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Published by Juliusmedia Group Pty ltd ACN 134170460 under licence from CX Network Pty Ltd ACN 153165167.
Locked Bag 30, Epping NSW 1710 Australia
Phone: +61 2 408 498 180
Email: mail@juliusmedia.com

Editor: Jason Allen
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Apogee Electronics has partnered with Amber Technology as a sole distributor of a range of Apogee audio recording products. Apogee, an American audio interface provider, allows musicians and music professionals to record studio-quality audio from anywhere in the world.

Apogee has a diverse product range, from small handheld recording interfaces for iPad and iPhone to multichannel live venue and studio systems for Mac. Apogee's products are widely regarded as the reference standard in the professional audio industry.

"Amber Technology are excited to be working alongside Apogee and introducing its highly respected products into the Australian market," commented Peter Amos, group managing director, Amber Technology. "With over three decades of experience designing and engineering superior audio recording devices and interfaces, Apogee's high-quality products have contributed to the success of countless GRAMMY and OSCAR award-winning artists."

Apogee products provide the ultimate in audio quality, portability and convenience. The Apogee range is available now from Amber Technology. For stockist enquiries please visit the new Amber Technology website www.ambertech.com.au or contact 1800 251 367.

JBL A8 LAUNCH – IT'S JBL, BUT NOT AS YOU KNOW IT

by Jason Allen

The great and the good of the audio community gathered at CMI's Melbourne HQ on Wednesday 27 Feb to hear the new, fresh-off-the-plane JBL A8 line array. Hosted by Harman's George Georgalis (Product Manager – Tour Sound Amps, Speakers & DSP), the crowd were treated to the usual PowerPoint talk through, which was followed by some insightful and well-answered questions largely about how competitive JBL is against its more rider-dominant European cousins. To which the answers were; quite, particularly in the US, and becoming more so internationally.

But the proof is in the listening. Outside on CMI's demo area/driveway hung 10 elements of A8, paired with SRX subs, as the A Series matched subs hadn't made the same shipment. I'll be honest – with the exception of the odd JBL wedge that is excellent for cut-through, I've never been a fan of the JBL sound. That famous 'bark' and American timbre is not for a prissy theatre sound tech the likes of me. The A8 however, sounds nothing like any JBL I've ever heard. It's smooth, almost neutral, and dare I say, European in its voicing. This is not the 1980s JBL we knew.

After listening to several test tracks at various points through its coverage, I would be happy to mix on an A8, and not just a rock band; they're a versatile box. I went in to the listening session with my built-in JBL prejudice whispering 'notch out that bark around 1kHz and the annoying fizz at 3kHz' but it just didn't need to be done. The HF is remarkably improved, even from just one generation of product ago.

"It's the new compression driver that makes the biggest audible difference," explained George Georgalis. "This whole product was

HARRY THE HIRER GOES TO THE SHOW

Sydney Showground and the Royal Agricultural Society of NSW (RAS) have appointed Harry the Hirer Productions as a preferred partner for all in-house audio visual requirements.

The announcement follows a four-month review and tender process, in which Harry the Hirer showcased its ability to help lead and shape the venue's AV vision for years to come.

Sydney Showground chief operating officer Darryl Jeffrey welcomed the new partnership.

"Our team has always demonstrated a drive to take on challenges and create unforgettable events," he said. "We need a partner by our side who will continue to push boundaries and support our clients with fantastic AV vision, Harry the Hirer has proven its ability to provide that service."

Simon Finlayson, general manager of productions at Harry the Hirer, said the company is looking forward to a great partnership; "Our range of industry leading technical services, including non-traditional AV services, such as rigging and electrical reticulation, will benefit many events and exhibitions held within the venue, with the added advantage that a large number of clients will already have strong connections to our team," he said. "Thank you to the Showground management in supporting us to provide a key role within their business."

Tech Upgrade for Sydney Showground

The news comes as Sydney Showground also reveals a major Wi-Fi upgrade for the venue.

Following a successful trial, an integrated Wi-Fi system will be implemented across the venue providing free access to all visitors ahead of the ICC T20 World Cup 2020.

The initiative has been supported by the NSW Government as part of improving spectator experience for the ICC T20 World Cup 2020 tournament, where Sydney Showground Stadium will host the Women's World Cup Opening ceremony and four Group Stage matches.

Sydney Showground general manager Peter Thorpe said access to free Wi-Fi is a step in the right direction for the stadium. "This installation is the first step in a greater technological upgrade planned for Sydney Showground Stadium," Mr Thorpe said, "We pride ourselves on offering big experiences and in order to do so must continue to grow and adapt."

a new design from the component level, and we're no longer using metallic domes. We've changed the compression drivers to a composite material with a much better response, which makes the HF far less aggressive and much smoother sounding. A lot of R&D went into the HF drivers, as well as how to integrate all the new components together. The A8s have all new packaging and rigging, and travel in carts of four, which is far more efficient in terms of tracking and transport."

The icing on the cake was a demonstration by the CMI crew just how easy it was to roll in, rig, fly, and then roll out the A Series when they swapped the A8s for the A12s. It was smooth and blindingly quick, and with all due respect to CMI's audio sales team, if they can do it that quickly, real road crew will be like lightning.

With a lot of audio engineers in Australia professing, as I did, a certain dislike for JBL, the brand has work to do to cut through the snobbery. "JBL has a huge legacy, which is its advantage," explained George. "We make our own transducers, and engineer everything from the ground up. The compression driver and waveguide used in the A8 is new technology that was developed just for the A Series. There are now demo systems in Australia, and the system speaks for itself. JBL have listened to feedback from the global customer base, including Australia, and paid attention to the international market. If you're an audio tech, get in front of the system and you'll change your opinion."

NEP MOVING TO AMALGAMATE AUSTRALIAN AND NZ PRODUCTION FIRMS

by Julius Grafton

There's consolidation in the wind after Freeman sold their venue AV business to their major competitor PSAV recently, creating a dominant venue AV provider in the USA, and potentially changing the face of Australia's Encore Event Technologies. PSAV may not try to do in Australia the things they do in the USA, but crazy things still could happen across their 60+ hotel venues here.

But the stalking giant right now is NEP Group, a USA privately owned international production conglomerate that provides outsourced services for major events and TV networks throughout the world. In Australia they most recently acquired live video house Big Picture, and in 2014 snagged Global Television. Over the past 12 months they've acquired six sizeable operations world-wide.

NEP are owned by The Carlyle Group who have funds under management north of 200 billion (US$). NEP have backing from the deepest pockets on the planet. They also had an Australian in a major role until 2017 when COO Keith Andrews died sadly and suddenly. Australia is in their DNA.

Now the local production industry are all talking, and the talk is that NEP want to move in hard. Industry sources tell me that Chameleon Touring, NW Group and possibly smaller Adelaide company Novatech Creative Event Technologies (NCET) are all in play. NCET are admired for their 'system', which has seen a small city production supplier grow to 50+ staff.

Some other significant names have been mentioned.

Also on the horizon are changes at PRG - Production Resource Group, the New York based major provider of event production. They have a sizeable Australian operation which they bought from Staging Connections (now Encore, owned by PSAV) who in turn acquired them from Bytecraft. Are you confused yet?

The final actor in this game of musical chairs could well be giant Canadian audio firm Solotech, which recently acquired SSE Audio Group in the UK. They presently have no physical presence in Australia, but with arch rivals Clair Brothers now owning JPJ Audio, and Eighth Day Sound operating from Sydney, anything is possible.

VuePix Infiled Adds Spark for the Finest Australian Bubbles…

Domaine Chandon – flying the flag as the only Australian sparkling specialist with genuine French heritage – has recently undergone a major upgrade of their facilities, which included a brand new VuePix Infiled LED wall installed in their wine exhibit space.

In June of 2018, the team at Alaud creative studio reached out to their partners at Vision One to collaborate on an audio visual project for their client Domaine Chandon. And the Vision One creative team was ready to sparkle!

Working closely with the VuePix Infiled team to specify the very best solution for the client, the Vision One team installed a breathtaking 4m x 1.5m QE series LED wall display with a 2.6mm pixel pitch into the venue. The QE series lightweight panels allowed for a quick and easy installation of a seamless display. Featuring high brightness LEDs, the new VuePix Infiled LED wall delivered a stunning visual performance as part of the Chandon wine exhibit. The custom content for the screen was created by Alaud studio and is distributed via a Novastar Taurus Series TB6 Multimedia Player. The LED wall system provides an easy front service access for future maintenance.

Located in Melbourne's prestigious Yarra Valley, Domaine Chandon is one of the leaders of the Australian sparkling wine market, exclusively producing sparkling wines from the traditional Champagne varieties of Chardonnay, Pinot Noir and Pinot Meunier. The Chandon wines couple Australian expertise with 250 years of Champagne history in every bottle. The Chandon wine makers pride themselves on pairing innovation with the traditional alchemy of bubbles. The Vision One team delivered exactly the same with this project – first class innovative LED technology for the client's wine tradition exhibit.

...while Audio Plus Invests in VuePix Infiled ER Series

Audio Plus, a long running and rapidly growing production company based in central west NSW, have just invested in VuePix Infiled ER4 screens for their rental division.

Audio Plus has worked with VuePix screens for many years, and more recently with the new VuePix Infiled technology in a permanent installation at a local airport featuring VuePix Infiled QE series.

Glenn Richardson, the owner of Audio Plus, comments: "We have been looking into adding additional LED screens into our rental inventory for some time now. The VuePix ER 4.6mm outdoor screen is a perfect fit and natural progression for many of the events and clients we supply Australia wide".

"It was very important for us to purchase from an Australian distributor with a market proven product", explains Glenn. "There is a new 'ME TOO' importer with screens every day and no end to the cheap self-imported products floating around our market. We have been operating for 21 years and are unaware of a more experienced distributor of production rental screens than the team at ULA Group. We could not afford to gamble our reputation on cheap imports."

Audio Plus is now the proud owner of just under 1,000,000 pixels in ER series panels. These were supplied with the newly designed combination header / footer bars and for the first time in Australia featuring 1921 MiniLED chips, which achieve a substantially higher contrast to previous cabinets, especially in outdoor applications. Novastar VX4s controllers will also be used to process and optimise video content on these screens.

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Audio-Technica ES954

The Audio-Technica ES954 is a hanging microphone array for huddle rooms, conference rooms and other meeting spaces. Via DSP control the four-capsule array provides 360-degree coverage through virtual hypercardioid or cardioid outputs which can be steered horizontally and tilted vertically. Intended primarily for videoconferencing applications, the ES954 can be used singly or in multiples to capture every person speaking in a room, with the total number of channels restricted only by the capacity of the DSP controller. When used with the Audio-Technica ATDM-0604 Digital SmartMixer, or other DSP like QSC Q-SYS, the intuitive graphic interface provides control of the width and orientation of each virtual polar pattern which can then be steered in 30-degree increments. A tilt function accommodates differing ceiling heights or users that are sitting/standing.

Australia: TAG
www.tag.com.au
or (02) 9519 0900

New Zealand: Jansen
www.jansen.co.nz
or 0800 452 673

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The UTVIII includes built-in audio, supports multiple HDMI inputs and outputs, has a variety of resolution and size options, ultra high display resolution and ultra wide perspective, providing an immersive visual experience. Ideal for use in exhibitions, meeting rooms, training rooms, classrooms, airports and retail.

Australia and New Zealand: Unilumin unilumin.com or +61 (0) 3 9006 8960

NEW

K-array Lyzard-KZ14

The Lyzard-KZ14 is a miniature loudspeaker designed for discreet use in a variety of intimate environments such as restaurants, bars and museums. Milled from a single bar of aluminium into a slim column that is only 10 cm tall and 2.2 cm wide, the KZ14 has a resistant frame that contains four 0.5” full-range drivers that produce high intelligibility and coherent coverage at an output of 92 dB continuous. The high-efficiency drive units have neodymium magnet structures and suspensions engineered for maximum linear excursion and minimum residual transducer noise.

Australia and New Zealand: NAS
nas.solutions or +61 (0) 3 8756 2600

Martin ELP

The Martin ELP is an ellipsoidal LED fixture available in two versions; the ELP WW (Warm White) offers industry-leading colour rendering and brightness, while the ELP CL (Colour) delivers rich, saturated colours and class-leading output. Both versions can be configured with one of four Martin lens tubes in 19, 26, 36 and 50-degree beam angles. The ELP fixtures are also compatible with third-party lens tubes along with a wide range of accessories including gel frames and gobos for flexibility in lighting design and inventory management.

Australia: Show Technology www.showtech.com.au or (02) 9748 1122

New Zealand: Show Technology www.showtech.com.au or (09) 869 3293

QSC Business Music

QSC has introduced an end-to-end audio solution for background and foreground music reinforcement in retail, restaurant, hospitality and other commercial spaces. Individual products within the system include multi-zone mixers, wall controllers, configurable multi-channel amplifiers, SUB/SAT loudspeaker combinations and accompanying installation and management apps for easy configuration and management.

Australia: TAG www.tag.com.au or (02) 9519 0900
New Zealand: NSL www.nsl.co.nz or (09) 913 6212

GEAR

GLP impression FR1

The GLP impression FR1 runs a 60W RGBW Osram Ostar LED source rated for 50,000 hours with a CRI of 80. Its optical system produces focused octagon beams down to 5° with a fast 1:10 zoom and a flat field wash of 35°. It offers flicker-free operation with flexible PWM, smooth electronic dimming from 0-100%, and variable electronic strobe from 1-10Hz. It's capable of 540° continuous pan rotation and 220° tilt with 16-bit resolution and position feedback. Effects include a Virtual Color wheel with match referenced LEE colours, and its colour temperature can be set form 2,500 K to 10,000 K.

Australia: TLC
thelightingcollective.com.au or (07) 5539 2142

New Zealand: Kenderdine Electrical
kelpls.co.nz or (09) 302 4100

Earthworks IMDL1

The IMDL1 is a directional boundary microphone designed for permanent installation. The IMDL1 comes in a black or stainless steel finish and features the LumiComm Touch Ring, which consists of a dual-colour LED light ring and a touch sensor output, providing integrators complete freedom to assign function and LED colour with a media control system. Measuring just under 40.5mm in diameter and 17.78mm tall when installed, the IMDL1 provides a low-profile appearance. Frequency response is 20Hz to 30kHz and optimised for speech. The polar pattern is cardioid, and max acoustic input is 145dB SPL with a sensitivity of 10mV/Pa.

Australia and New Zealand:
Audio Brands Australia
www.audiobrands.com.au
or (02) 9659 7711

Chauvet DJ EZBar

The EZBar is a battery powered LED bar with three independent warm white pin spots designed to accent event space elements. Quick to charge and capable of running up to 8hrs on maximum output, each of the 3 pin spots can be easily re-positioned and angled, and is supplied with 10° and 25° diffusers to suit various applications. A magnetic fixing system allows installation onto most metallic surfaces, while M10 fixtures are included for conventional clamps or hooks. The EZBar has 4 dimming curves that can be accessed via the LED dimming button on the unit or by using the IRC-6 remote.

Chauvet DJ VIVID 4 and VIVID Drive 28N

The Vivid 4 is a premium modular LED video panel that displays content without the need of media servers, perfect for the portable market. Utilising black body LEDs that accurately reproduce high-contrast videos, and a high 1920Hz refresh rate, set up is easy and fast with multiple magnets and positioning pins that make getting up and running tool-free and effortless. Each panel features dual power supplies to ensure downstream panels don't lose signal, while intelligent modules with dedicated memory improve the image quality and simplify maintenance. Panels can be suspended vertically or horizontally offering different aspect ratio options.

The new VIVID Drive 28N controls panel configuration and automatically scales media to the perfect size for the panels. VIVID Drive 28N has the setup configuration built-in, allowing users to create and configure the panels in the field with no computer connection - simply setup the screen and then connect the media source.

Australia: AVE www.avecorp.com.au or (03) 9706 5325

New Zealand: M.D.R Sound & Lighting www.mdrlighting.co.nz or (06) 355 5073

NEW GEAR

ENTTEC Pixel Octo

The new Pixel Octo from ENTTEC allows for the control of LED digital pixel strips through both an intuitive web interface, or by receiving up to 8 Universes of DMX. Each of the Pixel Octo's two outputs can support both 3- and 4-wire LED pixel protocols, ensuring compatibility with a wide range of the most popular products. In addition to this, ENTTEC consulted many industry professionals to ensure that the Pixel Octo would be the ultimate installer-friendly device.

ENTTEC Pixel Triton

The Pixel Triton is ENTTEC's high-power LED digital pixel driver built for use within both the live entertainment and installation sectors. The Triton's main function is to convert up to 8 Universes of DMX protocol to pixel data and output it through each of its two ruggedized XLR connectors alongside 260W (12v) or 300W (24v) of power directly to your LED pixels. Perfect for quick installations or large-scale touring projects requiring a simple, one-box solution.

Australia and New Zealand: www.enttec.com or +61 (0) 3 9763 5755

Tascam MX-8A

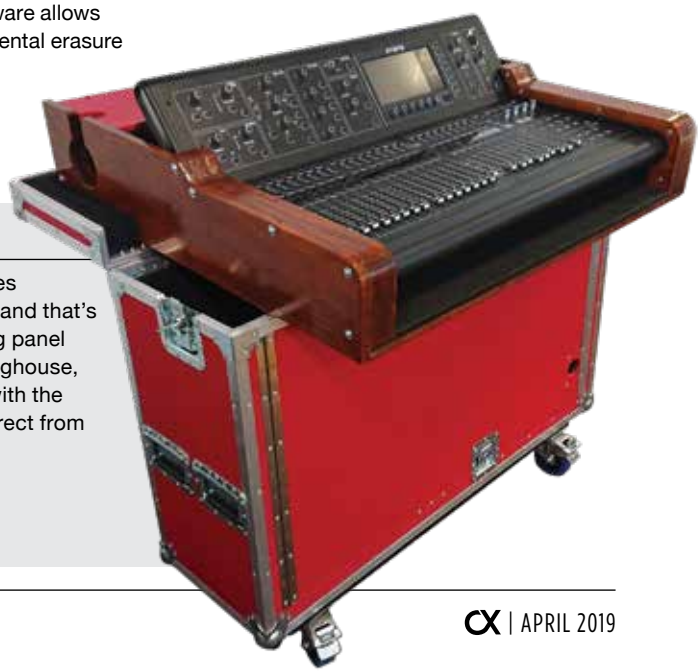
The Tascam MX-8A is a Matrix Mixer equipped with 8 mic / line inputs and 8 line outputs, integrated DSP, and 2x2 USB audio interface. MX Connect software allows system integrators control over the configuration and settings of an entire system, while EZ connect software allows end users basic control without access to higher end functions to ensure no accidental erasure of setups.

Tascam Dante Compact Processors

The Dante Compact Processor (DCP) Series provide easy additional mic/line or AES/EBU input/output to any application where Dante distribution is being used. They are the optimal input/output unit for small scale environments where larger channel counts are not required, or as satellite I/O in larger systems. Their DCP Connect software allows system integrators control over the configuration and settings of an entire system, while the EZ connect software allows end users basic control without access to higher end functions to ensure no accidental erasure of setups.

Australia: CMI Audio www.cmi.com.au or (03) 9315 2244

New Zealand: Direct Imports directimports.co.nz or (06) 873 0129



Cases Com Au TILT-STATION

The Cases Com Au TILT-STATION is a road case for mixers and control surfaces designed for one-person set-up. Remove the lids, tilt up mixer, close front lid, and that's it - all in under 20 seconds. Many customisation choices are available including panel colours, gas struts to do the lifting, storage boxes for monitors and cabling, doghouse, and rack modules and sliders under the console. Customers can work direct with the case designers (and not sales people) to create their perfect case. Available direct from the manufacturer at Cases.Com.Au

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AVD GIVE IT A BIG BASH WITH EAW'S RADIUS

by Fraser Walker

EAW created a stir in the live audio market in 2013 with the release of its flagship adaptive Anya system.

Picking up where Martin's MLA left off, Anya was completely electronically steered thanks to its 22 individual transducers fed from 22 channels of onboard DSP and amplification per cabinet. Even six years after its release, Anya is arguably still the most technologically advanced large format PA to date. Whilst EAW has proven Anya's technology in the hotly contested field of touring and festival production, the fact remains that the adaptive series is inaccessible to a large proportion of production companies and venues by means of scale and cost. Thankfully, EAW's Radius series has inherited some DNA from its concept driven sibling to deliver functionality well above its weight.

With Radius and its accompanying Mosaic software, EAW has managed to rectify a major issue facing this sector of the market: line arrays are not a point and shoot solution, yet many are marketed at end users who cannot justify the design time and training on the CAD software required to deploy them correctly. Coupling this frustration is that for many operators, there are no venue drawings supplied in advance anyway; you get the gear in the room on the day of the show and do the best you can. Mosaic has basic venue templates and a touch-focused interface that could see most venues drawn in under 10 minutes with a laser distometer and an iPad. A quick optimise feature with sliding scales for SPL and coverage will give you ideal trim heights and inter-cabinet splay angles depending on the desired result. It is line array optimisation for the point-and-shoot crowd.

While 15 minutes seems a reasonable time allowed for system design, such luxuries do not always exist. Enter the OptiLogic system built into every cabinet. Infrared sensors at the top and bottom of each cabinet are used to identify their position in an array. The inclinometer will ascertain the inter-cabinet angles and the onscreen menu of any cabinet can be used to enter the near and far throw distance and desired tuning. OptiLogic will then optimise the array wavefront to suit - literally point-and-shoot. I seem to be coming back on my words here, but the trick here is that the Radius array knows what it is comprised of, and what the desired outcome is.

To complement the rear panel interface, every cabinet is equipped with Dante ports. Enabling wireless control with Dante has been a source of much apprehension in the past, and EAW have cleverly mitigated this with a third network port, multicast filtered and dedicated for a wireless router or access point. Once wireless, Mosaic on iPad becomes a full functioning system remote control, able to process arrays as a whole or grant access to cabinets individually for more granular control. Of course Dante is not required for Mosaic remote control – but it will be a welcome addition for many users.

Audio Visual Dynamics has taken an inventory of 12x RSX208L and 4x RSX18F and have recently been putting it through its paces on the Big Bash League Cricket matches held at Marvel Stadium. The system was comprised of 4x ground stacks of 3x RSX208L over 1x RSX18F, secured via an inverted flybar. The groundstacks were placed in each quadrant of the field and brought the impact of the action down to the lower levels, with the stadium PA covering intelligibility above the third floor.

Tim Murrell, Operations Manager for AVD at Marvel Stadium has kept the initial deployment very simple, however the intuitive Radius system is already delivering benefits.

"We ran each stack as analogue input, and controlled DSP via the back panel interface. It was incredibly simple to setup. The rear menu system enables you to set near and far throw distances, as well as the delay required to align to the stadium system." Thanks to the OptiLogic IR sensors, the delay time was automatically applied to each cabinet in the array, and the inclinometer will flip the on screen display when the cabinets are inverted for groundstacks.

"After receiving some feedback after the first game we realised we needed a bit more level and intelligibility on the third level, and adjusting the far throw distance from 40m to 50m achieved this effortlessly."

AVD's previous solution was a small format array, with multiple cabinets linked per amplifier. Having granular amplification and DSP has enabled a much smoother distribution of SPL across the listening area, not to mention they no longer need to run 3-phase power out to the amp racks. Each stack is idling away on a single 10amp supply.

For all the smart and automatic features, there is still scope for experienced operators to gain the best results from Radius by using more detailed room modeling in EAW's Resolution software and dual channel FFT analysers for optimisation. However where time or user experience does not permit such activities – EAW has delivered a powerful series of clever loudspeakers that work together to achieve an impressive end result from minimal user input.

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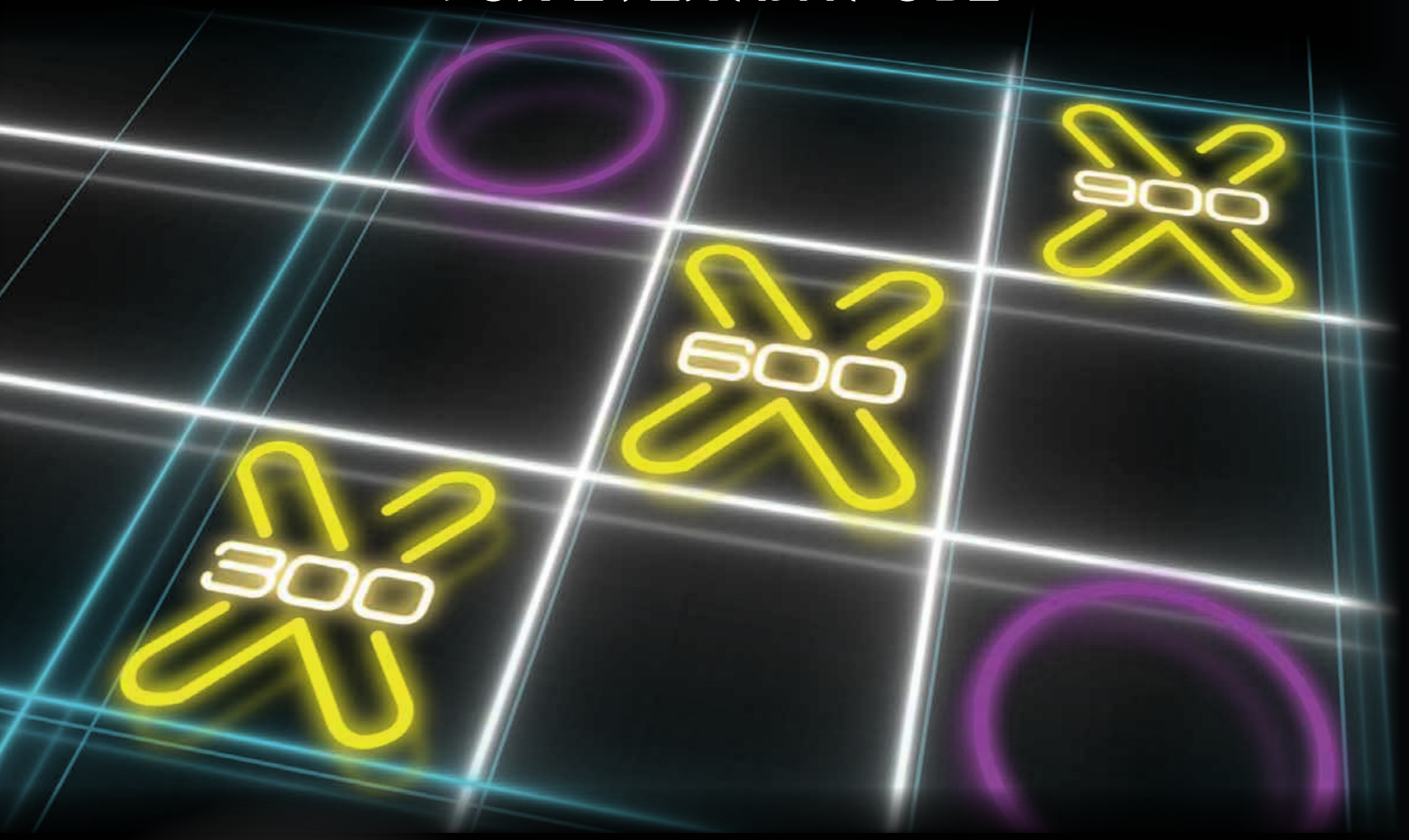

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CLAYPAKY AN OSRAM BUSINESS

BRYAN FERRY

by Cat Strom

Bryan Ferry has a reputation as an artistic performer who cares deeply about his music, constantly changing arrangements and songs.

Audio

With an outstanding ear for the songs' arrangement, both Bryan's FOH and monitor mix require constant, active mixing throughout each song at a very detailed level.

FOH engineer Davide Lombardi has worked with other iconic British singers such as Kate Bush, Ed Sheeran, Gary Barlow, and Tom Jones. When the Ferry tour finishes, he hits the road with Dido who has finally released another album after a 15 year hiatus.

"This tour has been going for a while, but then again, Bryan never really stops," remarked Davide. "He goes out every year but never for a long time, a maximum of four weeks at one time"

The tours utilised an L-Acoustics K1/K2 PA system with SB28s subs and a front face of ARCs and 108s, all controlled by a Lake and LA network. At the ICC in Sydney the set up was 12 K1s and four K2s on the main hangs with side hangs of 12 K2s, four subs flown, four ARCs per side as outfills, two ARCs per side as infill, and 218s as front fills.

"The venue here is very steep so we've had to fly quite high in order to cover the very top seats," said Davide. "We spend a lot of time tuning, making sure that there is a good balance between delays and gain structure in order to get the image back to where Bryan is. Also, Bryan is not a powerful singer so the more coverage there is, the better it is to control his vocal."

Out front Davide was mixing on a DiGiCo SD10, saying the way he mixes is pretty simple, with little in the way of routing. He doesn't use plugins and the only external effect he had was a Bricasti M7 reverb, which he loves, and a TC Electronic D2 delay unit especially used for the saxophone to recreate an 80s sound. An SPX 2000 is used for effect in just one moment of one song.

"It's really very simple," added Davide. "Everything is routed into groups going to the matrix and then out of the matrix into the Lake and then out into the LA Network. I get a lot of precision from stage which is why it is simple. Before making changes on the console, we work a lot with the band adjusting levels with them when we can so we don't change the

sound too much. I try to leave it as natural and organic as possible."

Davide's biggest challenge is getting Bryan's vocal above everything else as he is a gentle singer and talker, and can sometimes mumble!

As well as Bryan, there are eight people onstage and with his music being very busy, there is not much space left for his vocal to cut through. However Davide says that is something Bryan seeks as he wants to express himself with his music rather than his voice. The result is a lot going on for Davide with a 'proper' live mix.

"There are constant changes and we can't rest for one second," he said. "There are layers and layers happening all the time."

Bryan uses an Audio Technica 6100 microphone, a dynamic mic that has condenser characteristics according to monitor engineer Tom Howat.

"It's an interesting mic, although you could potentially get a lot of spill in it, so a lot of what we do is containment," Tom commented. "It's a good choice though because it's not a condenser mic but you still get a quality output from it and Bryan really likes it."

Modeling amps are used for the guitars so there are no guitar amps onstage to help keep spill under control.

Sax mics are from SD Systems; again, they are dynamic, and have tripod prongs that clip onto the bell of the horn.

"They give you a very nice rich sax tone," said Tom. "We have DPAs for the violin and the rest is pretty standard, although the Shure SM57 on the washboard is a highlight of the show."

Tom mixed monitors on an Allen and Heath dLive, his console of choice but fessed up to having a history with it as he was part of the development team!

"It's a great sounding console, is very powerful, and is good for IEMs," he added. "We did some orchestra shows last year and I completely maxed it out, used the modularity of the system to expand with it which is all very cool."

Everyone was on IEMs; Sennheiser 2050s, with Tom having 16 transmitters. Only the drums were hard-wired.

"Mixing monitors for Bryan is a very parallel equation to Davide - precision, accuracy, coping with what he's hearing and wanting to hear," said Tom. "And also like the FOH mix, you're riding every solo and readjusting all the time. The band basically get my attention during the soundcheck and I'm pretty much pinned on Bryan through the show. It's mix, mix, mix and without snapshots I'd be lost on this one. The musicians play different instruments so there's a fair bit of rotation there. Arrangements are everything with Bryan and I have to mix monitors as if I'm mixing out front, you can't leave it alone for a minute. With the vocal you're riding that fader up and down, pulling it back every time he's not singing – so the finger grips that fader all the time."

Tom reveals that he has to watch Bryan closely taking cues from whatever he is looking at, maybe something has to go up or down depending upon the look on his face. Reading his body language is a key part of Tom's job.

Davide discovered that the ICC room had specific places that sounded quite different and he was interested to see how it changed once the audience were in the house.

"The corridor by the FOH has a cancellation about the low end at 40 – 50 Hz so we've been measuring that with Smaart," he said. "You can see when you move the microphone you see a big scoop coming on 50Hz. We've tried to fix it but you can't, it's a natural thing but hopefully it will be better when the audience are in. I always make sure that the mix is not exactly perfect at the FOH, walk around the venue a lot during soundcheck to make sure I find a good balance between everywhere. That takes a long time but it's worth it."

The music comes at them at such a

Matt Arthur - Lighting Director

complicated level it pays off to keep the technical elements as simple as possible whilst using the power of technology to simplify the process.

"Smaart, snapshots ….. all great examples of using technology to enable us to do what we need to do mix wise because that's where it is all at for Bryan," added Tom. "It may sound like it's straightforward but it's not. You bury the technology so the actual hands-on bit really counts. Its old school but using high tech."

JPJ Audio supplied the gear and crew with Davide and Tom commenting on how well they work together as a team.

Lighting

The original lighting design, devised between Rob Sinclair and Bryan, was about creating a classy, classic theatre environment by using crushed red Satinac drapes to frame the stage. There were borders for each of the three main lighting trusses (front/ mid/ back) with a set of legs on the mid truss to create the false proscenium, even in a standard rock venue.

Upstage there is a traveller track with larger Satinac drapes on it that give great depth when lit up - and of course, somewhere to go once it opened about half way through the show.

"It does look the best when in a theatre environment where you can frame the stage nicely with house black legs and borders, but works well in all venues even in the arenas we have played over here," commented Matt Arthur, ex-pat and lighting director on the tour.

A mirror ball was hung centre stage off its own truss and as the story goes, was really the only specific design request from Bryan! That flies in on a Kinesys motor (or two as was the case in Australia) and is a particular highlight for the later part of the set. During the song Jealous Guy it flies into its low position and lights up the entire room.

"This was on a 2ch DMX rotator to allow me to have fast and slow movement in either direction," said Matt. "The truss was trimmed high and the ball was hidden in a black drape so it was only visible once it was flown in. Again, another little trick to have somewhere to go to avoid the show getting too boring."

The lighting, spilt over the three lighting trusses was pretty simple with 14 ETC Source 4 19° profiles for band key light on the front truss and six Martin MAC Vipers. The mid truss held five MAC Vipers and four Source 4 19° profiles for the band positions on the risers there. Finally, the upstage truss had six MAC Vipers on the downstage side and the traveller track on the upstage side.

Behind that was the drapes truss and between the mid and upstage was the mirror ball truss.

"There has been some evolution since this shows inception in 2015, when I first programmed it on WYSIWYG in a small room with Rob in London, before hitting production rehearsals and changing most of it!" laughed Matt. "We started with 40 songs in the desk,

Tom Howat - Monitor Engineer

Davide Lombardi - FOH mix

and now there are over 80 so I have put my stamp on it in that way. Over the past year I have designed and had manufactured some flown set panels that hang in front of the cyc which work well. The main reason to add them was to change the look of things when the curtains open and have something different upstage. As we were going back around to a lot of places and they have seen the show probably at least once before, it was important to present something new and not keep repeating the same old show. The panels are five asymmetric pieces that hang off the front chord of the drapes truss."

With the addition of the set panels, Matt changed the front truss Vipers to Performances so that he could frame around the panels using the internal shutters, which was a nice touch.

Moving forward, he is in the process of redesigning the show for the next legs that go into Europe in May/ June and then onto the USA in July through September.

For this Australian leg which had them come through South Africa, then out to New Zealand and onto Japan, it wasn't possible to freight the set panels.

"But that was a blessing in disguise I think as it forced me to come up with something to replace them," added Matt. "I ended up designing a backdrop that looked like an inflated panel. It's silver velour 'slashes' appliquéd onto a gauze that is hung in front of the white cyc, revealed once the red curtains opened, in an eerie green and in full silhouette."

Again, it was all asymmetric and large scale so it filled the upstage space nicely and with the positive and negative elements created a really cool picture upstage.

Matt added 11 Chauvet Colband LED Strips underneath the drape to uplight it and highlight the texture of the silver velour at times. This was a nice effect that gave them another look as opposed to just having it in silhouette all the time.

Matt reverted back to standard Vipers on the front truss as Phaseshift didn't have Performances, but also as there wasn't really specific areas to 'cut' around, it was better to have broader brush strokes with the standard Vipers … plus a larger gobo choice too.

"The only other thing we didn't have here were the LED strips that would normally have sat top and bottom and around the front and sides of the risers to give it a 'neon' effect to detail the riser edge," said Matt. "Each piece is 8ft and hence were not freightable in this situation."

Along with the Vipers on the trusses, all the floor movers were Viper profiles as well. There were three per side down stage left and right for side light and then there was seven upstage in a line behind the risers.

In addition to these there was a 1.5m pipe each side, just downstage of the red traveller that have three Martin Aura XB's on them and between the 'slash' drape and the cyc there are nine more Auras.

On the floor behind each band member there was a Source 4 with no lens tube to give a wide blast of white light from the floor for punchy moments but to also isolate each member where needed.

"Choosing all spots was a design decision made early by Rob, but they are my favourite fixture and having all of them the same means consistent looks all around," said Matt. "Having six on the front truss means I can get some lovely projection looks onto the red drapes and the backdrops once the curtains open, but also some nice gobo looks on the band too. With the sides and upstage we can get the same, but also some nice big beam and gobo looks coming through the band. And of course the brightness to light up the mirror ball when that appears."

The side Auras on the pipes primarily light the red drapes when they're closed giving a lot of depth and colour back there. Later they also turn forward and shoot through the upstage band to give another look.

"Again, once the curtain opens, especially when we had the panels, they would light them up and create some nice silhouettes of the cutouts onto the cyc," explained Matt. "This run in Australia, with the new backdrop, they helped lift the front side of the backdrop out of the darkness, especially when I didn't have the LED battens on the floor to do this job in South Africa and Japan."

The Auras in between the two drapes primarily lit the cyc this time around to give the big

silhouette of the backdrop which was a big feature on this run. Also when zoomed down and tilting up and down the cyc, they delivered another look to go to. On previous tours when they had the panels, they would also be able to tilt forward and give the washy beam looks through the band that allowed the Vipers then to light the cyc with gobos, whilst not losing any backlight from the floor on the band.

Matt has been a longtime user of the Jands Vista and brought his own Vista on the tour.

"I have been running this console for about 12 years now," he said. "It's a great compact setup that consists of a Mac laptop, one S1 and two M1 control wings. It all fits in a Pelican case and I can make it 23kg if I take out the laptop….so no excuses not to fly it everywhere. Currently I'm running the V3.1 software which is pretty good. I love the ability to copy and paste anything to anywhere and a function called 'Alias Cues' is a god-send! Being laptop driven means that I can edit on a plane or in my hotel room and not have a big setup required. I look forward to using V3.2 software soon. It's a very powerful desk and I like the fact that I don't have to punch in fixture numbers all the time."

Matt says he is super proud of this show and he was proud to bring it back home to Australia and showcase it to his friends and family.

THE WORLD BEFORE DIGITAL PIXELS

by Simon Byrne

Before DVI, HDMI, SDI and Video over IP, we operated strictly in an analogue world.

All video signals and displays were analogue. We didn't talk pixels. We were more interested in "horizontal scan rate", cable, distribution and amplifier bandwidth, as well as voltage loss in the cable runs.

I got into this business in about 1986 when computer projection was just becoming popular in "business theatre" as we used to call it back then. In those days, data display standards were all over the place. The common standard was the Color Graphics Adaptor (CGA). Developed by IBM, it delivered (wait for it), a full sixteen colours with an effective resolution of a massive 320 by 200 pixels. When I say sixteen colours, that was it. Your entire pallet was sixteen colours. It was designed to be largely compatible with standard definition television.

Next from IBM came the Extended Graphics Adaptor (EGA) and it was impressive! Capable of sixteen colours as well, but they were chosen from a pallet of sixty-four. And it had an even higher resolution mode, a full 640 by 350 effective pixels.

You notice that I am saying "effective" pixels. That is because in terms of the displays, they were analogue standards which drew horizontal lines on a CRT display tube. The digital concept of precise pixel addressing on displays was yet to come. The higher the resolution, the higher the horizontal scan rate. Most CRT (Cathode Ray Tube) projectors were capable of displaying CGA, but to display EGA you needed expensive data projectors which could deal with the higher horizontal scan rates and bandwidths.

On top of those two mainstays, you might be presented with a plethora of other standards. SUN SPARC, SGI, DEC, HP, NeXT, Apple MAC, MAC Quadra or PowerMAC. You could buy from Extron "universal" interface

A Barco Graphics 800 CRT data projector. Cost about $35,000 and produced about 800 ANSI Lumens.

kits containing a universal interface, and a range of interface cables that would (hopefully) make it possible to connect the computer to the projector.

Getting this to work was often a real hit and miss affair. We'd routinely do tests prior to taking a booking to make sure we could deliver a large image.

Then came the Video Graphics Array (VGA), and life got simpler. Also developed by IBM, VGA was an analogue RGB signal on a fifteen pin D-sub connector. Initially capable of images up to 800 effective pixels wide and 256 colours, it formed the basis for display technology for the next fifteen years. Other manufacturers latched onto the format and built on it by increasing the colour count as well as resolutions. The VGA connector became the ubiquitous standard which evolved into SVGA, XGA, SXGA, WGA and UXGA to name but a few. They are all essentially variations and improvements of the original VGA technology.

Because the RGB signals were analogue of about 1.1 volts peak to peak (at full white), any voltage loss in cabling resulted in darker images. You never passively split a signal for this reason, but also mismatched impedance in cables would produce ghosting. Induced noise, earth loops and reduced frequency response were problems that had to be managed too. You could for example, get an earth loop or dimmer buzz in your audio circuits, via the video cabling and vice versa because they shared a common earth.

Cathode Ray Tube (CRT) projectors were the most popular technology. A good CRT projector was capable of a peak white light output of about 500 lumens (in ANSI output, say 230 ANSI lumens) and weighed about forty-five plus kilograms. It would have three, seven to nine inch CRT tubes. One for red, one for green and of course one for blue. The blue CRT was the hardest to manufacturer. It was a compromise between sharpness and brightness, so blue always looked a bit soft.

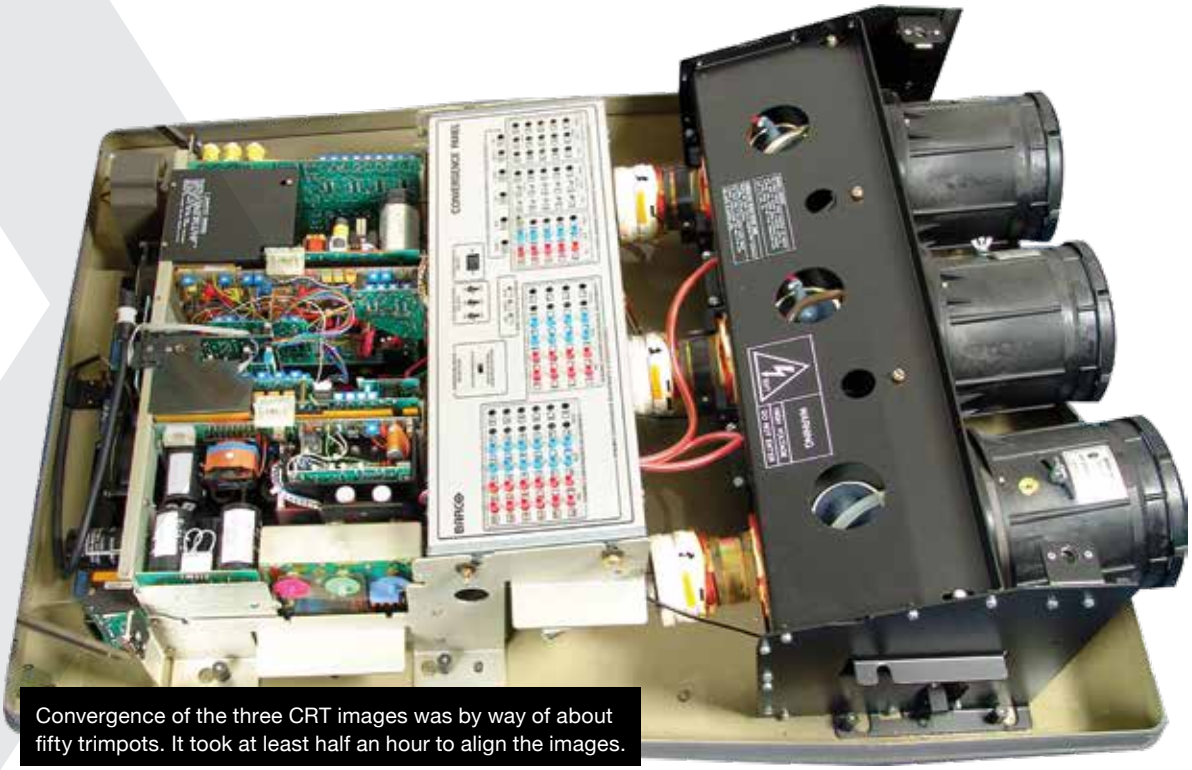
The Extron Universal Interface was a workhorse. It let you match up and drive the analog RGBHV signals to the CRT projector.

Sony was easily the king of CRT projector manufacturers, and Barco were known for their high resolution, but temperamental machines. Back in the late eighties, Barco were still finding their feet in projectors. As we all know, they've since become the world powerhouse in large scale projection.

CRT projectors always had a fixed focal length, usually about 1.2 times the screen width with extremely wide lens apertures to get the maximum light though. Therefore the screens had to be perfectly flat. No zoom lenses were available for this reason, and the CRT tubes were mechanically aligned in the factory. On top of the mechanical alignment, the images on the CRTs also had to be electronically converged too. This was done with about fifty separate trimpots whilst looking at a crosshatch. You'd start off by getting the green tube looking nice and square, then you'd align red over the green, and then do the procedure again with blue. Recall that this is all analogue so the circuitry would drift so that meant to do a proper lineup took at least half an hour, and had to be done for every job. Especially if the projector was reconfigured for front/rear projection, or desktop/ceiling mount. This required flipping the polarity on high voltage connectors that fed the horizontal sweep in the CRT tubes.

The cabling was done by way of five-way BNC looms. Red, Green, Blue, Horizontal Sync and Vertical Sync, or RGBHV. The signal path was usually computer output into an interface. The interface let you adjust the horizontal image centering, sometimes vertical centering, as well as amplify the RGB signals so as to permit driving long lines. They often had gain, and peaking adjustments which was a high frequency adjustment which was useful for restoring image quality lost over long RGBHV runs.

Seamless switching between computer sources? There was none of that! Because the signals were analogue RGBHV with slightly different sync timings, it was beyond manufacturing at the time (at a reasonable price at least). The best you could do was a neat dip to black between sources.



Convergence of the three CRT images was by way of about fifty trimpots. It took at least half an hour to align the images.

It was messy and expensive by today's standards, but it worked.

Microsoft Powerpoint came out in May 1990 with Windows 3. That combined with LCD projectors coming out in the mid 1990s changed everything. Suddenly things got easier, brighter, more flexible (zoom lenses) as well as cheaper. Clients could do their own Powerpoint presentations and simply plug into a projector. Presentations had come of age!

MULTIV

- Multiple Users, Multiple Independent Viewpoints

What do we mean by “MultiView”?

We’ve all seen stereoscopic, “3D” images, where our left and right eyes see different views, the effect being that we get a perception of distance and depth. In these conventional 3D installations, everyone sees the same images, no matter where they are positioned relative to the screen, so just two images are required, one for all the audiences left eyes and one for all of their right eyes. This is acceptable where the audience is seated some distance from the screen and they are viewing pre-prepared content, such as a 3D movie.

What if we want the viewers to be able to move around relative to the screen and interact with the projected 3D images in a way that makes sense from their changing viewing angles and distances? In other words, we want viewers to be able to get out of their seats and walk up to and around the 3D object as it floats in space before them! It is already possible for an individual to view images in this way through a process called “Head-Tracking”: the projection system uses camera-based technology to follow a viewer and update his 3D view as his position changes. This works well for one viewer, however other viewers looking at the screen will be frustrated that the image from their perspective will not make sense.

Digital Projection has developed a way to allow up to six viewers to each see high quality 3D images on a common screen. Each of the six viewers can move around and view a 3D image that remains convincing from their individual changing perspectives.

The impact of this is transformative: not only does each viewer become immersed in his 3D environment, but the confidence that the other viewers also see things correctly and contextually from their differing positions creates a truly collaborative environment. That’s MultiView!

The Key Facts:

Collaboration

- MultiView enables new, collaborative environments by allowing multiple users each to see their own 3D perspective
- Unlike Head Mounted Displays, MultiView participants are not closed off from each other, so their environment is truly shared

Technology

- Native 4K Resolution projectors running at 360 frames per second (fps)
- 6 x DisplayPort inputs, each at up to 4096 x 2160 x 60fps
- Industry standard synchronisation signal for 3D Active Shutter Glasses
- Collaboration with a specialist manufacturer has led to glasses that can switch between the black and transmissive states in around 200µ. That is three times faster than any other commercially available glasses
- For the user to “observe” their correct perspective view of the shared scene, they must be tracked to 6 Degrees of Freedom [6DOF]. So, in addition to the usual spatial positions (x,y,z) we track roll, pitch and yaw of the observer’s head

The MultiView Projector

To achieve good quality, flicker-free 3D images, each viewer needs to see 120 frames per second (60 frames per second, per eye).

Digital Projection has developed a projector that can display 360 frames per second, so one projector can support three 3D viewers.

We have also developed a very efficient way to combine two of these projectors to support six viewers. Each of these views is displayed in true native 4k resolution with great colour and dynamic range.

As shown in Figure 1, each projector can accept six DisplayPort inputs, each at up to 4096 x 2160 x 60fps. For a three viewer system, we accept six, 4k images (three Left Eye and three Right Eye) in parallel, then display them sequentially at 360 frames per second.

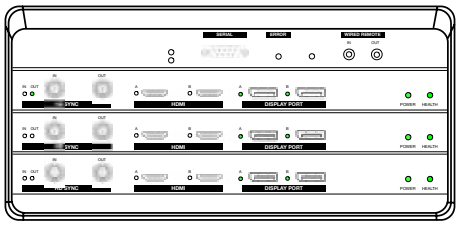


Figure 1 - Inputs for Digital Projection INSIGHT 360 HFR Stereo MultiView Projector

IEW

Each input card in the INSIGHT 4K HFR 360 is dedicated to one of the three users, their left and right eye frames being fed to inputs DISPLAY PORT A and DISPLAY B respectively. This enables the building of a PC platform/image generation source using currently available NVIDIA or AMD GPU cards.

The synchronisation signal for 3D active shutter glasses from the projector also remains the same as the industry standard 3D sync used for many years in Digital Cinema. This is recognised widely by companies such as XPAND, Volfoni and Eyes3Shut. It is provided on the BNC connector marked 3D SYNC OUT.

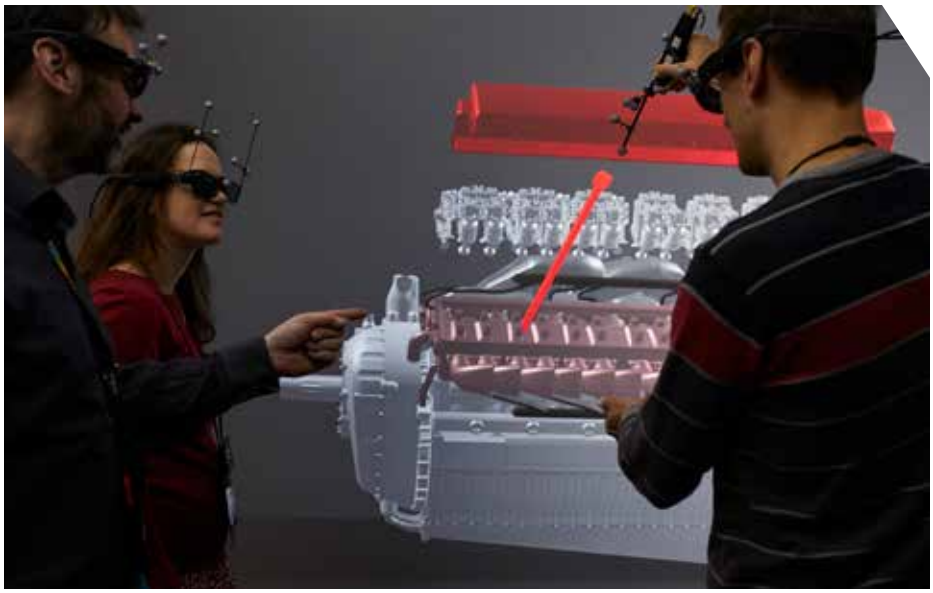
Glasses

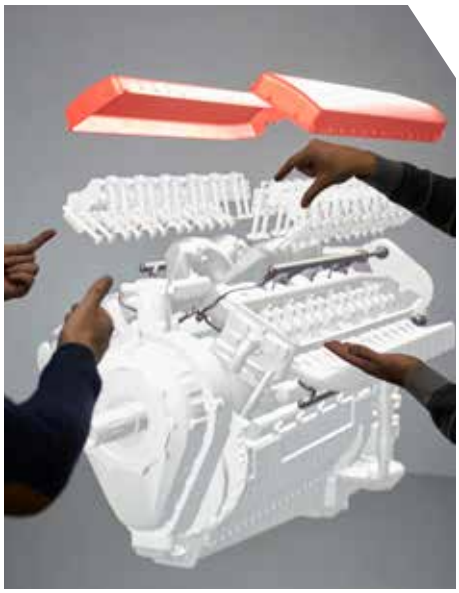
Each of the viewers needs to see only the images appropriate to their position relative to the screen. In addition, the viewer's left and right eyes should see different images. This is achieved by using glasses with LCD shutters over each eye. These LCD shutters only open for long enough to transmit the appropriate images for that viewer and that eye. During the periods when images intended for other viewers, or other eyes are being displayed, the LCD shutter will go black. High speed and accuracy of switching of the glasses between the two states (transmissive and black) is critical to ensure that each viewer and eye sees only the appropriate images, whilst providing a high attenuation of images that were not intended for that eye. The glasses are synchronised with the projected frames via an RF transmitter. Digital Projection's INSIGHT 4K HFR 360 projector is unique in its ability to display at 360 frames per second.

Collaboration with a specialist manufacturer has led to Glasses that can switch between the black and transmissive states in around 200us. That's three times faster than any other commercially available Glasses.

In a three viewer system, using one projector, all of the separation between left and right eyes, and different viewers is achieved by switching of the panels in the glasses.

The LCD panels in the glasses inherently contain circular polarisers. A six viewer system uses two projectors and takes advantage of the polarisers already in the glasses to work with complementary circular polarisers placed in front of the projection lenses. One projector image is left circularly polarized (for the left eye), and the other is right circularly polarized (for the right eye). So in a two projector, six viewer system we use polarisers to separate the left and right eyes, and switching of the glasses to separate the viewers. In this case all six left eye images are fed into one projector and all six right images into the other. This approach is highly efficient because little additional light loss is caused by the use of the circular polarisers in front of the projection lenses.





Server / Image Generator

Very typically, it is only the GPU manufacturer's range of professional cards that are specified to frame/gen lock their video outputs, both within cards (they may have more than one DP1.2 output) and between cards. This is not usually the case for gaming cards! For example the NVIDIA Pascal GPU cards with four DisplayPort 1.2 outputs claim the outputs can be frame locked to one another

Head Tracking System

For the user to "observe" their correct perspective view of the shared scene, they must be tracked to what is often referred to as 6 Degrees of Freedom [6DOF]. These are not only the usual spatial positions (x,y,z) but also the roll, pitch and yaw of the observer's head. With this system they can also track each individual observer's position as they move around within the 3D area.

Head / Eye Tracking - Restricted Movement

There are applications of MultiView projection where the viewer is less free to move and interact, and therefore tracking them becomes simpler: we already know where they are positioned!

An example could be in the realisation of a theme park ride in which the riders are fixed in their seats.

So long as the viewer's glasses can be correlated with the seat they occupy then there is no need for tracking. This also allows the glasses themselves to be simpler and more attractive.

Digital Projection is distributed in Australia and New Zealand by Amber Technology. ambertech.com.au 1800 251 367

Photo Credit: Thomas Motta

Left to right: Dirk Siedle - EMEA Sales & Marketing Manager, Digital Projection. Dermot Quin - Chief Operating Officer / Chief Technical Officer, Digital Projection. Steve Chapman - Head Of Research And Development, Digital Projection

WHAT IS A PIXEL, ANYWAY?

by John O'Brien

Most of us now live our lives in front of screens. Each of those screens (phones, tablets, monitors, projectors) comprise an array of picture elements, or pixels, that combine to make a full image (whether static or moving).

There are:

- Pixels printed on a page (dots per inch / dpi)
- Pixels represented by digital values (including luminance, chromaticity and colour/bit depth)
- Pixels on a display device (display resolution)
- Pixels in a digital camera (photosensor elements)
- Pixels (px) used as a measurement unit in graphic and web design

And many more, even before we delve into the branded uses of the word.

One definition of pixels is: "the smallest controllable element of a picture represented on the screen." Unfortunately for us tech folks, that definition is but one of many and most are highly context-sensitive.

In video world, our displays and projectors are comprised of matrices of these little dots. We have progressed from standard definition (SD @ 576 lines) to HD (720 lines, either interlaced or progressive), through fullHD (1080p), 4K (2300 x 4096 pixels) and now 8K (4320 x 7680). Video formats are fast approaching the limits of the human eye. 8K resolution is 33,177,600 pixels (~33 megapixels) all in one frame, commonly refreshing at 60 frames per second. That's a lot of data - both for our display or distribution hardware and our bodies to process.

The human eye is generally accepted to have an ability to perceive around 40 megapixels of visual signals, a threshold that we are nearly at. Yeh, I know our eyes have awesome dynamic range and sensitivity but my impression is that we are getting to the point of diminishing returns with increases in display resolution.

Pixelation and pixel art

While the industry strives towards ever greater resolution, there are cases for reducing that definition. Pixelation occurs when an image (or portion thereof) is displayed at such a relatively large size that individual pixels are visible. This can sometimes be a good thing. You'll often see it used as a technique deliberately used for obscuring faces / body parts or gestures in mainstream media.

Pixel art is a creative genre gaining popularity across the world. Some of it is static and some dynamic. The hugely successful game Minecraft deliberately lowered resolution to look like an old school arcade game. These typically ran at around 250-300 lines but in different aspect ratios to today's crop of displays. This graphical limitation was no impediment to Minecraft and its assets being sold for $2.5 billion!

Static instances are still in wide use for cheaper phones and portable devices with limited resolution and memory. Icons and favicons still very much rely on skilful image manipulation at the pixel level. There are even thriving online communities dedicated to low-res and 8-bit art.

Going back some technological generations, analogue film could exhibit a similar effect with film grain. Although not comprised of a matrix of fixed size elements as such, 'faster' (or more sensitive) film would show obvious grains, particularly when enlarged. Even earlier display technologies, such as embroidery or mosaics, had much more pronounced tessellation. The only way to get better resolution was by using finer thread

or smaller and more fiddly tiles. No fancy graphics processors back then - just fine motor skills and much patience.

Personal Examples

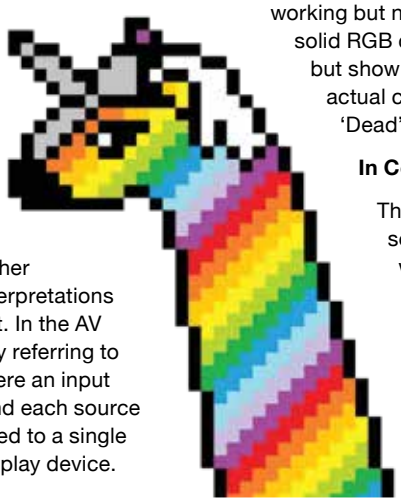
After giving concert gigging a rest in the late 90s, I moved into videowalls - giant matrices of screens composed of individual CRT screens, each with its own internal matrix of pixels. One of the coolest things we did with this was playing Doom in the factory on a 6x4 wall of rear project cubes that we were preparing for an install. Cubes were 50 inch diagonal each, which gives a 300 inch screen. At the time, this was extremely large (domestic screens were still 3:2 ratio CRTs at up to 60 inches for the obscenely rich). From memory, resolution of the PC feed was 640 x 480 unscaled. Extrapolated over the size of the composite screen, the pixels were pretty noticeable but, coupled with a decent 15 & horn P.A. for ambient noise, this had to be one of the most visceral and scary experiences of my life.

Around the same time, I got a good deal on a slightly damaged 50 inch rear project cube and took it home to the share house. Being a scumbag party palace, the best inputs we could afford were op-shop VHS units and someone's old Atari 2600. Pong bats were life sized and the 'ball' large enough to eat. We later upgraded to a SNES and PGA tour golf. Many hours were lost in 8 bit glory...

Noise

When media are digitally compressed with 'lossy' compressions (to take up less memory or bandwidth) artefacts are often introduced. With both static and moving images, these can then appear pixelated or posterised. This is quite noticeable with text with aliasing becoming more apparent with more compression. Visually, various tools can assist with anti-aliasing. The finer technical details of these are beyond me - I get lost at Nyquist! Ditto for audio aliasing with low or band-pass filters, oversampling and other such heady concepts.

Sonic artefacts are another thing altogether. My life would be so much less without dirty distorted overdriven guitars.



Other...

Pixel mapping is another term with different interpretations depending on context. In the AV world, this is generally referring to 1:1 pixel mapping where an input source is unscaled and each source pixel is directly mapped to a single native pixel on the display device.

Confusingly, some camera manufacturers (here's looking at you, Olympus) also call their sensor diagnostic routines pixel mapping.

This is quite different to projection mapping (or video mapping). The name might sound similar but instead refers to projecting a video or image source on to a multi-dimensional object. Again, this is one area better for more expert minds than mine.

Dead pixels / stuck pixels / hot pixels - fairly interchangeable terminology in video applications. However, in digital stills photography, they take on discrete meanings. 'Stuck' pixels are pixels on the sensor that are working but not correctly and will show as a solid RGB colour. 'Hot' pixels are similar but show as a 'hotter' (brighter) than the actual colour trying to be captured. 'Dead' pixels no longer work - period.

In Conclusion...

The screens are here to stay. Until some clever bunny comes up with an infinitely scalable vector based display system, we're going to be dealing with pixels and dots. Fortunately, these dots are getting so small and packed in so tightly to our screens that we may not notice the difference.

IMAGING SCIENCE FOUNDATION

Australian Seminars 2019

ISF Classroom

AVPro and Audio Visual Distributors – AV Distributors are thrilled to be bringing the Imaging Science Foundation (ISF) Level III Seminar to Australia in 2019. Since day one, the goal of the ISF has been to deliver the ultimate picture quality throughout any video system. Working alongside ISF, AVPro Edge and Murideo are manufacturing products that keep the ISF method at the forefront of 4K video distribution. It is paramount to the mission of ISF to get the complete and correct signal from the source through any repeaters in the HDMI network all the way to the display. Our goal is to assure that what the client sees on their display is as close to the director's original intent as possible.

Few integrators have successfully taken the dive into distributing 4K with HDR because the signal exceeds the limitations of most of the current infrastructure in homes and businesses. CEDIA integrators have either put in systems with 4K and no HDR, limit the system to 1080P SDR, or they put the sources in the room with the HDR display. None of these compromises are necessary. At the ISF Seminar, these missteps will be covered at length to help attendees confidently sell and install these high bandwidth products and systems without the need for any shortcuts or compromises. For example, the course will cover high bandwidth distribution products like the AVPro Edge HDBaseT extenders. Thanks to the proprietary compression algorithm ICT (Invisible Compression Technology), AVPro is able to deliver a pristine image, free from compression artifacts, over category cable. With these and other 4K + HDR solutions from AVPro Edge, including matrix switchers, audio down-mixers, distribution amplifiers and more, the system can be optimized for high bandwidth signal distribution. Then, it will be time to perfect the display.

Thanks to advanced tools and software the calibration process is as easy as ever, and today's displays typically calibrate very well. With Murideo's SIX-G Test Pattern Generator and AutoCal by CalMAN, the tedious parts of calibration are now automated, saving calibrators tons of time. This leaves more time for educating the client and giving them a great demo.

The ISF Seminar attendees will have the chance to get hands on with the latest calibration and display imaging techniques being used today. For more information or to register for the ISF Level III Seminar, please contact AVD at +61 7 5561 7530 or visit avpro.training.

Now, let's cover some basics on what calibration is all about and some of the tools that are needed.

What makes a great picture?

It's easy to look at a TV in a showroom and say "that TV looks great!", but what is so great about it? Most people are fooled by the blaringly blue-ish whites, the way too dark shadow details, the oversaturated colors, the extra sharpness and edge enhancement, and the dreaded soap opera effect. Luckily we've studied what makes a great picture, and at the end of the day it's all based on our human biology and how we see. Here are the four things that we look for while judging picture quality:

1 Dynamic Range. This refers to the difference between the darkest and brightest part of the picture. The bigger the difference the better, and this is all due to human vision. In the back of our retina we have millions of tiny cells called rods and cones. Rods are responsible for picking up dark and bright information, and the cones are responsible for the colors that we see. The average human has around 20x more rods than cones, which explains why colors are hard to detect in the dark. Audiophiles understand this as Dynamic Range is the most glaring aspect when judging the quality of an audio system as well.

2 Color Saturation. This refers to how much color is in the image. Too much color and you will have sunburned news anchors and neon green grass on the baseball field. Too little color and the same news anchors look sick or ghoulish while the same green grass looks washed out or like it is dying.

3 Colorimetry (AKA color accuracy). Simply put, Colorimetry refers to the overall accuracy of color. We look for things in nature to appear correct such as the blue sky or the white snow in a nature documentary. We also look at colors in company and sports logos. Take the Home Depot logo for example. When you see the logo on TV it should be the correct orange, not a yellow-ish orange or red-ish orange.

4 Resolution. There are two things we look for when judging resolution. First take a look at the overall shape of the image and especially notice the shape of characters on the screen. If people look overly tall and skinny or short and squatty the screen size settings could be wrong. It is also a good idea to turn off Overscan. Overscan is used by the manufacturers to hide artifacts on the edges of the screen that can sometimes come from a broadcast. Although Overscan hides these artifacts, it hurts the overall clarity and resolution of the image especially on other sources such as Blu-ray discs. Once the Aspect Ratio is sorted out we can take a look at the display's Sharpness setting. Most people do not realize this, but it is possible to have too much sharpness! Too much Sharpness can cause an artifact called "Edge Enhancement". It is easy to spot when viewing something with a lot of details such as text on the screen, a person's face, or the scales that make up an iguana's skin. Distortion and noise will be apparent and fine details like the iguana's scales will look distorted. Sharpness can also be set too low, and this makes the image look too soft, almost as if the camera that took the picture was out of focus.

Why calibrate a display?

There are two approaches to why a display should be calibrated. The first approach is easy! All you need to know are the four qualities of a great image that you just read

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about. Let's use these and talk about how the picture will be improved after calibration.

1 Dynamic Range - When Dynamic Range is set correctly, you will have the most amount of detail in the brightest and darkest parts of the picture. This means things like scary shadows in a dark horror movie or the fur on a polar bear's face and everything in between will be visible.

2 Color Saturation - The display will have the right amount of color. Things like flowers, food, grass, sports fields, and especially skin tones will look natural.

3 Colorimetry - Things that you are familiar with in real life will be the appropriate color. The ice will be white for hockey fans and jersey colors and other logos will be correct.

4 Resolution - The image will be as clear as it can be while seeing as many details as possible, and people on the screen will appear to be the appropriate shape and size.

The second approach is all about standards, which can be somewhat abstract to the average Joe. When we calibrate a display we are setting it to known standards. There is a major benefit to this because it will allow you to view the movie, video game, TV show, etc as the creators intended. Calibration is all about honoring the art of content creation. When a filmmaker uses a specific color palette for a scene of a movie, it is done intentionally. Color in movies is used to set the mood of a scene and to evoke emotion within the viewer. This type of emotional manipulation is not only used in film, but video games and TV shows as well. As someone who appreciates the time, effort, and artistry that goes into production, calibration ensures that the reproduction is as close as possible to what was intended.

Now that we have defined picture quality and covered the benefits of display calibration, let's cover what tools are needed to offer this unique service.

What tools are needed?

1 Test Pattern Generator - This tool is responsible for putting test patterns on the display. Test patterns are used throughout the calibration process to verify a variety of things like black level, white level, color, resolution, and more. There are a few things to look for when shopping for a pattern generator such as portability, size, and functionality. The Murideo SIX-G is the go-to as it is 4k and HDR/Dolby Vision compliant, has a rechargeable battery, is small and portable, and field upgradeable. You can also use it for troubleshooting purposes and to test HDMI cables if paired up with the Murideo SIX-A signal analyzer.

2 Light Meter - This tool will read the light and color of light that comes from the display that you are calibrating. There are many different makes, models, and prices of light meters, and each one serves a specific purpose. When shopping for a light meter, consider its portability, size, and speed. There are two types of light meters; tristimulus and spectral, and the one you pick depends on your budget and how fast or accurate you need the calibration to be. Tristimulus devices are known for their speed while spectral devices are known for accuracy. A lot of calibrators use both by using one to profile the other. Profiling two meters ensures the accuracy of the spectral meter but gives you the speed of the tristimulus meter.

3 Software - There are a variety of software packages available to drive the calibration with prices ranging from free to thousands of dollars. I personally use CalMAN, but there are others such as Light Illusion, HCFR, DisplayCal, and more. I prefer CalMAN for multiple reasons; such as, its intuitive workflows, compatibility with a variety of different light meters and test pattern generators, and a relatively new feature call AutoCal. AutoCal allows CalMAN to take control of the display and automates the tedious and time consuming steps such as grayscale and color gamut adjustments. This is a huge time saver and will help you get through a calibration efficiently without any sacrifice to accuracy.

4 Infrastructure – Today's video signals are passed though many products that can have an effect on the picture you see. In order to distribute a solid 4K, 18Gbps signal, you need products developed to pass this kind of signal. Most products being developed today are not able to meet this data rate. AVPro Edge has developed a line of video distribution products built to handle high bandwidth 4K. When you need to extend, switch, split, scale or downmix; AVPro Edge products will help you get the job done.

ISF Calibration is a very unique, custom service that you should be offering to your clients. Labor dollars will contribute to your bottom line and system maintenance will not only ensure that your client's system is performing it's best, but it will also bring in recurring revenue. We have studied the numbers over the years and have also found out that ISF calibration also helps prevent TV returns which is a great added bonus. With the help of AVPro and the ISF, we can give you knowledge to not only perform this service, but also how to explain the benefits to your salespeople and ultimately your clients. Again, for more information including dates for ISF Australia and other AVPro Academy classes, contact AV Distributors at www.avdistributors.com.au or +61 7 5561 7530 or visit www.avpro.training

AVPro edge

MURIDEO

Video Playback and Projection Systems Delivery at the Gold Coast 2018 Commonwealth Games

The 2018 Commonwealth Games welcomed more than 6,600 athletes and officials from 71 Commonwealth nations and territories to the Gold Coast. The largest sporting event to be staged in Australia this decade, GC2018 also featured the biggest integrated sports program in Commonwealth Games history.

The Opening Ceremony, produced by Jack Morton Worldwide, took place on 4th April at Carrara Stadium. The Ceremony's cultural program was a showcase of Queensland and Australia's finest talent, complemented by breathtaking large-scale projection provided by The Electric Canvas and visual content by design agency, The Pulse. Christie Digital Systems Australia was TEC's supply and support partner for this major event, broadcast live around the world to an estimated television audience of 1.5 billion.

Peter Milne, TEC's managing director, was appointed as the Ceremonies' director of projection and led a team of 10 specialist projection technicians to deliver the complex mission. The principal projection component was a 3,200 square metre circle onto the field of play in Carrara Stadium, covered in sand to represent the famous beaches of the Gold Coast. To achieve this, The Electric Canvas provided a total of 20 Christie 2K30 Boxer projectors (30,000 lumens / 2048 x 1080 pixels), installed

in custom structures with weatherproof enclosures.

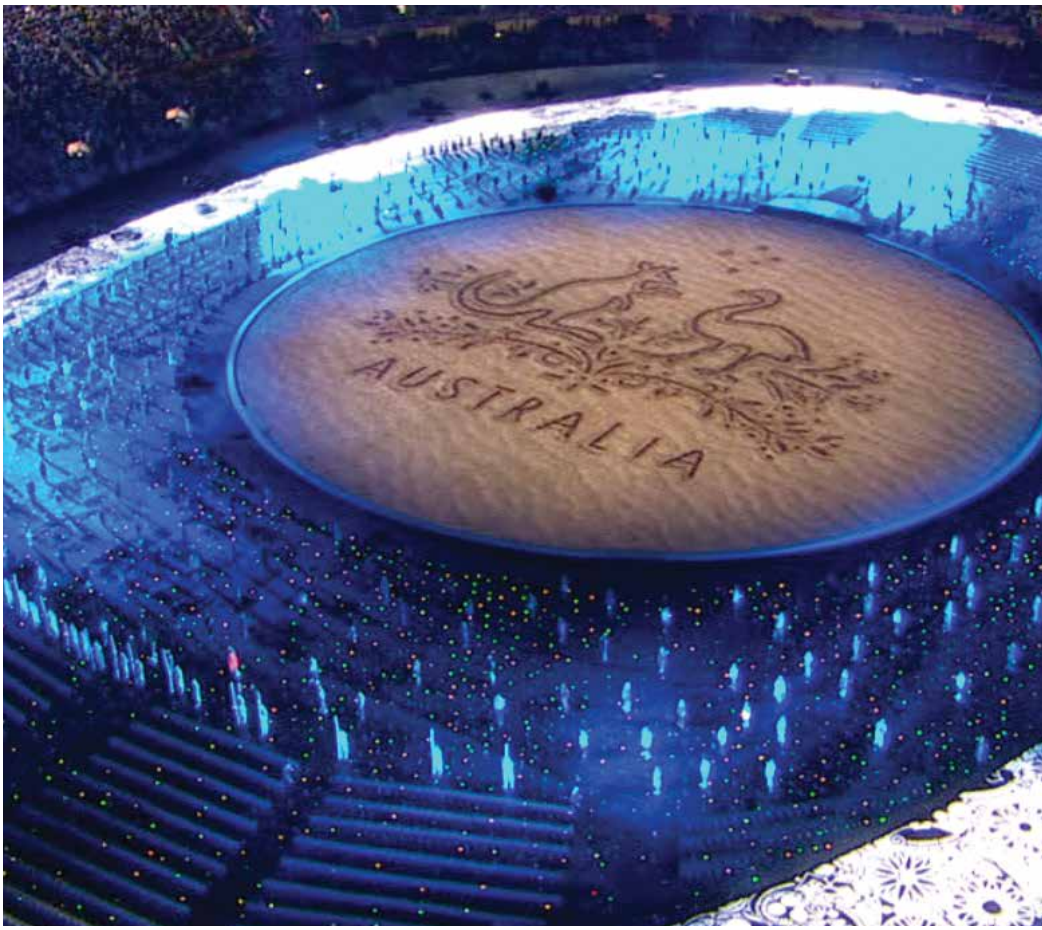
Four Boxer 4K30 projectors were installed on cantilevered structures suspended from the seating bowl balcony. These were used to project onto a 30-meter long inflatable replica of Migaloo, the famous white humpback whale often sighted off the Queensland coast.

Milne hatched an ambitious plan for the field of play projection, which utilised the heads of two of Carrara Stadium's lighting towers to house the projectors. A 100 tonne crane was required to lift the projectors, enclosures and other materials to their positions, some 67 metres above the ground. The projection installation layout was designed with limited information about the construction of the tower heads, as no accurate working plans or CAD models existed. Projector positioning also had to allow for a steel grid that originally supported sports lights on the two levels of the towers that the projectors occupied.

The projector installation was plagued by high winds and rain that caused a number of scheduled crane lifts to be cancelled. Once the projectors were safely installed, there was very little manoeuvring room for TEC's technicians. Access to projectors could only be afforded by climbing under each projection structure. The technicians regularly climbed the towers' seemingly endless vertical ladders and, over the course of the project, worked out that they'd exceeded a climb of Mount Fuji!

Milne comments, "Due to budget constraints I was asked to rework the original projection design, whilst retaining the same amount of coverage. Although this resulted in a reduction of projected brightness from 300 to 200 lux and added challenges for Lighting and Broadcast, the lighting tower strategy paid off in spades! Placing projectors at 67 and 70 metres above the field of play delivered an image quality greatly superior to that achieved from the alternative seating bowl locations, where smeared pixels and undesirable effects would have been caused by the nap and undulations of the sand. The improved efficiency of coverage afforded by the tower positions was further enhanced by the lack of shadows cast on the projection by props and performers."

"The performance of the Christie Boxer projectors was flawless and we were very impressed with their reliability despite the



environmental conditions, which included high temperatures and humidity", continues Milne. "We developed a projector control application that allowed us not only to interrogate many parameters and sensors within the projectors, but to also preview what signal was arriving at the projector inputs."

Milne also assisted content producers, The Pulse, to optimise visual opportunities. To manage and deliver the content to the projectors, stadium screens and broadcast, The Electric Canvas chose their new Modulo Kinetic media server system. Kinetic, a timeline-based platform that works in 2D and 3D space, includes a number of features that facilitate projector alignment and rapid programming changes. The entire media server system featured 100% hot back up to the projectors, completely free of matrixes and other single points of failure. The Kinetic servers and masters were installed on TEC's new Gen-6 server platform using M.2 RAID arrays.

The Closing Ceremony required a completely different projector coverage scheme, for which The Electric Canvas had to develop another clever strategy. The lenses on certain projectors were changed so that four individual stages erected for the Closing Ceremony could be covered. At the same time, enough projectors from the original Opening Ceremony coverage needed to be retained so that alignment marks could be placed on the field of play to assist with positioning of the Closing Ceremony stages.

Simon Toomer, production manager – systems for GC2018 Ceremonies, comments, "The Electric Canvas team's professionalism and unparalleled expertise, through the dedicated eye of Peter Milne, provided a confidence and reassurance which is rarely seen. All this, together with the close integration and support from Christie and their Boxer series projectors, proved a match that would be hard to beat in this competitive industry."

TEC Crew:

Director of Projection / Project Manager
Peter Milne

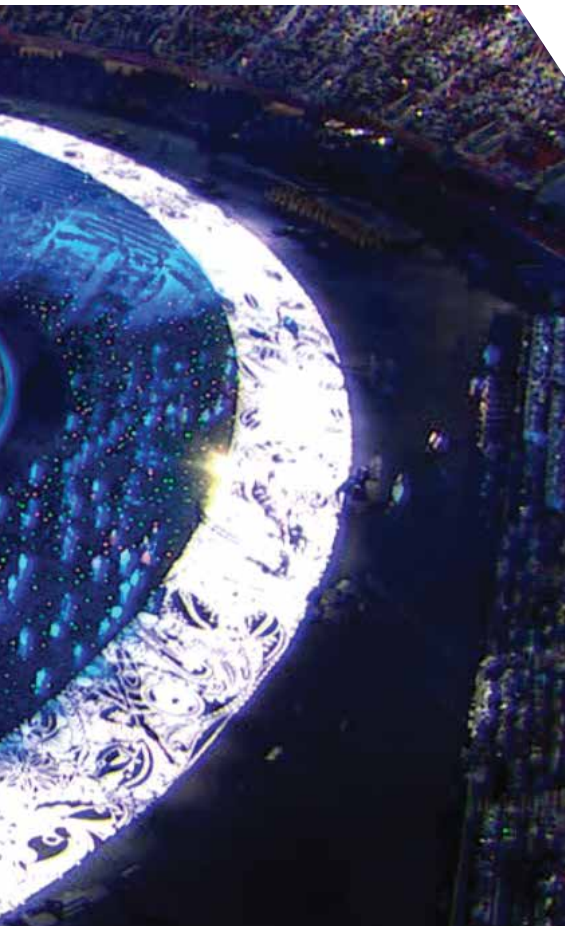
Principal media server programmer/operator
François Rocchetti

Systems manager/Understudy programmer
Blake Johnson

Crew boss / Server technician
Piotr Janusz

Climbing technicians
Joshua Feltham, Stephen Paul, Takao Hashino, Alex Melville

Ground-based technicians
Kyle Remphrey, Jackson Niehaus, Anthony Ripamont



AN INTRODUCTION TO PIXELS

VJ Suriya from Australian lighting control experts ENTTEC takes us through what you need to know in order to get started with LED pixels.

What does pixel mean?

We get asked a lot about pixel strips (sometimes known as 'smart strips', 'intelligent strips', addressable strips, media strips/flex and a multitude of other names depending on the brand). The first thing that most people want to know is exactly what pixel strips do and how they differ from standard RGB LED strips, which we're all pretty familiar with already.

A pixel strip is a flexible circuit board populated by multicoloured, addressable surface-mounted (SMD) light-emitting diodes (LEDs). It usually has an adhesive backing for quick and easy installation.

Whether it takes the form of a flexible strip, dots, or tiles, the commonality of pixels is that - unlike a standard RGB strip - each LED has its own chip which means it can be controlled to respond individually (e.g. change colour, switch off etc). Pixel strips can still do everything that standard RGB tape can do … only more!

How it all comes together

Once you or your lighting designer have looked over your space and decided where you're going to need pixel strips, and of what length, you can then get into the nitty-gritty of putting a system together.

Say you had a 5m x 7m area where you wanted to put a grid of pixels on the ceiling to provide lighting and dynamic patterns. Let's assume you wanted a strip every metre. That comes to a total of 5 x 7m strips, and 7 x 5m strips.

Colour

No matter which supplier you go to, you'll soon discover that pixels come in a range of colour and voltage options.

In terms of colour, the most common would be RGB, where each LED is able to produce the colours red, green and blue. When all are on together, they produce white light. However, this requires the LED to be running at its maximum capacity, which means you'll be using a lot of power.

If your system is going to be playing a lot of white colour effects, or you want finer control over the white you are displaying, you can usually opt for an RGBW strip. Each pixel here can still produce the standard red, green and blue hues, but also has an additional dedicated white LED. This usually makes the strip more costly, but lets you have greater control over the colour and brightness of the white you are displaying.

Some situations like architectural installations may not need the RGB colour range at all, instead only requiring white hues ranging from warm to cool (think circadian lighting, for example). In these cases, you can use another type of tape: WWA - which stands for Cool White/Warm White/Amber. Mixing these 3 hues can give you precise control over the temperature and brightness of your white displays.

Voltage

When it comes to pixels, voltage is usually limited to 5V and 12V. The main difference between the two is that the maximum run length possible will differ, i.e., the distance that a pixel tape can run before the effects of voltage drop kick in- and do keep in mind that our goal should be to minimise any voltage drop.

You can imagine electrons flowing through your pixel strip as being like water flowing in a pipe. The voltage is like the water pressure in the pipe. If you don't have much pressure, the water won't go very far before it starts to slow down to a trickle. Similarly, if you have lower voltage, the electrons can't travel as far before their "pressure" – voltage – decreases. How this relates to your project, is that the lower your voltage, the shorter your maximum run length will be.

ENTTEC provides handy installation guides which tell you what the run lengths are for each of our pixel strips. For example, here's the run length table from one of our most popular pixel strips, 8PL60-F (5V RGB):

As you can see, with our 60 LED/m tape, the maximum run length with single power injection is 1.5m on white, and 5m on the colours (the wiring schematics below show what we mean by single or dual power injection). White is always going to result in a lower run length than the colours, because it is using up more power, so it will drop the voltage faster. In our water-flowing metaphor, the LEDs are like little turbines that use the flow and pressure of the water to produce power, only on pixel strips, they are using the current to produce light instead.

MAXIMUM RUN LENGTH

COLOUR AND LUMEN OUTPUT WILL BE AFFECTED IF MAXIMUM LENGTH IS EXCEEDED. TEST CONDUCTED AT MAXIMUM BRIGHTNESS USING 5 VOLT DRIVER.

		MAXIMUM LENGTH			
	LEDS PER METRE	WHITE	RED	GREEN	BLUE
SINGLE POWER INJECTION	30	5m	5m	5m	5m
	60	1.5m	5m	5m	5m
	144	1m	2m	2m	2m
DUAL POWER INJECTION	30	5m	7m	7m	7m
	60	5m	7m	7m	7m
	144	1m	2m	2m	2m

But back to the project! When designing a system, it is always more prudent to consider the maximum output of the strip i.e. white output. This ensures that no matter what the system is pushed into doing, it won't be overloaded or possibly malfunction.

We can see from the table above that the max run length for white output is only 1.5m on the 60LED/m strip, while it is 5m with dual injection. Remembering that our project is comprised of 5m and 7m lengths, this means that for the 5m lengths, we will need to ensure power is injected from both ends. Although 7m exceeds our maximum run length, it is still achievable - it just means we will just need additional power injections, for example, we could do one at the start, end and middle.

Let's remember that we also have the 12V strip which we haven't looked at yet. ENTTEC also has a 12V tape in 60LEDs/m. Here is its run length table:

We can see here that the run length with dual injection is up to 9.5m for this strip. Therefore, by switching to 12V, we could do our 5m lengths and our 7m lengths without having to

MAXIMUM RUN LENGTH

COLOUR AND LUMEN OUTPUT WILL BE AFFECTED IF MAXIMUM LENGTH IS EXCEEDED. TEST CONDUCTED AT MAXIMUM BRIGHTNESS USING 12 VOLT DRIVER.

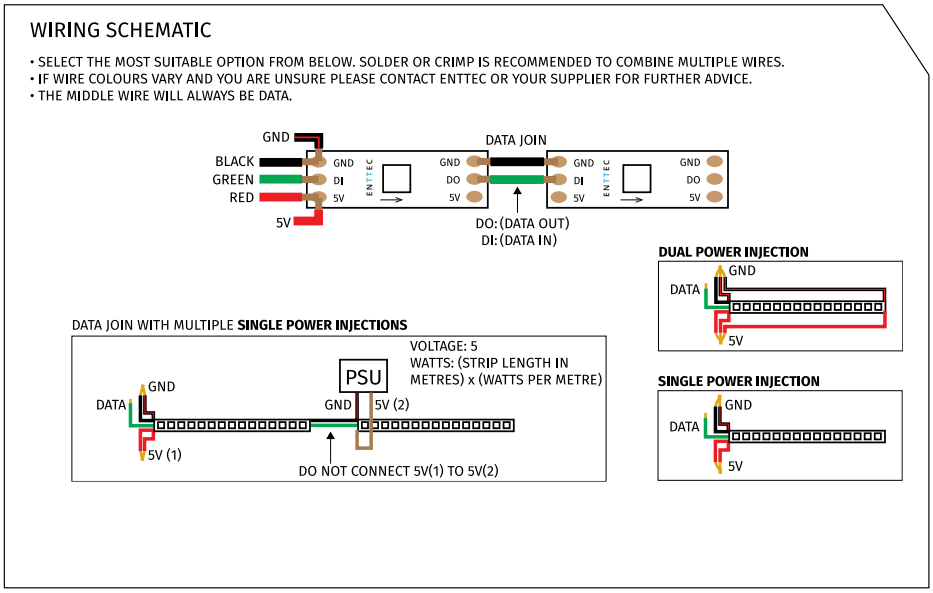
		MAXIMUM LENGTH	
	LEDS PER METRE	WHITE	RED,GREEN,BLUE
SINGLE POWER INJECTION	60	4.7m	11.5m
DUAL POWER INJECTION	60	9.5m	11.5m

inject power in the middle of the 7m run!

This is where you have a decision to make as a designer: Do I go with a more expensive strip which is easier to install? Or a cheaper one that is more difficult to install. In most cases, we would recommend going with the option that is easier to install. Electricians can be expensive, so limiting their time on site could save you more than the slight increase in equipment cost.

There are many valuable online resources that will help you with this, including lighting designer David Henry's excellent Learn Stage Lighting website. Once you've familiarized yourself with the basics, you'll understand what we mean when we say that a pixel strip is also DMX-controlled.

The DMX channels on your pixel strip will depend on the available colours. For example, an RGB strip will have DMX channels for red, green, and blue separately. Since a pixel strip's whole purpose is that it is individually controllable, this means that each LED will have these 3 channels associated with it. For example, the first LED might use channels 1, 2, and 3, while the second LED uses channels 4, 5, and 6 and so on down the rest of the tape. Knowing this, you can figure out how much control 'capacity' you need to control your setup.



Looking back to our project, we have 5m lengths and 7m lengths. Each 5m length will have 60LEDs/m, and each pixel uses 3 channels, therefore, the 5m length will use a total of 900 channels. Remembering that 1 DMX universe is 512 channels, this means that each 5m length will be just under 2 universes. This also means each 7m length will be 1260 channels, which is just over 2 universes.

At ENTTEC, we have a wide range of controller options that are suited to projects of different types and scales. To home in on which kind of control system to use, we should first calculate how many universes in total we need to control.

As we calculated before, each 5m length is 900 channels which is 1.8 universes – lets round up to 2. And each 7m length is 1260 channels which is 2.5 universes. Therefore, in total that comes to 14 universes for the 7 x 5m strips, and 12.5 universes for the 5 x 7m lengths. Let's round this up to a total of 27.

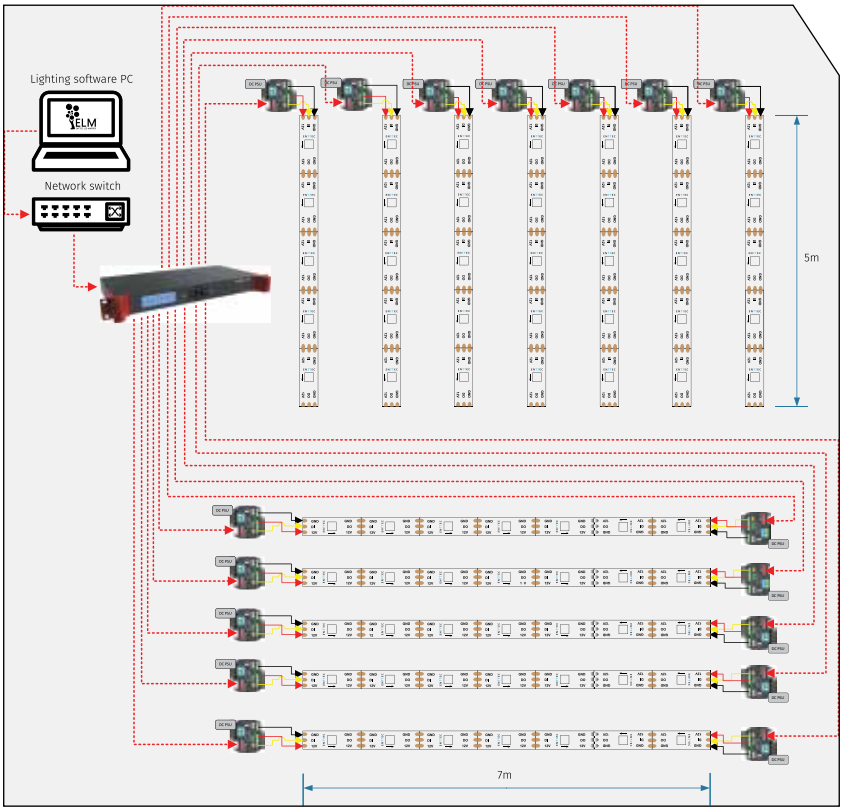
Control hardware

Now that we've decided upon the type of strip and checked that we can run the lengths required; the next step is to determine what kind of controls we need to run everything. To explain the controls, you will need to look briefly into what DMX is and how it works.

Which controller type Is most cost effective for your scale of project?

Number of Universes	Recommended Controllers
0-8	Pixie Driver/Pixel Port
4-16	Pixelator Mini/Pixel Octo/Pixel Triton
16-32	Pixelator Mini/Pixelator/Pixel Octo/Pixel Triton
32+	Pixelator/Pixel Octo/Pixel Triton

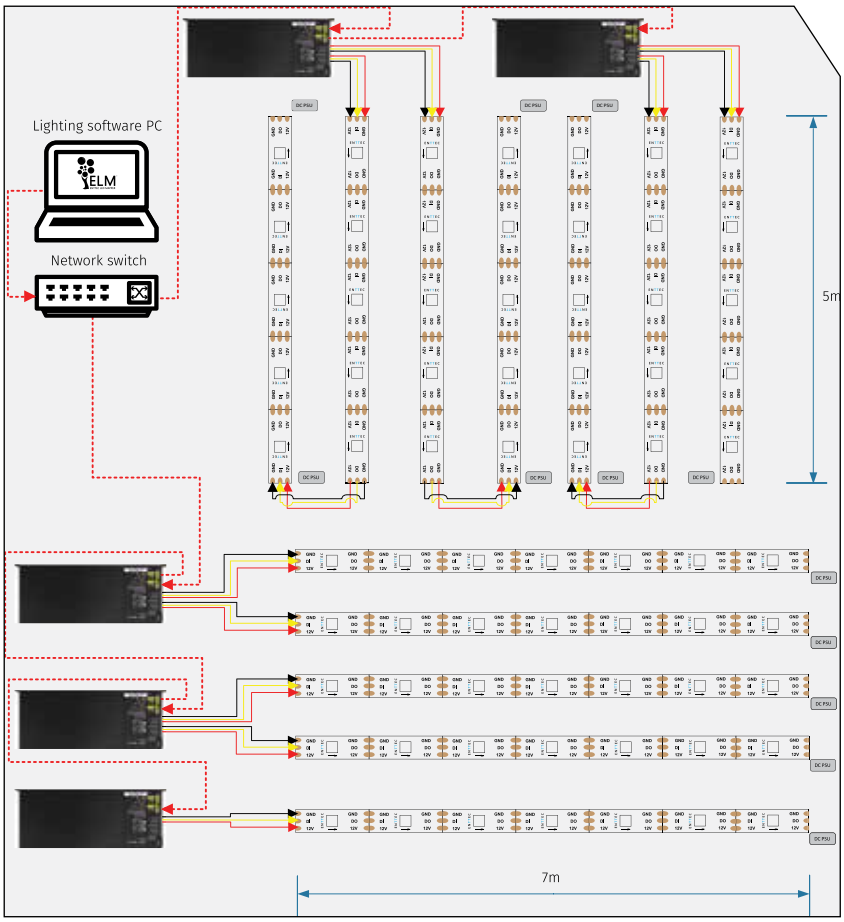
Our project is ~27 universes, so we could use either the Pixelator, Pixel Octo or Pixel Triton. For the sake of comparison, let's take a look at how a typical set-up might look for this project using each of these three control devices...



1

Using a Pixelator

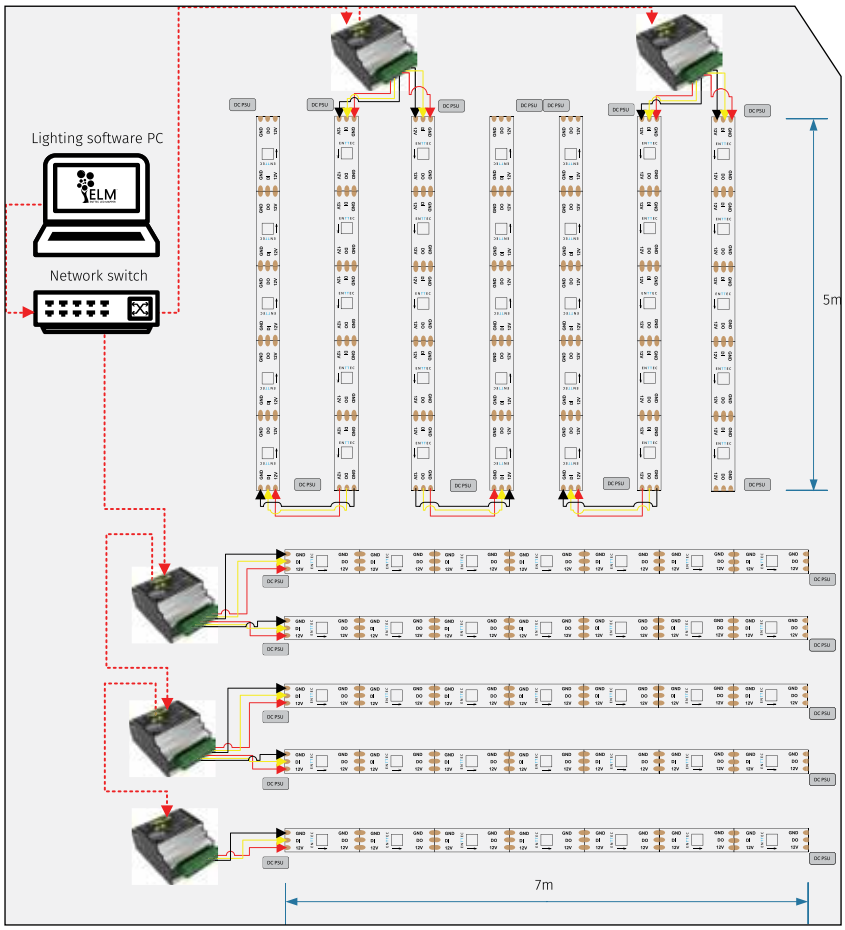
The Pixelator/PLink option lets you do up to 2 universes of output per PLink injector. This is fine for the 5m lengths, as these are just under 2 universes. For the 7m lengths however, which are just over 2 universes, this is a bit inconvenient, as the 7m length needs to be broken down into 2 sections so that we can meet the data requirement.



2

Using a Pixel Triton

The Pixel Triton has the same configuration of data output in that it has 2 x 4 Universe outputs just like the Pixel Octo. This means it will have a very similar layout to the Octo. The difference is that the Triton comes with its own on-board power supply, so you will need fewer additional power supplies in your layout. In terms of power output, the Triton packs a whopping 300W. You'll only need the additional power supplies to overcome any voltage drop throughout the strip section.



3

Using a Pixel Octo

As you can see, the option using the Pixel Octo is a lot less crowded in terms of controllers. Always keep in mind that if all these different controller options/layouts get confusing, do feel free to reach out to the helpful customer service team at ENTTEC who will happily assist you with your design.

universes.

Mounting

So, you have chosen your pixel strips and decided on your controller layout, the next question is how you're going to mount the strips to your chosen surface(s). Pixel strips usually come with an adhesive strip on the back, so … can we simply peel the backing off and stick the strip down?

NO!

All LEDs, whether regular RGB or pixel, tend to heat up during operation. If this heat generation is not managed, over time the high temperatures can deteriorate the LEDs, possibly causing some or even the whole string to fail.

ENTTEC always recommend mounting the tape to a clean, heat conductive surface. We have a range of purpose made aluminium extrusions for this.

Aluminium is a great material for this since it is easily accessible, light, strong, and has a high thermal conductivity to help wick that heat away. Whether you use an extrusion, a piece of flat bar/u-channel, or even aluminium sheet/plate, just remember to clean down the surface with alcohol. You may be surprised at the amount of dirt and grease you find on your cloth.

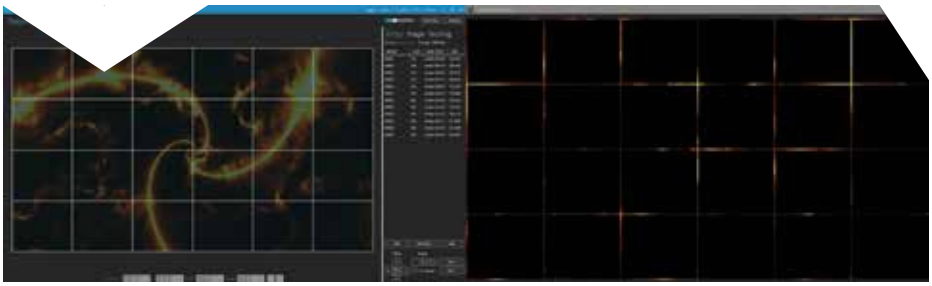
Control software

When it comes to controlling simple RGB strips, it's easy enough to use a simple colour dial controller and a 3 or 4 channel DMX driver to control your strips.

With pixels, however, you have control over each individual pixel. If you controlled these with colour dial controllers, you would need a lot of controllers!

This is why pixel projects are usually controlled by pixel mapping software. We go into a lot more detail about pixel mapping on our website, but the crux of it is that you essentially draw out your LED configuration in a mapping software and save this configuration. These pixels are now 'mapped' so now you can play media over the top of your pixels, and they will light up accordingly.

Below you can see what our pixel ceiling looks like in the award-winning ENTTEC LED Mapper (ELM) software. The effect that is superimposed on there is the "noise flow" effect from ELM's pattern library. And below, you can see what the LEDs would look like

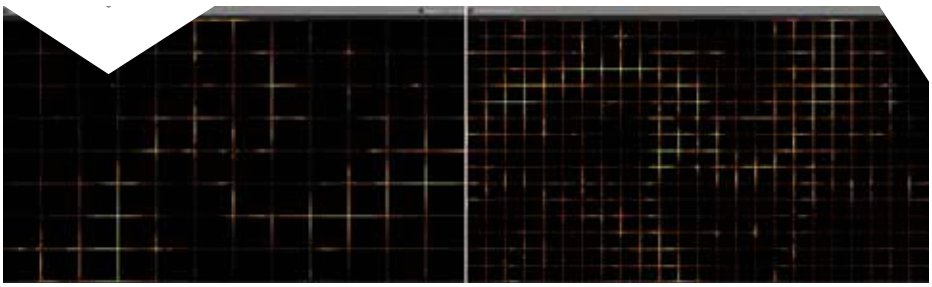


if that pattern was played out through the controllers.

ELM lets you import all sorts of media to light up your pixels. You can do something as basic as static images, but there is also a library of dynamic visual effects. You can import video data for example from a YouTube video or live streaming data through NDI. You can even sync to a webcam and be playing your video feed in real time over your LEDs.

Of course, the grid above is a fairly low-density display. Pixel effects can get really elaborate when you increase the density of your pixels.

You can see from the following pictures that as you increase the number of strips, the display becomes much more impressive. The cost price also becomes a lot more impressive however!



Simple dial

So again, this is something for you to weigh up as a designer.

But don't be disheartened if your budget doesn't allow for a high-res screen worth of pixels! A touch of pixel mapped LEDs as part of a larger project can really bring a space to life. Just look at what the folks at Beyond Imagination Entertainment were able to do for RSQ Nightclub in Adelaide using ENTTEC pixels.

LED Mapping software is usually sold in licenses/versions that are sized by number of DMX universes they let you map out. When deciding on a size of software license to purchase, it is very tempting to simply look at the amount of tape you have in total, do a simple calculation for number of channels, divide by 512, and base your purchase on that. If you calculate it this way, you'll often find yourself short on universes!

Let's take the PLink layout option for example. If you do a simple calculation based on the number of LEDs we have:

> 70m of tape all up

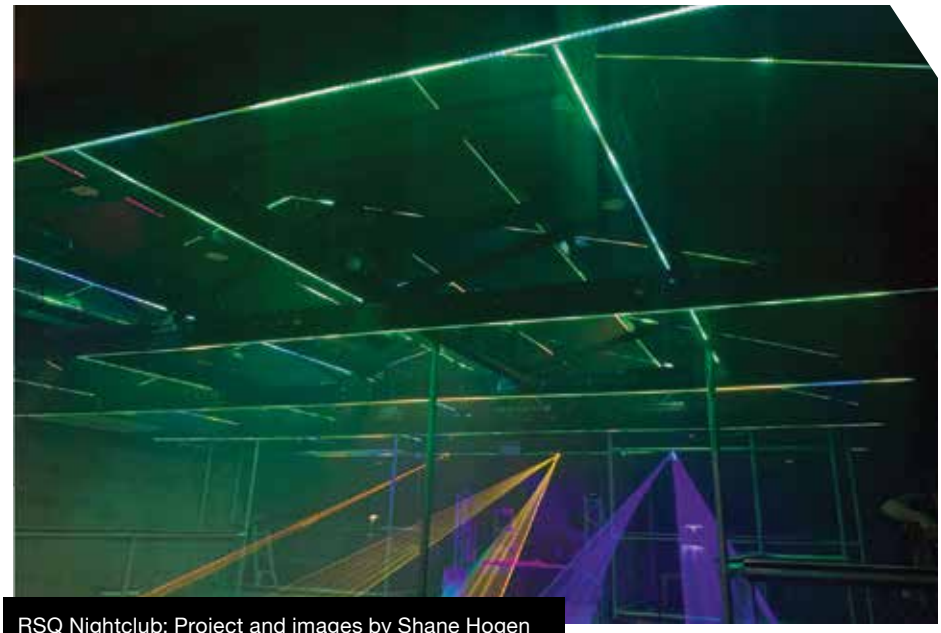
> 60 LEDs per metre - giving us 4200 LEDs

> 3 channels per LED since we're using RGB - giving us 12,600 channels

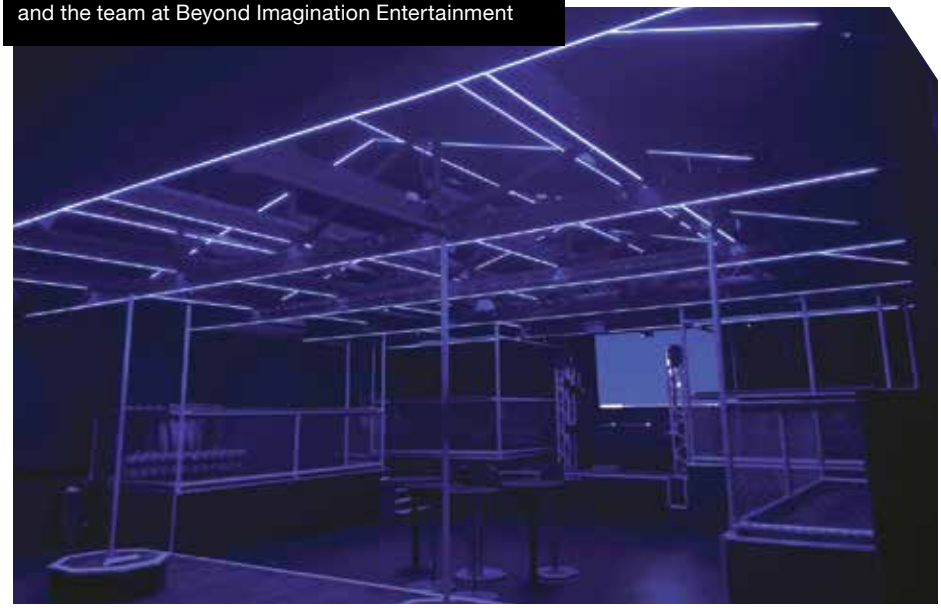
> divided by 512 channels per universe - giving us 25 universes

In reality we have 17 PLink injectors in total, most or all of them would be using over 1 universe each, so would be rounded up to using 2U each, giving us a total of 34U.

With ELM, if you hadn't purchased enough universes, you could easily jump online and purchase another license to add to your universe count. But it is more cost-effective if you simply buy the larger license to begin



RSQ Nightclub: Project and images by Shane Hogen and the team at Beyond Imagination Entertainment



with. This also lets you work on bigger projects or expand your systems in the future.

Conclusion

So there you have it! A comprehensive manual on designing pixel systems! Well, not quite- there is a bit more to it - but this will get you started on the right track. Just remember if any of this gets too confusing or time-consuming, you are more than welcome to reach out to the team at ENTTEC. We'd be happy to help you with your lighting control needs.

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RÜFÜS DU SOL

by Cat Strom

Photo Credit: Derek Rickert

RÜFÜS DU SOL's years of intensive touring has helped pave the way for the Solace live show, crafted through years of varied live experience for the band.

Sydney three-piece band RÜFÜS DU SOL are back on the road in Australia with their 'Solace' tour which follows their rigorous two-years touring the world. April will see them perform at the legendary Coachella Valley Music and Arts Festival for the second time.

This tour started in the US last October with show designer Matt Smith of Colourblind adapting the rig for the local tour.

The band wanted some kind of video LED structure built around them and an encompassing set piece that would be instantly recognisable as a RÜFÜS DU SOL show. An enveloping back wall of 120 Martin Sceptron, comprising four sections of thirty units was designed to cast the band into silhouettes. They also wanted higher risers and Matt had the idea to use clear acrylic which flowed through to custom clear keyboard stands and drum kit resulting in a very clean stage.

"In the US we had 20 GLP impression X4 Bars underneath the clear acrylic top risers which looked amazing, but I was finding that it was a bit of a waste of those fixtures," explained Matt. "So we've replaced them with more generic LED fixtures which illuminate the band from below and still give us a bit of pixel control. Plus we've added five extra JDC-1 under the risers and it's definitely an improvement on the first run."

The clean and streamlined stage design is echoed in the lighting design which is quite simple; it's essentially long rows of fixtures of limited type. Matt was adamant that he didn't want any beams, in fact his personal goal for the year is not to have any Sharpys or Blinders on any of his shows!

The X4 Bar 20s are now in the roof from where they mirror the angles of the Sceptron structure. Matt comments that he loves this fixture and he puts them on everything he designs. The rig also had 15 JDC-1 and those two sets of fixtures are really the basis of the show. Both are running in their full modes so there is individual control of the RGB cells as well as the strobe pixels. Five JDC-1 are in front of the risers on the floor, five behind the band and five on the upstage truss.

"There are two particular moments in the show where we have mimicked programming on the JDC-1s with the Sceptron and the X4 Bar 20s resulting in huge looks," added Matt. "One disorientating look involves video content running through the Sceptron that gives the feeling of spinning. Adding to that, the video wall runs similar content, plus the spinning effect in the pixels in both the JDC-1s and X4 Bar 20s looks amazing.

"We're touring one of Colourblind's Green Hippo Hippotizer Racks - in particular using a feature called Colour Blocks. Basically as well as running video content through the Sceptron, we've setup each length of Sceptron to appear as an RGB DMX fixture in the console. This allows us to run solid colour though each piece, or effects, or video, or both! We do that quite a bit, especially for the points in the show where we want to light-up the entire stage in one solid colour. Alternatively, we can activate a certain section of Sceptron to highlight a certain band member, while running video on the rest."

The back video screen was Roe 5mm at 14m x 3.6m, giving a wide ratio aspect to match the width of the Sceptron structure.

"There are definitely a few points in the show where we like that layered look, occasionally you can't really tell what's Sceptron and what's the LED screen," added Matt. "On this leg of the tour we have a fair amount of new video content from three sources; a company out of LA called Electronic Counter Measures, Tim Lovett from Melbourne, and Nic George.

The three GLP X4 washes provide key light, with three more on the upstage truss for backlight and four more stage left and right supplied side light.

"It is always good having a rig of the same LED chips so your colours match really nicely" Matt noted. "I also have 12 Martin MAC Vipers, six on the floor behind the Sceptron and six in the overhead truss, although in the US I used Robe Megapointes," explained Matt. "Although I love the Megapointes, I just keep going back to the MAC Viper as they're

Matt Smith

the best workhorse fixture and the gobos are really good. I always miss the tracking of focus to the zoom when I use other profile fixtures."

For control Matt ran an MA Lighting MA2 light with an MA2 full-size as backup.

"For a show that is 90% timecode, I don't need all of those faders or that extra screen," commented Matt on using the MA2 light as the main console. "Programming this show was intensive, Brad Salt and I have been working on it for the past six months and when we did this slight redesign, we only spent a week in the Colourblind pre-viz suite. The band also came in for a few days which was awesome."

Two days of full production rehearsals followed in Margaret Court Arena before the first show in Melbourne at Sidney Myer Music Bowl.

Brownnote Productions in the US supplied the Sceptrons for the entire world tour with the rest of the lighting and video supplied by Novatech for the Australian tour.

Show Designer and Programmer: Matthew Smith (Colourblind)

Associate Show Designer and Programmer: Brad Salt (Colourblind)

Production Manager: Jonathan Nelson

Sceptron: Bronwnnote Productions, Inc.

Lighting and Video Vendor: James Sacca (Novatech)

LX & Video Techs: Nathaniel Collins, David Murdoch, Jordan Scheer (Novatech)

THIS IS A PIXEL-FREE ZONE!

by Andy Stewart

If you're looking for info on pixels here, like: what is their relative size to an ant, what happens when you smash one in the Large Hadron Collider, or how large can a pixel get before it's visible from space, and so on, please skip this article. This is a pixel-free zone, devoid of all forms of pixel banter, large or (very) small. Oops, sorry.

Last night I learned an important lesson about music, one I've been taught many times before by countless great artists, but which, for some reason, needs constant reaffirming in my head. I suspect this is also true for other producers and engineers out there with tricks up their sleeves and a recording studio at the ready.

It's a simple enough lesson, and last night's teacher just happened to be one of the greatest songwriters in American history: John Prine.

Mr. Prine performed at The Palais and his lesson was this: great performances are all about great players playing together, their sensitivity and skill on show for all to see, and for a singular purpose – to serve the song.

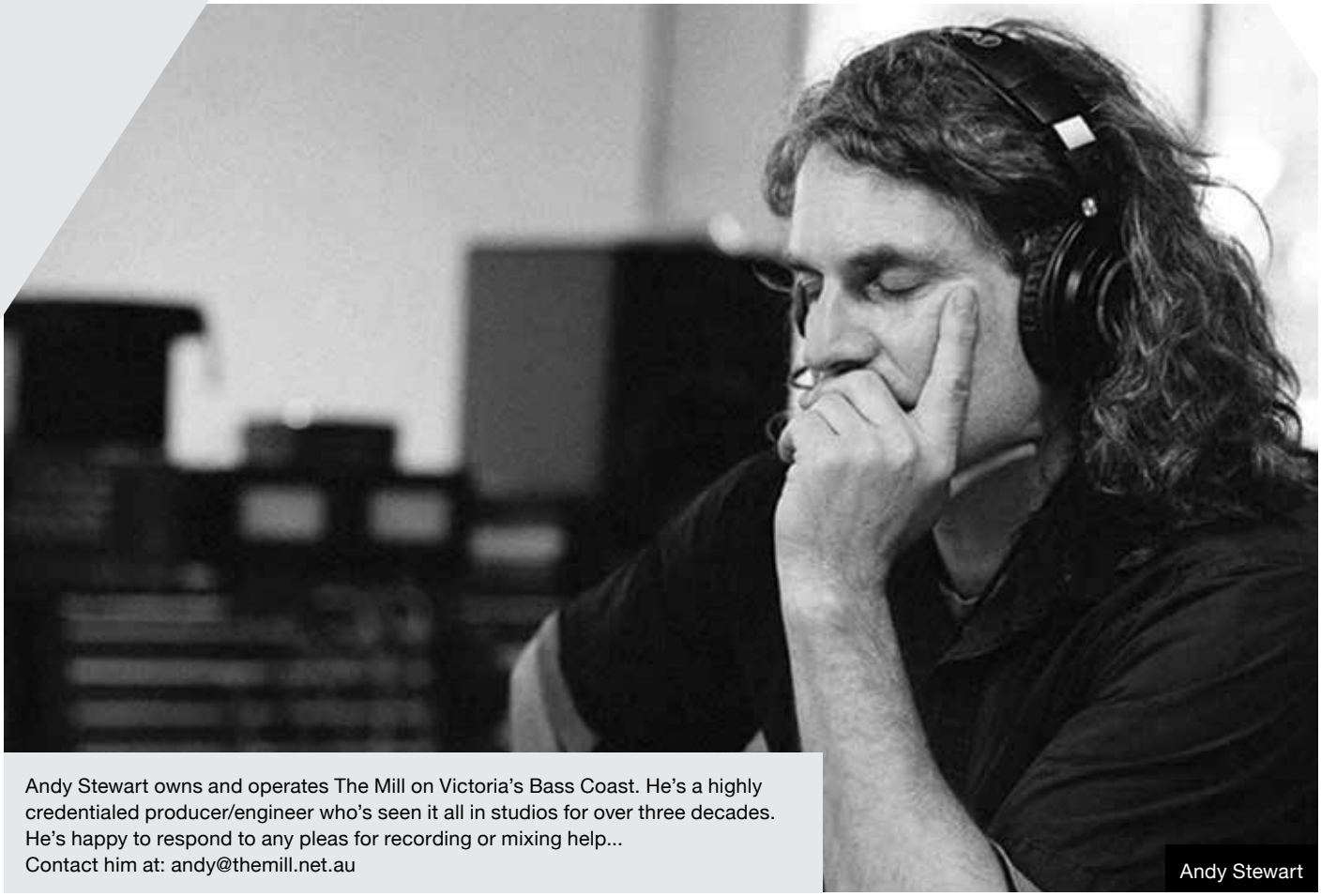
It just so happens that John Prine's song writing involves some of the most honest, gut-wrenching lyrics ever inked to paper, so when he and his magnificent band play live, magic permeates every dusty corner of the room. I came away from last night's performance in raptures, with one singularly relentless thought pin-balling around in my head: if that gig had been recorded for an album just as it was, with no fiddling, no edits, no 'improvements' (and certainly no playlists) it would have become one of the all-time great compilation albums by any artist.

What John Prine illustrated last night was that engineers and producers must never lose sight of the fact that a great song is the single most important element of any ambitious recording, and when played live by a great band, it is imbued with a musical complexity and nuance that preserves the song's life force – a self-evident cornerstone of the work we do, surely, but one that is constantly undermined and indirectly questioned by our recording practises.

Every day we are drawn away from this basic principle: by technical advancements that promise to manoeuvre us around the need for great players or performances, by modern recording best-practise, which insidiously infers that band chemistry is but a quaint notion, not easily proven; by technology which allows endless overdubbing, isolated performances, editing and deep playlist options, all designed to improve – surely – the sounds themselves, the performances, and the speed at which they are captured. But do they ultimately improve anything? When I bear witness to extraordinary performances like the one John Prine dished up last night, I seriously start to wonder.

Apart from simply witnessing greatness in all its live majesty, what I absorbed into my very being last night as a producer of music, was the need to work harder on albums with a pen, rather than a mic.

Recording technique, mixing chops, software and plug-ins all run a distant, emaciated second to the far more crucial pursuit of great songs involving brutal honesty and humility. I have never seen anyone stay out of a song's way better than John Prine; he's the ultimate example of the writer serving the song, not the song serving the writer. It's hard to do, but when it succeeds, it cuts through the crap like a hot knife.



Andy Stewart

Andy Stewart owns and operates The Mill on Victoria's Bass Coast. He's a highly credentialed producer/engineer who's seen it all in studios for over three decades. He's happy to respond to any pleas for recording or mixing help...
Contact him at: andy@themill.net.au

Lessons From The Drawing Board.

So how do we serve this principle better in our day-to-day lives in the recording studio? Well, it's certainly not easy, but the first thing to do is be mindful of the fact that a lot of our choices as producers and engineers are self-serving. We claim to be serving the song and the artist, but are we really? If we were brutally honest with ourselves, is it not possible that we are actually serving our preferred technique, rather than the song; the easiest recording option, not the song; or the least difficult, most convenient mixing chains, rather than the song? I suspect – in far more cases than we are prepared to admit – we are.

It's an almost natural extension of our job, it seems – especially when we're being paid to achieve a guaranteed outcome – that we become 'solutions' driven rather than musically curious, like the sonic equivalent of a bank's obsession with risk aversion. We find ourselves baulking at risky recording choices, the most obvious of which is putting six players in a room at once. In that situation, we often find ourselves saying things to the artist like: "It's probably better for the song that we break this process down into overdubs, laid over a tempo map," when, in truth, we might be simply be fearful of having a nervous breakdown that day trying to manage all those recording chains and headphone mixes, or achieving nothing if the band isn't on its game. Sure, it's arguably riskier and more time consuming to wait for lightning to strike six people at once, but is the alternative really better? And if so, by what measure exactly?

Worse, our preference for overdubbing rather than live tracking might disingenuously stem from far more mundane fears, rather than considered, professional opinion. With six players in the room – assuming we can even fit them all in – we may not be able to scrounge together enough mics, stands, leads, patch cables and outboard gear to build that many recording chains. Or our headphone system might have to then include our girlfriend's ear buds, or that dodgy pair with the crumbling pads that turn the sides of your head black. We might not have enough decent converters if we're recording digitally, or enough working channels if we're rolling tape. Whatever the hidden agenda is, we are often guilty of arguing for a process based, not on what's best for the song, but rather, what is most convenient or comfortable for us. If that sounds arse about, that's because it is!

Everything to do with great album production involves genuine honesty, not just the appearance of it. It's not enough to talk about it, or expect honesty from the artist if everyone on the other side of the glass is making up half-truths and bulldust just to save the embarrassment of admitting to a technical shortcoming. When a producer or engineer does that they undermine the very process they claim to serve, slowly but surely weakening the artist's faith in their musical process, and by inference, their performance.

When John Prine plays live, there is nothing between him and every listener's innermost feelings. He tells stories that resonate inside you like a bell, stirring up emotions that you weren't prepared to show in public (without a handkerchief). At that, he is a master, and if ever you're lucky enough to be involved with an artist that gifted, try not to corrupt their process with recording options that are, in truth, more about what serves you and your studio's technical limitations than what's best for their songs.

The Dilemma.

But to track a live band properly we need lots more gear, and far more physical space.

Decades ago now we lost most of the big studios that allowed bands to record as a group, to downsizing home recordists armed with ADATs and a few mics. It was a great pity in at least one respect: it wasn't just the SSL consoles, fancy mics and great tape machines that made the big facilities awesome, it was their physical space and still air – room to track, room to move, room to play table tennis... For me, more and more, a good recording facility is about spacious rooms that people can play in together. The real trick is being able to provide this space without going broke!

SKILLS WE HAD, SKILLS YOU HAVE

A random series from a 70s veteran. By Julius Grafton

Coming from the distant past there were skills we acquired and skills we needed, along with knowledge we gained. The same applies of working crew today – obviously – since if you can't set up and operate something then you are by definition a loader. Many loaders are on the pathway to becoming working crew. Many are on the pathway to a building site as well, since they are just not 'technical'.

Working crew fall in to two camps. All crew need to be 'technical', since everything needs to be brought together to make a working whole. Some are also 'creative', like lighting or video designers and like front of house engineers. A creative technical is more valuable than a plain vanilla tech, although we need a bunch of those on every show.

The first thing I learned about was electricity, since I started as a lightshow kid. I needed to quickly get to know current, since if I connected more than 2,400 watts to a 10 amp circuit, the fuse wire would blow. I also learned that if that fuse blew, before I replaced it with new wire screwed in, I needed to turn off the load. Not doing so made for a lovely zapping arc as the connection was restored. With sweaty hands, you would get some of that zap and fall over.

I had to strip and terminate my own cables, essential when you have no money and you are scrounging broken parts to salvage plugs, sockets and cables. I needed a switchboard to turn my motley collection of lights on and off in time with the music. That was made with domestic light switches, and power outlets. These became quite elaborate, with 'A' and 'B' two way switching, and as many groovy indicator lights as we could get our hands on.

The theory was that a lot of coloured indicator lights would attract girls. I tested the theory extensively and did eventually attract a few inquisitive types but later realised it had more to do with my attractive personality that was ever so slowly developing.

With my van load of assorted lights, I would arrive at a suburban dance venue or school hall and survey the available power sources. The band would need one circuit, since a complete Transit van load of amps and column PA didn't demand too much current. I'd take a couple more, always mindful the power regime in every hall was different. I still find this every time we do a roadshow around Australia and New Zealand – power outlets are duplicated (sharing a common circuit) in odd patterns around the place.

Once we started to use dimmer racks – the first were 10 channels, not 12 – we needed 3 phase power. This was a step up in knowledge and sometimes required me to do a hot hook-up straight into a venue power board. Pretty dumb in hindsight, but how else was the show to go on?

I learned to solder. Badly at first, but practice makes better. Not having a proper iron I used one that just plugs in and goes, and these get too hot too quick. But I graduated to soldering multi-pin connectors and was a dab hand at making mic leads or speaker leads, which once used female 3 pin XLR connectors at each end!

Building roadcases was a lesson in failure at first since I didn't have a riveter so I screwed the hardware on. This is before electric drills became variable speed, so we didn't have electric screwdrivers. We used the old fashioned pump action variety!

Early speaker cabinets and road cases were made from particle 'chip' board which was both heavier than ply and prone to immediate destruction when wet. When worn the edges would dig into your hands and arms. Plywood was so much better!

I could rewire most things, replace loudspeakers, figure out series or parallel wiring and thus calculate ohms. How many of today's techs know that 2 x 8 ohm speakers wired in parallel produce a 4 ohm load, while wired in series they become 16 ohms?

We all know the resistor colour code, because we use the colours as markers for things like cable length. A 10 metre cable is marked with Brown (1) and Black (0) coloured tabs. 15 metres is Brown and Green (5).

Do today's techs know about speaker phase? As in, if one speaker is reverse wired (red terminal given neutral, black terminal given active from the amplifier) then the adjacent speaker will be seriously disturbed?

But old school crew like myself usually don't know much about wireless, complex comms, or distributed networks. We didn't know about first aid or CPR either. These are 'must knows' for working techs today.

Colour	Value
Black (2nd and 3rd bands only)	0
Brown	1
Red	2
Orange	3
Yellow	4
Green	5
Blue	6
Violet	7
Grey	8
White	9

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SIX60 GET NZ TO COME TO THEM - BOTH AUDIENCE AND PRODUCTION

by Jenny Barrett. Photo Credits: Dexter Cheng.

Six60 opted out of the traditional Summer circuit of vineyards and iconic pub backyards and stunned a nation by getting 50,000 Kiwis to travel to Auckland to see a home grown band. They repaid their faithful by delivering a stage show worthy of any international tour, yet hired an all-Kiwi production team to ensure that the show remained true to themselves, their Dunedin student roots, and their audiences.

The Six60 concert at Western Springs was a ground breaker. The first New Zealand band to headline a sell-out gig at Western Springs with an audience of 50,000. First stadium-sized concert produced entirely by New Zealand based companies. Largest LED setup in NZ at 320 m2 (sadly to be trumped a few days later by Eminem). First stadium gig for the New Zealand duo at Global Production Partners Ltd. First stadium show designed by Jason Steel under the auspices of his own design company Negative Space.

Recommended by some of the bigger entities involved, Global Production owners Leon Dalton and MJ Van Lingen began work on the show in October 2018 as Production Managers, with MJ also picking up the Video Technical Director role, "It was unusual in that we weren't handed a design and were heavily involved in the concept stages, with input from the band, ourselves and Jason Steel, the show designer." Jason recalls the brief from the band as being five more or less contradictory words, "Stealth, moody, dark, edgy and not too rock and roll." Five designers both nationally and internationally were shortlisted and Jason, having recently moved on from Oceania, and Mike Knapp (Snapper) from The Green Room NZ, were the guys who impressed the band and joined the production team.

The team interpreted the five word brief as the band really wanting to tell their story, and create something unique to them, from point of entry through the entire concert, "The band wanted the audience to feel that the show started when the audience first arrived, as they walked over the hill into Western Springs. They wanted people to know that they weren't just at any concert, that they were at a Six60 concert." Jason took advantage of the huge screen to show a simulated 'live feed' from Six60's original flat in Dunedin where the band interacted with the crowd by walking out of the house, waving to the crowd and sitting out front, hanging out and even ordering a Pizza, "It was a great way of really showing that everyone was invited to what was essentially a big block party."

The band did not want the evening to be just about them being up on a stage, "It is really important to Six60 that the audience feel that they are a key part of the show. As we all worked on the show design there was a natural progression towards the concept of bringing together 'the choir of 50,000' that the band referred to on the night."

Jason achieved this by using live video sources over all the video elements and his team then crafted it using Notch, a real-time rendering agent usually used to create and edit content and renowned for enabling users to work in real-time all in one place. Jason went a step further and exploited Notch's powerful capacity to interact with IMAG, "We used a lot of IMAG over the whole LED canvas, also overlaid with graphics and made the crowd look like part of the show. It achieved the desired effect of letting everybody feel like they played a part in the show."

He was able to create sophisticated visual effects in real time whilst watching the target output on the huge LED screens, stylizing the nine live inputs with black and white imagery, and blinding graphics that lit up the band Any changes were instant, "The best thing about it was that the IMAG screens didn't look like a clip-on, they were part of the actual stage. Plus, because we were manipulating the IMAG content and had such huge screens, for the people 130 metres away on the hill, it not only served its purpose of delivering content but really created a visual impact for them too."

One of the significant advantages of Notch for Jason on this show was its capability to

control the overall look for the lighting, vision and cameras. This meant that he was able to create a really cohesive feel to the whole show and keep any major 'scene' transitions very tight with everything changing from one look to another simultaneously.

The Rest of the Kiwis

Other members of the all-Kiwi production team included Spotlight Systems for lighting, Big Picture on video, College Hill Productions running the audio, CP Solutions on automation and Viking providing the staging. And all the gear was sourced locally, "Sourcing the gear for a stadium-sized show is less of a problem now in New Zealand, although getting it at the right price is a different story!" Negotiations must have gone well though, as the production team didn't skimp. Leon, Production Manager, describes pack in as being reminiscent of an AC/DC or Guns N' Roses show.

Where next?

With Six60 having successfully pulled in 50,000 Kiwis and put on a show to rave reviews, it will be interesting to see what Kiwi band is next to rise to the challenge of filling Western Springs Stadium. The band ended the evening by announcing that they are set to play Western Springs again in February 2020, and by then they could potentially be a far more international beast as a result of the large numbers of international record companies that flew in.

Both Global Productions and Jason Steel at Negative Space also view the success of this concert as a platform to more overseas ventures, "New Zealand designers are starting to be noticed by the international market and we'd like to be a part of that and have an opportunity to do bigger shows." It would seem not only are Kiwi bands moving to the next stage, but so too are our Kiwi Production companies.

MIKING & MIXING JAZZ IN A SMALL VENUE – PART ONE

by Greg Simmons

The following pragmatic advice is based on mixing live gigs in an inner-city jazz club in Sydney, five nights per week, every week, for two years. The venue, Foundry 616, is a dinner club with relatively low ceilings and a maximum capacity of 160 people. The stage measures approximately 6m x 3m and stands about 40cm above the floor, with heavy drapes and absorption on the rear and side walls. The off-stage sound is a major part of what the audience hears throughout the room, so the mixing approach is one of working with the off-stage sound rather than against it. I've done sound reinforcement for many things, but I found this gig to be one of the most challenging and satisfying.

Typical ensembles

Before getting into the nitty-gritty, it's worth describing the types of ensembles this information applies to. The Modern Jazz ensemble consists of piano, double bass and drums, typically with one or two horn or sax players out front. From the audience perspective, the stage set up is always piano on the left, double bass in the centre and drums on the right. The Trad Jazz ensemble consists of a back line rhythm section (drums, double bass, piano, guitar and/or banjo) with a front line of clarinet, trumpet, trombone and, in contemporary interpretations, saxophone. The Big Band typically consists of 15 to 18 musicians with a rhythm section (piano, drums, double bass and guitar) along with sections of trumpets, trombones and saxophones. The Organ Trio consists of drums, electric guitar and organ, and the Guitar Trio consists of guitar, double bass and drums.

Microphone techniques

I'm going to start with miking the drums, double bass and piano, because they exist in most of the common jazz ensembles and each of them requires considerable explanation with perspectives unique to jazz.

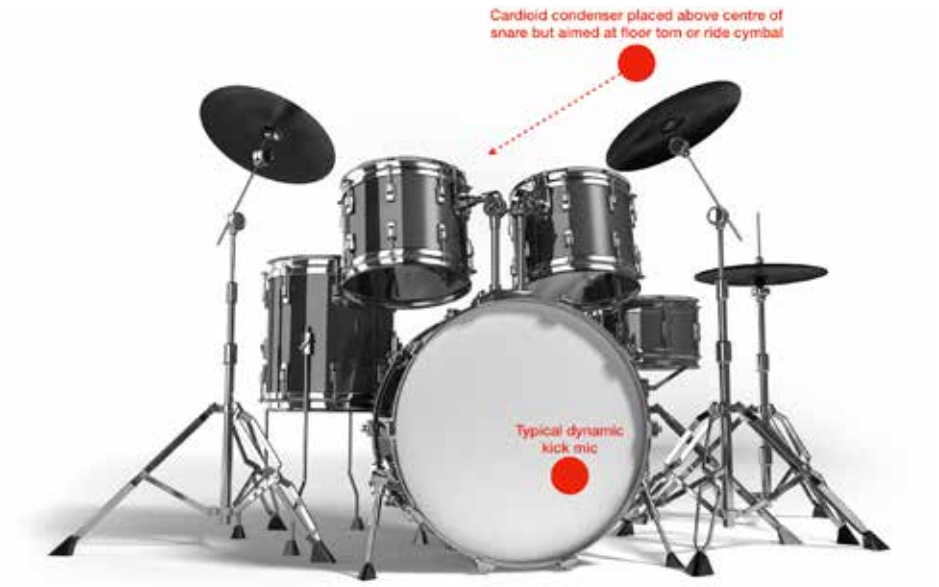
Experienced jazz musicians will often have valid and useful suggestions for miking their particular instrument, so a cooperative 'willing to try' attitude goes a long way – especially in situations where the musicians need to 'work' the microphone. And finally, mixing jazz is like mixing theatre; leave your ego in the bathroom because it's not about you or your sound.

Miking drums

Jazz drummers are always wary of sound engineers, and that's probably because at some point in their career they've had to deal with control-addict engineers who insist on sticking a mic on every drum and processing it as if they're mixing metal. Jazz drummers consider their entire kit as a single instrument and expect it to be miked that way; putting a mic on each drum is as disrespectful as putting a mic on each note of a piano on the assumption that you, the engineer, can create a better balance of the notes than the pianist can. Many jazz drummers (especially those in Modern Jazz ensembles) prefer no mics on their kit in a small venue. Explaining that the mics are not there to make the drums louder but to help tie them in tonally and spatially with the other instruments, which are all miked and/or DI'd, usually does the trick. The term 'recreating a sense of ensemble' always worked wonders for me...

For a Modern Jazz ensemble, where the drums play more of a nuanced instrumental role rather than a driving force, I never needed more than two mics. A small single-diaphragm cardioid condenser about 60cm to a metre above the centre of the snare but angled towards the ride cymbal and floor tom delivered an excellent balance of the kit with good capture of brushes and any hand-held percussion. Choose one that is not too bright or 'splashy' on cymbals; I got consistently stellar results from Milab's VM44, but Neumann's KM184 sounded best when unplugged and returned to its box.

Being a cardioid, the overhead mic will lack the bottom end of the kick at that distance so a kick mic was always placed as a safety precaution. Any of the numerous dynamics



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made for kick did the trick, typically placed about 15cm off-centre and about 4cm away from the resonant skin (the skin facing the audience). Note that the resonant skin rarely has a hole in it, so get used to it: if a kick drum has a woolly sound it's because that's the sound the drummer likes and you'd better reproduce it like that.

For Big Bands, where the drums provide more of a driving force, I'd start with three mics – kick, snare and a single overhead placed a metre or so above the centre of the kit. I'd add tom mics only if the overhead mic couldn't capture the toms in a good balance with the cymbals.

Miking double bass

The double bass was never an issue as long as I was prepared in advance with two channels, two XLR leads and a short mic stand with boom arm. Some players carry surprisingly good little amps from boutique manufacturers who make amps specifically for double bass. These amps have useful direct outputs on XLRs; some players will insist that you use it because it is post-EQ and they are using the amp's EQ to tame the sound of their pickups. Some have Gallien-Krueger's classic MBX series amps which have direct outputs but sometimes require a bit of fiddling with pre/post switches to get a decent sound.

At the other extreme are those who will only use a microphone. The mic of choice here is EV's RE20 due to its low proximity effect. This is typically placed about 20cm in front of the right-side F-hole (audience perspective); experienced players will show you exactly the right spot and angle to place it so they can 'work it' – pivoting their instrument on its pin and moving it towards and around the mic to suit whatever they're playing at the time. Take their advice and they'll make it work for you. Some players will bring their own mics, typically an RE20 or the clip-on DPA 4099; give it a try before foisting your own preference on them.

For Modern Jazz, where the drums are located on one side of the double bass and the piano is located on the other, Neumann's TLM170 in bidirectional mode provides good capture while minimising spill, but with greater proximity issues as the player pivots the instrument around the mic. No matter what mic you're using, be sure to check polarities if you're combining it with a direct feed from an amp.

Miking grand piano

The grand piano is one of the most difficult instruments to reinforce when sharing a small stage with a drum kit. There are many ways to mic it, and yet pianists are often the least fussy about how it is miked as long as they can hear it in the monitors and it sounds acceptable. They'll let you know if they don't like it. There are two goals here. One is to sit the piano appropriately against the other instruments in the mix for the audience, the other is to provide on-stage monitoring to the pianist and other musicians. The opportunities for feedback are considerable, and maximum GBF (Gain Before Feedback) is the goal.

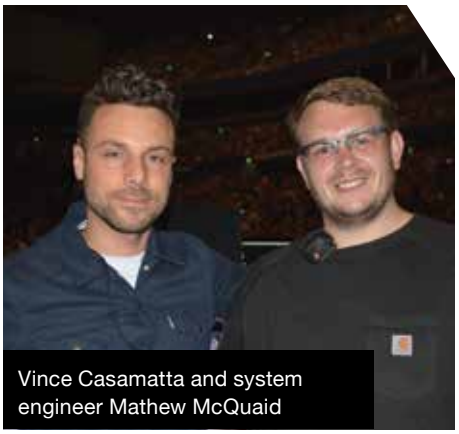
You may find this hard to believe, but placing a Shure SM57 under the piano's soundboard can provide a remarkably useful and acceptable sound with far more GBF than any other technique I've tried on a small stage shared with a drum kit. The very idea of an SM57 under a piano still irks the purist in me, but the reality is that it became my 'go to' approach for all gigs that included a piano on stage with a drum kit. This miking technique is a wonderful piece of audio symbiosis – it takes advantage of the SM57's excellent feedback rejection, and trades off its unique vocal-tailored frequency response (read: huge midrange peak) against the dullness expected from the underside of the soundboard and the bass boost due to being placed so close. I never got usable results from other mics in the same spot.

Place the SM57 on a short stand, facing directly up, with the diaphragm about 3cm from the soundboard and directly beneath the centre of the area where the strings overlap. Take it back to 4cm or 5cm if you're getting too much bass boost. It's not the best piano sound I've ever heard straight off the mic, certainly not as pretty as a pair of condensers over the strings, but with a bit of EQ it is a far more usable sound when you need to balance a grand piano against a drum kit and amplified double bass on a small stage. Trust me, nobody cares about your beautifully-crafted condenser-miked stereo piano sound if they can't hear it properly without feedback! With the SM57 under the soundboard of the mid-sized Yamaha grand on the stage at Foundry 616, I found that cutting 2kHz and 4kHz between -3dB to -6dB each (depending on how heavy-handed the pianist was), along with a dB or so of HF shelving and a touch of an appropriate 'jazz club' reverb resulted in a very acceptable sound with the right kind of feedback; i.e. the kind you get from performers and audience members when they can hear the piano clearly.

Leave the lid open on full stick for the typical Modern Jazz layouts, and close it if necessary for the Big Bands where the drum kit is often set up very close to the piano and spill is a major issue. Placing a baffle alongside the piano mic helped enormously in these situations.

Here's a final point in support of miking the grand piano from underneath. The best gigs take place when the musicians are happy, and pianists are happiest when the piano lid is at full stick. Apart from producing the best piano sound and allowing the pianist to hear the piano better, the lid is a wonderful reflector that helps to direct the piano sound across the stage to the musicians and also out to the audience. In the standard Modern Jazz stage configuration, however, a piano lid at full stick also does a great job of reflecting spill from the drum kit into any mics placed over the piano strings - especially cymbals! This can be disastrous when you need to turn the piano up to balance it against louder drums; louder drums means louder spill reflected into the piano mics, so turning up the piano mics also makes the drums louder and roomier, with no benefit in making the piano more audible against them. Engineers with a recording background will quickly recognise that in this situation the piano mics over the strings are essentially drum room mics placed in a corner, with a bit of piano in them!

Next issue... more about miking, then on to soundcheck, monitors and mixing...



Vince Casamatta and system engineer Mathew McQuaid

MAROON 5

by Cat Strom

Maroon 5's audio engineer Vince Casamatta learnt his trade mixing bands in small Chicago dives, eventually expanding to going on the road. At the same time he had his own studio and truthfully, he always wanted to be a studio mixer.

"But this is just what ended up working out!" he said. "I still occasionally mix an EP or album but mainly for indie artists."

On the Maroon 5's Red Pill Blues tour Vince is the new guy, although he has been with them for nearly a year.

"This is one of those camps where people have been around for a really long time," he added. "I think a lot of people have many opinions on what Maroon 5 should sound like, so initially it was challenging to navigate my way through that, but these guys were all very good at giving me space to do my own thing. Although Maroon 5 write a lot of pop-leaning songs, they are very much a rock band and want to be treated as such live."

Vince was clearly enjoying mixing for a real rock band that can all play together without any backing tracks, saying these sort of acts were becoming rarer.

"It's very much a rock mix that I want to grab you out of the gates and surround you," he elaborated. "I don't want it to be a wall of sound that just hits you for an hour and a half. I don't think anybody enjoys that. I try to find places to work with the dynamics of the musical arrangements and sometimes accentuate them so you can hit hard for a

bit and then pull back. These guys are really aware of those things anyway with their set list choices and live arrangements, I'm just trying to present that the best way I can."

As a fan of DiGiCo consoles, Vince opted for an SD5, favouring its work flow and complexity. As well as some outboard gear, he had a Waves SoundGrid server running up on the SD5, with anything that needs to be automated going on the server and anything that is static for the entire show in his outboard rack. The Waves plugins are used mainly for group compression and parallel compression, which gave the mix flavor and texture as the DiGiCo is such a neutral surface to begin with, according to Vince.

"The API 2500 is a great compressor and the SSL Quad compressor is always good to add parallel compression to drum busses," added Vince. "I really like the API 560 EQ plugin on the kick and snare buss; as it's a live drummer his dynamic changes throughout the set, and the API 560 allows me to re-tailor how the drums are sitting in the mix on the fly."

"On the road, you don't know what kind of support you're going to have so I like to keep things as simple as possible so if things go wrong, you can troubleshoot them easily," he said.

Outboard gear included a Bricasti M7 for Adam's main effect reverb with Vince using MIDI triggers from the snapshots to change patches in the Bricasti. A Tube-Tech CL 2A is used for a compressor on Adam's vocal and spare vocal, whilst a Neve 5045 primary source enhancer saves Vince a few headaches as most of the show designs feature Adam in front of the PA for nearly the entire set. However in Australia the set was scaled back with a design that kept Adam behind the PA.

"He's always in a different place with respect to the PA. L-Acoustics being so tonally linear as you walk through it is helpful but the Neve 5045 is super helpful," explained Vince.

PA was an L-Acoustics K1/K2, K1 main and sides with K2 below with the sub configuration often changing depending on the venue.

"We are flying K1 for main and side hangs with K2 below, so that we keep the coverage consistent close to the stage," explained Vince. "Rear hangs are almost always K2 only. K1SB are always flown directly behind the main K1 hang for added low extension and punch. We also use a cardioid sub arc on the floor. All powered by LA12s wherever possible. One of our main concerns in design is how to keep low end off the deck so the band aren't rattling around up there. Mathew McQuaid is responsible for overseeing the entire design process and has done a great job of maximizing FOH coverage while nulling the low end on the deck."

Systems engineer Mathew McQuaid used Soundvision, L-Acoustics' proprietary acoustic prediction software, and Rational Acoustics Smaart 8 to align the system each night.

"There are a lot of good PAs on the market and you can have a great show with many of them," said Vince. "This is the most vocal forward mix I have ever had and the L-Acoustics has made me feel like I'm not fighting myself as far as where the vocal sits in the mix. I want a really cool, rock-sounding mix but I don't want to sacrifice the fact the vocals have to be over top, in fact the vocal presence has been pretty easy to dial in."

The band are Shure endorsees with lead singer Adam Levine using the Shure Axient system and singing into a black SM58, a no frills approach that Vince admires and although Adam beats the mic and tosses it into the crowd every show, it always holds up.

"It's the right approach to pick a microphone that is tried and true, meat and potatoes, nothing fancy as he basically uses it for everything but a hammer," laughed Vince. "With this show, I have been less concerned with microphones than with other acts and I don't really know why that is. I have the new D12 kick mic, a dynamic microphone that, when supplied with phantom power has a few different EQ curves. I have a 57 on snare top which sounds great, all no frills. If you have a good band with good tones and a great mixing console, a lot of it is just getting out of the way and letting it happen."

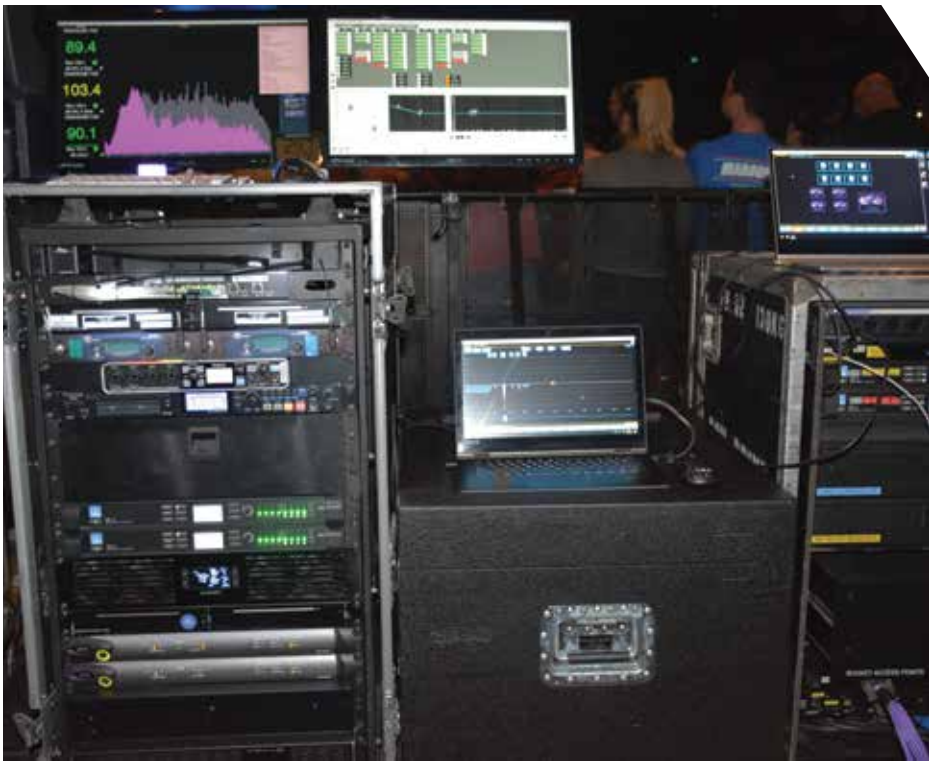
The band changed a lot of the guitars to Fractals from Royer Ribbon mics, which Vince says sound way better and sit in the mix well taking up less headroom. With seven people on stage headroom becomes a real challenge quickly.

Monitor engineer Bill Chrysler mixed on an Avid VENUE S6L-32D with the latest version of Waves SoundGrid. Most of the plugins he used were in the console, with the exception of Adam Levine's vocal reverb, which is a Waves TrueVerb.

Everyone has both IEMs and wedges, except the bass player who has no IEMs and Adam who only has IEMs.

"The wedges help to retain a bit of vibe onstage as stages become quieter and more isolated, it's a way for the band to feel connected," commented Vince.

JPJ Audio supplied the tour.



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Manufacturers Survey Update –

INDUSTRY HITS HALF A BILLION

In October 2017 we published a comprehensive survey revealing the size and nature of entertainment technology creation in Australia which offered many never-before known insights. We have taken the time to update this information and are please to advise, the manufacturing sector in Australia, and probably for the first time in its history, has exceeded over AUD half a billion in output.

The growth in just over 12 months can be attributed to the rapidly expanding local headphone producing sector. Using exactly the same criteria as the initial presentation:

1. National Composition

Turnover from – to	Organizations	Employees
100,000 – 999,999	60	111
1,000,000 – 4,999,999	18	132
5,000,000 – 9,999,999	10	197
10,000,000 – 24,999,999	2	55
25,000,000 – 99,999,999	1	110
100,000,000 – 249,999,999	-	-
250,000,000+	1	350
Total	92	955

2. Regional Composition

State/ Territory	Organizations	Turnover	Employees
QLD	10	5,800,000	30
NSW/ACT	32	118,500,000	276
VIC/TAS	35	361,450,000	541
SA/NT	8	5,600,000	26
WA	7	19,800,000	82
Total	92	511,150,000	955

3. Sector Composition

Sector	Organizations	Turnover	Employees
Audio	58	138,450,000	409
Lighting	6	14,800,000	51
Curtains, Staging, Scenery & Rigging	13	24,600,000	60
Vision	5	315,900,000	379
Ancillary	10	17,400,000	56
Total	92	511,150,000	955

The survey revealed that the four largest organisations had established a strong export presence and a growing international market share. However, with a few exceptions the majority of the 92 listed organisations had either a sporadic or no export program, relying instead on the small Australian market (around 1.5% of the world total) to sustain their business. A hypothetical analysis will lend perspective to the possibilities; given the same circumstances and market penetration a company turning over $100,000 in Australia would be turning over $1,316,000 if based in the USA. And a company turning over $999,999 in Australia would be turning over $13,160,000 if based in the USA. These figures are in AUD, based on market similarities and a USA population 13.16 times the size of Australia, with enhanced opportunity of export due to a significantly

higher sustaining income base. The majority of Australian companies in the survey, 60 in total (or 65%) currently turn over $100,000 to $999,999, therefore the key indicators in this survey remain positive and present remarkable potential for financial output and employment growth, but we must export.

The manufacturing sector of our Western nation competitors, particularly the UK, Europe and the USA operate in well-established decentralised environments, benefiting from realistic manufacturing and warehousing cost structures, not so Australia. Our survey shows we are primarily centralised in the capital cities, in particular the two highest cost of all Melbourne and Sydney where real estate, services and employment costs are by far the highest in the nation. As the market place is also rapidly decentralising, thanks to the internet, many of our manufacturers would be wise to investigate re-location to a much lower operational-cost region, to ensure we can successfully compete on a more level playing field. This important issue is being addressed by ACETA on behalf of the membership.

In summary, the survey confirmed, Australia's entertainment technology creative / manufacturing sector finds itself well positioned to substantially elevate its international influence and become a significant source of entertainment technology supply in all its forms. With only a few exceptions, the sector is conveniently compact, niche by nature, resilient, proven in the development of high-performance technology, and with very little baggage, a highly desirable international supply partner. But most importantly it is now empowered with its own increasingly influential 'peak body'. With or without the participation of any particular organisation, ACETA is determined to prevail. In partnering with resourcing agencies and the establishment of development programmes, the current financial output of 511 million could become well in excess of a billion and 955 employed individuals could become 2,000 or more. Obviously only bona-fide ACETA members receive the benefits and qualify for inclusion in programs, therefore it may be in your best interests to join the vision and secure the future. Contact www.aceta.org.au or phone (03) 9254 1033.

ACETA Needs Your Input

ACETA constituents fall into three categories, manufacturers, manufacturers representatives and service providers. There is no priority delineation; all sectors have unique needs which are addressed on constituent consensus and as specific issues arise. The second industry convention program is testament to this fact, where sector specific, along with general subject matter, will engage all industry participants, so make your convention bookings soon.

Many indicators suggest our industry has reached a point where it needs an injection of fresh and progressive thought to help address challenges and improve sustainability.

At the inaugural convention in 2018, delegates would have met seminar presenters Sheree Cross and Bernard Stapleton, who consult to SV Strategic Solutions. Individually and as a team, they have worked with many companies to bring about positive corporate change.

They have worked with a number of industries, for example, successfully assisting the Australian agricultural industry manufacturers into the large and lucrative USA market.

They know how to locate funding and how to develop strategies for successful export. We have reached an agreement where they will work with ACETA to assist individual members institute necessary corporate change. However, their first mission is potentially a real game-changer.

At the second industry convention Sheree and Bernard will facilitate a Manufacturers Summit where it is hoped that those wishing to succeed in export markets will unify under Sheree and Bernard's leadership. The plan is to access funding and develop a pro-active export program, initially focused on the most available market to Australian technology creators, the USA.

To begin the process Sheree and Bernard have authored a survey to assist their understanding of the current landscape and potential moving forward. The confidential information supplied in the survey will reside only with Sheree and Bernard, and form agenda points for the manufacturers summit at the second industry convention.

If you are a member in any sector wishing to change and improve your sustainability, if you are a manufacturer wanting to succeed in export, complete the survey and forward it as directed in the document.

There are no more excuses for failure, we have at our disposal, support, objectivity, experience, agents of change, use these resources to your benefit and prevail.

aceta

Australian Commercial & Entertainment Technologies Association

Sight and Sound

KEEP IT OUT OF SYNC

by Simon Byrne

That's right, out of sync. At least from an audience perspective.

There has been a lot of research done by the hearing aid industry to improve intelligibility for hearing aids. Some of that research can be applied to live events.

The really interesting thing that came out of the research, is that intelligibility actually increased when a small delay is inserted in the audio chain, when compared to the accompanying vision.

That is, the subject understands better when the audio arrives slightly after they see the lips move on the speaker. And the amount of delay is different for everyone. Conversely, comprehension dramatically decreases when the audio arrives slightly before the vision.

The research from University of London also showed potential benefits of adjusting the time delay between audio and video signals for each individual, finding that speech comprehension improved in half of participants by twenty words in every one hundred, on average. The amount of delay required is different for everyone!

When you think about it, that makes sense. In the natural world, humans are used to the sound arriving after the vision because light travels about 870,000 times faster. That is, light arrives instantly for our purposes, and sound takes about one millisecond per foot (or three milliseconds per metre). We are used to hearing things after we see them, and that delayed audio depends on how far away we are from the source.

But here is another interesting fact. The brain apparently processes the audio quicker than the vision! That means some of the audio delay is accounted for, by the added vision processing delay in the brain.

Probably as a result of so many variables, the boffins have also proved that it is very difficult for humans to match lip sync themselves (video editors will tell us this), and those matches are different for all of us.

It is no wonder that filmmakers use a clapper board at the start of shooting a scene. When the gate on the clapper closes, it delivers a definite visual cue as well as a perfectly timed audio clap which makes it possible for the editors to quickly sync up the audio peak waveform on the timeline, to the closed gate in the edit.

We place a lot of importance on latency in audio systems to an absolute minimum for obvious reasons, and the accompanying video systems need to be in sync. But generally speaking, there is more latency in the vision systems.

So in a real world, what does this mean? Maybe a rethink is required when using video displays, so as to ensure that the audio is delayed sufficiently after the video.

Instead of thinking of audio delay in milliseconds, we might think of it in feet. Roughly one millisecond equals one foot. At front of house, the audio and lighting folks are experiencing about one hundred feet of delay, or a tenth of a second. If the video display only has fifty milliseconds of delay, happy days. But those in the audience less than fifty feet away, according to this research, will perceive less intelligibility! This is due to the audio arriving before the matching vision.

It seems that audio lagging vision by as much as fifty milliseconds is acceptable, probably even preferred. However, based on this research, we never want audio to precede the vision, even slightly.

LISTEN EVERYWHERE

Jason Owen is the Managing Director of D2N, an Australian owned company specialising in wired and wireless communications and audio solutions, RF over fibre, ACMA licence planning, and RF engineering.

by Jason Owen

Listen Everywhere audio servers can stream from two to 16 different channels of audio over WiFi to 1000 users via a free, customisable app for smartphones. Systems with more than 16 individual channels to be broadcast can be catered for with customised solutions. Multi-screen and assistive listening environments, which include conference centres, sports bars, houses of worship, interpretation and hospitality, benefit from the flexibility to provide a wide range of streaming audio options with strong, clear, and reliable performance.

Application Examples

D2N have been installing Listen's LW-100P-02 two channel units and LW-200P-04 units. It's been a broad customer base – we've installed into Victoria's Parliament House, motor sport teams, lots of churches, a few production companies, and a federal law enforcement agency.

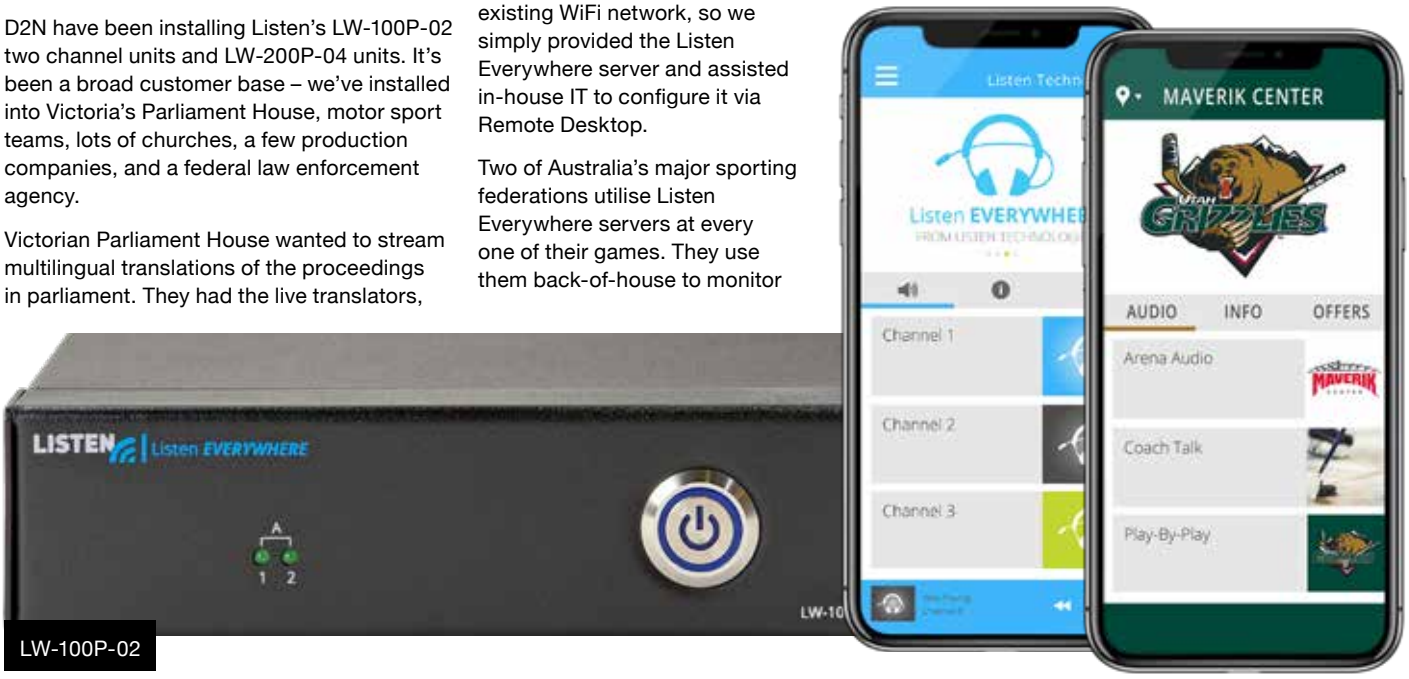
Victorian Parliament House wanted to stream multilingual translations of the proceedings in parliament. They had the live translators, audio infrastructure, and an existing WiFi network, so we simply provided the Listen Everywhere server and assisted in-house IT to configure it via Remote Desktop.

Two of Australia's major sporting federations utilise Listen Everywhere servers at every one of their games. They use them back-of-house to monitor referee and umpire audio, as well as the commentators on broadcast. D2N integrated the servers into the stadiums; they get their audio feeds from their IT department, connect to the stadium WiFi, and away they go.

We've also installed Listen Everywhere into retirement homes. They use it to broadcast the multiple audio channels of the TV they're showing. In application, it's a lot like the way a sports bar would use it. And because a lot of the latest hearing aids can be tethered by Bluetooth to your phone, it effectively becomes an assisted listening device.

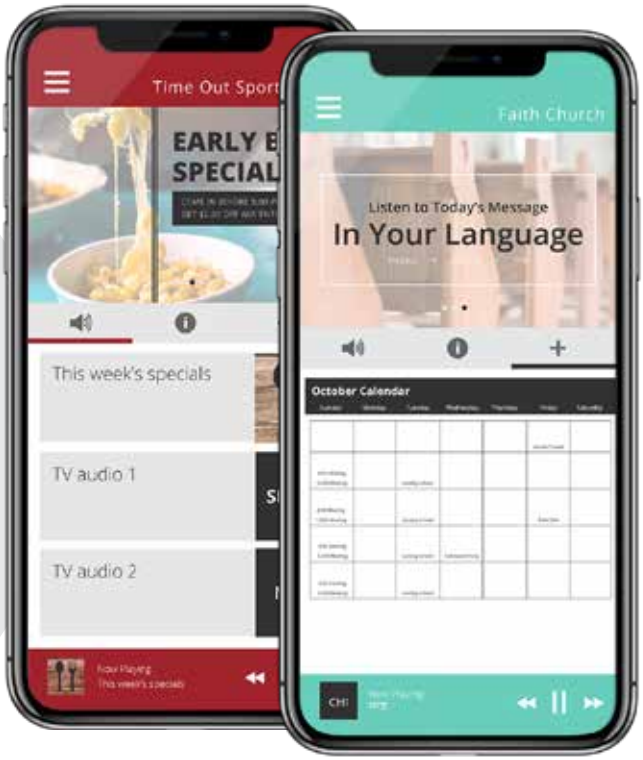
App Customisation

The Listen servers not only stream multi-channel audio content, they give you the ability to go inside the Listen app and add third party documentation. So, for instance if you're a club or a pub, you can add your bistro menu and your 'What's on this Week,' guide. You can also add web links - 'sign up to become a member' and that type of thing. As an integrator, you can give the client access to the server



LW-100P-02

"Listen is distributed by NAS and I have no complaints about their service and support. From day one they've been fantastic."



LW-200P-08

so they can change their logos, branding, colour scheme, or whatever else they want to do on the app. There are a couple of different profiles in terms of user rights on the server, so you can limit access to certain staff members, or give them full access as required.

Installation

About 80% of the time we're integrating Listen Everywhere into an existing WiFi network. The servers are able to be configured as either DHCP or with a static IP address. Almost all of our customers request it to be set up as DHCP, and it's usually just that simple. You put audio in the back, you download the app, you log on, and you're away.

Applications that want a static IP are normally where we've built them a WiFi network. For example, in some churches, we've built them a rolling rack with some radio mics, a mixer, the Listen Everywhere server, a router, and the WiFi node. We take a program feed out of the main PA and send it to the translators in another room, who have the wireless mics. That audio then comes back into the mixer, is fed into Listen Everywhere, and broadcast via the WiFi. For the end-users, we created a couple of A4 laminates with really simple instructions on how to install and use the app. These are simple, easily deployable systems that suit church services that set-up quickly in community halls, leagues clubs, or cinemas.

Product Development

Listen has certainly improved the products over the time we've been using them to make them more 'production friendly'. They've gone from using RCA unbalanced audio inputs to balanced audio via terminal strip. The base units used to accept 150 users, while the current generation now accepts a thousand users straight out of the box. As you go up the model chain and add more audio channels, the price doesn't go up all that much, so you get an incremental increase in price for an eight-fold increase in channel capacity.

Advantages

Traditionally, this kind of personal audio coverage was only possible with FM transmitters and receivers. There's a lot of issues with the FM approach - limited availability of spectrum, the signal penetration in buildings, heavy capital investment, ongoing license fees from the ACMA, and limitation to one channel. Listen Everywhere takes away the third-party device for the user and makes it BYOD; it's something they already own, and doesn't cost the provider anything. The Listen app is free to download for both iOS and Android. It's changed the model completely - it's a cost-effective way of getting multi-channel audio out to patrons.

Service and Support

Listen is distributed by NAS and I have no complaints about their service and support. From Day One they've been fantastic. They've looked after me with a couple of warranty issues, and they're very responsive. I look forward to doing business with them as more Listen projects develop.

Brand: Listen

Model: Listen Everywhere

Product Info: www.listentech.com

Australia and New Zealand: nas.solutions

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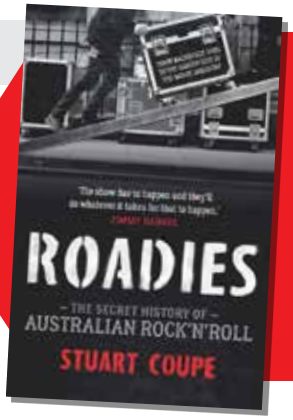

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BGV-D8

Chainmaster BGV-D8 - The Specs

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CHAINMASTER BGV-D8

by James Pavey and Tim Missenden

Double brake

James Pavey is National Manager – Exhibitions at Clifton Productions, a family owned, nationally operating production company specialising in staging, rigging, and exhibitions with offices in Melbourne, Sydney, and Brisbane.

I manage sales and operations of Clifton's exhibitions business, which includes rigging and lighting at the MCEC, ICC, and the Brisbane and Gold Coast Convention Centres, where we assist custom stand builders and production companies to deliver rigging and lighting solutions. Clifton's have purchased 65 Chainmaster BGV-D8s with 500kg capacity for our general inventory, and they're predominantly used for our exhibition business. We've been using them most often in the aforementioned venues, and we like to keep them indoors to keep them in the best possible condition.

On any given day, the BGV-D8s will be lifting bulkheads, lighting rigs, and LED screens. As they're half-tonne motors, they're used for the mid-range of what we lift. When we need to lift bigger LED screens or beyond we use our one tonne motors. With our BGV-D8s half-tonne capacity, two lift points will give us the power to lift most of the things we need to lift.

Comparisons

The BGV-D8s sit in the market somewhere between high-end and midrange; they're not the most expensive, and they're not the cheapest. When we were researching for our purchase, we were looking for features like the double brake, which provides redundancy. We wanted to ensure that Cliftons are ahead of the game when it comes to compliance, because you never know what might change in future legislation or standards. We wanted anything we invested in to cover that eventuality.

Manual Handling and Appearance

We've had custom made roadcases manufactured that fit two BGV-D8s per box. They're a standard 800x600x600, which fits well into a truck, so with a truck 2400 wide, you can fit three across. When we get on-site, the BGV-D8s lift out of the cases easily, and are quickly engaged to be hung into the roof. They have integrated easily into our existing control systems, with no need to alter our systems or cables, which is a standard motor control with a Weiland connector. We get a lot of positive comments about the 'bling' of the gold chains; they look the part for exhibition work, and they're a good looking motor.

Service and Support

The after-sales support available from distributor ULA Group was an important factor in our purchase. All motors require an annual load test – they need to be lifted up, pulled apart and inspected, put back together, logged and tagged, and ULA Group provide that service. ULA sent their techs to Chainmaster HQ in Germany to get the certification, and they provide support for all of their products. We have a long-standing relationship with ULA, and we've always found them to provide excellent support.

Conclusion

The Chainmaster BGV-D8s are solid German engineering. Reliability is important when it comes to buying chain motors. Risk is in the nature of lifting, and it's the number one factor you're looking at. That's why you don't go with the cheapest.

Tim Missenden is the Managing Director of BCL Productions, a Brisbane-based production company that has been providing sound, lighting, and vision services for 20 years. BCL's clients include the Channel 9 Telethon, Lord Mayor's Christmas Carols, and the Woodford Folk Festival

BCL have invested in 12 BGV-D8s with one tonne capacity and 12 with half-tonne capacity. We've been using the one tonners for four or five years, and purchased the half-tonners recently. We decided to add the half-tonnes to the inventory because we needed a lighter weight motor for ease of use, predominantly for lighting where we don't need the larger capacity. It relieves loadings on the structures we have to rig from, including Brisbane's River Stage, which has limited weight loading. On gigs like the Lord Mayor's Carols, there's a large production component that pushes weight boundaries, and any weight reduction you can get is helpful. We carry two half-tonners two per case, and the crew appreciate a motor that is lighter and easier to handle.

Comparisons

In doing our research before purchase, we looked at the accepted industry standard brands, and what other production houses were using, PRG in particular. PRG use one brand in the USA and Chainmaster in Europe. We talked to someone who had used both extensively and listened to their feedback. The brand PRG use in the USA is very heavy duty, and as such is a very heavy motor. Chainmaster has been designed specifically for the entertainment industry, and while considerably lighter than its competitor, is more than adequate to the task.

Features

The BGV-D8's safety rating and build quality are very good. Their double brake is a fantastic safety feature. Chain management going through the motor is excellent; I've had no chain tangles, knots or jams. They even run quietly; there's not much not to like.

Support

The support from ULA Group has been good, and we've only needed one repair in five years. We appreciate ULA carrying out the annual testing, and they're quite capable in that regard.

Conclusion

The BGV-D8's stand-out features are the build quality, compact size, light weight, high safety rating, and quiet operation. Comparable products can be twice as heavy with the same safety margins, so why cart around the extra weight? Chainmaster have done a good job delivering a product that works well in the entertainment production environment.

Brand: Chainmaster

Model: BGV-D8

Product Info: www.chainmaster.de/en/

Australia and New Zealand: www.ulagroup.com

D8P

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A Traveller's Tale

FLYING HIGH ON THE A380

by Duncan Fry

I see on the news that Airbus is ceasing production of its jumbo-riffic giant of the skies - the A380, citing changing tastes in passenger's plane requirements. It turns out it's a bit thirsty, and needs to be full of passengers to have a worthwhile trip. A bit like driving my old 8 litre Plymouth Superbird to the shops and back, and having to re-fill on the way back.

That's a shame because, speaking on behalf of all the more generously sized passengers like me at 188cm tall or more, the A380 is the only plane that I really feel comfortable flying in. There's plenty of room to move and eat, plenty of toilets (more on this later) and even in economy it's very quiet. It's the ideal plane for the long haul from Australia to Europe and back, making all other planes seem tiny by comparison. I haven't tried a Dreamliner yet, but judging by the number of people going a bit wacko on its 17 hour flight to the UK via Perth, I may not try it for some time, if ever.

When we went to the Frankfurt Pro Light and Sound exhibition in 2014, for the long

"This is crazy," I thought, "I'll just go down the back stairs and use one of the toilets on the lower deck."

hop to Dubai we flew on a Qantas Airbus A380, then onto an Emirates Boeing 777 for the seven hour trip into Frankfurt. The A380 was a dream to fly on; quiet, spacious and comfortable. The 777 was like a sardine can by comparison. I've been more comfortable three-up in the backseat of an original Mini! My travelling partner in crime - Colin from ARX - has a preference for an aisle seat, but I prefer the seat that's one in from the aisle. I'm quite wide, and if I sit on the aisle I get bumped into by every trolley and lurching passenger wandering up or down trying to make their way to the bathroom in the dark.

These 777 seats were the tiniest I've ever tried to sit in on a plane, very uncomfortable, and set out in a 3-4-3 configuration just like a jumbo. Of course, the 777's not as wide as a jumbo and that's where the problems started.

Sitting in the window seat next to me was a German guy, with a very similar Body Mass Index to me, so all in all it was ultra-squeezy. He had his shoulder in my chest, I had my shoulder in Col's, and Col had his shoulder halfway into the aisle, where every passing trolley duly thumped it.

At least it gave him an opportunity to stop them and get another bottle of red wine, thus pursuing his long-term research project into exactly how much red wine a modern passenger jet actually carries - quite a lot, it would appear!

Speaking of alcohol, though... Several years ago a bunch of us were on our way to the NAMM show in Anaheim, California, flying with Continental Airlines. Col was never happy with the amount of alcohol they served on Continental, and this time he'd brought along his own duty-free litre bottle of Cointreau. So the lights were dim, and the lads were hoeing into liberal amounts of the stuff, when all of a sudden the plane hit an air pocket and dropped like a stone for about one second. Whoosh! Up in the air go the contents of 4 full glasses of Cointreau, only to come back down again half a second later and about 6 inches to the left - right in their laps!

A sticky night was had by all!

But I digress.

Coming back from the ISE show in Amsterdam this year we had an A380 all the way to Melbourne. Unfortunately for me, I had picked up some horrible 'Amster-flu' at the show and was feeling rather poorly, wallowing in a pool of self-pity and snot!

I normally sleep like a drugged sloth on a plane, but not this time. I couldn't get comfortable at all, couldn't sleep, couldn't settle into any of the movies, and got sick of trying to keep my A5 size plastic food plate from sliding off the tiny slippery tray table. Just about the only thing I could do was drink lots of water and visit the toilets on a regular hourly schedule, hoping to flush the bugs out of my system.

And therein lay the problem.

By booking our flights early, Col had managed to score good seats for us in the upstairs section of the plane, towards the back, and in handy proximity to the toilet. An ideal position, you might think. But no. Let me explain:

If you've been to the upper deck toilets on the A380, you'll know what I'm talking about. The ceiling of the toilet cubicle follows the curve of the roof of the plane. I open the door, walk in, and the roof curves away from me. The toilet is there, beckoning me from the furthest point away, where the roof meets the floor. With a 'Thud' my head hit the ceiling! I bent my head down, and it still banged against the ceiling, making it very hard to see exactly where one was aiming.

"This is crazy," I thought, "I'll just go down the back stairs and use one of the toilets on the lower deck."

No, that wasn't possible, as a gate had been installed across the stairs after take-off, probably to stop any riff-raff from downstairs sneaking up to the rarified heights of the upper level!

I made my way back to the upstairs toilet, a bit quicker now, as my toilet visit was rapidly acquiring a degree of urgency, bringing with it a more literal meaning to the expression 'to splash the boots!' Luckily no queue had started in my absence, and I managed to get inside quickly. I looked at the problem with an analytical eye (luckily I had brought it with me!) What I needed was to make myself shorter.

I bent my knees as much as I could and shuffled towards the toilet, hunching my back at the same time. The plane suddenly started shaking and with a 'Ding,' on went the 'fasten seatbelts' sign. Jeez that's all I needed!

To steady myself I gripped the toilet with my knees, lifted the lid and proceeded to 'water the horses' as fast as I could, and then got out of there back to my seat, ready to do it all over again in about an hour!

The flight droned on for another five hours, and then miraculously we were landing in Melbourne and climbing into the relative luxury of the hire car that was waiting for us.

When I arrived back at home my gf took one look at me and whizzed me off to the doctor for a double dose of strong antibiotics, followed by a week in bed.

Ah, the joys of overseas trade shows!

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