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# The Calvary transformation

What was an acoustically difficult sanctuary has been transformed with a new loudspeaker system at Calvary Assembly of God, writes **Richard Lawn**



Each EVA2082S hang weighs 108kg including the bracket



The Calvary Assembly of God Church on Upper Coast Road has been installed with an EV sound solution



The audio and visual systems conform with the elongated room shape



The Allen & Heath GL4000 analogue console will soon be replaced with a digital board

**SINCE THE NEW MILLENNIUM, SINGAPOREAN** church memberships have grown exponentially. Whilst the mega-churches such as City Harvest and New Creation, with their highly charismatic services, have added a new dimension to worshipping, the majority continue to fulfil vital roles within their community neighbourhoods in the same manner as when they first opened their doors. One such church is the Calvary Assembly of God, which started off as a church plant from Bethel Assembly in 1960. Over the past 50 years, Calvary has grown and established itself in several Singaporean communities including one on the Upper East Coast Road. During this time, the dynamic style of worship has become increasingly vibrant with music playing its part. This in turn has led the church leaders to focus their attention on upgrading the technology in order to ensure their musicians and singers create that special ambience required to lift the worshippers.

The 10m wide by 25m long third floor sanctuary within Calvary Assembly of God was built in 1990 and is a typically acoustically challenging auditorium-style room, in which the roof rises from 5.5m to 11m from the lateral walls to the apex. In 2000, two point source speakers were installed both at the front and the rear of the room in an attempt to provide even coverage over the 220 seats. However, as the band members and singers



The 220 capacity church sanctuary measures 10m in width and is 25m in length

on stage increased in numbers and the services have become more musical, this sound system was clearly insufficient for live performances with poor reflections becoming increasingly evident. Therefore, Calvary's full-time AVL engineer Jay Ong was asked to seek a new solution to enhance the musicality of the services that would offer even dispersion without reverberation or feedback.

Concept Systems Technologies won the phase one tender bid to design, supply and install a larger audio system using EV components. An EVA2082S line array has been added as the main L-R FOH system, each combining three elements on wall brackets. Although a single central hang was proposed, it was dismissed as it would obstruct the central stage and the rear motorised screen. Bosch Communications assisted Concept Systems Technologies (CST) in its design to provide even coverage, ensuring the energy was concentrated on the seats. This has been achieved with the top EVA2082S models providing just six-degrees vertical dispersion, whilst the lowest one acts as more of a down-fill with 20-degrees dispersion. Both arrays have been angled 10-degrees away from the lateral walls, ensuring none of the horizontal dispersion creates reverberation.

To enhance the lower frequencies, two EVA2151S subwoofers have been floor-mounted at the front of the stage and a pair of portable ZX1i speakers have been mounted on them as front fills. Whilst four EV CPS 2.12 amplifiers power both arrays and subwoofers, a single CPS2.6 amplifier powers the two ZX1i speakers. 'The amplifiers are driving the arrays in 16-ohms mode,' explains CST assistant project engineer Yohanes Wiguna. 'By driving the arrays with a minimum amount of amplification, you can control their energies a lot better.' An EV Netmax

N8000 has been added to manage the DSP and although no presets have been added, the addition of this unit, which can be configured remotely, has allowed Mr Ong to determine the crossovers.

Having been approved prior to Christmas to proceed with the design, CST was called to site once the Christmas 2014 festivities had ended. The church sanctuary is largely unused during weekdays, leaving the CST project team just five days in which to dismantle the old system, provide new conduits and cabling, install the new speaker system and tune it prior to weekend services. 'The clock was definitely ticking and we worked long hours to get the job done,' confesses Mr Wiguna. 'We made life easier for ourselves by preparing as much as we could, including all the documentation in advance of installation. The feedback we received from the volunteers after the first weekend services allowed us to further fine-tune it, as we discovered the low-mids were set too high and there were some reflections emitting from the rear.'

Following the final adjustments, Mr Ong was full of praise for the new EVA system. 'It's providing clear, even dispersion throughout the sanctuary but it also adds a warmth at the same time. Some systems are better for



**Dual floor standing EVA2151S subwoofers with ZX1i cabinets providing front fills**

speech and others for music, but this is great for both. The spoken word is intelligible whilst the live performances are now full range and inspirational. Previously, we didn't have any subwoofers and the mids were muddy, but with EVA we are now blessed with a much wider spectrum. The choir sounds vastly superior, which is encouraging our worshippers to become more involved.'

The sound emitting from the musicians on stage has always been a concern for Mr Ong, particularly for the audience members in the front

row seats. 'We are sensitive with the monitoring positions and we have screened the percussionist,' adds Mr Ong. 'We knew the addition of the front fills and subwoofers may concern some of our worshippers, but we can control the low frequency volume levels. Flexibility is the key.' A mixture of pre-existing Shure ULX, and Mipro 787-D, 707, and 808 wireless systems assist the musicians and worship leaders on stage, whilst a pair of Rode NT1A mics are used on the grand piano and an assortment of Samson and Shure models are used by the

other drummer, guitarists, bass player and keyboardist. A pair of Furman sequencers/power conditioners located at the FOH position (PL Plus E) and the main amplifier rack (CN3600) located behind the drummer allow one-touch powering up and down.

The Allen & Heath GL4000 analogue console together with the assortment of limiters, gates, compressors, processors, reverb units and equalisers will be replaced during the next phase of development. 'Now we have upgraded the speaker system, we know that the remainder of the signal path requires the same,' confesses Mr Ong. The simple video system feeds one output at a time to an Epson projector and onto a motorised 5m by 4m screen. Inputs include a DVD player, a hand held Canon camera located on an upper balcony and a PC supplying song lyrics via a Kramer VP-719 switcher/scaler.

The message of God continues to be refined and delivered in a manner that will not distract or overpower its audience. With the addition of the EVA line array in Calvary Assembly of God church, its worshippers are enjoying a long overdue enhancement to their aural senses.

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