Martin Audio's O-Line for Tasmanian Church

Dating back to 1824, St. John’s Anglican church in Launceston, Tasmania is the oldest church in the city, having recently celebrated its 200th anniversary. To mark the bicentennial the church committee commissioned a major upgrade, largely to enhance speech intelligibility. GUZ BOX design + audio, headed by founder Tim Kuschel, were tasked with overseeing the acoustic and electroacoustic design works.

This was back in 2020, but hampered by COVID restrictions and a lack of data, it wasn’t until March 2021, in the post-COVID era, that the Canberra-based consultant fully realised the overwhelming number of architectural constraints he would be facing in this heritage - listed building - not least the demanding acoustics, with multiple reflections created by a 22m-high dome.

The reason intelligibility was such a concern was because a large proportion of the congregants are elderly worshippers, struggling to understand spoken word services. The existing speaker system simply did not meet the requirements, as it consisted of too many non-compatible enclosures, randomly installed as new extensions had been added over time. But speech wasn’t the only consideration as St John’s also hosts more contemporary music for its youth services—as well as

orchestral and pipe organ recitals.

After evaluation, Tim Kuschel’s upgrade solution to provide enhanced coverage in the sanctuary, platform and presentation areas, came down in favour of Martin Audio’s multi-award-winning O-Line modular micro-array set-up, with scalable resolution. “This offered the most consistent results across the seating areas,” he rationalised. “With its compact form factor, O-Line excels in houses of worship where speech intelligibility is the primary function.”

GUZ BOX had arrived at this solution only after conducting extensive acoustic measurements using EASE software, to ensure that the loudspeaker energy was focused on the main church seating areas, and that the sound would operate within the full frequency range for speech and music, setting a desired Speech Transmission Index (STI) and other key parameters.

He built a model in AutoCAD, converted it into a virtual acoustic model using AFMG’s EASE version 5 and correlated the physical measurements with the EASE model. He also worked closely with Cumulus Studio by proposing an extensive acoustic works treatment programme, including ceiling absorbers and wall treatments. Working closely with Martin Audio distributor Technical Audio Group (TAG), he detailed two hangs of 16 Martin Audio O-Line elements.

For the ability to reproduce music, however, he recognised that additional subwoofers would be required. Thus low-end extension is provided by six of Martin Audio’s SX110 10in direct radiating sub bass arrays, equally spaced across the front of the stage under the main platform. Each was individually amplified and processed to optimise steering. However, the installation was not without its challenges. Unable to suspend the main arrays from the 22m-high concrete dome - due to it being 16m higher than the optimum speaker placement - in order to achieve optimum coverage, in line with the modelling prediction the top speaker of each hang was suspended 6m above the sanctuary floor. This required customised speaker brackets to be fabricated, to extend the distance of the arrays from the wall. The 16 pairs of loudspeaker cable were also concealed within the mounting bracket. “It was a pretty neat solution all round,” reasoned the consultant. “The installer did a great job with this.”

Tim Kuschel turned to Martin Audio’s proprietary DISPLAY 2 software, deploying the ‘Hard Avoid’ feature largely to avoid spill back onto the stage/platform area. In this case, single-element resolution was used for optimised coverage over the audience area. Other infill speakers have been strategically placed including several Martin Audio CDD6 and CDD5’s, which have been fixed in the side chapel and chancel/choir stalls on ball and ceiling brackets. These were chosen for directional characteristics and form factor. As for aesthetics, the O-Line elements (and other Martin Audio loudspeakers) were installed in standard colour finish, however all other fixings including cable-runs in conduit were colour-matched where possible to satisfy heritage requirements.

Other project considerations included independent wireless iPAD control for the clergy, enhanced assistive listening, isolation from other interference and advanced acoustic treatment (as well as carpet absorption). The latter included an aesthetic acoustic treatment of Megasorber C50 50mm sound absorbing panels to approximately two-thirds of the ceiling over the main seating areas.

Tim Kuschel can reflect with satisfaction on a project in which all his goals were met. The reverberant energy over the audience area has been controlled and the new audio system provides a minimum measured STI value of 0.61 from the front row to the last seat of the balcony - with the speech clarity uniformly intelligible throughout. He has ensured intuitive control and management by non-technical staff in whatever mode the system is set up.

He has also struck the right RT60 balance, recording 2.5s of reverberation time, mainly in the mid-frequencies. “The organist demanded reverberant energy in the space, and it was pleasing to note that this has been unaffected by the acoustic works,” he noted. “Crucially, the reflected energy has been controlled and so the performance of singers and musicians is not compromised.” Installation works were carried out by Tasmania-based Contact Group, while T-Built project manager Joel Taylor coordinated and managed all the onsite contractors and systems integrators.

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