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## Solving 3-D on Blu-ray

By Chris Tribbey | Posted: 29 Jan 2009  
[ctribbey@questex.com](mailto:ctribbey@questex.com)

Studios are investing to be doing 3-D, but everyone seems to be doing it differently.

DreamWorks invested millions in ad time and free glasses for its 3-D Super Bowl commercial. Panasonic made a splash at this year's Consumer Electronics Show (CES), showing off new at-home 3-D technology. And 3-D versions of the *Hannah Montana* movie, *Journey to the Center of the Earth* and *Polar Express* made their way to Blu-ray Disc recently.

Panasonic's solution revolves around adding a second HDMI channel for hardware and software, allowing for left- and right-eye video streams. DreamWorks uses new technology from Intel and ColorCode that makes its images viewable in both 3-D and 2-D at the same time. The Blu-rays are using the traditional anaglyph 3-D, which uses two, superimposed color layers offset to produce a 3-D depth effect when glasses are used.

Glasses are about the only thing the three have in common, and the lack of 3-D standards for media in the home — especially Blu-ray — is causing, as one analyst put it, "a lot of hand-wringing."

## Blu-ray Disc 3-D standards

"[The Blu-rays were] encoded in anaglyph 3-D. That technology is almost 100 years old," said David Wertheimer, executive director of the Entertainment Technology Center at the University of Southern California (ETC at USC), of the old red and cyan glasses. "Like consumers, the studios want 3-D in the homes as well. ... Until the technologies we saw all over CES this year hit the mainstream, the world needs bridge technologies to allow for enhanced experiences on existing TVs."

"The studios are doing what they can to satisfy the consumer demand for 3-D."

Most HDTV companies are making 3-D-ready TVs, and some are putting autostereoscopic displays (without glasses) into the consumer market. But both the consumer electronics industry and content owners are looking at Blu-ray to satisfy the demand for packaged media on 3-D.

"We do not yet have any proposals being made for 3-D within the [Blu-ray Disc Association], but we do believe that Blu-ray Disc is the best packaged media format for 3-D," said Andy Parsons, SVP of advanced product development at Pioneer Electronics and chair of the Blu-ray Disc Association promotion committee in the United States. "There are many different approaches being shown by various companies, so we're interested in studying how we might be able to combine the best 3-D experience with the best HD experience."

"The quality, compatibility and uniformity of 3-D viewing will be very important considerations for us once we begin to evaluate various technologies."

Bill Hunt, editor of TheDigitalBits.com, said he was impressed by Panasonic's and other companies' 3-D technologies at CES, though when it comes to Blu-ray 3-D, he believes the industry should find a way to make disc content future-proof, able to play on current Blu-ray players that may not handle a future 3-D standard.

"It remains to be seen whether it's a fad," he said. "Not every movie is going to be shot in 3-D."

Chris Chinnock, president of Insight Media, said he sees two paths to 3-D standards for Blu-ray. The longer road has everyone involved sitting down together and hammering out an agreement on what everyone will do, while the other involves a major consumer electronics company taking the initiative and introducing technology that becomes the standard, he said.

Hardware is one option; encoding 3-D on software is another. Or there's the possibility of multiple standards. After all, there are multiple ways

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to compress video files and store media to portable devices. But Chinnock hopes, for the home entertainment industry's sake, that it doesn't come to that.

"We're just coming off the HD DVD, Blu-ray war, and that was painful," Chinnock said. "It would be nice if we could take care of this from the beginning."

50 GB goes a long way

The appeal of 3-D on Blu-ray comes from the high-def format's storage capacity, 3-D industry experts agreed.

"Blu-ray presents an opportunity for high-quality images," said Greg Agostinelli, who spent years developing autostereoscopic technologies with Stereoscope Studios. "Because of the storage capacity of the disc, you can do 3-D well. In very general terminology, 3-D is two times the information, and you need every bit of that capacity."

Daniel Evanicky, principal of 3-D company Information Interaction, agreed, saying, "It's Blu-ray or nothing."

Morgan Hurley, a marketing manager with 3-D company MacNaughton Inc., said getting 1080p resolution for 3-D will be the key.

"You get the right resolution, and the market will respond," she said, adding that Blu-ray also presents opportunities for autostereoscopic solutions. "Who likes having anaglyph glasses on their face, and be seen wearing them?"

But, Chinnock said, autostereoscopic displays have issues.

"If you have a 1080p panel with eight views, you lose resolution," he said. "And that's not OK for Blu-ray movies."

Autostereoscopic displays work by offering a certain number of views at different angles. A person watching an autostereoscopic display can't move around while watching the image.

Yet finding standards for 3-D in the home may be hard now, because the technology is constantly changing. As John Rupkalvis, CEO of StereoScope International put it, "What's true today could change tomorrow."

Wertheimer of the ETC at USC said no matter what standards emerge, "consumers and content providers are both very interested in 3-D in the home."

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