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Revolving doors

With an expanding neighbourhood on its doorstep, **Richard Lawn** discovers how Church of Our Saviour is enhancing its AVL systems to appeal to new congregants



Jonathan Hemsley joined by Anders Teo and a colleague in the FOH technical area

HAVING RENOVATED AN OLD cinema complex to create its home for the past 40 years, Church of Our Saviour (COOS) remains astute and wary with current technological advances. The surrounding neighbourhood of Queenstown, Singapore is rapidly transforming with new housing and condominiums opening up and, with it, potential new congregants. The 1,200-seat auditorium within the 5-storey complex hosts six charismatic worship services every weekend, for which the audio, video and lighting technology continues to play a crucial part.

A technical masterplan was drawn up in 2004 to develop its performance systems by systematically replacing or upgrading various systems. A full upgrade was enacted over the following three years with the assistance of technical consultant, Lim Kheong Sen. The stage lighting system added a motorised FOH bar together with a variety of ETC and Selecon luminaires, six Vari*lite VL1000TS moving heads and an Avolites Pearl 2004 console. Further Vari*lite VL2500 washes and spots were added to the lighting mix in 2007.

Sound and Video Professional was called upon to install the new audio system combining L-R ceiling-suspended EAW MQ and BH models. 3D computer-generated simulations were used by qualified structural engineers to highlight points where the loudspeaker arrays could be



The new 350-seat chapel adjacent to COOS will be used for additional services and weddings



The EAW FOH loudspeaker system combines Quad 12-inch QX models with SB1002 subwoofers

suspended safely within the limits of the building structure in addition to providing the most precise coverage. Fourteen Crown Macro-Tech amplifiers powered the speakers, while the audio signals from the Yamaha PM5D consoles at FOH and monitors to the BSS Soundweb London Blu-80 processors were routed via CobraNet. Front-fills were added later by Electronics & Engineering Pte Ltd (E&E) consisting of JBL Control 29AV cabinets together with 12 channels of Shure UHF wireless microphones.

Fulfilled by 10 years of faithful service of the original EAW components, COOS drafted the EAW distributor back to its facility to design, supply and install a new EAW loudspeaker system. Having



EAW MK2396i speakers provide first tier upper balcony-fill coverage

previously represented JBL, BSS and Crown for 18 years, E&E returned in 2017 as the EAW distributor for whom Jason Yeo served as project manager. 'In addition to the MQ speakers, some of the Crown Macro-Tech amplifiers were in need of replacement,' explains senior technical executive, Jonathan Hemsley. 'We'd listened to the QX models and were impressed by the true stereo full coverage they provided.'

'Despite having relocated to Melbourne, Kheong returned from Australia and assisted us with the new design as he knows this church hall very well,' furthers Mr Hemsley. 'We did look at line array solutions.'

However, we had to rule against it as the hangs would conflict with the sightlines of our projection screens. We eventually settled on the QX500 speakers as our senior pastor was impressed with the clarity of the vocal range and the overall dynamics.'

As a testimony to Mr Kheong's excellent planning 10 years previously, the initial loudspeaker positions that had been earmarked for FOH in addition to the fills were re-employed. Each L-R FOH cluster comprises four quad 12-inch QX loudspeakers, providing controlled directivity to the main downstairs and balcony seating areas. The QX594i, QX566i and QX5441 speakers provide 90° x 45°, 60° x 60° and 40° x 40° coverage, respectively, with tri-amplification per speaker. The lower frequencies have been extended courtesy of the existing four BH822 dual 12-inch subwoofers suspended as a centre cluster. Rather than conduct the entire works within one week as had occurred in 2006, the latest upgrade was staggered in three weekly phases over a 3-month period. Scaffold towers were erected each week, but work was completed without disrupting the church's weekend service programme.

'You don't immediately realise how long a decade is in terms of technology until you undergo a refit such as this,' furthers Mr Hemsley. 'The QX speakers not only provide much improved directivity, but they also weighed significantly less when hoisting into position. We noticed that there was much more fidelity and clarity over the first three months of using it. When I recorded an SPL level of 120dB during testing, yet still had plenty of headroom, I was quite amazed.'

An interim upgrade in 2011 as a result of I/O expansions at FOH included the addition of a DiGiCo SD10 console for its evolving services. 'So far, the SD10 hasn't demonstrated any limitations and the firmware updates have really

benefitted us. The addition of iPad control has been useful when training new volunteers, allowing a supervisor to have oversight without needing to be at the console.' In the same year, the Avolites Pearl console was replaced with a Titan Mobile with a PC touchscreen from the same manufacturer.



LG displays have been added for restrictive views behind pillars



The level one, 1,200-seat auditorium

Similarly, the visual services have been significantly enhanced between audio upgrades. A Ross Carbonite video switcher accepts Panasonic HE-130 PTZ camera inputs in addition to graphics fed from four Mac minis, a GoPro camera used for baptisms and a roving camera. The resultant images from three Panasonic PT-DW100 XGA projectors are output to the main fixed screen behind the stage in addition to two 5m x 3m screens on either side of this. LG displays throughout the church building provide overspill and assistive viewing behind balconies.

Like the evolution in loudspeakers,



The EAW QX main speakers are tri-amplified by Powersoft X8, X4 and Ottocanali 8K4 DSP+D amplifiers whilst various Ottocanali models serve the fills

the 4- and 8-channel Powersoft amplifiers take less than half the rack space of the older Macro-Tech models and provide much higher power supplies. A Dante network has been created between the Powersoft amplifiers and signal from the SD10 FOH console is delivered via an 8-channel digital AES output card in the DiGiCo SD rack. 'DSP settings such as the crossover point for the subwoofers and all system EQ have been created using the Powersoft Armonia software. We have also created zone management so that the upper balcony can be switched off when there is nobody upstairs.'

Five different bands each comprising between five and seven musicians provide six charismatic church services each Sunday. They all rely on Allen & Heath ME-1 personal monitors running over MAD1 to a DiGiCo SD10-24 monitor console at stage left. The worship leaders and pastors prefer to use Shure UHX4D wireless handheld microphones with a combination of Beta 87C and KSM9 capsules during services. DPA d:fine ear-worn microphones are used for preaching. 'Wireless Workbench software programming helps us troubleshoot the congested bandwidth,' explains

Mr Hemsley. 'With increasing building construction in the area, and up to 50 channels of wireless equipment in use, we needed to take special care of our frequency coordination and monitoring to avoid interference.'

Recently, COOS expanded its premises with a 5-storey annex building next to the existing main auditorium. With the addition of the newly built facility, COOS will be able to better serve its congregation all under one campus. Located on level four of the annex building is a multipurpose hall to be used for weddings in addition to Filipino and Chinese youth services.

A 5.5m x 3m, 3.9mm pitch, 2,885Hz refresh rate Liantronics indoor LED videowall display is managed by a Novastar VX4S LED processor, while video switching is handled via a Ross Video Carbonite Black Solo video switcher for visual production. An Allen & Heath dLive C3500 mixing surface, dLive CDM32 stagerack with Dante and Waves v.3 expansion cards, two DX168 stageboxes and five Shure PSM900 wireless IEMs take care of all the audio routing, mixing and monitoring for the venue.



Six EAW JF8 speakers serve as front-fills built into the lip of the stage

Four EAW QX396 loudspeakers, which are tri-amplified per speaker, four EAW JFL118 subwoofers and four EAW VFM129i stage monitor speakers are powered by three Powersoft Quattrocanali 4804 DSP+Ds, one Quattrocanali 2404 DSP+D and one Quattrocanali 1204 DSP+D power amplifiers.

For lighting, an MA Lighting dot2 core console driving eight Osram Kreios profile lighting fixtures were chosen. A Datavideo NVS-25 H.264 encoder has been added to provide bidirectional broadcasting of services throughout the campus.

The return of Mr Kheong in 10 years' time cannot be guaranteed, but it can be safely assumed that COOS will have evolved significantly in terms of technology over that time span. Going full circle, perhaps the church will add a cinema as part of its services?

www.coos.org.sg
www.enepl.com.sg



Anders Teo operating the DiGiCo SD10 at FOH