

Lucas Oil Stadium, the new home of the Indianapolis Colts, is the latest example of how HD scoreboards are becoming the norm.

HD Presence Grows In Venues, Online, In Theaters

High-definition technology continues to move beyond the television set, giving leagues, teams and networks brand new reasons (and revenue streams) to justify going HD. Whether it's a new HD scoreboard in a sports venue, 3D HD productions of top-level sporting events or HD sporting events delivered over the Web, HD continues to transform the sports fans experience beyond the living room couch.

"The trend to HD reflects that sports teams and venues are in competition with HD television and home theater," says Mark Steinkamp, Daktronics marketing manager for large sports venues. "More fans are becoming accustomed to seeing a great picture at home and they expect to see the same quality of image while at the stadium or arena."

Lucas Field, the new home of the Indianapolis Colts slated to open this month, is an example of the trend as Daktronics designed and built the two large end zone scoreboards, each with a true HD display, along with two smaller digital displays to show statistical information, sponsor recognition and other data. Daktronics also recently won a \$45 million bid to have four large HD LED screens installed in the new home for the New York Giants and New York Jets. The field, slated to open in 2010, will be the largest integrated HD facility ever constructed.

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Peter Angell
director of production and programming, HBS

HD is also moving north of the border as Mitsubishi will provide the Air Canada Centre and its Toronto Maple Leafs and Toronto Raptors fans with the most advanced video screens of any arena in Canada. The system will contain 17 new displays with the highlight, or pièce de résistance, being a four-sided 6mm "black package" LED main display.

Mitsubishi also continues to see HD become commonplace and its newest technology, known as black package LED, is also making inroads. The Air Canada Centre system will be the first in the NHL/NBA market to feature black package LED, which is available on Mitsubishi Electric's 6mm, 4mm and 3mm displays and, according to the company, provides superior contrast and black levels over existing white packaged LEDs.

"Of the systems we saw, the Mitsubishi Diamond Vision boards were consistently superior in uniformity and reliability," says Dwayne Brown, technical producer for Maple Leaf Sports & Entertainment. "Plus, being able to showcase the black package LED is particularly exciting given that Air Canada Centre continues to be a world-class facility."

Going HD in a venue is about more than just the scoreboard as HD production gear like cameras, lenses and graphics need to be on hand to pump HD images to the high-resolution screens. Cameras from companies like Sony, Panasonic, Ikegami and Thomson Grass Valley lead the way alongside lenses from Canon and Fujinon as key equipment choices.

"We work closely with the manufacturers of the HD control equipment to make sure the image clarity and color reproduction on the display is the very best it can be," says Steinkamp. "Sometimes consultants and integrators are involved with control room design and configuration and we also work very closely with them to deliver the best system for the end user."

The move to HD for in-venue productions will also help drive more HD productions for viewers at home. Many mid-major college or college Olympic sports productions rely on the cameras that are already in the venue to cut production costs. So as those cameras go HD, there is an opportunity to deliver sports to viewers in HD, whether on TV or over the Internet.

"In any given week, there is about 100 times as much HD sports video shot as there are cable or satellite channels to show it," says Grover Righter, vice president of marketing for Vusion, a new entry into the online HD streaming market. "And depending on the content and screen size, HD can look better on the PC than standard-definition content. You can easily see the difference in HD."

Righter says that consumer testing shows that viewers also respond positively to HD over the Internet as it lessens eyestrain. "Viewers can watch HD video over the Web for up to four times as long as standard-definition video," says Righter. "More eyeball minutes means more monetization potential for advertising."

While broadcasters and leagues are looking to find more eyeballs online, they are also beginning to take a closer look at finding eyeballs in movie theaters via 3D HD.

When the NBA produced a live 3D HD closed-circuit event at the 2007 NBA All-Star Game in Las Vegas, many wondered if it would be a one-time thing. But this year, not only has it reappeared at an NBA contest, but also at the French Open and during the International Ice Hockey Championships.

The demonstration of 3D coverage of the French Open by Orange involved NHK MT, formerly NHK Technical Services, and was shown on a 46-inch 3D HD television set. "Everyone thought it was wonderful," says Philippe Delbary, Orange director of 3D services. "You enjoy 3D because it is a more natural way of seeing."

Delbary says the effort proved that live sports could be produced and transmitted in 3D as the signal passed through an Orange HD set-top box. "The message is we are ready to do 3D as soon as the manufacturers launch 3D TV sets in Europe," he says.

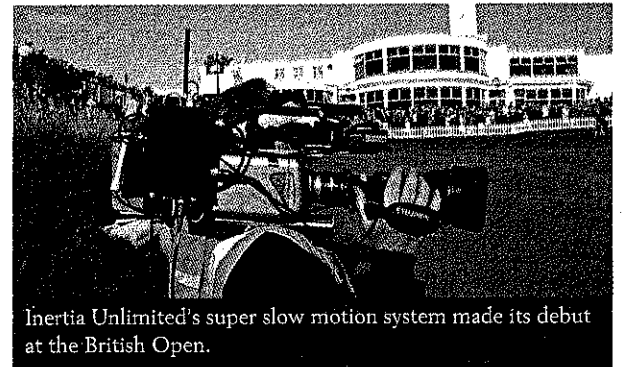
The viability of 3D, he adds, was proven by the reaction of those who saw the French Open in 3D. "After 20 minutes they were saying it was like watching the French Open through a window," says Delbary.

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Also this summer, European-based Infront Sports & Media/Host Broadcast Services recorded the International Ice Hockey Federation world championship finals in 3D HD for private screenings after the games.

Peter Angell, director of production and programming for HBS,



Inertia Unlimited's super slow motion system made its debut at the British Open.

says the explosion in interest in 3D HD compelled HBS to tape the final four games of the tourney in 3D and post-produce the content into a 3D highlight show for private viewing after the event.

HBS teamed up with broadcast production vendor Dome Productions and The 3D Firm, a consortium of European 3D specialists, to complete the project. The 3D Firm has designed special rigs that will attach to Dome's standard HD broadcast equipment in the Majestic HD truck to create the 3D HD feed.

As 3D HD capable movie theaters continue to become more common place (nearly 4,000 are expected to be operating by 2011), there will be a strong revenue opportunity akin to the Metropolitan Opera live theater telecasts that typically sell out at \$20 per ticket. The challenge will be negotiating a rights landscape that involves striking a deal with theater owners and easing fears of local broadcast TV stations and cable operators over potential ratings erosion.

"We have a lot of events coming up in the next few years that can benefit from 3D and we feel it's something we're going to have to offer to our partners in the future," Angell says. "For big landmark events like the World Cup final, the Super Bowl, the Olympics and other must-see events, we're probably only a couple of years away from 3D HD." ■

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Rosica says that by being fully selectable the user does not have to compromise regular speed playback. Previous systems would record at three-times speed and play out at regular speed by subsampling frames.

"The problem is the camera is still operating in three-times mode so there is a loss of sensitivity and flicker," he says. "But this camera operates in one-times mode at the flip of a switch." The camera also solves another problem that has plagued slow-motion camera systems: shooting clear images under artificial lighting conditions. Thomson's Anylight high-quality anti-flicker system eliminates any perceived changes in light levels due to any differences in the main power frequency and the synchronization with artificial lights.

"The different lighting and signage technology in stadiums can impact color imagery or cause artifacts that are more noticeable in HD," says Rosica. "With Anylight, the camera operator can dial in and have the camera compensate for timing differences between the frames and electrical light sources."

The Inertia Unlimited camera system and similar systems from Fletcher Chicago push the limit well beyond 150 frames per second. Based on camera systems originally designed to monitor rocket and missile launches, they can also capture images at up to 6,000 HD frames per second. That level of detail is ideal for sports action that happens in a split second, like a golf club hitting a ball or a tag at second base.

The Vision Research V12 camera used by Inertia Unlimited can operate at up to 6,933 HD frames per second but the realistic limit for frame rates for golf coverage, however, is in the 1,000 to 2,000-frame range.

During the past four years, the Diamondcam has become a standard feature of Los Angeles Dodgers telecasts by FSN Prime Ticket, giving viewers at home a sense of what it is like to, literally, be on the field thanks to its field-level images captured in front of home plate, first base and the pitcher's mound. But last week, the Diamondcam made the leap to high-definition and 16:9 for FSN Prime Ticket, giving viewers at home a truly life-like on-the-field viewing experience. "Now you can actually see the particles of dirt and the faces in the crowd behind home plate," says Tom Feuer, Prime Ticket/FSN West executive producer. "I would rather watch baseball on home in HD than go to the ballpark." ■