

# Drowning in a Sea of Sound

## How to Wade Through an Ocean of Audio Options

by James M. Weil

The growth of new products and technology in today's audio market has created an overwhelming array of choices for even the most experienced audiophile. The multitude of features and specifications offered makes it difficult to distinguish which products will best serve your needs. A knowledgeable salesperson can guide you in your decision, but some tend to push products that yield the highest profit margin and ignore a customer's needs.

You can spend as little as \$500 on a stereo system or as much as \$50,000, but a working knowledge of some basic principles can help you make an intelligent choice without having to rely on a salesperson's recommendation.

### SPEAKERS

Speakers have the largest margin of error when reproducing sound; therefore, it is best to spend half of your budget on speakers and the rest on ancillary equipment. More expensive speakers are generally more accurate; however, audio equipment quality has improved dramatically, so that a great-sounding pair of speakers doesn't have to break your budget.

Furthermore, with the advent of compact disc players, the dynamic range of frequencies speakers must handle is larger, and less expensive speakers may not be able to reproduce the full-frequency spectrum faithfully.

Size means little in speakers; what matters is the design and the quality of the components. Prices usually reflect quality, but two sets of equally-priced speakers rarely will sound the same.

Different cabinet designs can affect the overall sound drastically. Some tweeters (the small speakers that produce the higher frequencies and are usually found in the top of a speaker cabinet) may sound brighter than others; and some woofers (the large speakers at the bottom that produce bass sounds) may sound deeper or richer than others.

Your musical tastes, whether rock, classical or jazz, ultimately will guide you in deciding what kind of speakers to buy. People who listen to jazz or rock may prefer a bright-sounding speaker that accentuates the high notes and deep, rich bass. Those who prefer classical music may want a flat-sounding speaker that produces music approximately the way it



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was recorded.

Most speakers today are capable of producing 20 Hz to 20,000 Hz, which matches the audible range of frequencies that humans can hear. The lowest frequency, 20 Hz, corresponds to about low A played on a pipe organ; 20,000 Hz corresponds to the crashing of cymbals or bells. Not all speakers accurately reproduce the entire frequency spectrum. Some speakers are deficient in the lower or higher frequencies. What you are looking for is an

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overall flat response; the speaker should produce all the frequencies with equal clarity.

When auditioning speakers, bring in your own records or CDs. Many stores use special discs to enhance the speakers' sound. Also, if you are familiar with the music, your attention won't be diverted by new sounds. In order to evaluate each speaker's performance, it is best to listen to each frequency range separately.

Listen for clarity, definition and accuracy when testing the speakers. Do the low frequencies sound boomy or muddy? Do the high notes seem shrill? How crisp is the sound? If the speakers distort a little at high volumes, you eventually may

develop "listener fatigue," which would give you the compulsion to ride in department store elevators.

It is especially important that you listen to each set of speakers at the same volume. Some speakers perform better at higher or lower volumes.

### AMPLIFIERS

Amplifiers come in a variety of shapes and sizes, with an almost infinite variety of features. When considering amplifiers, don't be sold by fancy controls. Since electrical signals are colored when they pass through networks, every switch and control must be carefully justified. Some of the most expensive amplifiers merely have power switches and volume controls.

Always use the same speakers when auditioning amplifiers, preferably the speakers you intend to buy. Again, you are looking for a flat response. If the cymbals sound muted from a good program source, the amplifier has poor high-end response. The opposite is true for low-end response. Make sure the tone controls are set at zero. (Tone controls should only be used to compensate for speaker or room acoustic deficiencies.) Play the amplifier at high volumes and listen for distortion, especially during peaks in the music.

Finally, when considering the purchase of amplifiers, you have to decide how much power is enough. Some amplifiers are capable of producing 500 watts of power and more, but most people don't require that much. If you intend to listen to music in a small room with hardwood floors and plaster walls, 50 watts may be enough. However, if the same room has

wall-to-wall carpeting, thick, fabric furniture and heavy drapes, you may want to consider more power. Volume also can determine how much power you need. If your listening area is very large and you like to hear music at high volumes, you may need as much as 200 watts of power.

#### CD PLAYERS

It's easy to become overwhelmed by technology when trying to make a choice about which CD player to buy. Most CD players work on the same principle. Music is recorded on a disc in digital code. The music that we normally hear is in analogue format; sound comes to us in sine waves. Music recorded on a phonograph is a replication of sine waves. Music recorded on CDs, however, takes an analogue signal and converts it to a binary number system called bits. A bit is represented as either zero (off) or one (on). Every sound on a CD is represented by a series of bits. The CD player uses a laser to read thousands of these bits and converts them to analogue signals before sending them to the amplifier and subsequently to the speakers. Because so many bits can be recorded on the disc, the music sounds more accurate.

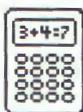
The information that is read from the disc must be converted to analogue through a digital/analogue (D/A) converter.

Here's where the confusion begins. Some CD players use 14, 16, 18 or 20 bit converters. This means that some CD players convert more bits at a time than others. How many bits a CD player converts is simply a design judgment—more bits does not mean better sound. Ideally, 16 to 18 bits should do the job well, but the true test is to listen to each CD player and judge for yourself. The best way to compare CD players is to listen to them through a good pair of headphones; this way you can discern the subtle differences between them.

Oversampling is the way CD players limit distortion. Some CD players are rated at 2x, 4x and 8x oversampling rates. It is a logical assumption that the more unwanted frequencies that are filtered off, the better a CD player will sound. But too much oversampling can tax the D/A converter by making it work too quickly, jeopardizing the quality of the sound. Using 4x and 8x oversampling should be sufficient to do the job, but again, the true test is listening.

Don't be afraid to make the salespeople work by having them set up different system configurations. That's their job. When you think you have decided what you want, shop around. You'll be surprised at the price discrepancies between different stereo stores. Happy hunting. ▼

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