

# Olympic overtaking

Presenting an ideal test site, the Sydney Olympic Park has been equipped with the pilot version of Biamp's distributed paging system ahead of full release. **Stephen Bruel** reports



Sydney Olympic Park

## A MAJOR MOMENT IN AUSTRALIA'S

proud sporting history, the 2000 Sydney Olympic Games was a spectacle of a magnitude rarely experienced 'down under'. Held at the purpose-built Sydney Olympic Park, the games' site covers eight square kilometres and had 250,000 visitors per day passing through it at the peak of the event. Biamp Systems (formerly Creative Audio) designed control and processing systems for the PA system, while its sister organisation, The PA People, installed the 500 loudspeakers used to address the moving masses of people as they entered or exited venues. Using what was the latest MediaMatrix paging technology at the time, 10 years on the complex is still at the forefront of Biamp Systems' technology. Most recently, it has become a 'beta' site for the company's Vocia, a distributed paging system that operates without a central routing matrix. This is a world first.

Biamp has a 20-year track record of developing innovative systems and products for the professional audio and communications markets by applying a unique mix of hardware and software design skills. Using this approach, the company has provided paging and stage management solutions for high-profile clients around the world, including the Sydney Opera House, Sydney Stadium Australia, London Heathrow Airport, Atlanta Airport, Washington Smithsonian Museum, Chicago Metra Rail and the Hong Kong Airport Sky Plaza.

Biamp's Brisbane engineering

operations director, Neil Packer, managed the team responsible for creating the equipment behind these installations, as well as the new Vocia system. With a background in professional recording and broadcast television, and as a design engineer for audio mixing equipment, he began Creative Audio as a design and development arm of The PA People in 1985.

'The original system was installed in early 2000, just prior to the Olympics, and was based on Peavey's MediaMatrix with additional software and hardware designed by Creative Audio to create a paging and messaging overlay,' he recalls. 'By 2009, this system had reached the end of its operational life. While still functioning well, it had become difficult to maintain with many of the component parts difficult to source.'

With the PA People on board, the Sydney Olympic Park Authority (SOPA) agreed to allow a beta version of the soon-to-be-released Vocia system to be tested as a replacement for the aging 2000 set-up. As a beta installation, it comprised pre-release pilot run hardware and beta-version software, and was set up in November 2009, with the global public release of Vocia occurring at the Integrated Systems Europe trade show in Amsterdam in February 2010. 'As a beta test site, the installation provided information on how the system performed under real world conditions,' Mr Packer explains.



## The PA People on site

'Although Biamp's strict QA testing regime had subjected the Vocia system to an ongoing battery of laboratory tests for many months, the beta installation was an important means to trial any issues that may arise in a "real world" environment.'

Mr Packer says that testing the system fell largely in the hands of The PA People, who installed and commissioned the system. However, Biamp support teams were involved with staff at The PA People to respond to questions and collect valuable feedback. For PA People managing director Chris Dodds, the chance to be involved in this project using the latest technology, as well as help create a world-first system using a totally distributed paging system without a central routing matrix, was very appealing. 'Sydney Olympic Park is a very large precinct, but was created with a vision to use a network backbone for all services,' he says. 'We captured that vision with our original

system in 2000, and enhanced it with the new Vocia system.'

As Mr Dodds has a 31-year history with the company, which is one of Australia's leading suppliers and integrators of public address and sound reinforcement systems, and having been involved in the original 2000 installation, the project was in good hands.

The company has been involved in many prestigious installations in Australia including many of the Olympic Venues, the Sydney Opera House and the majority of east coast football stadiums over the past 10 years. Another focus of the business is the provision of event communications systems for major international events. The company has recently completed work on its third Olympic games and was also involved in the opening ceremony of World Expo in Shanghai. 'Since the original installation, we have maintained a close working relationship with the SOPA through our ongoing service and maintenance of the original site-wide paging system as well as our extensive hire/production presence at the many venues across the SOPA site,' says Mr Dodds. 'These two factors ensured that The PA People had detailed knowledge of the site's existing system/infrastructure, as well as current operational requirements, to successfully design, install and test the replacement site-wide paging system.'

According to Mr Packer, Sydney Olympic Park was chosen as a beta site because it is a large challenging site, capable of revealing shortcomings in systems of varying sizes. The strong working relationships formed by all parties since the original installation and the ability to install the Vocia quickly made it

viable as well. 'We were trying to prove that a Vocia system could be successfully installed by competent personnel, in a very large site, in minimal time and that this would lead to a successful implementation that could easily be understood and operated by the site owners,' Mr Packer says. 'We were looking for any indications of difficulties or problems involved with system installation, commissioning or operation.'

Paging systems can be broken down into two traditional configurations; the focus being on



## The paging mic set up

either quality audio reproduction, or on life safety aspects including reliability, and speech intelligibility. Historically, this led to a duplication of systems with quality paging and background music being provided by one system, and emergency voice announcements through another. 'Realising the cost of duplication, customers and regulators now seek products capable of meeting all requirements,' says Mr Packer. 'Paging systems must now deliver excellent audio quality while meeting the safety, reliability and functional requirements for life safety. This entails systems meeting international standards and quality assurance requirements for emergency voice messaging.'

At the heart of the Sydney Olympic Park Vocia installation is one networked Message Server



Networked Vocia Amplifier devices

## INSTALLATION

(MS-1), which supports global paging (message playback, event scheduling, VoIP paging interface, logging, remote access, inter-world paging and communications) via TCP/IP. For audio inputs and sources, there are four six-channel Vocia Input (VI-6) expansion devices, five Desk Station 4 (DS-4) desktop networked paging stations offering four user-configurable page codes, and two Desk Station 10 (DS-10) units allowing up to 999 page codes.

For getting messages out through the system via audio outputs, there are 11 Vocia Output (VO-4) units that convert four channels of digital audio input into line-level analogue audio outputs. There are also 21 networked multichannel Vocia Amplifier (VA-8600) devices that provide eight channels of modular amplification with up to 2.4kW of power per chassis with an optional channel-to-channel or device-to-device fail over. Finally, there are 62 AM-600 amplifier module cards, offering software configurable power levels/load options with eight



Light towers at Sydney Olympic Park

amplification modules per frame with 100W to 600W per module (maximum of 2.4kW per chassis) and 70V or 100V with direct drive capability, or low-impedance (4Ω or 8Ω) operation.

This equipment is spread across the site via remote pylon/node rack locations that service adjoining speaker zones, all connected via a 1Gb fibre network. Each location contains a combination of VA-8600s, VO-4s and VI-6s, depending on the requirements of the local speaker zones connected to the node/pylon. Some pylons/nodes also contain a VI6 to enable the input of field background music sources and radio microphones around the site, while other nodes also contain DS4 paging microphones. 'This set-up enables SOPA staff to page to any location,' says Mr Dodds. 'They can route global background music sources, record and schedule messages, monitor the status of the Vocia



VI-6 and VO-4 units in situ

equipment, and provide local audio output zones from within the building, all across and throughout the site.

'Our aim was to design a system that was able to deliver the flexibility and functionality of the original site-wide paging system without the complexity. The modular and distributed nature of the Vocia allowed us to design a system that had increased system reliability and where the selection of equipment was primarily based on such a widely distributed system with pre-existing fibre network infrastructure, speaker cabling and speaker loads.'

When developing Vocia, one challenge facing Mr Packer and his team was for it to meet diverse and sometimes competing international compliance issues. Until recently many different standards existed throughout the world, some addressing equipment with others concerned with installations, making all round compliance very difficult. 'A new equipment standard EN54 [particularly Part 16] will shortly be enacted across EU countries while many other countries will adopt a similar international standard [ISO7240], which is based upon EN54,' says Mr Packer. 'In developing Vocia, Biamp sought not only to meet the highest audio standards, but also to deliver EN54-16 compliant equipment, a challenge made more difficult because this standard is new and ambiguities are still being resolved.'

In attempting to deliver a safe and reliable solution, Biamp's answer was to fully distribute all system functionality to networked appliances, thereby removing the possibility that failure of any one or a group of key central items would bring down the whole system. Biamp was therefore faced with the challenge of designing nodes with powerful processing and communication protocols that carry adequate systems information to manage the complex interactions that exist across paging systems. 'Placing system intelligence in a central location appears to make good sense and it certainly eases system design,' says Mr Packer. 'This is the traditional approach in paging systems, however it



Equipment rack serving one of the speaker zones

has a major shortcoming: if the central equipment fails, the whole system goes down. By pushing the intelligence to the system periphery, the possibility of catastrophic system failure is greatly reduced. However, this architecture requires each network node – such as an amplifier or paging microphone – to have adequate processing power and an intelligent understanding of the whole system. Vocia meets this requirement.'

Biamp also set out to create a simple, intuitive configuration user interface and a superior feature set to distinguish them from market competitors. 'Most Vocia devices connect via a single Ethernet cable – audio, control and power-over-

Ethernet,' says Mr Packer. 'Ease of equipment replacement was a development priority; most Vocia devices can be replaced in the field without need of re-configuration.'

Overall, Mr Packer was pleased with the final results, having successfully achieved a totally networked paging system – a world first. Biamp is an industry leader in networked media systems and according to Mr Packer, intends to grow this position into the future through innovative products like Vocia. 'It uses standard network infrastructure, delivers high-quality audio, has pleasing, ergonomic paging stations, an unsurpassed range of systems features, an intuitive software interface for configuration, it is designed for EN-54 compliance (certification due later in 2010), is released and is being delivered today,' says Mr Packer.

'Overall we found that the entire process from installation to final testing and commissioning went very smoothly,' adds Mr Dodds. 'The Vocia system was very easy to configure, and the system provided more than enough DSP processing to achieve the desired electro-acoustic outcomes. The distributed nature of the Vocia system also made testing and commissioning very easy on such a large site. Most importantly, however, was that the client was very pleased with the simplicity and flexibility of the site wide paging system.'

These days, Sydney Olympic Park is home to a diverse range of events including football (all major codes in Australia), swimming titles, the iconic Sydney Royal Easter Show and a variety of expos and conferences and charity events. Although it may not be attracting quite the same size audience as it did during the Olympic Games, there is still considerable interest in the geographical heartland of Sydney, and it's good to know they have a PA system to serve them well for current and future events.

[www.papeople.com.au](http://www.papeople.com.au)  
[www.biamp.com](http://www.biamp.com)



Crowds flock to the Olympic Park

# 1/5 vert