The issue of image retention on Plasma TVs

Does "burn-in" still exist?

By Dennis P. Barker

Plasma TVs have been around now for several years now. They were the original flat-panel display designed for hanging on the wall or over the fireplace. From the beginning, they were the darling television of interior designers. In fact, plasma has always had a certain cachet, mystery, myth about them. I guess that they represented the future being able to hang a TV on the wall, which culled up visions of H.G. Wells' prophetic novel "Things to Come." Or, maybe, it simply conjured up thoughts of Capt. Kirk on the bridge of the StarShip Enterprise looking at that large wall-hanging display. Whether rightly or wrongly, many consumers still believe that plasma TVs are superior to other types of TVs possibly because they have a specialized gas encased inside the display and that they still seem somewhat exotic. In any case, they are certainly a marvel of creativity and engineering.

The perceived problem with plasma, however, is something called "burn-in" or more technically called "image retention." What this means is that if you keep an image "frozen" on the screen too long, a ghost of the image will stay with the display forever. A good example of things that could leave permanent images on the screen could be news or stock tickers staying on the bottom of the screen, or station logos or icons sometimes called "bugs." In the beginning, this was certainly an issue. Now, several years later, all of the leading manufacturers of plasma TVs (Panasonic, LG, Samsung, Pioneer, and Hitachi) have all taken several steps to greatly reduce or eliminate completely any signs of image retention.

The Plasma Display Coalition (PDC) acknowledges that there were issues in the past, but those detractors of image quality have been addressed and virtually elimintated in PDPs (Plasma Display Panels). The PDC is comprised of four companies: LG, Hitachi, Panasonic, and Pioneer.

According to Jim Palumbo, who the President of the Plasma Display Coalition (PDC), "New plasma advancements in cell structure and phosphor formulations have virtually eliminated image retention, also known as ghosting. Tests verify that any residual ghosting generally disappeared with normal use after a relatively short time. If you haven't burned images into your CRT television, there is little chance that you will with plasma. As with any electronic product, you should follow the usage guidelines in your owner's manual." Basically, the PDC position is that image retention (burn-in) has been virtually eliminated and is no longer an issue.

Tim Alessi, Director of Product Development, LG Electronics, explains that "LG has gone to great lengths to eliminate uneven aging. As far as LG is concerned, it's a non-issue today. All of our plasma sets offer an image sticking mode in case "paused" images were left on the screen for too long. As well, each set includes three other functions that further help reduce or eliminate "burn-in." All sets include an orbiter feature that constantly shifts images by 1 to 2 pixels at a time. Secondly, there is an inversion mode; and lastly, there is a whitewash mode. Via the on-screen menus, the consumer can invoke the whitewash mode that completely turns the screen image white for between 5 - 10 seconds to eliminate any images that have been retained."

Samsung offers similar options to consumers with its Plasma HDTVs, which are available via the on-screen menu of their current 2007 models. These modes include: Pixel Shift - Adjustable image shift; slowly shifts the image up and down and/or side to side to keep the pixels from burning in. User can adjust the amount of shift, the direction and the timing, up to 4 pixels horizontally and/or vertically, taking up to 2 minutes to make a complete shift and back; White - displays a white screen to alleviate image retention and/or burn-in; Scrolling - displays a gray ramp (image that ramps from black on one side of the screen to white on the other), that then rolls across the screen, horizontally, and Side bars - adds gray side bars to 4:3 images.

Additionally, according to Mike Wood, TV Test Manager for Samsung QA Labs America, "For reference, there is a difference between "image retention" and "burn-in." When used correctly, the former term refers to an image that stays on screen long after the original image is gone, but that doesn't mean the plasma or the phosphors are permanently "burned. It just means the pixel is kind of stuck (though not usually stuck in the original state, nor in the generally considered usage of the term- it's more of a lag) and will revert back to its "newest" state with a new signal (usually a white signal, or at least something brighter than the original signal that got it stuck in the first place), or time. One would really have to use them with a static image for a really long time (think: digital signage) to see any "burn-in" with currently available sets. Studies show the same is true of LCD."

According to a recent study (2005) conducted by the Imaging Science Foundation (ISF) for the IDC and sponsored by Pioneer Electronics, the study found the following results. "So what's the verdict on plasma? Our test results and other research show that, while there may be a tiny glimmer of truth in some of these statements, they are all myths. Plasma TVs are an excellent choice for consumers who are willing to pay the relatively high price for these displays and want accurate image recreation, particularly in viewing environments with controlled lighting. First, while image retention can occur in modern plasmas, the effect is temporary. After the 48-hour torture test, all three of the plasma TVs that were tested showed clearly visible images from the game menu, whereas none of the LCD or MD [micro-display] rear projection-based sets showed any image retention. However, after regular video material (a DVD movie set to continuously loop) was played through the sets for 24 hours, the image completely disappeared from all three plasmas, leaving no trace. Unlike early generation plasmas, where those type of images would not go away and could actually "burn" onto the screen, modern plasma TVs enjoy a combination of more robust screen materials and subtle image-
shifting technologies that have rendered this former issue moot.”

The IDC study concluded, “The commonly held beliefs about the viability and performance quality of plasma TVs turn out to be merely myths when held up to the discerning eye of quantifiable testing. In particular, concerns about plasma lifetimes and image retention (“burn in”) are half-truths that may have been legitimate concerns for early generations of plasma displays, but are non-issues with today’s current generation products. Yes, plasmas may show signs of retention if still images are left on the display for very long periods of time (such as 24 hours or more), but even in this extreme example, the result is only temporary. Today’s plasma TVs essentially heal themselves with subsequent viewing of regular TV material. As a result, more common scenarios of 5 to 10 minute (or even several hour) image pauses will not cause permanent damage.”

Joel Silver, Executive Director for the ISF sums up, “The short summary from that work [the IDC study] was that 48 continuous burn-in hours of a video game still frame menu screen was enough to produce a clearly visible but non-permanent "retained" image on many PDPs [plasma display panels]” none of the units showed any long term ill effects after running an additional 24 hours of moving video after the burn in test! Running a PDP in 4x3 for long periods will still result in uneven wear that will eventually be visible and is not recommended. Current generation PDPs are far more rugged than early models but phosphors do wear for electronic signage with permanent fixed images LCDs are better choices for home usage the LCD/PDP decisions are application specific and the decision parameters as you well know are now complex. But those decisions might get easier for dedicated theaters.”

So, that’s pretty much the story. Image retention or "burn-in" has reportedly all but vanished from plasma TVs today. Yes, it can still occur, if the display is abused or mis-used. However, unlike earlier models, today’s plasmas can virtually eliminate "burn-in" via various methods employed by the leading manufactures. According to the experts, it's a non-issue or myth. Pass me the popcorn!

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