

# Fog is our passion!

## Haze generator

UNIQUE [HAZER]  
1500 W



- Optimal visualization of light and laser effects
- Minimal heat-up time (only 60 seconds)
- Pump and fan can be adjusted separately in steps of 1%. Therefore any desired effect - from the finest mist to a thick haze, similar to fog - can be achieved
- DMX 512 as standard, plus Analog (0 - 10V) and Stand alone Mode
- Minimal noise
- Control panel with LED display and simple symbols allows for easy operation
- No cleaning necessary
- Special water-based fluid for an optimal haze effect and minimal fluid consumption. One 2L-canister guarantees up to 50 hours of continuous output
- Accessories: analog XLR-remote, Diverter, Hanging set, Flight case

## Fog generators

VIPER NT  
1300 W  
VIPER 2.6  
2600 W



- Fine adjustments of the pump is made in increments of 1%. Thus, any desired effect - from a tiny cloud to the thickest fog - can be produced.
- DMX 512 as standard, plus Analog (0 - 10V) and Stand alone Mode
- Internal digital timer to adjust the fogging time, the wait time and output exactly
- Control panel with LED-display and simple symbols allows for easy operation
- No cleaning necessary
- Water-based fluid for an optimal thick, white fog
- Viper 2.6: Connector for external fan with max. 800 W
- Accessories: analog XLR-remote, Wireless remote, Hanging set, Flight case, Duct adaptor, Fan (Viper 2.6)

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## TECHNICAL FOCUS : SOUND

# Rethinking the Sound

## Selecting the right PA system to achieve the right sound

Everywhere you look at sound reinforcement systems these days, line arrays are all the rage. They have some distinct advantages and disadvantages, depending on the application. One advantage is that they allow a system designer to achieve maximum gain before feedback behind and below the arrays, which is where the stage is. At the same time, the line array extends the pass band of effective directivity; the longer the line array, the greater control you have over the directivity of lower frequencies. This effectively increases the signal-to-noise ratio in the room at those lower frequencies relative to conventional loudspeaker systems.

But in at least one recent case at a well-known concert hall, line arrays did not test as well as the traditional cluster approach. During the system upgrade at the 2,000-seat Jack Singer Concert Hall at Calgary's Epcor Centre for the Performing Arts, the project team found that, when tested carefully, line arrays interacted adversely with the architecture of the room. They reflected so much sound back to the stage from the balcony faces that, at times, those faces appeared to be point sources of sound.

"The problem was that the line arrays gave an intense, coherent reflection from the back of the hall," says Dave Clark, director of engineering at Engineering Harmonics, Inc., consultants on the project. "The original cluster was fairly diffuse, but highly zoned. In contrast, the line arrays produced an intense reflection that was very obvious on the stage.

"Symphony halls are designed to reflect sound back to the stage, using hard reflective surfaces, such as those on the balcony faces," says Clark. "Line arrays tend to blast right into them with their homogeneous pattern, and you can't really change the directivity or mix other boxes in the system design without interfering with the operation of the line array."

Engineering Harmonics' design

engineer Martin Van Dijk elaborated, "With the line array, the wave front either 'fits' or it 'doesn't fit' the environment, whereas, using a number of different boxes, we had the ability to design a more articulated coverage pattern, and were better able to define different areas within the hall."

## Evaluating the situation

Engineering Harmonics worked with the Epcor Centre to develop a master plan for upgrading all of its venues, the first major sound-system renovation since it opened in 1985. Occupying a full city block, the Epcor Centre is a six-level complex measuring over 400,000 sq. ft.—almost 10 acres—that includes four theatres, the Jack Singer Concert Hall, rehearsal halls, theatre workshops, offices, meeting rooms, a café, radio station, salon spa, and gift store. The concert hall was the first of the venues slated for a redesign. In addition to the new sound-reinforcement system, there were renovations to the power, grounding, and distribution systems; relocation of the patching and routing facilities from the somewhat cramped control room to the stage-left rack room; replacement of the front end of the paging and program sound system; and upgrades to the monitor system.

Head sound technician Jack Jamieson describes the sound system evaluation process: "In February 2004, we did a shoot-out of a Renkus-Heinz traditional cabinet system versus a Meyer line array. This shoot-out was moderated by Martin Van Dijk and included a survey of the subjective impressions from various stakeholders in the project-management, clients, and end-users. Engineering Harmonics then compiled the data from the survey, which we used in evaluating which aspects of each system showed the most promise.

"There were distinct negatives with each of them, and this led us to the conclusion that a traditional cabinet design from the Meyer inventory, rather

# System at the Jack Singer Concert Hall

by Alan Hardiman

than their line array, would best suit our needs. In March 2004, with the help of our system installers, Allstar Show Industries, we mocked up a significant portion of the traditional design we'd created in MAPP [Meyer Sound's online acoustical prediction program], to insure that our speculations would prove correct. This was done on a dark day in the hall, so the hang only needed to be physically accurate; it didn't have to look attractive.

"We put in the main left and right arrays (two MSL-4s per side), using chain motors and breasting ropes, and, using our in-house trussing, mocked up the bottom tier of main horizontal coverage for the cluster (three MSL-4s) and one vertical array of side coverage (two UPA-1s)," says Jamieson. "All of this was placed using the data from our virtual work in MAPP, including cabinet splay angles, time delays, trim heights, and cabinet tilt angles. Again, a cross-section of stakeholders was invited in to listen. Actual Smaart data showed remarkable accuracy with respect to the virtual data predicted in MAPP, and the results were every bit as pleasing for the intended coverage as we speculated they would be. Thus, we felt very confident that the MAPP predictions for the other areas would show similar accuracy, and went ahead with specifying the Meyer conventional product for the tender process."

## The new system

The new house system features a retractable center cluster comprised of 13 self-powered Meyer cabinets: six MSL-4s, five UPA-1Ps, and two UPA-2Ps. One PSW-6 subwoofer per side handles extreme low-frequency audio. Two UPM-1P cabinets provide coverage for the "royal box." A second pair of UPM-1Ps is mounted in the rear ceiling of the balcony.

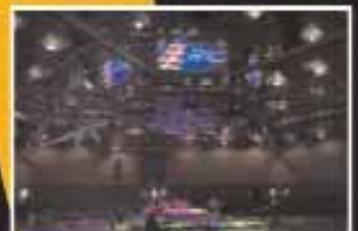
In addition, four MSL-4 cabinets—two per side in a stereo left-right configuration—are mounted on tracks to slide upstage or downstage depending on the configuration of the pit seating. The forestage is split into three thrust sections, any or all of which can be raised as necessary. For example, the center forestage section can be raised to form the runway typically employed in fashion shows. In

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"We've had extremely positive response to the new system, that it sounds every bit as good as you'd expect from a line array. If I had to do it all over again, I wouldn't change a thing."

any configuration, 11 of 22 Meyer MM-4 loudspeakers are present as lip fills, arranged as alternating left-right sources.

"The stereo configuration for the lip fills was suggested by Martin Van Dijk, and it's one of the things that has received the most positive feedback from users of the hall," said Jamieson. Van Dijk noted that this configuration also yields some de-correlation of the sound field, providing a more diffuse, ambient sound. It's a small touch that has made a big impact, and, as might be expected, required additional processing, given the number and placement of movable loudspeakers.

The Lake Technology Contour Pro 26 digital loudspeaker processor was selected for control and processing of the sound-reinforcement system—EQ, filtering, crossovers, limiting, and so on. Five of the units were installed in the Singer Concert Hall, packaged with a SIA SmartLive interface and wireless tablet PC.

Jamieson says that he has had nothing but very good feedback on the sound quality of the Lake Contours, noting, "It was the audio quality of the Lakes that sold us on them before we ever got a sense of how cool the interface is. We put them side by side with our existing

processors, which we're still using with the monitors. It was jaw-dropping how much better the Lakes sounded, because of the 24-bit/96kHz resolution. It just sounds stunning and it's really facile."

Users can be given access to whatever level of control they feel most comfortable with, noted Jamieson. "When kd lang came through, I gave them access right down to the base level of the processors. They're all SIM-trained folks and really knew what they were doing. But on another level, when the Afro-Cuban Allstars came through, I showed the front-of-house operator the system and the reaction was that it was way too complex for the available time in the schedule. What I've done is develop a whole series of groups in the Lake Contours, and one is an all-group, so they just used one 1/3-octave equalizer on the entire sound system. They loved that. So you can give visiting engineers as little or as much control as they'd like. The Lakes do a brilliant job. People are just blown away by them."

In addition to the adjustable, multi-section stage elevators, configurable seating areas, and movable left-right loudspeaker systems, the hall features an acoustic canopy above the stage

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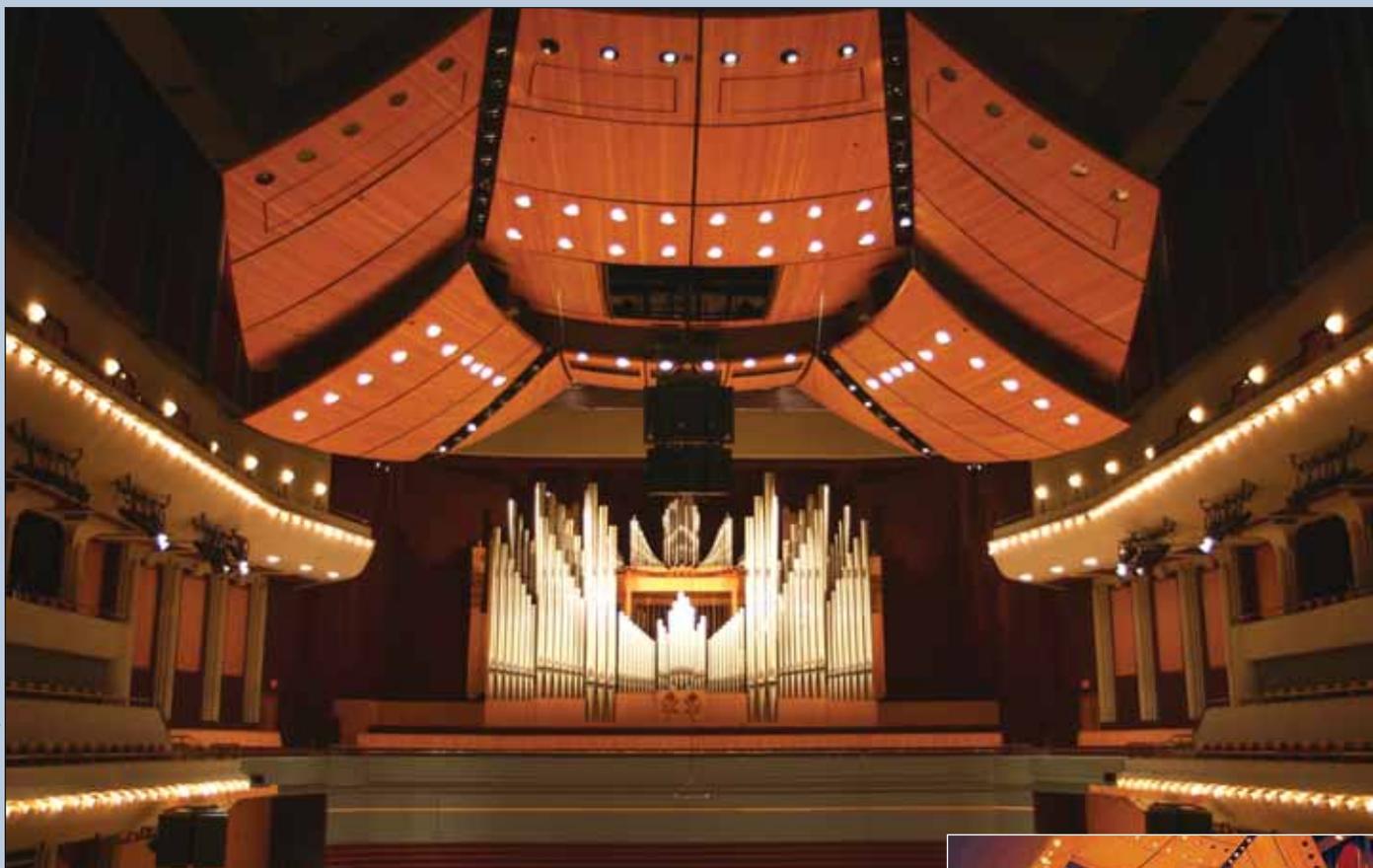
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CIRCLE READER SERVICE 66



that may be raised or lowered. Given this degree of flexibility, the ability to save system settings within Lake Contour has proved invaluable. For example, two presets in the Lake Contour are reserved for the main speaker system in the upstage and the downstage positions respectively.

Clark noted that Lake was extremely responsive to suggestions for improving the interface. "In their subsequent revision, they included everything I had asked for," he says, adding that the product differs from other DSP control systems—such as the BSS Soundweb—in that it has been specifically designed for use in a show environment, rather than as a set-and-forget component of an installed sound system. To round out the system's flexibility, Engineering Harmonics specified a WiFi environment, so that an operator can sit in front of a loudspeaker system, make changes on the wireless tablet PC, hear those changes in real time, and simultaneously see a display of those changes on the SmaartLive interface.

Rounding out the story of the room, Clark adds, "The original sound system

was designed by Dave Collison of Theatre Projects in the UK. It was an amazing system—it became known as the Death Star. It was a point-and-shoot cluster of horns and mid-bass cabinets, and it served the venue extremely well for 20 years. When Jack Jamieson got a hold of it, he replaced all the amplification and the processing, got himself an FFT—Smaart—and over the years he recalibrated that Death Star and rearranged the drivers. I've got to say it was the most amazing thing I've ever heard. For that vintage, he had that old equipment singing. It was singing! It sounded fantastic.

"Now, it didn't satisfy modern-day requirements for sheer output and it didn't satisfy people's rider requirements for brand-name equipment, but Jack did many successful shows with it. When it came time to do this upgrade—designing a system for Jack—he had a lot to say, and it resulted in a system that is extremely well matched to the room," Clark said. "And now it's in the hands of someone who is going to make the most of it. We provided the engineering that essentially implemented a lot of his ideas.

He consulted with us for our ideas, but you've got to give Jack Jamieson a lot of credit for how it all turned out."

For his part, Jamieson reported, "We've had extremely positive response to the new system, that it sounds every bit as good as you'd expect from a line array. If I had to do it all over again, I wouldn't change a thing. The guys at Engineering Harmonics really did this right." 📶

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