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Designed for Calibration

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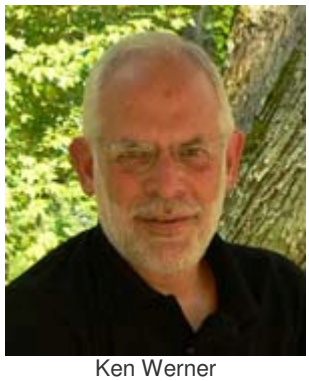
By Ken Werner

Last week I was a student again, participating in the Imaging Science Foundation's (ISF's) Commercial Training and Certification Course. The purpose of the course is to qualify people to perform accurate calibrations of projection and flat-panel displays and to certify their demonstrated competence. Since this course was ISF Commercial, the emphasis was on displays in commercial applications, including signage, financial, medical, simulation, and video conferencing.



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Many display-industry professionals have only a rough idea of what calibration entails, and some may feel it's of interest only to home-theater extremists. In fact, there is (almost) no such thing as a display that is set up perfectly when it comes out of the box since proper calibration depends on the environment in which the display is installed. Since the environment can change throughout the day - think of a financial trading floor with windows - it helps if a display can store more than one set of calibration settings and be switched easily from one to the other.

The main elements of a calibration, as ISF is quick to tell you, are maximizing contrast ratio, optimizing gray scale, optimizing color space and reproduction, assuring flat-field uniformity, and in more advanced calibrations, adjusting the gamma curves. In practice, this means adjusting color balance, black level, system gain (contrast), color level, phase (tint or hue), and "sharpness" using appropriate test patterns and a colorimeter.

This may sound more straightforward than it is, and it gets more difficult when the required adjustments are not on the user menus. For instance,

virtually all modern displays have a rough user-accessible adjustment for color temperature (along the lines of "warm, normal, cool"). But if you want individual access to the red, green, and blue gain controls so you can set color temperature to an exact D65 (6500K), on many displays you will be out of luck (unless you access the factory set-up menu, which will probably void your warranty. Similarly, gamma adjustments are often hidden away.

Since the course I attended was being presented at the facilities of Panasonic North America in Secaucus, New Jersey, Panasonic Professional's Jim Noecker was able to supply the class with a preproduction prototype of a 65-inch VX100 Premium plasma TV for calibration. This model, with a handsome matte-black bezel that resembles black-stained Japanese wood, will be available in January 2009 to the CEDIA market.

The striking thing about the VX100 - as far as the calibration class was concerned - was that the unit's calibration was spot on for use in low ambients, as would be found in home theater applications. And the advanced settings menu included RGB gain controls for precise setting of color temperature. ISF Commercial Managing Director Alan Brawn, who was also one of the course's instructors, said this set was the "most calibratable" he'd ever seen.

While I was in the same room with Jim Noecker, I asked him to wade in on the discussion of why plasma displays exhibit so much less motion blur than LCDs - even frame-rate-doubled LCDs. The most significant reason lies in the portion of the motion blur that's caused by the sample-and-hold nature of LCD and PDP addressing. Because sub-field addressing is used in PDPs there are effectively many samples and holds during a frame time instead of the one used in LCDs (or two in the case of frame-rate doubled LCDs), Noecker said. The effect is a quasi-dynamic display with very good motion-blur performance.

In LCDs, frame-rate doubling has not been enough to match the motion-blur performance of PDPs. Now, Sony has introduced a frame-rate-quadrupled LCD-TV. Will that do the job? I hope to find out at Flat Panel Display International in Yokohama next week.

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