Performance Media Industries, Ltd.

Is It Time for Bigger Screens?
10/2006

by A. Grimani

Well, folks, I've just returned from CEDIA Expo 2006, and as usual, there was no end of classes to teach, friends to meet, and cool new stuff to see. Every show seems to develop its own buzz or unique beat that sets it apart from the others. A few years ago, for example, it was the unfortunate and surprisingly swift demise of the CRT. This year, the unmistakable theme was the emergence of 1080p as the dominant resolution for high definition video. In addition to 1080p HD DVD and Blu-ray Disc offerings, there were native 1920x1080 displays everywhere – flat panel LCDs, plasmas, and video projectors using every technology you can name.

Nowhere was 1080p's preeminence more clearly apparent than at a side show presentation conducted by video wizard Joe Kane of *Video Essentials* fame. Joe was demonstrating clips at 1080i/p using MPEG-2 compression, 720p using Windows Media Video (WMV), and 1080p using VC-1 (the updated, tweaked version of WMV that is receiving universal acclaim on HD DVD). From my seat on the front row, where the viewing angle pushed 50 degrees, the differences were stunning. 720p WMV did look better than 1080i and 1080p MPEG-2, but the hands-down winner was 1080p VC-1. Gone were the motion artifacts and compression macro-blocking we've come to expect from MPEG-2, leaving nothing but a sharp, detailed, film-like image. The only remaining factor restricting viewing angle was the pixel structure, but it was barely visible from my close vantage point.

1080p's introduction into the mainstream raises an interesting issue for home theater design. Traditionally, we have limited the horizontal viewing angle to 30 degrees (Screen Width = 0.54 x Viewing Distance) for SD and 36 degrees (Screen Width = 0.65 x Viewing Distance) for broadcast HD. With 1080p and improved video codecs like VC-1 and MPEG-4/AVC, we have our first real shot at a true cinematic presentation in the home. Film images are composed to be viewed at an angle of 45 degrees (Screen Width = 0.83 x Viewing Distance), which is supported by 35mm film but not HD video – at least not until now. Based on what I saw, 1080p allows us to legitimately increase the viewing angle to 45 degrees without compromising picture quality.

Performance Media Industries, Ltd.
9A Mono Avenue. • Fairfax • CA 94930 • USA
(415) 454 2087 • (415) 454 2171 Fax • info@pmiltd.com

However, we must avoid the urge to go hog raving wild with home theater screens that rival Cinerama just because we can. A number of factors ultimately influence what screen and viewing angle are appropriate for a home theater. Perhaps the most important thing to remember is that, for the foreseeable future, only a very small percentage of the program material we watch will be 1080p VC-1. The rest will be MPEG-2, mostly at lower resolutions. (MPEG-4 will eventually figure into the mix somewhere.) 1920x1080 displays haven't really been in the field long enough for us to draw hard conclusions, but the early reports are not favorable toward viewing SD and HD MPEG-2 at very wide angles. It's also important to remember that TV images are composed for 27-36" displays viewed from at least twelve feet away. That's why the photography features so many tight shots and close-ups. Throw these up on a giant screen and prepare to break out the Dramamine! I'm not personally a gamer, but my technical editor is, and he reports the same kind of issue for gaming. So, while it might seem that bigger is better, it ain't always so.

As I see it, we have several different ways to reconcile the gaps between proper viewing angles for various program material. The first is to have two rooms: a dedicated theater with a 45 degree viewing angle for 1080p HD movies, and a multipurpose media room with a 30-35 degree viewing angle for standard DVDs, broadcast HD, and games. Two rooms isn't going to sit well with everyone, so the next best thing is to build a theater where the projector and screen masking can be adjusted from a 45-degree-wide image down to a 30 degrees. Existing projectors don't have the kind of motorized zoom and focus controls required for this operation, so it's really only an option for the few experienced people who are willing to manually reconfigure their projectors. Another solution is to fire two projectors onto the same screen: one small for SD and one big for HD. This could very well be the most popular choice because it's the best of both worlds. However, people may understandably have a difficult time comprehending why they need to buy two projectors instead of one! Ultimately, with the remarkably affordable costs of 1280x720 projectors, a dual projector approach will be more cost effective than implementing zoom and focus correction systems…

CEDIA made it clear that the future holds bigger, more cinematic HD pictures for home theater. 1080p can give us the wide images for movies that we've always craved, but we can't ignore everything else. We know what mistakes to avoid with lower resolutions, so, to paraphrase Dr. Ian Malcolm in *Jurassic Park II*, let's be careful not to make all new mistakes now that we have 1080p.

This article is based on a column published by A. Grimani in Residential Systems magazine October 2006. Chase Walton contributed to this article.