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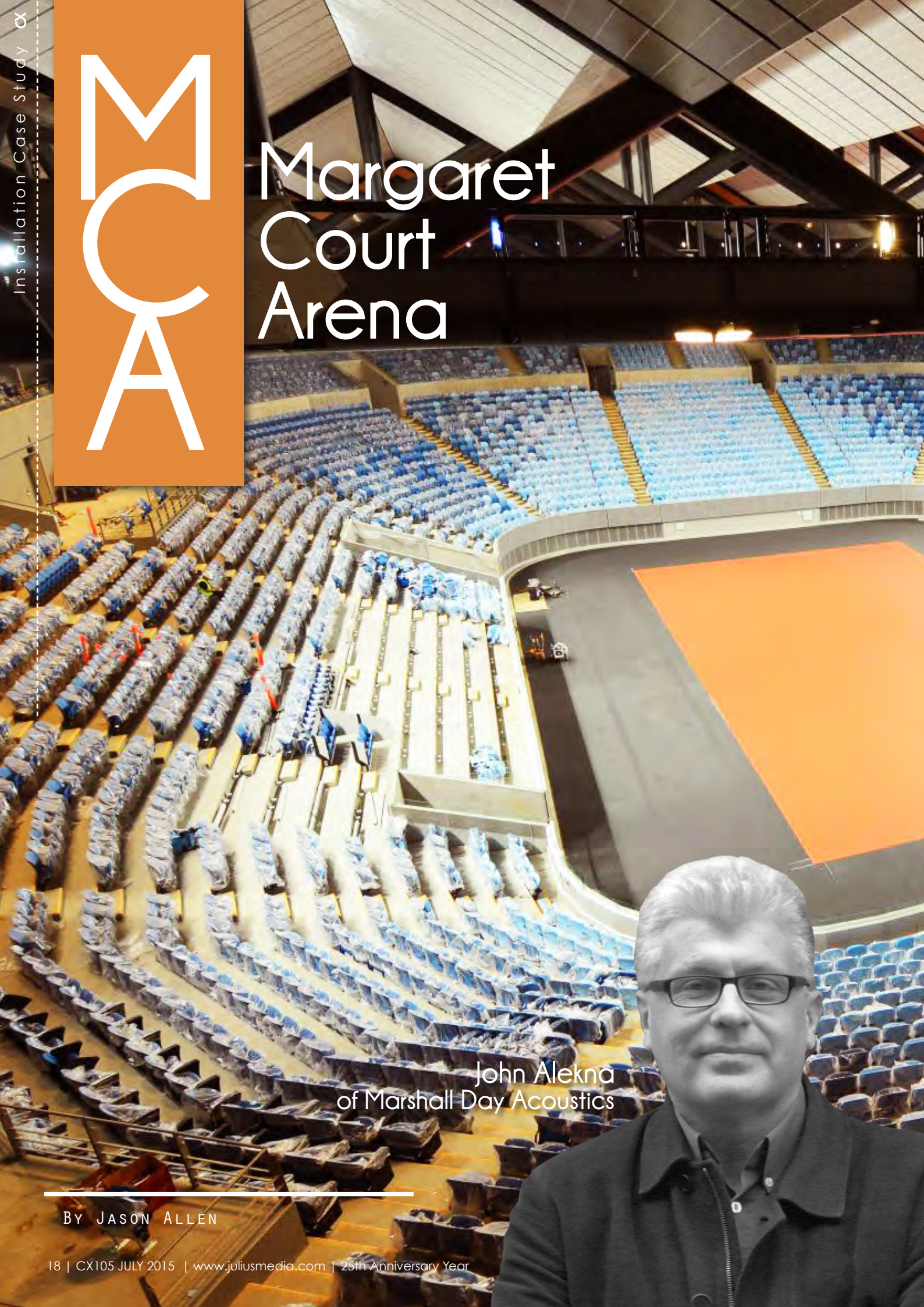
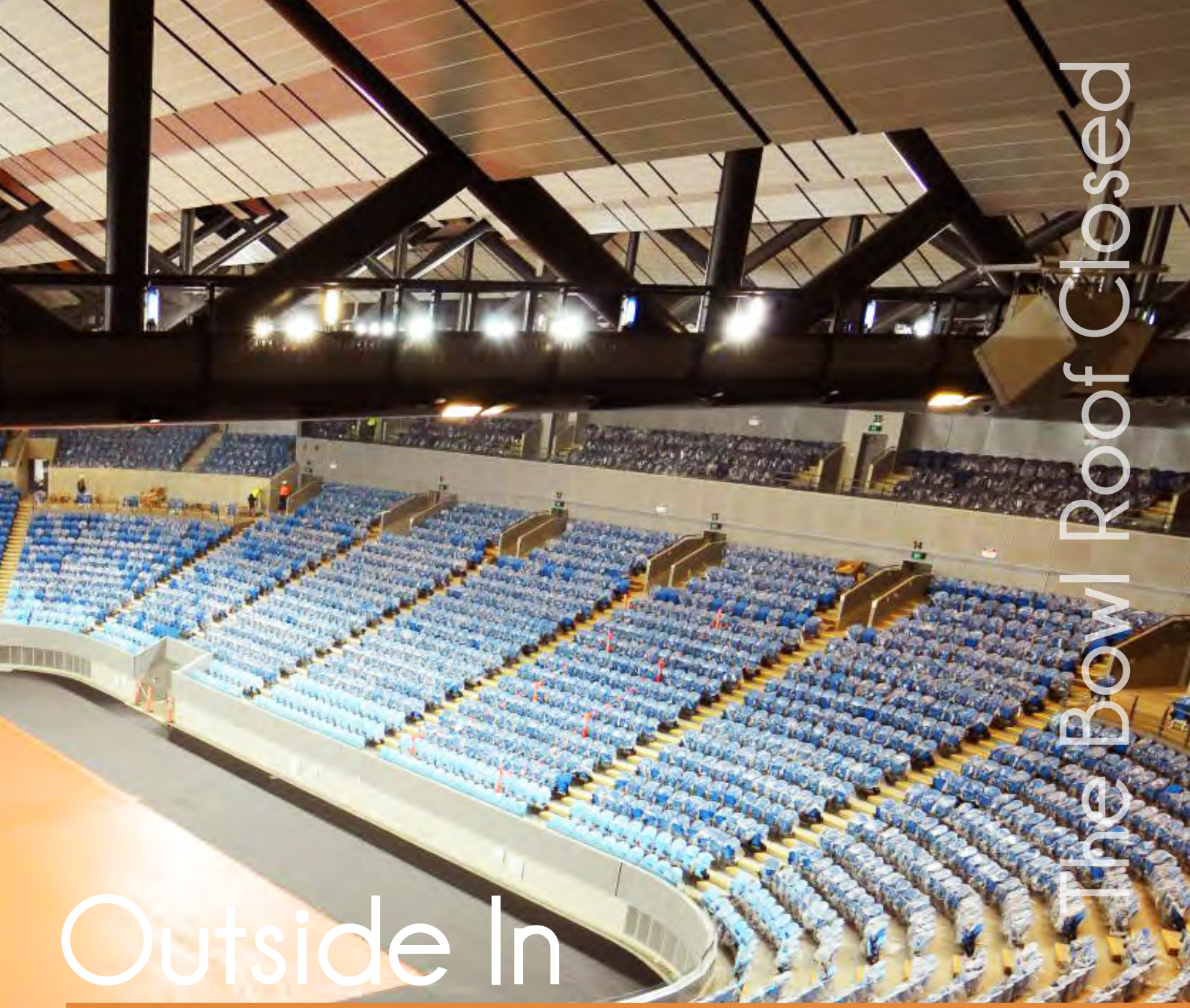
Margaret Court Arena



John Alekna
of Marshall Day Acoustics

By Jason Allen



The Bowl Roof Closed

Outside In

Margaret Court Arena, in Melbourne Park, started life in 1988 as an open air tennis court known as Show Court One. Thanks to the $700 million Melbourne Park Masterplan, the outdoor court was brought inside with a retractable roof, just in time for the 2015 Australian Open, and renamed after the legendary Margaret Court, winner of more Grand Slam titles than any other tennis player in history. It now boasts a capacity of 7,500, and hosts not only tennis, basketball and netball, but a huge range of concerts by international and local touring acts.

Graham Alderman of Australian Sound

MCA

"Everything had to be fitted up high." – John Alekna

Team Sport

A team involving NH Architecture, specialist stadia architects Populous and services consultant Aurecon got to work. The Melbourne-based office of Marshall Day Acoustics was contracted by Aurecon to work on the new sound system, which would need to accommodate a much broader range of duties to service Margaret Court's new capabilities. John Alekna, Associate at Marshall Day Acoustics, got down to the business of designing the new systems.

"Marshal Day Acoustics was engaged to provide room acoustic design, noise control to external areas and building services," said John. "Everything was being refurbished. There were new foyers, and lots of new infrastructure. Working with Aurecon, my role was sound system design; we were designing for public address. Their biggest event is the Australian Open, so it had to be clear and loud. It's a reverberant space; we measured a time of 1.5 seconds when it was empty, so it required a loudspeaker system with good pattern control. We chose the Electro-Voice EVH system, which exhibits good control down to 500Hz due to its horn-loaded design."

"We were limited by load on the gantry because of the retractable roof and a counterweighted Spidercam system."
– John Alekna

In The Zone

With as many solutions to stadia sound as there are stadia, we asked John Alekna why the Electro-Voice EVH Series were the way to go at Margaret Court. "The EVH Series were chosen because they deliver controlled coverage in each seating zone. A line array wouldn't have had the right pattern or be as cost effective, the directivity of front loaded boxes wouldn't have delivered adequate intelligibility and the retractable roof precluded a centre cluster. We wanted a punchy sound to get over the crowd noise, and the EVH's horn loading means they're good at providing direct sound in reverberant spaces. The EVH range has a large range of coverage angles, so there are different loudspeakers that suit different areas."

Far from a straightforward installation, integration of the PA into the building's emergency systems and the physical limitations of the roof meant there were some tricky problems to solve. "There was a requirement to cover the court, mainly for evacuation, as it tied into the EWIS," John continued. "We had put end-of-line monitoring on the bowl system to meet the statutory

"We had six 90 foot cherry pickers"
– Graham Alderman

requirements. We also had restrictions regarding aesthetics. We were forbidden to hang loudspeakers under the gantry - everything had to be fitted up high. We were also limited by load on the gantry because of the retractable roof and a counterweighted Spidercam system."

EV Let Your Hair Hang Down

The design evolved to include 38 units of Electro-Voice EVH Series across four models, including six EVF-2151D subwoofers, distributed around the bowl. 12 Electro-Voice CPS 4.10 four channel power amplifiers run the system, with 12 Electro-Voice RCM-810 IRIS-Net remote control modules providing control and monitoring across the site-wide network. Bosch Communications Systems provided EASE modelling, the design went to tender, and Melbourne integrator Australian Sound won the contract to supply, install and commission.

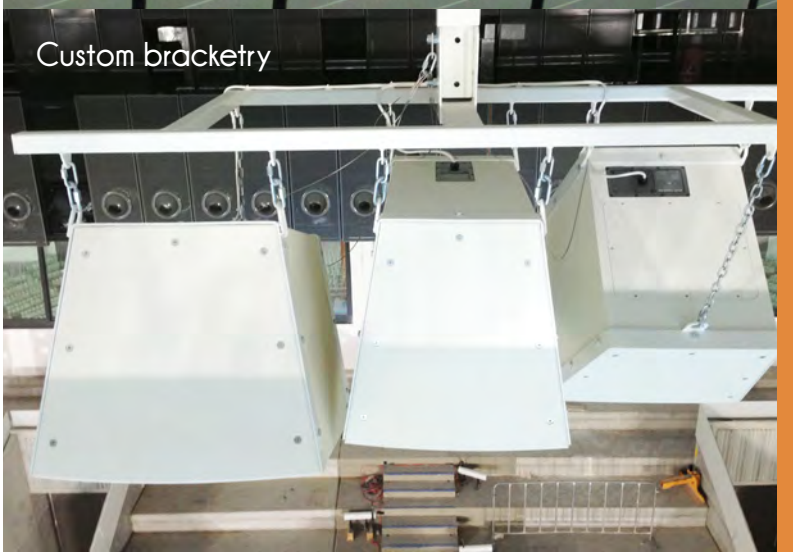
"The bowl PA system is part of the evacuation and paging system that runs through the whole complex," explained Graham Alderman, Director at Australian Sound Systems. "A BiAmp Vocia paging and evacuation system runs everywhere from ground level to level three. With EWIS, Australian Standard 1670 stops at the main fire panel, which is installed by the fire company. We interface from the fire panel to the Vocia. Because the system runs on a fibre network, the fibre cable had to be fire-rated. All the cables coming out of the main rack are fire-rated to the first speaker in a zone. All the drive equipment is kept in two-hour fire rated compartments. All cable coming in is fire-rated. It's a hybrid; a conventional system in the bowl, but the feed to it from Vocia is a fire-rated network, with fire-rated cable, from a fire-rated room."

All Systems Go

Vocia's signal network backbone is run on the tried-and-true CobraNet platform, but that didn't stop a little bit of CobraNet's modern replacement, Dante, from sneaking into the building. "We supplied a digital mixing desk, a Yamaha QL5, for the control room," Graham added. "Sporting clients like basketball use it to mix their events, while concerts bring their own production. The QL5 is currently patched into the bowl PA system via analogue cabling, but it has a Dante interface built-in. We've installed a complete structured cable network in the bowl for productions coming in with Dante gear."

Sennheiser radio microphones, Denon CD players, Crestron control and hearing augmentation from Listen round out the system. And what was the hardest element of the install? "Because the bowl loudspeaker design was very precise in the units used and their coverage angles, we had to have customised brackets fabricated to hang them from the roof trusses," Graham elaborated. "At one point, we had six 90 foot cherry pickers working. It was difficult to get the boxes hanging on the brackets at the right angles to conform to the EASE plot, but we got there in the end. Bosch came in and assisted with tuning, alignment, and measurement. Everything's on the network, you can drop in anything and connect it to anywhere, and it's all run really well."

"The EVH's horn loading means they're good at providing direct sound in reverberant spaces."
- John Alekna



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