

# WorshipAVL

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January–February 2018

## SOUND IN A NEW LIGHT

### Expansion at Singapore's Church of Alphonse

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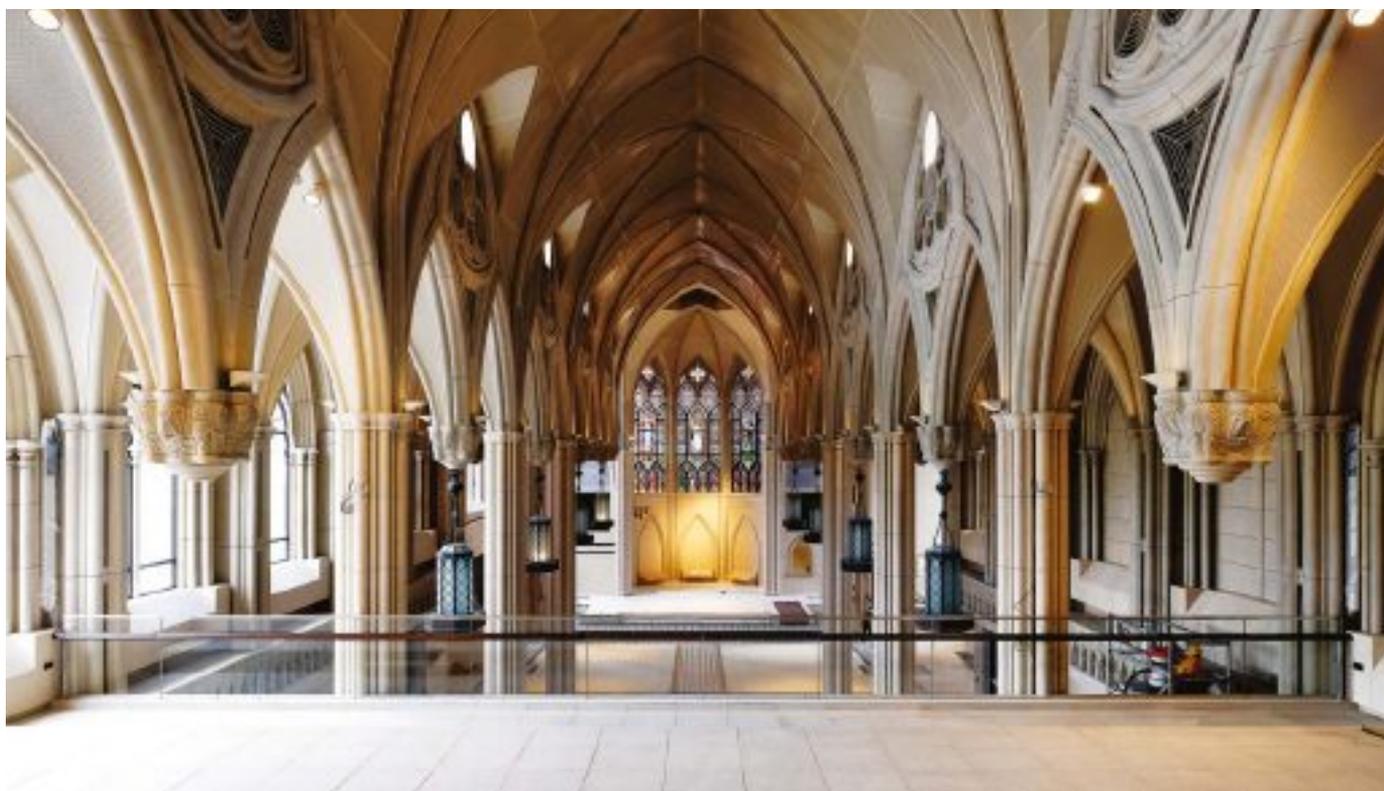
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A pair of Fohhn LFI-220 cabinets serve the upper rear balcony

# Sound in a new light

When Singapore’s Church of St Alphonus undertook expansion, unobtrusive sonic fidelity was planned along with the architectural design shares **Richard Lawn**

## NAMED AFTER ST ALPHONSUS MARY

Liguori – who founded the Catholic Order, the Congregation of the Most Holy Redeemer in Naples in 1732 – Singapore’s Church of St Alphonus is a Redemptorist missionary house of worship. Coming from Australia in 1934, the Redemptorists initially established a chapel at 339 Thomson Road. In 1950, the foundations of a new chapel were laid down at the present site of 300 Thomson Road, close to the Newton Hawker Centre. Named Novena, after ‘nine’ in Latin, architects Swan and Maclaren created what’s become a famous local landmark and cornerstone of the community.

For six decades, Novena served as an island of calm whilst the local area underwent huge transformations. Popular with both Catholics and non-Catholics, the church was busy on any given day, catering to diverse population groups with Filipino and Mandarin services alongside English for its multi-national worshippers. Its 10 hourly services each Saturday were characterised by hundreds

having to spill out across the courtyard owing to the limited interior space. Despite the discomfort of being exposed to the Singaporean heat, humidity and rain, Novena welcomed some 20,000 worshippers each Saturday alone.

With the advent of the new millennium, an upgrade was timely as the church was bursting at the seams. The church committee led by Father Paul Lim requested additional A/V equipment to be installed following the creation of covered peripheral wings with extra seating. Despite being sheltered by roofing, the balconies outside the main body were isolated from the altar and sanctuary with restrictive views.

As such, the audio system was upgraded with JBL Control 28 loudspeakers to enhance intelligibility of the spoken word services in these newly created zones. Coverage of the Shure SLX wireless microphone system was also extended by adding UA830 wideband UHF in-line antenna amplifiers and an active directional antenna. Furthermore, Panasonic TV

screens were suspended from the low ceilings to enhance the worship experience.

## The church’s vision

By 2009, the Redemptorists concluded that although the existing church needed to be preserved, it could no longer be deemed adequate for the future. The committee agreed that a new church would need to be built providing them with an opportunity to preach the gospel anew. Financing of the upgrade works was ensured when a main benefactor stepped in to cover the majority of the project’s costs.

Having successfully hurdled the formidable barrier of finance, another daunting obstacle appeared in the form of the Urban Redevelopment Authority (URA). Plans to upgrade the church stalled after the possibility of conserving it was raised by the authorities. Although the green light was eventually granted in 2011, including the replacement of the leaking roof, the URA declared that



Novena’s challenging acoustics were addressed

the façade of the existing church, including its distinctive triple arc front pediment, could not be altered. A waiver did, however, allow the new sanctuary to abut the existing church, ensuring that the old and new structures could differentiate themselves in character.

cgArchitects Pte Ltd was appointed to create a new church that would integrate the extensive wish list made by those who had served with the church over its 60-year existence. The actual architectural design for the new church was inspired by the classical and Gothic periods to include limestone-clad columns, towering pillars, high arches, 22 Italian-crafted stained-glass windows, high internal columns clad with fluted limestone and a new shrine. The pillars' structures were inspired by the palm



Novena Church adds elegance to Singapore's skyline



by a Fohhn beam steering solution



**Two Fohhn LFI-450 column speakers blend into the rising stone column**

trees of King Solomon's new temple in the Bible as they point towards Heaven. Additionally, the façade of the Our Mother of Perpetual Help Shrine incorporates a sanctuary with an overhead dome accommodating additional worshippers with tiered seating and – most crucially – air conditioning.

Furthermore, a grotto on the west side, and a new tower using the existing bronze bells on the east side, were drawn into the blueprints. Covering 3,600m<sup>2</sup> of gross floor space, the submitted design incorporated a 24-hour prayer garden, a three-storey Pastoral Centre with an auditorium for seating up to 192 people, meeting

rooms, two basement car parks, a canteen/kitchen, and new driveways, drop-off points, passenger ramps and stairways.

**Incorporating audio and architecture**

In addition to the comfortable seats and air conditioning, cgArchitects emphasised the requirement for an intelligible audio system that would enhance the sermons and readings for the regular congregants and not distract from the architectural aesthetics. 'One of the main considerations listed for the new sanctuary was the provision for clear intelligible speech,' explained cgArchitects director, Chee Ghit Chay. 'However, nobody wants to see black boxes suspended from the ceiling or hanging from walls.'

Spoken word remains the overriding requirement when communicating to the masses during traditional




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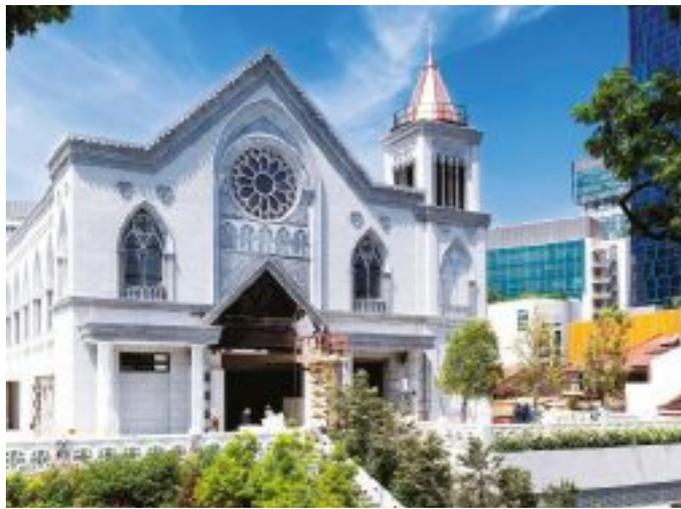
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# PROJECTS

Catholic services, although cgnA also stipulated the importance of enhancing the musical services at Christmas and Easter. Working closely with the electrical engineering contractor, Jerevin Industrial Pte Ltd, acoustic consultants Acoustic & Environmental Solutions Pte Ltd was contracted to provide Reverberation Time (RT) calculations to allow system analysis and design by AFMG Technologies' EASE software. Having calculated the reverberation times and suitable speaker placements, demonstrations were held with a preference towards utilising a columnar beam steering solution.

Ultimately, Control Logic Systems Pte Ltd's (Fohhn Audio's exclusive distributor for the ASEAN region)



**Novena also underwent exterior renovation**



**Three Fohhn AS30 subwoofers suspended in cardioid mode**

proposal to integrate a Fohhn Audio Linea Focus speaker system accrued the highest score by the church committee judges. Having concluded its audio preference in advance of final building works meant speaker templates and electrical diagrams could be forwarded to the general building contractor. As such, cabling conduits and speaker recesses were created within the rising columns that would allow L-R LFI-450 speaker cabinets to blend into the stone courtesy of a colour-matched RAL finish.

'The priests who judged all five speaker demonstrations were unanimous in their decision to install the Linea Focus column speakers,' recalls Ms Ghit. 'One of the main benefactors – a serious audiophile with a very musical ear – was astounded by the quality and the even dispersion characteristics that this system created. From my perspective, I was delighted as their slim, elegant housings blended unobtrusively within the rising pillars.'

Jerevin was called upon to install the Fohhn loudspeaker system. Measuring 4.5m in height, each LFI-450 chassis comprises 32 loudspeakers, amplifiers and DSP-based signal control. Whilst

the vertical sound inclination angle can be adjusted between  $\pm 40^\circ$ , the vertical beam width can be adjusted in  $0.1^\circ$  steps from  $0^\circ$  to  $90^\circ$  using proprietary Fohhn Audio Soft V5.1 software.

Employing 'two-beam technology', the speakers can generate two separate dispersion patterns in their vertical range, used by the Church of St Alphonsus for simultaneous and focused coverage of the main downstairs sanctuary and the upper-tier seating area. The acoustic centres of both beams can be set anywhere

from  $0^\circ$  at the bottom of the column to  $100^\circ$  at the top, ensuring that the speaker can overcome the harsh acoustic conditions that include the stone surfaces, glazed windows and domed roof. The integration of Fohhn's 'side lobe free technology' uses an algorithm that is said to suppress unwanted side lobes within the beam, reportedly providing more directional audio with improved speech intelligibility.

Serving as delays in the middle of the nave, a pair of LFI-220 cabinets have been recessed into the pillars further into the main seating area, whilst another pair serve the upper balcony seats. The combined Linea Focus systems are networked together enabling monitoring and real-time control from a PC. Capable of operating within a frequency range of 60Hz to 17kHz, the LFI-450 models are supplemented in the low frequencies with additional Fohhn gear – three AS-31 subwoofers in cardioid mode, powered by a D-2.1500 amplifier and a further two AS-22 models added in the centre of the church. Finally, the priests and the choir benefit from monitoring courtesy of discreetly placed Fohhn



**The priests and the choir monitor themselves from discreetly installed LX60 and LX10 models**

LX-60 and LX-10 monitor speakers, one of which is fixed into the altar table. Further LX-60 passive column speakers have been installed within the main foyer, creating an ambiance for worshippers when arriving and departing.

The worship area located between the old sanctuary and the new church is equipped with three Linea Focus LFI-120 models. The lower frequencies are boosted with the addition of two AS-22 compact 12-inch subwoofers powered by Fohhn D-4.750 4-channel amplifiers that also drive the AS-22 subwoofers in the centre of the main nave. The partitions of this transitional area can be opened when the main sanctuary needs to be enlarged to cater for larger numbers of worshippers. As such, the smaller LFI-120 speakers have been time aligned with the larger LFI-450 models.

## Sound in a new light

Having acoustically treated the high vaulted ceiling beneath the copper-plated roofing, the church's reverberation has been artificially dampened. 'It sounds more like an auditorium than a sanctuary,' exclaims CLS Pte Ltd MD, David Seow. 'When the acoustic consultant measured the RT, it was an average of 1.9s. You would normally expect this to be 5s or 6s.'

As the wraps came off the stained-glass windows following an extensive cleaning operation, the Fohhn column speakers were cast in a new light as the day progressed. 'The morning light was very different to the evening light,' explains Mr Seow. 'Although we had a real challenge to precisely match the RAL of the speaker housing to the limestone column due to natural and man-made colours, you could still detect slight differences throughout the day.'

Although a 64-channel Yamaha QL5 digital console, an extensive array of DPA podiums and the Shure wireless microphone system can be called upon for the rare charismatic services, it is the Fohhn speakers that are relied upon up to 10 times a day for the scriptures, readings and prayers. It's a far cry from the car park service that typified Novena up to 2014, when overspill crowds would amass in the sun and the rain, straining to hear what the pastor was saying. Now they can all be seated comfortably, unaware that the unobtrusive Linea Focus system is accurately delivering the Word like never before.

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