

# Raising Eyebrows at the O'Shaughnessy

Digital sound provides the solution to an anomalous architectural concept

by David Barbour



All theatre buildings pose challenges for sound system designers, but those from the 1970s are, arguably, the toughest. That's the decade in which architectural experimentation yielded all sorts of unusual, complex, or just plain odd concepts. For example, there's the O'Shaughnessy at the College of St. Catherine, in St. Paul, Minnesota. It's a campus theatre and is also used by outside touring shows. Built in the early '70s and redone in 2003, it's a theatre with an eyebrow.

An eyebrow? Here's how John Markiewicz of the Minneapolis-based design and install firm Audio Logic Systems explains it: "The theatre's lower level main floor is smaller than the upper level; the lower level seats 650 and the upper seats 1,200. It's an interesting space to design; when you close the balcony [using the eyebrow, a ceiling device], you create an intimate, 650-seat theatre. It sounds really good." However, he adds, this "creates a lot of problems, because the spaces are so different."

In a way, it was like designing for two theatres, except for the fact that they combine when the eyebrow is open. Markiewicz's solution to equipping the space was both ingenious and up-to-the-minute: it's an all-digital system that can be adapted to the needs of designers who prefer to use an analog console.

When approached about putting a new sound system into the

O'Shaughnessy, Markiewicz says, "The client wanted a portable system on the main floor, because they have visiting acts that want to use their own PA." As a result, on the main floor, he put in two stacks each of two d&b audiotechnik Q7 loudspeakers on top of that company's B2 subwoofers—one stack for each side of the stage. With the included hardware, the Q7s can be mounted in several different configurations, thus providing the portability the client requested.

Upstairs, in the balcony, there are two arrays of four d&b Q1 loudspeakers. Each has its own amplifier channel, except for the top two in each stack, which share an amplifier channel. This configuration is designed to offer the most versatile control over the system for different events. Also, three d&b Qi subs are flown at center and run in a cardioid sub configuration to keep low frequencies from spilling to the main floor.

When asked about the choice of d&b gear, Markiewicz says, "Our company uses d&b quite frequently. When a customer is looking for something in the upper echelon, it's often less expensive than other brands—we use fewer cabinets, because they're so accurate."

Markiewicz adds that, as a matter of course, he makes sure that the client understands and agrees with his gear choices: "We demonstrate our systems—the clients use them before buying. We start by modeling the space using [Renkus-Heinz's] EASE software, and then we take in a demo system to verify what we've modeled. That way, we don't have unhappy clients, because they make the decisions. Again, it's a more expensive way to run things, but everybody's happy."

The trick to the O'Shaughnessy, the engineer says, is, "When the balcony is open and both levels are seated, you have a smaller area that needs less SPL and a larger upper area that needs a lot more SPL. The original system was delayed, but I try to stay away from that—I like to keep the image to the stage. The problem is, if I'm in the lower level, there's a loud PA above that will be heard by the audience as indirect sound."

This problem, he says, is addressed by the d&b Q1 line array, along with the Qi cardioid sub arrangement in the balcony. "One sub is rear-firing and controls dispersion—both vertically and horizontally. By doing that, with the tightly focused Q1 line, and tighter, more focused subwoofers, when you're in the lower level, you don't hear the sound from upstairs. You hear more

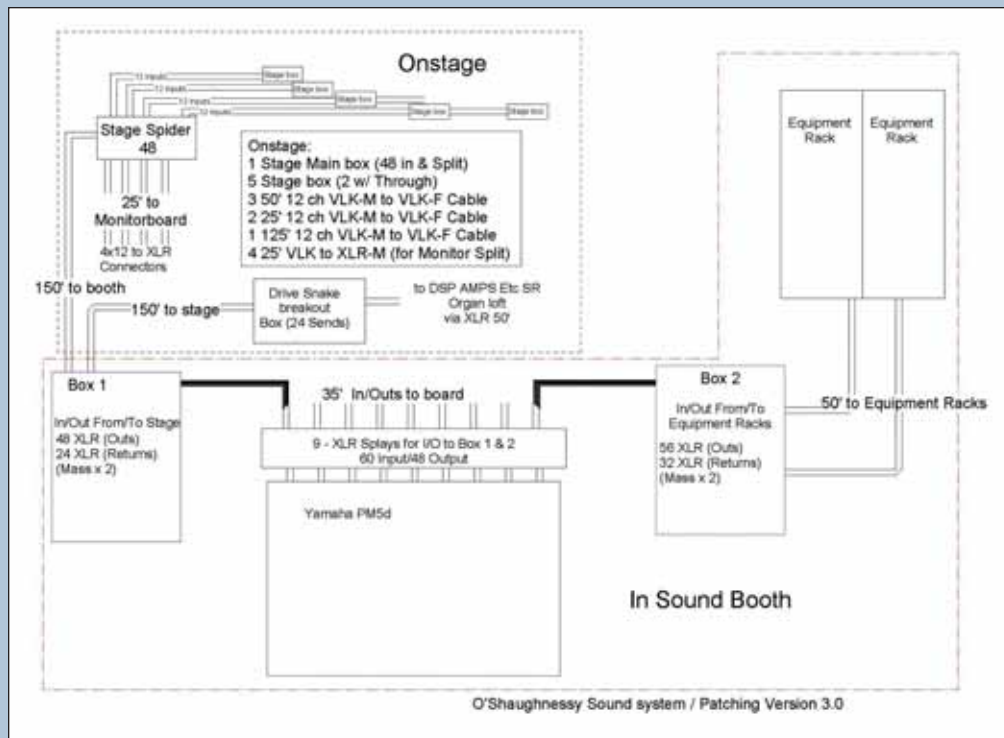
reverberation, but not in the low-beam and off-axis stuff. D&b's off-axis sound is very good, accurate, and flat. With some brands' off-axis, you get mid-range honk, but not with d&b."

Downstairs, he says, "I would have much preferred to fly the speakers—then I could have put the PA where I wanted it. But it needed to be portable to meet the client's specifications. That gave me a very wide image up front in the first couple of rows, so I used four E3 front fills and filled in that area to bring the image back to the center. The Q7s are delayed, using the Precedence Effect, to bring the image back toward the stage."

The rest of the sound system, Markiewicz notes, is completely digital, beginning with the Yamaha PM5D console. To anchor the entire audio setup, a Biamp Systems AudiaFLEX CM processor was installed in the rack room to facilitate systems routing and processing needs. At the front-of-house mixing point, AudiaEXPI analog and Audia DXPI-D expansion modules were installed to collect sound from the console and route it, via CobraNet, to the AudiaFLEX. This facilitates the use of the Yamaha, but also means a visiting musical act touring with an analog board can plug directly into the system, bypassing the PM5D console completely. Also in the rack room, Audia EXPO-D digital module converts the CobraNet signal to AES/EBU to drive the d&b PA system. The EXPO module feeds digital audio directly to the d&b D12 power amplifiers, ensuring that the system signal is digital through the entire routing process.

The setup provides for plenty of flexibility, says Markiewicz. "At the front of house is a computer running DaVinci, the Audio design page. When you open it up, it has different scenes that can be recalled—digital input only, analog input, analog inputs on the floor, a system test page, and a system default recall, to get the system back to the way it's supposed to be. There's also a system EQ—three bands of parametric for the balcony and house, in case someone wants to change it. And there's a systems levels page, so if an engineer comes in and wants more out of the subs or would like to drive them from an aux send, he can go to that page and adjust them. Also on that page, he has control over all the levels—the balcony left; balcony right, top, and bottom; floor left and right; front fills; balcony fills; and stage fills. When the guest engineer leaves, the house engineer can hit the system recall and it goes to the basic setup."

There's another important detail, says Markiewicz. "The B2 subs on the lower level are set to INFRA-mode. That restricts the frequency response of the subwoofer to a very narrow band of 32-68Hz, allowing the subwoofer to become an INFRA sub. The Q7s are full range, which takes us down to about 60-65Hz. The Q7s are warmer this way; it's nice not to have the crossover at



125Hz. By running the B2s in INFRA-mode, it's very non-directional; it fills the balcony and does not affect the audience members that sit close to a ground-stacked subwoofer. This way, they feel it, but don't focus to it, and they don't feel like they're getting hit in the head by the subwoofer. It works well."

The Audia platform can be configured to work with an external control device; in this case, a Xantech touch-screen remote control was installed to provide for easy selection of various preset front-of-house input configurations. These allow the system to be configured, however it is required for any event that comes into the O'Shaughnessy.

Markiewicz adds one small but significant detail about the system: "The signal chain is all digital, except for the stage inputs, which are still analog. We're currently designing a system for a client with the stage inputs run on fiber using the Whirlwind E Snake, so that the signal will remain digital all the way to the output of the amplifiers. This installation is for an existing sanctuary that does not have enough conduit to add the additional 60 channels requested, so running fiber optic cable cuts down the conduit requirements, also."

Clearly, Markiewicz believes digital is the wave of the future: "We're putting in a lot of digital consoles. I pursue it on every install I can. It's a clean, beautiful way to go." The learning curve, he adds, is vanishing. "The Yamaha M7 CL is so easy to use that PowerPoint is more difficult to run. It's so simple, it's mind-boggling. Our philosophy is to demonstrate the equipment; we give people digital consoles to try out before making a purchase, so there aren't any surprises. Usually, it's just a matter of taking time to learn it. I have a ten-year-old son who mixes on digital consoles. He says, 'Dad, what's an analog console?'" Given the success of installs like this, it's a question that's likely to be asked more often in the future. 🎧