 'Elusive'

With the drive for better and better audio performance, we often find ourselves on a quest for the elusive - the 'holy grail' if you will, of the ultimate, engaging, dynamic, clean audio we can afford, or justify to ourselves. These adjectives are only a few of the terms used to describe the feeling of perfect audio.

Consider the following;
Is the "Perfect Audio" performance solely the abilities of the equipment?

How much impact on the "Perfect Audio" performance, does the room play?

Sound Systems

Unlike wine but very much like wine, good audio will last for a life time but bad wine will always leave a bad taste in the mouth no matter how great the cost.

The Fundamental laws of Physics determine the quality of audio, any given piece of electronics can give an audio performance. Balance of acoustic qualities from each component must be considered, Ignore one components acoustic quality, you may as well ignore them all, along with the signatures of a room, these two areas of acoustical parameters must be taken into consideration during the initial systems design.

ROOM ACOUSTICS

It is very important not to confuse the isolation capabilities of a room with acoustic properties of a room.

Isolation: e.g. Soundproofing is specifically designed to increase the degree of acoustic isolation between the home theatre and the rest of the house - cutting down on noise that leaks into or out of the Theatre room. Sound isolation works the same in both directions, no difference to keeping the sound in or out.

Double plaster and sound bats are isolation construction materials, use of these materials keep the sound in the room, while also stopping outside sounds from entering the room.

Acoustic treatment, on the other hand, in the context of a home theatre, fixes the problem caused by isolation. Acoustic treatment deals with the acoustic performance quality of the room from a listener's point of view.

In other words, if you listen in a theatre room that has been designed using the correct acoustic treatment, what you hear is likely to be more accurate than the same recording played back over the same equipment and speakers in an acoustically untreated room.

It is also worth noting acoustic treatment of a space can significantly improve a space without the need to isolate, although if a room is isolated it generally requires more attention and acoustic treatment.

The following, looks at a Room's Acoustic properties. Categorised into four main groups, the acoustic performance of a room can be determined reasonably accurately with an understanding of how these main groups interact with one another.

Solid: Sound waves stay within the boundaries of the room. High requirement for acoustic treatment

Leaky: Sound waves freely escape the boundaries of the room. High requirement for isolation treatment

Hard: Sound waves reflection by surfaces within the space High requirement for careful selection acoustic treatment

Soft: Sound waves absorbed by surfaces and materials within the space High requirement for careful selection acoustic treatment

A anechoic chamber is an extremely Soft and Solid room.

The percentage of construction materials and methods used influence the acoustic performance of a room.
A well balanced room across the spectrum of frequencies 20Hz to 20KHz consists of all four elements. If a room has all four elements does that automatically make it a well balanced room acoustically?
The short answer is, it will help, although as well as construction, the rooms dimensions need to be considered. Room dimensions also influence the behavior of sound waves for more information on this topic see the article "Physics of Sound".

Room Differentiation.

The differences between room A and B are significant enough to change the sonic character of the rooms from Solid, Hard and Bright to Leaky, Bright and Soft.

EG: Lounge room A

Polished floors on Slab
Lightweight sparsely furnished
More than 45% wall area is windows
Light weight vertical blinds
3 mtr High Ceilings
7 meter x 5 meter
Plaster internal walls Brick veneer

EG: Lounge room B

Polished floors on Stumps
Lightweight sparsely furnished
More than 45% wall area is windows
Light weight vertical blinds
3 mtr High Ceilings
7 meter x 5 meter
Plaster internal walls Weatherboard

Notice room dimensions haven't changed, but the underlying construction of the room. The external walls being Brick to weather board, the flooring being slab to on stumps;
The sound pressure wave will behave differently in each room, based purely on one simple fact of physics, resonance density of construction materials.

The resonance and density of construction materials considerably contribute to the sonic characteristics of the room across the frequency spectrum 20Hz - 20KHz

Designing a system to suit the sonic characteristics of a space requires more due diligence on the part of the system designer, more information the designer asks for the better the performance result.
Knowing and understanding the sonic characteristics of each brand of electronics and loudspeakers, is only the beginning of system design, the blending together of these component ingredients, incorporating the appropriate cable characteristics will make a gold medal winning performance in a given room.

Are all specialists equal?

A Contentious subject, as all retailers will promote themselves as specialists in their field; walk into the retailer of choice, have a good look around, is there anything in the environment that doesn't relate?
There are some retailers, generally chain store retailers that promote themselves as specialists.
What area of specialty? Selling at cheaper prices? Or designing a system for your needs?
So ask yourself, are they really a specialist, or are they really just selling boxes?

Credibility, Integrity of information, How do you know what is what?

Sound systems are relatively easy to connect and setup, to the point where all of us will know at least one person who is capable of connecting all the wires and getting a sound out of the equipment.

Well done, just as easy as choosing tires for your car. After all, you wouldn't put four wheel drive tires on your sports car.

Audio equipment recommendations based in physics using information gathered during a one on one consult is far and away superior to any purchase based on reviews, specifications or even dare I say it, friend's opinions. Keep in mind, professional advice, is professional advice. How good that advice is depends on the cost, experience: and the measure of that advice is determined purely in the performance of equipment for your room?

How to tell a true specialist.

The first time you walk into a true specialist you'll know, but not by the brands on the door or by the size of the shop, but the questions the staff ask and in what order they ask them.

Performance, Is it related to price?

The short answer is no!

Although all too often considered out of reach of us poor common folk High Fidelity Audio Systems are more than likely, closer than you think.

Performance is directly related to the fundamental design characteristics of the signal path, Room acoustics, Consistency and continuity, system set up and calibration. All are equally as important, ignore one, you may as well ignore them all.

Speaker placement in a room is one of five most critical fundamentals of performance regardless of how much the speaker COST. Incorrect placement can reduce the sonic performance of a speaker dramatically.

Design Fundamentals

System design fundamentals are too frequently completely ignored. Continuity of the Signal path promotes consistency of sonic signature characteristics, thus improving performance of all equipment equally. From source to speaker to ear, no point in the signal path is either less or more important than any other point.

Acoustics is the science, fundamental sonic characteristics of electrical signals, and pathways is all part of that science, but the art of system design knows when to include a particular manufacturer's cable or amplifier or speaker, to get the right performance balance for a given room.
Component matching has been long recognized as a way of maximizing the performance of audio electronics, many hobbyists world wide experiment with such exercises with many a varied result.

The Science of Illusion

Sound staging of movie sound tracks generated on computers using in some cases very old original bytes of audio, some as old as 30 years.
Using technology, sound engineers are able to manipulate these byes to such a degree the original sound is all but none existent. This control over the sound is needed when generation of explosions and specific sound effects required for a particular movie scene.

The creation of an acoustic illusion

In order to create a convincing acoustic illusion, the system must control the presentation of the acoustic image, power delivery, control, and speed of which assist in the presentation of the whole, however it is the space between the instruments that

becomes apparent when the system's balance and control are all working together, providing the equipment is capable of such control then the rest is up to the room.

"Who would've thought that removing only one part of the system would make so much difference? After all, a system using four amplifiers to drive only two speakers is a bit much. Isn't it?"
Well after removing the two amplifiers that drove the bass section of the speakers, leaving one pair to do the entire job, the results were unexpected, yet amazing. To go from a bass response that delivered so much impact, so much detail through every piece of a drum kit to the sloppy, slow and somewhat blended bass notes was truly amazing. And that was just was just one part of the sound.
The midrange previously warm and smooth, gave the impression that the vocalist was right there. With imaging that extended far beyond the seating position and the separation of instruments that with your eyes closed could be pointed at with your finger. Piano left, guitar slightly to the right. After removal of the extra amplification, the midrange was lost. Warm and smooth to an immediate thin and lifeless sound. Though the imaging was still impressive it had completely lost the feeling of being captured in the sound. That enveloping feel you get when the music is all around you was now gone.
How much difference did this one part of the system make? A world of difference.

Discover that world of difference first hand, make the journey to hear the sonically different demonstration rooms of Audio Trends, and speak to quite possibly the most experienced team in the country.