

# RECENT SPORTS FACILITY PROJECTS

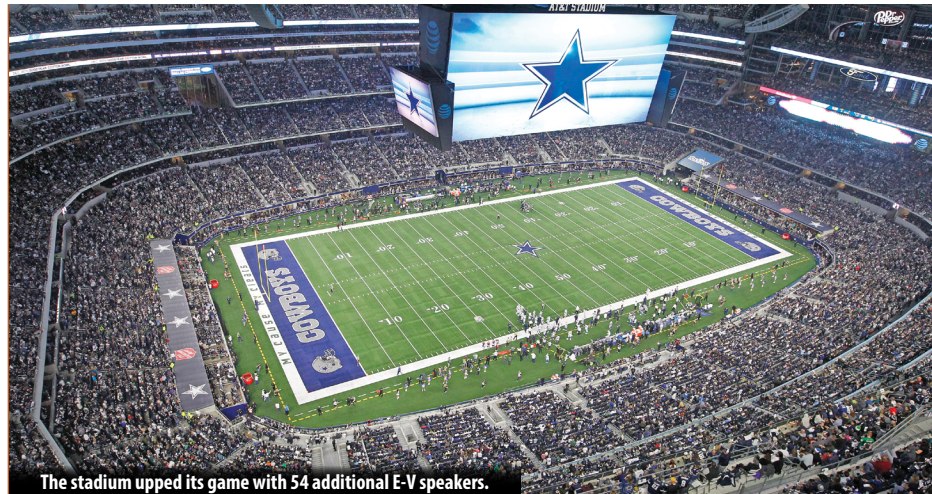
By George Petersen

Audio installations in sports facilities present challenges to integrators and system designers. These often entail working with cavernous open-air spaces in an effort to deliver an acceptable listening experience all fans, whether courtside, in the upper “nose-bleed” seats or beneath a second or third deck.

Meanwhile, multi-use arenas need sound systems versatile enough to support a basketball game one day, a hockey game the next, and then

a major concert event. Another factor to consider is the exuberance of the fans themselves, where the P.A. must be heard above the crowd that can easily peak at 105 dB or more.

With that in mind, we decided to look into several recent sports facility projects — each different, but all with successful outcomes that worked for all concerned — integrators, teams, management, and most of all, the fans.



The stadium upped its game with 54 additional E-V speakers.

## AT&T Stadium, Arlington, TX

When the Dallas Cowboys opened Cowboys Stadium in 2009 (renamed AT&T Stadium in 2013), it boasted the world’s largest Electro-Voice sound system in a permanent installation, including over 240 line-array loudspeakers from the X-Line family.

The design team, spearheaded by Kevin Day of WJHW, selected EV systems for their audio quality, reliability and depth of control provided by the IRIS-Net processing and monitoring platform. After enthusiastic approval from team owner Jerry Jones, Pro Media Audio Video was enlisted to help coordinate the challenging installation.

Fast-forward to 2019. Noting that the many touring concert acts coming through the retractable roof stadium simply do not carry enough P.A. to provide adequate coverage for the upper seating areas, the audio team decided to take advantage of E-V’s scalability to address the challenge.

“We’re always working to improve the fan experience for all events, not just on game days,” says Gary French, audio engineer in charge for the Dallas Cowboys. “Most concert tours augment their traveling systems with our E-V arrays as the delay system for the upper levels. We decided a little extra coverage would be a big upgrade for those events.”

The Cowboys’ audio team worked with system programmer Richard Bratcher, along with original design/installation partners including Kevin Day of WJHW, head engineer Demetrius Palavos and COO Ted Leamy of Pro Media Audio Video, and the Electro-Voice engineering team. Together, they determined that the 14 XLCi127DVX (compact three-way) delay systems covering the upper level could be scaled up to produce smoother coverage with improved intelligibility.

Leamy reports the upgrade went smoothly. “This project is a great example of using real-world experience hand-in-hand with predictive computer models to improve a system,” he says. “By listening to the customer, we find ways to improve a system that already sounds great. We’re extraordinarily pleased at the increased intelligibility we achieved.”

The upgrade includes two added XLC arrays on each side of the stadium, plus the addition of one more loudspeaker element to the 14 existing arrays serving the 400 level, for a total of 54 added boxes. The system is bolstered with 20 additional Electro-Voice TG series amps, each equipped with RCM-26 remote control DSP modules. One additional NetMax N8000 digital matrix controller was also added. The IRIS-Net platform’s proven stability and scalability was a key factor in the expansion.

“Having used this system for every type of event, it’s amazing how flexible it is,” adds French. “We’ve had no real issues with it this whole time, and Electro-Voice is there for us whenever we decide to tweak something. After 10 years, everything still looks and sounds new and I’ve been really happy with it. You can’t ask for more than that.”

**AT&T Stadium**  
Capacity: 80,000 seats; 105,000 standing  
Key Components: E-V XLC line arrays; TG series amps  
Designer: WJHW  
Integrator: Pro Media Audio Video



A scrim above the scoreboard hides three K-1 arrays that provide most of the sonic punch.

## Carter Stadium, TCU, Fort Worth, TX

For fans of Texas Christian University’s (TCU) Horned Frogs football team, last fall’s Big 12 conference football season was bigger and bolder than ever, thanks to the \$118M expansion of the Fort Worth campus’ Amon G. Carter Stadium. The first phase of this multi-year initiative upgraded the nearly 50,000-capacity stadium’s AV facilities, including an L-Acoustics K1/Kara P.A. system designed and installed by local integrator Electro Acoustics (EA).

According to EA account manager Ryan Walker, the project marked the second L-Acoustics system installation on TCU’s campus. In 2015, the company installed a highly effective Kara speaker system paired with SB18i subs at the school’s Garvey-Rosenthal Soccer Stadium.

When the university revealed it would be installing a much larger 5,500-square-foot video display at the top of the north end-zone seating section at “The Carter,” the EA team reached out to L-Acoustics sports facilities application manager Gino Pellicano for product guidance and Soundvision design assistance.

“The new video board — 100-plus feet wide and nearly 50 feet tall — took most of the space, leaving less than 12 vertical feet to hang our loudspeaker arrays above the display,” recalls EA’s Walker. “With such tight space constraints, we needed a fairly compact speaker system that could still throw 500 feet and push 95 to 98 dB at that distance when needed. Gino suggested use the K1, which to my knowledge is the only solution that could check off each of those boxes.”

EA systems designer Steve Burge worked with Pellicano on the football stadium’s new system design, which currently features three centrally positioned K1 arrays — each comprised of six enclosures firing down the field to cover the far southern half of the bowl. To address fans on the closer northern half, 16 smaller Kara enclosures were also flown directly above the video board, divided into arrays tailored to the heights of the nearby seating stands. Dual hangs of five SB28 subs are flown behind the center K1 array for LF impact, with all the arrays visually concealed behind a scrim bearing the home team’s moniker.

On the underside of the display, six short-throw X12 enclosures provide downfill coverage. Furthermore, 12 LA12X and seven LA4X amplified controllers power the entire loudspeaker complement, which is networked via a new Milan-compliant P1 AVB processor.

With the new P.A. ready for the Horned Frogs’ 2019 season opener, Walker says the sonic improvement was immediately apparent. “Everyone notices the improved clarity of the L-Acoustics system,” he says, “yet everyone thinks this system is louder than the old one. It’s certainly capable of being much louder, but now, they’re averaging between 88 and 90 dB for games, which is quieter than they ran their old rig. Plus, one comment I’ve heard over and over is, ‘I can finally understand what the announcers and refs are saying!’”

Pellicano confirmed that the Soundvision model predictions accurately matched the performance of the real-world system, although Walker verified those results with his own ears. “I was very surprised — and impressed — with how consistent the sound is throughout the entire stadium,” he shares. “The transition between the Kara and K1 coverage areas is so smooth that it’s almost imperceptible, even when you’re listening for the changeover.”

**TCU’s Carter Stadium**  
Capacity: 50,000  
Key Components: L-Acoustics K1/Kara  
Designer/Integrator: Electro Acoustics

Omaha’s CHI Health Center now sports a Meyer Sound Leopard system.

## CHI Health Center, Omaha, NE

A new Meyer Sound system based on Leopard line arrays is the keystone of an audio upgrade for Omaha’s CHI Health Center arena, which handles a wide range of athletic, community and corporate events.

Integrated by the sports and entertainment division of Alpha Video, the new system replaces a sturdy but dated Meyer Sound point-source cluster that was there since the arena opened in 2003.

“The durability of those Meyer speakers outlasted most of the rest of the system,” notes Gino Meyer, manager of audio-video technology for the Omaha Metropolitan Entertainment & Convention Authority (MECA), the venue’s manager and operator. “When it was time to upgrade, going with a new Meyer system was a no-brainer.”

CHI Health Center had worked extensively with Alpha Video on their broadcast systems, so Gino Meyer called on company VP Jeff Volk to work on solutions. System design was a collaborative effort involving Alpha Video engineer Fred Street in consultation with Meyer Sound design services.

Alpha Video’s complete overhaul of systems in the arena also included a complete network infrastructure upgrade on 10 GB fiber optic with fully redundant topology, new back-of-house systems and new DSP and control systems. Also new are the two Yamaha consoles, with a QL5 at FOH and a QL1 at scoreboard control.

“Creighton University men’s basketball is our main tenant, so we wanted a system with both high intelligibility plus a solid low-end,” says Meyer. “Most of their incidental music is hip-hop. We really needed a system with punch, and the new Meyer Sound system definitely delivers.”

The system’s 88 Leopard line array loudspeakers are configured in six hangs, with four arrays of 16 each at the corners for near- and far-throw, and two of 12 each for the end arrays with a shorter throw. For low-end impact, 12 900-LFC low-frequency control elements are deployed in four cardioid arrays. System drive and processing is courtesy of five Galaxy 816 network platforms, with three RMServers implementing comprehensive remote system monitoring.



The system produces uniform coverage across the full bandwidth, according to Alpha Video’s Fred Street. “Meyer Sound likes to hit within a couple dB consistently, and we’re doing that here,” he says. “Predicted maximum levels are well over 90 dB, and we’re certainly capable of doing that. We didn’t have time to do formal intelligibility measurements, but it wasn’t necessary. The clarity is amazing — smooth, consistent and beautiful-sounding, top to bottom and all the way around,” notes Street.

“It used to be just speech reinforcement in the P.A., but what we’ve designed gives them a full range of music playback capability, including a lot of low-frequency power,” says Volk. “Now, when the basketball team comes out, they can complement the opening video with a lot of low-end punch to match the visual elements on the screen. Yet it still delivers a high level of speech intelligibility, even when announcements are over the music.”

Joe Willman, director of marketing and broadcast services for Creighton University Athletics, the venue’s principal user, added that “the new Meyer Sound system certainly has delivered. We’ve revised the way we create content for the venue, knowing that we have a lot more room to play with as far as what we’re giving the system. We’ve received compliments on the clarity of our P.A. announcer, and now when the opening video plays and the sound booms, the fans really know it’s game time!”

**Omaha’s CHI Health Center**  
Capacity: 18,300  
Key Components: Meyer Sound Leopard  
Integrator: Alpha Video



The stadium’s retractable roof presents several audio challenges.

## Noevir Stadium, Kobe, Japan

Since 1970, Kobe City Misaki Park Stadium — also known as the Noevir Stadium — has been the center for major sports events, such as the Rugby World Cup. To handle a variety of events, the stadium upgraded with Powersoft X8 and Ottocanali amplifiers.

“The audio systems in a modern venue like Noevir Stadium have to be able to handle spoken word, music playback and even commercials,” explained Powersoft’s Marc Kocks. “When designing or refurbishing an audio system in a stadium, you must ensure it can offer both flexibility and scalability. A good place to start is by selecting DSP- and Dante-enabled products, as they allow users to change the function and behavior of the system with the click of a mouse.”

Project integrator Shigeyoshi Ariga specified 24 Powersoft X8’s to power the line arrays and six Ottocanali 12K4 DSP+D’s on aux speakers that cover any dead space in the upper tiers. An 8K4 DSP+D handles temporary speakers, and a 4K4 DSP+D drives the Hi-Z speaker line and monitor speakers in the operating room.

With a lot of reflective surfaces, the stadium is difficult to control from a tuning point of view. “Within ArmoniaPlus (Powersoft’s proprietary software), the Raised-cosine filter helped with this aspect,” says in-house system engineer Fumiaki Yuasa. The stadium’s retractable roof was another obstacle. “I tried to create the best conditions with the roof open — a complex task, due to resonance points at certain frequencies. Using ArmoniaPlus, I could create grouping functions to turn this complex system into an easy-to-understand



The stadium upgraded with Powersoft X8 and Ottocanali amplifiers.

one, which allows me to carry out my work more efficiently,” notes Yuasa.

“The ArmoniaPlus Interactive Tuning and Limiter functions let me fine-tune the synchronization with SMAART v8, as well as make adjustments while looking at the screen and keeping the system quiet. This unique feature reduces stress to engineers on-site, something that may have been overlooked by other amplifier platforms.”

Ariga added that “it’s not uncommon to have the amplifier room separated from the operating room by quite long distance, and this often makes it difficult to monitor the status of the power amplifiers or the output meter or detect faults remotely. With ArmoniaPlus, we can now centrally monitor all of these functions — a massive advantage for me. And with no dedicated operator in the stadium, the ArmoniaPlus Operator View function only displays the headroom meter and the mute function, so someone unfamiliar with the management of the stadium can still operate it easily.”

Ariga also singled out ArmoniaPlus’ Live Impedance Monitoring feature as a major strength at Noevir Stadium. “The impedance frequency characteristics of the load can be visualized and stored by letting the test signal and pink noise flow, so the state of the speakers after one or two years can be checked remotely. This will be of great use to us for future maintenance.”

**Noevir Stadium**  
Capacity: 30,000  
Key Components: Powersoft X8 and Ottocanali Amplifiers  
Integrator: Shigeyoshi Ariga