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Graceful return

Richard Lawn revisits Grace Assembly of God church in Singapore



The Aoto MXC4 LED wall was aligned with the existing features

THIRTEEN YEARS HAVE PASSED since *Worship Audio Asia* was launched as a dedicated publication to educate AV technicians operating in Asia Pacific houses of worship. In that inaugural 2006 issue, the magazine reported on the newly constructed Grace Assembly of God church in Singapore's Bukit Batok district. Blessed with a budget to upgrade the AV equipment in 2019, Grace@BukitBatok (GII) – as it is affectionately known – opened its doors to *Worship AVL* to evaluate if any equipment had stood the test of time.

The previous audio setup within the sanctuary of the multi-level facility selected for the church's contemporary services comprised a Meyer Sound M1D line array, Digidesign Venue digital console and Aviom monitor mixers. For the upgrade, project lead for AVL James Chang and head of audio Christopher Soh invited HOW AV consultant Robert Soo (Cogent Acoustics) to provide recommendations. 'As the interior is acoustically well treated, a retrofit was not required,' comments Robert. 'And, with a limited budget, some of the original equipment, which was starting to fade and in need of replacement, would also need to be maintained for a little longer.'

A shortlist of systems integrators was invited to tender for the project, while Concept Systems Technologies (CST) was selected to carry out the integration of the AV technology. The church committee assessed several audio systems in live music, speech

and playback modes. Ultimately, an L-Acoustics' Kiva II WST line source system was rated with the highest score. 'The committee was not only impressed by the power, quality and the coverage of the dual 6.5-inch modules, they were also won over by its compact footprint,' recalls Robert. 'It makes you appreciate how far line array technology has developed over the years.'

The L-R 10 per side Kiva II modules are augmented by four SB18i single 18-inch subwoofers providing LF extension to 32Hz (± 3 Hz) as a centre cardioid cluster. Powered by four LA4X amplified controllers, the loudspeaker system is completed with the addition of eight free-standing XT5 coaxial front cabinets on the steps leading to the stage. Contrasting with the previous dedicated processor required for all loudspeaker management settings, the LA4X's integral DSP filtering provides crossover functions and system EQ in addition to ample headroom power for the entire Kiva II, SB18i and XT5 speaker setup.

Having created simulations and analysis on the proprietary Soundvision software, L-Acoustics applications engineer Chung Wah Khiew worked closely with CST project manager John Tan to execute the final positioning. 'We only had two weeks to complete the upgraded AV works in the sanctuary and naturally we had to suspend our activities to allow the weekend services to run uninterrupted,' comments Tan. 'It was not as straightforward as it first

seemed. The L-R Kiva II arrays had to be suspended on new mounting points as they were between 250–300mm away from the original M1D points. Furthermore, the final positioning of the SB18i units was critical as the front and rear pairs had to be precisely distanced from one another and they had to be fixed out of the sightlines of the LED screen. As a result, the front pair have been installed at a higher point to ensure there is no obstruction.'

Prior to the upgrade, Yamaha supplied a flagship PM10 digital console for FOH and monitoring requirements. Operating within the Dante network domain, the PM10 can record services through Logic Pro on a PC, while MP3 or WAV files can also be downloaded for further postproduction editing. Still in good working order and providing familiarity of use for the musicians, the Aviom A-16II personal monitor mixers maintain their presence onstage, while the shielded percussionist was never going to sacrifice his trusted Audix D2, D6 and i5 microphones.

The original Panasonic projector and motorised screen were earmarked for replacement with an HD LED videowall. The Grace Assembly committee was invited to a demonstration of an Aoto LED 2.5mm pixel pitch display at CST's showroom. 'The quality and the reliability of the high-resolution display definitely made a good impression,' comments CST MD, Gerald Fong. 'The assurance of the JCDecaux global partnership and the support that the Aoto brand provides also proved to be a major factor in the sale.'

'The original MXC3 design stipulated a larger-format display, but we had to decrease this in order to allow free movement from back of house



The Kiva II arrays are augmented by SB18i subwoofers



L-Acoustics XT5 coaxials serve as discreet front-fills



A Yamaha Rivaqe PM10 console at FOH

onto the stage,' comments Robert. The 480mm x 480mm tiles have been arranged in an eight units (3.84m) high x 14 units (6.72m) wide configuration. The original inputs including Panasonic PTZ HE130 cameras have been retained, but CST has added Kramer receivers, transmitters and converters to ensure compatibility of the HD/SDI and HDMI signals along the single mode, fibre-optic transport.

Above the sanctuary, the Love Room, Praise Room, Agape Hall and Shalom are used for smaller ceremonies, weddings, rehearsals and choir practices. The common 4m-high ceiling of these rooms placed restrictions on what AV technology could be applied. The chapel has

received an L-Acoustics upgrade courtesy of L-R ARCS Wide (inner) and ARCS Focus (outer) speakers providing 45° and 15° horizontal dispersion, respectively. Rear delays have been added in the form of X12 coaxials. 'Owing to the restricted height of the ceiling, the point source cabinets are fixed horizontally to maximise their energy on the congregation and away from the hard surfaces.'

Prior to the AV upgrade, the church opted to add full glazing to the lateral wall that separates the chapel from Shalom. 'While the windows can be opened up providing the audience from Shalom next door with a view of the stage, the addition of glass has created an acoustic problem,' adds Robert. At his insistence, the church

inserted partition screens on the Shalom side to minimise the audio spillage leaking from one room to the other during separate events.

Following the Aoto demo at the CST facility, Fong and Tan also showcased their Norton coaxial loudspeakers to Grace Assembly's select committee. Suitably impressed, the other rooms are now furnished with a combination of i12 and i10 ceiling-mounted speakers, for which the Agape Hall is further augmented by i118B subs. 'The limited room height ensured that the subwoofers had to be positioned almost flush to the ceiling so that they would not block the sightlines of

inserted into the pre-existing Yamaha M7CL console.

Sharing the same lower floor as the sanctuary below, the Love Room for children and Praise youth room share similar AV upgrades as the Agape Hall. The video element includes Datavideo SE-650 switchers and Panasonic PT-EZ590 projectors. Providing ease of powering on and off for the volunteers, Furman CN-3600 sequencers have been universally added to all the room equipment racks. Pre-existing equipment such as the Midas PRO2 console in the chapel continues to serve the church's requirements until the next budget is approved.



The Agape Hall has been upgraded with a Norton coaxial speaker system

the L-R Panasonic PT-VW590 video projection screens,' says Robert. Monitoring is provided by Norton Audio NF8 speakers, while Dynacord L3600FD amplifiers power the whole system.

Controlled by an ETC SmartFade controller, a combination of 12 Martin Rush PAR 1 washes and PAR 2 Fresnels were included as part of the CST makeover. 'Again, the limited open ceiling space created a headache for CST in terms of placement as there are few locations without ducting.' Dante connectivity to the sanctuary has been created with the addition of a Rio3224-D2 stagerack and MY16-AUD2 card

Having opted for a partial AV upgrade of the church's infrastructure, the resultant transformation reflects well on the original designs created by Laud Architects and Acviron Acoustic Consultants. It may not be fashion, but the changes highlight how AV technology – whether it's networking, loudspeaker design or HD video transmission – rapidly progresses over a relatively short period of time. Projection, line array and digital console technology has indeed come a long way.

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The audio system with L-R L-Acoustics ARCS Wide speakers

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