

QUESTION: IS THERE A HIGH-QUALITY VIDEO SWITCHER/SCALER WITH KEYING THAT RETAILS FOR UNDER \$1800?
ANSWER: I SEE TV ONE'S C2-1250 IN YOUR FUTURE.



SOLUTIONS

- Installs
- Cheat Sheets
- Your Business
- Hands On
- Market Trends
- Tech Apps

PRODUCTS

- Hot Products
- New Products
- Product Reviews
- Buyers Guide

MARKETS

- Corporate
- House of Worship
- Education
- Government/Legal
- Sports
- Entertainment
- Retail/Restaurants
- Healthcare
- Museums
- Transportation
- Residential
- Rental & Staging
- Security

RESEARCH CENTER

ProAV REPRINTS

Read **Samsung LCD and Plasma Case Studies** for professional applications.

Click to also learn how you can receive a **free laser level** ➔



Where can innovation take you?



Conferences: April 14–19
Exhibits: April 16–19
 Las Vegas Convention Center
 Las Vegas, Nevada USA

2007 February

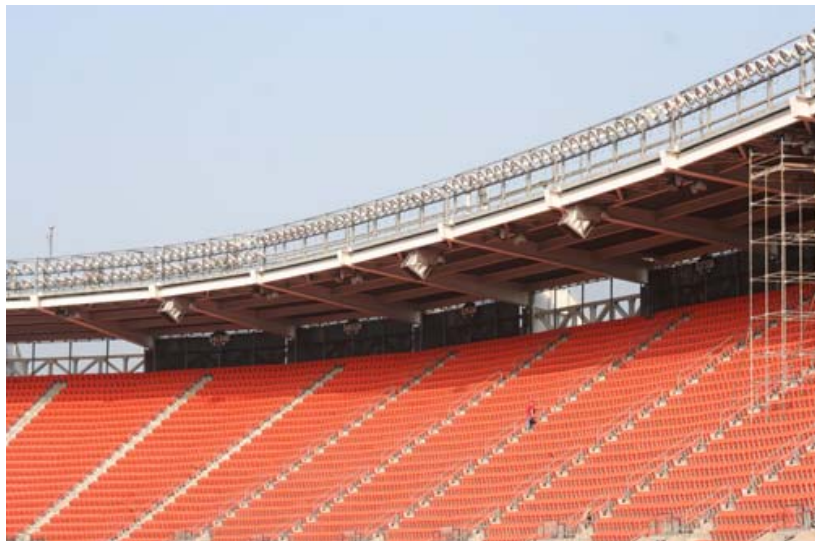
February 2007

Sports Install: Audio Revives Game Day Experience

The Cleveland Browns installs a new audio system to increase intelligibility and sound quality for its players and fans.

Challenge: Create even sound distribution with high intelligibility in a large, harsh-weather environment for fans, while providing players with high-energy pre-game music.

Solution: Use a combination of weather-resistant medium- and short-throw loudspeakers and audio components to increase speech quality, and create custom mobile carts for pre-game sound.



Community R.5 and R.5 HP loudspeakers and Community Wet Series speakers, mounted using custom stainless steel brackets, are placed under the canopy at Cleveland Browns Stadium.

by Paul Kramer

A multi-tiered, 73,000-seat NFL stadium located on the banks of Lake Erie isn't the easiest place to achieve even sound distribution. But adding in a raucous crowd on a Sunday afternoon and the region's harsh winter weather conditions only compounded the sound quality problems in Cleveland Browns stadium.

The Browns' production staff had outgrown its seven-year-old audio system and needed a new solution capable of addressing its intelligibility, sound level, and equipment durability problems. To accomplish this, George Veras, vice president of broadcast and production for the Browns, called on Durrell Sports Audio Management, a division of Nashville, TN-based acoustical consulting firm Durrell LLC, to handle the \$2.2 million project.

Veras needed to upgrade more than 300 loudspeakers and other outdated components throughout the stadium, but also wanted to add new production technology. "Our production level has become increasingly complex," he says. "We're using a lot more sound clips and produced content on the scoreboard, which called for the ability to better hear the mix, sound, and narrations."

Shortly after Christmas 2005, John Horrell, president of Durrell Sports, went to Cleveland to evaluate the system. "We found that they had virtually no low-end sound

AV INTELLIGENCE

5-Minute Interview | Tech Tips | Q&A
Fascinating Facts | Pop Quiz
Industry Calendar

AV MARKETPLACE CLASSIFIED ADS

TECH
Tutorials™
Get free tips & tutorials

Gain industry know-how whenever it fits into your schedule.
An online resource from
NSCA ProAV
NATIONAL SOUND & AUDIO ASSOCIATION

fiber-ed.com

Your fiber knowledge resource center
in the classroom and online.

ProAV@
ONLINE

Begin your AV product search with just one click.....

in their stadium,” he says. “They had blown about 320 of the 12- and 15-inch low-frequency drivers throughout the stadium.”

Rather than replace components, Durrell decided it would be more effective and cost-efficient to entirely remove the old loudspeakers and install new ones. Horrell also specified new amplifiers, microphones, antennas, processing equipment, and specialized intelligibility components. In addition, the team was tasked with developing a solution capable of providing high-energy music for the players during pre-game warm-ups.

Sound system overhaul

Before any of the intelligibility or processing effects could be installed or tested, Horrell and his team, which included Director of Engineering Steve Garrity, needed to replace the stadium’s loudspeakers.

“The stadium is right on Lake Erie, and they have a tremendous salt issue,” Horrell says. “We looked for a speaker cabinet that was one of the better environmental speakers. That ended up being the Community R and Wet Series.” Although Lake Erie is a fresh water lake, Horrell says that because salt is used in the winter to melt ice, the wind blows the saltwater froth directly into the stadium.

To ensure adequate coverage throughout the stadium, Horrell specified 172 Community R.5 and 14 R.5 HP loudspeakers for short throw applications. The R.5 is a 12-inch, horn-loaded plastic cabinet with a 1-inch horn coaxially mounted in front of the 12-inch horn. The HP version includes a 2-inch horn within the same cabinet, and is used for applications with a slightly longer throw. For medium throw applications, Horrell specified 66 Community Wet 315 loudspeakers.

To remove the old loudspeakers and install the new ones, Durrell subcontracted Cleveland-based electrical contractor Doan Pyramid Electric. Doan used Durrell’s custom-made stainless steel brackets to hang the loudspeakers — which are powered by QSC PL 6, QSC PL4, QSC CX-1102, and QSC CX-1202 amplifiers in the control room — in various locations around the stadium.



Durrell Sports Audio Management created custom brackets to secure the more than 300 loudspeakers installed in Cleveland Browns stadium. The brackets were fabricated from stainless steel to help prevent erosion caused by the damp climate and harsh winter winds.

During the installation process, Garrity came across inaccurately labeled cables and unidentified junction boxes. Because the original installation was completed in 1999 when the stadium was being built, much of the cabling was poorly documented. “The only way to get around that is brute force,” he says. “We had to literally follow the cables. Sometimes we had to just follow along the conduit point-to-point, and we found a number of ‘mystery’ junction boxes.”

Ensuring intelligibility

While installing the new loudspeakers improved the sound quality in the stadium, audio coming from multiple sources during a game — including an announcer through a PA system, pre-recorded player interviews, third-party content from advertisers, and music

— ensuring audio clarity remained a challenge.

To address this problem, the Durrell team installed a PreSonus VXP voice processor with parametric EQ. The team also added two Aphex 204 Aural Exciters. “The aural exciters were used to boost intelligibility of pre-recorded sound and music,” Horrell says. “We also use them for the announcer to optimize his voice intelligibility. It’s a very sophisticated parametric EQ device. It allows you to optimize the voice in a specific bandwidth — whether it’s a female or male voice — to highlight its characteristics in the audio.”

Horrell says Durrell also added QSC Audio’s QSCControl.net networked audio system platform, which was chosen because of its DSP functionality. “Now, not only does it monitor the amplifier for thermal levels and impedance loads, it also extends and gives you the ability to delay an amp channel, or put an EQ or crossover network on an amp channel,” he says.

On-field audio

After addressing the stadium audio, Durrell turned its attention to creating a mobile audio solution to help pump up the players during pre-game warm-ups. The solution includes four self-powered Durrell Rolling Thunder Carts, which can be placed on the Browns’ side of the field, facing inward (see sidebar). Due to NFL restrictions, sound can’t be generated on the field during the game, so the carts are controlled separately from the rest of the stadium’s audio system to ensure that they don’t come on during the game.

Each of the four carts includes eight D.A.S Audio 18-inch subwoofers and six mid/high-frequency D.A.S Audio line arrays. With so many speakers in a small area, Garrity says controlling the volume was important. “We have them limited to about 105 dB,” he says. “Initially we were making about 115 dB on the field, which can get painfully loud.”

Horrell and his team also updated many of the outdated on-field microphones for the game referees and other on-field activities. “The referees’ wireless system is specified by the NFL,” Garrity says. “We just updated it to the Telex FMR-1000 and WT-1000 beltacks.”

The team also added a Lectrosonics wireless system to capture sounds from the game for later use in archived footage. Durrell used six Lectrosonics UM250C beltacks, one Lectrosonics Venue receiver, and two Lectrosonics UT400 handheld microphones for use during national anthem and half-time shows.

Looking ahead

As could be expected with any system of this scope, the team’s production staff still encountered a few challenges with the finished product. However, Veras says Durrell immediately resolved these issues. “We knew we’d have some initial complaints in different sections, and a couple of sections were problematic,” he says. “When we had problems, they flew people in during the course of the season. They would address it, track it down, and correct it.”

Horrell adds that the complaints were more knee-jerk reactions to change than technical problems with the system. “When you make a dramatic change, especially when the sound went from almost non-existent to the NFL’s most dynamic, fan complaints are expected,” he says. “Depending on the type and volume of music being played, or if a husband and wife are used to talking to each other a lot during the game, complaints are almost always, ‘it’s just too loud.’ This is where we work with the fans to better understand what the new sound system is designed to accomplish. Then we use this dialogue to report back to the production team to inform them if complaints are about music content or volume.”

Durrell also worked with Veras to create a replacement program that allows the Browns to update individual pieces of equipment without affecting the rest of the system, which should prevent the team from having to replace the entire system in the future.

Mobile Audio System

When plans for a new audio system at the Cleveland Browns stadium were being put together in early 2006, the team’s management wanted to include an on-field audio system that would address the football

staff's desire to play loud, energetic music during pre-game warm-ups.

The Browns approached John Horrell, president of Durrell Sports Audio Management, a division of Nashville, TN-based acoustical consulting firm Durrell LLC, for a solution. To meet the team's needs, Horrell and his team created four customized mobile carts, each including eight D.A.S Audio 18-inch subwoofers and six mid/high-frequency D.A.S Audio self-powered line arrays. Each cart, which weighs around 1,400 pounds when fully loaded, includes a trailer hitch, so staff can pull them into place hours before a game starts. The carts are also built on especially wide tires for turf or grass conditions that may be wet or muddy.



Durrell Sports Audio Management's Rolling Thunder on-field loudspeaker system is used to provide loud, energetic music to pump up players during pre-game warm-ups. The self-powered Rolling Thunder carts include eight D.A.S Audio 18-inch subwoofers and six mid/high-frequency D.A.S Audio self-powered line arrays.

The audio components housed in each cart provide 15,000 W @ 4 ohms, with a 25 amps/220 V total current draw. An electrical outlet provides power to the equipment. Without the audio components, each cart alone weighs 735 pounds, and measures 7 feet, 8 inches high by 8 feet, 3 inches wide by 4 feet, 1 inch deep.

After the Browns started using the carts, they drew the attention of other teams around the league. Durrell has already provided similar carts to the Kansas City Chiefs, and has demos planned for seven other NFL teams during the 2007 off-season. Durrell has also started marketing the carts for concerts and indoor/outdoor sports practice facilities. Additional cart options include an all-weather, padded vinyl covering, a self-powered diesel generator, and a road-rated trailer system.

For More Information

Aphex www.aphex.com
Community www.loudspeakers.net
D.A.S Audio www.dasaudio.com
Durrell Sports www.durrellacoustics.com
Lectrosonics www.lectrosonics.com
PreSonus www.presonus.com
QSC www.qscaudio.com
Telex www.telexcommunications.com

Paul Kramer is associate editor of Pro AV. He can be reached at pkramer@ascendmedia.com.

MARKETPLACE (Sponsored Links)

[Solstice Destination Club](#)

Solstice Destination Club Offers Private Homes And Five Star Treatment At Locations Worldwide.

www.FindALuxuryVacation.com

[The National Hotel in Miami South Beach Florida](#)

Official Site- The National Hotel. The premier choice of South Beach Luxury Hotels. Book online now.

www.NationalHotel.com

[Cayman Islands Weddings](#)

View "Real Weddings" albums, virtual tours and more to help you plan the perfect Cayman wedding

www.caymanislands.ky/romance

[Luxury Panama City Beach Hotels](#)

Family Spring Break - beachfront condos with full kitchen, wash/dryer and balcony along Gulf Coast

<http://www.WaterstoneResort.com/>

[Napa River Inn - A Luxury Historic Hotel](#)

Charming accommodations along Napa River. Ideal romantic destination with rates from \$179 a night.

www.NapaRiverInn.com

[Buy a Link Now>>](#)