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Stereographic Video—without the Glasses

HDTV (high-definition television) has set a new standard for broadcast television. The good news is that market demand for the new systems has led to an increase in **manufacturability**, and a resulting larger supply of units has brought falling HDTV prices. To describe this kind of event in the marketplace, economists use the phrase *economy of scale*.

Could a new **three-dimensional** HDTV system soon eclipse the popularity of **two-dimensional** HDTV systems? Is it possible that just when you thought it was safe to purchase an HDTV, someone has developed a newer 3D system?

X3D Technologies released **stereographic** video as a consumer product in 2002. The system used special battery-powered glasses in synchronization with **software-altered** computer images to trick the viewer's eyes into seeing 3D DVDs and video games on the computer monitor. (My December 2002 column "3D Video Cruising" described how the X3D system works.) It soon became clear that for Stereographic video to gain mass popularity, **someone** would have to find a way of getting rid of the 3D glasses.

When mass marketing didn't create a strong enough consumer demand for 3D video systems, X3D and other manufacturers still had a viable system for use as a scientific and visualization tool. Scientists, doctors, architects and others purchased the systems to view real or imagined objects three **dimensionally**. At the same time, the companies involved continued to develop the technology into an eyeglass-free system.

Two independent companies are now ready to **introduce Stereographic** vision to mainstream consumers. X3D Technologies, which has changed its name to Opticality Corporation, calls its **eye-glass-free**

3D system **autostereoscopic vision**. StereoGraphics Corporation has also introduced its own system, **SynthaGram** 3D, which is also viewed without 3D eyeglasses. When I tried out both of these systems at a recent technology conference, I was impressed. Their images seemed to actually jump out of the screen. Some images seemed to float inches



StereoGraphics Corp

from the monitor. The dolphin illustration is a reasonable 2D representation of what such an **image** would look like in 3D. If I could actually place a 3D image on this page it would be like what you currently see in an **IMAX 3D presentation**—but you wouldn't need to wear the 3D glasses.

Both **Opticality's** and **StereoGraphics'** systems use a screen covering that splits or filters the image so that each eye receives different information that the viewer's brain converts into 3D images. **StereoGraphics** describes the **SynthaGram** 3D display covering as a "columnar lens sheet." This lens sheet splits the screen's image into multiple images for **separate-eye** viewing. The shape of the columnar lens also produces multiple viewing **zones**.

Opticality calls its covering a

"wavelength filter array." The individual filters in this array are smaller than the individual pixels that make up the image on the screen. Both systems use specially formatted images that are transmitted at a particular angle for **left- and right-eye** viewing. Both systems have multiple images transmitted from the screen for viewing at **different** viewer angles. The person viewing the screen only sees one 3D image at a time that physically changes depending on their viewing **angle**.

The most fascinating thing about both of these systems is that if you view a still picture on one of their larger screens, *the picture moves when you move your head*. As your viewing angle changes from a frontal to a left or right view, the amount of the object that you see increases or decreases as it would if you were viewing a true **three-dimensional** object. This creates the illusion that you are looking at a **real** scene through a glass window. The image you see actually appears to have true depth. This is true **parallax** vision. This new technology is now being introduced to the public in the form of large 3D advertising signs. Opticality recently built a **180-inch** 3D video system to show off its 3D imaging technology in **Aichi, Japan**.

It **will** take some time before this technology is ready to replace 2D television in the marketplace. To get a good idea of the possibilities it offers, Google the companies and the names of their technologies.

Recalling the Facts

1. Why do you think people were slow to adopt 3D systems that require special glasses?

2. Why are people in technical or medical areas willing to adopt 3D systems even if they require the wearing of special glasses?

3. Describe how a 3D video **system** that doesn't require glasses works. ©

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