Making an Intelligible Decision:
BYU's Marriott Center Upgrades to Electro-Voice® X-Line™

The hottest shootout at Brigham Young University's Marriott Center arena last winter didn't involve the school's Cougars basketball team. The contest was between rival sound reinforcement loudspeaker systems. The clear winner—literally—was Electro-Voice® X-Line™ linear arrays.

"At our first meeting in the Fall of 2001, the Marriott Center people were only thinking about amplifier replacements," says Deward Timothy of Poll Sound in Salt Lake City, which designed and installed the new X-Line system. "In their overall plan, replacing components in the speaker clusters wouldn't happen until 2003."

Timothy had mentioned to the Marriott Center staff that loudspeaker line arrays were achieving great success for both concert tours and fixed installations. His clients were intrigued enough to ask for some demos. So Timothy called some manufacturer contacts, including Monte Wise, Electro-Voice Concert Sound Sales Manager at Telex Communications. Wise packed an X-Line demo system, including Electro-Voice Precision Series™ amplifiers and Klark Teknik processors, and headed for Salt Lake City.

"The system demo was an actual BYU event at Marriott Center," Wise recalls. "We weren't playing CDs. There was live music, acting, dancing—a very dynamic presentation. I had already modeled the space with our AADS Advanced Array Design Software. When I got on site, I shot the distances and angles, entered the data into the computer, and put up the system the way Deward envisioned it." Wise adds that, since X-Line was originally designed for concert tours, he was able to unpack, assemble, and fly the line array hangs with very little assistance.

Timothy says that X-Line wowed his Marriott Center clients. "Electro-Voice was not the only system they listened to, but it was the most pleasing. Great voicing, great intelligibility. That's been a trademark of Electro-Voice ever since the X-Array™ and Ring Mode Decoupling® came out. EV won the shootout based on EV sounding better. Marriott Center gave us a purchase order for a new X-Line system six weeks later."

Designing and installing the actual X-Line system proved a bit more challenging than running the one-event demo. "The demo system was aimed in one direction," Timothy explains. "But the installed X-Line system had to cover the entire 360-degree arena. I used the EV® software to see the lobing of the arrays, and worked out the design from there. It's not difficult; you just have to understand what the arrays do."

Timothy's final design consisted of six X-Line arrays with seven cabinets each: a total of 4 Xvls long-throw cabinets; 1 Xvlt medium throw, wider coverage cabinets used in the lower part of the array; 1 Xfil for downfill under the array, and 1 Xsub subwoofer flown. In addition to the X-Line arrays, Poll Sound replaced the old speaker cluster under the scoreboard with Electro-Voice QRx-153 three-way speakers for fill-in on the arena floor.

"There are basically four factors that determine the design of an X-Line system," Monte Wise says. "First is your budget—can you afford six-cabinet hangs or 14-cabinet hangs? Second is the desired SPL (sound pressure level). Third is coverage; how you cover the entire seating plane of the house so there's an even distribution of energy. And fourth is setting the LF intercept point which determines low-frequency directivity. When it's done right, you hear the amazing benefits of a line array. With traditional systems, you hear a lot of the room. The PA sounds 'way back there.' But when you listen to a properly designed X-Line system, a lot of the room goes away. There's much more direct field energy so that every sound is present—right in front of you—that in-your-face presence with great vocal intelligibility."

Timothy says that you can easily hear the X-Line's coverage and intelligibility advantages in the 22,700-seat Marriott Center. "The longest throw is 168 feet, the shortest throw is 70 feet, and the X-Line arrays hang probably 12 feet in front of the first row. You walk from the front of the arena to the back row and coverage doesn't vary by 3 dB."

He adds that the new system's clarity was dramatically demonstrated during its first public performance. "The LDS Church put on a 'Patriotic Fireside' event around July 4th. It was all spoken word, no music. The Marriott Center people were just blown away by the clarity. They could hear every word, everywhere, and said that the X-Line system gave them *a lot* of gain. Much better than their previous system." Since then, the X-Line system has gotten a workout from music and dance performances, and has some "really demanding" events coming in the fall, including BYU's homecoming and basketball season.

"Marriott Center is even thinking about doing a system preview event; a production just to highlight the capabilities of their new sound system," Timothy says.

Poll Sound is no stranger to Electro-Voice concert-grade sound systems. Poll bought the first EV X-Array speaker system for use in a fixed installation (the first X-Array touring system went to the Rolling Stones), and has been an Electro-Voice dealer since 1940. Poll Sound has installed thousands of sound systems since the company began in 1924 and today. "We are now more of an engineering company specializing in audio design-builds."

"We provide a lot of consulting to consultants for large-scale sound reinforcement. Everybody at Poll Sound knows what they're doing, and some of our people have worked here for 30 years. We combine the most modern sound technology with old-fashioned craftsmanship."

Based on their Marriott Center experience, Timothy sees Poll Sound doing more line array installations in the future. "Most people can't afford a full-size X-Line system, which is why we're really interested in the new Electro-Voice X-Line Compact system (X^{LC}™). We probably have a dozen customers interested in X^{LC}, and our rental guys are looking at it, too. When we want customers to hear what a line array sounds like, we'll use the X-Line at BYU as a demo."

For more information, call 1-800-667-3968, or visit www.electrovoice.com.

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