

Total 3D Experience System

Delivers Dynamic 3D Solutions For The Home

Jeff Brum

"3D is here."
 "3D is here to stay."
 "3D is a fad."
 "It's the savior of the movie theatres."
 "It's a new creative medium."

There are many opinions about 3D right now, especially given the product launches announced at the recent CES show. It seems that 3D has suddenly exploded onto the scene. Interestingly enough, 3-D solutions have been available for years, but the technologies that can offer an enjoyable, immersive 3-D experience have only recently converged into viable solutions for commercial venues and home theatres alike.

The 3D used for movies back in the 1950s, namely red and blue anaglyph glasses, returned in the 2000s as a means of delivering 3D to the home. Similar color-based technologies were tested late last year for delivery of 3D via broadcast. Though positive signs of technological progress, they didn't deliver the ultimate immersive experience—especially in regards to discriminating buyers of luxury home cinema systems.

Recently, there have also been a flurry of announcements from major electronics companies introducing 3-D Blu-ray™ and 3-D televisions. These utilize 3-D technology that promises a sharp, colorful image. However, these technologies are targeting the mass home theatre consumer with flat panel options. 3-D technology suitable for projector-driven home theatres is not mass marketed, as it represents a smaller and more discriminating selection of A/V consumers.

That discerning group of home cinema aficionados now has access to a powerful 3-D solution for their personal screening rooms. Years of cooperation between two respected industry leaders has produced a precise and powerful solution for home venue-oriented, precision 3D. Mechdyne, in conjunction with Digital Projection International, developed the Total 3D Experience System: an expert pairing of Mechdyne's new Dimension 3D media server and Digital Projection's TITAN series of projectors. Both are engineered to provide the best stereoscopic 3-D imagery, specifically for high-end home theatres.

Mechdyne specializes in complex 3D and high-resolution display environments for

commercial applications; research, automotive, aerospace, oil exploration, life sciences, and more. As a company, Mechdyne's 3-D experience dates back to 1996, while several Mechdyne employees have worked with 3-D imaging since the mid-80s. Look up "CAVE virtual reality" on Google, and you will find



Mechdyne as the world's leading developer of the "holodeck-style" walk-in virtual reality room, among other highly integrated products. The Dimension server is Mechdyne's first high-end consumer-oriented product offering.

Digital Projection, the only Emmy award-winning projector manufacturer, approached Mechdyne for help and guidance regarding the development of what is now known as the Total 3D Experience system. The Total 3D Experience system consists of the Dimension media server and professional 3-D glasses paired with Digital Projection's Reference series 3D projectors. This dynamic system is the world's first turnkey 3-D solution for projector-based home venues.

Given that this is the first solution of its kind, what distinct benefits can consumers

expect from the system? The answers lie in the two most frequently asked questions, with respect to 3D.

The first set of questions concern content availability. "Where is 3-D content going to come from?" "There are so few 3-D movies in the theatre, is 3D just a fad?" "What will the

server actually display now and in the long term?" The following summarizes the Total 3D Experience system's abilities in content management:

Movies

A standard has been announced for 3-D Blu-ray Disc players, which should allow new 3-D movies compatible with shutter glasses to be available in 2010. Even then, only 12 movies were mastered in 3D in 2009, and so far 14 3-D feature movies have been announced for release in 2010. However, due to the rampant success of James Cameron's 3-D epic, *Avatar*, the number of 3-D films in production is sure to exponentially increase. Even with all the interest, it will still take time



for the pipeline to fill. One reason is that the 3-D Blu-ray standard has only just been announced. The good news is that, due to the advanced design of the Dimension server, it appears that only a firmware upgrade will be necessary to enable 3-D Blu-ray playback.

Legacy 3-D movies can also be found for purchase on the Internet. Granted, many won't be in the newest high-definition formats, but they will still be entertaining and in many cases, demonstrate very compelling 3-D imagery. This wealth of legacy 3-D content can be accessed and accurately played back via the Dimension server.

3-D Gaming

Gaming currently represents the broadest range of available 3-D content. The prolific availability of 3-D gaming assures today's technology revolution in 3D will become broadly adopted by a diversity of consumers. The stereoscopic effect greatly enhances the gaming experience as participants become both emotionally and visually immersed in the virtual world of the game. There are already hundreds of 3-D PC games available that the Dimension server can play, and more games are being released almost daily. Additionally, 3-D gaming consoles are expected in 2010, and the Dimension server will be able to accommodate those platforms as well.

Conversion of Existing Movie Libraries

Converting standard 2-D DVDs into a 3-D viewing experience can be done using the Dimension server's advanced 2D to 3D conversion software. Conversion happens in real time as you play the movie, so you can experience your favorite movies with enhanced 3-D effects without having to wait. Conversion of 2-D Blu-ray will soon be possible as well. More on 2D to 3D conversion is discussed later in the article.

Conversion of Existing 2-D Digital Photographs

The 2D to 3D conversion capability also allows a customer's existing 2-D digital photographs to have enhanced 3-D effects.

3-D TV Broadcasts

3-D TV channels such as ESPN, Discovery Channel, DirecTV, and many more are expected to appear in 2010. The Dimension server will incorporate a tuner that will allow customers to enjoy this approaching, widely available content. Viewing sporting events in 3D is one of the most highly anticipated features associated with 3-D technology.

Create YOUR OWN 3-D Content

An avalanche of new 3-D creation tools, such as digital cameras and software, can confidently be predicted to emerge in the consumer market. Fuji has already introduced a 3-D digital still/video camera, available as of December 2009. More information can be found by visiting http://www.fujifilm.com/products/3d/camera/finepix_real3dw1/. 3-D cameras will enable consumers to create and play back their own home movies and vacation videos, in 3D, in the comfort of their own theatre. The possibilities are unlimited, as customers simply upload their creations to the server for storage and playback, using included software.

A Wealth of Online 3-D Content

3-D photos, 3-D slide shows, movies/animations, and feature movies are all currently available on the Web. Furthermore, online content will surely continue to grow as 3D becomes more popular among amateur photographers, filmmakers, and graphic designers/animations. Links to numerous 3-D content sites are provided with the Dimension server.

In closing, there is an extraordinary amount of 3-D content for immediate and future viewing.

A second pervasive question from consumers is: "I've heard about converting 2D movies to 3D. What can I expect?" As with any new technological process, it is always best to see examples in person. With that in mind, a description of the process can help set expectations. Essentially, the 2D to 3D converter that is included within the Dimension server looks at several frames of the movie simultaneously; both the one presently being displayed as well as several frames before

and after that frame. The software analyzes color, position, and motion of objects in the frames, then uses that information to estimate and render the stereoscopic view. Animated movies, like *Madagascar* and *Coraline*, convert quite well since characters are richly colored and well defined.

Sports movies such as *Friday Night Lights* (football) showed good 3D in huddles and most of the play action. Fast-moving action sequences do affect the converter's ability to assess the scene for depth cues, but a tangible difference in depth is noticeable. Results vary in films with concentrated fast-action scenes, such as recent James Bond films and the new *Star Trek* film's battle sequences. Scenes that are only a few frames long don't give the converter much to work with to generate depth before it detects a different scene. In conclusion, very fast scenes may not reveal much depth effect and may appear more like 2D. It is important to note, this same observation can be made for movies mastered in 3D as well. As soon as the action slows, as when Bond gets his new toys from Q, the 3-D effect becomes far more intense.

Mechdyne's extensive experience with 3-D technology has bred expertise with multiple technologies. The Digital Projection TITAN Reference 1080p 3D is the best 3-D projector Mechdyne has encountered: bright, rich colors, exceptional 3-D reproduction, and robust performance in a compact and highly efficient design. A high-contrast version of the TITAN 3D projector that won a Manufacturers' Excellence Award for Best New Product at the 2009 CEDIA Expo, the TITAN Reference 1080p 3D relies on key technological innovations such as:

- FastFrame™—technology that vastly reduces the artifacts and image blur typically associated with rapidly moving display content. Especially important when viewing sporting events or any other fast-moving entertainment content.
- Dual-Flash Processing™—enables signal distribution of 3-D content via 60 Hz formats by frame-doubling the signal within the projector.
- Xenon Color Mode—produces the rich

color gamut and native white point of cinema projectors, which employ Xenon lamps, but from the UHP-type lamps that the TITAN employs. UHP lamps are far more efficient in terms of lumens per watt, deliver thousands of hours of operational life, and are far less expensive than Xenon lamp technology.

Lumen performance of the TITAN Reference 1080p 3D can be customized to optimize screen brightness and black level for each specific venue. The projector delivers between 4,000 to 6,000 lumens of the most precise, immersive 2-D and 3-D imagery imaginable with an amazingly rich 5000:1 contrast ratio.

Mechdyne has elected to use professional-grade 3-D shutter glasses for this solution. These are the same high-quality glasses Mechdyne has been specifying for world-leading organizations to design cars, research atomic structures, explore for oil, and other commercial applications. The glasses offer exceptionally high-light blocking capabilities, referred to as "extinction ratio" that stop any images intended for the left eye from reaching the right eye, and vice versa. These glasses match very well with the DP cinema projector's color and contrast specifications; two very important factors in home

theatre. Theatre owners won't have to search for replacement batteries because the glasses contain rechargeable batteries. A USB charger is included for the glasses.

Given all of the available 3-D viewing sources and content, the most important feature of the Dimension server becomes its user interface. Users must be able to easily and intuitively search for and select the content they want to enjoy while the popcorn is still hot. The Dimension server uses an iPod Touch as the "remote" for the Total 3D Experience system. Mechdyne designed and programmed a kiosk-style visual interface involving icons and simple touch and scrolling techniques to enable:

- Image source selection.
- Specific content selection. Movies, games and pictures can be selected from the hard drive using file names and/or custom-generated icons.
- Projector on/off.
- Projector lens shutter control (to block the light from the screen without turning the projector off).
- Projector input selection—if more than one source is connected to the projector.
- Operation of the built-in DVD.
- 3D troubleshooting—one of the most

common visual errors with some newly loaded 3D is the "swapping" of eyes, meaning the left becomes right, and vice versa. When this happens, all depth cues are distorted. Dimension's touch interface includes a simple eye-swap capability to correct this issue.

When a source is selected, the server will configure the necessary playback software/device and settings automatically.

Third-party control systems, such as those offered by Crestron, AMX, and others, can be easily configured to interface and control with both the Dimension server and TITAN 3D projectors, via RS 232.

In addition to 3-D content, the server will also play back 2-D content, as well as music files that can be stored on the hard drive.

The Dimension Media Server is available as the L1, with a 1 Terabyte hard drive, and the L2, with a 2 Terabyte hard drive. For more information on the Total 3D Experience system, including specifications and an updated FAQ, please visit <http://www.digitalprojection.com/3D>. **WSR**

The Author

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