A Fresh Look at Monitors

Once upon a time, a discussion of monitors would have been pretty bland. They were flat, monoscopic, and RGB, and all had 1,280 × 1,024 resolution. This is no longer the case. Recently, there has been an explosion of styles and functionality in monitor production. Our goal in this installment is to show some of the ways monitors have broken out of their mold. (Of course, there are many more monitor vendors and models than we can show here. Our purpose is just to show examples of current monitor diversity.)

4K Monitors
Well, first of all, 4K doesn’t mean exactly 4,096—at least not yet. But it does mean 3,840 × 2,160 (a 16:9 aspect ratio). A number of vendors now have monitors at this resolution. For example, the Samsung U28D590D is a 28-in.-diagonal monitor (see Figure 1). At this size, the pixel pitch is very small, giving a crispness we’re not used to seeing. This type of display would be useful, for example, when viewing ultrahigh-resolution photographs or renderings or highly detailed data displays.

Typically, these types of monitors are driven by either HDMI (High-Definition Multimedia Interface) or DisplayPort interfaces.

Caveat: At this point in time, not all graphics devices can drive all 4K monitors. Check before you buy.

Figure 1. The Samsung U28D590D is a 28-in.-diagonal monitor with 3,840 × 2,160 resolution. With this resolution, the pixel pitch is very small.
For more information on the Samsung U28D590D, visit www.samsung.com/us/computer/monitors/LU28D590DS/ZA.

**Curved Monitors**

For some time, the graphics world has used multi-projector systems whose adjacent screens tilt inward to give viewers a slight “surrounding” effect. That idea has spread to the world of monitors. For example, the LG 34UC97 is a curved 34-inch monitor with a cinematic 21:9 aspect ratio and 3,440 × 1,440 resolution (see Figure 2).

Why a curved monitor, you ask? When you sit closely enough to one, the curvature effectively cuts off your peripheral vision, giving a heightened sense of immersion. Applications that can exploit this include gaming, simulation, and scientific visualization. If you have an application for which you want the viewer to feel more a part of the synthetic world on the screen and less a part of the real world, this is an excellent technology.

Caveat: The lack of peripheral vision to show the stable world around us can induce motion sickness in some people.


**Enhanced Color Gamut**

Since the beginning of the color display era, RGB has been the standard way to create the monitor’s color gamut. Different vendors have experimented with slightly different placements of those color components on the CIE chromaticity diagram. However, the monitor’s color gamut has always been an RGB triangle inside the horseshoe-shaped CIE human color perception envelope.

The Sharp 920 monitors use “Quad Pixel” technology, which adds a fourth color component, yellow, to the subpixel array. This makes the monitor’s color gamut a quadrilateral and allows it to better fill the CIE horseshoe, enabling more faithful reproduction of colors in the orange-yellow-green part of the spectrum.


**Stereographics**

Stereographic monitors have been a mainstay in the visualization world for the past 20 years, but they’ve employed lower-resolution, fuzzier CRTs. Today’s LCD color displays can produce interactive stereographic imagery with a crispness only dreamed of in the past. The Samsung H7150 monitors, for example, have 1,920 × 1,080 resolution, are up to 75 in. diagonal, and can refresh at 240 Hz. This refresh rate is high enough to produce vivid, stable stereographic images. These images switch left-right-left-right on alternate refresh cycles, thus requiring active shutterglasses to view the stereo effect.

We know what you’re thinking. If you remember active stereoglasses as big, clunky, heavy, expensive monstrosities with a short battery life, think again. Today’s shutterglasses cost $20 or less, weigh less than an ounce, and have an in-use battery life of around 70 hours.

Caveat: Producing stereographic imagery involves drawing the 3D scene twice: once from a left eye position and once from a right eye position. This means you’ll likely get half the interactive update rate that you did before you switched to stereographic mode.

For more information on the Samsung H7150 monitors, visit www.samsung.com/us/video/tvs/UN75H7150AFXZA.