Meadowlark Audio

next generation technology for music lovers

High Definition Audio Brings Big Changes

What You Need to Know

Ever wonder who bought the last Cathode Ray Tube TV? When HDTV was about to replace Standard Definition who was the last guy to bring home a brand new set that could only play Standard Def?

He had only himself to blame: the FCC had engaged in Public Service Announcements for years to warn consumers of the impending switch.

No such warning has come with the arrival of HD Audio. And the stereo industry has been mum because, for the most part, they're not ready. Here's what you need to know:

Your old gear can't reproduce HD; it can barely do better than CD. The stuff on your retailer's showroom floor can't do it either. So be informed. Changes lie ahead, big ones.

Here's my shot at bringing you up to speed:

The issue is Dynamic Range. Let me explain. As an engineer, I'd prefer to show you directly how things work, but in this case making an analogy to video makes it a bit easier.

In audio and in video there are two performance issues that deserve our attention: Resolution, meaning how detailed the reproduction is, and Dynamic Range meaning the difference between the smallest signal that the system can pass and the largest. HD audio greatly improves on both.

For video, Dynamic Range, DR, means: How black are the blacks? And, how bright are the whites and colors? Ideally the blacks emit no visible light and the brights look just like outdoors in full sunlight. That is the range of interest for human eyes. At present there is a pitched battle inside the TV industry to reach higher and higher levels of DR.

Tiny lesson: Light intensity and sound intensity are both expressed in decibels, a logarithmic scale that tracks the logarithmic performance of both human sight and hearing. 10 decibels (10dB) make one Bel. Each Bel is an order of magnitude. So 10dB is ten times, 20dB is one hundred times, 30dB one thousand times, and so on. Human hearing tops out at 140dB meaning that the largest perceivable sound (ouch!) is 100,000,000,000,000 times louder than the threshold of hearing. This is why nature has given us logarithmic perception rather than linear perception; so our minds don't have to deal with such enormous differences. To us, both sight and sound SEEM linear - that's nature's little trick - but it's just not the case.

This is the underlying reason why DR presents a much more difficult engineering challenge than Resolution, which is merely linear.

In audio, during the early Hi Fi era, DR was limited by the source, LP, to about 75dB. The better speakers of the time could do that. When CD came along, upping the ante to 96dB, we speaker makers did manage to get there by using conventional technology.

Now comes HD audio with 140dB of DR.....FINALLY matching that of our hearing. So we FINALLY have a shot at making stereo sound just like the real thing. But can we get there with conventional technology? No. Not this time. Not possible. We squeezed every drop out of it on that last round.

The fact is that a typical high end system composed of a 200W stereo amp and a pair of conventional speakers with passive crossovers doesn't have a prayer. You'll get DR of maaaybe 100dB on a good day. Sure it can play really loud, but don't be confused: loudness and DR are not the same things. Turning up the brightness on your TV makes the blacks brighter too, the DR stays the same. Analogously, just because a stereo can play extra loud does not mean it has good DR; it can easily have poor DR. Think of a PA system.

Aside: I've been amused, lately, by guys who evaluate HD audio recordings through their conventional systems then report not hearing the DR improvement. You can see that if you're system can only do 100dB, a recording with 120dB is going to be limited to your crummy 100dB. You'll probably hear the resolution improvement, a good conventional high end system is capable of portraying fantastic detail, but the DR improvement will be completely lost.

Here's our current situation: the source guys are way ahead of the playback guys. So the onus is on us. But you'll be glad to know that next generation audio is well under way. At Meadowlark we saw this coming early and have been at it for several years with great success. Our Nightingale can swing 120dB easy-breezy. And you can be sure we're not the only guys making progress on this.

Next generation audio is coming and it is a real 'game changer'. And fair warning: next generation technologies bring profound changes to how a stereo system is executed. Fundamental changes. Most of the old familiar bits and pieces are soon to be obsolete. Especially the speakers.

Now you know. Take heed. Don't be like the guy who bought the last Standard Def TV.