Six things you need to know about 120Hz LCD TVs

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(October 25, 2007)

We field a lot of questions about HDTVs here at CNET, and not surprisingly, one of the more prevalent ones these days is whether or not it's worth spending the extra dough on a new flat-panel LCD TV that features a 120Hz refresh rate. For those who don't know what I'm talking about, a 120Hz LCD TV is one that refreshes motion picture images at twice the speed of "standard" 60Hz models. What's the benefit of that? Well, the knock against LCD TVs—which doesn't apply to plasma or rear-projection HDTVs—has been that their slower refresh rates and response times leave them susceptible to motion blur with fast-motion content. To combat this perception, LCD manufacturers are pushing 120Hz—it's the hot spec of the moment, the 1680p of 2007. The question is, how much of a difference does it make?

In hopes of answering that question, I sat down with Senior Editor David Katzmaier and Associate Editor Matthew Moskowitz in our TV lab, where we have several 120Hz TVs on hand, namely the JVC LT-47X890, the Mitsubishi LT-46144, and the Sony KDL-40XBR4. Here are our shared conclusions.

1. 120Hz on its own doesn't appear to significantly reduce motion blur. This may seem like a bold statement right out of the starting gate, but I can tell you only what I saw. We watched a non-HD LCD TV, JVC's LT-47X890, next to those three 120Hz TVs, as well as three plasma: Pioneer's PDP-50HD9D and PDP-F10HD, along with Samsung's FP-75P. Watching the same HD source material on every TV (it included recorded footage of a Saints-Colts football game and a U.S. Open men's singles tennis match), neither you nor my camerapersons—saw anything that made us feel 120Hz was making a real difference. Yes, when you run a fast-moving score ticker on the bottom of the screen, the letters and numbers appear slightly sharper (no blurring around the edges), but it's just not a big deal. The fact is, we haven't had a motion-blur problem with any of the newer 60Hz LCD TVs we've reviewed in recent times. Don't get me wrong—we did see a lot of what you might call blurring in faster-motion scenes, but it was always inherent in the source, so it looked basically the same on all of the TVs, including the plasmas.

2. Motion blur is a fuzzy concept, OK, this where it gets more complicated. Typically, manufacturers are coupling 120Hz with a video-processing feature that is designed to eliminate judder in film-based (24 frame-per-second) material. This is often referred to as a "smoothing" feature, and companies have come up with different marketing-friendly names for it: Sony calls it Motion Fix, Samsung's dubbed X-Link Plus, Sharp's is TruXel, and Toshiba's is Film Stabilization, and some work better than others. Even same plasmas, such as the Pioneer PDP-50HD9D, offer this type of smoothing feature, though we didn't think it was implemented as well in that model as in the LCDs (it introduced major artifacts). To be clear, motion blur and judder are two different beasts. However, they seem to be getting lumped together because both involve the clarity and stability of the image. Mitsubishi, for example, calls its 120Hz processing "Smooth 120Hz," even though the company's LCDs, such as the LT-46144, do not incorporate anti-judder processing.

3. Anti-judder can have a major impact on picture quality. The smoother is designed to eliminate judder in film-based content, which is most noticeable in scenes that incorporate slow camera pans or in scenes shot with a handheld camera. We mostly looked at the effects of judder in the...
and a research scientist, we may see it in the future at a videogame store. Sony's anti-judder, which has two settings: standard and high. Even at the lower setting (standard), the difference in the picture was immediately apparent. The image just looks more stable. Kick it up to high and everything becomes rock solid—it's night and day. However, the high setting tends to introduce artifacts into the picture. These look like a little tear or glitch in the picture. They appear for just a fraction of a second, but they are noticeable. It's worth noting that the picture on the standard setting sometimes looks unnatural, too, particularly when the anti-judder suddenly kicks in during a fast pan and stabilizes objects moving across the screen.

4. Eliminating judder is not for everyone. Judder is part of what makes film feel like film, so when you remove it, it starts to look like video. Now, some folks like the look of video and contend that it looks more true-to-life. Both Matthew Moscowitz and I are judder-free fans. On the other hand, David Katzmarik likes the effect only in certain scenes—he generally prefers to leave it turned off during Hollywood films and turned on for some other film-based content, such as the nature documentary Planet Earth—because, in some instances, it can really alter a scene, or at least take away from what the director intended the scene to look like. This is called "director's intent," and movie purists would argue that anti-judder tamishes the viewing experience much in the same way that performance-enhancing drugs might change the outcome of a sporting event. OK, maybe that's a stretch, but I couldn't help myself.

5. If you're a fan of anti-judder, it's hard to live without. Moscovitz says he now has a hard time watching movies with judder; he finds it excruciatingly irritating. Personally, I don't feel quite that strongly, but I keep asking Katzmarik to crank the Sony's Motion Flow setting to "yep." I was willing to live with the artifacts in exchange for that rock-solid image. (Katzmarik strongly disagrees.) I'm quickly becoming an anti-judder juniper.

6. Smoothing will only get smoother. As I said, some smoothers are better than others. But remember, this is a relatively new technology, and most of these companies are taking their first cracks at these special video-processing modes. Sony's Motion Flow and others will get better with time, and chances are you'll see fewer—or hopefully, no—artifacts in future televisions when the anti-judder mode is engaged. For the record, we've tested only three HDTVs with anti-judder technology so far: the Sony, the Pioneer 50HDX, and the Toshiba 52ZL1777, but we'll check out more as soon as we can get our hands on them.

So, is it worth paying extra for a 120Hz model now? If you can afford it, I'd say go for it, as long as you get a model that does anti-judder well—and offers good picture quality based on the fundamentals: decent black levels, color saturation, color accuracy, and resolution. Ultimately, reducing judder, not motion blur, is the real game-changer here. Get a demo yourself. Maybe you'll see what I mean.

Is a 120Hz a game-changer or is it overrated? Click the TalkBack button to get your two cents in.