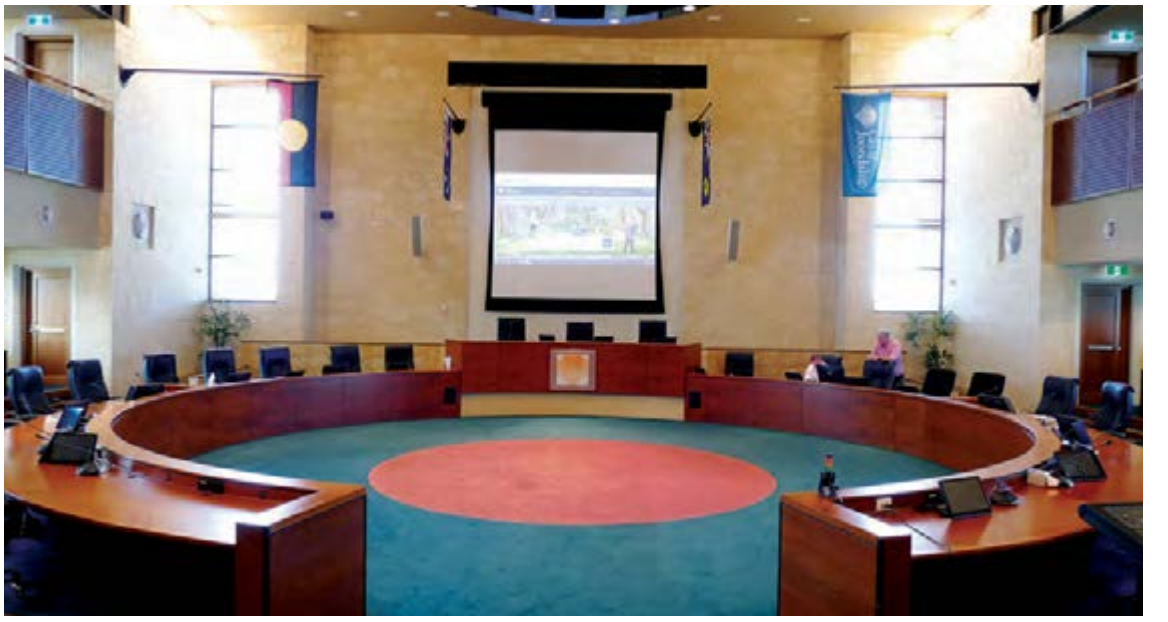
Striking gold in Western Australia

Richard Lawn meets a fellow Englishman who has made the craft of courtroom, parliamentary, law enforcement and local government AV his speciality down under

L–R: Stuart Herring (Redfish Technologies), Brad Sillence (manager of governance) and Marc Sharman (TAG)

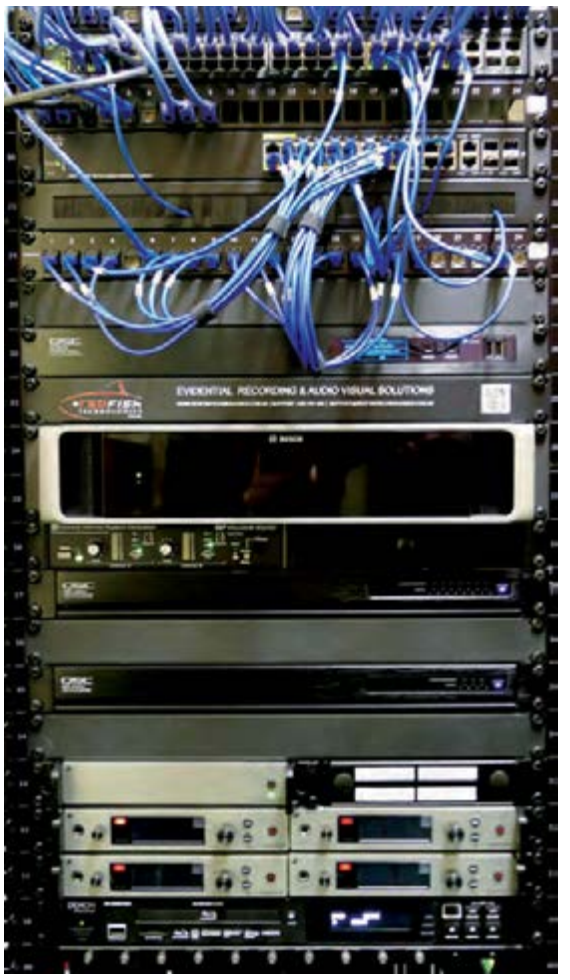
FROM GOLD, NICKEL AND COPPER TO LITHIUM AND diamonds, the remote and huge expanse that is Western Australia continues to bear a rich mix of minerals that contribute greatly to the GDP of the state. However, having emigrated to Australia in 1998, Englishman Stuart Herring entered the country with AV and IT rather than geological experience. Over the last decade, he has enhanced his expertise by tapping into what was an undiscovered rich motherload – the local governance sector.

"I was extremely lucky when I arrived," reflects Herring, referring to the role he was offered with a software development company that was to emerge as a leading producer of court recording software, For the Record (FTR). Herring immersed himself into that business, studying courtroom operations and integrating AV products with the software. Leaving FTR in 2008, Herring started his own business a year later in the justice sector and its adoption of AV systems and court recording software. "Shortly after leaving FTR, I soon realised that there was a significant gap in terms of overall AV technology in law courts," he continues. "This led me to take a more detailed look at similar vertical markets like the justice sector, and local governance was something that had



The City of Joondalup council chambers

similar requirements." Naming his company with a play on words of his surname, Redfish Technologies has continued to pioneer the adoption of digital recording products, including those from FTR and Liberty Court Recorder to the Western Australia and greater Australian justice sector. A small niche perhaps, but the fledgling business-enhancing AV systems in this remote outpost started to blossom, focused upon evidential-based recording and integrated AV systems.



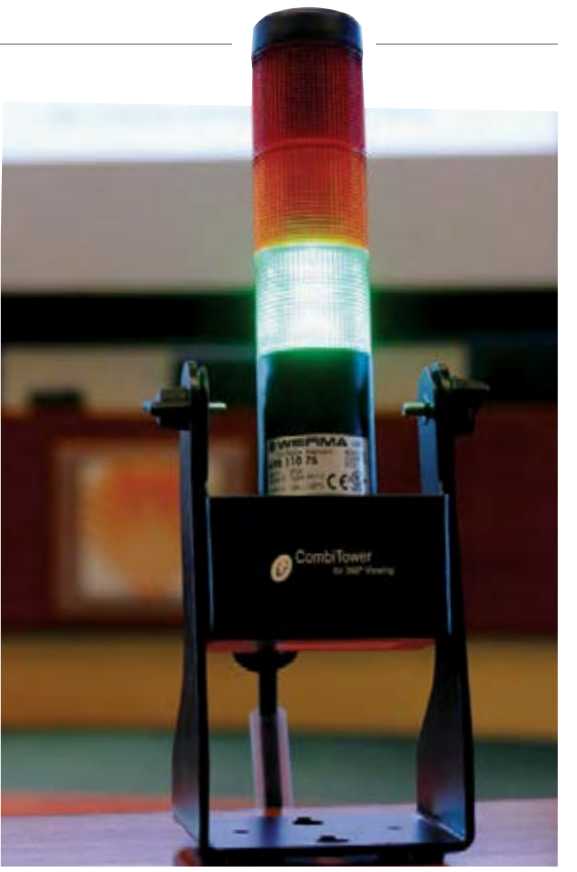
Cat-6a cabling connects to a Cisco SG350 network switch in the rear room equipment rack

Enacted in 1973, the Corridor Plan for Perth cited that Fremantle, Midland, Armadale, Rockingham and Joondalup would become nodes of commercial and economic focus to take the commercial burden away from the Perth CBD. Joondalup, which gets its name from the Noongar word, Doondalup, meaning "lake that glistens", started to become an important city in the north and a key regional hub during the late 1980s. It became a local government in its own right when it split from the former City of Wanneroo in 1998, shortly after which the council chambers for the City of Joondalup were formally opened. Brad Sillence has held the role of manager of governance at the City of Joondalup since 2011.

"My primary focus is to support the decision-making processes of the Joondalup Council," he explains. "The elected council meets and makes decisions in these chambers that benefit the businesses, visitors and a community of over 160,000 residents that covers a 99km^2 catchment area. A decision was made to upgrade the original electronic voting system, microphones and speakers that had been in operation for over 15 years. The original AV system had exceeded its life expectancy and, as the equipment could not be supported, we had to take the strategic decision of upgrading and future-proofing the chamber. In addition to replacing the voting and discussion system, the audio, visuals and acoustics required significant improvements."

No stranger to the chamber, Redfish Technologies submitted a detailed tender based on the bespoke requirements of the Joondalup council. "Our company has been providing AV support here since the business started in 2009," explains Herring. "We initially provided a risk assessment service, filed maintenance reports and performed a partial upgrade/maintenance with some piecemeal equipment. Immersing the business in the local government sector, we have become increasingly aware that people's lives are affected by the decisions made in any council chamber, and as such they need to hear what is being discussed and fully observe the meetings. Similarly, I assessed it from the client's point of view, concluding that the overall functionality of the technical equipment required ease-of-use operations as a main consideration."

Herring's tender documentation left no stone unturned thanks to his understanding of the decision-making processes and, subsequently, Redfish Technologies was



An InterSpace FiliBuster cue system notifies councillors when to talk

Councillors are equipped with a Bosch Dicentis discussion unit and a 15-inch HD display

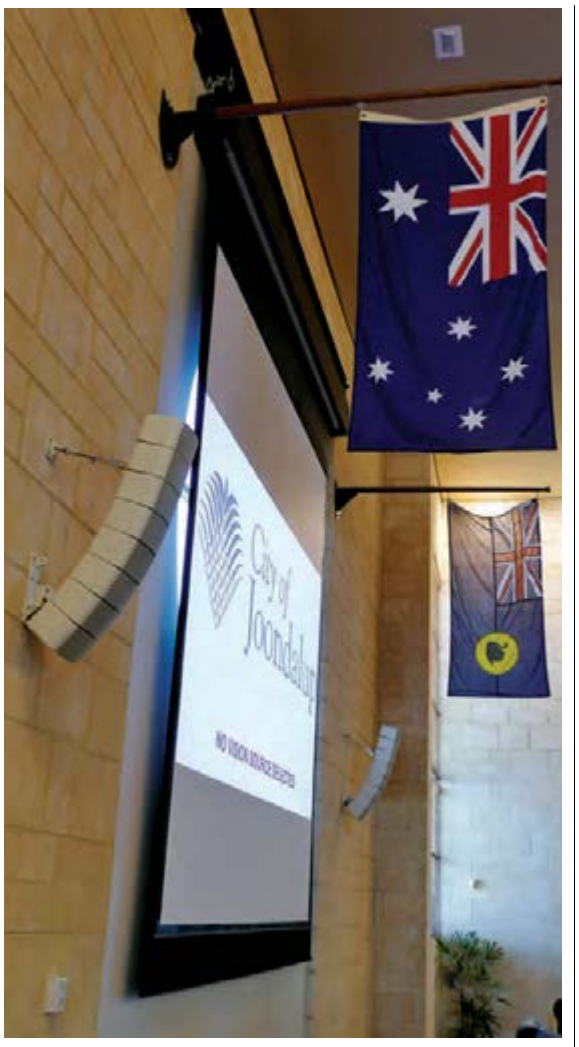
AV in the public gallery is enhanced with Samsung 82-inch HD displays and Martin Audio CDD8 speakers

awarded the contract. “We knew what we wanted, but not the technical aspects,” explains Sillence. “In awarding the contract to Redfish, I was confident that they fully comprehended what we were doing and so understood what we wanted.” Sillence acknowledges that maintaining even audio coverage in the public gallery area that can seat up to 180 guests had always been a struggle. “Acoustically there are some challenges, and we didn’t want anyone to question the ability of the sound system or the acoustics. Previously, we had focused our attention more on the clarity of the voting procedures for the council members, rather the public gallery guests.”

As one of the first local governments to adopt the original Bosch Consensus electronic voting and discussion system, Joondalup council had continued to be forward-thinking in terms of its application of AV technology. “We were one of the first council chambers to have installed an e-voting system and we have simply built on that platform, adding Bosch software in 2012,” continues Sillence. “A new discussion system was sought for the elected body that would better facilitate voting, agendas and the recording of minutes. The goal was to benefit decision-making processes with the interaction of the elected members and, of course, the procedures of the meetings.”

Accordingly, Sillence instructed his team to research other local government chambers. “Our officers undertook the task to research the technology applied elsewhere in addition to assessing our bespoke future needs, such as video streaming, any interactions and legislative requirements going forward. What is good today in terms of technology, however, may be derelict and dated tomorrow. The equipment and technology need to stand the test of time and allow expansion for at least the next 10 years.”

Provided with a brief, Redfish Technologies could start planning the upgrade accordingly. “For any AV integration company, planning is the foundation stone of the works,” explains Herring. “There is no point entering into a project assuming that you know everything, so at the onset of the works we start with a concept plan and an overview of what major components we are intending to implement at the tender submission stage. After being awarded the project, we proceed to the planning stage and the detailed design plan. That in turn builds into schematics using D-Tools software that determines the cable routing to be applied and where the base equipment will be located. From that point, we can create the elevation and rack drawings. The whole package has to be agreed before the start of the project and signed off with adjustments where required.”



DVD content is played onto a motorised projection screen

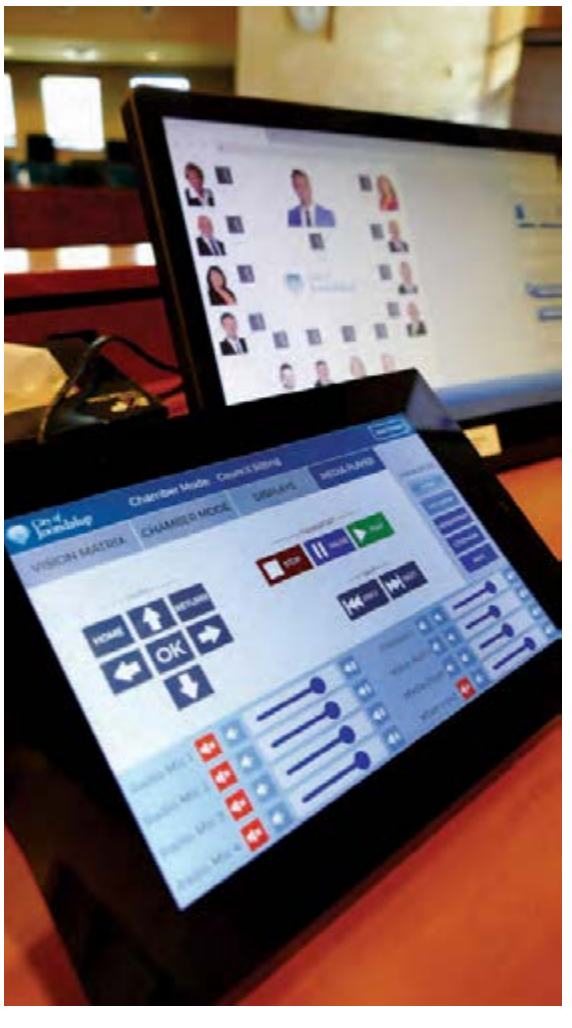
The transformation, from decommissioning the complete old system in the chamber to signing off the commissioning of the new system, took place during a three-week recess window in late 2019/early 2020, including Christmas and New Year breaks. “To fully comprehend the solution being applied, all the documentation has to be clearly understood,” says Herring. “It is a transfer of knowledge without having to explain the details verbally, so the documentation has to be thorough. From the outset of the tendering process, my biggest concern was the tight time frame we had to complete the cabling, installation, fit out, commissioning and systems training, all prior to the next scheduled council meeting, that couldn’t be changed. Having carefully made our plans, I was confident that we could deliver the whole package on time and on budget.”

Redfish Technologies operates within a niche sector in a remote region, but Herring and his team, which includes a dedicated AV and control systems programmer, refuse to adopt cut-and-paste AV designs. The conferencing, audio and visual technologies selected for the Joondalup Council Chambers had been installed in some of the team’s previous governmental works as separate systems, but never as one integrated whole. These include a Bosch Dicentis conferencing system, a Vision video network based on WyreStorm NetworkHD transmitters and receivers and a QSC Q-Sys audio DSP platform that also provides all the AV control functions in the room.

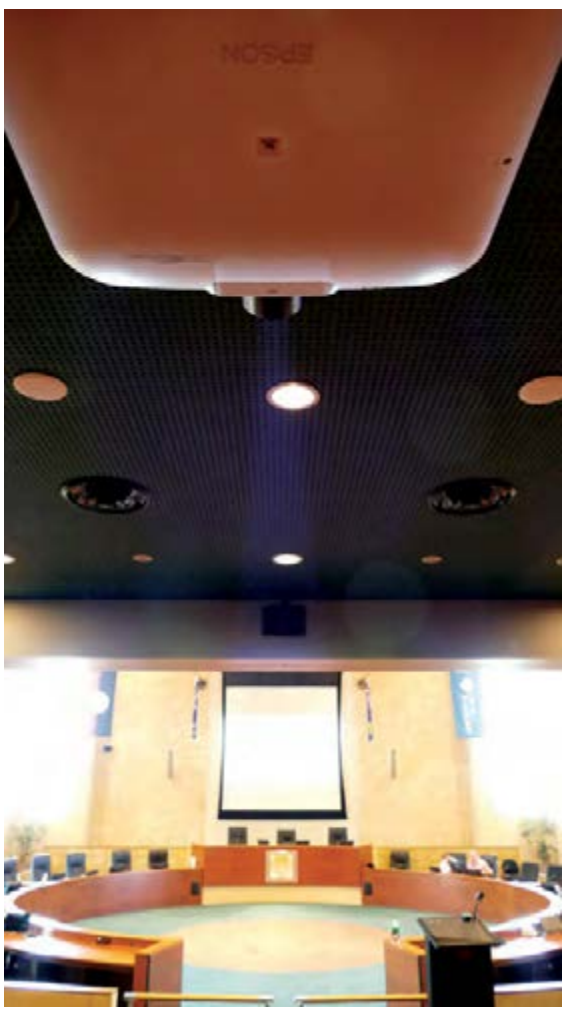
“The infrastructure relies heavily on a Cat-6a shielded and structured cabling network, which in turn minimised the audio and visual cabling requirements,” adds Herring. “With the exception of the audio outputs, all of the technology operates within the digital domain. The Q-Sys DSP audio system also controls the WyreStorm visual system, while everything else is peripheral and sits on top. There is always going to be some sort of risk when integrating disparate products from different manufacturers within such an environment. Following research into these new technologies, we thoroughly tested them once we’d been given relevant information and samples from the suppliers.”

Allowing multiple delegates to speak at the same time, a wired version of the Bosch Dicentis discussion and voting system was selected for its feature set, reliability and world-class attributes. Operating over the Omneo IP-based network, Dicentis incorporates a Near Field Communication card reader that identifies the user. The foundation of the Dicentis Network is Cat-6 shielded cabling connected to a dedicated 48-port Cisco SG350 network switch. Equipped with 18-inch gooseneck mics, 15 of the 25 connected DCNM-DE discussion units come with licensed voting capabilities exclusively for the mayor and elected members. Loaded onto a dedicated discussion laptop, the Chamber Meeting Agenda software located on the Minutes Desk allows control of all 25 discussion units from anyone in the city’s governance team.

The dedicated discussion and minutes computer is connected via USB to a QSC I/O-8 Flex network expander, providing the audio to the two-channel High Criteria Liberty Meeting Recorder. It can display into the chamber via HDMI to the WyreStorm NHD-100-TX transmitter. “As a discussion platform, Dicentis is ideally suited for a setup such as Joondalup,” says Herring. “With its high-quality audio processing including acoustic feedback suppression and excellent functionality, I was immediately impressed with the intuitive feature set of Dicentis. The user-friendly interface allows councillors to monitor from the integrated loudspeaker or headphone connection. From the touchscreen controller, you can see who is talking or waiting in the queue. For the 15 voting units, elected members simply press the coloured buttons on the touchscreen.”



A QSC TSC-80T display provides touchscreen control



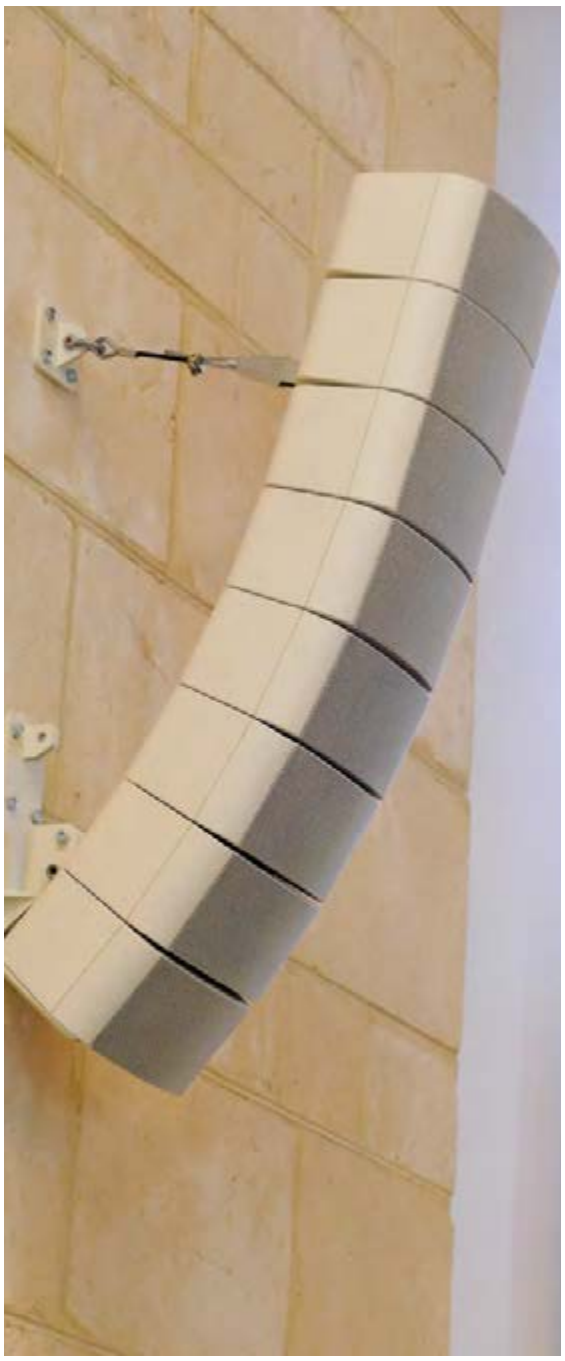
An Epson EBL-1070 projector outputs DVD playback

Operating with Bosch Agenda Management, the centralised control provides audio to the digital Liberty Meeting Recorder. “The PC-based evidential recorder is well-designed for this type of environment,” explains Herring. “The recorder wholly integrates with MS Word, and time stamps can be inserted at any point into the document as the minutes are produced. Following the meeting, the audio can be monitored and proofread for corrections. For higher-quality transcriptions and speech management such as meeting minutes, the recorder also allows up to four cameras to be inserted, in addition to eight channels of audio recording. A broadcast engine outputs the live audio/video feed to the web for the benefit of local community, if required, but it can also be converted into a non-proprietary format for uploading onto the website the following day.”

Providing the public submission area with a clear visual signal of when to begin and cease talking, an InterSpace FiliBuster cue system, Combi-Tower and Combi-Lamp have been added to the 25-seat chamber setup. Creating scalable matrix distribution over the network, the WyreStorm HD-over-IP AV matrix distribution platform is zoned to provide varying visual outputs. Six vision inputs are provided into this digital system and controlled via Q-Sys TSC-80T touchscreen panel via the TCP/IP network switch. Further sources can be inputted, while zones can be expanded with the addition of more transmitters or receivers.

HDMI video signals in the main council space are provided to 22 councillors on Liliput 15-inch HD executive screens. The vision inputs are broadcast over the Vision LAN network to WyreStorm NHD-100-RX receivers and Kramer VM-4UHD 1:4 and VM-8UX 1:8 distribution amplifiers. Equalised and re-clocked, the 1080p@60Hz HDMI signals are then outputted to the displays. The mayor and executive officer on the front bench receive exclusive HDMI feeds on their individual displays equipped with a dedicated receiver, allowing different outputs to those shown for the councillors.

Visually, the public gallery is enhanced with Samsung 82-inch HD displays mounted on the left and right walls with Chief PDRUB mounted brackets, while a third Samsung 82-inch display outside the chambers provides an overflow display. The HD outputs are connected by further WyreStorm receivers that sit behind these large screens to provide the output. A Chief RPMAUW universal mounting kit has been used to install the new Epson EBL-1070 laser projector system to the low ceiling at the rear of the room, with added QLAN network connectivity enabling Q-Sys control.



Speech intelligibility is reinforced by L-R Martin Audio O-Line modules

> *“Once the works have been completed, training the operatives and the council staff is a vital part of the process. They need to know how the system works and how to control it.”*

The Q-Sys control and DSP platform is a game-changer for Redfish Technologies. “I’d used another brand of DSP for many years but, having trialled Q-Sys in 2018, I was impressed by its capabilities,” adds Herring. “In addition to providing the most powerful DSP on the market, it comes with its own control platform. It’s simple to programme, flexible, cost-effective and, aesthetically, it blends in. The Q-Sys Core 110f processor provides more than our DSP requirements, in addition to coming with a huge amount of extra functionality. As a result, no other control system or touchpanels were required. The Q-Sys system controls the WyreStorm NetworkHD system and can route any input to any output. This platform offers abundant future-proofing capabilities for the city should they decide to further upgrade in six months’ or six years’ time, such as added screens or inputs.”

As Redfish Technologies was introducing Q-Sys for the first time, QSC distributor Technical Audio Group (TAG) worked very closely with its client to ensure the project was a success. “I had been promoting the virtues of Q-Sys to Stuart for some time before this project,” says TAG WA sales manager, Marc Sharman. “From the initial design and documentation to support during the commissioning, it was important that I assisted Redfish. With ease of programming in mind, Joondalup leant itself well for capitalising on both the control capabilities and audio processing functionality of Q-Sys. It is a complete AV platform and, with the control side, the fully developed GUI benefits the technical staff in the council. The control panel GUI on the dedicated QSC TSC-80T touchscreen control panel provides quick switching and selection from the Vision inputs to the required number of output zones.”

The main audio signal from the Bosch Dicentis DCNM-APS central discussion system is routed to the Q-Sys Core 110f processor. Further inputs including a Denon Pro Blu-ray and CD player, together with four channels of Sennheiser ew 500 G4 wireless using MKE2 clip-on lavaliers and e945 handheld wireless mics, enable video and music playback during citizenship ceremonies within the same chamber. Transmission is boosted by hidden A-2003-UHF antennas and ASA-214-UHF splitters. AES signals are then output to three distinct zones via QSC MP-A40V two-channel and MP-A80V eight-channel amplifiers. The pre-existing QSC AD-C8T-LP line ceiling speakers in the foyer are output at 100V impedance, while three Martin Audio CDD8 speakers cater for seated guests in the public gallery. However, a more bespoke sound reinforcement solution was required for the third zone.

“Even though I had studied the plans, I was slightly overwhelmed by the acoustic challenges presented by the room,” says Sharman. “As speech intelligibility was the overriding criteria for the chamber, I recommended that the Martin Audio O-Line be added.” Following a full evaluation, a front of house system comprising eight modules per side are driven in low impedance mode. Delay settings have been applied to the 100V line ceiling speakers and CDD8 enclosures.

“Initially, I came up with a concept and sent pictures and details to the TAG design team in Sydney who verified the design,” furthers Sharman. “Following simulation, the Martin Audio software was used to calculate the number of speakers to be used, STI predictions, coverage needed and approximate angles for splaying between cabinets so we could confidently give Redfish an estimate. Once approved, we provided the exact angles and heights above the floor in addition to the chambers with the three different floor levels. Finally, there was a requirement to have these painted to match the stone wall colour of the chamber. Their colour chart allowed us to match this with an RAL – a Dulux Barrister White (PN1E6) – and we painted the arrays prior to assembly in Sydney before shipping.”

The Q-Sys system driving the arrays is set up in one box resolution with one MP-A80V amplifier channel used per array. The outputs on the Core 110f allow individual elements to be driven and tuned according to the throw and EQ required. A final output from the Core 110f connects to a Williams Sound IR assistive listening system. The absence of induction loops meant an IR solution had to be adopted, particularly as audio bleeding can’t be tolerated in such a sensitive environment. “Following the upgrade, the STI average has been increased to 0.74,” confirms Herring. “This reading was better than we could have initially hoped for.”

Reflecting on Redfish’s decision to debut the Dicentis, Q-Sys and WyreStorm digital technologies together, Herring asserts that he suffered no nerves prior to the chambers going live. “Once the works have been completed, training the operatives and the council staff is a vital part of the process. They need to know how the system works and how to control it without getting lost in there, so the GUIs need to be intuitive. We spent the last day-and-a-half with the client and relevant workforce hosting various three-hour training classes.” Should any gaps in knowledge remain, Redfish has published a thorough customised reference guide for staff as part of the final documentation deliverables.

The Redfish founder admits, however, that not everything went exactly to plan. “Before we drilled into the limestone block walls, they appeared solid, but they were in fact very soft,” he says. “My installation teams leader always builds in contingencies to allow time for these challenges, but the client in this instance was also flexible with the times, allowing us to work late onsite and reposition some speakers and visual fixtures.”

Having dug deep into the narrow but rich seam of local governance, Herring’s open-mindedness and impartiality have provided a seamless service for his clients.

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