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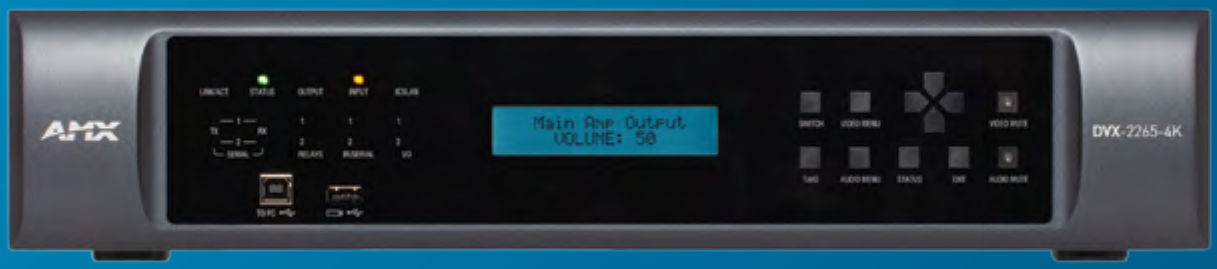

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Julius Grafton and Channels Magazine

ACETA Convention Wangaratta, VIC. 26-28 March, 2021.

Industry peak body ACETA have confirmed that the full, cancelled programme from 2020 will run for the 2021 convention, scheduled for March 26 – 28 at the Wangaratta Gateway Hotel.

In a first for the industry, attendance will be free for ACETA members, with social events subsidised, all capped at 100 delegates.

"We've done this due to the financial impact of the pandemic on our members," explains ACETA president Frank Hinton. "The cap of 100 delegate registrations is the optimum that ACETA can responsibly finance and a comfortable number should there be any social distancing required. Many have indicated they wish to bring partners which we wholeheartedly encourage, and the social events can easily accommodate the additional numbers. We had no alternative but to offer this once-only free event in the endeavour to bring the industry together, uncover potential, search for and agree on new initiative towards sustainability and growth in whatever a new world presents, but also to develop a new empowering age to an industry not known for its cohesion."

For full programme details and delegate registration, please visit: www.aceta.org.au/convention-2021.html

30 YEARS, STILL RIGHT HERE.

On December 15, it is 30 years since CX founder Julius Grafton published the first edition of 'Channels Magazine', which was intended to be the house magazine for Jands. At the time, Jands CEO Paul Mulholland embraced the idea to help Jands through a big economic recession. Channels started as eight pages, in glorious black and white. Ironically, it had a glorious typo on the cover, the date was shown as Dec. 15, 1991. It was a year ahead of itself!

Two years later, it boasted 64 pages, many in colour, and carried advertising from most of Jands competitors. It was a quirky, bizarre aberration and a phenomenal success, with 12,000 readers. Grafton somehow managed to negotiate an exit from Jands, and started Connections Magazine with his wife Caroline.

That took off too, and a few years later spawned the ENTECH Tradeshow, which also boomed. In 2001 Grafton re-booted the magazine as CX, short for Connections and a play on the word we all love, SEX. "I loved calling someone and saying "Hello, this is Julius from CX. It almost always freaked them out," he said.

Late last year Grafton sold CX and his media interests to Jason Allen who today can boast this is a very rare trade journal - it is proudly in print and digital, while almost all others have gone digital only. And CX has a continual and direct lineage back 30 years. All back issues of the magazines are online in our heavily trafficked archival resource, at www.cxnetwork.com.au

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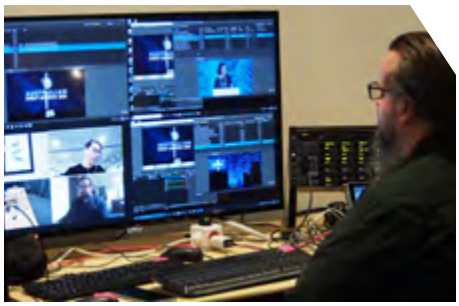

The Australian Event Awards 2020 – All Right On The Virtual Night

by Jason Allen

There's a tried and true formula for an industry awards night – find a big ballroom in a capital city, fill it full of production and theming, fly in the luminaries, put on a big show with dinner, and hand out the gongs. But of course, all of that went completely out the window for the premiere night for the Australian events industry in 2020.

Faced with COVID restrictions and closed borders, the 2020 edition of the annual Australian Event Awards, slated for 21 October, almost didn't go ahead. It was only after a monumental effort from the organisers and their production and technical partners that the show evolved into four separate, but linked, gala events, a 'virtual' show in Melbourne, and a livestreamed broadcast pulling it all together. On the night, winners included 'Highway to Hell', the Perth Festival's closing event, for 'Best Cultural, Arts or Music Event', and the ICC Women's T20 World Cup, for 'Australian Event of the Year'.

Sydney, Adelaide, Perth, and Brisbane all got their (COVID-safe) dinner and a show, with Sydney functioning as HQ for the livestream. Big Picture set up their broadcast control room at the Luna Park venue, with internet services supplied by Barrett Evolution and streaming production from Firesteel. The P.A. People were brought in to supply the video links between each site, and with five separate shows across four time zones needing to be co-ordinated, the all-important distributed comms system to keep it all on track.

"Each state had its own local production," explains Andy Carson, Senior Systems Engineer (Event Communications) at The P.A. People. "It was slightly different in every state, but basically the local suppliers provided audio, lighting, video, and cameras. We took a live feed from the local vision mixer at each venue along with an audio split and sent them via SRT over the public internet back to Sydney, to the broadcast control room at Luna Park. Ian Cooper mixed audio on a Yamaha PM10 supplied by Coda. After the video and audio was switched and mixed by Big Picture, we sent the mixed feed back out via SRT to each site."

The P.A. People sent a pre-configured rack to each remote site that contained a network switch, Clear-Com LQ audio-over-Ethernet interface, Clear-Com FreeSpeak II wireless comms system with beltpacks, and a computer loaded with SDI to NDI converters. There were also PTZ NDI cameras at each venue that sent confidence shots back to the control room.

"We have a Clear-Com matrix frame in a Sydney data centre," elaborates Andy. "This enabled us to link all the site's comms together. We are also hosting an instance of Clear-Com's Agent-IC in the cloud, which enables us to run comms on mobile devices, anywhere. All up, there were four channels of comms running to each site. They included the linked global show call from the caller in Sydney, who could speak to every site at once, the local show call channel for each state to talk to each other, the channel for the camera call in each state, and a channel to talk to the local techs without talking over the show call. Everything was linked via the internet and into the FreeSpeak II system in each state, so the local techs could all go wireless while talking to us in Sydney."

Co-ordinating the shows was down to the skill and experience of the show callers, with help from some very capable presenters and rock-solid comms. "Each state had its own stage manager and caller, and the awards shows were designed to run around dinner," outlines Andy. "The whole production relied on the showcallers to keep everyone in check. The P.A. People and Barrett Evolution have done many multi-site productions across national and international borders, and it's always full on! We enabled IFB for every presenter and IFB connectivity to the show callers, so they could talk to every presenter's IEMs individually. We even did IFB feeds into Zoom to cue respondents for the virtual Melbourne event!".

With virtual and livestreamed events blossoming amid the pandemic, The P.A. People have been constantly busy providing services for remote comms and production, enabling them to hone and perfect their local and remote systems. "We have clients that are doing major events every month," offers Andy. "As the virtual event market has expanded, it's allowed us to expand our requirements and polish all our native IP technologies."

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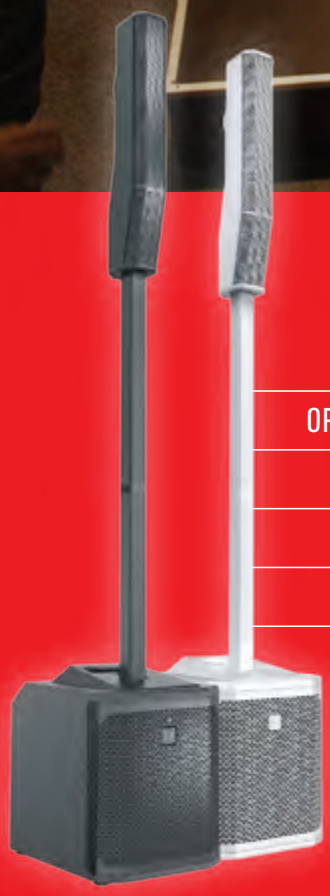

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CMI Launches JBL BRX300 Nationally

by Jason Allen

In a coordinated national event across four cities on Thursday 19 November, CMI Music and Audio launched JBL's new BRX300 modular line array system to the audio masses. I attended the launch at CMI headquarters in Melbourne, while Sydney folk gathered at Turramurra Music, Brisbane-ites at Brisbane Sound Group, and our kinfolk out west at Perth's Kosmic Sound.

This is the kind of event that is usually done by flying everyone to a central location, which is an expensive exercise. COVID has forced this kind of logistical problem-solving, and it's easy to see how this kind of hybrid launch may become standard. I think many will appreciate the convenience of not having to get on a plane, while distributor's marketing budgets will get some relief.

I got a sneak preview of the BRX300 two weeks before the launch event, and this time around, the team had tweaked the setup slightly, for the better. We first got to hear the system with two top boxes pole mounted above one sub, a configuration I didn't hear previously. This is the config that's going to get used for the majority of small corporate and community events, and the most portable. It still packs serious punch, throwing a lot of air a significant distance with satisfyingly wide coverage.

Two of CMI's crew then invited us to watch them switch configuration to four top boxes mounted on one sub. Audio Brand Manager Billy Makarewicz had the stopwatch out,

Billy Mak and his new baby

and from taking the two tops off the pole mount to powering up and passing audio through four only took an impressive two minutes and 15 seconds. The BRX300 is designed to be incredibly simple to set-up and operate – there's no complex modelling in software, little to muck around with in terms of presets in the sub's on-board DSP, very straightforward angle and pin configs in the rigging, and simple cabling. One sub powers up to four top boxes, and it all goes together logically.

A good cross-section of Melbourne's audio community were in attendance, with techs from retail, install, and production. Many lingered to talk pricing, dates, and delivery with the CMI crew, indicating that JBL have found a sweet spot where pricing, performance and ease-of-use are sitting well together. I remain impressed by the quality for the price, and can definitely see BRX300 popping up at a lot of events and installs.

"We are very happy with the turnout at these launch events, especially during a pandemic," said CMI's Billy Makarewicz. "We've had a restricted but very excited crowd listen up close to the BRX systems. The response was overwhelmingly positive and the system exceeded expectations in every way across the country. We expect to see many of these systems across Australia in 2021."

"I can see a real niche for BRX300 in moving certain clients up to a line array who wouldn't otherwise consider one," said Tony Marshall, Design Manager at Melbourne's Prime Technology Solutions.

Melbourne independent production professional Michael Zagarn had a simple response when asked where he could see himself using JBL's BRX300: "Everywhere."

Meanwhile, in Sydney, Brett Steele, Manager - Installed Systems at The P.A. People summed it up superbly when he said, with a smile, "JBL BRX300 definitely has places to be."

'This Could be Serious' - Grafton pens a book for hard times

Former CX publisher Julius Grafton has released a 340 page memoir that reveals more than most - and contains some stunning admissions. Proceeds go to the CrewCare charity, with pre-sales already hitting four figures in as many days.

With chapters such as 'Lighting a strip show is boring' and 'Blowing shit up', the book ricochets between characters in the technical community like Tom Misner and Bruce Jackson, to notorious nightclub queen Dawn O'Donnell and her henchman Todor 'The Torch' Maksimovitch. It details the gritty streets of east Sydney during the brothel wars of the 1960s, viewed through Grafton's bedroom window.

Starting with psychedelic lightshows in 1973, Grafton went on to became a protege of the late Roger Barratt, acclaimed as one of Australia's greatest lighting designers. Tony Davies and Gavan Swift were later beneficiaries of Roger's mentorship. In 1980 Grafton flipped over to audio, and started a touring production firm with his late wife Caroline. That spawned the Australian Monitor brand which led him into the shady world of venture capital which became an obsession.

The pages of CX Magazine would sometimes explode with features on the crazy mad money ventures like Ted Pretty's pillage of Hills, or the Staging Connections value destruction decade. Also getting a shellacking in the book are some larger than life music industry characters like A. J. Maddah, and a very recent crazy train wreck where Grafton became a (short-term) music promoter.

"I tested the book across a lot of people, and then hired a real editor to polish it off", Grafton told CX. "It's designed so you can read any of the 63 chapters in isolation without worrying about losing your place.

The book is available at Amazon Kindle, Apple Books, and as a paperback direct from www.juliusgrafton.com where the funds go directly to CrewCare.

Go to page 46 of this magazine for an exclusive preview of the book; "I Was A Roadie".

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Vale Russell Nelson

Industry veteran has died aged 59, after a two year battle with cancer

by Tony Wilde

Russell spent over 40 years full-time in the music industry, in many roles ranging from audio engineer to guitar tech, musician and music teacher.

I first met him in September 1980 when we were thrust together by a band manager who had booked a two-month tour of gigs up the coast to Cairns and an inland return for a local Melbourne band. It involved us as a two-man crew in a seriously overloaded old International C1300 truck and the band in a station wagon that belonged to the drummer. I had already been working for local bands, but Russell had just bailed out of his panel beating apprenticeship early to follow his music industry dream, so live gigs and touring was all new to him.

It was a tough but memorable tour, with some hugely funny moments that we often reminisced about in later years. We stayed friends once back in Melbourne and crossed paths a lot over the years while each working for different acts, and of course having the same road crew and muso colleagues socially.

Sometime in the mid-80s, I couldn't re-join Matt Finish as stage tech for their next tour, so got Russell to fill in for me. While they were in Melbourne, staying at the trusty old Diplomat Motor Inn, their guitarist went out to do his laundry and never came back. So Russell put his hand up to fill in for him at that night's gig. Well, he ended up doing the rest of the tour and became a full time member of the band, so just as well it wasn't me doing stage on that tour or a lot of shows would have been cancelled until they could find and rehearse a new guitarist! He also filled in on guitar and keys when required while on the road with Midnight Oil a few years later.

Another band he covered for me with when I couldn't do their next tour was Wendy & The Rocketts. They ended up taking him on his first overseas trip where he had the fantastic experience of touring as support act to bands such as ZZ Top and Bryan Adams.

Back in Australia in the mid-80s he was constantly working, doing audio and backline work for many bands, such as the Oils, Aust Crawl, The Church, always gaining the respect of those he worked with.

His main passion was playing music, and his first love was guitar. So late in the 80s he permanently moved to Sydney to study at the Australian Institute of Music, where he excelled with honours, obtaining his Diploma of Music. Not known to a lot of people was his other passion of Martial Arts, where he rose way above Black Belt, making it to 4th Kyu. He became a Sensei in training and was probably going to compete for Australia at the World Masters in Japan this year. And of course, he loved motorcycling, getting out for long rides on his sports bike as often as possible.

When our mutual friend, audio veteran Greg Thompson passed suddenly four years ago, Russell was straight on a plane to Melbourne with his guitar to play a song at the funeral, and then played late into the small hours at the huge wake. I know Russell really loved getting back to Melbourne for that and valued the big catch-up with old colleagues he had while here. Little did we know he would become so ill himself only two years later. He was a kind and sensitive soul, who I don't think I've ever heard anyone speak ill of, which is pretty rare in our industry!

In the 90s he married Belinda who often sung in a duo with him, and they had three daughters. During this time, they opened their own music school, Russell's Music in Beecroft, which grew successfully for many years until he had to wind it down a bit when he became ill with tumours on the brain. He endured very serious surgery and amazed the doctors by tackling this condition until he seemed to be clear. He continued running his business part-time, and was even back gigging, playing guitar at some of his regular venues, and also picking up new ones. But the beast returned, along with various other medical issues, and he was determined to beat all of them. Just as it looked like he was getting back on track again he suddenly declined rapidly and he passed away on 1st November 2020. His positive attitude, physical fitness and love of life probably bought him a priceless extra 12 months or more.

He is survived by his three lovely (and musically talented!) daughters who adored him, Belinda, his mother, two brothers, and sister.

No matter how serious a situation was in life, we could always have a laugh together, and I will really miss that ….until we laugh again.

Rock on, Russell (aka Rex Calypso).

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Parrtjima Festival of Light

by Louise Stickland

The Show. Photo credit: Mandylights

Set up. Photo credit: MPH Australia

Set up. Photo credit: MPH Australia

Festivals have fast become an elusive dream resembling gold dust in the Covid era – a much-missed environment for enjoying and sharing culture, ideas and social activities. As such, the 2020 Parrtjima Festival of Light at Alice Springs in the Northern Territory provided a rare reminder of the community, camaraderie, magic, and imagination evoked by lighting art.

Moved from its original April slot to September, the 10-day event organised by the Northern Territory Major Event Company (NTMEC), and produced and curated by AGB, went ahead due to the state's highly successful Covid-19 management strategy.

Featuring a carefully picked collection of amazing and fun light artworks together with a spectacular nightly lightshow designed by Richard Neville from Mandylights delivered to a locally produced soundtrack, 80 Robe MegaPointes were used to throw lighting and effects onto a section of the West MacDonnell mountain range.

The lighting equipment was supplied by Melbourne-based MPH Australia, who've been involved as event suppliers for moving lights, LED, and other specialist fixtures in conjunction with Mandylights for the last four years.

The first year MPH was involved, their Robe BMFLs were utilised for the task of lighting the mountains. However, in 2018 these were all in Jakarta on the Asian Games, so MPH's founder and MD Matt Hansen made a decisive investment in the MegaPointes, which do the job brilliantly due to their impressive brightness!

When the new Parrtjima 2020 dates were confirmed as going ahead, Matt and his team re-prepped everything in their Melbourne HQ – it had been two days away from loading for the original dates when lockdown was imposed – and the kit journeyed from Victoria by rail, while Matt and MPH's production manager Michael Parsons flew to Darwin.

There they did the mandatory 14 day's quarantine required for interstate travel at Howard Springs Accommodation Village, a 3,500 capacity compound originally built in 2012 for construction workers building the gas processing facilities at Blaydin Point. Despite some dodgy internet connections and food, Matt was generally impressed with the experience.

After their 14 days was up, they flew from Darwin down to Alice Springs and started rigging for the Festival.

The MegaPointes were positioned on four scaffolding structures – 20 fixtures each – distanced 1 – 1.5km apart, and between 250 and 400 metres away from the base of the mountains. Width-wise their light covered an area of around 2.5 kilometres along the mountain range.

The nearby ground areas involved in the lightshow including the Festival site are traditionally covered by projected images plus some additional light sources, which this year included 12 BMFL Spots focussed on the park area and fairground.

MPH also supplied around 200 other luminaires for the event – including some Robe LEDWash 600s which were used inside a giant inflatable sphere projection surface.

Data to the fixtures site-wide was run via Art-Net and sACN. The MegaPointes used a Ubiquiti point-to-point wireless Ethernet (Art-Net over Ethernet) network comprising a central omnidirectional antenna located in the main desert park site and smaller nanobeams at each MegaPointe scaffold tower.

Parrtjima's 2020 lightshow was programmed and run on a grandMA 2 console operated by Mandylights' Richard Neville.

Like anyone who has been lucky enough to be working on any events so far in this pandemic era, Matt and Michael were delighted to be back on site, even though it meant quarantining and taking on the enormous caseload of additional paperwork and logistics related to ensuring they were Covid-19 compliant.

On site, they worked alongside two technicians who they knew from Cairns, plus three local stagehands.

Matt stated, "It was just fantastic to be getting our hands dirty, putting up lights, running power – data to the MegaPointes was wireless – and generally working hard at a festival doing the things we love that we once took for granted, and now nothing is certain! It was also great to see the event unfold and be enjoyed so enthusiastically by the public! Some of the lighting art was fantastic and truly unique!"

On site, everyone working 'backstage' followed the golden Covid rules of 'hands, face, and space': frequently washed hands, wore masks, and practised social distancing.

"Events like this are a lifeline right now. Apart from the much-needed cashflow, it's the morale boost more than anything else. It will be interesting to see what the Australian Government has on their roadmap for the entertainment industry's road out of all of this," Matt concluded.

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Big Picture Deliver World's First Live To Air xR Broadcast

by Jason Allen

Big Picture is always looking for new methods to allow creative and technical professionals to tell stories in fresh and innovative ways, especially during Covid-19. One area that certainly required a Covid-revamp was the award show format, and so with the Dally M Awards looming, thinking caps were put on by the guys at Fox Sports and Big Picture.

"Usually the Dally M Awards are staged in a large event venue, but with Covid-19 we had to rethink how we would stage the 2020 production," remarked Paul Slater, Senior Producer at Fox Sports. "We still wanted to have a big auditorium feel but we didn't have the budget or resources to shoot something like that in reality."

Paul turned to Big Picture for inspiration who in turn demonstrated how an xR broadcast could work. xR (extended reality) is a technology that allows you to blend virtual and physical worlds in live production environments to create fully immersive experiences. This was a big step for Fox Sports, and a vote of confidence for Big Picture, as a live to air broadcast xR production had never been done anywhere in the world.

"We were approached by Fox Sports who had been looking at several technologies to integrate a virtual component into a live multi-camera environment," explained Josh Moffat, Special Projects and Business Development at Big Picture. "With only a short lead time until the event, we designed a technical solution around the disguise xR workflow."

The event took place at Fox Sports in Sydney. The main studio setup comprised a 12m by 3m ROE Black Onyx 2.8mm LED Wall integrated into the disguise xR workflow. The seamless extension of Big Picture's real-world LED screens to the virtual world environments could only be done with disguise's xR multi-camera registration workflow, allowing switching between camera perspectives and the LED content.

Three Panasonic 4000 camera chains ran a 1080P workflow which integrated downstream into Fox Sports 1080i transmission path. Big Picture's UHD-2 PPU System with a ROSS Ultrix and Carbonite Ultra was at the heart of the system managing routing, monitoring, and conversion.

"Two Panasonic AW-HD150 UHD PTZ cameras were in a clean zone studio green screen to bring players into the main set virtually to interact with hosts," added Josh. "There were virtual objects in real-time in the 3D scene such as the leader board, player profiles and a virtual big screen fed from a mixture of disguise timeline and external EVS feeds."

Five disguise gx 2c servers were used with Lightware HDMI 2.0 Matrix and Ross Ultrix SDI Matrix for failovers.

Stype RedSpy camera tracking devices were mounted on all three cameras, one studio pedestal, a jib and one Stedicam operated by Fox's Glenn Steer, who did an amazing job with all the virtual graphics. The Stype RedSpy figures out where the camera is in 3D space and where it's pointing - its position, angle, and field of view.

The Notch real-time engine then quickly drew the background scene from that point of view, before rendering the resulting image onto the screens on stage thus creating the illusion that the performers and props are actually in the virtual scene.

The Notch programming and integration was flawlessly executed by Ryan Sheppard, based in Canada. Big Picture had Ryan on comms in real-time for rehearsals, using a low-latency

multiview stream and Clear-Com Agent-IC for communications. He was then connected with remote desktop to the Notch file onsite, making changes as required.

"We used Notch to render the 3D world designed by Fox Sports in real-time," commented Ryan. "Performance of the Notch scene was of utmost importance for a live to air multi-camera xR broadcast as there was no tolerance for dropped frames. We were able to achieve this level of performance by using a strategic combination of baked and unbaked textures that allowed for some dynamic elements while maintaining maximum performance of the scene."

Working remotely on any project has its challenges. With Ryan located in Toronto, the biggest challenge for him was shifting his sleep schedule to match that of the Big Picture team in Sydney.

"However, once I was on the same sleep schedule, we were able to develop a workflow that allowed me to communicate via ClearCom Agent-IC as well as a VNC connection over AnyDesk to a computer on the network. That allowed me to network edit the block during programming and rehearsals if necessary. Once we had this workflow developed with Agent-IC, VNC, and low latency multiviews, I might as well have been sitting in the studio."

Nathan Barnier, Senior Technician and Content Specialist at Big Picture, observed that there were several challenges with this project. Time was the major challenge, but a lack of a LED floor and the LED wall being flat and not curved had an impact on what is the usual xR workflow.

"Fortunately, we were able to build the cameras along with a test strip of the LED in the corner of the studio. This let us get ahead to achieve frame accuracy and seamless switching before the main LED wall build the night before going to air," he revealed. "Anyone with experience in the disguise xR workflow would acknowledge that frame accuracy and perfectly timed camera, tracking and, composite delay is extremely important, and the underlying factor to the successful execution of multi-camera xR."

Having no LED floor is something that Ryan and Nathan tested a few weeks before the broadcast. Fox Sports wanted a gloss finish floor which would allow for reflections from the LED wall and the virtual scene to be realised in the environment. A combination of alpha blend mode in the Notch block and a dummy LED floor in disguise was able to deliver a great outcome. Notch reflections of front plate objects such as players worked well on the high gloss acrylic chosen by Fox Sports. Douglas Heriot ran the content from a MA Lighting grandMA2 console.

The set up also ensured everyone was Covid-safe. disguise xR is perfect for avoiding non-essential contact, mitigating the risks posed by traditional approaches to filming immersive visuals which would involve high-level, real-time in-camera shoots, green screen, and other VFX.

"Fox Sports were very happy with the result and I'm sure most people watching would have no idea of the technology used, as it worked so seamlessly," said Paul. "It was the perfect solution. We cover such a wide array of different sports and we like all of our hostings to look different to match the code, so to be able to change your set at the flick of a button is exciting to us and something we'll be looking to use more in the future."

Paul noted that Big Picture went above and beyond to rig and set up the system in a near impossibly short time frame.

"They guys worked around the clock to make it happen which gave me all the confidence in the world that it was going to work!" he concluded.

Big Picture Crew

Project Manager/Technical Director:
Josh Moffat

Disguise XR Engineer:
Nathan Barnier

Broadcast Engineers:
Nick Bojdak, Olin Winton

Disguise Operator/Programmer:
Douglas Heriot

Notch Programming and Integration:
Ryan Sheppard

LED:
Cameron Richards, Justin Brown

NEW GEAR

Attero Tech by QSC I/O Endpoints

QSC has introduced several new Attero Tech by QSC solutions. The new Axon Series Network Audio Interfaces include a Dante/AES67 wallplate with analog inputs, and a surface mount Dante/AES67 interface with bi-directional USB and stereo Bluetooth audio I/O. New Axiom Series Analog Audio I/O Extenders include the Axiom AXPio audio expander with two Flex I/O channels, the Axiom USB1 providing bi-directional USB audio connectivity, and the Axiom BT1 is bi-directional Bluetooth audio wallplate. Lastly, the Axon DTH1620 is a Dante/AES67 network amplifier specifically designed to support high-channel, low-power applications.

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

Bose L1 Pro

Bose has introduced three new portable line array systems — the L1 Pro8, the L1 Pro16, and L1 Pro32 with its choice of two subwoofers. Their built-in multi-channel mixers offer EQ, reverb and phantom power, with Bluetooth streaming capabilities and access to the complete library of ToneMatch custom EQ presets.

The Bose L1 Pro portable systems are complimented by the L1 Mix app, placing complete wireless control in the hands of users for on-the-fly tweaks. Performers can adjust mixer settings via phone or tablet from the stage, or even walk the room.

The L1 Pro8 weighs 17.7 kilograms. Its C-shaped line array features eight articulated 2” neodymium drivers and 180-degree horizontal coverage with wide vertical dispersion. Its integrated 7” × 13” subwoofer features a high-excursion RaceTrack driver.

The L1 Pro16 weighs 24.4 kilograms. Its J-shaped line array features 16 articulated 2” neodymium drivers, 180-degree horizontal coverage, tight vertical control on top, and wide dispersion on the bottom. Its integrated 10” × 18” subwoofer features a high-excursion neodymium RaceTrack driver.

The L1 Pro32 weighs 13.0 kilograms. The Sub1 and Sub2 modular subwoofers weigh 16.1 kilograms and 23.4 kilograms respectively. It’s a straight line array, featuring 32 articulated 2” neodymium drivers, and 180-degree horizontal coverage with the most focused vertical coverage pattern and highest SPL over distance in an L1 ever. It combines with the Bose Sub1 or Sub2 powered bass module via a single cable and SubMatch connectivity is included for both power and audio. Users can stack two Sub1 or Sub2 subwoofers for even more bass, or employ Cardioid Mode for focused, directional performance that negates rear-firing bass energy.

Australia and New Zealand: Bose pro.bose.com or +61 (0)2 8737 9999

DeSisti Vari-White + Color

DeSisti has released its new Vari-White + Color lighting fixtures. The new range includes Fresnels, softlights, cyclorama and space lights. They have been designed to work with DeSisti’s existing fixture range and allow for exact colour temperature matching, with the advantage of adding RGBA colours, thereby offering a colour temperature range from 1,500K to 11,000K. This allows any other fixtures that have a CRI of over 95, including florescent fixtures, to be easily matched within their colour spectrums. With a flicker-free output of 40,000 fps, low energy consumption and barn doors that provide true Fresnel beam shaping, these pole-operated fixtures are the perfect solution for the modern TV and film studio.

Australia: LSC Control Systems www.lsccontrol.com.au or (03) 9702 8000

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NEW GEAR

ETC fos/4 Fresnel

ETC's fos/4 Fresnel takes the most desired features of an incandescent Fresnel and adds in the nuanced colour mixing, smooth fades, and LED technology of ETC's other professional grade fixtures. With fos/4, you get a true Fresnel with an LED engine, not the other way around. The fos/4 Fresnel includes all the features you'd expect from a standard Fresnel. Adjust the 15-50 degree zoom from either the front or the rear of the fixture. Use the accessory slot to add any number of beam-control accessories such as barn doors and soft boxes. The adjustable yoke enables easy balancing of the fixture after focus, and the homogenised optic gives you an impressively seamless beam of light.

Australia and New Zealand: Jands jands.com.au or +61 (0) 2 9582 0909

PROLiGHTS Eclipse Profile CT Plus

The EclProfile CT+ is a six colour mixing LED ellipsoidal. Its custom LED array and on-board colour control allows for bright and high-quality whites, up to 97 CRI, keeping a consistent output and ensuring total control of the light. The wide feature set includes special theatrical functions such as tungsten emulation dimming, colour gels, virtual CTO and studio functions, such as +/- green correction on linear white CCT.

PROLiGHTS EclPanel TWCJr

EclPanel TWCJr is a compact 1x1 LED soft light that provides a wide source of soft and precise colours. It comes with a full range of white reproduction, from daylight through to tungsten tones, with high CRI, TLCI and TM-30. The EclPanel TWCJr allows for quick and accurate local adjustment of light through 3 rotatory knobs with three fully featured modes: CCT with +/- green shift, HSI for total control of hue, saturation and intensity, and FX mode to access the on-board pixel cinema effects.

PROLiGHTS EclCyclorama 050

EclCyclorama 050 is a soft-edge, linear cyclorama and floodlight, designed with a low profile form factor to meet applications at both front and end of the stage. The fixture is equipped with a custom, calibrated RGB + Warm White LED source, which is capable of delivering linear reproduction of the entire white spectrum with high CRI, TLCI and TM30 performance. The optical system has been designed to offer a very wide asymetric beam angle, making the EclCyclorama range a very flexible solution.

Australia: Show Technology Australia www.showtech.com.au (02) 9748 1122
New Zealand: Show Technology New Zealand www.showtech.nz (09) 869 3293

JBL Nano KX

The JBL Nano KX Bluetooth-enabled volume controller is perfect for content creators, home-recording enthusiasts as well as mobile DJs and performers who want to integrate Bluetooth into their project studio or non-Bluetooth, portable PA system. With professional analogue I/O and easy pairing of Bluetooth-enabled devices such as mobile phones and tablets, it seamlessly integrates into your production space to provide non-Bluetooth speakers with wireless playback capabilities. Plus, the easy-to-use knob allows you to control volume levels of your signal, as well as advance tracks, pause and mute devices connected via Bluetooth.

Australia: CMI Audio www.cmi.com.au or (03) 9315 2244
New Zealand: JPRO www.jpro.co.nz or (09) 275 8710

Highlite Infinity iW-741 & iW-1941 WASH

The Infinity iW-741 is a compact power-pack moving beam wash. The motorised zoom controls a 3.6° beam, which zooms to a 60° wash. Equipped with 7 RGBW 40W Osram LEDs that produce bright and saturated colours, and having the option of changing the PWM rate via DMX, the iW-741 is very well suited for theatre or television applications.

The Infinity iW-1941 moving head beam wash is powered by 19 RGBW 40W Osram LEDs. With a motorised zoom range of 3.6° to 60°, the 19 pixels can be individually controlled via DMX, Art-Net or RDM. The iW-1941 combines very fast movements, a wide zoom-range and impressive output to function as a powerful wash fixture, while offering designers the individual pixel control to create spectacular visual effects.

Australia: Clearlight Shows www.clearlight.com.au or (03) 9553 1688
New Zealand: Kenderdine Electrical kelpls.co.nz or (09) 302 4100

Sennheiser MD 445

The MD 445 wired vocal mic is a large-diaphragm, dynamic stage microphone with a tight super-cardioid pick pattern. The MD 445 has been tailored to modern stage set-ups with B stages and runways in front of the PA. At the core of the design is a newly developed voice coil made of lightweight aluminium-copper. Its fast transient response ensures a detailed, nuanced and transparent sound that is complemented by rich mid-range and bass. The MM 445 microphone head is also available for use with Sennheiser wireless transmitters.

Sennheiser MD 435

Sennheiser has brought the sound of its dynamic MD 9235 capsule to a wired vocal microphone. Its lightweight aluminium-copper voice coil ensures fast transient response. The large diaphragm microphone features very wide dynamics of 146 dB(A) and can handle sound pressure levels of up to 163 dB/1 kHz. The MD 435 features a metal casing and has a shock-mounted capsule to protect it from structure-borne noise. A hum-compensating coil protects the microphone against electromagnetic interference. The capsule of the MD 435 is also available for use with Sennheiser wireless transmitters.

Australia: Sennheiser en-au.sennheiser.com or 1800 648 628
New Zealand: Sennheiser en-nz.sennheiser.com or (09) 580 0489

Shure DuraPlex

Shure's DuraPlex subminiature lavalier and headset microphones are consistent, long-lasting, and resistant to dust, dirt, water, and sweat. Offering professional-quality audio for film, broadcast, speech, theatre, and performance applications, DuraPlex is perfect for everyday situations but excels in the harshest environments. Capture every moment with confidence. Rain, or shine.

Australia: Jands www.jands.com.au or (02) 9582 0909
New Zealand: NSL www.nsl.co.nz or (09) 913 6212

GLP JDC Line

The JDC Line features hyper-bright white LED and RGB pixel mapping capabilities. The pixel segments of the JDC line measure 25mm in width and are positioned seamlessly to ensure that there are no black out areas between the pixels. Each pixel segment can be split into upper and lower parts offering additional flexibility in creative options. The strobe tube also offers segmentation of 25mm. The JDC Line is available in two different versions: The JDC Line 500 offers a width of 500 mm and the JDC 1000 a width of 1,000mm.

Australia: Showtools www.showtools.com.au or (02) 4646 1199
New Zealand: Kenderdine Electrical kelpls.co.nz or (09) 302 4100

NEW GEAR

QSC NV-32-H

The NV-32-H's new 'Core Mode' adds software-based DSP with integrated video switching for in-room collaboration spaces. 'Core Mode' transforms the device into a fully capable Q-SYS processor with local HDMI switching capabilities, in addition to its existing 'Peripheral Mode', which is designed for network HDMI video distribution over standard AV networks. The NV-32-H offers a fully-featured audio processing engine for the Q-SYS Ecosystem, including 32 x 32 network audio channels, eight AEC channels, one VoIP softphone instance, and optional support for Software-based Dante. As with the rest of the Q-SYS processing portfolio, it also features a robust software-based control engine allowing for simple control integration for native Q-SYS devices as well as third-party connected devices.

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

ARX USB DI-Q

The USB DI-Q USB-Analogue interface has been designed by ARX in response to a specific request from the Australian Court System. The USB DI-Q provides a solution for interfacing and monitoring the playback of audio evidence files in a courtroom or similar environment. The USB DI-Q allows the user to monitor and cue audio files in a closed headphone environment and switch the audio output to a public address system as required. The simplicity of the setup of the USB DI-Q means that this product can be integrated easily into the existing AV infrastructure of a building. Once in place, the USB–DI-Q only requires touch button operation, and the simple user interface means that it is easy to use by non-technical operators.

Australia: ARX arx.com.au or (03) 8525 2003
New Zealand: LiveSound www.livesound.co.nz or (09) 378 9863

Tascam US-HR

Tascam have released three new models of USB-C Audio Interfaces; the 1 Mic, 2-in/2-out US-1x2HR, the 2-Mic, 2-in/2-out US-2x2HR, and the 4 Mic, 4-in/4-out US-4x4HR. All models support up to 24bit audio formats with sampling frequencies of 44.1, 48, 88.2, 96, 176.4, or 192 kHz. They feature zero-latency direct monitoring, support USB bus power, include a loopback function with stereo/mono switch support equipped (Windows, Mac, iOS, iPadOS), and are ready for immediate music production with their extensive line-up of bundled software.

Australia: CMI Audio www.cmi.com.au or (03) 9315 2244
New Zealand: Direct Imports directimports.co.nz or (06) 873 0129

IT'S NOT A NUMBERS GAME

by Andy Stewart

In Part II of my discussion about the Art of Mixing, let's get past the eye-rolling around the word 'art' shall we, and get down to what really makes a good mix engineer emerge as a great one: confidence.

Last issue I finally came out and said it – that audio mixing is an art form, and that without recognition of this simple truth you can't achieve mastery of the pursuit.

Well, you know… someone had to say it!

I know constructing a sentence around the word 'art' in the audio industry – as opposed to the music industry, where it's tossed around like a salad – generally has people rolling their eyes in sarcastic judgement. But it's time we got over this puerile response and embraced our artistic side, because I can tell you right now, if you don't, you won't get far in this game.

As I politely pointed out last issue, mixing – as opposed to just knowing how gear works – involves years of dedication to the role; mixing week after week, year in and year out, all while reaffirming that the gig is as much about art as it is science.

These elements are like two sides of the same coin. One doesn't exist without the other. At times you find yourself staring at one side for too long, of course, to the detriment of the other, tangling yourself up in specifics around technique or equipment. Eventually, however, as you grow in confidence with your mixing, you start to see both sides as one. That's when your mixing advances to the next level.

You don't advance by asking your favourite mix engineer naïve questions like: 'How do you mix like that?' or 'What compression settings do you use?' – as if there's even an answer to questions like that!

But if that's not issue enough, even if you do manage to garner specific information about another person's mix, attempting to apply it to your next job will typically send it off the rails. Why? Because at that point, you've stopped backing your own judgement, stopped listening objectively, and ceased to think of your own work as a unique piece of art. From here you can quickly head down the path of a copycat, or worse, a thief.

One other thing I can guarantee you: your favourite mix engineer didn't arrive at his or her settings by asking someone else. They embraced what they do as an art form and never thought twice about it.

If you do the same, I promise you, you'll never look back.

With this in mind I want to explore some different aspects of mixing that will artistically enhance who you are as a mix engineer.

I Like It Like That

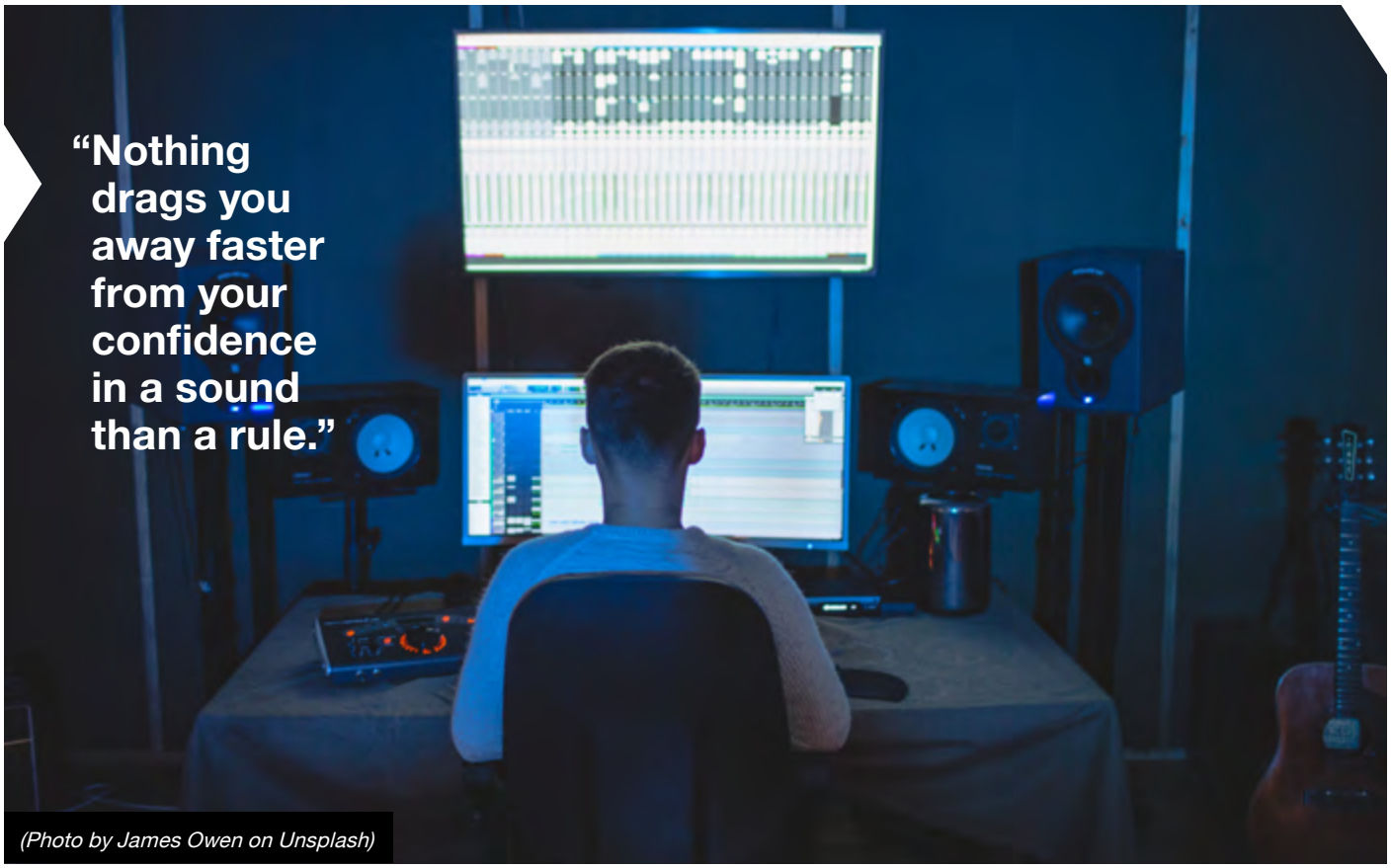
From my own artistic perspective, many of my mix 'decisions' – some of which are laboured over, others of which I'm barely conscious of – are often as much about simple yes/no answers to questions around 'Do I like that?' as anything else. It's this principle that informs much of what the art of mixing is all about.

Sure, you can be focussed on the numerical value of a reverb's tail, or curious about how its early reflection might transform your mix – I do that all the time – but still the question remains: 'Do I like it?'

In the end, the values of things: reverb times, attack times, levels of instruments, the crossover point of a filter etc, in and of themselves mean nothing. They certainly mean zero to the end listener. Each question you ask yourself during the course of a mix is simply a means to that end: 'Do I like it?' The answer is not about the numerical values at all.

So, by extension; developing yourself as an artist whose pursuit is mixing, you will 'find yourself' – your style, as it were – by answering these sorts of simple questions honestly, with confidence in your ear, and without fear or concern for what other people (apart from those with whom you work) might think.

You will NOT 'find yourself' by asking others what settings are 'best' for something, because that's not learning, nor is it art. In fact, it's tantamount to admitting: 'I don't want to learn this for myself, I want the answers given to me by someone else.'



(Photo by James Owen on Unsplash)

Moreover, any answers you obtain to these sorts of questions cannot be applied to your work anyway, because the numbers simply aren't objectively relative to anything.

To labour the point for a moment: of another engineer, you might ask, for example: “Should I roll off my kick drums at 60Hz?” Well, should you? Put another way – and while you're at it – ask the engineer this: “Should I like the colour blue?”

Can you see how the question is absurd? How could the numeric value of a sound in someone else's work ever be applied to yours when every single kick drum (and musical context) is different?

A far more progressive question to ask yourself – about your own mix – is this: ‘Do I like how the kick drum sounds now, or not?’ If the answer to your question is an honest ‘no,’ how would you otherwise like it to sound? To your discerning, confident ear, does it sound better rolled off at 45 or 35, or maybe it sounds cool rolled off at 235? In the end, these values mean very little beyond what they provide your mix, and whether you like these sounds in the context of the music in front of you, right now! Everything else is horse excretion.

Avoid Rules

Nothing drags you away faster from your confidence in a sound than a rule.

Countless engineers apply them in all sorts of ways to myriad situations, almost always to their detriment. It gets so bad at times that some mix engineers will ascribe a theory to some aspect of their workflow with almost religious fervour. Ironically, this often renders them deaf to the true qualities of the sounds playing right in front of them. I once had a fellow engineer mix for two days straight with his speakers out of phase, even though, right in front of him on his own custom-built master section was a phase flip button. He refused to hear the problem – let alone acknowledge it and flip the switch – because his system “could not possibly be the cause.” In his words, “The studio just sounds shit!” Once invited to hear the problem for myself, I discovered the issue in about 10 seconds because I hadn't been blinded, as he had, by a misguided faith in his equipment.

Rules are for roads, not mixes. Develop them you will, and learn from their shortcomings you most certainly will! But that's okay – as long as you're learning, you're advancing.

Back Your Endeavour

When it comes to mixing, there's always the perennial question: ‘How do I know when my mix is finished?’

This is a tough question for most engineers to answer, particularly so when viewed from a purely scientific standpoint. Assessed from this side of the coin, you could be forgiven for thinking that there is, indeed, no answer!

But if nothing else, what this dilemma illustrates is that not all questions around mixing are quantifiable or technical. On the contrary, most revolve around artistic concepts like taste, preference and subjectivity. This is why you need to develop a confidence in your own artistic perspective: for without it, many of your most important mix decisions will be faced in the absence of this key ingredient.

The key to knowing when a mix is finished is by developing an insight into how you work – a bit like self-analysis. Get to know yourself: the things you like to hear in a finished mix, what encourages you to keep going, what your aims for the mix originally were, and whether you've achieved that outcome. You might want the mix to sound rough or polished, aggressive or enormous. If you think you've managed all that: you're excited by the outcome and can't think of anything else that might add to the spectacle, then stop.

Personally, I find – for me at least – that a mix is essentially finished when I cease to have a reaction to it. I become aware that I've stopped working on the song soon after: I've ceased fiddling with automation, tweaking EQ and adjusting compression settings, and am now only listening. If I manage to get through the song a few times without stopping to adjust something, I know we're close, if not done.

After that there might be a debate or two with any others involved around some minor changes to a sound, but these will rarely have any significant impact on the final mix.

Over time, your feelings around all these different aspects of mixing will inevitably change, but that's fine too. That's art for you.

Andy Stewart owns and operates The Mill in the hills of Bass Coast Shire in Victoria. He's happy to respond to any pleas for recording, mixing or mastering help... contact him at: andy@themill.net.au

LUCAS TÓFANI SOUZA

Skills Active Apprentice of the Year

by Jenny Barrett

Lucas Tófani Souza recently completed the NZ Certificate in Entertainment and Event Technology Level 4, a new qualification launched in November last year. A few months ago he was nominated as one of three finalists for the 2020 Skills Active Apprentice of the Year. Each year, this award goes to a high-potential apprentice with commitment, passion and diligence, who has the skills and qualifications to improve the wellbeing of New Zealanders, through the medium of sport, recreation or the performing arts. Up against a swim instructor and a fitness coach, the lighting technician won, a timely acknowledgement of the importance of the performing arts for wellbeing.

Lucas got his start in the live music industry aged just fourteen, back in his home country of Brazil, travelling the country supporting big acts. Andre Goldsmith, CEO of Hang-Up Entertainment Services in Christchurch, recognised Lucas' potential and sponsored his shift to New Zealand in 2016. Now a Senior Lighting Technician, Lucas is responsible for lighting design, drawing 3D plans, selecting equipment, coordinating crew and operating the lighting consoles on live events.

Studying – the Student Perspective

Lucas completed the Skills Active Entertainment and Event Technology apprenticeship with the support of Hang Up, and help from his Skills Active registered assessor and his evidence verifier. The apprenticeship offers seven strands and Lucas opted for lighting, his main specialism, and rigging, "I have searched for years to find a qualification that acknowledges what I do. When this qualification was launched, it was like a dream come true. I could finally study something that I love."

Asked how he found studying, Lucas says, "The process of the qualification was enjoyable for me. Studying something you love makes it lighter. The meetings with my assessor and verifier were among my highlights of this process, as we had good discussions about the subjects, but also about the industry in general. Stopping and thinking about what I do every day was a valuable opportunity to reflect on industry standards and on health and safety."

One of the big challenges was completing the qualification with English as his second language. But this didn't hold him back and he passed his training with flying colours. Although he was already a highly experienced senior lighting technician, pursuing the apprenticeship has boosted his career further.

"I now have a better base foundation from

which to discuss day-to-day work situations. [The apprenticeship] is more than a frame on the wall. It means greater acknowledgement and respect in work-related matters. And it's a step up for my career and CV."

Lucas says his goal is to keep doing what he loves, and using his skills to contribute to international shows and events, "Lighting has always been my passion. I love working with intensities and colours. In any job that I do, when I'm designing a show, I put my feelings into that show. I try to express myself through my work. I think it's a privilege to pursue something that you love. To stamp your heart on your work."

Studying – the Employer's Perspective

For Andre Goldsmith, Lucas' employer, there are significant benefits in his staff upskilling too, "Having qualified staff adds legitimacy to what we do, providing evidence of competency in a compliant world. It separates us from our competitors." He actively encourages his staff to get on the qualifications ladder and has even completed Level 3 himself, "I'll do Level 4 once I've finished my truck loader crane operator's ticket!"

Asked if he worries about other companies poaching his newly qualified staff, Andre is pragmatic, "It is up to you as an employer to create an environment where people want to be, and want to stay. I believe what we offer, including our support for self-fulfilment, creates a good place to be and to work."

Going forward, a Level 3 and Level 4 qualification is something that Andre will look for in a job applicant, "If someone has got their Level 3 at school, and then gone off and done this and that but used that experience to get their Level 4, that would put them ahead of someone who has got nothing. It shows commitment, and will add to what our company can offer."

And finally on Lucas, winner of the Skills Active Apprentice of the Year Award, "Lucas has earned it. He is passionate about his role, about our industry, and about being involved with us at Hang Up. He says he has found his place. This is exactly what he wants to do and where he wants to be doing it."

Zero-fees until end 2022

The NZ Certificate in Entertainment and Event Technology Level 4 qualifies for the government's Targeted Training Fund, meaning zero-fees until the end of 2022.

All apprenticeships in NZ are now being funded to help employers and apprentices during the COVID recovery period; the fees are simply waived. On top of that, there are funding options including Apprenticeship Boost: a payment to help employers keep and take on new apprentices. According to WINZ, this funding "can be paid for an apprentice who is self-employed if they're employed or contracted by you. You need to apply for your apprentice, and you need to have a training agreement between yourself, your apprentice and your TEC approved transitional ITO or provider. If you're self-employed, contact the company overseeing your apprenticeship. They'll need to apply on your behalf." You can read more on all the subsidy options under the Apprenticeship Support Programme on the Entertainment Technology New Zealand (ETNZ)'s COVID Resources page.

Morning Glow, Pippin. Photo by Shinobu Ikazaki.

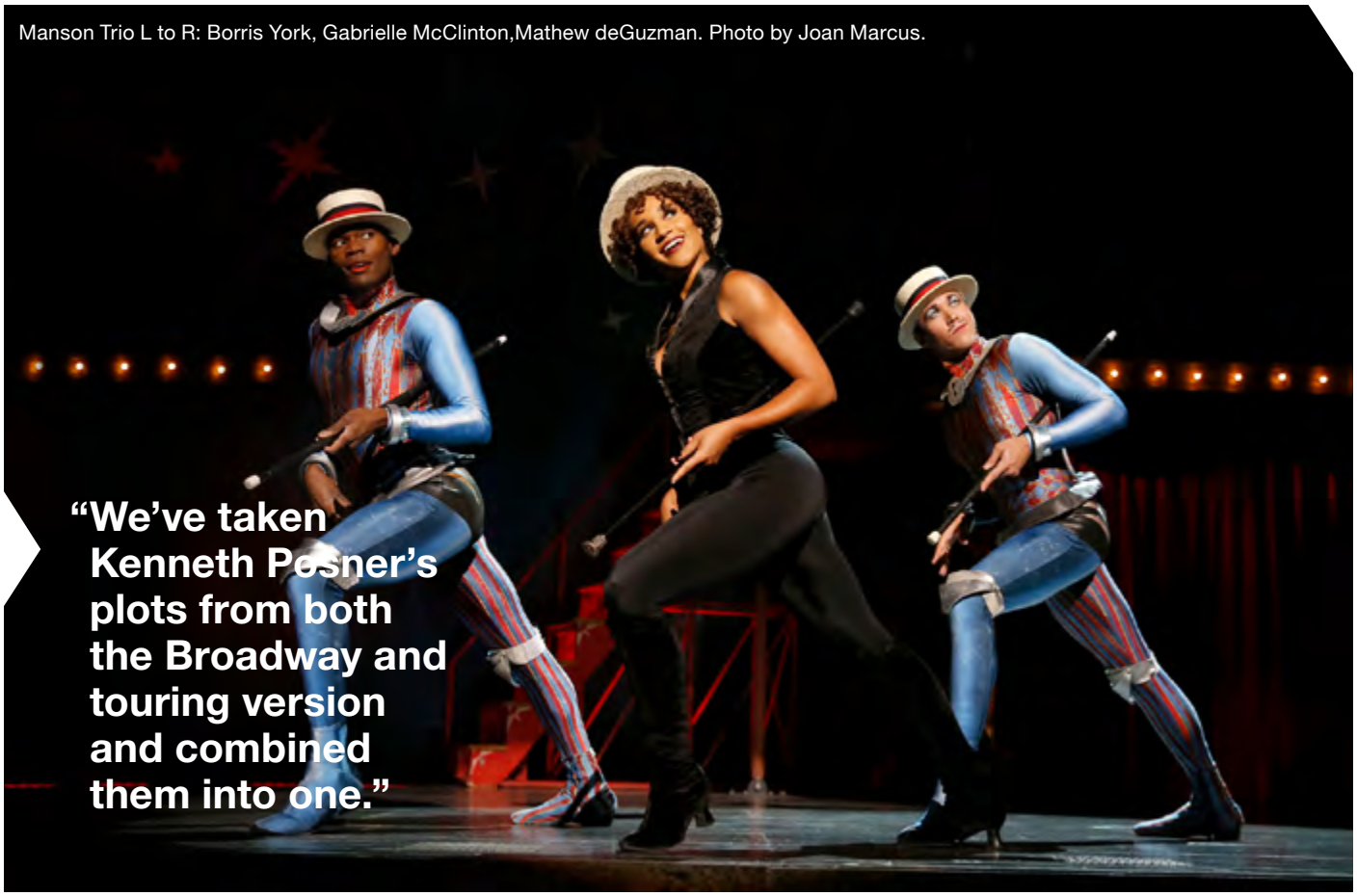
WE'VE GOT MAGIC TO DO: PIPPIN RE-OPENS SYDNEY

by Jason Allen

The Sydney Lyric burst back into life on 24 November with the first major post-COVID theatre production; the 2013 Broadway revival of Stephen Schwartz's beloved Pippin, with Tony-nominated lighting design by Kenneth Posner. CX interviewed Associate LD Mitch Fenton before curtain about how we make our magic while staying safe in 2020…

Australian born WAAPA graduate Mitch Fenton has been living in the USA for the last eight years. After going over to study at State University of New York, he decided to stay, and has forged an impressive career lighting theatre, television, live events, and concert tours. Having previously worked with Broadway legend Kenneth Posner, Mitch became the obvious choice to bring the Tony-winning 2013 revival of Pippin to Sydney.

Pippin tells the fictionalised story of medieval emperor Charlemagne's son and his search for meaning and purpose in life. Told as a performance-within-a-performance, the story is presented by a troupe of players, who in



Manson Trio L to R: Borris York, Gabrielle McClinton,Mathew deGuzman. Photo by Joan Marcus.

"We've taken Kenneth Posner's plots from both the Broadway and touring version and combined them into one."

The Cast of Pippin. Photo by Terry Shapiro.

this revival, are a group of circus performers. After blitzing the Tonys in its first year, Pippin went on the road in the US, and the lighting design was adapted for touring. The version presented at Sydney Lyric is a hybrid of the two designs.

"We've taken Kenneth Posner's plots from both the Broadway and touring version and combined them into one," explains Mitch. "There are quite a few differences between them, for example, the touring version runs a lot of movers because it has to get in and out of venues faster, while the Broadway version uses a lot more conventionals. Broadway used lots of big colour washes from FOH and we've added that back in, which I really like."

As the troupe tell Pippin's story, Mitch finds himself often lighting very small areas quite tightly. There's a lot of colour and movement, with bold costumes adorning acrobatic performers. The structure of the show and nature of the production has posed some lighting design challenges, which have been met with some custom solutions.

"OPTO Project's Scott Opie and Simon Toomer have made us a load of custom set electrics," Mitch relates. "There's a trough upstage that uplights the circus tent, and OPTO built a custom LED ground row for it. There's also a lot of LED tape controlled wirelessly built into the set."

The fixtures the show relies on most are 46 Vari-Lite VL3500 Spots and 14 VL3500 Washes. "On Broadway, we used the VL3000, but they weren't available here," explains Mitch. "The change has cut our gobo load in half, but we've managed to make the show still look the same. Also key to the rig are our 192 ETC Source Four Profiles, and 32 ColoRam II Scrollers as side lights." Control is via an ETC Titanium, programmed by Jason Fripp. Mitch has also utilised an ETC Gio @5 in the circle during tech.

Sasha Allen. Photo by Terry Shapiro.

Theatre in the COVID Era

Of course, it's not just the challenge of adapting a lighting design that's unique to this production. COVID looms large over every aspect of the show, from bump-in to curtain. Mitch had to complete two week's quarantine on arrival in Sydney, and COVID-safe regulations have completely changed how the crew work on the show.

"In the US, it would have normally taken us two and half weeks from bump-in to opening night," elaborates Mitch. "This production will be two and half months from day one to opening. Load-in alone took a month because of social distancing requirements."

COVID almost threw another spanner in the lighting works in the form of Melbourne's second lockdown. "The majority of the lighting rig was sourced from PRG's Melbourne warehouse," says Mitch. "Melbourne's lockdown was announced the week before our load-in. PRG's staff only had time get into the warehouse, test the fixtures, and put them on a truck before they weren't allowed to come into work again. There was no time to build anything. It all came right down to the nail, and we ended up doing all the prep in the venue."

The company's schedule during the build was almost alien to anyone who is used to working in theatre; the cast rehearsed on set from 10 am to 6 pm, then the lighting crew came in at 6 pm and worked until 11 pm. That schedule remained in place until tech.

"If you look at it, we focused and cued across two weeks," Mitch continues. "But it wasn't really two weeks, it was three-and-a-bit work days, which is how long we normally take. In reality, we're working the same hours, they're just spread out. It's an interesting feeling, having your day free. It's actually quite nice, but the reality is that we can't work on as many shows. Normally, I'll come in from another production and leave around opening. By extending the time building a show takes, everyone puts themselves out of work for longer. Not that I'm complaining, as theatre in the rest of the world is closed everywhere except here and South Korea!"

With the show up and running, the cast and crew stay COVID-safe on a 'zone' basis. "There's a FOH zone and BOH zone," outlines Mitch. "Once you're in one of those zones and doors open, you can't cross into the other for the night. So, after I watch the show from FOH, I can't go backstage for notes. We run the production meetings after the show with the creatives out the front and everyone else on stage. Everyone wears masks backstage for entire show, and the cast only remove them as they go onstage. We sign in and out on an iPad, and answer COVID questions every day. All of us are tested every Wednesday. There is a lot scrutiny, and there's a lot of extra work involved."

Pippin is currently on sale until the end of January, after which Sydney Lyric is set to host the hotly anticipated Hamilton, opening March 12. "I stayed in Sydney for opening, and now I'm heading to see my family in Queensland," concludes Mitch. "I'll then go back to New York in mid-January. Broadway is likely to remain closed until the end of May, and we're planning a big June re-opening."

THE LIGHTING RIG:

192 x Source Four Profiles

57 x Source Four Pars

14 x CLF Lighting LED Wash RGB LED Batten

12 x Rosco Miro Cubes 4C

26 x ColorBlast TRX

32 x Custom Built 1'-0" LED Tape Ground Row from Opto Projects

46 x VL3500 Spot

14 x VL3500 Wash

32 x ColoRam II Scrollers

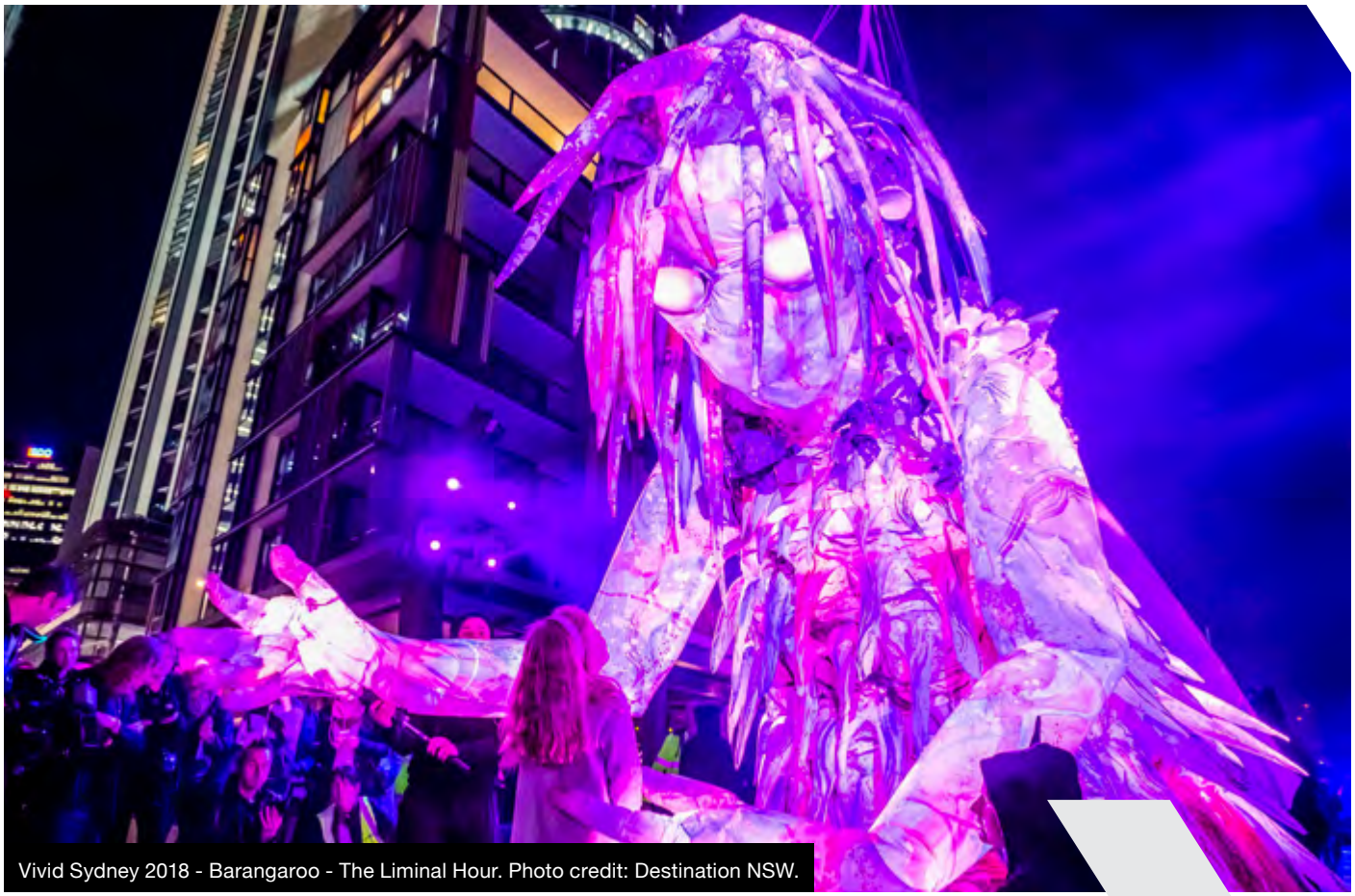
4 x Look Solutions Viper NY Fogger

2 x Look Solutions Unqiue 2.1 Hazer

2 x MDG Atmosphere Hazer

9 x Martin Jem AF-1 Fans

3 x Lycian 1293 Xenon Followspot



Vivid Sydney 2018 - Barangaroo - The Liminal Hour. Photo credit: Destination NSW.

LIGHTING THE UNCONVENTIONAL

Mandylights' Richard Neville, by Jason Allen

Jason Allen spoke with Mandylights' Managing Director Richard Neville about not just surviving but thriving in 2020, their extensive light art and site-specific portfolio, and tips and tricks for working on large scale outdoor events…

When I spoke to Richard, Mandylights had 16 light art works loading in around the UK, and had spent 2020 delivering stunning, unique events including the Parrtjima Festival of Light in the NT. Clearly COVID had affected, but not stopped, Mandylights' work. How did the company continue on when so much else had gone dark?

"We're very diverse in what we light," states Richard. "Even in my early career, I was jumping between theatre, corporate, and building projects. All of our team have this diversity of experience, and that's really helped us over the last months; we don't just do concert or broadcast. Architectural and light art projects have just kept going - we're still sitting at consoles programming things, but it's 100,000 pixels on a bridge instead of a stage. It's part of our ethos that we're open to anything."

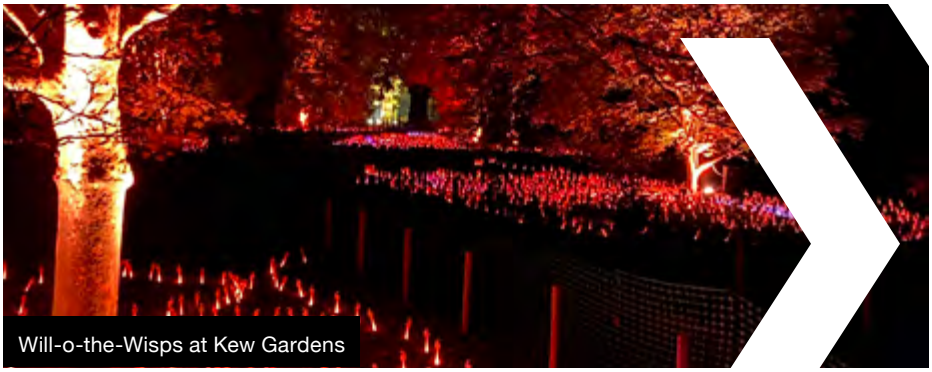
Large-scale public festivals of illumination are now spread around the globe. "Light art is a massive part of experiences and festivals globally," agrees Richard. "We've been working in a dozen countries even through the pandemic. People want and crave meaningful visual experiences. For example, we work on Christmas illuminations at Kew Gardens in London. There are dozens of artworks, and a million people come through. They walk through, touching and interacting with the works. I get as much satisfaction designing something that goes into a park as I do a world concert tour. You're working for the same size audience, with the same


Floriade


Floriade programming

TNSW George St Christmas Wreaths


Vivid Sydney 2018 - Barangaroo - Pygmy Tarsiers. Photo credit: Destination NSW.


Will-o-the-Wisps at Kew Gardens

technology, but you get to use it in such an unconstrained manner; instead of a focus on a stage with artists, you're lighting in a pitch-black area with complete free rein to control the experience."

Working on such unconventional projects means Mandylights usually have to create technological solutions where none existed previously. "We approach everything from a design point of view," Richard explains. "Our approach is that if a client wants something, they place creative trust in us to execute that brief - it's up to us to dictate how we create the experience We then work with suppliers to develop novel fixtures and control solutions. We actively seek products to fit the creative brief, as opposed to using existing stocks of the same old moving lights. When we create new, innovative ways to do things on novel projects, the results flow into our concert and entertainment work."

With Mandylights often working on large sites to implement unique experiences, I asked Richard to share his thoughts on which technical problems regularly present as the most challenging. Talking on a case-by-case basis, he used real-world examples of Mandylights' work to illustrate the issues that most often crop up, and how he and the team handle them.

Taronga Zoo, Floriade, and Sydney's CBD – Data and Power Distribution

"We were brought in to create an immersive, site-wide lighting design to support light art installations at Taronga Zoo. One of the big design challenges we frequently face when we light sites that are two or three square kilometres in size are issues with data and power. You're taking a similar creative approach as you would in theatre, but everything just blows out with the scale; it can take you 45 minutes to walk back to the shed just to get some more electrical tape!"

"As we're placing lights in the design, we're thinking 'How is this going to be powered and how do we get data to it?' It's a coordinated site and installation, where lights need to be changing in sync with each other - how important is data speed and refresh rate? Is it tied in with audio, and if so, how do we coordinate with audio's delays?"

"Data distribution is always difficult. You can go wireless, but that's always affected by other traffic. You can use fiber, but that's not without issues and costs. Five years ago, we had a tree fall down in the middle of Canberra's Floriade festival and it took down the main fiber run, which shut down the back-end of the whole site. Data is also hard to standardise – how many universes do you need, how big is the site? Data is a constant variable. We have tried to standardise our approach; we've invested in about 1000 universes of sACN distribution units that are housed in little weatherproof boxes, so we can have power and data in nodes all over the site, with options for wired and wireless, including 4G. It's taken us years to get that right."

"Another issue is that you can never really simulate network load and strain until you fill your site full of people. We once worked on a Christmas illumination in Sydney's George Street for Transport NSW, and we used wireless DMX to run control down the street. The network performance was great on the first night after we loaded in, but on the first rehearsal day, data performance went through the floor because the street was full of people with phones and all the building's Wi-Fi networks were active – we had to do a huge rethink."

Barangaroo – Weather

"We've worked the Barangaroo precinct for three years for Vivid, and run other activations in between. For Vivid, we collaborated with puppetry company Erth on an open brief to create an experience. Our part of the work included an immersive lighting and audio system to run down Wulugul Walk, the main promenade at Barangaroo South. The piece ran for 200 metres – there's water on one side, and expensive apartments and restaurants on the other. It's a difficult site; there's one group that owns it, another company that manages it, and Transport for NSW manages the wharf for ferries – there's a lot of stakeholders. We needed to design an outdoor lighting, rigging and audio system that would keep everyone happy and last over four weeks in winter, outside."

"After some research, we determined we could create our own moving head fixtures and get all of the functionality we wanted without having to resort to hiring standard fixtures and spending thousands on outdoor domes. This has all been part of developing our own supply lines. I spend about a month each year in Asia looking at new fixtures and building relationships with manufacturers. This way, if we want a fixture with wider zoom, particular gobos, or the animation, prism, or colour wheels we want, we can get it made. It's not always cheaper than buying something off-the-shelf, but for us, if it doesn't exist, we like to go and make it. Over the years, we've created around 50 fixture types that range from LED floods to tape and pixel products. We've taken the same approach with control, and ultimately it creates infinitely more freedom for us as designers."

Investing in Vision

Pitching bespoke projects to festivals with international reputations requires convincing simulations and visualisation. Traditional lighting pre-vis software just doesn't have the scope that Mandylights needs, so, true to form, they've sought out an alternative and participated in its development.

"What we've found is that there shouldn't be just 'lighting pre vis' anymore," offers Richard. "Lighting pre-vis is fine for a concert arena or theatre, but if we're working on a project that has a three square kilometre site, or if I want to visualise an entire city, I don't want wireframes or grey blocks, I want photorealistic textures. Lighting pre-vis software is always playing catch-up to the design industry."

Mandylights' requirements have brought them to a software called Depence, by Syncronorm. "We've been involved closely with its development for a couple of years now," confides Richard. "It can simulate complete outdoor environments, with the angle of light from the sun adjusted accurately for longitude, latitude, and time of day. You can simulate an entire city – I'm currently working on a model of the entire Sydney CBD where we can control the height of the waves on the harbour. Tools like this are critical for competition at the pitch stage. And you need this level of simulation not just to show to clients, but also for your own work, as we often don't get as much time on site as we used to. We want to be doing as much of our work as possible using these tools, which can import drone scans, GPS and LIDAR data, imagery from Google Earth, or models that are available at marketplaces like 3D Warehouse. Depence and products like it enable us to model lighting on a huge scale."

GARY PRITCHARD

LSC and the engineer behind the brand

by John O'Brien

This is a story about one of Australia's pioneer lighting technicians, Gary Pritchard.

Starting as an apprentice electronic technician with the Department of Civil Aviation, he completed a Bachelor of Engineering in Electronic Communications in 1978. While building everything from mining machines to UPSs and telecommunications equipment during the day, after hours he built dimmers for rock and roll mates. In 1984, LSC Electronics became his mainstay and continues so to this day.

Trading without trade shows

This year has been interesting for us all and no different for LSC. Gary: "From a business perspective, March and April were really weird and very stressful. We couldn't plan on anything and the whole game could change within two hours. But we're still here, taking a hit like everybody else but we're ticking along."

With major dealers in UK, France, Germany, Holland, and all the large European centres, LSC are still "doing OK in the international market. Quite apart from all the things going on in Europe, it's still our strongest export market."

To get those relationships in place took a lot of leg work and overseas travel for LSC. For Gary, from the "late 90s onwards, my time was more occupied in the management side of things. I stepped out of R&D and went on the road for 15 years." During their peak at that time and beyond, LSC were exhibiting at seven international trade shows per year.

With travel restrictions as they currently stand, it's "impossible to get over there and show new products and reinforce relationships". For now, they are relying on long standing associations with these outlets.

The DMX512 story

In 1986, LSC attended their first international trade show in Oakland, California where Gary met up with the working group that was looking into digital lighting control. He explains further: "It just so happened that's where the USITT people were meeting and discussing what was to become DMX, and I got involved. They were a fair way down the track by then. We were about to release our own digital communications standard and it turned out it that ours was very close to what they were doing so we took the decision to move our standard to what was being proposed there. If it was to be a standard it was best to join in and be on the front foot."

I asked if he is still involved with USITT and protocol development. "I am but to a lesser extent. As much as I'd like to, active voting rights require attending 3-4 meetings per year and by and large all of those meetings are in the USA, which is a large commitment and difficult to meet these days. However, I can and do still offer suggestions and critique."

Having seen more than a few standards being met with mixed success, I posited that DMX is one of the few truly universal electronics standards.

"It's good from that point of view but took a while to get accepted. It was difficult for some people to grasp and there were many people who wanted to stick with something that still works. As an engineer it was easy for me - a no-brainer in a lot of ways. But with any new tech, you have to put some trust in it. There will be a few risks until you get a working knowledge of how it functions. Even with DMX, those risks still exist - with people using the wrong cable or not using terminators."

RDM - an extension to DMX

Staying in contact with the technical working groups keeps Gary in touch with luminaries like ex-Melbournian Peter Willis. "He is 'Mr RDM' - he came up with the concept and followed it through."

RDM (Remote Device Management) is an extension to the DMX512 protocol that allows bi-directional communications over the DMX network to remotely interrogate and adjust settings on connected lighting equipment.

Gary and LSC have been enthusiastic supporters of this development: "RDM has taken a long time getting traction but it has huge advantages. With a lot of products on straight DMX, there's no real other way of getting information out of them. We are releasing a software product soon called Houston X. It's a PC and Mac based program that integrates both with our hardware and other manufacturer's hardware on an RDM basis, enabling remote control and monitoring of our products. With our APS and GenVI dimmers, we can log in via RDM and change DMX addresses, control curves on dimmers, set timeouts and much more, all remotely."

Unfortunately, like with many other protocols, "the standard is standard, just the implementation of it is not always standard." Because of this, one of LSC's challenges is to find good diagnostic tools to test their products before release. As Gary points out: "Different people can interpret the standard in different ways so, as a manufacturer, if you build the test gear to test your own product, it is easy to replicate the same mistakes."

Consolation

Without giving up any trade secrets, I asked what Gary sees in the crystal ball for our sector. "Basically, more and more integration. In my time in the industry there have been a couple of major turns - par cans, scrollers, moving mirrors, moving lights, LED - these were all big ones. We had to think how we could control each one and each console got a bit more complex. Today it's incredibly complex - controlling lighting fixtures, media servers, video screens and more - pretty much integrated into one box."

Unfortunately for LSC, the great shakeup of 2020 meant that their flagship console, Clarity LX, became no longer viable and was recently discontinued. "Consoles are a difficult market these days and require huge amounts of R&D. The amount of work to get it there is one thing and to keep it there is another task again."

The timing of world events has certainly factored heavily with LSC over time. Gary muses: "From R&D, we developed the Clarity LX Consoles just before the GFC kicked in. Post GFC, (around 2010-11), the high Australian exchange rate really impacted us heavily. Trade with the UK went from 42p to the dollar up to 60p. It impacted all our product range, of course, and sadly due to the downturn we lost several staff including some of the engineers involved."

Since then, Clarity had been going OK with a dedicated fan-base but this year saw it "get to the point where the hardware was over 10 years old and our software partner could no longer support fixture templates and updates." Obsolescence in some crucial components helped seal the deal.

Consolidation

Control interfaces aside, "Our particular focus at the moment is power control. A few new products are about to pop out the other end. We've seen the advent of LED fixtures, video walls etc - the DMX side of it is fairly straight forward - but it's now all about power control."

Gary gives a good example: "In a typical installation (church, school etc), at the end of the day someone would turn off the console and go home. The lights would go off and the dimmer would draw minimal power. The problem these days with modern fixtures is

that you can turn the DMX off but the power is still going, lamps are still struck, screens are still on and suddenly there is lots of power being wasted. That's where we moved into intelligent power control."

"Our APS is one of the products to fix that sort of thing. You can set it up so if the DMX disappears you can turn off each channel with whatever time-frame you want, be it 15 seconds or 30 minutes or three hours. Inexperienced operators can turn the console off, go home and the rest of the rig will shut itself down."

Dealing with equipment inrush draws (from screens in particular) is also a big concern these days in productions as they tend to trip breakers on power up. LSC is very focussed on that and staying ahead of the curve. "Modern day power supplies have very high start-up current. That's where we've been spending a lot of design time in the last couple of years." Smart systems like APS minimise inrush currents and can be configured for cascading start-up routines thus spreading the load preventing the upstream breaker from tripping.

UNITY

An extension on pure power control are the UNITY hybrid cabinets. "They're power control and also dimming for traditional and LED fixtures but its more an installation product. The majority have gone into big theme parks. The largest installation we have is Warner Bros World in Abu Dhabi, the largest undercover theme park in the world at 1,000,000,000 square feet. This installation consists of about 3600 channels of control. There's another large theme park installation going in to Doha at the moment, although it has stalled due to Covid-19."

With a few DIN rail products in their line, I wondered if LSC are also looking at the architectural structured lighting market. According to Gary, "Are we moving into that area - yes we are. Our roots are still pretty heavy with the live market and it's a different format but I think we'll see more of that as time goes on. In fact, we are about to release our first architectural DIN rail controller based on our Mantra lighting console."

Getting on the consultant list is the key with installs. "It's a hard paradigm to break. That's an issue we face everywhere including Australia, so we hope that the current 'buy local' thinking will help things like UNITY appear more often in a spec."

LSC recently announced it in a touring format - UNITOUR - but they are prepared for a slow burn on this one as the industry opens back up.

A thoughtful approach

I spent a lot of gig time with the first LSC microprocessor-controlled desks, the Precept range. From day one, they felt intuitive and comfortable. The philosophy behind that has continued with LSC to this day. For Gary "it's one thing to have a desk that is infinitely configurable but if it's a steep learning curve to do something simple like turn a light on, you've missed the point."

Trade shows and third parties are great ways to get good perspective from (potential) users and LSC try to get as much feedback from the field as possible. "We do lots of that. Give it to someone else and say 'Go and break it. Push the buttons the wrong way around.' This feedback loop helps keep their product robust and easy to use."

Constant testing and development have long been a hallmark of LSC: "During these times, a lot of manufacturers are suffering and it will be interesting to see what they do with R&D. For us, it's the one thing that we have been able to keep working on ... so that we'll have a set of new products coming out of this!"

Where to next?

On LSC's time ahead, Gary commented "Products such as the APS are equally suited to the audio, video and power distribution markets but we have found in the past that customers in these fields tend to skim over LSC given our name contains lighting and lighting is not the market they operate in. Thus, to reflect the changing product range from LSC, we felt it was time for a name change to one that better reflects the markets that our products are aimed at. As a result, December will see a change in the company name, supported by a brand-new website." Gary confirms that there are no internal changes at all, the management and ownership remains as is.

As live touring is likely to remain quiet for a while, I asked Gary where he sees the near future. "One of our big markets is the film industry. Once we get out the other side of this, that industry is going to explode. We've all sat and watched as much Netflix as we can and very little content has been made this year."

With significant film studios like Pinewood in the UK already owning over 5,000 channels of LSC dimming and power products, I can see this iconic Australian brand forging ahead, especially with an insightful inventor like Gary Pritchard at the helm.

by Jason Allen

LIGHTING FOR CAMERA

Lynden Gare and Colourblind go back to their roots

When Melbourne's creative lighting design agency Colourblind were forced into lockdown harder and longer than most, Director Lynden Gare and the team drew on their history in broadcast to help their clients continue to deliver to their audiences…

"One of the first livestreamed events we were heavily involved in was the Isol-Aid Festival," begins Lynden Gare. "It was 20 minute musical performances, streamed on Instagram live from 10 pm to midnight, all in support of the artists. We worked on the festival in April and May. We'd do three acts on Saturday night live to camera, with one camera locked off. Our general manager Claire Casement and I both worked at Channel 9 in our early 20s. We were both trained to light for camera; what's involved, how to approach composition, and what works, which became really useful for streaming work, and knowledge that we could pass on to the rest of the Colourblind team."

With Colourblind's reputation well-known in EDM and touring circles, what's not as widely publicised is their extensive experience in broadcast. "All light creates an emotion," observes Lynden. "Everything from position to colour matters to a camera. The big difference between live and broadcast is that in broadcast you're lighting for one angle. If we're working with one keylight, then we could position it on the off-camera side of someone's face to make mood with shape and shadow. If we're lighting a lighthearted, poppy band, we might go with a big soft source. We have to think about how lighting effects the emotion of the song. In broadcast

Meanwhile in Iso – Freakin’ Lasers!

Like many, Colourblind have taken the opportunity inherent in enforced downtime to do a bit of upskilling. “At the last LDI in Vegas, I met a lady that runs a company that specialises in laser safety training,” shares Lynden. “I hadn’t found anyone in Australia that did this, so I got her contact details. In April, we put the feelers out to freelancers and our partners around Australia and asked if anyone was interested in doing the training with us. It was $300 a head, and ran five hours. In the end, we got 20 people in total trained up in the safe operation of lasers for entertainment.”

“It was a mix of LDs, production managers, and stage managers, all of whom now have a better appreciation of the possibilities and hazards of lasers. I would now never, ever point a laser into a crowd, or a camera for that matter, not that I’ve ever done that before, of course! Seeing the damage that can be done is very sobering. I don’t ever want to be the person to make the decision to point a laser at a crowd. All it would take is for a mirror to fail and a beam to be static for a second. Drug and alcohol consumption, obviously common at festivals, slow down eyelid reactions, so there are many things to consider when pointing beams into an audience. After this training course, I think the whole industry can reduce risk based on safe work methods.”

and streaming, we’re not relying on the colour and movement of moving lights to convey what’s in the music. We’re usually focussing on what someone’s face looks like. On camera, sometimes that’s the only thing we’re looking at.”

The tools and workflow of getting a good look on camera is quite different to a big arena show. “We almost don’t use our eye at all,” Lynden says “We balance while looking through a monitor. You’ve got to be careful not to use overly saturated colours. Something might look one way to the eye, for example a beautiful rich saturated magenta, and through the camera it might look blobby and pink. There’s almost no point in looking up from the lens when you’re making sure everything looks as intended.”

The biggest difference between the live and broadcast workflow is the pace of structure of the work. “Broadcast and streaming are finely tuned things,” relates Lynden. “You have to

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Conventions & Exhibitions	13%
Theatre	13%
Education	8%
Worship	5%

*typically Audio/Lighting/Staging

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Permanent	67%
Freelance	11%
Other*	9%
Perm/Casual	7%
Casual	7%

*typically self employed

ANNUAL SPENDING

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$10K - $49K	14%
$50K - $99K	11%
$100K - $499K	15%
Over $500K	15%

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finesse a look for a few minutes, get the shot, and be done. It’s meticulous. It’s not actually a slower pace than live – sometimes you have to do things very quickly. It is however more refined. You achieve fewer looks in a day, but might only have a few minutes to create each of them.”

With ‘streaming’ meaning everything from a solo muso in their lounge room through an iPhone, to a professional multicamera studio shoot with a massive lighting rig, the Colourblind team have worked every variation through the pandemic. “Something streamed live might be a quick rehearsal to make sure the colour palette is nice on people’s faces and away you go, or so much more,” says Lynden. “We did one livestream music event where we went all out. Matt Downes at South West Solutions set up a huge lighting rig in his warehouse. Showtech Australia delivered a special slow geared winch, and over the course of a 30 minute performance, we produced a light and laser show around a riser that moved 3 cm a minute down the room. At the other end of the scale, we’ve done streams with a soft keylight and backlight with no control and a single camera.”

Like many production companies, Colourblind has capitalised on the ability of SRT and cloud hosting to deliver on jobs in other states and even countries. “We’ve been working with Tones and I, who has had lot of guest spots on overseas breakfast shows,” illustrates Lynden. “We provided her with a simple rig, delivered to her house. Her housemate sets it up when required, and we operate it remotely. We provide the link between her house and the television station overseas. We remote desktop to the laptop we’ve sent, and do a quick mix of her keyboard and vocal remotely via SRT. We’re using software called Restream, and we sometimes use OBS hosted in the cloud via Telstra.”

Mental Health First Aid

Crew charity CrewCare has partnered with Support Act and Griffith University to arrange for accredited courses in Mental Health First Aid training for CrewCare members, approved by the national Mental Health First Aid body and facilitated by Paige Gaudry from PNP Health. All any company has to do to access the course is become a CrewCare member. Colourblind, along with other companies around Australia, have taken them up on the offer.

“As creative people, we are so exposed to common triggers for anxiety and depression,” remarks Lynden. “We can be on tour away from family and friends, with easy access to drugs and alcohol, and under lots of pressure to perform. We’re always showing the vulnerable side of ourselves, whether tech or performer. Add sleep deprivation to the mix and it’s a potent cocktail of risk.”

The course equips crew with the tools to identify the signs of someone struggling, and how to get them the help they need. “The course is not for people who need help themselves immediately,” clarifies Lynden. “This is for those of us in supporting roles. Mental Health First Aid equips crew with the ability to help people to get help. It’s not turning us into counsellors; it’s the first step to helping others. Anyone who feels like they are often a confidant or counsellor to their to crew, and who likes helping people, should do this course. If several hundred Australian crew from all corners of the industry do this course, and we’re getting close to those numbers, it will put the industry in a good position coming out of COVID. I can’t recommend it highly enough.”

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WHILE WE'RE POWERED DOWN

Tips for Keeping Your Gear Healthy During Hibernation

Presented by Show Technology

Today, Lithium-Ion batteries are the common battery type found in pretty much all of our battery-operated lighting products.

During the period of reduced usage that we are experiencing right now, we need to take some extra steps to ensure we maintain and care for the batteries inside these products so that when we are given the green light to return to events and gigs, they are ready to go.

Lithium-Ion batteries generally perform well for 3-5 years when maintained properly. By following the steps below, you can ensure you get the most out of these batteries, particularly when in storage.

- Before storing your product ensure the battery is not completely flat - batteries will leak power over time so if it's stored flat there's a chance it won't accept charge again.
- Charge your battery to approximately 40% charge, then unplug it and store it in a temperature controlled location.
- The ambient temperature around batteries is incredibly important to maintain optimum consistency whilst in storage. The below graph shows the ideal charge point and temperature for battery storage.
- Whilst we don't all have freezers in our warehouses you can see the colder the temperature, the better the battery stores – however consistent temperature is your best friend here.
- Be aware if you do store at 0 °C, condensation can cause problems like rust and moisture ingress, so this would only be advised if the battery was completely removed from the product and put in a Ziplock type bag.
- Every month complete a full recharge-discharge cycle on the product before putting back into storage.

By following these steps, you will ensure your battery-operated products will be in great shape next time you need them.

Turning Off LED Fixtures When Not In Use

With LED fixtures now dominating the entertainment lighting space, we often jump to the conclusion that when the LED is turned off that the fixture is not using any power.

This is true for the LED engines contained within the fixtures – they don't use power or count towards 'lamp hours' whilst the light is not outputting. But there are many other electronic components inside the light that are still burning away even when the light is off. If the unit remains powered, these certainly count towards 'fixture hours' and can substantially reduce the reliability and usable life of the product.

Did you know that the first point of failure in these types of lights is usually the power supply? This is due to the type of componentry that goes into the design of a PSU, for example electrolytic capacitors, which are renowned for their short lifespans.

If we were to leave fixtures powered 24/7 365 days a year, that would be the equivalent to 8,760 hours per year of runtime. Of the 8,760 hours it's likely only 20-30% of this time would be actual use.

Power supplies and electronic componentry in these units are not designed to be 100% duty cycle, meaning they are not designed to be continuously run. This combined with the fans running all the time and sucking in dust and dirt from the air contributes to early component failure.

Studies and experience tell us that turning off your equipment when you are not using it can make it last up to 10 times longer.

So, what can we do to help ensure our lights are turned off when not in use?

- Ensure that we have signage in control rooms and staff entry and exit points asking "Have you powered down the lighting system?"
- Install easy-to-access power outlets so lights can be physically switched on and off easily.
- Place the lights on a relay switched circuit so the lights can be remotely powered on and off from a simple switch in the control room.
- Install a DMX relay power distribution unit so that you can remotely power lighting fixtures on and off from your lighting console. The Theatrelight Switch Pack DMX is a solution for this.
- Install a DMX relay power distribution unit that has automatic power sequencing to ensure lighting rigs are turned on whilst keeping balanced phases and managing in-rush current of connected loads to prevent tripping. The Theatrelight Contact 12 is a solution for this.
- Log the use of fixtures and keep records so that you can track the running time of fixtures and when they may be due for periodic preventative maintenance.

Keeping on top of preventative maintenance will help detect any potential issues with power supplies and other componentry before they do fail.

It is important to note that the manufacturers service intervals are only a guide and your own servicing intervals should be developed based on things like location and frequency of use.

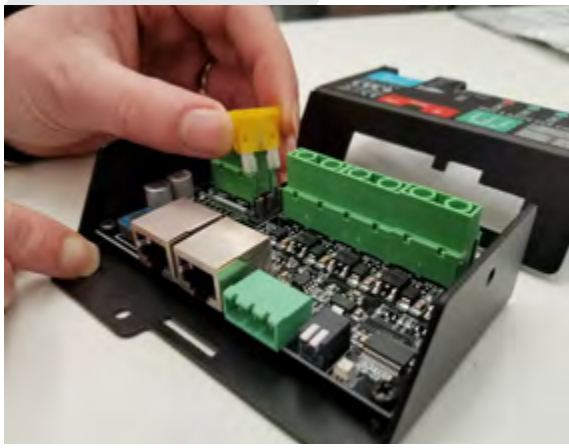
It is important that all staff and workers get into the mindset and habit of turning units off when not in use to avoid costly repair, service bills, or voiding the manufacturer's warranty.

Our sales and technical department at Show Technology is more than happy discuss your venue's power system and help recommend the best solution for your needs to ensure your fixtures are ready when you need them most.

ENTTEC'S CVC4 LED DRIVER

by VJ Suriya

Given that this is The Lighting Issue, we just knew we had to contribute. It has been a challenging year, especially for the entertainment industry, and especially in Melbourne. Through all the lockdowns, ENTTEC has been fortunate enough to remain operational, and what's more is that we've used this time to bring out some new goodies!



We've already talked about our new Octo pixel controller, and the S-Play playback controller this year, but now we've come out with a great new DMX-controllable, pixel mappable, constant voltage LED driver – the CVC4. So now when you are planning your lighting ecosystem, you can easily control CV strip, LED tiles, or signage modules, all using the CVC4, and better yet, control them alongside your pixel lighting using ENTTEC pixel controls, and tie the whole system together with a building BMS using the S-Play.

First off, let's talk the new CVC4.

This unit has a compact, low-profile, form factor reminiscent of ENTTEC PLink injectors and our previous gen CVC3s that you may be familiar with. The difference though, is that it's elongated to fit these chunky, heavy-duty screw terminals. You can drive a max of 5A per channel, across four channels, with a total overall throughput of 20A.

Next to the DC input you'll see a marking for a fuse – this is a user-serviceable fuse that will protect your installation. We've opted for simple blade fuses here so you have no trouble finding a suitable replacement should it burst.

Speaking of protection, there is also an in-built overheat protection to save your CVC4 from cooking in non-ideal situations. An onboard temperature sensor ensures that if your CVC4 looks like it's getting too hot, it will dim to 50% and flash the status LED red, letting you know that you need to fix or add cooling before anything gets destroyed.

The CVC4 has four channels of output and incorporates DIP switches for setting the operation mode. The left switch controls RGB or RGBW mode, and the right switch lets you choose between 8-bit or 16-bit operation so you can easily adjust this controller to suit your application.

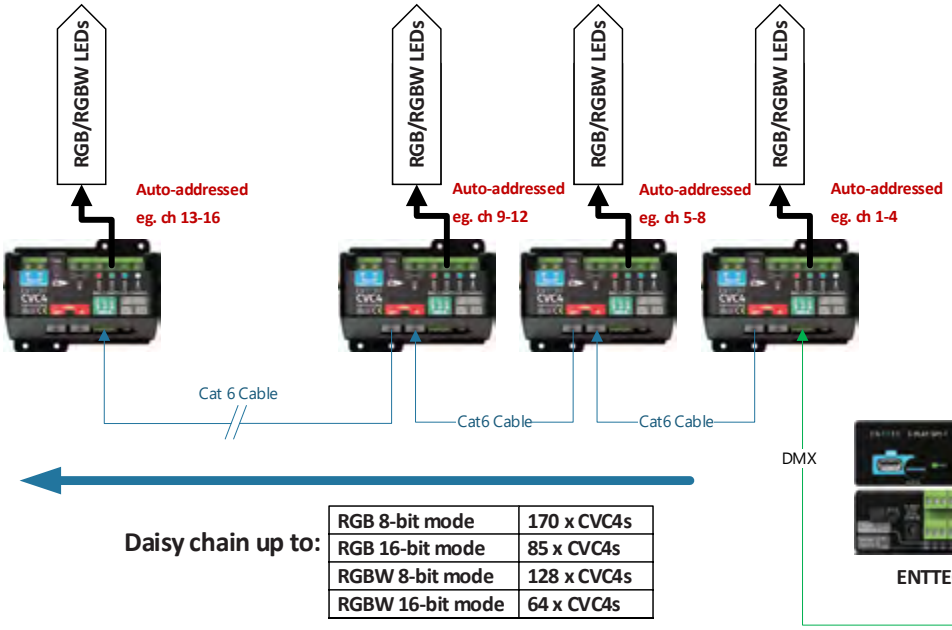
DIP switch settings help with the auto-addressing function which makes this product extremely easy to set up and commission.

You can control these with DMX in to the first CVC4 and daisy chain them using Cat5 cable on the PLink ports to get them to auto-address themselves like LED pixels:

This lets you daisy chain up to 170 x CVC4s on one DMX line, and because they're using PLink to daisy chain, there's no need for additional DMX splitters or terminators.

You can also control this with PLink in from a Pixelator/Pixelator Mini and double your daisy-chain quantity!

On DMX

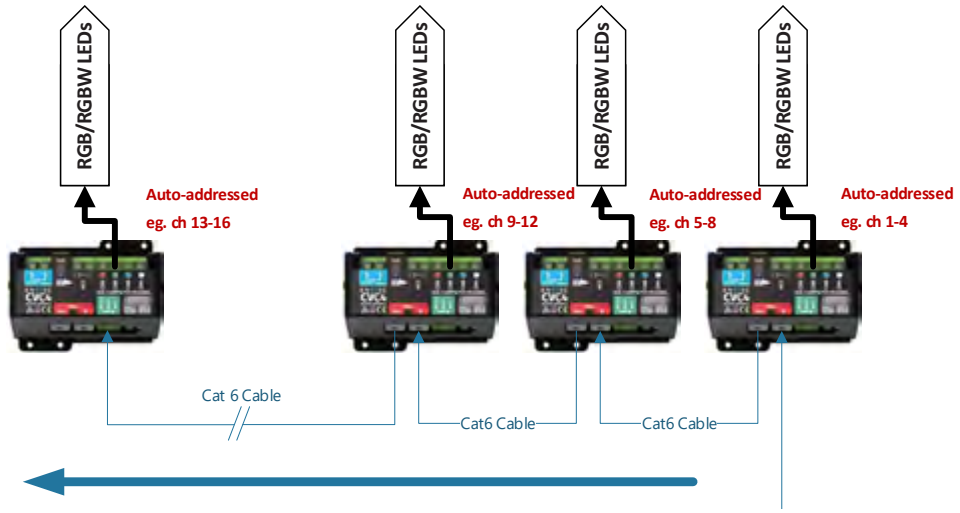


ENTTEC S-Play Controller

Daisy chain up to:

RGB 8-bit mode	170 x CVC4s
RGB 16-bit mode	85 x CVC4s
RGBW 8-bit mode	128 x CVC4s
RGBW 16-bit mode	64 x CVC4s

On PLink



ENTTEC S-Play Controller

ENTTEC Pixelator Mini

Daisy chain up to:

RGB 8-bit mode	340 x CVC4s
RGB 16-bit mode	170 x CVC4s
RGBW 8-bit mode	256 x CVC4s
RGBW 16-bit mode	128 x CVC4s

We wanted the CVC4 to be feature packed and uncompromising on performance, so it’s designed to have a fixed PWM frequency of 1kHz, high enough to ensure that any filming or photography can take place without the lights appearing to flicker in the footage like slower refreshing controllers would. You can be sure that using the CVC4 in your film set or livestream studio will result in beautiful, professional, flicker-free footage.

That’s about it for the CVC4 – but let’s go back to talking ‘lighting ecosystem’ for a moment. Let’s say we have a fixed installation project. There’s some constant voltage RGBW strip in extrusion grazing the walls, a pixel lighting feature in the lobby, and the space is already fitted out with a BMS. How can we easily integrate all this for control via the BMS?

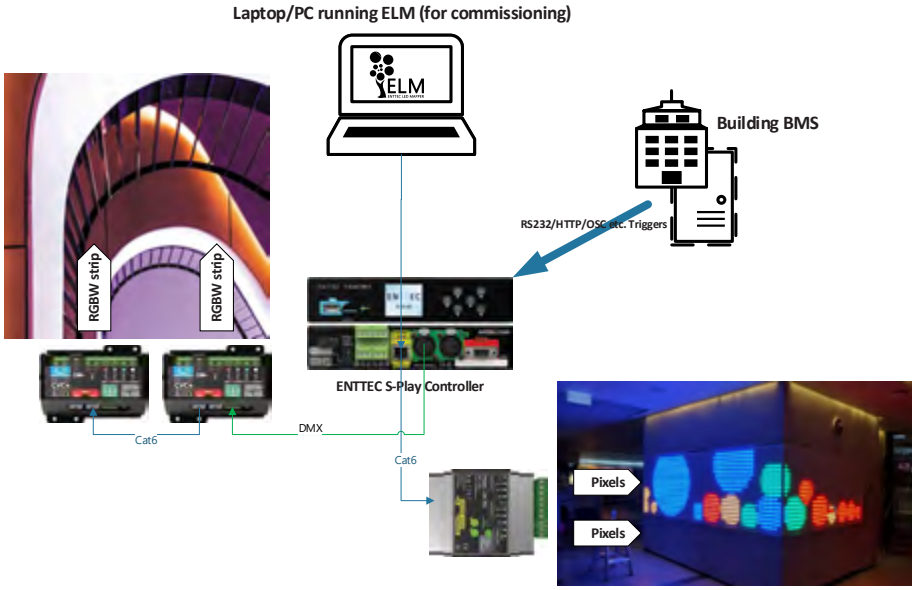
We have the CVC4s for the RGBW wall grazing strip – Octo for the pixel lighting feature, and then we can have the S-Play controlling the lot:

Here we have the S-Play acting as our ‘hub’ for all the decorative lighting so the BMS only has to send low-bandwidth trigger commands to the S-Play and not be burdened with sending DMX/pixel data out itself. Commissioning of the pixels is quick because they auto-address. Commissioning of the RGBW strip is quick thanks to the auto-addressing CVC4s, and the whole rig is pixel mappable since you can map each CVC4 as an RGBW pixel.

Record your shows into the S-Play, set up your playlists, triggers, and schedules, then take your laptop home, and let the system run on its own!

And there it is, your decorative lighting ecosystem, made even more complete with the new CVC4 controller.

The CVC4 is available now – reach out to your nearest ENTTEC office or dealer to get more info. Check us out on YouTube, Facebook, and Instagram for more updates, videos, and inspiration.



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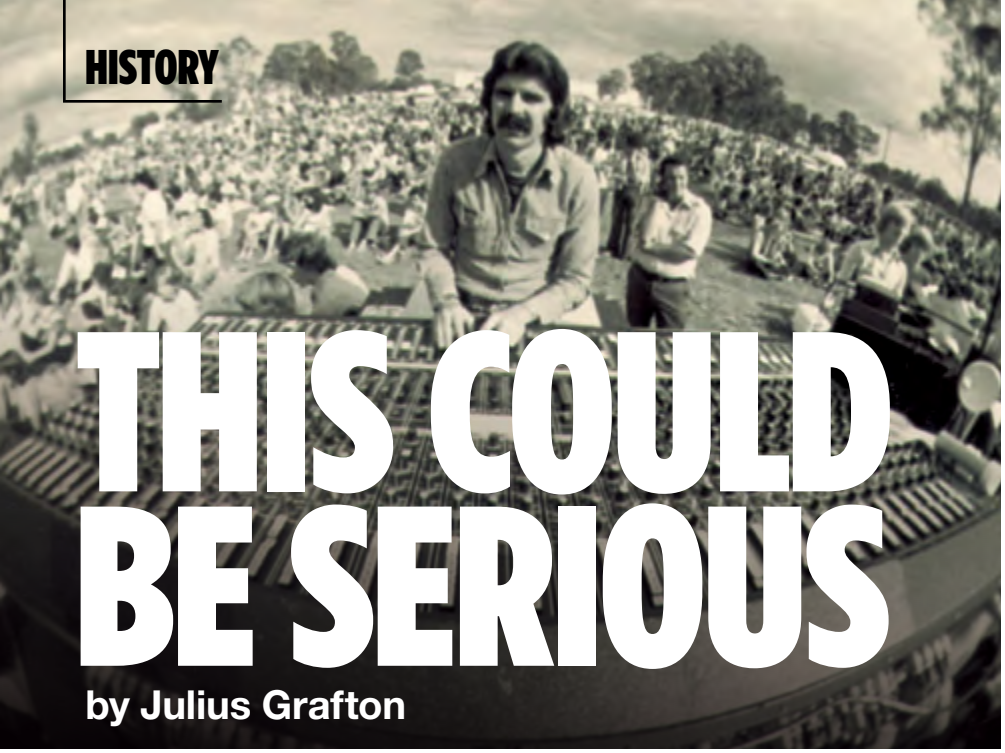

THIS COULD BE SERIOUS

by Julius Grafton

"Julius Grafton writes like he talks - direct, no bullshit, in-your-face, full of energy and with a healthy disdain for pretence. He tells good stories, full of insight and hard-won wisdom. There's a lot of all of this in his book."

- Stuart Coupe

"Order has finally come from the chaos of Julius Grafton. All those nagging questions I have had about the author are now answered and in such a riveting way. I could not put this book down. Julius discovers the meaning of life and unlike most of us, has actually written it down."

- Stephen Devine

"I really hated Julius back in the 1990s when he ran Connections magazine. I would write letters to the editor calling him on grammar, sexism, and general lack of political correctness. Since then I've read some of his material from time to time, and feel that he has the right grasp on life. So I did buy this book on Kindle, and now I want to meet him. Do yourself a favour."

- Sheila Yates

The following is an excerpt from the book 'This Could Be Serious', by founder and ex-publisher of CX, Julius Grafton. All proceeds from sales of the book go to charity CrewCare.

I Was A Roadie

The "FIxible" Clipper coach roared up to Campbelltown Civic Centre, the bus leaving a trail of black smoke. Built in the late 1950s, these American long-distance coaches were used by Ansett around Australia, and AC/DC had purchased a well-travelled version for use as a tour bus. The band's gear was in the back, and a roller door was installed at the side in front of the rear engine compartment. It was 1975.

The FIxible part of the Clipper name wasn't a typo, there was a trademark issue that resulted in the strange name. The coach was a thing of awe with a swept rear end below a big air intake scoop. The AC/DC bus carried the band, backline, and a smallish PA system.

The crew was accustomed to working fast, since the band was on board - there was never any waiting around for the group to roll up. Bon Scott would leer out the windows at girls, waving a bottle of Red Label, and with a fag hanging out of his mouth. The coach was handy at the end of a gig for the band to retire into while the crew loaded it.

Back then, no one thought about consequences, and I think there were few. The parade of gorgeous young—and some were too young - women were essentially competing to get laid. We assisted them in their endeavours.

Sex, dope, and rock n' roll all equalled teenage heaven. That's what was on the cover of the Daddy Cool album, and those were primary drivers in our lives. The free love, drop-out movement from California hit Australia in 1971, and we were all of that era. People would get naked, and get stoned, without much prompting at all.

Our lives were flipped upside down. The rest of the world was mostly straight and conservative, TV was slowly transitioning from black and white to colour, and it wasn't that long ago that square people wore hair cream and danced under fluoro lights to cheesy pop groups wearing badges that said 'I like Swipe". We had long hair. We were anti-establishment. We were in the rock industry.

We got arrested.

Literally everyone smoked dope, pot, ganja, weed, cannabis, bongs, joints and spliffs. Sometimes all at once. LSD and acid were prevalent. Heroin wasn't on the scene, neither was cocaine. Alcohol was part of the mix, but most gigs were in halls that weren't licensed.

There were some discothèque venues that programmed bands, and towards the end of the decade the pubs started to open up in a big way as audiences grew up, coming out of the schools and community halls.

The police were very interested in long-haired hippy rock-types, and would routinely pull us over and search us. There were no breathalysers so we were more prone to drink-driving. Sydney to Melbourne required a bottle of Southern Comfort. We had just escaped the national draft, which Whitlam abolished a few years earlier. Soldiers returned from Vietnam were pilloried as murderers and didn't go to rock gigs.

Sex was happening everywhere. The worst thing that could happen was you got venereal disease and had to visit the Blue Light Clinic to deal with the riot in your underwear—thanks to Billy Thorpe for that quote. The pill had liberated women and the media was full of free love and desire. Number 96 was a TV soap that featured women taking off their clothes in every episode. If you couldn't get laid, it was because you were too afraid to ask. Guys virtually did just that: see a girl at a gig, sidle up and suggest a walk outside. Code: have sex.

Girls didn't think of themselves as groupies. They would simply try and do anything to get close to their idols. Crews were well placed as intermediaries. Pants down, transaction, introduction, and a motel room number.

After load out, of course.

On the road we would pull into a town, circumnavigate the main street, and back up to the rear of the hall. There was always a hall attendant to open up, and usually the place smelled of fresh floor polish. The timber floor was all pristine, and there was usually a plaque above the stage commemorating the fallen.

By the end of the night we would be in some fluoro-lit fibro motel room with a ceiling fan and a breakfast hatch on the wall, keeping the rest of the place awake with booze and girls, yelling and smoking. Sometimes an enraged father would arrive with a couple of uncles, looking for Darlene, Debbie or Donna. Sometimes we would get run out of town by the police.

Some of the bigger bands played extremely hot gigs packed with thousands of punters. There were no controls on venues, no noise laws, and no reason to cool down a hot crowd

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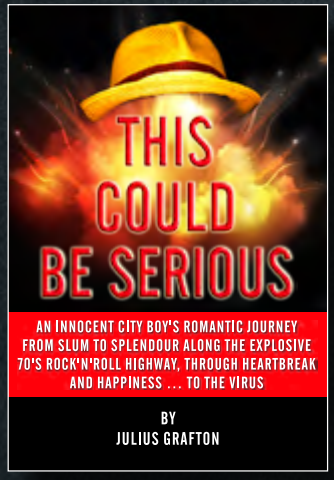
THIS COULD BE SERIOUS

CX FOUNDER JULIUS GRAFTON'S JOURNEY STARTED LIGHTING STRIP SHOWS IN THE 1970s - AND WENT DOWNHILL FROM THERE.



He has experienced exhilarating highs and crashed brutally low since, rising and falling like a series of defective souffles. His 340 page book contains a lot of surprises, lifting the lid on many topics in and out of the pages of the magazine.

Written when Covid struck, the book is edgy and unrestrained. Some of it is undoubtably defamatory. Grafton ignored his lawyer's advice and turned to self-publishing since the big publishers would not touch it. The book details a life starting in abject poverty, and finishes on a happy note as Grafton ekes out a living in the pandemic - with his (fourth) wife Kate by his side.

With rave reviews already in, *This Could Be Serious* is set to be a hit this holiday season. Available in paperback, Kindle, Apple Books and as an Audible audio book, narrated by Graeme Hague.

Visit www.juliusgrafton.com to buy now

who would drink more. Press reports had some rock stars needing oxygen side-stage. We carried a tank alright, but it wasn't oxygen, it was nitrous oxide. You could buy it anywhere they sold industrial gas, no questions asked. We bought CO2 gas for our Genie foggers and pneumatic lighting stands. So adding on a cylinder of nitrous was easy. If they asked, we said it was for the caterer, since they used it to whip cream. Sucking a face full of that stuff gave you a rush, but it also knocked you out. I had a balloon full one night after a gig and woke up after hitting the floor. I was being tenderly ministered by a girl—her care extended beyond a bandaid.

Some girls respond well to blood, it seems.

We were primitive. But the conditions were too. Air conditioning wasn't common. Deodorant was Uncle Sam, or Brut 33. The truck was petrol-engined with four on the floor. Power brakes were a luxury, power steering very optional. The truck cabin had a vinyl bench seat, no heater, no radio, and no air vents.

Phones were made of Bakelite and phone numbers had six digits. To call interstate or overseas you needed an operator. Air tickets were crazy expensive, and exactly the same price on TAA or Ansett. Even the flights left at the same time - Australia had a two-airlines system that was totally regulated. Two competing DC9s would take off from somewhere ridiculous, like Proserpine, and land at the same time in Brisbane.

There were no faxes; we used telex machines that fed out typed telegram-style messages, or we sent a telegram, and presumably some kid on a bike would deliver them. The last telegram I ever got was from a girl. "I hate your guts," it read.

We wore denim, and tee-shirts, and running shoes. Our long hair was greasy and the food was too. McDonalds had just opened at Yagoona in Sydney, and Kentucky Fried, as it was known back then, had been going a while. Fast food was more commonly made by a Greek guy in a blue coat at a suburban takeaway and washed down with a milkshake.

At the gig there was no three-phase power, which is the safe way to run lots of electrical equipment. We scrounged single circuits from around the place, running long leads. Soon we needed more. The Miniset 10 dimmer and the new Jands dimmer needed three-phase, so we made our own single-phase to three-phase adaptors. But to get real power, you needed to tap into the switchboard at the gig. We did it live, with the master switch on, screwing bare wires into the back of the porcelain fuse holders.

There was no FM radio, only AM with the radio station names printed on the tuner dial. 2SM, 3XY … those radio stations had immense power, and the DJs would routinely turn up at gigs in their tight denim flares and walk out with a gorgeous woman. We wore platform shoes, men had perms. We all had too much hair, everywhere.

Bands would be paid maybe eighty bucks as a support act through to a couple of hundred bucks for a headline show. Crew got about ten dollars a night each. The Sydney Harbor Bridge toll was twenty cents.

Legends were born, but some were killed off early.

Safety was not a concept. There were a series of road accidents, the most horrible involved two Swanee crew members whose truck ran off the Hume Highway and burned down to the wheel hubs.

Because we were ready and willing to drive overnight after a gig, usually fuelled by drugs and booze, we were more prone to dying. It helped if the band paid for the drugs and booze - somehow that seemed an honourable arrangement. Death seemed less fatal then than it does now.

It was ridiculously easy to smash the car, truck, or van. My Kombi came to an early end on the Bulli Pass when I ran into a truck. I remember the random thought at the moment of impact; "Gee, the truck is inside the Kombi, on the passenger seat. I could reach over and touch the side." I walked away, not scratched, covered in glittering windscreen shards and soaked from the rain.

One night my Ford F350 truck ran off the road and, as it careened out of control, brushed an overhanging tree branch. I had been asleep behind the wheel, and the branch gave me enough of a wakeup to somehow bring the thing under control and not hit anything.

I found out how a rental car will spin out of control. I did it once on the Pacific Highway, and once on the New England Highway. Somehow there was a break in the oncoming traffic both times. I also found out that those speed advisory signs on corners actually make sense. I overshot a - and again there was fortunately a break in the oncoming traffic.

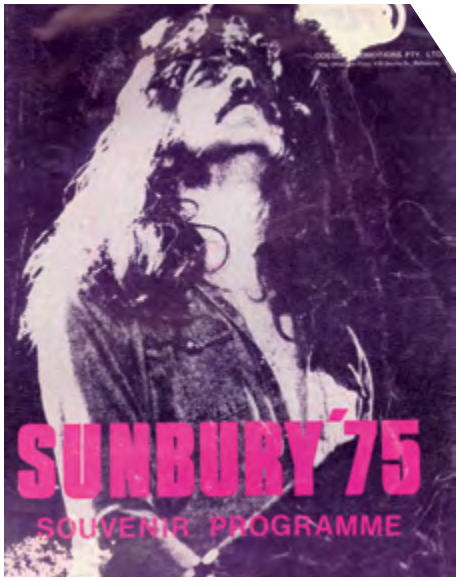
Fall off a tall ladder and not break any bones? Get hit over the head with a steel bar and just bleed without brain damage? Maybe I was brain damaged.

Then heroin did become a thing and there was a rash of deaths associated with the drug as people miscalculated doses. For all who died, there were just as many lives wrecked or simply left behind.

A lot of brains were fried by drugs, plenty became alcoholics, and some people were taken out back and bashed senseless by uncles or fathers or bouncers or gangs. A bashing was seen as something routine and I don't remember anyone afraid of being charged with assault. You were judged by how you handled yourself, how you handled your liquor or alcohol, and how many women you laid.

Those of us who established families left our beloved at home to become rock and roll widows, expected to be happy with the occasional phone call. Some crew burned the relationship candle at both ends; free love meant no responsibility. Women with women. Wives with mates. Mates with wives. Men with men. Nothing was going too far.

Insidiously there were underage girls everywhere, and no one seemed to go to jail for carnal knowledge when birthdays were revealed. There was a totally alien and almost



 All Images: History of Roadcrew exhibit, various photographers, compiled by C. Baldwin, G. Harrison and J. Grafton, 1999.

Sometimes it all gets too much....

The *Support Act Wellbeing Helpline* is a free, confidential counselling service that is available to anyone working in Australian music who needs to talk to someone about any aspect of their wellbeing.

surreal attitude to morality which we've dramatically reprogrammed since.

There was no responsibility for anything.

Like when some genius at Hertz decided to "corner the music industry" and they hired us Falcon wagons and trucks at flat rate with no insurance excess and a no-fault replacement scheme. We put two new wagons into wrecker yards on one trip to Queensland, yelling at the Hertz chick when we were forced to await a replacement for two hours in Kempsey.

For a while we blew things up, until it got ugly and someone got killed.

I experimented with gunpowder. If you mixed in some magnesium powder it got brighter. But then I discovered a fireworks company would sell flash powder over the counter, so I was typically carrying a kilo of grey powder in my attaché case.

We had flash pots and strips of roof gutter filled with a trail of powder. If we didn't have igniters, a camera flash bulb would do it. We had twelve-volt power supplies and a firing board, and too much fun. Sometimes the band got more than they bargained for. We didn't care.

The music industry grew at a staggering rate through to the first half of the 1980s. Bands could and did sell hundreds of thousands of vinyl albums and singles, promoters and managers could and did skim plenty of money off the gullible. If you're drunk and stoned, it's hard to count banknotes.

The audiences were bedazzled by the emerging colour TV, and Countdown came along. But cinema sound was basic and movies couldn't compete with the loud ballsy sound we produced. We had big bottom end and sizzling highs, and our lighting rigs were bright. We were technicolor in a monochrome world.

There seemed to be no stopping the music business.

By the end of the decade, halls were giving way to beer barns and pubs that crammed in 1,500 punters. When The Angels and Cold Chisel toured, the door gross could be over $10,000 in cash.

The highways always had a band truck passing by. We used to spot the other crews, meet them at roadhouses, and stop when they broke down. By the early eighties we were all driving five-tonne Isuzu pantechs, and soon eight-tonners. Still with no air conditioning, still with vinyl seats. I remember the summer heat in Queensland, windows open, sweat dripping out of my shorts onto my thongs. Bare-chested. Swigging Fosters down the highway. A cassette tape of Little River Band playing. My girlfriend chucked a banana milkshake out the window and it blew right back in. The back of the truck - hot as hell. Inside the gig, stale beer smell, sweat, puke, de-odour gas on sticky pub carpets. Gaff tape on everything, sharp staples from hastily hung stage rags. Innocently yelling "hang the blacks" (the backdrop) and getting into a fight with a table full of aboriginals in a beer garden.

Big and packed venues like the Playroom on the Gold Coast, Bombay Rock, and the Bondi Lifesaver, small and packed venues like the Manzil Room or the Khardoma Café. Strange pubs in country towns, little bowling clubs whose secretary managers had been stitched up by a booking agency into believing that paying $8,000 for a band on a Tuesday would save the place.

There was a lot of cash changing hands. I was always pushing a drug dealer out of the way to get paid by the tour manager. Some people fabricated some wild stories about why and how money had disappeared. Lies and more lies, promises and unreality. Just show me the money.

It was still the cash era, before electronic banking, before computers or internets, no emails, no GST, no mandatory reporting if you deposited twenty grand cash at the bank. Mainly the cash was kept out of the bank and dished up in one and two dollar bills stuffed into the attaché case that was de rigueur back then.

The rip-offs were routine, the cheque often bounced, and hollow promises were thick on the ground. There were bikers, fires, fists and guns. Hookers and dealers, groupies and managers, record company staff who really thought they wrote the songs, and booking agents who lied for a living. Dope, diesel, and degradation. Then there were the rock stars.

Amongst the struggles, drugs, fatigue, violence and the egos, there were some people who were complete utter bastards, who practiced the art of duplicity and who just didn't care about others. A few still work in the industry and are well-avoided by those who remember—most of the rest are dead.

I smelled the turning point in 1984 and got off the road, a road that peaked with Whispering Jack shifting twenty-four platinum records several years later. Somehow we faded as our audience grew up and had kids.

AIDS and random breath-testing took the fun out. Bolivian marching powder—cocaine—and speed made people crazy. How would you feel? You're tired, jaded, trying to do your gig, and a guy is yelling spittle into your face for no reason, or trying to take a swing at you? Telling you that you can't do this or that, turn the PA down, just being ridiculous. Refusing to load out after the gig—the list goes on. I remember them all. Sometimes the best response was a microphone stand over the head. Take a nap, sunshine.

I carry enough scars, enough broken teeth, and like most old roadies I have a back injury that flares up when it is cold. And I'm half deaf, with a liver that's suffered more than most.

We fought, we struggled against the authorities, we exceeded our limits, and we had a burning passion for the music. Ours was a generation with a big gap between us and the confused pre-war generation who parented us. These weren't the good old days at all, really; these were bad times with flashes of brilliance.

I used to cringe when someone called me a roadie. Now I'm proud of it.

You should have seen that damned Clipper coach ...

 All Images: History of Roadcrew exhibit, various photographers, compiled by C. Baldwin, G. Harrison and J. Grafton, 1999.

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STACEY BROSNAN

Lighting Tech / Software Engineer

by Toni McAllister

Stacey Brosnan hails from a small town in County Kerry, Ireland. With a passion for gigs and music she took matters into her own hands to get her start in the industry.

"I started organising gigs in my hometown, just to get bands there and so I could be exposed to the industry, so I could learn from it. That was my solution to getting into the industry. When the bands were setting up I would help them. I had absolutely no idea what I was doing and was really insecure about myself, but I just wanted to help."

"Then I moved to Limerick for college and worked at Dolan's Bar every Friday or Saturday night for free, just so I could learn. Because 10-15 years ago that's how you learned - find someone who was good at their job and learn from them. And that's how I got into AV in Ireland."

What did you study at college?

"I did a course called Music Media Performance Technology. And while I was there I basically worked for free in bars and did any audio work available at the time. I started working at the Concert Hall and University of Limerick. I started getting more confidence in myself and learnt a lot about AV and about how the industry worked."

And where to from there?

"There was a recession at that point in Ireland so I decided to go to Australia. Our hours are so sporadic in this industry, so going to a hot country made a lot of sense to me. I could go to work and then enjoy my time off rather than it raining and not being able to go anywhere. Also, I skydive so I thought, I have two passions and this way I can do both of them."

"When I came over to Australia I started going from company to company and got a job at what was then called Staging Connections on a trial basis and ended up getting sponsorship. I was working long hours, but I had such a fun time because I had a such a supportive team."

"I worked in the Westin Hotel and that's probably when I got a lot better at lighting. I stayed behind after work all the time and just learned. I moved on after about four and a half years. And ended up doing more freelance work."

How was the transition into freelance work?

"It was quite frustrating as I'd already done the hard work building up a network in Ireland. Then I was in one company in Australia for so long and you just don't end up making as many connections that way. That was the downfall of starting out my career in Ireland rather than Australia. Making connections in this industry is a massive thing. So, for the past two years, I've just been trying to get to know more people and for them to know me."

What is one of the things you love most about working in AV?

"I love it because it's so collaborative and because it's such a teamwork environment. I left one of my jobs in the past because they were no longer working as a team, and that was it, I was done. For me, it's about having fun on the day. Yes, you're sweating and it can be hugely physical work, and there's plenty of problem solving. But it's also about the banter and everyone enjoying themselves. This is what you do every day, you might as well enjoy it."

"I also love that I have been able to constantly sidestep. I've gone from audio to lighting and I learned vision as well. I go wherever I'm needed. For me it's the learning, the camaraderie, and the teamwork."

The mission for Women in AV is to encourage more women to work in the industry, so it important to know that they have support when they do. Have you felt supported?

"There is really good support from guys. I have had the best support and best mentorship from guys in the industry. You just have to work hard like everyone does, it doesn't matter whether you're male or female. Sometimes you'll get along with people and other times you won't and that's usually a personality clash more than anything else."

Why do you think there aren't more women getting into the industry?

"It's an industry where you don't really see as much of what you can do. With gigs and concerts, it's more about the artists than who's behind the scenes and the technical aspects. You don't see what the possibilities are. I think that's part of it. It's not a very obvious career. My parents have no idea what I do."

Did you have any challenges when you were trying to break into the AV industry?

"During college, I did a bit of programming, a lot of report writing, and making music and composing. The biggest challenge I had when I started working was actually just doing it - problem solving on the job. Because you don't really do that in school or college."

So, the challenge was putting the theory or learnings into practice?

"Yeah exactly. I've realised that I'm very much a visual learner. I need to learn by doing. I think that's why I like lighting and vision a bit more. Because with audio it's your opinion whether it sounds good or not, and everyone has a different kind of ear. But with lighting and vision you can see if it looks good, if it's a nice combination of colours or it's a good effect."

"I was about 20 when I started to get into AV. I think I waited for college before I started because I thought that a degree would be more practical, which it wasn't, which is fine because I still learned a lot. When I was in my second year of college I thought "okay, well if this is it, I'll just have to do it myself". And then I just started learning the practical side myself."

Is there a project or aspect of your career that you are most proud of?

"I am proud of how I am able to adapt. I'm able to ask questions. I don't feel nervous about it. Someone might think that I'm stupid but I really don't care. I just I want to know how things work."

"If you don't feel comfortable asking someone that you work with how to do something, then stop working with them because it really is the best way to learn."

"I'm happy with how going freelance has helped me with my confidence. That was one of the annoying things this year, obviously aside from COVID, was that I was just getting my momentum going with freelance work. I was getting a bit more ambitious, going for bigger jobs and making connections, but it is what it is."

And now you've made a transition into software engineering.

"When COVID hit I started looking at different technologies and learning a little bit by myself. And then in July I decided that things are so uncertain and I have been so bored this year, it just made sense for me to learn a new skill. And software engineering is problem solving so it'll help me with problem solving on shows later if I do go back into the industry over weekends. Plus, I had wanted to upskill. So maybe it was the right time."

There's a buzz that you get from events that keeps you coming back. Will you miss working on shows?

"Yes, it is very addictive. I really have no idea how web development is going to work out for me, but, I think I'm still going to try and do some weekend AV jobs, if I can, every now and then as I really love the atmosphere."

Have you learned anything about the industry as a result of the current situation?

"The industry has completely changed now, the webcasting side has evolved so much. And it's harder than ever trying to explain to clients that it just isn't possible to do what they want with the money that they have. Clients want the world now. Before you could explain things to them visually by pointing at things in a room, and things seemed more real. But now because it's on a screen and everyone has cameras and they see people streaming from their home they assume that it's a lot easier and cheaper than it is. Client expectations are higher and they don't realise it's actually more expensive for what they want, if they want good quality."

Do you have a superpower?

"Given my skydiving, I'm going to have to say flying. But seriously I'd have to say I am like a chameleon. I'm able to go into any role that's needed at the time."

Any advice you'd give to women wanting to make a start in AV?

"I think the best advice I can give to women or anyone starting out is that if you're not learning in a team because you don't feel you can ask questions, just move on, move on to the next thing. When you start out in a company, having a really good team that supports you is so important. Being a woman shouldn't hold you back, not in an industry like this; people are so supportive."

To find out more about Women in AV Australia visit:

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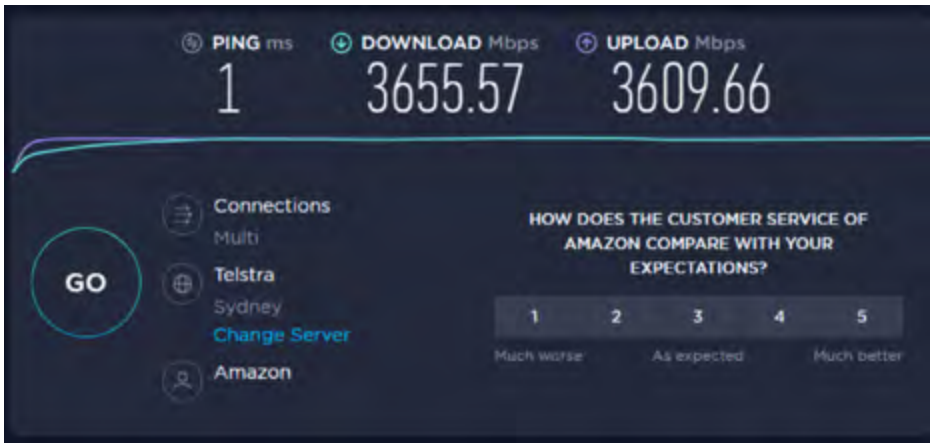
CLOUD COMPUTING IN YOUR PRODUCTION BUSINESS

by Simon Byrne



Covid has changed the way we use the internet. NBN data shows that downloads nationally have risen by 51%, and uploads up by a massive 92% over the same period last year (September 2019/2020).

Most of the upload increase would be the huge adoption of videoconferencing technologies such as Zoom. We were all suddenly using it! Disappointingly, 30% of the NBN users in Australia chose the lowest speed connection of 12 Mbit down and just 800 Kbit up which means those cheapskates have poor outgoing video quality.

A lot of this internet activity is powered by Amazon Web Services (AWS). AWS is a cloud services behemoth that is unique in that the customer only pays for what they use. At one end of the scale, there is Netflix who use more than 100,000 server instances in a month, and at the other end, there is me who uses one or two instances for a few hours, six or seven times a month.

AWS' offerings are attractive because for most of them, you only pay for the individual services you use, for as long as you use them, and without requiring long-term contracts or complex licensing. AWS pricing is similar to how you pay for utilities like water and electricity. You only pay for the services you consume, and once you stop using them, there are no additional costs or termination fees.

For example, I recently did a virtual conference for some doctors where the presenters participated using Zoom and I added the slides, videos and other assets using vMix and pushed the program out to about a thousand viewers. I did this by spinning up three of AWS' Elastic Cloud instances (called EC2), as well as using their Elemental Media Live Service to push it out to the punters.

The first EC2 instance was a powerful graphics-oriented windows server where I installed vMix. The remaining instances were smaller virtual machines as all they were doing was running the Zoom conferencing client. BTW, the majority of Zoom's infrastructure is also on AWS so the connectivity between me and the Zoom servers could not be better. All three machines were in my Virtual Private Cloud which is essentially the virtual equivalent of a local area network. That meant I could bring the three machines together using NDI and the Zoom calls came in and out of vMix that way.

I brought the PowerPoint slides into the system from a fourth local laptop in my control room. Using two Kiloview E1 Encoders, I sent the outputs (program and presenter view) by way of SRT to the vMix instance. The presenters control their own slides using internetclicker.com which gives them forward and back buttons on a web page on their phone.

I control the EC2 instances using virtual remote desktop clients such as Parsec, which brings the screens of the remote desktops to my local computer screens.

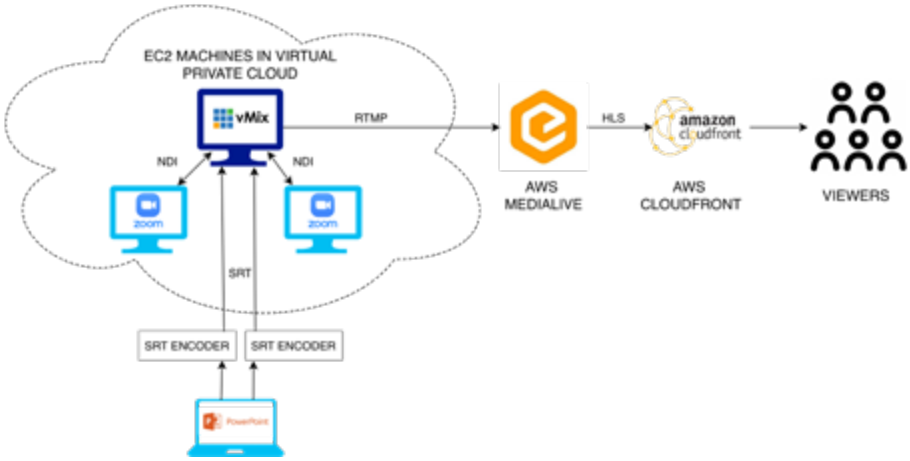
Why don't I do all of this locally? The weakest links in any online event are the 'first mile', and the 'last mile'. The last mile is the viewer's internet connection which we all know is highly variable. You can do nothing about that. The first mile is your connection into the production network. By moving the production into the cloud from my office, the quality of my internet connection has no impact on the production as long as I can control the remote desktops. And if my connection were to fail or suffer poor speed, the virtual machines will keep running. So instead of the internet traffic from two Zoom machines and the vMix machine being handled by my NBN connection where my upload bandwidth is 40 Mbit at best, it all stays in the cloud where my bandwidth is 3600 Mbit. Ninety times faster!

The output of my vMix instance was pushed to AWS' Elemental Medialive service. Medialive takes my RTMP stream, packages it up into HLS chunks and pushes it to Cloudfront which is the AWS content delivery network.

Why AWS and not another Cloud behemoth? AWS has a huge presence in Australia, I like their on-demand pricing model, and their architecture is particularly resilient.

AWS has the concept of a Region, which is a physical location around the world where they cluster data centres. Australia is part of their Asia Pacific Region.

They call each group of data centres an Availability Zone. Each AWS Region consists



of multiple, isolated, and physically separate Availability Zones within a geographic area. In Australia, there are three AWS Availability Zones, spread across eight locations around Sydney. Each location has independent power, cooling, and physical security and is connected via redundant, ultra-low-latency networks. As well as these, AWS also has edge location servers in Melbourne and Perth. They are direct connections into the Sydney Availability Zones which means users in those cities connect as if they were located in Sydney, and for other users, there is a connection point reasonably nearby.

All of this means that my data stays in Australia which means more reliability and especially less latency. The latency is only in the range of about ten milliseconds to AWS in Sydney from anywhere in Australia.

What services on AWS might interest you?

EC2 is their bread and butter web service that provides secure, resizable compute capacity in the cloud. Running vMix on a powerful EC2 instance is an ideal use, as are temporary video editing machines if you have a large project and it does not make sense to buy more high-end computers. People use EC2 for websites where extremely high traffic over a short term is expected. Yes, Ticketmaster use scalable EC2 farms when a hot ticket goes on sale. When the event is sold out, they terminate most of the instances because they are no longer needed.

S3, or Amazon Simple Storage Service is the AWS file storage service that offers scalability, security, and performance. It is a great place to store large amounts of data. I store master video files on S3 and my NAS (Network Attached Storage) box in my office syncs with S3 for my fully automated offsite backups.

Workspaces - Desktops in the cloud. Are you a Mac guy but need a Windows machine for a project? Fire up an AWS Windows workspace and you'll have Windows on your laptop immediately.

Medialive - AWS Elemental MediaLive is their broadcast-grade live video processing service. It lets you create broadcast quality video streams for delivery for streaming but also to broadcast television. One thing I like about Medialive is that it has a dual pipeline architecture so you can have a backup stream and it seamlessly switches over should the primary feed fail. You can also feed multiple destinations at the same time.

Cloudfront - Amazon CloudFront is a monster of a content delivery network (CDN) service that securely delivers data, videos, and applications. Cloudfront is capable of millions of simultaneous streams. On one recent occasion, Cloudfront delivered thirty-five million simultaneous streams for an Indian cricket match. Netflix, Amazon Prime, BBC and Discovery Channel all use Cloudfront to get their content out and you can too.

AWS has a range of entry level services that are available for free including EC2 which you can play with right now. You access all their service by signing up for an account on AWS (link below).

From there you have access to over 160 cloud services. As you get more confident and start using more powerful features, you will start to incur costs. However, you only pay for what you use, and those costs are usually very reasonable unless you are building something massive. A word of warning though, it is very easy to build something massive!

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SECURE RELIABLE TRANSPORT

by Simon Byrne

As we all know, internet speeds and jitter are not reliable or consistent. It is a wild world out there! That means moving real-time video across the internet is a challenge. Generally, overcoming these problems requires the provisioning of high-cost reserved links like MPLS or satellite networks.

For those of us who cannot access those high cost links, we used RTMP (Real Time Messaging Protocol) over the standard internet. RTMP was initially a proprietary protocol and codec developed by Macromedia for streaming audio, video and data over the Internet between a Flash player and a server. Macromedia is now owned by Adobe, which has released an incomplete version of the specification of the protocol for public use

which is loosely based around H.264. By today's standards it is old as it was primarily designed for delivering content to the Flash media player. As the Flash player has been phased out, so has RTMP and its development was abandoned in 2012. There is one notable exception. RTMP is still the main method of pushing audio and video to live stream servers which takes the RTMP and transcodes it into usually HLS for distribution.

Apart from the use above, it is a poor production protocol, mainly because you cannot change codecs. SRT fills that void as it was designed for low-latency live video transmission.

Originally developed and pioneered by Haivision, SRT stands for Secure Reliable Transport. SRT is an open source video transport protocol and technology stack that optimises video streaming performance across unpredictable networks. It is also designed to deliver the streams securely and features a clever firewall traversal. Haivision made the protocol open source which means anyone can use it. As a result, there are now over 450 companies in the SRT Alliance of users and developers.

SRT is a UDP protocol. UDP (User Datagram Protocol) is a communications protocol that is primarily used for establishing low-latency and loss-tolerating connections between applications on the internet. It speeds up transmissions by enabling the transfer of data before an agreement is provided by the receiving party. It is like a hose of data that just keeps coming, irrespective of whether the receiving party can keep up.

SRT's key features:

- AES 128/256 bit encryption - Your stream is secure.
- Packet loss recovery through advanced low latency retransmission techniques - this is SRT's secret sauce.
- Video and audio stream timing recovery - you have predictable latency.
- Ability to designate any endpoint as "sender", "receiver", or "rendezvous" mode - more on this later.
- Detect the network performance between endpoints (packet loss, latency, jitter) - it adjusts for conditions.

SRT is superb for connecting quality video across the internet with a fixed latency. For example, I recently did a job where I switched broadcast cameras that were in Adelaide and Melbourne. The local crews used vMix to send a SRT stream to my vMix instance in the cloud, where I did the switching.

In Melbourne we had two cameras, so we had two SRT streams. Because the latency is fixed by me, both cameras were perfectly in sync.

SRT is very simple to set up and it has three modes to establish a connection:

Caller mode

This is where the source calls the Listener. In order to call the Listener, you need the public IP address of that Listener machine.

Listener Mode

In this mode you are simply listening for the incoming stream. In most cases, the Listener machine is behind a firewall and the traffic will have to be forwarded to it.

Rendezvous mode

In this mode, both the SRT source and destination devices are ready to establish the SRT connection as soon as an SRT stream starts. It works by both ends of the connection attempting to make the link. It is quite handy if you are having difficulty traversing a firewall because the firewall is tricked into forwarding the stream. What happens is that the stream appears on the internet side of the firewall. On the LAN side of the firewall, you also have a local machine looking for the stream. The firewall makes a best effort to put the two requests together and a link is established. It does not always work but often it solves a problem. In this case you need the public IP addresses for both ends of the link.

There are a couple of other settings:

Port number

You must nominate a port number and that number must be identical on both ends. Then, if there is a firewall on the Listener end, you can use that port number to forward the traffic onto the Listener machine. The Listener machine will be listening on that port too.

You can have multiple SRT streams going to a machine as long as you use different port numbers for each stream.

Latency

The recommendation is that this should be set to triple the ping time. If you ping the listener machine from the caller machine and it comes back at 30 milliseconds, you should set the latency at least 90 milliseconds. However, in my experience it needs to be more because sometimes the ping time is temporarily much longer. I use a minimum of 200 milliseconds, often 300 milliseconds. But here is the great thing about SRT; if your link is poor, you simply set the latency longer and you will achieve a stable image, albeit delayed.

Passphrase

You can add a passphrase to your encrypted stream if you wish but it is not essential.

In my experience, you can get a very acceptable 1080p25 image using about 2.7 Mbit bandwidth.

SRT does not care what codec is used. That means it can take advantage of the newer ones such as H.265 and it is being actively supported and developed by the SRT Alliance, which is the group of 450 manufacturers behind it. I'm confident that SRT will replace RTMP in the near future.

Want to try it? The free streaming software OBS supports SRT. I know guys who use multiple copies of OBS to send single camera SRT streams and it works great. Another great app is Larix Broadcaster for both Android and IOS. It is a simple camera app that sends a SRT stream. vMix supports SRT but as far as I know, Wirecast does not.

You can also get hardware SRT encoders and decoders. I have Kiloview encoders but Magewell, Matrox, Epiphan and several other manufacturers make them as well.

Keep an eye on SRT. There is no doubt that it will emerge as the standard that we will be using for years to come.

SRT Alliance

https://www.srtalliance.org/

Larix Broadcaster

https://softvelum.com/larix/

OBS SRT

https://obsproject.com/wiki/Streaming-With SRT-Protocol

"SRT is an open source video transport protocol and technology stack that optimises video streaming performance across unpredictable networks"

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CHAMSYS MAGICQ MQ500M STADIUM

by Simon Horn

Simon Horn is a UK based lighting designer and operator, working mainly in live touring. He has designed or programmed and operated for acts including Anastacia, Maribou State, Twinnie, Olly Murs, Westlife, Alison Moyet, The Pouges, Peter Andre, 5ive, B*Witched, Blue, 911, The Honeys, A1, and Liberty X, and for festivals including Cream25, Shiiine On, IOW Festival, Global Gathering, Beautiful Days, Hop Farm, Larmer Tree Festival, End of the Road, and Big Chill.

I've been very faithful to ChamSys consoles since I came across them in my early career. I first used one when working for a production company, and it was instantly the easiest lighting console I'd used to date. All the stress of programming a show just went away. It was like I was blind and could now see. I've toured with other brands, but they all frustrate me in different ways. To some extent, you're stuck with their methods and can't customise things to the same depth you can on a ChamSys. I find ChamSys consoles relaxing to use, and they just work.

Capabilities

I got hold of the full version of the ChamSys MagicQ MQ500M Stadium three months ago. It has instantly made its money back for me as I needed something that could do more than 64 Universes.

I'm currently pushing 80 universes out of my single MagicQ MQ500M Stadium console with no external processing. To my knowledge, the MQ500M is the only stand-alone console that can do that. Another unique feature is that it can also run audio. The show I'm working on now is programmed to sound and all of the show audio is loaded on the console, firing along with the cues. Adding audio is simple; load onto the console's hard drive, pick an audio file in the cue column, bring up the timeline view to show the full waveform, edit and drag the cue to the right point in the audio, and you're done. I much prefer that the whole show is on the console without having to use any other external hardware.

Lots of people don't realise the MQ500M plays back audio, which it can also do from within the MagicQ Stadium software. I've even run a show with little audio stings; you can set buttons on the touch screens to fire an audio file, you hit it, and bang, there's a sting.

I'm currently programing a show that's quite unique; it's two steam trains covered in pixel mappable lighting as a Christmas event. There are around 12,000 addressable LEDs on each train. The lighting is both inside and out, with passengers wearing LED wristbands that light up. The hour-long trip is set to a DJ mix of Christmas songs. The ops position with the MagicQ MQ500M is in middle of train in a

guards and luggage area. I'm running software that monitors the train's GPS location, which in turn triggers lighting cues – it's mainly to avoid the fact a train is not allowed to flash red, yellow, or green at the signals!

The Big News - Moving Faders

ChamSys have made a big deal of the fact that the MagicQ MQ500M Stadium has moving faders. Honestly, I never thought I really needed moving faders, but they have blown my mind with what you can do with them. For me, the big benefit is quick access to features, including Intensity Masters. If you want to control the brightness of certain fixtures without affecting anything else, you set up the control as an Intensity Master. You'd normally have to assign a dedicated fader to that, and take up a fader space. In the ChamSys operating system, there's a button that takes you straight to a dedicated Intensity Master page, and instantly shows you all the groups. They've really thought about the extra functionality moving faders gives you, and they're really useful for operating a touring show.

Pixel Mapping

Pixel mapping in ChamSys used to be similar to other mapping systems – there's a grid, and you draw your map in it. But now, because the MagicQ MQ500M Stadium supports importing lighting plots, you can bring in your map directly from your design software. You can then select your fixtures, hit 'create pixel map', and it's done. I almost cried – I could instantly achieve everything I wanted to. I don't know of any other console that does that.

Physical

I feel the MQ500M is more 'grown up' than its predecessors. Every touch and press is more solid. The Illuminated keys are brilliant – it's easy to find where you are even without desk lamps. Your last button pressed turns red and everything else remains white. The touch screens do what they should, with multitouch, and a clear and solid look. I used to have to type with one finger, now everything's more natural, including dragging and dropping, which has made life easier.

The ergonomics, design, and build quality have all improved. The ergonomics are important to me, as I am recovering from a back injury; I struggle leaning over consoles. The MQ500M is just right; everything is where you want it to be, because in the design phase, they've asked operators who are actually using it.

Connectivity and Operability

In terms of connectivity, it's all there. There's four Ethernet ports, which is plenty, four DMX, USB, audio I/O, LTC and MIDI ins and outs. On the latest version of the MagicQ Stadium software, you can do virtual management of each port.

At the top of the playback faders, there are 15 encoder knobs that are configurable. That means you can have another 15 playbacks, speed masters, or side masters. On your layout, the RGB illumination means every fader can be backlit with a different colour. The Execute Page gives you virtual buttons. You can customise images on the buttons, with the ability to set different images for the 'active' and 'inactive' states. I've mapped images of railway signals onto them for our Christmas train show to let the operator know where we are. Fun!

Libraries

The Fixture Libraries are all there. If you're touring in China or come up against some unique fixtures, you can make a phone call to ChamSys, whose support is second to none, or you can find something similar enough and edit it easily. There's a very helpful search utility in the console that can search the library for fixtures that are similar.

Scene and Cue Management

The scene and cue management on ChamSys consoles makes busking a show very easy. If you've got a certain set of fixtures that you've used on another show, you can go into that show file, select those fixtures, and export the settings into the current show file. You can grab any of the bits you want from other shows; colour palettes, for example. I've not started a show from scratch for a decade!

Show file management is also easy. Just plug in a laptop, and you have instant access to the console's hard drive. You can grab show files, of course, and even individual audio files. Being able to use a computer for show file management is great. For example, my current show file is 400MB, excluding media content, so that's much easier to deal with on a laptop than a USB stick.

Product Info:
chamsyslighting.com/products/mq500m

Distributor Australia and New Zealand:
www.ulagroup.com

ChamSys MagicQ MQ500M Stadium – The Specs

- 256 universes direct from the console
- 15 fully motorised fader playbacks
- 15 encoder playbacks with RGB indicators
- 12 multi-purpose Macro/Executes/ Playbacks keys
- RGB illumination of playbacks
- Backlit buttons
- Dual Inbuilt 15" Multi HD touch displays
- Up to eight touch displays support (five via remote network)
- Dual motorised 100mm crossfaders, ideal for theatre
- Inbuilt MagicVis Visualiser with full rendering of beams and gobos

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MEYER SOUND SPACEMAP GO

by Jimmy Den-Ouden

"Immersive sound" is something we've been hearing and reading more about in recent times, but the concept itself isn't actually new at all. Essentially it's based on the idea of giving acoustic elements positions in a space. Think back to the grand pneumatically driven organs once seen in cinemas, where different physical instruments or speakers were mounted around the proscenium to give them a definite sonic position on the sound stage. They sounded huge, and amazing.

The thing about immersive sound is that making it into a usable format for professional audio is not without its own challenges. Meyer Sound acquired LCS Audio way back in 2005, and for quite some time now their D-Mitri platform has supported Spacemap as part of CueStation. But D-Mitri is a pretty full-on system, and the reality is that not everyone needs that level of functionality. Meyer Sound has now upped the game and made some of the same tech more accessible with the release of Spacemap Go. So accessible in fact that it's free. If you have an iPad and have access to a GALAXY Processor, you can use it right now without spending a cent.

Spacemap Go controls a Spacemap System of one to 16 GALAXY processors with up to 32 shared inputs. These can be configured to create a dynamic mix matrix which responds very fast to control information, and can perform many operations simultaneously. Spacemap Go is the iPad app that provides the front-end user interface, and I think the smartest aspect of the system. It's one thing to have a big matrix, but another thing entirely for a human to be able to effectively issue instructions to the whole thing all at once, all the time. That's what Spacemap Go can do.

GALAXY processors all support up to 32 inputs between their physical IO and Milan AVB inputs. GALAXY 408 provide 4 analog or AES inputs and 8 analog outputs, and GALAXY 816 provide 8 analog or AES inputs and 16 analog outputs. These are combined into a Spacemap System where they share up to 32 inputs and use all the available outputs.

Getting started is as easy as connecting up your AVB and control network, wireless router, and booting up your GALAXY processor in Spacemap mode, which is done via the latest version of Compass software. The networking side is very straightforward. There's some initial one-off firmware-updatey stuff to do, but the help site walks you through the whole

"Leverage the processing power of the GALAXY Network Platform."

process so it's dead simple.

Next, do whatever setup is required to network your iPad to your GALAXY (ie: connect to your wireless router) and fire up the Spacemap Go app. For demo purposes you can use Compass to create a virtual GALAXY, but it's way more fun if you have a real one. Note that you can use the virtual GALAXY as a kind of offline editor for the system, so if you're hiring in processors you can do much of the setup in advance.

Once you're connected to the processor, there's a setup wizard to help route signals to inputs – these could be post-fade direct outs from a mixer, or playback channels from a Mac – anything you like. Latency is low enough I'd call it inconsequential, so using Spacemap Go for live sound is absolutely a realistic and viable option. Outputs feed to your various speaker systems, and it's possible to still use the GALAXY to apply appropriate processing for your Meyer Sound speakers.

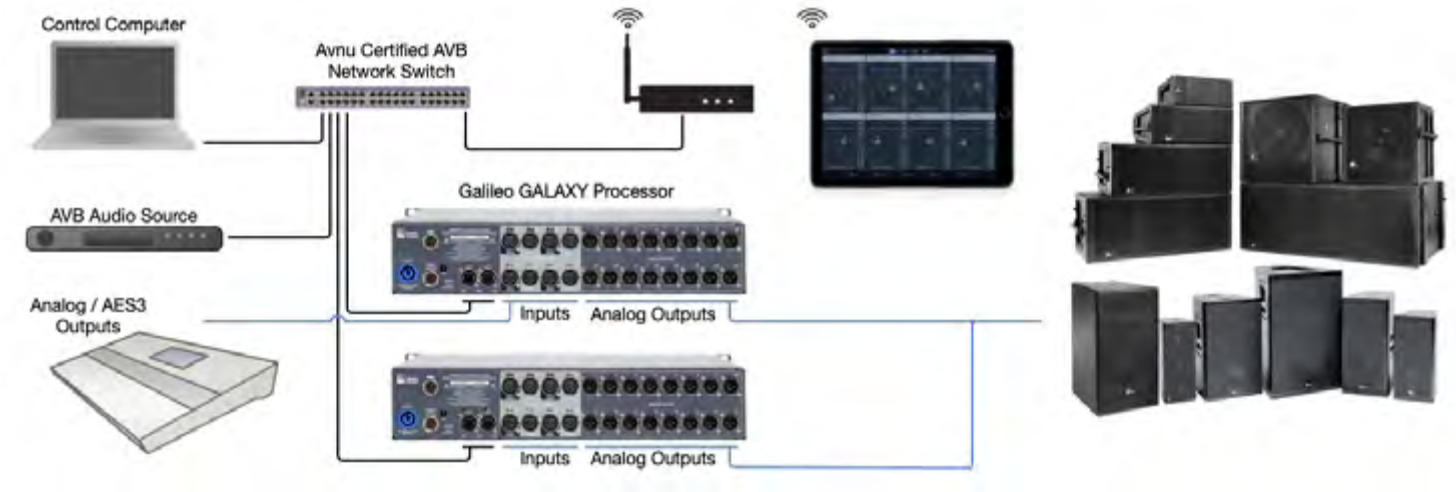
Next, draw a Spacemap! That is a 2D representation of where you want to be able to pan your audio to. It could represent your speaker systems in the room (or stadium, or outdoor area, whatever you like cause it's scalable), or it could be an abstract layout designed to allow better control over the movement of the sound. It can be whatever you want.

Spacemaps are made up of nodes – speaker, virtual, derived and silent. Each of these does different things, but the basics are that a speaker node represents a speaker connected to an output – each of these is associated with an audio output on the GALAXY. A derived node represents a speaker whose output is a sum of multiple speaker nodes (for example a mono sub associated with a stereo left / right pair). I think of silent nodes like attenuators, and virtual nodes as intermediary points between speaker nodes.

Groups of three nodes link together to form Trisets – here's the official explanation of Trisets which is much better than anything I could write: Trisets are triangular panning surfaces defined by three nodes. They ensure smooth panning without signal drops, like the two-dimensional panning law used by a conventional pan pot. Just as two points are the minimum required to define a line, three points are the minimum required to define a plane. This all sounds a bit confusing, but you don't actually need to fully understand it to use it.

The 'main' mix screen of Spacemap Go has four layers, each of which shows eight channels simultaneously. There's a master system level control pop-up in the top right corner, and you can have basic control over each channel from this screen. For more detailed operation, tap into a single channel to bring it up in full screen mode. You can see all 32 channels at a time in the Overview page.

From this point you can load two Spacemaps concurrently on to the channel, and fade between them. Again, it's hard to explain but easy to understand once you try it. Dragging your finger around on the active Spacemap moves the sound around, and it happens absolutely responsively in real time. The spread control defines how tightly the sound is confined to the nearest node(s). 0% spread positioned on top of a speaker node will result in the sound being routed only to that speaker. Widening the spread will pan the sound into all speakers in the Spacemap. It's pretty cool. Naturally you can adjust level for each channel too.



Positioning sounds is one thing, but the trajectory function allows you to move them continuously around. Think of a trajectory as a path along which the sound will travel, passing by the various nodes as it goes. You can pick from pre-defined trajectories or draw your own. Drawing a trajectory results in a kind of 'cue-list' of coordinates, along with editable time values for each step. So you can control precisely how long a sound takes to complete each part of the trajectory. Trajectories can be sped up, or slowed down, and moved, re-sized and skewed to fit onto your Spacemap the way you want.

The really wild part is that you can apply a different trajectory and pair of Spacemaps to every single channel at once. All 32 of them. On top of this, you can create both channel snapshots and mix snapshots. Those can be recalled externally via systems that use OSC such as QLab, complete with variable recall times. Or you can set the positions with tracking systems such as BlackTrax; the automation options are comprehensive.

Of course you can save and recall multiple projects, and export projects as well. File management has obviously been considered during the development process.

By now it should be apparent that there's considerably more depth and detail to Spacemap Go than this review has scope to cover. Fortunately it's really well documented on the website, so I'd encourage you to go there to read more detail on things like automation and Spacemaps. Even if you were never to lay hands on a system, it's genuinely interesting from an audio perspective. I was fortunate enough to spend some hours on a proper demo system and I still feel like I've barely scratched the surface of what's possible.

I think the beauty of Spacemap Go is that it makes a very complex process simple enough to be approachable, yet it does so without sacrificing any of the features or power an immersive mixing system can offer. It's really an amazing tool, and it's easy to make it do what you want it to. The hardest part of using the system will not be a technological challenge, but the artistic one of choosing what to do with it.

More info: meyersound.com/spacemap-go

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Meyer Sound

Spacemap **Go**

Did the earth move for you?

by Duncan Fry

I didn't realise until a few weeks ago that it's been over 25 years since the 6.7 Richter scale earthquake that happened in the early hours of January 17th 1994 in Northridge, California.

I wrote about it at the time, but I was on the phone the other day to my friend Bruce Maddocks – originally a top engineer from L.A. but now living the good life in Port Macquarie – who was there when it happened, as was I, and with the insight of hindsight we were swapping reminiscences of that strange time.

I was over there for the NAMM show, and had arrived a couple of days early to get organised, rent a car, and get our booth set up. I had checked into my usual accommodation, the Anaheim 'Penny Sleeper' Inn, known to my colleagues at ARX as the 'Penny Pincher' Inn, because of its extremely affordable nightly rates, thanks to being situated on the centre median strip of the I-5 freeway (not really but it felt like it!)

Bruce lived in a 1920s-era house in the Hollywood Hills. He had heard the noise - a long, low rumbling that seemed to be coming from over the hill and was funnelling its way down his street, so he went out into the garden to have a look.

"It felt and sounded like a runaway freight train was coming straight towards me" he said. "Suddenly the ground flicked up, like shaking out a giant blanket! At that moment the chimney of the house toppled over and crashed through the roof into the room where I had been sleeping! It took a while for me to go back inside again, I can tell you."

For me, back at the Penny Pincher, I woke up to loud and strange noises in the room above me. My immediate thought was that some deviate had picked up an elephant at a singles bar, brought it back to their room and was engaging in some practices of questionable legality. “What are these people doing?” I thought; “Don't they know it's 4.30 in the morning?” The long slow creaking and shuddering movements continued, getting louder and louder, when suddenly a light bulb went on in my head “Uh oh, this is no elephantine hump...this is an earthquake!”

What's the earthquake drill? Get under something solid like a door frame? No way. I wasn't budging from that bed. Instead, like the fearless, battle hardened, courageous road warrior that I am, I shoved my head under the pillow and waited for it all to go away.

The movements got worse, and a really low rumble was clearly audible. The room seemed to float and bump. The feeling was like being in a dream with the bed bumping over a very bad road in a car with very soft suspension. It was a really eerie feeling. Mother Nature flexing her muscles just to show us who's really in charge here.

Then, just as suddenly as it had started, it stopped. I slowly eased my head out from under the pillow and looked out the window. No damage that I could see. The old Penny Pincher (and I) would live to see another day! Warren Zevon had got it right:

''...and if California slides into the ocean
As the mystics and statistics say it will
I predict this hotel will be standing
Until I pay my bill ...”

I switched on the TV and instantly I could see that Anaheim had got off lightly. On the screen there was a staffer who had been dragged out of the video department where he had been working, and shoved on camera. He looked scared tishless, and I can't say that I blamed him. The TV station was in the heart of the Valley, and had received the brunt of the shock. The newsroom behind him was a total mess. Ten or more 21" TV monitors

had crashed off the wall on to people's desks, shelves had been pushed over and their contents had spread all over the floor, pieces of ceiling were hanging down. After 10 minutes he said "That's it - I'm going home to check on my family. Good luck everyone." And off he went while they tried to find someone else to anchor the news.

In Northridge, the epicentre of the earthquake, entire apartment complexes had collapsed, killing at least 21 people. What were once three storey buildings were now two storey; the first floor was now where the ground floor had been. Only the fact that the ground floor had mainly been car parking had saved many more people from being killed.

The scary part for me was that I had been in Northridge the previous afternoon, looking at a dark blue Plymouth Superbird car that was for sale. In fact, I'd driven right through the area that had been worst hit only about eight hours earlier. I called the guy who had the car to see if perhaps it had been damaged in the 'quake, and whether he'd take less money for it now! However, although half his house had fallen down, luckily for him the garage remained untouched. Obviously the builder had got his priorities right!

The news images went on; a four-mile long freight train carrying toxic chemicals had been derailed, indeed it had been completely flipped over as the tracks had buckled and twisted. A shopping complex had fallen down, and hospitals were turning people away because they were inundated with walking wounded and worse. To add to the chaos in the hospitals, they had only emergency lighting, no power, and no water.

The Santa Monica freeway is eight lanes in each direction, and is the major traffic artery in and out of LA and Hollywood to and from the coast and Santa Monica. In fact, it's the world's busiest freeway. Or it was. If you couldn't drive on the freeway then you'd go along Santa Monica Boulevard. Trouble was, the freeway had collapsed right onto it, causing double the traffic congestion. The police recommended allowing another hour to hour and a half for your journey if you had to go along the Santa Monica freeway. This was definitely the understatement of the year. At the NAMM show, people were telling me it took them five hours to get to work!

And congestion it sure was. A TV news traffic helicopter (Tele-copter!) showed us the Santa Monica freeway at night. You could see a glowing trail of tail-lights leading up to the spot where it had collapsed, and then there was nothing - a black hole where everyone had to turn off the freeway - and a mile further on the tail-lights started up again where the cars turned back onto the freeway.

"The Government offered special financial incentives for the contractors who were rebuilding these overpasses," said Bruce. "The guy doing the one near my studio got an extra million for getting it done ahead of time! I heard he took the money and disappeared to Mexico before the cracks started appearing in the concrete!"

"People became very cautious about driving over these rebuilt overpasses. They would slow down and stop as they approached, then floor the accelerator to get over it quickly. And even quicker when driving underneath them!"

Still, life went on. And every cloud has a silver lining, even in the middle of an earthquake zone, where one person's disaster is another's business opportunity. As I drove through Anaheim the morning after the day of the 'quake, opportunity was knocking loud and clear on the street corners:

"Earthquake T-shirts! Earthquake T-shirts! It's a BIG one - 6.7 on the Richter scale! Come and get your souvenir earthquake T-shirts!"

History was in the making and I was determined to grab a piece of it!

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Cheers

TO ALL YOU

INDUSTRY LEGENDS!

Our industry may have been temporarily grounded this year, but our **passion will never be taken away.**

Wishing you and your families
a safe and joyful festive season.

LET'S THRIVE AGAIN IN 2021!

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