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GETTING STARTED IN High-Performance Audio

- How to audition and select speakers
- Why separate components are important
 - What audiophiles listen for
- Why room acoustics matters and how to fix

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Release Your Inner **AUDIOPHILE**

The pieces and parts that turn an average system into audiophile gold.



TALK TO PEOPLE OVER A CERTAIN AGE (I won't say what age), and they'll wax nostalgic over their first stereo system—usually purchased in college, or shortly after when they landed that first post-college job. So why has music taken a back seat to video? Is music no longer important?

The answer clearly is that music still is important, but our hectic lifestyles have pulled us away from one of the greatest pleasures technology can provide. While niche audiophiles are catching onto the vinyl trend, more people are moving to digital streaming from services like Spotify and Pandora. In fact, the growth in these services, and the number of devices that support them, is positive evidence that people still love music, they're just changing the ways in which they access and collect it.

Bob Cole, president of World Wide Stereo in Montgomeryville, Penn., actually thinks flat-panel TVs have contributed to increased interest in quality audio products. "The thinner the TV panel, the worse the built-in speakers sound," he says, which is leading more people to invest in receivers and speakers to balance out their entertainment system.

Even so, many people are still missing out on the true beauty of their favorite music. Overly compressed digital files, inexpensive mass produced components, poor understanding of basic audio concepts and the general fast pace of our lives all contribute to a condition where people believe that the washed out low range sounds that come from their earbuds or desktop speakers are perfectly adequate.

This couldn't be further from the truth. A high-performance audio experience isn't difficult; nor does it require esoteric equipment or second mortgages. However, it does require the consumer to slow down long enough to listen and learn about the differences between a good and great audio system.

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Hear Like An Audiophile

Our ears, despite years of abuse by loud concerts and July 4th explosions, are pretty good at hearing fine detail. The problem is that we often don't let them, so we don't know what we're missing. Cole notes that most people don't believe they can hear like audiophiles so that they can hear the difference between good sound and bad sound, but he knows from experience that they're wrong. "It's in our DNA to tell the difference between sounds. We survived in the wilderness by hearing," he says.

Try this experiment. Go sit in your backyard after midnight with a friend or spouse and have a normal conversation. Then stop talking. Pay attention. Before long you'll be surprised at how loud your backyard really is. You may hear insects and animals you never noticed, maybe a freeway that's a mile away or the hum of a neighbor's AC unit.

Everyone is capable of fine detail appreciation if they just let themselves notice it. And that's what high-performance audio is about—hearing the things you didn't know were there. From the subtle rasp of a guitar pick on the E string or the inhale between words in a verse. These things are the texture and life of music, but poor quality gear can't reveal it. Once you hear it, you can't live without it.

HIGH-PERFORMANCE AUDIO COMPONENTS YOU NEED



The back view of a high-performance amplifier.

THE TYPICAL IPOD SPEAKER SYSTEM or all-in-one home theater-in-a-box system can't deliver the subtle nuances your music contains. Even many popular wireless multiroom audio systems fall short of providing the best sound. High-performance products include more finely tuned parts, audiophile-grade construction and hand-built attention.

The ingredients of a high-performance system aren't complicated: a quality source component, most likely a CD player or music server; a preamp or integrated amplifier

and processor, full-range speakers (a subwoofer may be optional depending on the specifics) and quality interconnects and speaker wire. Additional components, such as a turntable, power conditioners, high-end iPod dock, DAC (digital to analog converter), and a streaming media player can also be added. Many audiophiles opt for individual amplifiers (called monoblocks) for each speaker channel. Audiophile amps are usually solid-state or tube-based. Some class D (digital) amps can be found in audiophile-grade products. Many high-performance components go out of their way to isolate the signal paths to prevent contamination of the audio signal.

Quality speakers use high-quality driver materials, such as Kevlar, aluminum, layered ceramic composites, magnesium and beryllium rather than paper. The speaker cabinets will be made of highly-braced MDF (medium density fiberboard) or metal, but not plastic. High-quality in-wall speakers are also suitable for multiroom or theater audio systems.



An integrated audio/video receiver.



Setting Up Your System

Your room is as much a part of your sound system as the quality of the needle cartridge on your turntable. Many seemingly mundane things can impact how your system sounds, from where you place the speakers and your listening chair to the kind of floor covering in your media room. Here are a few simple tips to get you started:

1. For your critical listening space, avoid room sizes with dimensions that are multiples of each other. This will reduce the likelihood of “standing waves” that occur when sound bounces off the walls and interferes with the direct sound waves coming from your speakers.
2. Don't place floorstanding speakers tight up against a wall. Speakers need room to perform, and putting them too close to the wall will over emphasize the low frequencies and reduce accuracy. Most floorstanding speakers need to be at least a foot from the wall.
3. Toe in your speakers. The left and right speakers usually will need to be aimed toward the center listening position for ideal sound. This will get the music directly to you with the least amount of interference from the side walls.
4. Listen for vibrations. Are there any knickknacks that may rattle? Glass tables that may cause reflections? Windows? Secure and/or cover anything that may vibrate or cause reflections (double-sided tape can be a cheap fix).

TUNING YOUR LIVING ROOM

FOR DECADES, AUDIOPHILES HAVE SEARCHED for the Holy Grail of sound. During this time, most of their efforts have focused on equipment changes—from turntables and CD players to swapping out amplifiers and cables. Often overlooked, though, are the acoustical characteristics of a listening space.

A trained custom electronics (CE) pro may be the best person to fine-tune your listening room, but it doesn't hurt for homeowners to know a thing or two about acoustics. In fact, there are many simple modifications you can make to your room now to improve the way your music sounds.

Why Treat Your Room?

You've made a sizable investment in your sound system and music collection. You've trained your ears to pick up on the nuances of certain songs. You've become a real audio aficionado, and you demand that the music you play sounds as close to the real thing as possible.

This is rarely possible, though, without the addition of some acoustical treatments. What often results without acoustic treatments is echo. Hard surfaces like wood flooring, large banks of windows, even a glass coffee table can cause the sound waves to bounce uncontrollably around the room. This effect is called reflection, and too much of it is a bad thing.

Conversely, a room could have too much absorption of sound, making it difficult to hear certain parts of a soundtrack. This is what's known as a sonically "dead" room, and is often caused by too many soft materials such as draperies, cushy couches and carpeting.

The desired effect is a balance of reflection and absorption. A CE pro can determine where the problems exist in your listening space and fix them by installing a variety of acoustical treatments. For example, they might hang absorptive panels on the walls to tame the reflections or place some diffusers near the back of the room or on the ceiling. Diffusers help spread the audio evenly throughout the



A home theater with quality speakers is also an excellent music listening room.

space. There are also materials that prevent sound from escaping the room and outside noises from interfering with your listening experience. “The last thing you want to hear is the toilet flushing ” says Dr. Bonnie Schnitta, a professional acoustician.

Attractive Options

Don't worry about acoustical treatments messing with your room design. They usually protrude only a few inches from the wall, and manufacturers offer a variety of great-looking options that can actually enhance your decor. Whether your room could use more absorption, reflection or diffusion, the actual treatments can be concealed inside fabric wall panels. You can choose the color, texture and style of the fabric to complement your room design.

You can also use acoustic treatments as an opportunity to redecorate. Some acoustical manufacturers invite homeowners to choose an image to appear on the panels. This can be a photo of your children, a rendering of a favorite painting or a movie poster, for example. The panels can be designed with a wooden frame and finished or stained however you like. Another benefit of acoustic paneling: When the right fabric is used, you can use them to hide in-wall speakers. The sound filters through the fabric and into the room unaffected.

How to **AUDITION** & **SHOP** for Speakers

3 tricks to finding the best speakers



Subwoofers can be critical parts of a quality audio system.

THE MOST IMPORTANT TOOL when auditioning speakers is silence. Some custom A/V installers propose that their clients spend more on controlling noisy environments with sound mitigation materials than on the speakers themselves. A quiet environment provides a baseline. Speakers will perform at their best in a quiet room, as isolated and as far removed from other speakers as possible. Why? Sound emanating from one pair of speakers, which are located closely to others, will cause the others to resonate, contributing to distortion. This interferes with your ability to give speakers a fair audition.

This is why manufacturers' critical testing takes place in 'anechoic' soundproof chambers. In the real world, you'll have the best shot at silence by visiting a specialty A/V retailer.

Here's what to do:

1. Bring your own music—but not on a smartphone or portable MP3 player. Music from portable devices lacks dynamic range—in other words, the varying soft and loud parts. If your tastes are eclectic, bring a good mix of solo instruments, small combo and orchestral extravaganzas. If you know what your favorite tracks are supposed to sound like, you will be better able to identify the strengths and flaws of the speakers you audition. If your homegrown selection doesn't reveal much, ask the salesperson to provide different recordings within the same genres. If it is possible to choose source and playback electronics, select the same class of amp/preamp or receiver from store to store.
2. Listen to the same music at different volumes. Audiophiles often listen at a very quiet volume. Why? Low volume forces you to focus. With heightened attention, you pick



In-wall speakers like these can bring music into any room without taking up floor or shelf space.

up musical detail that you otherwise might miss. Think of it as tasting a fine wine. Rather than identifying a ‘hint of oak’ or a ‘piquant sense of boysenberry,’ you will discover nuances in the soundtrack that will become more audible through one pair of speakers than in another pair. Low-volume listening is a great way to differentiate between various speakers.

Next, listen at a robust, loud level to discover a speaker’s limits. For example, a bass line in a rock tune, when cranked up, may reveal unwanted buzzes and distortions, which may be emanating from the speaker and not the overdriven signal from the amp.

Finally, listen at the volume level that would best duplicate the volume level of the room you’ll use the speakers in. Walk around the room and determine if the sound is altered by location. Does the speaker spread the sound evenly or does it only sound good at one “sweet spot”? Depending on how you listen at home, should this matter to you?



3. Physically inspect the speaker for overall fit and finish. Look for solid, tightly manufactured corners and edges. Bring a wine glass, fill it with water and set it on the top of a speaker. Play some bass-heavy music, and see if the water forms ripples in the glass. If it does, the speaker cabinet is resonating, producing its own bass tones, which are not part of the original music. A well-designed speaker will allow you to hear the sound of the foot pedal mallet striking the head of a kick drum and not a boomy resonance. When testing, if you can’t distinguish the types of characteristics of a bass instrument, a kick drum from a tympani, or a pipe organ from a electric bass guitar, keep shopping.

EAR TRAINING

Part of ear training is picking up on the tempo of a piece of music. This could be as simple as learning intervals, which refers to the distance between two notes and the relationship between those notes.

Focus on one instrument and listen to it throughout the song. Do this for each instrument, and it will help you hear the changes in the music. An Eagles song, for example, might have three or four guitars playing at the same time. Pick up on those tonal differences for a greater appreciation of the music.

Why do some albums sound so polished and perfect? Keep your ears open for some sound-altering and time-altering effects commonly used in music for added depth.

TIPS For Choosing The Right Amp, Preamps & Receivers

THE FIRST DECISION YOU'LL FACE when picking out your new audio system is whether to go with *integrated components* or *separates*. Integrated audio/video receivers offer an easy way to control all of your entertainment gear. It's not the best solution for everyone, though, especially if you're aiming for an optimal music listening experience. In the high-end audio world, a setup of separates is usually the way to go. In this arrangement, the components and signals are isolated from one another, which can help reduce contamination, crosstalk and other problems that affect the audio performance. Some separate preamps and amps also afford the flexibility to change your system as needed through modular, card-based designs and flash upgrades. You can update your audio system without having to buy a new piece of equipment.



Receivers and Pre-amps

The pre-amp (as well as the pre-amp section of an integrated receiver) is the control and processing center of the audio system. Here you want to look for the best assortment of inputs and outputs, high-quality speaker binding posts and gold-plated ports and easy-to-use controls. An audiophile pre-amp will include an analog topography with digital controls. High resolution DACs are also important for today's high-resolution music formats.

A high-quality amp is an important part of an audio system.

Amps

Not all amplifiers are created equal, though. A basic guideline many people use is to go by the weight and the quality of construction. You can compare two amps that are both rated to deliver 100 watts, but some manufacturers manipulate their figures by expressing peak levels rather than continuous power levels, and others may test their power at "one channel driven" as opposed to "all channels driven." If an amp feels heavy, that's probably due to the design and engineering, lots of heavy copper wire,

large aluminum heat sinks and sturdy internal bracing. Do a side-by-side demo to compare amps if possible. Listen for distortion, clarity and smoothness and whether the amps that are rated similarly deliver the same volume levels at the same settings. Remember, just because a spec sheet says something doesn't mean it's gospel.



Speakers

When it comes to speakers, it's best to invest in a package. It all has to do with timbre (pronounced "tam-bur"), which describes the physical qualities of sound that are distinct from either its pitch or volume. For example, a student and a concert soloist might play the same note on the same instrument, yet the results would sound markedly different. In this case, the timbre the professional could elicit from the instrument would be superior. Timbre can also describe why that same note played by different instruments would be distinct to the piano or guitar, for instance. High-quality loudspeakers reproduce the sometimes subtle differences in timbre more clearly than lower-end speakers.

Putting it All Together

Talk of wattage, ohms, decibels and impedance can leave your ears ringing. So how do you know that the amp or receiver you bought will provide enough juice to your speakers? The rule of thumb is the higher the sensitivity rating (listed as decibels), the easier it is for an amp to power the speaker and, in turn, produce higher levels of clean volume. For example, a speaker rated a 89 decibels (dB) would play louder than a speaker rated at 86 dB. In this case, the latter speaker would require twice the amount of power to play at the same level as the 89 dB speaker. Also, you should compare an amp's impedance rating (degrees of electrical resistance, measured in ohms) against the impedance rating of the speaker. An amp rated to operate at 8 ohms will have a hard time driving a speaker with a nominal impedance of 4 ohms.

BIG DECISIONS

Integrated Receiver or Separate Components?

A high-performance audio system is both the parts and the whole.

Big Decisions

Today it's rare to buy a technology product that does only one thing. Our cell phones play video and act as TV remotes. Our thermostats send text messages. Our TVs can make video phone calls. This is especially true with audio systems, where manufacturers cram loads of functionality into integrated components. That's great if you need to save space, but if you're building an A/V system to savor, with best performance today and best options for extending it the future, here are some essential reasons to consider basing your system on separate components, rather than an all-in-one receiver.

Flexibility

Want to expand on your A/V investment with new software, features and upgrades as they become available? A separate preamp/processor will let you download them and also give you enough connectivity to extend hardware too, such as through outboard D/A converters, video scalars, flash drives and the like.



Connectivity

Separates will almost always give you more connection options for more gear (old and new). Want more power to drive those new tower speakers you've just upgraded to? Connect more amplification. Want an extra input so the family can watch the camcorder footage you just shot, or a USB slot for some music? You'll usually find more (and higher quality) connection jacks/ports on separates than on all-in-one receivers.

Performance

With separates, engineers don't have to compromise their art by the practical considerations of having to jam things into a single small (and less costly) box. The task at hand—preamplification, decoding, routing, amplification, etc., is all that matters in a separate component. Long story short—best possible performance almost always comes from separate, dedicated components, where the designers have not been constrained nearly as much by factors of size, weight and cost.

Reliability

When one thing goes wrong with a receiver, the entire receiver goes in for repair. With separates, you're never stuck without some form of entertainment when there's an equipment problem. For example, tuner not receiving channels? Tuner goes in for repair, but you can still watch and listen to other sources. In a one-box receiver, multiple functions are often built onto the same circuit board. If one aspect of the board goes, the whole board (even the working functions) needs replacement. In separates, there are usually dedicated circuit boards for various functions, which are easier (and ironically, often cheaper) to replace.

Upgradability

When you've outgrown your receiver you need to replace it. When does this happen? Maybe you're moving the setup into a larger room that needs more power. Or you've upgraded to bigger, hungrier speakers. Or you've decided that 7.1 would be more fun than 5.1. Or you've decided a new D/A converter with the latest decoding might sound even better than what you have. With separates you can always improve every link in the chain over time.

All-in-one is a nice idea for a phone. For an A/V system that performs rather than just plays, you need to hear what's possible these days. And the best of what's possible is in separate components.

For more on speakers, audio components, wireless music systems and more for your Electronic House check out these resources:

Electronic House [Learning Center](#)

Electronic House [Audio Channel](#) for news, reviews and updates.

Focus Series: [Wireless Speakers and Wireless Audio Systems](#)

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