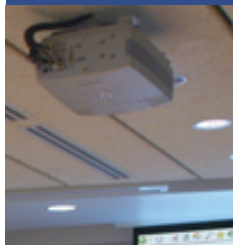


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Sports

January 2004

Sports Install: The Sound Of Speed

Overcoming the roar of 43 stock cars is no easy task at a NASCAR track like Bristol Motor Speedway.

Challenge: Cost-effectively provide hi-fi audio throughout the 30-story grandstands at the Bristol Motor Speedway amidst extremely high ambient noise levels.

Solution: Augment existing speaker systems with new vertical delay rings, custom subs, miles of wiring, and a mobile production trailer as-needed.

by **Dan Daley**

When the announcer signals the start of a NASCAR race with the traditional, "Gentlemen, start your engines," most everything else is drowned out as the 43-car field revs to a deafening 138dB SPL. "You're crazy if you try to compete with that," says Steve Durr, co-principal with partner John Worrell in Nashville-based Durrell Sports Audio Management, a company responsible for many of the AV systems at NASCAR tracks in the Southeast United States.

Tennessee's Bristol Motor Speedway presented the company with a special challenge - one that took a full three years to resolve - in large part because of stock car racing's growing popularity. The oval-shaped 0.533-mile track, dubbed "the world's fastest half mile," is surrounded by an ever-expanding stadium. When the track first opened in 1961, seating capacity was 18,000; in 1992 the grandstands were enlarged to seat 71,000. As of 2003, seating capacity has topped out at 160,000, more than double the capacity of most NFL stadiums.




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Along with that larger sea of people comes the need to entertain them. The venue hosts only two NASCAR races a year, but fans begin arriving in the area nearly a week before race day, and many enter the track at the crack of dawn for a 7 p.m. green flag.

The speedway has added band stages on the turns and the straightaways, as well as three Jumbotron screens. Several media centers send feeds to Fox and ESPN, as well as national radio, all of which are sharing an ever-larger amount of audio.

The grandstand expansions cost an estimated \$50 million in capital improvements, and Durr says the track's management wasn't in the mood to spend commensurately on an expanded sound system. Audio coverage became the major challenge, with the stands now extending 30 stories into the sky - almost 300 feet straight up.

"People come to NASCAR in large part because it's so damned loud," says Durr, who clearly enjoys the spectacle and the deafening roar himself. But once it became entertainment, they knew the sound system had to meet the fans' higher level of expectations. The PA had to be able to project announcements, live music, music video, and support communications between all the media centers. Durr says track officials received bids ranging from \$3 million and \$4 million. Because that was more than they were willing to pay, they asked Durr and his company to get creative.

First, Durr and Worrell evaluated the track's existing Cobraflex speakers, which were mounted to the track fencing and had been in place for several decades. Getting the system to reproduce sound between 30Hz and 10 kHz had to be done without affecting spectator sightlines. Durrell relocated and re-aimed the existing Cobraflex speakers to better focus their directionality. The company also replaced the speakers' drivers with Electro-Voice 1829 drivers, which increased their frequency response. Durrell custom-built 12 new subwoofer cabinets and loaded each with a pair of 15-inch E-V speakers and placed them in the track infield. The grandstands were peppered with new Cobraflex speakers mounted on poles every 25 feet horizontally and extended upward in two rings spaced 80 feet apart vertically, and delayed appropriately.

"We calculated this to maintain the same SPL level that people were getting at track level," Durr explains. "The acoustical signature at Bristol is unique - it's a combination of outdoor acoustics and indoor arena-type mechanics. It's a parabolic dish that can

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have nightmare reflections, so you need a lot of speakers to get even coverage without having to dramatically increase the audio level."

Considering the miles of wiring the system demanded, Durr opted for a 70V constant-voltage system powered by Crown 1610 amps and Edcor custom-wound transformers. Two other considerations had to be addressed in the wiring. First, the wiring would be exposed to the elements, and would go unused and untested for 50 weeks a year. Secondly, a NASCAR race is an RF nightmare, with as many as 450 radios going at once between two frequencies in each car for driver/crew communications, broadcast walkie-talkies, and other wireless communications. "We used the most shielded Gepco wire we could lay our hands on. We also put the connectors in sealed housings to keep moisture out of them," Durr says.

Interestingly, the brains of the Bristol system isn't part of the fixed installation. The signal processing - such as the TC Electronic TC-5000 DSP unit, the Prosonus compressor, the 32-input Crest mixing console, and the BSS Soundweb processor - are housed in a portable trailer, which Durrell Sports owns and leases to NASCAR tracks for specific races. This helped reduce the final cost of the project to about a quarter of the initial bids, Durr estimates.

The trailer also routes the audio to an estimated 475 video points, ranging from the three Sony Jumbotrons to the TV sets used in the media centers and 146 private suites. The 4:3 Sony Jumbotron screens mimic the feed displayed on the broadcast and cable networks during the race.

Prior to a race, the Jumbotrons project coverage of live music events. These productions are mixed in the production truck and audio is fed back to the PA in sync with picture. Finally, the same screens carry pre- and post-race interviews with the drivers. The media centers are fitted with Rane eight-channel mixers that members of the press can use to control their audio feed.

Pre- and post-race entertainment is now a major part of the NASCAR experience at Bristol. This capability is critical to an industry that, according to one report, brought in more money than the NFL, NHL, and MLB combined during one weekend in Atlanta last year. So it's not surprising that a night race at Bristol came in at number 10 in a recent USA Today listing of top 10 sporting events. "When you get 160,000

people in one place like that and you're standing at the finish line looking up 30 stories and seeing how magnificent it all looks, you know it had better sound good," Durr says.

Dan Daley is a veteran freelance journalist and author specializing in media and entertainment technology and business sectors. He can be reached at danwriter@aol.com.

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