TVTechnology
SPECIAL SUPPLEMENT

GUIDE TO

SPORTS PRODUCTION

FUTURE

SPORTS FOR TELEVISION

By Tom Butts, Content Director, TV Technology

It's a cliché that today's sports business wouldn't exist without television. In fact, most of the popular televised sports leagues develop and revise many of their rules because of television. And some sports are made for television—what is tennis but a version of Pong but with humans involved?

But has there ever been a sport that based its very origin on television? There is now. Say what you will about whether or not it's a "sport," eSports—the business of video game competition—is serious business. From social media to dedicated networks providing the latest championship news, eSports is a worldwide fast-growing multi-million dollar business that shows no signs of slowing down.

However, there's perhaps no other sport in the world today that illustrates the digital "get off my lawn" generation gap between Millennials and other sports fans. Sports is for athletes, so where does this generation get off, identifying a couch potato culture as a "sport?" Well, sports is also competition as well, and when it comes to "the thrill of victory and the agony of defeat," video game competitions take it to the next level. When arenas that host world-class gamers sell out in a matter of minutes, it's time to pay attention.

It's a culture that's also full of glamour and glitz, so it's no surprise that Las Vegas is getting in on the act.

Esports revenues will reach $905 million in 2018 and grow to $1.4 billion worldwide by 2020 as brand investment doubles, according to market research firm Newzoo.

In our latest guide to sports production, we profile the new Luxor Esports Arena Las Vegas, a 30,000 square foot multilevel venue that can host every form of competitive gaming. The facility is fairly unique in that it was built for eSports, which means it was built for broadcast and video production. Producing for the events bears all the hallmarks of today's broadcasts, adapting for interactive play or broadcasting to tens of thousands of fans in attendance.

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We can't overlook tradition, however, so in this ebook, we also take a look back at one of the oldest traditions in the U.S., the Kentucky Derby. We also preview the latest technology going into the new MLS D.C. United stadium, which opens this summer, as well as the growing popularity of small and mid-market sized hockey leagues and how the availability of cost-effective and user-friendly production tools are bringing the game to a growing online fanbase.

As always, we value your feedback. Got a comment or suggestion? Contact us at tom.butts@futurenet.com.

INSIDE

Competitors get ready for battle during Ninja Vegas 18 at Esports Arena Las Vegas.

IT'S GAMING OF THE OTHER KIND AT VEGAS' LUXOR

eSports gets the broadcast treatment

By Mark R. Smith

LAS VEGAS—The list of attractions tourists can see in Las Vegas is always in growth mode, and sometimes it seems like the latest might really be the greatest.

Until a month later, anyway.

But consider one of Sin City's new offerings, this time at the Luxor: Esports Arena Las Vegas, a 30,000-square-foot, multi-level venue that can host every form of competitive gaming. Unveiled just before the NAB Show, it can host everything from daily play to high-stakes esports tournaments and features a competition stage, 50-foot LED video wall, telescopic seating, PC and console gaming stations, and a network TV-quality production studio.

It's an impressive setup, but the venue has been open about two months and already doesn't represent the latest step forward in esports' maturation: That would be the new NBA 2K League, in which 17 of the 30 NBA franchises have founded gaming teams. It held its first tournament in early May at Long Island's Brooklyn Studios.

So today, an industry that's been criticized for keeping gamers relatively inactive has them dashing off to compete in places that range from small gaming venues in a community or at a college to a major professional sports arena to watch gaming teams play—often times. the same games they play.

LATEST, GREATEST

As for Esports Arena Las Vegas, "It's the only such forum of its size, and is what others aspire to," said Drew Ohlmeyer, director of content for owner Santa Ana, Calif.-based Allied Esports International (AEI), noting that other esports operators have built similar venues, like Blizzard, in Burbank, Calif. [in the old "Tonight Show" studio] and in Dubai. "Ours is set up to be a [large] studio, with more than two dozen camera bays" and accommodates about 1,500 enthusiasts, depending on the event setup.

It's now the flagship of AEI, which owns eight properties worldwide, including mobile trucks in the U.S. and in Germany. "There's not an inch of this new building that we can't put on camera," Ohlmeyer said, including "the control room, for those observers who want to see the high action of the game."

As for what's in the control room, the switcher is a Grass Valley Karrera and the audio board is a Lawo MC^2 36 for the

front (and the back) of house, which makes for easy work flow.

"The front-of-house drives everything needed for events," Ohlmeyer said, "including our 50-foot horizontal LED video wall and our vertical screens." The equipment roster also features Sony (PXWX 400) and Panasonic (AW-HE130K) cameras; Ross Carbonite Black and xPression for more switching, and graphics, respectively; and a full complement of Shure mics.

The studio can be configured three ways, according to Darryl Wenhardt, president of San Diego-based CBT Systems, the venue's equipment integrator. The first clears the floor for the audience with up to 12 player pods with Panasonic AW-HE2 cameras on the stage, when people are paying to see the match; or the floor can be populated with high-performance PCs during tournaments, when guests pay to play; or it can become a hybrid during elimination tournaments where those who advance are invited to play on stage.

Tyler Ninja Blevins on stage during Ninja Vegas 18 at Esports Arena Las Vegas.

INNER WORKINGS

As for content capture, the Panasonic AW-HE2s can pan, tilt and zoom "without any possibility of distracting moving elements," Wenhardt said, and the model has two outputs: to the player's CPU and, in team games, to the team intercom from a player headset that includes a party line. It also includes a recordable ISO system for each player.

While broadcasting eSports is relatively new, "it isn't much different than covering other sports," he said. "The one thing that is different from an NBA game," he said, "is when we're presenting the in-house arena show, the TV production front-of-house guys are using the same camera and audio resources, so we're creating multiple productions," he said, "though even then, they use the same Evertz routing system and the same audio."

From a director's perspective, much of the setup is done before the event "and that generally includes a high-level view of the player board," Wenhardt said. "The director uses the main display and side [vertical] displays for player identification and stats, like he would at a basketball game. The difference is the dense intercutting and heavy pan/tilt/zoom during game competition, with a camera on each player where we show the action from a player's perspective."

Esports Arena Las Vegas is also "game agnostic," as some game publishers just have one game, like Blizzard has Overwatch. "In our case, we play different games in-house and we're also streaming, so the arena has to be flexible" on the floor and behind the scenes, Ohlmeyer said.

"Our player pods [on the floor] give our broadcast an almost NFL Films-type feel when players converse during action," he said, "and each player has a wired headset, so we can hear their conversations," as the crew recently did during the $100,000 eSport Superstars Paladins tournament by the game's publisher, Hi-Rez Studios.

"One of the things we're proud of here is the broadcast-quality infrastructure, [which allows] game publishers and networks to broadcast an event here in high quality, in a turnkey way," said Ohlmeyer. "They simply sit down and get to work. They may need to add some cameras, but there's no need to roll up a truck."

GOOD BOUNCES

While the Esports Arena Las Vegas studio is new, it may soon have a spinoff or two. "I think we'll see some franchising and similar arenas," said Wenhardt. "It's an exploding industry. The NBA already has its own [eSports] league."

Indeed, early May marked the start of the NBA 2K League, with the broadcast of its Tip-Off Tournament being broadcast on Twitch, the popular online streaming service in the industry, from Long Island's Brooklyn Studios.

Grant Paranjape is director of esports business and team operations with Monumental Sports Entertainment (MSE), which owns the NBA's Washington Wizards, the NHL's Washington Capitals and Capital One Arena, among other entities. MSE is also involved in Axiomatic, a holding company

The Esports Arena Las Vegas crowd reacts during play at Ninja Vegas 18.

that owns controlling interest in Santa Monica, Calif.-based Team Liquid, and directly owns Wizards District Gaming, making the Wizards one of the 17 NBA [of 30] franchises that have boarded the esports bandwagon.

Parnajape said MSE is planning to host eSports events at the Wizards' as-yet-unnamed 3,500-seat practice facility that's opening later this year in Southeast Washington.

"We haven't held any eSports events at [D.C.'s largest indoor venue] Capital One Arena, but that's not due to lack of interest," he said. "The scheduling hasn't worked out."

Parnajape added that there have been events at smaller venues in the D.C. area. The new Southeast arena—home of NBA team Washington Wizards' practice facility—will be "a good size for a weekly or monthly gathering that we think will eventually develop into [a large event] we can hold at Capital One."

Other observers share those expectations. "In the next five years, I would not be surprised to see the Capital One Arena segue into more of an eSports arena, with a jumbo scoreboard, and host different events," said James Bittner, marketing director for the year-old American College eSports League. "With the additions of virtual reality and augmented reality, gaming events could turn into something bigger."

WITH THE FLOW

While the hope in the U.S. is to start filling more 18,000+-seat arenas with fans, massive crowds have already posted huge at various locales, said Frank Ishizaki, general manager and executive producer with Ultimate Media Ventures, in Huntington Beach, Calif.

"Events are routinely held in South Korea that require a football-sized stadium, and that's started to happen [stateside] in recent years," Ishizaki said, adding that they've aired not only on Twitch, but on ESPN and other networks. "The Staples Center [the large indoor sports venue in L.A.] has sold out for these events."

As futuristic as the scene is, Ishizaki said eSports still needs to be thought of in a traditional manner. "In terms of flow, the events unfold in just that way, with traditional high-end cameras. The cuts to computer feeds during games are the only major difference.

> "One of the things we're proud of here is the broadcast-quality infrastructure, [which allows] game publishers and networks to broadcast an event here in high quality, in a turnkey way."
>
> —Drew Ohlmeyer, Allied Esports International

eSports production isn't yet on the level of the four major league sports, Ishizaki said.

"The takeaway here is that, like anything else, budget usually determines the workflow," he said. "Tech-wise, you have a range spanning from the desktop to full-blown televised event. While big-budget events can afford high-end traditional broadcast gear, smaller budgets that [call for] consumer cameras and software-based technical solutions can still create a great production."

Solutions for 3 Challenges when Moving Media Files for Major Sporting Events

By Megan Cater, Signiant

Media coverage for a major sports event requires layers of technology and talent at every stage. Signiant's secure, accelerated file transfer solutions come into play as soon as recording begins and are used throughout the life of media files. Here are a few examples.

1. INTERNATIONAL BROADCASTERS: QUALITY CONTROL AND GLOBAL DISTRIBUTION

Most major sports events have one or more main broadcasters covering a range of responsibilities, from project managing of the entire event and ensuring quality control for facilities at all venues to delivering unbiased footage to billions of viewers around the world. They produce live coverage of every match, race or performance and transmits a feed as a service to rights-holding broadcasters. But the live feed is only a portion of what they handle.

Two of Signiant's accelerated file transfer solutions are critical in preparing for the massive global workflows that surround a major live sports event, both the pre-planned distribution and unknowable number of requests for short and long-form content files.

Signiant Manager+Agents for Automatically Transferring Captured Footage Across Locations

Throughout a major sports event, every match is recorded locally. At the same time, everything is transferred back to a central repository (often halfway around the world) and to the main broadcaster's headquarters. Manager+Agents is used to automatically transfer files quickly and securely between locations, providing lights out, rules-based or automated global content distribution from a centralized control.

Media Shuttle for Specific Content Requests and Temporary Staff

Media Shuttle, in this case, is used for ad hoc requests for content when human intervention is required. For example, if a rights-holding broadcaster puts in a request for a specific match or even a specific moment, a media manager would use a Media Shuttle send portal to send the file directly to that person, wherever they are in the world.

Media Shuttle is especially useful when additional staff and freelancers are brought on, a common practice for all major sports events. With browser-based portals that require no training to use, a SaaS pricing model that ensures budget efficiency, and a cloud architecture that automatically scales to production demand, Media Shuttle fits the needs of high volume, high demand broadcast events that only come around a few times a year, or less.

2. RIGHTS-HOLDING BROADCASTERS: GROWING FILES, REGIONAL DISTRIBUTION AND REMOTE CREWS

Depending on the country or region, there may be one or several broadcasters that own rights to televise and capture footage at an international sports event. Rights-holding broadcasters not only receive the general feed, they also run their own unilateral production coverage.

Large Scale Manager+Agents Deployment into Multiple Countries and Production Locations

International sports broadcasters often have teams geographically separated but working on the same production. They not only need to capture all the footage and get it back to a central hub in their home territory, they then need to distribute it to regional broadcasters (for example, across

all the countries in Europe) based on negotiations they've made for distribution rights. For this purpose, a complex, rules-based Manager+Agents deployment is used, bringing content back from the event location and then out to multiple locations across the region.

When Everything is Live, and Turnaround Time is a Factor

The hours of live footage from a major sports event can reach well into the thousands and draws huge demand. Regional and national broadcasters commonly use Manager+Agents growing file support in order to start transferring files while they are still being written to storage, and get footage turned around as quickly as possible.

Collaborating with Multiple Remote Crews and Freelancers

Media Shuttle can come into play in a slightly different way when multiple remote crews and freelancers need to collaborate. Media Shuttle is very easy to set up as a collaborative repository. Remote crews and freelancers can access a share portal from any location and use auto delivery to quickly and securely get content back to headquarters for archiving. Media Shuttle scales to any file size without the need for compression.

3. ORGANIZING COMMITTEES: ACQUISITION CREWS AND HISTORICAL ARCHIVES

Major global sports events have organizing committees responsible for housing historical archives of media coverage gathered by officially sanctioned acquisition crews.

Flight for Fast Automatic Cloud Uploads, Archiving

Official camera operators shoot content across the entire host city. Where archiving is the concern, both remote acquisition crews and managers at headquarters want the easiest, fastest and most reliable means to get finished content organized and securely into archives. In this case, all three Signiant solutions are used.

Onsite camera operators have a Media Shuttle auto delivery folder on their laptops. Once they've gone through what they've shot and decided what they want to publish, they add all the files to the folder. Then, the next time they're on Wi-Fi, it automatically syncs to a master folder in a Media Shuttle share portal, which is connected to cloud storage (Amazon S3 and/or Microsoft Azure) via Signiant Flight (IT handles the easy setup of storage for portals, either cloud or on-premises, so photographers never have to think about it).

From there, Manager+Agents automatically picks up any new content in the master folder and dumps it into their headquarters, sometimes countries away. Utilizing Signiant and the cloud for distributed ingest improves file transfer efficiency, and avoids gridlock and connectivity costs at headquarters.

Reversing the Workflow for Content Requests from Historical Archives

As you can imagine, official historical archives are huge and valuable. Organizing committees have MAM systems where broadcasters can view and select content online, and order the content clips they require. A reverse of the process used to archive content is used to send these requested clips from official archives.

Essentially, once the order has been placed, Manager+Agents receives an instruction to package up content (file format, transcoding, rewrapping, topping and tailing of the file) and triggers a Flight upload to cloud storage. Then Manager+Agents instructs Media Shuttle to deliver it to the broadcaster.

SIGNIANT'S SIMPLE YET POWERFUL PORTFOLIO IS DESIGNED FOR MAJOR SPORTS MEDIA PRODUCTIONS

From international broadcasters to historical archivists, those that are responsible for bringing the athletes, performances, matches, races and ceremonies from major events need the best technology available. Signiant **Manager+Agents** has long been a cornerstone for large broadcast companies to automate file movement between their locations. With the addition of **Media Shuttle** and **Flight**, SaaS solutions that scale to the needs of short, high volume production demands, Signiant has become the choice architecture for global sports event operations.

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NBC'S KENTUCKY DERBY COVERAGE SHINES DESPITE SOGGY CONDITIONS

Network deploys 'BATCAM' drone to cover the back stretch

By James Careless

CHURCHILL DOWNS, KY.—The 144th running of the Kentucky Derby on May 5 was the wettest Derby in the event's history. By the time the field of three year-old thoroughbreds (including race winner Justify) thundered down the legendary Churchill Downs track, more than 2.8 inches of rain had fallen at nearby Louisville Airport, breaking the previous Louisville May 5th rainfall record of 2.31 inches, which had stood since 1918.

NBC Sports' "BATCAM" is a cable-supported, self-powered moving Panasonic AK-HC1500G HD box camera that goes from 0 to 60 mph in 1.5 seconds, reaching speeds in excess of 100 mph.

For NBC Sports, whose Kentucky Derby coverage capped three days of horse racing on NBC and NBCSN, the working conditions were extremely difficult. The relentless heavy rain turned the Churchill Downs track into muddy, sloppy muck that splashed skywards wherever the horses ran (sheets of mud spray can be seen in the Derby race video) while drenching crews and equipment. Granted, NBC Sports had weatherproofed cameras and operator positions before the race, but the rain still made life tough for personnel to work outside.

"It was a miserable, miserable day, all day," said John Roche, senior technical manager for NEP, which provided the mobile units and related equipment to NBC. "Just to try to keep 52 cameras up in rainy weather that continued all day was a feat in itself."

Despite the damp weather, NBC Sports was able to break new ground with a never-before-seen camera angle on the track's distant back stretch, thanks to "BATCAM." "It was a true innovation at the Derby," said Tim DeKime, vice president of sports operations for NBC Sports.

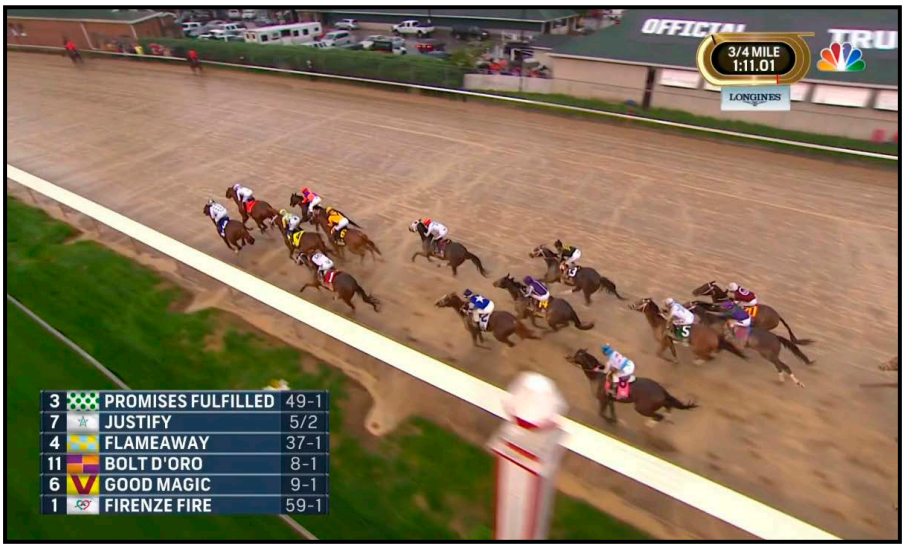
FROM NASCAR TO REAL HORSE POWER

Initially used by NBC Sports to cover high-speed NASCAR races, BATCAM is a cable-supported, self-powered moving Panasonic AK-HC1500G HD box camera that goes from 0 to 60 mph in 1.5 seconds; reaching speeds in excess of 100 mph. BATCAM's combination of quick acceleration, high speed and unobstructed suspended camera angle made it well-suited to cover Churchill Downs' back stretch. (Top horse speeds at the Derby typically hover around the 40 mph mark.)

The decision to use BATCAM came after long discussions between NBC Sports and Churchill Downs managers. "Our producers' desire was to get a different shot of the back stretch that we've not seen before," said DeKime. Eventually, everyone opted for the high-speed BATCAM after considering "various types of

camera systems," because none of the others were fast enough to keep up with the horses while providing consistent, smooth video.

To use BATCAM at the Derby, two 80-foot reticulated arm lift trucks with 10-foot extension trusses were positioned inside the track's second and third turns respectively. Next, a high-tension cable measuring 2,200 feet was suspended between them at a height of 90 feet above ground. BATCAM—with its remotely-controlled AK-HC1500G HD "camera car" unit—was then mounted on the cable.



The BATCAM provided a smooth, extremely clear overhead camera view of the Churchill Downs' back stretch from end to end.

The result was a smooth, extremely clear overhead camera view of the Churchill Downs' back stretch from end to end. (It can be seen in this NBC Sports clip of the race by clicking on the picture above.)

"You could see the race from a spectator's point of view," said Roche. "You were travelling side-by-side with the horses as they ran along the back stretch."

CAMERAS & OTHER CONSIDERATIONS

In addition to BATCAM, NBC Sports had 52 HD cameras positioned around the Churchill Downs course. "We used 27 Sony HDC-2500 cameras—including six handhelds connected wirelessly by BSI RF equipment—eight HDC-4300s and one HDC-4800 4K camera for the finish line," said Keith Kice, NBC Sports' senior technical manager. "We ran the 4800 at four times speed and were able to do the digital zoom on the camera [to take a closer look at the finishers while delivering 1080p video resolution]."

The owners of Justify, the winner of the "Run for the Roses," are awarded the trophy.

For the Kentucky Derby—which averaged 15 million viewers this year—NBC Sports thought it worthwhile to add a 4K camera to the production.

"If our budget has the room, we use 4K where we can," said DeKime. "4K lends itself to the finish line camera, and we'll use it on various other horse races. If the Belmont becomes a Triple Crown contender, I can promise you that we'll have 4K on the finish line as well." *{This issue went to press prior to the race.}* He noted that the Sony HDC-4300s can be upgraded to 4K if required, allowing NBC Sports to scale up 4K resolution if need be.

As for the mobile production trucks NBC Sports used NEP's ND1s A, B, C and D units for the main NBC network show, according to Kice. "Earlier in the day, when we were on NBCSN, we used NEP's SS-15. We also had a mobile unit there from BSI that provided all of our RF audio and video for the show."

Laying out all 52 cameras, and connecting them back to the production trucks (by fiber optic cable or RF), was a major challenge for NBC Sports due to Churchill Downs' sheer size. "It's about a mile around," Kice said. "Getting everything in place, connected, and checked out on schedule made for a very full three days."

Despite all the factors NBC Sports had to deal with, everything went as planned for Derby fans.

"The weather was pretty horrible, and it put a damper on everything; no pun intended," said DeKime. "But for as much rain as we got, during what was probably the wettest Kentucky Derby ever, we had very few problems. One of the cables got fried due to water near the end of the day, but overall it was technically a pretty good day for everybody despite the circumstances."

Tedial's New SMARTLIVE Marries AI to MAMs for Elevated Storytelling and Increased Fan Engagement in Sports Production

With over 18 years' experience, Tedial has earned an impeccable reputation as a MAM visionary and innovator. Tedial provides international broadcasters and global media companies with an intelligently engineered platform that enables users to take full advantage of file-based workflows, cloud computing and other technologies such as IMF and AI with maximum benefits and minimum risk. The Company's proven track record is supported by over 80 high-profile reference sites around the world, including some of the most complex and largest MAM systems in the broadcast and media industry. Solutions are third party and hardware independent, releasing customers from proprietary constraints and enabling them to maximize operational efficiency and increase return on investment.

Tedial continued its pioneering leadership role at NAB 2018 by introducing SMARTLIVE, the world's most comprehensive live event support tool and a major breakthrough in sports production. SMARTLIVE dramatically transforms the way Sports and Live Events are staged, cataloged and content delivered across numerous platforms, including Social Media. Tightly integrated with AI tools, SMARTLIVE can automatically generate an increased number of highlight clips during or after an event and deliver this advanced story-telling to a very targeted audience increasing the potential for significant growth in fan engagement while reducing production costs.

What makes SMARTLIVE unique in the industry?

Before any action happens, SMARTLIVE ingests event data feeds and automatically prepares the broadcast event inside its metadata engine. Simultaneously SMARTLIVE automatically creates the corresponding log sheets, the player grids and a schedule of the event for human assisted logging. All these preparations are linked and organized by collections, so an entire season of sports events can be prepared in advance.

During an event, AI generated metadata, like "speech to text", is ingested and applied to the program feed, and the system is configured to automatically create clips based on actions, keywords or manually logged occurrences. SMARTLIVE automatically pushes content to AI engines; video and audio recognition can be leveraged to generate additional locator data and annotate the media proxies. And the system can automatically publish clips and/or push content to social media platforms.

SMARTLIVE is agnostic to any sports or data providers. Its powerful metadata engine can be easily configured to create an automatic metadata ingest process addressing demanding and complex sport workflows. SMARTLIVE dramatically increases the utility of the MAM GUI interface, bringing MAM much closer to LIVE production than ever before.

SMARTLIVE is 100% compatible with PAM providers such as SAM or EVS, making it the perfect tool to orchestrate all business processes on top of an existing PAM. Thanks to Tedial's award-winning AST storage management system, SMARTLIVE can manage the media life-cycle and all media movements between different locations, or simply manage historical sport archives. Multilevel search functionality allows the program producer to include timely historical archive footage for inclusion in the broadcasts or highlight clips.

SMARTLIVE also provides substantial financial benefits by reducing preparation time and creating more highlights with minimal staff. More content published means more fan engagement and more revenues.

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D.C. UNITED'S NEW AUDI FIELD MAXIMIZES FAN ENGAGEMENT

3,300-square-foot video board highlights MLS's newest soccer stadium

By Mark R. Smith

WASHINGTON—It's been a long time coming for D.C. United—since the Major League Soccer (MLS) franchise's inaugural season in 1996—but the years of negotiating and the recent construction are almost over, and Washington's soccer fans are ready for its debut.

The Saturday, July 14, 2018 match against the Vancouver Whitecaps will mark the opening of $500 million, 20,000-seat Audi Field, in the city's Buzzard Point area, and providing crystal clear video that evening will be the 3,306-square-foot Samsung video board atop the stadium's north end zone. Also enhancing the event will be a long ribbon board that encompasses much of the field and other video accoutrements, plus the broadcast center.

NOT BIGGER BUT BETTER

The debut of Audi Field also marks a step forward in video board technology, said Chris Olinger, director of sports sales with Prismview Electronics, a Samsung company. "The main screen is a true 10mm board. That's really tight and that makes it unique in soccer.

"What's interesting," he added, "is the L.A. Galaxy's LED screen is larger, but it's a 16mm board. So, I believe the Audi Field board offers the tightest resolution in the MLS."

Olinger also cited the stadium's other 10mm board, the 11-foot by 48-footer at the player's field entrance, at its south end; and the ribbon display that wraps around three-quarters of the venue (save the north end zone), which is typical in the

D.C. United

The $500 million, 20,000-seat Audi Field, home to D.C. United, is the newest stadium built for Major League Soccer.

D.C. United

The stadium during construction

MLS. The latter is a 16mm board, per the league requirement.

He sees the improvements in the big boards reaching the MLS as part of the technology's evolution.

"When the NFL's Baltimore Ravens updated to the team's 200-foot by 36-foot end zone boards two years ago to 10mm (which was also Olinger's project), I think the D.C. United's people went to a game and saw it. So, when the team built Audi Field, it wanted that image quality. Ten millimeter is a true HD 1080 image, and going that route also enabled United to incorporate a scorer's bug, so the in-game producers can add advertisements, scores, stats, etc.," to its presentation.

Elsewhere around Audi Field, United went with about 250 Samsung commercial displays, ranging from 49 to 98 inches, at the suites, concession stands and other areas.

34 MILES OF CABLE

Representatives of D.C. United declined to be interviewed about the broadcast setup, the location of the camera bays and the installation of certain equipment at Audi Field, saying those decisions were still to be made at press time.

Instead, a team official referred TV Technology to Samsung and to Washington Professional Systems (WPS), which also contracted on the project.

John Fish, senior project engineer with Wheaton, Md.-based WPS, reeled off several stats about Audi Field. For instance, it houses 34 miles of broadcast cable; and the bowl's sound system features 80,000W of speaker load, powered by 130,000W of amplifier power, and houses four independent amplifier rack rooms.

In addition, the ancillary speaker systems total 16,700W from the console to the speakers, and analog paths run parallel, with primary and secondary digital paths for redundancy. WPS installed the audio system, bowl sound system with Community Professional Loudspeakers that include a QSZ headend distributed system, according to Fish, who added that WPS also provided and installed SMPTE fiber, the NewTek TriCaster in the head end and the Exterity IPTV system.

> "This is an excellent setup for an MLS franchise and I think the fans will be excited."
>
> —Chris Olinger, Prismview Electronics

Fish noted the requirement that the bowl sound system recover and pass audio within 15 seconds when being switched to generator power was a particular challenge.

"To accomplish this, we went 'old school' and avoided amplifiers with built-in networking, which take in excess of 60 seconds to boot back up and pass signal," he said. "All networked digital signal processing [DSP] components, which are fully supported by battery backup, feed analog audio to the amplifiers, which are on generator power."

The ancillary speaker systems, which are muted for emergency announcements, all use networked amplifiers due to the convenience, he said.

Continued on page 16 ❯

NDI® Makes the Grade At Harvard

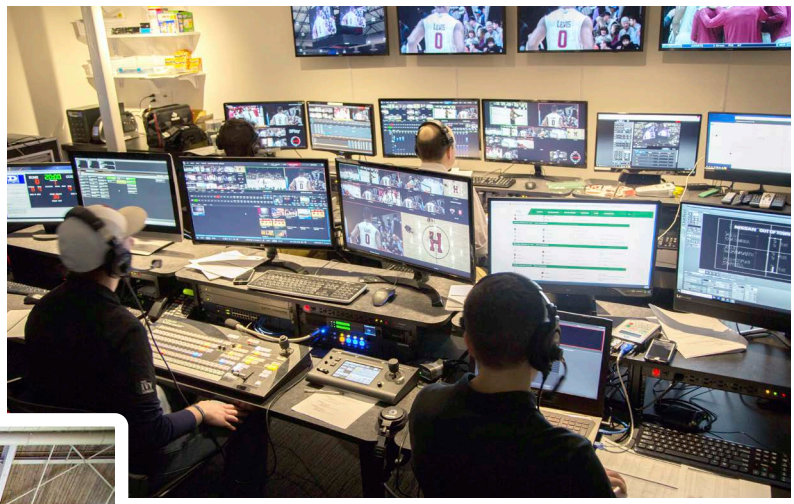
Harvard University has more Division I sports teams than any other school in the country and nearly every one of them is broadcasting all its home games, matches and competitions.

The Multimedia and Production Department at Harvard University Athletics is tasked with coverage of 32 teams throughout the year. That adds up to an annual average of 275 games to produce, often, several at the same time.

An average weekend of sports can include men's and women's track and field, men's swimming and diving, women's basketball, women's hockey, women's tennis, women's squash, men's squash, men's tennis, men's swimming and diving, women's swimming and diving, wrestling, women's hockey, and women's basketball.

The numbers add up to hundreds of hours of live video every year. And Imry Halevi, the Director of Multimedia and Production, is the only full-time professional on staff.

One of the most critical technologies that empower Halevi to succeed in this role is NewTek's NDI® video over IP standard.



Using Harvard's campus-wide Gigabit Ethernet network, Halevi was able to send all his video sources over the existing – and standard – IP infrastructure.

With built-in NDI support for NewTek TriCaster® multi-camera production systems, NewTek 3Play® instant replay systems, and other third party NDI integrations, Halevi and his part-time and volunteer crews can take any video source on the Harvard network and use it in their productions.

"We can now send and receive video feeds over our network, without any special equipment, or any additional thought during setup," Halevi says. "I can't begin to describe how much easier NDI has made our lives."

In the larger productions he's maximizing the feeds his two control rooms can access.

"I don't have to use the SDI inputs on my router or my switcher, which are very limited, and I can bring in all my replay feeds or graphics into the switcher using NDI. I can share cameras between the broadcast and video board switchers using NDI," Halevi says.

He's also using NDI to share inputs between control rooms. This allows him to display hockey action on the video board in the basketball arena during time outs, and vice versa, something far too costly to consider using traditional SDI techniques.

The smaller sports also benefit. With the mid-level productions' tabletop setup, his crew can take in any other team's live footage and feed it to the large video board at the Blodgett Pool during breaks in swimming and diving meets. They've also added cameras to supplement the TriCaster Mini's input connections, using NewTek Connect Spark™ hardware-to-IP converters.

"It's difficult to remember how productions were before NDI," Halevi says. "It's implemented in such an easy way that we don't even think about it. Bringing an NDI feed in, as opposed to bringing in a feed in from a camera that's physically plugged into a switcher, is exactly the same. We don't see a difference."

And quality is a factor he is constantly paying attention to.

"People pay to watch our games," Halevi says. "We make sure they get their money's worth."

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Continued from page 13

For the wireless microphone systems, WPS selected Shure's new Axient Digital Quadversity systems, allowing the crew to shoot four antennae across the field.

In addition, "We're using an isolated fiber-based Q-Sys network for sound system distribution and processing," said Fish "and we're also employing Dante for signal acquisition to the console, from the console to the Q-Sys Primary/Secondary DSP frames, from the console to the video broadcast suite and for general distribution throughout the stadium."


D.C. United

D.C. United's home field from 1996 until this year was the 45,596-seat Robert F. Kennedy Memorial Stadium, owned by the District of Columbia.

A NICE FIT

John Knight, principal with Populous, the Kansas City-based architect for Audi Field, said the firm went through "a lengthy process with the D.C. government and, at one point, its Historic Preservation Office, which said we had the stadium backwards, and that [the group] wanted more of the seating for an open-air bleacher section on the stadium's north end.

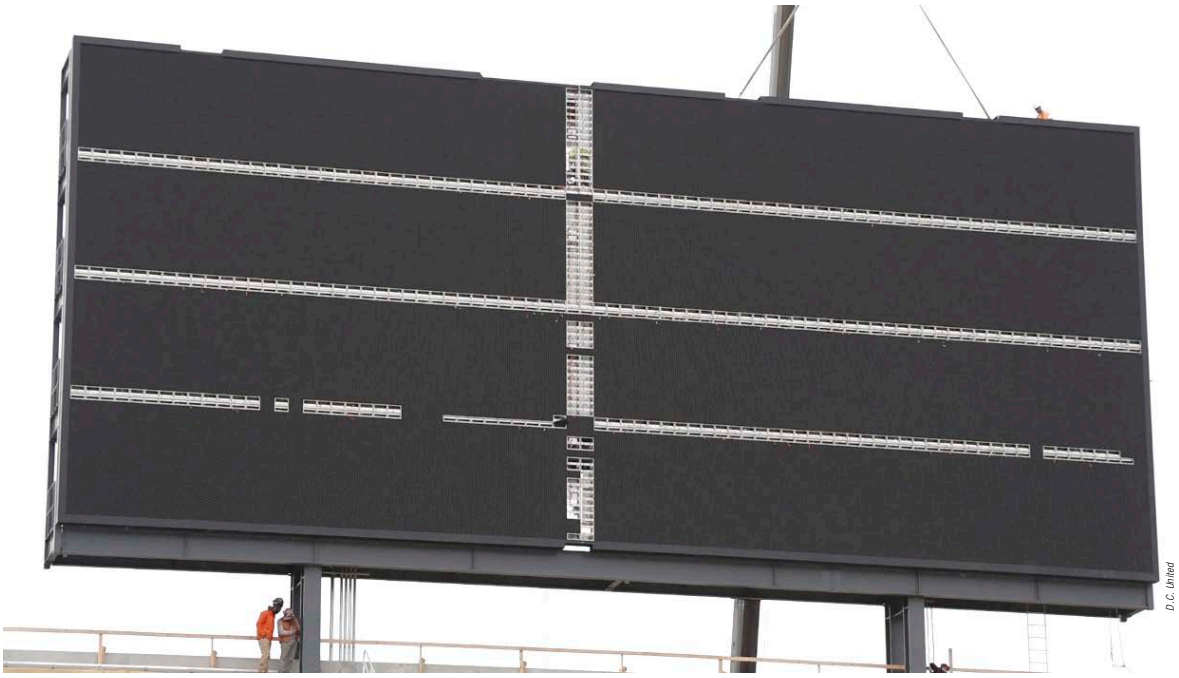
"That's where the offices and the team store were, but we flipped the design and put those fans on the north end. That ended up being a good spot for the scoreboard, too," said Knight. "So, from the south end of the stadium, you can see the most dramatic fans, as well as the U.S. Capitol, which is great for TV shots."

All told, D.C. United is eager to finally be able to show off its new audio and video options, after spending its entire existence in obsolete RFK Stadium.

"This is an excellent setup for an MLS franchise and I think the fans will be excited. In fact, I think United's owners went overboard," said Olinger. "But this project is about fan engagement and they realized that."

And again, it's important to realize that bigger doesn't necessarily mean better.

"When you consider the other aspects of the stadium," he said, "the overall video installation fits in well."

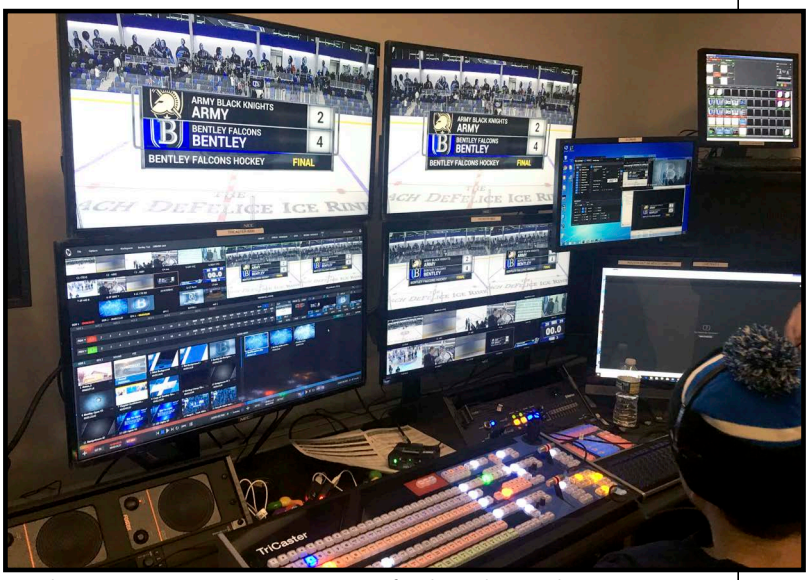

D.C. United

The nearly 3,300-square-foot LED board offers a tight resolution of 10mm. The new video board was installed in late March. Click here to see video.

FROM THE RINK TO A SCREEN NEAR YOU

Beyond the majors, streaming connects lesser-known hockey leagues to its fan base

By Mark R. Smith



Bentley University uses a Tricaster 8000 for the in-house show.

As one of the four major sports leagues in the United States, the National Hockey League ranks fourth in popularity through the eyes of the sporting public. While it's obviously the major deal north of the border, Canada has roughly one-tenth of the population of its neighbor to the south.

Those facts don't usually produce the highest TV ratings.

NBC carries the NHL in the United States while Rogers Communications holds the rights in Canada (along with TVA Sports for French language broadcasts), with sportnets for each franchise. At the lower levels—including the minor leagues, college and juniors—hockey isn't a huge draw like college football or basketball, for instance.

So, how do the millions of enthusiastic fans in North America get their fix? By buying packages from streaming companies as they support the game at its roots, in a way that the economics of a major league broadcast wouldn't allow.

HD UPDATE IN HERSHEY

In the American Hockey League (AHL), the Hershey Bears have played before a rabid fan base since 1938. The franchise has always drawn well at home, since 2002 in the 10,500-seat Giant Center; and via its web stream.

Aaron Henry, who contracts with the Bears through Great Save Productions, said an upgrade at the rink three years ago to HD bolstered the fan experience.

The team worked with Diversified Systems Inc., of Kenilworth, N.J., on the HD upgrades to the four-sided center ice board, as well as cable boxes, including channel insertion from Radiant Communications Corp., based in South Plainfield, N.J.

Diversified installed a Ross Carbonite switcher, "which led to the creation of an auxiliary bus with different channels: one for feeds in Giant Center, the other for streaming," Henry said. At the time of installation, the NeuLion feed was encoded at 720p.

Everything the team bought for the HD upgrade is in use, including five Hitachi cameras that are hardwired with triax cabling, plus one wireless. Camera positions include two spots in Section 120 atop the lower level; one in Section 110, behind the goal; one above Section 117 at the Zamboni tunnel; and one above Section 113, for power play setup.

A sixth handheld camera is stationed next to the Zamboni tunnel, where the referees enter the ice at Section 116; there are also two Marshall lipstick cameras mounted behind the goals, with a third at the Bears' bench.

The Bears took an economical approach to content capture with the ZEPLAY system from Tightrope Media Systems, which Henry called "a hybrid of EVS and the NewTek 3Play," which is Windows-based and has similar functions.

ON THE JOB LEARNING

John Mitchell, owner of Digital Multimedia Solutions in Belmont, Mass., is working in a new facility at Bentley

University in Waltham, Mass., which opened its new 2,000-seat arena earlier this year. The arena features a Nevco video board and a user-friendly broadcast facility, with its game stream provided via Stretch Internet.

"The control room is run by students," said Mitchell, who also works for the NHL's Boston Bruins (and the NBA's Boston Celtics) at TD Garden. "The kids can learn to run replays in 5–10 minutes, which is great, because the challenge in this part of the business is getting the students involved in a learning environment and communicating as a team, with professionals," he said.

The game presentation uses up to 10 cameras, with four Panasonic AW-HE130s and 40S, including two over both goals and two at each blue line; and six Panasonic P-2HD robotics for shoulder or tripod mounts, with Fujinon HA Premier series lenses.

Fiber is built out to five camera locations, with the setup featuring a Blackmagic Designs 72x72 Universal router and two switchers: the NewTek TriCaster TC-1 for the broadcast and Tricaster 8000 for inside the in-house show. The two replay machines are also NewTek designs, the 3Play 4800 and the 3Play 440.

A production crew at Bentley University operates the robotic cameras during the games.

Bentley, a member of the Atlantic Hockey collegiate conference, employs "the higher end of the more affordable equipment," said Mitchell, noting his company has done similar installs at various arenas in the northeast, that don't require more experienced crews to operate.

"We used to need racks and racks of equipment to make this all work," Mitchell said. "The NewTek NDI is the largest router in the world—without having a router.

"This," he added, "is all about the future and IP video."

'THE STANDARD'

In the hockey hotbed of Regina, Sask., Ryan Borowko and his crew bring junior hockey action to the locals in a broadcast facility he said is "great, and we're making it better." The technical producer of the Western Hockey League's (WHL) Regina Pats said setup at the 6,400-seat Brandt Centre is already "the standard of the league for what a video operation should be."

The Pats' 10-camera show includes three hard and one wireless Sony PMW 320 cameras, plus one robocam under the score clock for on-ice shots, another in the arena's northwest corner for wide-angle shots during camera switches, and two in-board cameras in the northwest and southwest bottom corners, straight back from the face-off circles that are about six inches off the ice. There are also overhead cameras above both goals, which are replay-only.

> "The challenge in this part of the business is getting the students involved in a learning environment and communicating as a team, with professionals."
>
> —John Mitchell, Digital Multimedia Solutions

Borowko and company switch the show with a Blackmagic A-10, with the NewTek 3Play 4800 for replays. But what sets this setup apart from other WHL teams is the MotionRocket LaunchPad, an all-in-one clip server and playback source for all graphics and videos, including the scorebar atop the scoreboard, automatically.

"It's one of the most unique and versatile platforms available," he said. "If you can't afford a Chyron, MotionRocket is your only other option, because you can control up to five surfaces from each machine, as well as handle data ingest from any source, be it Daktronics, OES [which is used by most WHL arenas] or Nevco."

STREAMING RIGHT ALONG

While these three arenas feature some of the finer facilities in organized hockey, they are somewhat the exceptions, as teams have varying equipment rosters, according to John Fiore, director of HockeyTV in Waterloo, Ontario, which streams the games from teams in about two dozen leagues.

"Some teams do multicamera shoots with as many as five cameras," Fiore said, "and others just have the one camera at center ice. Some teams offer elaborate broadcasts with pre- and post-game shows, and various bonus content. That all depends on what each team can pay or how many volunteers they have available."

The job of HockeyTV is "to provide the teams with necessary hardware, which is proprietary, for them to be able to stream from their buildings," he said.

"No two venues are the same," Fiore said, "so whatever they are allowed to do and can do varies from team to team, venue to venue."