

# An Evolution To Sonic Quality

Persistence in the refinement of a high-end club system

By E. Victor Brown

**S**tanding in the shadow of Wrigley Field, the oldest ballpark in the National League and home of the beloved Chicago Cubs, The Cubby Bear Lounge has cast quite a shadow of its own as a live music hotbed.

Hosting local, regional and national acts the past 15-plus years, the club originally opened its doors in the early 1950s as a small-scale watering hole taking advantage of built-in ballgame traffic. It grew and evolved over the years to its present incarnation as a multi-faceted complex, built around a recently renovated live performance space equipped with new house and monitor systems.

The Cubby Bear stage has hosted everyone from B.B. King, Johnny Cash and Chuck Berry to Run DMC, Papa Roach and The Flaming Lips. Also considered a hotspot for emerging local artists, it was recognized by Pollstar magazine in 1991 with an award for "National Nightclub of the Year."

More recently, the club has seen a significant increase in the number of hip hop, reggae and funk acts, with Dr. Dre and Parliament Funkadelic being two recent shows. Recorded music spun by popular DJs furthers the punishment on the house system. Also, extended low-end performance emerged as a top priority.

Crunch-time for the implementation of the new system coincided with "the autumn of the Cubs" - one of those rare occasions of the past century when the team was actually in contention for the World Series. Twice the number of rabid fans was upping sound levels inside the club to something comparable produced in the grandstands across the street.

It turned an otherwise relatively straightforward system project into just the type of real-world stress-fest quite familiar to audio professionals the world over. And the work commenced just a year after a comprehensive rehab of the room, complete with a then-new system. However, concerns with specific elements of that system led to significant revision.

## FORM AND FUNCTION

By club standards, the Cubby Bear offers a relatively expansive stage, measuring about 50 feet by 60 feet. During the renovation, the stage was shifted fully into one of the corners of the approximately 600-capacity performance space. Meanwhile, the mix position was transferred to a two-level, decently sized structure in an adjacent cover - not optimum for hearing the balance of the system, but not obstructed either. The monitor mix position is tucked to one side of the stage.

Aesthetically, the room is attractive, with a deep green color scheme playing well with walls of exposed sandstone brick and large windows. A 12-foot ceiling height reduces the "cave" factor. Unfortunately, what looks good isn't always ideal for acoustics, so without a full crowd in place, the room is a bit live in signature, with several support pillars in the 100-plus-year-old original structure not capable of being eliminated.

## An Evolution To Sonic Quality

On the other hand, the meeting of city building codes during a second-story renovation process meant the inclusion of plenty of load-bearing support, making the loudspeaker flying process much more convenient. No additional structure was needed, in fact.

According to Chris King of Chicago-based GMK, which handled the design and install phases of this latest evolutionary phase of the project, the primary problem with the initial upgraded house sound system centered around the house loudspeakers and power amplifiers. "Any system must meet the standards of riders for national acts appearing at the club, but the best the previous version of the system could attain was 95 dB at front of house, and that's not enough," he explains.

Opening its doors in the early 1980s, GMK initially specialized in security, telecommunications and 70-volt systems, but has since expanded to encompass an A/V installation division led by King, a second-generation family member in the business. While the company works with a number of different loudspeaker manufacturers, a successful track record with Sound Physics Labs/ServoDrive loudspeakers led to their selection for the needs of this project.



One of the house arrays, with stage fill speaker flown behind.



"John Smith" with the MH4 in the newly appointed FOH position.

Early in the system upgrade process, Cubby Bear Senior House Engineer Jon Halverson contacted GMK (among other qualified firms) to suggest possible solutions. Being familiar with the room (and its duly noted challenges), King chose to bring in three Sound Physics Labs SPL-td1 three-way loudspeakers per side, arranged in tight-packed arrays. Each array was positioned on temporary scaffolding located to the very far sides of the stage, taking them about eight feet above the floor.

Each SPL-td1 is loaded with dual 12-inch woofers, as well as a mid section comprised of a quad-pack of 5-inch cones, and a single, horn-loaded 1-inch-exit compression driver. Nominal coverage pattern is 60 degrees by 40 degrees, and each cabinet offers a splay angle of 30 degrees. Impedance for each loudspeaker, individually, is 8 ohms.

"Three SPL-td1's per side supplies 120 degrees of hori-

zontal coverage, and by taking the outside box and aiming its horn so that it just barely cuts the side of the wall, we'd be able to get good pattern control down front while keeping the energy off the adjacent walls," King says.

### THE LOWEST FREQUENCIES

Now, back to that demand for substantial low-frequency energy to meet the reproduction needs of bass-heavy, dance-oriented live and recorded programming. Along with the main loudspeakers, GML supplied four ServoDrive B-DEAP-32 subwoofers, each loaded with two high excursion 12-inch woofers in a unique bass horn configuration. (For more about B-DEAP subwoofers, see the December 2003 issue of Live Sound.)

"We wanted very solid pattern control down to the lowest frequencies, which is one of several ways the B-DEAP-32 really shines," King notes. During the demo period, the subwoofers were arranged in two pairs and placed in "standing" position in front of the stage. All were fed program from an aux channel of the house console.

## An Evolution To Sonic Quality

GMK and SPL/Servo personnel (coming from headquarters in nearby Glenview, Illinois) performed a number of specific prediction calculations for the room and system before launching the demo. However, on-site analysis with SIA SMAART found that the original data supplied with the loudspeakers to be very accurate.

“What we discovered was that the initial performance data on the loudspeakers supplied by SPL reproduces accurately in actual use, so calculating the compression and limiter settings and compensating for the horn length between the subs and the mid/high boxes was simple. The only other adjustment was shading the outside sub boxes in the subsequent final install, in order to even the low end coverage around the room,” King says.

The Cubs rare late-season run meant the Cubby Bear was inundated with a tremendous influx of crowds both before and after games. As a result, GMK and club management negotiated the use of the temporary system during this period, lasting an entire month - up considerably from the originally planned two-day demo process. “During that time, other comparable systems were evaluated here as well, but the rig we brought in proved more capable,” King adds. In



*Some third-octave BSS EQ to drop in, as well as tc electronic and Yamaha effects and dbx compression/limiting.*

short order, the decision was made to permanently install the temporary demo system.

Utilizing the loudspeakers' internally coupling ATM fly ware with track hardware, the arrays are solidly flown from support beams, residing about a foot

below the tile ceiling, with a gentle downward tilt. (Two full-range Electro-Voice DML loudspeakers from an earlier system were retained and are flown one per side behind the new arrays, aimed at the stage to provide fill.)

### EXTENDING THE FLAIR

Custom stands constructed by R & R Cases of Chicago host all four B-DEAP subwoofers under the stage. Specifically, the stands allow the subs to be mounted in a downward firing position, with approximately eight inches of free space between sub and floor. By doing so, the subs use external air from the horn to extend the flair and direct output while also preventing excessive energy build-up under the stage.

“The center pair is mounted so the horn mouths sit in the back of the stand, oriented so they couple when the pressure hits the mouth of the stand,” King elaborates.

All house system power is supplied by Crown amplification. Two Macro-Tech MA-5002VZ's drive the subs, with one channel per B-DEAP providing 2,000 watts into four ohms. Three Macro-Tech MA3600VZ's power the



*Four subs under the stage with special bracketing and space to breath.*

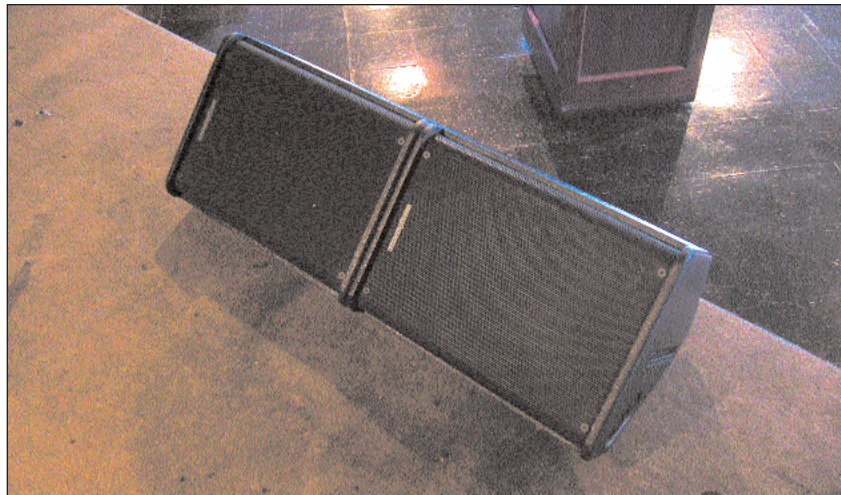
## An Evolution To Sonic Quality

full-range boxes, one channel per loudspeaker, running eight-ohm loads. (Loudspeakers are run in three-way, passive mode, keeping the amp count down.)

Subs are wired with 12-gauge, four-conductor cable, with a single pair to each unit's two 12-inch cone drivers. The amp rack sits beneath the monitor console at the side of the stage, making cable runs insignificant for all cabinets. "Wiring that way lowers the resistance while simultaneously allowing the house staff to check the impedance and monitor the life of each driver from the amp rack, rather than having to go under the stage," King adds.

A Shure P4800 digital signal processor, retained from the earlier system, provides all house system processing parameters - minor compression, limiting and parametric equalization. It's also set to provide delay the output of the main arrays, synching them up with the subwoofer output.

During the initial new system process, two new Soundcraft MH4



*Two of several MacPherson wedges at the ready for deployment.*

mixing consoles - in fact, the first two deployed in the U.S.- were installed for house and monitor mixing duties. Given their recent vintage and excellent performance, there wasn't any reason to replace them.

The two MH4s are twins, each outfitted with 40 mono channels with four stereo channels and dual power supplies. One resides at the front of the FOH mix platform, while the second MH4, for monitors, is outfitted with Soundcraft's touring package option. It's housed in a flight case and set up "stage left." These modular consoles include 16 auxiliary busses, as well as new mic amp and EQ designs, eight VCA and eight mute groups with snapshot automation, true LCR panning and outputs, and an integral 20 by 8 matrix.

### VERY LITTLE DEVIATION

While the loudspeakers are mounted pretty close to the ceiling, the adsorptive nature of the tiles helps cut reflection problems. Arrival issues are smoothed via the delay between the mains and the subs.

With the bottom of the main cabinets just over eight feet from the floor, firing at an approximate 45-degree angle, GMK has found very little deviation in perceived SPL from the front to the back of the room. Intelligibility, aided by the tight directional nature of the loudspeakers, has proven satisfactory.

With most live acts performing at the club typically not exceeding 115 dB, the system has about 10 dB of headroom to spare. Although Chicago is known for strict noise ordinances near residential areas, it hasn't been an issue here, although it should be noted that the primary neighbors are Wrigley Field across the street and surrounding bars and restaurants.

Senior Sound Engineer Halverson, who works by day in the wireless division of Shure, drove system expectations as well as DSP setup in cooperation with GMK and SPL personnel. "We're coming into our slower period of the year booking-wise, which gives me some time to experiment with maximizing the system for the room," he notes.

"A good band really shines on this system, but the speakers are so revealing that the musical chops of lesser bands must rise to the occasion to sound as good as they think they do," King concludes with a smile. ■



*One of the MH4 consoles, this one on stage for monitoring. Plenty of channels of Klark-Teknik third-octaves available as well.*

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