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Learning About 5.1 From Grade No. 9

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The hearts of many children and teenagers are beginning to sink as they realize that this month is the last full month of vacation they will have until next year. The only thing that may help their spirits just a little is the realization that the new fall television season will arrive at the same time some of their first term papers are due.

The majority of them probably, and understandably, do not realize that this fall season also brings with it the promise of 5.1-channel audio from all the major terrestrial television networks. This month, we will do a quick, high-level review of each network's capabilities thus far, and then begin looking at cable, satellite and video-on-demand services to determine how they have been doing it all along and where they might be headed next.

Over a few past installments of Audio Notes, we have covered the nuts and bolts of each terrestrial network. ABC has been ahead of the other networks since its inaugural 5.1-channel broadcast of "101 Dalmatians" in November 1998. Yes, it will be six years this November (and yes, it was 5.1 years as of December 2003).

That is simply amazing to me, as I was fortunate enough to be invited by Robin Thomas to see the event and it seems like it was just yesterday that it all happened.

I knew it would be something for the history books, so I brought along Mr. Paul Werner, the chief engineer of my high-school radio station (WJSV, 90.5 FM) and its television facilities. Along with the station's director, Virginia Lyttle, Werner put up with me regularly disassembling the audio processing equipment to see what made it tick (or not tick). I was fortunate enough to meet Werner and Lyttle when I was a freshman, and I did not realize until many years later how lucky I was that Mr. Werner was a tubes-and-transformers kind of engineer.

THE POWER SUPPLY

I learned how to use and respect these "archaic" devices, became quite handy with relays and learned a thing or two about tuning RF circuits. Importantly, Mr. Werner believed and instilled the belief in me this sage piece of advice: The power supply is the root of all evil, start there when troubleshooting.

Mrs. Lyttle also instilled her own sage advice when she would sometimes sternly remind me to "say it in English, Mr. Carroll."

In other words, not everyone is as neck-deep in this as I am, and a careful, patient explanation goes a long way. Far too many times, I have not heeded these simple mantras, and far too many times I have ended up rewinding and starting where I should have started from the beginning.

Anyhow, we watched in amazement as the broadcast progressed, and I was mentally rehearsing how I thought the rest of the industry would quickly follow suit, each network in its own special way of course. Little did I know how complex it would become and how long it would take to get to where we are today.

PBS has also been there right from the beginning. Choosing the then-controversial transport stream distribution model was a brave and very forward-thinking move. It allowed HD video and 5.1-channel audio to be carried by more affiliates more quickly than any other system in place at the time. I remember Ken Hunold of Dolby lending Andy Butler a hand in pulling off a number of July 4th broadcasts long before 5.1-channel sound and HD pictures were as common as they are today.

Nothing has really changed with the other networks since our last report on each of them, but quite a bit of the initial planning and rollout will culminate with regular 5.1-channel broadcasts this fall. CBS has done a number of sports and music award events in 5.1 over the past year, and its infrastructure is in place to allow regularly scheduled primetime shows to do the same. From what I understand, the network will accept programming with either discrete audio channels via the Panasonic HD-3700 eight-channel format, or via Dolby E. In either case, the audio will make it all the way through the network and to the affiliate stations with all 5.1 channels and audio metadata. Bravo!

Fox has also carried a number of special programs and sporting events with 5.1-channel audio, but that was via the old distribution system, which used Dolby E to distribute audio to its affiliates. With the new transport stream distribution model set to be in place in time for the start of the fall season, things should actually improve as far more affiliate stations will instantly be able to carry 5.1-channel audio. After visiting Richard Friedel and crew back in June, I can say that they are well on the way to making all of this happen.

NBC will be carrying the Olympics in HD almost around-the-clock, and from what I am told, much of it will be with 5.1-channel audio. I know that Jim Hilson from Dolby is busy working with Bob Dixon to make it happen on the Greece side of

the world, and Jim Starzynski and Tom Duff are getting the "last mile" (!) to the affiliate stations, with audio metadata to boot.

Now that's a remote broadcast. Once the Olympics are over, the network will be an old hand at carrying HD video and 5.1-channel audio, and the fall season will seem like a cakewalk. I do not know what NBC might be planning programming-wise, but the infrastructure sure will be rung out by then.

Word on the street is that The WB will also be carrying some 5.1-channel programming this fall. I do not have any more details on the programming or the network structure, but I am doing some digging and will report back in a future column.

All in all, this should be an exciting fall season in terms of video and audio. With sales of HDTV sets and surround system rising, it seems that consumers have caught the bug, and it is contagious. As it turns out, both cable and satellite have been there from the beginning, helping to fuel the fire; they have been carrying 5.1-channel audio and Dolby Digital (AC-3) longer than anyone else.

5.1 FROM THE SKY

At least one pay-per-view channel on DirecTV carried an occasional standard-definition movie with a Dolby Digital (AC-3) bitstream long before there were many, if any, receivers available to do anything with it. I saw one of the first boxes, purchased one of the next ones and have been watching it grow from the pay-per-views to other services such as HBO, Showtime and Starz! Echostar followed suit very quickly, and now AC-3 is commonplace on most every satellite service.

Here is an interesting and very well-hidden fact-all digital audio in digital cable is Dolby Digital (AC-3). Yup, the two-channel stuff has been delivered this way for years. The very nice side-benefit is that when cable operators decided to start carrying 5.1-channel audio, the millions of set-top boxes already deployed simply downmixed the audio and no one was the wiser, except for those who had a new set-top box that output the encoded audio bitstream.

Connected to an external surround receiver, the audio was decoded into 5.1 channels. So while your neighbor might be stuck listening to the mono RF re-modulated version of a program, you might be decoding the exact same program and enjoying all 5.1 discrete channels; that is, if you were lucky enough to figure out how to pry one of those special set-top boxes out of the hands of your cable company.

I know. All of this is old hat. Realize that the hat is not that old though. This has all happened in less than 10 years; in fact it has all happened in slightly more than five. That is amazing. Just like the Ginsu knives on late night TV... wait, there's more!

Taking this to the next stage, video-on-demand is now offering 5.1-channel audio with certain programs, and that little digital video recorder built in to your set-top box can also delay the 5.1 audio so that you can enjoy it at your convenience. How is this done? We'll have to wait until next time to start looking at the technical details of these services.

Next time, we will continue to explore the audio technologies of cable, satellite and video-on-demand services. Incidentally, both Mr. Werner and Mrs. Lyttle have since retired (they tell me it was actually not due to me), and I know there are many of us that even after years of further education still credit both of them with building our somewhat insane love of all that is broadcast and at least for me, being somewhat able to explain it. As always, thanks for your time! [Print Page](#)