

## DOLBY DOES 3D

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ShoWest 2007 provided another big boost to digital cinema. With numerous announcements and equally enlightening panel presentations on the subject, it nonetheless seemed at times as if the deployment of d-cinema systems was becoming old news. Instead, all the excitement was bubbling up into a new dimension. After an exclusive media preview on March 12, news that Dolby Laboratories had developed another and apparently more flexible cinema solution for digital 3D quickly spread throughout the convention. Theatre operators and technology experts signed up in record numbers at the Dolby tradeshow booth to attend an invitation-only demonstration of the all-new Dolby 3D Digital Cinema (D3DDC). And even though the company carefully spoke of a "sneak peek" and about developments that are "still in the early stages of testing," from all accounts received, people were deeply impressed by what they saw. [Disclosure: Due to an eye deficiency, this author cannot properly see any images produced by 3D systems.]

After a mere six months of "working very hard" to develop hard- and software and testing both, "we are very happy with the way it looks to date," states Tim Partridge, Dolby Laboratories' senior VP and general manager. Though it won't be commercially available--list price is expected to be just under \$20,000 with no recurring licensing/marketing fees--until the re-release of *A Nightmare Before Christmas* and the new fantasy of *Beowulf* later this year, "we wanted to show the progress that we've been making and just how good the system looks," Partridge explained.

As for the reasons to enter the digital third dimension, he ventures that Dolby "built its reputation on producing innovative cinema presentation technology" from back in the 1970s to Dolby Digital Cinema today. "Having seen the reactions of both the public and the studios to digital 3D and knowing ourselves that digital-cinema technologies would allow for a much better experience in 3D, we started thinking about our own system. The idea was to combine the advantages of each of the present systems and none of the inherent disadvantages," Partridge confirms, all the while "creating the same level of quality or better." Determined to develop a solution that would be "a bit more practical and hopefully more cost-effective," Dolby "searched the world" and finally connected with INFITEC GmbH from Germany as technology partner.

Headed by engineer Helmut Jorke, who tells *FJI* that he has "been fascinated by stereoscopic images ever since looking through a View-Master as a child," INFITEC technology originated from a research project of DaimlerChrysler AG. Under the rather scientific project title of "wavelength multiplex visualization system," Jorke and his team investigated how "to improve image quality and enlarge functionality in virtual-reality systems." In early 2003, INFITEC became an independent company licensed by DaimlerChrysler to market and further improve on those results.

Without getting into too much physiological and technical detail, INFITEC uses a sophisticated and extremely fine-tuned color/filter wheel--the name actually stands for "interference filter technology"--to take advantage of the way in which the human eye receives light and our brains process the information. Light waves entering the eye are

"separated into three different spectral ranges by three types of receptors that are related to the primary colors blue, red and green," Jorke explains. Consequently, the Dolby 3D system uses six color bands--three for each eye. Reducing them to very narrow bandwidth in conjunction with complementary images for the right and left eye facilitates the use of one light source in a single-lens projector.

Placing the corrective filter wheel in the light path before the image is formed allows for higher lamp power without impacting the DLP Cinema chip. By ShoWest, Dolby had tested with both NEC and Barco projectors. "The picture itself does not go through any active filters," Partridge details. The implementation of INFITEC's spectral color-separation technology "leads to a spectacular-looking image, very sharp and clear."

Unlike polarization systems, in D3DDC there is no need for a silver-coated screen and larger picture sizes are possible without fall-off in brightness towards the edges. Instead of being bound by a dedicated 3D house, the 3D feature can move into any multiplex auditorium over the course of its run. With the filter wheel automatically moving out of the way, switching back into the second dimension takes just seconds.

In other words, exhibitors can continue to use their existing white screens without having to resort to battery-powered active glasses. Rather, D3DDC works with lightweight passive-viewing glasses that, by being reusable, will minimize environmental impact and carry a lower cost than for one-time use. To clean them, Dolby recommends industrial dishwashers with a cycle that takes no more than 90 seconds. In the future, they nonetheless expect to offer the option of disposable souvenir glasses.

Last, but certainly not least, Partridge addresses how the technology "also simplifies the process of creating and distributing 3D movies," saving filmmakers time and studios money in the process. "There is no need for extra color correction--it is, in fact, the same for both 3D and 2D digital-cinema presentations--or other compensation processes in post-production, as all processing is performed in the server." Currently, he says, "we are working with SMPTE and the DCI studios to establish one file format across the industry, so that a single 3D file can be sent to any cinema." Once the standard has been set, all the servers will be able to play out the same file, he predicts, including 2D should the cinema not be equipped. "There is no reason why the other systems could not do that."

While on the subject, Partridge also states his belief "that all vendors must adhere to digital-cinema standards to ensure interoperability for a viable digital-cinema business globally." To that end, ShoWest marked the DCI-required JPEG 2000 upgrade to some 280 installed Dolby Digital Cinema systems. In addition to continued MPEG-2 encoded capabilities for alternative content, Dolby also added the option to accommodate 4K file ingest as well as making security enhancements with Texas Instrument's CineLink2 link encryption and video forensic watermarking.

"We believe that Dolby Digital Cinema is equipped with the necessary features and functionality currently specified by DCI," Partridge concludes. "It is a milestone year for the digital cinema industry"--in and by any dimension, we might add.