# **Bethany Christian School, Adelaide, Australia** Case Study



# Adelaide's Bethany Christian School Expands Performance Space and its Electro-Voice Arsenal

n 2012 Osmond Electronics designed and installed an extensive entertainment system into the Performing Arts Centre at Bethany Christian School in suburban Adelaide.

The performing arts complex was designed to handle everything from contemporary worship to music and theatre productions. It comprises of a theatre stage and auditorium with a balcony that can be sectioned off and utilised as a separate lecture space. A recent audio-system extension for the new function room now allows Bethany to run more events throughout its Performing Arts Centre.

### **Existing System**

The auditorium is equipped with a Digico digital console that drives an Electro-Voice Netmax N8000 matrix providing DSP control for the audio system. This includes delays for the over balcony speakers that can then be switched to operate in a



standalone mode from a local mixer if required. The N8000 incorporates a TP12 touch panel adjacent to the mix position that allows for the configuration of the system to be easily changed as required.

With the exception of the mixing desk, Electro-Voice, Dynacord, Telex and Bosch equipment was used for the project, with EV featuring most prominently. The FOH system consists of Electro-Voice EVA loudspeakers with a combination of 90 degree long-throw cabinets and 120 degree short-throw cabinets. Attenuation modules are fitted to the 120 degree cabinets to ensure an even coverage of the room. Touring-grade Dynacord Power H Amplifiers are used to drive the main system.

Low frequency is managed by a cardioid sub array consisting of an Electro-Voice XCS 312 cabinet behind each of the midhigh hangs. Processing for these subs is derived from the N8000. A front fill send is also derived from the N8000 for two portable ZXA1 powered cabinets located in front of the stage to cover front rows and to help lower the audio image.

The stage incorporates a foldback system featuring Electro-Voice TX 1122FM wedges being driven from EV CP 2200 power amplifiers providing four sends of monitors.

Electro-Voice PL series vocal and instrument microphones are also used in conjunction with eight channels of REV wireless microphone systems combining hand-held and



Kostas Psorakis with TX 1122FM wedges and ZXA1 cabinets



beltpack transmitters. The entire system has been set up to be operated in two modes; either a fully-supervised mode from the digital console at FOH, or an unsupervised mode via the simple mixer in the main equipment rack. The unsupervised mode allows any teacher to access the Netmax touch panel and control the system with the simple side of stage mixer.

#### **The Balcony**

Two Electro-Voice EVF 1122 cabinets are used for the overbalcony system which is controlled via the N8000 Touch Panel. They can be used as a delayed feed from the main system or can be isolated and controlled independently. The balcony features a retractable isolation panel system that allows it to be closed off and used as an independent lecture theatre.



A localised Bosch rack mount mixer with an EV wireless mic system can be used here independently of the FOH system.

#### **The Function Room Extension**

A new Function Room has been built to the rear of the stage to offer a flexible multi-use space with an AV system. It can act as a green room to the main theatre with all sound and vision extended from the performance stage. It is also used by students as a performance space and quite often is utilised as a function room with full kitchen facilities next door.

Two EVF1122s94 mid-hi loudspeakers are coupled with two EVF2121s 12-inch one-way subwoofers for an effective FOH system ideal for this medium-size room. Two CPS2.12 amplifiers drive the FOH system while a CPS2.9 drives the foldback TourX loudspeakers.

A local mixing desk is connected to the Bosch PLENA matrix which provides processed console left and right inputs. Foldback sends are also patched to the inputs of the PLENA matrix unit allowing FOH and Foldback system EQ, speaker cross-over and system limiting to the function room EVF system. Two EV R300 wireless mic systems are also patched into the matrix unit.

The school is now able to use three separate areas for individual events with local control in each zone, or one event where sound distribution is controlled centrally through the Netmax matrix.

## **Additional Gear**

The venue is fitted out with Electro-Voice EVID ceiling speakers in the foyer and the Function Room. Bosch mixer amplifiers drive the ceiling speakers and allow for central or localised paging. Bosch Plena Loop Amplifier is also used and the production crew use Telex headsets, beltpacks and speaker station. A range of wired and wireless EV microphones are used for instruments, speech and vocal performance.

Osmond project manager, Kostas Psorakis, looked after both projects from their inception and was instrumental in ensuring that an advanced entertainment system could provide a topnotch performance and be easily used by both experienced and inexperienced staff. "EV's Innovations range is perfect for installs such as this and the available amplifiers and matrix systems compliment them well. The resulting flexibility, ease of use and performance balance is ideal for Bethany's Performing Arts Centre," said Kostas.

Bethany Christian School are also happy with their investment in terms of the quality of sound and functional usability. "The systems and the multi-zoning work great. We are very satisfied with the production equipment and the custom installation Osmonds designed and created for us." said Jez Graetz, Bethany Christian School ICT Manager.





EVF speakers in the Function Room.



| Auditorium Equipment:                               |  |  |  |
|---|--|--|--|
| 1 x Digico SD-9                                     |  |  |  |
| 4 x EVA 906 Line Array Elements                     |  |  |  |
| 4 x EVA 1220 Line Array Elements                    |  |  |  |
| 2 x EVA AM Modules                                  |  |  |  |
| 2 x EVA Fly Grids                                   |  |  |  |
| 2 x XCS 312 Cardioid Subwoofers                     |  |  |  |
| 2 x XCS Fly Grids                                   |  |  |  |
| 3 x Dynacord H5000 Power Amplifiers                 |  |  |  |
| 3 x Dynacord RCM 26 DSP Modules                     |  |  |  |
| 1 x Netmax N 8000 DSP Frame                         |  |  |  |
| 2 x Netmax Al Input Cards                           |  |  |  |
| 2 x Netmax AO Output Cards                          |  |  |  |
| 1 x Netmax TP 12 Touch Panel                        |  |  |  |
| 1 x Bosch PLN-1LA10 Loop Amplifier                  |  |  |  |
| 2 x Bosch PLN-DVDT Playback Units                   |  |  |  |
| 6 x EV TX 1122FM Foldback Wedges                    |  |  |  |
| 2 x EV CP 2200 Foldback amplifiers                  |  |  |  |
| 4 x EV PL80 Vocal Microphones                       |  |  |  |
| 6 x EV RE 510 General Purpose Condenser Microphones |  |  |  |
| 1 x EV DK 7 Drum Pack                               |  |  |  |
| 4 x RE 92 Hanging Choir Microphones                 |  |  |  |
| 2 x PL 37 Ambience Microphones                      |  |  |  |
| 4 x EV REV D Dual UHF Wireless Receivers            |  |  |  |
|   |  |  |  |



4 x EV REV HD 9 Hand Held Transmitters 4 x EV REV WT Beltpack Transmitters 2 x EV Guitar Cables to Suit Wireless 1 x EV RE 90TX Lapel Capsule 1 x EV RE 97-2TX Face Microphone 2 x EV BH 200 Wireless Battery Chargers 2 x EV EVF 1122S/126 Speakers 2 x EV EVF-UB Mounting Brackets 1 x EV CPS 2.9 Power Amplifier 1 x EV RCM 810 Module 1 x Telex Audiocom MS2002 Master Station 5 x Telex Audiocom BP 1002 Beltpacks 6 x Telex PH 1 Headsets 1 x Telex Audiocom SS-1002 Speaker Station 2 x Bosch PLE-1MA120 Mixer-Amplifier 8 x EV EVID 4.2 Ceiling Mount Speakers

### **Function Room Equipment:**

2 x EVF1122s94 Mid-Hi Loudspeakers 2 x EVF2121s 12-inch One-way Subwoofers 2 x CPS2.12 EV Precision Installation Amplifiers (FOH) 1 x CPS 2.9 EV Precision Amplifier (Foldback) 2 x RE300 EV Wireless Mic System 1 x PLM-8M8 Bosch PLENA matrix DSP Mixer

#### **Systems Integrator:**

Osmond Electronics 142 - 150 Gray Street Adelaide, SA 5000 Ph: (08) 8410 1111 www.osmondelectronics.com.au

#### **End User:**

Bethany Christian School 17 Countess Street Paralowie, SA 5108

#### Supplier:

Bosch Communications Systems Suite 1, Level 2, 21 Solent Circuit, Baulkham Hills, NSW 2153 Ph: 1300 0 BOSCH (26724) www.boschcommunications.com.au

# EV Audio Solution for Bethany College



Osmond Electronics in Adelaide have recently completed the installation of a complete entertainment system into the new performing arts centre at Bethany College in suburban Adelaide. The work involved a complete design and construct resulting in extensive liaising with both architects and builders during all phases of the design and building process. Osmond project manager Kostas Psorakis looked after the project from its inception and was instrumental in ensuring the building incorporated the infrastructure to ensure that an advanced entertainment system could be easily integrated.

The venue has been designed as a performing arts complex to handle everything from contemporary worship on Sundays to school and community theatre and music productions. The venue comprises of a main performance space which includes a balcony that can then be divided off to be utilised as a separate lecture space. In addition there is separate classroom attached that can be used as marshalling and warm-up space. This space as well as the foyer have an incorporated audio and vision system to allow for show relay from the main auditorium.

The Auditorium itself is equipped with a Digico digital audio console that drives a Netmax N8000 matrix controller that incorporates DSP control for the audio system. This includes delay's for the over balcony speakers that can then be switched to operate in a stand alone mode from a local mixer if required. The N8000 incorporates a TP 12 touch panel adjacent to the mix position that allows for the configuration of the system to be easily changed as required.

The main audio system comprises of an Electro Voice EVA system with a combination of 90 deg long throw cabinets and 120 deg short throw cabinets. There is then attenuation modules fitted to the 120 deg cabinets to ensure an even coverage of the room. The main speaker system is driven by Dynacord Power H amplifiers. In order to control the low frequency in the room Kostas opted for a Cardioid sub array by mounting an Electro Voice XCS 312 cabinet behind each of the mid high hangs processing for these subs is derived from the N8000. A front fill send is also derived from the N8000 that allows for two portable ZXA 1 powered cabinets to be located immediately in front of the stage to cover the front rows and to help lower the audio image.



EVA hang with XCS 312 subwoofer hanging behind

The over balcony cabinets are EV EVF 1122 cabinets chosen for the cosmetic and sonic similarity to the EVA with both being part of the EV Innovations speaker range. The overbalcony system is controlled via the N8000 Touch Panel to allow for it to be used as a delayed feed from the main system or to be isolated and controlled independently. The balcony area is fitted with a retractable isolation panel system to allow for it to be closed off and utilised as an independent lecture theatre. This then has its own localised control consisting of a Bosch rack mount mixer with a EV wireless microphone system.



Balcony with dividers in place as independent theatre.

One aspect of the system design that has appealed to the college is the dual mode operation set up that has been programmed into the Netmax by Osmond system engineer and technical whizz kid Adam Budgen to allow for the system to be operated in either a fully supervised state from the large digital console at FOH or in a unsupervised state via the simple mixer in the main equipment rack. This is a particularly function



for the college staff as it allows a teacher to come in and access the Netmax touchpanel and via the staff access code power the system up with all control routed to the side of stage mixer. Thus for general school assemblies and public meetings a microphone and simple playback can be activated without the need to deal with the complexity of a large mixing console.

Main equipment rack located side of stage

The venue also incorporates a stage foldback system consisting of EV TX 1122FM wedges being driven from EV CP 2200 power amplifiers

providing four sends of monitors. The system also incorporates electro voice microphones with PL series vocal and instrument microphones being used in conjunction with eight channels of REV wireless microphone systems combining both hand held and beltpack transmitters.

The venue is fitted out with Electro Voice EVID ceiling speakers in both the foyer and classroom/rehearsal space area with these drivers being driven by Bosch mixer amplifiers to allow for central paging or localised paging in all areas.

Bethany College have been very happy with the performance and reliability of the system and it has allowed them to provide a high quality experience for both the school and the local community.

"We are really pleased with the time and effort Osmond's have put in to get our AV system right. The Digico SD9 sounds amazing through the paired EV speaker system, with the versatility of the Netmax it gives our performing arts centre the sound we need for every occasion". Bethany College ICT Manager and teacher Jez Graetz



Bethany College ICT Manager and teacher Jez Graetz (left) with Osmonds project manager Kostas Psorakis

# Equipment Profile:

| 4 | Х | EVA 906 Line Array elements                       |
|---|---|---|
| 4 | х | EVA 1220 Line Array elements                      |
| 2 | Х | EVA AM Modules                                    |
| 2 | Х | EVA Fly Grids                                     |
| 2 | Х | XCS 312 Cardioid Subwoofers                       |
| 2 | Х | XCS Fly Grids                                     |
| 3 | Х | Dynacord H5000 FOH and Subwoofer Power Amplifiers |
| 3 | Х | Dynacord RCM 26 DSP modules                       |
| 1 | Х | Netmax N 8000 DSP frame                           |
| 2 | Х | Netmax AI input cards                             |
| 2 | Х | Netmax AO output cards                            |
| 1 | Х | Netmax TP 12 Touch Panel                          |
| 1 | Х | Bosch PLN-1LA10 Loop Amplifier                    |
| 2 | Х | Bosch PLN-DVDT playback units                     |
| 6 | Х | EV TX 1122FM foldback wedges                      |
| 2 | Х | EV CP 2200 foldback amplifiers                    |
| 4 | Х | EV PL80 Vocal Microphones                         |
| 6 | Х | EV RE 510 general purpose condenser microphones   |
| 1 | Х | EV DK 7 Drum Pack                                 |
| 4 | Х | RE 92 hanging choir microphones                   |
| 2 | Х | PL 37 ambience microphones                        |
| 4 | Х | EV REV D dual UHF wireless receivers              |
| 4 | Х | EV REV HD 9 Hand Held transmitters                |
| 4 | Х | EV REV WT beltpack transmitters                   |
| 2 | Х | EV Guitar Cables to suit wireless                 |
| 1 | Х | EV RE 90TX Lapel Capsule                          |
| 1 | Х | EV RE 97-2TX face microphone                      |
| 2 | Х | EV BH 200 wireless battery chargers               |
| 2 | Х | EV EVF 1122S/126 speakers                         |
| 2 | Х | EV EVF-UB mounting brackets                       |
| 1 | Х | EV CPS 2.9 power amplifier                        |
| 1 | Х | EV RCM 810 module                                 |
| 1 | Х | Telex Audiocom MS2002 Master Station              |
| 5 | Х | Telex Audiocom BP 1002 Beltpacks                  |
| 6 | Х | Telex PH 1 Headsets                               |
| 1 | Х | Telex Audiocom SS-1002 Speaker station            |
| 2 | х | Bosch PLE-1MA120 Mixer-Amplifier                  |
| 8 | Х | EV Evid 4.2W Wall mount speaker s                 |

Bethany College Audio Visual system was designed and installed by Osmond Electronics Project Manager – Kostas Psorkais Systems Engineer – Adam Budgen

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