

# Cutting the Cable

By: R. Maxwell

## Wireless microphone options for distraction-free performances

Of all the equipment used in today's theatrical performances, the impact made by wireless microphone technology may well be the most influential. The ability to project one's voice and be heard throughout the hall was, for years, one of the most daunting challenges facing actors, directors, and technicians. Nobody wanted to deal with the constraints of being tethered to a cabled microphone; overhead mics weren't a viable solution, either, as onstage movement resulted in inconsistent pickup of the actors' voices. The deployment of wireless microphones—with their ability to achieve sound quality on par with cabled microphones—has had a profound effect on modern theatre. Hence, an understanding of what to look for in a wireless microphone setup is critically important to a prospective customer.

Though it may seem obvious, there remains confusion as to what exactly constitutes a wireless microphone. While a microphone is certainly part of

the equation, there are also the issues of transmitters and receivers. Wardrobe considerations, the number of required channels, RF (radio frequency) congestion, moisture, transmitter size, battery longevity, and other issues further influence one's buying decisions. While for some time it may have been tempting to take the all-in-one approach by purchasing an entire system from a single manufacturer, technological advancements in the past few years have resulted in greater and more compelling choices. By mixing and matching the two major components—the microphones and the wireless technology that supports them—finding a system that is truly in sync with one's production goals is much more likely to be accomplished. What follows is a look at one popular gear combination.

### Miniature microphones

Lavaliere and headset microphones are the most common types for the-

atrical work, and usage is generally gauged by wardrobe considerations and the type of production (music-oriented as opposed to drama).

Headband microphones are generally preferred for musical productions, while lavaliere microphones can be discreetly deployed on costumes.

Various models from Denmark-based DPA Microphones have become popular for theatrical applications, and are frequently chosen for productions ranging from Broadway to the extravaganzas that take place on the ships of Royal Caribbean International.

The most popular DPA lavaliere microphone for theatrical applications is model 4061. Available in black, brown, beige, or white to blend with wardrobe, this low-sensitivity, omnidirectional, miniature microphone uses a 5.4mm vertical diaphragm especially designed for optimum performance under the often difficult conditions that occur when it is mounted directly onto the human body, where moisture such as perspiration can be detrimental to a microphone's capsule. This model features a double vent protection system, with water-resistant materials that make it difficult for moisture to cause microphone failure.

If one's preference is for a headband model, DPA's 4066 and 4088 models merit a close look. Offering excellent isolation for musical work and the choice of three colors (black, beige, or brown) to blend with one's skin tone, the 4066 is an omnidirectional model that can be configured for left or right mounting. Of particular note, this model can withstand SPLs of 144dB, making it particularly suitable for loud vocals, such as in musical theatre or opera. This model is also highly resistant to moisture.

Should you prefer the greater directionality of a cardioid microphone, you might consider the DPA 4088. Using the identical head-mounting system as the 4066 but with a longer boom so as to facilitate proper placement at the corner of one's mouth, the 4088 is a solid choice where background noise and feedback are concerns. The capsule is a pre-polarized first order pres-



Jeremy J. Lee used a DPA/Lectronics combo for *Rich and Famous*.

sure gradient transducer, hidden in a small and lightweight housing with dimensions just slightly larger than the capsule found on the 4066.

Bruce Myers, president of Longmont, Colorado-based DPA Microphones, Inc., DPA's U.S. subsidiary, says, "DPA microphones have become the de-facto miniature microphone of choice for theatrical productions everywhere from Broadway to London's West End. While they pair with virtually every wireless equipment manufacturer's offerings, we most frequently recommend Lectrosonics. Together, the DPA-Lectrosonics combination makes a formidable system that offers superior sound and drop-out free performance that is ideally suited to theatrical use."

Jeremy J. Lee, a New York-based freelance sound designer who specifies sound system designs from regional theatres to both on and off Broadway, echoed Myers' comments. "The American Conservatory Theatre in San Francisco, California hired me to oversee all audio aspects of their January 2009 presentation of John Guare's *Rich and Famous*, which was directed by John Rando," he says. "We wanted the actors to sound fantastic, and with the DPA microphones and Lectrosonics wireless equipment, this was readily accomplished. The Lectrosonics Venue/SMDa, along with the DPA 4061 mics that we used, are the best I've heard in a wireless system. The frequency and dynamic response are phenomenal, and we had zero RF problems, no dropouts, and no 'fizzie' intermod noises. The entire cast sounded warm and completely natural."

### Coping with RF issues

With changes in the FCC's regulatory policies related to the DTV transition and the sell-off of the 700MHz band, there has been a considerable amount of concern over the potentially dense RF environment for wireless microphones in concert, theatrical, and related usage. Karl Winkler, Lectrosonics' director of business development, says, "For those looking



Adriana Mater, at Santa Fe Opera, where wireless mics are sometimes used.

to upgrade their wireless equipment as a means of ensuring it will be fully operative with the frequency changes that have been allotted for this type of wireless application, Lectrosonics' is a solid bet. Presently, no other wireless equipment manufacturer in this class offers frequencies ranging from 470MHz-692MHz without any gaps."

Lectrosonics' proprietary Digital Hybrid Wireless technology has a compandor-free audio path. Compandors—typically used to compress the signal on input and expand it on the other end—are one of the main culprits that have given wireless microphones a bad rap for their "RF mic" sound. By contrast, Digital Hybrid Wireless technology uses a proprietary algorithm to encode 24-bit digital audio information with no compression and low distortion into an analog format that can be transmitted in a robust manner over an analog FM wireless link. The result is much higher dynamic range than wireless systems using a compandor are able to offer, the company says. The technology delivers long operating range, graceful signal decay, and a small spectral footprint, facilitating more channels to be operated simultaneously.

Regarding the subject of multiple



Santa Fe Opera's FOH mixer Elisabeth Ryan and AV manager Dave Dillman.

channels, the company's Venue Wideband (VRMWB) receiver addresses this subject and, thus, makes a suitable choice for musicals and other productions that typically require numerous wireless channels. Designed as a 1RU (single rack-space) system that can accommodate up to six VRS or VRT receiver modules, the Lectrosonics Venue enables one to start small and easily expand the system. Six wireless mic channels in a 1RU space are considerable. As each Venue mainframe incorporates a built-in zero-gain antenna amplifier that facilitates RF signal "loop through" to additional Venue receivers, it becomes easy to configure a 24-channel wireless system in a only three rack spaces with a single pair of antennas.

As for transmitters, compact form factor, battery longevity, and build quali-

ty are key concerns for the theatre crowd. Nobody wants an unsightly bulge in his or her costume; battery life may be even more important, since no audio tech ever wants to explain that the lead character's voice suddenly disappeared because the battery died. As for build quality, Lectrosonics transmitters are rugged enough to be placed in the shoulder pads of NFL football players to give sports fans a live, on-the-field perspective of the action.

The Lectrosonics transmitters that incorporate the aforementioned attributes include the SM Series—most notably the SMa and SMDa (which doubles battery life). Featuring splash-proof, machined aluminum housing, these transmitters can be concealed under skirts, in hats, placed in the small of one's back and numerous other out-of-sight places. Lectrosonics also offers the RM remote control for these transmitters. With the ability to adjust audio input gain, frequency, lock or unlock modes, as well as sleep mode on/off, the RM is the ideal solution to making adjustments without disrupting wardrobe.

Dave Dillman, audio/video manager for Santa Fe Opera, says, "Signal strength is consistently strong, operating duration is very good, and the sound quality is first-rate. Combined with our DPA microphones, the entire system has been terrific."

Dillman is also enamored with the Lectrosonics RM remote control. "With the transmitter buried under several layers of costumes, it can be a monumental task to get at the transmitter should it require adjustment," Dillman said. "With the RM remote, we can make adjustments without having to dig down into the costume. Whether it's waking the system up, changing the input gain, or altering the RF operating frequency, this is a tremendous benefit and was a very strong selling point for us."

If water figures prominently into your production, you should also con-

sider the company's MM400C water resistant miniature transmitter. When *Romeo and Juliet* ran in the summer of 2007 at the Delacorte Theatre in New York's Central Park, Tom Clark, of New York City-based Acme Sound Partners, LLC provided the sound design. The production featured a pool of water on stage.

"With the frequent fighting and death scenes that takes place during the performance," recalled Clark, "several of the principal actors found themselves on their backs or face-down in the water. We needed to ensure the wireless microphones were protected and capable of surviving this situation. That's when we discovered the Lectrosonics MM400C wireless transmitter. Throughout the entire month *Romeo and Juliet* ran, not once did we encounter a single hiccup from any of the Lectrosonics equipment. I was very impressed by the audio and radio quality, the robustness, and cost benefits of the system. These transmitters were literally the only devices available anywhere that enabled the director's vision of this production to be realized."

For theatre organizations, schools, and other groups operating on a particularly tight budget, the Lectrosonics LMa transmitter is worth a look. While slightly larger, the LMa incorporates Lectrosonics' Digital Hybrid Wireless technology and, hence, offers the same high level of sonic performance in a robust, all-metal housing.

Wireless microphone technology has made huge advances in the past several years and theatre professionals stand much to gain by implementing a state-of-the-art system. The combination of DPA microphones with Lectrosonics wireless technology is popular with many theatre professionals. However, many other companies with theatre-oriented product lines, including Sennheiser, Countryman, Shure, and Audio-Technica, offer various wireless components, as well. Now it's your turn: Happy shopping! 📶